SMART MANUFACTURING

YAGEO

PRODUCT SELECTION GUIDE 2020

5G

TELECOMMUNICATION

CHIP RESISTORS
SURFACE MOUNT MLCC
WIRELESS COMPONENTS

www.yageo.com

POWER & ENERGY

AUTOMOTIVE

Part numbering system and ordering

You can order components from this catalogue in two ways. Both ways give logistic and packing information.

- **Clear text ordering code**

  This unique number is an easily-readable code.
  - 17 digits code (GLOBAL PART NUMBER for both Yageo and Phycomp branded products)

You will find details for ordering in the "*Ordering"* section next to each selection chart.

Minimum shipment quantities, prices and delivering details can be obtained from the Yageo sales organization in your country or from one of our franchised distributors.

Case size codes

Throughout this catalogue, inch-based codes are used for the component sizes. According to IEC 60384-10, amendment 2 of September 2000 for MLCCs, and IEC 60115-8, amendment 1 of July 2000 for R-chip. Values for length and width should be in millimeters rather than in inches. To distinguish between inch-based codes and metric-based codes, metric-based codes will temporarily have the suffix ''M''. The table right next shows the relation between inch-based case sizes versus the recommended metric case size designators. Please note that HF products use metric case size only.

Case size designation and cross-reference					
Inch-based	Metric	Inch-based	Metric	Inch-based	Metric
0050	0201M	0612	1632M	1812	4532M
0075	03015M	0616	1640M	2007	5320M
01005	0402M	0805	2012M	2010	5025M
0201	0603M	0815	2037M	2220	5750M
0202	0605M	0830	2075M	2512	6432M
0402	1005M	1008	2520M	3014	7836M
0404	1010M	1206	3216M	4527	11070M
0408	1020M	1210	3225M	3921	10052M
0508	1220M	1218	3245M	5931	15078M
0603	1608M	1224	3250M		
0606	1616M	1225	3264M		

Contact us

Founded in 1977, the Yageo Corporation has become a world-class provider of passive-component services with capabilities on a global scale, including production and sales facilities in Asia, Europe and America. The corporation is uniquely positioned to provide one-stop-shopping, offering its complete product portfolio of resistors, capacitors and inductors in both commodity and specialty versions, plus design-in capability, distribution, e-commerce connection and logistics. Yageo markets its products under the product brand names Yageo, Phycomp and Vitrohm. All products can be obtained from our Yageo sales offices, of which contact details can be found on the backcover of this catalogue. For most up-to-date information, as well as contact details of our franchise distributors, please refer to our website: **www.yageo.com**

Table of Contents

Chip Resistors General Information		
	Specification overview	7
	Ordering information - Global part number	15
	Ordering information - North America	17
	IEC publication 63, SPQ, last digit of 12NC	18
Chip Resistors Selection Charts		
	RC - Thick film general purpose chip resistors, 0075 to 2512	19
	RC_P - Total lead free thick film general purpose chip resistor, 0201 to 2512	24
	RE - Thick film precision grade chip resistors, 0201 to 1206	27
	YC/TC - Thick film array / network chip resistors	29
	YC/TC - Arrays, convex / concave / flat	31
	YC/TC - Network, T-type / L-type	32
	AC - Automotive grade chip resistors, 0201 to 2512	33
	AC - Automotive grade sulfur-resistant chip resistors, wide termination, 0612 to 1225	36
	AC - Automotive grade chip resistors, TCR 50ppm, 0402 to 1206	38
	AF - Sulfur resistant chip resistors, 0201 to 2512	40
	AF - Sulfur resistant chip resistors, Arrays	43
	AA - Automotive grade sulfur-resistant chip resistors, 0201 to 2512	46
	SR - Surge chip resistors, 0402 to 2512	49
	RV - High voltage chip resistors, 0603 to 2512	52
	CP - Cooper termination chip resistor, 0201	55
	RT - Thin film high precision high stability chip resistors, 0201 to 2512	57
	AT - Automotive grade Thin film high precision high stability chip resistors	61
	RL - Thick film low ohmic chip resistors, 0402 to 2512	63
	RL - Thick film low ohmic, high power chip resistors, 0805 / 1206	66
	PT - Thick film low ohmic low T. C. R. chip resistors, 0402 to 2512	67
	PA - Current sensors - low T. C. R. chip resistors, 0201 to 2512	70
	PA - Low profile current sensors - low T. C. R. chip resistors, 1206 to 2010	73
	PE - Current sensors - low T. C. R. chip resistors, 01005 to 2512	75
	PE - Current sensors - low T. C. R. chip resistors, wide termination, 0508 to 0815	78
	PS - Current sensors - low T. C. R. chip resistors, 4 termination, 0306 / 0612 / 1206	80
	PU - Shunt chip resistors, 2512 / 3921 / 5931	83
	PU - Shunt chip resistors, 6820	86
	PU - Shunt chip resistors, 8420 / 8518	88
	PU - Shunt chip resistors, 8420_E	90
	PU - Shunt chip resistors, 8420_N	92
	AR - NiAu termination chip resistors, 0402 to 1206	94
	TR - Trimmable chip resistors, 0402 to 1206	96
	ATV - RF attenuator chip resistors, 0404	98
	Sample Kits / Sample Books	101
MLCC General Information		
	Specification overview	103
	Ordering information - Global part number	104
	Thickness classes and packing quantities for all series	106

MLCC Selection Charts		
	NPO - General purpose	107
	NPO - General purpose 10 to 50V, 01005 to 1812	107
	NPO - Medium & High voltage	111
	NPO - Medium voltage, 0201 to 1812	112
	NPO - High voltage, 0805 to 1812	114
	NPO - High frequency	115
	NPO - High frequency, 01005 to 0805	115
	X7R - General purpose & High capacitance	117
	X7R - General purpose & High capacitance, 01005 to 2220	117
	X7R - Medium voltage & High voltage	121
	X7R - Medium voltage & High voltage, 0402 to 1812	121
	X7R / X5R - Low inductance	124
	X7R / X5R - Low inductance, 0204 to 0612	124
	NPO / X7R - Soft termination	125
	NPO - Soft termination, 0402 to 1812	126
	X7R - Soft termination, 0402 to 1812	129
	X5R / Y5V - General purpose & High capacitance	134
	X5R - General purpose & High capacitance, 01005 to 1210	134
	Y5V - General purpose & High capacitance 6.3 to 50V, 0402 to 1210	139
	Automotive grade MLCCs	141
	NPO / X8G / X7R / X8R - Automotive grade / High frequency, 0201 to 1812	141
	NPO / X7R - Automotive grade 4-C Arrays, 0508 / 0612	147
	X7R - Automotive grade with Soft termination, 0805 to 1210	148
	Arrays	150
	NPO / X7R - 4C Arrays, 0508 / 0612	150
	Sample Books	152
X2Y® Product Selection Charts		
	SMD ceramic EMI filter capacitors X2Y® series & Ordering information	154
Wireless Components Selection Charts		
	Introduction	158
	Antenna - 2.4 GHz	160
	Antenna - 2.4 GHz, 2.4 GHz / GPS, 2.4 / 5 GHz	161
	Antenna - 5 GHz, Cellular WWAN, Short Range	162
	Antenna - Short-Range, GPS	163
	Antenna - GPS	164
	Antenna - GPS, GPS+Glonass, GNSS	165
	Antenna - GNSS, GPS L1+L5, GNSS+L2&L5, Active GPS / GPS+Glonass / L1+L5	166
	Antenna - Active L1+L2, FM, SDARS, Filter (BPF)	167
	Filter (BPF) / (LPF)	168
	Filter (LPF) / (Diplexer)	169
	Filter (Diplexer)	170
	Filter (Triplexer), Balun	171
	Balun, Balance Filter (Combo), Coupler	172
	Ordering Information	173
	Sample Books	174

SURFACE MOUNT CHIP RESISTORS

Global part number	Series	Size	Power rating	Max. voltage	Operating Temp. range	Resistance range	Tolerance	T. C. R.
RC0075xR-07xxxxL	RC	0075	1/50W	10V	-55°C to 125°C	10Ω ≤ R ≤ 1MΩ Jumper < 50mΩ	±1% ±5%	10Ω ≤ R < 100Ω -200/+600 ppm/°C 100Ω ≤ R ≤ 1MΩ ±200 ppm/°C
RC0100xR-07xxxxL		01005	1/32W	15V		1Ω ≤ R ≤ 22MΩ Jumper < 50mΩ	Max./Min.:10MΩ/1Ω ±1% Max.: 22MΩ ±5% Max./Min.:470KΩ/33Ω ±0.5%	1Ω ≤ R < 10Ω -200/+600 ppm/°C 10Ω ≤ R < 100Ω ±300 ppm/°C 100Ω ≤ R ≤ 10MΩ ±200 ppm/°C 10MΩ < R ≤ 22MΩ ±250 ppm/°C
RC0201xR-07xxxxL		0201	1/20W	25V		1Ω ≤ R ≤ 10MΩ Jumper < 50mΩ	Max./Min.:1MΩ/10Ω ±0.1,0.5% Max.: 10MΩ ±1%,±5%	1Ω ≤ R ≤ 10Ω -100/+350 ppm/°C 10Ω < R ≤ 10MΩ ±200 ppm/°C
RC0402xR-07xxxxL		0402	1/16W	50V	-55°C to 155°C	1Ω ≤ R ≤ 22MΩ Jumper < 50mΩ	Max./Min.:1MΩ/10Ω ±0.1%,±0.5% Max.:10MΩ ±1% Max.:22MΩ ±5%	1Ω ≤ R ≤ 10Ω ±200 ppm/°C 10Ω < R ≤ 10MΩ ±100 ppm/°C 10MΩ < R ≤ 22MΩ ±200 ppm/°C
RC0603xR-07xxxxL		0603	1/10W	75V				
RC0805xR-07xxxxL		0805	1/8W	150V		1Ω ≤ R ≤ 100MΩ Jumper < 50mΩ	Max./Min.:1MΩ/10Ω ±0.1%,±0.5% Max.:10MΩ ±1% Max.:100MΩ ±5% Max./Min.:100MΩ/24MΩ ±10%,±20%	1Ω ≤ R ≤ 10Ω ±200 ppm/°C 10Ω < R ≤ 10MΩ ±100 ppm/°C 10MΩ < R ≤ 22MΩ ±200 ppm/°C 24MΩ ≤ R ≤ 100MΩ ±300 ppm/°C
RC1206xR-07xxxxL		1206	1/4W	200V		1Ω ≤ R ≤ 100MΩ Jumper < 50mΩ	Max./Min.:1MΩ/10Ω ±0.1%,±0.5% Max.:10MΩ ±1% Max.:100MΩ ±5% Max./Min.:100MΩ/24MΩ ±10%,±20%	1Ω ≤ R ≤ 10Ω ±200 ppm/°C 10Ω < R ≤ 10MΩ ±100 ppm/°C 10MΩ < R ≤ 22MΩ ±200 ppm/°C 24MΩ ≤ R ≤ 100MΩ ±300 ppm/°C
RC1210xR-07xxxxL		1210	1/2W	200V		1Ω ≤ R ≤ 22MΩ Jumper < 50mΩ	Max./Min.:1MΩ/10Ω ±0.1%,±0.5% Max.: 10MΩ ±1% Max.:22MΩ ±5%	1Ω ≤ R ≤ 10Ω ±200 ppm/°C 10Ω < R ≤ 10MΩ ±100 ppm/°C 10MΩ < R ≤ 22MΩ ±200 ppm/°C
RC1218xK-07xxxxL		1218	1W	200V		1Ω ≤ R ≤ 1MΩ Jumper < 50mΩ	Max./Min.:1MΩ/10Ω ±0.1%,±0.5% Max.:1MΩ ±1%,±5%	1Ω ≤ R ≤ 10Ω ±200 ppm/°C 10Ω < R ≤ 1MΩ ±100 ppm/°C
RC2010xK-07xxxxL		2010	3/4W	200V		1Ω ≤ R ≤ 22MΩ Jumper < 50mΩ	Max./Min.:1MΩ/10Ω ±0.1%,±0.5% Max.: 10MΩ ±1% Max.:22MΩ ±5%	1Ω ≤ R ≤ 10Ω ±200 ppm/°C 10Ω < R ≤ 10MΩ ±100 ppm/°C 10MΩ < R ≤ 22MΩ ±200 ppm/°C
RC2512xK-07xxxxL		2512	1W	200V				
RC0402xR-7WxxxxL		0402	1/8W	50V		1Ω ≤ R ≤ 1MΩ	±1% ±5%	±200 ppm/°C
RC0603xR-7WxxxxL		0603	1/5W	75V				
RC0805xR-7WxxxxL		0805	1/4W	150V				
RC1206xR-7WxxxxL		1206	1/2W	200V				
RC2512xK-7WxxxxL		2512	2W	200V				
RC0201xR-07xxxxP	RC_P	0201	1/20W	25V	-55°C to 125°C	1Ω ≤ R ≤ 10MΩ Jumper < 50mΩ	Max./Min.:1MΩ/10Ω ±0.5% Max.: 10MΩ ±1%,±5%	1Ω ≤ R ≤ 10Ω -100/+500 ppm/°C 10Ω ≤ R ≤ 100Ω ±300 ppm/°C 100Ω ≤ R ≤ 10MΩ ±200 ppm/°C
RC0402xR-07xxxxP		0402	1/16W	50V	-55°C to 155°C	1Ω ≤ R ≤ 22MΩ Jumper < 50mΩ	Max./Min.: 1MΩ/10Ω ±0.5% Max.: 22MΩ ±5% Max.: 10MΩ ±1%	1Ω ≤ R ≤ 10Ω ±350 ppm/°C 10Ω ≤ R ≤ 100Ω ±200 ppm/°C 100Ω ≤ R ≤ 10MΩ ±150 ppm/°C 10MΩ ≤ R ≤ 22MΩ ±200 ppm/°C
RC0603xR-07xxxxP		0603	1/10W	75V				1Ω ≤ R ≤ 10Ω ±300 ppm/°C 10Ω ≤ R ≤ 100Ω ±200 ppm/°C 100Ω ≤ R ≤ 10MΩ ±150 ppm/°C 10MΩ ≤ R ≤ 22MΩ ±200 ppm/°C
RC0805xR-07xxxxP		0805	1/8W	150V				1Ω ≤ R ≤ 10Ω ±300 ppm/°C 10Ω ≤ R ≤ 100Ω ±150 ppm/°C 100Ω ≤ R ≤ 10MΩ ±100 ppm/°C 10MΩ ≤ R ≤ 22MΩ ±200 ppm/°C
RC1206xR-07xxxxP		1206	1/4W	200V				1Ω ≤ R ≤ 10Ω ±300 ppm/°C 10Ω ≤ R ≤ 100Ω ±100 ppm/°C 100Ω ≤ R ≤ 10MΩ ±100 ppm/°C 10MΩ ≤ R ≤ 22MΩ ±200 ppm/°C
RC1210xR-07xxxxP		1210	1/2W	200V				
RC1218xK-07xxxxP		1218	1W	200V		1Ω ≤ R ≤ 1MΩ Jumper < 50mΩ	Max./Min.:1MΩ/10Ω ±0.5% Max.: 1MΩ ±1%,±5%	
RC2010xK-07xxxxP		2010	3/4W	200V		1Ω ≤ R ≤ 22MΩ Jumper < 50mΩ	Max./Min.: 1MΩ/10Ω ±0.5% Max.: 22MΩ ±5% Max.: 10MΩ ±1%	
RC2512xK-07xxxxP		2512	1W	200V				

Note: " **!** " is the symbol for new product

Specification overview

Global part number	Series	Size	Power rating	Max. voltage	Operating Temp range	Resistance range	Tolerance	T. C. R.
RE0201xRE07xxxxL	RE	0201	1/20W	25V	-55°C to 155°C	100Ω ≤ R ≤ 1MΩ	±0.1% ±0.5% ±1%	±50 ppm/°C
RE0402xRE07xxxxL		0402	1/16W	50V		10Ω ≤ R ≤ 1MΩ		
RE0603xRE07xxxxL		0603	1/10W	75V		10Ω ≤ R ≤ 1MΩ		
RE0805xRE07xxxxL		0805	1/8W	150V		10Ω ≤ R ≤ 1MΩ		
RE1206xRE07xxxxL		1206	1/4W	200V		10Ω ≤ R ≤ 1MΩ		
YC102-xR-07xxxxL	YC	2*0201	1/32W	15V	-55°C to 125°C	10Ω ≤ R ≤ 1MΩ Jumper < 50mΩ	±1% ±5%	±200 ppm/°C
YC104-xR-07xxxxL		4*0201	1/32W	12.5V				
YC122-xR-07xxxxL		2*0402	1/16W	50V	-55°C to 155°C	1Ω ≤ R ≤ 1MΩ Jumper < 50mΩ	±1% ±5%	
YC124-xR-07xxxxL		4*0402	1/16W	25V		1Ω ≤ R ≤ 1MΩ Jumper < 50mΩ	±1% ±5%	1Ω ≤ R < 10Ω ±250 ppm/°C 10Ω ≤ R ≤ 1MΩ ±200 ppm/°C
YC162-xR-07xxxxL		2*0603	1/16W	50V		1Ω ≤ R ≤ 1MΩ Jumper < 50mΩ		±200 ppm/°C
YC164-xR-07xxxxL		4*0603	1/16W	50V		1Ω ≤ R ≤ 1MΩ Jumper < 50mΩ		
YC248-xR-07xxxxL		8*0602	1/16W	50V		10Ω ≤ R ≤ 1MΩ Jumper < 50mΩ		
YC324-xK-07xxxxL		4*1206	1/8W	200V		10Ω ≤ R ≤ 1MΩ Jumper < 50mΩ		
TC122-xR-07xxxxL	TC	2*0402	1/16W	50V	-55°C to 125°C	10Ω ≤ R ≤ 1MΩ Jumper < 50mΩ	±1% ±5%	±200 ppm/°C
TC124-xR-07xxxxL		4*0402	1/16W	50V				
TC164-xR-07xxxxL		4*0603	1/16W	50V	-55°C to 155°C			
YC158TJR-07xxxxL	YC158T	10P8R (0612)	1/16W	25V	-55°C to 155°C	10Ω ≤ R ≤ 100KΩ	±5%	±200 ppm/°C
YC358TJx-07xxxxL YC358LJx-07xxxxL	YC358L YC358T	10P8R (1225)	1/16W	50V		10Ω ≤ R ≤ 330KΩ		±200 ppm/°C
AC0201xR-07xxxxL	AC	0201	1/20W	25V	-55°C to 155°C	1Ω ≤ R ≤ 10MΩ Jumper < 50mΩ	Max.: 10MΩ ±5%, ±1% Max./Min.: 1MΩ/10Ω ±0.5%	1Ω ≤ R ≤ 10Ω -100/+350 ppm/°C 10Ω < R ≤ 10MΩ ±200 ppm/°C
AC0402xR-07xxxxL		0402	1/16W	50V		1Ω ≤ R ≤ 22MΩ Jumper < 50mΩ	Max.: 10MΩ ±0.5%, ±1% Max./Min.: 1MΩ/10Ω ±5%	1Ω ≤ R ≤ 10Ω ±200 ppm/°C 10Ω < R ≤ 10MΩ ±100 ppm/°C 10MΩ < R ≤ 22MΩ ±200 ppm/°C
AC0603xR-07xxxxL		0603	1/10W	75V				
AC0805xR-07xxxxL		0805	1/8W	150V				
AC1206xR-07xxxxL		1206	1/4W	200V				
AC1210xR-07xxxxL		1210	1/2W	200V				
AC1218xK-07xxxxL		1218	1W	200V		1Ω ≤ R ≤ 1MΩ Jumper < 50mΩ	±0.5%, ±1%, ±5%	1Ω ≤ R ≤ 10Ω ±200 ppm/°C 10Ω < R ≤ 1MΩ ±100 ppm/°C
AC2010xK-07xxxxL		2010	3/4W	200V		1Ω ≤ R ≤ 22MΩ Jumper < 50mΩ	Max.: 10MΩ ±0.5%, ±1% Max./Min.: 1MΩ/10Ω ±5%	1Ω ≤ R ≤ 10Ω ±200 ppm/°C 10Ω < R ≤ 10MΩ ±100 ppm/°C 10MΩ < R ≤ 22MΩ ±200 ppm/°C
AC2512xK-07xxxxL		2512	1W	200V				
AC0402xR-7WxxxxL		0402	1/8W	50V	-55°C to 155°C	1Ω ≤ R ≤ 10MΩ	±0.5%, ±1%, ±5%	1Ω ≤ R ≤ 10Ω ±200 ppm/°C 10Ω < R ≤ 10MΩ ±100 ppm/°C
AC0603xR-7WxxxxL		0603	1/5W	75V				
AC0805xR-7WxxxxL		0805	1/4W	150V				
AC1206xR-7WxxxxL		1206	1/2W	200V				
AC1210xR-7WxxxxL		1210	1W	200V				
AC1218xK-7WxxxxL		1218	1.5W	200V				
AC2010xK-7WxxxxL		2010	1.25W	200V				
AC2512xK-7WxxxxL		2512	2W	200V				

Note: " **!** " is the symbol for new product

Global part number	Series	Size	Power rating	Max. voltage	Operating Temp range	Resistance range	Tolerance	T. C. R.
AC0612xR-07xxxxL	AC wide	0612	3/4W	200V	-55°C to 155°C	1Ω ≤ R ≤ 1MΩ	±0.5%, ±1%, ±5%	1Ω ≤ R ≤ 10Ω ±200 ppm/°C 10Ω < R ≤ 1MΩ ±100 ppm/°C
AC1020xK-07xxxxL		1020	1W	200V				
AC1225xK-07xxxxL		1225	2W	200V				
!AC0402xRE07xxxxL	AC 50 ppm	0402	1/16W	50V	-55°C to 155°C	10Ω ≤ R ≤ 1MΩ	±0.1%, ±0.5%, ±1%	± 50 ppm/°C
!AC0603xRE07xxxxL		0603	1/10W	75V				
!AC0805xRE07xxxxL		0805	1/8W	150V				
!AC1206xRE07xxxxL		1206	1/4W	200V				
AF0201xR-07xxxxL	AF	0201	1/20W	25V	-55°C to 155°C	1Ω ≤ R ≤ 10MΩ Jumper < 50mΩ	±1%, ±5%, ±0.5%	1Ω ≤ R ≤ 10Ω -100/+350 ppm/°C 10Ω < R ≤ 10MΩ ±200 ppm/°C
AF0402xR-07xxxxL		0402	1/16W	50V		1Ω ≤ R ≤ 22MΩ Jumper < 50mΩ	Max:10MΩ ±0.5%, ±1% Max:22MΩ ±5%	1Ω ≤ R ≤ 10Ω ±200 ppm/°C 10Ω < R ≤ 10MΩ ±100 ppm/°C 10MΩ < R ≤ 22MΩ ±200 ppm/°C
AF0603xR-07xxxxL		0603	1/10W	75V				
AF0805xR-07xxxxL		0805	1/8W	150V				
AF1206xR-07xxxxL		1206	1/4W	200V				
AF1210xR-07xxxxL		1210	1/2W	200V		1Ω ≤ R ≤ 10MΩ Jumper < 50mΩ	±1%, ±5% , ±0.5%	1Ω ≤ R ≤ 10Ω ±200 ppm/°C 10Ω < R ≤ 10MΩ ±100 ppm/°C
AF1218xK-07xxxxL		1218	1W	200V		1Ω ≤ R ≤ 1MΩ Jumper < 50mΩ		
AF2010xK-07xxxxL		2010	3/4W	200V		1Ω ≤ R ≤ 10MΩ Jumper < 50mΩ		
AF2512xK-07xxxxL		2512	1W	200V				
!AF0402xR-7WxxxxL		0402	1/8W	50V		1Ω≤R≤10MΩ	±0.5%, ±1%, ±5%	1Ω≤R≤10Ω ±200 ppm°C 10Ω<R≤10MΩ ±100 ppm°C
!AF0603xR-7WxxxxL		0603	1/5W	75V				
!AF0805xR-7WxxxxL		0805	1/4W	150V				
!AF1206xR-7WxxxxL		1206	1/2W	200V				
AF122-xR-07xxxxL		2*0402	1/16W	50V		1Ω ≤ R ≤ 1MΩ Jumper < 50mΩ	Max.: 1MΩ ±5% Max./Min.: 1MΩ/10Ω ±1%	1Ω ≤ R ≤ 10Ω ±250 ppm/°C 10Ω < R ≤ 1MΩ ±200 ppm/°C
AF124-xR-07xxxxL		4*0402	1/16W	25V			±1%,±5%	
AF162-xR-07xxxxL		2*0603	1/16W	50V			±1%,±5%	
AF164-xR-07xxxxL		4*0603	1/16W	50V			±1%,±5%	±250 ppm/°C
AA0201xR-07xxxxL	AA	0201	1/20W	25V	-55°C to 155°C	1Ω ≤ R ≤ 10MΩ Jumper < 50mΩ	±0.5%, ±1%, ±5%	1Ω ≤ R ≤ 10Ω -100/ +400 ppm/°C 10Ω < R ≤ 10MΩ ±300 ppm/°C
AA0402xR-07xxxxL		0402	1/16W	50V		1Ω ≤ R ≤ 22MΩ Jumper < 50mΩ	Max:22MΩ, ±5% Max:10MΩ, ±0.5%, ±1%	1Ω ≤ R ≤ 10Ω ±200 ppm/°C 10Ω < R ≤ 10MΩ ±150 ppm/°C 10MΩ ≤ R ≤ 22MΩ ±200 ppm/°C
AA0603xR-07xxxxL		0603	1/10W	75V				
AA0805xR-07xxxxL		0805	1/8W	150V				
AA1206xR-07xxxxL		1206	1/4W	200V				
AA1210xR-07xxxxL		1210	1/2W	200V				
AA1218xK-07xxxxL		1218	1W	200V		1Ω ≤ R ≤ 1MΩ Jumper< 50mΩ	±0.5%, ±1%, ±5%	
AA2010xK-07xxxxL		2010	3/4W	200V		1Ω ≤ R ≤ 22MΩ Jumper < 50mΩ	Max:22MΩ, ±5% Max:10MΩ, ±0.5%, ±1%	
AA2512xK-07xxxxL		2512	1W	200V				

Note: " **!** " is the symbol for new product

Specification overview

Global part number	Series	Size	Power rating	Max. voltage	Operating Temp range	Resistance range	Tolerance	T. C. R.
SR0402xR-07xxxxL	SR	0402	1/16W	50V	-55°C to 155°C	1Ω ≤ R ≤ 1MΩ	±0.5% ±1% ±5% ±10% ±20%	±200 ppm/°C
SR0402xR-7WxxxxL			1/8W					
!SR0402xR-7TxxxxL			1/5W					
SR0603xR-07xxxxL		0603	1/10W	75V				
SR0603xR-7WxxxxL			1/5W					
SR0603xR-7TxxxxL			1/4W					
SR0805xR-07xxxxL		0805	1/8W	150V				
SR0805xR-7WxxxxL			1/4W					
SR0805xR-7TxxxxL			1/3W					
!SR0805xR-47xxxxL			1/2W					
SR1206xR-07xxxxL		1206	1/4W	200V				
SR1206xR-7WxxxxL			1/2W					
!SR1206xR-7TxxxxL			3/4W					
!SR1206xR-47xxxxL			1W					
SR1210xR-07xxxxL		1210	1/2W	200V				
SR1210xR-7WxxxxL			1W	200V				
SR1218xK-07xxxxL		1218	1W	200V				
!SR1218xK-7WxxxxL			1.5W					
SR2010xK-07xxxxL		2010	3/4W	200V				
!SR2010xK-7WxxxxL			1.25W					
SR2512xK-07xxxxL		2512	1W	200V				
!SR2512xK-7WxxxxL			2W					
RV0603xR-07xxxxL	RV	0603	1/10W	350V	-55°C to 155°C	47Ω ≤ R ≤ 10MΩ	±0.5%,±1%,±5%	±100 ppm/°C ±200 ppm/°C
RV0805xR-07xxxxL		0805	1/8W	400V		47Ω ≤ R ≤ 22MΩ	Max.: 22MΩ ±5%,±1% Max.: 10MΩ ±0.5%	
RV1206xR-07xxxxL		1206	1/4W	500V		47Ω ≤ R ≤ 27MΩ	Max.: 27MΩ ±5%,±1% Max.: 15MΩ ±0.5%	
RV2010xK-07xxxxL		2010	3/4W			47Ω ≤ R ≤ 22MΩ	Max.: 22MΩ ±5%,±1% Max.: 10MΩ ±0.5%	
RV2512xK-07xxxxL		2512	1W			47Ω ≤ R ≤ 16MΩ	Max.: 16MΩ ±5%,±1% Max.: 10MΩ ±0.5%	
CP0201xR-07xxxxL	CP	0201	1/20W	25V	-55°C to 125°C	10Ω~1MΩ	±1%, ±5%	±200 ppm/°C
RT0201xRx07xxxxL	RT	0201	1/20W	25V	-55°C to 125°C	22Ω ≤ R ≤ 75KΩ	±0.1%,±0.25%, ±0.5%,±1%	±5 ppm/°C ±10 ppm/°C ±15 ppm/°C ±25 ppm/°C ±50 ppm/°C
RT0402xRx07xxxxL		0402	1/16W	50V	-55°C to 155°C	4.7Ω ≤ R ≤ 240KΩ	±0.01% ±0.02% ±0.05% ±0.1% ±0.25% ±0.5% ±1%	
RT0603xRx07xxxxL		0603	1/10W	75V		1Ω ≤ R ≤ 1MΩ		
RT0805xRx07xxxxL		0805	1/8W	150V		1Ω ≤ R ≤ 1.5MΩ		
RT1206xRx07xxxxL		1206	1/4W	200V		1Ω ≤ R ≤ 1.5MΩ		
RT1210xRx07xxxxL		1210	1/4W		-55°C to 125°C	4.7Ω ≤ R ≤ 1MΩ		
RT2010xKx07xxxxL		2010	1/2W			4.7Ω ≤ R ≤ 1MΩ		
RT2512xKx07xxxxL		2512	3/4W			4.7Ω ≤ R ≤ 1MΩ		

Note: " **!** " is the symbol for new product

Global part number	Series	Size	Power rating	Max. voltage	Operating Temp range	Resistance range	Tolerance	T. C. R.
!AT0402xRx07xxxxL	AT	0402	1/16W	50V	-55°C to 155°C	10Ω ≤ R ≤ 100KΩ	±0.1% ±0.25% ±0.5% ±1%	±15 ppm/°C ±25 ppm/°C ±50 ppm/°C
!AT0603xRx07xxxxL		0603	1/10W	75V		10Ω ≤ R ≤ 330KΩ		
!AT0805xRx07xxxxL		0805	1/8W	150V		10Ω ≤ R ≤ 1MΩ		
!AT1206xRx07xxxxL		1206	1/4W	200V				
RL0402xR-07xxxxL	RL	0402	1/16W	(PxR)^1/2	-55°C to 155°C	50mΩ ≤ R < 1Ω	±1% ±2% ±5%	See table T. C. R. - RL series
RL0603xR-07xxxxL		0603	1/10W			10mΩ ≤ R < 1Ω		
RL0805xR-07xxxxL		0805	1/8W					
RL1206xR-07xxxxL		1206	1/4W					
RL1210xR-07xxxxL		1210	1/2W			10mΩ ≤ R < 1Ω		
RL1218xK-07xxxxL		1218	1W					
RL2010xK-07xxxxL		2010	3/4W					
RL2512xK-07xxxxL		2512	1W					
RL0805xR-7WxxxxL		0805	1/4W		-55°C to 125°C	10mΩ ≤ R < 1Ω		
RL1206xR-7WxxxxL		1206	1/2W					
PT0402xR-07xxxxL	PT	0402	1/16W	(PxR)^1/2	-55°C to 155°C	50mΩ ≤ R < 1Ω	±1% ±2% ±5%	See table T.C.R. - PT series
PT0603xR-07xxxxL		0603	1/10W			50mΩ ≤ R < 1Ω		
PT0805xR-07xxxxL		0805	1/8W			50mΩ ≤ R < 1Ω		
PT1206xR-07xxxxL		1206	1/4W					
PT2010xK-07xxxxL		2010	3/4W			100mΩ ≤ R < 1Ω		
PT2512xK-07xxxxL		2512	1W					
PT0402xR-7WxxxxL		0402	1/8W			50mΩ ≤ R < 1Ω		
PT0603xR-7WxxxxL		0603	1/5W					
PT0805xR-7WxxxxL		0805	1/4W					
PT1206xR-7WxxxxL		1206	1/2W					
PT2010xK-7WxxxxL		2010	1W			100mΩ ≤ R < 1Ω		
PT2512xK-7WxxxxL		2512	2W					
PT0603xR-7TxxxxL		0603	1/3W			50mΩ ≤ R ≤ 68mΩ		

Note: " **!** " is the symbol for new product

Specification overview

Global part number	Series	Size	Power rating	Max. voltage	Operating Temp. range	Resistance range	Tolerance	T. C. R.
!PA0201xRL07xxxxxL	PA	0201	1/20W	(PxR)^1/2	-55°C to 125°C	5mΩ ≤ R ≤ 10mΩ Jumper < 5mΩ	±1% ±5%	±150 ppm/°C
!PA0201xRL7WxxxxxL			1/10W					
!PA0201xRL7TxxxxxL			3/20W					
!PA0201xRL47xxxxxL			1/5W					
!PA0402xRL07xxxxxL		0402	1/16W			2.5mΩ 5mΩ ≤ R ≤ 20mΩ Jumper < 1mΩ		±150 ppm/°C
!PA0402xRL7WxxxxxL			1/8W					
!PA0402xRL7TxxxxxL			1/6W					
!PA0402xRL47xxxxxL			1/4W					
!PA0402xRL57xxxxxL			1/3W					
!PA0603xRx07xxxxxL		0603	1/10W		-55°C to 155°C	1mΩ ≤ R ≤ 20mΩ Jumper < 0.2mΩ		1mΩ ±100 ppm/°C 2mΩ/ 2.5mΩ ±150 ppm/°C 3mΩ~20mΩ ±50 ppm/°C ±75 ppm/°C ±100 ppm/°C
!PA0603xRx7WxxxxxL			1/5W					
!PA0603xRx7TxxxxxL			1/3W					
!PA0603xRx47xxxxxL			2/5W					
!PA0603xRx57xxxxxL			1/2W					
!PA0805xRx07xxxxxL		0805	1/8W			1mΩ ≤ R ≤ 20mΩ Jumper < 0.2mΩ		1mΩ ±150 ppm/°C 2mΩ ±100 ppm/°C 3mΩ ~20mΩ ± 50 ppm/°C
!PA0805xRx7WxxxxxL			1/4W					
!PA0805xRx47xxxxxL			1/2W					
!PA0805xRx87xxxxxL			1W					
!PA1206xRx07xxxxL		1206	1/4W		-55°C to 170°C	1mΩ ≤ R ≤ 50mΩ		1mΩ ≤ R ≤ 2mΩ ±75 ppm/°C ±100 ppm/°C 3mΩ ≤ R ≤ 50mΩ ±50 ppm/°C ±75 ppm/°C ±100 ppm/°C
!PA1206xRx7WxxxxL			1/2W					
!PA1206xRx47xxxxL			1W					
!PA2512xKx07xxxxE		2512	1W			0.5mΩ ≤ R ≤ 100mΩ		±50 ppm/°C ±75 ppm/°C ±100 ppm/°C
!PA2512xKx7WxxxxE			2W					
!PA2512xKx7TxxxxE			3W					
!PA1206xRE07xxxxxZ		1206	1/4W			5mΩ ≤ R ≤ 20mΩ	±0.5%	±50ppm°C
!PA1206xRE7WxxxxxZ			1/2W			1mΩ ≤ R ≤ 20mΩ	±1% ±5%	
!PA1206xRE47xxxxxZ			1W					
!PA2010xKE07xxxxxZ		2010	1/2W			1mΩ ≤ R ≤ 20mΩ		±50ppm°C
!PA2010xKE7WxxxxxZ			1W					
!PA2010xKE47xxxxxZ			2W					
!PA2010xKE67xxxxxZ			3W					

Note: " **!** " is the symbol for new product

Global part number	Series	Size	Power rating	Max. voltage	Operating Temp. range	Resistance range	Tolerance	T. C. R.
!PE0100xRx07xxxxL	PE	01005	1/32W	(PxR)^1/2	-55°C to 125°C	200mΩ ≤ R ≤ 500mΩ	±1% ±5%	200mΩ ≤ R < 300mΩ ±300 ppm/°C 300mΩ ≤ R ≤ 500mΩ ±200 ppm/°C
!PE0100xRx7Wxxxx L			1/16W					
!PE0201xRx07xxxxL		0201	1/20W			50mΩ ≤ R ≤ 200mΩ	±0.5% (>10mΩ) ±1% ±5%	50mΩ ≤ R ≤ 70mΩ ±350 ppm/°C 70mΩ < R ≤ 200mΩ ±100 ppm/°C
!PE0201xRx7Wxxxx L			1/10W					
!PE0402xRx07xxxxL		0402	1/16W			10mΩ ≤ R ≤ 910mΩ		±100 ppm/°C
!PE0402xRx7Wxxxx L			1/8W					
!PE0402xRx7Txxxx L			1/6W					
!PE0402xRx47xxxxL			1/4W					
!PE0603xRx07xxxxL		0603	1/10W		-55°C to 170°C	5mΩ ≤ R ≤ 910mΩ		±75 ppm/°C ±100 ppm/°C
!PE0603xRx7Wxxxx L			1/5W					
!PE0603xRx7Txxxx L			1/3W					
!PE0603xRx47xxxxxL			2/5W					
!PE0603xRx57xxxxxL			1/2W					
!PE0805xRx07xxxxxL		0805	1/8W					
!PE0805xRx7Wxxxxx L			1/4W					
!PE0805xRx7Txxxxx L			1/3W					
!PE0805xRx47xxxxxL			1/2W					
!PE1206xRx07xxxxxL		1206	1/4W			5mΩ ≤ R ≤ 910mΩ		5mΩ ≤ R ≤ 19mΩ ±75 ppm/°C ±100 ppm/°C ±50 ppm/°C 20mΩ ≤ R ≤ 910mΩ ±75 ppm/°C ±100 ppm/°C
!PE1206xRx7Wxxxxx L			1/2W					
!PE1206xRx47xxxxxL			1W					
!PE2010xKx07xxxxxL		2010	1/2W			5mΩ ≤ R ≤ 910mΩ		±50 ppm/°C ±75 ppm/°C ±100 ppm/°C
!PE2010xKx7Wxxxxx L			1W					
!PE2512xKx07xxxxxL		2512	1W			6mΩ ≤ R ≤ 910mΩ		
!PE2512xKx7Wxxxxx L			2W					
!PE0508xRx07xxxxxL	PE (Wide)	0508	1W	(PxR)^1/2	-55°C to 155°C	5mΩ ≤ R ≤ 1Ω	±1% ±5%	5mΩ ≤ R < 75mΩ ±100 ppm/°C 75mΩ ≤ R ≤ 1Ω ±50 ppm/°C
!PE0612xKx07xxxxxL		0612	1W			1mΩ ≤ R ≤ 1Ω		1mΩ ±150 ppm/°C 2mΩ ±100 ppm/°C 3mΩ ≤ R ≤ 1Ω ±50 ppm/°C ±75 ppm/°C ±100 ppm/°C
!PE0815xKx07xxxxL		0815	1/2W			1mΩ ≤ R ≤ 100mΩ		±75 ppm/°C ±100 ppm/°C
!PE0815xKx7Wxxxx L			1W					
!PS0306xRx07xxxxxL	PS (4 Termi-nation)	0306	1/4W	(PxR)^1/2	-55°C to 125°C	2mΩ ≤ R ≤ 100mΩ	±1% ±5%	5mΩ ≤ R < 100mΩ ±75 ppm/°C ±100 ppm/°C 2mΩ ≤ R < 5mΩ ±150 ppm/°C
!PS0306xRx7Wxxxxx L			1/3W					
!PS0306xRx7Txxxxx L			1/2W					
!PS0612xKx07xxxxxL		0612	1W		0.5mΩ ≤ R ≤10mΩ -55°C to 150°C 12mΩ ≤ R ≤ 100mΩ -55°C to 125°C	0.5mΩ 1mΩ ≤ R ≤ 100mΩ		0.5mΩ ±300 ppm/°C 1mΩ ±150 ppm/°C 10mΩ ≤ R ≤ 13mΩ ±200 ppm/°C 2mΩ ≤ R ≤ 9mΩ ±100 ppm/°C 14mΩ ≤ R ≤ 100mΩ ±100 ppm/°C
!PS1206xRx07xxxxL		1206	1/2W		-40°C to 125°C	10mΩ ≤ R ≤ 100mΩ		±50 ppm/°C ±75 ppm/°C ±100 ppm/°C
PS1225xKx07xxxxL		1225	3W	(PxR)^1/2	-55°C to 150°C	3mΩ ≤ R ≤ 100mΩ	±1% ±5%	3mΩ ±500ppm/°C 4mΩ ≤ R ≤100mΩ ±100ppm/°C

Note: "!" is the symbol for new product

Specification overview

Global part number	Series	Size	Power rating	Max. voltage	Operating Temp. range	Resistance range	Tolerance	T. C. R.
!PU2512xKx07xxxxL	PU	2512	4W	(PxR)^1/2	-55°C to 170°C	3mΩ/ 4mΩ/ 5mΩ	±1% ±5%	0.3mΩ / 0.5mΩ ±200 ppm/°C 1mΩ ±175 ppm/°C 2mΩ~5mΩ ±75 ppm/°C
!PU2512xKxP5xxxxL			5W			1mΩ/ 2mΩ		
!PU2512xKxP6xxxxL			6W			0.3mΩ/ 0.5mΩ		
!PU3921xKx13xxxxL		3921	3W		-55°C to 170°C	0.2mΩ/ 0.25mΩ/ 0.3mΩ/ 0.4mΩ/ 0.5mΩ/ 0.7mΩ 1mΩ/ 2mΩ/ 3mΩ/ 4mΩ/ 5mΩ		0.2mΩ/ 0.25mΩ/ 0.3mΩ/ 0.4mΩ/ 0.5mΩ/ 0.7mΩ ±175 ppm/°C 1mΩ~5mΩ ±75 ppm/°C
					-55°C to 275°C	0.5mΩ/ 1mΩ/ 2mΩ/ 3mΩ/ 4mΩ		0.2mΩ ±325 ppm/°C
!PU3921xKxP5xxxxL			5W		-55°C to 170°C	0.2mΩ/ 0.25mΩ/ 0.3mΩ/ 0.4mΩ/ 0.5mΩ/ 0.7mΩ 1mΩ/ 2mΩ/ 3mΩ/ 4mΩ/ 5mΩ		0.2mΩ/ 0.25mΩ 0.3mΩ/ 0.4mΩ ±175 ppm/°C 0.5mΩ/ 0.7mΩ 1mΩ~5mΩ ±75 ppm/°C
!PU3921xKxP9xxxxL			9W			0.2mΩ/ 0.25mΩ/ 0.3mΩ/ 0.4mΩ/ 0.5mΩ/ 0.7mΩ/1mΩ		
!PU5931xKx13xxxxL		5931	5W		-55°C to 170°C	0.2mΩ/ 0.3mΩ/ 0.5mΩ/ 1mΩ/ 2mΩ/ 3mΩ/ 4mΩ		0.1mΩ ±300 ppm/°C 0.2mΩ ±225 ppm/°C 0.3mΩ/ 0.5mΩ ±175 ppm/°C 1mΩ~4mΩ ±75 ppm/°C
					-55°C to 275°C	0.3mΩ/ 0.5mΩ/ 1mΩ/ 2mΩ/ 3mΩ/ 4mΩ		
!PU5931xKxP7xxxxL			7W		-55°C to 170°C	0.2mΩ/ 0.3mΩ/ 0.5mΩ/ 1mΩ/ 2mΩ/ 3mΩ/ 4mΩ		
!PU5931xKxPAxxxxL			10W			0.2mΩ/ 0.3mΩ/ 0.5mΩ		
!PU5931xKxPBxxxxL			15W			0.1mΩ		
!PU6820JKF070U1L		6820	36W		-65°C to 170°C	0.1mΩ	±5%	±100 ppm/°C
!PU8518xKx070UxxxL		8518	36W		-65°C to 170°C	0.05mΩ/ 0.1mΩ/ 0.125mΩ/ 0.25mΩ	±5% ±10%	0.05mΩ ±200 ppm/°C 0.1mΩ/ 0.125mΩ ±175 ppm/°C 0.25mΩ ±100 ppm/°C
!PU8420xKE070UxxxL		8420	36W		-40°C to 170°C	0.05mΩ/ 0.1mΩ	±5%	±50 ppm/°C
!PU8420JKExx0UxxxE			15W			0.1mΩ		±50 ppm/°C
!PU8420JKP640U035N			15W			0.035mΩ		±250 ppm/°C
AR0402xR-07xxxxL	AR	0402	1/16W	50V	-55°C to 155°C	1Ω ≤ R ≤ 10MΩ Jumper < 50mΩ	±1% ±5%	1Ω ≤ R ≤ 10Ω ±200 ppm/°C 10Ω < R ≤ 10MΩ ±100 ppm/°C
AR0603xR-07xxxxL		0603	1/10W	50V				
AR0805xR-07xxxxL		0805	1/8W	150V				
AR1206xR-07xxxxL		1206	1/4W	200V				
TR0402xR-07xxxxL	TR	0402	1/16W	50V	-55°C to 125°C	1Ω ≤ R ≤ 10MΩ	+0/-10% +0/-20% +0/-30%	1Ω ≤ R ≤ 10Ω ±200 ppm/°C 10Ω < R ≤ 1MΩ ±100 ppm/°C 1MΩ < R ≤ 10MΩ ±200 ppm/°C
TR0603xR-07xxxxL		0603	1/16W					
TR0805xR-07xxxxL		0805	1/8W	150V	-55°C to 155°C			
TR1206xR-07xxxxL		1206	1/4W	200V				
ATV321xR-07xxxxL	ATV	0404	40mW	50V	-55°C to 125°C	-1dB to -20dB	±0.3dB ±0.5dB ±1.0dB ±2.0dB	---

Note: " **!** " is the symbol for new product

Global part number - Single resistor [3]

R C 0 4 02 J R — 07 1 0 R L

Series name (code 1-2)
- RC = Thick film general purpose
- RE = Thick film precision grade
- AC = Automotive grade
- AF = Sulfur resistant
- AA = Sulfur resistant automotive grade
- SR = Surge
- RV = High voltage
- RT = Thin film high precision high stability
- AT = Thin film automotive grade
- RL = Thick film low ohmic
- PT = Thick film low ohmic low T. C. R.
- PA/PE = Current sensor - low T. C. R.
- PS = Current sensor - low T.C.R, 4 termination
- PU = Shunt resistor
- AR = NiAu termination
- TR = Trimmable

Size code (code 3-6)
(inch / metric)
- 0075 = 0.3 x 0.1
- 0100 = 0.4 x 0.2
- 0201 = 0.6 x 0.3
- 0402 = 1.0 x 0.5
- 0603 = 1.6 x 0.8
- 0612 = 1.6 x 3.2
- 0805 = 2.0 x 1.25
- 0830 = 2.0 x 7.5
- 1206 = 3.2 x 1.6
- 1210 = 3.2 x 2.6
- 1218 = 3.2 x 4.5
- 2010 = 5.0 x 2.5
- 2512 = 6.35 x 3.2
- 3921 =10.0 x 5.2
- 5931 =15.0 x 7.75

Tolerance (code 7)
- L = ±0.01%
- P = ±0.02%
- W = ±0.05%
- B = ±0.1%
- C = ±0.25%
- D = ±0.5%
- F = ±1%
- G = ±2%
- J = ±5% (for RC/AR/AF/AC Jumper ordering)
- K = ±10% (for TR = 0/-10%)
- M = ±20% (for TR = 0/-20%)
- N = ±30% (for TR = 0/-30%)
- "—" for RL/PT Jumper ordering

Default code [1/2] (code 17)

Resistance (code 12-16)
- 0R = Jumper
- 0U5 = 0.0005Ω
- 0R1 = 0.1Ω
- 1R = 1Ω
- 10R = 10Ω
- 100R = 100Ω
- 1K = 1 000Ω
- 1M = 1 000 000Ω
- 100M = 100 000 000Ω

Taping reel (code 10-11)
- 07 = 7 inch Dia. reel
- 10 = 10 inch Dia. reel
- 13 = 13 inch Dia. reel
- 7W = 7 inch Dia. reel 2 x standard power
- 3W = 13 inch Dia. reel 2 x standard power
- 7N = 7 inch Dia. reel, ESD safe reel

T. C. R. (code 9)
- A = ±5 ppm/°C
- B = ±10 ppm/°C
- C = ±15 ppm/°C
- D = ±25 ppm/°C
- E = ±50 ppm/°C
- M = ±75 ppm/°C
- F = ±100 ppm/°C
- L = ±150 ppm/°C
- G = ±200 ppm/°C
- H = ±225 ppm/°C
- I = ±300 ppm/°C
- N = ±175 ppm/°C
- O = ±325 ppm/°C
- J = ±350 ppm/°C
- K = ±400 ppm/°C
- Q = ±700 ppm/°C
- "—" = Based on spec.
- (— for thick film only)

Packing style (code 8)
- R = Paper tape reel
- K = Embossed plastic tape reel
- S = ESD safe reel

Note: 1. All of our RSMD products are RoHS compliant. "LFP" of the internal 2D reel label mentions "Lead Free Process"
2. Letter L is system default code for ordering only
3. Global Part Number is the preferred clear text code for ordering Yageo and Phycomp branded products.

Ordering information - Global part number

Global part number - Power enhancement

RL 0805 J R — 7W 0R015 L

Series name (code 1-2)
- RC = Thick film general purpose
- AF = Sulfur resistant
- AC = Automotive grade chip resistor
- SR = Surge
- RL = Thick film low ohmic
- PT = Thick film low ohmic low T. C. R.
- PA/PE = Current sensor - low T. C. R.
- PS = Current sensor - low T.C.R, 4 termination
- PU = Shunt resistor

Size code (code 3-6) (inch / metric)
- 0306 = 0.8 x 1.6
- 0508 = 1.25 x 2.0
- 0612 = 1.6 x 3.2
- 0402 = 1.0 x 0.5
- 0603 = 1.6 x 0.8
- 0805 = 2.0 x 1.25
- 1206 = 3.2 x 1.6
- 2010 = 5.0 x 2.5
- 2512 = 6.35 x 3.2
- 3921 =10.0 x 5.2
- 5931 =15.0 x 7.75

Tolerance (code 7)
- B = ±0.1%
- D = ±0.5%
- F = ±1%
- G = ±2%
- J = ±5%

Packing style (code 8)
- R = Paper tape reel
- K = Embossed plastic tape reel

Default code (code 17)

Resistance (code 12-16)
- 0U5 = 0.0005Ω
- 0R01 = 0.01Ω
- 0R1 = 0.1Ω
- 1R = 1Ω
- 10R = 10Ω
- 100R = 100Ω
- 1K = 1000Ω
- 1M = 1000000Ω
- 100M = 100000000Ω

Taping reel (code 10-11)
- 07 = 7 inch Dia. reel
- 7W = 7 inch Dia. reel 2 x standard power type
- 7T = 7 inch Dia. reel 3 x standard power type
- 47 = 7 inch Dia. reel 4 x standard power type
- 57 = 7 inch Dia. reel 5 x standard power type

T. C. R. (code 9)
- E = ±50 ppm/°C
- M = ±75 ppm/°C
- F = ±100 ppm/°C
- G = ±200 ppm/°C
- "—" = Based on spec.
- (— for thick film only)

Global part number - Arrays & Networks

YC 164 — J R — 07 10R L

Series name (code 1-2)
- YC = Array & Network (convex / flat) thick film
- TC = Array (concave) thick film
- AF = Sulfur resistant

Size code (inch) (code 3-4)
- 10 = 0201 x 2 (0202)
- 0201 x 4 (0204)
- 12 = 0402 x 2 (0404)
- 0402 x 4 (0408)
- 15 = 10Pin/8R (0612)
- 16 = 0603 x 2 (0606)
- 0603 x 4 (0612)
- 24 = 0602 x 8 (0616)
- 32 = 1206 x 4 (1224)
- 35 = 10Pin/8R (1225)

Number of resistors (code 5)
- 2 = 2 resistors
- 4 = 4 resistors
- 8 = 8 resistors

Schematic (code 6)
- L = L-type (for YC358)
- T = T-type (for YC158/358)
- "—" = Based on spec.

Default code (code 17)

Resistance (code 12-16)
- 0R = Jumper
- 0R1 = 0.1Ω
- 1R = 1Ω
- 10R = 10Ω
- 100R = 100Ω
- 1K = 1 000Ω
- 1M = 100 000 000

Taping reel (code 10-11)
- 07 = 7 inch Dia. reel
- 13 = 13 inch Dia. reel

T.C.R. (code 9)
- "—" = Based on spec.

Packing style (code 8)
- R = Paper tape reel
- K = Embossed plastic tape reel

Tolerance (code 7)
- F = ±1%
- J = ±5% (for Jumper ordering)

Phycomp CTC ordering code - North America

Ordering example: 9C06031A10R0FKHFT = R-Chip 0603, 10R0, 1%, 5K reel

1-2	3-6	7-8	9-12	13	14	15-16	17
XX	XXXX	XX	XXXX	X	X	XX	X

Series name (code 1-2)
- 9C = Phycomp thick film chip resistors
- 9T = Phycomp thin film chip resistors

Size code (standard resistors, code 3-6)

0201	0201 (0603)
0402	0402 (1005)
0603	0603 (1608)
0805	0805 (2012)
1206	1206 (3216)
1210	1210 (3225)
1218	1218 (3248)
2010	2010 (5025)
2512	2512 (6432)
AC34	0603 (1608) 4R concave array
AV34	0603 (1608) 4R convex array
AV22	0402 (1005) 2R convex array
AV24	0402 (1005) 4R convex array
AV28	0402 (1005) 8R convex array
RN31	10P8R in 1206 convex network
FR01	1206 (3216) Fusible
FR21	0603 (1608) Fusible
SR01	1206 (3216) Surge
VR01	1206 (3216) High voltage 5%
VR02	1206 (3216) High voltage 1%
VR11	0805 (2012) High voltage 5%
VR12	0805 (2012) High voltage 1%
VR21	2512 (6432) High voltage 5%
MR22	2512 (6432) Current sensor - low T. C. R.
MF22	2512 (6432) Current sensor - low T. C. R.
V321	0404 (1010) RF attenuator

Power rating (code 7-8)

1A	1/16W	0.063W	(0402)
1A	1/10W	0.10W	(0603)
2A	1/8W	0.125W	(0805)
3A	1/4W	0.25W	(1206)
5A	1/2W	0.5W	(1210)
7A	1/20W	0.05W	(0201)
8A	1/32W	0.03125W	(RN31)
12	3/4W	0.75W	(2010)
1W	1W	1W	(1218/2512)
2W	2W	2W	

Resistance value (code 9-12)
- 0R00 = Jumper
- R0XX < 0.1Ω
- RXXX = 0.1Ω - 0.976Ω
- XRXX = 1Ω - 9.76Ω
- XXRX = 10Ω - 97.6Ω
- XXX0 = 100Ω - 976Ω
- XXX1 = 1K - 9.76K
- XXX2 = 10K - 97.6K
- XXX3 = 100K - 9.78K
- XXX4 = 1M - 9.76M
- XXX5 = 10M - 97.6M
- XXX6 = 100M+
- XXDB = 1 - 20DB

Tolerance (code 13)
- E = ±0.01%
- A = ±0.05%
- B = ±0.1%; 0.2dB
- C = ±0.25%; 0.3dB
- D = ±0.5%; 0.5dB
- F = ±1%; 1dB
- G = ±2%; 2dB
- J = ±5%
- N = 0/-20%
- R = 0/-30%

dB values apply to attenuators

Right values apply to trimmable resistors

T. C. R. (code 14)
- C = ±10 ppm/°C
- D = ±15 ppm/°C
- A = ±25 ppm/°C
- B = ±50 ppm/°C
- K = ±100 ppm/°C
- L = ±200 ppm/°C
- E = ±250 ppm/°C
- M = ±300 ppm/°C
- G = ±500 ppm/°C
- F = 0/+500 ppm/°C
- R = ±600 ppm/°C
- Q = -100/+600 ppm/°C
- P = ±750 ppm/°C
- H = ±1000 ppm/°C
- I = ±1500 ppm/°C
- J = ±2000 ppm/°C
- N = ±3000 ppm/°C

Special coding (code 15-16)
- HF = SnPb
- PF = Lead-free
- AF = NiAu

Packing style (code 17)
- T = 5K paper
- 3 = 10K paper
- 4 = 20K paper
- 5 = 4K blister
- 6 = 5K blister
- 7 = 50K paper
- P = 25K bulk case

IEC publication 63, SPQ, last digit of 12NC

Standard of values in a decade according to "IEC publication 63"

E24 series	10	11	12	13	15	16	18	20	22	24	27	30
	33	36	39	43	47	51	56	62	68	75	82	91
E96 series	100	102	105	107	110	113	115	118	121	124	127	130
	133	137	140	143	147	150	154	158	162	165	169	174
	178	182	187	191	196	200	205	210	215	221	226	232
	237	243	249	255	261	267	274	280	287	294	301	309
	316	324	332	340	348	357	365	374	383	392	402	412
	422	432	442	453	464	475	487	499	511	523	536	549
	562	576	590	604	619	634	649	665	681	698	715	732
	750	768	787	806	825	845	866	887	909	931	953	976

Packing quantities

Size code	Tape width	178mm / Ø7" reel		254mm/Ø10" reel	330mm / Ø13" reel		Weight	Volume
		Paper	Embossed	Paper	Paper	Embossed	g /100pcs	mm^3
0075	4mm	40000	---	---	---	---		
0100	8mm	20000	---	---	---	---	0.007	0.0104
0201	8mm	10000 / 20000	---	---	80000	---	0.016	0.041
0306	4mm	5000	---	---	---	---		
0402	8mm	10000 / 20000	---	20000	50000	---	0.058	0.175
0508	8mm	5000	---	---	---	---		
0603	8mm	5000	---	10000	20000	---	0.192	0.576
0612	8mm	4000	4000	---	---	---	0.862	2.728
0805	8mm	4000 / 5000	---	10000	20000	---	0.450	1.250
1020	12mm	---	4000	---	---	---		
1206	8mm	4000 / 5000	---	10000	20000	---	0.862	2.728
1210	8mm	5 000	---	10000	20000	---	1.471	4.030
1218	12mm	---	4000	---	---	---	2.703	7.590
1225	12mm	---	4000	---	---	---		
2010	12mm	---	4000	---	---	16000	2.273	6.875
2512	12mm	---	4000	---	---	---	3.704	10.827
YC102	8mm	10000	---	---	---	---	0.052	---
YC104	8mm	10000	---	---	---	---	0.099	---
AF/YC122	8mm	10000	---	---	50000	---	0.100	---
TC122	8mm	10000	---	---	50000	---	0.112	---
ATV321	8mm	10000	--	---	---	---	0.100	---
AF/YC124	8mm	10000	---	20000	40000	---	0.281	---
TC124	8mm	10000	---	20000	40000	---	0.311	---
AF/YC162	8mm	5000	---	---	---	---	0.376	---
AF/YC164	8mm	5000	---	10000	20000	---	0.833	---
TC164	8mm	5000	---	10000	20000	---	1.030	---
YC158T	8mm	5000	---	---	20000	---	0.855	---
YC248	12mm	5000	4000	---	---	---	0.885	---
YC324	12mm	---	4000	---	---	---	2.703	---
YC358T YC358L	12mm	---	4000	---	---	---	3.333	---

12NC Ordering information

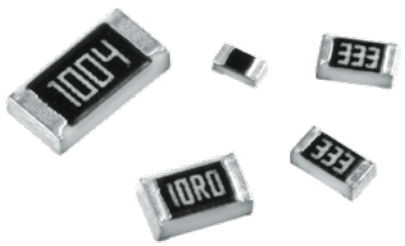
The first 8 or 9 digits of the 12 digit catalogue number are given under section "Phycomp worldwide - Traditional type" on following pages.

The remaining 4 or 3 digits represent the resistance value with the last digit indicating the multiplier as shown in table on the right.

Example:

0.001 Ω = 0010 or 010
0.02 Ω = 0200 or 200
0.3 Ω = 3007 or 307
1 Ω = 1008 or 108
33 kΩ = 3303 or 333
10 MΩ = 1006 or 106

Last digit of 12NC	
Resistance	Last digit
0.001 to 0.0976 Ω	0
0.1 to 0.976 Ω	7
1 to 9.76 Ω	8
10 to 97.6 Ω	9
100 to 976 Ω	1
1 to 9.76 kΩ	2
10 to 97.6 kΩ	3
100 to 976 kΩ	4
1 to 9.76 MΩ	5
10 to 97.6 MΩ	6

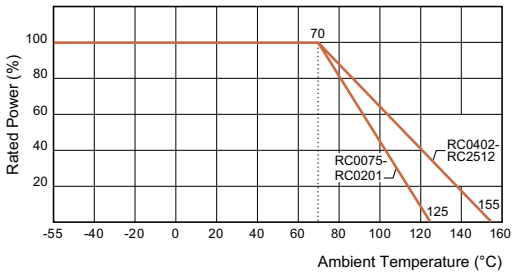


Features

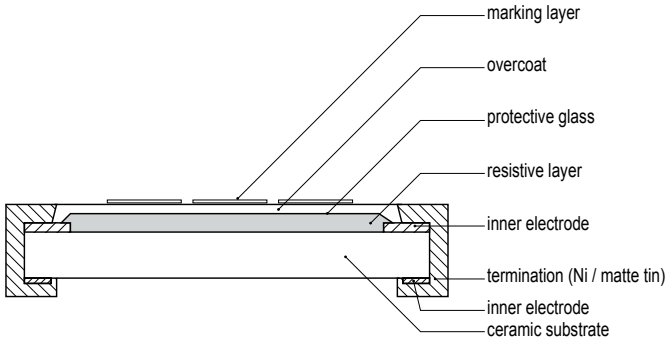
- Extremely thin and light (0075 & 0100)
- Highly reliable construction
- Compatible with all soldering processes
- Highly stable in auto-placement surface mounting applications
- Jumper is available
- Available in 8mm tape & reel per IEC 60286-3 (EIA -RS 481)

Derating curve

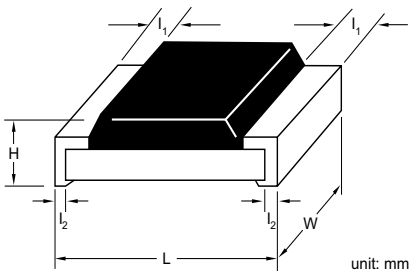
Maximum dissipation (P) in percentage of rated power as a function of the operating ambient temperature (T_{amb}).



Construction



Dimensions



Type	L	W	H	l_1	l_2
RC0075	0.30 ± 0.01	0.15 ± 0.01	0.13 ± 0.01	0.08 ± 0.03	0.08 ± 0.03
RC01005	0.40 ± 0.02	0.20 ± 0.02	0.13 ± 0.02	0.10 ± 0.03	0.10 ± 0.03
RC0201	0.60 ± 0.03	0.30 ± 0.03	0.23 ± 0.03	0.10 ± 0.05	0.15 ± 0.05
RC0402	1.00 ± 0.05	0.50 ± 0.05	0.32 ± 0.05	0.20 ± 0.10	0.25 ± 0.10
RC0603	1.60 ± 0.10	0.80 ± 0.10	0.45 ± 0.10	0.25 ± 0.15	0.25 ± 0.15
RC0805	2.00 ± 0.10	1.25 ± 0.10	0.50 ± 0.10	0.35 ± 0.20	0.35 ± 0.20
RC1206	3.10 ± 0.10	1.60 ± 0.10	0.55 ± 0.10	0.45 ± 0.20	0.40 ± 0.20
RC1210	3.10 ± 0.10	2.60 ± 0.15	0.55 ± 0.10	0.45 ± 0.15	0.50 ± 0.20
RC1218	3.10 ± 0.10	4.60 ± 0.10	0.55 ± 0.10	0.45 ± 0.20	0.40 ± 0.20
RC2010	5.00 ± 0.10	2.50 ± 0.15	0.55 ± 0.10	0.45 ± 0.15	0.50 ± 0.20
RC2512	6.35 ± 0.10	3.10 ± 0.15	0.55 ± 0.10	0.60 ± 0.20	0.50 ± 0.20

RC - Thick film general purpose chip resistors, 0075 to 2512

Electrical characteristics

Type	Power P_{70}	Operating Temp. range	MWV	RCOV	DWV	Resistance range & tolerance	T. C. R.	Jumper criteria (unit: A)
RC0075	1/50W	-55°C to +125°C	10V	25V	25V	E24 ±5% 10Ω ≤ R ≤ 1MΩ E24/E96 ±1% 10Ω ≤ R ≤ 1MΩ	10Ω ≤ R < 100Ω -200 / ±600 ppm/°C 100Ω ≤ R ≤ 1MΩ ±200 ppm/°C	Rated current 0.5 Max. current 1.0
RC0100	1/32W		15V	30V	30V	E24 ±5% 1Ω ≤ R ≤ 22MΩ E24/E96 ±1% 1Ω ≤ R ≤ 10MΩ E24/E96 ±0.5% 33Ω ≤ R ≤ 470KΩ Jumper < 50mΩ	1Ω ≤ R < 10Ω -200 /±600 ppm/°C 10Ω ≤ R < 100Ω ±300 ppm/°C 100Ω ≤ R ≤ 10MΩ ±200 ppm/°C 10MΩ < R ≤ 22MΩ ±250 ppm/°C	Rated current 0.5 Max. current 1.0
RC0201	1/20W		25V	50V	50V	E24 ±5% 1Ω ≤ R ≤ 10MΩ E24/E96 ±1% 1Ω ≤ R ≤ 10MΩ E24/E96 ±0.1%,±0.5% 10Ω ≤ R ≤ 1MΩ Jumper < 50mΩ	10Ω < R ≤ 10MΩ ±200 ppm/°C 1Ω ≤ R ≤ 10Ω -100 / ±350 ppm/°C	Rated current 0.5 Max. current 1.0
RC0402	1/16W	-55°C to +155°C	50V	100V	100V	E24 ±5% 1Ω ≤ R ≤ 22MΩ E24/E96 ±1% 1Ω ≤ R ≤ 10MΩ E24/E96 ±0.1%,±0.5% 10Ω ≤ R ≤ 1MΩ Jumper < 50mΩ	1Ω ≤ R ≤ 10Ω ±200 ppm/°C 10Ω < R ≤ 10MΩ ±100 ppm/°C 10MΩ < R ≤ 22MΩ ±200 ppm/°C	Rated current 1.0 Max. current 2.0
	1/8W		50V	100V	100V	E24 ±5% 1Ω ≤ R ≤ 1MΩ E24/E96 ±1% 1Ω ≤ R ≤ 1MΩ	1Ω ≤ R < 1MΩ ±200 ppm/°C	-- --
RC0603	1/10W		75V	150V	150V	E24 ±5% 1Ω ≤ R ≤ 22MΩ E24/E96 ±1% 1Ω ≤ R ≤ 10MΩ E24/E96 ±0.1%,±0.5% 10Ω ≤ R ≤ 1MΩ Jumper < 50mΩ	1Ω ≤ R ≤ 10Ω ±200 ppm/°C 10Ω < R ≤ 10MΩ ±100 ppm/°C 10MΩ <R ≤ 22MΩ ±200 ppm/°C	Rated current 1.0 Max. current 2.0
	1/5W		75V	150V	150V	E24 ±5% 1Ω ≤ R ≤ 1MΩ E24/E96 ±1% 1Ω ≤ R ≤ 1MΩ	1Ω ≤ R ≤ 1MΩ ±200 ppm/°C	-- --
RC0805	1/8W		150V	300V	300V	E24 ±5% 1Ω ≤ R ≤ 100MΩ E24/E96 ±1% 1Ω ≤ R ≤ 10MΩ E24/E96 ±0.1%,±0.5% 10Ω ≤ R ≤ 1MΩ E24 ±10%,20% 24MΩ ≤ R ≤ 100MΩ Jumper < 50mΩ	1Ω ≤ R ≤ 10Ω ±200 ppm/°C 10Ω < R ≤ 10MΩ ±100 ppm/°C 10MΩ < R ≤ 22MΩ ±200 ppm/°C 24MΩ ≤ R ≤ 100MΩ ±300 ppm/°C	Rated current 2.0 Max. current 5.0
	1/4W		150V	300V	300V	E24 ±5% 1Ω ≤ R ≤ 1MΩ E24/E96 ±1% 1Ω ≤ R ≤ 1MΩ	1Ω ≤ R ≤ 1MΩ ±200 ppm/°C	-- --
RC1206	1/4W		200V	400V	500V	E24 ±5% 1Ω ≤ R ≤ 100MΩ E24/E96 ±1% 1Ω ≤ R ≤ 10MΩ E24/E96 ±0.1%,±0.5% 10Ω ≤ R ≤ 1MΩ E24 ±10%,20% 24MΩ ≤ R ≤ 100MΩ Jumper < 50mΩ	1Ω ≤ R ≤ 10Ω ±200 ppm/°C 10Ω < R ≤ 10MΩ ±100 ppm/°C 10MΩ < R ≤ 22MΩ ±200 ppm/°C 24MΩ ≤ R ≤ 100MΩ ±300 ppm/°C	Rated current 2.0 Max. current 10.0
	1/2W		200V	400V	500V	E24 ±5% 1Ω ≤ R ≤ 1MΩ E24/E96 ±1% 1Ω ≤ R ≤ 1MΩ	1Ω ≤ R ≤ 1MΩ ±200 ppm/°C	-- --
RC1210	1/2W		200V	500V	500V	E24 ±5% 1Ω ≤ R ≤ 22MΩ E24/E96 ±1% 1Ω ≤ R ≤ 10MΩ E24/E96 ±0.1%,±0.5% 10Ω ≤ R ≤ 1MΩ Jumper < 50mΩ	1Ω ≤ R ≤ 10Ω ±200 ppm/°C 10Ω < R ≤ 10MΩ ±100 ppm/°C 10MΩ < R ≤ 22MΩ ±200 ppm/°C	Rated current 2.0 Max. current 10.0
RC1218	1W		200V	500V	500V	E24 ±5% 1Ω ≤ R ≤ 1MΩ E24/E96 ±1% 1Ω ≤ R ≤ 1MΩ E24/E96 ±0.1%,±0.5% 10Ω ≤ R ≤ 1MΩ Jumper < 50mΩ	1Ω ≤ R ≤ 10Ω ±200 ppm/°C 11Ω ≤ R ≤ 1MΩ ±100 ppm/°C	Rated current 6.0 Max. current 10.0
RC2010	3/4W		200V	500V	500V	E24 ±5% 1Ω ≤ R ≤ 22MΩ E24/E96 ±1% 1Ω ≤ R ≤ 10MΩ E24/E96 ±0.1%,±0.5% 10Ω ≤ R ≤ 1MΩ Jumper < 50mΩ	1Ω ≤ R ≤ 10Ω ±200 ppm/°C 10Ω < R ≤ 10MΩ ±100 ppm/°C 10MΩ < R ≤ 22MΩ ±200 ppm/°C	Rated current 2.0 Max. current 10.0
RC2512	1W		200V	500V	500V			Rated current 2.0 Max. current 10.0
	2W		200V	400V	500V	E24 ±5% 1Ω ≤ R ≤ 1M E24/E96 ±1% 1Ω ≤ R ≤ 1M	1Ω ≤ R ≤ 1MΩ ±200 ppm/°C	-- --

Environmental characteristics				
Performance test		Test method	Procedure	Requirements
Life		MIL-STD-202 -method 108A	1000 hours at 70 ±2°C applied RCWV 1.5 hours on, 0.5 hours off, still air required	0075: ± (5%+100mΩ) < 100mΩ for jumper 01005: ± (3% +50mΩ) < 100mΩ for jumper Others: ± (1% +50mΩ) for 0.1%/0.5%/1% tol. ± (3% +50mΩ) for 5% tol. < 100mΩ for jumper
High temperature exposure		MIL-STD-202 -method 108A	1000 hours at maximum operating temperature depending on specification, unpowered	0075: ± (5%+100mΩ) < 100mΩ for jumper 01005: ± (1% +50mΩ) < 50mΩ for jumper Others: ± (1% +50mΩ) for 0.1%/0.5%/1% tol. ± (2% +50mΩ) for 5% tol. < 50mΩ for jumper
Moisture resistance		MIL-STD-202 -method 106G	Each temperature / humidity cycle is defined as 8 hours (method 106G), 3 cycles / 24 hours for 10d with 25°C / 65°C 95% R.H	0075/ 01005: ± (2.0% +50mΩ) < 100mΩ for jumper Others: ± (0.5% +50mΩ) for 0.1%/0.5%/1% tol. ± (2% +50mΩ) for 5% tol. < 100mΩ for jumper
Thermal shock		MIL-STD-202 -method 107G	-55 / +125°C Note: Number of cycles required is 300. Devices mounted Maximum transfer time is 20 seconds. Dwell time is 15 minutes. Air – Air	0075/ 01005: ± (1% +50mΩ) < 50mΩ for jumper Others: ± (0.5% +50mΩ) for 0.1%/0.5%/1% tol. ± (1% +50mΩ) for 5% tol. < 50mΩ for jumper
Solderability	Wetting	J-STD-002B test B	Electrical test not required. Magnification 50X Lead-free solder bath at 245 ±3°C Dipping time: 3 ±0.5 seconds	Well tinned (≥ 95% covered) No visible damage
	Resistance to soldering heat	MIL-STD-202 -method 210F	Lead-free solder, 260°C, 10 seconds immersion time	0075/ 01005: ± (1% +50mΩ) < 50mΩ for jumper Others: ± (0.5% +50mΩ) for 0.1%/0.5%/1% tol. ± (1% +0.05 Ω) for 5% tol. < 50mΩ for jumper No visible damage
Short time overload		IEC 60115 -1 4.13	2.5 times RCWV or maximum overload voltage whichever is less for 5 seconds at room temperature	0075/ 01005: ± (2% +50mΩ) < 50mΩ for jumper Others: ± (1% +50mΩ) for 0.1%/0.5%/1% tol. ± (2% +50mΩ) for 5% tol. < 50mΩ for jumper No visible damage

RC - Thick film general purpose chip resistors, 0075 to 2512

Global part number - Preferred type for ordering Yageo / Phycomp branded products

Ordering example: RC0402JR-07100KL

RC 0402 J R — 07 100K L

Series name (code 1-2)
RC = General purpose thick film

Size code (code 3-6)
(inch / metric)
0075 = 0.3 x 0.1
0100 = 0.4 x 0.2
0201 = 0.6 x 0.3
0402 = 1.0 x 0.5
0603 = 1.6 x 0.8
0805 = 2.0 x 1.25
1206 = 3.2 x 1.6
1210 = 3.2 x 2.6
1218 = 3.2 x 4.5
2010 = 5.0 x 2.5
2512 = 6.35 x 3.2

Tolerance (code 7)
B = ±0.1%
D = ±0.5%
F = ±1%
J = ±5% (for Jumper ordering)

Default code(1/2) (code 17)

Resistance (code 12-16)
0R = Jumper
10R = 10Ω
100R = 100Ω
100K = 100KΩ

Taping reel (code 10-11)
07 = 7 inch Dia. reel
10 = 10 inch Dia. reel
13 = 13 inch Dia. reel
7N = 7 inch Dia. reel,ESD safe reel (0075/0100 only)
7W = 7 inch Dia. reel, 2 x standard power
3W = 13 inch Dia. reel, 2 x standard power

T. C. R. (code 9)
"—" = Based on spec.
(— for thick film only)

Packing style (code 8)
R = Paper tape reel
K = Embossed plastic tape reel
S = ESD safe reel (0075/0100 only)

Note: 1. All of our RSMD products are RoHS compliant. "LFP" of the internal 2D reel label mentions "Lead Free Process"
2. Letter L is system default code for ordering only

Phycomp worldwide - Traditional type									
General purpose thick film / RC series									
Size: inch (mm)		0201 (0603)		0402 (1005)		0603 (1608)		0805 (2012)	
Power		1/20 W		1/16 W		1/10 W		1/8 W	
Tolerance		+5%	+1%	+5%	+1%	+5%	+1%	+5%	+1%
Resistance		E24	E24 / E96	E24	E24 / E96	E24	E24 / E96	E24	E24 / E96
Packing		paper tape		paper tape		paper tape		paper tape	
Quantity	5 000	---	---	---	---	2322 702 60...L	2322 704 6....L	2322 730 61...L	2322 734 6....L
	10 000	2322 803 70...L	2322 806 7....L	2322 705 70...L	2322 706 7....L	2322 702 70...L	2322 704 7....L	2322 730 71...L	2322 734 7....L
	20 000	2322 806 80...L	2322 806 8....L	---	---	2322 702 81...L	2322 704 8....L	2322 730 81...L	2322 734 8....L
	50 000	2322 803 60...L	2322 806 6....L	2322 705 87...L	2322 706 8....L	---	---	---	---
Jumper	5 000	---	---	---	---	2322 702 96001L	---	2322 730 91002L	---
	10 000	2322 803 91001L	---	2322 705 91001L	---	2322 702 97001L	---	2322 730 91003L	---
	20 000	---	---	---	---	2322 702 92002L	---	2322 730 92002L	---
	50 000	---	---	2322 705 91007L	---	---	---	---	---

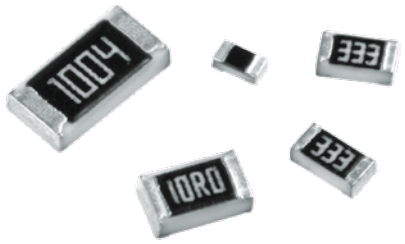
For ordering rules: See page 14 for E24 / E96 values and the last 4 or 3 digits of the 12NC catalogue number

Phycomp worldwide - Traditional type											
General purpose thick film / RC series											
Size: inch (mm)		1206 (3216)		1210 (3225)		1218 (3248)		2010 (5025)		2512 (6432)	
Power		1/4 W		1/2 W		1 W		3/4 W		1 W	
Tolerance		+5%	+1%	+5%	+1%	+5%	+1%	+5%	+1%	+5%	+1%
Resistance		E24	E24 / E96	E24	E24 / E96	E24	E24 / E96	E24	E24 / E96	E24	E24 / E96
Packing		paper tape		paper tape		blister tape		blister tape		blister tape	
Quantity	4 000	---	---	---	---	2322 735 64...L	2322 735 7....L	2322 760 60...L	2322 761 6....L	2322 762 60...L	2322 763 6....L
	5 000	2322 711 61...L	2322 724 6....L	2390 735 70...L	2390 735 3....L	---	---	---	---	---	---
	10 000	2322 711 51...L	2322 724 7....L	---	---	---	---	---	---	---	---
	20 000	2322 711 81...L	2322 724 8....L	2390 735 71...L	2390 735 5....L	---	---	---	---	---	---
Jumper	4 000	---	---	---	---	2322 735 90007L	---	2322 760 90003L	---	2322 762 90000L	---
	5 000	2322 711 91032L	---	2390 735 90001L	---	---	---	---	---	---	---
	10 000	2322 711 91005L	---	---	---	---	---	---	---	---	---
	20 000	2322 711 92004L	---	---	---	---	---	---	---	---	---

For ordering rules: See page 14 for E24 / E96 values and the last 4 or 3 digits of the 12NC catalogue number

Phycomp CTC ordering code - Traditional type - North America
Regional code for ordering Phycomp branded products. Please see page 17 for details.

RC_P - Total lead free thick film general purpose chip resistor, 0201 to 2512

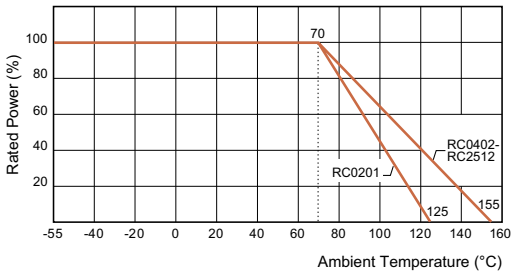


Features

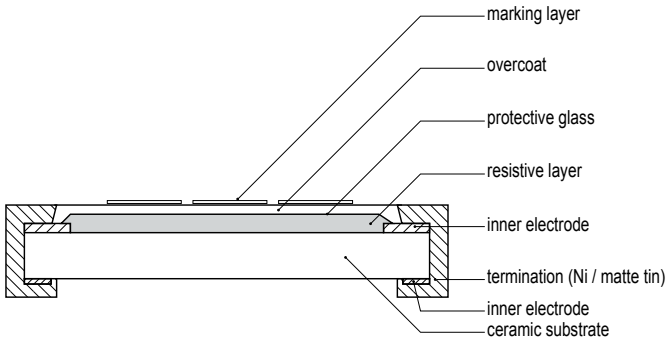
- Highly reliable electrode construction
- Compatible with all soldering processes
- Highly stable in auto-placement surface mounting applications
- Barrier layer end termination
- Lead free (Pb<100ppm) without RoHS exemptions (7C-1)

Derating curve

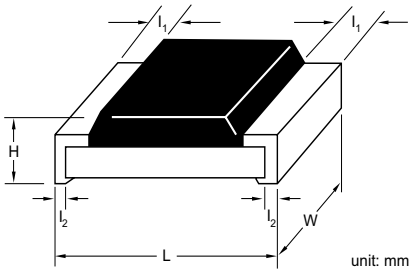
Maximum dissipation (P) in percentage of rated power as a function of the operating ambient temperature (T_{amb}).



Construction



Dimensions



Type	L	W	H	l_1	l_2
RC0201	0.60 ± 0.03	0.30 ± 0.03	0.23 ± 0.03	0.10 ± 0.05	0.15 ± 0.05
RC0402	1.00 ± 0.05	0.50 ± 0.05	0.32 ± 0.05	0.20 ± 0.10	0.25 ± 0.10
RC0603	1.60 ± 0.10	0.80 ± 0.10	0.45 ± 0.10	0.25 ± 0.15	0.25 ± 0.15
RC0805	2.00 ± 0.10	1.25 ± 0.10	0.50 ± 0.10	0.35 ± 0.20	0.35 ± 0.20
RC1206	3.10 ± 0.10	1.60 ± 0.10	0.55 ± 0.10	0.45 ± 0.20	0.40 ± 0.20
RC1210	3.10 ± 0.10	2.60 ± 0.15	0.55 ± 0.10	0.45 ± 0.15	0.50 ± 0.20
RC1218	3.10 ± 0.10	4.60 ± 0.10	0.55 ± 0.10	0.45 ± 0.20	0.40 ± 0.20
RC2010	5.00 ± 0.10	2.50 ± 0.15	0.55 ± 0.10	0.45 ± 0.15	0.50 ± 0.20
RC2512	6.35 ± 0.10	3.10 ± 0.15	0.55 ± 0.10	0.60 ± 0.20	0.50 ± 0.20

RC_P - Total lead free thick film general purpose chip resistor, 0201 to 2512

Electrical characteristics								
Type	Power P_{70}	Operating Temp. range	MWV	RCOV	DWV	Resistance range & tolerance	T. C. R.	Jumper criteria (unit: A)
RC0201	1/20W	-55°C to +125°C	25V	50V	50V	E24 ±5% 1Ω ≤ R ≤ 10MΩ E24/E96 ±1% 1Ω ≤ R ≤ 10MΩ E24/E96 ±0.5% 10Ω ≤ R ≤ 1MΩ Jumper < 50mΩ	1Ω ≤ R ≤ 10Ω -100/ ±500 ppm/°C 10Ω < R ≤ 100Ω ±300 ppm/°C 100Ω < R ≤ 10MΩ ±200 ppm/°C	Rated current 0.5 Max. current 1.0
RC0402	1/16W	-55°C to +155°C	50V	100V	100V	E24 ±5% 1Ω ≤ R ≤ 22MΩ E24/E96 ±1% 1Ω ≤ R ≤ 10MΩ E24/E96 ±0.5% 10Ω ≤ R ≤ 1MΩ Jumper < 50mΩ	1Ω ≤ R ≤ 10Ω ±350 ppm/°C 10Ω < R ≤ 100Ω ±200 ppm/°C 100Ω < R ≤ 10MΩ ±150 ppm/°C 10MΩ < R ≤ 22MΩ ±200 ppm/°C	Rated current 1.0 Max. current 2.0
RC0603	1/10W		75V	150V	150V	E24 ±5% 1Ω ≤ R ≤ 22MΩ E24/E96 ±1% 1Ω ≤ R ≤ 10MΩ E24/E96 ±0.5% 10Ω ≤ R ≤ 1MΩ Jumper < 50mΩ	1Ω ≤ R ≤ 10Ω ±300 ppm/°C 10Ω < R ≤ 100Ω ±200 ppm/°C 100Ω < R ≤ 10MΩ ±150 ppm/°C 10MΩ < R ≤ 22MΩ ±200 ppm/°C	Rated current 1.0 Max. current 2.0
RC0805	1/8W		150V	300V	300V	E24 ±5% 1Ω ≤ R ≤ 22MΩ E24/E96 ±1% 1Ω ≤ R ≤ 10MΩ E24/E96±0.5% 10Ω ≤ R ≤ 1MΩ Jumper < 50mΩ	1Ω ≤ R ≤ 10Ω ±300 ppm/°C 10Ω < R ≤ 100Ω ±150 ppm/°C 100Ω < R ≤ 10MΩ ±100 ppm/°C 10MΩ < R ≤ 22MΩ ±200 ppm/°C	Rated current 2.0 Max. current 5.0
RC1206	1/4W		200V	400V	500V	E24 ±5% 1Ω ≤ R ≤ 22MΩ E24/E96 ±1% 1Ω ≤ R ≤ 10MΩ E24/E96 ±0.5% 10Ω ≤ R ≤ 1MΩ Jumper < 50mΩ	1Ω ≤ R ≤ 10Ω ±300 ppm/°C 10Ω < R ≤ 100Ω ±100 ppm/°C 100Ω < R ≤ 10MΩ ±100 ppm/°C 10MΩ < R ≤ 22MΩ ±200 ppm/°C	Rated current 2.0 Max. current 10.0
RC1210	1/2W		200V	500V	500V	E24 ±5% 1Ω ≤ R ≤ 22MΩ E24/E96 ±1% 1Ω ≤ R ≤ 10MΩ E24/E96 ±0.5% 10Ω ≤ R ≤ 1MΩ Jumper < 50mΩ	1Ω ≤ R ≤ 10Ω ±300 ppm/°C 10Ω < R ≤ 100Ω ±100 ppm/°C 100Ω < R ≤ 10MΩ ±100 ppm/°C 10MΩ < R ≤ 22MΩ ±200 ppm/°C	Rated current 2.0 Max. current 10.0
RC1218	1W		200V	500V	500V	E24 ±5% 1Ω ≤ R ≤ 1MΩ E24/E96 ±1% 1Ω ≤ R ≤ 1MΩ E24/E96 ±0.5% 10Ω ≤ R ≤ 1MΩ Jumper < 50mΩ		Rated current 6.0 Max. current 10.0
RC2010	3/4W		200V	500V	500V	E24 ±5% 1Ω ≤ R ≤ 22MΩ E24/E96 ±1% 1Ω ≤ R ≤ 10MΩ E24/E96 ±0.5% 10Ω ≤ R ≤ 1MΩ Jumper < 50mΩ		Rated current 2.0 Max. current 10.0
RC2512	1W		200V	500V	500V			Rated current 2.0 Max. current 10.0

RC_P - Total lead free thick film general purpose chip resistor, 0201 to 2512

Environmental characteristics				
Performance test		Test method	Procedure	Requirements
Life		MIL-STD-202 -method 108A	1000 hours at 70 ±2°C applied RCWV 1.5 hours on, 0.5 hours off, still air required	± (1% +50mΩ) for 0.5%/1% tol. ± (3% +50mΩ) for 5% tol. < 100mΩ for jumper
High temperature exposure		MIL-STD-202 -method 108A	1000 hours at maximum operating temperature depending on specification, unpowered	± (1% +50mΩ) for 0.5%/1% tol. ± (2% +50mΩ) for 5% tol. < 50mΩ for jumper
Moisture resistance		MIL-STD-202 -method 106G	Each temperature / humidity cycle is defined as 8 hours (method 106G), 3 cycles / 24 hours for 10d with 25°C / 65°C 95% R.H	± (0.5% +50mΩ) for 0.5%/1% tol. ± (2% +50mΩ) for 5% tol. < 100mΩ for jumper
Thermal shock		MIL-STD-202 -method 107G	-55 / +125°C Note: Number of cycles required is 300. Devices mounted Maximum transfer time is 20 seconds. Dwell time is 15 minutes. Air – Air	± (0.5% +50mΩ) for 0.5%/1% tol. ± (1% +50mΩ) for 5% tol. < 50mΩ for jumper
Solderability	Wetting	J-STD-002B test B	Electrical test not required. Magnification 50X Lead-free solder bath at 245 ±3°C Dipping time: 3 ±0.5 seconds	Well tinned (≥ 95% covered) No visible damage
	Resistance to soldering heat	MIL-STD-202 -method 210F	Lead-free solder, 260°C, 10 seconds immersion time	± (0.5% +50mΩ) for 0.5%/1% tol. ± (1% +0.05 Ω) for 5% tol. < 50mΩ for jumper No visible damage
Short time overload		IEC 60115 -1 4.13	2.5 times RCWV or maximum overload voltage whichever is less for 5 seconds at room temperature	± (1% +50mΩ) for 0.5%/1% tol. ± (2% +50mΩ) for 5% tol. < 50mΩ for jumper No visible damage

Global part number - Preferred type for ordering Yageo / Phycomp branded products

Ordering example: RC0402JR-07100KP

RC 0402 J R — 07 100K P

Series name (code 1-2)
RC = General purpose thick film

Size code (code 3-6)
(inch / metric)
0201 = 0.6 x 0.3
0402 = 1.0 x 0.5
0603 = 1.6 x 0.8
0805 = 2.0 x 1.25
1206 = 3.2 x 1.6
1210 = 3.2 x 2.6
1218 = 3.2 x 4.5
2010 = 5.0 x 2.5
2512 = 6.35 x 3.2

Tolerance (code 7)
D = ±0.5%
F = ±1%
J = ±5% (for Jumper ordering)

Default code(1/2) (code 17)

Resistance (code 12-16)
0R = Jumper
10R = 10Ω
100R = 100Ω
100K = 100KΩ

Taping reel (code 10-11)
07 = 7 inch Dia. reel
13 = 13 inch Dia. reel

T. C. R. (code 9)
"—" = Based on spec.
(— for thick film only)

Packing style (code 8)
R = Paper tape reel
K = Embossed plastic tape reel

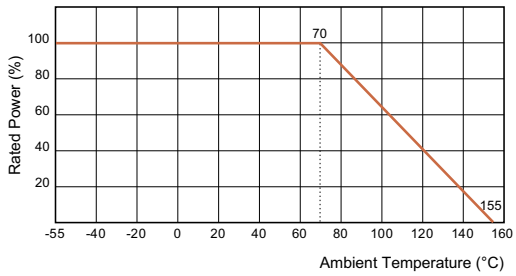
Note: 1. All of our RSMD products are RoHS compliant. "LFP" of the internal 2D reel label mentions "Lead Free Process"
2. Letter L is system default code for ordering only

Features

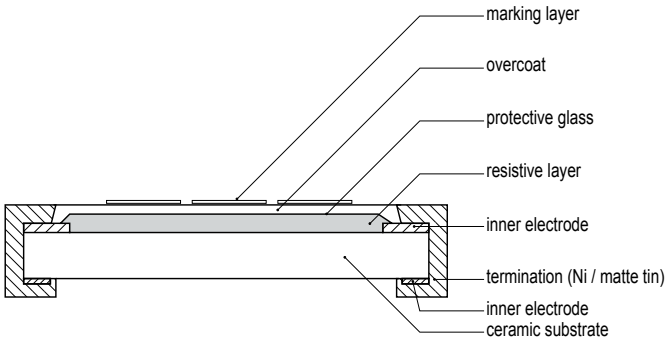
- Narrow tolerance
- Low T. C. R.
- Highly reliable construction
- Compatible with all soldering processes
- Suitable for auto-placement surface mounting applications
- Available in 8mm tape & reel per EIA RS481

Derating curve

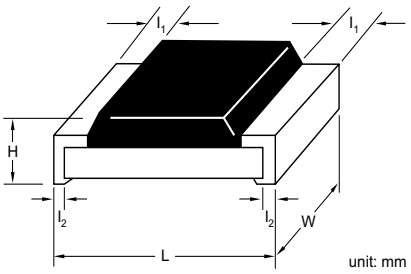
Maximum dissipation (P) in percentage of rated power as a function of the operating ambient temperature (T_{amb}).



Construction



Dimensions



Type	L	W	H	l_1	l_2
RE0201	0.60 ± 0.03	0.30 ± 0.03	0.23 ± 0.03	0.10 ± 0.05	0.15 ± 0.05
RE0402	1.00 ± 0.05	0.50 ± 0.05	0.32 ± 0.05	0.20 ± 0.10	0.25 ± 0.10
RE0603	1.60 ± 0.10	0.80 ± 0.10	0.45 ± 0.10	0.25 ± 0.15	0.25 ± 0.15
RE0805	2.00 ± 0.10	1.25 ± 0.10	0.50 ± 0.10	0.35 ± 0.20	0.35 ± 0.20
RE1206	3.10 ± 0.10	1.60 ± 0.10	0.55 ± 0.10	0.45 ± 0.20	0.40 ± 0.20

Electrical characteristics

Type	Power P_{70}	Operating Temp. range	MWV	RCOV	DWV	Resistance range & tolerance	T. C. R.
RE0201	1/20W	-55°C to +155°C	25V	50V	50V	E24/E96 ±0.1%,±0.5%, ±1% 100Ω ≤ R ≤ 1MΩ	±50 ppm/°C
RE0402	1/16W		50V	100V	100V	E24/E96 ±0.1%,±0.5%, ±1% 10Ω ≤ R ≤ 1MΩ	
RE0603	1/10W		75V	150V	150V		
RE0805	1/8W		150V	300V	300V		
RE1206	1/4W		200V	400V	500V		

RE - Thick film precision grade chip resistors, 0201 to 1206

Environmental characteristics				
Performance test		Test method	Procedure	Requirements
Life		MIL-STD-202 -method 108A	1000 hours at 70 ±2°C applied RCWV 1.5 hours on, 0.5 hours off, still air required	± (3% +50mΩ)
High temperature exposure		MIL-STD-202 -method 108A	1000 hours at maximum operating temperature depending on specification, unpowered	± (3% +50mΩ)
Moisture resistance		MIL-STD-202 -method 106G	Each temperature / humidity cycle is defined as 8 hours (method 106G), 3 cycles / 24 hours for 10d with 25°C / 65°C 95% R.H	± (3% +50mΩ)
Thermal shock		MIL-STD-202 -method 107G	-55 / +125°C Note: Number of cycles required is 300. Devices mounted Maximum transfer time is 20 seconds. Dwell time is 15 minutes. Air – Air	± (1% +50mΩ)
Solderability	Wetting	IPC/JEDECJ-STD-002B test B	Electrical test not required. Magnification 50X Lead-free solder bath at 245 ±3°C Dipping time: 3 ±0.5 seconds	Well tinned (≥ 95% covered) No visible damage
	Resistance to soldering heat	MIL-STD-202 -method 210F	Lead-free solder, 260°C, 10 seconds immersion time	± (0.5%+ 50mΩ) No visible damage
Short time overload		IEC 60115 -1 4.13	2.5 times RCWV or maximum overload voltage whichever is less for 5 seconds at room temperature	± (1%+ 50mΩ) No visible damage

Global part number - Preferred type for ordering Yageo / Phycomp branded products

Ordering example: RE0603DRE07100KL

RE 0603 D R E 07 100K L

Series name (code 1-2)
RE = Thick film precision grade

Size code (code 3-6)
(inch / metric)
0201 = 0.6 x 0.3
0402 = 1.0 x 0.5
0603 = 1.6 x 0.8
0805 = 2.0 x 1.25
1206 = 3.2 x 1.6

Tolerance (code 7)
B = ±0.1%
D = ±0.5%
F = ±1%

Default code(1/2) (code 17)

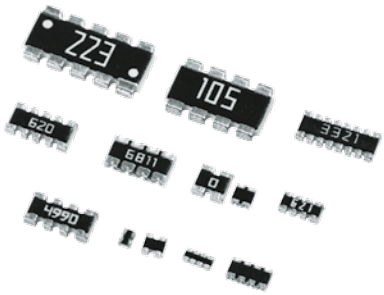
Resistance (code 12-16)
10R = 10Ω
100R = 100Ω
100K = 100KΩ

Taping reel (code 10-11)
07 = 7 inch Dia. reel
10 = 10 inch Dia. reel
13 = 13 inch Dia. reel

T. C. R. (code 9)
E = ±50 ppm/°C

Packing style (code 8)
R = Paper tape reel

Note: 1. All of our RSMD products are RoHS compliant. "LFP" of the internal 2D reel label mentions "Lead Free Process"
2. Letter L is system default code for ordering only
3. RE series products are available by "Global part number" only

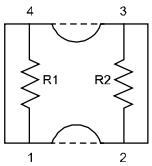


Features

- Integrated discrete chip resistors from 2 to 8 pcs
- More efficient in pick & place application
- Low assembly costs
- Reduced size of final equipment
- Higher component and equipment reliability

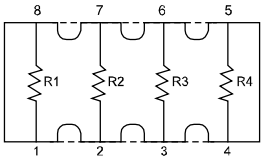
Schematics

YC102/122/162[1]



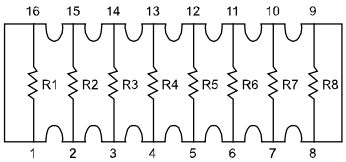
R1 = R2

YC104/124/164/324[1]



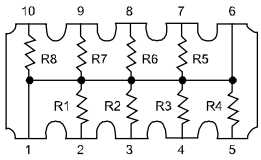
R1 = R2 = R3 = R4

YC248



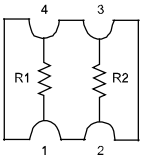
R1 = R2 = R3 = R4 = R5 = R6 = R7 = R8

YC358 (L-Type)



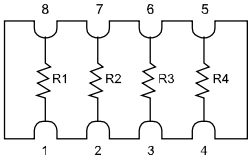
R1 = R2 = R3 = R4 = R5 = R6 = R7 = R8

TC122



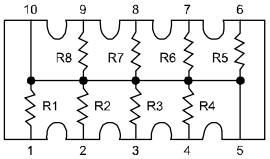
R1 = R2

TC124/164



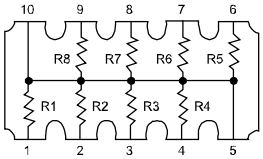
R1 = R2 = R3 = R4

YC158



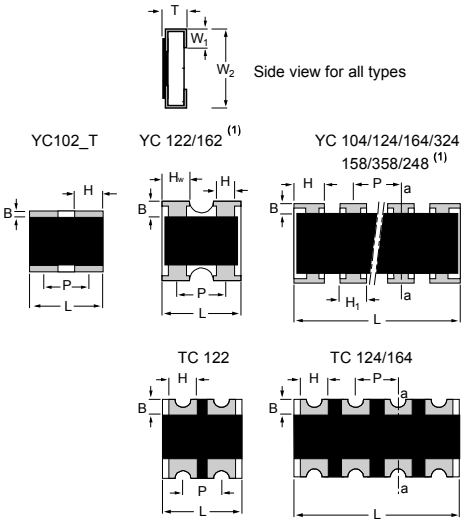
R1 = R2 = R3 = R4 = R5 = R6 = R7 = R8

YC358 (T-Type)



R1 = R2 = R3 = R4 = R5 = R6 = R7 = R8

Dimensions



Note: 1. YC102/104 are flat type

Type	H / H_1/H_w	B	P	L	T	W_1	W_2
YC102	H: 0.30 ± 0.10	0.15 ± 0.10	0.55 ± 0.10	0.80 ± 0.10	0.35 ± 0.10	0.15 ± 0.10	0.60 ± 0.10
YC104	H: 0.20 ± 0.10	0.15 ± 0.05	0.40 ± 0.10	1.40 ± 0.10	0.35 ± 0.10	0.15 ± 0.10	0.60 ± 0.10
YC122	H_w: 0.35 ± 0.10 H: 0.21 +0.10 /-0.05	0.20 ± 0.10	0.67 ± 0.05	1.00 ± 0.10	0.30 ± 0.10	0.25 ± 0.10	1.00 ± 0.10
YC124	H: 0.45 ± 0.05 H_1:0.30 ± 0.05	0.20 ± 0.15	0.50 ± 0.05	2.00 ± 0.10	0.45 ± 0.10	0.30 ± 0.15	1.00 ± 0.10
YC162	H_w: 0.65± 0.15 H: 0.30 ± 0.10	0.30 ± 0.10	0.80 ± 0.05	1.60 ± 0.10	0.40 ± 0.10	0.30 ± 0.10	1.60 ± 0.10
YC164	H: 0.65 ± 0.05 H_1:0.50 ± 0.15	0.30 ± 0.15	0.80 ± 0.05	3.20 ± 0.15	0.60 ± 0.10	0.30 ± 0.15	1.60 ± 0.15
YC248	H: 0.45 ± 0.05 H_1:0.30 ± 0.05	0.30 ± 0.15	0.50 ± 0.05	4.00 ± 0.20	0.45 ± 0.10	0.40 ± 0.15	1.60 ± 0.15
YC324	H: 1.10 ± 0.15 H_1:0.90 ± 0.15	0.50 ± 0.20	1.27 ± 0.05	5.08 ± 0.20	0.60 ± 0.10	0.50 ± 0.15	3.20 ± 0.20
TC122	H: 0.30 ± 0.05	0.25 ± 0.15	0.50 ± 0.05	1.00 ± 0.10	0.30 ± 0.10	0.25 ± 0.15	1.00 ± 0.10
TC124	H: 0.30 ± 0.10	0.20 ± 0.10	0.50 ± 0.05	2.00 ± 0.10	0.40 ± 0.10	0.25 ± 0.10	1.00 ± 0.10
TC164	H: 0.60 ± 0.15	0.30 ± 0.15	0.80 ± 0.05	3.20 ± 0.15	0.60 ± 0.10	0.30 ± 0.15	1.60 ± 0.15
YC158T	H: 0.45 ± 0.05 H_1:0.32 ± 0.05	0.30 ± 0.15	0.64 ± 0.05	3.20 ± 0.20	0.60 ± 0.10	0.35 ± 0.15	1.60 ± 0.15
YC358L YC358T	H: 1.10 ± 0.15 H_1:0.90 ± 0.15	0.50 ± 0.15	1.27 ± 0.05	6.40 ± 0.20	0.60 ± 0.10	0.50 ± 0.15	3.20 ± 0.20

YC/TC - Thick film array / network chip resistors

Electrical characteristics

Type	Power P_{70}	Operating Temp. range	MWV	RCOV	DWV	Resistance range & tolerance	T. C. R.	Jumper criteria (unit: A)
YC102	1/32W	-55°C to +125°C	15V	30V	30V	E24 ±5% 10Ω ≤ R ≤ 1MΩ E24/E96 ±1% 10Ω ≤ R ≤ 1MΩ Jumper < 50mΩ	±200 ppm/°C	Rated current 0.5 Max. current 1.0
YC104	1/32W		12.5V	25V	25V	E24 ±5% 10Ω ≤ R ≤ 1MΩ E24/E96 ±1% 10Ω ≤ R ≤ 1MΩ Jumper < 50mΩ		Rated current 0.5 Max. current 1.0
YC122	1/16W	-55°C to +155°C	50V	100V	100V	E24 ±5% 1Ω ≤ R ≤ 1MΩ E24/E96 ±1% 1Ω ≤ R ≤ 1MΩ Jumper < 50mΩ	1Ω ≤ R ≤ 10Ω ±250 ppm/°C 10Ω ≤ R ≤ 1MΩ ±200 ppm/°C	Rated current 0.5 Max. current 1.0
YC124	1/16W		25V	50V	100V	E24 ±5% 1Ω ≤ R ≤ 1MΩ E24/E96 ±1% 1Ω ≤ R ≤ 1MΩ Jumper < 50mΩ		Rated current 1.0 Max. current 2.0
YC162	1/16W		50V	100V	100V	E24/E96 ±1% 1Ω ≤ R ≤ 1MΩ E24 ±5% 1Ω ≤ R ≤ 1MΩ Jumper < 50mΩ		Rated current 1.0 Max. current 2.0
YC164	1/16W		50V	100V	100V	E24 ±5% 1Ω ≤ R ≤ 1MΩ E24/E96 ±1% 1Ω ≤ R ≤ 1MΩ Jumper < 50mΩ	±200 ppm/°C	Rated current 1.0 Max. current 2.0
YC248	1/16W		50V	100V	100V	E24 ±5% 10Ω ≤ R ≤ 1MΩ E24/E96 ±1% 10Ω ≤ R ≤ 1MΩ Jumper < 50mΩ		Rated current 2.0 Max. current 10.0
YC324	1/8W		200V	500V	500V	E24 ±5% 10Ω ≤ R ≤ 1MΩ E24/E96 ±1% 10Ω ≤ R ≤ 1MΩ Jumper < 50mΩ		Rated current 2.0 Max. current 10.0
TC122	1/16W		50V	100V	100V	E24 ±5% 10Ω ≤ R ≤ 1MΩ E24/E96 ±1% 10Ω ≤ R ≤ 1MΩ Jumper < 50mΩ		Rated current 1.0 Max. current 1.5
TC124	1/16W		50V	100V	100V	E24 ±5% 10Ω ≤ R ≤ 1MΩ E24/E96 ±1% 10Ω ≤ R ≤ 1MΩ Jumper < 50mΩ		Rated current 1.0 Max. current 1.5
TC164	1/16W		50V	100V	100V	E24 ±5% 10Ω ≤ R ≤ 1MΩ E24/E96 ±1% 10Ω ≤ R ≤ 1MΩ Jumper < 50mΩ		Rated current 1.0 Max. current 2.0
YC158T	1/16W		25V	50V	50V	E24 ±5% 10Ω ≤ R ≤ 100KΩ		-- --
YC358T YC358L	1/16W		50V	100V	100V	E24 ±5% 10Ω ≤ R ≤ 330KΩ		-- --

Environmental characteristics

Performance test		Test method	Procedure	Requirements
Life		MIL-STD-202 Method 108A	1000 hours at 70 ±2°C applied RCWV 1.5 hours on, 0.5 hours off, still air required	± (2% +50mΩ) < 100mΩ for jumper
High temperature exposure		MIL-STD-202 Method 108A	1000 hours at maximum operating temperature depending on specification, unpowered	± (1% +50mΩ) < 50mΩ for jumper
Moisture resistance		MIL-STD-202 Method 106G	Each temperature / humidity cycle is defined as 8 hours(method 106G), 3 cycles / 24 hours for 10d with25°C / 65°C 95% R.H	± (2% +50mΩ) < 100mΩ for jumper
Thermal shock		MIL-STD-202 Method 107G	-55 / +125°C Note: Number of cycles required is 300. Devices mounted Maximum transfer time is 20 seconds. Dwell time is 15 minutes. Air – Air	± (1% +50mΩ) for others < 50mΩ for jumper
Solderability	Wetting	J-STD-002B test B	Electrical test not required. Magnification 50X Lead-free solder bath at 245 ±3°C Dipping time: 3 ±0.5 seconds	Well tinned (≥ 95% covered)
	Resistance to soldering heat	MIL-STD-202 method 210F	Lead-free solder, 260°C, 10 seconds immersion time	± (1% +50mΩ) < 50mΩ for jumper No visible damage
Short time overload		IEC 60115 -1 4.13	2.5 times RCWV or maximum overload voltage whichever is less for 5 seconds at room temperature	± (2% +50mΩ) < 50mΩ for jumper No visible damage

Global part number - Arrays

Ordering example: YC122-JR-07100KL

YC 12 2 – J R — 07 100K L/T

Series name (code 1-2)
- YC = Array & Network (convex / flat) thick film
- TC = Array (concave) thick film

Size code (inch) (code 3-4)
- 10 = 0201 x 2 (0202)
- 0201 x 4 (0204)
- 12 = 0402 x 2 (0404)
- 0402 x 4 (0408)
- 16 = 0603 x 2 (0606)
- 0603 x 4 (0612)
- 24 = 0602 x 8 (0616)
- 32 = 1206 x 4 (1224)

Number of resistors (code 5)
- 2 = 2 resistors
- 4 = 4 resistors
- 8 = 8 resistors

Default code (code 17)
- T = The only code for YC102

Resistance (code 12-16)
- 0R = Jumper
- 10R = 10Ω
- 100R = 100Ω
- 100K = 100KΩ

Taping reel (code 10-11)
- 07 = 7 inch Dia. reel
- 13 = 13 inch Dia. reel

T. C. R. (code 9)
- "—" = Based on spec.

Packing style (code 8)
- R = Paper tape reel
- K = Embossed plastic tape reel

Tolerance (code 7)
- F = ±1%
- J = ±5% (for Jumper ordering)

Note: 1. All of our RSMD products are RoHS compliant. "LFP" of the internal 2D reel label mentions "Lead Free Process"
2. Letter L is system default code for ordering only

Phycomp worldwide - Traditional type

Array thick film chip resistors											
Size: inch / mm	2 X 0402 / 1 X 1		4 X 0402 / 2 X 1		8 X 0602 / 4.0 X 1.6		4 X 0603 / 3.2 X 1.3				4 X1206 / 5.2 X 3.1
Power	1/16 W		1/16 W		1/16 W		1/16 W				1/8 W
Tolerance	+5%	+1%	+5%	+1%	+5%	+1%	+5%	+1%	+5%	+1%	+5%
Type	R-array / R-network (convex)	R-array / R-network (convex)	R-array / R-network (convex)	R-array / R-network (convex)	R-array / R-network (convex)	R-array / R-network (convex)	R-array / R-network (convex)	R-array / R-network (convex)	R-array / R-network R-network (concave)	R-array / R-network (concave)	R-array / R-network (convex)
Resistance	E24	E24 / E96	E24	E24 / E96	E24	E24 / E96	E24	E24 / E96	E24	E24/E96	E24
Packing	paper tape		paper tape		paper tape		paper tape				blister tape
Quantity 4 000	---	---	---	---	---	---	---	---	---	---	2350 039 10...L
5 000	---	---	---	---	2350 053 10...L	2350 043 1....L	2350 035 10...L	2350 025 1....L	2350 034 10...L	2350 024 1...L	---
10 000	2350 013 11...L	2350 013 2....L	2350 033 11...L	2350 023 2....L	---	---	---	---	---	---	---
Jumper 5 000	---	---	---	---	2350 053 91001L	---	2350 035 91001L	---	2350 034 91001L	---	---
10 000	2350 013 91001L	---	2350 033 91001L	---	---	---	---	---	---	---	---

For ordering rules: See page 14 for E24 / E96 values and the last 4 or 3 digits of the 12NC catalogue number

Global part number - Networks

Ordering example: YC158TJR-07100KL

YC 15 8 T J R — 07 100K L

Series name (code 1-2)
YC = Array & Network (convex) thick film

Size code (inch) (code 3-4)
15 = 10Pin/8R (0612)
35 = 10Pin/8R (1225)

Number of resistors (code 5)
8 = 8 resistors

Schematic (code 6)
L = L-type (for YC358)
T = T-type (for YC158/358)

Default code (code 17)

Resistance (code 12-16)
0R = Jumper
10R = 10Ω
100R = 100Ω
100K = 100KΩ

Taping reel (code 10-11)
07 = 7 inch Dia. reel
13 = 13 inch Dia. reel

T. C. R. (code 9)
"—" = Based on spec.

Packing style (code 8)
R = Paper tape reel
K = Embossed plastic tape reel

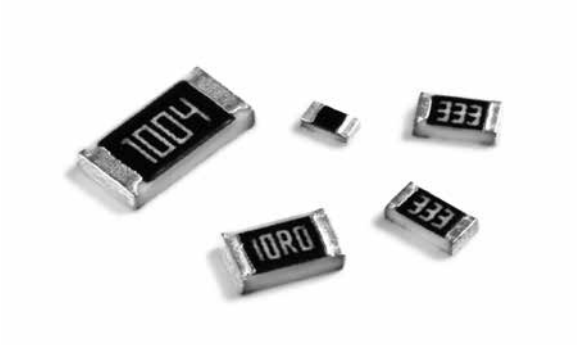
Tolerance (code 7)
J = ±5%

Note: 1. All of our RSMD products are RoHS compliant. "LFP" of the internal 2D reel label mentions "Lead Free Process"
2. Letter L is system default code for ordering only

Phycomp worldwide - Traditional type

Network thick film chip resistors			
Size: inch (mm)	**0612 (1632)**	**1225 (3264)**	
Power	1/16 W	1/16 W	
Tolerance	+5%	+5%	
Type	T-type 10 Pin / 8R PIN 5 and PIN 10 no resistance	T-type 10 Pin / 8R PIN 5 and PIN 10 no resistance	L-type 10 Pin / 8R PIN 1 and PIN 6 no resistance
Resistance	E24	E24	E24
Packing	paper tape	blister tape	
Quantity 4 000	---	2350 201 10...L	2350 200 10...L
Quantity 5 000	2350 230 10...L	---	---

For ordering rules: See page 14 for E24 / E96 values and the last 4 or 3 digits of the 12NC catalogue number

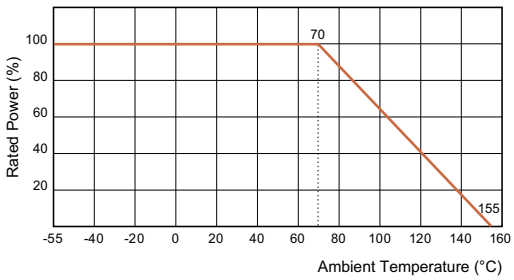


Features

- AEC-Q200 qualified
- Production part approval process (PPAP) support
- High reliability
- High quality level

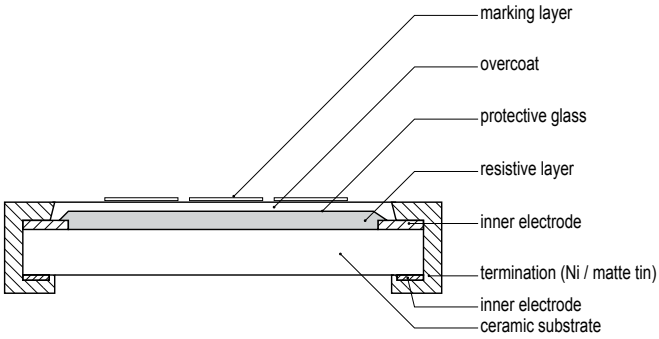
Derating curve

Maximum dissipation (P) in percentage of rated power as a function of the operating ambient temperature (T_{amb}).

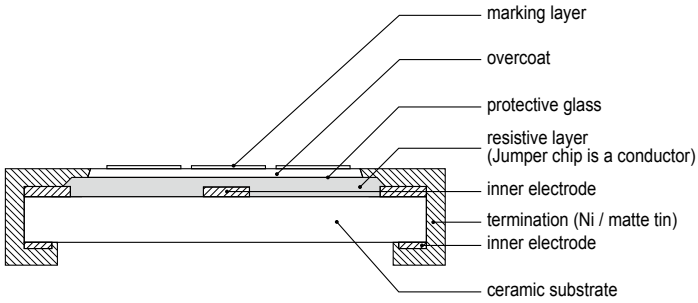


Construction

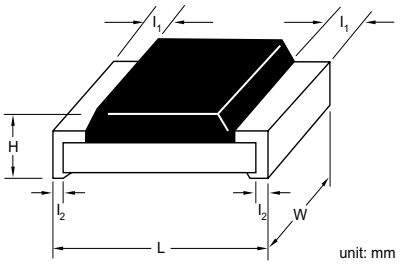
All size range except AC2010/ 2512 double power



AC2010/ 2512 double power



Dimensions



Type	L	W	H	l_1	l_2
AC0201	0.60 ± 0.03	0.30 ± 0.03	0.23 ± 0.03	0.12 ± 0.05	0.15 ± 0.05
AC0402	1.00 ± 0.05	0.50 ± 0.05	0.32 ± 0.05	0.20 ± 0.10	0.25 ± 0.10
AC0603	1.60 ± 0.10	0.80 ± 0.10	0.45 ± 0.10	0.25 ± 0.15	0.25 ± 0.15
AC0805	2.00 ± 0.10	1.25 ± 0.10	0.50 ± 0.10	0.35 ± 0.20	0.35 ± 0.20
AC1206	3.10 ± 0.10	1.60 ± 0.10	0.55 ± 0.10	0.45 ± 0.20	0.40 ± 0.20
AC1210	3.10 ± 0.10	2.60 ± 0.15	0.55 ± 0.10	0.45 ± 0.15	0.50 ± 0.20
AC1218	3.10 ± 0.10	4.60 ± 0.10	0.55 ± 0.10	0.45 ± 0.20	0.40 ± 0.20
AC2010	5.00 ± 0.10	2.50 ± 0.15	0.55 ± 0.10	0.55 ± 0.15	0.50 ± 0.20
AC2512	6.35 ± 0.10	3.10 ± 0.15	0.55 ± 0.10	0.60 ± 0.20	0.50 ± 0.20

AC - Automotive grade chip resistors, 0201 to 2512

Electrical characteristics

Type	Power P_{70}	Operating Temp. range	MWV	RCOV	DWV	Resistance range & tolerance	T. C. R.	Jumper criteria (unit: A)
AC0201	1/20W	-55°C to 155°C	25V	50V	50V	E24 ±1%,±5% 1Ω ≤ R ≤ 10MΩ E24/E96 ±0.5% 10Ω ≤ R ≤ 1MΩ Jumper < 50mΩ	1Ω ≤ R ≤ 10Ω -100/ +350 ppm/°C 10Ω < R ≤ 10MΩ ±200 ppm/°C	Rated Current 0.5A Max. Current 1.0A
AC0402	1/16W		50V	100V	100V	E24 ±5% 1Ω ≤ R ≤ 22MΩ E24/E96 ±0.5%,±1% 1Ω ≤ R ≤ 10MΩ Jumper < 50mΩ	1Ω ≤ R ≤ 10Ω ±200 ppm/°C 10Ω < R ≤ 10MΩ ±100 ppm/°C 10MΩ < R ≤ 22MΩ ±200 ppm/°C	Rated Current 1A Max. Current 2A
	1/8W		50V	100V	100V	E24 ±5% 1Ω ≤ R ≤ 10MΩ E24/E96 ±1%, 0.5% 1Ω ≤ R ≤ 10MΩ	1Ω ≤ R ≤ 10Ω ±200 ppm/°C 10Ω < R ≤ 10MΩ ±100 ppm/°C	-- --
AC0603	1/10W		75V	150V	150V	E24 ±5% 1Ω ≤ R ≤ 22MΩ E24/E96 ±0.5%,±1% 1Ω ≤ R ≤ 10MΩ Jumper < 50mΩ	1Ω ≤ R ≤ 10Ω ±200 ppm/°C 10Ω < R ≤ 10MΩ ±100 ppm/°C 10MΩ < R ≤ 22MΩ ±200 ppm/°C	Rated Current 1A Max. Current 2A
	1/5W		75V	150V	150V	E24 ±5% 1Ω ≤ R ≤ 10MΩ E24/E96 ±1%, 0.5% 1Ω ≤ R ≤ 10MΩ	1Ω ≤ R ≤ 10Ω ±200 ppm/°C 10Ω < R ≤ 10MΩ ±100 ppm/°C	-- --
AC0805	1/8W		150V	300V	300V	E24 ±5% 1Ω ≤ R ≤ 22MΩ E24/E96 ±0.5%,±1% 1Ω ≤ R ≤ 10MΩ Jumper < 50mΩ	1Ω ≤ R ≤ 10Ω ±200 ppm/°C 10Ω < R ≤ 10MΩ ±100 ppm/°C 10MΩ < R ≤ 22MΩ ±200 ppm/°C	Rated Current 2A Max. Current 5A
	1/4W		150V	300V	300V	E24 ±5% 1Ω ≤ R ≤ 10MΩ E24/E96 ±1%, 0.5% 1Ω ≤ R ≤ 10MΩ	1Ω ≤ R ≤ 10Ω ±200 ppm/°C 10Ω < R ≤ 10MΩ ±100 ppm/°C	-- --
AC1206	1/4W		200V	400V	500V	E24 ±5% 1Ω ≤ R ≤ 22MΩ E24/E96 ±0.5%,±1% 1Ω ≤ R ≤ 10MΩ Jumper < 50mΩ	1Ω ≤ R ≤ 10Ω ±200 ppm/°C 10Ω < R ≤ 10MΩ ±100 ppm/°C 10MΩ < R ≤ 22MΩ ±200 ppm/°C	Rated Current 2A Max. Current 10A
	1/2W		200V	400V	500V	E24 ±5% 1Ω ≤ R ≤ 10MΩ E24/E96 ±1%, 0.5% 1Ω ≤ R ≤ 10MΩ	1Ω ≤ R ≤ 10Ω ±200 ppm/°C 10Ω < R ≤ 10MΩ ±100 ppm/°C	-- --
AC1210	1/2W		200V	500V	500V	E24 ±5% 1Ω ≤ R ≤ 22MΩ E24/E96 ±0.5%,±1% 1Ω ≤ R ≤ 10MΩ Jumper < 50mΩ	1Ω ≤ R ≤ 10Ω ±200 ppm/°C 10Ω < R ≤ 10MΩ ±100 ppm/°C 10MΩ < R ≤ 22MΩ ±200 ppm/°C	Rated Current 2A Max. Current 10A
	1W		200V	500V	500V	E24 ±5% 1Ω ≤ R ≤ 10MΩ E24/E96 ±1%, 0.5% 1Ω ≤ R ≤ 10MΩ	1Ω ≤ R ≤ 10Ω ±200 ppm/°C 10Ω < R ≤ 10MΩ ±100 ppm/°C	-- --
AC1218	1W		200V	500V	500V	E24 ±5% 1Ω ≤ R ≤ 1MΩ E24/E96 ±0.5%,±1% 1Ω ≤ R ≤ 1MΩ Jumper < 50mΩ	1Ω ≤ R ≤ 10Ω ±200 ppm/°C 10Ω < R ≤ 1MΩ ±100 ppm/°C	Rated Current 6A Max. Current 10A
	1.5W		200V	500V	500V	E24 ±5% 1Ω ≤ R ≤ 1MΩ E24/E96 ±1%, 0.5% 1Ω ≤ R ≤ 1MΩ	1Ω ≤ R ≤ 10Ω ±200 ppm/°C 10Ω < R ≤ 1MΩ ±100 ppm/°C	-- --
AC2010	3/4W		200V	500V	500V	E24 ±5% 1Ω ≤ R ≤ 22MΩ E24/E96 ±0.5%,±1% 1Ω ≤ R ≤ 10MΩ Jumper < 50mΩ	1Ω ≤ R ≤ 10Ω ±200 ppm/°C 10Ω < R ≤ 10MΩ ±100 ppm/°C 10MΩ < R ≤ 22MΩ ±200 ppm/°C	Rated Current 2A Max. Current 10A
	1.25W		200V	500V	500V	E24 ±5% 1Ω ≤ R ≤ 10MΩ E24/E96 ±1%, 0.5% 1Ω ≤ R ≤ 10MΩ	1Ω ≤ R ≤ 10Ω ±200 ppm/°C 10Ω < R ≤ 10MΩ ±100 ppm/°C	-- --
AC2512	1W		200V	500V	500V	E24 ±5% 1Ω ≤ R ≤ 22MΩ E24/E96 ±0.5%,±1% 1Ω ≤ R ≤ 10MΩ Jumper < 50mΩ	1Ω ≤ R ≤ 10Ω ±200 ppm/°C 10Ω < R ≤ 10MΩ ±100 ppm/°C 10MΩ < R ≤ 22MΩ ±200 ppm/°C	Rated Current 2A Max. Current 10A
	2W		200V	500V	500V	E24 ±5% 1Ω ≤ R ≤ 10MΩ E24/E96 ±1%, 0.5% 1Ω ≤ R ≤ 10MΩ	1Ω ≤ R ≤ 10Ω ±200 ppm/°C 10Ω < R ≤ 10MΩ ±100 ppm/°C	-- --

AC - Automotive grade chip resistors, 0201 to 2512

Environmental characteristics				
Performance test		Test method	Procedure	Requirements
Life		AEC-Q200-REV C-Test 8 MIL-STD-202 Method 108	1000 hours at 125°C applied RCWV 1.5 hours on, 0.5 hours off	± (1%+50mΩ) for D/F tol ± (3%+50mΩ) for J tol < 100 mΩ for Jumper
High temperature exposure		AEC-Q200 Test 3 MIL-STD-202 Method 108	1000 hours at TA = 155°C, unpowered	± (1%+50mΩ) for D/F tol ± (2%+50mΩ) for J tol < 50 mΩ for Jumper
Moisture resistance		AEC-Q200 Test 6 MIL-STD-202 Method 106	Each temperature / humidity cycle is defined as 8 hours (method 106F), 3 cycles / 24 hours for 10d with 25°C / 65°C 95% R.H.	± (0.5%+50mΩ) for D/F tol ± (2%+50mΩ) for J tol < 100 mΩ for Jumper
Biased humidity		AEC-Q200 Test 7 MIL-STD-202 Method 103	1000 hours; + 85°C 85% R.H.; 10% of operating power Measured at 24 ±2 hours after test	± (1%+50mΩ) for D/F tol ± (3%+50mΩ) for J tol < 100 mΩ for Jumper
Thermal shock		AEC-Q200 Test 16 MIL-STD-202 Method 107	-55 / +125°C Number of cycles is 300. Devices mounted Maximum transfer time is 20 seconds. Dwell time is 15 minutes. Air – Air	± (0.5%+50mΩ) for D/F tol ± (1%+50mΩ) for J tol < 50 mΩ for Jumper
Solderability	Wetting	AEC-Q200 Test 18 J-STD-002B test B	Electrical test not required. Magnification 50X Lead-free solder bath at 245 ±3°C Dipping time: 3 ±0.5 seconds	Well tinned (≥ 95% covered) No visible damage
	Resistance to soldering heat	AEC-Q200 Test 15 MIL-STD-202 Method 215	Lead-free solder, 260°C, 10 seconds immersion time	± (0.5%+50mΩ) for D/F tol ± (1%+50mΩ) for J tol < 50 mΩ for Jumper No visible damage
Short time overload		IEC60115-1 4.13	2.5 times RCWV or maximum overload voltage whichever is less for 5 seconds at room temperature	± (1%+50mΩ) for D/F tol ± (2%+50mΩ) for J tol < 50 mΩ for Jumper
ESD		AEC-Q200 Test 17 AEC-Q200-002	Human Body Mode, 1 pos. + 1 neg. discharges 0402/0603: 1KV 0805 and above: 2KV	± (3.0%+0.05Ω)
FOS		ASTM-B-809-95	Sulfur (saturated vapor) 500 hours, 60 ±2°C unpowered	± (1.0%+0.05Ω)

Global part number - Preferred type

Ordering example: AC0603JR-07100KL

A C 0 6 0 3 J R — 0 7 1 0 0 K L

Series name (code 1-2)
AC = Automotive grade

Size code (code 3-6)
(inch / metric)
0201 = 0.6 x 0.3
0402 = 1.0 x 0.5
0603 = 1.6 x 0.8
0612 = 1.6 x 3.2
0805 = 2.0 x 1.25
1020 = 2.5 x 5.0
1206 = 3.2 x 1.6
1210 = 3.2 x 2.6
1218 = 3.2 x 4.5
1225 = 3.2 x 6.4
2010 = 5.0 x 2.5
2512 = 6.35 x 3.2

Tolerance (code 7)
D = ±0.5%
F = ±1%
J = ±5% (for jumper ordering)

Default code(1/2) (code 17)

Resistance (code 12-16)
0R = Jumper
10R = 10Ω
100R = 100Ω
100K = 100KΩ

Taping reel (code 10-11)
07 = 7 inch Dia. reel
10 = 10 inch Dia. reel
13 = 13 inch Dia. reel
7W = 7 inch Dia. reel
2 x standard power type
3W = 13 inch Dia. reel
2 x standard power type

T. C. R. (code 9)
"—" = Based on spec.
(— for thick film only)

Packing style (code 8)
R = Paper tape reel
K = Embossed plastic tape reel

Note: 1. All of our RSMD products are RoHS compliant. "LFP" of the internal 2D reel label mentions "Lead Free Process"
2. Letter L is system default code for ordering only
3. AC series products are available by "Global part number" only

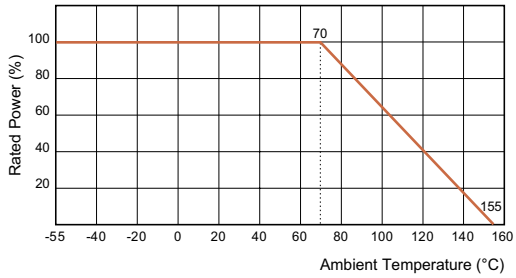
AC - Automotive grade chip resistors, wide termination , 0612 to 1225

Features

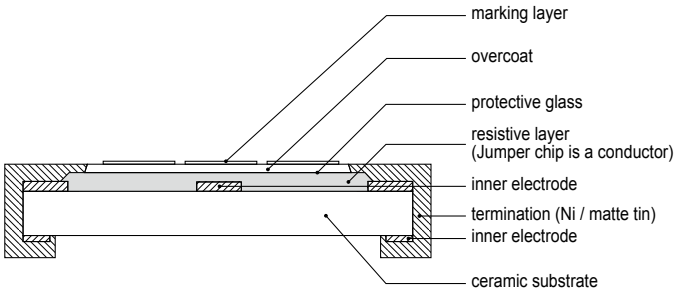
- AEC-Q200 qualified
- Production part approval process (PPAP) support
- High reliability
- High quality level

Derating curve

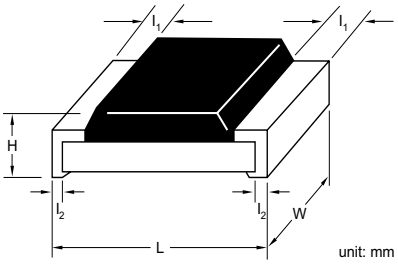
Maximum dissipation (P) in percentage of rated power as a function of the operating ambient temperature (T_{amb}).



Construction



Dimensions



Type	L	W	H	l_1	l_2
AC0612	1.60 ± 0.20	3.20 ± 0.20	0.55 ± 0.10	0.18 ± 0.15	0.40 ± 0.15
AC1020	2.50 ± 0.20	5.00 ± 0.20	0.55 ± 0.10	0.25 ± 0.20	0.90 ± 0.20
AC1225	3.20 ± 0.20	6.40 ± 0.20	0.55 ± 0.10	0.45 ± 0.20	0.75 ± 0.20

Electrical characteristics

Type	Power P_{70}	Operating Temp. range	MWV	RCOV	DWV	Resistance range & tolerance	T. C. R.	Jumper criteria (unit: A)
AC0612	3/4W	-55°C to 155°C	200V	400V	500V	E24 ±5% 1Ω ≤ R ≤ 1MΩ E24/E96 ±0.5%,±1% 1Ω ≤ R ≤ 1MΩ Jumper < 50mΩ	1Ω ≤ R ≤ 10Ω ±200 ppm/°C 10Ω< R ≤1MΩ ±100 ppm/°C	Rated Current 2A Max. Current 10A
AC1020	1W		200V	400V	500V			
AC1225	2W		200V	400V	500V			

AC - Automotive grade chip resistors, wide termination , 0612 to 1225

Environmental characteristics				
Performance test		Test method	Procedure	Requirements
Life		AEC-Q200-REV C-Test 8 MIL-STD-202 Method 108	1000 hours at 125°C applied RCWV 1.5 hours on, 0.5 hours off	± (1%+50mΩ) for D/F tol ± (3%+50mΩ) for J tol < 100 mΩ for Jumper
High temperature exposure		AEC-Q200 Test 3 MIL-STD-202 Method 108	1000 hours at maximum operating temperature depending on specification	± (1%+50mΩ) for D/F tol ± (2%+50mΩ) for J tol < 50 mΩ for Jumper
Moisture resistance		AEC-Q200 Test 6 MIL-STD-202 Method 106	Each temperature / humidity cycle is defined as 8 hours (method 106F), 3 cycles / 24 hours for 10d with 25°C / 65°C 95% R.H.	± (0.5%+50mΩ) for D/F tol ± (2%+50mΩ) for J tol < 100 mΩ for Jumper
Biased humidity		AEC-Q200 Test 7 MIL-STD-202 Method 103	1000 hours; + 85°C 85% R.H.; 10% of operating power Measured at 24 ±2 hours after test	± (1%+50mΩ) for D/F tol ± (3%+50mΩ) for J tol < 100 mΩ for Jumper
Thermal shock		AEC-Q200 Test 16 MIL-STD-202 Method 107	-55 / +125°C Number of cycles is 300. Devices mounted Maximum transfer time is 20 seconds. Dwell time is 15 minutes. Air – Air	± (0.5%+50mΩ) for D/F tol ± (1%+50mΩ) for J tol < 50 mΩ for Jumper
Solderability	Wetting	AEC-Q200 Test 18 J-STD-002B test B	Electrical test not required. Magnification 50X Lead-free solder bath at 245 ±3°C Dipping time: 3 ±0.5 seconds	Well tinned (≥ 95% covered) No visible damage
	Resistance to soldering heat	AEC-Q200 Test 15 MIL-STD-202 Method 215	Lead-free solder, 260°C, 10 seconds immersion time	± (0.5%+50mΩ) for D/F tol ± (1%+50mΩ) for J tol < 50 mΩ for Jumper No visible damage
Short time overload		IEC60115-1 4.13	2.5 times RCWV or maximum overload voltage whichever is less for 5 seconds at room temperature	± (1%+50mΩ) for D/F tol ± (2%+50mΩ) for J tol < 50 mΩ for Jumper

Global part number - Preferred type

Ordering example: AC0612FR-07100KL

A C 0 6 1 2 J R — 0 7 1 0 0 K L

Series name (code 1-2)
AC = Automotive grade

Size code (code 3-6)
(inch / metric)
0612 = 1.6 x 3.2
1020 = 2.5 x 5.0
1225 = 3.2 x 6.4

Tolerance (code 7)
D = ±0.5%
F = ±1%
J = ±5% (for jumper ordering)

Packing style (code 8)
R = Paper tape reel
K = Embossed plastic tape reel

Default code(1/2) (code 17)

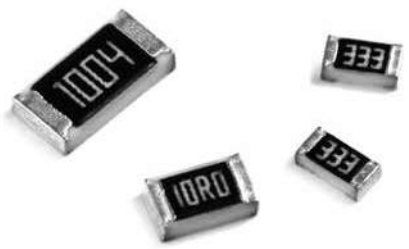
Resistance (code 12-16)
0R = Jumper
10R = 10Ω
100R = 100Ω
100K = 100KΩ

Taping reel (code 10-11)
07 = 7 inch Dia. reel
13 = 13 inch Dia. reel

T. C. R. (code 9)
"—" = Based on spec.
(— for thick film only)

Note: 1. All of our RSMD products are RoHS compliant. "LFP" of the internal 2D reel label mentions "Lead Free Process"
2. Letter L is system default code for ordering only
3. AC wide series products are available by "Global part number" only

AC - Automotive grade chip resistors, TCR 50ppm, 0402 to 1206

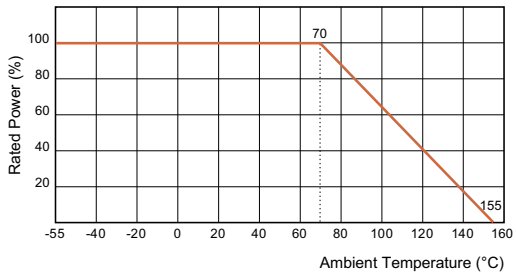


Features

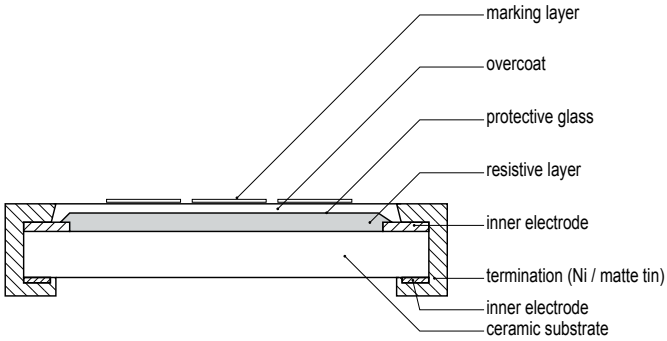
- AEC-Q200 qualified
- Narrow tolerance
- Low T. C. R.
- Highly reliable construction
- Compatible with all soldering processes
- RoHS compliant
- Moisture sensitivity level: MSL I

Derating curve

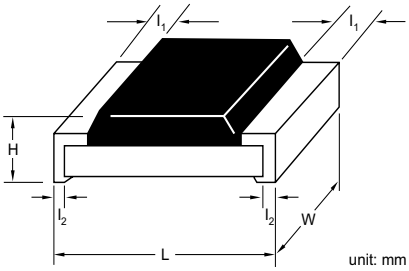
Maximum dissipation (P) in percentage of rated power as a function of the operating ambient temperature (T_{amb}).



Construction



Dimensions



Type	L	W	H	I_1	I_2
AC0402	1.00 ± 0.05	0.50 ± 0.05	0.32 ± 0.05	0.20 ± 0.10	0.25 ± 0.10
AC0603	1.60 ± 0.10	0.80 ± 0.10	0.45 ± 0.10	0.25 ± 0.15	0.25 ± 0.15
AC0805	2.00 ± 0.10	1.25 ± 0.10	0.50 ± 0.10	0.35 ± 0.20	0.35 ± 0.20
AC1206	3.10 ± 0.10	1.60 ± 0.10	0.55 ± 0.10	0.45 ± 0.20	0.40 ± 0.20

Electrical characteristics

Type	Power P_{70}	Operating Temp. range	MWV	RCOV	DWV	Resistance range & tolerance	T. C. R.
AC0402	1/16W	-55°C to +155°C	50V	100V	100V	E24/E96 ±0.1%,±0.5%, ±1% 10Ω ≤ R ≤ 1MΩ	±50 ppm/°C
AC0603	1/10W		75V	150V	150V		
AC0805	1/8W		150V	300V	300V		
AC1206	1/4W		200V	400V	500V		

AC - Automotive grade chip resistors, TCR 50ppm, 0402 to 1206

Environmental characteristics				
Performance test		Test method	Procedure	Requirements
Life		MIL-STD-202 -method 108A	1000 hours at 70 ±2°C applied RCWV 1.5 hours on, 0.5 hours off, still air required	± (1% +50mΩ)
High temperature exposure		MIL-STD-202 -method 108A	1000 hours at maximum operating temperature depending on specification, unpowered	± (1% +50mΩ)
Moisture resistance		MIL-STD-202 -method 106G	Each temperature / humidity cycle is defined as 8 hours (method 106G), 3 cycles / 24 hours for 10d with 25°C / 65°C 95% R.H	± (0.5% +50mΩ)
Thermal shock		MIL-STD-202 -method 107G	-55 / +125°C Note: Number of cycles required is 300. Devices mounted Maximum transfer time is 20 seconds. Dwell time is 15 minutes. Air – Air	± (0.5% +50mΩ)
Solderability	Wetting	IPC/JEDECJ-STD-002B test B	Electrical test not required. Magnification 50X Lead-free solder bath at 245 ±3°C Dipping time: 3 ±0.5 seconds	Well tinned (≥ 95% covered) No visible damage
	Resistance to soldering heat	MIL-STD-202 -method 210F	Lead-free solder, 260°C, 10 seconds immersion time	± (0.5%+ 50mΩ) No visible damage
Short time overload		IEC 60115 -1 4.13	2.5 times RCWV or maximum overload voltage whichever is less for 5 seconds at room temperature	± (1%+ 50mΩ) No visible damage
Biased Humidity		AEC-Q200 -Test 7 MIL-STD-202 -method 103	1,000 hours; 85°C / 85% RH 10% of operating power Measurement at 24± 4 hours after test conclusion.	± (1.0%+0.05Ω)
ESD		AEC-Q200 -Test 17 AEC-Q200-002	Human Body Mode, 1 pos. + 1 neg. discharges 0402/0603: 1KV 0805 and above: 2KV	± (3.0%+0.05 Ω)
FOS		ASTM-B-809-95	Sulfur (saturated vapor) 500 hours, 60± 2°C unpowered	± (1.0%+0.05Ω)

Global part number - Preferred type for ordering Yageo / Phycomp branded products

Ordering example: AC0603DRE07100KL

AC 0603 D R E 07 100K L

Series name (code 1-2)
- AC = Automotive grade

Size code (code 3-6)
(inch / metric)
- 0402 = 1.0 x 0.5
- 0603 = 1.6 x 0.8
- 0805 = 2.0 x 1.25
- 1206 = 3.2 x 1.6

Tolerance (code 7)
- B = ±0.1%
- D = ±0.5%
- F = ±1%

Packing style (code 8)
- R = Paper tape reel

T. C. R. (code 9)
- E = ±50 ppm/°C

Taping reel (code 10-11)
- 07 = 7 inch Dia. reel
- 13 = 13 inch Dia. reel

Resistance (code 12-16)
- 10R = 10Ω
- 100R = 100Ω
- 100K = 100KΩ

Default code(1/2) (code 17)

Note: 1. All of our RSMD products are RoHS compliant. "LFP" of the internal 2D reel label mentions "Lead Free Process"
2. Letter L is system default code for ordering only
3. AC series products are available by "Global part number" only

AF - Sulfur resistant chip resistors, 0201 to 2512

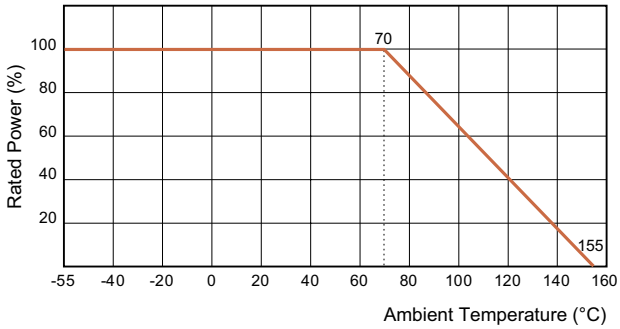
Features

- AEC-Q200 qualified
- Superior resistance against sulfur containing atmosphere
- Highly reliable electrode construction
- Compatible with all soldering processes
- Highly stable in auto-placement surface mounting applications
- Halogen free product and production

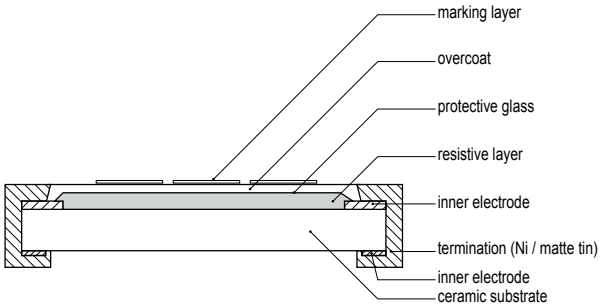
Derating curve

Maximum dissipation (P) in percentage of rated power as a function of the operating ambient temperature (T_{amb}).

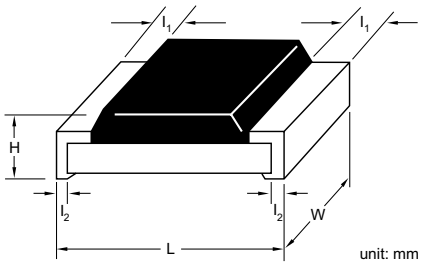
AF0201 - AF2512 Range: -55°C to + 155°C



Construction



Dimensions



Type	L	W	H	l_1	l_2
AF0201	0.60 ± 0.03	0.30 ± 0.03	0.23 ± 0.03	0.12 ± 0.05	0.15 ± 0.05
AF0402	1.00 ± 0.05	0.50 ± 0.05	0.35 ± 0.05	0.20 ± 0.10	0.25 ± 0.10
AF0603	1.60 ± 0.10	0.80 ± 0.10	0.45 ± 0.10	0.25 ± 0.15	0.25 ± 0.15
AF0805	2.00 ± 0.10	1.25 ± 0.10	0.50 ± 0.10	0.35 ± 0.20	0.35 ± 0.20
AF1206	3.10 ± 0.10	1.60 ± 0.10	0.55 ± 0.10	0.45 ± 0.20	0.50 ± 0.20
AF1210	3.10 ± 0.10	2.60 ± 0.15	0.57 ± 0.10	0.45 ± 0.20	0.50 ± 0.20
AF1218	3.10 ± 0.10	4.60 ± 0.10	0.57 ± 0.10	0.45 ± 0.20	0.50 ± 0.20
AF2010	5.00 ± 0.10	2.50 ± 0.15	0.57 ± 0.10	0.55 ± 0.20	0.55 ± 0.20
AF2512	6.35 ± 0.10	3.10 ± 0.15	0.57 ± 0.10	0.60 ± 0.20	0.60 ± 0.20

AF - Sulfur resistant chip resistors, 0201 to 2512

Electrical characteristics

Type	Power P_{70}	Operating Temp. range	MWV	RCOV	DWV	Resistance range & tolerance	T. C. R.	Jumper criteria (unit: A)
AF0201	1/20W	-55°C to +155°C	25V	50V	50V	E24 ±5% 1Ω ≤ R ≤ 10MΩ E24/E96 ±0.5%, ±1% 1Ω ≤ R ≤ 10MΩ Jumper < 50mΩ	1Ω≤R≤10Ω -100/ 350 ppm/°C 10Ω<R≤10MΩ ±200 ppm/°C	Rated current 0.5 Max. current 1.0
AF0402	1/16W		50V	100V	100V	5% (E24) 1Ω≤R≤22MΩ 0.5%, 1% (E24/E96) 1Ω≤R≤10MΩ Jumper <50mΩ	1Ω≤R≤10Ω ±200ppm°C 10Ω<R≤10MΩ ±100ppm°C 10MΩ<R≤22MΩ ±200ppm°C	Rated current 1.0 Max. current 2.0
	1/8W		50V	100V	100V	5% (E24) 1Ω≤R≤10MΩ 0.5%, 1%, (E24/E96) 1Ω≤R≤10MΩ	1Ω≤R≤10Ω ±200 ppm°C 10Ω<R≤10MΩ ±100 ppm°C	-
AF0603	1/10W		75V	150V	150V	5% (E24) 1Ω≤R≤22MΩ 0.5%, 1% (E24/E96) 1Ω≤R≤10MΩ Jumper <50mΩ	1Ω≤R≤10Ω ±200ppm°C 10Ω<R≤10MΩ ±100ppm°C 10MΩ<R≤22MΩ ±200ppm°C	Rated current 1.0 Max. current 2.0
	1/5 W		75V	150V	150V	5% (E24) 1Ω≤R≤10MΩ 0.5%, 1%, (E24/E96) 1Ω≤R≤10MΩ	1Ω≤R≤10Ω ±200 ppm°C 10Ω<R≤10MΩ ±100 ppm°C	-
AF0805	1/8W		150V	300V	300V	5% (E24) 1Ω≤R≤22MΩ 0.5%, 1% (E24/E96) 1Ω≤R≤10MΩ Jumper <50mΩ	1Ω≤R≤10Ω ±200ppm°C 10Ω<R≤10MΩ ±100ppm°C 10MΩ<R≤22MΩ ±200ppm°C	Rated current 2.0 Max. current 5.0
	1/4W		150V	300V	300V	5% (E24) 1Ω≤R≤10MΩ 0.5%, 1%, (E24/E96) 1Ω≤R≤10MΩ	1Ω≤R≤10Ω ±200 ppm°C 10Ω<R≤10MΩ ±100 ppm°C	-
AF1206	1/4W		200V	400V	500V	5% (E24) 1Ω≤R≤22MΩ 0.5%, 1% (E24/E96) 1Ω≤R≤10MΩ Jumper <50mΩ	1Ω≤R≤10Ω ±200ppm°C 10Ω<R≤10MΩ ±100ppm°C 10MΩ<R≤22MΩ ±200ppm°C	Rated current 2.0 Max. current 10.0
	1/2 W		200V	400V	500V	5% (E24) 1Ω≤R≤10MΩ 0.5%, 1%, (E24/E96) 1Ω≤R≤10MΩ	1Ω≤R≤10Ω ±200 ppm°C 10Ω<R≤10MΩ ±100 ppm°C	-
AF1210	1/2W		200V	500V	500V	E24 ±5% 1Ω ≤ R ≤ 10MΩ E24/E96 ±0.5%, ±1% 1Ω ≤ R ≤ 10MΩ Jumper < 50mΩ	1Ω ≤ R ≤ 10Ω ±200 ppm/°C 10Ω < R ≤ 10MΩ ±100 ppm/°C	Rated current 2.0 Max. current 10.0
AF1218	1W		200V	500V	500V	E24 ±5% 1Ω ≤ R ≤ 1MΩ E24/E96 ±0.5%, ±1% 1Ω ≤ R ≤ 1MΩ Jumper < 50mΩ		Rated current 2.0 Max. current 10.0
AF2010	3/4W		200V	500V	500V	E24 ±5% 1Ω ≤ R ≤ 10MΩ E24/E96 ±0.5%, ±1% 1Ω ≤ R ≤ 10MΩ Jumper < 50mΩ		Rated current 2.0 Max. current 10.0
AF2512	1W		200V	500V	500V			Rated current 2.0 Max. current 10.0

Environmental characteristics

Performance test		Test method	Procedure	Requirements
Life		MIL-STD-202 Method 108	1000 hours at 70 ±2°C applied RCWV 1.5 hours on, 0.5 hours off, still air required	± (1% +50mΩ) < 100mΩ for jumper
High temperature exposure		MIL-STD-202 Method 108	1000 hours at maximum operating temperature depending on specification, unpowered	± (1% +50mΩ) < 100mΩ for jumper
Moisture resistance		MIL-STD-202 Method 106	Each temperature / humidity cycle is defined as 8 hours (method 106G), 3 cycles / 24 hours for 10d with 25°C / 65°C 95% R.H	± (0.5% +50mΩ) for 1% tol. ± (1% +50mΩ) for 5% tol. < 100mΩ for jumper
Thermal shock		MIL-STD-202 Method 107	-55 / +125°C Note: Number of cycles required is 300. Devices mounted Maximum transfer time is 20 seconds. Dwell time is 15 minutes. Air – Air	± (0.5% +50mΩ) for 1% tol. ± (1% +50mΩ) for 5% tol. < 100mΩ for jumper
Solderability	Wetting	J-STD-002B test B	Electrical test not required. Magnification 50X Lead-free solder bath at 245 ±3°C Dipping time: 3 ±0.5 seconds	Well tinned (≥ 95% covered) No visible damage
	Resistance to soldering heat	MIL-STD-202 Method 215	Lead-free solder, 260°C, 10 seconds immersion time	± (1% +50mΩ) No visible damage
Short time overload		IEC60115-1 4.13	2.5 times RCWV or maximum overload voltage whichever is less for 5 seconds at room temperature	± (1% +50mΩ) No visible damage
FOS		ASTM-B-809-95* * Modified	Sulfur 750 hours, 105°C, Rating with no power	± (4% +50mΩ)

AF - Sulfur resistant chip resistors, 0201 to 2512

Global part number - Preferred type

Ordering example: AF0603JR-07100KL

AF 0603 J R — 07 100K L

Series name (code 1-2)
AF = Anti-sulfurated

Size code (code 3-6)
(inch / metric)
0201 = 0.6 x 0.3
0402 = 1.0 x 0.5
0603 = 1.6 x 0.8
0805 = 2.0 x 1.25
1206 = 3.2 x 1.6
1210 = 3.2 x 1.6
1218 = 3.2 x 2.6
2010 = 5.0 x 2.5
2512 = 6.35 x 3.2

Tolerance (code 7)
D = ±0.5%
F = ±1%
J = ±5% (for Jumper ordering)

Packing style (code 8)
R = Paper tape reel
K = Embossed plastic tape reel

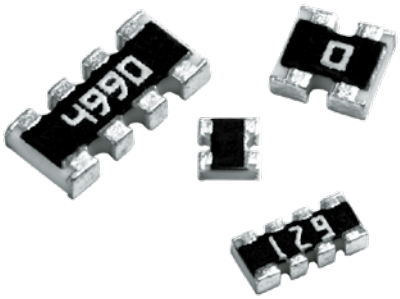
Default code(1/2) (code 17)

Resistance (code 12-16)
0R = Jumper
10R = 10Ω
100R = 100Ω
100K = 100KΩ

Taping reel (code 10-11)
07 = 7 inch Dia. reel
10 = 10 inch Dia. reel
13 = 13 inch Dia. reel
7W = 7 inch Dia. reel & 2 x standard power

T. C. R. (code 9)
"—" = Based on spec.
(— for thick film only)

Note: 1. All our RSMD products meet RoHS Compliant. "LFP" of the internal 2D reel label mentions "Lead Free Process"
2. Letter L is system default code for order only
3. AF series products are available by "Global part number" only

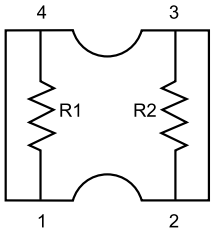


Features

- AEC-Q200 qualified
- Superior resistance against sulfur containing atmosphere
- Highly reliable electrode construction
- Compatible with all soldering processes
- Highly stable in auto-placement surface mounting applications
- Halogen free product and production

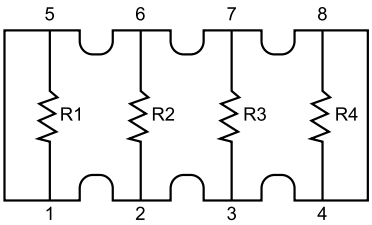
Schematics

AF122 /AF162



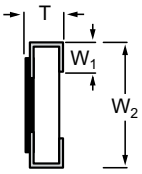
R1 = R2

AF124 /AF164



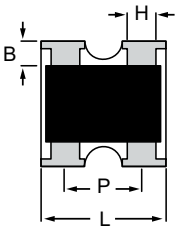
R1 = R2 = R3 = R4

Dimensions

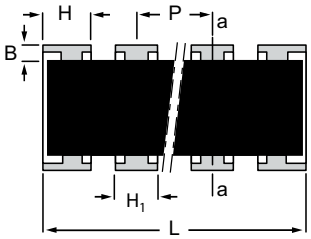


Side view for all types

AF122/ AF162



AF124/ AF164



unit: mm

Type	H / H1	B	P	L	T	W1	W2
AF122	0.30 +0.10/-0.05	0.24 ± 0.10	0.67 ± 0.05	1.00 ± 0.10	0.30 ± 0.10	0.25 ± 0.10	1.00 ± 0.10
AF124	H : 0.45 ± 0.05 H1 : 0.30 ± 0.05	0.25 ± 0.15	0.50 ± 0.05	2.00 ± 0.10	0.45 ± 0.10	0.30 ± 0.15	1.00 ± 0.10
AF162	0.35 ± 0.10	0.30 ± 0.10	0.80 ± 0.05	1.6 ± 0.10	0.40 ± 0.10	0.30 ± 0.10	1.6 ± 0.10
AF164	H: 0.65 ± 0.05 H1: 0.50 ± 0.15	0.30 ± 0.15	0.80 ± 0.05	3.2 ± 0.15	0.60 ± 0.10	0.30 ± 0.15	1.6 ± 0.15

AF - Sulfur resistant chip resistors, Arrays

Electrical characteristics

Type	Power rating	Operating Temp. range	MWV	RCOV	DWV	Resistance range & tolerance	T. C. R.	Jumper criteria (unit: A)
AF122	1/16W	-55°C to 155°C	50V	100V	100V	E24 ±5% 1Ω ≤ R ≤ 1MΩ E24/E96 ±1% 10Ω ≤ R ≤ 1MΩ Jumper < 50mΩ	1Ω ≤ R < 10Ω ±250 ppm/°C 10Ω ≤ R < 1MΩ ±200 ppm/°C	Rated current 0.5A Max. current 1.0A
AF124	1/16W		25V	50V	100V	E24 ±5% 1Ω ≤ R ≤ 1MΩ E24/E96 ±1% 1Ω ≤ R ≤ 1MΩ Jumper < 50mΩ	1Ω ≤ R < 10Ω ±250 ppm/°C 10Ω ≤ R < 1MΩ ±200 ppm/°C	Rated current 1.0A Max. current 2.0A
AF162	1/16W		50V	100V	100V	E24 ±5% 1Ω ≤ R ≤ 1MΩ E24/E96 ±1% 1Ω ≤ R ≤ 1MΩ Jumper < 50mΩ	1Ω ≤ R < 10Ω ±250 ppm/°C 10Ω ≤ R < 1MΩ ±200 ppm/°C	Rated current 1.0A Max. current 2.0A
AF164	1/16W		50V	100V	100V	E24 ±5% 1Ω ≤ R ≤ 1MΩ E24/E96 ±1% 1Ω ≤ R ≤ 1MΩ Jumper < 50mΩ	±250 ppm/°C	Rated current 1.0A Max. current 2.0A

Environmental characteristics

Performance test		Test method	Procedure	Requirements
Life		MIL-STD-202 -method 108	1000 hours at 70 ±5°C applied RCWV 1.5 hours on, 0.5 hours off, still air required	± (2% +50mΩ) < 100mΩ for jumper
High temperature exposure		MIL-STD-202 -method 108	1000 hours at maximum operating temperature depending on specification, unpowered No direct impingement of forced air to the parts Tolerances: 125±3°C	± (1% +50mΩ) < 50mΩ for jumper
Moisture resistance		MIL-STD-202 -method 106	Each temperature / humidity cycle is defined as 8 hours (method 106F), 3 cycles / 24 hours for 10d with 25°C / 65°C 95% R.H	± (2% +50mΩ) < 50mΩ for jumper
Thermal shock		MIL-STD-202 -method 107	-55 / +125°C Note: Number of cycles required is 300. Devices mounted Maximum transfer time is 20 seconds. Dwell time is 15 minutes. Air – Air	± (1% +50mΩ) for others < 50mΩ for jumper
Solderability	Wetting	J-STD-002B test B	Electrical test not required. Magnification 50X Lead-free solder bath at 245 ±3°C Dipping time: 3 ±0.5 seconds	Well tinned (≥ 95% covered)
	Resistance to soldering heat	MIL-STD-202 Method 210	Lead-free solder, 260°C, 10 seconds immersion time	± (1% +50mΩ) < 50mΩ for jumper No visible damage
Short time overload		IEC60115-1 4.13	2.5 times RCWV or maximum overload voltage whichever is less for 5 seconds at room temperature	± (2% +50mΩ) < 50mΩ for jumper No visible damage
FOS		ASTM-B-809-95* *Modified	Sulfur 750 hours, 105°C, Rating with no power	± (4% +50mΩ)

Global part number - Array

Ordering example: AF122-JR-07100KL

AF 12 2 — J R — 07 100K L

Series name (code 1-2)
AF = Array (convex) thick film

Size code (inch) (code 3-4)

12 = 0402 x 2 (0404)
0402 x 4 (0408)
16 = 0603 x 2 (0606)
= 0603 x 4 (0612)

Number of resistor (code 5)
2 = 2 resistors
4 = 4 resistors

Schematic (code 6)

"—" = Based on spec.

Default code (code 17)

Resistance (code 12-16)
0R = Jumper
10R = 10Ω
100R = 100Ω
100K = 100KΩ

Taping reel (code 10-11)
07 = 7 inch Dia. reel
10 = 10 inch Dia. reel
13 = 13 inch Dia. reel

T. C. R. (code 9)

"—" = Based on spec.

Packing style (code 8)
R = Paper tape reel

Tolerance (code 7)
F = ± 1%
J = ± 5% (for jumper ordering)

Note: 1. All our RSMD products meet RoHS Compliant. "LFP" of the internal 2D reel label mentions "Lead Free Process"
2. Letter L is system default code for order only

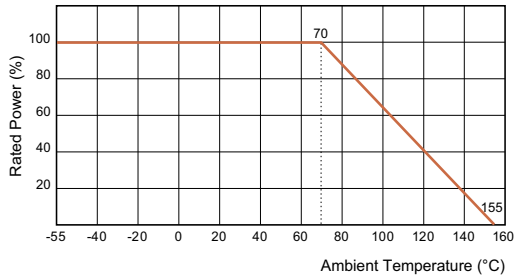
AA - Automotive grade sulfur-resistant chip resistors, 0201 to 2512

Features

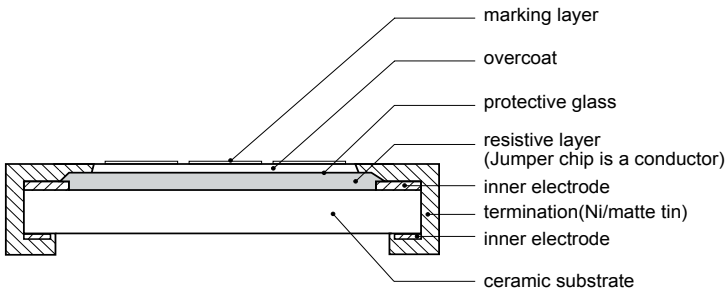
- AEC-Q200 qualified
- Production part approval process (PPAP) support
- High reliability
- High quality level

Derating curve

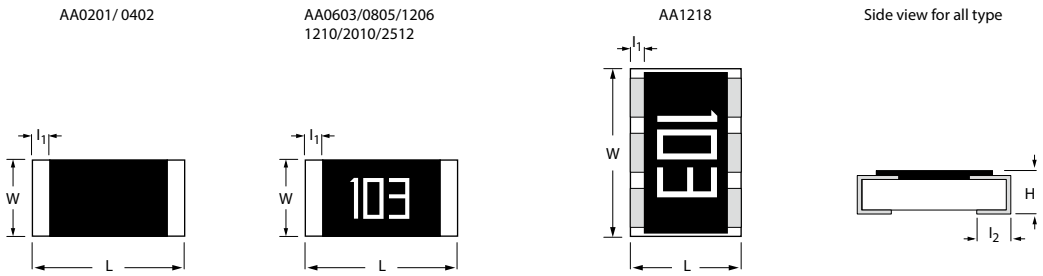
Maximum dissipation (P) in percentage of rated power as a function of the operating ambient temperature (T_{amb}).



Construction



Dimensions



unit: mm

Type	L	W	H	l_1	l_2
AA0201	0.60 ± 0.03	0.30 ± 0.03	0.23 ± 0.03	0.12 ± 0.05	0.15 ± 0.05
AA0402	1.00 ± 0.05	0.50 ± 0.05	0.32 ± 0.05	0.20 ± 0.10	0.25 ± 0.10
AA0603	1.60 ± 0.10	0.80 ± 0.10	0.45 ± 0.10	0.25 ± 0.15	0.25 ± 0.15
AA0805	2.00 ± 0.10	1.25 ± 0.10	0.50 ± 0.10	0.35 ± 0.20	0.35 ± 0.20
AA1206	3.10 ± 0.10	1.60 ± 0.10	0.55 ± 0.10	0.45 ± 0.20	0.40 ± 0.20
AA1210	3.10 ± 0.10	2.60 ± 0.15	0.55 ± 0.10	0.45 ± 0.15	0.50 ± 0.20
AA1218	3.10 ± 0.10	4.60 ± 0.10	0.55 ± 0.10	0.45 ± 0.20	0.40 ± 0.20
AA2010	5.00 ± 0.10	2.50 ± 0.15	0.55 ± 0.10	0.55 ± 0.15	0.50 ± 0.20
AA2512	6.35 ± 0.10	3.10 ± 0.15	0.55 ± 0.10	0.60 ± 0.20	0.50 ± 0.20

AA - Automotive grade sulfur-resistant chip resistors, 0201 to 2512

Electrical characteristics

Type	Power P_{70}	Operating Temp. range	MWV	RCOV	DWV	Resistance range & tolerance	T. C. R. (ppm/°C)	Jumper criteria (unit: A)
AA0201	1/20W	-55°C to 155°C	25V	50V	50V	E24 ±5% 1Ω ≤ R ≤ 10MΩ E24/E96 ±0.5%,±1% 1Ω ≤ R ≤ 10MΩ Jumper < 50mΩ	1Ω ≤ R ≤ 10Ω -100/ ±400 ppm/°C 10Ω < R ≤ 10MΩ ±300 ppm/°C	Rated Current 0.5A Max. Current 1.0A
AA0402	1/16W		50V	100V	100V	E24 ±5% 1Ω ≤ R ≤ 22MΩ E24/E96 ±0.5%,±1% 1Ω ≤ R ≤ 10MΩ Jumper < 50mΩ	1Ω ≤ R ≤ 10Ω ±200 ppm/°C 10Ω < R ≤ 10MΩ ±150 ppm/°C 10MΩ < R ≤ 22MΩ ±200 ppm/°C	Rated Current 1A Max. Current 2A
AA0603	1/10W		75V	150V	150V			Rated Current 1A Max. Current 2A
AA0805	1/8W		150V	300V	300V			Rated Current 2A Max. Current 5A
AA1206	1/4W		200V	400V	500V			Rated Current 2A Max. Current 10A
AA1210	1/2W		200V	500V	500V			Rated Current 2A Max. Current 10A
AA1218	1W		200V	500V	500V	E24 ±5% 1Ω ≤ R ≤ 1MΩ E24/E96 ±0.5%,±1% 1Ω ≤ R ≤ 1MΩ Jumper < 50mΩ		Rated Current 6A Max. Current 10A
AA2010	3/4W		200V	500V	500V	E24 ±5% 1Ω ≤ R ≤ 22MΩ E24/E96 ±0.5%,±1% 1Ω ≤ R ≤ 10MΩ Jumper < 50mΩ		Rated Current 2A Max. Current 10A
AA2512	1W		200V	500V	500V			Rated Current 2A Max. Current 10A

AA - Automotive grade sulfur-resistant chip resistors, 0201 to 2512

Environmental characteristics				
Performance test		Test method	Procedure	Requirements
Life		AEC-Q200 Test 8 MIL-STD-202 Method 108	1000 hours at 125°C applied RCWV 1.5 hours on, 0.5 hours off	± (1% +50mΩ) < 100mΩ for jumper
High temperature exposure		AEC-Q200 Test 3 MIL-STD-202 Method 108	1000 hours at maximum operating temperature depending on specification	± (1% +50mΩ) < 50mΩ for jumper
Moisture resistance		AEC-Q200 Test 6 MIL-STD-202 Method 106	Each temperature / humidity cycle is defined as 8 hours (method 106F), 3 cycles / 24 hours for 10d with 25°C / 65°C 95% R.H.	± (0.5% +50mΩ) for 1% tol. ± (2% +50mΩ) for 5% tol. < 100mΩ for jumper
Biased humidity		AEC-Q200 Test 7 MIL-STD-202 Method 103	1000 hours; + 85°C 85% R.H.; 10% of operating power Measured at 24 ±2 hours after test	± (3% +50mΩ) < 100mΩ for jumper
Thermal shock		AEC-Q200 Test 16 MIL-STD-202 Method 107	-55 / +125°C Number of cycles is 300. Devices mounted Maximum transfer time is 20 seconds. Dwell time is 15 minutes. Air – Air	± (1% +50mΩ) < 50mΩ for jumper
Solderability	Wetting	AEC-Q200 Test 18 J-STD-002B test B	Electrical test not required. Magnification 50X Lead-free solder bath at 245 ±3°C Dipping time: 3 ±0.5 seconds	Well tinned (≥ 95% covered) No visible damage
	Resistance to soldering heat	AEC-Q200 Test 15 MIL-STD-202 Method 210	Lead-free solder, 260°C, 10 seconds immersion time	± (0.5%+50mΩ) for 1% tol. ± (1%+50mΩ) for 5% tol. < 50 mΩ for Jumper No visible damage
Short time overload		IEC60115-1 4.13	2.5 times RCWV or maximum overload voltage whichever is less for 5 seconds at room temperature	± (1%+50mΩ) < 50 mΩ for Jumper
FOS		ASTM-B-809-95	Sulfur (saturated vapor) 1000 hours, 90±2°C, Rating with no power	± (1%+50mΩ)
		ASTM-B-809-95* * Modified	Sulfur 750 hours, 105°C, Rating with no power	± (4%+50mΩ)

Global part number - Preferred type

Ordering example: AA0603JR-07100KL

AA 0603 J R — 07 100K L

Series name (code 1-2)
AA = Automotive grade

Size code (code 3-6)
(inch / metric)
0201 = 0.6 x 0.3
0402 = 1.0 x 0.5
0603 = 1.6 x 0.8
0805 = 2.0 x 1.25
1206 = 3.2 x 1.6
1210 = 3.2 x 2.6
1218 = 3.2 x 4.5
2010 = 5.0 x 2.5
2512 = 6.35 x 3.2

Tolerance (code 7)
D = ±0.5%
F = ±1%
J = ±5% (for jumper ordering)

Default code(1/2) (code 17)

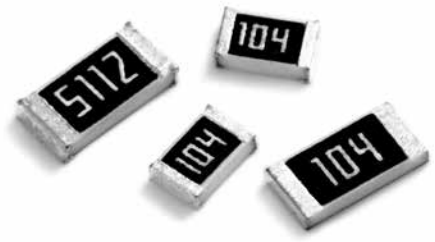
Resistance (code 12-16)
0R = Jumper
10R = 10Ω
100R = 100Ω
100K = 100KΩ

Taping reel (code 10-11)
07 = 7 inch Dia. reel
13 = 13 inch Dia. reel

T. C. R. (code 9)
"—" = Based on spec.
(— for thick film only)

Packing style (code 8)
R = Paper tape reel
K = Embossed plastic tape reel

Note: 1. All of our RSMD products are RoHS compliant. "LFP" of the internal 2D reel label mentions "Lead Free Process"
2. Letter L is system default code for ordering only
3. AA series products are available by "Global part number" only

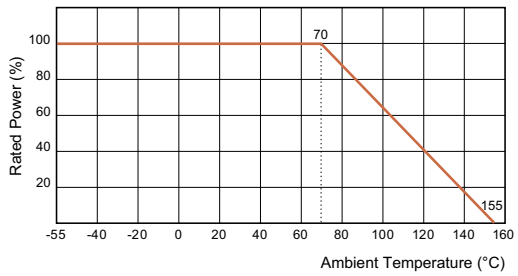


Features

- AEC-Q200 qualified
- Higher component and equipment reliability
- Excellent performance at pulse loading

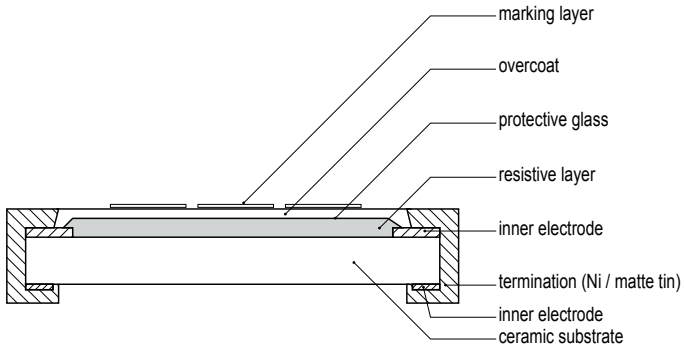
Derating curve

Maximum dissipation (P) in percentage of rated power as a function of the operating ambient temperature (T_{amb}).

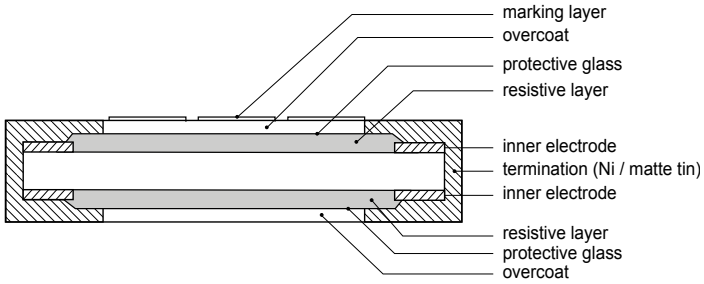


Construction

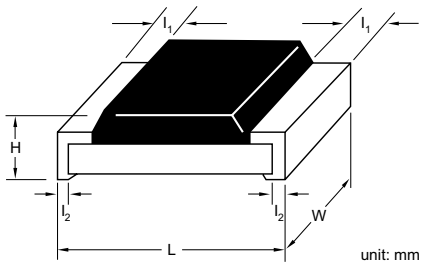
All size range except SR2512 with D/F tol



SR1206 (1W) & SR2512 (D/F tol)



Dimensions



Type	L	W	H	I_1	I_2
SR0402	1.00 ± 0.05	0.50 ± 0.05	0.35 ± 0.05	0.20 ± 0.10	0.25 ± 0.10
SR0603	1.60 ± 0.10	0.80 ± 0.10	0.45 ± 0.10	0.25 ± 0.15	0.25 ± 0.15
SR0805	2.00 ± 0.10	1.25 ± 0.10	0.50 ± 0.10	0.35 ± 0.20	0.35 ± 0.20
SR1206	3.10 ± 0.10	1.60 ± 0.10	0.55 ± 0.10	0.45 ± 0.20	0.40 ± 0.20
SR1210	3.10 ± 0.10	2.60 ± 0.15	0.55 ± 0.10	0.45 ± 0.15	0.50 ± 0.20
SR1218	3.10 ± 0.10	4.60 ± 0.10	0.55 ± 0.10	0.45 ± 0.20	0.40 ± 0.20
SR2010	5.00 ± 0.10	2.50 ± 0.15	0.55 ± 0.10	0.55 ± 0.15	0.50 ± 0.20
SR2512	6.35 ± 0.10	3.10 ± 0.15	0.55 ± 0.10	0.60 ± 0.20	0.50 ± 0.20

SR - Surge chip resistors, 0402 to 2512

Electrical characteristics

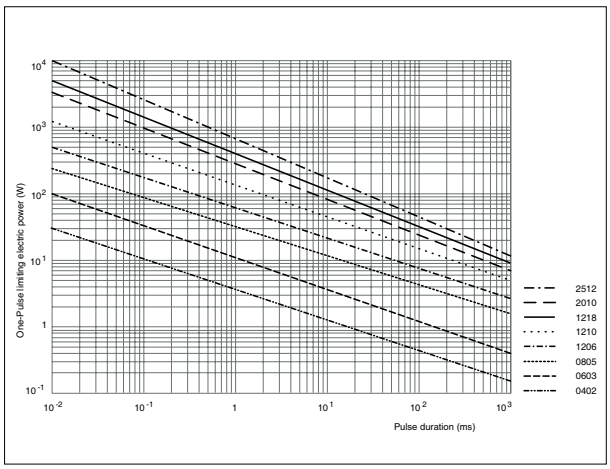
Type	Power P_{70}	Operating Temp. range	MWV	RCOV	DWV	Resistance range & tolerance		T. C. R.
SR0402	1/16W	-55°C to +155°C	50V	100V	100V	E24 ±0.5%,±1%,±5%,±10%,±20% E96 ±0.5%,±1%	1Ω ≤ R ≤ 1MΩ	±200 ppm/°C
	1/8W							
	1/5W							
SR0603	1/10W		75V	150V	150V			
	1/5W							
	1/4W							
SR0805	1/8W		150V	300V	300V			
	1/4W							
	1/3W							
	1/2W							
SR1206	1/4W		200V	400V	500V			
	1/2W							
	3/4W							
	1W							
SR1210	1/2W							
	1W							
SR1218	1W							
	1.5W							
SR2010	3/4W							
	1.25W							
SR2512	1W							
	2W							

Environmental characteristics

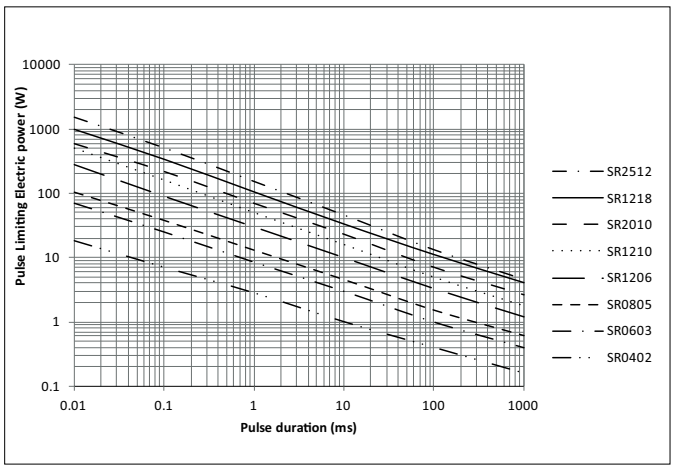
Performance test		Test method	Procedure	Requirements
Life		MIL-STD-202 -method 108	1000 hours at 70 ±2°C applied RCWV 1.5 hours on, 0.5 hours off, still air required	± (3% +50mΩ)
High temperature exposure		IEC 60068-2-2	1000 hours at maximum operating temperature depending on specification, unpowered	± (3% +50mΩ)
Solderability	Wetting	J-STD-002B test B	Electrical test not required. Magnification 50X Lead-free solder bath at 245 ±3°C Dipping time: 3 ±0.5 seconds	Well tinned (≥ 95% covered) No visible damage
	Resistance to soldering heat	MIL-STD-202 -method 210F	Lead-free solder, 260°C, 10 seconds immersion time	± (1% +50mΩ) No visible damage
Short time overload		IEC60115-1 4.13	2.5 times RCWV or maximum overload voltage whichever is less for 5 seconds at room temperature	± (2% +50mΩ) No visible damage

Pulse-Load behavior

±5%, ±10%, ±20%



±0.5%, ±1%



Global part number - Preferred type for ordering Yageo / Phycomp branded products

Ordering example: SR0805MR-07100KL

S R 0 8 0 5 M R — 0 7 1 0 0 K L

Series name (code 1-2)
SR = Surge

Size code (code 3-6)
(inch / metric)
0402 = 1.0 x 0.5
0603 = 1.6 x 0.8
0805 = 2.0 x 1.25
1206 = 3.2 x 1.6
1218 = 3.2 x 4.5
2010 = 5.0 x 2.5
2512 = 6.35 x 3.2

Tolerance (code 7)
D = ±0.5%
F = ±1%
J = ±5%
K = ±10%
M = ±20%

Default code(1/2) (code 17)

Resistance (code 12-16)
10R = 10Ω
100K = 100KΩ

Taping reel (code 10-11)
7T = 7 inch Dia. reel
3 x standard power type
7W = 7 inch Dia. reel
2 x standard power type
47 = 7 inch Dia. reel
4 x standard power type
07 = 7 inch Dia. reel
13 = 13 inch Dia. reel

T. C. R. (code 9)
"—" = Based on spec.
(— for thick film only)

Packing style (code 8)
R = Paper tape reel
K = Embossed plastic tape reel

Note: 1. All of our RSMD products are RoHS compliant. "LFP" of the internal 2D reel label mentions "Lead Free Process"
2. Letter L is system default code for ordering only

Phycomp worldwide - Traditional type

Surge chip resistors						
Size: inch (mm)	0805 (2012)	1206 (3216)	1218 (3248)	2512 (6432)		
Power	1/8 W	1/4 W	1 W	1 W		
Tolerance	+10%	+5%	+10%	+5%	+10%	+20%
Resistance	E24	E24	E24	E24	E24	E24
Packing	paper tape	paper tape	paper tape	paper tape	paper tape	paper tape
Quantity 4 000	---	---	2350 557 10…L	2350 556 11…L	2350 556 10…L	2350 556 13…L
Quantity 5 000	2350 554 12…L	2350 550 10…L	---	---	---	---

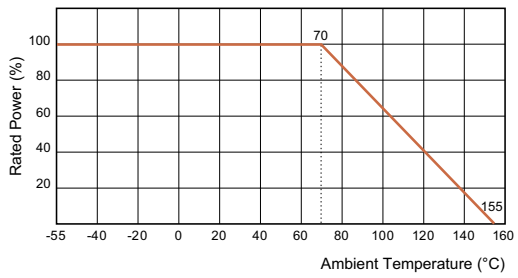
For ordering rules: See page 14 for E24 / E96 values and the last 4 or 3 digits of the 12NC catalogue number

Features

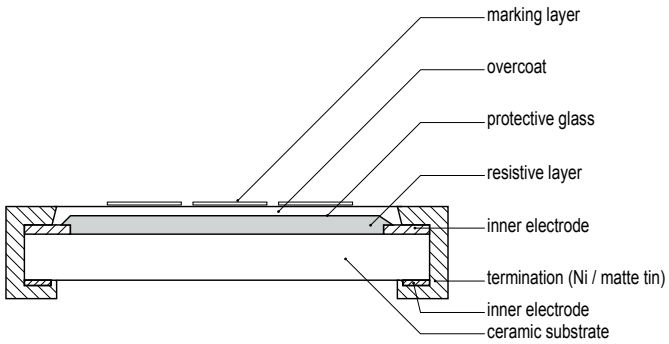
- Higher maximum working voltage compared to RC series
- Safety certificate IEC62368-1 G.10.2 (2.5kV impulse) compliance: RV0603 (100K ~ 10MΩ)
  RV0805 (100K ~ 22MΩ)
  RV1206 (100K ~ 27MΩ)
- Compatible with lead containing and lead-free soldering processes
- Highly stable in auto-placement surface mounting

Derating curve

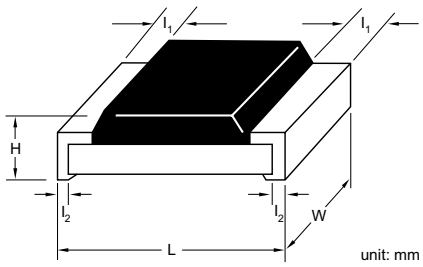
Maximum dissipation (P) in percentage of rated power as a function of the operating ambient temperature (T_{amb}).



Construction



Dimensions



Type	L	W	H	I_1	I_2
RV0603	1.60 ± 0.10	0.80 ± 0.10	0.45 ± 0.10	0.25 ± 0.15	0.25 ± 0.15
RV0805	2.00 ± 0.10	1.25 ± 0.10	0.50 ± 0.10	0.35 ± 0.20	0.35 ± 0.20
RV1206	3.10 ± 0.10	1.60 ± 0.10	0.55 ± 0.10	0.40 ± 0.20	0.45 ± 0.20
RV2010	5.00 ± 0.10	2.50 ± 0.15	0.55 ± 0.10	0.45 ± 0.15	0.50 ± 0.20
RV2512	6.35 ± 0.10	3.10 ± 0.15	0.55 ± 0.10	0.60 ± 0.20	0.50 ± 0.20

RV - High voltage chip resistors, 0603 to 2512

Electrical characteristics							
Type	Power P_{70}	Operating Temp. range	MWV	RCOV	DWV	Resistance range & tolerance	T. C. R.
RV0603	1/10W	-55°C to +155°C	350V	500V	500V	E24 ±5% E24/E96 ±1% 47Ω ≤ R ≤ 10MΩ E24/E96 ±0.5%	47Ω ≤ R ≤ 10MΩ ±100 ppm/°C 10MΩ < R ≤ 22MΩ ±200 ppm/°C
RV0805	1/8W		400V	800V	800V	E24 ±5% 47Ω ≤ R ≤ 22MΩ E24/E96 ±1% 47Ω ≤ R ≤ 22MΩ E24/E96 ±0.5% 47Ω ≤ R ≤ 10MΩ	
RV1206	1/4W		500V	1000V	1000V	E24 ±5% 47Ω ≤ R ≤ 27MΩ E24/E96 ±1% 47Ω ≤ R ≤ 27MΩ E24/E96 ±0.5% 47Ω ≤ R ≤ 15MΩ	
RV2010	3/4W		500V	1000V	1000V	E24 ±5% 47Ω ≤ R ≤ 22MΩ E24/E96 ±1% 47Ω ≤ R ≤ 22MΩ E24/E96 ±0.5% 47Ω ≤ R ≤ 10MΩ	
RV2512	1W		500V	1000V	1000V	E24 ±5% 47Ω ≤ R ≤ 16MΩ E24/E96 ±1% 47Ω ≤ R ≤ 16MΩ E24/E96 ±0.5% 47Ω ≤ R ≤ 10MΩ	

Environmental characteristics				
Performance test		Test method	Procedure	Requirements
Life		MIL-STD-202 Method 108A	1000 hours at 70 ±2°C applied RCWV 1.5 hours on, 0.5 hours off, still air required	± (2% +50mΩ)
High temperature exposure		MIL-STD-202 Method 108A	1000 hours at maximum operating temperature depending on specification, unpowered	± (1% +50mΩ)
Moisture resistance		MIL-STD-202 Method 106G	Each temperature / humidity cycle is defined as 8 hours (method 106G), 3 cycles / 24 hours for 10d with 25°C / 65°C 95% R.H	± (2% +50mΩ)
Thermal shock		MIL-STD-202 Method 107G	-55 / +125°C Note: Number of cycles required is 300. Devices mounted Maximum transfer time is 20 seconds. Dwell time is 15 minutes. Air – Air	± (0.5% +50mΩ) for 10K to 10M ± (1% +50mΩ) for others
Solderability	Wetting	IEC 60115 -1 4.13	Electrical test not required. Magnification 50X Lead-free solder bath at 245 ±3°C Dipping time: 3 ±0.5 seconds	Well tinned (≥ 95% covered) No visible damage
	Resistance to soldering heat	MIL-STD-202 method 210F	Lead-free solder, 260°C, 10 seconds immersion time	± (1% +50mΩ) No visible damage
Short time overload		J-STD-002B test B	2.5 times RCWV or maximum overload voltage whichever is less for 5 seconds at room temperature	± (2% +50mΩ) No visible damage

RV - High voltage chip resistors, 0603 to 2512

Global part number - Preferred type for ordering Yageo / Phycomp branded products

Ordering example: RV0805JR-07100KL

RV 0805 J R — 07 100K L

Series name (code 1-2)
RV = High voltage

Size code (code 3-6)
(inch / metric)
0603 = 1.6 x 0.8
0805 = 2.0 x 1.25
1206 = 3.2 x 1.6
2010 = 5.0 x 2.5
2512 = 6.35 x 3.2

Tolerance (code 7)
D = ±0.5%
F = ±1%
J = ±5%

Default code(1/2) (code 17)

Resistance (code 12-16)
100K = 100KΩ
1M = 1MΩ

Taping reel (code 10-11)
07 = 7 inch Dia. reel

T. C. R. (code 9)
"—" = Based on spec.
(— for thick film only)

Packing style (code 8)
R = Paper tape reel
K = Embossed plastic tape reel

Note: 1. All of our RSMD products are RoHS compliant. "LFP" of the internal 2D reel label mentions "Lead Free Process"
2. Letter L is system default code for ordering only

Phycomp worldwide - Traditional type

High voltage chip resistors					
Size: inch (mm)	0805 (2012)		1206 (3216)		2512 (6432)
Power	1/8 W		1/4 W		1 W
Tolerance	+5%	+1%	+5%	+1%	+5%
Resistance	E24	E24 / E96	E24	E24 / E96	E24
Packing	paper tape		paper tape		blister tape
Quantity 4 000	---	---	---	---	2322 762 98...L
Quantity 5 000	2322 792 61...L	2322 793 6....L	2322 790 61...L	2322 791 6....L	---

For ordering rules: See page 14 for E24 / E96 values and the last 4 or 3 digits of the 12NC catalogue number

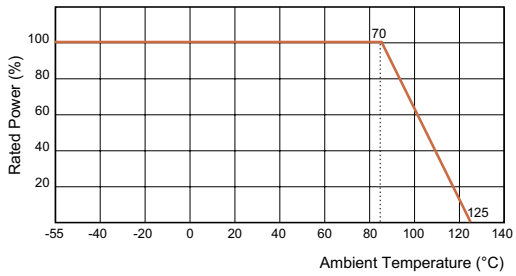
CP - Cooper termination chip resistor, 0201

Features

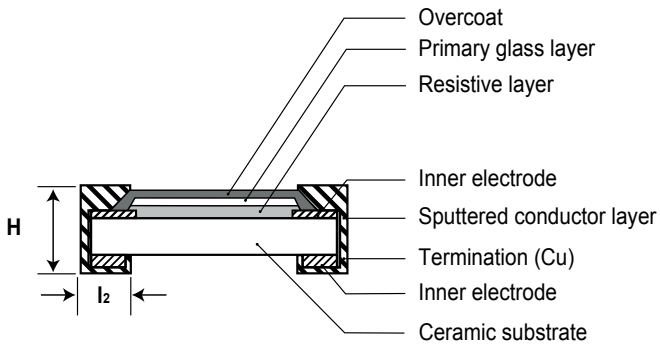
- This product with lead free terminations meet RoHS requirements.
- Excellent bending strength
- High reliability
- High component and equipment reliability
- Saving of PCB space
- Better thermal conductivity

Derating curve

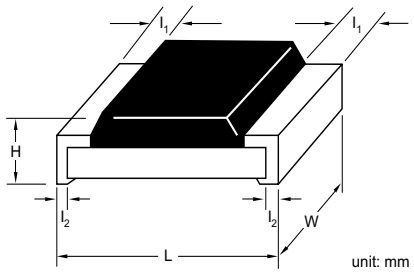
Maximum dissipation (P) in percentage of rated power as a function of the operating ambient temperature (T_{amb}).



Construction



Dimensions



Type	L	W	H	l1	l2
CP0201	0.60 ± 0.03	0.30 ± 0.03	0.27 ± 0.03	>0.05	>0.2

Electrical characteristics

Type	Power P70	Operating Temp. range	MWV	RCOV	DWV	Resistance range	T.C.R
CP0201	1/20W	-55°C to 125°C	25V	50V	50V	E24/96 ±1%, ±5% 10Ω~1MΩ	±200 ppm/°C

CP - Cooper termination chip resistor, 0201

Environmental characteristics				
Performance test		Test method	Procedure	Requirements
Life		MIL-STD-202 -method 108A	1000 hours at 70 ±2°C applied RCWV 1.5 hours on, 0.5 hours off, still air required	±(1%+50mΩ) for F tol. ±(3%+50mΩ) for J tol.
High temperature exposure		MIL-STD-202 -method 108A	1000 hours at maximum operating temperature depending on specification, unpowered	±(1%+50mΩ)
Rapid change of temperature		MIL-STD-202 Method 107	-55/+125°C Note Number of cycles required is 100 Devices Maximum transfer time is 20 seconds Dwell time is 30 minutes. Air - Air	±(1%+50mΩ)
Terminal Strength (SMD)		AEC-Q200 Test 22 AEC-Q200-006	Force of 5N for 0201, The force applied for 10±1 seconds.	± (1% +50mΩ) No visible damage
Solderability	Wetting	IPC/JEDECJ-STD-002B test B	Electrical test not required. Magnification 50X Lead-free solder bath at 245 ±3°C Dipping time: 3 ±0.5 seconds	Well tinned (≥ 95% covered) No visible damage
	Resistance to soldering heat	MIL-STD-202 -method 210F	Lead-free solder, 260°C, 10 seconds immersion time	± (0.5%+ 50mΩ) No visible damage
Short time overload		IEC 60115 -1 4.13	2.5 times RCWV or maximum overload voltage whichever is less for 5 seconds at room temperature	± (1%+ 50mΩ) No visible damage

Global part number - Preferred type for ordering Yageo / Phycomp branded products

Ordering example: CP0201FR-07100KL

CP 0201 F R - 07 100K L

Series name (code 1-2)
CP = Cooper termination chip resistor

Size code (code 3-6)
(inch / metric)
0201 = 0.6 x 0.3

Tolerance (code 7)
F = ±1%
J= ±5%

Default code(1/2) (code 17)

Resistance (code 12-16)
10R = 10Ω
100R = 100Ω
100K = 100KΩ

Taping reel (code 10-11)
07 = 7 inch Dia. reel

T. C. R. (code 9)
- = Based on spec

Packing style (code 8)
R = Paper tape reel

Note: 1. All of our RSMD products are RoHS compliant. "LFP" of the internal 2D reel label mentions "Lead Free Process"
2. Letter L is system default code for ordering only
3. CP series products are available by "Global part number" only

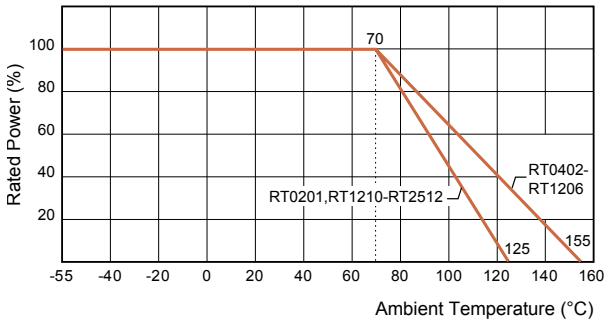
RT - Thin film high precision high stability chip resistors, 0201 to 2512

Features

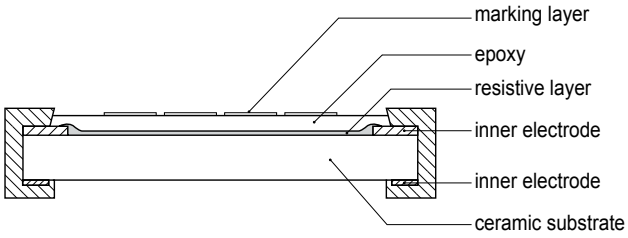
- High precision - High stability
- Low T. C. R. / low noise
- High accuracy (±0.01%, ±0.02%, ±0.05%, ±0.1%, ±0.25%, ±0.5%, ±1%)

Derating curve

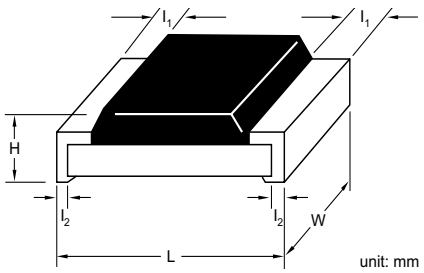
Maximum dissipation (P) in percentage of rated power as a function of the operating ambient temperature (T_{amb}).



Construction



Dimensions



Type	L	W	H	l_1	l_2
RT0201	0.60 ± 0.03	0.30 ± 0.03	0.23 ± 0.03	0.10 ± 0.05	0.15 ± 0.05
RT0402	1.00 ± 0.10	0.50 ± 0.05	0.30 ± 0.05	0.20 ± 0.10	0.25 ± 0.10
RT0603	1.60 ± 0.10	0.80 ± 0.10	0.45 ± 0.10	0.25 ± 0.15	0.25 ± 0.15
RT0805	2.00 ± 0.10	1.25 ± 0.10	0.50 ± 0.10	0.35 ± 0.20	0.35 ± 0.20
RT1206	3.10 ± 0.10	1.60 ± 0.10	0.55 ± 0.10	0.45 ± 0.20	0.40 ± 0.20
RT1210	3.10 ± 0.10	2.60 ± 0.15	0.55 ± 0.10	0.50 ± 0.20	0.50 ± 0.20
RT2010	5.00 ± 0.10	2.50 ± 0.15	0.55 ± 0.10	0.60 ± 0.20	0.50 ± 0.20
RT2512	6.35 ± 0.10	3.20 ± 0.15	0.55 ± 0.10	0.60 ± 0.20	0.50 ± 0.20

RT - Thin film high precision high stability chip resistors, 0201 to 2512

Electrical characteristics

Type	Power P_{70}	Operating Temp. range	MWV	RCOV	DWV	T.C.R. (ppm/°C)	Resistance Range (E24/E96) & tolerance						
							±0.01%	±0.02%	±0.05%	±0.1%	±0.25%	±0.5%	±1.0%
RT0201	1/20W	–55°C to +125°C	25V	50V	50V	±50	---	---	---	22 ~75K	22 ~75K	22 ~75K	22 ~75K
						±25	---	---	---	22~75K	22~75K	22~75K	22~75K
						±15	---	---	---	22~5K	22~5K	22~5K	22~5K
						±10	---	---	---	22~5K	22~5K	22~5K	22~5K
						±5	---	---	---	---	---	---	---
RT0402	1/16W	–55°C to +155°C	50V	100V	75V	±50	50.1~12K	50.1~12K	20~12K	4.7~240K	4.7~240K	4.7~240K	4.7~240K
						±25	50.1~12K	50.1~12K	20~12K	4.7~240K	4.7~240K	4.7~240K	4.7~240K
						±15	20~12K	20~12K	20~12K	20~200K	20~200K	20~200K	20~200K
						±10	20~12K	20~12K	20~12K	20~200K	20~200K	20~200K	20~200K
						±5	20~10K	20~10K	20~10K	20~10K	20~10K	---	---
RT0603	1/10W		75V	150V	100V	±50	50.1~30K	50.1~30K	4.7~100K	1~1M	1~1M	1~1M	1~1M
						±25	50.1~30K	50.1~30K	4.7~100K	1~1M	1~1M	1~1M	1~1M
						±15	50.1~100K	50.1~100K	4.7~100K	4.7~680K	4.7~680K	4.7~680K	4.7~680K
						±10	50.1~100K	50.1~100K	4.7~100K	4.7~680K	4.7~680K	4.7~680K	4.7~680K
						±5	20~30K	20~30K	20~30K	20~30K	20~30K	---	---
RT0805	1/8W		150V	300V	200V	±50	50.1~30K	50.1~30K	4.7~200K	1~1.5M	1~1.5M	1~1.5M	1~1.5M
						±25	50.1~30K	50.1~30K	4.7~200K	1~1.5M	1~1.5M	1~1.5M	1~1.5M
						±15	50.1~200K	50.1~200K	4.7~200K	4.7~1M	4.7~1M	4.7~1M	4.7~1M
						±10	50.1~200K	50.1~200K	4.7~200K	4.7~1M	4.7~1M	4.7~1M	4.7~1M
						±5	20~50K	20~50K	20~50K	20~50K	20~50K	---	---
RT1206	1/4W		200V	400V	300V	±50	50.1~30K	50.1~30K	5.6~500K	1~1.5M	1~1.5M	1~1.5M	1~1.5M
						±25	50.1~30K	50.1~30K	5.6~500K	1~1.5M	1~1.5M	1~1.5M	1~1.5M
						±15	50.1~500K	50.1~500K	5.6~500K	5.6~1.5M	5.6~1.5M	5.6~1.5M	5.6~1.5M
						±10	50.1~500K	50.1~500K	5.6~500K	5.6~1.5M	5.6~1.5M	5.6~1.5M	5.6~1.5M
						±5	20~100K	20~100K	20~100K	20~100K	20~100K	---	---
RT1210	1/4W	–55°C to +125°C	200V	400V	400V	±50	---	---	4.7~1M	4.7~1M	4.7~1M	4.7~1M	4.7~1M
						±25	---	---	4.7~1M	4.7~1M	4.7~1M	4.7~1M	4.7~1M
						±15	---	---	100~100k	4.7~100k	4.7~100k	---	---
						±10	---	---	100~100k	4.7~100k	4.7~100k	---	---
						±5	---	---	---	---	---	---	---
RT2010	1/2W		200V	400V	400V	±50	---	---	4.7~1M	4.7~1M	4.7~1M	4.7~1M	4.7~1M
						±25	---	---	4.7~1M	4.7~1M	4.7~1M	4.7~1M	4.7~1M
						±15	---	---	100~100k	4.7~100k	4.7~100k	---	---
						±10	---	---	100~100k	4.7~100k	4.7~100k	---	---
						±5	---	---	---	---	---	---	---
RT2512	3/4W		200V	400V	400V	±50	---	---	4.7~1M	4.7~1M	4.7~1M	4.7~1M	4.7~1M
						±25	---	---	4.7~1M	4.7~1M	4.7~1M	4.7~1M	4.7~1M
						±15	---	---	100~100k	4.7~100k	4.7~100k	---	---
						±10	---	---	100~100k	4.7~100k	4.7~100k	---	---
						±5	---	---	---	---	---	---	---

RT - Thin film high precision high stability chip resistors, 0201 to 2512

Environmental characteristics				
Performance test		Test method	Procedure	Requirements
Life		MIL-STD-202 Method 108A	1000 hours at 70 ±2°C applied RCWV 1.5 hours on, 0.5 hours off, still air required	±(0.5%+ 50mΩ)
High temperature exposure		MIL-STD-202 Method 108A	1000 hours at maximum operating temperature depending on specification, unpowered	±(0.5%+ 50mΩ)
Moisture resistance		MIL-STD-202 Method 106G	Each temperature / humidity cycle is defined as 8 hours (method 106G), 3 cycles / 24 hours for 10d with 25°C / 65°C 95% R.H	±(0.5%+ 50mΩ)
Thermal shock		MIL-STD-202 Method 107G	-55 / +125°C Note: Number of cycles required is 300. Devices mounted Maximum transfer time is 20 seconds. Dwell time is 15 minutes. Air – Air	±(0.5%+ 50mΩ)
Short time overload		IEC 60115-1 4.13	2.5 times RCWV or maximum overload voltage whichever is less for 5 seconds at room temperature	±(0.5%+ 50mΩ) No visible damage
Solderability	Resistance to soldering heat	MIL-STD-202 method 210F	Lead-free solder, 260°C, 10 seconds immersion time	±(0.5% +50mΩ) No visible damage
	Wetting	J-STD-002B test B	Electrical test not required. Magnification 50X Lead-free solder bath at 245 ±3°C Dipping time: 3 ±0.5 seconds	Well tinned (≥ 95% covered) No visible damage

Global part number - Preferred type for ordering Yageo / Phycomp branded products

Ordering example: RT0603DRE07100KL

RT 0603 D R E 07 100K L

Series name (code 1-2)
RT = High precision - High stability thin film

Size code (code 3-6)
(inch / metric)
0201 = 0.6 x 0.3
0402 = 1.0 x 0.5
0603 = 1.6 x 0.8
0805 = 2.0 x 1.25
1206 = 3.2 x 1.6
1210 = 3.2 x 2.6
2010 = 5.0 x 2.5
2512 = 6.35 x 3.2

Tolerance (code 7)
L = ±0.01%
P = ±0.02%
W = ±0.05%
B = ±0.1%
C = ±0.25%
D = ±0.5%
F = ±1%

Default code (1/2) (code 17)

Resistance (code 12-16)
10R = 10Ω
100R = 100Ω
10K = 10KΩ
100K = 100KΩ

Taping reel (code 10-11)
07 = 7 inch Dia. reel
13 = 13 inch Dia. reel

T. C. R. (code 9)
A = ±5 ppm/°C
B = ±10 ppm/°C
C = ±15 ppm/°C
D = ±25 ppm/°C
E = ±50 ppm/°C

Packing style (code 8)
R = Paper tape reel
K = Embossed plastic tape reel

Note: 1. All of our RSMD products are RoHS compliant. "LFP" of the internal 2D reel label mentions "Lead Free Process"
2. Letter L is system default code for ordering only

RT - Thin film high precision high stability chip resistors, 0201 to 2512

Phycomp worldwide - Traditional type									
High precision - High stability									
Size: inch (mm)		0402 (1005)				0603 (1608)			
Power		1/16 W				1/10 W			
Tolerance		±1%	±0.5%	±0.25%	±0.1%	±1%	±0.5%	±0.25%	±0.1%
Resistance		E24 / E96				E24 / E96			
Packing		paper tape				paper tape			
Quantity	TC25 5 000	---	---	---	---	2390 604 7....L	2390 604 6....L	2390 604 5....L	2390 604 4....L
	TC50 5 000	---	---	---	---	2390 404 7....L	2390 404 6....L	2390 404 5....L	2390 404 4....L
	TC25 10 000	2390 607 7....L	2390 607 6....L	2390 607 5....L	2390 607 4....L	---	---	---	---
	TC50 10 000	2390 407 7....L	2390 407 6....L	2390 407 5....L	2390 407 4....L	---	---	---	---

For ordering rules: See page 14 for E24 / E96 values and the last 4 or 3 digits of the 12NC catalogue number

Phycomp worldwide - Traditional type													
High precision - High stability													
Size: inch (mm)		0805 (2012)				1206 (3216)				1210 (3225)			
Power		1/8 W				1/4 W				1/2 W			
Tolerance		±1%	±0.5%	±0.25%	±0.1%	±1%	±0.5%	±0.25%	±0.1%	±1%	±0.5%	±0.25%	±0.1%
Resistance		E24 / E96				E24 / E96				E24 / E96			
Packing		paper tape				paper tape				paper tape			
Quantity	TC10 5 000	2390 801 7....L	2390 801 6....L	2390 801 5....L	2390 801 4....L	2390 811 7....L	2390 811 6....L	2390 811 5....L	2390 811 4....L	2390 812 7....L	2390 812 6....L	2390 812 5....L	2390 812 4....L
	TC15 5 000	2390 701 7....L	2390 701 6....L	2390 701 5....L	2390 701 4....L	2390 711 7....L	2390 711 6....L	2390 711 5....L	2390 711 4....L	2390 712 7....L	2390 712 6....L	2390 712 5....L	2390 712 4....L
	TC25 5 000	2390 601 7....L	2390 601 6....L	2390 601 5....L	2390 601 4....L	2390 611 7....L	2390 611 6....L	2390 611 5....L	2390 611 4....L	2390 612 7....L	2390 612 6....L	2390 612 5....L	2390 612 4....L
	TC50 5 000	2390 401 7....L	2390 401 6....L	2390 401 5....L	2390 401 4....L	2390 411 7....L	2390 411 6....L	2390 411 5....L	2390 411 4....L	2390 412 7....L	2390 412 6....L	2390 412 5....L	2390 412 4....L

For ordering rules: See page 14 for E24 / E96 values and the last 4 or 3 digits of the 12NC catalogue number

Phycomp worldwide - Traditional type									
High precision - High stability									
Size: inch (mm)		2010 (5025)				2512 (6432)			
Power		1/2 W				3/4 W			
Tolerance		±1%	±0.5%	±0.25%	±0.1%	±1%	±0.5%	±0.25%	±0.1%
Resistance		E24 / E96				E24 / E96			
Packing		blister tape				blister tape			
Quantity	TC10 4 000	2390 815 7....L	2390 815 6....L	2390 815 5....L	2390 815 4....L	2390 818 7....L	2390 818 6....L	2390 818 5....L	2390 818 4....L
	TC15 4 000	2390 731 7....L	2390 731 6....L	2390 731 5....L	2390 731 4....L	2390 735 7....L	2390 735 6....L	2390 735 5....L	2390 735 4....L
	TC25 4 000	2390 615 7....L	2390 615 6....L	2390 615 5....L	2390 615 4....L	2390 618 7....L	2390 618 6....L	2390 618 5....L	2390 618 4....L
	TC50 4 000	2390 415 7....L	2390 415 6....L	2390 415 5....L	2390 415 4....L	2390 418 7....L	2390 418 6....L	2390 418 5....L	2390 418 4....L

For ordering rules: See page 14 for E24 / E96 values and the last 4 or 3 digits of the 12NC catalogue number

Thin film product range against tolerance / T. C. R. (ordering code)																			
Tolerance	±0.05% (W)					±0.1% (B)					±0.25% (C)					±0.5% (D)		±1% (F)	
T. C. R. (ppm/°C)	±5 (A)	±10 (B)	±15 (C)	±25 (D)	±50 (E)	±5 (A)	±10 (B)	±15 (C)	±25 (D)	±50 (E)	±5 (A)	±10 (B)	±15 (C)	±25 (D)	±50 (E)	±25 (D)	±50 (E)	±25 (D)	±50 (E)
RT0201									22R - 75K	22R - 75K				22R - 75K	22R - 75K	22R - 75K	22R - 75K	22R - 75K	22R - 75K
RT0402	20R-10K	20R-12K	20R-12K	20R-12K	20R-12K	20R-10K	20R-70K	20R-70K	4.7R-240K	4.7R-240K	20R-10K	20R-70K	20R-70K	4.7R-240K	4.7R-240K	4.7R-240K	4.7R-240K	4.7R-240K	4.7R-240K
RT0603	20-30K	4.7R-100K	4.7R-100K	4.7R-100K	4.7R-100K	20-30K	4.7R-332K	4.7R-332K	1R-1M	1R-1M	20-30K	4.7R-332K	4.7R-332K	1R-1M	1R-1M	1R-1M	1R-1M	1R-1M	1 R-1M
RT0805	20-50K	4.7R-200K	4.7R-200K	4.7R-200K	4.7R-200K	20-50K	4.7R-800K	4.7R-800K	1R-1.5M	1R-1.5M	20-50K	4.7R-800K	4.7R-800K	1R-1.5M	1R-1.5M	1R-1.5M	1R-1.5M	1R-1.5M	1R-1.5M
RT1206	20-100K	5.6R-500K	5.6R-500K	5.6R-500K	5.6R-500K	20-100K	5.6R-1M	5.6R-1M	1R-1.5M	1R-1.5M	20-100K	5.6R-1M	5.6R-1M	1R-1.5M	1R-1.5M	1R-1.5M	1R-1.5M	1R-1.5M	1R-1.5M
RT1210		100R-100K	100R-100K	4.7R-1M	4.7R-1M		4.7R-100K	4.7R-100K	4.7R-1M	4.7R-1M		4.7R-100K	4.7R-100K	4.7R-1M	4.7R-1M	4.7R-1M	4.7R-1M	4.7R-1M	4.7R-1M
RT2010		100R-100K	100R-100K	4.7R-1M	4.7R-1M		4.7R-100K	4.7R-100K	4.7R-1M	4.7R-1M		4.7R-100K	4.7R-100K	4.7R-1M	4.7R-1M	4.7R-1M	4.7R-1M	4.7R-1M	4.7R-1M
RT2512		100R-100K	100R-100K	4.7R-1M	4.7R-1M		4.7R-100K	4.7R-100K	4.7R-1M	4.7R-1M		4.7R-100K	4.7R-100K	4.7R-1M	4.7R-1M	4.7R-1M	4.7R-1M	4.7R-1M	4.7R-1M

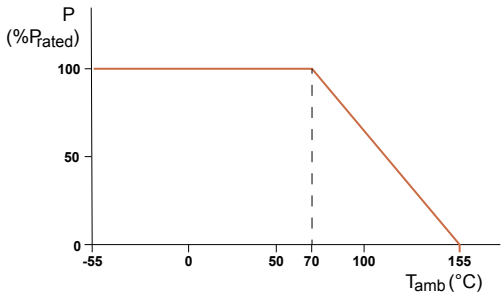
AT - Automotive grade thin film high precision high stability chip resistors, 0402 to 1206

Features

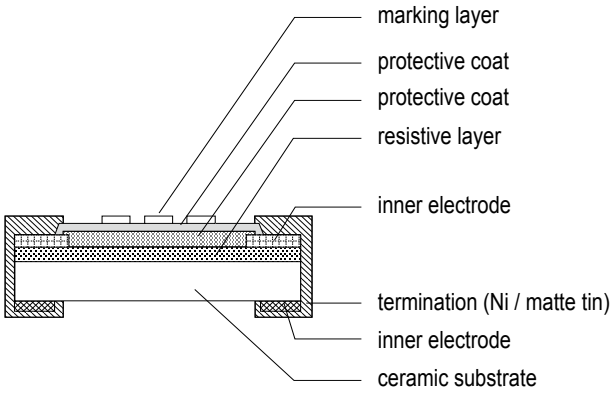
- High precision - High stability
- Low T. C. R. / low noise
- High accuracy (±0.1%, ±0.25%, ±0.5%, ±1%)
- Superior resistance against sulfur containing atmosphere
- AEC-Q200 qualified

Derating curve

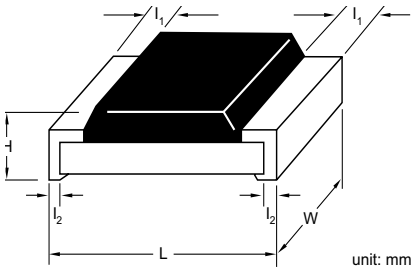
Maximum dissipation (P) in percentage of rated power as a function of the operating ambient temperature (T_{amb}).



Construction



Dimensions



Type	L	W	H	I_1	I_2
AT0402	1.00 ± 0.10	0.50 ± 0.05	0.30 ± 0.05	0.20 ± 0.10	0.25 ± 0.10
AT0603	1.60 ± 0.10	0.80 ± 0.10	0.45 ± 0.10	0.25 ± 0.15	0.25 ± 0.15
AT0805	2.00 ± 0.10	1.25 ± 0.10	0.50 ± 0.10	0.35 ± 0.20	0.35 ± 0.20
AT1206	3.10 ± 0.10	1.60 ± 0.10	0.55 ± 0.10	0.45 ± 0.20	0.40 ± 0.20

Electrical characteristics

Type	Power rating	Operating Temp. range	MWV	RCOV	DWV	Resistance Range (E24/E96) & tolerance				T. C. R. (ppm/°C)
						±0.1%	±0.25%	±0.5%	±1.0%	
AT0402	1/16W	–55°C to +155°C	50V	100V	100V	10Ω~11KΩ				±15 ppm/°C
						10Ω~100KΩ				±25 ppm/°C, ±50 ppm/°C
AT0603	1/10W		75V	150V	100V	10Ω~14KΩ				±15 ppm/°C
						10Ω~330KΩ				±25 ppm/°C, ±50 ppm/°C
AT0805	1/8W		150V	300V	300V	10Ω~17KΩ				±15 ppm/°C
						10Ω~1MΩ				±25 ppm/°C, ±50 ppm/°C
AT1206	1/4W		200V	400V	500V	10Ω~20KΩ				±15 ppm/°C
						10Ω~1MΩ				±25 ppm/°C, ±50 ppm/°C

AT - Automotive grade thin film high precision high stability chip resistors, 0402 to 1206

Environmental characteristics				
Performance test		Test method	Procedure	Requirements
Life/ Endurance		AEC-Q200 Test 8 MIL-STD-202 Method 108	1000 hours at 70± 5°C, RCWV applied for 1.5 hours on, 0.5 hour off, still air required	± (0.1%+50mΩ)
			1000 hours at 125°C, derated voltage applied for 1.5 hours on, 0.5 hour off, still air required	± (0.3%+50mΩ)
High Temperature Exposure temperature		AEC-Q200 Test 3 MIL-STD-202 Method 108	1000 hours at Tamb = 125°C, unpowered	± (0.1%+50mΩ)
			1000 hours at Tamb = 155°C, unpowered	± (0.3%+50mΩ)
Moisture Resistance		AEC-Q200 Test 6 MIL-STD-202 Method 106	Each temperature / humidity cycle is defined at 8 hours (method 106F), 3 cycles / 24 hours for 10d. with 25°C / 65°C 95% R.H, without steps 7a & 7b, unpowered Parts mounted on test-boards, without condensation on parts	± (0.1%+50mΩ)
Thermal Shock		AEC-Q200 Test 16 MIL-STD-202 Method 107	-55 / +125°C Number of cycles is 300. Devicesmounted Maximum transfer time is 20 seconds. Dwell time is 15 minutes. Air –Air	± (0.1%+50mΩ) No visible damage
Short time overload		IEC60115-1 4.13	2.5 times of rated voltage or maximum overload voltage, the less of the above, for 5 sec at room temperature	± (0.05%+50mΩ)
Solderability	Wetting	AEC-Q200 Test 18 J-STD-002	Electrical Test not required Magnification 50X SMD conditions: (a) Method B, aging 4 hours at 155°C dry heat, dipping at 235± 3°C for 5± 0.5 seconds. (b) Method B, steam aging 8 hours, dipping at 215± 3°C for 5± 0.5 seconds. (c) Method D, steam aging 8 hours, dipping at 260± 3°C for 7± 0.5 seconds	Well tinned (>95% covered) No visible damage
	Resistance to soldering heat	AEC-Q200 Test 15 MIL-STD-202 Method 210	Condition B, no pre-heat of samples Lead-free solder, 260± 5°C, 10± 1 seconds immersion time Procedure 2 for SMD: devices fluxed and cleaned with isopropanol	± (0.05%+50mΩ)
FOS		ASTM-B-809-5* * Modified	Sulfur 750 hours, 105°C, Rating with no power	± (4%+50mΩ)

Global part number - Preferred type for ordering Yageo / Phycomp branded products

Ordering example: AT0603DRE07100KL

AT 0603 D R E 07 100K L

Series name (code 1-2)
AT = Automotive grade thin film high precision high stability

Size code (code 3-6)
(inch / metric)
0402 = 1.0 x 0.5
0603 = 1.6 x 0.8
0805 = 2.0 x 1.25
1206 = 3.2 x 1.6

Tolerance (code 7)
B = ±0.1%
C = ±0.25%
D = ±0.5%
F = ±1%

Default code (1/2) (code 17)

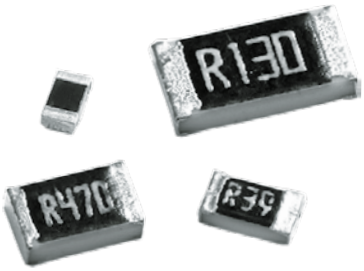
Resistance (code 12-16)
10R = 10Ω
100R = 100Ω
10K = 10KΩ
100K = 100KΩ

Taping reel (code 10-11)
07 = 7 inch Dia. reel

T. C. R. (code 9)
C = ±15 ppm/°C
D = ±25 ppm/°C
E = ±50 ppm/°C

Packing style (code 8)
R = Paper tape reel

Note: 1. All of our RSMD products are RoHS compliant. "LFP" of the internal 2D reel label mentions "Lead Free Process"
2. Letter L is system default code for ordering only



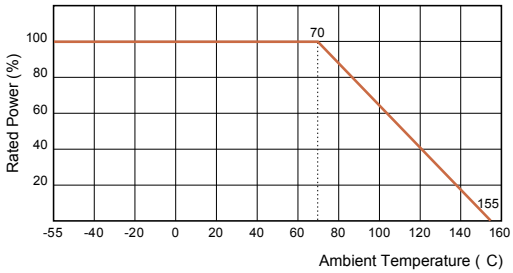
Features

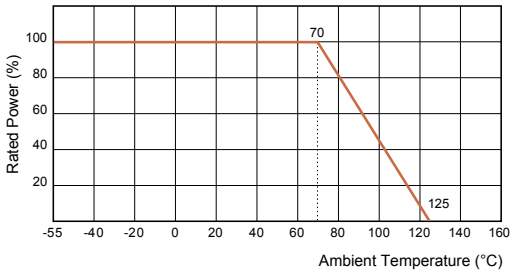
- Current sensing of desktop & notebook PC
- Resistance values down to 0.01Ω
- Highly reliable electrode construction

Derating curve

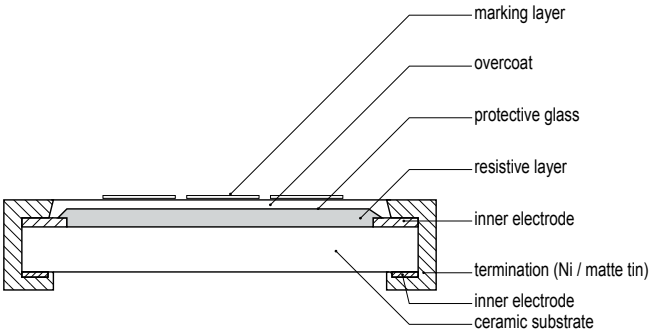
Maximum dissipation (P) in percentage of rated power as a function of the operating ambient temperature (T_{amb}).

Normal Power: Range: –55°C to +155°C
Double Power: Range: –55°C to +125°C

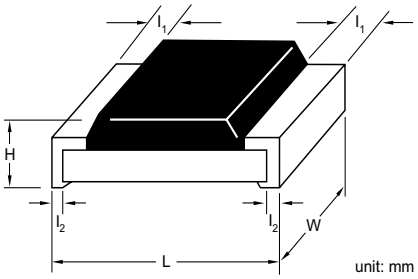




Construction



Dimensions



Type	L	W	H	I_1	I_2
RL0402	1.00 ± 0.10	0.50 ± 0.05	0.35 ± 0.05	0.20 ± 0.10	0.25 ± 0.10
RL0603	1.60 ± 0.10	0.80 ± 0.10	0.45 ± 0.10	0.25 ± 0.15	0.25 ± 0.15
RL0805	2.00 ± 0.10	1.25 ± 0.10	0.50 ± 0.10	0.35 ± 0.20	0.35 ± 0.20
RL1206	3.10 ± 0.10	1.60 ± 0.10	0.55 ± 0.10	0.45 ± 0.20	0.45± 0.20
RL1210	3.10 ± 0.10	2.60 ± 0.15	0.55 ± 0.10	0.50 ± 0.20	0.50 ± 0.20
RL1218	3.05 ± 0.15	4.60 ± 0.20	0.55 ± 0.10	0.45 ± 0.25	0.50 ± 0.25
RL2010	5.00 ± 0.10	2.50 ± 0.15	0.55 ± 0.10	0.60 ± 0.20	0.50 ± 0.20
RL2512	6.35 ± 0.10	3.20 ± 0.15	0.55 ± 0.10	0.60 ± 0.20	0.50 ± 0.20

RL - Thick film low ohmic chip resistors, 0402 to 2512

Electrical characteristics

Type	Power P_{70}	Operating Temp. range	Resistance range & tolerance		T. C. R.	Jumper criteria
RL0402	1/16W	-55°C to +155°C	E24 ±1%, ±2%, ±5%	50mΩ ≤ R < 1Ω	See following table "T.C.R.- RL series"	Max. resistance 20mΩ Rated current 1.5A
RL0603	1/10W			10mΩ ≤ R < 1Ω		Max. resistance 20mΩ Rated current 2A
RL0805	1/8W			10mΩ ≤ R < 1Ω		Max. resistance 20mΩ Rated current 2.5A
	1/4W	-55°C to +125°C		10mΩ ≤ R < 1Ω		-- --
RL1206	1/4W	-55°C to +155°C		10mΩ ≤ R < 1Ω		Max. resistance 20mΩ Rated current 3.5A
	1/2W	-55°C to +125°C		10mΩ ≤ R < 1Ω		-- --
RL1210	1/2W	-55°C to +155°C		10mΩ ≤ R < 1Ω		-- --
RL1218	1W			10mΩ ≤ R < 1Ω		-- --
RL2010	3/4W			10mΩ ≤ R < 1Ω		-- --
RL2512	1W			10mΩ ≤ R < 1Ω		-- --

Note: The partial values of 25 / 40 / 50 / 60 / 250 / 400 / 500 mΩ are also available

T. C. R. - RL series

Type	Operating Temp. range	Resistancec range	T. C. R.					
			50mΩ≤R<100mΩ		**100mΩ≤R<500mΩ**		**500mΩ≤R<1Ω**	
RL0402	-55°C to +125°C	50mΩ≤R<1Ω	±1000 ppm/°C		±800 ppm/°C		±300 ppm/°C	
			10mΩ≤R≤36mΩ	36mΩ≤R≤91mΩ	91mΩ<R≤500mΩ	500mΩ<R<1Ω		
RL0603	-55°C to +125°C	10mΩ≤R<1Ω	±1500 ppm/°C	±1200 ppm/°C	±800 ppm/°C	±300 ppm/°C		
			10mΩ≤R≤18mΩ	18mΩ<R≤47mΩ	47mΩ<R≤91mΩ	91mΩ<R≤360mΩ	360mΩ<R≤500mΩ	500mΩ<R<1Ω
RL0805	-55°C to +125°C	10mΩ≤R<1Ω	±1500 ppm/°C	±1200 ppm/°C	±1000 ppm/°C	±600 ppm/°C	±300 ppm/°C	±200 ppm/°C
RL1206								
RL1210			±1500 ppm/°C	±1000 ppm/°C	±800 ppm/°C	±600 ppm/°C	±300 ppm/°C	±200 ppm/°C
			10mΩ≤R≤30mΩ	30mΩ<R≤56mΩ	56mΩ<R≤180mΩ	180mΩ<R<1Ω		
RL1218	-55°C to +125°C	10mΩ≤R<1Ω	±2000 ppm/°C	±1000 ppm/°C	±700 ppm/°C	±250 ppm/°C		
			10mΩ≤R≤18mΩ	18mΩ<R≤47mΩ	47mΩ<R≤91mΩ	91mΩ<R≤360mΩ	360mΩ<R≤500mΩ	500mΩ<R<1Ω
RL2010	-55°C to +125°C	10mΩ≤R<1Ω	±1500 ppm/°C	±1200 ppm/°C	±1000 ppm/°C	±600 ppm/°C	±300 ppm/°C	±200 ppm/°C
RL2512			±1500 ppm/°C	±1200 ppm/°C	±800 ppm/°C	±600 ppm/°C	±300 ppm/°C	±200 ppm/°C

Environmental characteristics

Performance test		Test method	Procedure	Requirements
Life		MIL-STD-202 Method 108A	1000 hours at 70°C ±2°C applied RCWV 1.5 hours on, 0.5 hours off, still air required	± (2%+0.5mΩ)
High temperature exposure		MIL-STD-202 Method 108A	1000 hours at maximum operating temperature depending on specification, unpowered	± (1%+0.5mΩ)
Moisture resistance		MIL-STD-202 Method 106G	Each temperature / humidity cycle is defined as 8 hours (method 106G), 3 cycles / 24 hours for 10d with 25°C / 65°C 95% R.H	± (2%+0.5mΩ)
Thermal shock		MIL-STD-202 Method 107G	-55 / +125°C Note: Number of cycles required is 300. Devices mounted Maximum transfer time is 20 seconds. Dwell time is 15 minutes. Air – Air	± (1%+0.5mΩ)
Solderability	Wetting	J-STD-002B test B	Electrical test not required. Magnification 50X Lead-free solder bath at 245 ±3°C Dipping time: 3 ±0.5 seconds	Well tinned (≥ 95% covered) No visible damage
	Resistance to soldering heat	MIL-STD-202 method 210F	Lead-free solder, 260°C, 10 seconds immersion time	± (1%+0.5mΩ) No visible damage
Short time overload		IEC 60115 -1 4.13	RL standard power: 6.25 times of rated power for 5 seconds at room temperature RL high power: 5 times of rated power for 5 seconds at room temperature	± (2%+0.5mΩ) No visible damage

Global part number - Preferred type

Ordering example: RL0603JR-070R01L

RL 0603 J R — 07 0R01 L

Series name (code 1-2)
RL = Thick Film Low ohmic

Size code (code 3-6)
(inch / metric)
0402 = 1.0 x 0.5
0603 = 1.6 x 0.8
0805 = 2.0 x 1.25
1206 = 3.2 x 1.6
1210 = 3.2 x 2.6
1218 = 3.2 x 4.5
2010 = 5.0 x 2.5
2512 = 6.35 x 3.2

Tolerance (code 7)
F = ±1%
G = ±2%
J = ±5%
"-" = Jumper ordering

Default code(1/2) (code 17)

Resistance (code 12-16)
0R01 = 0.01Ω
0R1 = 0.1Ω
0R2 = 0.2Ω

Taping reel (code 10-11)
07 = 7 inch Dia. reel
13 = 13 inch Dia. reel

T. C. R. (code 9)
"—" = Based on spec.
(— for thick film only)

Packing style (code 8)
R = Paper tape reel
K = Embossed plastic tape reel

Note: 1. All of our RSMD products are RoHS compliant. "LFP" of the internal 2D reel label mentions "Lead Free Process"
2. Letter L is system default code for ordering only

Phycomp worldwide - Traditional type

Low ohmic chip resistors								
Size: inch (mm)	**0402 (1005)**		**0603 (1608)**		**0805 (2012)**		**1206 (3216)**	
Power	1/16 W		1/10 W		1/8 W		1/4 W	
Tolerance	+5%	+1%	+5%	+1%	+5%	+1%	+5%	+1%
Resistance	E24	E24	E24	E24	E24	E24	E24	E24
Packing	paper tape		paper tape		paper tape		paper tape	
Quantity 5 000	---	---	2350 512 10…L	2350 512 12…L	2350 511 10…L	2350 511 12…L	2350 510 10…L	2350 510 12…L
10 000	2350 513 20…L	2350 513 22…L	---	---	---	---	---	---

For ordering rules: See page 14 for E24 / E96 values and the last 4 or 3 digits of the 12NC catalogue number

Phycomp worldwide - Traditional type

Low ohmic chip resistors								
Size: inch (mm)	**1210 (3225)**		**1218 (3248)**		**2010 (5025)**		**2512 (6432)**	
Power	1/2 W		1 W		3/4 W		1 W	
Tolerance	+5%	+1%	+5%	+1%	+5%	+1%	+5%	+1%
Resistance	E24	E24	E24	E24	E24	E24	E24	E24
Packing	paper tape		blister tape		blister tape		blister tape	
Quantity 4 000	---	---	2322 735 64…L	2322 735 7….L	2322 760 90..0L/60..7L	2322 761 90..0L/6...7L	2322 762 90..0L/60..7L	2322 763 90..0L/6...7L
5 000	2390 735 90..0L/60..7L	2390 735 3….L	---	---	---	---	---	---

For ordering rules: See page 14 for E24 / E96 values and the last 4 or 3 digits of the 12NC catalogue number

RL - Thick film low ohmic, high power chip resistors, 0805 / 1206

Global part number - Preferred type

Ordering example: RL0805JR-7W0R01L

RL 0805 J R — 7W 0R01 L

Series name (code 1-2)
RL = Thick film low ohmic

Size code (code 3-6)
(inch / metric)
0805 = 2.0 x 1.25
1206 = 3.2 x 1.6

Tolerance (code 7)
F = ±1%
G = ±2%
J = ±5%

Packing style (code 8)
R = Paper tape reel

Default code (code 17)

Resistance (code 12-16)
0R01 = 0.01Ω
0R1 = 0.1Ω
0R2 = 0.2Ω

Taping reel (code 10-11)
7W = 7 inch Dia. reel and
2 x standard power type

T. C. R. (code 9)
"—" = Based on spec.
(— for thick film only)

Note: 1. All of our RSMD products are RoHS compliant. "LFP" of the internal 2D reel label mentions "Lead Free Process"
2. Letter L is system default code for ordering only

Phycomp worldwide - Traditional type

Low ohmic high power chip resistors				
Size: inch (mm)	**0805 (2012)**		**1206 (3216)**	
Power	1/4 W		1/2 W	
Tolerance	+5%	+1%	+5%	+1%
Resistance	E24	E24 / E96	E24	E24 / E96
Packing	paper tape		paper tape	
Quantity 5000	2350 511 15…L	2350 511 17…L	2350 519 01…L	2350 519 1….L

For ordering rules: See page 14 for E24 / E96 values and the last 4 or 3 digits of the 12NC catalogue number

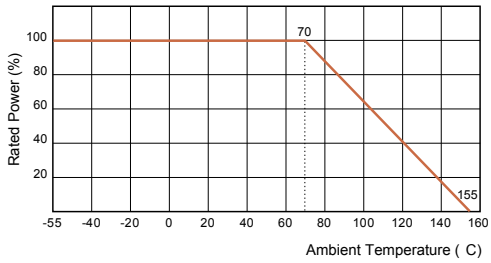
PT - Thick film low ohmic low T. C. R. chip resistors, 0402 to 2512

Features

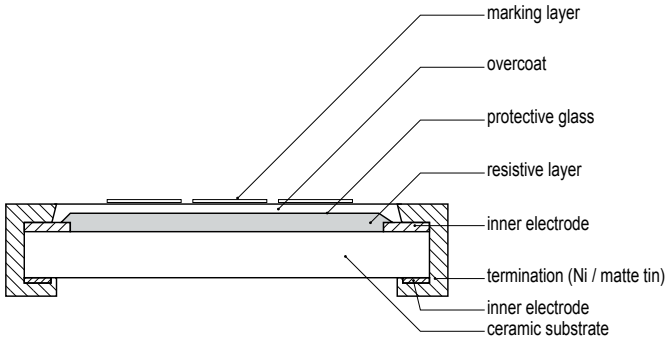
- Excellent T. C. R.
- Precision current sensing control
- Excellent performance for current sensing applications
- Low ohmic and high power

Derating curve

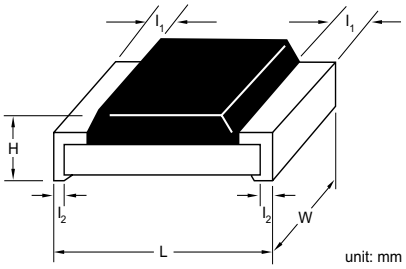
Maximum dissipation (P) in percentage of rated power as a function of the operating ambient temperature (T_{amb}).



Construction



Dimensions



Type	L	W	H	l_1	l_2
PT0402	1.00 ± 0.10	0.50 ± 0.05	0.35 ± 0.05	0.20 ± 0.10	0.25 ± 0.10
PT0603	1.60 ± 0.10	0.80 ± 0.10	0.45 ± 0.10	0.25 ± 0.15	0.25 ± 0.15
PT0805	2.00 ± 0.10	1.25 ± 0.10	0.55 ± 0.10	0.35 ± 0.20	0.35 ± 0.20
PT1206 (50mΩ ≤ R < 75mΩ & 91mΩ ≤ R < 1Ω)	3.10 ± 0.10	1.60 ± 0.10	0.55 ± 0.10	0.45 ± 0.20	0.45 ± 0.20
PT1206 (75mΩ ≤ R < 91mΩ)	3.10 ± 0.10	1.60 ± 0.10	0.55 ± 0.10	0.75 ± 0.20	0.45 ± 0.20
PT2010	5.00 ± 0.10	2.50 ± 0.15	0.55 ± 0.10	0.60 ± 0.20	0.50 ± 0.20
PT2512	6.35 ± 0.10	3.20 ± 0.15	0.55 ± 0.10	0.60 ± 0.20	0.50 ± 0.20

Note: For relevant physical dimensions, please refer to above construction outlines
Please contact our sales offices, distributors and representatives in your region before ordering

PT - Thick film low ohmic low T. C. R. chip resistors, 0402 to 2512

Electrical characteristics

Type	Power P_{70}	Operating Temp. range	Max. working voltage	Tolerance	Resistance range & T. C. R.	Jumper criteria
PT0402	1/16W	-55°C to +155°C	(PxR)^1/2	E24 ±2%, ±5% E24/E96 ±1%	50mΩ ≤ R < 68mΩ ±600 ppm/°C 68mΩ ≤ R < 100mΩ ±300 ppm/°C 100mΩ ≤ R < 1Ω ±200 ppm/°C	Max. resistance 10mΩ Rated current 3A
	1/8W					
PT0603	1/10W				50mΩ 0/+400 ppm/°C 50mΩ < R < 68mΩ 0/+350 ppm/°C 68mΩ ≤ R < 100mΩ 0/+300 ppm/°C 100mΩ ≤ R < 1Ω ±200 ppm/°C	Max. resistance 8mΩ Rated current 5A
	1/5W					
	1/3W				50mΩ 0/+400 ppm/°C 50mΩ < R < 68mΩ 0/+350 ppm/°C 68mΩ 0/+300 ppm/°C	
PT0805	1/8W				50mΩ 0/+350 ppm/°C 50mΩ < R < 68mΩ 0/+300 ppm/°C 68mΩ ≤ R < 100mΩ 0/+250 ppm/°C 100mΩ ≤ R < 1Ω ±100 ppm/°C	Max. resistance 5mΩ Rated current 6A
	1/4W					
PT1206	1/4W				50mΩ ≤ R < 75mΩ ±350 ppm/°C 75mΩ ≤ R ≤ 100mΩ ±100 ppm/°C 100mΩ < R < 1Ω ±75 ppm/°C	Max. resistance 5mΩ Rated current 10A
	1/2W					
PT2010	3/4W				100mΩ ±100 ppm/°C 100mΩ < R < 1Ω ±75 ppm/°C	Max. resistance --- Rated current ---
	1W					
PT2512	1W					Max. resistance --- Rated current ---
	2W					

Environmental characteristics

Performance test		Test method	Procedure	Requirements
Life		MIL-STD-202 Method 108A	1000 hours at 70 ±2°C applied RCWV 1.5 hours on, 0.5 hours off, still air required	± (1% +0.5mΩ) < 20mΩ for jumper
High temperature exposure		MIL-STD-202 Method 108A	1000 hours at maximum operating temperature depending on specification, unpowered	± (1% +0.5mΩ) < 20mΩ for jumper
Moisture resistance		MIL-STD-202 Method 106G	Each temperature / humidity cycle is defined as 8 hours (method 106G), 3 cycles / 24 hours for 10d with 25°C / 65°C 95% R.H	± (0.5% +0.5mΩ) < 20mΩ for jumper
Thermal shock		MIL-STD-202 Method 107G	-55 / +125°C Note: Number of cycles required is 300. Devices mounted Maximum transfer time is 20 seconds. Dwell time is 15 minutes. Air – Air	± (1% +0.5mΩ) < 10mΩ for jumper
Solderability	Wetting	J-STD-002B test B	Electrical test not required. Magnification 50X Lead-free solder bath at 245 ±3°C Dipping time: 3 ±0.5 seconds	Well tinned (≥ 95% covered) No visible damage
	Resistance to soldering heat	MIL-STD-202 method 210F	Lead-free solder, 260°C, 10 seconds immersion time	± (0.5% +0.5mΩ) No visible damage < 10mΩ for jumper
Short time overload		IEC 60115 -1 4.13	PT standard power: 6.25 times of rated power for 5 seconds at room temperature PT high power: 5 times of rated power for 5 seconds at room temperature PT jumper: 2.5 times of rated current for 5 seconds at room temperature	± (1% +0.5mΩ) No visible damage < 10mΩ for jumper

PT - Thick film low ohmic low T. C. R. chip resistors, 0402 to 2512

Global part number - Preferred type

Ordering example: PT2512FK-070R01L

PT 2512 F K — 07 0R01 L

Series name (code 1-2)
PT = Thick film low ohmic low T. C. R.

Size code (code 3-6)
(inch / metric)
0402 = 1.0 x 0.5
0603 = 1.6 x 0.8
0805 = 2.0 x 1.25
1206 = 3.2 x 1.6
2010 = 5.0 x 2.5
2512 = 6.35 x 3.2

Tolerance (code 7)
F = ± 1%
G = ± 2%
J = ± 5%
"—" for Jumper ordering

Packing style (code 8)
R = Paper tape reel
K = Embossed plastic tape reel

Default code(1/2) (code 17)

Resistance (code 12-16)
0R = Jumper
0R1 = 0.1Ω
0R2 = 0.2Ω

Taping reel (code 10-11)
07 = 7 inch Dia. reel
13 = 13 inch Dia. reel
7W = 7 inch Dia. reel and 2 x standard power type
7T = 7 inch Dia. reel and 3 x standard power type
3W = 13 inch Dia. reel and 2 x standard power type

T. C. R. (code 9)
"—" = Based on spec.

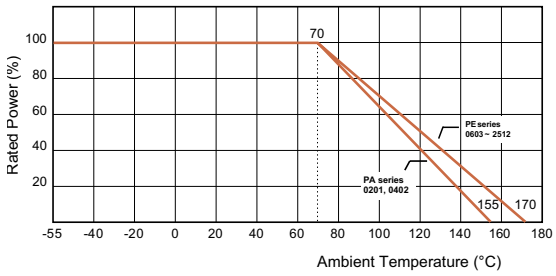
Note: 1. All of our RSMD products are RoHS compliant. "LFP" of the internal 2D reel label mentions "Lead Free Process"
2. Letter L is system default code for ordering only
3. PT series products are available by "Global part number" only

Features

- Excellent T. C. R. compared to thick film low ohmic
- Precision current sensing control
- Excellent performance for current sensing applications
- Ultra low ohmic down to 0.0005Ω

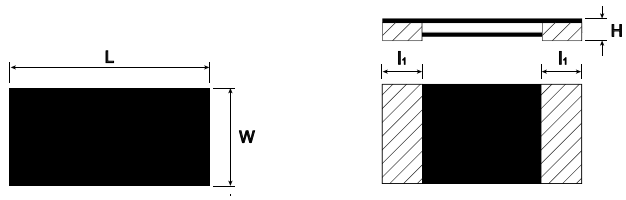
Derating curve

Maximum dissipation (P) in percentage of rated power as a function of the operating ambient temperature (T_{amb}).

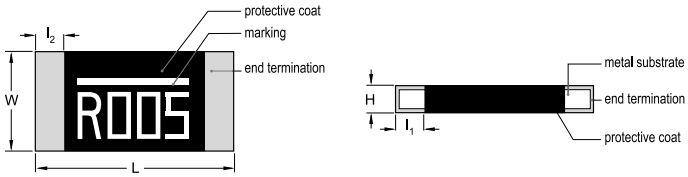


Construction

0201~0805



1206 / 2512



Note: construction will be adjusted to resistance value.

Dimensions

unit: mm

Type	Resistance range	L	W	H	l_1	l_2
PA0201	5mΩ ≤ R ≤ 10mΩ	0.60 ± 0.03	0.31 ± 0.04	Max. 0.3	0.15 ± 0.06	--
PA0402	5mΩ ≤ R ≤ 20mΩ	1.00 ± 0.10	0.55 ± 0.10	Max. 0.4	0.25 ± 0.10	--
PA0603	1mΩ	1.60 ± 0.20	0.80 ± 0.20	0.55 ± 0.15	0.38 ± 0.12	--
	1mΩ < R ≤ 20mΩ	1.60 ± 0.20	0.80 + 0.1/-0.20	0.45 ± 0.15	0.38 ± 0.12	--
PA0805	1mΩ	2.03 ± 0.20	1.27 ± 0.20	0.45 ± 0.10	0.60 ± 0.15	--
	2mΩ	2.03 ± 0.20	1.27 ± 0.20	0.35 ± 0.10	0.50 ± 0.15	--
	3mΩ ≤ R ≤ 20mΩ	2.03 ± 0.20	1.27 ± 0.20	0.30 ± 0.10	0.35 ± 0.10	--
PA1206	1mΩ	3.20 ± 0.25	1.60 ± 0.25	0.65 ± 0.25	1.04 ± 0.25	1.04 ± 0.25
	2mΩ ≤ R ≤ 5mΩ	3.20 ± 0.25	1.60 ± 0.25	0.65 ± 0.25	0.64 ± 0.25	0.64 ± 0.25
	6mΩ ≤ R ≤ 50mΩ	3.20 ± 0.25	1.60 ± 0.25	0.65 ± 0.25	0.51 ± 0.25	0.51 ± 0.25
PA2512	0.5mΩ ≤ R ≤ 0.75mΩ	6.35 ± 0.25	3.18 ± 0.25	0.63 ± 0.25	2.72 ± 0.25	2.72 ± 0.25
	1mΩ ≤ R ≤ 4mΩ	6.35 ± 0.25	3.18 ± 0.25	0.63 ± 0.25	2.21 ± 0.25	2.21 ± 0.25
	5mΩ ≤ R ≤ 6mΩ	6.35 ± 0.25	3.18 ± 0.25	0.63 ± 0.25	1.19 ± 0.25	1.19 ± 0.25
	7mΩ ≤ R ≤100mΩ	6.35 ± 0.25	3.18 ± 0.25	0.63 ± 0.25	0.76 ± 0.25	0.76 ± 0.25

PA - Current sensors - low T. C. R. chip resistors, 1206 to 2010

Electrical characteristics

Type	Technology	Size	Power P70	Operating Temp. range	Max. working voltage	Tolerance	Resistance range	T. C. R.
PA	Metal Plate	0201	1/20W	-55°C to 125°C	(PxR)^1/2	±0.5% ±1% ±5%	5mΩ ≤ R ≤ 10mΩ Jumper < 5mΩ	±150 ppm/°C
			1/10W					
			3/20W					
			1/5W					
		0402	1/16W				2.5mΩ 5mΩ ≤ R ≤ 20mΩ Jumper < 1mΩ	±150 ppm/°C
			1/8W					
			1/6W					
			1/4W					
			1/3W					
		0603	1/10W	-55°C to 155°C			1mΩ ≤ R ≤ 20mΩ Jumper < 0.2mΩ	1mΩ ±200 ppm/°C 2mΩ/ 2.5mΩ ±150 ppm/°C 3mΩ~20mΩ ±50 ppm/°C ±75 ppm/°C
			1/5W					
			1/3W					
			2/5W					
			1/2W					
		0805	1/8W				1mΩ ≤ R ≤ 20mΩ Jumper < 0.2mΩ	1mΩ/ 1.5mΩ ±150 ppm/°C 2mΩ~20mΩ ± 50 ppm/°C
			1/4W					
			1/2W					
			1W					
		1206	1/4W	-55°C to 170°C			1mΩ ≤ R ≤ 50mΩ Jumper < 0.2mΩ	1mΩ ≤ R ≤ 2mΩ ±75 ppm/°C ±100 ppm/°C 3mΩ ≤ R ≤ 50mΩ ±50 ppm/°C ±75 ppm/°C ±100 ppm/°C
			1/2W					
			1W					
			1.5W				1mΩ ≤ R ≤ 5mΩ	
		2512	1W				0.5mΩ ≤ R ≤ 100mΩ	±50 ppm/°C ±75 ppm/°C ±100 ppm/°C
			2W					
			3W					

Note: Please contact with sales offices, distributors and representatives in your region before ordering

Environmental characteristics

Performance test		Test method	Procedure	Requirements
Life		MIL-STD-202 Method 108A	1000 hours at 70 ±2°C applied RCWV 1.5 hours on, 0.5 hours off, still air required	± (1% +0.5mΩ)
High temperature exposure		MIL-STD-202 Method 108A	1000 hours at maximum operating temperature depending on specification, unpowered	± (1% +0.5mΩ)
Moisture resistance		MIL-STD-202 Method 106G	Each temperature / humidity cycle is defined as 8 hours (method 106G), 3 cycles / 24 hours for 10d with 25°C / 65°C 95% R.H	± (0.5% +0.5mΩ)
Thermal shock		MIL-STD-202 Method 107G	-55 / +125°C Note: Number of cycles required is 300. Devices mounted Maximum transfer time is 20 seconds. Dwell time is 15 minutes. Air – Air	± (0.5% +0.5mΩ)
Solderability	Wetting	J-STD-002B test B	Electrical test not required. Magnification 50X Lead-free solder bath at 245 ±3°C Dipping time: 3 ±0.5 seconds	Well tinned (≥ 95% covered)
	Resistance to soldering heat	MIL-STD-202 method 210F	Lead-free solder, 260°C, 10 seconds immersion time	± (0.5% +0.5mΩ) No visible damage
Short time overload		IEC 60115 -1 4.13	5 times of rated power for 5 seconds at room temperature	± (0.5% +0.5mΩ) No visible damage

PA - Current sensors - low T. C. R. chip resistors, 0201 to 2512

Global part number - Preferred type

Ordering example: PA2512FKF070R01E

PA 2512 F K F 07 0R01 L/E

Series name (code 1-2)
PA = Current sensors - low T. C. R.

Size code (code 3-6)
(inch / metric)
0201 = 0.6 x 0.31
0402 = 1.0 x 0.5
0603 = 1.6 x 0.8
0805 = 2.0 x 1.25
1206 = 3.2 x 1.6
2512 = 6.35 x 3.2

Tolerance (code 7)
F = ±1%
J = ±5%

Packing style (code 8)
R = Paper tape reel
K = Embossed plastic tape reel

Default code[1] (code 17)
E = PA2512 only
L = for others

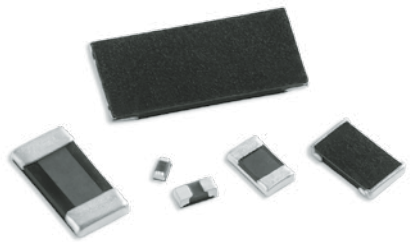
Resistance (code 12-16)
0U5 = 0.0005Ω
0R01 = 0.01Ω
0R1 = 0.1Ω
0R2 = 0.2Ω

Taping reel (code 10-11)
07 = 7 inch Dia. reel
7W = 7 inch Dia. reel
2 x standard power type
7T = 7 inch Dia. reel
3 x standard power type
47 = 7 inch Dia. reel
4 x standard power type
57 = 7 inch Dia. reel
5 x standard power type
87 = 7 inch Dia. reel
8 x standard power type

T. C. R. (code 9)
E = ±50 ppm/°C
M = ±75 ppm/°C
F = ±100 ppm/°C
L = ±150 ppm/°C
G = ±200 ppm/°C

Note: 1. All of our RSMD products are RoHS compliant. "LFP" of the internal 2D reel label mentions "Lead Free Process"

PA - Low profile current sensors - low T. C. R. chip resistors, 1206 to 2010

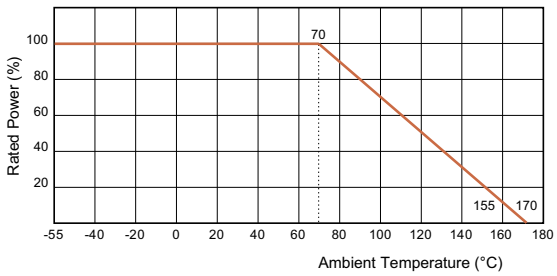


Features

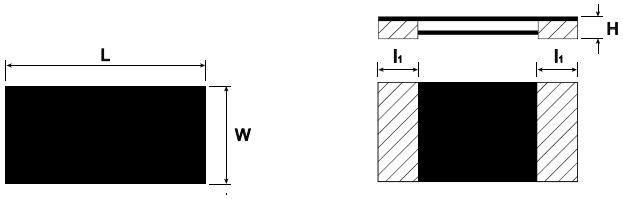
- Excellent T. C. R. compared to thick film low ohmic
- Precision current sensing control
- Excellent performance for current sensing applications
- Ultra low ohmic down to 0.0005Ω

Derating curve

Maximum dissipation (P) in percentage of rated power as a function of the operating ambient temperature (T_{amb}).



Construction



Note: construction will be adjusted to resistance value.

Dimensions

unit: mm

Type	Resistance range	L (mm)	W (mm)	H (mm)	l1 (mm)
PA1206	1mΩ	3.20 ± 0.25	1.60 ± 0.25	0.65 ± 0.25	0.51 ± 0.25
	2mΩ	3.20 ± 0.25	1.60 ± 0.25	0.55 ± 0.25	0.60 ± 0.25
	2.5/ 3mΩ	3.20 ± 0.25	1.60 ± 0.25	0.40 ± 0.25	0.80 ± 0.30
	4mΩ ≤ R ≤ 20mΩ	3.20 ± 0.25	1.60 ± 0.25	0.40 ± 0.25	0.60 ± 0.30
PA2010	1mΩ ≤ R ≤ 2mΩ	5.08 ± 0.20	2.54 ± 0.20	0.70 ± 0.15	0.70 ± 0.20
	3mΩ ≤ R ≤ 20mΩ	5.08 ± 0.20	2.54 ± 0.20	0.40 ± 0.15	0.70 ± 0.20

Electrical characteristics

Type	Technology	Size	Power P70	Operating Temp. range	Max. working voltage	Tolerance	Resistance range	T. C. R.
PA	Metal Plate	1206	1/4W	-55°C to 170°C	(PxR)^1/2	±0.5%	5mΩ≤R≤20mΩ	±50 ppm/°C
			1/2W			±1% ±5%	1mΩ≤R≤20mΩ	
			1W					
		2010	1/2W			±1% ±5%	1mΩ≤R≤20mΩ	
			1W					
			2W					
			3W					

Note: Please contact with sales offices, distributors and representatives in your region before ordering.

PA - Low profile current sensors - low T. C. R. chip resistors, 1206 to 2010

Environmental characteristics				
Performance test		Test method	Procedure	Requirements
Life		MIL-STD-202 Method 108A	1000 hours at 70 ±2°C applied RCWV 1.5 hours on, 0.5 hours off, still air required	± (1% +0.5mΩ)
High temperature exposure		MIL-STD-202 Method 108A	1000 hours at maximum operating temperature depending on specification, unpowered	± (1% +0.5mΩ)
Moisture resistance		MIL-STD-202 Method 106G	Each temperature / humidity cycle is defined as 8 hours (method 106G), 3 cycles / 24 hours for 10d with 25°C / 65°C 95% R.H	± (0.5% +0.5mΩ)
Thermal shock		MIL-STD-202 Method 107G	-55 / +125°C Note: Number of cycles required is 300. Devices mounted Maximum transfer time is 20 seconds. Dwell time is 15 minutes. Air – Air	± (0.5% +0.5mΩ)
Solderability	Wetting	J-STD-002B test B	Electrical test not required. Magnification 50X Lead-free solder bath at 245 ±3°C Dipping time: 3 ±0.5 seconds	Well tinned (≥ 95% covered)
	Resistance to soldering heat	MIL-STD-202 method 210F	Lead-free solder, 260°C, 10 seconds immersion time	± (0.5% +0.5mΩ) No visible damage
Short time overload		IEC 60115 -1 4.13	5 times of rated power for 5 seconds at room temperature	± (0.5% +0.5mΩ) No visible damage

Global part number - Preferred type

Ordering example: PA1206FRE070R01Z

PA 2010 F K E 07 0R01 Z

Series name (code 1-2)
PA = Current sensors - low T. C. R.

Size code (code 3-6)
(inch / metric)
1206 = 3.2 x 1.6
2010 = 5.0 x 2.5

Tolerance (code 7)
D = ±0.5%
F = ±1%
J = ±5%

Packing style (code 8)
R = Paper tape reel
K = Embossed plastic tape reel

Default code[1] (code 17)
Z = Default code for PA low profile

Resistance (code 12-16)
0R001 = 0.001Ω
0R01 = 0.01Ω

Taping reel (code 10-11)
07 = 7 inch Dia. reel
7W = 7 inch Dia. reel
2 x standard power type
47 = 7 inch Dia. reel
4 x standard power type
67 = 7 inch Dia. reel
6 x standard power type

T. C. R. (code 9)
E = ±50 ppm/°C

Note: 1. All of our RSMD products are RoHS compliant. "LFP" of the internal 2D reel label mentions "Lead Free Process"

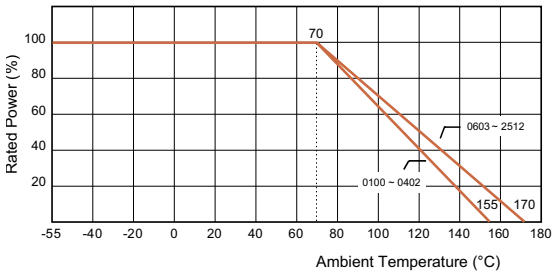
PE - Current sensors - low T. C. R. chip resistors, 01005 to 2512

Features

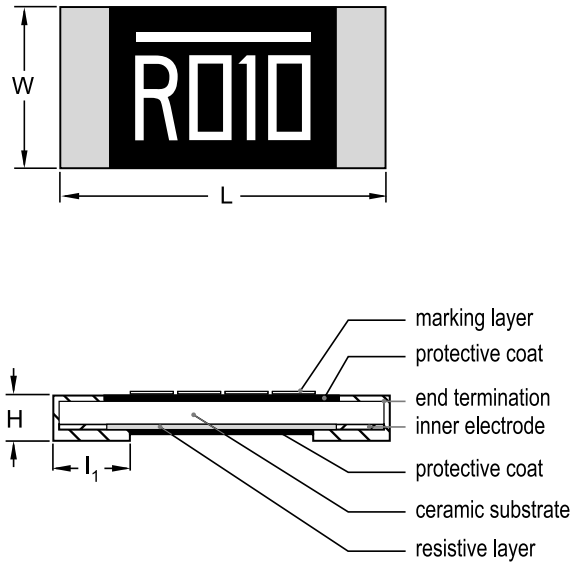
- Excellent T. C. R. compared to thick film low ohmic
- Precision current sensing control
- Excellent performance for current sensing applications
- Ultra low ohmic down to 0.0005Ω

Derating curve

Maximum dissipation (P) in percentage of rated power as a function of the operating ambient temperature (T_{amb}).



Construction



Note: construction will be adjusted to resistance value.

Dimensions

unit: mm

Type	Resistance range	L	W	H	l_1
PE0100	200mΩ ≤ R ≤ 500mΩ	0.40 ± 0.03	0.20 ± 0.03	0.14 ± 0.03	0.10 ± 0.03
PE0201	50mΩ ≤ R ≤ 200mΩ	0.60 ± 0.03	0.31 ± 0.04	0.27 ± 0.04	0.14 ± 0.06
PE0402	10mΩ ≤ R ≤ 910mΩ	1.00+0.10/-0.15	0.50+0.10/-0.15	0.35 ± 0.15	0.25 ± 0.10
PE0603	20mΩ ≤ R ≤ 50mΩ	1.60 ± 0.20	0.76 ± 0.25	0.35 ± 0.25	0.38 ± 0.25
	51mΩ ≤ R ≤ 910mΩ	1.52 ± 0.25	0.76 ± 0.25	0.45 ± 0.10	0.38 ± 0.25
PE0805	20 mΩ ≤ R ≤ 50mΩ	2.03 ± 0.25	1.27 ± 0.25	0.35 ± 0.25	0.38 ± 0.25
	51mΩ ≤ R ≤ 910mΩ			0.55 ± 0.10	0.35 ± 0.20
PE1206	5mΩ	3.20 ± 0.25	1.60 ± 0.25	0.64 ± 0.25	0.64 ± 0.25
	6mΩ ≤ R ≤ 910mΩ				0.51 ± 0.25
PE2010	5mΩ ≤ R ≤ 6mΩ	5.08 ± 0.25	2.54 ± 0.25	0.64 ± 0.25	1.47 ± 0.25
	7mΩ ≤ R ≤ 910mΩ				0.51 ± 0.25
PE2512	6mΩ ≤ R ≤ 910mΩ	6.35 ± 0.25	3.18 ± 0.25	0.64 ± 0.25	0.76 ± 0.25

PE - Current sensors - low T. C. R. chip resistors, 01005 to 2512

Electrical characteristics

Type	Technology	Size	Power P70	Operating Temp. range	Max. working voltage	Tolerance	Resistance range	T. C. R.
PE	Metal Film	01005	1/32W	-55°C to 125°C	(PxR)^1/2	±1% ±5%	200mΩ ≤ R ≤ 500mΩ	200mΩ ≤ R < 300mΩ ±300 ppm/°C 300mΩ ≤ R ≤ 500mΩ ±200 ppm/°C
			1/16W					
		0201	1/20W			±0.5% R > 10mΩ ±1% ±5%	50mΩ ≤ R ≤ 200mΩ	50mΩ ≤ R ≤ 70mΩ ±350 ppm/°C 70mΩ < R ≤ 200mΩ ±100 ppm/°C
			1/10W					
		0402	1/16W				10mΩ ≤ R ≤ 910mΩ	±100 ppm/°C
			1/8W					
			1/6W					
			1/4W					
		0603	1/10W	-55°C to 170°C			5m,10m, 20mΩ ≤ R ≤ 910mΩ	±75 ppm/°C ±100 ppm/°C
			1/5W					
			1/3W					
			2/5W					
			1/2W					
		0805	1/8W					
			1/4W					
			1/3W					
			1/2W					
		1206	1/4W				5mΩ ≤ R ≤ 910mΩ	5mΩ ≤ R ≤ 19mΩ ±75 ppm/°C ±100 ppm/°C 20mΩ ≤ R ≤ 910mΩ ±50 ppm/°C ±75 ppm/°C ±100 ppm/°C
			1/2W					
			1W					
		2010	1/2W				5mΩ ≤ R< 910mΩ	±50 ppm/°C ±75 ppm/°C ±100 ppm/°C
			1W					
		2512	1W				6mΩ ≤ R< 910mΩ	
			2W					

Note: Please contact with sales offices, distributors and representatives in your region before ordering

Environmental characteristics

Performance test		Test method	Procedure	Requirements
Life		MIL-STD-202 Method 108A	1000 hours at 70 ±2°C applied RCWV 1.5 hours on, 0.5 hours off, still air required	± (1% +0.5mΩ)
High temperature exposure		MIL-STD-202 Method 108A	1000 hours at maximum operating temperature depending on specification, unpowered	± (1% +0.5mΩ)
Moisture resistance		MIL-STD-202 Method 106G	Each temperature / humidity cycle is defined as 8 hours (method 106G), 3 cycles / 24 hours for 10d with 25°C / 65°C 95% R.H	± (0.5% +0.5mΩ)
Thermal shock		MIL-STD-202 Method 107G	-55 / +125°C Note: Number of cycles required is 300. Devices mounted Maximum transfer time is 20 seconds. Dwell time is 15 minutes. Air – Air	± (0.5% +0.5mΩ)
Solderability	Wetting	J-STD-002B test B	Electrical test not required. Magnification 50X Lead-free solder bath at 245 ±3°C Dipping time: 3 ±0.5 seconds	Well tinned (≥ 95% covered)
	Resistance to soldering heat	MIL-STD-202 method 210F	Lead-free solder, 260°C, 10 seconds immersion time	± (0.5% +0.5mΩ) No visible damage
Short time overload		IEC 60115 -1 4.13	5 times of rated power for 5 seconds at room temperature	± (0.5% +0.5mΩ) No visible damage

PE - Current sensors - low T. C. R. chip resistors, 01005 to 2512

Global part number - Preferred type

Ordering example: PE2512FKF070R01L

PE 2512 F K F 07 0R01 L

Series name (code 1-2)
PE = Current sensors - low T. C. R.

Size code (code 3-6)
(inch / metric)
0100 = 0.4 x 0.2
0201 = 0.6 x 0.31
0402 = 1.0 x 0.5
0603 = 1.6 x 0.8
0805 = 2.0 x 1.25
1206 = 3.2 x 1.6
2010 = 5.0 x 2.5
2512 = 6.35 x 3.2

Tolerance (code 7)
D = ±0.5%
F = ±1%
J = ±5%

Packing style (code 8)
R = Paper tape reel
K = Embossed plastic tape reel

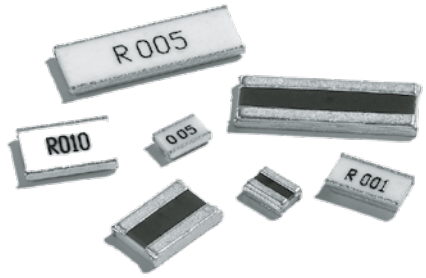
Default code[1] (code 17)

Resistance (code 12-16)
0U5 = 0.0005Ω
0R01 = 0.01Ω
0R1 = 0.1Ω
0R2 = 0.2Ω

Taping reel (code 10-11)
07 = 7 inch Dia. reel
7W = 7 inch Dia. reel
2 x standard power type
7T = 7 inch Dia. reel
3 x standard power type
47 = 7 inch Dia. reel
4 x standard power type
57 = 7 inch Dia. reel
5 x standard power type

T. C. R. (code 9)
E = ±50 ppm/°C
M = ±75 ppm/°C
F = ±100 ppm/°C
G = ±200 ppm/°C
I = ±300 ppm/°C
J = ±350 ppm/°C

Note: 1. All of our RSMD products are RoHS compliant. "LFP" of the internal 2D reel label mentions "Lead Free Process"

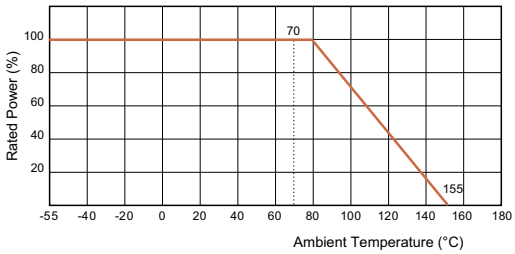


Features

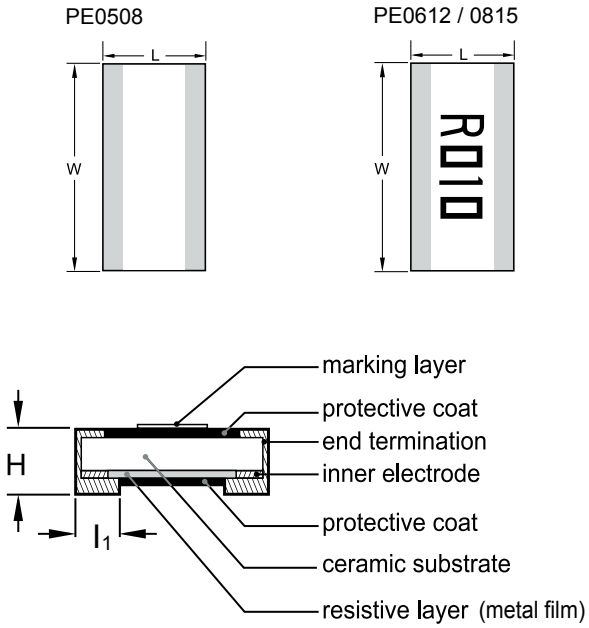
- Excellent T. C. R. compared to thick film low ohmic
- Precision current sensing control
- Excellent performance for current sensing applications
- Low ohmic and high power

Derating curve

Maximum dissipation (P) in percentage of rated power as a function of the operating ambient temperature (T_{amb}).



Construction



Dimensions

unit: mm

Type	Resistance range	L	W	H	l_1
PE0508	5mΩ ≤ R ≤ 1Ω	1.25 ± 0.10	2.00 ± 0.10	0.55 ± 0.15	0.35 ± 0.15
PE0612	0.5mΩ / 1mΩ	1.60 ± 0.20	3.20 ± 0.20	0.60 ± 0.15	0.55 ± 0.20
	2mΩ ≤ R ≤ 4mΩ	1.60 ± 0.20	3.20 ± 0.20	0.60 ± 0.15	0.40 ± 0.20
	5mΩ ≤ R ≤ 100mΩ	1.60 ± 0.20	3.20 ± 0.20	0.60 ± 0.15	0.30 ± 0.15
PE0815	1mΩ ≤ R ≤ 2mΩ	2.00 ± 0.20	3.70 ± 0.20	0.60 ± 0.15	0.50 ± 0.20
	3mΩ ≤ R ≤ 100mΩ	2.00 ± 0.20	3.70 ± 0.20	0.60 ± 0.15	0.60 ± 0.20

PE - Current sensors - low T. C. R. chip resistors, wide termination, 0508 to 0815

Electrical characteristics

Type	Technology	Size	Power P_{70}	Operating Temp. range	Max. working voltage	Tolerance	Resistance range & T. C. R.
PE	Metal Film	0508	1W	-55°C to +155°C	(PxR)^1/2	±1% ±5%	5mΩ ≤ R < 75mΩ ±100 ppm/°C 75mΩ ≤ R ≤ 1Ω ±50 ppm/°C
		0612	1W				1mΩ ±150 ppm/°C 2mΩ ±100 ppm/°C 3mΩ ≤ R ≤ 1Ω ±50 ppm/°C
		0815	1/2W				1mΩ ≤ R ≤ 100mΩ ±75 ppm/°C ±100 ppm/°C
			1W				

Note: Please contact with sales offices, distributors and representatives in your region before ordering

Environmental characteristics

Performance test		Test method	Procedure	Requirements
Life		MIL-STD-202 Method 108A	1000 hours at 70 ±2°C applied RCWV 1.5 hours on, 0.5 hours off, still air required	± (1% +0.5mΩ)
High temperature exposure		MIL-STD-202 Method 108A	1000 hours at maximum operating temperature depending on specification, unpowered	± (1% +0.5mΩ)
Moisture resistance		MIL-STD-202 Method 106G	Each temperature / humidity cycle is defined as 8 hours (method 106G), 3 cycles / 24 hours for 10d with 25°C / 65°C 95% R.H	± (0.5% +0.5mΩ)
Solderability	Wetting	J-STD-002B test B	Electrical test not required. Magnification 50X Lead-free solder bath at 245 ±3°C Dipping time: 3 ±0.5 seconds	Well tinned (≥ 95% covered)
	Resistance to soldering heat	MIL-STD-202 method 210F	Lead-free solder, 260°C, 10 seconds immersion time	± (0.5% +0.5mΩ) No visible damage
Short time overload		IEC 60115-1 4.13	5 times of rated power for 5 seconds at room temperature	± (0.5% +0.5mΩ) No visible damage

Global part number - Preferred type

Ordering example: PE0612FKF070R01L

PE 0612 F K F 07 0R01 L

Series name (code 1-2)
PE = current sensors - low T. C. R., wide termination

Size code (code 3-6)
(inch / metric)
0508 = 1.35 x 2.1
0612 = 1.6 x 3.2
0815 = 2.0 x 3.7

Tolerance (code 7)
F = ±1%
J = ±5%

Packing style (code 8)
K = Embossed plastic tape reel
R = Paper tape reel

Default code[1] (code 17)

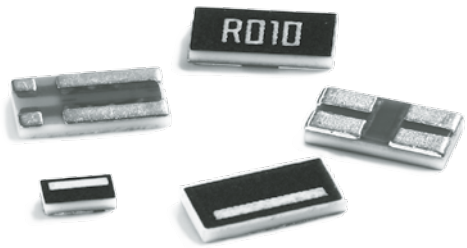
Resistance (code 12-16)
0R01 = 0.01Ω
0R02 = 0.02Ω

Taping reel (code 10-11)
07 = 7 inch Dia. reel
7W = 7 inch Dia. reel
2 x standard power type

T. C. R. (code 9)
E = ±50 ppm/°C
M = ±75 ppm/°C
F = ±100 ppm/°C
L = ±150 ppm/°C

Note: 1. All of our RSMD products are RoHS compliant. "LFP" of the internal 2D reel label mentions "Lead Free Process"

PS - Current sensors - low T.C.R. chip resistors, 4 termination, 0306 / 0612 / 1206

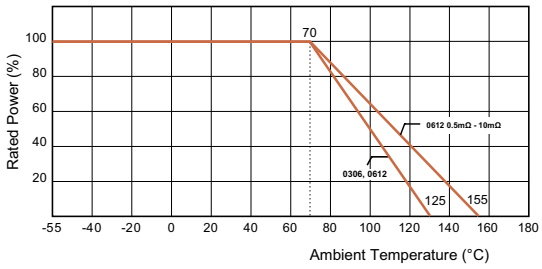


Features

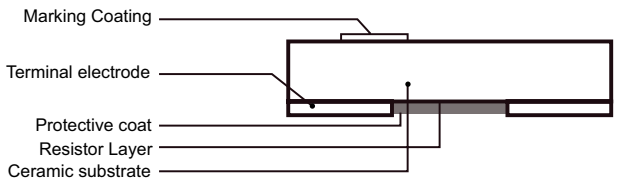
- Excellent T. C. R. compared to thick film low ohmic
- Precision current sensing control
- Excellent performance for current sensing applications
- Ultra-low resistance and narrow tolerance are suitable for current detection

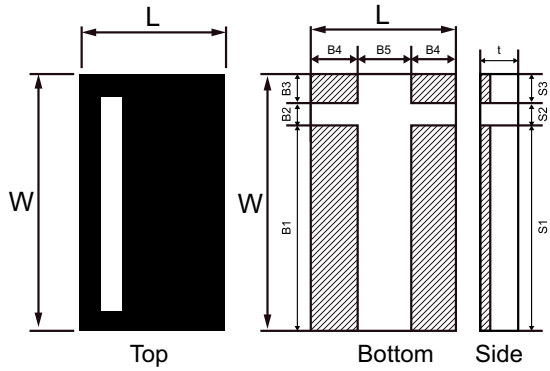
Derating curve (PS 0306 / 0612)

Maximum dissipation (P) in percentage of rated power as a function of the operating ambient temperature (T_{amb}).



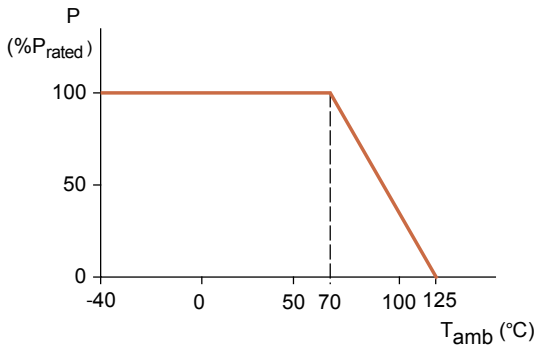
Construction (PS 0306 / 0612)



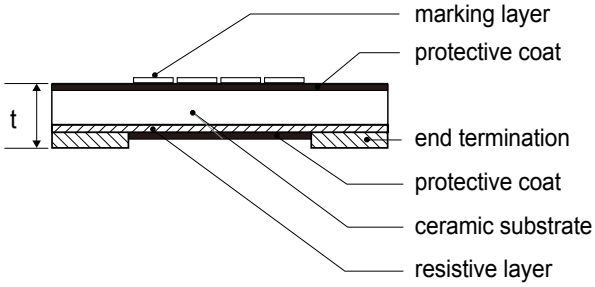


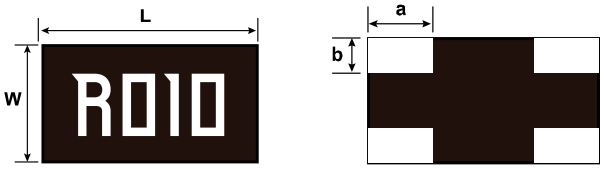
Derating curve (PS 1206)

PS1206 Derating curve (-40 ~ 125°C)



Construction (PS 1206)





PS - Current sensors - low T.C.R. chip resistors, 4 termination, 0306 / 0612 / 1206

Dimensions

unit: mm

Type	Resistance range	L	W	B1/S1	B2/S2	B3/S3	B4	B5	t
PS0306	5mΩ ≤ R ≤100mΩ	0.80 ±0.15	1.60 ±0.20	1.10 ±0.20	0.25 ±0.10	0.25 ±0.10	0.20 ±0.10	0.40 ±0.20	0.50 ±0.20
PS0612	0.5mΩ ≤ R ≤ 1mΩ	1.60+0.15 /-0.20	3.20 ±0.20	2.20 ±0.20	0.50 ±0.20	0.50 ±0.20	0.45 ±0.20	0.70 ±0.20	0.70 ±0.20
	2mΩ ≤ R ≤ 10mΩ								0.60 ±0.20
	12mΩ ≤ R ≤ 100mΩ								0.50 ±0.20

Type	Resistance range	L	W	a	b	t
PS1206	10mΩ ≤ R ≤ 100mΩ	3.20±0.20	1.60±0.20	1.00±0.20	0.55±0.20	1.60±0.20

Electrical characteristics

Type	Technology	Size	Power P_{70}	Operating Temp. range	Max. working voltage	Tolerance	Resistance range & T. C. R.
PS	Metal Foil 4 termination	0306	1/4W	-55°C to 125°C	(PxR)^1/2	±1%, ±5%	5mΩ ≤ R ≤ 100mΩ ±75 ppm/°C ±100 ppm/°C
			1/3W				
			1/2W				3mΩ ≤ R < 5mΩ ±150 ppm/°C
		0612	1W	0.5mΩ ~ 10mΩ –55°C to +150°C 12mΩ ~ 100mΩ –55°C to +125°C			0.5mΩ ≤ R ≤ 1mΩ ±150 ppm/°C 2mΩ ≤ R ≤ 9mΩ ±100 ppm/°C 14mΩ ≤ R ≤ 100mΩ ±100 ppm/°C 10mΩ ≤ R ≤ 13mΩ ±200 ppm/°C
		1206	1/2W	-40°C to 125°C		±0.5%, ±1%, ±5%	10mΩ ≤ R ≤ 100mΩ ±50 ppm/°C ±75 ppm/°C ±100 ppm/°C

Note: Please contact with sales offices, distributors and representatives in your region before ordering

Environmental characteristics

Performance test		Test method	Procedure	Requirements
Life		MIL-STD-202 Method 108A	1000 hours at 70 ±2°C applied RCWV 1.5 hours on, 0.5 hours off, still air required	± (1% +0.5mΩ)
High temperature exposure		MIL-STD-202 Method 108A	1000 hours at maximum operating temperature depending on specification, unpowered	± (1% +0.5mΩ)
Moisture resistance		MIL-STD-202 Method 106G	Each temperature / humidity cycle is defined as 8 hours (method 106G), 3 cycles / 24 hours for 10d with 25°C / 65°C 95% R.H	± (0.5% +0.5mΩ)
Solderability	Wetting	J-STD-002B test B	Electrical test not required. Magnification 50X Lead-free solder bath at 245 ±3°C Dipping time: 3 ±0.5 seconds	Well tinned (≥ 95% covered)
	Resistance to soldering heat	MIL-STD-202 method 210F	Lead-free solder, 260°C, 10 seconds immersion time	± (0.5% +0.5mΩ) No visible damage
Short time overload		IEC 60115-1 4.13	5 times of rated power for 5 seconds at room temperature	PS0306: ± (0.5% +0.5mΩ) PS0612: ± (0.5% +0.5mΩ) PS1206: ± (1% +0.5mΩ) No visible damage

PS - Current sensors - low T.C.R. chip resistors, 4 termination, 0306 / 0612 / 1206

Global part number - Preferred type

Ordering example: PS0612FKF070R01L

PS 0612 F K F 07 0R01 L

Series name (code 1-2)

PS = current sensors - low T.C.R., 4 termination

Size code (code 3-6)
(inch / metric)
0306 = 0.8 x 1.6
0612 = 1.6 x 3.2
1206 = 3.2 x 1.6

Tolerance (code 7)
F = ±1%
J = ±5%

Packing style (code 8)
R = Paper tape reel
K = Embossed plastic tape reel

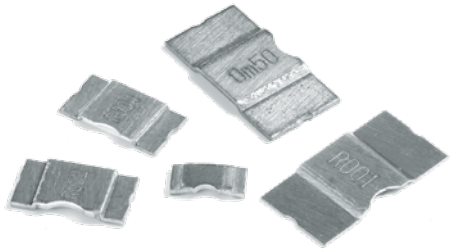
Default code(1/2) (code 17)

Resistance (code 12-16)
0U5 = 0.0005Ω
0R01 = 0.01Ω
0R02 = 0.02Ω

Taping reel (code 10-11)
07 = 7 inch Dia. reel
7W = 7 inch Dia. reel
2 x standard power type
7T = 7 inch Dia. reel
3 x standard power type

T. C. R. (code 9)
M = ±75 ppm/°C
F = ±100 ppm/°C
L = ±150 ppm/°C
G = ±200 ppm/°C

Note: 1. All of our RSMD products are RoHS compliant. "LFP" of the internal 2D reel label mentions "Lead Free Process"
2. PS series 4 termination type products are available by "Global part number" only



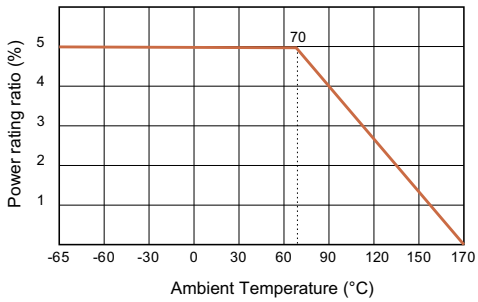
Features

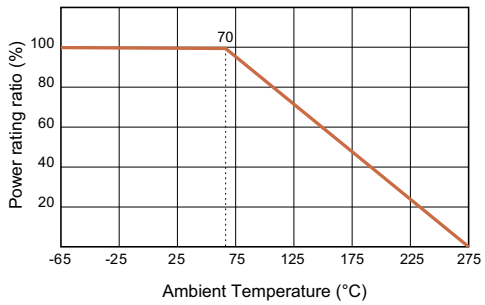
- Resistance value down to 0.0001Ω and high power to 15(W)
- 85°C/85% for high temperature & high humidity
- Welded metal plate construction

Derating curve

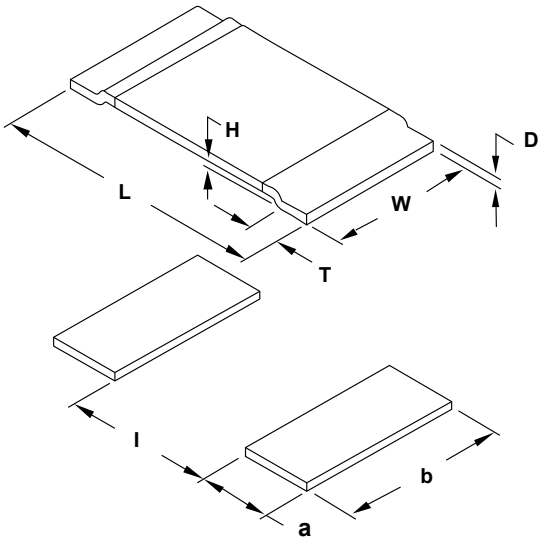
Maximum dissipation (P) in percentage of rated power as a function of the operating ambient temperature (T_{amb}).

Normal Temperature Range: −65°C to +170°C
High Temperature Range: −65°C to +275°C





Construction



Dimensions

unit: mm

Type	L	W	H	T	a	b	l
PU2512	6.35 ± 0.25	3.18 ± 0.25	0.35 ± 0.15	1.14 ± 0.25	1.80	3.40	3.40
PU3921	10.00 ± 0.25	5.20 ± 0.25	0.50 ± 0.13	2.00 ± 0.25	2.75 ± 0.25	6.20 ± 0.25	5.60 ± 0.13
PU5931	15.00 ± 0.25	7.75 ± 0.25	0.50 ± 0.13	5.20 ± 0.25	5.20 ± 0.25	8.75 ± 0.25	5.60 ± 0.13

PU - Shunt chip resistors, 2512 / 3921 / 5931

Electrical characteristics

Type	Size	Power P_{70}	Max voltage	Operating Temp. range	Resistance range	Tolerance	TCR
PU	2512	4W	(PxR)^1/2	-55°C to 170°C	3mΩ/ 4mΩ/ 5mΩ 1mΩ/ 2mΩ 0.3mΩ/ 0.5mΩ	±1% ±5%	0.3mΩ/ 0.5mΩ ±200 ppm/°C 1mΩ ±175 ppm/°C 2mΩ~5mΩ ±75 ppm/°C
		5W					
		6W					
	3921	3W		-65°C to 170°C	0.2mΩ/ 0.25mΩ/ 0.3mΩ/ 0.4mΩ/ 0.5mΩ/ 0.7mΩ 1mΩ/ 2mΩ/ 3mΩ/ 4mΩ/ 5mΩ	±1% ±5%	0.2mΩ/ 0.25mΩ/ 0.3mΩ/ 0.4mΩ/ 0.5mΩ/ 0.7mΩ ±175 ppm/°C 1mΩ~5mΩ ±75 ppm/°C
		5W			0.2mΩ/ 0.25mΩ/ 0.3mΩ/ 0.4mΩ/ 0.5mΩ/ 0.7mΩ 1mΩ/ 2mΩ/ 3mΩ/ 4mΩ/ 5mΩ		0.2mΩ ±325 ppm/°C 0.2mΩ/ 0.25mΩ/ 0.3mΩ/ 0.4mΩ/ 0.5mΩ/ 0.7mΩ ±175 ppm/°C 1mΩ~4mΩ ±75 ppm/°C
		9W			0.2mΩ/ 0.3mΩ/ 0.4mΩ/ 0.5mΩ/ 0.7mΩ/ 1mΩ		
		3W		-65°C to 275°C	0.5mΩ/1mΩ/ 2mΩ/ 3mΩ/ 4mΩ		0.5mΩ ±175 ppm/°C 1mΩ~4mΩ ±75 ppm/°C
	5931	5W		-65°C to 170°C	0.2mΩ/ 0.3mΩ/ 0.5mΩ/ 1mΩ/ 2mΩ/ 3mΩ/ 4mΩ	±1% ±5%	0.2mΩ ±225 ppm/°C 0.3mΩ/ 0.5mΩ ±175 ppm/°C 1mΩ~4mΩ ±75 ppm/°C
		7W			0.2mΩ/ 0.3mΩ/ 0.5mΩ/ 1mΩ/ 2mΩ/ 3mΩ/ 4mΩ		0.1mΩ ±300 ppm/°C 0.2mΩ ±225 ppm/°C 0.3mΩ/ 0.5mΩ ±175 ppm/°C 1mΩ~4mΩ ±75 ppm/°C
		10W			0.2mΩ/ 0.3mΩ/ 0.5mΩ		
		15W			0.1mΩ		
		5W		-65°C to 275°C	0.3mΩ/0.5mΩ/ 1mΩ/ 2mΩ/ 3mΩ/ 4mΩ		0.3mΩ/ 0.5mΩ ±175 ppm/°C 1mΩ~4mΩ ±75 ppm/°C

Note: Please contact with sales offices, distributors and representatives in your region before ordering

Environmental characteristics

Performance test		Test method	Procedure	Requirements
Life		AEC-Q200 Test 8 MIL-STD-202 method 108A IEC 60115-1 4.25.1	1000 hours at 70 ±2°C applied RCWV 1.5 hours on, 0.5 hours off, still air required	±(1% +0.5mΩ)
High temperature exposure		AEC-Q200 Test 3 MIL-STD-202 method 108A IEC 60115-1 4.25.3	1000 hours at maximum operating temperature depending on specification, unpowered	±(1% +0.5mΩ)
Moisture resistance		AEC-Q200 Test 6 MIL-STD-202 method 106F	Each temperature / humidity cycle is defined as 8 hours (method 106G), 3 cycles / 24 hours for 10d with 25°C / 65°C 95% R.H	±(1% +0.5mΩ)
Solderability	Resistance to soldering heat	AEC-Q200 Test 15 MIL-STD-202 method 210F IEC 60115-1 4.18	Lead-free solder, 260°C, 10 seconds immersion time	±(0.5% +0.5mΩ) No visible damage
Short time overload		IEC 60115-1 4.13	5 times of rated power for 5 seconds at room temperature	±(1% +0.5mΩ) No visible damage

Global part number - Preferred type

Ordering example: PU3921FKO130U2L

PU 3921 F K O 13 0U2 L

Series name (code 1-2)
PU = Metal shunt resistor

Size code (code 3-6)
(inch / metric)
2512 = 6.25 x 3.18
3921 = 10.0 x 5.20
5931 = 15.0 x 7.75

Tolerance (code 7)
F = ±1%
J = ±5%

Packing style (code 8)
K = Embossed plastic tape reel

Default code(1/2) (code 17)

Resistance (code 12-16)
0R005 = 0.005Ω
0U2 = 0.0002Ω

Taping reel (code 10-11)
13 = Standard power, 13 inch Dia. reel,
4W for 2512, 3W for 3921 and 5W for 5931
P5 = 5W, 13 inch Dia. reel, for 2512
13 inch Dia. reel, for 3921
P6 = 6W, 13 inch Dia. reel 2512 only
P7 = 7W, 13 inch Dia. reel
P9 = 9W, 13 inch Dia. reel
T3 = 3W, High temperature 13 inch Dia. reel
T5 = 5W, High temperature 13 inch Dia. reel
PA = 10W, 13 inch Dia. reel
PB = 15W, 13 inch Dia. reel

T. C. R. (code 9)
M = ±75 ppm/°C
N = ±175 ppm/°C
G = ±200 ppm/°C
H = ±225 ppm/°C
I = ±300 ppm/°C
O = ±325 ppm/°C

Note: 1. All of our RSMD products are RoHS compliant. "LFP" of the internal 2D reel label mentions "Lead Free Process"
2. PU series 4 termination type products are available by "Global part number" only

PU - Shunt chip resistors, 6820

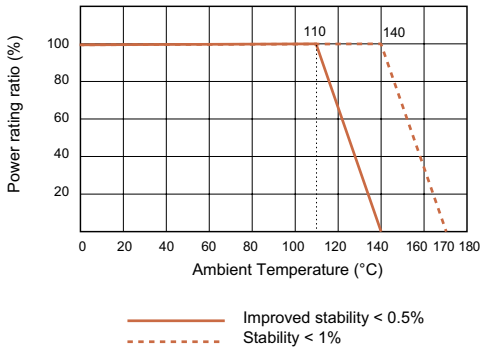
Features

- Resistance value down to 0.0001Ω and high power to 36(W)
- 85°C/ 85% for high temperature & high humidity
- Welded metal plate construction

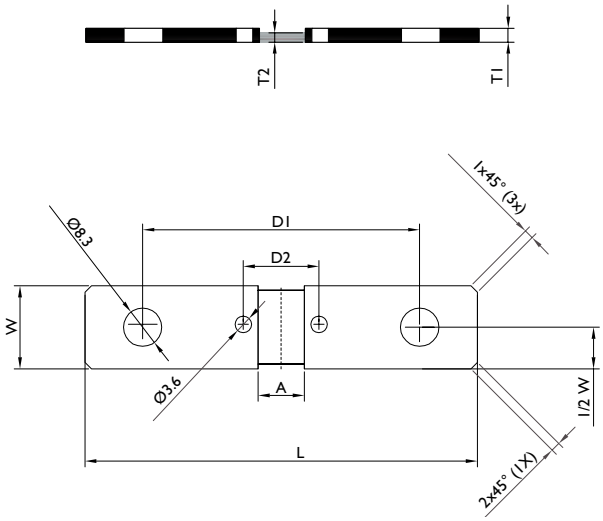
Derating curve

Maximum dissipation (P) in percentage of rated power as a function of the operating ambient temperature (T_{amb}).

Temperature Range: −65°C to +170°C



Construction



Dimensions

unit: mm

	L	W	D1	T1	T2	A	D2
PU6820	68.0 ± 0.2	20.0 ± 0.1	51.0 ± 0.2	3.0 ± 0.1	2.1 ± 0.3	10.0 ± 0.5	18.2 ± 0.13

PU - Shunt chip resistors, 6820

Electrical characteristics

Type	Size	Power P_{70}	Max voltage	Operating Temp. range	Resistance range	Tolerance	TCR
PU	6820	36W	(PxR)^1/2	-65°C to 170°C	0.1mΩ	±5%	±100 ppm/°C

Note: Please contact with sales offices, distributors and representatives in your region before ordering

Environmental characteristics

Performance test	Test method	Procedure	Requirements
Life	AEC-Q200 Test 8 MIL-STD-202 method 108A IEC 60115-1 4.25.1	1000 hours at 70 ±2°C applied RCWV 1.5 hours on, 0.5 hours off, still air required	±(1%+0.005mΩ)
High temperature exposure	AEC-Q200 Test 3 MIL-STD-202 method 108A IEC 60115-1 4.25.3	1000 hours at maximum operating temperature depending on specification, unpowered	±(1%+0.005mΩ)
Moisture resistance	AEC-Q200 Test 6 MIL-STD-202 method 106F	Each temperature / humidity cycle is defined as 8 hours (method 106G), 3 cycles / 24 hours for 10d with 25°C / 65°C 95% R.H	±(0.5%+0.005mΩ)
Short time overload	IEC 60115-1 4.13	5 times of rated power for 5 seconds at room temperature	±(0.5%+0.005mΩ) No visible damage

Global part number - Preferred type

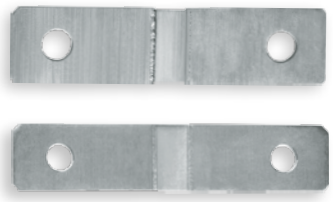
Ordering example: PU6820JKF070U1L

PU 6820 J K F 07 0U1 L

- Series name (code 1-2)
  PU = Metal shunt resistor
- Size code (code 3-6)
  6820 = 68.0 x 20.0
- Tolerance (code 7)
  J = ±5%
- Packing style (code 8)
  K = Vacuum Packing
- T. C. R. (code 9)
  F = ±100 ppm/°C
- Taping reel (code 10-11)
  07 = Standard power, 36W
- Resistance (code 12-16)
  0U1 = 0.0001Ω
- Default code (code 17)

Note: 1. All of our RSMD products are RoHS compliant. "LFP" of the internal 2D reel label mentions "Lead Free Process"
2. PU series type products are available by "Global part number" only

PU - Shunt chip resistors, 8420 / 8518



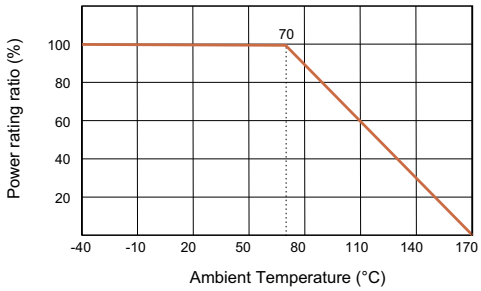
Features

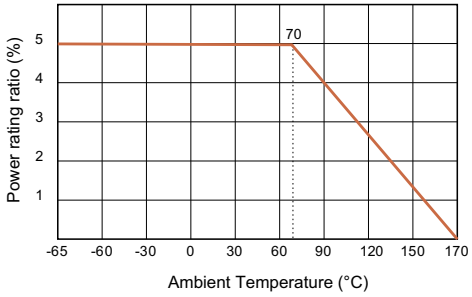
- Resistance value down to 0.00005Ω and high power to 36(W)
- 85°C/ 85% for high temperature & high humidity
- Welded metal plate construction

Derating curve

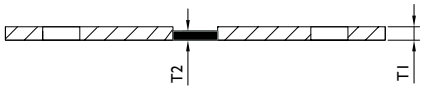
Maximum dissipation (P) in percentage of rated power as a function of the operating ambient temperature (T_{amb}).

8420 Temperature Range: −40°C to +170°C
8518 Temperature Range: −65°C to +170°C

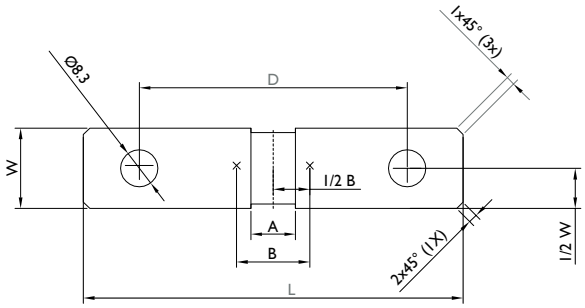




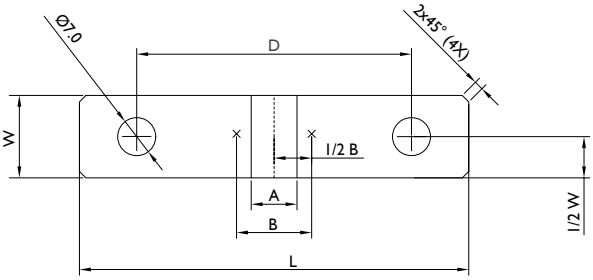
Construction



8420



8518



Dimensions

unit: mm

	Resistance Value	L	W	D	T1	T2	A	B
PU8420	0.05mΩ	84.0 ± 0.15	20.0 ± 0.10	60.0 ± 0.20	3.0 ± 0.15	2.3 ± 0.20	5.0 ± 0.50	8.2 ± 0.10
	0.1mΩ	84.0 ± 0.15	20.0 ± 0.10	60.0 ± 0.20	3.0 ± 0.15	2.3 ± 0.20	10.1 ± 0.50	13.2 ± 0.10
PU8518	0.05mΩ	85.0 ± 0.40	18.0 ± 0.20	60.0 ± 0.10	3.0 ± 0.10	2.0 ± 0.10	3.68 ± 0.10	8.71 ± 0.13
	0.1mΩ	85.0 ± 0.40	18.0 ± 0.20	60.0 ± 0.10	3.0 ± 0.10	2.0 ± 0.10	9.40 ± 0.10	12.57 ± 0.13
	0.125mΩ	85.0 ± 0.40	18.0 ± 0.20	60.0 ± 0.10	3.0 ± 0.10	2.0 ± 0.10	12.19 ± 0.10	15.37 ± 0.13
	0.25mΩ	85.0 ± 0.40	18.0 ± 0.20	60.0 ± 0.10	3.0 ± 0.10	2.0 ± 0.10	22.86 ± 0.10	26.04 ± 0.13

Electrical characteristics

Type	Size	Power P_{70}	Max voltage	Operating Temp. range	Resistance range	Tolerance	TCR
PU	8518	36W	(PxR)^1/2	-65°C to 170°C	0.05mΩ/ 0.1mΩ/ 0.125mΩ/ 0.25mΩ	±5% ±10%	0.05mΩ ±200ppm/°C 0.1/ 0.125mΩ ±175ppm/°C 0.25mΩ ±100ppm/°C
	8420	36W		-40°C to 170°C	0.05mΩ/ 0.1mΩ	±5%	±50ppm/°C

Note: Please contact with sales offices, distributors and representatives in your region before ordering

Environmental characteristics

Performance test	Test method	Procedure	Requirements
Life	AEC-Q200 Test 8 MIL-STD-202 method 108A IEC 60115-1 4.25.1	1000 hours at 70 ±2°C applied RCWV 1.5 hours on, 0.5 hours off, still air required	±(1%+0.005mΩ)
High temperature exposure	AEC-Q200 Test 3 MIL-STD-202 method 108A IEC 60115-1 4.25.3	1000 hours at maximum operating temperature depending on specification, unpowered	±(1%+0.005mΩ)
Moisture resistance	AEC-Q200 Test 6 MIL-STD-202 method 106F	Each temperature / humidity cycle is defined as 8 hours (method 106G), 3 cycles / 24 hours for 10d with 25°C / 65°C 95% R.H	±(0.5%+0.005mΩ)
Short time overload	IEC 60115-1 4.13	5 times of rated power for 5 seconds at room temperature	±(0.5%+0.005mΩ) No visible damage

Global part number - Preferred type

Ordering example: PU8420JKE070U1L

P U 8 4 2 0 J K E 0 7 0 U 1 L

Series name (code 1-2)
PU = Metal shunt resistor

Size code (code 3-6)
(inch / metric)
8420 = 84.0 x 20.0
8518 = 85.0 x 18.0

Tolerance (code 7)
J = ±5%
K = ±10%

Packing style (code 8)
K = Vacuum Packing

T. C. R. (code 9)
E = ±50 ppm/°C
F = ±100 ppm/°C
N = ±175 ppm/°C
G = ±200 ppm/°C

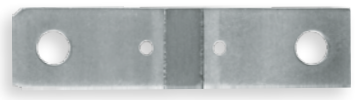
Taping reel (code 10-11)
07 = Standard power, 36W

Resistance (code 12-16)
0U05 = 0.00005Ω
0U1 = 0.0001Ω

Default code(1/2) (code 17)

Note: 1. All of our RSMD products are RoHS compliant. "LFP" of the internal 2D reel label mentions "Lead Free Process"
2. PU series type products are available by "Global part number" only

PU - Shunt chip resistors, 8420_E



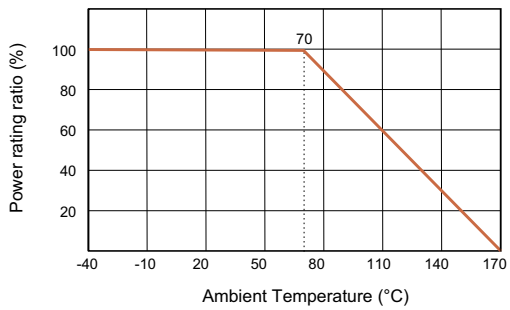
Features

- Resistance value down to 0.0001Ω and high power to 15(W)
- 85°C/ 85% for high temperature & high humidity
- Welded metal plate construction

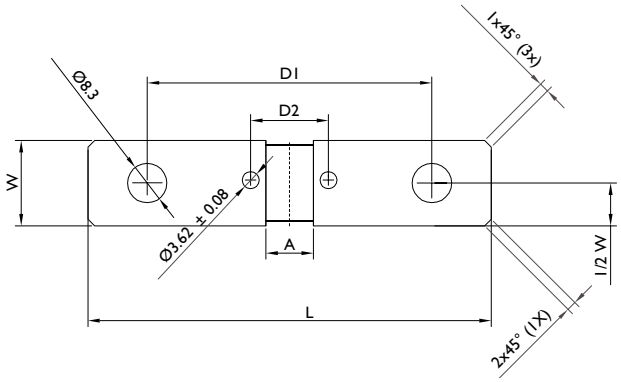
Derating curve

Maximum dissipation (P) in percentage of rated power as a function of the operating ambient temperature (T_{amb}).

Temperature Range: −40°C to +170°C



Construction



Dimensions

unit: mm

	Hole Distance	L	W	D1	T1	T2	A	D2
PU8420_E	60mm	84.0 ± 0.15	20.0 ± 0.10	60.0 ± 0.20	3.0 ± 0.15	2.3 ± 0.20	10.1 ± 0.50	18.2 ± 0.10
	64mm	84.0 ± 0.15	20.0 ± 0.10	64.0 ± 0.20	3.0 ± 0.15	2.3 ± 0.20	10.1 ± 0.50	18.2 ± 0.10

Electrical characteristics

Type	Size	Power P_{70}	Max voltage	Operating Temp. range	Resistance range	Tolerance	TCR
PU	8420_E	15W	(PxR)^1/2	-40°C to 170°C	0.1mΩ	±5%	±50 ppm/°C

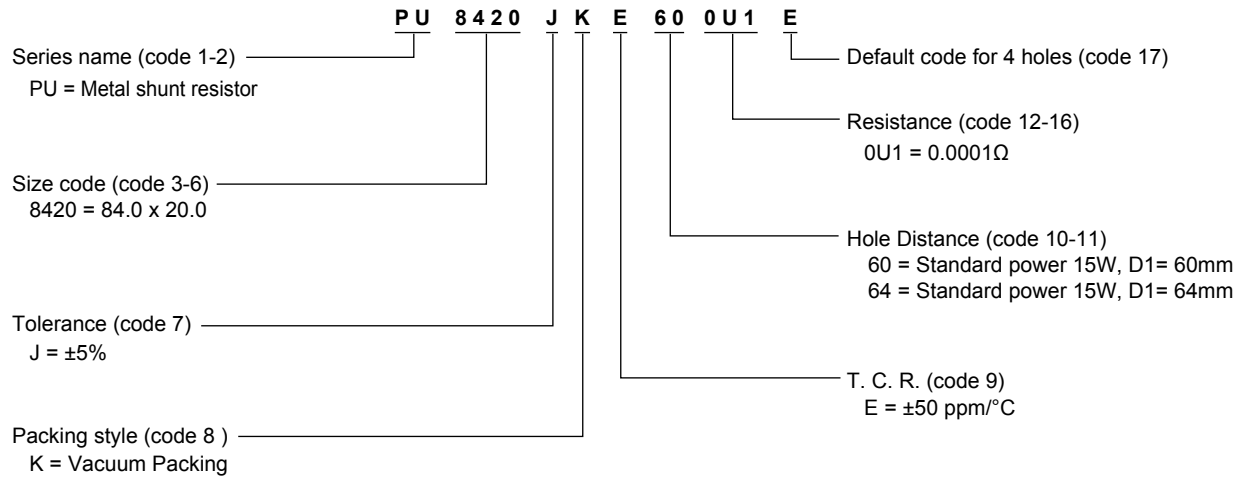
Note: Please contact with sales offices, distributors and representatives in your region before ordering

Environmental characteristics

Performance test	Test method	Procedure	Requirements
Life	AEC-Q200 Test 8 MIL-STD-202 method 108A IEC 60115-1 4.25.1	1000 hours at 70 ±2°C applied RCWV 1.5 hours on, 0.5 hours off, still air required	±(1%+0.005mΩ)
High temperature exposure	AEC-Q200 Test 3 MIL-STD-202 method 108A IEC 60115-1 4.25.3	1000 hours at maximum operating temperature depending on specification, unpowered	±(1%+0.005mΩ)
Moisture resistance	AEC-Q200 Test 6 MIL-STD-202 method 106F	Each temperature / humidity cycle is defined as 8 hours (method 106G), 3 cycles / 24 hours for 10d with 25°C / 65°C 95% R.H	±(0.5%+0.005mΩ)
Short time overload	IEC 60115-1 4.13	5 times of rated power for 5 seconds at room temperature	±(0.5%+0.005mΩ) No visible damage

Global part number - Preferred type

Ordering example: PU8420JKE600U1E



Note: 1. All of our RSMD products are RoHS compliant. "LFP" of the internal 2D reel label mentions "Lead Free Process"
2. PU series type products are available by "Global part number" only

PU - Shunt chip resistors, 8420_N

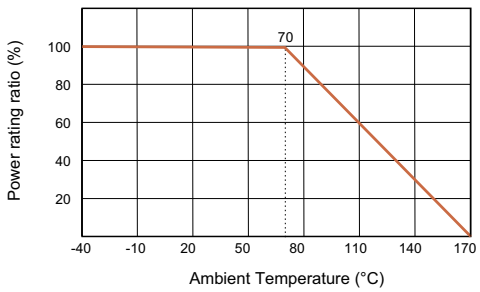
Features

- Resistance value down to 0.000035Ω and high power to 15(W)
- 85°C/ 85% for high temperature & high humidity
- Welded metal plate construction

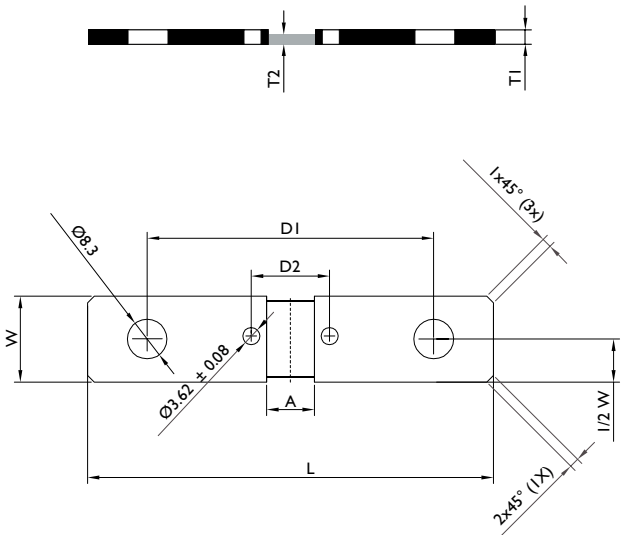
Derating curve

Maximum dissipation (P) in percentage of rated power as a function of the operating ambient temperature (T_{amb}).

Temperature Range: −40°C to +170°C



Construction



Dimensions

unit: mm

	Hole Distance	L	W	D1	T1	T2	A	D2
PU8420_N	64mm	84.0 ± 0.15	20.0 ± 0.10	64.0 ± 0.20	3.0 ± 0.15	2.3 ± 0.20	5.3 ± 0.30	18.2 ± 0.10

Electrical characteristics

Type	Size	Power P_{70}	Max voltage	Operating Temp. range	Resistance range	Tolerance	TCR
PU	8420_N	15W	(PxR)^1/2	-40°C to 170°C	0.035mΩ	±5%	±250 ppm/°C

Note: Please contact with sales offices, distributors and representatives in your region before ordering

Environmental characteristics

Performance test	Test method	Procedure	Requirements
Life	AEC-Q200 Test 8 MIL-STD-202 method 108A IEC 60115-1 4.25.1	1000 hours at 70 ±2°C applied RCWV 1.5 hours on, 0.5 hours off, still air required	±(1%+0.005mΩ)
High temperature exposure	AEC-Q200 Test 3 MIL-STD-202 method 108A IEC 60115-1 4.25.3	1000 hours at maximum operating temperature depending on specification, unpowered	±(1%+0.005mΩ)
Moisture resistance	AEC-Q200 Test 6 MIL-STD-202 method 106F	Each temperature / humidity cycle is defined as 8 hours (method 106G), 3 cycles / 24 hours for 10d with 25°C / 65°C 95% R.H	±(0.5%+0.005mΩ)
Short time overload	IEC 60115-1 4.13	5 times of rated power for 5 seconds at room temperature	±(0.5%+0.005mΩ) No visible damage

Global part number - Preferred type

Ordering example: PU8420JKP640U035N

PU 8420 J K P 64 0U035 N

Series name (code 1-2)
PU = Metal shunt resistor

Size code (code 3-6)
8420 = 84.0 x 20.0

Tolerance (code 7)
J = ±5%

Packing style (code 8)
K = Vacuum Packing

Letter N is 4 holes and Ni/Sn, plating on the Top and bottom (code 17)

Resistance (code 12-16)
0U035 = 0.000035Ω

Hole Distance (code 10-11)
64 = Standard power 15W, D1= 64mm

T. C. R. (code 9)
P = ±250 ppm/°C (20°C ~ 60°C)

Note: 1. All of our RSMD products are RoHS compliant. "LFP" of the internal 2D reel label mentions "Lead Free Process"
2. PU series type products are available by "Global part number" only

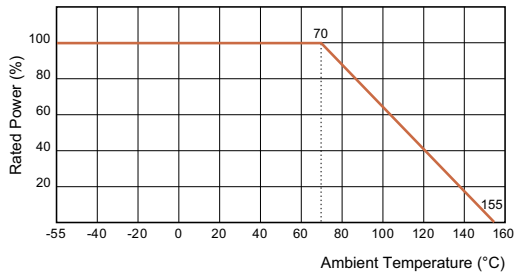
AR - NiAu termination chip resistors, 0402 to 1206

Features

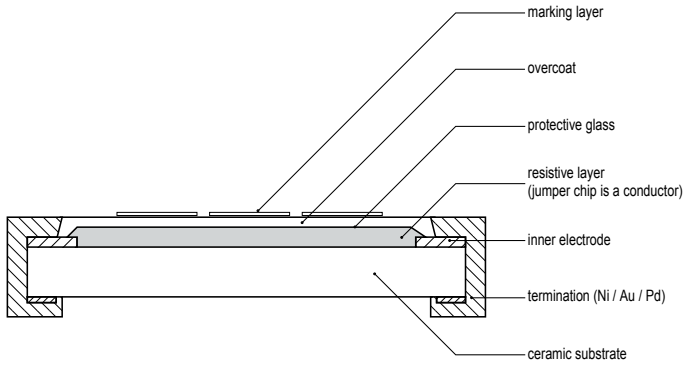
- New NiAu terminations provide special application for hybrid board gluing
- Competitive with NiAu terminations
- Special use in high temperature environment
- Higher component and equipment reliability

Derating curve

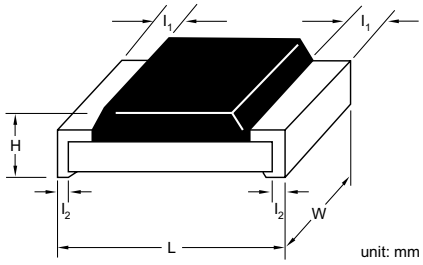
Maximum dissipation (P) in percentage of rated power as a function of the operating ambient temperature (T_{amb}).



Construction



Dimensions



Type	L	W	H	l_1	l_2
AR0402	1.00 ± 0.05	0.50 ± 0.05	0.35 ± 0.05	0.20 ± 0.10	0.25 ± 0.10
AR0603	1.60 ± 0.10	0.80 ± 0.10	0.45 ± 0.10	0.25 ± 0.15	0.25 ± 0.15
AR0805	2.00 ± 0.10	1.25 ± 0.10	0.50 ± 0.10	0.35 ± 0.20	0.35 ± 0.20
AR1206	3.10 ± 0.10	1.60 ± 0.10	0.55 ± 0.10	0.45 ± 0.20	0.40 ± 0.20

Electrical characteristics

Type	Power P_{70}	Operating Temp. range	MWV	RCOV	DWV	Resistance range & tolerance	T. C. R.	Jumper criteria (unit: A)
AR0402	1/16W	-55°C to +155°C	50V	100V	100V	E24 ±5% 1Ω ≤ R ≤ 10MΩ E24/E96 ±1% 1Ω ≤ R ≤ 10MΩ Jumper < 50mΩ	10Ω < R ≤ 10MΩ ±100 ppm/°C 1Ω ≤ R ≤ 10Ω ±200 ppm/°C	Rated current 1.0 Max. current 2.0
AR0603	1/10W		50V	100V	100V			Rated current 1.0 Max. current 2.0
AR0805	1/8W		150V	300V	300V			Rated current 2.0 Max. current 5.0
AR1206	1/4W		200V	500V	500V			Rated current 2.0 Max. current 10.0

Environmental characteristics				
Performance test		Test method	Procedure	Requirements
Life		MIL-STD-202 -method 108A	1000 hours at 70 ±2°C applied RCWV 1.5 hours on, 0.5 hours off, still air required	± (2% +50mΩ) < 100mΩ for jumper
High temperature exposure		MIL-STD-202 -method 108A	1000 hours at maximum operating temperature depending on specification, unpowered	± (1% +50mΩ) < 50mΩ for jumper
Moisture resistance		MIL-STD-202 -method 106F	Each temperature / humidity cycle is defined as 8 hours (method 106F), 3 cycles / 24 hours for 10d with 25°C / 65°C 95% R.H	± (2% +50mΩ) < 100mΩ for jumper
Thermal shock		MIL-STD-202 -method 107G	-55/ +125°C Note: Number of cycles required is 300. Devices mounted Maximum transfer time is 20 seconds. Dwell time is 15 minutes. Air – Air	± (0.5% +50mΩ) for 10K to 10M ± (1% +50mΩ) for others < 50mΩ for jumper
Solderability	Wetting	J-STD-002B test B	Electrical test not required. Magnification 50X Lead-free solder bath at 245 ±3°C Dipping time: 3 ±0.5 seconds	Well tinned (≥ 95% covered) No visible damage
	Resistance to soldering heat	MIL-STD-202 -method 107G	Lead-free solder, 260°C, 10 seconds immersion time	± (1% +50mΩ) < 50mΩ for jumper No visible damage
Short time overload		MIL-R-55342D -para 4.7.5	2.5 times RCWV or maximum overload voltage whichever is less for 5 seconds at room temperature	± (2% +50mΩ) < 50mΩ for jumper No visible damage

Global part number - Preferred type for ordering Yageo / Phycomp branded products

Ordering example: AR0603JR-07100KL

A R 0 6 0 3 J R — 0 7 1 0 0 K L

Series name (code 1-2)
AR = NiAu termination

Size code (code 3-6)
(inch / metric)
0402 = 1.0 x 0.5
0603 = 1.6 x 0.8
0805 = 2.0 x 1.25
1206 = 3.2 x 1.6

Tolerance (code 7)
F = ±1%
J = ±5% (for Jumper ordering)

Default code(1/2) (code 17)

Resistance (code 12-16)
0R = Jumper
10R = 10Ω
100R = 100Ω
100K = 100KΩ

Taping reel (code 10-11)
07 = 7 inch Dia. reel

T. C. R. (code 9)
"—" = Based on spec.
(— for thick film only)

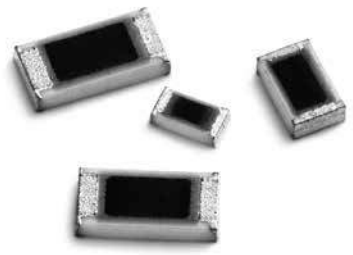
Packing style (code 8)
R = Paper tape reel

Note: 1. All of our RSMD products are RoHS compliant. "LFP" of the internal 2D reel label mentions "Lead Free Process"
2. Letter L is system default code for ordering only

Phycomp worldwide - Traditional type

Chip resistors with Ni/Au terminations								
Size: inch (mm)	0402 (1005)		0603 (1608)		0805 (2012)		1206 (3216)	
Power	1/16 W		1/10 W		1/8 W		1/4 W	
Tolerance	+5%	+1%	+5%	+1%	+5%	+1%	+5%	+1%
Resistance	E24	E24 / E96	E24	E24 / E96	E24	E24 / E96	E24	E24 / E96
Packing	paper tape		paper tape		paper tape		paper tape	
Quantity 5 000	---	---	2322 702 11…L	2322 704 1….L	2322 730 11…	2322 734 1….L	2322 711 11...L	2322 729 1….L
Quantity 10 000	2322 705 12…L	2322 706 2….	---	---	---	---	---	---
Jumper 5 000	---	---	2322 702 19001L	---	2322 730 19001L	---	2322 711 19001L	---
Jumper 10 000	2322 705 19001 L	---	---	---	---	---	---	---

For ordering rules: See page 14 for E24 / E96 values and the last 4 or 3 digits of the 12NC catalogue number

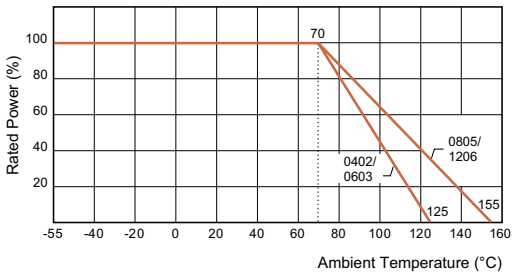


Features

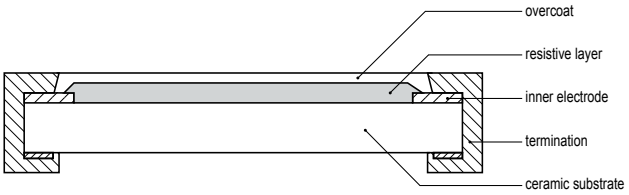
- Reduced size of final equipment
- Higher component and equipment reliability
- Low noise, when not trimmed
- Flexible for resistance trimming

Derating curve

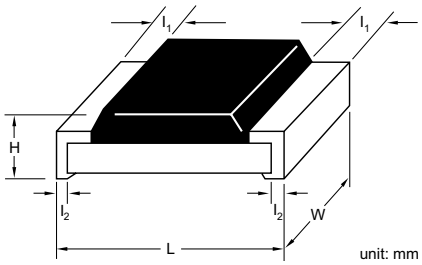
Maximum dissipation (P) in percentage of rated power as a function of the operating ambient temperature (T_{amb}).



Construction



Dimensions



Type	L	W	H	l_1	l_2
TR0402	1.00 ± 0.10	0.50 ± 0.05	0.35 ± 0.05	0.20 ± 0.10	0.25 ± 0.10
TR0603	1.60 ± 0.10	0.80 ± 0.10	0.45 ± 0.10	0.25 ± 0.15	0.25 ± 0.15
TR0805	2.00 ± 0.10	1.25 ± 0.10	0.50 ± 0.10	0.35 ± 0.20	0.35 ± 0.20
TR1206	3.10 ± 0.10	1.60 ± 0.10	0.55 ± 0.10	0.45 ± 0.20	0.40 ± 0.20

Electrical characteristics

Type	Power P_{70}	Operating Temp. range	MWV	RCOV	DWV	Resistance range & tolerance		T. C. R.
TR0402	1/16W	-55°C to +125°C	50V	100V	100V	E24 +0/-10%, +0/-20%, +0/-30%	1Ω ≤ R ≤ 10MΩ	1Ω ≤ R ≤ 10Ω ±200 ppm/°C 10Ω < R ≤ 1MΩ ±100 ppm/°C 1MΩ < R ≤ 10MΩ ±200 ppm/°C
TR0603	1/16W		50V	100V	100V			
TR0805	1/8W	-55°C to +155°C	150V	300V	500V			
TR1206	1/4W		200V	500V	500V			

Environmental characteristics				
Performance test		Test method	Procedure	Requirements
Life		MIL-STD-202 Method 108A	1000 hours at 70 ±2°C applied RCWV 1.5 hours on, 0.5 hours off, still air required	± (1% +50mΩ)
High temperature exposure		MIL-STD-202 Method 108A	1000 hours at maximum operating temperature depending on specification, unpowered	± (1% +50mΩ)
Moisture resistance		MIL-STD-202 Method 106G	Each temperature / humidity cycle is defined as 8 hours (method 106G), 3 cycles / 24 hours for 10d with 25°C / 65°C 95% R.H	± (2% +50mΩ)
Thermal shock		MIL-STD-202 Method 107G	-55 / +125°C Note: Number of cycles required is 300. Devices mounted Maximum transfer time is 20 seconds. Dwell time is 15 minutes. Air – Air	± (1% +50mΩ)
Solderability	Wetting	J-STD-002B test B	Electrical test not required. Magnification 50X Lead-free solder bath at 245 ±3°C Dipping time: 3 ±0.5 seconds	Well tinned (≥ 95% covered) No visible damage
	Resistance to soldering heat	MIL-STD-202 method 210F	Lead-free solder, 260°C, 10 seconds immersion time	± (1% +50mΩ) No visible damage
Short time overload		IEC 60115 -1 4.13	2.5 times RCWV or maximum overload voltage whichever is less for 5 seconds at room temperature	± (1% +50mΩ) No visible damage

Global part number - Preferred type for ordering Yageo / Phycomp branded products

Ordering example: TR0603MR-07100KL

T R 0 6 0 3 M R — 0 7 1 0 0 K L

Series name (code 1-2)
TR = Trimmable

Size code (code 3-6)
(inch / metric)
0402 = 1.0 x 0.5
0603 = 1.6 x 0.8
0805 = 2.0 x 1.25
1206 = 3.2 x 1.6

Tolerance (code 7)
K = 0/-10%
M = 0/-20%
N = 0/-30%

Default code(1/2) (code 17)

Resistance (code 12-16)
10R = 10Ω
100R = 100Ω
100K = 100KΩ

Taping reel (code 10-11)
07 = 7 inch Dia. reel

T. C. R. (code 9)
"—" = Based on spec.
(— for thick film only)

Packing style (code 8)
R = Paper tape reel

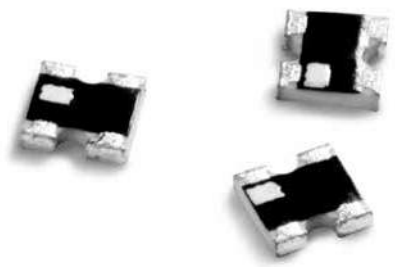
Note: 1. All of our RSMD products are RoHS compliant. "LFP" of the internal 2D reel label mentions "Lead Free Process"
2. Letter L is system default code for ordering only

Phycomp worldwide - Traditional type

Trimmable chip resistors				
Size: inch (mm)	0402 (1005)	0603 (1608)	0805 (2012)	1206 (3216)
Power	1/16 W	1/10 W	1/8 W	1/4 W
Tolerance	E24	E24	E24	E24
Resistance	paper tape	paper tape	paper tape	paper tape
Packing	2350 503 21…L	2350 502 11…L	2350 501 11…L	2350 500 11…L
Quantity 5 000 0/-20%	2350 503 20…L	2350 502 10…L	2350 511 10…L	2350 500 10…L
5 000 0/-30%	on request	on request	on request	2322 724 94…L
Europe 5 000	2322 792 61...L	2322 793 6....L	2322 791 6....L	---

For ordering rules: See page 14 for E24 / E96 values and the last 4 or 3 digits of the 12NC catalogue number

ATV - RF attenuator chip resistors, 0404

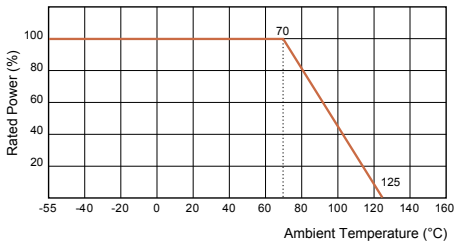


Features

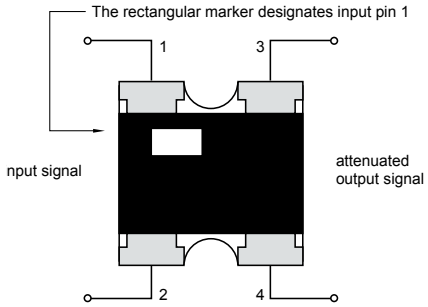
- Reduce system size
- Low assembly cost
- Higher component and system reliability
- Suitable for applications of mobile phones, receivers, battery chargers and tablets

Derating curve

Maximum dissipation (P) in percentage of rated power as a function of the operating ambient temperature (T_{amb}).

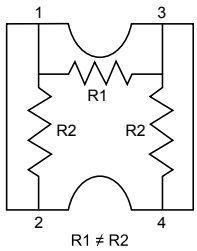


Construction

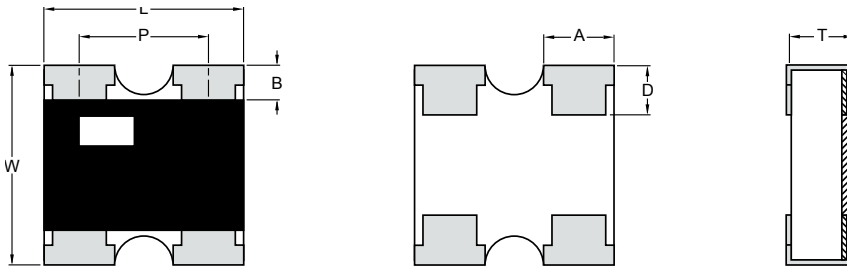


Schematics

ATV 321



Dimensions



unit: mm

Type	L	W	T	A	B	P	D
ATV321	1.00 ± 0.10	1.00 ± 0.10	0.35 ± 0.05	0.33 ± 0.10	0.15 ± 0.10	0.65 ± 0.10	0.25 ± 0.10

Electrical characteristics

Type	Power P_{70}	Operating Temp. range	MPV	VSWR (Max.)	Impedance	Attenuation range & tolerance	Frequency range
ATV321	40mW	-55°C to +125°C	50V	1.3	50Ω	-1dB to -5dB ±0.3 dB	-1dB to -10dB DC to 2.5 GHz
						-6dB to -10dB ±0.5 dB	
						-15dB ±1.0 dB	-15dB to -20dB DC to 2.0 GHz
						-20dB ±2.0 dB	

Environmental characteristics

Performance test		Test method	Procedure	Requirements
Life		MIL-STD-202 -method 108A	1000 hours at 70 ±5°C applied RCWV 1.5 hours on, 0.5 hours off, still air required	Max.: ±0.3 dB
Humidity (steady state)		JIS C 5202 7.5	1000 hours, 40 ±2°C, 93(+2/-3)% RH RCWV applied for 1.5 hours on and 0.5 hour off	Max.: ±0.3 dB
Moisture resistance		MIL-STD-202 -method 106F	Each temperature / humidity cycle is defined as 8 hours (method 106F), 3 cycles / 24 hours for 10d with 25°C / 65°C 95% R.H	Max.: ±0.3 dB
Thermal shock		MIL-STD-202 -method 107G	LCT / UCT, number of cycles required is 300 Maximum transfer time is 20 seconds	Max.: ±0.3 dB
Solderability	Wetting	J-STD-002B Test B	Electrical test not required. Magnification 50X Lead-free solder bath at 245 ±3°C Dipping time: 3 ±0.5 seconds	Well tinned (≥ 95% covered)
	Resistance to soldering heat	MIL-STD-202 -method 210F	Lead-free solder, 260°C, 10 seconds immersion time	Max.: ±0.1 dB
Short time overload		MIL-R-55342D -para 4.7.5	2.5 times RCWV or maximum overload voltage whichever is less for 5 seconds at room temperature	Max.: ±0.3 dB

Global part number - Preferred type for ordering Yageo / Phycomp branded products

Ordering example: ATV321CR-071DBL

ATV 321 C R — 07 1DB L

Series name (code 1-2)
ATV = RF attenuator thick film

Size code (code 3-6)
(inch / metric)
321 = 0404 = 1.0 x 1.0

Tolerance (code 7)
C = ±0.3dB
D = ±0.5dB
F = ±1dB
G = ± 2dB

Packing style (code 8)
R = Paper/PE tape reel

Default code(1/2) (code 16)

Attenuation (code 12-15)
0dB
-1dB
-2dB
-10dB
-15dB
-20dB

Taping reel (code 10-11)
07 = 7 inch Dia. reel

T. C. R. (code 9)
"—" = Based on spec.
(— for thick film only)

Note: 1. All of our RSMD products are RoHS compliant. "LFP" of the internal 2D reel label mentions "Lead Free Process"
2. Letter L is system default code for ordering only

Phycomp worldwide - Traditional type	
Packing	paper tape
Quantity 10 000	2350 703 11…L
Remark	For last three digits, see following table "Attenuation codes"

Note: L = Default code

Phycomp CTC ordering code - Traditional type - North America	
Packing	paper tape
Quantity 10 000	9CV3218AXXXXX-PF3
Remark	For last 9th to 13th digits, see following table "Attenuation codes"

Attenuation codes			
Standard			
Value (dB)	Tolerance (dB)	Phycomp worldwide code (12NC)	Phycomp North America code (NA code)
1	±0.3	012	01DBC
2	±0.3	022	02DBC
3	±0.3	032	03DBC
4	±0.3	042	04DBC
5	±0.3	052	05DBC
6	±0.5	063	06DBD
7	±0.5	073	07DBD
8	±0.5	083	08DBD
9	±0.5	093	09DBD
10	±0.5	103	10DBD
15	±1.0	154	15DBF
20	±2.0	205	20DBG

Yageo Part Number	Resistor pieces	Resistor values	Description	Size	Toler-ance	Max. power	Resistance range
Thick film chip resistors							
RC0201FR-SNE96L	100	300	RC0201, ±1%, E24&E96, RoHS compliant + Jumper	0201	F	1/20W	0R,1R-10M
RC0402FR-SNE96L	100	300	RC0402, ±1%, E24&E96, RoHS compliant + Jumper	0402	F	1/16W	0R,1R-10M
RC0603FR-SNE96L	50	300	RC0603, ±1%, E24&E96, RoHS compliant + Jumper	0603	F	1/10W	0R,1R-10M
RC0805FR-SNE96L	50	300	RC0805, ±1%, E24&E96, RoHS compliant + Jumper	0805	F	1/8W	0R,1R-10M
RC1206FR-SNE96L	50	300	RC1206, ±1%, E24&E96, RoHS compliant + Jumper	1206	F	1/4W	0R,1R-10M
RC0100-R-SKE24L	100	80	RC0100, ±1% & ±5% , E24 & E96, RoHS compliant, + Jumper	0100	F/J	1/32W	0R, 1R-3M32
RC0201-R-SKE24L	100	120	RC0201, ±1% & ±5% , E24 & E96, RoHS compliant, + Jumper	0201	F/J	1/20W	0R, 1R-10M
RC0201FR-SKE96L	100	200	RC0201, ±1%, E96, RoHS compliant	0201	F	1/20W	1R-10M
RC0402JR-SKE24L	100	120	RC0402, ±5%, E24, RoHS compliant, + Jumper	0402	J	1/16W	0R, 1R-22M
RC0402FR-SKE96L	100	200	RC0402, ±1%, E96, RoHS compliant	0402	F	1/16W	1R-10M
RC0603JR-SKE24L	50	120	RC0603, ±5%, E24, RoHS compliant, + Jumper	0603	J	1/10W	0R, 1R-22M
RC0603FR-SKE96L	50	200	RC0603, ±1%, E96, RoHS compliant	0603	F	1/10W	1R-10M
RC0805JR-SKE24L	50	120	RC0805, ±5%, E24, RoHS compliant, + Jumper	0805	J	1/8W	0R, 1R-22M
RC0805FR-SKE96L	50	200	RC0805, ±1%, E96, RoHS compliant	0805	F	1/8W	1R-10M
RC1206JR-SKE24L	50	120	RC1206, ±5%, E24, RoHS compliant, + Jumper	1206	J	1/4W	0R, 1R-22M
RC1206FR-SKE96L	50	200	RC1206, ±1%, E96, RoHS compliant	1206	F	1/4W	1R-10M
RC0000-R-SK001L	50 - 100	570	RC0201-RC1206, ±1% & ±5%, RoHS compliant, + Jumper	0201-1206	F/J	---	0R, 10R-1M
Thick film array chip resistors (convex)							
YC12X-JR-SK001L	100	75	YC124/122, ±5%, RoHS compliant, + Jumper	0402x2 0402x4	J	1/16W	0R, 1R-1M
Engineering design kit for current sensing application							
CS0201-R-SB001L	10	60	PA/PE/RL/PT, ±5%, ±1%, E24 & E96, RoHS compliant	0201~2512	F/J	---	1m-820m
CS0402-R-SK001L	30	160	RL0402-RL2512, ±1% & ±5%, RoHS compliant	0402 - 2512	F/J	---	100m - 910m
ME0201-R-SB001L	15	60	Metal current sensor, PA/PE/PS/ PU,E24 & E96, RoHS compliant	0201-2512	F	---	0.2m-150m
Engineering design kit for general purpose							
RC0402-R-SK001L	50 - 100	472	Chip resistor / MLCC	0402 - 1206	---	---	---
Engineering design book for thin film chip resistor							
RT0402-R-SB001L	10	60	RT0402-RT1206, ±0.1%, RoHS compliant	0402 - 1206	B	---	10R-1M
RT0201-R-SB001L	10	60	RT0201-RT0402, ±0.1%, RoHS compliant	0201 - 0402	B	---	10R-120K
AT0402-R-SB001L	10	60	AT0402~AT1206, ±0.1~ ±1%, E24 & E96, RoHS compliant	0402~1206	B/D/F	1/4W	10R~1M
Engineering design book for automotive application							
AC0402-R-SB001L	10	60	AC0402-AC1206, ±1%, RoHS compliant	0402 - 1206	F	---	10R-1M
AC0201-R-SB001L	10	60	Automotive Grade: AC/AF/AT/PE/PA/RL/PT, ±0.1~ ±5%, E24 & E96, RoHS compliant, +Jumper	0201~2512	B/D/F/ J	---	---
Engineering design book for Thick film chip resistors							
RC0805-R-SBE24L	10	60	RC0805, ±1% & ±5% , RoHS compliant, High power	0805	F	1/4W	1R-1M
RC1206-R-SBE24L	10	60	RC1206, ±1% & ±5% , RoHS compliant, High power	1206	F	1/2W	1R-1M
RC0201-R-SB001P	10	60	Total Lead Free: RC0201~1206, ±1%, + Jumper	0201~1206	F	---	0R, 1R-10M

SURFACE MOUNT MLCC

Specification overview					
Description	TC code	Series	Capacitance range	Voltage range	Size
Discrete	NPO	General purpose	0.47 pF to 100 nF	10 V to 50 V	01005, 0201, 0402, 0603, 0805, 1206, 1210,1812
		Medium and High voltage	10 pF to 22 nF	100 V to 3000 V	0201, 0402, 0603, 0805, 1206, 1210, 1808, 1812
		High frequency	0.2 pF to 100 pF	16V to 250 V	01005, 0201, 0402, 0603, 0805
	X7R	General purpose & High capacitance	100 pF to 47 μF	6.3 V to 50 V	01005, 0201, 0402, 0603, 0805, 1206, 1210,1812, 2220
		Medium and High voltage	100 pF to 2.2 μF	100 V to 3000 V	0402, 0603, 0805, 1206, 1210, 1812
		Low inductance	10 nF to 220 nF	10 V to 50 V	0204, 0306, 0508, 0612
	X5R	General purpose & High capacitance	100 pF to 220 μF	6.3 V to 50 V	01005, 0201, 0402, 0603, 0805, 1206, 1210
	Y5V	General purpose & High capacitance	10 nF to 47 μF	6.3 V to 50 V	0402, 0603, 0805, 1206, 1210
Automotive grade products	NPO	Automotive grade	10 pF to 10 nF	50 V to 630 V	0402, 0603, 0805,1206, 1210
	X8R	Automotive grade	22 nF to 100 nF	16 V to 50 V	0805
	X8G	Automotive grade	1 nF to 10 nF	25 V to 100 V	0805
	X7R	Automotive grade	100 pF to 2.2 μF	16 V to 630 V	0201, 0402, 0603, 0805,1206, 1210
	X7R	Soft-termination	1nF to 4.7μF	16V to 250V	0603, 0805, 1206, 1210
	NPO	High frequency	0.2pF to 100pF	50V	0603
Soft-termination Series	NPO	Soft-termination series	0.47 pF to 22 nF	100 V to 3 KV	0402, 0603, 0805, 1206, 1210, 1808, 1812
	X7R	Soft-termination series	100 pF to 10 μF	16 V to 3 KV	0402, 0603, 0805, 1206, 1210, 1808, 1812
C-Arrays	NPO	4C arrays	10 pF to 470 pF	50 V	0508, 0612
	X7R	4C arrays	180 pF to 100 nF	16 V to 50 V	0508, 0612

Ordering information - Global part number

Global part number

Ordering example: CC0201KRX7R8BB102

C C 0 2 0 1 K R X 7 R 8 B B 1 0 2

Series name (code 1-2)
- CA = 4 x Capacitors array
- CC = Multilayer chip capacitors
- CL = Low inductance capacitors
- CQ = High frequency capacitors
- AC = Automotive grade capacitors
- CS = Soft termination capacitors
- AS = Automotive grade soft termination capacitors
- AQ = Automotive grade high frequency capacitors

Size code (code 3-6)
- 0100
- 0201
- 0402
- 0603
- 0805
- 1206
- 1210
- 1808
- 1812
- 2220
- 0204
- 0306
- 0508
- 0612

Capacitance tolerance (code 7)
- A = ±0.05 pF (CQ series only)
- B = ±0.1 pF
- C = ±0.25 pF
- D = ±0.5 pF
- F = ±1%
- G = ±2%
- J = ±5%
- K = ±10%
- M = ±20%
- Z = -20% to +80%

Packing style (code 8)
- R = Paper / PE tape reel Ø7 inch
- P = Paper / PE tape reel Ø13 inch
- K = Embossed plastic tape reel Ø7 inch
- F = Embossed plastic tape reel Ø13 inch

TC material (code 9-11)
- NPO
- X5R
- X7R
- Y5V
- X6S
- X8G
- X8R

Capacitance value (code 15-17)
- 102 = 1 000 pF
- (2 significant digits+number of zeros; the 3rd digit signifies the multiplying factor, and letter R is decimal point)
- 0 = x 1
- 1 = x 10^1
- 2 = x 10^2
- 4 = x 10^4
- 5 = x 10^5
- 6 = x 10^6
- 7 = x 10^7
- X X R = Special capacitance
- (X X: capacitance before decimal point)

Process code (code 14)
- N = Class 1 product (NPO/X8G)
- B = Class 2 product (X5R/X6S/X7R/X8R/Y5V)

Termination (code 13)
- B = Ni-Barrier

Rated voltage (code 12)
- 4 = 4 V
- 5 = 6.3 V
- 6 = 10 V
- 7 = 16 V
- 8 = 25 V
- G = 35 V
- 9 = 50 V
- 0 = 100 V
- A = 200 V
- Y = 250 V
- B = 500 V
- Z = 630 V
- C = 1 kV
- D = 2 kV
- S = 2.5 kV
- E = 3 kV

Global part number

Ordering example: CCxxxxKRX5RxBBxxx (for Low profile)

C C 1 05 9 K R X 7 R 8 B B 1 0 2

Series name (code 1-2)
- CC = Multilayer chip capacitors

Number of cap (code 3)
- 4 = 4 cap
- 2 = 2 cap
- 1 = Single

Size code (code 4-5)
- 01 = 0201
- 02 = 0402
- 03 = 0603
- 05 = 0805
- 06 = 1206, 0306
- 08 = 1808, 0508
- 10 = 1210
- 12 = 1812, 0612

Thickness (code 6)
- 3 = 0.3 mm
- 4 = 0.45 mm
- 5 = 0.5 mm
- 6 = 0.6 mm
- 8 = 0.8 mm
- 9 = 0.85 mm
- A = 1.0 mm
- B = 1.25 mm
- C = 1.6 mm
- D = 2.0 mm
- E = 2.5 mm
- F = 1.7 mm
- M = 1.15 mm
- N = 1.35 mm
- Q = 1.5 mm
- R = 1.8 mm

Capacitance tolerance (code 7)
- B = ±0.1 pF
- C = ±0.25 pF
- D = ±0.5 pF
- F = ±1%
- G = ±2%
- J = ±5%
- K = ±10%
- M = ±20%
- Z = -20% to +80%

Packing style (code 8)
- R = Paper / PE tape reel Ø7 inch
- P = Paper / PE tape reel Ø13 inch
- K = Embossed plastic tape reel Ø7 inch
- F = Embossed plastic tape reel Ø13 inch

Capacitance value (code 15-17)
- 102 = 1 000 pF
- (2 significant digits+number of zeros; the 3rd digit signifies the multiplying factor, and letter R is decimal point)
- 0 = x 1
- 1 = x 10^1
- 2 = x 10^2
- 3 = x 10^3
- 4 = x 10^4
- 5 = x 10^5
- 6 = x 10^6
- 7 = x 10^7
- X X R = Special capacitance
- (X X: capacitance before decimal point)

Process code (code 14)
- N = Class 1 product
- B = Class 2 product

Termination (code 13)
- B = Ni-Barrier

Rated voltage (code 12)
- 5 = 6.3 V
- 6 = 10 V
- 7 = 16 V
- 8 = 25 V
- 9 = 50 V
- 0 = 100 V
- A = 200 V
- B = 500 V
- C = 1 kV
- D = 2 kV
- E = 3 kV
- G = 35 V
- Y = 250 V
- Z = 630 V

TC material (code 9-11)
- X5R
- X7R

Thickness classes and packing quantities for all series

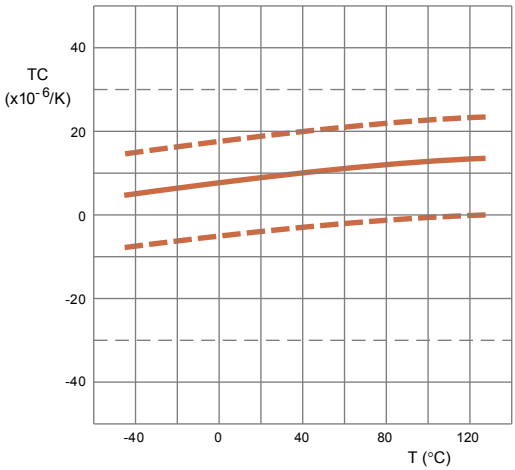
Thickness classes and packing quantities

Description	Size code	Thickness classification (mm)	Quantity per reel					Quantity per bulk case
			Tape width	180 mm / 7”		330 mm / 13”		
				Paper	Blister	Paper	Blister	
Discrete capacitors	01005	0.2 ±0.02	8 mm	20000	---	---	---	---
	0201	0.3 ±0.03 / ±0.05		15000	---	50000	---	---
	0402	0.5 ±0.05 / ±0.15 / ±0.20		10000	---	50000	---	50000
	0603	0.8 ±0.1 / ±0.2		4000	---	15000	---	15000
	0805	0.6 ±0.1		4000	---	20000	---	10000
		0.85 / 1.0 ±0.1		4000	---	15000	---	8000
		1.25 ±0.2		---	3000	---	10000	5000
	1206	0.6 ±0.1		4000	---	20000	---	---
		0.85 ±0.1		4000	---	15000	---	---
		1.00 / 1.15 ±0.1		---	3000	---	10000	---
		1.25 ±0.2		---	3000	---	10000	---
		1.6 ±0.15		---	2500	---	8000	---
		1.6 ±0.2 / ±0.3		---	2000	---	8000	---
	1210	0.6 / 0.7 ±0.1		---	4000	---	15000	---
		0.85 ±0.1		---	4000	---	10000	---
		1.0 ±0.15		---	3000	---	10000	---
		1.15 ±0.1		---	3000	---	10000	---
		1.15 ±0.15		---	3000	---	10000	---
		1.25 ±0.2		---	3000	---	10000	---
		1.5 ±0.1		---	2000	---	8000	---
		1.6 / 1.9 ±0.2		---	2000	---	5000	---
		2.0 ±0.2		---	2000 / 1000	---	---	---
		2.5 ±0.2 / ±0.3		---	1000 / 500	---	---	---
	1808	1.15 ±0.15	12 mm	---	3000	---	---	---
		1.25 ±0.2		---	3000	---	---	---
		1.35 ±0.15		---	2000	---	---	---
		1.5 ±0.1		---	2000	---	---	---
		1.6 ±0.2		---	2000	---	8000	---
		2.0 ±0.2		---	2000	---	---	---
	1812	0.6 / 0.85 ±0.1		---	2000	---	---	---
		1.15 ±0.1		---	1000	---	---	---
		1.15 ±0.15		---	1000	---	---	---
		1.25 ±0.2		---	1000	---	8000	---
		1.35 ±0.15		---	1000	---	---	---
		1.5 ±0.1		---	1000	---	---	---
		1.6 ±0.2		---	1000	---	---	---
		2.0 ±0.2		---	1000	---	---	---
	2220	0.85 ±0.1		---	1500	---	---	---
		1.15 ±0.1		---	1500	---	---	---
Low inductance	0204	0.3 ±0.1	8 mm	10000	---	---	---	---
	0306	0.5 ±0.1		4000	---	15000	---	---
	0508	0.85 ±0.1		4000	---	15000	---	---
	0612	0.85 ±0.1		4000	---	15000	---	---
Arrays	0508	0.6 ±0.1		4000	---	20000	---	---
	0612	0.8 ±0.1		4000	---	15000	---	---

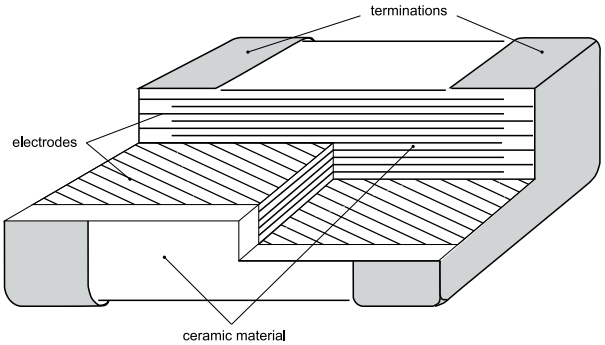
Features

- Ultra-stable on capacitance
- Tight tolerance available
- High reliability
- Low ESR
- Good frequency performance
- No aging of capacitance

Temperature characteristic

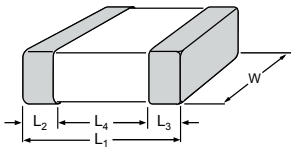


Construction



Case dimensions

Discrete capacitors - General purpose



Case size designation		Dimensions in mm				
Inch-based	Metric	L_1	W	L_2 / L_3 min	L_2 / L_3 max	L_4 min
01005	0402M	0.4 ±0.02	0.2 ±0.02	0.07	0.14	0.14
0201	0603M	0.6 ±0.03	0.3 ±0.03	0.10	0.20	0.20
0402	1005M	1.0 ±0.05	0.5 ±0.05	0.15	0.35	0.40
0603	1608M	1.6 ±0.10	0.8 ±0.10	0.20	0.60	0.40
0805	2012M	2.0 ±0.10 (1)	1.25 ±0.10 (1)	0.25	0.75	0.55
		2.0 ±0.20 (2)	1.25 ±0.20 (2)	0.25	0.75	0.55
1206	3216M	3.2 ±0.15 (1)	1.6 ±0.15 (1)	0.25	0.75	1.40
		3.2 ±0.30 (2)	1.6 ±0.20 (2)	0.25	0.75	1.40
1210	3225M	3.2 ±0.20 (1)	2.5 ±0.20 (1)	0.25	0.75	1.40
		3.2 ±0.40 (2)	2.5 ±0.30 (2)	0.25	0.75	1.40
1812	4532M	4.5 ±0.20 (1)	3.2 ±0.20 (1)	0.25	0.75	2.20
		4.5 ±0.40 (2)	3.2 ±0.40 (2)	0.25	0.75	2.20

Note: 1. Dimension for size 0805 to 1812, C ≤ 1 nF
2. Dimension for size 0805 to 1812, C > 1 nF

NPO - General purpose 10 to 50V, 01005 to 0603

NPO												
	General purpose											
Capacitance	01005			0201			0402			0603		
	10 V	16 V	25 V	16 V	25 V	50 V	16 V	25 V	50 V	16 V	25 V	50 V
0.22 pF				0.3 ±0.03	0.3 ±0.03	0.3 ±0.03						
0.47 pF				0.3 ±0.03	0.3 ±0.03	0.3 ±0.03	0.5 ±0.05	0.5 ±0.05	0.5 ±0.05	0.8 ±0.1	0.8 ±0.1	0.8 ±0.1
0.5 pF	0.2 ±0.02	0.2 ±0.02	0.2 ±0.02									
0.56 pF				0.3 ±0.03	0.3 ±0.03	0.3 ±0.03	0.5 ±0.05	0.5 ±0.05	0.5 ±0.05	0.8 ±0.1	0.8 ±0.1	0.8 ±0.1
0.6 pF	0.2 ±0.02	0.2 ±0.02	0.2 ±0.02									
0.68 pF				0.3 ±0.03	0.3 ±0.03	0.3 ±0.03	0.5 ±0.05	0.5 ±0.05	0.5 ±0.05	0.8 ±0.1	0.8 ±0.1	0.8 ±0.1
0.7 pF	0.2 ±0.02	0.2 ±0.02	0.2 ±0.02									
0.8 pF	0.2 ±0.02	0.2 ±0.02	0.2 ±0.02									
0.82 pF				0.3 ±0.03	0.3 ±0.03	0.3 ±0.03	0.5 ±0.05	0.5 ±0.05	0.5 ±0.05	0.8 ±0.1	0.8 ±0.1	0.8 ±0.1
0.9 pF	0.2 ±0.02	0.2 ±0.02	0.2 ±0.02									
1 pF												
1.2 pF												
1.5 pF												
1.8 pF												
2.2 pF												
2.7 pF												
3.3 pF												
3.9 pF												
4.7 pF												
5.6 pF												
6.8 pF												
8.2 pF												
10 pF	0.2 ±0.02	0.2 ±0.02	0.2 ±0.02	0.3 ±0.03	0.3 ±0.03	0.3 ±0.03						
12 pF												
15 pF												
18 pF												
22 pF												
27 pF												
33 pF							0.5 ±0.05	0.5 ±0.05	0.5 ±0.05	0.8 ±0.1	0.8 ±0.1	0.8 ±0.1
39 pF												
47 pF												
56 pF												
68 pF												
82 pF												
100 pF												
120 pF												
150 pF												
180 pF												
220 pF												
270 pF												
330 pF												
390 pF												
470 pF												
560 pF												
680 pF												
820 pF												
1000 pF												
Tape width	8 mm											

Note: Values in shaded cells indicate thickness class (unit: mm)

NPO										
General purpose										
Capacitance	01005	0201			0402			0603		
	16 V	16 V	25 V	50 V	16 V	25 V	50 V	16 V	25 V	50 V
1.2 nF								0.8 ±0.1	0.8 ±0.1	0.8 ±0.1
1.5 nF										
1.8 nF										
2.2 nF										
2.7 nF										
3.3 nF										
3.9 nF										
4.7 nF										
5.6 nF										
6.8 nF										
8.2 nF										
10 nF										
Tape width	8 mm									

Note: Values in shaded cells indicate thickness class (unit: mm)

NPO									
General purpose									
Capacitance	0805			1206			1210		1812
	16 V	25 V	50 V	16 V	25 V	50 V	25 V	50 V	50 V
0.47 pF	0.6 ±0.1	0.6 ±0.1	0.6 ±0.1	0.6 ±0.1	0.6 ±0.1	0.6 ±0.1			
0.56 pF									
0.68 pF									
0.82 pF									
1 pF									
1.2 pF									
1.5 pF									
1.8 pF									
2.2 pF									
2.7 pF									
3.3 pF									
3.9 pF									
4.7 pF									
5.6 pF									
6.8 pF									
8.2 pF									
10 pF									
12 pF									
15 pF									
18 pF									
22 pF									
27 pF									
33 pF									
39 pF									
47 pF							1.25 ±0.2	1.25 ±0.2	
56 pF									1.25 ±0.2
68 pF									
82 pF									
100 pF									
120 pF									
150 pF									
180 pF									
220 pF									
270 pF									
330 pF									
390 pF									
470 pF									
560 pF									
680 pF									
820 pF									
1000 pF									
Tape width	8 mm								

Note: Values in shaded cells indicate thickness class (unit: mm)

NPO - General purpose 10 to 50V, 0805 to 1812

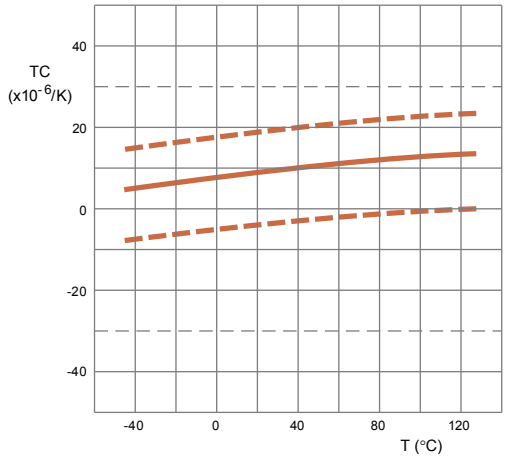
NPO									
General purpose									
Capacitance	0805			1206			1210		1812
	16 V	25 V	50 V	16 V	25 V	50 V	25 V	50 V	50 V
1.2 nF	0.85 ±0.1	0.85 ±0.1	0.85 ±0.1	0.6 ±0.1	0.6 ±0.1	0.6 ±0.1	1.25 ±0.2	1.25 ±0.2	1.25 ±0.2
1.5 nF									
1.8 nF									
2.2 nF	1.25 ±0.2	1.25 ±0.2	1.25 ±0.2						
2.7 nF									
3.3 nF				0.85 ±0.1	0.85 ±0.1	0.85 ±0.1			
3.9 nF									
4.7 nF									
5.6 nF									
6.8 nF									
8.2 nF				1.25 ±0.2	1.25 ±0.2	1.25 ±0.2			
10 nF									
12 nF				0.85 ±0.1	0.85 ±0.1	0.85 ±0.1			
15 nF									
18 nF							1.6 ±0.2	1.6 ±0.2	
22 nF									
33 nF									
39 nF				1.25 ±0.2	1.25 ±0.2	1.25 ±0.2			
47 nF									
56 nF									
68 nF				1.6 ±0.2	1.6 ±0.2	1.6 ±0.2			
82 nF									
100 nF									
Tape width	8 mm								

Note: Values in shaded cells indicate thickness class (unit: mm)

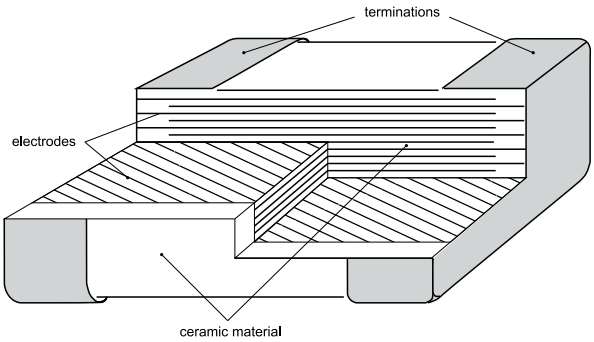
Features

- Capable of operating at high voltage levels
- For high frequency snubber
- Decoupling / smoothing function

Temperature characteristic

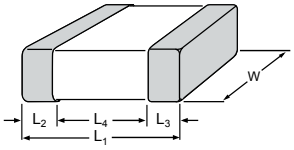


Construction



Dimensions

Discrete capacitors - Medium and High voltage



Case size designation		Dimensions in mm				
Inch-based	Metric	L_1	W	L_2 / L_3 min	L_2 / L_3 max	L_4 min
0201	0603M	0.6 ±0.03	0.3 ±0.03	0.10	0.20	0.20
0402	1005M	1.0 ±0.05	0.5 ±0.05	0.15	0.35	0.40
0603	1608M	1.6 ±0.10	0.8 ±0.10	0.20	0.60	0.40
0805	2012M	2.0 ±0.20	1.25 ±0.20	0.25	0.75	0.55
1206	3216M	3.2 ±0.30	1.6 ±0.20	0.25	0.75	1.40
1210	3225M	3.2 ±0.40	2.5 ±0.30	0.25	0.75	1.40
1808	4520M	4.5 ±0.40	2.0 ±0.30	0.25	0.75	2.20
1812	4532M	4.5 ±0.40	3.2 ±0.30	0.25	0.75	2.20

NPO - Medium voltage, 0201 to 0805

NPO								
	Medium voltage							
Capacitance	0201	0402	0603		0805			
	100V	100 V	100 V	250 V	100 V	250 V	500 V	630 V
0.22 pF	0.3 ±0.03	0.5 ±0.05	0.8 ±0.1	0.8 ±0.1	0.6 ±0.1	0.6 ±0.1	0.6 ±0.1	0.6 ±0.1
0.47 pF								
0.56 pF								
0.68 pF								
0.82 pF								
1 pF								
1.2 pF								
1.5 pF								
1.8 pF								
2.2 pF								
2.7 pF								
3.3 pF								
3.9 pF								
4.7 pF								
5.6 pF								
6.8 pF								
8.2 pF								
10 pF								
12 pF								
15 pF								
18 pF								
22 pF								
27 pF								
33 pF								
39 pF								
47 pF								
56 pF								
68 pF								
82 pF								
100 pF								
120 pF								
150 pF								
180 pF								
220 pF						0.85 ±0.1	0.85 ±0.1	0.85 ±0.1
270 pF								
330 pF								
390 pF								
470 pF								
560 pF							1.25 ±0.2	1.25 ±0.2
680 pF								
820 pF								
1000 pF								
1.2 nF					0.85 ±0.1	1.25 ±0.2		
1.5 nF								
1.8 nF								
2.2 nF					1.25 ±0.2			
2.7 nF								
3.3 nF								
3.9 nF								
4.7 nF								
5.6 nF								
6.8 nF								
8.2 nF								
10 nF								
Tape width	8 mm							

Note: Values in shaded cells indicate thickness class (unit: mm)

NPO												
	Medium voltage											
Capacitance	1206				1210				1812			
	100 V	250 V	500 V	630 V	100 V	250 V	500 V	630 V	100 V	250 V	500 V	630 V
1 pF												
1.2 pF												
1.5 pF												
1.8 pF												
2.2 pF												
2.7 pF												
3.3 pF												
3.9 pF												
4.7 pF												
5.6 pF												
6.8 pF												
8.2 pF												
10 pF												
12 pF												
15 pF												
18 pF												
22 pF												
27 pF		0.6 ±0.1										
33 pF												
39 pF			0.6 ±0.1									
47 pF												
56 pF												
68 pF												
82 pF												
100 pF												
120 pF												
150 pF				1.25 ±0.2								
180 pF								1.25 ±0.2				
220 pF												
270 pF												1.25 ±0.2
330 pF												
390 pF												
470 pF						1.25 ±0.2	1.25 ±0.2				1.25 ±0.2	
560 pF												
680 pF					1.25 ±0.2							
820 pF		0.85 ±0.1	0.85 ±0.1									
1000 pF												
1.2 nF										1.25 ±0.2		
1.5 nF												
1.8 nF		1.25 ±0.2	1.25 ±0.2						1.25 ±0.2			
2.2 nF												
2.7 nF												
3.3 nF												
3.9 nF												
4.7 nF	0.85 ±0.1											
5.6 nF												
6.8 nF												
8.2 nF	1.25 ±0.2											
10 nF												
22 nF												
Tape width	8 mm											

Note: Values in shaded cells indicate thickness class (unit: mm)

NPO - High voltage, 0805 to 1812

NPO						
	High voltage					
Capacitance	0805	1206			1210	
	1000 V	1000 V	2000 V	3000V	1000 V	2000 V
10 pF	0.85 ±0.1	1.25 ±0.2	1.25 ±0.2	1.25 ±0.2		
12 pF						
15 pF						
18 pF						
22 pF						
27 pF						
33 pF					1.25 ±0.2	1.25 ±0.2
39 pF						
47 pF						
56 pF						
68 pF						
82 pF						
100 pF						
120 pF						
150 pF						
180 pF						
220 pF						
270 pF						
330 pF						
390 pF						
470 pF						
560 pF						
680 pF						
820 pF						
1000 pF						
Tape width	8 mm					

Note: Values in shaded cells indicate thickness class (unit: mm)

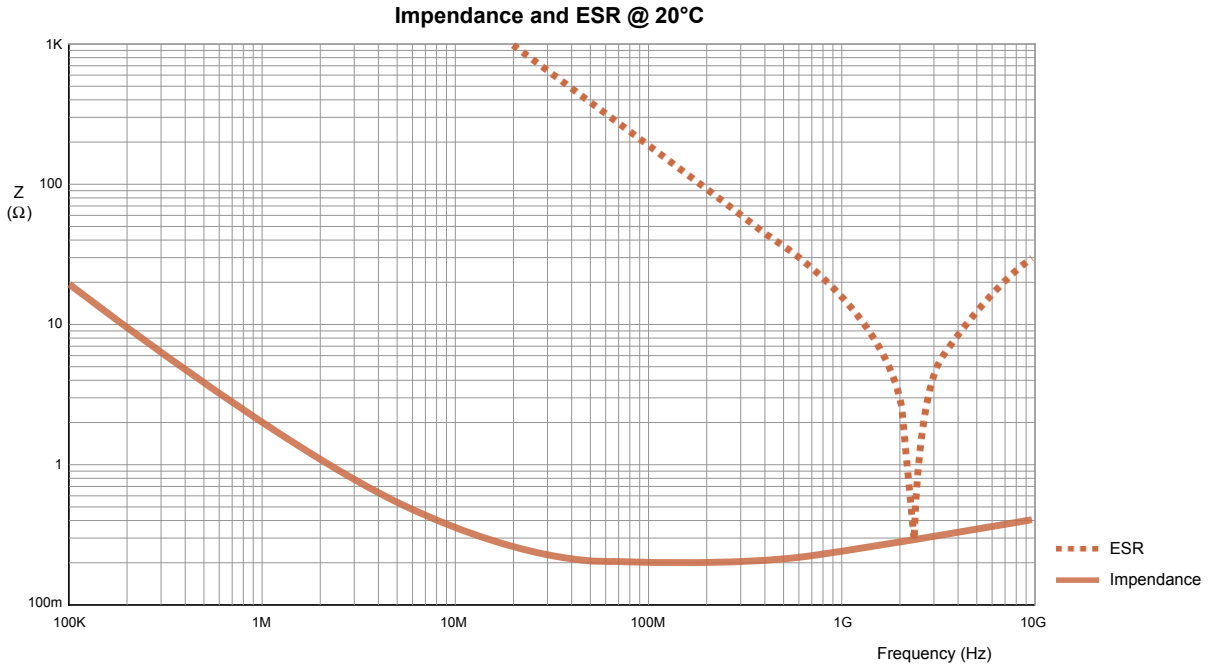
NPO						
	High voltage					
Capacitance	1808			1812		
	1000 V	2000 V	3000 V	1000 V	2000 V	3000 V
10 pF			1.6 ±0.2	1.25 ±0.2	1.25 ±0.2	1.25 ±0.2
12 pF						
15 pF						
18 pF						
22 pF						
27 pF						
33 pF	1.25 ±0.2	1.25 ±0.2				
39 pF						
47 pF						
56 pF						
68 pF						
82 pF						
100 pF						
120 pF						
150 pF						
180 pF						
220 pF						
270 pF						
330 pF						
390 pF						
470 pF						
560 pF						
680 pF						
820 pF						
1000 pF	2.0 ±0.2					
1.2 nF						
1.5 nF						
Tape width	12 mm					

Note: Values in shaded cells indicate thickness class (unit: mm)

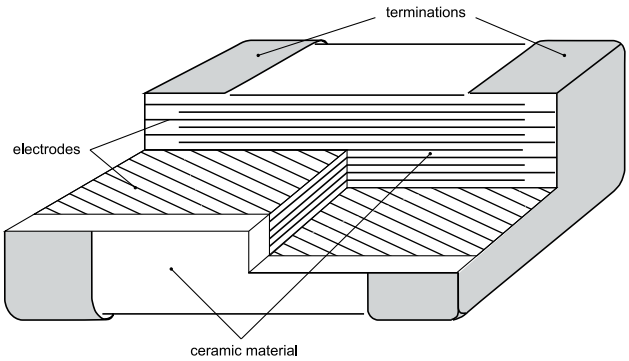
Features

- Lowest ESR in high frequency
- Ultra small
- Noise filtering

ESR characteristic

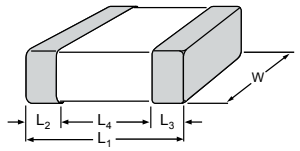


Construction



Case dimensions

Discrete capacitors - High Frequency



Case size designation		Dimensions in mm				
Inch-based	Metric	L_1	W	L_2 / L_3 min	L_2 / L_3 max	L_4 min
01005	0402M	0.4 ±0.02	0.2 ±0.02	0.07	0.14	0.13
0201	0603M	0.6 ±0.03	0.3 ±0.03	0.10	0.20	0.20
0402	1005M	1.0 ±0.05	0.5 ±0.05	0.15	0.35	0.40
0603	1608M	1.6 ±0.10	0.8 ±0.10	0.20	0.60	0.40
0805	2012M	2.0 ±0.10	1.25 ±0.10	0.25	0.75	0.55

NPO

High frequency

Capacitance	01005	0201		0402				0603			0805		
	16 V	25 V	50 V	25 V	50 V	100 V	250 V	50 V	100 V	250 V	50 V	100 V	250 V
0.1 pF		0.3 ±0.03	0.3 ±0.03	0.5 ±0.05	0.5 ±0.05	0.5 ±0.05	0.5 ±0.05	0.8 ±0.1	0.8 ±0.1	0.8 ±0.1	0.6 ±0.1	0.6 ±0.1	0.6 ±0.1
0.2 pF	0.2 ±0.02												
0.3 pF													
0.4 pF													
0.5 pF													
0.6 pF													
0.7 pF													
0.8 pF													
0.9 pF													
1 pF													
1.2 pF													
1.5 pF													
1.8 pF													
2.2 pF													
2.7 pF													
3.3 pF													
3.9 pF													
4.7 pF													
5.6 pF													
6.8 pF													
8.2 pF													
10 pF													
12 pF													
15 pF													
18 pF													
22 pF													
27 pF													
33 pF													
39 pF													
47 pF													
56 pF													
68 pF													
82 pF													
100 pF													
Tape width	8 mm												

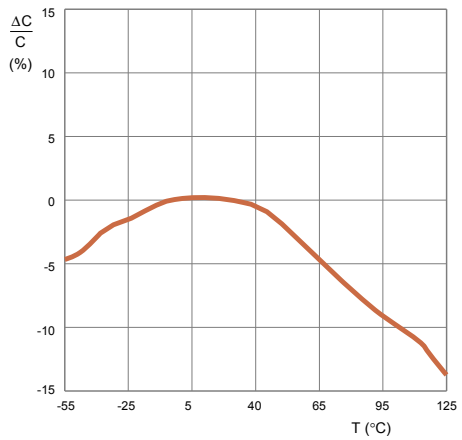
Note: Values in shaded cells indicate thickness class (unit: mm)

X7R - General purpose & High capacitance, 01005 to 2220

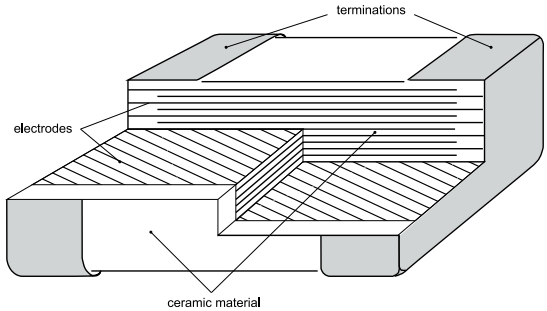
Features

- Semi-stable on capacitance and high K
- High volumetric efficiency
- Highly reliable in high temperature application
- High insulation resistance

Temperature characteristic

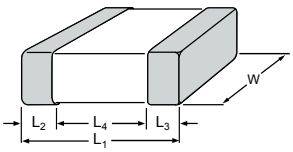


Construction



Case dimensions

Discrete capacitors - General purpose & High capacitance



Case size designation		Dimensions in mm				
Inch-based	Metric	L_1	W	L_2 / L_3 min	L_2 / L_3 max	L_4 min
01005	0402M	0.4 ±0.02	0.2 ±0.02	0.07	0.14	0.14
0201	0603M	0.6 ±0.03	0.3 ±0.03	0.10	0.20	0.20
		0.6 ±0.05	0.3 ±0.05	0.10	0.20	0.20
0402	1005M	1.0 ±0.05 (1)	0.5 ±0.05 (1)	0.15	0.35	0.40
0603	1608M	1.6 ±0.10 (1)	0.8 ±0.10 (1)	0.20	0.60	0.40
		1.6 ±0.15 (2)	0.8 ±0.15 (2)	0.20	0.60	0.40
0805	2012M	2.0 ±0.10 (1)	1.25 ±0.10 (1)	0.25	0.75	0.55
		2.0 ±0.20 (2)	1.25 ±0.20 (2)	0.25	0.75	0.55
1206	3216M	3.2 ±0.15 (1)	1.6 ±0.15 (1)	0.25	0.75	1.40
		3.2 ±0.30 (2)	1.6 ±0.20 (2)	0.25	0.75	1.40
1210	3225M	3.2 ±0.20 (1)	2.5 ±0.20 (1)	0.25	0.75	1.40
		3.2 ±0.40 (2)	2.5 ±0.30 (2)	0.25	0.75	1.40
1808	4520M	4.5 ±0.40	2.0 ±0.30	0.25	0.75	2.20
1812	4532M	4.5 ±0.20 (1)	3.2 ±0.20 (1)	0.25	0.75	2.20
		4.5 ±0.40 (2)	3.2 ±0.40 (2)	0.25	0.75	2.20
2220	5750M	5.7 ±0.40	5.0 ±0.30	0.25	0.75	3.40

Note: 1. Dimension for size 0603, C < 10 µF; 0805 to 1812, C ≤ 100 nF
2. Dimension for size 0402, C ≥ 4.7 µF; 0603, C = 1 µF, 50V; 0805 to 1812, C > 100 nF

X7R - General purpose & High capacitance , 01005 to 0402

X7R												
General purpose & High capacitance												
Capacitance	01005		0201					0402				
	6.3 V/10V	16 V	6.3 V	10 V	16 V	25 V	50 V	6.3 V	10 V	16 V	25 V	50 V
47 pF			0.3 ±0.03	0.3 ±0.03	0.3 ±0.03	0.3 ±0.03	0.3 ±0.03					
68 pF												
100 pF	0.2 ±0.02	0.2 ±0.02						0.5 ±0.05	0.5 ±0.05	0.5 ±0.05	0.5 ±0.05	0.5 ±0.05
150 pF												
220 pF												
330 pF												
470 pF												
680 pF												
1.0 nF												
1.5 nF												
2.2 nF												
3.3 nF												
4.7 nF												
6.8 nF												
10 nF												
15 nF												
22 nF												
33 nF												
47 nF												
68 nF												
100 nF			0.3 ±0.03									
150 nF												
220 nF											0.5 ±0.15	
330 nF												
470 nF								0.5 ±0.05	0.5 ±0.05			
680 nF												
1000 nF								0.5 ±0.05				
Tape width	8 mm											

Note: Values in shaded cells indicate thickness class (unit: mm)

X7R - General purpose & High capacitance, 0603 / 0805

X7R										
General purpose & High capacitance										
Capacitance	0603					0805				
	6.3 V	10 V	16 V	25 V	50 V	6.3 V	10 V	16 V	25 V	50 V
100 pF	0.8 ±0.1	0.8 ±0.1	0.8 ±0.1	0.8 ±0.1	0.8 ±0.1					
150 pF						0.6 ±0.1	0.6 ±0.1	0.6 ±0.1	0.6 ±0.1	0.6 ±0.1
220 pF										
330 pF										
470 pF										
680 pF										
1.0 nF										
1.5 nF										
2.2 nF										
3.3 nF										
4.7 nF										
6.8 nF										
10 nF										
15 nF										
22 nF										
33 nF						0.85 ±0.1	0.85 ±0.1	0.85 ±0.1	0.85 ±0.1	0.85 ±0.1
47 nF										
68 nF										
100 nF										
150 nF										
220 nF										1.25 ±0.2
330 nF						1.25 ±0.2	1.25 ±0.2	1.25 ±0.2	1.25 ±0.2	
470 nF					0.8 ±0.1					
680 nF										
1000 nF					0.8 ±0.15					
2.2 µF										
4.7 µF										
10 µF										
Tape width	8 mm									

Note: Values in shaded cells indicate thickness class (unit: mm)

X7R - General purpose & High capacitance, 1206 to 2220

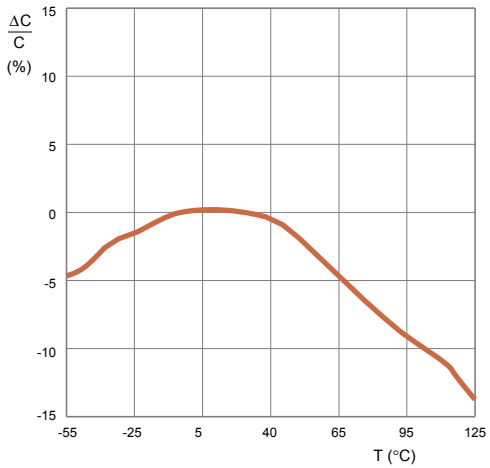
X7R												
General purpose & High capacitance												
Capacitance	1206					1210					1812	2220
	6.3 V	10 V	16 V	25 V	50 V	6.3 V	10 V	16 V	25 V	50 V	50 V	50 V
220 pF	0.85 ±0.1	0.85 ±0.1	0.85 ±0.1	0.85 ±0.1	0.85 ±0.1							
330 pF												
470 pF												
680 pF												
1.0 nF												
1.5 nF												
2.2 nF						0.85 ±0.1	0.85 ±0.1	0.85 ±0.1	0.85 ±0.1	0.85 ±0.1		
3.3 nF												
4.7 nF											0.85 ±0.1	
6.8 nF												
10 nF												
15 nF												
22 nF												
33 nF												
47 nF												
68 nF												
100 nF											1.15 ±0.1	
150 nF										1.15 ±0.1		
220 nF												0.85 ±0.1
330 nF												
470 nF					1.0 ±0.1	1.15 ±0.1	1.15 ±0.1	1.15 ±0.1	1.15 ±0.1	1.25 ±0.2		
680 nF	1.15 ±0.1	1.15 ±0.1	1.15 ±0.1	1.15 ±0.1	1.6 ±0.2						1.6 ±0.2	
1000 nF						1.25 ±0.2	1.25 ±0.2	1.25 ±0.2	1.25 ±0.2			1.15 ±0.1
2.2 µF						1.9 ±0.2	1.9 ±0.2	1.9 ±0.2	1.9 ±0.2	1.9 ±0.2		
4.7 µF	1.6 ±0.2	1.6 ±0.2	1.6 ±0.2	1.6 ±0.2						2.5 ±0.3		
10 µF												
22 µF						2.5 ±0.2	2.5 ±0.2	2.5 ±0.2	2.5 ±0.2			
47 µF												
Tape width	8 mm											

Note: Values in shaded cells indicate thickness class (unit: mm)

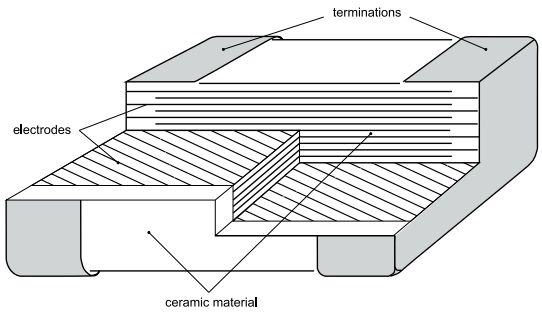
Features

- Capable of operating at high voltage levels
- For high frequency snubber
- Decoupling / smoothing function

Temperature characteristic

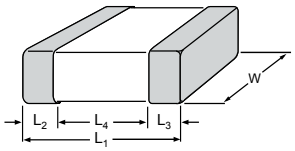


Construction



Dimensions

Discrete capacitors - Medium and High voltage



Case size designation		Dimensions in mm				
Inch-based	Metric	L_1	W	L_2 / L_3 min	L_2 / L_3 max	L_4 min
0402	1005M	1.0 ±0.05	0.5 ±0.05	0.15	0.35	0.40
0603	1608M	1.6 ±0.10	0.8 ±0.10	0.20	0.60	0.40
0805	2012M	2.0 ±0.20	1.25 ±0.20	0.25	0.75	0.55
1206	3216M	3.2 ±0.30	1.6 ±0.20	0.25	0.75	1.40
1210	3225M	3.2 ±0.40	2.5 ±0.30	0.25	0.75	1.40
1808	4520M	4.5 ±0.40	2.0 ±0.30	0.25	0.75	2.20
1812	4532M	4.5 ±0.40	3.2 ±0.30	0.25	0.75	2.20

X7R - Medium and High voltage, 0402 to 1210

X7R								
Medium voltage & High voltage								
Capacitance	0402	0603		0805				
	100 V	100 V	250 V	100 V	250 V	500 V	630 V	1000 V
100 pF	0.5 ±0.05	0.8 ±0.1						
150 pF				0.6 ±0.1	0.85 ±0.1	0.85 ±0.1	0.85 ±0.1	0.85 ±0.1
220 pF			0.8 ±0.1					
330 pF								
470 pF								
680 pF								
1.0 nF								
1.5 nF								1.25 ±0.2
2.2 nF								
3.3 nF								
4.7 nF								
6.8 nF					1.25 ±0.2			
10 nF						1.25 ±0.2	1.25 ±0.2	
15 nF				0.85 ±0.1				
22 nF								
33 nF				1.25 ±0.2				
47 nF								
68 nF								
100 nF								
150 nF								
220 nF								
470 nF								
1 µF								
Tape width	12 mm							

Note: Values in shaded cells indicate thickness class (unit: mm)

X7R													
Medium voltage & High voltage													
Capacitance	1206							1210					
	100 V	250 V	500 V	630 V	1000 V	2000 V	2500 V	100 V	250 V	500 V	630 V	1000 V	2000 V
220 pF	0.85 ±0.1	0.85 ±0.1	1.25 ±0.2	1.25 ±0.2	1.25 ±0.2	1.25 ±0.2						1.25 ±0.2	1.25 ±0.2
330 pF													
470 pF													
680 pF													
1.0 nF							1.6 ±0.2						
1.5 nF													
2.2 nF								0.85 ±0.1	0.85 ±0.1		1.25 ±0.2		
3.3 nF										1.25 ±0.2			
4.7 nF													
6.8 nF													
10 nF													
15 nF													
22 nF		1.25 ±0.2							1.25 ±0.2		1.6 ±0.2	1.6 ±0.2	
33 nF			1.6 ±0.2	1.6 ±0.2									
47 nF													
68 nF	1.25 ±0.2												
100 nF		1.6 ±0.2											
150 nF								1.25 ±0.2					
220 nF													
330 nF	1.6 ±0.2							1.6 ±0.2					
470 nF								1.25 ±0.2					
680 nF								2.0 ±0.2					
1000 nF	1.6 ±0.2												
2.2 µF	1.6 ±0.3												
Tape width	12 mm												

Note: Values in shaded cells indicate thickness class (unit: mm)

X7R - Medium and High voltage, 1808 / 1812

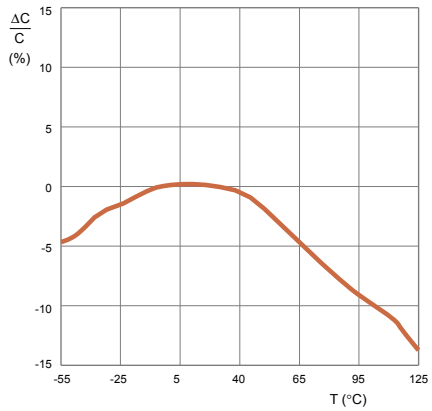
X7R										
Medium voltage & High voltage										
Capacitance	1808			1812						
	1000 V	2000 V	3000 V	100 V	250 V	500 V	630 V	1000 V	2000 V	3000 V
150 pF			1.6 ±0.2							
220 pF										
330 pF		1.35 ±0.2								
470 pF	1.35 ±0.2									
680 pF										
1.0 nF			2.0 ±0.2	0.85 ±0.1	0.85 ±0.1	1.25 ±0.2	1.35 ±0.2	1.35 ±0.2	1.35 ±0.2	1.6 ±0.2
1.5 nF										
2.2 nF		1.6 ±0.2								
3.3 nF										
4.7 nF										
6.8 nF	1.6 ±0.2									
10 nF										
15 nF										
22 nF										
33 nF							1.6 ±0.2	1.6 ±0.2		
47 nF					1.25 ±0.2					
68 nF										
100 nF				1.25 ±0.2		1.6 ±0.2				
150 nF										
220 nF					1.6 ±0.2					
330 nF										
470 nF				1.6 ±0.2						
680 nF										
1000 nF										
Tape width	12 mm									

Note: Values in shaded cells indicate thickness class (unit: mm)

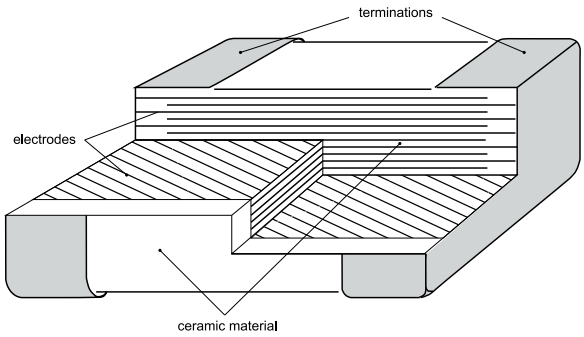
Features

- Good solution for anti-resonance reduction with controlled ESR
- Suitable for high speed IC decoupling due to low inductance type

Temperature characteristic

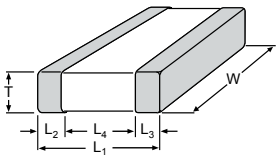


Construction



Dimensions

Discrete capacitors - Low inductance types only



Case size designation		Dimensions in mm					
Inch-based	Metric	L_1	W	T	L_2 / L_3 min	L_2 / L_3 max	L_4 min
0204	0510M	0.5 ±0.10	1.0 ±0.10	0.30 ±0.10	0.10	0.30	0.10
0306	0816M	0.8 ±0.15	1.6 ±0.20	0.50 ±0.10	0.10	0.30	0.20
0508	1220M	1.25 ±0.20	2.0 ±0.20	0.85 ±0.10	0.13	0.46	0.38
0612	1632M	1.6 ±0.20	3.2 ±0.20	0.85 ±0.10	0.13	0.46	0.50

X7R — Low Inductance series

Capacitance	0306	0508			0612		
	10 V	10 V	16 V	25 V	16 V	25 V	50 V
10 nF		0.85 ±0.1	0.85 ±0.1	0.85 ±0.1	0.85 ±0.1	0.85 ±0.1	0.85 ±0.1
22 nF							
47 nF							
100 nF	0.5 ±0.1						
220 nF						1.15 ±0.1	1.15 ±0.1
470 nF							
1000 nF					1.15 ±0.1		
Tape width	8 mm						

X5R — Low Inductance series

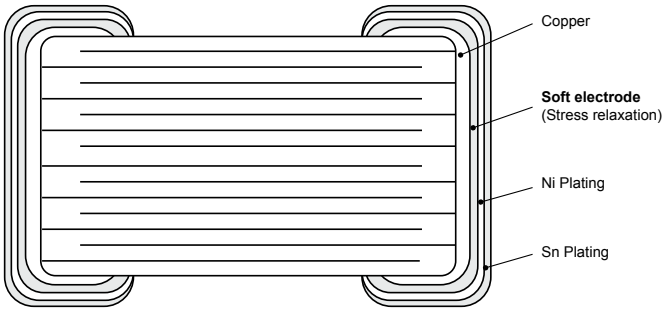
0204
10 V
0.3±0.1
8 mm

Note: Values in shaded cells indicate thickness class (unit: mm)

Features

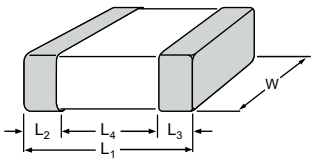
- Flexible termination system
- Improved resistance to thermal stresses
- Increased mechanical performance

Construction



Dimensions

Discrete capacitors - Soft termination



Case size designation		Dimensions in mm				
Inch-based	Metric	L1	W	L2 / L3 min	L2 / L3 max	L4 min
0402	1005M	1.0 ±0.15	0.5 ±0.15	0.10	0.35	0.20
0603	1608M	1.6 ±0.20	0.8 ±0.15	0.20	0.50	0.40
0805	2012M	2.0 ±0.30	1.25 ±0.20	0.25	0.75	0.55
1206	3216M	3.2 ±0.40	1.6 ±0.20	0.25	0.85	1.40
1210	3225M	3.2 ±0.40	2.5 ±0.30	0.25	0.85	1.40
1808	4520M	4.5 ±0.40	2.0 ±0.30	0.25	0.85	2.20
1812	4532M	4.5 ±0.40	3.2 ±0.20	0.25	0.85	2.20

NPO - Soft termination, 0402 to 0805

NPO											
Soft termination											
Capacitance	0402		0603			0805					
	50 V	100 V	50 V	100 V	250 V	50 V	100 V	250 V	500 V	630 V	1000 V
0.47 pF											
0.56 pF											
0.68 pF											
0.82 pF											
1 pF											
1.2 pF											
1.5 pF											
1.8 pF											
2.2 pF											
2.7 pF											
3.3 pF											
3.9 pF											
4.7 pF											
5.6 pF											
6.8 pF											
8.2 pF		0.5 ±0.15						0.6 ±0.15	0.6 ±0.15		
10 pF											
12 pF											
15 pF	0.5 ±0.15										
18 pF					0.8 ±0.15						
22 pF				0.8 ±0.15		0.6 ±0.15	0.6 ±0.15				0.85 ±0.15
27 pF											
33 pF											
39 pF			0.8 ±0.15							0.6 ±0.15	
47 pF											
56 pF											
68 pF											1.25 ±0.2
82 pF											
100 pF											
120 pF											
150 pF											
180 pF											
220 pF											
270 pF											
330 pF									0.85 ±0.15	0.85 ±0.15	
390 pF											
470 pF								0.85 ±0.15			
560 pF											
680 pF									1.25 ±0.2	1.25 ±0.2	
820 pF											
1000 pF											
1.2 nF											
1.5 nF						0.85 ±0.15	0.85 ±0.15				
1.8 nF											
2.2 nF								1.25 ±0.2			
2.7 nF											
3.3 nF											
3.9 nF											
4.7 nF						1.25 ±0.2	1.25 ±0.2				
5.6 nF											
6.8 nF											
8.2 nF											
10 nF											
Tape width		8 mm									

Note: Values in shaded cells indicate thickness class (unit: mm)

NPO														
	Soft termination													
Capacitance	1206							1210						
	50 V	100 V	250 V	500 V	630 V	1000 V	2000 V	50 V	100 V	250 V	500 V	630 V	1000 V	2000 V
1 pF														
1.2 pF														
1.5 pF														
1.8 pF														
2.2 pF														
2.7 pF														
3.3 pF														
3.9 pF														
4.7 pF														
5.6 pF														
6.8 pF														
8.2 pF														
10 pF														
12 pF														
15 pF														
18 pF														
22 pF														
27 pF			0.6 ±0.15											
33 pF														
39 pF				0.6 ±0.15										
47 pF	0.6 ±0.15	0.6 ±0.15					1.25 ±0.2							
56 pF														
68 pF														
82 pF														1.25 ±0.2
100 pF						1.25 ±0.2								
120 pF														
150 pF					1.25 ±0.2									
180 pF												1.25 ±0.2	1.25 ±0.2	
220 pF														
270 pF														
330 pF														
390 pF														
470 pF										1.25 ±0.2	1.25 ±0.2			
560 pF														
680 pF								1.25 ±0.2	1.25 ±0.2					
820 pF			0.85 ±0.15	0.85 ±0.15										
1000 pF														
1.2 nF														
1.5 nF														
1.8 nF				1.25 ±0.2										
2.2 nF														
2.7 nF			1.25 ±0.2											
3.3 nF														
3.9 nF														
4.7 nF	0.85 ±0.15	0.85 ±0.15												
5.6 nF														
6.8 nF														
8.2 nF	1.25 ±0.2	1.25 ±0.2												
10 nF														
22 nF														
Tape width	8 mm													

Note: Values in shaded cells indicate thickness class (unit: mm)

NPO - Soft termination, 1808 / 1812

NPO										
Soft termination										
Capacitance	1808			1812						
	1 KV	2 KV	3K V	100 V	250 V	500 V	630 V	1000 V	2000 V	3000 V
10 pF			1.6 ±0.2					1.25 ±0.2	1.25 ±0.2	1.25 ±0.2
12 pF										
15 pF										
18 pF										
22 pF										
27 pF										
33 pF	1.25 ±0.2	1.25 ±0.2								
39 pF										
47 pF										
56 pF				1.25 ±0.2	1.25 ±0.2	1.25 ±0.2	1.25 ±0.2			
68 pF										
82 pF										
100 pF										
120 pF										
150 pF										
180 pF										
220 pF										
270 pF										
330 pF										
390 pF										
470 pF										
560 pF										
680 pF										
820 pF										
1000 pF										
1.2 nF										
1.5 nF										
1.8 nF										
2.2 nF										
2.7 nF										
3.3 nF										
3.9 nF										
4.7 nF										
5.6 nF										
6.8 nF										
8.2 nF										
10 nF										
22 nF										
Tape width	12mm									

Note: Values in shaded cells indicate thickness class (unit: mm)

X7R - Soft termination, 0402 / 0603

X7R									
Soft termination									
Capacitance	0402				0603				
	16 V	25 V	50 V	100 V	16 V	25 V	50 V	100 V	250 V
100 pF	0.5 ±0.15	0.5 ±0.15	0.5 ±0.15	0.5 ±0.15	0.8 ±0.15	0.8 ±0.15	0.8 ±0.15	0.8 ±0.15	0.8 ±0.15
150 pF									
220 pF									
330 pF									
470 pF									
680 pF									
1.0 nF									
1.5 nF									
2.2 nF									
3.3 nF									
4.7 nF									
6.8 nF									
10 nF									
15 nF									
22 nF									
33 nF									
47 nF									
68 nF									
100 nF									
150 nF									
220 nF									
330 nF									
470 nF									
680 nF									
1000 nF									
Tape width	8 mm								

Note: Values in shaded cells indicate thickness class (unit: mm)

X7R - Soft termination, 0805

X7R								
Soft termination								
Capacitance	0805							
	16 V	25 V	50 V	100 V	250 V	500 V	630 V	1000 V
150 pF	0.6 ±0.15	0.6 ±0.15	0.6 ±0.15	0.6 ±0.15	0.85 ±0.15	0.85 ±0.15	0.85 ±0.15	0.85 ±0.15
220 pF								
330 pF								
470 pF								
680 pF								
1.0 nF								
1.5 nF								
2.2 nF								
3.3 nF								
4.7 nF								
6.8 nF					1.25 ±0.2			
10 nF						1.25 ±0.2	1.25 ±0.2	
15 nF				0.85 ±0.15				
22 nF								
33 nF	0.85 ±0.15	0.85 ±0.15	0.85 ±0.15	1.25 ±0.2				
47 nF								
68 nF								
100 nF								
150 nF	1.25 ±0.2	1.25 ±0.2	1.25 ±0.2					
220 nF								
330 nF								
470 nF								
680 nF								
1000 nF								
2.2 µF		1.25 ±0.25						
4.7 µF	1.25 ±0.25							
Tape width	8 mm							

Note: Values in shaded cells indicate thickness class (unit: mm)

X7R - Soft termination, 1206

X7R									
Soft termination									
Capacitance	1206								
	16 V	25 V	50 V	100 V	250 V	500 V	630 V	1000 V	2000 V
220 pF	0.85 ±0.15	0.85 ±0.15	0.85 ±0.15	0.85 ±0.15	0.85 ±0.15	1.25 ±0.2	1.25 ±0.2	1.25 ±0.2	1.25 ±0.2
330 pF									
470 pF									
680 pF									
1.0 nF									
1.5 nF									
2.2 nF									
3.3 nF									
4.7 nF									
6.8 nF									
10 nF									
15 nF									
22 nF					1.25 ±0.2		1.6 ±0.2		
33 nF						1.6 ±0.2			
47 nF									
68 nF				1.25 ±0.2					
100 nF					1.6 ±0.2				
150 nF			1.15 ±0.2						
220 nF									
330 nF	1.6 ±0.2	1.6 ±0.2	1.6 ±0.2	1.6 ±0.3					
470 nF									
680 nF	1.15 ±0.2	1.15 ±0.2	1.6 ±0.3						
1000 nF									
2.2 µF									
4.7 µF	1.6 ±0.3	1.6 ±0.3							
10 µF									
Tape width	12 mm								

Note: Values in shaded cells indicate thickness class (unit: mm)

X7R - Soft termination, 1210

X7R									
Soft termination									
Capacitance	1210								
	16 V	25 V	50 V	100 V	250 V	500 V	630 V	1000 V	2000 V
470 pF								1.25 ±0.3	1.25 ±0.3
680 pF									
1.0 nF									
1.5 nF									
2.2 nF	0.85 ±0.2	0.85 ±0.2	0.85 ±0.2	0.85 ±0.2	0.85 ±0.2				1.6 ±0.3
3.3 nF						1.25 ±0.3	1.25 ±0.3		
4.7 nF									
6.8 nF									
10 nF									
15 nF									
22 nF					1.25 ±0.3		1.6 ±0.3	1.6 ±0.3	
33 nF									
47 nF									
68 nF									
100 nF									
150 nF			1.15 ±0.3	1.25 ±0.3					
220 nF									
330 nF									
470 nF	1.15 ±0.3	1.15 ±0.3	1.25 ±0.3						
680 nF				2.0 ±0.3					
1000 nF	1.25 ±0.3	1.25 ±0.3							
2.2 µF	2.5 ±0.3	2.5 ±0.3	2.5 ±0.3	2.5 ±0.3					
4.7 µF									
10 µF									
Tape width	12 mm								

Note: Values in shaded cells indicate thickness class (unit: mm)

X7R			
Soft termination			
Capacitance	1808		
	1000 V	2000 V	3000 V
330 pF	1.35 ±0.4	1.35 ±0.4	1.6 ±0.4
470 pF			
680 pF			
1.0 nF			2.0 ±0.4
1.5 nF			
2.2 nF		1.6 ±0.4	
3.3 nF			
4.7 nF			
6.8 nF	1.6 ±0.4		
10 nF			
Tape width	12 mm		

Note: Values in shaded cells indicate thickness class (unit: mm)

X7R							
Soft termination							
Capacitance	1812						
	50 V	100 V	250 V	500 V	630 V	1000 V	2000 V
2.2 nF	0.85 ±0.3	0.85 ±0.3	0.85 ±0.3	1.25 ±0.4	1.35 ±0.4	1.35 ±0.4	1.35 ±0.4
3.3 nF							
4.7 nF							
6.8 nF							
10 nF							
15 nF							
22 nF							
33 nF					1.6 ±0.4	1.6 ±0.4	
47 nF			1.25 ±0.4				
68 nF							
100 nF	1.15 ±0.4	1.25 ±0.4		1.6 ±0.4			
150 nF							
220 nF			1.6 ±0.4				
330 nF							
470 nF		1.6 ±0.4					
680 nF	1.6 ±0.4						
1000 nF							
Tape width	12 mm						

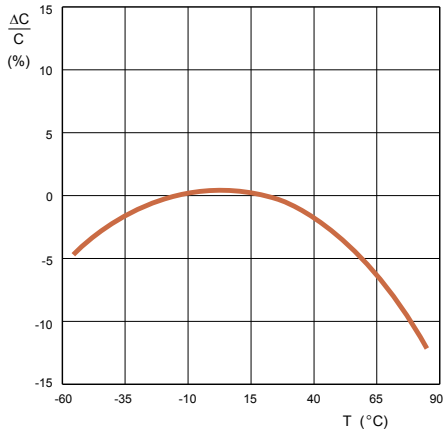
Note: Values in shaded cells indicate thickness class (unit: mm)

X5R - General purpose & High capacitance, 01005 to 1210

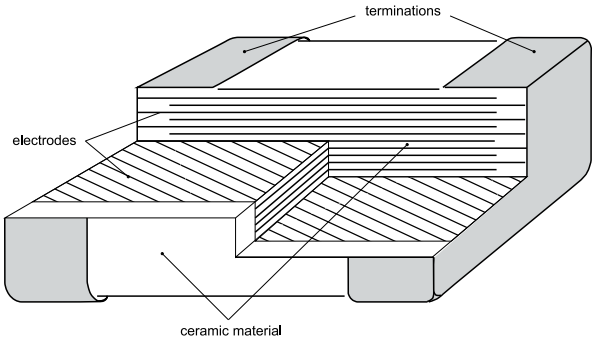
Features

- Semi-stable on capacitance and high K
- High volumetric efficiency
- Highly reliable in high temperature application
- High insulation resistance

Temperature characteristic

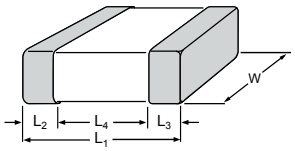


Construction



Case dimensions

Discrete capacitors - General purpose & High capacitance



Case size designation		Dimensions in mm				
Inch-based	Metric	L_1	W	L_2 / L_3 min	L_2 / L_3 max	L_4 min
01005	0402M	0.4 ±0.02	0.2 ±0.02	0.07	0.14	0.14
0201	0603M	0.6 ±0.03 (1)	0.3 ±0.03 (1)	0.10	0.20	0.20
		0.6 ±0.05 (2)	0.3 ±0.05 (2)	0.10	0.20	0.20
0402	1005M	1.0 ±0.05 (1)	0.5 ±0.05 (1)	0.15	0.35	0.40
		1.0 ±0.15 (2)	0.5 ±0.15 (2)	0.15	0.35	0.40
		1.0 ±0.20 (3)	0.5 ±0.20 (3)	0.15	0.35	0.40
0603	1608M	1.6 ±0.10 (1)	0.8 ±0.10 (1)	0.20	0.60	0.40
		1.6 ±0.20 (2)	0.8 ±0.20 (2)	0.20	0.60	0.40
0805	2012M	2.0 ±0.10 (1)	1.25 ±0.10 (1)	0.25	0.75	0.55
		2.0 ±0.20 (2)	1.25 ±0.20 (2)	0.25	0.75	0.55
1206	3216M	3.2 ±0.15 (1)	1.6 ±0.15 (1)	0.25	0.75	1.40
		3.2 ±0.30 (2)	1.6 ±0.20 (2)	0.25	0.75	1.40
1210	3225M	3.2 ±0.20 (1)	2.5 ±0.20 (1)	0.25	0.75	1.40
		3.2 ±0.40 (2)	2.5 ±0.30 (2)	0.25	0.75	1.40

Note: 1. Dimension for size 0201, C < 1 µF; 0402, C < 4.7 µF; 0603, C < 10 µF; 0805 to 1812, C ≤ 100 nF
2. Dimension for size 0201, C ≥ 1 µF; 0402, C = 2.2 µF, 16V/25V and C = 4.7 µF ; 0603, C ≥ 10 µF; 0805 to 1812, C > 100 nF
3. Dimension for size 0402, C ≥ 10 µF

X5R - General purpose & High capacitance, 01005 to 0402

X5R												
General purpose & High capacitance												
Capacitance	01005		0201					0402				
	6.3 V	10 V	6.3 V	10 V	16 V	25 V	50 V	6.3 V	10 V	16 V	25 V	50 V
100 pF	0.2 ±0.02	0.2 ±0.02										
150 pF												
220 pF	0.2 ±0.02	0.2 ±0.02										
330 pF							0.3 ±0.03					
470 pF	0.2 ±0.02	0.2 ±0.02										
680 pF												
1.0 nF	0.2 ±0.02	0.2 ±0.02										
1.5 nF												
2.2 nF	0.2 ±0.02	0.2 ±0.02										
3.3 nF				0.3 ±0.03	0.3 ±0.03	0.3 ±0.03						0.5 ±0.05
4.7 nF	0.2 ±0.02	0.2 ±0.02	0.3 ±0.03							0.5 ±0.05	0.5 ±0.05	
6.8 nF								0.5 ±0.05				
10 nF	0.2 ±0.02	0.2 ±0.02							0.5 ±0.05			
15 nF												
22 nF	0.2 ±0.02											
33 nF												
47 nF	0.2 ±0.02											
68 nF												
100 nF	0.2 ±0.02	0.2 ±0.02										
150 nF												
220 nF	0.2 ±0.02			0.3 ±0.03								0.5 ±0.05
330 nF												
470 nF	0.2 ±0.02		0.3 ±0.03	0.3 ±0.03						0.5 ±0.1	0.5 ±0.15	0.5 ±0.15
680 nF												
1 000 nF			0.3 ±0.05	0.3 ±0.05	0.3 ±0.09			*		0.5 ±0.05	0.5 ±0.05	0.5 ±0.2
2.2 µF			0.3 ±0.09	0.3 ±0.09				*		0.5 ±0.15	0.5 ±0.15	
4.7 µF								0.5 ±0.15*	0.5 ±0.15			
10 µF								0.5 ±0.2	0.5 ±0.2			
22 µF								0.5 ±0.2				
Tape width	8 mm											

Note: Values in shaded cells indicate thickness class (unit: mm)
*: 0402 low profile, T=0.3+/-0.03mm.

X5R - General purpose & High capacitance, 0603 / 0805

X5R											
General purpose & High capacitance											
Capacitance	0603						0805				
	4 V	6.3 V	10 V	16 V	25 V	50 V	6.3 V	10 V	16 V	25 V	50 V
100 pF	0.8 ±0.1	0.8 ±0.1	0.8 ±0.1	0.8 ±0.1	0.8 ±0.1	0.8 ±0.1					
150 pF											
220 pF							0.6 ±0.1	0.6 ±0.1	0.6 ±0.1	0.6 ±0.1	0.6 ±0.1
330 pF											
470 pF											
680 pF											
1.0 nF											
1.5 nF											
2.2 nF											
3.3 nF											
4.7 nF											
6.8 nF											
10 nF											
15 nF											
22 nF											
33 nF											
47 nF							0.85 ±0.1	0.85 ±0.1	0.85 ±0.1	0.85 ±0.1	0.85 ±0.1
68 nF											
100 nF											
150 nF											
220 nF											1.25 ±0.2
330 nF							1.25 ±0.2	1.25 ±0.2	1.25 ±0.2	1.25 ±0.2	
470 nF											
680 nF											
1 000 nF	*	*	*	*	*						
2.2 µF	*	*	*			0.8 ±0.2	*	*			
4.7 µF				0.8 ±0.15	0.8 ±0.15		*	*			
10 µF	0.8 ±0.2	0.8 ±0.2	0.8 ±0.2	0.8 ±0.2	0.8 ±0.2		*	*			
22 µF											
47 µF											
100 µF											
Tape width	8 mm										

Note: Values in shaded cells indicate thickness class (unit: mm)
*:0603 low profile, T=0.5+/-0.05mm; 0805 low profile, T=0.85+/-0.15mm

X5R - General purpose & High capacitance, 1206

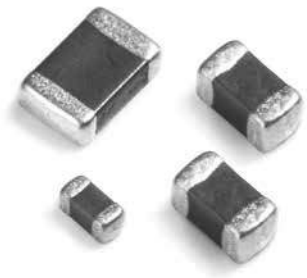
X5R					
General purpose & High capacitance					
Capacitance	1206				
	6.3 V	10 V	16 V	25 V	50 V
220 pF	0.85 ±0.1	0.85 ±0.1	0.85 ±0.1	0.85 ±0.1	0.85 ±0.1
330 pF					
470 pF					
680 pF					
1.0 nF					
1.5 nF					
2.2 nF					
3.3 nF					
4.7 nF					
6.8 nF					
10 nF					
15 nF					
22 nF					
33 nF					
47 nF					
68 nF					
100 nF					
150 nF					1.15 ±0.1
220 nF					
330 nF					1.0 ±0.1
470 nF					
680 nF	1.15 ±0.1	1.15 ±0.1	1.15 ±0.1	1.15 ±0.1	1.6 ±0.2
1 000 nF					
2.2 µF					
4.7 µF	1.6 ±0.2	1.6 ±0.2	1.6 ±0.2	1.6 ±0.2	
10 µF					1.6 ±0.3
22 µF				1.6 ±0.3	
47 µF					
100 µF	1.6 ±0.3	1.6 ±0.3			
Tape width	8 mm				

Note: Values in shaded cells indicate thickness class (unit: mm)

X5R - General purpose & High capacitance, 1210

X5R					
General purpose & High capacitance					
Capacitance	1210				
	6.3 V	10 V	16 V	25 V	50 V
2.2 nF	0.85 ±0.1	0.85 ±0.1	0.85 ±0.1	0.85 ±0.1	0.85 ±0.1
3.3 nF					
4.7 nF					
6.8 nF					
10 nF					
15 nF					
22 nF					
33 nF					
47 nF					
68 nF					
100 nF					
150 nF					1.15 ±0.1
220 nF					
330 nF					
470 nF	1.15 ±0.1	1.15 ±0.1	1.15 ±0.1	1.15 ±0.1	1.25 ±0.2
680 nF					
1 000 nF	1.25 ±0.2	1.25 ±0.2	1.25 ±0.2	1.25 ±0.2	
2.2 µF	1.9 ±0.2	1.9 ±0.2	1.9 ±0.2	1.9 ±0.2	1.9 ±0.2
4.7 µF					
10 µF					2.5 ±0.2
22 µF	2.5 ±0.2	2.5 ±0.2	2.5 ±0.2	2.5 ±0.3	
47 µF					
100 µF	2.5 ±0.3	2.5 ±0.3	2.5 ±0.3		
220 µF					
Tape width	8 mm				

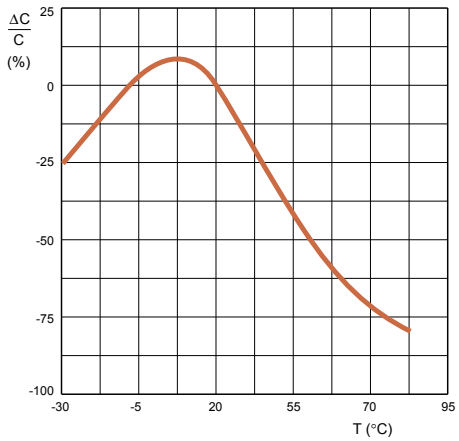
Note: Values in shaded cells indicate thickness class (unit: mm)



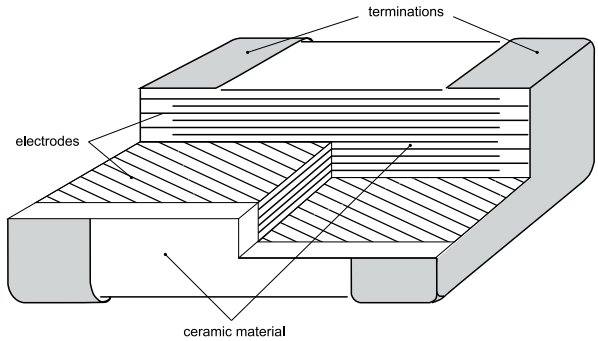
Features

- High volumetric efficiency
- Non-polar construction

Temperature characteristic

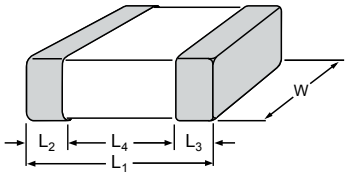


Construction



Case dimensions

Discrete capacitors - General purpose & High capacitance



Case size designation		Dimensions in mm				
Inch-based	Metric	L_1	W	L_2 / L_3 min	L_2 / L_3 max	L_4 min
0402	1005M	1.0 ±0.05 (1)	0.5 ±0.05 (1)	0.15	0.35	0.40
		1.0 ±0.20 (2)	0.5 ±0.20 (2)	0.15	0.35	0.40
0603	1608M	1.6 ±0.10 (1)	0.8 ±0.10 (1)	0.20	0.60	0.40
		1.6 ±0.15 (2)	0.8 ±0.15 (2)	0.20	0.60	0.40
0805	2012M	2.0 ±0.10 (1)	1.25 ±0.10 (1)	0.25	0.75	0.55
		2.0 ±0.20 (2)	1.25 ±0.20 (2)	0.25	0.75	0.55
1206	3216M	3.2 ±0.15 (1)	1.6 ±0.15 (1)	0.25	0.75	1.40
		3.2 ±0.30 (2)	1.6 ±0.20 (2)	0.25	0.75	1.40
1210	3225M	3.2 ±0.20 (1)	2.5 ±0.20 (1)	0.25	0.75	1.40
		3.2 ±0.40 (2)	2.5 ±0.30 (2)	0.25	0.75	1.40

Note: 1. Dimension for size 0402, C < 4.7 μF; 0603, C < 10 μF; 0805 to 1210, C ≤ 100 nF
2. Dimension for size 0402, C ≥ 4.7 μF; 0603, C ≥ 10 μF; 0805 to 1210, C > 100 nF

Y5V					
General purpose & High capacitance					
Capacitance	0402				
	6.3 V	10 V	16 V	25 V	50 V
10 nF	0.5 ±0.05	0.5 ±0.05	0.5 ±0.05	0.5 ±0.05	0.5 ±0.05
22 nF					
47 nF					
100 nF					
220 nF					
470 nF					
1000 nF					
Tape width	8 mm				

Note: Values in shaded cells indicate thickness class (unit: mm)

Y5V										
General purpose & High capacitance										
Capacitance	0603					0805				
	6.3 V	10 V	16 V	25 V	50 V	6.3 V	10 V	16 V	25 V	50 V
10 nF	0.8 ±0.1	0.8 ±0.1	0.8 ±0.1	0.8 ±0.1	0.8 ±0.1	0.6 ±0.1	0.6 ±0.1	0.6 ±0.1	0.6 ±0.1	0.6 ±0.1
22 nF										
47 nF										
100 nF										
220 nF									0.85 ±0.1	0.85 ±0.1
470 nF						0.85 ±0.1	0.85 ±0.1	0.85 ±0.1		
1000 nF										1.25 ±0.2
2.2 µF									1.25 ±0.2	
4.7 µF								1.25 ±0.2		
10 µF						1.25 ±0.2	1.25 ±0.2			
22 µF										
Tape width	8 mm									

Note: Values in shaded cells indicate thickness class (unit: mm)

Y5V										
General purpose & High capacitance										
Capacitance	1206					1210				
	6.3 V	10 V	16 V	25 V	50 V	6.3 V	10 V	16 V	25 V	50 V
10 nF	0.6 ±0.1	0.6 ±0.1	0.6 ±0.1	0.6 ±0.1	0.6 ±0.1					
22 nF										
47 nF										
100 nF										
220 nF										
470 nF	0.85 ±0.1	0.85 ±0.1	0.85 ±0.1	0.85 ±0.1	0.85 ±0.1					
1000 nF										
2.2 µF					1.15 ±0.1					
4.7 µF										
10 µF			1.15 ±0.1	1.6 ±0.2		1.5 ±0.1	1.5 ±0.1	1.5 ±0.1	1.5 ±0.1	1.5 ±0.1
22 µF	1.6 ±0.2	1.6 ±0.2	1.6 ±0.2			1.6 ±0.2	1.6 ±0.2	1.6 ±0.2		
47 µF										
Tape width	8 mm									

Note: Values in shaded cells indicate thickness class (unit: mm)

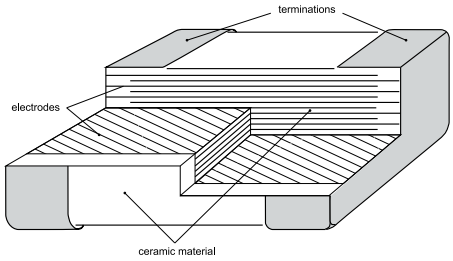
Features

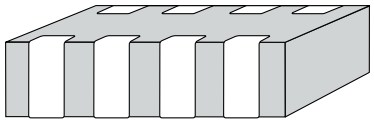
- AEC-Q200 qualified
- MSL class: MSL 1
- J-STD-020D and TS-16949 compliant
- Halogen free epoxy
- RoHS compliant

Applications

- All general purpose applications
- Entertainment applications
- Comfort / security applications
- Information applications

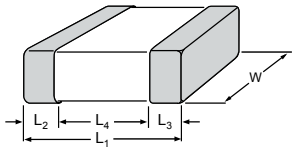
Construction





Dimensions

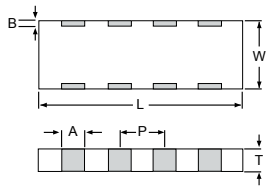
Discrete capacitors - Automotive grade



Case size designation		Dimensions in mm				
Inch-based	Metric	L1	W	L2 / L3 min	L2 / L3 max	L4 min
0201	0603M	0.6 ±0.03	0.3 ±0.03	0.10	0.20	0.20
0402	1005M	1.0 ±0.05	0.5 ±0.05	0.15	0.35	0.40
0603	1608M	1.6 ±0.20	0.8 ±0.10	0.20	0.60	0.40
0805	2012M	2.0 ±0.20	1.25 ±0.20	0.25	0.75	0.55
1206	3216M	3.2 ±0.30	1.6 ±0.20	0.25	0.75	1.40
1210	3225M	3.2 ±0.30	2.5 ±0.20	0.25	0.75	1.40
1812	4532M	4.5 ±0.40	3.2 ±0.30	0.25	0.75	2.20

Dimensions

4C arrays



Case size designation		Dimensions in mm						
Inch-based	Metric	L	W	T_{min}	T_{max}	A	B	P
0508 (4 x 0402)	1220M (4 x 1005)	2.0 ±0.15	1.25 ±0.15	0.50	0.70	0.28 ±0.10	0.2 ±0.10	0.5 ±0.10
0612 (4 x 0603)	1632M (4 x 1608)	3.2 ±0.15	1.60 ±0.15	0.70 (1)	0.90 (1)	0.4 ±0.10	0.3 ±0.20	0.8 ±0.10

Note: 1. Available for NPO and X7R

NPO - Automotive grade, 0201 to 0805

NPO								
	Automotive Grade							
Capacitance	0201	0402		0603			0805	
	50V	50V	50V	100V	250V	50V	100V	250V
0.47 pF	0.3 ±0.03	0.5 ±0.05	0.8 ±0.1	0.8 ±0.1	0.8 ±0.1	0.6 ±0.1	0.6 ±0.1	0.6 ±0.1
0. 56 pF								
0.68 pF								
0.82 pF								
1 pF								
1.2 pF								
1.5 pF								
1.8 pF								
2.2 pF								
2.7 pF								
3.3 pF								
3.9 pF								
4.7 pF								
5.6 pF								
6.8 pF								
8.2 pF								
10 pF								
12 pF								
15 pF								
18 pF								
22 pF								
27 pF								
33 pF								
39 pF								
47 pF								
56 pF								
68 pF								
82 pF								
100 pF								
120 pF								
150 pF								
180 pF								
220 pF								0.85 ±0.1
270 pF								
330 pF								
390 pF								
470 pF								
560 pF							0.85 ±0.1	
680 pF								
820 pF								
1 000 pF								
1.2 nF						0.85 ±0.1	1.25 ±0.2	
1.5 nF								
1.8 nF								
2.2 nF						1.25 ±0.2		
2.7 nF								
3.3 nF								
3.9 nF								
4.7 nF								
5.6 nF								
6.8 nF								
8.2 nF								
10 nF								
Tape width	8 mm							

Note: Values in shaded cells indicate thickness class (unit: mm)

NPO / X8G - Automotive grade / High Frequency, 0603 to 1210

NPO

Automotive Grade

Capacitance	1206					1210			
	50V	100V	250V	500V	630V	50V	100V	250V	500 V
47 pF	0.6 ±0.1	0.6 ±0.1	0.6 ±0.1	0.6 ±0.1	1.25 ±0.2				
56 pF									
68 pF									
82 pF									
100 pF									
120 pF									
150 pF									
180 pF									
220 pF									
270 pF									
330 pF									
390 pF									
470 pF									
560 pF									
680 pF									
820 pF			0.85 ±0.1	0.85 ±0.1					
1000 pF						1.25 ±0.2	1.25 ±0.2	1.25 ±0.2	1.25 ±0.2
1.2 nF									
1.5 nF									
1.8 nF									
2.2 nF									
2.7 nF									
3.3 nF									
3.9 nF									
4.7 nF									
5.6 nF									
6.8 nF									
8.2 nF									
10 nF									
Tape width	8 mm								

Note: Values in shaded cells indicate thickness class (unit: mm)

NPO

Automotive Grade High Frequency

Capacitance	0603		
	16V	25V	50V
0.2 pF	0.8 ±0.1	0.8 ±0.1	0.8 ±0.1
0.3 pF			
0.4 pF			
0.5 pF			
0.6 pF			
0.7 pF			
0.8 pF			
0.9 pF			
1 pF			
1.2 pF			
1.5 pF			
1.8 pF			
2.2 pF			
2.7 pF			
3.3 pF			
3.9 pF			
4.7 pF			
5.6 pF			
6.8 pF			
8.2 pF			
10 pF			
12 pF			
15 pF			
18 pF			
22 pF			
27 pF			
33 pF			
39 pF			
47 pF			
56 pF			
68 pF			
82 pF			
100 pF			
Tape width	8 mm		

X8G

Automotive Grade

Capacitance	0805	
	50 V	100 V
1 nF	0.6 ±0.1	0.6 ±0.1
2.2 nF		
4.7 nF		
10 nF	0.85 ±0.1	0.85 ±0.1
Tape width	8 mm	

Note: Values in shaded cells indicate thickness class (unit: mm)

X7R											
Automotive grade											
Capacitance	0201		0402				0603				
	25 V	50 V	10 V	16 V	25 V	50 V	10 V	16 V	25 V	50 V	100 V
100 pF	0.3 ±0.03	0.3 ±0.03									
150 pF											
180 pF											
220 pF			0.5 ±0.05	0.5 ±0.05	0.5 ±0.05	0.5 ±0.05					
330 pF											
390 pF											
470 pF											
680 pF											
1000 pF							0.8 ±0.1	0.8 ±0.1	0.8 ±0.1	0.8 ±0.1	0.8 ±0.1
1.5 nF											
2.2 nF											
3.3 nF											
4.7 nF											
6.8 nF											
10 nF											
15 nF											
18 nF											
22 nF											
27 nF											
33 nF											
47 nF											
68 nF											
100 nF											
150 nF											
220 nF											
270 nF											
330 nF											
390 nF											
470 nF											
680 nF											
1000 nF							0.8 ±0.1	0.8 ±0.1	0.8 ±0.1		
Tape width	8 mm										

Note: Values in shaded cells indicate thickness class (unit: mm)

X7R							
Automotive grade							
Capacitance	0805						
	10 V	16 V	25 V	50 V	100 V	250 V	500 V
1000 pF	0.85 ±0.1	0.85 ±0.1	0.85 ±0.1	0.85 ±0.1	0.85 ±0.1	0.85 ±0.1	0.85 ±0.1
1.5 nF							
2.2 nF							
3.3 nF							
4.7 nF							
6.8 nF						1.25 ±0.2	
10 nF							
15 nF							
18 nF							
22 nF							
27 nF					1.25 ±0.2		
33 nF							
47 nF							
68 nF				0.85 ±0.1 1.25 ±0.2			
100 nF							
150 nF	1.25 ±0.2	1.25 ±0.2	1.25 ±0.2	1.25 ±0.2			
220 nF							
270 nF							
330 nF							
390 nF							
470 nF							
680 nF							
1000 nF							
2.2 µF							
4.7µF							
Tape width	8 mm						

Note: Values in shaded cells indicate thickness class (unit: mm)

X8R			
Automotive Grade			
Capacitance	0805		
	16 V	25 V	50 V
22 nF	1.25 ±0.2	1.25 ±0.2	1.25 ±0.2
33 nF			
47 nF			
68 nF			
100 nF			
Tape width	8 mm		

Note: Values in shaded cells indicate thickness class (unit: mm)

X7R - Automotive grade, 1206 / 1210 / 1812

X7R							
Automotive grade							
Capacitance	1206						
	6.3 V	10 V	16 V	25V	50V	100V	250 V
22 nF	0.85 ±0.1	0.85 ±0.1	0.85 ±0.1	0.85 ±0.1	0.85 ±0.1	0.85 ±0.1	1.25 ±0.2
27 nF							1.6 ±0.2
33 nF							
47 nF							
68 nF						1.25 ±0.2	
100 nF							
150 nF					1.25 ±0.2		
220 nF							
270 nF					1.6 ±0.2	1.6 ±0.2	
330 nF							
390 nF							
470 nF	1.0 ±0.1	1.0 ±0.1	1.0 ±0.1	1.0 ±0.1			
680 nF	1.15 ±0.1	1.15 ±0.1	1.15 ±0.1	1.15 ±0.1			
1000 nF							
2.2µF	1.6 ±0.2	1.6 ±0.2	1.6 ±0.2	1.6 ±0.2			
Tape width	8 mm						

Note: Values in shaded cells indicate thickness class (unit: mm)

X7R									
Automotive grade									
Capacitance	1210							1812	
	6.3 V	10 V	16 V	25V	50V	100V	250 V	50 V	100 V
100 nF	0.85 ±0.1	0.85 ±0.1	0.85 ±0.1	0.85 ±0.1	0.85 ±0.1	0.85 ±0.1	1.25 ±0.2		
150 nF					1.25 ±0.2	1.25 ±0.2			
220 nF									
270 nF						2.0 ±0.2			
330 nF									
390 nF	1.25 ±0.2	1.25 ±0.2	1.25 ±0.2	1.25 ±0.2					
470 nF								1.6 ±0.2	1.6 ±0.2
680 nF									
1000 nF									
2.2µF					2.0 ±0.2				
4.7µF					2.5 ±0.2				
Tape width	12 mm								

Note: Values in shaded cells indicate thickness class (unit: mm)

NPO		
	4-C arrays	
Capacitance	0508	0612
	6.3 V	10 V
10 pF	0.6 ±0.1	0.8 ±0.1
12 pF		
15 pF		
18 pF		
22 pF		
33 pF		
39 pF		
47 pF		
56 pF		
68 pF		
82 pF		
100 pF		
120 pF		
150 pF		
180 pF		
220 pF		
330 pF		
390 pF		
470 pF		
Tape width	8 mm	

Note: Values in shaded cells indicate thickness class (unit: mm)

X7R						
	4-C arrays					
Capacitance	0508			0612		
	16 V	25 V	50 V	16 V	25 V	50 V
220 pF				0.8 ±0.1	0.8 ±0.1	0.8 ±0.1
330 pF						
470 pF						
680 pF						
1 nF	0.6 ±0.1	0.6 ±0.1	0.6 ±0.1			
1.2 nF						
1.5 nF						
1.8 nF						
2.2 nF						
2.7 nF						
3.3 nF						
4.7 nF						
5.6 nF						
6.8 nF						
8.2 nF						
10 nF						
12 nF						
15 nF						
18 nF						
22 nF						
27 nF						
33 nF						
47 nF						
56 nF						
68 nF						
82 nF						
100 nF						
Tape width	8 mm					

Note: Values in shaded cells indicate thickness class (unit: mm)

X7R - Automotive grade with Soft termination, 0805 to 1210

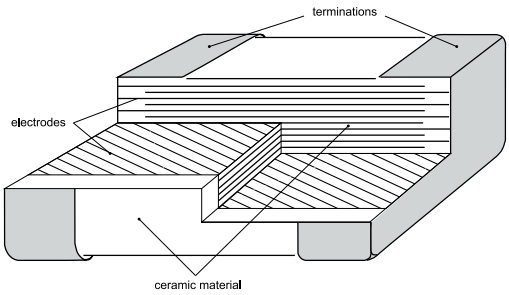
Features

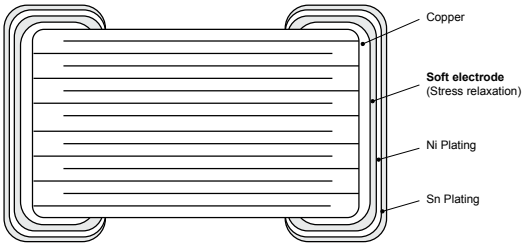
- AEC-Q200 qualified
- MSL class: MSL 1
- J-STD-020D and TS-16949 compliant
- Halogen free epoxy
- RoHS compliant
- Flexible termination system
- Increased mechanical performance

Applications

- All general purpose applications
- Entertainment applications
- Comfort / security applications
- Information applications

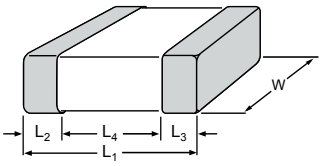
Construction





Dimensions

Discrete capacitors - Automotive grade



Case size designation		Dimensions in mm				
Inch-based	Metric	L1	W	L2 / L3 min	L2 / L3 max	L4 min
0805	2012M	2.0 ±0.30	1.25 ±0.20	0.25	0.75	0.70
1206	3216M	3.2 ±0.40	1.6 ±0.20	0.25	0.75	1.50
1210	3225M	3.2 ±0.50	2.5 ±0.30	0.25	0.85	1.40

X7R - Automotive grade with Soft termination, 0805 to 1210

X7R								
Automotive grade								
Capacitance	0603			0805				
	25 V	50 V	100 V	10 V	16 V	25 V	50 V	100 V
1.0 nF				0.85 ±0.15	0.85±0.15	0.85 ±0.15	0.85 ±0.15	0.85 ±0.15
1.5 nF								
2.2 nF								
3.3 nF								
4.7 nF								
6.8 nF								
10 nF								
15 nF								
22 nF	0.8 ±0.15	0.8 ±0.15	0.8 ±0.15					
33 nF								1.25 ±0.2
47 nF								
68 nF							1.25 ±0.2	
100 nF								
Tape width	8 mm							

Note: Values in shaded cells indicate thickness class (unit: mm)

X7R							
Automotive grade							
Capacitance	1206						
	6.3 V	10V	16V	25V	50 V	100 V	250 V
22 nF	0.85 ±0.15	0.85 ±0.15	0.85 ±0.15	0.85 ±0.15	0.85 ±0.15	0.85 ±0.15	1.25 ±0.2
33 nF							
47 nF							
68 nF						1.25 ±0.2	
100 nF							1.6 ±0.2
150 nF	1.25 ±0.2	1.25 ±0.2	1.25 ±0.2	1.25 ±0.2	1.25 ±0.2		
220 nF							
Tape width	8 mm						

Note: Values in shaded cells indicate thickness class (unit: mm)

X7R				
Automotive grade				
Capacitance	1210			
	25V	50 V	100 V	250 V
100 nF	1.25 ±0.2	1.25 ±0.2	1.25 ±0.2	1.25 ±0.2
150 nF				
220 nF				
4.7 µF	2.5 ±0.3	2.5 ±0.3		
Tape width	8 mm			

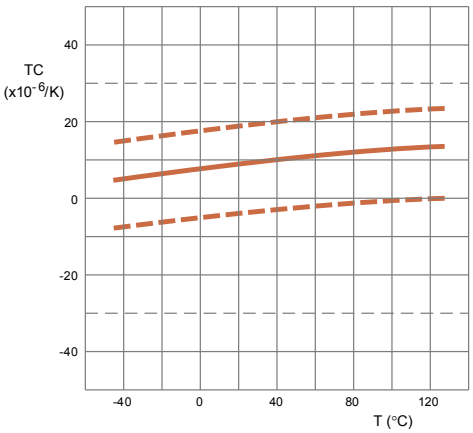
Note: Values in shaded cells indicate thickness class (unit: mm)

Features

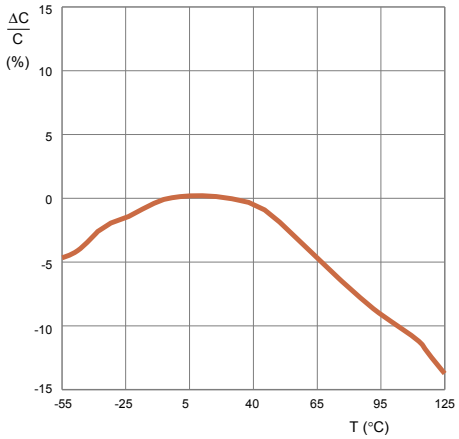
- Less than 50% board space of an equivalent discrete component
- High volumetric efficiency
- Increased throughput, by time saved in mounting

Temperature characteristic

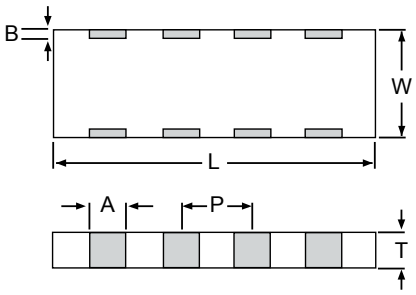
NPO



X7R



Dimensions



Dimensions

4C arrays

Case size designation		Dimensions in mm						
Inch-based	Metric	L	W	T_{min}	T_{max}	A	B	P
0508 (4 x 0402)	1220M (4 x 1005)	2.0 ±0.15	1.25 ±0.15	0.50	0.70	0.28 ±0.10	0.2 ±0.10	0.5 ±0.10
0612 (4 x 0603)	1632M (4 x 1608)	3.2 ±0.15	1.60 ±0.15	0.70	0.90	0.4 ±0.10	0.3 ±0.20	0.8 ±0.10

NPO				
4C arrays				
Capacitance	0508		0612	
	50 V	100 V	50 V	100 V
10 pF	0.6 ±0.1	0.6 ±0.1	0.8 ±0.1	0.8 ±0.1
15 pF				
18 pF				
22 pF				
27 pF				
47 pF				
100 pF				
150 pF				
180 pF				
220 pF				
270 pF				
330 pF				
390 pF				
470 pF				
Tape width	8 mm			

Note: Values in shaded cells indicate thickness class (unit: mm)

X7R							
4C arrays							
Capacitance	0508				0612		
	16 V	25 V	50 V	16 V	25 V	50 V	100 V
1 nF	0.6 ±0.1	0.6 ±0.1	0.6 ±0.1	0.8 ±0.1	0.8 ±0.1	0.8 ±0.1	
1.2 nF							
1.5 nF							
1.8 nF							
2.2 nF							
2.7 nF							
3.3 nF							
4.7 nF							
5.6 nF							
6.8 nF							
8.2 nF							
10 nF							0.85 ±0.1
12 nF							
15 nF							
18 nF							
22 nF							
27 nF							
33 nF							
47 nF							
56 nF							
68 nF							
82 nF							
100 nF							
Tape width	8 mm						

Note: Values in shaded cells indicate thickness class (unit: mm)

Sample Books

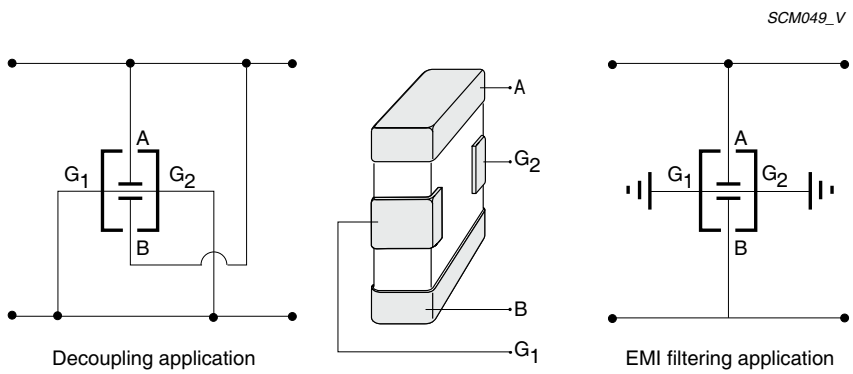
Sample book (small)	Description	Size	Volt.	Cap range
CC0402000000SB000	CC0402 Commodity	0402	≤ 50V	<1μF
CC0603000000SB000	CC0603 Commodity	0603	≤ 50V	<1μF
CC0805000000SB000	CC0805 Commodity	0805	≤ 50V	<1μF
CC1206000000SB000	CC1206 Commodity	1206	≤ 50V	<1μF
CQ0201000000SB000	HiQ 0201	0201	25V	0.2pF to 10pF
CQ0402000000SB000	HiQ 0402	0402	50V	0.2pF to 33pF
CQ0603000000SB000	HiQ 0603	0603	50V	0.2pF to 47pF
CQ0805000000SB000	HiQ 0805	0805	250V	0.2pF to 100pF
HV777S00000000000	Hi-Votage sample book	0805 to 1206	100V to 630V	47pF to 1μF
AC7777000000SB000	AC sample book	0402 to 1206	16V to 100V	10pF to 1μF
HC8888000000SB000	Hi-Cap Series	0201 to 1210	6.3V to 25V	1μF to 220μF
HCV888800000SB000	HCV Series	0402 to 1210	6.3V to 100V	1μF to 22μF
SS1111000000SB000	CC Small Size series	01005 + 0201	6.3V to 50V	0.5pF to 2.2μF
CS8888000000SB000	Soft termination Series	0402 to 1206	16V to 1000V	100pF to 1μF

SMD CERAMIC EMI FILTER CAPACITORS
X2Y® PRODUCTS

Features

- Broadband Filtering and Decoupling: X2Y® is effective up to 10 GHz and frequencies beyond
- Ultra Low ESL: Noise cancellation within X2Y® makes ESL reducing from nanohenry to picohenry levels
- Bypass: Unlike feedthrough capacitors, X2Y® is in bypass, so no DC current limitations
- Matched Y-caps: Two tightly matched line to ground capacitors in one device
- Superior Balance: Temperature and voltage variations balanced of two Y-caps
- Aging Reliability: Aging effects are equal on two Y-caps

Circuit of typical applications



Benefits

- Fewer Components in Filtering: One X2Y® can replace multiple inductors and/or capacitors
- Superior Performance in Filtering: One X2Y® can eliminate both differential and common mode noises
- Fewer Components in Decoupling: Up to 1:7 replacement of MLCC in power delivering system bypass networks
- Superior Performance in Decoupling: Large or small, X2Y® components exhibit ultra low ESL
- Total Cost Savings: Assembly cost savings through reduced component count and placement costs
- Board Level Design Advantages: Dramatically reduces via drills, which blocks routing

Applications

- EMI filtering on DC motors
- Filtered connectors (airbag connectors, RJ-45 connectors)
- High speed data-line filtering
- Decoupling of supply-lines in high speed digital circuits
- Broadband filtering
- Amplifier decoupling and EMI suppression
- IC Decoupling, on-package, on-PCB
- DC power line filtering
- Data line filtering
- EMI suppression for DC motors
- Sensors
- Audio

X7R					
Size	Y-Capacitor		Voltage rating (V)	Thickness (mm)	Global part number
	Capacitance (nF)	Tolerance (%)			
0603	1	20%	100	0.65	CX 0603 MR X7R 0BB 102
	1.5	20%	100	0.65	CX 0603 MR X7R 0BB 152
	2.2	20%	100	0.65	CX 0603 MR X7R 0BB 222
	4.7	20%	100	0.65	CX 0603 MR X7R 0BB 472
	5.6	20%	100	0.65	CX 0603 MR X7R 0BB 562
	10	20%	50 / 63	0.65	CX 0603 MR X7R 9BB 103
	15	20%	25	0.65	CX 0603 MR X7R 8BB 153
	18	20%	25	0.65	CX 0603 MR X7R 8BB 183
	22	20%	25	0.65	CX 0603 MR X7R 8BB 223
	39	20%	16	0.65	CX 0603 MR X7R 7BB 393
	47	20%	16	0.65	CX 0603 MR X7R 7BB 473
	56	20%	16	0.65	CX 0603 MR X7R 7BB 563
	100	20%	10	0.65	CX 0603 MR X7R 6BB 104
	180	20%	10	0.65	CX 0603 MR X7R 6BB 184
	220	20%	10	0.65	CX 0603 MR X7R 6BB 224
	270	20%	10	0.65	CX 0603 MR X7R 6BB 274
	330	20%	10	0.65	CX 0603 MR X7R 6BB 334
0805	1	20%	100	0.85	CX 0805 MR X7R 0BB 102
	1.5	20%	100	0.85	CX 0805 MR X7R 0BB 152
	2.2	20%	100	0.85	CX 0805 MR X7R 0BB 222
	4.7	20%	100	0.85	CX 0805 MR X7R 0BB 472
	5.6	20%	100	0.85	CX 0805 MR X7R 0BB 562
	10	20%	100	0.85	CX 0805 MR X7R 0BB 103
	15	20%	50 / 63	0.85	CX 0805 MR X7R 9BB 153
	18	20%	50 / 63	0.85	CX 0805 MR X7R 9BB 183
	22	20%	50 / 63	0.85	CX 0805 MR X7R 9BB 223
	47	20%	16	0.85	CX 0805 MR X7R 7BB 473
	56	20%	16	0.85	CX 0805 MR X7R 7BB 563
	100	20%	16	0.85	CX 0805 MR X7R 7BB 104
	180	20%	10	0.85	CX 0805 MR X7R 6BB 184
1206	10	20%	100	1.2	CX 1206 MK X7R 0BB 103
	15	20%	100	1.2	CX 1206 MK X7R 0BB 153
	18	20%	100	1.2	CX 1206 MK X7R 0BB 183
	22	20%	100	1.2	CX 1206 MK X7R 0BB 223
	33	20%	100	1.2	CX 1206 MK X7R 0BB 333
	39	20%	50 / 63	1.2	CX 1206 MK X7R 9BB 393
	47	20%	50 / 63	1.2	CX 1206 MK X7R 9BB 473
	56	20%	50 / 63	1.2	CX 1206 MK X7R 9BB 563
	100	20%	50 / 63	1.2	CX 1206 MK X7R 9BB 104
	180	20%	16	1.2	CX 1206 MK X7R 7BB 184
	220	20%	16	1.2	CX 1206 MK X7R 7BB 224
	270	20%	16	1.2	CX 1206 MK X7R 7BB 274
	330	20%	16	1.2	CX 1206 MK X7R 7BB 334
	390	20%	16	1.2	CX 1206 MK X7R 7BB 394
	470	20%	10	1.2	CX 1206 MK X7R 6BB 474
1210	100	20%	50	1.6	CX1210MKX7R9BB104
	180	20%	50	1.6	CX1210MKX7R9BB184
	220	20%	50	1.6	CX1210MKX7R9BB224
	270	20%	50	1.6	CX1210MKX7R9BB274
	330	20%	50	1.6	CX1210MKX7R9BB334
	390	20%	50	1.6	CX1210MKX7R9BB394
	470	20%	50	1.6	CX1210MKX7R9BB474
	560	20%	50	1.6	CX1210MKX7R9BB564
	820	20%	16	1.6	CX1210MKX7R7BB824
	1000	20%	16	1.6	CX1210MKX7R7BB105

X5R					
Size	Y-Capacitor		Voltage rating (V)	Thickness (mm)	Global part number
	Capacitance (nF)	Tolerance (%)			
0603	180	20%	10	0.65	CX 0603 MR X5R 6BB 184
	220	20%	10	0.65	CX 0603 MR X5R 6BB 224
	330	20%	10	0.65	CX 0603 MR X5R 6BB 334
	390	20%	10	0.65	CX 0603 MR X5R 6BB 394
	470	20%	10	0.65	CX 0603 MR X5R 6BB 474

Thickness classes and packing quantities		
Thickness Classification (mm)	Quantity per reel	
	8 mm tape width	
	Ø180mm / 7"	
	0603 - 1410	
	Paper	Blister
0.60 ±0.10	4 000	---
0.85 ±0.10	4 000	---
1.20 ±0.15	---	3 000
1.60 ±0.15	---	2 000
1.90 ±0.20	---	2 000

Note: 1. Special values are available on request

Global part number

Ordering example: CX0603MKX7R6BB104

X 0603 M K X7R 6 B B 104

Series name (code 1-2)
CX = X2Y®-series

Size code (code 3-6)

EIA	mm
0603	(1608M)
0805	(2012M)
1206	(3216M)
1210	(3225M)
1410	(3625M)

Capacitance tolerance (code 7)
M = ±20%

Packing style (code 8)
R = Paper tape reel Ø7"
K = Embossed plastic tape reel Ø7"

TC material (code 9-11)
NPO
X7R
X5R

Capacitance value (code 15-17)
104 = 100 000 pF
(2 significant digits+number of zeros; the 3rd digit signifies the multiplying factor, and letter R is decimal point)
0 = x 1
1 = x 10^1
2 = x 10^2
3 = x 10^3
4 = x 10^4
5 = x 10^5
6 = x 10^6

Process code (code 14)
B = BME

Termination (code 13)
B = Ni-barrier

Rated voltage (code 12)
5 = 6.3 V
6 = 10 V
7 = 16 V
8 = 25 V
9 = 50 V
0 = 100 V

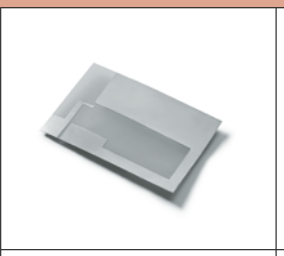
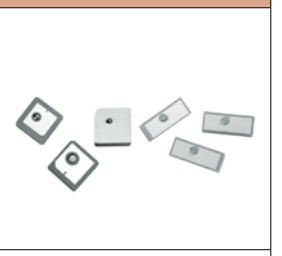
WIRELESS COMPONENTS

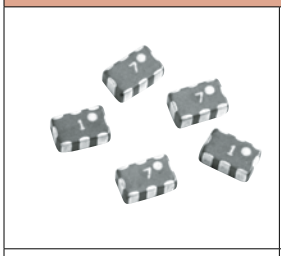
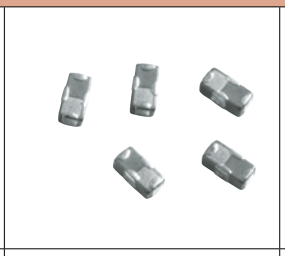
Introduction

Yageo produces a comprehensive range of wireless components, inclding metal/PCB/FPCB antenna, patch antenna (ceramic bulk), active antenna (LNA circuit), chip antenna, and RF components (filter/balancer).

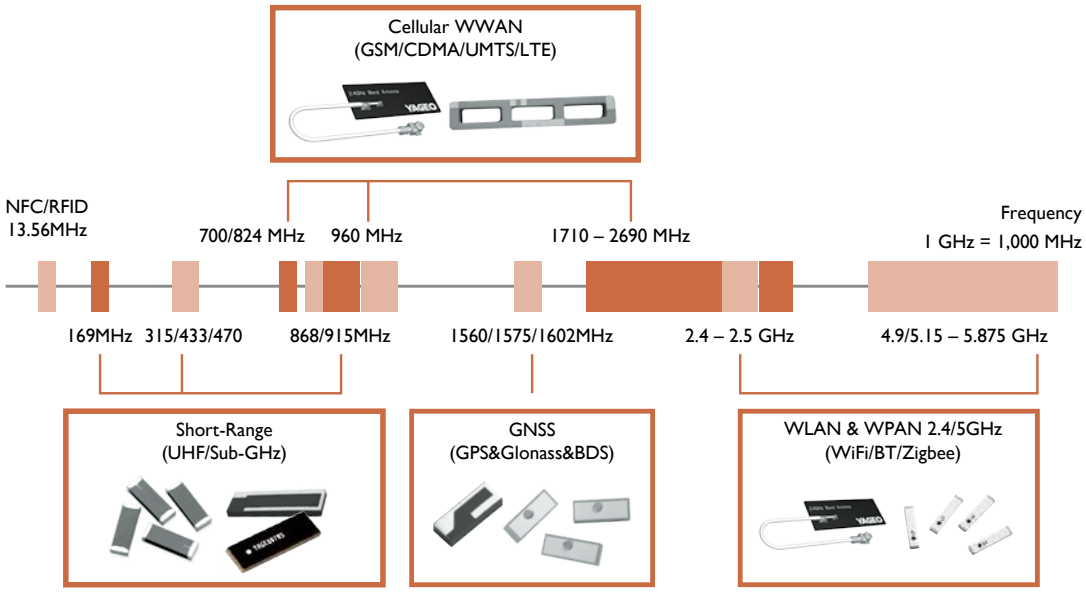
Our products cover a wide variety of wireless communication protocols, including Bluetooth & IEEE 802.11b/g, WPAN (Wireless Personal Area Network), WLAN (Wireless Local Area Network), WMAN (Wireless Metropolitan Area Network), WWAN (Wireless Wide Area Network) and LTE (Long Term Evolution).

Wireless Components

Antenna				
				
Metal	PCB	FPCB	LTCC / Ceramic	Patch / Ceramic

LTCC Balun/ Filter/ Balun + Filter (Combo) / Coupler				
				
Balun	Filter	Diplexer	Balanced Filter	Coupler

Yageo Antenna Portfolio



Portable devices, home appliances, industrial/medical equipment will be equipped with wireless connectivity for Peer-to-Peer data exchange. More wireless components are needed.

Key features of wireless components

Compact
- **Maximize performance with the smallest size required**
- **The smallest 2.4/5 GHz antenna: PCB 18.4x7.5 mm / LTCC 1.0x0.5 mm**

Multi-Band & High Efficiency
- **WWAN: Quad-band (850/900/1800/1900 MHz) to Penta-band (850/900/1800/1900/2100 MHz)**
- **Support 4G cellular network LTE 700 MHz (Band 12,13,17), 2300/2600 MHz**
- **Multi-band 2.3/2.4/2.7 & 5 GHz supporting WLAN/WiMAX/LTE**
- **Operating in navigational systems Beidou, GPS & Glonass: 1561 - 1606 MHz**

High Reliability
- **Operating temperature range: -40°C ~ 105°C**
- **Operating humidity 95% RH at 40°C**
- **Vibration verification**

Easy Installation
- **Reliable adhesive tape, surface mount, and flexible cable/connector selection**

2.4 GHz

Model	Part No./ Description	Electrical Data	Mechanical Data
	ANT1204F001R2400A 1204 2.4GHz PIFA Chip Ante	**Freq. Range:** 2400~2500 MHz **VSWR*:** 2.0 (Max) **Polarization:** Linear **Peak Gain :** 6.66 dBi (Typ.)	**Size** (mm) **:** 12*4*2.0 **Operating Temp.:** -40 ~ 105°C **RoHS Compliance**
	ANT9520LL06R2400A 9520 2.4GHz Chip Antenna	**Freq. Range:** 2400~2500 MHz **VSWR*:** 2.5 (Max) **Polarization:** Linear **Peak Gain :** 2.85 dBi (Typ.)	**Size** (mm) **:** 9.5*2.0*1.2 **Operating Temp.:** -40 ~ 105°C **RoHS Compliance**
	ANT8010LL04R2400A 8010 2.4GHz Chip Antenna	**Freq. Range:** 2400~2500 MHz **VSWR*:** 2.0 (Max) **Polarization:** Linear **Peak Gain :** 5.88 dBi (Typ.)	**Size** (mm) **:** 8.0*1.0*1.0 **Operating Temp.:** -40 ~ 105°C **RoHS Compliance**
	ANT7836A003R2400A 7836 2.4GHz Chip Antenna	**Freq. Range:** 2400~2500 MHz **VSWR*:** 2.0 (Max) **Polarization:** Linear **Peak Gain :** 3.93 dBi (Typ.)	**Size** (mm) **:** 7.8*3.6*0.5 **Operating Temp.:** -40 ~ 105°C **RoHS Compliance**
	ANT7020LL05R2400A 7020 2.4GHz Chip Antenna	**Freq. Range:** 2400~2500 MHz **VSWR*:** 2.8 (Max) **Polarization:** Linear **Peak Gain :** 2.62 dBi (Typ.)	**Size** (mm) **:** 7.0*2.0*0.8 **Operating Temp.:** -40 ~ 105°C **RoHS Compliance**
	ANT5320LL45R2400A 5320 2.4GHz Chip Antenna	**Freq. Range:** 2400~2500 MHz **VSWR*:** 2.0 (Max) **Polarization:** Linear **Peak Gain :** 5.5 dBi (Typ.)	**Size** (mm) **:** 5.3*2.0*1.2 **Operating Temp.:** -40 ~ 105°C **RoHS Compliance**
	ANT5320LL24R2400A 5320 2.4GHz PIFA Chip Antenna	**Freq. Range:** 2400~2500 MHz **VSWR*:** 2.0 (Max) **Polarization:** Linear **Peak Gain :** 2.78 dBi (Typ.)	**Size** (mm) **:** 5.3*2.0*1.25 **Operating Temp.:** -40 ~ 105°C **RoHS Compliance**
	ANT5010LL04R2400A 5010 2.4GHz Chip Antenna	**Freq. Range:** 2400~2500 MHz **VSWR*:** 2.8 (Max) **Polarization:** Linear **Peak Gain :** 2.28 dBi (Typ.)	**Size** (mm) **:** 5.0*1.0*1.0 **Operating Temp.:** -40 ~ 105°C **RoHS Compliance**
	ANT3216LL00R2400A 3216 2.4Ghz Chip Antenna	**Freq. Range:** 2400~2500 MHz **VSWR*:** 2.5 (Max) **Polarization:** Linear **Peak Gain :** 5 dBi (Typ.)	**Size** (mm) **:** 3.2*1.6*1.3 **Operating Temp.:** -40 ~ 105°C **RoHS Compliance**
	ANT3216LL11R2400A 3216 2.4GHz PIFA Chip Antenna	**Freq. Range:** 2400~2500 MHz **VSWR*:** 2.8 (Max) **Polarization:** Linear **Peak Gain :** 3.68 dBi (Typ.)	**Size** (mm) : 3.2*1.6*1.2 **Operating Temp.:** -40 ~ 105°C **RoHS Compliance**
	ANT2012LL13R2400A 2012 2.4GHz PIFA Chip Antenna	**Freq. Range :** 2400~2500 MHz **VSWR*:** 2.0 (Max) **Polarization:** Linear **Peak Gain :** 2.72 dBi (Typ.)	**Size** (mm) **:** 2.0*1.2*1.0 **Operating Temp.:** -40 ~ 105°C **RoHS Compliance**
	ANT1608LL14R2400A 1608 2.4GHz PIFA Chip Antenna	**Freq. Range :** 2400~2500 MHz **VSWR*:** 3.0 (Max) **Polarization:** Linear **Peak Gain :** 2.0 dBi (Typ.)	**Size** (mm) **:** 1.6*0.8*0.4 **Operating Temp.:** -40 ~ 105°C **RoHS Compliance**

* VSWR depends on the environment

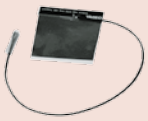
2.4 GHz

Model	Part No./ Description	Electrical Data	Mechanical Data
	ANT1005LL14R2400A 1005 2.4G PIFA Chip Antenna	**Freq. Range :** 2400~2484 MHz **VSWR*:** 3.0 (Max) **Polarization:** Linear **Peak Gain :** 2.21 dBi (Typ.)	**Size** (mm) **:** 1.0*0.5*0.37 **Operating Temp.:** -40 ~ 105°C **RoHS Compliance**
	ANTX200P001B24003 2.4GHz PCB Antenna - mini	**Freq. Range :** 2400 MHz **VSWR*:** 2.5 (Max) **Polarization:** Linear **Peak Gain :** 4.8 dBi (Typ.)	**Size** (mm) **:** 18.4*7.5*0.55 **Operating Temp.:** -40 ~ 80°C **RoHS Compliance**

2.4 GHz / GPS

Model	Part No./ Description	Electrical Data	Mechanical Data
	ANT1003LL15R1524A 1003 2.4GHz+GPS PIFA Chip Antenna	**Freq. Range :** 1575 / 2400 MHz **VSWR*:** 2.8 (Max) **Polarization:** Linear **Peak Gain :** 1.15 dBi / 2.90 dBi (Typ.)	**Size** (mm) **:** 10*3*1.5 **Operating Temp.:** -40 ~ 105°C **RoHS Compliance**
	ANT5320LL07R1524A / 5320 2.4GHz+GPS PIFA Chip Antenna	**Freq. Range :** 1575 / 2400 MHz **VSWR*:** 2.0 (Max) **Polarization:** Linear **Peak Gain :** 2.47 dBi / 2.04 dBi (Typ.)	**Size** (mm) **:** 5.3*2.0*1.2 **Operating Temp.:** -40 ~ 105°C **RoHS Compliance**

2.4 / 5 GHz

Model	Part No./ Description	Electrical Data	Mechanical Data
	ANT1003LL15R2455A 1003 2.4+5GHz Chip Antenna	**Freq. Range :** 2400~2500/ 5150~5875 MHz **VSWR*:** 2.8 (Max) **Polarization:** Linear **Peak Gain :** 2.45 dBi / 1.55dBi (Typ.)	**Size** (mm) **:** 10*3*1.6 **Operating Temp.:** -40 ~ 105°C **RoHS Compliance**
	ANT5320LL04R2455A 5320 2.4+5GHz Chip Antenna	**Freq. Range :** 2400~2500/ 5150~5875 MHz **VSWR*:** 2.8 (Max) **Polarization:** Linear **Peak Gain :** 2.72 dBi / 3.85 dBi (Typ.)	**Size** (mm) **:** 5.3*2.0*1.4 **Operating Temp.:** -40 ~ 105°C **RoHS Compliance**
	ANT5320LL24R2455A 5320 2.4+5GHz PIFA Chip Antenna	**Freq. Range :** 2400~2500/ 5150~5875 MHz **VSWR*:** 2.8 (Max) **Polarization:** Linear **Peak Gain :** 2.17 dBi / 3.51 dBi (Typ.)	**Size** (mm) **:** 5.3*2.0*1.2 **Operating Temp.:** -40 ~ 105°C **RoHS Compliance**
	ANT3216LL11R2455A 3216 2.4+5GHz PIFA Chip Antenna	**Freq. Range:** 2400 - 2500/5150 - 5875 MHz **VSWR*:** 2.8 (Max) **Polarization:** Linear **Peak Gain :** 0.45/0.64 dBi (Typ.)	**Size (mm) :** 3.2*1.6*1.2 **Operating Temp.:** -40 ~ 105°C **RoHS Compliance**
	ANT1608LL14R2455A 1608 2.4+5GHz Chip Antenna	**Freq. Range :** 2400 - 2500/5150 - 5875 MHz **VSWR*:** 6/3.5 (Max) **Polarization:** Linear **Peak Gain :** 3.11 / 3.43 dBi (Typ.)	**Size** (mm) **:** 1.6*0.8*0.4 **Operating Temp.:** -40~105°C **RoHS Compliance**
	ANTX200P002B24553 2.4+5GHz PCB Antenna	**Freq. Range :** 2400 - 2500/5150 - 5875MHz **VSWR*:** 2.5 (Max) **Polarization:** Linear **Peak Gain :** 2.3 dBi (Typ.)	**Size** (mm) **:** 40*43*0.55 **Operating Temp.:** -40 ~ 105°C **RoHS Compliance**
	ANTX100P001B24553 2.4+5GHz PCB Antenna	**Freq. Range :** 2400~2500/ 5150~5875 MHz **VSWR*:** 2.5 (Max) **Polarization:** Linear **Peak Gain :** 5.1 dBi (Typ.)	**Size** (mm) **:** 50*10*0.9 **Operating Temp.:** -40 ~ 80°C **RoHS Compliance**

* VSWR depends on the environment

5 GHz

Model	Part No./ Description	Electrical Data	Mechanical Data
	ANT3216LL05R5000A 3216 5GHz Chip Antenna	**Freq. Range :** 5150~5875 MHz **VSWR*:** 2.0 (Max) **Polarization:** Linear **Peak Gain :** 5.71 dBi (Typ.)	**Size** (mm) **:** 3.2*1.6*1.3 **Operating Temp.:** -40 ~ 105°C **RoHS Compliance**

* VSWR depends on the environment

Cellular WWAN

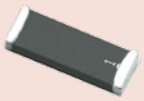
Model	Part No./ Description	Electrical Data	Mechanical Data
	ANT2112A010B0918A 2112 Cellular-Band Chip Antenna	**Freq. Range :** 824~960 / 1710~1990 MHz **VSWR*:** 2.0 (Max) **Polarization:** Linear **Peak Gain :** 0.5 ~ 1 dBi (Typ.)	**Size** (mm) **:** 21*12*0.5 **Operating Temp.:** -40 ~ 105°C **RoHS Compliance**
	ANT1204LL00R0918A 1204 Cellular-Band Chip Antenna	**Freq. Range :** 900/1800 MHz **VSWR*:** 3.0 (Max) **Polarization:** Linear **Peak Gain :** N/A	**Size** (mm) **:** 12*4*1.2 **Operating Temp.:** -40 ~ 105°C **RoHS Compliance**
	ANT3505B002TWPENS 3505 Penta-band Antenna	**Freq. Range :** 824~960 /1710~2170 MHz **VSWR*:** 2.8 / 3.5 (Max) **Polarization:** Linear **Peak Gain :** 2.9 dBi (Typ.)	**Size** (mm) **:** 35*5*6 **Operating Temp.:** -40 ~ 105°C **RoHS Compliance**
	ANTX100P001BWPEN3 Penta-band PCB Antenna	**Freq. Range :** 824~960 / 1710~2170 MHz **VSWR*** 2.5 Max (Low Band) 3.5 Max (High Band) **Polarization:** Linear **Peak Gain :** 4.2 dBi (Typ.)	**Size** (mm) **:** 50*20*0.55 **Operating Temp.:** -40 ~ 80°C **Cable*:** Φ1.13 / 100mm **Connector:** I-PEX **Mounting:** Adhesive Tape **RoHS Compliance**
	ANT4005B000RWHEXS 4005 LTE Antenna	**Freq. Range :** 698 - 960/1710 - 2690 MHz **VSWR*:** 3.0 Max (Low Band) **Polarization:** Linear **Peak Gain :** 3.2 / 4.0 dBi (Typ.)	**Size** (mm) **:** 40*5*6 **Operating Temp.:** -40 ~ 80°C **RoHS Compliance**
	ANTX100P120BUNVS3 Universal PCB Antenna	**Freq. Range:** 700~6000 MHz **VSWR*:** **Polarization:** Linear **Peak Gain :** 4.14 dBi (Typ.)	**Size** (mm) : 90*20*0.55 **Operating Temp.:** -40 ~ 105°C **RoHS Compliance**
	ANT4005B000RUNVSS 4005 Universal Antenna	**Freq. Range:** 700~6000 MHz **VSWR*:** **Polarization:** Linear **Peak Gain :** 1.46 / 2.89 / 1.81 dBi (Typ.)	**Size** (mm) : 40*5*6 **Operating Temp.:** -40 ~ 105°C **RoHS Compliance**

Short-Range

Model	Part No./ Description	Electrical Data	Mechanical Data
	ANT1204LL05R0915A 1204 915MHz Chip Antenna	**Freq. Range :** 915 MHz **VSWR*:** 2.0 (Max) **Polarization:** Linear **Peak Gain :** 3.32 dBi (Typ.)	**Size** (mm) **:** 12*4*1.6 **Operating Temp.:** -40 ~ 105°C **RoHS Compliance**
	ANT1204F005R0915A 1204 915MHz Chip Antenna	**Freq. Range :** 915 MHz **VSWR*:** 2.0 (Max) **Polarization:** Linear **Peak Gain :** 1.59 dBi (Typ.)	**Size** (mm) **:** 12*4*1.6 **Operating Temp.:** -40 ~ 85°C **RoHS Compliance**

* VSWR depends on the environment

Short-Range

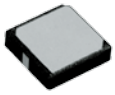
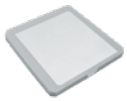
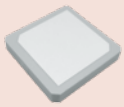
Model	Part No./ Description	Electrical Data	Mechanical Data
	ANT1204LL08R0870A 1204 870MHz Chip Antenna	**Freq. Range :** 870 MHz **VSWR*:** 2.0 (Max) **Polarization:** Linear **Peak Gain :** 0.5 dBi (Typ.)	**Size** (mm) **:** 12*4*1.6 **Operating Temp.:** -40 ~ 105°C **RoHS Compliance**
	ANT1204LL16R0870A 1204 870MHz PIFA Chip Antenna	**Freq. Range :** 870 MHz **VSWR*:** 2.8 (Max) **Polarization:** Linear **Peak Gain :** 1.05 dBi (Typ.)	**Size** (mm) **:** 12*4*1.0 **Operating Temp.:** -40 ~ 105°C **RoHS Compliance**
	ANT1204F007R0870A 1204 870MHz Chip Antenna	**Freq. Range :** 870 MHz **VSWR*:** 2.0 (Max) **Polarization:** Linear **Peak Gain :** 1.67 dBi (Typ.)	**Size** (mm) **:** 12*4*1.6 **Operating Temp.:** -40 ~ 85°C **RoHS Compliance**
	ANT7020LL05R0870A 7020 870MHz Chip Antenna	**Freq. Range :** 870 MHz **VSWR*:** 2.0 (Max) **Polarization:** Linear **Peak Gain :** N/A	**Size** (mm) **:** 7.0*2.0*0.7 **Operating Temp.:** -40 ~ 105°C **RoHS Compliance**
	ANT1204LL20R0433A 1204 433MHz Chip Antenna	**Freq. Range :** 315/ 433 MHz **VSWR*:** 3.0 (Max) **Polarization:** Linear **Peak Gain :** 0.83 dBi (Typ.)	**Size** (mm) **:** 12*4*1.2 **Operating Temp.:** -40 ~ 105°C **RoHS Compliance**
	ANT1204F002R0433A 1204 433MHz Chip Antenna	**Freq. Range :** 315/ 433 MHz **VSWR*:** 2.0 (Max) **Polarization:** Linear **Peak Gain :** 0.79 dBi (Typ.)	**Size** (mm) **:** 12*4*1.6 **Operating Temp.:** -40 ~ 105°C **RoHS Compliance**
	ANT2405F001R0169A 2405 169MHz Chip Antenna	**Freq. Range :** 169 MHz **VSWR*:** 2.0 (Max) **Polarization:** Linear **Peak Gain :** N/A	**Size** (mm)**:** 24*5*1.6 **Operating Temp.:** -40 ~ 105°C **RoHS Compliance**

GPS

Model	Part No./ Description	Electrical Data	Mechanical Data
	ANT8010LL05R1575A 8010 GPS Chip Antenna	**Freq. Range :** 1575 MHz **VSWR*:** 2.0 (Max) **Polarization:** Linear **Peak Gain:** 0.67 dBi (Typ.)	**Size** (mm)**:** 8.0*1.0*1.0 **Operating Temp.:** -40 ~ 105°C **RoHS Compliance**
	ANT5320LL14R1575A 5320 GPS PIFA Chip Antenna	**Freq. Range :** 1575 MHz **VSWR*:** 2.0 (Max) **Polarization:** Linear **Peak Gain:** 3.16 dBi (Typ.)	**Size** (mm)**:** 5.3*2.0*1.2 **Operating Temp.:** -40 ~ 105°C **RoHS Compliance**
	ANT3216LL15R1575A 3216 GPS PIFA Chip Antenna	**Freq. Range :** 1575 MHz **VSWR*:** 2.0 (Max) **Polarization:** Linear **Peak Gain:** 7.32 dBi (Typ.)	**Size** (mm)**:** 3.2*1.6*1.2 **Operating Temp.:** -40 ~ 105°C **RoHS Compliance**
	ANT1010B00FT1575S 10104 GPS Patch Antenna	**Freq. Range :** 1575 MHz **VSWR*:** 2.0 (Max) **Polarization:** RHCP **Peak Gain:** -3 dBic(Typ.)	**Size** (mm)**:** 10*10*4 **Operating Temp.:** -40 ~ 105°C **Mounting:** PIN **RoHS Compliance**

* VSWR depends on the environment

GPS

Model	Part No./ Description	Electrical Data	Mechanical Data
	ANT1212B00DT1575S 12124 GPS Patch Antenna	**Freq. Range :** 1575 MHz **VSWR*:** 2.0 (Max) **Polarization:** RHCP **Peak Gain:** -1 dBic(Typ.)	**Size** (mm): 12*12*4 **Operating Temp.:** -40 ~ 105°C **Mounting:** PIN **RoHS Compliance**
	ANT1515B00DT1575S 15154 GPS Patch Antenna	**Freq. Range :** 1575 MHz **VSWR*:** 2.0 (Max) **Polarization:** RHCP **Peak Gain:** 1.5 dBic(Typ.)	**Size** (mm): 15*15*4 **Operating Temp.:** -40 ~ 105°C **Mounting:** PIN **RoHS Compliance**
	ANT1515B00FT1575S 15154 GPS Patch Ant	**Freq. Range :** 1575 MHz **VSWR*:** 2.0 (Max) **Polarization:** RHCP **Peak Gain:** 2.0 dBic(Typ.)	**Size** (mm): 15*15*4 **Operating Temp.:** -40 ~ 105°C **Mounting:** PIN **RoHS Compliance**
	ANT1818B00AT1575S 18182 GPS Patch Antenna	**Freq. Range :** 1575 MHz **VSWR*:** 2.0 (Max) **Polarization:** RHCP **Peak Gain:** 2 dBic(Typ.)	**Size** (mm): 18*18*2 **Operating Temp.:** -40 ~ 105°C **Mounting:** SMD **RoHS Compliance**
	ANT1818B00BT1575S 18184 GPS Patch Antenna	**Freq. Range :** 1575 MHz **VSWR*:** 2.0 (Max) **Polarization:** RHCP **Peak Gain:** 2 dBic(Typ.)	**Size** (mm): 18*18*4 **Operating Temp.:** -40 ~ 105°C **Mounting:** SMD **RoHS Compliance**
	ANT1818B00CT1575S 18182 GPS Patch Antenna	**Freq. Range:** 1575 MHz **VSWR*:** 2.0 (Max) **Polarization:** RHCP **Peak Gain:** 2 dBic(Typ.)	**Size** (mm): 18*18*2 **Operating Temp. :** -40 ~ 105°C **Mounting:** PIN **RoHS Compliance**
	ANT1818B00DT1575S 18184 GPS Patch Antenna	**Freq. Range:** 1575 MHz **VSWR*:** 2.0 (Max) **Polarization:** RHCP **Peak Gain:** 4 dBic(Typ.)	**Size** (mm): 18*18*4 **Operating Temp. :** -40 ~ 105°C **Mounting:** PIN **RoHS Compliance**
	ANT1818B00ET1575S 18182 GPS Patch Antenna	**Freq. Range:** 1575 MHz **VSWR*:** 2.0 (Max) **Polarization:** RHCP **Peak Gain:** 2 dBic(Typ.)	**Size** (mm): 18*18*2 **Operating Temp. :** -40 ~ 105°C **Mounting:** PIN **RoHS Compliance**
	ANT2525B00AT1575S 25252 GPS Patch Antenna	**Freq. Range:** 1575 MHz **VSWR*:** 2.0 (Max) **Polarization:** RHCP **Peak Gain:** 5 dBic(Typ.)	**Size** (mm): 25*25*2 **Operating Temp. :** -40 ~ 105°C **Mounting:** SMD **RoHS Compliance**
	ANT2525B00BT1575S 25254 GPS Patch Antenna	**Freq. Range:** 1575 MHz **VSWR*:** 2.0 (Max) **Polarization:** RHCP **Peak Gain:** 5.5 dBic(Typ.)	**Size** (mm): 25*25*4 **Operating Temp. :** -40 ~ 105°C **Mounting:** SMD **RoHS Compliance**
	ANT2525B00CT1575S 25252 GPS Patch Antenna	**Freq. Range:** 1575 MHz **VSWR*:** 2.0 (Max) **Polarization:** RHCP **Peak Gain:** 4.5 dBic(Typ.)	**Size** (mm): 25*25*2 **Operating Temp. :** -40 ~ 105°C **Mounting:** PIN **RoHS Compliance**
	ANT2525B00DT1575S 25254 GPS Patch Antenna	**Freq. Range:** 1575 MHz **VSWR*:** 2.0 (Max) **Polarization:** RHCP **Peak Gain:** 5 dBic(Typ.)	**Size** (mm): 25*25*4 **Operating Temp. :** -40 ~ 105°C **Mounting:** PIN **RoHS Compliance**

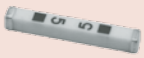
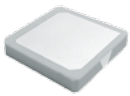
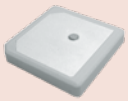
* VSWR depends on the environment

GPS

Model	Part No./ Description	Electrical Data	Mechanical Data
	ANT2525B00ET1575S 25252 GPS Patch Antenna	**Freq. Range:** 1575 MHz **VSWR*:** 2.0 (Max) **Polarization:** RHCP **Peak Gain:** 4.5 dBic(Typ.)	**Size** (mm): 25*25*2 **Operating Temp. :** -40 ~ 105°C **Mounting:** PIN **RoHS Compliance**
	ANT2525B00FT1575S 25254 GPS Patch Antenna	**Freq. Range:** 1575 MHz **VSWR*:** 2.0 (Max) **Polarization:** RHCP **Peak Gain:** 5 dBic(Typ.)	**Size** (mm): 25*25*4 **Operating Temp. :** -40 ~ 105°C **Mounting:** PIN **RoHS Compliance**
	ANT1606B00DT1575S 16064 GPS Patch Antenna	**Freq. Range:** 1575 MHz **VSWR*:** 2.0 (Max) **Polarization:** Linear **Peak Gain:** -0.5 dBic(Typ.)	**Size** (mm): 16*6*4 **Operating Temp. :** -40 ~ 105°C **Mounting:** PIN **RoHS Compliance**

* VSWR depends on the environment

GPS+Glonass

Model	Part No./ Description	Electrical Data	Mechanical Data
	ANT8010LL05R1516A 8010 GPS+Glonass Chip Antenna	**Freq. Range :** 1575 / 1602 MHz **VSWR* :** 2.0 (Max) **Polarization:** Linear **Peak Gain:** 1.53 / 1.69 dBi (Typ.)	**Size** (mm): 8.0*1.0*1.0 **Operating Temp.:** -40 ~ 105°C **RoHS Compliance**
	ANT1818B00BT1516S 18184 Gps+Glonass Patch Antenna	**Freq. Range:** 1575 / 1602 MHz **VSWR*:** 2.0 (Max) **Polarization:** Linear **Peak Gain:** 1.89 / 2.59 dBi (Typ.)	**Size** (mm): 18*18*4 **Operating Temp. :** -40 ~ 105°C **Mounting:** SMD **RoHS Compliance**
	ANT1818B00DT1516S 18184 Gps+Glonass Patch Antenna	**Freq. Range:** 1575 / 1602 MHz **VSWR*:** 2.0 (Max) **Polarization:** Linear **Peak Gain:** 2.65 / 2.79 dBi (Typ.)	**Size** (mm): 18*18*4 **Operating Temp. :** -40 ~ 105°C **Mounting:** PIN **RoHS Compliance**
	ANT2525B00BT1516S 25254 Gps+Glonass Patch Antenna	**Freq. Range:** 1575 / 1602 MHz **VSWR*:** 2.0 (Max) **Polarization:** Linear **Peak Gain:** 3.44 / 4.10 dBi (Typ.)	**Size** (mm): 25*25*4 **Operating Temp. :** -40 ~ 105°C **Mounting:** SMD **RoHS Compliance**
	ANT2525B00DT1516S 25254 Gps+Glonass Patch Antenna	**Freq. Range:** 1575 / 1602 MHz **VSWR*:** 2.0 (Max) **Polarization:** Linear **Peak Gain:** 3.5 / 3.8 dBi (Typ.)	**Size** (mm): 25*25*4 **Operating Temp. :** -40 ~ 105°C **Mounting:** PIN **RoHS Compliance**

GNSS

Model	Part No./ Description	Electrical Data	Mechanical Data
	ANT1204LL04RGNSSA 1204 GNSS Chip Antenna	**Freq. Range :** 1559 - 1610 MHz **VSWR*:** 2.0 (Max) **Polarization:** RHCP **Peak Gain :** 2.32 dBic (Typ.)	**Size** (mm): 12*4*1.1 **Operating Temp.:** -40 ~ 105°C **RoHS Compliance**
	ANT2525B00FTGNSSS 25254 GNSS Patch Antenna	**Freq. Range :** 1559 - 1610 MHz **VSWR*:** 2.0 (Max) **Polarization:** RHCP **Peak Gain :** 5.16 dBic (Typ.)	**Size** (mm): 25*25*4 **Operating Temp.:** -40 ~ 105°C **Mounting:** PIN **RoHS Compliance**

* VSWR depends on the environment

Antenna - GNSS, GPS L1+L5, GNSS+L2&L5, Active GPS / GPS+Glonass / L1+L5

GNSS

Model	Part No./ Description	Electrical Data	Mechanical Data
	ANT1818B00FTGNSSS 18184 GNSS Patch Antenna	**Freq. Range :** 1559 - 1610 MHz **VSWR*:** 3.5 (Max) **Polarization:** RHCP **Peak Gain :** 3 dBic (Typ.)	**Size** (mm): 18*18*4 **Operating Temp.:** -40 ~ 105°C **Mounting:** PIN **RoHS Compliance**
	ANT2525B00TTGNSSS 25256 GNSS Patch Antenna	**Freq. Range :** 1559 - 1610 MHz **VSWR*:** 2.0 (Max) **Polarization:** RHCP **Peak Gain:** 5.0 dBi (Typ.)	**Size** (mm): 25*25*6 **Operating Temp.:** -40 ~ 105°C **Mounting:** PIN **RoHS Compliance**

GPS L1+L5

Model	Part No./ Description	Electrical Data	Mechanical Data
	ANT2535BS0XTL1L5S 25254 + 35354 GPS L1+L5 Stack Antenna	**Freq. Range :** 1176 & 1575Mhz **VSWR*:** 2.0 (Max) **Polarization:** RHCP **Peak Gain:** L5: 2.7 / L2: 4.7 dBi (Typ.)	**Size** (mm): 25*25*4 + 35*35*4 **Operating Temp.:** -40 ~ 105°C **Mounting:** PIN **RoHS Compliance**

GNSS+L2&L5

Model	Part No./ Description	Electrical Data	Mechanical Data
	ANT4050BS0WTGN25S 40404 + 50508 GNSS+GPS L2&L5 Stack Antenna	**Freq. Range :** 1176/1227 & 1559-1610Mhz **VSWR*:** 2.0 (Max) **Polarization:** RHCP **Antenna Gain:** L5:1.34 / L2:0.56 /GNSS : 4.73 dBi(Typ.)	**Size** (mm): 40*40*4 + 50*50*8 **Operating Temp.:** -40 ~ 105°C **RoHS Compliance**

Active GPS

Model	Part No./ Description	Electrical Data	Mechanical Data
	ANT2525JB08B1575A 25256.9 GPS Active Antenna	**Freq. Range:** 1575 MHz **VSWR*:** 2.0 (Max) **Polarization:** RHCP **LNA Gain:** 16 dB (Typ.) **Antenna Gain:** 5.5 dBic(Typ.)	**Size** (mm): 25*25*6.9 **Cable*** (mm): 1.13*75 **Operating Temp. :** -30 ~ 85°C **RoHS Compliance**

Active GPS+Glonass

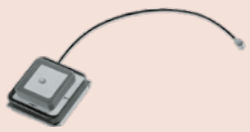
Model	Part No./ Description	Electrical Data	Mechanical Data
	ANT8010JLC1B1516A 22061.9 GPS+Glonass Active Antenna	**Freq. Range:** 1575/1602 MHz **VSWR*:** 2.0 (Max) **Polarization:** Linear **LNA Gain:** 20 / 20 dB (Typ.) **Antenna Gain:** 5.88 dBi (Typ.)	**Size** (mm): 22*6*1.9 **Cable* (mm):** 1.13*100 **Operating Temp. :** -30 ~ 85°C **RoHS Compliance**

Active L1+L5

Model	Part No./ Description	Electrical Data	Mechanical Data
	ANT1825JB51BGNL5A 282812 GNSS+GPS L5 Active Antenna	**Freq. Range :** 1176 & 1559-1610Mhz **VSWR*:** 2.0 (Max) **Polarization:** RHCP **LNA Gain:** 38 dB (Typ.) **Antenna Gain:** L5: 2.51/ L1:2.01 dBic (Typ.)	**Size** (mm): 28*28*12 **Operating Temp.:** -40 ~ 105°C **Cable*** (mm): 1.13 *100 **RoHS Compliance**

* VSWR depends on the environment

Active L1+L2

Model	Part No./ Description	Electrical Data	Mechanical Data
	ANT1825JB01BGNL2A 252512 GNSS+GPS L2 Active Antenna	**Freq. Range :** 1227 & 1559-1610Mhz **VSWR*:** 2.0 (Max) **Polarization:** RHCP **LNA Gain:** 38 dB (Typ.) **Antenna Gain:** L2: 2.58/ L1:2.50 dBic (Typ.)	**Size** (mm): 25*25*12 **Operating Temp.:** -40 ~ 105°C **Cable*** (mm): 1.13 *100 **RoHS Compliance**

FM

Model	Part No./ Description	Electrical Data	Mechanical Data
	ANT2405F001R0098A 2405 FM Chip Antenna	**Freq. Range :** 88 MHz **VSWR*:** 2.0 (Max) **Polarization:** Linear **Peak Gain :** N/A	**Size** (mm): 24*5*1.6 **Operating Temp.:** -40 ~ 105°C **RoHS Compliance**

SDARS

Model	Part No./ Description	Electrical Data	Mechanical Data
	ANT2020B00FT2300S 20204 SDARS Patch Antenna	**Freq. Range :** 2320~2345 MHz **VSWR*:** 2.0 (Max) **Polarization:** LHCP **Peak Gain :** 6 dBic(Typ.)	**Size (mm):**20*20*4 **Operating Temp.:** -40 ~ 105°C **Mounting:** PIN **RoHS Compliance**

* VSWR depends on the environment

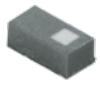
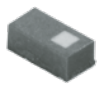
Filter (BPF)

Model	Part No./ Description	Electrical Data		Mechanical Data
	BPF2520LL03R2400A 2520 2.4G BPF Type03	**Freq. Range:** 2400-2500MHz **Insertion Loss:** 1.5dB(Max) **VSWR*:** 2.0dB(Max)	**Attenuation** 40dB Min @ 880~960MHz 30dB Min @ 1710~1785MHz 30dB Min @ 1850~1910MHz 20dB Min @ 4800~5000MHz 30dB Min @ 7200~7500MHz	**Size**(mm): 2.5*2.0*0.95 **Operating Temp.:** -40~85°C **RoHS Compliance**
	BPF2012LL03R2400A 2012 2.4G BPF Type03	**Freq. Range:** 2400-2500MHz **Insertion Loss:** 2.3dB(Max) **VSWR*:** 2.0dB(Max)	**Attenuation** 40dB Min @ 1000~1600MHz 40dB Min @ 4900MHz 25dB Min @ 7500MHz	**Size**(mm): 2.0*1.25*1.0 **Operating Temp.:** -40~85°C **RoHS Compliance**
	BPF1608LM02R2400A 1608 2.4G BPF Type02	**Freq. Range:** 2400-2500 MHz **Insertion Loss:** 1.7 dB (Max) **VSWR*:** 2.0 (Max)	**Attenuation:** 30dB Min @ 880~960 MHz 20dB Min @ 1710~1990 MHz 8.5dB Min@ 2170 MHz 20dB Min @ 4800~5000 MHz 25dB Min @ 7200~7500 MHz	**Size**(mm): 1.6*0.8*0.6 **Operating Temp.:** -40~85°C **RoHS Compliance**
	BPF1005LM03R2400A 1005 2.4G BPF Type03, L.L.	**Freq. Range:** 2400-2500MHz **Insertion Loss:** 1.5dB(Max) **VSWR*:** 2.0dB (Max)	**Attenuation** 10dB Min@ 880 ~ 960MHz 25dB Min@ 4800 ~ 5000MHz 25dB Min@ 7200 ~ 7500MHz	**Size(mm):** 1.0*0.5*0.35 **Operating Temp.:** -40~85°C **RoHS Compliance**
	BPF2012LL01R5000A 2012 5G BPF Type01	**Freq. Range:** 4900-5950 MHz **Insertion Loss:** 1.5dB (Max) **VSWR*:**2.0 (Max)	**Attenuation:** 30dB Min @1280~3000MHz 25dBMin @ 3300~4000MHz 25dBMin @ 9800~11900MHz	**Size**(mm): 2.0*1.2*1 **Operating Temp.:** -40~85°C **RoHS Compliance**

Filter (BPF)

Model	Part No./ Description	Electrical Data		Mechanical Data
	BPF1608LM08R5000A 1608 5.0G BPF Type08	**Freq. Range:** 4900~5840MHz **Insertion Loss:** 1.5dB(Max) **VSWR*:** 2.0 (Max)	**Attenuation** 35dB Min @ 500~2170MHz 35dB Min @ 2170~2500MHz 30dB Min @ 9800~12000MHz	**Size(mm):** 1.6*0.8*0.6 **Operating Temp.:** -40~85°C **RoHS Compliance**

Filter (LPF)

Model	Part No./ Description	Electrical Data		Mechanical Data
	LPF2012LM50R0433A 2012 0.433Ghz LPF Type50	Freq. Range: 400-470MHz Instertion Loss: 0.5dB Max **VSWR*:** 2.0(Max)	**Attenuation** 33dB Min @ 800~940MHz	**Size(mm):2.0*1.25*0.9** **Operating Temp.:-40~85°C** **RoHS Compliance**
	LPF1608LL55R0709A 1608 LTE LPF Type55	**Freq. Range:** 698-960MHz **Insertion Loss:** 0.6dB Max @ 698~830MHz 0.7dB Max @ 830~900MHz 0.75dB Max @ 900~915MHz 0.9dB Max @ 915~960MHz **VSWR*:** 2.0dB (Max)	**Attenuation** 30dB Min @ 1554~1830MHz 35dB Min @ 2097~2745MHz	**Size**(mm): 1.6*0.8*0.6 **Operating Temp.:** -40~85°C **RoHS Compliance**
	LPF1608LL60R0709A 1608 0.7-0.9GHz LPF Type60	**Freq. Range:** 698-960 MHz **Instertion Loss:** 0.6(Max) **VSWR*:** 2.0dB(Max)	**Attenuation** 13dB Min @ 1554~1610MHz 35dB Min @ 1805~1830MHz 35dB Min @ 2110~2170MHz 30dB Min @ 1710~2700MHz	**Size**(mm): 1.6*0.8*0.6 **Operating Temp.:** -40~85°C **RoHS Compliance**
	LPF1608LL61R0780A 1608 787MHz LPF Type61	**Freq. Range:** 746-787 MHz **Instertion Loss:** 0.6(Max) **VSWR*:** 2.0dB (Max)	**Attenuation** 30dB Min @ 1554~1610MHz 25dB Min @ 2238~2361MHz	**Size(mm):**1.6*0.8*0.6 **Operating Temp.:** -40~85°C **RoHS Compliance**
	LPF2012LM59RWPENA 2012 LTE LPF Type59	**Freq. Range:** 800-2025 MHz **Insertion Loss:** 0.5dB Max @ 800~1000MHz 0.8dB Max @ 1700~1910MHz 1.5dB Max @ 2120~2025MHz **VSWR*:** 1.5 (Max)	**Attenuation** 26dB Min @ 2300~6100MHz 35dB Min @ 3400~3820MHz	**Size**(mm): 2.0*1.25*0.9 **Operating Temp.:** -40~85°C **RoHS Compliance**
	LPF1608LL54RWHEXA 1608 LTE LPF Type54	**Freq. Range:** 699-2690MHz **Instertion Loss:** 0.25dB(Max) **VSWR*:** 1.5dB (Max)	**Attenuation:** 23dB Min @ 5150~5960MHz	**Size**(mm): 1.6*0.8*0.6 **Operating Temp.:** -40~85°C **RoHS Compliance**
	LPF1608LL56RWHEXA 1608 LTE LPF Type56	**Freq. Range:** 600-2700MHz **Instertion Loss:** 0.5dB(Max) **VSWR*:** 2.0dB (Max)	**Attenuation:** 30dB Min @ 4800~8000MHz 25dB Min @ 8500~12500MHz	**Size**(mm): 1.6*0.8*0.65 **Operating Temp.:** -40~85°C **RoHS Compliance**
	LPF1608LL57RWHEXA 1608 LTE-Hexa LPF Type57	**Freq. Range:** 600-2690MHz **Instertion Loss:** 0.5dB(Max) **VSWR*:** 2.0dB(Max)	**Attenuation** 35dB Min@ 4950 ~ 6000MHz 30dB Min@ 6000 ~ 12500MHz	**Size(mm):** 1.6*0.8*0.6 **Operating Temp.:** -40~85°C **RoHS Compliance**
	LPF1608LL62R1719A 1608 1.7-1.9GHz LPF Type62	**Freq. Range:** 1710-1910 MHz **Instertion Loss:** 0.8(Max) **VSWR*:** 2.0dB(Max)	**Attenuation** 20dB Min @ 2400~2500MHz 25dB Min @ 3700~3820MHz	**Size(mm):** 1.6*0.8*0.6 **Operating Temp.:** -40~85°C **RoHS Compliance**

* VSWR depends on the environment

Filter (LPF)

Model	Part No./ Description	Electrical Data		Mechanical Data
	LPF1608LL53R2400A 1608 2.4G LPF Type53	**Freq. Range:** 2400-2500 MHz **Insertion Loss:** 0.48dB (Max) **VSWR*:** 1.5 (Max)	**Attenuation:** 35dB Min @ 4800~5000 MHz 27dB Min @ 7200~7500 MHz	**Size**(mm): 1.6*0.8*0.65 **Operating Temp.:** -40~85°C **RoHS Compliance**
	LPF1005LL50R2400A 1005 2.4G LPF Type50	**Freq. Range:** 2400-2500MHz **Instertion Loss:** 0.5dB(Max) **VSWR*:** 2.0dB(Max)	**Attenuation:** 25dB Min @ 4800~5000MHz 20dB Min @ 7200~7500MHz	**Size**(mm): 1.0*0.5*0.35 **Operating Temp.:** -40~85°C **RoHS Compliance**
	LPF1608LL52R2500A 1608 Wimax LPF Type52	**Freq. Range:** 2300-2700MHz **Instertion Loss:** 1.25dB(Max) **VSWR*:** 1.5dB(Max)	**Attenuation:** 35dB Min @ 4800~5390MHz 25dB Min @ 7200~8085MHz	**Size**(mm): 1.6*0.8*0.65 **Operating Temp.:** -40~105°C **RoHS Compliance**

Filter (Diplexer)

Model	Part No./ Description	Electrical Data		Mechanical Data
	DPX1608LM70R0917A 1608 0.9/1.7GHz Diplexer Type70	**Freq. Range:** 698-960MHz/ 1710-2700 MHz **Instertion Loss:** Low: 0.8dB(Max) High: 0.7dB(Max) **VSWR*:** 2.0dB (Max)	**Attenuation** **Low Band:** 25dB (Min).@1710~2700GHz **High Band:** 20dB (Min).@698~960MHz 20dB (Min).@5150~5850MHz	**Size(mm):** 1.6*0.8*0.6 **Operating Temp.:** -40~85°C **RoHS Compliance**
	DPX1608LL88R1524A 1608 1.575/2.4GHz Diplexer Type88	**Freq. Range:** 1559-1610MHz/ 2400-2500 MHz/ 4900-6000 MHz **Instertion Loss:** Low: 0.6dB(Typ) High Band: 0.7/ 0.6dB(Typ) **VSWR*:** 2.0(Max)/ 10.0dB(Min)	**Attenuation** **Low Band:** 18dB(Min).@2400~2500MHz 15dB(Min).@4900~6000MHz **High Band:** 20dB(Min).@1575~1610MHz	**Size(mm):** 1.68*0.8*0.6 **Operating Temp.:** -40~85°C **RoHS Compliance**
	DPX1608LL87R1524A 1608 1.575/2.4GHz Diplexer Type87	**Freq. Range:** 1570-1610MHz/ 2400-2500 MHz/4900-6000 MHz **Insertion Loss:** Low: 0.6dB/ High: 0.7dB/0.6dB **VSWR*:** 2.0 dB (Max)	**Attenuation:** **Low Band:** 15dB(Min) @2400~2500MHz 15dB(Min) @4900~6000MHz **High Band:** 15dB(Min) @1570~1610MHz	**Size(mm):** 1.68*0.8*0.6 **Operating Temp.:** -40~85°C **RoHS Compliance**
	DPX1608LL76R1925A 1608 1.9/2.5GHz Diplexer Type76	**Freq. Range:** 1710-1880MHz/ 2500-2690 MHz **Insertion Loss:** Low: 0.7dB(Max) High: 0.8dB(Max) **VSWR*:** 2.0dB (Max)	**Attenuation** **Low Band:** 15dB (Min).@2500~2690MHz **High Band:** 15dB (Min).@1710~1880MHz	**Size(mm):** 1.6*0.8*0.6 **Operating Temp.:** -40~85°C **RoHS Compliance**
	DPX2012LL76R2455A 2012 2.4/5GHz Diplexer Type76	**Freq. Range:** 2400~2500MHz/ 4900~5950MHz **Insertion Loss:** Low: 0.65dB(Max) High: 0.65dB(Max) **VSWR*:** 2.0 (Max)	**Attenuation** **Low Band:** 20dB(Min).@4800~5000MHz 20dB(Min).@7200~7500MHz **High Band:** 20dB (Min).@824~915MHz 20dB (Min).@1800~2500MHz 15dB (Min).@9800~11900MHz	**Size(mm):** 2.0*1.25*0.5 **Operating Temp.:** -40~85°C **RoHS Compliance**

* VSWR depends on the environment

Filter (Diplexer)

Model	Part No./ Description	Electrical Data		Mechanical Data
	DPX2012LL75R2455A 2012 2.4/5GHz Diplexer Type75	**Freq. Range:** 2400~2500MHz/ 4900~5950MHz **Instertion Loss:** Low: 0.65dB(Max) High: 0.65dB(Max) **VSWR*:** 2.0dB (Max)	**Attenuation** **Low Band:** 20dB(Min).@4800~5000MHz 20dB(Min).@7200~7500MHz **High Band:** 20dB(Min).@824~915 MHz 20dB(Min).@1800~2500 MHz 15dB(Min).@9800~11900 MHz	**Size(mm):** 2.0*1.25*0.5 **Operating Temp.:** -40~85°C **RoHS Compliance**
	DPX1608LL80R2455A 1608 2.4/5GHz Diplexer Type80	**Freq. Range:** 2400-2500MHz/ 4900-6000MHz **Instertion Loss:** Low: 0.7dB/ High: 0.8dB	**Attenuation:** **Low Band:** 20dB(Min). @4800~5000MHz 20dB(Min). @7200~7500MHz **High Band:**	**Size**(mm): 1.6*0.8*0.6 **Operating Temp.:** -40~85°C **RoHS Compliance**
	DPX1608LL85R2455A 1608 2.4/5GHz Diplexer Type85	**VSWR*:** Low: 2.0dB(Max)/ High: 1.7dB(Max)	28dB(Min). @860~960MHz 23dB(Min). @1545~1605MHz 23dB(Min). @1710~1990MHz 28dB(Min). @2170MHz 8dB(Min). @8100MHz 15dB(Min). @8820~9800MHz 27dB(Min). @9800~11800MHz	**Size**(mm): 1.6*0.8*0.6 **Operating Temp.:** -40~85°C **RoHS Compliance**
	DPX1608LL86R2455A 1608 2.4/5GHz Diplexer Type86	**Freq. Range:** 2400-2500MHz/ 4900-5950MHz **Instertion Loss:** Low: 0.6dB/ High: 1.2dB **VSWR*:** 2.0 (Max)	**Attenuation:** **Low Band:** 20dB(Min).@4800-5000MHz **High Band:** 28dB(Min).@30-2700MHz 10dB(Min).@9800-11900MHz 5dB(Min).@14700-17850MHz	**Size**(mm): 1.6*0.8*0.6 **Operating Temp.:** -40~85°C **RoHS Compliance**
	DPX1608LL82R2455A 1608 2.4/5GHz Diplexer Type82	**Freq. Range:** 2400~2500MHz/ 4900~6000MHz **Instertion Loss:** Low: 0.5dB(Max) High:1.0dB(Max) **VSWR*:** 2.0dB (Max)	**Attenuation** **Low Band:** 25dB(Min).@4800~5000MHz 25dB(Min).@7200~7500MHz **High Band:** 32dB(Min).@300~2700MHz 15dB(Min).@9800~11900MHz 11dB(Min).@14700~17850MHz	**Size(mm):** 1.68*0.8*0.6 **Operating Temp.:** -40~85°C **RoHS Compliance**
	DPX1608LL83R2455A 1608 2.4/5GHz Diplexer Type83	**Instertion Loss:** 0.5dB Max @ 2400~2500MHz 1.5dB Max @ 4900~5950MHz **VSWR*:**2.0(Max) **Isolation:** 35dB Max @ 2400~2500MHz 28dB Max @ 4900~5950MHz	**Attenuation** **Low Band:** 25dB(Min).@4800~5000MHz 25dB(Min).@7200~7500MHz **High Band:** 32dB(Min).@300~2700MHz 15dB(Min).@9800~11900MHz 11dB(Min).@14700~17850MHz	**Size(mm):** 1.68*0.8*0.6 **Operating Temp.:** -40~85°C **RoHS Compliance**

* VSWR depends on the environment

Filter (Triplexer)

Model	Part No./ Description	Electrical Data		Mechanical Data
	TPX2012LL90R1525A 2012 1.575/2.4/5GHz Triplexer Type90 TPX2012LL95R1525A 2012 1.575/2.4/5GHz Triplexer Type95	**Freq. Range:** 1570-1610MHz/ 2400-2500MHz/4900-5950MHz **Instertion Loss:** Low: 0.8dB/ Mid.: 0.7dB/ High: 0.8dB **VSWR*:** Low: 2.0dB(Max)/ Mid.: 2.0dB(Max) High: 1.6dB(Max)	**Attenuation:** **Low Band:** 20dB(Min). @2400~2500MHz 20dB(Min). @4800~6000MHz **Mid Band:** 17.5dB(Min). @4800~5000MHz 10dB(Min). @1545~1605MHz 10dB(Min). @9600~10000MHz **High Band:** 27dB(Min). @860~960MHz 25dB(Min). @1545~1605MHz 25dB(Min). @1710~1990MHz 30dB(Min). @2170MHz 8dB(Min). @8100MHz 15dB(Min). @8820~9800MHz 27dB(Min). @9800~10760MHz 25dB(Min). @10760~11800MHz	**Size**(mm): 2.0*1.2*0.9 **Operating Temp.:** -40~85°C **RoHS Compliance**

Balun

Model	Part No./ Description	Electrical Data		Mechanical Data
	BLN0605LM09R0780A 0605 LSMH/EUDD Balun Type09, 5050	**Freq. Range:** 729~821MHz **Instertion Loss:** 0.6 dB (Max) **VSWR*:** 2.0dB (Max)	**Unbalanced Impedance:** 50Ω **Balanced Impedance:** 100Ω **Phase Difference:** 180 ± 10degree **Amplitude Difference:** ± 2 dB (Max)	**Size(mm):** 0.65*0.5*0.35 **Operating Temp.:** -40~85°C **RoHS Compliance**
	BLN0605LL19R1880A 0605 PCS/DCS RX Balun Type19, 5050	**Freq. Range:** 1805~1990MHz **Instertion Loss:** 0.6 dB (Max) **VSWR*:** 2.0dB (Max)	**Unbalanced Impedance:** 50Ω **Balanced Impedance:** 100Ω **Phase Difference:** 180 ± 10degree **Amplitude Difference:** ± 2 dB (Max)	**Size(mm):** 0.65*0.5*0.35 **Operating Temp.:** -40~85°C **RoHS Compliance**
	BLN1608LL01R2400A 1608 2.4G Balun Type01, 50100	**Freq. Range:** 2400-2500MHz **Insertion Loss:** 1.1 dB (Max) **VSWR*:** 2.0 (Max)	**Unbalanced Impedance:** 50Ω **Balanced Impedance:** 100Ω **Phase Difference:** 180 ±10 degree **Amplitude Difference:** 2 dB (Max)	**Size**(mm): 1.6*0.8*0.65 **Operating Temp.:** -40~85°C **RoHS Compliance**
	BLN1608LL30R2400A 1608 2.4G Balun Type30, 5050	**Freq. Range:** 2400-2500MHz **Insertion Loss:** 1.2dB(Max) **VSWR*:** 2.0dB(Max)	**Unbalanced Impedance:** 50Ω **Balanced Impedance:** 50Ω **Phase Difference:** 180 ± 10 degree **Amplitude Difference:** 2 dB (Max)	**Size**(mm): 1.6*0.8*0.65 **Operating Temp.:** -40~85°C **RoHS Compliance**
	BLN1005LM39R2500A 1005 2.3-2.7GHz Balun Type39, 5050	**Freq. Range:** 2300~2690MHz **Instertion Loss:** 0.6 (Max) **VSWR*:** 2.0dB (Max)	**Unbalanced Impedance:** 50Ω **Balanced Impedance:** 100Ω **Phase Difference:** 180 ± 17 degree **Amplitude Difference:** ± 3.7 dB (Max)	**Size(mm):** 1.0*0.5*0.35 **Operating Temp.:** -40~85°C **RoHS Compliance**

* VSWR depends on the environment

Balun

Model	Part No./ Description	Electrical Data		Mechanical Data
	BLN0605LL39R2500A 0605 2.3-2.7GHz Balun Type39, 5050	**Freq. Range:** 2300~2690MHz **Insertion Loss:** 0.6 dB (Max) **VSWR*:** 2.0dB (Max)	**Unbalanced Impedance:** 50Ω **Balanced Impedance:** 100Ω **Phase Difference:** 180 ± 10degree **Amplitude Difference:** ± 2 dB (Max)	**Size(mm):** 0.65*0.5*0.35 **Operating Temp.:** -40~85°C **RoHS Compliance**
	BLN1608LL01R5000A 1608 5G Balun Type01, 50100	**Freq. Range:** 4900-5950MHz **Insertion Loss:** 1.2 dB (Max) **VSWR*:** 2.0 (Max)	**Unbalanced Impedance:** 50Ω **Balanced Impedance:** 100Ω **Phase Difference:** 180 ±10 degree **Amplitude Difference:** 1.5 dB (Max)	**Size**(mm): 1.6*0.8*0.65 **Operating Temp.:** -40~85°C **RoHS Compliance**

Balance Filter (Combo)

Model	Part No./ Description	Electrical Data		Mechanical Data
	BLF2012LL98R2400A 2012 2.4G Combo Type98	**Freq. Range:** 2400-2500MHz **Insertion Loss:** 3.5dB (Max) **VSWR*:** 2.0 (Max) **Unbalanced Impedance:** 50Ω **Balanced Impedance:** Conjugate match to CSR BC03/04 series **Phase Difference:** 180 ±5 degree @25°C **Amplitude Balance:** 1.0 dB (Max)	**Attenuation:** 40dB Min@880~960MHz 25dB Min@1300~1600MHz 35dB Min@4800~5000MHz 30dB Min@7200~7500MHz	**Size**(mm): 2.0*1.2*0.9 **Operating Temp.:** -40~85°C **RoHS Compliance**

Coupler

Model	Part No./ Description	Electrical Data		Mechanical Data
	CPL1608LL09RWHEXA 1608 WWAN&LTE Coupler Type09	**Freq. Range:** 689.5-960.5MHz 1700-2100MHz/2300-2700MHz **Insertion Loss:** 0.25dB(Max)/ 0.3dB(Max)/ 0.4dB(Max) **VSWR*:** 1.4dB(Max)	**Coupling:** 23~28dB@689.5-960.5MHz 19.5~22.5dB@1700-2100MHz 19.5~24.5dB@2300-2700MHz	**Size**(mm): 1.6*0.8*0.7 **Operating Temp.:** -40~85°C **RoHS Compliance**
	CPL1608LL12RWHEXA 1608 WWAN&LTE Coupler Type12	**Freq. Range:** 689-960MHz 1710-2170MHz/2300-2690MHz **Insertion Loss:** 0.2dB(Max)/ 0.25dB(Max)/ 0.3dB(Max) **VSWR*:** 1.45dB(Max)	**Coupling:** 23~27dB@689-960MHz 21.5~26.5dB@1710-2170MHz 22.5~27.5dB@2300-2690MHz	**Size**(mm): 1.6*0.8*0.6 **Operating Temp.:** -40~85°C **RoHS Compliance**

* VSWR depends on the environment

Explanation of ordering code - New

Ordering example : ANT3216LL11R2400A

ANT 3216 L L11 R 2400 A

Product Type (code 1)
- ANT: Antenna
- BPF: Band-Pass Filter
- LPF: Low-Pass Filter
- BLN: Balun
- BLF: Balun Filter
- DPX: Diplexer

(1) Size (mm) - SMD (LTCC) (code 2)
- 3216: 3.2 x 1.6 mm
- 2012: 2.0 x 1.2 mm
- 2520: 2.5 x 2.0 mm

(2) Connector - Cable length (mm) Stand-alone (code 2)

Ex: X100 – IPEX connector, 100 mm cable length
X: IPEX, M: MMCX, S: SMA, Z: Stripped
100: 100 mm cable length

Type (code 3)
- L, F, A: Chip antenna / Filter / Balun
- B: Bulk antenna
- P: PCB
- X: FPCB
- S: Metal
- E: External
- J: Integrated antenna

Factory Control Code / Cable Type (code 7)

Frequency Band (MHz)(code 6)
- 2400: 2.4 – 2.5 GHz;
- 2455: 2.4&5 GHz
- 1575: GPS; 1516: GPS+Glonass
- 0433: 433 MHz
- 0870: 868 MHz
- 0918: 900/1800 MHz
- WQUD: 850/900/1800/1900 MHz
- WPEN: 850/900/1800/1900/2100 MHz

Packing Style (code 5)
- R: Tape & Reel
- T: Tray
- B: Bag

Serial No. (code 4)

Wireless Sample Book: Ordering code ANTSB000000020190				
Product	Series	Dimension (mm)	PART NUMBER	Frequency Range (MHz)
Antenna	2.4 GHz	8*1*1	ANT8010LL04R2400A	2400 - 2500
		3.2*1.6*1.2	ANT3216LL11R2400A	2400 - 2500
		3.2*1.6*1.2	ANT3216LL00R2400A	2400 - 2500
		2*1.2*1	ANT2012LL13R2400A	2400 - 2500
		1.6*0.8*0.4	ANT1608LL14R2400A	2400 - 2500
		30*5*0.15	ANTX100F113B24003	2400 - 2500
	2.4/5 GHz	5.3*2*1.1	ANT5320LL24R2455A	2400 - 2500
				5150 - 5875
		3.2*1.6*1.2	ANT3216LL11R2455A	2400 - 2500
				5150 - 5875
		1.6*0.8*0.4	ANT1608LL14R2455A	2400 - 2500
				5150 - 5875
		40*6*0.15	ANTX100F112B24553	2400 - 2500
				5150 - 5875
	GPS	8*1*1	ANT8010LL05R1575A	1575
		5.3*2*1.2	ANT5320LL14R1575A	1575
		3.2*1.6*1.2	ANT3216LL15R1575A	1575
		12*12*4	ANT1212B00DT1575S	1575
		15*15*4	ANT1515B00FT1575S	1575
		18*18*2	ANT1818B00AT1575S	1575
	GNSS	25*25*4	ANT2525B00FTGNSSS	1559 - 1610
	GPS& GLONASS	5.3*2*1.2	ANT5320LL14R1516A	1575 / 1602
		8*1*1	ANT8010LL05R1516A	1575 / 1602
		18*18*4	ANT1818B00BT1516S	1575 / 1602
		25*25*4	ANT2525B00DT1516S	1575 / 1602
	GPS/2.4 GHz	5.3*2*1.2	ANT5320LL17R1524A	1575 / 2400
	Cellular WWAN	21*12*0.9	ANT2112LL00B0918A	880 - 960
				1710 - 1880
		12*4*1.2	ANT1204LL00R0918A	900 / 1800
		35*5*6	ANT3505B002TWPENS	824 - 960
				1710 - 2170
		50*20*0.95	ANTX100P001BWPEN3	824 - 960
				1710 - 2170
		40*5*6	ANT4005B000RWHEXS	698 - 960
				1710 - 2690
	Short-Range	24*0.5*1.6	ANT2405F001R0169A	169
		12*4*1.6	ANT1204F002R0433A	315/433
		12*4*1.5	ANT1204LL20R0433A	315/433
		12*4*1.6	ANT1204LL08R0870A	870/915
		12*4*1.6	ANT1204F007R0870A	870/915
	SDARS	25*25*4	ANT2525B00FT2300S	2320 - 2345
Filter	GPS/2.4/5 GHz	1.6*0.8*0.6	DPX1608LL87R1524A	1570-1610
				2400 - 2500
				4900-6000
	2.4 GHz	2.0*1.25*0.9	BLF2012LL98R2400A	2400 - 2500
		1.6*0.8*0.6	BLN1608LL30R2400A	2400 - 2500
			BPF1608LM02R2400A	2400 - 2500
		1.0* 0.5*0.35	LPF1005LL50R2400A	2400 - 2500
		1.6*0.8*0.65	LPF1608LL53R2400A	2400 - 2500
	2.4/5 GHz	1.6*0.8*0.6	DPX1608LL80R2455A	2400 - 2500
			DPX1608LL85R2455A	4900-6000
		2.0*1.25*0.5	DPX2012LL75R2455A	2400 - 2500
				4900-5950

YAGEO - A GLOBAL COMPANY

ASIA

HQ
Taipei, Taiwan
Tel. +886 2 6629 9999
Fax. +886 2 6628 8886

Suzhou, China
Tel. +86 512 6825 5568
Fax. +86 512 6825 5386

Shanghai, China
Tel. +86 21 64858697

Dongguan, China
Tel. +86 769 8772 0275
Fax. +86 769 8791 0053

Kuala Lumpur, Malaysia
Tel. +60 3 8063 8864
Fax. +60 3 8063 7376

Penang, Malaysia
Tel. +60 4 3973049
Fax. +60 4 3973050

Tokyo, Japan
Tel. +81 3 6809 3972
Fax. +81 3 6809 3982

Seongnam, Korea
Tel. +82 31 712 4797
Fax. +82 31 712 5866

Singapore
Tel. +65 6244 7800
Fax. +65 6244 4943

EUROPE

Munich, Germany
Tel. +49 8990 7784 380
Fax. +49 8990 7784 379

Milan, Italy
Tel. +39 02 6129 1017
Fax. +39 02 6601 7490

Szombathely, Hungary
Tel. +36 94 517 702
Fax. +36 94 517 701

Roermond, Benelux
Tel. +31 475 575 090
Fax. +31 475 575 090

NORTH AMERICA

San Jose, U.S.A.
Tel. +1 408 240 6200
Fax. +1 408 240 6201

For a complete listing of all Yageo sales offices, distributors, and representatives, please visit "contact us" at

www.yageo.com

© YAGEO Corporation

All rights are reserved. Reproduction in whole or in part is prohibited without the prior written consent of the copyright owner.
The information presented in this document does not form part of any quotation or contract, is believed to be accurate and reliable and may be changed without notice.
No liability will be accepted by the publisher for any consequence of its use. Publication thereof does not convey nor imply any license under patent or other industrial or intellectual property rights.

Printed in Taiwan

Document order number : YL 100 00172

Date of release: Jan. 2020

Innovative Service Around the Globe YAGEO