

PRODUCT SELECTION GUIDE

2011

SMD RESISTORS + MLCC

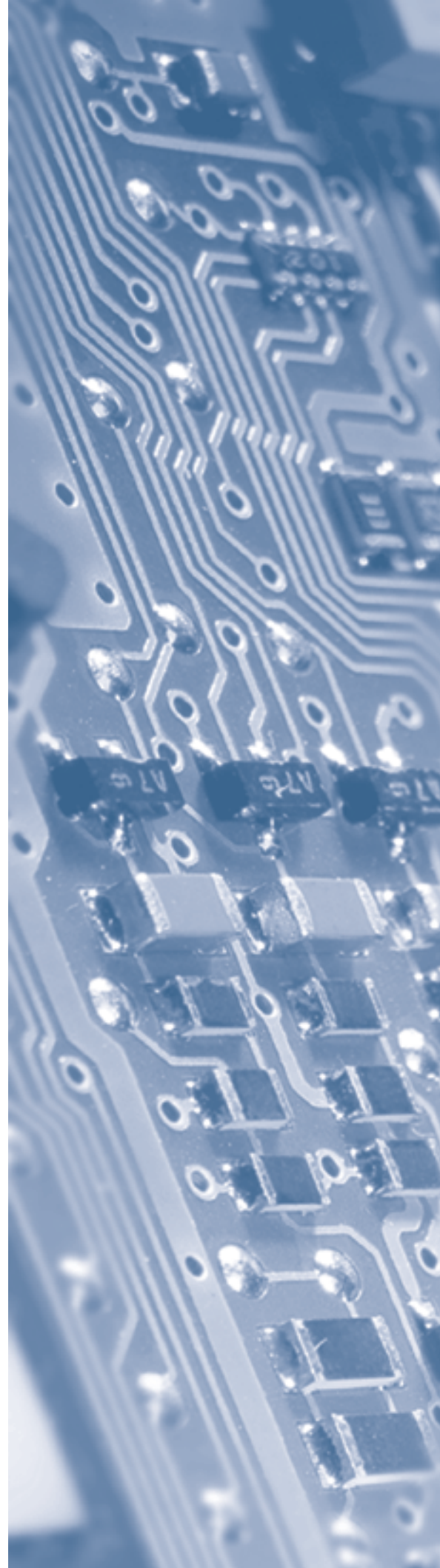
SMD CERAMIC EMI FILTER CAPACITORS - X2Y®

HIGH FREQUENCY PRODUCTS

MULTILAYER CHIP VARISTORS



www.yageo.com



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.

- 15 digits code (PHYCOMP CTC)

- 14 to 17 digits code (GLOBAL PART NUMBER for both Yageo and Phycomp branded products)

- **12 digits ordering code**

This unique 12NC number forms the basis of the Phycomp logistic system.

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 designvvation and cross-reference					
Inch-based	Metric	Inch-based	Metric	Inch-based	Metric
01005	0402M	0612	1632M	1225	3264M
0201	0603M	0616	1640M	1812	4532M
0202	0605M	0805	2012M	2007	5320M
0402	1005M	0815	2037M	2010	5025M
0404	1010M	1008	2520M	2220	5750M
0408	1020M	1206	3216M	2512	6432M
0508	1220M	1210	3225M	2728	6872M
0603	1608M	1218	3245M	3014	7836M
0606	1616M	1224	3250M		

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

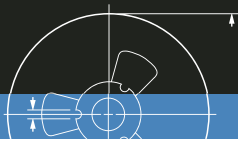


Table of Contents

Chip Resistors General Information		8
	Specification overview	8
	Ordering information - Global part number	11
	Ordering information - North America	13
	IEC publication 63, SPQ, last digit of 12NC	14
Chip Resistors Selection Charts		15
	Thick film chip resistors	15
	Introduction to thick film general purpose chip resistors	15
	01005 to 2512	17
	Thick film high ohmic chip resistors	19
	Introduction to thick film high ohmic chip resistors	19
	Thick film precision grade chip resistors	21
	Introduction to thick film precision grade chip resistors	21
	0402 to 1206	23
	Thin film high precision high stability chip resistors	24
	Introduction to thin film high precision high stability chip resistors	24
	Thin film high precision high stability, 0402 to 2512	26
	Thin film general purpose, 0402 to 2512	28
	Thick film low ohmic chip resistors	29
	Introduction to thick film low ohmic chip resistors	29
	Low ohmic, 0402 to 2512	31
	Low ohmic, high power, 0805 / 1206	33
	Thick film low ohmic low T. C. R. chip resistors	34
	Introduction to thick film low ohmic low T. C. R. chip resistors	34
	0402 to 2512	36
	Thick film low ohmic low T. C. R. chip resistors, wide termination	37
	Introduction to thick film low ohmic low T. C. R. chip resistors, wide termination	37
	0815	39
	Current sensors - low T. C. R. chip resistors	40
	Introduction to current sensors - low T. C. R. chip resistors	40
	0805 to 2512	42
	Current sensors - low T. C. R. chip resistors, wide termination	43
	Introduction to current sensors - low T. C. R. chip resistors, wide termination	43
	0612 / 0815	45
	Thick film array / network chip resistors	46
	Introduction to thick film array / network chip resistors	46
	Arrays, convex / concave	48
	Networks, T-type / L-type	49
	Chip resistors with NiAu terminations	50
	Introduction to NiAu termination chip resistors	50
	0402 to 1206	52
	Surge chip resistors	53
	Introduction to surge chip resistors	53
	0805 to 2512	55
	High voltage chip resistors	56
	Introduction to high voltage chip resistors	56
	0805 to 2512	58



	Trimmable chip resistors	59
	Introduction to trimmable chip resistors	59
	0402 to 1206	61
	Anti-sulfurated chip resistors	62
	Introduction to anti-sulfurated chip resistors	62
	0402 to 1206	64
	Automotive grade chip resistors	65
	Introduction to automotive grade chip resistors	65
	0402 to 1206	67
	RF attenuator chip resistors	68
	Introduction to RF attenuator chip resistors	68
	0404	70
Chip Resistors Engineering Design Kits		71
	Engineering design kits	71

MLCC General Information		74
	Specification overview	74
	Case dimensions	75
	Ordering information - Global part number	77
	Ordering information for North America	78
	Thickness classes and packing quantities for all series	79

MLCC Selection Charts		80
	NP0	80
	NP0 - General purpose 16 to 25V, 0201 to 0603	80
	NP0 - General purpose 16 to 25V, 0805 to 1210	81
	NP0 - General purpose 50V, 0201 to 1812	83
	NP0 - Medium voltage, 0603 / 0805	86
	NP0 - Medium voltage, 1206 / 1210	87
	NP0 - Medium voltage, 1808 / 1812	88
	NP0 - High voltage, 1206 / 1210	89
	NP0 - High voltage, 1808 / 1812	90
	NP0 - High frequency, 0402 to 0805	92
	NP0 - Microwave, 0603 to 1206	94
	X7R	96
	X7R - General purpose, 0201 / 0402	96
	X7R - General purpose & High capacitance, 0603 / 0805	97
	X7R - General purpose & High capacitance, 1206 to 1812	98
	X7R - Medium voltage, 0603 / 0805	99
	X7R - Medium voltage, 1206 / 1210	100
	X7R - Medium voltage, 1808 / 1812	101
	X7R - High voltage, 1206 / 1210	102
	X7R - High voltage, 1808 / 1812	103
	X7R - Low inductance, 0306 to 0612	105
	X5R	107
	X5R - General purpose & High capacitance, 0201 / 0402	107
	X5R - General purpose & High capacitance, 0603 / 0805	108
	X5R - High capacitance, 1206 to 1812	109



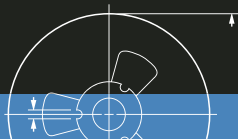
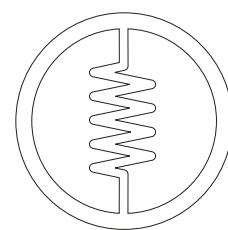


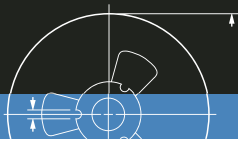
Table of Contents

	Y5V	111
	Y5V - General purpose & High capacitance 6.3 to 25V, 0201 / 0402	111
	Y5V - General purpose & High capacitance 6.3 to 25V, 0603 / 0805	112
	Y5V - General purpose & High capacitance 6.3 to 25V, 1206 / 1210	113
	Y5V - General purpose & High capacitance 50V, 0402 to 1206	114
	Safety certification MLCCs	116
	NP0 - High voltage SC type, 1808 / 1812	116
	X7R - High voltage SC type, 1808 / 1812	117
	Arrays	119
	NP0 - 4C Arrays, 0508 / 0612	119
	X7R - 4C Arrays, 0508 / 0612	120
	Y5V - 4C Arrays, 0612	121
MLCC Engineering Design Kits		123
	Sample kits for 0201 / 0402	123
	Sample kits for 0603 / 0805	124
	Sample kits for 1206	125
	Sample kits for high capacitance series	126
	High voltage sample kits for PCs segment	127
	High voltage sample kits for inverter segment	128
	High voltage sample kits for general applications	129
	High voltage sample kits for safety certification MLCCs	130
	Sample kits for high frequency series	131
	Sample kits for all sizes, all types, E1 series only	132
X2Y® Product Selection Charts		134
	SMD ceramic EMI filter capacitors X2Y® series	134
	Ordering information	135
HF General Information		138
	Specification overview	138
HF Product Selection Charts		139
	Patch antenna for GPS / SDARS / Glonass	139
	Chip antenna for FM / UHF / GPS / GSM / WiMAX	140
	Chip antenna for Dual-band / Triple-band	141
	Chip antenna for Bluetooth / WiFi	142
	Band pass filter and Low pass filter	144
	Diplexer	145
	Balun and Balanced filter	146
MLV Product Selection Charts		148
	Case dimensions and specification for 0402	148
	Specification for 0603 to 1206	149
	Ordering information for 0402 to 1206	150





SURFACE-MOUNT CHIP RESISTORS



Chip Resistors General Information

Specification overview

Global part number	Series	Size	Power rating	Max. voltage	Operating Temp. range	Resistance range	Tolerance	T. C. R.		
!RC0100xR-07xxxxL	RC	01005	1/32W	15V	-55°C to 125°C	10Ω ≤ R ≤ 1MΩ	±1% ±5%	10Ω ≤ R ≤ 1MΩ ±250 ppm/°C		
RC0201xR-07xxxxL		0201	1/20W	25V		1Ω ≤ R ≤ 10MΩ	Max.: 1MΩ ±1% Max.: 10MΩ ±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	Max./Min.: 1MΩ/10Ω ±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	50V		1Ω ≤ R ≤ 22MΩ				
RC0805xR-07xxxxL		0805	1/8W	150V		1Ω ≤ R ≤ 22MΩ				
RC1206xR-07xxxxL		1206	1/4W	200V		1Ω ≤ R ≤ 22MΩ				
RC1210xR-07xxxxL		1210	1/2W	200V		1Ω ≤ R ≤ 22MΩ				
RC1218xK-07xxxxL		1218	1W	200V		1Ω ≤ R ≤ 1MΩ				
RC2010xK-07xxxxL		2010	3/4W	200V		1Ω ≤ R ≤ 22MΩ				
RC2512xK-07xxxxL		2512	1W	200V		1Ω ≤ R ≤ 22MΩ				
!RC0805xR-7WxxxxL		0805	1/4W	150V		1Ω ≤ R ≤ 1MΩ			±1% ±5%	±200 ppm/°C
!RC1206xR-7WxxxxL		1206	1/2W	200V		1Ω ≤ R ≤ 1MΩ				
!RC2512xK-7WxxxxL		2512	2W	200V	1Ω ≤ R ≤ 150Ω					
!RC0805xR-07xxxxL		0805	1/8W	150V	-55°C to 155°C	24MΩ ≤ R ≤ 100MΩ	±5%, ±10%, ±20%	±300 ppm/°C		
!RC1206xR-07xxxxL		1206	1/4W	200V		24MΩ ≤ R ≤ 100MΩ				
!RE0402xR-07xxxxL		RE	0402	1/16W	50V	-55°C to 125°C	10Ω ≤ R ≤ 1MΩ	±0.5% ±1% ±5%	±50 ppm/°C	
!RE0603xR-07xxxxL	0603		1/10W	50V	10Ω ≤ R ≤ 1MΩ					
!RE0805xR-07xxxxL	0805		1/8W	150V	10Ω ≤ R ≤ 1MΩ					
!RE1206xR-07xxxxL	1206		1/4W	200V	10Ω ≤ R ≤ 1MΩ					
RT0402xRx07xxxxL	RT	0402	1/16W	50V	-55°C to 125°C	10Ω ≤ R < 121KΩ	±0.05% ±0.1% ±0.25% ±0.5% ±1%	±10 ppm/°C ±15 ppm/°C ±25 ppm/°C ±50 ppm/°C		
RT0603xRx07xxxxL		0603	1/10W	75V		5.1Ω ≤ R ≤ 681KΩ				
RT0805xRx07xxxxL		0805	1/8W	150V		5.1Ω ≤ R ≤ 1.5MΩ				
RT1206xRx07xxxxL		1206	1/4W	200V		5.1Ω ≤ R ≤ 1.5MΩ				
RT1210xRx07xxxxL		1210	1/4W			5.1Ω ≤ R ≤ 1MΩ				
RT2010xKx07xxxxL		2010	1/2W			10Ω ≤ R ≤ 1MΩ				
RT2512xKx07xxxxL	2512	3/4W	10Ω ≤ R ≤ 1MΩ							
RJ0402FRE07xxxxL	RJ	0402	1/16W	25V	-55°C to 125°C	10Ω ≤ R ≤ 121KΩ	±1%	±50 ppm/°C		
RJ0603FRE07xxxxL		0603	1/16W	50V		5.1Ω ≤ R ≤ 681KΩ				
RJ0805FRE07xxxxL		0805	1/10W	100V		5.1Ω ≤ R ≤ 1.5MΩ				
RJ1206FRE07xxxxL		1206	1/8W	150V		5.1Ω ≤ R ≤ 1.5MΩ				
RJ1210FRE07xxxxL		1210	1/4W			5.1Ω ≤ R ≤ 1MΩ				
RJ2010FKE07xxxxL		2010	1/2W			10Ω ≤ R ≤ 1MΩ				
RJ2512FKE07xxxxL		2512	3/4W			10Ω ≤ R ≤ 1MΩ				
!YC102-xR-07xxxxL	YC	2*0201	1/32W	15V	-55°C to 125°C	10Ω ≤ R ≤ 1MΩ	±1% ±5%	±200 ppm/°C		
YC122-xR-07xxxxL		2*0402	1/16W	50V		10Ω ≤ R ≤ 1MΩ 1Ω ≤ R ≤ 1MΩ				
YC124-xR-07xxxxL		4*0402	1/16W	50V	-55°C to 155°C	10Ω ≤ R ≤ 1MΩ	±1% ±5%			
!YC162-xR-07xxxxL		2*0603	1/16W	50V		10Ω ≤ R ≤ 1MΩ				
YC164-xR-07xxxxL		4*0603	1/16W	50V		1Ω ≤ R ≤ 1MΩ				
YC248-xR-07xxxxL		8*0603	1/16W	50V		10Ω ≤ R ≤ 1MΩ				
YC324-xR-07xxxxL		4*1206	1/8W	200V		10Ω ≤ R ≤ 1MΩ				
!TC122-xR-07xxxxL	TC	2*0402	1/16W	25V	-55°C to 125°C	10Ω ≤ R ≤ 1MΩ	±1% ±5%			
!TC124-xR-07xxxxL		4*0402	1/16W	50V		10Ω ≤ R ≤ 1MΩ				
TC164-xR-07xxxxL		4*0603	1/16W	50V		1Ω ≤ R ≤ 1MΩ				
YC158TJR-07xxxxL	YC158	10P8R (0612)	1/16W	25V	-55°C to 155°C	10Ω ≤ R ≤ 100KΩ	±5%	10Ω ≤ R ≤ 100KΩ ±200 ppm/°C		
YC358xJK-07xxxxL	YC358	10P8R (1225)	1/16W	50V		10Ω ≤ R ≤ 330KΩ		10Ω ≤ R ≤ 330KΩ ±200 ppm/°C		

Note: "!" is the symbol for new product

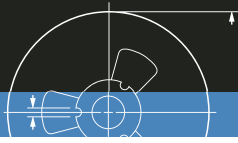


Chip Resistors General Information

Specification overview

Global part number	Series	Size	Power rating	Max. voltage	Operating Temp. range	Resistance range	Tolerance	T. C. R.						
RL0402xR-07xxxxL	RL	0402	1/16W	(PxR) ^{1/2}	-55°C to 125°C	100mΩ ≤ R < 1Ω	±1% ±2% ±5%	See page 30, table "T. C. R. - RL series"						
RL0603xR-07xxxxL		0603	1/10W	(PxR) ^{1/2}		10mΩ ≤ R < 1Ω								
RL0805xR-07xxxxL		0805	1/8W	(PxR) ^{1/2}										
!RL0805xR-7WxxxxL			1/4W	(PxR) ^{1/2}										
RL1206xR-07xxxxL		1206	1/4W	(PxR) ^{1/2}										
!RL1206xR-7WxxxxL			1/2W	(PxR) ^{1/2}										
RL1210xR-07xxxxL		1210	1/2W	(PxR) ^{1/2}										
RL1218xK-07xxxxL		1218	1W	(PxR) ^{1/2}										
RL2010xK-07xxxxL		2010	3/4W	(PxR) ^{1/2}										
RL2512xK-07xxxxL		2512	1W	(PxR) ^{1/2}										
!PT0402xRx07xxxxL	PT	0402	1/16W	(PxR) ^{1/2}	-55°C to 125°C	100mΩ ≤ R < 1Ω	±1% ±2% ±5%	±200 ppm/°C						
!PT0402xRx7WxxxxL			1/8W											
!PT0603xRx07xxxxL		0603	1/10W											
!PT0603xRx7WxxxxL			1/5W											
!PT0805xRx07xxxxL		0805	1/8W											
!PT0805xRx7WxxxxL			1/4W											
!PT1206xRx07xxxxL		1206	1/4W											
!PT1206xRx7WxxxxL			1/2W											
!PT2010xKx07xxxxL		2010	3/4W											
!PT2010xKx7WxxxxL			1W											
!PT2512xKx07xxxxL		2512	1W											
!PT2512xKx7WxxxxL			2W											
!PT0815xK-07xxxxL		PT (Wide)	0815						1/2W	(PxR) ^{1/2}	-55°C to 155°C	25mΩ ≤ R ≤ 50mΩ	±1% ±2% ±5%	±100 ppm/°C
!PT0815xK-7WxxxxL			0815						1W					
PR2010xKx07xxxxxx	PR	2010	1/2W	(PxR) ^{1/2}	-55°C to 155°C	1mΩ ≤ R ≤ 100mΩ	±1% ±2% ±5%	1mΩ ≤ R ≤ 100mΩ ±50 ppm/°C						
PR2010xKx7Wxxxxxx			1W											
PR2512xKx07xxxxxx		2512	1W											
PR2512xKx7Wxxxxxx			2W											
PF0805xRx07xxxxxx	PF	0805	1/8W	(PxR) ^{1/2}	-55°C to 155°C	10mΩ ≤ R ≤ 100mΩ	±1% ±2% ±5%	±75 ppm/°C ±100 ppm/°C						
PF0805xRx7Wxxxxxx			1/4W											
PF0805xRx7Txxxxxx			1/3W											
PF1206xRx07xxxxxx		1206	1/4W	(PxR) ^{1/2}	-55°C to 155°C	3mΩ ≤ R ≤ 100mΩ	±1% ±2% ±5%	3mΩ ≤ R ≤ 9mΩ ±100 ppm/°C 10mΩ ≤ R ≤ 100mΩ ±75 ppm/°C						
PF1206xRx7Wxxxxxx			1/2W											
PF2512xKx07xxxxxx		2512	1W	(PxR) ^{1/2}	-55°C to 155°C	6mΩ ≤ R ≤ 50mΩ	±1% ±2% ±5%	±75 ppm/°C ±100 ppm/°C						
PF2512xKx7Wxxxxxx			2W											
!PF0612xK-07xxxxxx		PF (Wide)	0612	1W	(PxR) ^{1/2}	-55°C to 155°C	2mΩ ≤ R ≤ 50mΩ	±1% ±2% ±5%	±75 ppm/°C ±100 ppm/°C					
!PF0815xK-07xxxxxx	PF (Wide)	0815	1/2W	(PxR) ^{1/2}	-55°C to 155°C	10mΩ ≤ R ≤ 20mΩ	±1% ±2% ±5%	±75 ppm/°C ±100 ppm/°C						
!PF0815xK-7Wxxxxxx			1W											
PH1206xR07Wxxxxxx	PH	1206	1W	(PxR) ^{1/2}	-55°C to 155°C	10mΩ ≤ R ≤ 50mΩ	±1% ±2% ±5%	±75 ppm/°C ±100 ppm/°C						
!PE1206xRx07xxxxxx	PE	1206	1/2W	(PxR) ^{1/2}	-55°C to 155°C	3mΩ ≤ R ≤ 100mΩ	±1% ±2% ±5%	3mΩ ≤ R ≤ 9mΩ ±100 ppm/°C 10mΩ ≤ R ≤ 100mΩ ±75 ppm/°C						
!PE1206xRx7Wxxxxxx			1W											
!PE2512xKx07xxxxxx		2512	1W											
!PE2512xKx7Wxxxxxx			2W											

Note: " ! " is the symbol for new product



Chip Resistors General Information

Specification overview

Global part number	Series	Size	Power rating	Max. voltage	Operating Temp. range	Resistance range	Tolerance	T. C. R.
AR0402xR-07xxxxL	AR	0402	1/16W	50V	-55°C to 155°C	1Ω ≤ R ≤ 10MΩ	±1% ±5%	1Ω ≤ R ≤ 10Ω ±200 ppm/°C 10Ω < R ≤ 10MΩ ±100 ppm/°C
AR0603xR-07xxxxL		0603	1/10W					
AR0805xR-07xxxxL		0805	1/8W	150V				
AR1206xR-07xxxxL		1206	1/4W	200V				
SR0805xR-07xxxxL	SR	0805	1/8W	150V	-55°C to 155°C	1Ω ≤ R ≤ 100KΩ	±5% ±10% ±20%	±200 ppm/°C
SR1206xR-07xxxxL		1206	1/4W					
SR1218xK-07xxxxL		1218	1W	200V				
SR2512xK-07xxxxL		2512	1W					
RV0805JR-07xxxxL	RV	0805	1/8W	400V	-55°C to 155°C	100KΩ ≤ R ≤ 10MΩ	±1% ±5%	±200 ppm/°C
RV1206JR-07xxxxL		1206	1/4W	500V		10KΩ ≤ R ≤ 27MΩ	±5%	±200 ppm/°C
RV1206FR-07xxxxL						10KΩ ≤ R ≤ 10MΩ	±1%	
RV2512JK-07xxxxL		2512	1W	4.7MΩ ≤ R ≤ 16MΩ		±5%	±200 ppm/°C	
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	1/10W					
TR0805xR-07xxxxL		0805	1/8W	150V				
TR1206xR-07xxxxL		1206	1/4W	200V				
!AF0402xR-07xxxxL	AF	0402	1/16W	50V	-55°C to 155°C	1Ω ≤ R ≤ 22MΩ	1Ω ≤ R ≤ 10MΩ ±1% 1Ω ≤ R ≤ 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					
!AF0805xR-07xxxxL		0805	1/8W	150V				
!AF1206xR-07xxxxL		1206	1/4W	200V				
!AC0402xR-07xxxxL	AC	0402	1/16W	50V	-55°C to 155°C	1Ω ≤ R ≤ 10MΩ	±1% ±5%	1Ω ≤ R ≤ 10Ω ±200 ppm/°C 10Ω < R ≤ 10MΩ ±100 ppm/°C
!AC0603xR-07xxxxL		0603	1/10W	50V				
!AC0805xR-07xxxxL		0805	1/8W	150V				
!AC1206xR-07xxxxL		1206	1/4W	200V				
ATV321xR-07xxxxL	AT	0404	40mW	50V	-55°C to 125°C	-1dB to -20dB	±0.3dB ±0.5dB ±1.0dB ±2.0dB	---

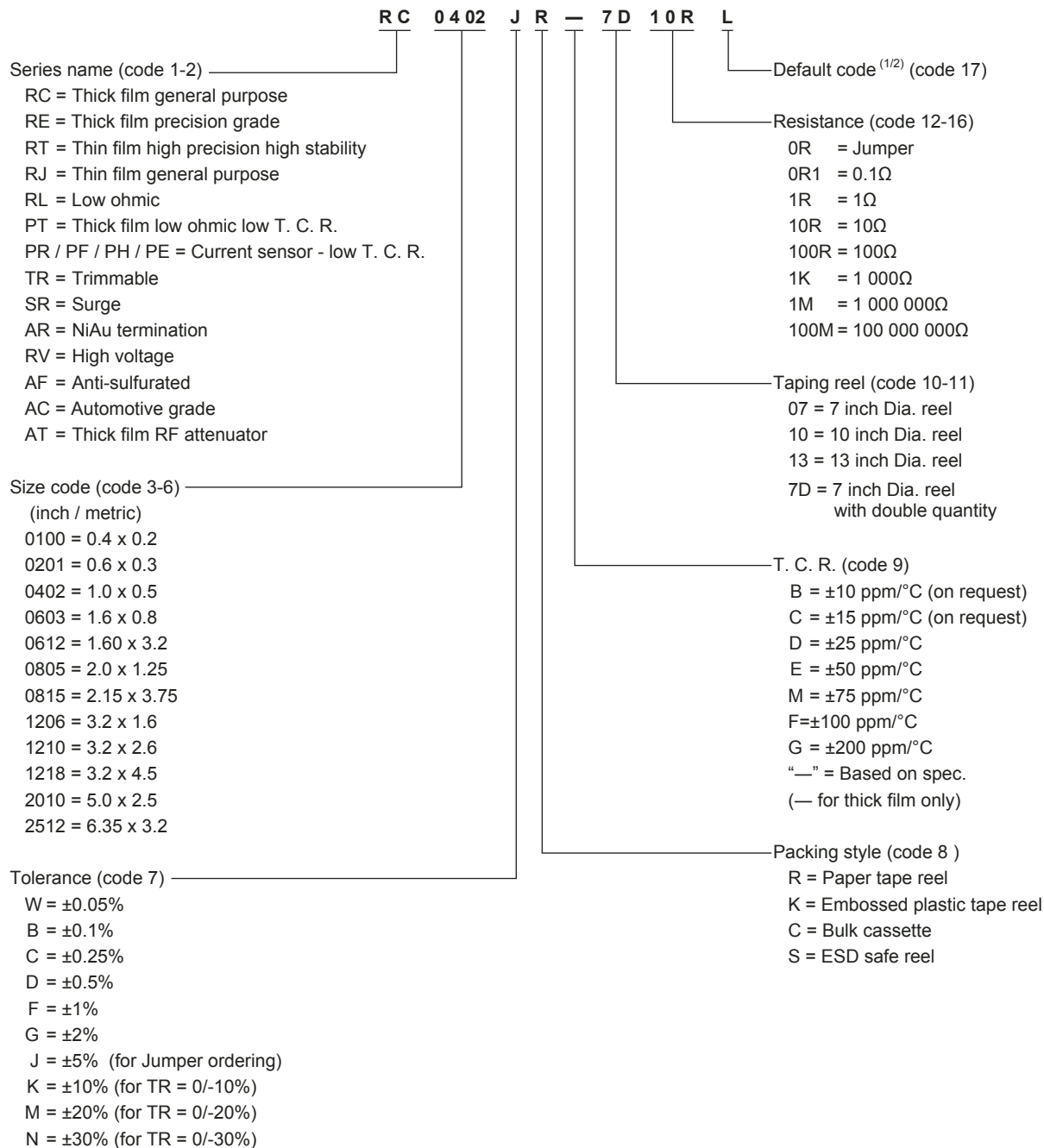
Note: "!" is the symbol for new product



Chip Resistors General Information

Ordering information - Global part number

Global part number - Single resistor ⁽³⁾

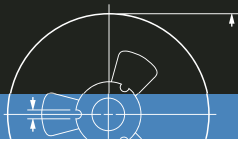


Note: 1. All of our RSMD products are RoHS compliant. "LFP" of the internal 2D reel label mentions "Lead Free Process"

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.

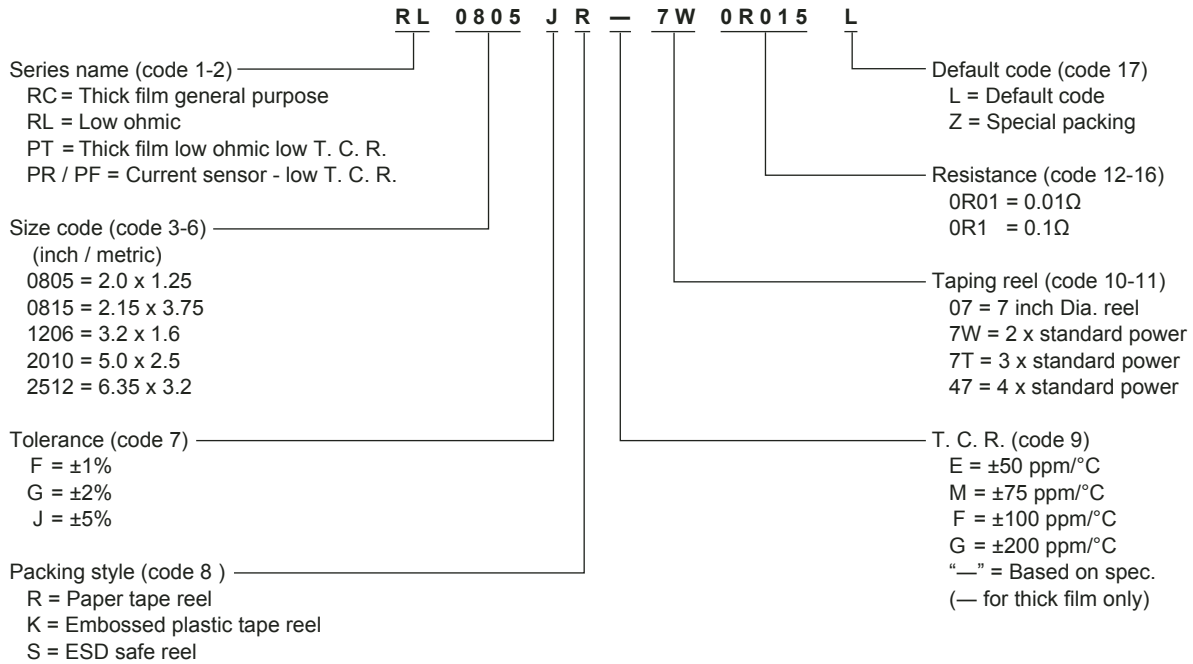




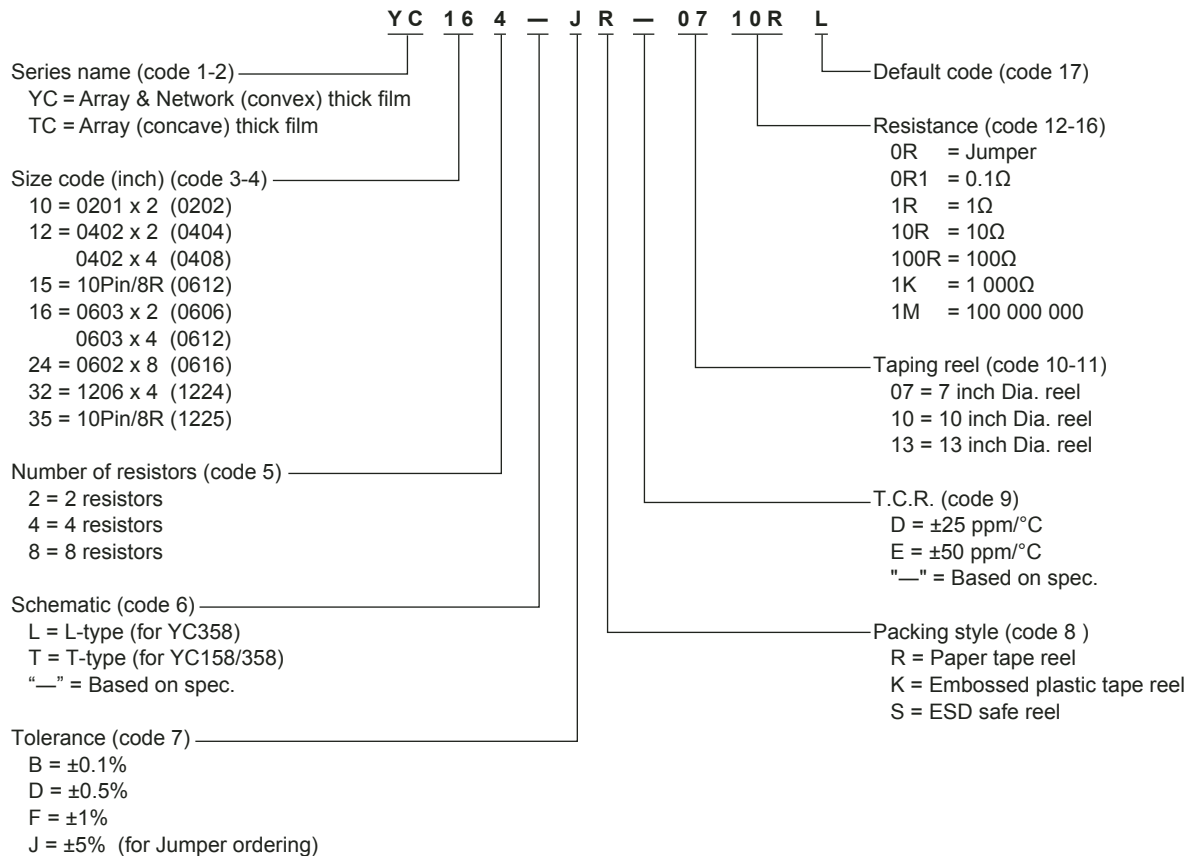
Chip Resistors General Information

Ordering information - Global part number

Global part number - Power enhancement



Global part number - Arrays & Networks

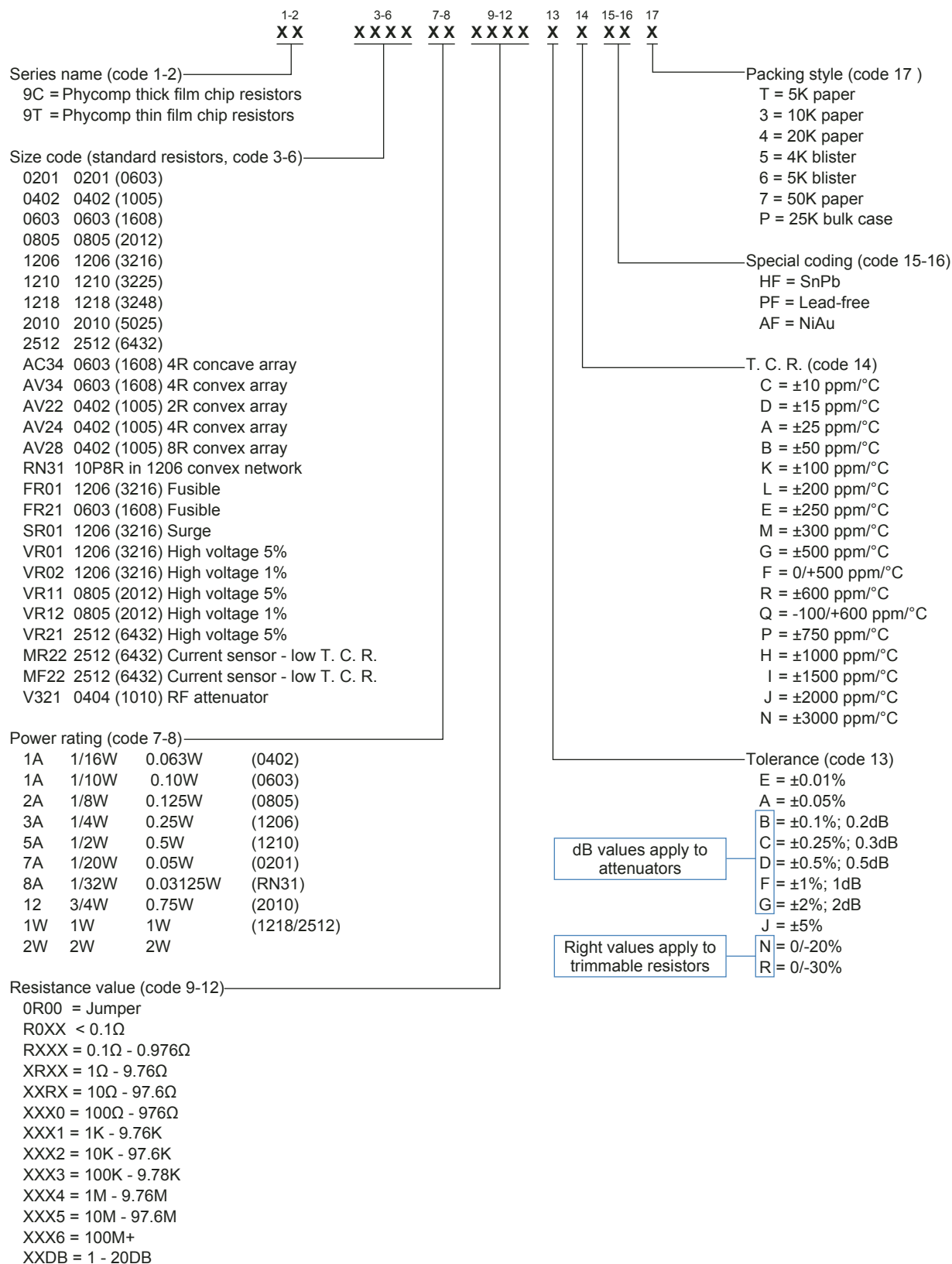


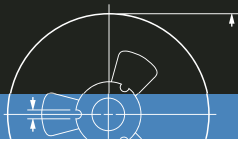
Chip Resistors General Information

Ordering information - North America

Phycomp CTC ordering code - North America

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





Chip Resistors General Information

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		Mass per 100 units Mass (g)	Volume mm ³
		Paper	Embossed	Paper	Paper	Embossed		
0100	8mm	20 000	---	---	---	---	0.007	0.0104
0201	8mm	10 000 / 20 000	---	20 000	50 000	---	0.016	0.041
0402	8mm	10 000 / 20 000	---	20 000	50 000	---	0.058	0.175
0603	8mm	5 000	---	10 000	20 000	---	0.192	0.576
0612	8mm	---	5 000	---	---	---	0.862	2.728
0805	8mm	4 000 / 5 000	---	10 000	20 000	---	0.450	1.250
0815	8mm	---	4 000	---	---	---	1.71	4.44
1206	8mm	5 000	5 000	10 000	20 000	---	0.862	2.728
1210	8mm	5 000	---	10 000	20 000	---	1.471	4.030
1218	12mm	---	4 000	---	---	---	2.703	7.590
2010	12mm	---	4 000	---	---	16 000	2.273	6.875
2512	12mm	---	4 000 / 2 000	---	---	---	3.704	10.827
YC102	8mm	10 000	---	---	---	---	0.052	---
YC122	8mm	10 000	---	---	50 000	---	0.100	---
TC122	8mm	10 000	---	---	50 000	---	0.112	---
ATV321	8mm	10 000	---	---	---	---	0.100	---
YC124	8mm	10 000	---	20 000	40 000	---	0.281	---
TC124	8mm	10 000	---	20 000	40 000	---	0.311	---
YC162	8mm	5 000	---	---	---	---	0.376	---
YC164	8mm	5 000	---	10 000	20 000	---	0.833	---
TC164	8mm	5 000	---	10 000	20 000	---	1.030	---
YC158	8mm	5 000	---	---	20 000	---	0.855	---
YC248	12mm	5 000	4 000	---	---	---	0.885	---
YC324	12mm	---	4 000	---	---	---	2.703	---
YC358	12mm	---	4 000	---	---	---	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



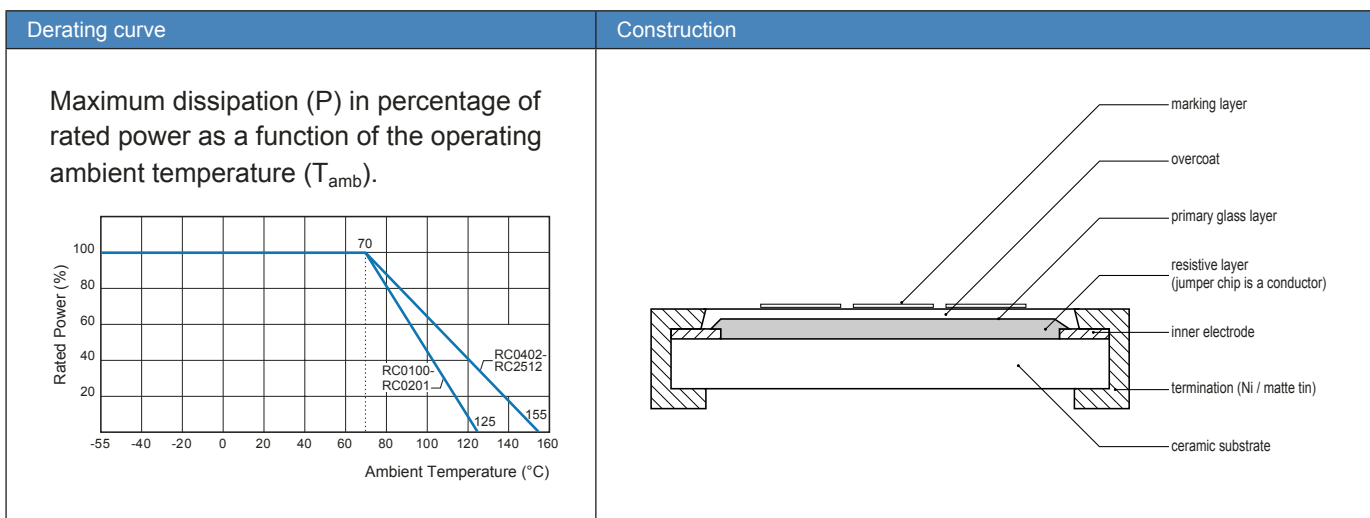
Chip Resistors Selection Charts

Introduction to thick film general purpose chip resistors

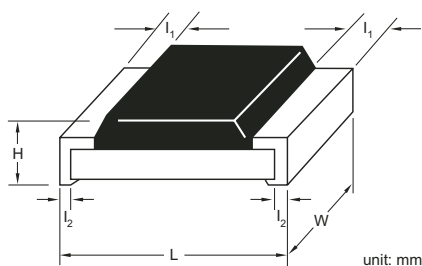


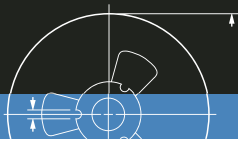
Features

- Extremely thin and light
- Highly reliable multilayer electrode construction
- Compatible with all soldering process
- Highly stable in auto-placement surface mounting applications
- Barrier layer end termination
- Zero ohm jumper is available
- Available in 8mm tape & reel per EIA RS481



Dimensions						
Type	L	W	H	l_1	l_2	
RC0100	0.40 ±0.03	0.20 ±0.03	0.13 ±0.03	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	0.35 ±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	0.50 ±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	0.55 ±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	





Chip Resistors Selection Charts

Introduction to thick film general purpose chip resistors

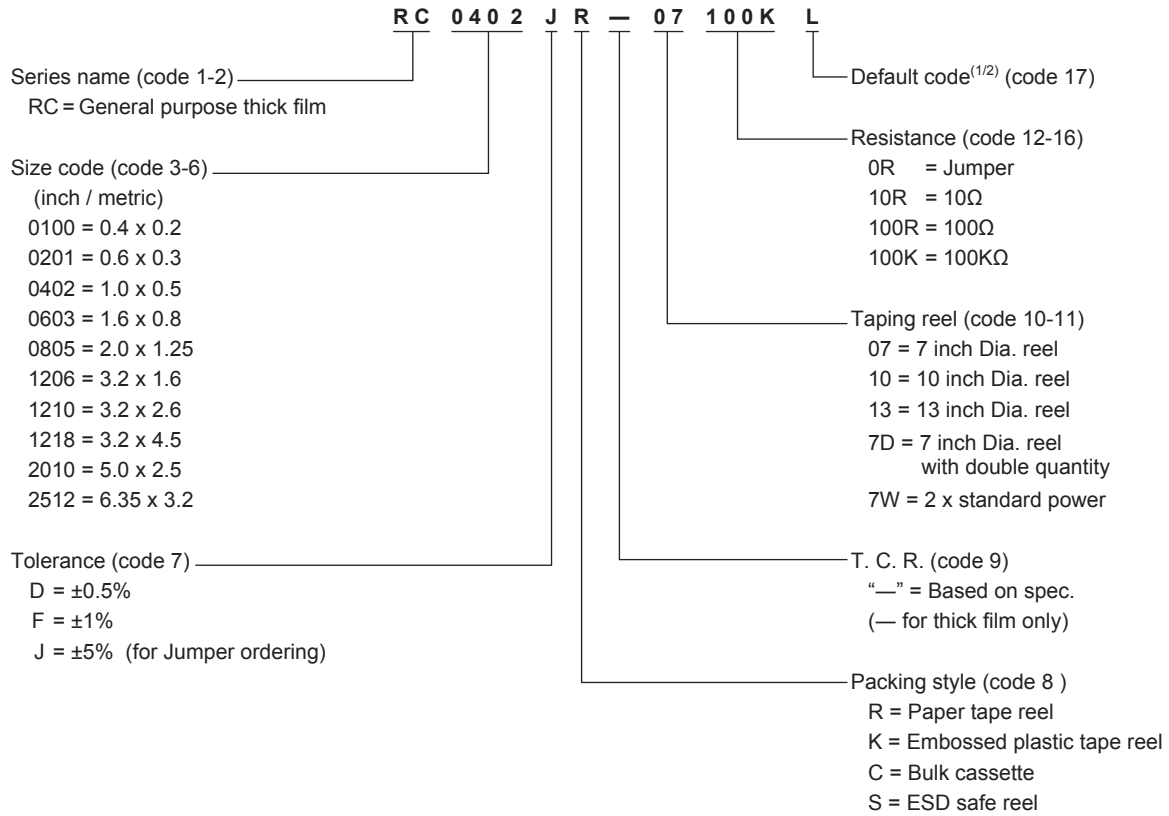
Electrical characteristics											
Type	Power P ₇₀	Operating Temp. range	MWV	RCOV	DWV	Resistance range & tolerance		T. C. R. (ppm/°C)		Jumper criteria (unit: A)	
RC0100	1/32W	-55°C to +125°C	15V	30V	30V	E24 ±1%, 5% Zero ohm jumper	10Ω≤R≤1MΩ <50mΩ	10Ω≤R≤1MΩ	±250	Rated current Max. current	0.5 1.0
RC0201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

Environmental characteristics			
Performance test	Test method	Procedure	Requirements
Life	MIL-STD-202G-method 108A	1 000 hours at 70 ±5°C applied RCWV 1.5 hours on, 0.5 hours off, still air required	±(3%+ 0.05Ω) for 01005 ±(2%+ 0.05Ω) for others < 100mΩ for jumper
High temperature exposure	MIL-STD-202G-method 108A	1 000 hours at maximum operating temperature depending on specification, unpowered	±(1%+ 0.05Ω) < 50mΩ for jumper
Moisture resistance	MIL-STD-202G-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	±(3%+ 0.05Ω) for 01005 ±(2%+ 0.05Ω) for others < 100mΩ for jumper
Thermal shock	MIL-STD-202G-method 107G	LCT / UCT, number of cycles required is 300 Maximum transfer time is 20 seconds	±(0.5%+ 0.05Ω) for 10K to 10M ±(1%+ 0.05Ω) for others
Solderability	Wetting	IPC/JEDECJ-STD-002B testB 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-202G-method 210F Lead-free solder, 260°C, 10 seconds immersion time	±(1%+ 0.05Ω) < 50mΩ for jumper
Short time overload	MIL-R-55342D-para 4.7.5	2.5 times RCWV or maximum overload voltage which- ever is less for 5 seconds at room temperature	±(2%+ 0.05Ω) < 50mΩ for jumper

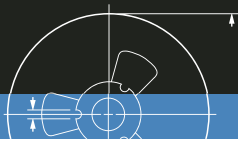


Global part number - Preferred type for ordering Yageo / Phycomp branded products

Ordering example: RC0402JR-07100KL



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



Chip Resistors Selection Charts

01005 to 2512

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 13 for details.



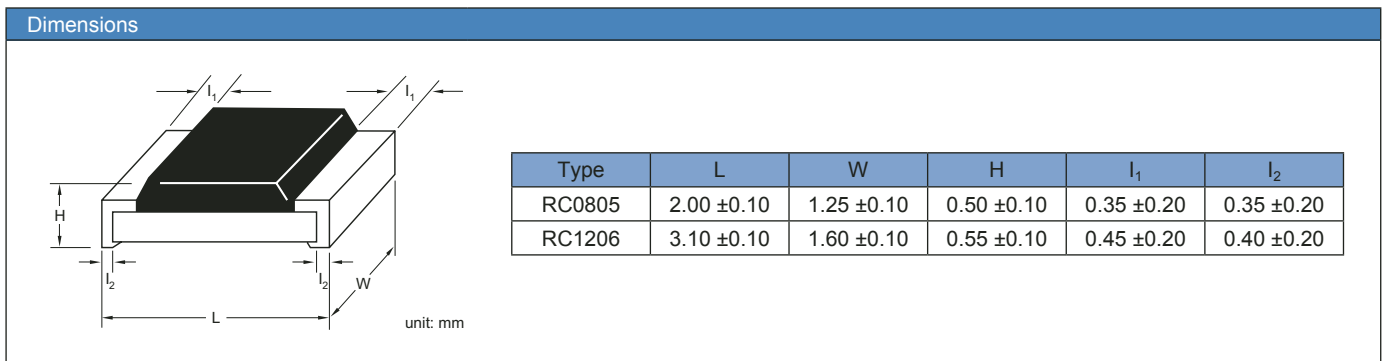
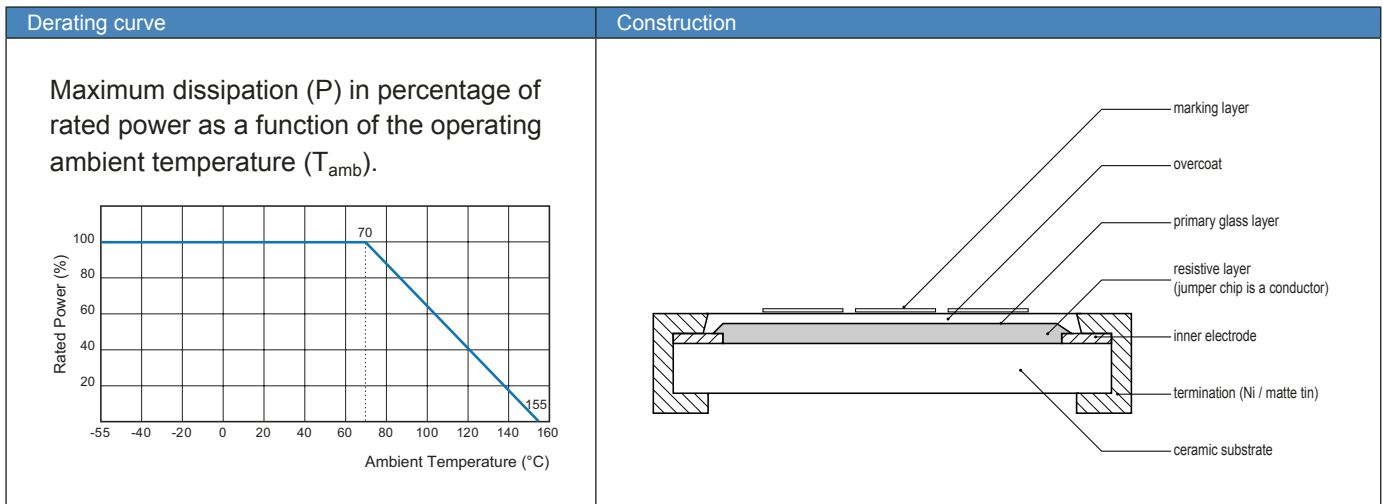
Chip Resistors Selection Charts

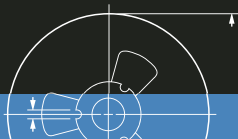
Introduction to thick film high ohmic chip resistors



Features

- Reduced size of final equipment
- Low assembly costs
- Higher component and equipment reliability
- High ohmic values up to 100MΩ
- Suitable for power supplies in small equipments





Chip Resistors Selection Charts

Introduction to high ohmic chip resistors

Electrical characteristics								
Type	Power P_{70}	Operating Temp. range	MWV	RCOV	DWV	Resistance range & tolerance		T. C. R. (ppm/°C)
RC0805	1/8W	-55°C to +155°C	150V	300V	300V	E24 ±5%, ±10%, ±20%	24MΩ ≤ R ≤ 100MΩ	±300
RC1206	1/4W	-55°C to +155°C	200V	400V	500V			

Note: See page 11 for ordering code. For more detailed, please contact our sales offices, distributors and representatives in your region.

Environmental characteristics				
Performance test		Test method	Procedure	Requirements
Life		MIL-STD-202G-method 108A	1 000 hours at 70 ±5°C applied RCWV 1.5 hours on, 0.5 hours off, still air required	±(2% +0.05Ω)
High temperature exposure		MIL-STD-202G-method 108A	1 000 hours at maximum operating temperature depending on specification, unpowered	±(1% +0.05Ω)
Moisture resistance		MIL-STD-202G-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% +0.05Ω)
Thermal shock		MIL-STD-202G-method 107G	LCT / UCT, number of cycles required is 300 Maximum transfer time is 20 seconds	±(0.5% +0.05Ω) ±(1% +0.05Ω)
Solderability	Wetting	IPC/JEDECJ-STD-002B testB	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-202G-method 210F	Lead-free solder, 260°C, 10 seconds immersion time	±(1% +0.05Ω)
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% +0.05Ω)



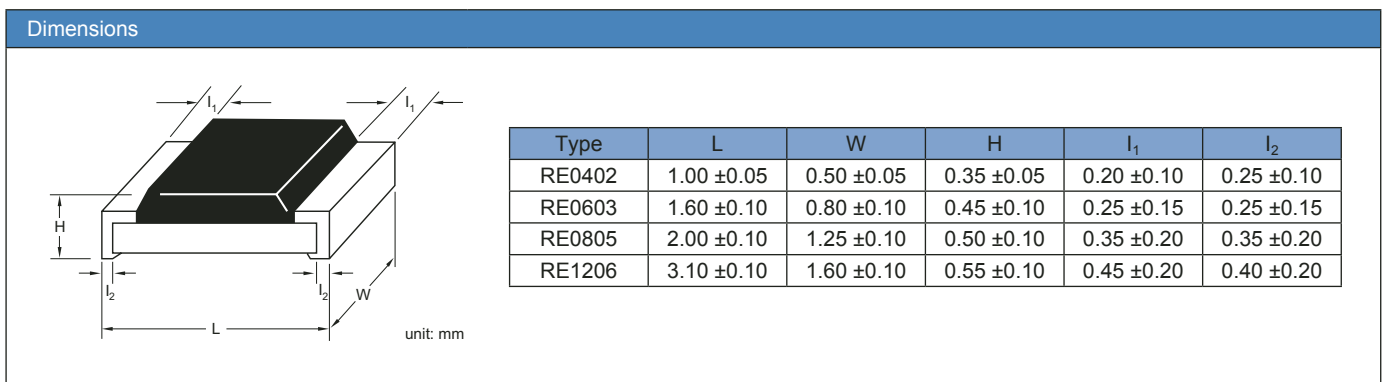
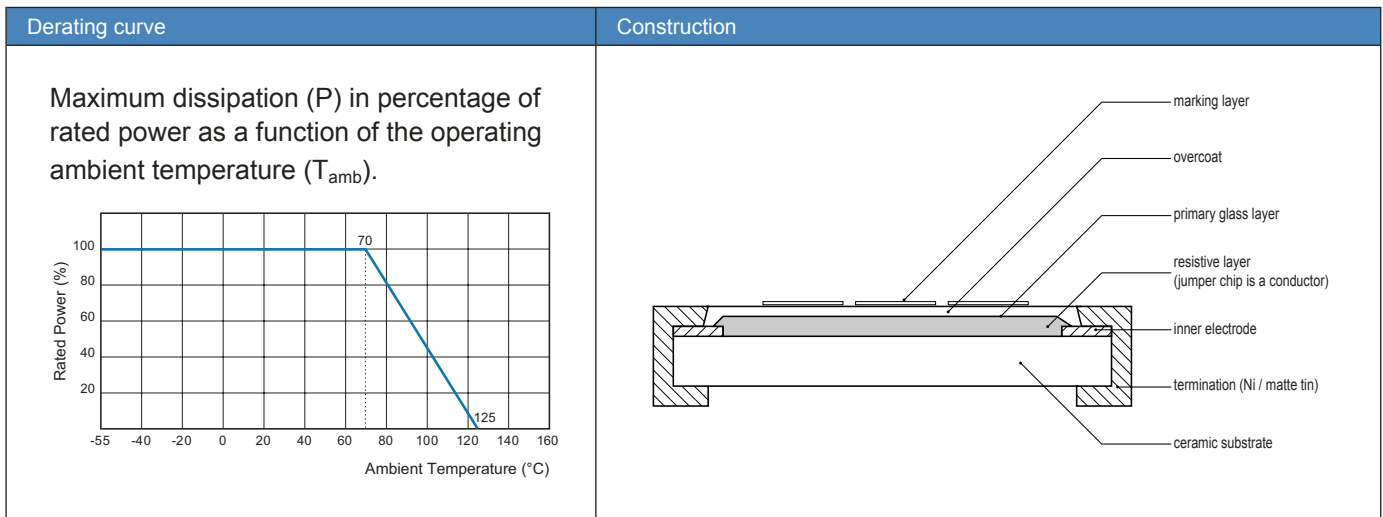
Chip Resistors Selection Charts

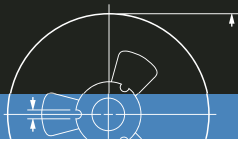
Introduction to thick film precision grade chip resistors



Features

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





Chip Resistors Selection Charts

Introduction to thick film precision grade chip resistors

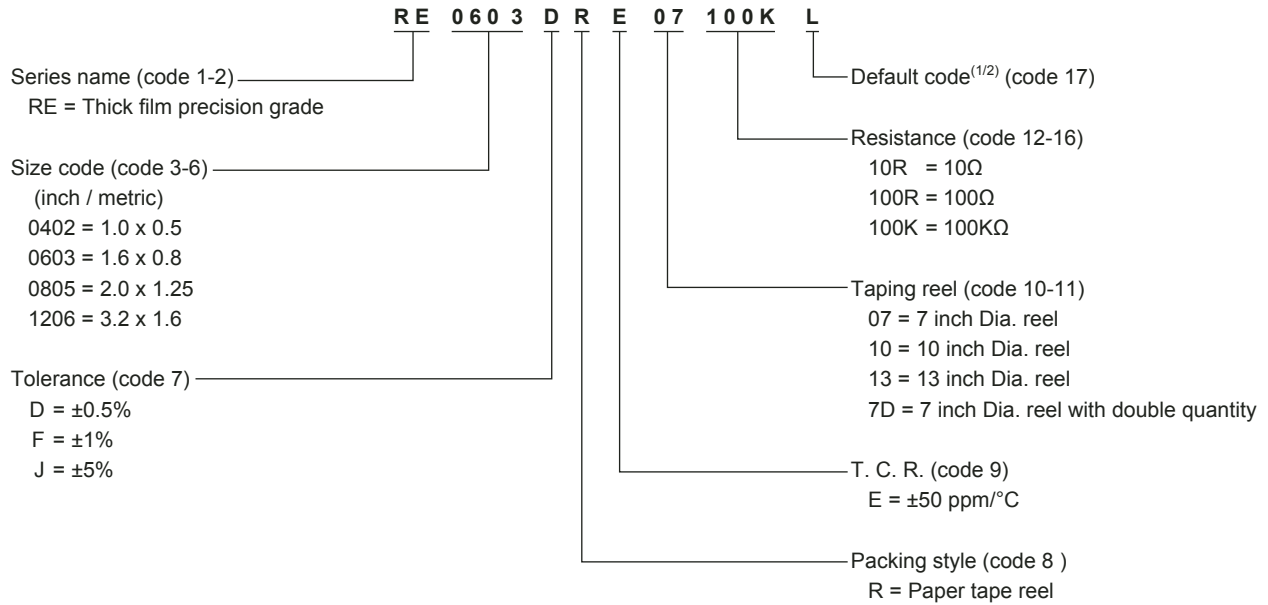
Electrical characteristics								
Type	Power P_{70}	Operating Temp. range	MWV	RCOV	DWV	Resistance range & tolerance		T. C. R. (ppm/°C)
RE0402	1/16W	-55°C to +125°C	50V	100V	100V	E24 ±5% E24/E96 ±1% E24/E96 ±0.5%	10Ω ≤ R ≤ 1MΩ	±50
RE0603	1/10W	-55°C to +125°C	50V	100V	100V			
RE0805	1/8W	-55°C to +125°C	150V	300V	300V			
RE1206	1/4W	-55°C to +125°C	200V	400V	500V			

Environmental characteristics				
Performance test		Test method	Procedure	Requirements
Life		MIL-STD-202G-method 108A	1 000 hours at 70 ±5°C applied RCWV 1.5 hours on, 0.5 hours off, still air required	±(1%+ 0.05Ω)
High temperature exposure		MIL-STD-202G-method 108A	1 000 hours at maximum operating temperature depending on specification, unpowered	±(1%+ 0.05Ω)
Moisture resistance		MIL-STD-202G-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	±(0.5%+ 0.05Ω)
Thermal shock		MIL-STD-202G-method 107G	LCT / UCT, number of cycles required is 300 Maximum transfer time is 20 seconds	±(0.5%+ 0.05Ω)
Solderability	Wetting	IPC/JEDECJ-STD-002B testB	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-202G-method 210F	Lead-free solder, 260°C, 10 seconds immersion time	±(0.5%+ 0.05Ω)
Short time overload		MIL-R-55342D-para 4.7.5	2.5 times RCWV or maximum overload voltage which- ever is less for 5 seconds at room temperature	±(1%+ 0.05Ω)



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

Ordering example: RE0603DRE07100KL

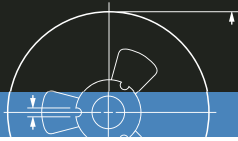


- Note:** 1. All of our RSMD products are RoHS compliant. "LFP" of the internal 2D reel label mentions "Lead Free Process"
 2. Letter L is system default code for ordering only
 3. RE series products are available by "Global part number" only

Phycomp CTC ordering code - Traditional type - North America

Regional code for ordering Phycomp branded products. Please see page 13 for details.





Chip Resistors Selection Charts

Introduction to thin film high precision high stability chip resistors

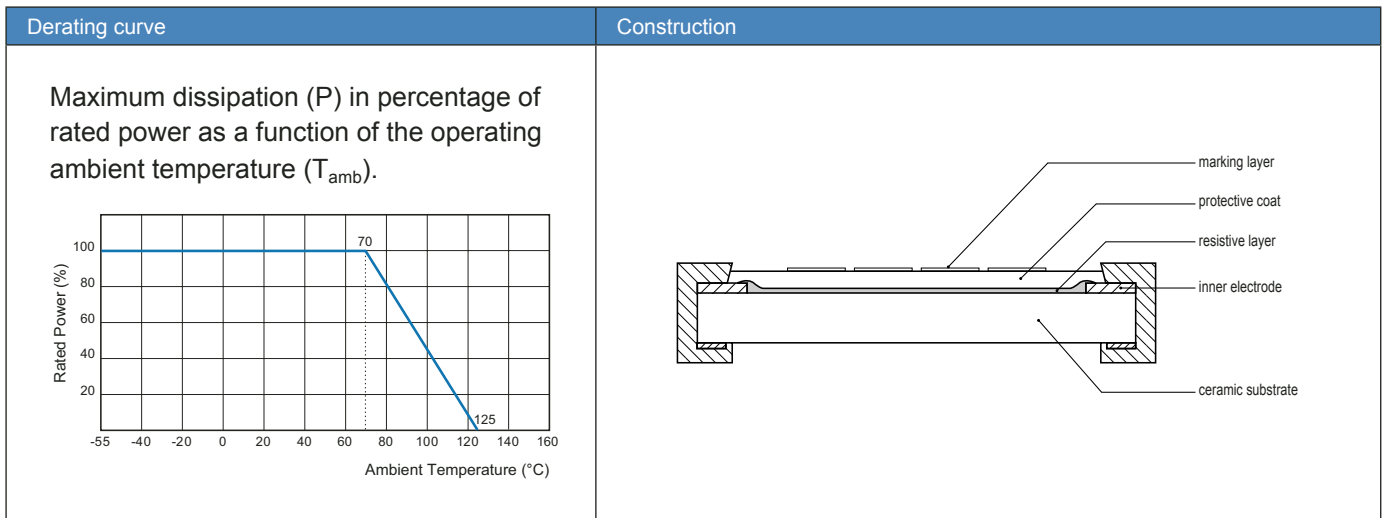
Features

RT series

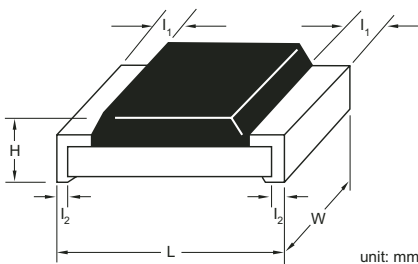
- High precision - High stability
- Low T. C. R. / low noise
- High accuracy ($\pm 0.05\%$, $\pm 0.1\%$, $\pm 0.25\%$, $\pm 0.5\%$, $\pm 1\%$)

RJ series

- General purpose
- T. C. R. : ± 50 ppm/ $^{\circ}\text{C}$
- Tolerance: $\pm 1\%$



Dimensions						
Type	L	W	H	l_1	l_2	
RT / RJ0402	1.00 ± 0.10	0.50 ± 0.05	0.30 ± 0.05	0.20 ± 0.10	0.25 ± 0.10	
RT / RJ0603	1.60 ± 0.10	0.80 ± 0.10	0.45 ± 0.10	0.25 ± 0.15	0.25 ± 0.15	
RT / RJ 0805	2.00 ± 0.10	1.25 ± 0.10	0.50 ± 0.10	0.35 ± 0.20	0.35 ± 0.20	
RT / RJ1206	3.10 ± 0.10	1.60 ± 0.10	0.55 ± 0.10	0.45 ± 0.20	0.40 ± 0.20	
RT / RJ1210	3.10 ± 0.10	2.60 ± 0.15	0.50 ± 0.10	0.50 ± 0.20	0.50 ± 0.20	
RT / RJ2010	5.00 ± 0.10	2.50 ± 0.15	0.55 ± 0.10	0.55 ± 0.15	0.50 ± 0.20	
RT / RJ2512	6.35 ± 0.10	3.20 ± 0.15	0.55 ± 0.10	0.60 ± 0.20	0.50 ± 0.20	

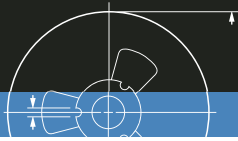


Chip Resistors Selection Charts

Introduction to thin film high precision high stability chip resistors

Electrical characteristics								
Type	Power P ₇₀	Operating Temp. range	MWV	RCOV	DWV	Resistance range & tolerance		T. C. R. (ppm/°C)
RT0402	1/16W	-55°C to +125°C	50V	100V	75V	E24/E96 ±0.05%, ±0.1%, ±0.25%, ±0.5%, ±1%	10Ω ≤ R ≤ 121KΩ	±50 ±25 ±15 ±10
RT0603	1/10W		75V	150V	100V		5.1Ω ≤ R ≤ 681KΩ	
RT0805	1/8W		150V	300V	200V		5.1Ω ≤ R ≤ 1.5MΩ	
RT1206	1/4W		200V	400V	300V		5.1Ω ≤ R ≤ 1MΩ	
RT1210	1/4W		200V	400V	400V		5.1Ω ≤ R ≤ 1MΩ	
RT2010	1/2W		200V	400V	400V		10Ω ≤ R ≤ 1MΩ	
RT2512	3/4W		200V	400V	400V		10Ω ≤ R ≤ 121KΩ	
RJ0402	1/16W		25V	100V	100V	5.1Ω ≤ R ≤ 681KΩ		
RJ0603	1/16W		50V	100V	100V	5.1Ω ≤ R ≤ 1.5MΩ		
RJ0805	1/10W		100V	200V	250V	5.1Ω ≤ R ≤ 1.5MΩ		
RJ1206	1/8W		150V	250V	250V	5.1Ω ≤ R ≤ 1.5MΩ		
RJ1210	1/4W		150V	250V	250V	5.1Ω ≤ R ≤ 1.5MΩ		
RJ2010	1/2W		150V	300V	400V	10Ω ≤ R ≤ 1MΩ		
RJ2512	3/4W		150V	300V	400V	10Ω ≤ R ≤ 1MΩ		

Environmental characteristics				
Performance test	Test method	Procedure	Requirements	
Life	MIL-STD-202G-method 108A	1 000 hours at 70 ±5°C applied RCWV 1.5 hours on, 0.5 hours off, still air required	±(0.25% +0.05Ω) for RT ±(0.5% +0.05Ω) for RJ	
High temperature exposure	MIL-STD-202G-method 108A	1 000 hours at maximum operating temperature depending on specification, unpowered		
Moisture resistance	MIL-STD-202G-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		
Thermal shock	MIL-STD-202G-method 107G	LCT / UCT, number of cycles required is 300 Maximum transfer time is 20 seconds		
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		
Solderability	Resistance to soldering heat	MIL-STD-202G-method 210F	Lead-free solder, 260°C, 10 seconds immersion time	±(0.5% +0.05Ω)
	Wetting	IPC/JEDECJ-STD-002B testB	Electrical test not required. Magnification 50X Lead-free solder bath at 245 ±3°C Dipping time: 3 ±0.5 seconds	Well tinned (≥95% covered)

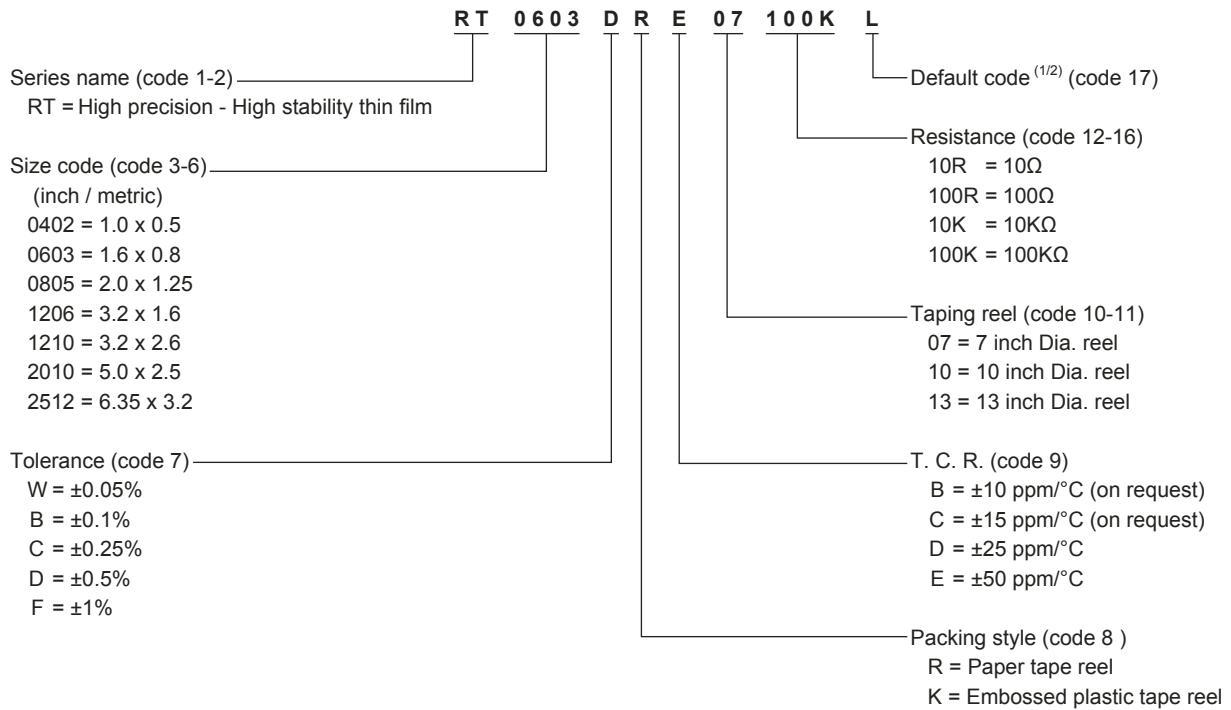


Chip Resistors Selection Charts

Thin film high precision high stability, 0402 to 2512

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

Ordering example: RT0603DRE07100KL



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



Chip Resistors Selection Charts

Thin film high precision high stability, 0402 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

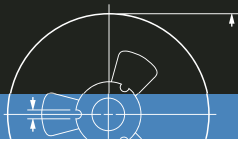
For ordering rules: See page 14 for E24 / E96 values and the last 4 or 3 digits of the 12NC catalogue number

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

Phycomp CTC ordering code - Traditional type - North America
Regional code for ordering Phycomp branded products. Please see page 13 for details.

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)	±10 (B)	±15 (C)	±25 (D)	±10 (B)	±15 (C)	±25 (D)	±50 (E)	±10 (B)	±15 (C)	±25 (D)	±50 (E)	±25 (D)	±50 (E)	±50 (E)
RT0402	--	--	--	10R - 100K	10R - 100K	10R - 121K	10R - 121K	10R - 100K	10R - 100K	10R - 121K	10R - 121K	10R - 121K	10R - 121K	10R - 121K
RT0603	1K - 47K	1K - 47K	1K - 47K	10R - 100K	10R - 100K	10R - 681K	10R - 681K	10R - 100K	10R - 100K	10R - 681K	5R1 - 681K	10R - 681K	5R1 - 681K	5R1 - 681K
RT0805	100R - 100K	100R - 100K	100R - 100K	10R - 100K	10R - 100K	10R - 1.5M	10R - 1.5M	10R - 100K	10R - 100K	10R - 1.5M	5R1 - 1.5M	10R - 1.5M	5R1 - 1.5M	5R1 - 1.5M
RT1206	100R - 100K	100R - 100K	100R - 100K	10R - 100K	10R - 100K	10R - 1.5M	10R - 1.5M	10R - 100K	10R - 100K	10R - 1.5M	5R1 - 1.5M	10R - 1.5M	5R1 - 1.5M	5R1 - 1.5M
RT1210	100R - 100K	100R - 100K	100R - 100K	10R - 100K	10R - 100K	10R - 1M	10R - 1M	10R - 100K	10R - 100K	10R - 1M	5R1 - 1M	10R - 1M	5R1 - 1M	5R1 - 1M
RT2010	100R - 100K	100R - 100K	100R - 100K	10R - 100K	10R - 100K	10R - 1M	10R - 1M	10R - 100K	10R - 100K	10R - 1M	10R - 1M	10R - 1M	10R - 1M	10R - 1M
RT2512	100R - 100K	100R - 100K	100R - 100K	10R - 100K	10R - 100K	10R - 1M	10R - 1M	10R - 100K	10R - 100K	10R - 1M	10R - 1M	10R - 1M	10R - 1M	10R - 1M

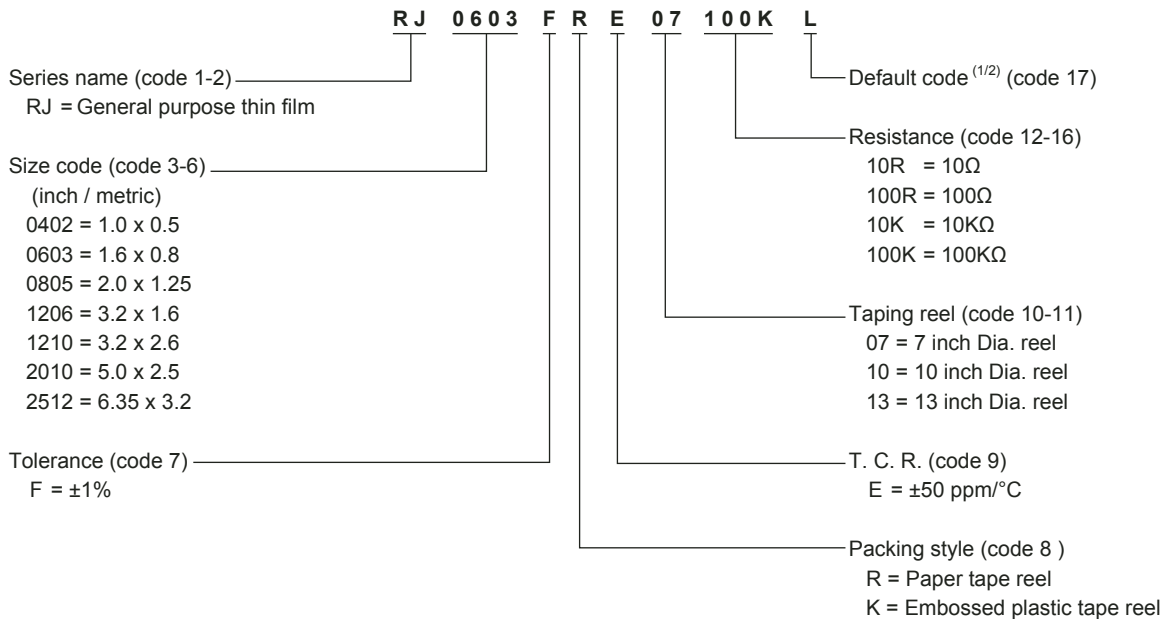


Chip Resistors Selection Charts

Thin film general purpose, 0402 to 2512

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

Ordering example: RJ0603FRE07100KL



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 thin film / RJ series							
Size: inch (mm)	0402 (1005)	0603 (1608)	0805 (2012)	1206 (3216)	1210 (3225)	2010 (5025)	2512 (6432)
Power	1/16 W	1/16 W	1/10 W	1/8 W	1/4 W	1/2 W	3/4 W
Tolerance	+1%	+1%	+1%	+1%	+1%	+1%	+1%
Resistance	E24 / E96	E24 / E96	E24 / E96	E24 / E96	E24 / E96	E24 / E96	E24 / E96
Packing	paper tape	paper tape	paper tape	paper tape	paper tape	blister tape	blister tape
Quantity	4 000	---	---	---	---	2390 415 8....L	2390 418 8....L
	5 000	---	2390 404 8....L	2390 401 8....L	2390 411 8....L	2390 412 0....L	---
	10 000	2390 407 8....L	2391 424 8....L	2391 421 8....L	2391 431 8....L	2391 432 8....L	---
	20 000	2390 427 8....L	2392 444 8....L	2392 441 8....L	2392 451 8....L	2392 412 8....L	---
	50 000	2390 447 8....L	---	---	---	---	---

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 13 for details.

Thin film product range against tolerance / T. C. R. (ordering code)

Tolerance	±1% (F)
T. C. R. (ppm/°C)	±50 (E)
RJ0402	10R - 121K
RJ0603	5R1 - 681K
RJ0805	5R1 - 1.5M
RJ1206	5R1 - 1.5M
RJ1210	10R - 1M
RJ2010	10R - 1M
RJ2512	10R - 1M



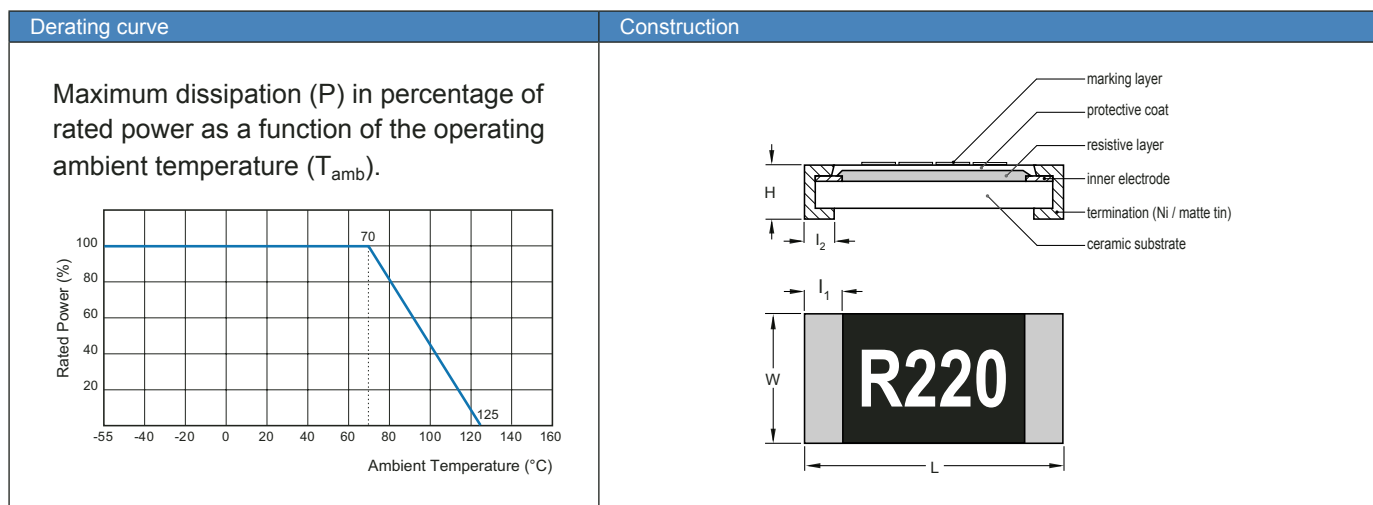
Chip Resistors Selection Charts

Introduction to thick film low ohmic chip resistors

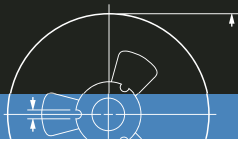


Features

- Current sensing of desktop & notebook PC
- Resistance values down to 0.010Ω
- Highly reliable multilayer electrode construction
- Low inductance
- High speed logic circuits



Dimensions						
Type	Resistance range	L	W	H	l_1	l_2
RL0402	$100\text{m}\Omega \leq R < 1\Omega$	1.00 ± 0.10	0.50 ± 0.05	0.35 ± 0.05	0.20 ± 0.10	0.25 ± 0.10
RL0603	$10\text{m}\Omega \leq R < 1\Omega$	1.60 ± 0.10	0.80 ± 0.10	0.45 ± 0.10	0.25 ± 0.15	0.25 ± 0.15
RL0805	$10\text{m}\Omega \leq R < 1\Omega$	2.00 ± 0.10	1.25 ± 0.10	0.50 ± 0.10	0.35 ± 0.20	0.35 ± 0.20
RL1206	$10\text{m}\Omega \leq R < 1\Omega$	3.10 ± 0.10	1.60 ± 0.10	0.55 ± 0.10	0.45 ± 0.20	0.45 ± 0.20
RL1210	$10\text{m}\Omega \leq R < 1\Omega$	3.10 ± 0.10	2.60 ± 0.15	0.50 ± 0.10	0.50 ± 0.20	0.50 ± 0.20
RL1218	$10\text{m}\Omega \leq R < 1\Omega$	3.05 ± 0.15	4.60 ± 0.10	0.55 ± 0.10	0.45 ± 0.25	0.50 ± 0.25
RL2010	$10\text{m}\Omega \leq R < 1\Omega$	5.00 ± 0.10	2.50 ± 0.15	0.55 ± 0.10	0.60 ± 0.20	0.50 ± 0.20
RL2512	$10\text{m}\Omega \leq R < 1\Omega$	6.35 ± 0.10	3.20 ± 0.15	0.55 ± 0.10	0.60 ± 0.20	0.50 ± 0.20



Chip Resistors Selection Charts

Introduction to thick film low ohmic chip resistors

Electrical characteristics					
Type	Power P_{70}	Operating Temp. range	Resistance range & tolerance		T. C. R. (ppm/°C)
RL0402	1/16W	-55°C to +125°C	E24 $\pm 1\%$, $\pm 2\%$, $\pm 5\%$	$100\text{m}\Omega \leq R < 1\Omega$	See following table "T.C.R.- RL series"
RL0603	1/10W	-55°C to +125°C		$10\text{m}\Omega \leq R < 1\Omega$	
RL0805	1/8W	-55°C to +125°C		$10\text{m}\Omega \leq R < 1\Omega$	
	1/4W	-55°C to +125°C		$15\text{m}\Omega \leq R < 1\Omega$	
RL1206	1/4W	-55°C to +125°C		$10\text{m}\Omega \leq R < 1\Omega$	
	1/2W	-55°C to +125°C		$15\text{m}\Omega \leq R < 1\Omega$	
RL1210	1/2W	-55°C to +125°C		$10\text{m}\Omega \leq R < 1\Omega$	
RL1218	1W	-55°C to +125°C		$10\text{m}\Omega \leq R < 1\Omega$	
RL2010	3/4W	-55°C to +125°C		$10\text{m}\Omega \leq R < 1\Omega$	
RL2512	1W	-55°C to +125°C		$10\text{m}\Omega \leq R < 1\Omega$	

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

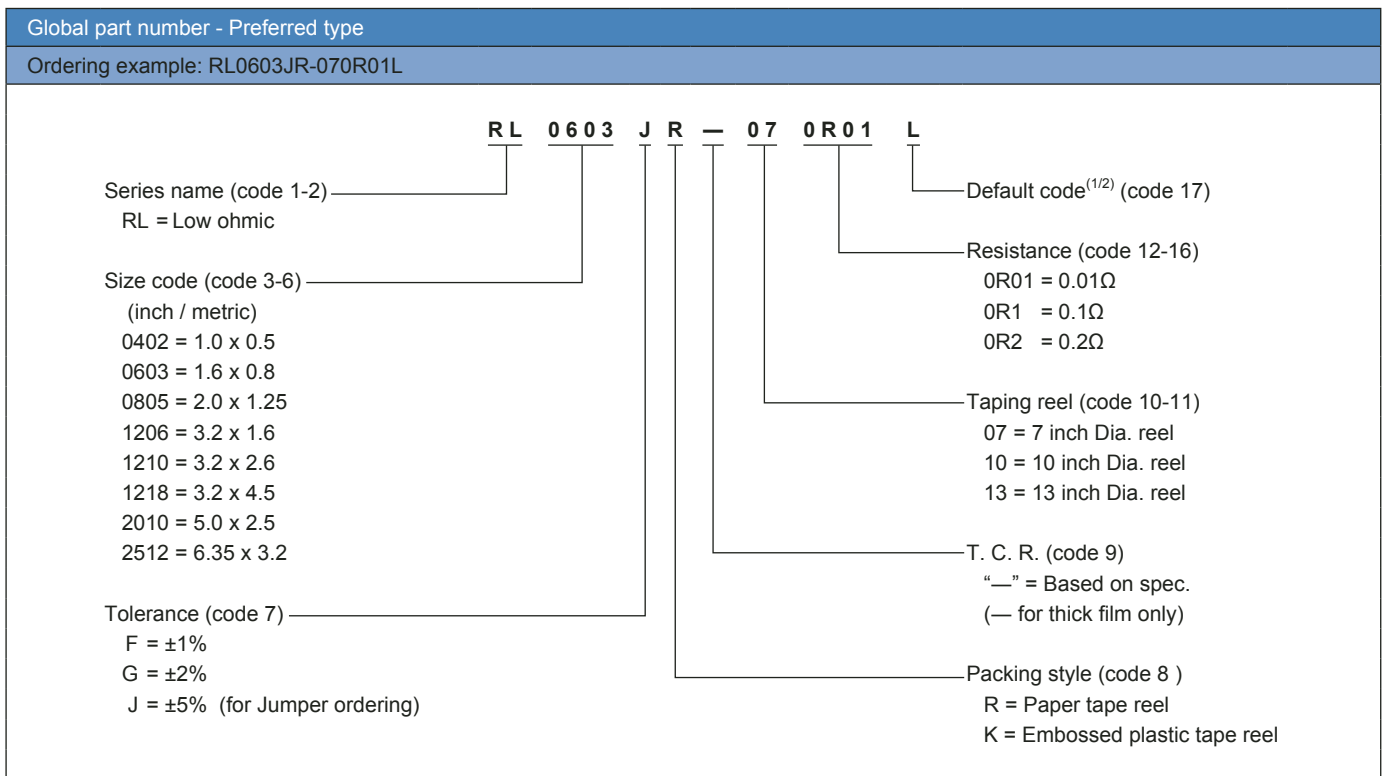
T. C. R. - RL series								
Type	Operating Temp. range	Resistance range	T. C. R.					
			100mΩ - 1Ω					
RL0402	-55°C to +125°C	$100\text{m}\Omega \leq R < 1\Omega$	± 800 ppm/°C					
			10mΩ - 36mΩ	36mΩ - 91mΩ	91mΩ - 500mΩ		500mΩ - 1Ω	
RL0603	-55°C to +125°C	$10\text{m}\Omega \leq R < 1\Omega$	$\pm 1\ 500$ ppm/°C	$\pm 1\ 200$ ppm/°C	± 800 ppm/°C		± 300 ppm/°C	
			10mΩ - 18mΩ	20mΩ - 47mΩ	51mΩ - 91mΩ	100mΩ - 360mΩ	390mΩ - 500mΩ	510mΩ - 1Ω
RL0805	-55°C to +125°C	$10\text{m}\Omega \leq R < 1\Omega$	$\pm 1\ 500$ ppm/°C	$\pm 1\ 200$ ppm/°C	$\pm 1\ 000$ ppm/°C	± 600 ppm/°C	± 300 ppm/°C	± 200 ppm/°C
RL1206	-55°C to +125°C	$10\text{m}\Omega \leq R < 1\Omega$	$\pm 1\ 500$ ppm/°C	$\pm 1\ 200$ ppm/°C	$\pm 1\ 000$ ppm/°C	± 600 ppm/°C	± 300 ppm/°C	± 200 ppm/°C
RL1210	-55°C to +125°C	$10\text{m}\Omega \leq R < 1\Omega$	$\pm 1\ 500$ ppm/°C	$\pm 1\ 000$ ppm/°C	± 800 ppm/°C	± 600 ppm/°C	± 300 ppm/°C	± 200 ppm/°C
			10mΩ - 30mΩ	33mΩ - 56mΩ	60mΩ - 180mΩ	200mΩ - 1Ω		
RL1218	-55°C to +125°C	$10\text{m}\Omega \leq R < 1\Omega$	$\pm 2\ 000$ ppm/°C	$\pm 1\ 000$ ppm/°C	± 700 ppm/°C	± 250 ppm/°C		
			10mΩ - 18mΩ	20mΩ - 47mΩ	51mΩ - 91mΩ	100mΩ - 360mΩ	390mΩ - 500mΩ	510mΩ - 1Ω
RL2010	-55°C to +125°C	$10\text{m}\Omega \leq R < 1\Omega$	$\pm 1\ 500$ ppm/°C	$\pm 1\ 200$ ppm/°C	$\pm 1\ 000$ ppm/°C	± 600 ppm/°C	± 300 ppm/°C	± 200 ppm/°C
RL2512	-55°C to +125°C	$10\text{m}\Omega \leq R < 1\Omega$	$\pm 1\ 500$ ppm/°C	$\pm 1\ 200$ 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-202G-method 108A	1 000 hours at 70°C $\pm 5^\circ\text{C}$ applied RCWV 1.5 hours on, 0.5 hours off, still air required	$\pm 2\%$
High temperature exposure	MIL-STD-202G-method 108A	1 000 hours at maximum operating temperature depending on specification, unpowered	$\pm 1\%$
Moisture resistance	MIL-STD-202G-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	$\pm 2\%$
Thermal shock	MIL-STD-202G-method 107G	LCT / UCT, number of cycles required is 300 Maximum transfer time is 20 seconds	$\pm 1\%$
Solderability	Wetting	Electrical test not required. Magnification 50X Lead-free solder bath at 245 $\pm 3^\circ\text{C}$ Dipping time: 3 ± 0.5 seconds	Well tinned ($\geq 95\%$ covered)
	Resistance to soldering heat	MIL-STD-202G-method 210F	Lead-free solder, 260°C, 10 seconds immersion time
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	$\pm 2\%$

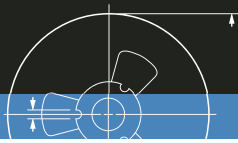


Chip Resistors Selection Charts

Low ohmic, 0402 to 2512



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



Chip Resistors Selection Charts

Low ohmic, 0402 to 2512

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

Phycomp CTC ordering code - Traditional type - North America
Regional code for ordering Phycomp branded products. Please see page 13 for details.



Chip Resistors Selection Charts

Low ohmic, high power, 0805 / 1206

Global part number - Preferred type

Ordering example: RL0805JR-7W0R01L

RL 0805 J R — 7W 0R01 L

Series name (code 1-2) RL = 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	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	Default code (code 17) L	T. C. R. (code 9) "—" = Based on spec. (— for thick film only)
--	--	---	---	---	--	-----------------------------	--

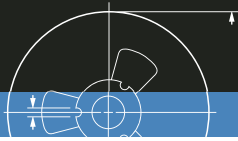
Note: 1. All of our RSMD products are RoHS compliant. "LFP" of the internal 2D reel label mentions "Lead Free Process"
2. Letter L is system default code for ordering only

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	5 000	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

Phycomp CTC ordering code - Traditional type - North America

Regional code for ordering Phycomp branded products. Please see page 13 for details.



Chip Resistors Selection Charts

Introduction to thick film low ohmic low T. C. R. chip resistors



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	Construction																												
<p>Maximum dissipation (P) in percentage of rated power as a function of the operating ambient temperature (T_{amb}).</p> <table border="1"> <caption>Derating Curve Data</caption> <thead> <tr> <th>Ambient Temperature (°C)</th> <th>Rated Power (%)</th> </tr> </thead> <tbody> <tr><td>-55</td><td>100</td></tr> <tr><td>-40</td><td>100</td></tr> <tr><td>-20</td><td>100</td></tr> <tr><td>0</td><td>100</td></tr> <tr><td>20</td><td>100</td></tr> <tr><td>40</td><td>100</td></tr> <tr><td>60</td><td>100</td></tr> <tr><td>70</td><td>100</td></tr> <tr><td>80</td><td>90</td></tr> <tr><td>100</td><td>66.7</td></tr> <tr><td>120</td><td>43.3</td></tr> <tr><td>140</td><td>20</td></tr> <tr><td>155</td><td>0</td></tr> </tbody> </table>	Ambient Temperature (°C)	Rated Power (%)	-55	100	-40	100	-20	100	0	100	20	100	40	100	60	100	70	100	80	90	100	66.7	120	43.3	140	20	155	0	
Ambient Temperature (°C)	Rated Power (%)																												
-55	100																												
-40	100																												
-20	100																												
0	100																												
20	100																												
40	100																												
60	100																												
70	100																												
80	90																												
100	66.7																												
120	43.3																												
140	20																												
155	0																												

Dimensions						
Type	Resistance range	L	W	H	l_1	l_2
PT0402	$100m\Omega \leq R < 1\Omega$	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	0.50 ± 0.10	0.35 ± 0.20	0.35 ± 0.20
PT1206		3.10 ± 0.10	1.60 ± 0.10	0.55 ± 0.10	0.45 ± 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

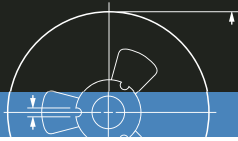


Chip Resistors Selection Charts

Introduction to thick film low ohmic low T. C. R. chip resistors

Electrical characteristics						
Type	Power P ₇₀	Operating Temp. range	Max. working voltage	Tolerance	Resistance range & T. C. R.	
PT0402	1/16W	-55°C to +155°C	(P x R) ^{1/2}	±1%, ±2%, ±5%	100mΩ ≤ R < 1 Ω	±200 ppm/°C
	1/8W					
PT0603	1/10W					
	1/5W					
PT0805	1/8W					
	1/4W					
PT1206	1/4W					
	1/2W					
PT2010	3/4W					±75 ppm/°C
	1W					
PT2512	1W					
	2W					

Environmental characteristics			
Performance test	Test method	Procedure	Requirements
Life	MIL-STD-202G-method 108A	1 000 hours at 70 ±5°C applied RCWV 1.5 hours on, 0.5 hours off, still air required	±(1% +0.0005Ω)
High temperature exposure	MIL-STD-202G-method 108A	1 000 hours at maximum operating temperature depending on specification, unpowered	±(1% +0.0005Ω)
Moisture resistance	MIL-STD-202G-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	±(0.5% +0.0005Ω)
Thermal shock	MIL-STD-202G-method 107G	LCT / UCT, number of cycles required is 300 Maximum transfer time is 20 seconds	±(1% +0.0005Ω)
Solderability	Wetting	IPC/JEDECJ-STD-002B testB 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-202G-method 210F Lead-free solder, 260°C, 10 seconds immersion time	±(0.5% +0.0005Ω)
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	±(1% +0.0005Ω)

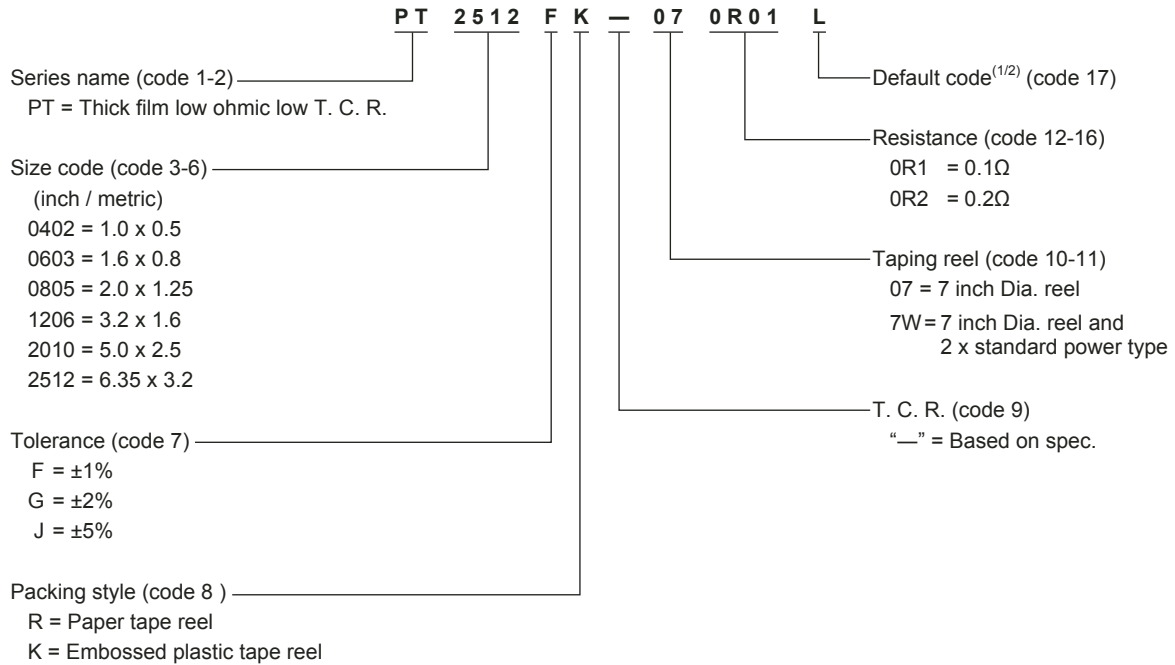


Chip Resistors Selection Charts

0402 to 2512

Global part number - Preferred type

Ordering example: PT2512FK-070R01L



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

Phycomp CTC ordering code - Traditional type - North America

Regional code for ordering Phycomp branded products. Please see page 13 for details.



Chip Resistors Selection Charts

Introduction to thick film low ohmic low T. C. R. chip resistors, wide termination

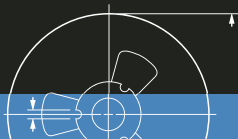


Features

- 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	Construction																												
<p>Maximum dissipation (P) in percentage of rated power as a function of the operating ambient temperature (T_{amb}).</p> <table border="1"> <caption>Derating Curve Data</caption> <thead> <tr> <th>Ambient Temperature (°C)</th> <th>Rated Power (%)</th> </tr> </thead> <tbody> <tr><td>-55</td><td>100</td></tr> <tr><td>-40</td><td>100</td></tr> <tr><td>-20</td><td>100</td></tr> <tr><td>0</td><td>100</td></tr> <tr><td>20</td><td>100</td></tr> <tr><td>40</td><td>100</td></tr> <tr><td>60</td><td>100</td></tr> <tr><td>70</td><td>100</td></tr> <tr><td>80</td><td>90</td></tr> <tr><td>100</td><td>66.7</td></tr> <tr><td>120</td><td>43.3</td></tr> <tr><td>140</td><td>20</td></tr> <tr><td>155</td><td>0</td></tr> </tbody> </table>	Ambient Temperature (°C)	Rated Power (%)	-55	100	-40	100	-20	100	0	100	20	100	40	100	60	100	70	100	80	90	100	66.7	120	43.3	140	20	155	0	
Ambient Temperature (°C)	Rated Power (%)																												
-55	100																												
-40	100																												
-20	100																												
0	100																												
20	100																												
40	100																												
60	100																												
70	100																												
80	90																												
100	66.7																												
120	43.3																												
140	20																												
155	0																												

Dimensions						
Type	Resistance range	L	W	H	I_1	I_2
PT0815	$25m\Omega \leq R \leq 50m\Omega$	2.00 ± 0.10	3.70 ± 0.10	0.50 ± 0.10	0.35 ± 0.20	0.40 ± 0.20



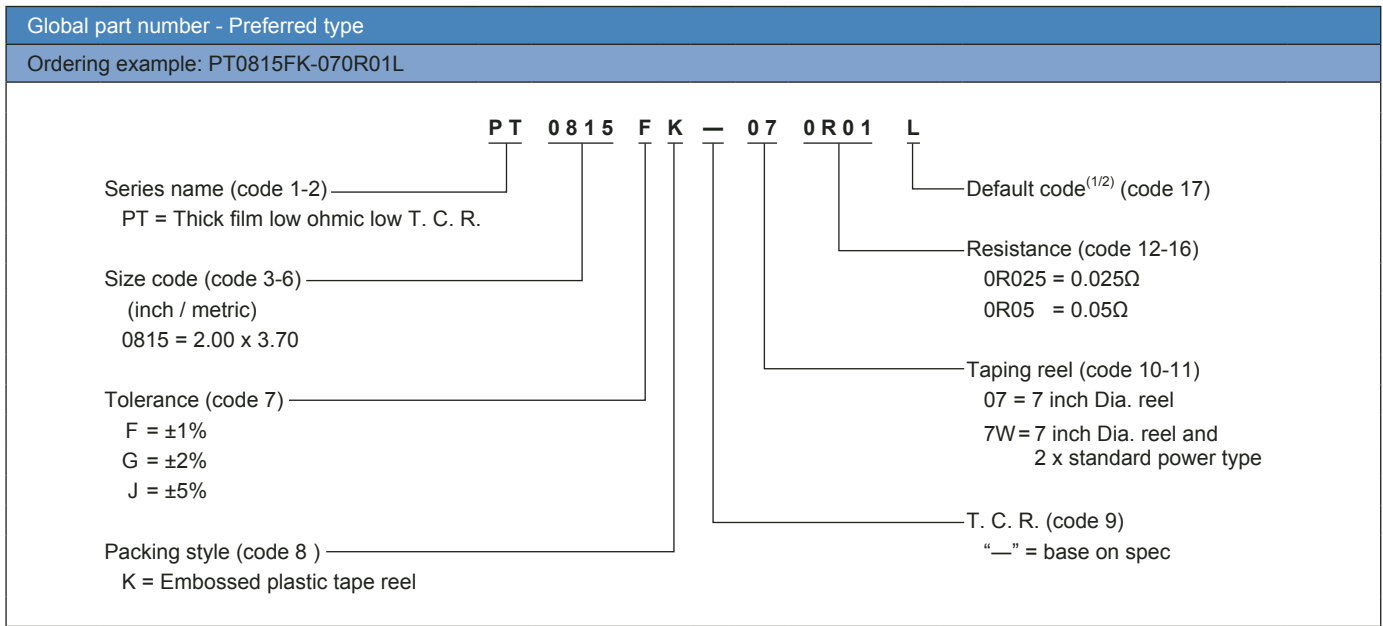
Chip Resistors Selection Charts

Introduction to thick film low ohmic low T. C. R. chip resistors, wide termination

Electrical characteristics					
Type	Power P_{70}	Operating Temp. range	Max. working voltage	Tolerance	Resistance range & T. C. R.
PT0815	1/2W	-55°C to +155°C	$(P \times R)^{1/2}$	E24 $\pm 1\%$, $\pm 2\%$, $\pm 5\%$	$25m\Omega \leq R \leq 50m\Omega$ ± 100 ppm/°C
	1W				

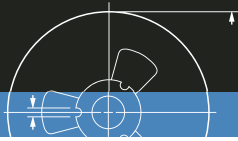
Environmental characteristics				
Performance test		Test method	Procedure	Requirements
Life		MIL-STD-202G-method 108A	1 000 hours at 70 $\pm 5^\circ\text{C}$ applied RCWV 1.5 hours on, 0.5 hours off, still air required	$\pm(1\% + 0.0005\Omega)$
High temperature exposure		MIL-STD-202G-method 108A	1 000 hours at maximum operating temperature depending on specification, unpowered	$\pm(1\% + 0.0005\Omega)$
Moisture resistance		MIL-STD-202G-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	$\pm(0.5\% + 0.0005\Omega)$
Solderability	Wetting	IPC/JEDECJ-STD-002B testB	Electrical test not required. Magnification 50X Lead-free solder bath at 245 $\pm 3^\circ\text{C}$ Dipping time: 3 ± 0.5 seconds	Well tinned ($\geq 95\%$ covered)
	Resistance to soldering heat	MIL-STD-202G-method 210F	Lead-free solder, 260°C, 10 seconds immersion time	$\pm(0.5\% + 0.0005\Omega)$
Short time overload		MIL-R-55342D-para 4.7.5	2.5 times RCWV or maximum overload voltage which- ever is less for 5 seconds at room temperature	$\pm(1\% + 0.0005\Omega)$





- 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





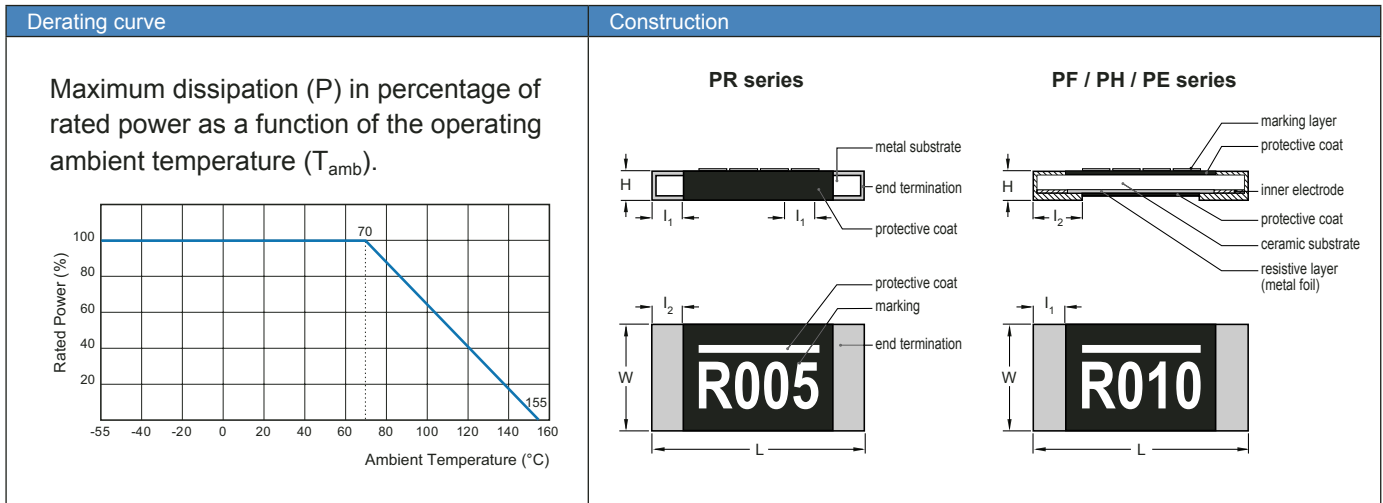
Chip Resistors Selection Charts

Introduction to current sensors - low T. C. R. chip resistors



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 0.001Ω



Dimensions						
PR series						
Type	Resistance range	L	W	H	l_1	l_2
PR2010	$1m\Omega \leq R \leq 3m\Omega$	5.10 ± 0.25	2.54 ± 0.25	0.80 ± 0.25	---	1.30 ± 0.25
	$4m\Omega \leq R \leq 100m\Omega$	5.10 ± 0.25	2.54 ± 0.25	0.64 ± 0.25	---	0.80 ± 0.25
PR2512	$1m\Omega \leq R \leq 2m\Omega$	6.30 ± 0.20	3.20 ± 0.20	0.75 ± 0.15	1.20 ± 0.20	1.20 ± 0.20
	$3m\Omega \leq R \leq 5m\Omega$	6.30 ± 0.20	3.20 ± 0.20	0.55 ± 0.15	0.60 ± 0.20	0.60 ± 0.20
Note: For relevant physical dimensions, please refer to above construction outlines						
PF / PH / PE series						
Type	Resistance range	L	W	H	l_1	l_2
PF0805 ⁽¹⁾	$10m\Omega < R \leq 50m\Omega$	2.03 ± 0.25	1.27 ± 0.25	0.33 ± 0.25	0.38 ± 0.25	0.38 ± 0.25
PF0805 ⁽²⁾	$10m\Omega < R \leq 100m\Omega$	2.00 ± 0.20	1.25 ± 0.20	0.60 ± 0.15	---	0.40 ± 0.15
PF / PH / PE1206 ⁽¹⁾	$10m\Omega < R \leq 50m\Omega$	3.20 ± 0.25	1.60 ± 0.25	0.60 ± 0.25	0.50 ± 0.25	0.65 ± 0.25
PF / PH / PE1206 ⁽²⁾	$10m\Omega \leq R \leq 100m\Omega$	3.20 ± 0.20	1.60 ± 0.20	0.60 ± 0.15	---	0.58 ± 0.20
PF2512 ⁽¹⁾	$6m\Omega$	6.45 ± 0.25	3.25 ± 0.25	0.70 ± 0.25	0.75 ± 0.25	1.85 ± 0.25
	$7m\Omega \leq R \leq 15m\Omega$	6.45 ± 0.25	3.25 ± 0.25	0.70 ± 0.25	0.75 ± 0.25	1.55 ± 0.25
	$20m\Omega \leq R \leq 50m\Omega$	6.45 ± 0.25	3.25 ± 0.25	0.70 ± 0.25	0.75 ± 0.25	1.30 ± 0.25
PF / PE2512 ⁽²⁾	$1m\Omega \leq R \leq 5m\Omega$	6.30 ± 0.20	3.10 ± 0.20	0.60 ± 0.15	---	$1.95 \text{ to } 2.93 \pm 0.20$
	$6m\Omega \leq R \leq 8m\Omega$	6.30 ± 0.20	3.10 ± 0.20	0.60 ± 0.15	---	1.90 ± 0.20
	$9m\Omega \leq R \leq 100m\Omega$	6.30 ± 0.20	3.10 ± 0.20	0.60 ± 0.15	---	0.95 ± 0.20
Note: 1. Apply to ordering codes ending in "L" 2. Apply to ordering codes ending in "Z" 3. For relevant physical dimensions, please refer to above construction outlines. Please contact with sales offices, distributors and representatives in your region before ordering						

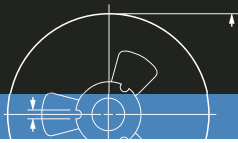


Chip Resistors Selection Charts

Introduction to current sensors - low T. C. R. chip resistors

Electrical characteristics						
Type	Power P ₇₀	Operating Temp. range	Max. working voltage	Tolerance	Resistance range & T. C. R.	
PR2010	1/2W	-55°C to +155°C	(P x R) ^{1/2}	±1%, ±2%, ±5% (E24)	1mΩ ≤ R ≤ 100mΩ	±50 ppm/°C
	1W					
PR2512	1W				1mΩ ≤ R ≤ 2mΩ 3mΩ ≤ R ≤ 5mΩ	±200 ppm/°C ±100 ppm/°C
	2W					
PF0805	1/8W				10mΩ ≤ R ≤ 100mΩ	±75 ppm/°C ±100 ppm/°C
	1/4W					
	1/3W					
PF/PE 1206	1/4W				3mΩ ≤ R ≤ 9mΩ 10mΩ ≤ R ≤ 100mΩ	±100 ppm/°C ±75 ppm/°C
	1/2W					
	1W					
PF2512	1W	6mΩ ≤ R ≤ 50mΩ	±100 ppm/°C ±75 ppm/°C			
	2W					
PH1206	1W	10mΩ ≤ R ≤ 50mΩ	±100 ppm/°C ±75 ppm/°C			
PE2512	1W	1mΩ ≤ R ≤ 9mΩ	±100 ppm/°C			
	2W	10mΩ ≤ R ≤ 100mΩ	±75 ppm/°C			

Environmental characteristics			
Performance test	Test method	Procedure	Requirements
Life	MIL-STD-202G-method 108A	1 000 hours at 70 ±5°C applied RCWV 1.5 hours on, 0.5 hours off, still air required	±(1% +0.0005Ω)
High temperature exposure	MIL-STD-202G-method 108A	1 000 hours at maximum operating temperature depending on specification, unpowered	±(1% +0.0005Ω)
Moisture resistance	MIL-STD-202G-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	±(0.5% +0.0005Ω)
Thermal shock	MIL-STD-202G-method 107G	LCT / UCT, number of cycles required is 300 Maximum transfer time is 20 seconds	±(0.5% +0.0005Ω)
Solderability	Wetting	IPC/JEDECJ-STD-002B testB 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-202G-method 210F Lead-free solder, 260°C, 10 seconds immersion time	±(0.5% +0.0005Ω)
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	±(0.5% +0.0005Ω)



Chip Resistors Selection Charts

0805 to 2512

Global part number - Preferred type

Ordering example: PF2512FKF070R01L

<p>Series name (code 1-2) ——— PF</p> <p>PR / PF / PH / PE = Current sensors - low T. C. R.</p> <p>Size code (code 3-6) ——— 2512</p> <p>(inch / metric)</p> <p>0402 = 1.0 x 0.5</p> <p>0603 = 1.6 x 0.8</p> <p>0805 = 2.0 x 1.25</p> <p>1206 = 3.2 x 1.6</p> <p>2010 = 5.0 x 2.5</p> <p>2512 = 6.35 x 3.2</p> <p>Tolerance (code 7) ——— F</p> <p>F = ±1%</p> <p>G = ±2%</p> <p>J = ±5% (for Jumper ordering)</p> <p>Packing style (code 8) ——— K</p> <p>R = Paper tape reel</p> <p>K = Embossed plastic tape reel</p> <p>S = ESD safe reel</p>	<p>07</p> <p>0R01</p> <p>L</p> <p>Resistance (code 12-16)</p> <p>0R01 = 0.01Ω</p> <p>0R1 = 0.1Ω</p> <p>0R2 = 0.2Ω</p> <p>Taping reel (code 10-11)</p> <p>07 = 7 inch Dia. reel</p> <p>7W = 2 x standard power</p> <p>7T = 3 x standard power</p> <p>47 = 4 x standard power</p> <p>T. C. R. (code 9)</p> <p>E = ±50 ppm/°C</p> <p>M = ±75 ppm/°C</p> <p>F = ±100 ppm/°C</p> <p>G = ±200 ppm/°C</p>
---	--

- 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. PH series products are available by "Global part number" only

Phycomp worldwide - Traditional type									
Current Sensor - Low T. C. R. / PR series									
Size: inch (mm)	2010 (5025)				2512 (6432)				
Power	1/2 W		1 W		1 W		2 W		
Tolerance	+5%	+1%	+5%	+1%	+5%	+1%	+5%	+1%	
Packing	blister tape				blister tape				
Quantity	4 000	2322 760 63..0L	2322 761 11..0L	2322 760 65..0L	2322 761 13..0L	2322 762 94..0L	2322 763 95..0L	2322 762 10..0L	2322 763 10..0L

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					
Current Sensor - Low T. C. R. / PF series					
Size: inch (mm)	2512 (6432)				
Power	1 W		2 W		
Tolerance	+5%	+1%	+5%	+1%	
Packing	blister tape				
Quantity	4 000	2322 764 96..L	2322 764 97..L	2322 764 10..L	2322 764 30..L

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 13 for details.



Chip Resistors Selection Charts

Introduction to current sensors - low T. C. R. chip resistors, wide termination



Features

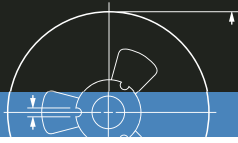
- Excellent T. C. R. compared to thick film low ohmic
- Precision current sensing control
- Excellent performance for current sensing applications
- Low ohmic and high power

Derating curve	Construction																												
<p>Maximum dissipation (P) in percentage of rated power as a function of the operating ambient temperature (T_{amb}).</p> <table border="1"> <caption>Derating Curve Data</caption> <thead> <tr> <th>Ambient Temperature (°C)</th> <th>Rated Power (%)</th> </tr> </thead> <tbody> <tr><td>-55</td><td>100</td></tr> <tr><td>-40</td><td>100</td></tr> <tr><td>-20</td><td>100</td></tr> <tr><td>0</td><td>100</td></tr> <tr><td>20</td><td>100</td></tr> <tr><td>40</td><td>100</td></tr> <tr><td>60</td><td>100</td></tr> <tr><td>70</td><td>100</td></tr> <tr><td>80</td><td>~90</td></tr> <tr><td>100</td><td>~67</td></tr> <tr><td>120</td><td>~44</td></tr> <tr><td>140</td><td>~21</td></tr> <tr><td>155</td><td>0</td></tr> </tbody> </table>	Ambient Temperature (°C)	Rated Power (%)	-55	100	-40	100	-20	100	0	100	20	100	40	100	60	100	70	100	80	~90	100	~67	120	~44	140	~21	155	0	
Ambient Temperature (°C)	Rated Power (%)																												
-55	100																												
-40	100																												
-20	100																												
0	100																												
20	100																												
40	100																												
60	100																												
70	100																												
80	~90																												
100	~67																												
120	~44																												
140	~21																												
155	0																												

Dimensions						
Type	Resistance range	L	W	H	l_1	l_2
PF0612	$2\text{m}\Omega \leq R \leq 50\text{m}\Omega$	1.60 ± 0.20	3.20 ± 0.20	0.60 ± 0.15	---	0.60 ± 0.20
PF0815	$1\text{m}\Omega \leq R \leq 20\text{m}\Omega$	2.15 ± 0.20	3.75 ± 0.20	0.60 ± 0.125	---	0.60 ± 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





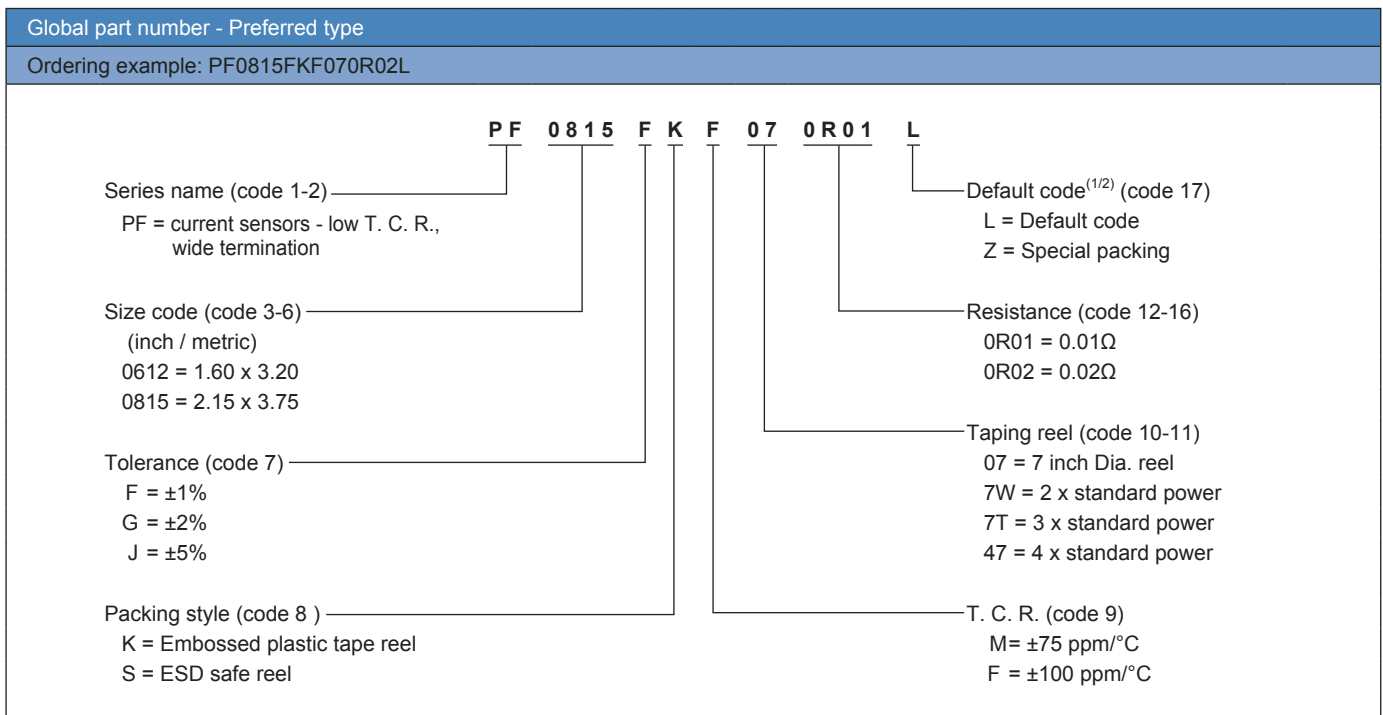
Chip Resistors Selection Charts

Introduction to current sensors - low T. C. R. chip resistors, wide termination

Electrical characteristics						
Type	Power P ₇₀	Operating Temp. range	Max. working voltage	Tolerance	Resistance range & T. C. R.	
PF0612	1W	-55°C to +155°C	$(P \times R)^{1/2}$	±1%, ±2%, ±5%	2mΩ ≤ R ≤ 50mΩ	±75 ppm/°C ±100 ppm/°C
PF0815	1/2W	-55°C to +155°C	$(P \times R)^{1/2}$	±1%, ±2%, ±5%	1mΩ ≤ R ≤ 20mΩ	±75 ppm/°C ±100 ppm/°C
	1W					

Environmental characteristics			
Performance test	Test method	Procedure	Requirements
Life	MIL-STD-202G-method 108A	1 000 hours at 70 ±5°C applied RCWV 1.5 hours on, 0.5 hours off, still air required	±(1%+ 0.0005Ω)
High temperature exposure	MIL-STD-202G-method 108A	1 000 hours at maximum operating temperature depending on specification, unpowered	±(1%+ 0.0005Ω)
Moisture resistance	MIL-STD-202G-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	±(0.5%+ 0.0005Ω)
Solderability	Wetting	IPC/JEDECJ-STD-002B testB 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-202G-method 210F Lead-free solder, 260°C, 10 seconds immersion time	±(0.5%+ 0.0005Ω)
Short time overload	MIL-R-55342D-para 4.7.5	2.5 times RCWV or maximum overload voltage which ever is less for 5 seconds at room temperature	±(1%+ 0.0005Ω)

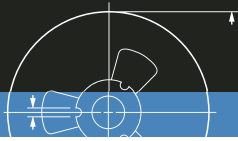




Note: 1. All of our RSMD products are RoHS compliant. "LFP" of the internal 2D reel label mentions "Lead Free Process"

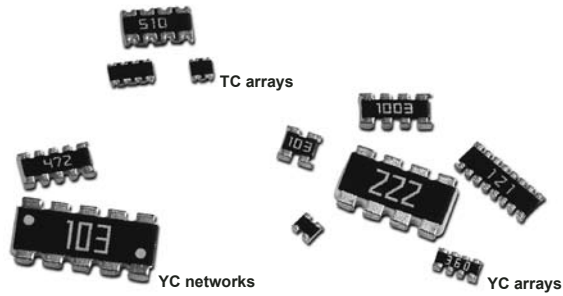
2. Letter L is system default code for ordering only

3. PF series wide termination type products are available by "Global part number" only



Chip Resistors Selection Charts

Introduction to thick film array / network chip resistors

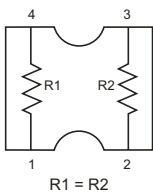


Features

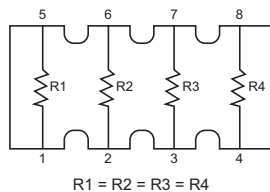
- Integrated discrete chip resistors from 2 to 8 pcs
- More efficient in pick & place application
- Low assembly costs
- Reduced size of final equipment
- Higher component and equipment reliability

Schematics

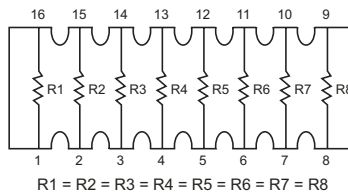
YC102/122/162



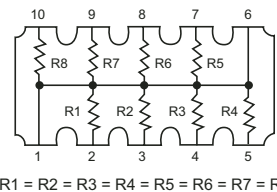
YC124/164/324



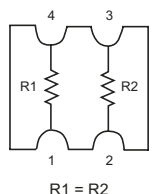
YC248



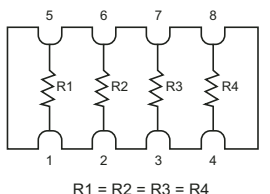
YC358 (L-Type)



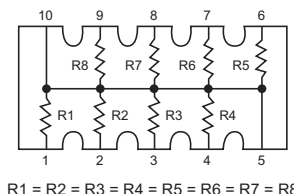
TC122



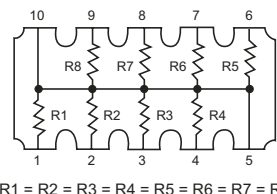
TC124/164



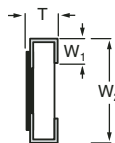
YC158



YC358 (T-Type)

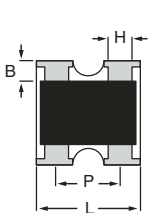


Dimensions

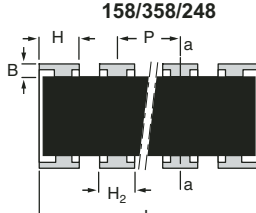


Side view for all types

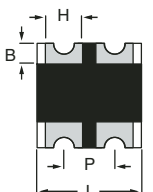
YC 102/122/162



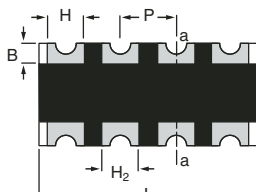
**YC 124/164/324
158/358/248**



TC 122



TC 124/164



Note: "H₂" is valued on button view

unit: mm

Type	H / H ₂	B	P	L	T	W ₁	W ₂
YC102	H: 0.35 ±0.10	0.20 ±0.10	0.50 ±0.05	0.80 ±0.10	0.35 ±0.10	0.15 ±0.10	0.60 ±0.10
YC122	H: 0.21 +0.10/-0.05	0.20 ±0.10	0.67 ±0.05	1.00 ±0.10	0.35 ±0.10	0.25 ±0.10	1.00 ±0.10
YC162	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
YC124	H: 0.45 ±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
YC164	H: 0.65 ±0.05	0.30 ±0.15	0.80 ±0.05	3.20 ±0.15	0.60 ±0.10	0.30 ±0.15	1.60 ±0.15
YC324	H: 1.10 ±0.15 H ₂ : 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
YC248	H: 0.45 ±0.05 H ₂ : 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
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 H ₂ : 0.25 ±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: --- H ₂ : 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
YC158	H: 0.45 ±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
YC358	H: 1.10 ±0.15 H ₂ : 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

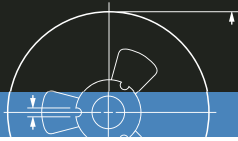


Chip Resistors Selection Charts

Introduction to thick film array / network chip resistors

Electrical characteristics										
Type	Power P ₇₀	Operating Temp. range	MWV	RCOV	DWV	Resistance range & tolerance		T. C. R. (ppm/°C)	Jumper criteria (unit: A)	
YC102	1/32W	-55°C to +125°C	15V	30V	30V	E24 ±5% E24/E96 ±1% Zero ohm jumper	10Ω ≤ R ≤ 1MΩ 10Ω ≤ R ≤ 1MΩ < 0.05Ω	±200	Rated current	0.5
YC122	1/16W	-55°C to +125°C	50V	100V	100V	E24 ±5% E24/E96 ±1% Zero ohm jumper	1Ω ≤ R ≤ 1MΩ 10Ω ≤ R ≤ 1MΩ < 0.05Ω		Rated current	1.0
YC162	1/16W	-55°C to +125°C	50V	100V	100V	E24 ±5% Zero ohm jumper	10Ω ≤ R ≤ 1MΩ < 0.05Ω		Rated current	1.0
YC124	1/16W	-55°C to +155°C	25V	50V	100V	E24 ±5% E24/E96 ±1% Zero ohm jumper	10Ω ≤ R ≤ 1MΩ 10Ω ≤ R ≤ 1MΩ < 0.05Ω		Max. current	2.0
YC164	1/16W	-55°C to +155°C	50V	100V	100V	E24 ±5% E24/E96 ±1% Zero ohm jumper	1Ω ≤ R ≤ 1MΩ 1Ω ≤ R ≤ 1MΩ < 0.05Ω		Rated current	1.0
YC324	1/8W	-55°C to +155°C	200V	500V	500V	E24 ±5% E24/E96 ±1%	10Ω ≤ R ≤ 1MΩ 10Ω ≤ R ≤ 1MΩ		Max. current	2.0
YC248	1/16W	-55°C to +155°C	50V	100V	100V	E24 ±5% E24/E96 ±1% Zero ohm jumper	10Ω ≤ R ≤ 1MΩ 10Ω ≤ R ≤ 1MΩ < 0.05Ω		Rated current	2.0
TC122	1/16W	-55°C to +125°C	50V	100V	100V	E24 ±5% E24/E96 ±1% Zero ohm jumper	10Ω ≤ R ≤ 1MΩ 10Ω ≤ R ≤ 1MΩ < 0.05Ω		Max. current	10.0
TC124	1/16W	-55°C to +125°C	50V	100V	100V	E24 ±5% E24/E96 ±1% Zero ohm jumper	10Ω ≤ R ≤ 1MΩ 10Ω ≤ R ≤ 1MΩ < 0.05Ω		Rated current	1.0
TC164	1/16W	-55°C to +155°C	50V	100V	100V	E24 ±5% E24/E96 ±1% Zero ohm jumper	10Ω ≤ R ≤ 1MΩ 10Ω ≤ R ≤ 1MΩ < 0.05Ω		Max. current	1.5
YC158	1/16W	-55°C to +155°C	25V	50V	50V	E24 ±5%	10Ω ≤ R ≤ 100KΩ		Rated current	1.0
YC358	1/16W	-55°C to +155°C	50V	100V	100V	E24 ±5%	10Ω ≤ R ≤ 330KΩ		Max. current	2.0

Environmental characteristics			
Performance test	Test method	Procedure	Requirements
Life	MIL-STD-202G-method 108A	1 000 hours at 70 ±5°C applied RCWV 1.5 hours on, 0.5 hours off, still air required	±(2% +0.05Ω) < 100mΩ for jumper
High temperature exposure	MIL-STD-202G-method 108A	1 000 hours at maximum operating temperature depending on specification, unpowered	±(1% +0.05Ω) < 50mΩ for jumper
Moisture resistance	MIL-STD-202G-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% +0.05Ω) < 100mΩ for jumper
Thermal shock	MIL-STD-202G-method 107G	LCT / UCT, number of cycles required is 300 Maximum transfer time is 20 seconds	±(0.5% +0.05Ω) for 10K to 10M ±(1% +0.05Ω) for others
Solderability	Wetting	IPC/JEDECJ-STD-002B testB 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-202G-method 210F Lead-free solder, 260°C, 10 seconds immersion time	±(1% +0.05Ω) < 50mΩ for jumper
Short time overload	MIL-R-55342D-para 4.7.5	2.5 times RCWV or maximum overload voltage which ever is less for 5 seconds at room temperature	±(2% +0.05Ω) < 50mΩ for jumper

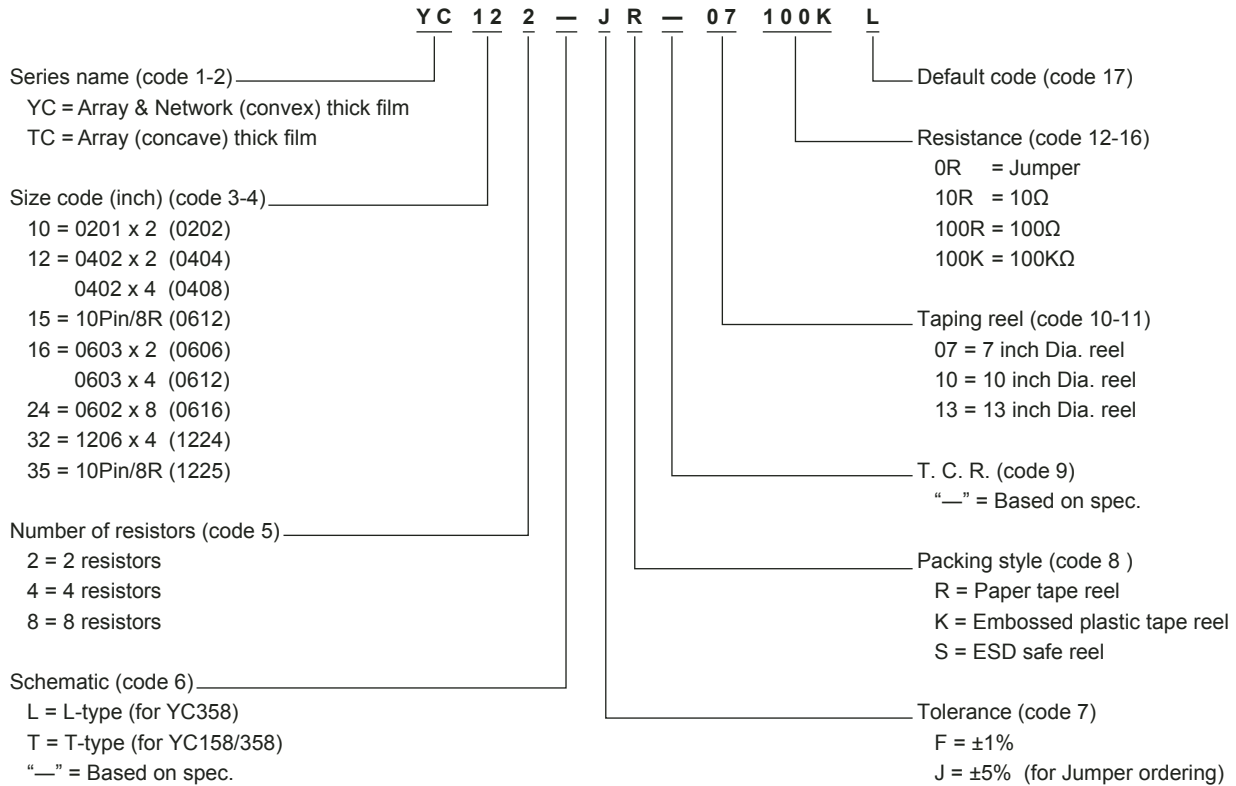


Chip Resistors Selection Charts

Arrays, convex / concave

Global part number - Arrays & Networks

Ordering example: YC122-JR-07100KL



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 0402 / 4.0 X 1.6		4 X 0603 / 3.2 X 1.3			4 X 1206 / 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%	+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 (convex)	R-array / R-network (convex)	
Resistance	E24	E24 / E96	E24	E24 / E96	E24	E24 / E96	E24	E24 / E96	E24	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	---	
	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

Phycomp CTC ordering code - Traditional type - North America

Regional code for ordering Phycomp branded products. Please see page 13 for details.



Chip Resistors Selection Charts

Networks, T-type / L-type

Global part number - Arrays & Networks

Ordering example: YC158TJR-07100KL

Y C 1 5 8 T J R - 0 7 1 0 0 K L

Series name (code 1-2)

YC = Array & Network (convex) thick film
TC = Array (concave) thick film

Size code (inch) (code 3-4)

10 = 0201 x 2 (0202)
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
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
S = ESD safe reel

Tolerance (code 7)

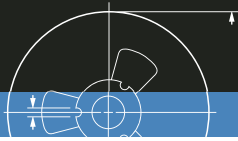
F = ±1%
J = ±5% (for Jumper ordering)

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			
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
	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

Phycomp CTC ordering code - Traditional type - North America
Regional code for ordering Phycomp branded products. Please see page 13 for details.



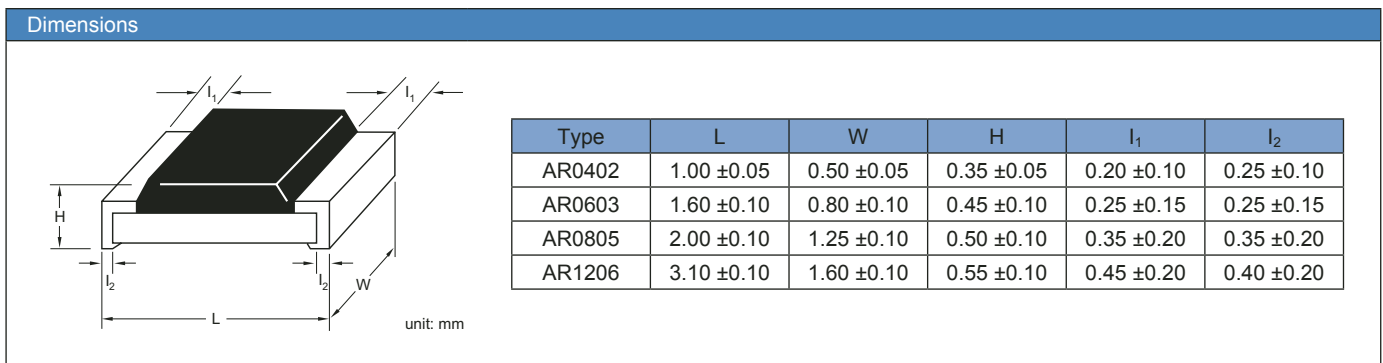
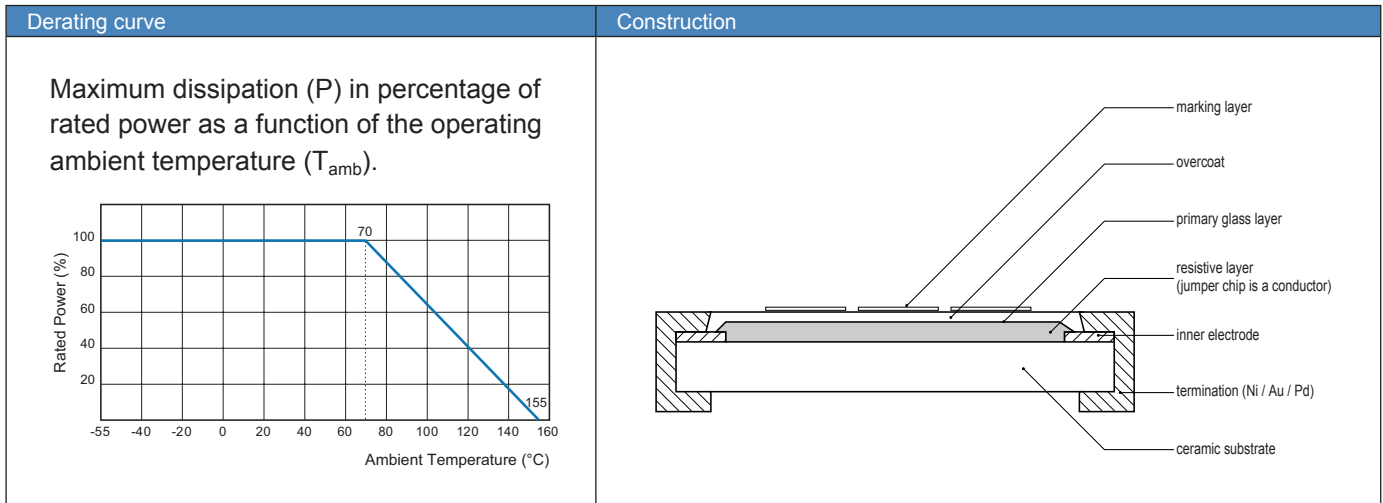
Chip Resistors Selection Charts

Introduction to NiAu termination chip resistors



Features

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

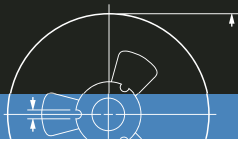


Chip Resistors Selection Charts

Introduction to NiAu termination chip resistors

Electrical characteristics											
Type	Power P_{70}	Operating Temp. range	MWV	RCOV	DWV	Resistance range & tolerance		T. C. R. (ppm/°C)		Jumper criteria (unit: A)	
AR0402	1/16W	-55°C to +155°C	50V	100V	100V	E24 ±5% E24/E96 ±1% Zero ohm jumper	$1\Omega \leq R \leq 10M\Omega$ $< 0.05\Omega$	$10\Omega < R \leq 10M\Omega$ $1\Omega \leq R \leq 10\Omega$	±100 ±200	Rated current	1.0
AR0603	1/10W	-55°C to +155°C	50V	100V	100V					Max. current	2.0
AR0805	1/8W	-55°C to +125°C	150V	300V	300V					Rated current	2.0
AR1206	1/4W	-55°C to +125°C	200V	500V	500V					Max. current	5.0
										Rated current	2.0
										Max. current	10.0

Environmental characteristics			
Performance test	Test method	Procedure	Requirements
Life	MIL-STD-202G-method 108A	1 000 hours at 70 ±5°C applied RCWV 1.5 hours on, 0.5 hours off, still air required	±(2% +0.05Ω) <100mΩ for jumper
High temperature exposure	MIL-STD-202G-method 108A	1 000 hours at maximum operating temperature depending on specification, unpowered	±(1% +0.05Ω) <50mΩ for jumper
Moisture resistance	MIL-STD-202G-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% +0.05Ω) <100mΩ for jumper
Thermal shock	MIL-STD-202G-method 107G	LCT / UCT, number of cycles required is 300 Maximum transfer time is 20 seconds	±(0.5% +0.05Ω) for 10K to 10M ±(1% +0.05Ω) for others
Solderability	Wetting	IPC/JEDECJ-STD-002B testB 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-202G-method 210F Lead-free solder, 260°C, 10 seconds immersion time	±(1% +0.05Ω) <50mΩ for jumper
Short time overload	MIL-R-55342D-para 4.7.5	2.5 times RCWV or maximum overload voltage which- ever is less for 5 seconds at room temperature	±(2% +0.05Ω) <50mΩ for jumper

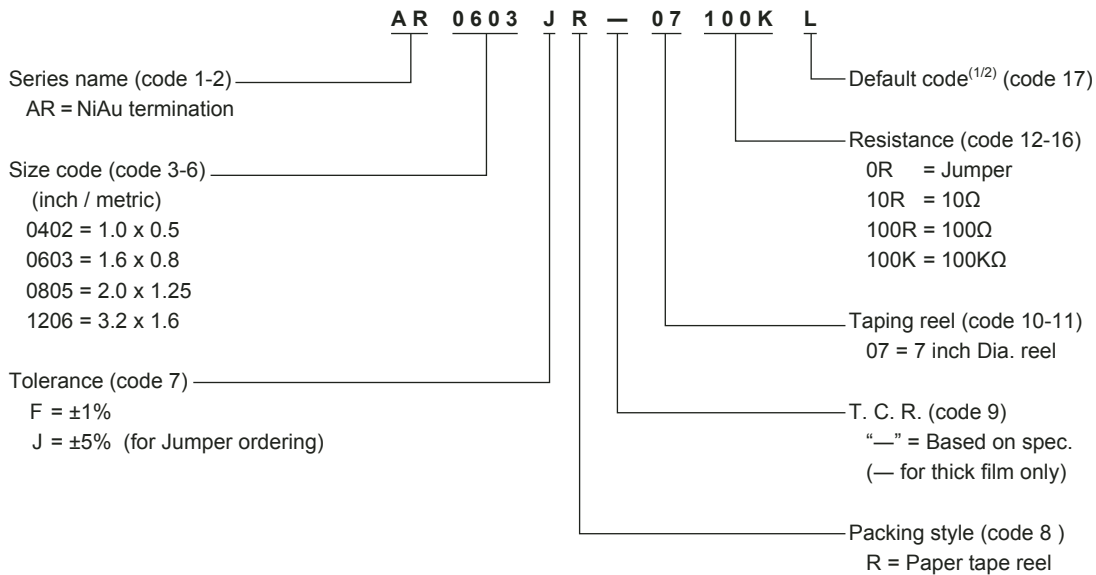


Chip Resistors Selection Charts

0402 to 1206

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

Ordering example: AR0603JR-07100KL



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
10 000	2322 705 12...L	2322 706 2....	---	---	---	---	---	---
Jumper 5 000	---	---	2322 702 19001L	---	2322 730 19001L	---	2322 711 19001L	---
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

Phycomp CTC ordering code - Traditional type - North America

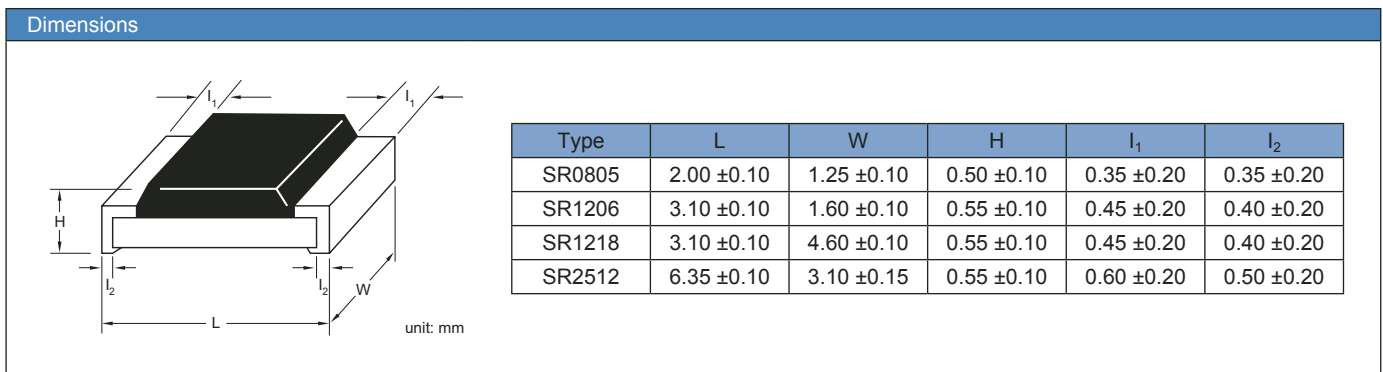
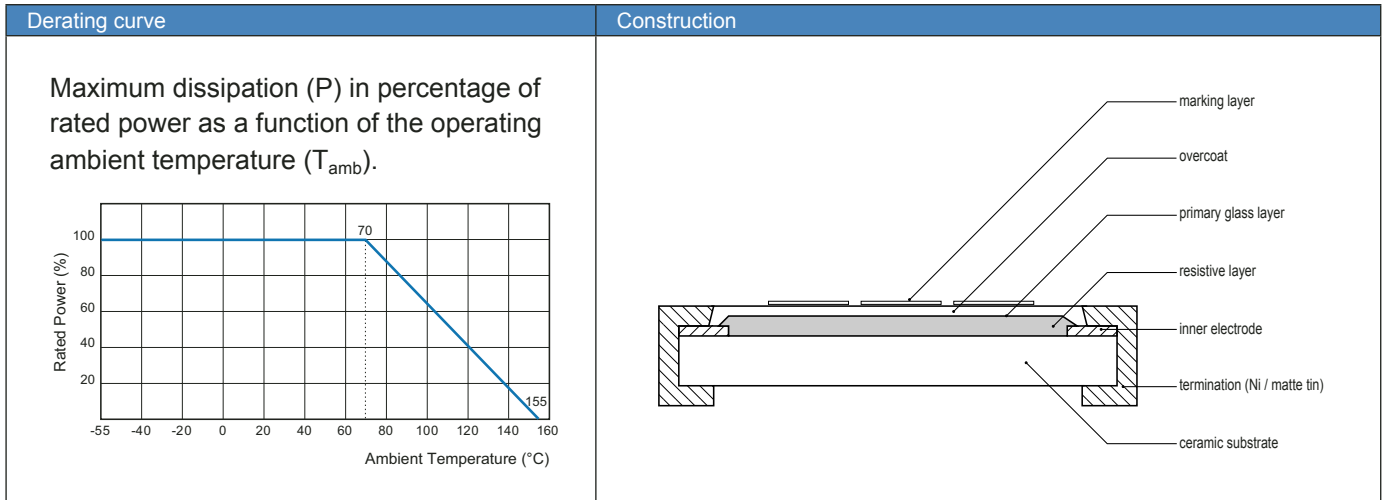
Regional code for ordering Phycomp branded products. Please see page 13 for details.

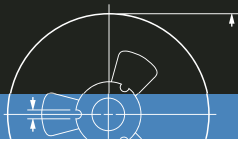




Features

- Reduced size of final equipment
- Low assembly costs
- Higher component and equipment reliability
- Excellent performance at pulse loading



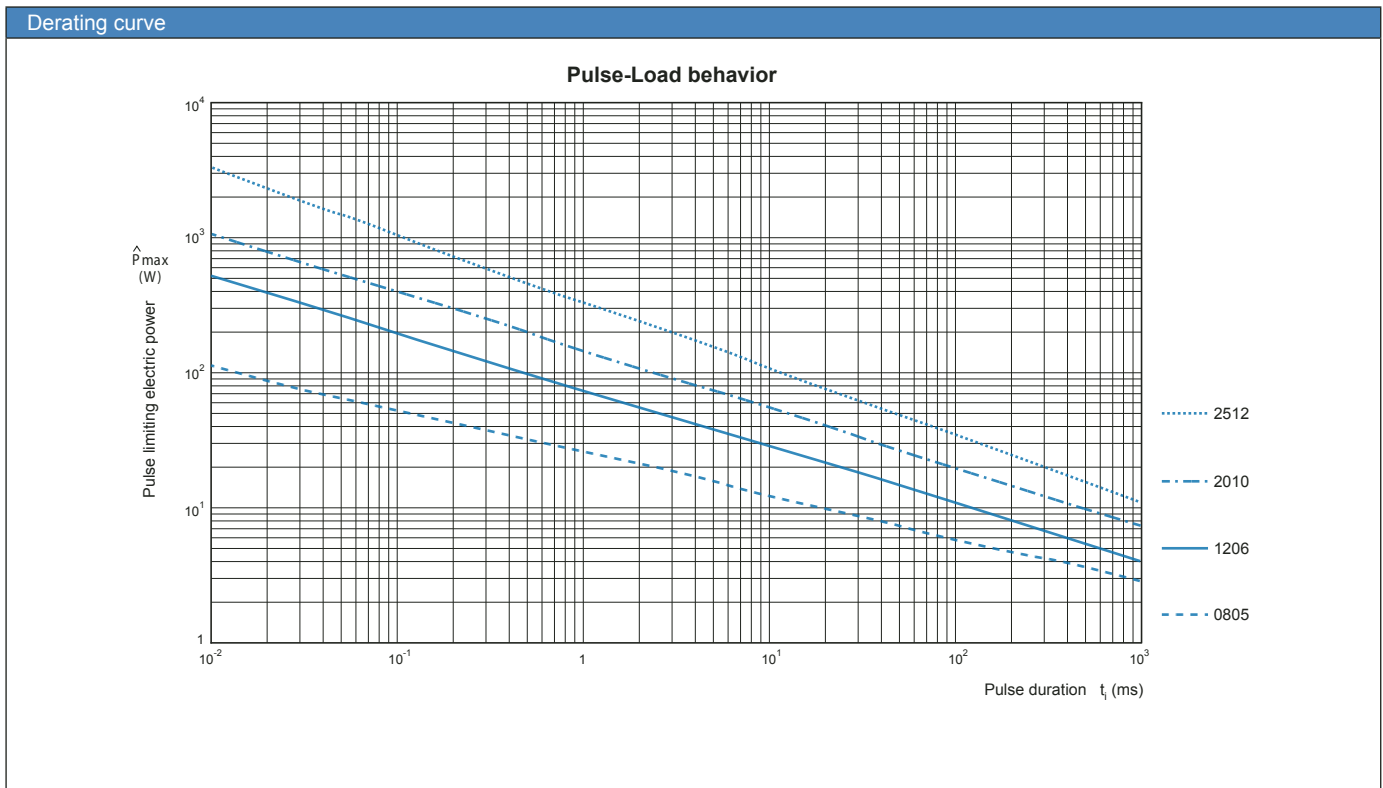


Chip Resistors Selection Charts

Introduction to surge chip resistors

Electrical characteristics								
Type	Power P ₇₀	Operating Temp. range	MWV	RCOV	DWV	Resistance range & tolerance		T. C. R. (ppm/°C)
SR0805	1/8W	-55°C to +155°C	150V	300V	300V	E24 ±5%, ±10%, ±20%	1Ω ≤ R ≤ 100KΩ	±200
SR1206	1/4W	-55°C to +155°C	150V	400V	500V			
SR1218	1W	-55°C to +155°C	200V	400V	500V			
SR2512	1W	-55°C to +155°C	200V	400V	500V			

Environmental characteristics				
Performance test		Test method	Procedure	Requirements
Life		MIL-STD-202G-method 108A	1 000 hours at 70 ±5°C applied RCWV 1.5 hours on, 0.5 hours off, still air required	±(2% +0.05Ω)
High temperature exposure		MIL-STD-202G-method 108A	1 000 hours at maximum operating temperature depending on specification, unpowered	±(1% +0.05Ω)
Moisture resistance		MIL-STD-202G-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% +0.05Ω)
Thermal shock		MIL-STD-202G-method 107G	LCT / UCT, number of cycles required is 300 Maximum transfer time is 20 seconds	±(0.5% +0.05Ω) for 10K to 10M ±(1% +0.05Ω) for others
Solderability	Wetting	IPC/JEDECJ-STD-002B testB	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-202G-method 210F	Lead-free solder, 260°C, 10 seconds immersion time	±(1% +0.05Ω)
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% +0.05Ω)



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

Ordering example: SR0805MR-07100KL

SR 0805 MR — 07 100K L

Series name (code 1-2) — SR = Surge

Size code (code 3-6) — (inch / metric)
 0805 = 2.0 x 1.25
 1206 = 3.2 x 1.6
 1218 = 3.2 x 4.5
 2512 = 6.35 x 3.2

Tolerance (code 7) —
 J = ±5% (for Jumper ordering)
 K = ±10%
 M = ±20%

Default code^(1/2) (code 17)

Resistance (code 12-16)
 10R = 10Ω
 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
 K = Embossed plastic tape reel

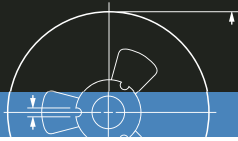
Note: 1. All of our RSMD products are RoHS compliant. "LFP" of the internal 2D reel label mentions "Lead Free Process"
 2. Letter L is system default code for ordering only

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
	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

Phycomp CTC ordering code - Traditional type - North America

Regional code for ordering Phycomp branded products. Please see page 13 for details.



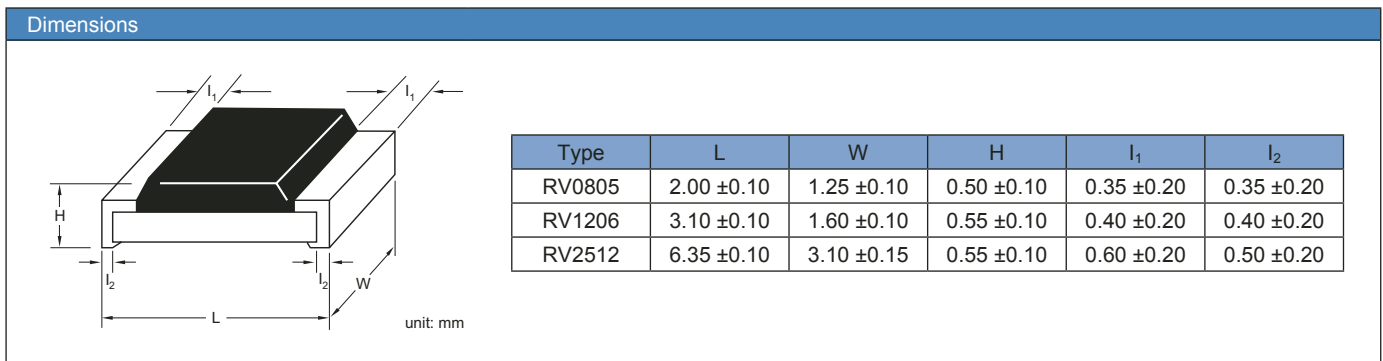
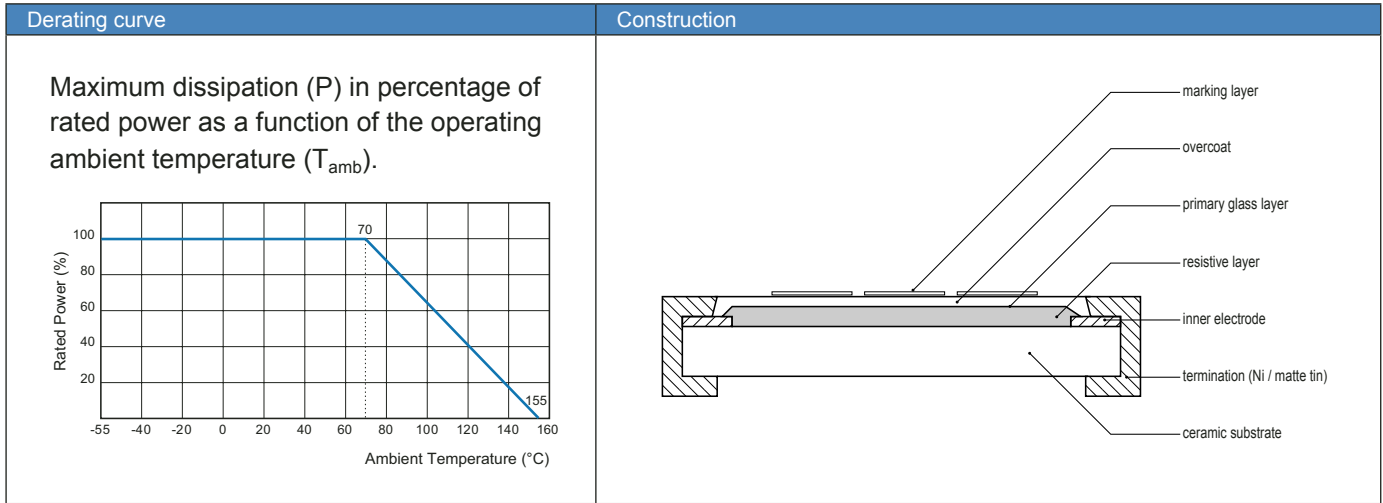
Chip Resistors Selection Charts

Introduction to high voltage chip resistors



Features

- Higher maximum working voltage compared to RC series
- Extremely thin and light
- Reliable electrode construction
- Compatible with lead containing and lead-free soldering processes
- Highly stable in auto-placement surface mounting

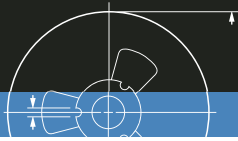


Chip Resistors Selection Charts

Introduction to high voltage chip resistors

Electrical characteristics								
Type	Power P_{70}	Operating Temp. range	MWV	RCOV	DWV	Resistance range & tolerance		T. C. R. (ppm/°C)
RV0805	1/8W	-55°C to +155°C	400V	800V	800V	E24 ±5% E24/E96 ±1%	100KΩ ≤ R ≤ 10MΩ	±200
RV1206	1/4W	-55°C to +155°C	500V	1000V	1000V	E24 ±5% E24/E96 ±1%	100KΩ ≤ R ≤ 27MΩ	±200
RV2512	1W	-55°C to +155°C	500V	1000V	1000V	E24 ±5%	4.7MΩ ≤ R ≤ 16MΩ	±200

Environmental characteristics				
Performance test		Test method	Procedure	Requirements
Life		MIL-STD-202G- method 108A	1 000 hours at 70 ±5°C applied RCWV 1.5 hours on, 0.5 hours off, still air required	±(2% +0.05Ω)
High temperature exposure		MIL-STD-202G- method 108A	1 000 hours at maximum operating temperature depending on specification, unpowered	±(1% +0.05Ω)
Moisture resistance		MIL-STD-202G- 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% +0.05Ω)
Thermal shock		MIL-STD-202G- method 107G	LCT / UCT, number of cycles required is 300 Maximum transfer time is 20 seconds	±(0.5% +0.05Ω) for 10K to 10M ±(1% +0.05Ω) for others
Solderability	Wetting	IPC/JEDECJ- STD-002B testB	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-202G- method 210F	Lead-free solder, 260°C, 10 seconds immersion time	±(1% +0.05Ω)
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% +0.05Ω)

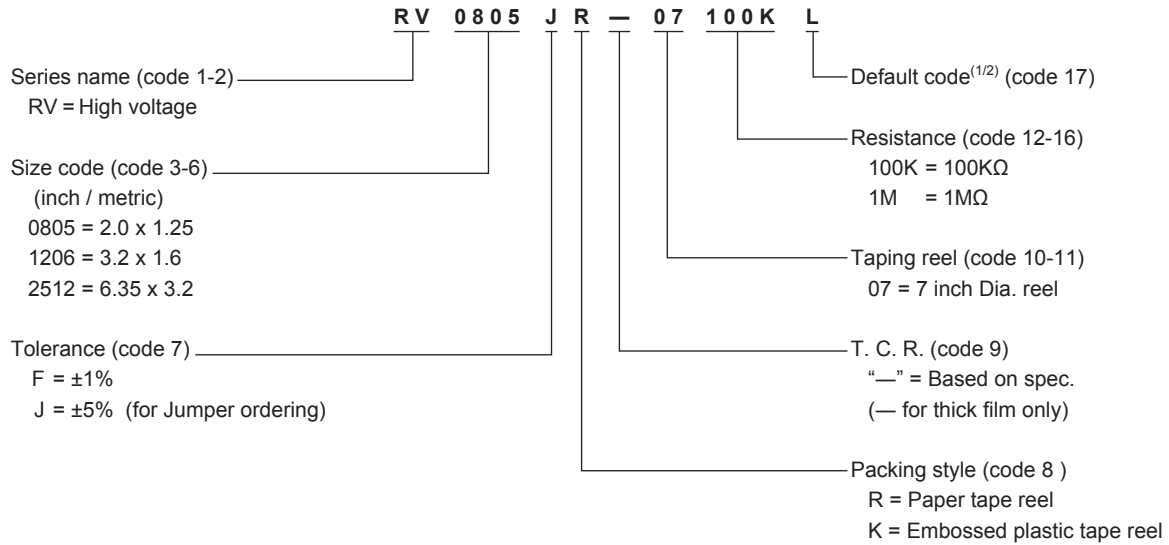


Chip Resistors Selection Charts

0805 to 2512

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

Ordering example: RV0805JR-07100KL



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
	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

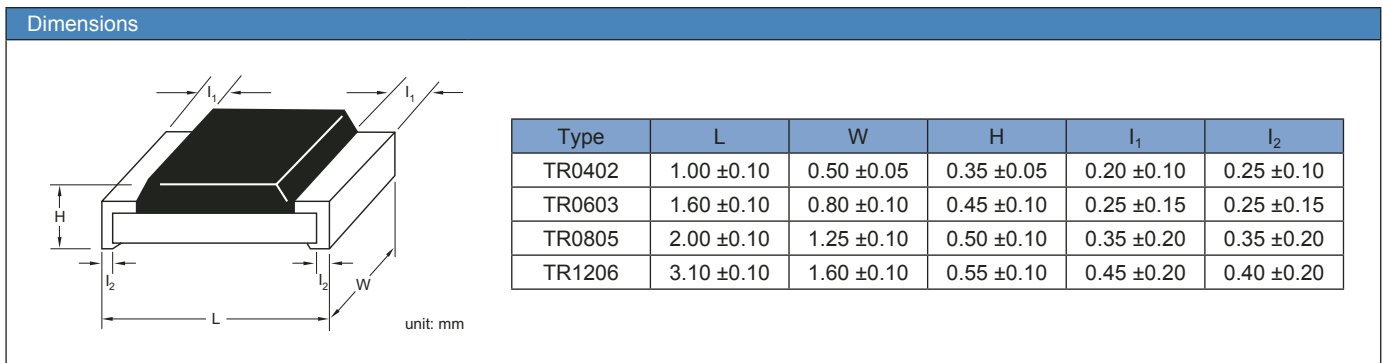
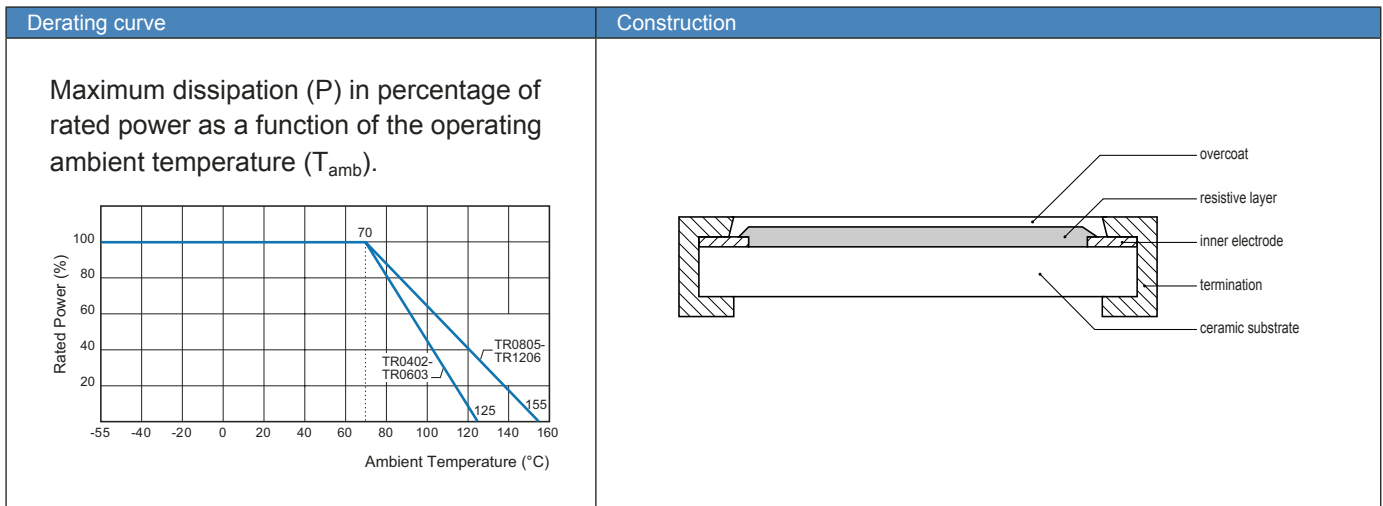
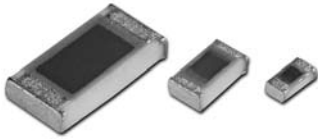
Phycomp CTC ordering code - Traditional type - North America

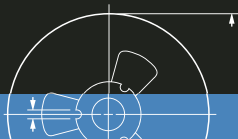
Regional code for ordering Phycomp branded products. Please see page 13 for details.



Features

- Reduced size of final equipment
- Low assembly costs
- Higher component and equipment reliability
- Improved performance at high frequency
- Low noise, when not trimmed





Chip Resistors Selection Charts

Introduction to trimmable chip resistors

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

Environmental characteristics				
Performance test		Test method	Procedure	Requirements
Life		MIL-STD-202G-method 108A	1 000 hours at 70 ±5°C applied RCWV 1.5 hours on, 0.5 hours off, still air required	±(2% +0.05Ω)
High temperature exposure		MIL-STD-202G-method 108A	1 000 hours at maximum operating temperature depending on specification, unpowered	±(1% +0.05Ω)
Moisture resistance		MIL-STD-202G-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% +0.05Ω)
Thermal shock		MIL-STD-202G-method 107G	LCT / UCT, number of cycles required is 300 Maximum transfer time is 20 seconds	±(0.5% +0.05Ω) for 10K to 10M ±(1% +0.05Ω) for others
Solderability	Wetting	IPC/JEDECJ-STD-002B testB	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-202G-method 210F	Lead-free solder, 260°C, 10 seconds immersion time	±(1% +0.05Ω)
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% +0.05Ω)



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

Ordering example: TR0603MR-07100KL

TR 0603 MR - 07 100K L

Series name (code 1-2) ——— TR
TR = Trimmable

Size code (code 3-6) ——— 0603
(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) ——— MR
K = 0/-10%
M = 0/-20%
N = 0/-30%

Default code^(1/2) (code 17) ——— L

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)

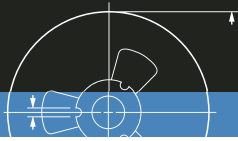
Packing style (code 8)
R = Paper tape reel

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				
Trimnable 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

Phycomp CTC ordering code - Traditional type - North America
Regional code for ordering Phycomp branded products. Please see page 13 for details.



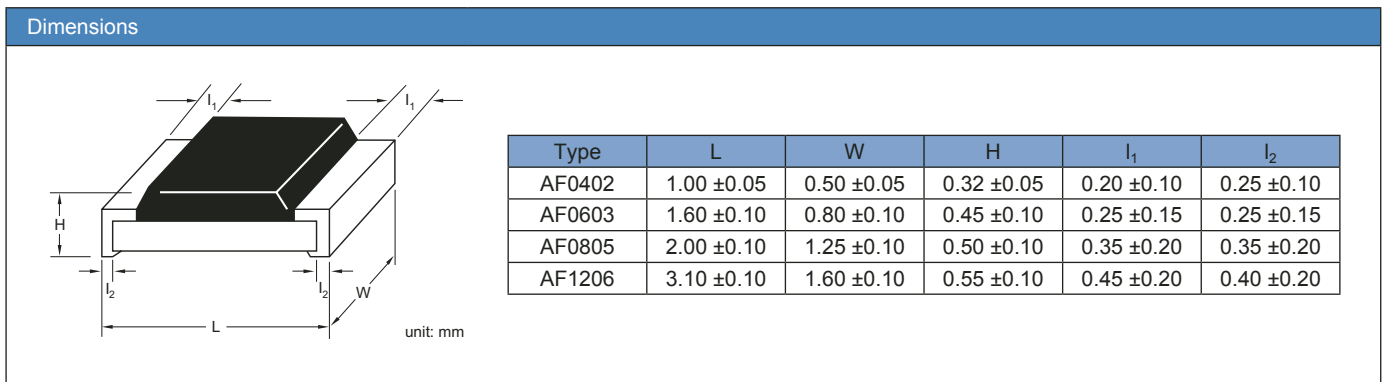
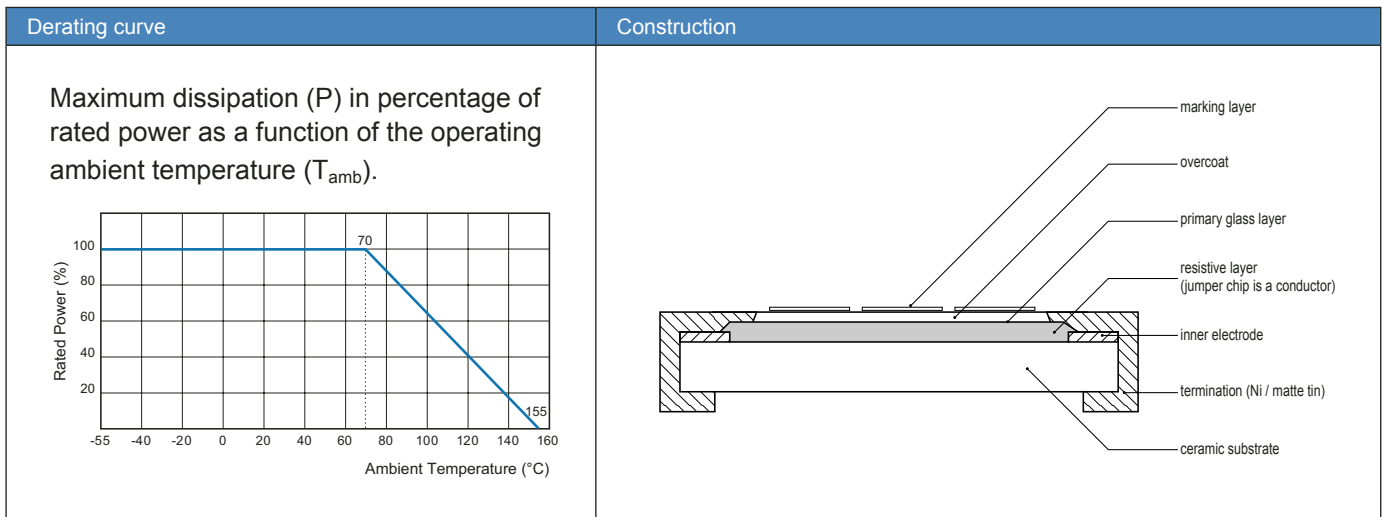
Chip Resistors Selection Charts

Introduction to anti-sulfurated chip resistors



Features

- Superior resistance against sulfur containing atmosphere
- Highly reliable multilayer electrode construction
- Compatible with all soldering processes
- Highly stable in auto-placement surface mounting applications
- Barrier layer end termination
- Halogen free product and production

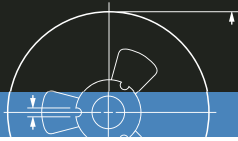


Chip Resistors Selection Charts

Introduction to anti-sulfurated chip resistors

Electrical characteristics									
Type	Power P ₇₀	Operating Temp. range	MWV	RCOV	DWV	Resistance range & tolerance		T. C. R. (ppm/°C)	
AF0402	1/16W	-55°C to +155°C	50V	100V	100V	E24 ±5% E24/E96 ±1%	1Ω ≤ R ≤ 22MΩ 1Ω ≤ R ≤ 10MΩ	1Ω ≤ R ≤ 10Ω	±200
AF0603	1/10W	-55°C to +155°C	50V	100V	100V			10Ω < R ≤ 10MΩ	±100
AF0805	1/8W	-55°C to +155°C	150V	300V	300V			10MΩ < R ≤ 22MΩ	±200
AF1206	1/4W	-55°C to +155°C	200V	400V	500V				

Environmental characteristics				
Performance test		Test method	Procedure	Requirements
Life		MIL-STD-202G-method 108A	1 000 hours at 70 ±5°C applied RCWV 1.5 hours on, 0.5 hours off, still air required	±(1%+ 0.05Ω)
High temperature exposure		MIL-STD-202G-method 108A	1 000 hours at maximum operating temperature depending on specification, unpowered	±(1%+ 0.05Ω)
Moisture resistance		MIL-STD-202G-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	±(1%+ 0.05Ω)
Thermal shock		MIL-STD-202G-method 107G	LCT / UCT, number of cycles required is 300 Maximum transfer time is 20 seconds	±(1%+ 0.05Ω)
Solderability	Wetting	IPC/JEDECJ-STD-002B testB	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-202G-method 210F	Lead-free solder, 260°C, 10 seconds immersion time	±(1%+ 0.05Ω)
Short time overload		MIL-R-55342D-para 4.7.5	2.5 times RCWV or maximum overload voltage which ever is less for 5 seconds at room temperature	±(1%+ 0.05Ω)
Anti-FOS		ASTM-B-809-95	Sulfur (saturated vapor) 1000 hours, 60±2°C, 91~93 %RH, Rating with no power	±(3.00%+0.05Ω)

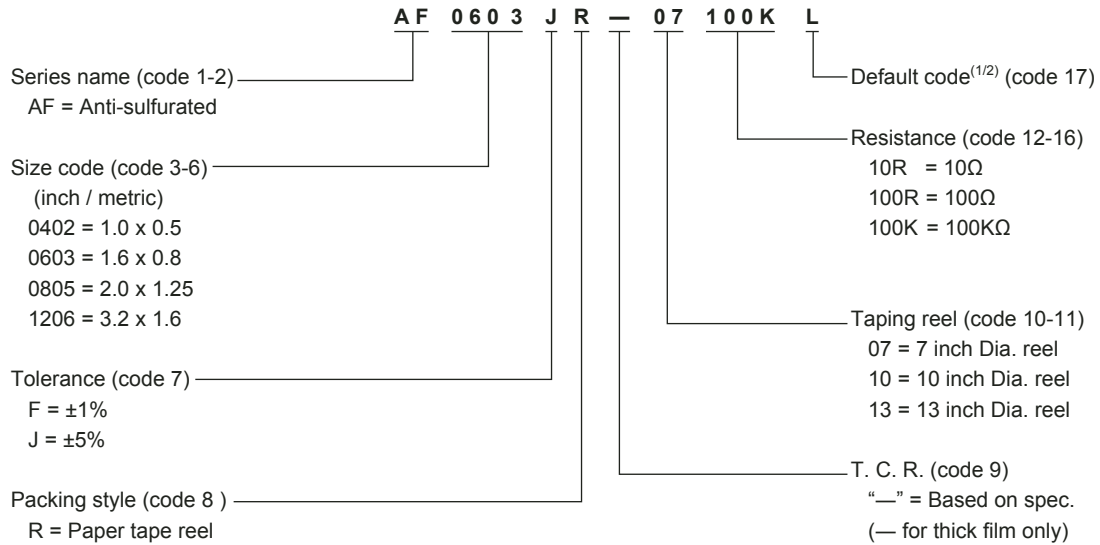


Chip Resistors Selection Charts

0402 to 1206

Global part number - Preferred type

Ordering example: AF0603JR-07100KL



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



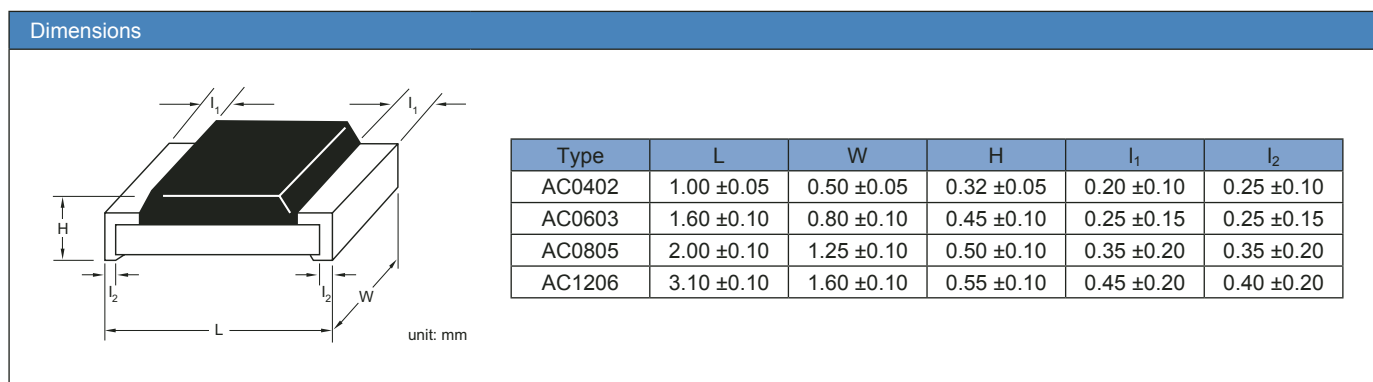
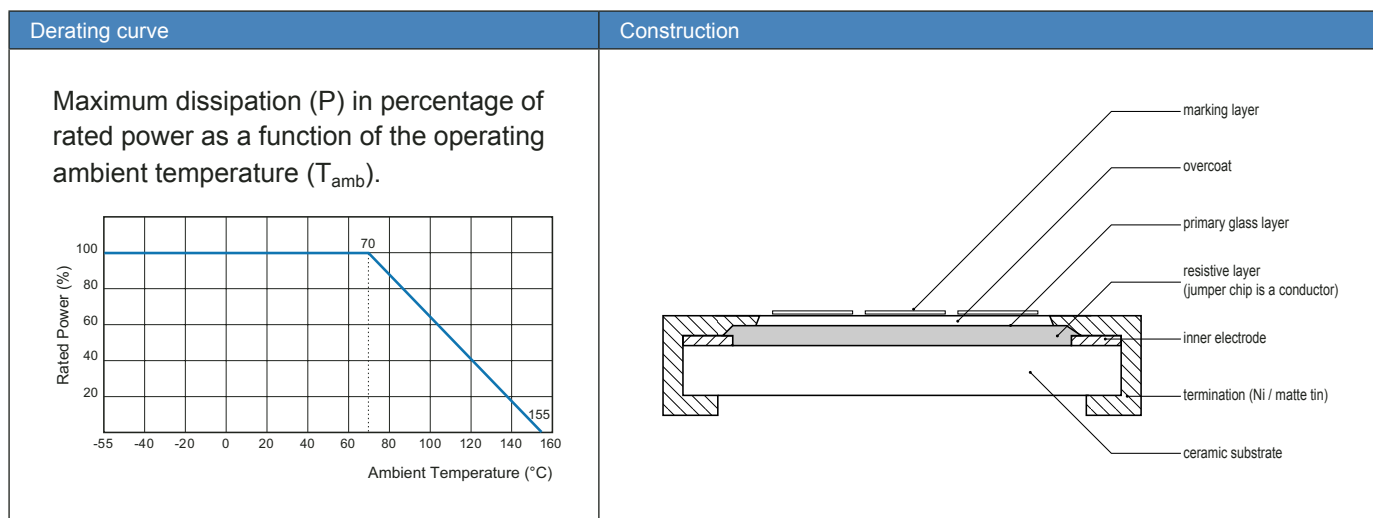
Chip Resistors Selection Charts

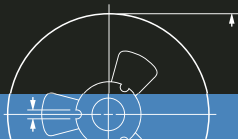
Introduction to automotive grade chip resistors



Features

- AEC-Q200 compliant
- Production part approval process (PPAP) support
- High reliability
- High quality level
- Superior resistance against sulfur containing atmosphere





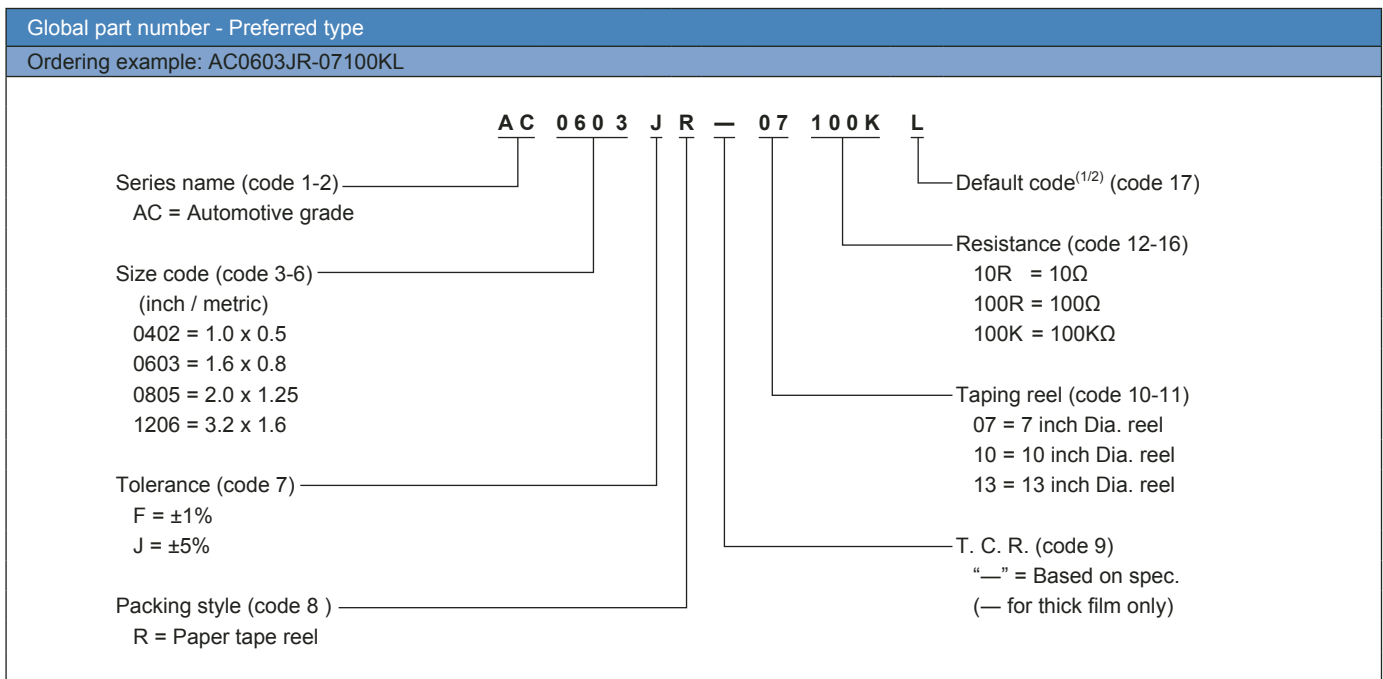
Chip Resistors Selection Charts

Introduction to automotive grade chip resistors

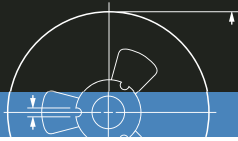
Electrical characteristics							
Type	Power P ₇₀	Operating Temp. range	MWV	RCOV	DWV	Resistance range & tolerance	T. C. R. (ppm/°C)
AC0402	1/16W	-55°C to +155°C	50V	100V	100V	E24 ±5% E24/E96 ±1%	±200
AC0603	1/10W	-55°C to +155°C	50V	100V	100V		1Ω ≤ R ≤ 10Ω
AC0805	1/8W	-55°C to +155°C	150V	300V	300V		10Ω < R ≤ 10MΩ
AC1206	1/4W	-55°C to +155°C	200V	400V	500V		

Environmental characteristics				
Performance test	Test method	Procedure	Requirements	
Life	AEC-Q200-REV C-Test 8 MIL-STD-202 Method 108	1 000 hours at 125°C applied RCWV 1.5 hours on, 0.5 hours off	±(1%+ 0.05Ω)	
High temperature exposure	AEC-Q200-REV C-Test 3 MIL-STD-202 Method 108	1 000 hours at maximum operating temperature depending on specification	±(1%+ 0.05Ω)	
Moisture resistance	AEC-Q200-REV C-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.	±(1%+ 0.05Ω)	
Biased humidity	AEC-Q200-REV C-Test 7 MIL-STD-202 Method 103	1 000 hours; + 85°C 85% R.H.; 10% of operating power Measured at 24 ±2 hours after test	±(3%+ 0.05Ω)	
Thermal shock	AEC-Q200-REV C-Test 16 MIL-STD-202 Method 107	LCT / UCT, number of cycles required is 300 Maximum transfer time is 20 seconds	±(1%+ 0.05Ω)	
Solderability	Wetting	AEC-Q200-REV C-Test 18 J-STD-002	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-REV C-Test 15 MIL-STD-202 Method 215	Lead-free solder, 260°C, 10 seconds immersion time	±(1%+ 0.05Ω)
Short time overload	MIL-R-55342D- para 4.7.5	2.5 times RCWV or maximum overload voltage which- ever is less for 5 seconds at room temperature	±(1%+ 0.05Ω)	



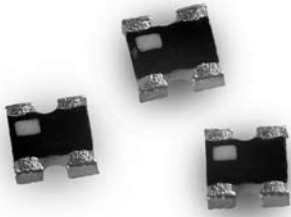


Note: 1. All of our RSMD products are RoHS compliant. "LFP" of the internal 2D reel label mentions "Lead Free Process"
 2. Letter L is system default code for ordering only



Chip Resistors Selection Charts

Introduction to RF attenuator chip resistors



Features

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

Derating curve	Construction	Schematics																										
<p>Maximum dissipation (P) in percentage of rated power as a function of the operating ambient temperature (T_{amb}).</p> <table border="1"> <caption>Derating Curve Data</caption> <thead> <tr> <th>Ambient Temperature (°C)</th> <th>Rated Power (%)</th> </tr> </thead> <tbody> <tr><td>-55</td><td>100</td></tr> <tr><td>-40</td><td>100</td></tr> <tr><td>-20</td><td>100</td></tr> <tr><td>0</td><td>100</td></tr> <tr><td>20</td><td>100</td></tr> <tr><td>40</td><td>100</td></tr> <tr><td>60</td><td>100</td></tr> <tr><td>70</td><td>100</td></tr> <tr><td>80</td><td>~83.3</td></tr> <tr><td>100</td><td>~66.7</td></tr> <tr><td>120</td><td>~50</td></tr> <tr><td>125</td><td>0</td></tr> </tbody> </table>	Ambient Temperature (°C)	Rated Power (%)	-55	100	-40	100	-20	100	0	100	20	100	40	100	60	100	70	100	80	~83.3	100	~66.7	120	~50	125	0	<p>The rectangular marker designates input pin 1</p> <p>input signal</p> <p>attenuated output signal</p>	<p>ATV 321</p> <p>R1 ≠ R2</p>
Ambient Temperature (°C)	Rated Power (%)																											
-55	100																											
-40	100																											
-20	100																											
0	100																											
20	100																											
40	100																											
60	100																											
70	100																											
80	~83.3																											
100	~66.7																											
120	~50																											
125	0																											

Dimensions							
<p style="text-align: center;">unit: mm</p>							
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

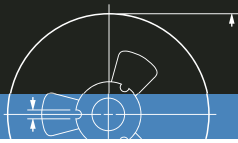


Chip Resistors Selection Charts

Introduction to RF attenuator chip resistors

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-202G-method 108A	1 000 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	1 000 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-202G-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-202G-method 107G	LCT / UCT, number of cycles required is 300 Maximum transfer time is 20 seconds	Max.: ±0.3 dB
Solderability	Wetting	IPC/JEDECJ-STD-002B testB	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-202G-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 which-ever is less for 5 seconds at room temperature	Max.: ±0.3 dB

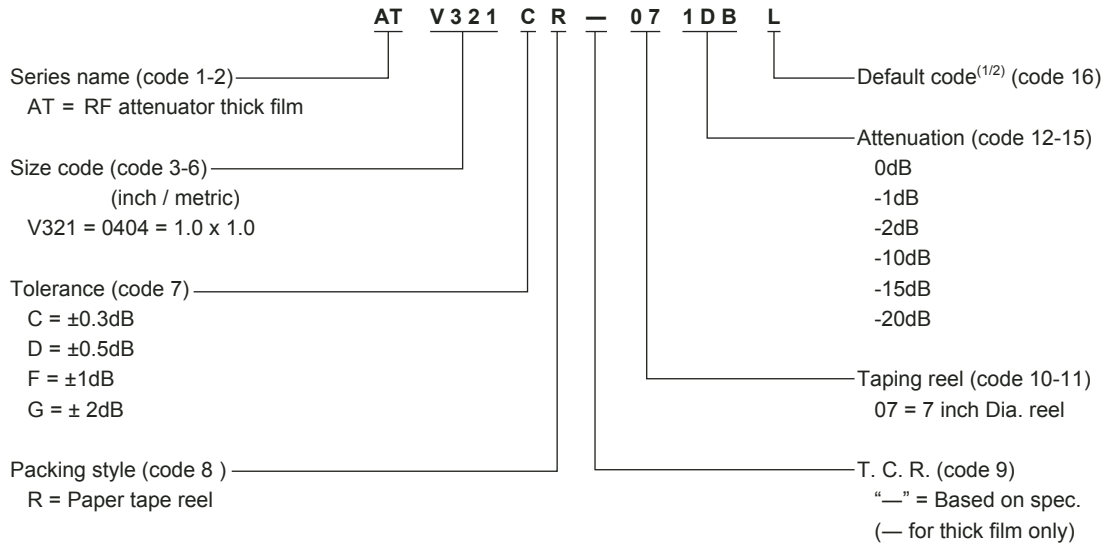


Chip Resistors Selection Charts

0404

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

Ordering example: ATV321CR-071DBL



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

Value (dB)	Tolerance (dB)	Standard	
		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



Chip Resistors Engineering Design Kits

Engineering design kits

Thick film chip resistors							
Global CTC (Preferred)	Description	Size	Tolerance	Max. power	Resistance range	Resistor pieces	Min. items
RC0201-R-SKE24L	0201, ±1% & ±5% , RoHS compliant, + Jumper	0201	F / J	1/20 W	10 - 1M	100	120
RC0402JR-SKE24L	0402, ±5%, RoHS compliant, + Jumper	0402	J	1/16 W	10 - 1M	100	110
RC0402FR-SKE96L	0402, ±1%, RoHS compliant, + Jumper	0402	F	1/16 W	10 - 1M	100	450
RC0603JR-SKE24L	0603, ±5%, RoHS compliant, + Jumper	0603	J	1/10 W	10 - 1M	50	110
RC0603FR-SKE96L	0603, ±1%, RoHS compliant, + Jumper	0603	F	1/10 W	10 - 1M	50	450
RC0805JR-SKE24L	0805, ±5%, RoHS compliant, + Jumper	0805	J	1/8 W	10 - 1M	50	110
RC0805FR-SKE96L	0805, ±1%, RoHS compliant, + Jumper	0805	F	1/8 W	10 - 1M	50	280
RC1206JR-SKE24L	1206, ±5%, RoHS compliant, + Jumper	1206	J	1/4 W	10 - 1M	50	110
RC1206FR-SKE96L	1206, ±1%, RoHS compliant, + Jumper	1206	F	1/4 W	10 - 1M	50	350

Thick film array chip resistors (convex)							
Global CTC (Preferred)	Description	Size	Tolerance	Max. power	Resistance range	Resistor pieces	Min. items
YC12X-JR-SK001L	YC124 / YC122, ±5%, +Jumper, RoHS compliant, refer to below table	0402 X 2 0402 X 4	J	1/16 W	10 - 1M	100	75

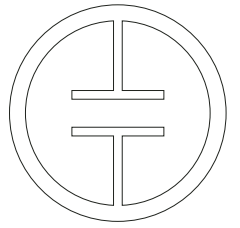
Global CTC	Description	Q'ty	Global CTC	Description	Q'ty
2R - Array series			4R - Array series		
YC122-JR-070RL	0404, ±5%, 1/16W	100	YC124-JR-070RL	0408, Jumper, 1/16W	100
YC122-JR-0710RL	0404, ±5%, 10R, 1/16W	100	YC124-JR-0710RL	0408, ±5%, 10R, 1/16W	100
YC122-JR-0722RL	0404, ±5%, 22R, 1/16W	100	YC124-JR-0722RL	0408, ±5%, 22R, 1/16W	100
YC122-JR-0733RL	0404, ±5%, 33R, 1/16W	100	YC124-JR-0733RL	0408, ±5%, 33R, 1/16W	100
YC122-JR-0747RL	0404, ±5%, 47R, 1/16W	100	YC124-JR-0747RL	0408, ±5%, 47R, 1/16W	100
YC122-JR-07100RL	0404, ±5%, 100R, 1/16W	100	YC124-JR-07100RL	0408, ±5%, 100R, 1/16W	100
YC122-JR-07330RL	0404, ±5%, 330R, 1/16W	100	YC124-JR-07330RL	0408, ±5%, 330R, 1/16W	100
YC122-JR-07470RL	0404, ±5%, 470R, 1/16W	100	YC124-JR-07470RL	0408, ±5%, 470R, 1/16W	100
YC122-JR-071KL	0404, ±5%, 1K, 1/16W	100	YC124-JR-071KL	0408, ±5%, 1K, 1/16W	100
YC122-JR-072K2L	0404, ±5%, 2K2, 1/16W	100	YC124-JR-072K2L	0408, ±5%, 2K2, 1/16W	100
YC122-JR-073K3L	0404, ±5%, 3K3, 1/16W	100	YC124-JR-073K3L	0408, ±5%, 3K3, 1/16W	100
YC122-JR-074K7L	0404, ±5%, 4K7, 1/16W	100	YC124-JR-074K7L	0408, ±5%, 4K7, 1/16W	100
YC122-JR-0710KL	0404, ±5%, 10K, 1/16W	100	YC124-JR-0710KL	0408, ±5%, 10K, 1/16W	100

Engineering design kit for current sensing application							
Global CTC (Preferred)	Description	Size	Tolerance	Max. power	Resistance range	Resistor pieces	Min. items
CS0402-R-SK001L	0402 - 2512, ±1% & ±5%, RoHS compliant	0402 - 2512	F / J	---	100m - 910m	30	160

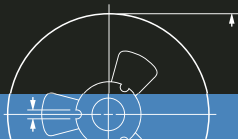
Engineering design kit for mobile application							
Global CTC (Preferred)	Description	Size	Tolerance	Max. power	Resistance range	Resistor pieces	Min. items
MD0402-R-SK001L	Chip resistors / MLCC / Attenuators, refer to below table	---	---	---	---	50 - 100	44

Global CTC	Description	Q'ty	Global CTC	Description	Q'ty
Low ohmic series			C - Array series		
RL0805FR-070R36L	0805, ±1%, 0R36, 1/8W	50	CA0508KRNP09BN100	0508, ±10%, 10pF, NP0, 50V	50
RL0805FR-070R4L	0805, ±1%, 0R4, 1/8W	50	CA0508KRNP09BN150	0508, ±10%, 15pF, NP0, 50V	50
RL0805FR-070R62L	0805, ±1%, 0R62, 1/8W	50	CA0508KRNP09BN180	0508, ±10%, 18pF, NP0, 50V	50
RL0805FR-7W0R2L	0805, ±1%, 0R2, 1/4W	50	CA0508KRNP09BN220	0508, ±10%, 22pF, NP0, 50V	50
RL0805FR-7W0R22L	0805, ±1%, 0R22, 1/4W	50	CA0508KRNP09BN330	0508, ±10%, 33pF, NP0, 50V	50
RL0805FR-7W0R33L	0805, ±1%, 0R33, 1/4W	50	Attenuator series		
RL0805FR-7W0R36L	0805, ±1%, 0R36, 1/4W	50	ATV321CR-071DBL	0404, ±0.3dB, -1dB	30
RL0805FR-7W0R39L	0805, ±1%, 0R39, 1/4W	50	ATV321CR-073DBL	0404, ±0.3dB, -3dB	30
RC0805FR-7W1R1L	0805, ±1%, 1R, 1/4W	50	ATV321CR-075DBL	0404, ±0.3dB, -5dB	30
			ATV321CR-076DBL	0404, ±0.3dB, -6dB	30

Note: Before ordering, please contact our sales force for detail of resistance



SMD CERAMIC MULTILAYER CAPACITORS

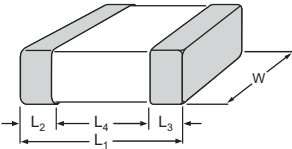


MLCC General Information

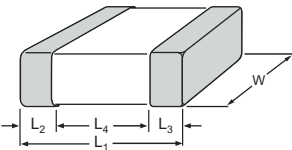
Specification overview

Specification overview					
Description	TC code	Series	Capacitance range	Voltage range	Size
Discrete	NP0	General purpose	0.22 pF to 33 nF	16 V to 25 V	0201, 0402, 0603, 0805, 1206, 1210
		General purpose	0.22 pF to 22 nF	50 V	0201, 0402, 0603, 0805, 1206, 1210, 1812
		Medium voltage	0.47 pF to 22 nF	100 V to 630 V	0603, 0805, 1206, 1210, 1808, 1812
		High voltage	0.47 pF to 2.7 nF	1 kV, 2 kV, 3 kV	1206, 1210, 1808, 1812
		High frequency	0.22 pF to 8.2 pF	50 V	0402, 0603, 0805
		Microwave	0.47 pF to 47 pF	50 V	0603, 0805, 1206
	X7R	General purpose & High capacitance	100 pF to 22 μ F	6.3 V to 50 V	0201, 0402, 0603, 0805, 1206, 1210, 1812
		Medium voltage	100 pF to 1 μ F	100 V to 630 V	0603, 0805, 1206, 1210, 1808, 1812
		High voltage	100 pF to 33 nF	1 kV to 3 kV	1206, 1210, 1808, 1812
		Low inductance	10 nF to 220 nF	10 V to 50 V	0306, 0508, 0612
	X5R	General purpose & High capacitance	10 nF to 100 μ F	6.3 V to 50 V	0201, 0402, 0603, 0805, 1206, 1210, 1812
Y5V	General purpose & High capacitance	4.7 nF to 47 μ F	6.3 V to 50 V	0201, 0402, 0603, 0805, 1206, 1210	
Safety certification product	NP0	High voltage SC type	2.0 pF to 470 pF	X1/Y2, X2/Y3	1808, 1812
	X7R	High voltage SC type	150 pF to 1.5 nF	X1/Y2, X2/Y3	1808, 1812
C-Arrays	NP0	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
	Y5V	4C arrays	10 nF to 100 nF	25 V	0612

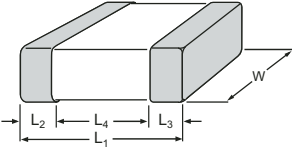


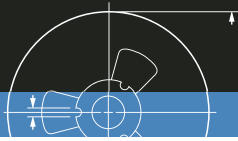
Case dimensions								
Discrete capacitors - General purpose								
	Case size designation		Dimensions in mm					
	Inch-based	Metric	L ₁	W	L ₂ / L ₃ min	L ₂ / L ₃ max	L ₄ min	
		0201	0603M	0.6 ±0.03	0.3 ±0.03	0.10	0.20	0.20
		0402	1005M	1.0 ±0.05	0.5 ±0.05	0.15	0.30	0.40
		0603	1608M	1.6 ±0.10	0.8 ±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	
	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	

Note: 1. Dimension for size 0805 to 1812, C ≤ 100 nF
 2. Dimension for size 0805 to 1812, C > 100 nF

Discrete capacitors - 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	0.5 ±0.05	0.15	0.30	0.40
				1.0 ±0.15	0.5 ±0.15 ⁽²⁾	0.15	0.30	0.40
		0603	1608M	1.6 ±0.10	0.8 ±0.10 ⁽¹⁾	0.20	0.60	0.40
				1.6 ±0.15	0.8 ±0.15 ⁽²⁾	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

Note: 1. Dimension for size 0603, C < 10 μF
 2. Dimension for size 0402, C ≥ 4.7 μF; 0603, C ≥ 10 μF

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	
		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



MLCC General Information

Case dimensions

Discrete capacitors - High voltage SC type						
	Case size designation		Dimensions in mm			
	Inch-based	Metric	L ₁	W	L ₂ / L ₃ min	L ₂ / L ₃ max
	1808	4520M	4.8 ±0.30	2.0 ±0.30	0.25	0.75
	1812	4532M	4.8 ±0.30	3.2 ±0.30	0.25	0.75

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⁾ 0.50 ⁽²⁾	0.90 ⁽¹⁾ 0.70 ⁽²⁾	0.4 ±0.10	0.3 ±0.20	0.8 ±0.10

Note: 1. Available for NP0 and X7R
2. Available for Y5V

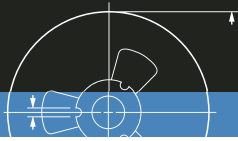
Discrete capacitors - Low inductance types only								
	Case size designation		Dimensions in mm					
	Inch-based	Metric	L ₁	W	T	L ₂ / L ₃ min	L ₂ / L ₃ max	L ₄ min
	0306	0816M	0.8 ±0.15	1.6 ±0.20	0.50 ±0.10	0.10	0.30	0.20
	0508	1220M	1.25 ±0.20	2.0 ±0.20	0.85 ±0.10	0.13	0.46	0.38
0612	1632M	1.6 ±0.20	3.2 ±0.20	0.85 ±0.10	0.13	0.46	0.50	



Global part number

Ordering example: CC0201KRX7R8BB102

<p>CC 0201 K R X7R 8 B B 102</p> <p>Series name (code 1-2) ————</p> <p>CA = 4 x Capacitors array CC = Multilayer chip capacitors CL = Low inductance capacitors CM = Microwave capacitors CH = High frequency SC = Safety certification capacitors</p> <p>Size code (code 3-6) ————</p> <p>0201 0402 0603 0805 1206 1210 1808 1812 0306 0508 0612</p> <p>Capacitance tolerance (code 7) ————</p> <p>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%</p> <p>Packing style (code 8) ————</p> <p>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 C = Bulk case</p> <p>TC material (code 9-11) ————</p> <p>NP0 X5R X7R Y5V</p>	<p>Capacitance value (code 15-17)</p> <p>102 = 1 000 pF (2 significant digits+number of zeros; the 3rd digit signifies the multiplying factor, and letter R is decimal point)</p> <p>0 = x 1 1 = x 10¹ 2 = x 10² 3 = x 10³ 4 = x 10⁴ 5 = x 10⁵ 6 = x 10⁶ 7 = x 10⁷ X X R = Special capacitance (X X: capacitance before decimal point)</p> <p>Process code (code 14)</p> <p>N = NP0 B = Class 2 product</p> <p>Termination (code 13)</p> <p>B = Ni-Barrier</p> <p>Rated voltage (code 12)</p> <p>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 S = 2.5 kV T = X2 / Y3 for TUV / UL W = X1 for TUV / UL U = Y2 for TUV / UL Y = 250 V Z = 630 V</p>
---	---



MLCC General Information

Ordering information for North America

Phycomp CTC ordering code - North America								
Ordering example: 02012R102K8B20								
0201	2R	102	K	8	B	2	0	0
Size code	Temperature characteristic	Capacitance (pF)	Tolerance	Voltage	Termination	Packing	Marking	Range identifier
0201	CG = NP0	102 = 1 000 pF	B = ± 0.1 pF	5 = 6.3 V	B = NiSn	2 = 180mm / 7" paper / PE	0 = No marking	0 = Conventional ceramic
0402	2B = X5R	The third digit	C = ± 0.25 pF	6 = 10 V		3 = 330 mm / 13" paper / PE		D = Class 2 MLCC
0603	2R = X7R	signifies the	D = ± 0.5 pF	7 = 16 V		B = 180mm / 7" blister		L = Low inductance
0805	2F = Y5V	multiplying factor:	F = $\pm 1\%$	8 = 25 V		F = 330 mm / 13" blister		M = Microwave
1206		8 = x 0.01	G = $\pm 2\%$	9 = 50 V		P = Bulk case		S = Safety certification capacitor
1210		9 = x 0.1	J = $\pm 5\%$	0 = 100 V				H = High frequency
1808		0 = x 1	K = $\pm 10\%$	B = 200 V				
1812		1 = x 10	M = $\pm 20\%$	C = 250 V				
0306		2 = x 100	Z = -20% to	D = 500 V				
0508		3 = x 1 000	+80%	E = 1 kV				
0612		4 = x 10 000		F = 2 kV				
		5 = x 100 000		G = 3 kV				
		6 = x 1 000 000		Z = 630 V				
		7 = x 10 000 000		S = 2.5 kV				
				T = X2/Y3				
				W = X1				
				U = Y2				

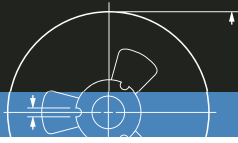


MLCC General Information

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	0201	0.3 ±0.03	8 mm	15 000	---	50 000	---	---
	0402	0.5 ±0.05		10 000	---	50 000	---	50 000
	0603	0.8 ±0.1		4 000	---	15 000	---	15 000
	0805	0.6 ±0.1		4 000	---	20 000	---	10 000
		0.85 ±0.1		4 000	---	15 000	---	8 000
		1.25 ±0.2		---	3 000	---	10 000	5 000
	1206	0.6 ±0.1		4 000	---	20 000	---	---
		0.85 ±0.1		4 000	---	15 000	---	---
		1.00 / 1.15 ±0.1		---	3 000	---	10 000	---
		1.25 ±0.2		---	3 000	---	10 000	---
		1.6 ±0.15		---	2 500	---	10 000	---
	1210	1.6 ±0.2		---	2 000	---	10 000	---
		0.6 / 0.7 ±0.1		---	4 000	---	15 000	---
		0.85 ±0.1		---	4 000	---	10 000	---
		1.0 ±0.15		---	3 000	---	10 000	---
		1.15 ±0.1		---	3 000	---	10 000	---
		1.15 ±0.15	---	3 000	---	10 000	---	
		1.25 ±0.2	---	3 000	---	---	---	
		1.5 ±0.1	---	2 000	---	---	---	
		1.6 / 1.9 ±0.2	---	2 000	---	---	---	
	1808	2.0 ±0.2	---	2 000 / 1 000	---	---	---	
		2.5 ±0.2	---	1 000 / 500	---	---	---	
		1.15 ±0.15	---	3 000	---	---	---	
		1.25 ±0.2	---	3 000	---	---	---	
		1.35 ±0.15	---	2 000	---	---	---	
		1.5 ±0.1	---	2 000	---	---	---	
		1.6 ±0.2	---	2 000	---	8 000	---	
		2.0 ±0.2	---	2 000	---	---	---	
		1812	0.6 / 0.85 ±0.1	---	2 000	---	---	---
			1.15 ±0.1	---	1 000	---	---	---
			1.15 ±0.15	---	1 000	---	---	---
			1.25 ±0.2	---	1 000	---	---	---
1.35 ±0.15	---		1 000	---	---	---		
1.5 ±0.1	---		1 000	---	---	---		
1.6 ±0.2	---		1 000	---	---	---		
2.0 ±0.2	---		1 000	---	---	---		
Low inductance	0306	0.5 ±0.1	8 mm	4 000	---	15 000	---	---
	0508	0.85 ±0.1		4 000	---	15 000	---	---
	0612	0.85 ±0.1		4 000	---	15 000	---	---
Arrays	0508	0.6 ±0.1	8 mm	4 000	---	---	---	---
	0612	0.8 ±0.1		4 000	---	---	---	---





MLCC Selection Charts

NPO - General purpose 16 to 25V, 0201 to 0603

NPO						
General purpose						
Capacitance	Last 2-digit of 12NC	0201	0402		0603	
		25 V	16 V	25 V	16 V	25 V
10 pF	23	0.3 ±0.03	0.5 ±0.05	0.5 ±0.05	0.8 ±0.1	0.8 ±0.1
12 pF	24					
15 pF	25					
18 pF	26					
22 pF	27					
27 pF	28					
33 pF	29					
39 pF	31					
47 pF	32					
56 pF	33					
68 pF	34					
82 pF	35					
100 pF	36					
120 pF	37					
150 pF	38					
180 pF	39					
220 pF	41					
270 pF	42					
330 pF	43					
390 pF	44					
470 pF	45					
560 pF	46					
680 pF	47					
820 pF	48					
1 000 pF	49					
1.2 nF	51					
1.5 nF	52					
1.8 nF	53					
2.2 nF	54					
2.7 nF	55					
3.3 nF	56					
Tape width		8 mm				

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

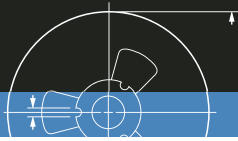


MLCC Selection Charts

NPO - General purpose 16 to 25V, 0805 to 1210

NPO							
General purpose							
Capacitance	Last 2-digit of 12NC	0805		1206		1210	
		16 V	25 V	16 V	25 V	25 V	
3.3 nF	56	1.25 ±0.2	1.25 ±0.2	0.85 ±0.1	0.85 ±0.1	1.0 ±0.15	
3.9 nF	57						
4.7 nF	58						
5.6 nF	59						
6.8 nF	61						
8.2 nF	62						
10 nF	63			1.25 ±0.2		1.25 ±0.2	
12 nF	64						
15 nF	65						
18 nF	66						
22 nF	67					2.0 ±0.2	
27 nF	68			1.6 ±0.2			
33 nF	69						
Tape width		8 mm					

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



MLCC Selection Charts

NPO - General purpose 50V, 0201 to 1812

NPO								
General purpose								
Capacitance	Last 3-digit of 12NC	0201 50 V	0402 50 V	0603 50 V	0805 50 V	1206 50 V	1210 50 V	1812 50 V
4.7 nF	472				1.25 ±0.2	0.85 ±0.1	1.25 ±0.2	1.0 ±0.15
5.6 nF	562							
6.8 nF	682							
8.2 nF	822					1.25 ±0.2		1.25 ±0.2
10 nF	103							
12 nF	123							
15 nF	153							
18 nF	183							
22 nF	223						2.0 ±0.2	
Tape width		8 mm						12 mm

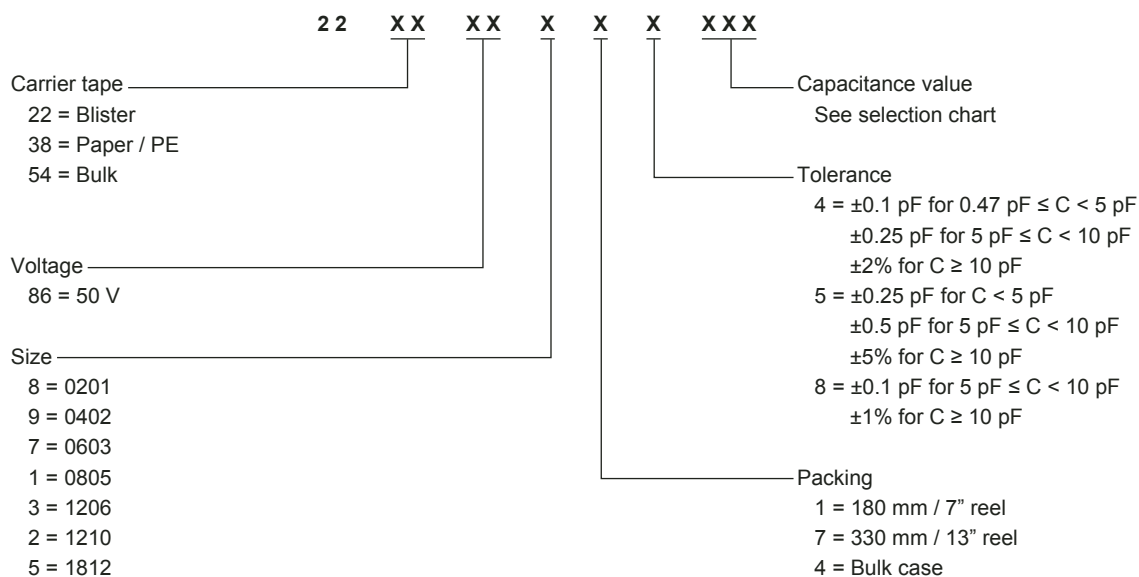
Note: Values in shaded cells indicate thickness class (unit: mm)



Global part number - Preferred type

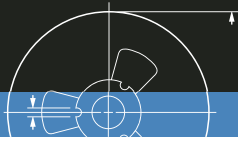
Global Part Number is the preferred clear text code for ordering Yageo and Phycomp branded products. For details, please see page 73.

12NC ordering code - Phycomp branded products only



Phycomp CTC ordering code - North America

Regional code for ordering Phycomp branded products. For details, please see page 78.



MLCC Selection Charts

NPO - Medium voltage, 0603 / 0805

NPO									
Medium voltage									
Capacitance	Last 2-digit of 12NC	0603			0805				
		100 V	200 V	250 V	100 V	200 V	250 V	500 V	
10 pF	23	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	
12 pF	24								
15 pF	25								
18 pF	26								
22 pF	27								
27 pF	28								
33 pF	29								
39 pF	31								
47 pF	32								
56 pF	33								
68 pF	34								
82 pF	35								
100 pF	36								
120 pF	37								
150 pF	38								
180 pF	39								
220 pF	41								
270 pF	42								
330 pF	43								
390 pF	44								
470 pF	45								
560 pF	46								
680 pF	47					0.85 ±0.1	0.85 ±0.1	1.25 ±0.2	
820 pF	48								
1 000 pF	49								
1.2 nF	51				1.25 ±0.2				
1.5 nF	52						1.25 ±0.2	1.25 ±0.2	
1.8 nF	53								
2.2 nF	54								
2.7 nF	55								
3.3 nF	56								
3.9 nF	57								
4.7 nF	58								
5.6 nF	59								
6.8 nF	61								
8.2 nF	62								
10 nF	63								
Tape width		8 mm							

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

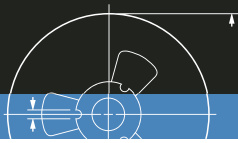


MLCC Selection Charts

NPO - Medium voltage, 1206 / 1210

NPO											
Medium voltage											
Capacitance	Last 2-digit of 12NC	1206					1210				
		100 V	200 V	250 V	500 V	630 V	100 V	200 V	250 V	500 V	630 V
10 pF	23										
12 pF	24										
15 pF	25										
18 pF	26										
22 pF	27										
27 pF	28										
33 pF	29										
39 pF	31										
47 pF	32										
56 pF	33										
68 pF	34										
82 pF	35		0.6 ±0.1	0.6 ±0.1	0.6 ±0.1						
100 pF	36					1.25 ±0.2					
120 pF	37										
150 pF	38										
180 pF	39	0.6 ±0.1									
220 pF	41										
270 pF	42										
330 pF	43										
390 pF	44										
470 pF	45										
560 pF	46										
680 pF	47										
820 pF	48					1.25 ±0.2					
1 000 pF	49		0.85 ±0.1	0.85 ±0.1	0.85 ±0.1		1.25 ±0.2	1.25 ±0.2			
1.2 nF	51										
1.5 nF	52										
1.8 nF	53				1.25 ±0.2						
2.2 nF	54										
2.7 nF	55		1.25 ±0.2	1.25 ±0.2							
3.3 nF	56										
3.9 nF	57										
4.7 nF	58	0.85 ±0.1									
5.6 nF	59										
6.8 nF	61										
8.2 nF	62										
10 nF	63	1.25 ±0.2									
12 nF	64										
15 nF	65										
Tape width		8 mm									

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



MLCC Selection Charts

NPO - Medium voltage, 1808 / 1812

NPO											
Medium voltage											
Capacitance	Last 2-digit of 12NC	1808					1812				
		100 V	200 V	250 V	500 V	630 V	100 V	200 V	250 V	500 V	630 V
10 pF	23										
12 pF	24										
15 pF	25										
18 pF	26										
22 pF	27										
27 pF	28										
33 pF	29										
39 pF	31										
47 pF	32										
56 pF	33										
68 pF	34										
82 pF	35										
100 pF	36										
120 pF	37					1.25 ±0.2					
150 pF	38										
180 pF	39										
220 pF	41										1.25 ±0.2
270 pF	42										
330 pF	43								1.25 ±0.2		
390 pF	44										
470 pF	45										
560 pF	46										
680 pF	47										
820 pF	48				1.25 ±0.2						
1 000 pF	49										
1.2 nF	51	1.25 ±0.2	1.25 ±0.2	1.25 ±0.2							
1.5 nF	52										
1.8 nF	53										
2.2 nF	54										
2.7 nF	55						1.25 ±0.2	1.25 ±0.2	1.25 ±0.2		1.6 ±0.2
3.3 nF	56										
3.9 nF	57										
4.7 nF	58										
5.6 nF	59										
6.8 nF	61										
8.2 nF	62										
10 nF	63										
12 nF	64										
15 nF	65										
18 nF	66										
22 nF	67										
Tape width		12 mm									

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



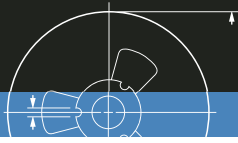
MLCC Selection Charts

NPO - High voltage, 1206 / 1210

NPO							
High voltage							
Capacitance	Last 2-digit of 12NC	1206		1210			
		1 kV	2 kV	1 kV	2 kV		
10 pF	23	1.25 ±0.2	1.25 ±0.2	1.25 ±0.2	1.25 ±0.2		
12 pF	24						
15 pF	25						
18 pF	26						
22 pF	27						
27 pF	28						
33 pF	29						
39 pF	31						
47 pF	32						
56 pF	33						
68 pF	34						
82 pF	35						
100 pF	36						
120 pF	37						
150 pF	38						
180 pF	39						
220 pF	41						
270 pF	42						
330 pF	43						
390 pF	44						
470 pF	45						
560 pF	46						
680 pF	47						
820 pF	48						
1 000 pF	49						
Tape width			8 mm				

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





MLCC Selection Charts

NPO - High voltage, 1808 / 1812

NPO								
High voltage								
Capacitance	Last 2-digit of 12NC	1808			1812			
		1 kV	2 kV	3 kV	1 kV	2 kV	3 kV	
10 pF	23	1.25 ±0.2	1.25 ±0.2	1.6 ±0.2		1.25 ±0.2	1.25 ±0.2	
12 pF	24							
15 pF	25							
18 pF	26							
22 pF	27							
27 pF	28							
33 pF	29							
39 pF	31							
47 pF	32							
56 pF	33							
68 pF	34							
82 pF	35							
100 pF	36							
120 pF	37							
150 pF	38							
180 pF	39			2.0 ±0.2	1.25 ±0.2			
220 pF	41							
270 pF	42							
330 pF	43							
390 pF	44							
470 pF	45							
560 pF	46							
680 pF	47							
820 pF	48							
1 000 pF	49							
1.2 nF	51							
1.5 nF	52							
1.8 nF	53							
2.2 nF	54							
2.7 nF	55				1.6 ±0.2			
Tape width		12 mm						

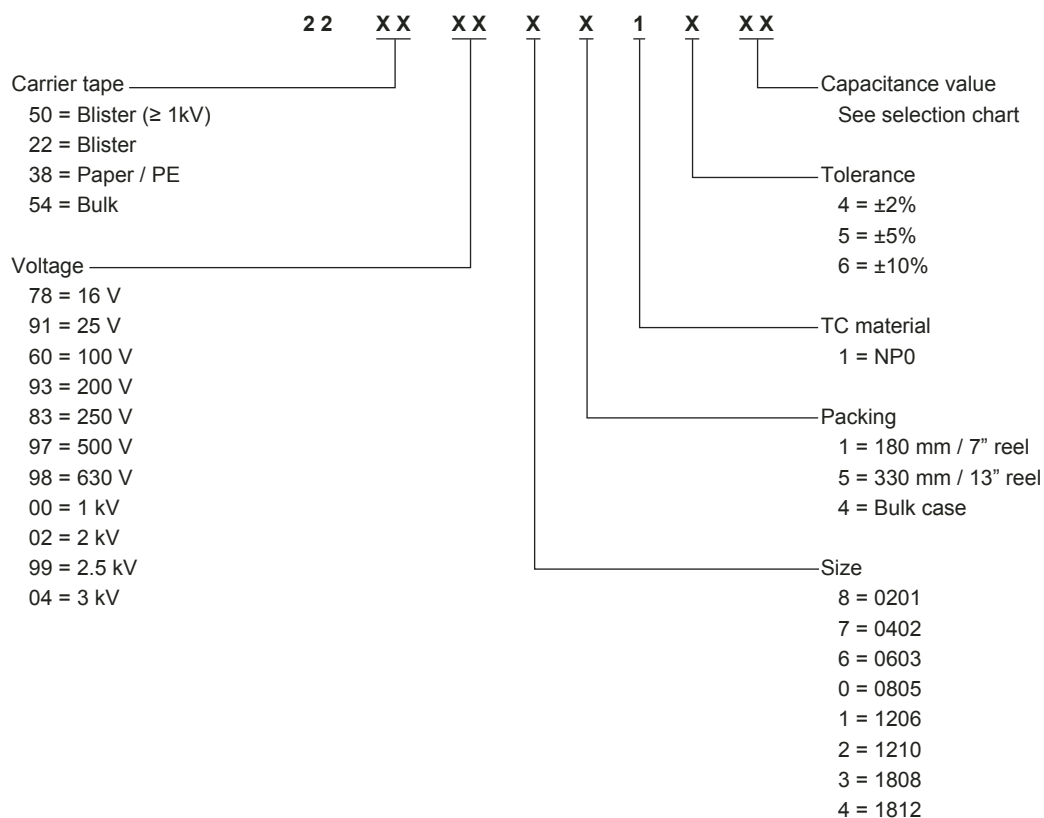
Note: Values in shaded cells indicate thickness class (unit: mm)



Global part number - Preferred type

Global Part Number is the preferred clear text code for ordering Yageo and Phycomp branded products. For details, please see page 73.

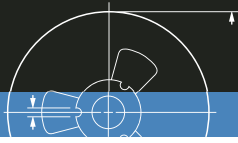
12NC ordering code - Phycomp branded products only



Phycomp CTC ordering code - North America

Regional code for ordering Phycomp branded products. For details, please see page 78.





MLCC Selection Charts

NPO - High frequency, 0402 to 0805

NPO				
High frequency				
Capacitance	Last 3-digit of 12NC	0402	0603	0805
		50 V	50 V	50 V
0.22 pF	227	0.5 ±0.05	0.8 ±0.1	0.6 ±0.1
0.47 pF	477			
0.56 pF	567			
0.68 pF	687			
0.82 pF	827			
1 pF	108			
1.2 pF	128			
1.5 pF	158			
1.8 pF	188			
2.2 pF	228			
2.7 pF	278			
3.3 pF	338			
3.9 pF	398			
4.7 pF	478			
5.6 pF	568			
6.8 pF	688			
8.2 pF	828			
10 pF	109			
12 pF	129			
15 pF	159			
18 pF	189			
22 pF	229			
27 pF	279			
33 pF	339			
39 pF	399			
47 pF	479			
56 pF	569			
68 pF	689			
82 pF	829			
100 pF	101			
Tape width		8 mm		

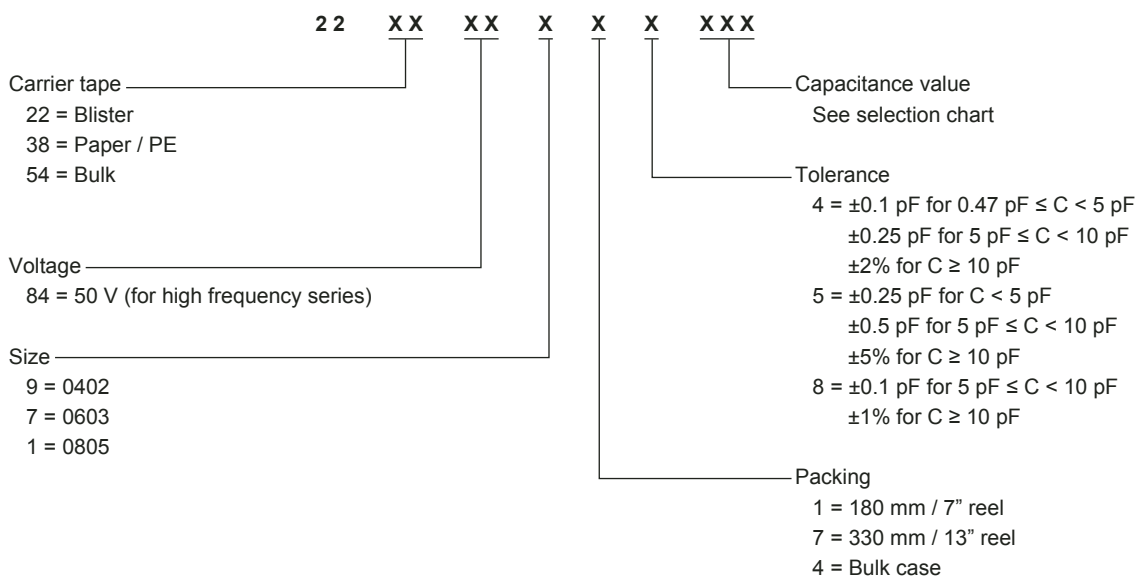
Note: Values in shaded cells indicate thickness class (unit: mm)



Global part number - Preferred type

Global Part Number is the preferred clear text code for ordering Yageo and Phycomp branded products. For details, please see page 73.

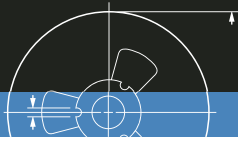
12NC ordering code - Phycomp branded products only



Phycomp CTC ordering code - North America

Regional code for ordering Phycomp branded products. For details, please see page 78.





MLCC Selection Charts

NPO - Microwave, 0603 to 1206

NPO							
Microwave							
Capacitance	Last 2-digit of 12NC	0603	0805	1206			
		50 V	50 V	50 V			
0.47 pF	5	0.8 ±0.1	0.6 ±0.1	0.6 ±0.1			
0.56 pF	6						
0.68 pF	7						
0.82 pF	8						
1 pF	9						
1.2 pF	11						
1.5 pF	12						
1.8 pF	13						
2.2 pF	14						
2.7 pF	15						
3.3 pF	16						
3.9 pF	17						
4.7 pF	18						
5.6 pF	19						
6.8 pF	21						
8.2 pF	22						
10 pF	23						
12 pF	24						
15 pF	25						
18 pF	26						
22 pF	27						
27 pF	28						
33 pF	29						
39 pF	31						
47 pF	32						
56 pF	33						
68 pF	34						
82 pF	35						
100 pF	36						
120 pF	37						
Tape width					8 mm		

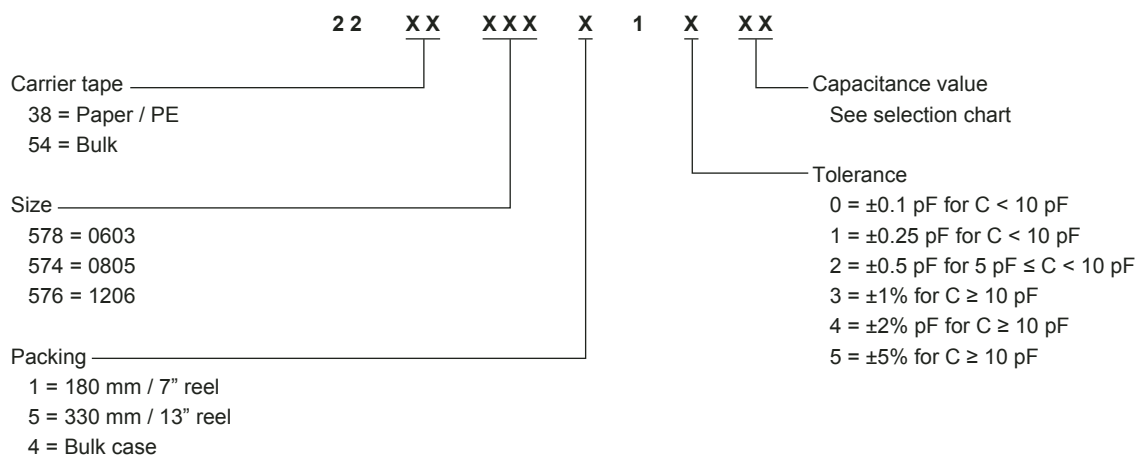
Note: Values in shaded cells indicate thickness class (unit: mm)



Global part number - Preferred type

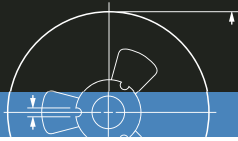
Global Part Number is the preferred clear text code for ordering Yageo and Phycomp branded products. For details, please see page 73.

12NC ordering code - Phycomp branded products only



Phycomp CTC ordering code - North America

Regional code for ordering Phycomp branded products. For details, please see page 78.



MLCC Selection Charts

X7R - General purpose, 0201 / 0402

X7R											
General purpose											
Capacitance	Last 2-digit of 12NC	0201					0402				
		6.3 V	10 V	16 V	25 V	50 V	6.3 V	10 V	16 V	25 V	50 V
100 pF	09										
150 pF	12										
220 pF	14										
330 pF	16				0.3 ±0.03	0.3 ±0.03					
470 pF	18										
680 pF	21										
1 000 pF	23	0.3 ±0.03	0.3 ±0.03	0.3 ±0.03							0.5 ±0.05
1.5 nF	25										
2.2 nF	27										
3.3 nF	29								0.5 ±0.05	0.5 ±0.05	
4.7 nF	32										
6.8 nF	34										
10 nF	36										
15 nF	38										
22 nF	41										
33 nF	43										
47 nF	45						0.5 ±0.05	0.5 ±0.05			
68 nF	47										
100 nF	49										
Tape width		8 mm									

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



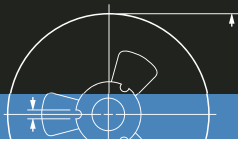
MLCC Selection Charts

X7R - General purpose & High capacitance, 0603 / 0805

X7R											
General purpose & High capacitance											
Capacitance	Last 2-digit of 12NC	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	09										
150 pF	12										
220 pF	14										
330 pF	16										
470 pF	18										
680 pF	21										
1 000 pF	23										
1.5 nF	25										
2.2 nF	27									0.6 ±0.1	0.6 ±0.1
3.3 nF	29										
4.7 nF	32				0.8 ±0.1	0.8 ±0.1					
6.8 nF	34										
10 nF	36		0.8 ±0.1	0.8 ±0.1							
15 nF	38										
22 nF	41										
33 nF	43										
47 nF	45										
68 nF	47										
100 nF	49								0.85 ±0.1	0.85 ±0.1	0.85 ±0.1
150 nF	52						0.85 ±0.1	0.85 ±0.1			
220 nF	54										
330 nF	56	0.8 ±0.1									
470 nF	58										
680 nF	61								1.25 ±0.2	1.25 ±0.2	
1 000 nF	63						1.25 ±0.2	1.25 ±0.2			1.25 ±0.2
2.2 µF	67										
4.7 µF	72										
10 µF	76										
Tape width		8 mm									

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





MLCC Selection Charts

X7R - General purpose & High capacitance, 1206 to 1812

X7R											
General purpose & High capacitance											
Capacitance	Last 2-digit of 2NC	1206					1210				1812
		6.3 V	10 V	16 V	25 V	50 V	10 V	16 V	25 V	50 V	50 V
220 pF	14										
330 pF	16										
470 pF	18										
680 pF	21										
1 000 pF	23										
1.5 nF	25										
2.2 nF	27										
3.3 nF	29										
4.7 nF	32										
6.8 nF	34										
10 nF	36										
15 nF	38										
22 nF	41										
33 nF	43										
47 nF	45										
68 nF	47										
100 nF	49										
150 nF	52										
220 nF	54										
330 nF	56										
470 nF	58										
680 nF	61										
1 000 nF	63										
2.2 µF	67										
4.7 µF	72										
10 µF	76										
22 µF	81										
Tape width		8 mm									12mm

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

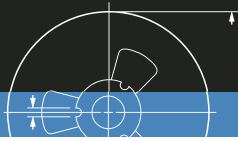


MLCC Selection Charts

X7R - Medium voltage, 0603 / 0805

X7R							
Medium voltage							
Capacitance	Last 2-digit of 12NC	0603	0805				
		100V	100 V	200 V	250 V	500 V	
100 pF	9	0.8 ±0.1					
150 pF	12						
220 pF	14						
330 pF	16						
470 pF	18						
680 pF	21						
1 000 pF	23						
1.5 nF	25			0.6 ±0.1 0.85 ±0.1	0.85 ±0.1	0.85 ±0.1	0.85 ±0.1
2.2 nF	27						
2.7 nF	28						
3.3 nF	29						
4.7 nF	32						
5.6 nF	33						
6.8 nF	34						
10 nF	36						
15 nF	38			1.25 ±0.2	1.25 ±0.2	1.25 ±0.2	
22 nF	41		0.85 ±0.1				
33 nF	43		1.25 ±0.2				
47 nF	45						
Tape width		8 mm					

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



MLCC Selection Charts

X7R - Medium voltage, 1206 / 1210

X7R											
Medium voltage											
Capacitance	Last 2-digit of 12NC	1206					1210				
		100V	200V	250V	500V	630V	100 V	200 V	250 V	500 V	630 V
220 pF	14										
330 pF	16										
470 pF	18										
680 pF	21										
820 pF	22										
1 000 pF	23										
1.2 nF	24										
1.5 nF	25										
1.8 nF	26										
2.2 nF	27		0.85 ±0.1	0.85 ±0.1		1.25 ±0.2					
2.7 nF	28				1.25 ±0.2	1.25 ±0.2					
3.3 nF	29	0.85 ±0.1									
3.9 nF	31										
4.7 nF	32										
6.8 nF	34							0.85 ±0.1	0.85 ±0.1		
10 nF	36										
12 nF	37									1.25 ±0.2	
15 nF	38						0.85 ±0.1				
18 nF	39										
22 nF	41										1.6 ±0.2
33 nF	43										2.0 ±0.2
47 nF	45		1.25 ±0.2	1.25 ±0.2		1.6 ±0.2					
56 nF	46										
68 nF	47										
82 nF	48										
100 nF	49										
120 nF	51	1.25 ±0.2									
150 nF	52										
180 nF	53						1.25 ±0.2				
220 nF	54										
270 nF	55										
330 nF	56										
390 nF	57	1.6 ±0.2									
470 nF	58										
Tape width		8 mm									

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



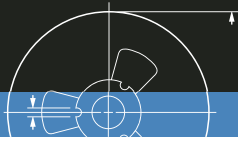
MLCC Selection Charts

X7R - Medium voltage, 1808 / 1812

X7R											
Medium voltage											
Capacitance	Last 2-digit of 12NC	1808					1812				
		100 V	200 V	250 V	500 V	630 V	100 V	200 V	250 V	500 V	630 V
1 000 pF	23										
1.5 nF	26										
2.2 nF	28					1.35 ±0.15					
3.3 nF	29										
4.7 nF	32					1.25 ±0.2					1.25 ±0.2
6.8 nF	34					1.6 ±0.2					
10 nF	36										
15 nF	38				1.25 ±0.2						
22 nF	41	1.25 ±0.2	1.25 ±0.2	1.25 ±0.2			0.85 ±0.1	0.85 ±0.1	0.85 ±0.1	1.25 ±0.2	
33 nF	43										1.6 ±0.2
47 nF	45										
68 nF	47										
100 nF	49							1.25 ±0.2	1.25 ±0.2		1.6 ±0.2
150 nF	52										
220 nF	54						1.25 ±0.2	1.6 ±0.2	1.6 ±0.2		
330 nF	56							2.0 ±0.2	2.0 ±0.2		
470 nF	58										
560 nF	59										
680 nF	61						1.6 ±0.2				
820 nF	62										
1 000 nF	63										
Tape width		12 mm									

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





MLCC Selection Charts

X7R - High voltage, 1206 / 1210

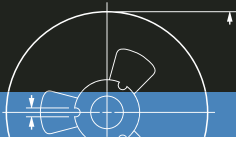
X7R					
High voltage					
Capacitance	Last 2-digit of 12NC	1206		1210	
		1 kV	2 kV	1 kV	2 kV
100 pF	09	0.85 ±0.10			
150 pF	12				
220 pF	14	1.25 ±0.2	1.25 ±0.2		
330 pF	16				
470 pF	18				
680 pF	21				
1 000 pF	23				
1.5 nF	25				
2.2 nF	27				
3.3 nF	29				
4.7 nF	32				
6.8 nF	34				
10 nF	36				
15 nF	38				
22 nF	41			1.6 ±0.2	
33 nF	43			2.0 ±0.2	
Tape width		8 mm			

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



X7R								
High voltage								
Capacitance	Last 2-digit of 12NC	1808			1812			
		1 kV	2 kV	3 kV	1 kV	2 kV	3 kV	
150 pF	12			1.6 ±0.2				
220 pF	14							
330 pF	16							
470 pF	18	1.35 ±0.15	1.35 ±0.15	2.0 ±0.2	1.25 ±0.2	1.35 ±0.15		
680 pF	21							
1 000 pF	23							1.6 ±0.2
1.5 nF	25							2.0 ±0.2
2.2 nF	27			1.6 ±0.2				
3.3 nF	29							
4.7 nF	32							
6.8 nF	34	1.6 ±0.2				1.6 ±0.2		
10 nF	36					2.0 ±0.2		
15 nF	38							
22 nF	41							
33 nF	43				1.6 ±0.2			
Tape width		12 mm						

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



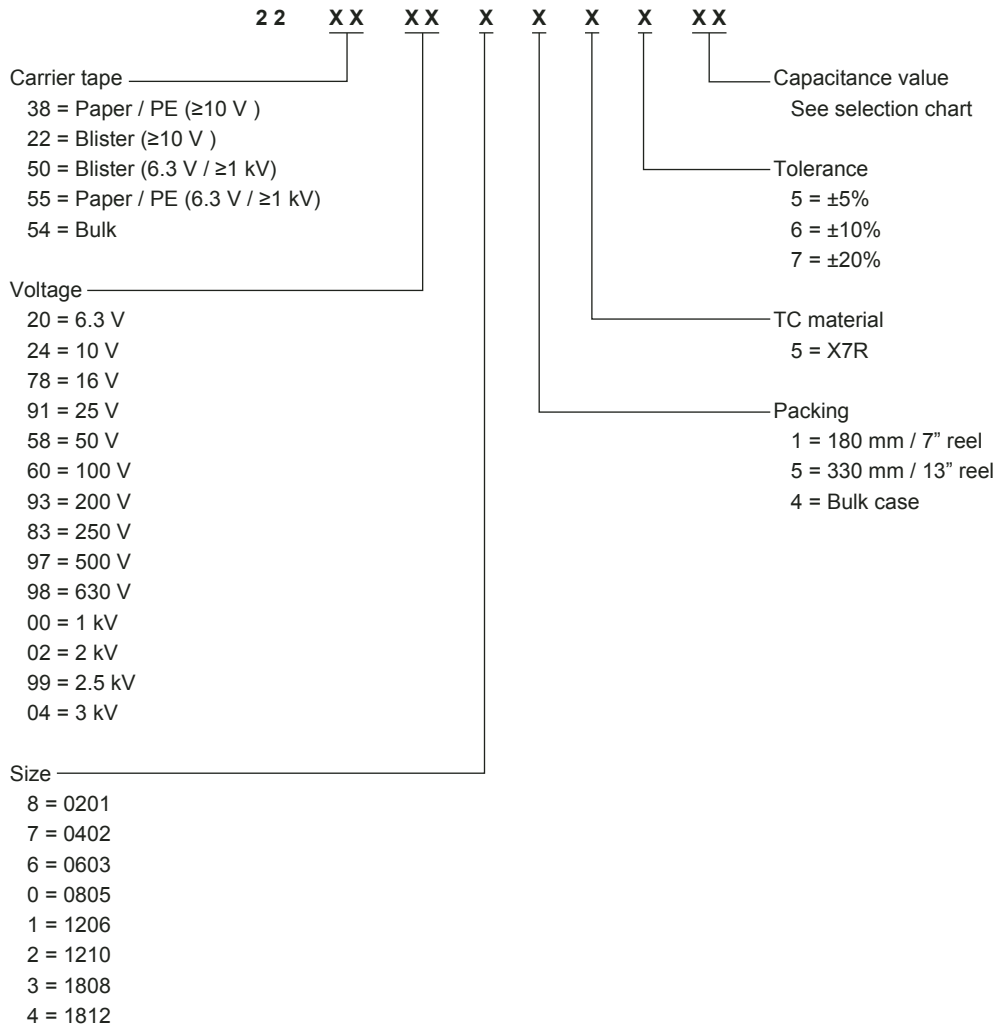
MLCC Selection Charts

X7R - General purpose, High Capacitance, Medium & High voltage

Global part number - Preferred type

Global Part Number is the preferred clear text code for ordering Yageo and Phycomp branded products. For details, please see page 77.

12NC ordering code - Phycomp branded products only



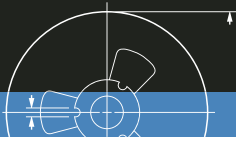
Phycomp CTC ordering code - North America

Regional code for ordering Phycomp branded products. For details, please see page 78.



X7R					
Low inductance					
Capacitance	Last 2-digit of 12NC	0306	0508	0508	0612
		10 V	16 V	25 V	50 V
10 nF	36			0.85 ±0.1	0.85 ±0.1
22 nF	41				
47 nF	45				
100 nF	49	0.5 ±0.1	0.85 ±0.1		
220 nF	54				
Tape width		8 mm			

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



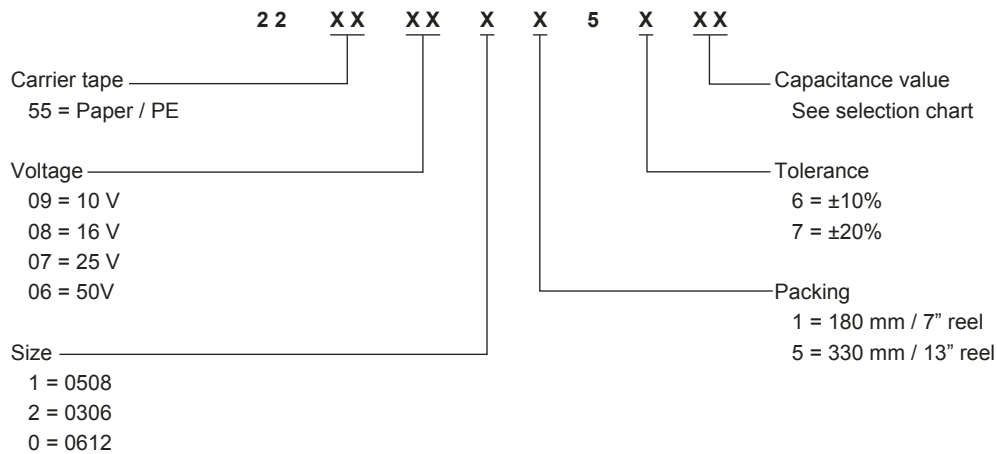
MLCC Selection Charts

X7R - Low inductance, 0306 to 0612

Global part number - Preferred type

Global Part Number is the preferred clear text code for ordering Yageo and Phycomp branded products. For details, please see page 77.

12NC ordering code - Phycomp branded products only



Phycomp CTC ordering code - North America

Regional code for ordering Phycomp branded products. For details, please see page 78.



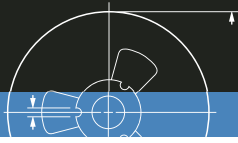
MLCC Selection Charts

X5R - General purpose & High capacitance, 0201 / 0402

X5R										
General purpose & High capacitance										
Capacitance	Last 2-digit of 12NC	0201					0402			
		6.3 V	10 V	16 V	25 V	50 V	6.3 V	10 V	16 V	25 V
100 pF	09									
150 pF	12									
220 pF	14									
330 pF	16				0.3 ±0.03	0.3 ±0.03				
470 pF	18									
680 pF	21									
1.0 nF	23			0.3 ±0.03						
1.5 nF	25									
2.2 nF	27									
3.3 nF	29	0.3 ±0.03	0.3 ±0.03							
4.7 nF	32									
6.8 nF	34									
10 nF	36									
15 nF	39									
22 nF	41									
33 nF	43									
47 nF	45									
68 nF	47									
100 nF	49									
150 nF	52									
220 nF	54						0.5 ±0.05	0.5 ±0.05	0.5 ±0.05	0.5 ±0.05
330 nF	56									
470 nF	58									
680 nF	61									
1 000 nF	63									
2.2 µF	65									
4.7 µF	67									
Tape width		8 mm								

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





MLCC Selection Charts

X5R - General purpose & High capacitance, 0603 / 0805

X5R									
General purpose & High capacitance									
Capacitance	Last 2-digit of 12NC	0603				0805			
		6.3 V	10 V	16 V	25 V	6.3 V	10 V	16 V	25 V
220 nF	54	0.8 ±0.1	0.8 ±0.1	0.8 ±0.1	0.8 ±0.1				
330 nF	56								
470 nF	58								
680 nF	61								
1 000 nF	63								
2.2 µF	67								
4.7 µF	72								
10 µF	76	0.8 ±0.15	0.8 ±0.15			0.85 ±0.1 1.25 ±0.2	0.85 ±0.1 1.25 ±0.2	0.85 ±0.1 1.25 ±0.2	1.25 ±0.2
22 µF	81								
47 µF	85					1.25 ±0.2			
100 µF	89								
Tape width		8 mm							

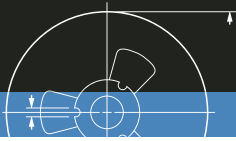
Note: Values in shaded cells indicate thickness class (unit: mm)



MLCC Selection Charts

X5R - High capacitance, 1206 to 1812

X5R											
High capacitance											
Capacitance	Last 2-digit of 12NC	1206				1210					1812
		6.3 V	10 V	16 V	25 V	6.3 V	10 V	16 V	25 V	50 V	6.3 V
2.2 μ F	67	1.15 \pm 0.1	1.15 \pm 0.1	1.15 \pm 0.1	1.15 \pm 0.1						
4.7 μ F	72	1.6 \pm 0.2 1.15 \pm 0.1	1.6 \pm 0.2 1.15 \pm 0.1	1.6 \pm 0.2 1.15 \pm 0.1	1.6 \pm 0.2			1.9 \pm 0.2	1.9 \pm 0.2		
10 μ F	76	1.6 \pm 0.2	1.6 \pm 0.2	1.6 \pm 0.2			1.9 \pm 0.2				2.5 \pm 0.2
22 μ F	81						2.5 \pm 0.2	2.5 \pm 0.2	2.5 \pm 0.2		
47 μ F	85										2.5 \pm 0.2
100 μ F	89										
Tape width		8 mm									12 mm



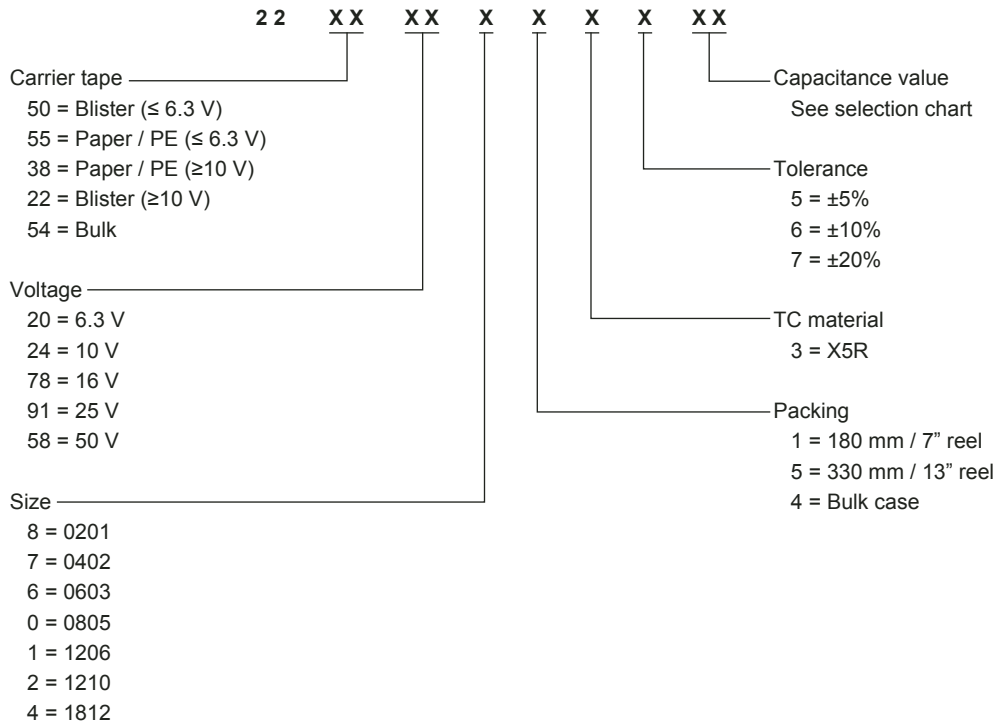
MLCC Selection Charts

X5R - General purpose & High Capacitance, 0201 to 1812

Global part number - Preferred type

Global Part Number is the preferred clear text code for ordering Yageo and Phycomp branded products. For details, please see page 77.

12NC ordering code - Phycomp branded products only



Phycomp CTC ordering code - North America

Regional code for ordering Phycomp branded products. For details, please see page 78.



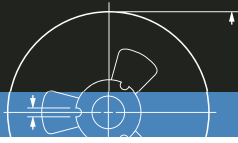
MLCC Selection Charts

Y5V - General purpose & High capacitance 6.3 to 25V, 0201 / 0402

Y5V						
General purpose & High capacitance						
Capacitance	Last 2-digit of 12NC	0201	0402			
		6.3 V	6.3 V	10 V	16 V	25 V
10 nF	36	0.3 ±0.03	0.5 ±0.05	0.5 ±0.05	0.5 ±0.05	0.5 ±0.05
22 nF	41					
47 nF	45					
100 nF	49					
220 nF	54					
470 nF	58					
1 000 nF	63					
Tape width		8 mm				

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





MLCC Selection Charts

Y5V - General purpose & High capacitance 6.3 to 25V, 0603 / 0805

Y5V										
General purpose & High capacitance										
Capacitance	Last 2-digit of 12NC	0603				0805				
		6.3 V	10 V	16 V	25 V	6.3 V	10 V	16 V	25 V	
10 nF	36	0.8 ±0.1	0.8 ±0.1	0.8 ±0.1	0.8 ±0.1			0.6 ±0.1	0.6 ±0.1	
22 nF	41									
47 nF	45									
100 nF	49									
220 nF	54									
470 nF	58							0.85 ±0.1	0.85 ±0.1	
1 000 nF	63									
2.2 µF	67							0.85 ±0.1	0.85 ±0.1	1.25 ±0.2
4.7 µF	72							0.85 ±0.1	0.85 ±0.1 1.25 ±0.2	1.25 ±0.2
10 µF	76							1.25 ±0.2	1.25 ±0.2	
22 µF	81									
Tape width		8 mm								

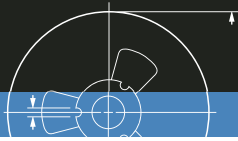
Note: Values in shaded cells indicate thickness class (unit: mm)



Y5V										
General purpose & High capacitance										
Capacitance	Last 2-digit of 12NC	1206				1210				
		6.3 V	10 V	16 V	25 V	6.3 V	10 V	16 V	25 V	
10 nF	36									
22 nF	41									
47 nF	45			0.6 ±0.1	0.6 ±0.1					
100 nF	49									
220 nF	54									
470 nF	58		0.85 ±0.1	0.85 ±0.1	0.85 ±0.1					
1 000 nF	63									
2.2 µF	67									
4.7 µF	72									
10 µF	76	0.85 ±0.1		1.15 ±0.1	1.6 ±0.2		1.5 ±0.1	1.5 ±0.1	1.5 ±0.1	
22 µF	81	1.6 ±0.2	1.6 ±0.2	1.6 ±0.2			1.6 ±0.2	1.6 ±0.2		
47 µF	85					2.0 ±0.2				
Tape width		8 mm								

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





MLCC Selection Charts

Y5V - General purpose & High capacitance 50V, 0402 to 1206

Y5V					
General purpose & High capacitance					
Capacitance	Last 2-digit of 12NC	0402	0603	0805	1206
		50 V	50 V	50 V	50 V
10 nF	05	0.5 ±0.05	0.8 ±0.1	0.6 ±0.1	0.6 ±0.1
22 nF	07				
47 nF	09				
100 nF	12			0.85 ±0.1	
220 nF	14				
470 nF	16			0.85 ±0.1	
1 000 nF	18		1.25 ±0.2		
2.2 µF	23				1.6 ±0.2
Tape width		8 mm			

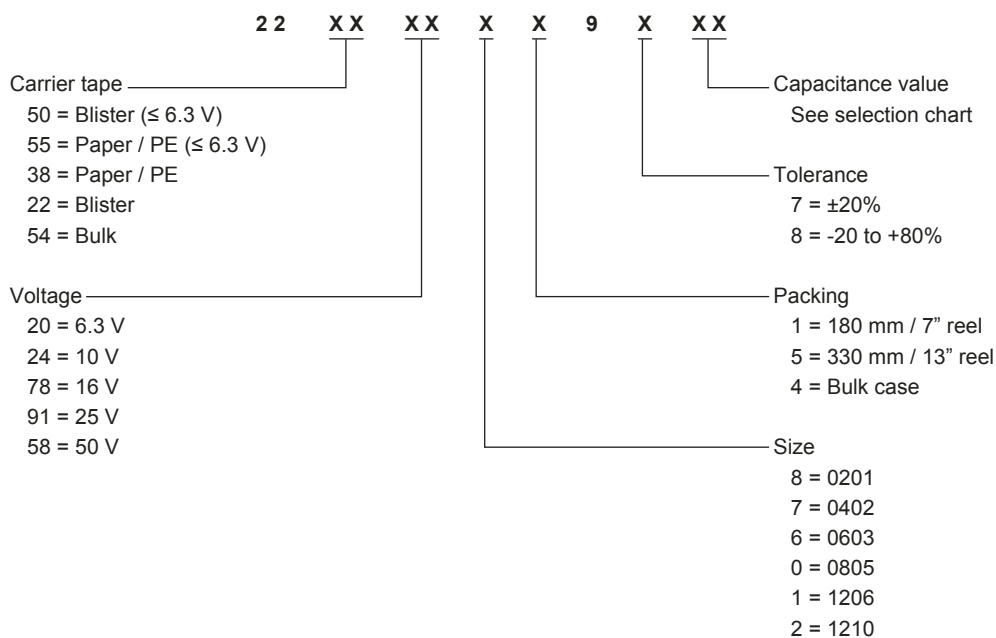
Note: Values in shaded cells indicate thickness class (unit: mm)



Global part number - Preferred type

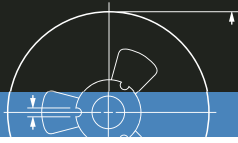
Global Part Number is the preferred clear text code for ordering Yageo and Phycomp branded products. For details, please see page 73.

12NC ordering code - Phycomp branded products only



Phycomp CTC ordering code - North America

Regional code for ordering Phycomp branded products. For details, please see page 78.



MLCC Selection Charts

NPO - High voltage SC type, 1808 / 1812

NPO									
High voltage SC type									
Capacitance	Last 2-digit of 12NC	1808		1812		1808			
		X1/Y2 for TUV	X1/Y2 for UL	X1/Y2 for TUV	X1/Y2 for UL	X2/Y3 for TUV	X2/Y3 for UL		
10 pF	23	1.6 ±0.2	1.6 ±0.2	1.6 ±0.2	1.6 ±0.2	1.6 ±0.2	1.6 ±0.2		
12 pF	24								
15 pF	25								
18 pF	26								
22 pF	27								
27 pF	28								
33 pF	29								
39 pF	31								
47 pF	32								
56 pF	33								
68 pF	34								
82 pF	35								
100 pF	36								
120 pF	37	2.0 ±0.2	2.0 ±0.2	2.0 ±0.2	2.0 ±0.2	2.0 ±0.2	2.0 ±0.2		
150 pF	38								
180 pF	39								
220 pF	41								
270 pF	42								
330 pF	43								
390 pF	44								
470 pF	45								
560 pF	46								
680 pF	47								
820 pF	48								
1 000 pF	49								
Tape width		12 mm							

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



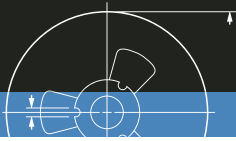
MLCC Selection Charts

X7R - High voltage SC type, 1808 / 1812

X7R							
High voltage SC type							
Capacitance	Last 2-digit of 12NC	1808		1812		1808	
		X1/Y2 for TUV	X1/Y2 for UL	X1/Y2 for TUV	X1/Y2 for UL	X2/Y3 for TUV	X2/Y3 for UL
150 pF	12	1.6 ±0.2	1.6 ±0.2			1.6 ±0.2	1.6 ±0.2
180 pF	13						
220 pF	14						
270 pF	15	2.0 ±0.2	2.0 ±0.2	1.6 ±0.2	1.6 ±0.2	1.6 ±0.2	1.6 ±0.2
330 pF	16						
390 pF	17						
470 pF	18					2.0 ±0.2	2.0 ±0.2
560 pF	19						
680 pF	21						
820 pF	22					2.0 ±0.2	2.0 ±0.2
1 000 pF	23						
1.2 nF	24						
1.5 nF	25						
Tape width		12 mm					

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





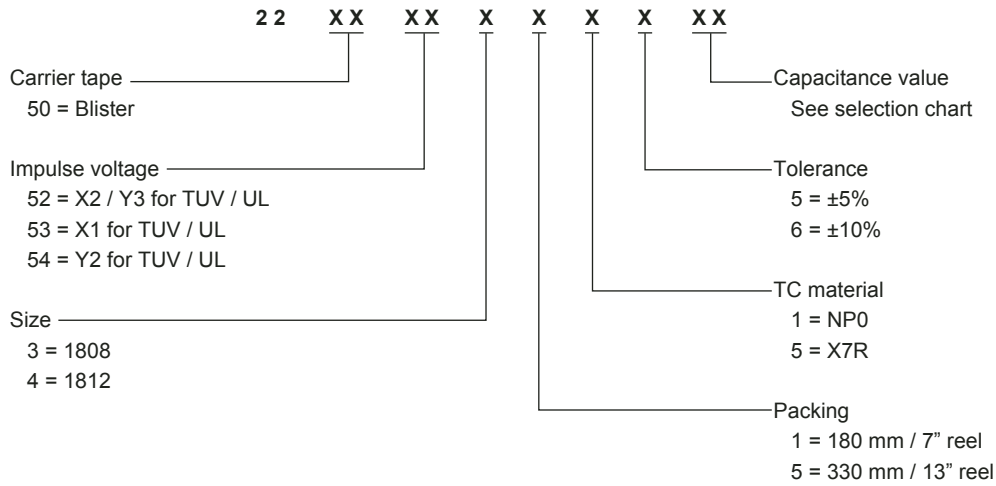
MLCC Selection Charts

NPO / X7R - High voltage SC type, 1808 / 1812

Global part number - Preferred type

Global Part Number is the preferred clear text code for ordering Yageo and Phycomp branded products. For details, please see page 77.

12NC ordering code - Phycomp branded products only



Phycomp CTC ordering code - North America

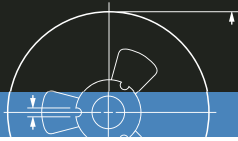
Regional code for ordering Phycomp branded products. For details, please see page 78.



NPO			
4C arrays			
Capacitance	Last 2-digit of 12NC	0508	0612
		50 V	50 V
10 pF	23	0.6 ±0.1	0.8 ±0.1
15 pF	25		
18 pF	26		
22 pF	27		
27 pF	28		
47 pF	32		
100 pF	36		
150 pF	38		
180 pF	39		
220 pF	41		
270 pF	42		
330 pF	43		
390 pF	44		
470 pF	45		
560 pF	46		
680 pF	47		
820 pF	48		
1 000 pF	49		
Tape width		8 mm	

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





MLCC Selection Charts

X7R - 4C Arrays, 0508 / 0612

X7R							
4C arrays							
Capacitance	Last 2-digit of 12NC	0508	0612				
		16 V	16 V	25 V	50 V		
180 pF	13			0.8 ±0.1	0.8 ±0.1		
220 pF	14						
270 pF	15						
330 pF	16						
390 pF	17						
470 pF	18						
560 pF	19						
680 pF	21						
820 pF	22						
1.0 nF	23	0.6 ±0.1				0.8 ±0.1	0.8 ±0.1
1.2 nF	24						
1.5 nF	25						
1.8 nF	26						
2.2 nF	27						
2.7 nF	28						
3.3 nF	29						
3.9 nF	31						
4.7 nF	32						
5.6 nF	33						
6.8 nF	34						
8.2 nF	35						
10 nF	36						
12 nF	37						
15 nF	38						
18 nF	39						
22 nF	41						
27 nF	42	0.8 ±0.1					
33 nF	43						
47 nF	45						
56 nF	46						
68 nF	47						
82 nF	48						
100 nF	49						
Tape width			8 mm				

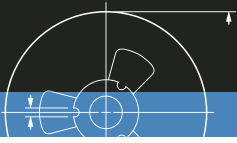
Note: Values in shaded cells indicate thickness class (unit: mm)



Y5V		
4C arrays		
Capacitance	Last 2-digit of 12NC	0612
		25 V
10 nF	36	0.6 ±0.1
22 nF	41	
47 nF	45	
100 nF	49	
Tape width		

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





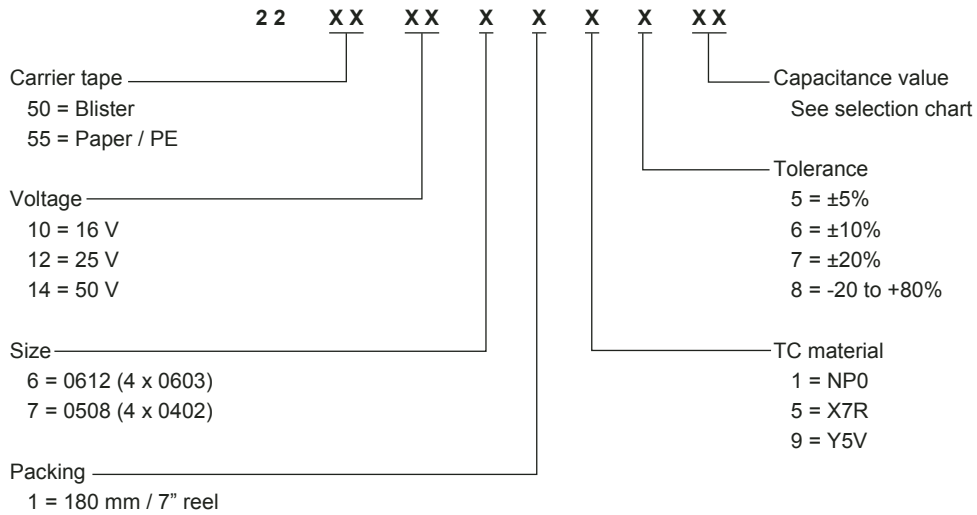
MLCC Selection Charts

NPO / X7R / Y5V - 4C Arrays, 0508 / 0612

Global part number - Preferred type

Global Part Number is the preferred clear text code for ordering Yageo and Phycomp branded products. For details, please see page 77.

12NC ordering code - Phycomp branded products only



Phycomp CTC ordering code - North America

Regional code for ordering Phycomp branded products. For details, please see page 78.

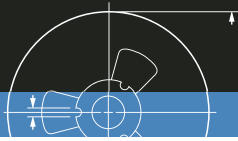


0201 sample kits					
NP0 50 V		NP0 25 V		X7R 50 V	
Capacitance (pF)	Tolerance	Capacitance (pF)	Tolerance	Capacitance (pF)	Tolerance
1	±0.25 pF	27	±5%	47	±10%
1.2	±0.25 pF	33	±5%	68	±10%
1.5	±0.25 pF	39	±5%	100	±10%
1.8	±0.25 pF	47	±5%	150	±10%
2.2	±0.25 pF	56	±5%	220	±10%
2.7	±0.25 pF	68	±5%	330	±10%
3.3	±0.25 pF	82	±5%	470	±10%
3.9	±0.25 pF	100	±5%	X7R 25 V	
4.7	±0.25 pF	Y5V 6.3V		Capacitance (pF)	Tolerance
5.6	±0.50 pF	Capacitance (pF)	Tolerance	680	±10%
6.8	±0.50 pF	100 000	-20% to +80%	1 000	±10%
8.2	±0.50 pF	X5R 6.3V		X7R 16V	
10	±5%	Capacitance (pF)	Tolerance	Capacitance (pF)	Tolerance
12	±5%	100 000	±10%	1 500	±10%
15	±5%			2 200	±10%
18	±5%			3 300	±10%
22	±5%			X7R 10 V	
				Capacitance (pF)	Tolerance
				10 000	±10%

Note: 100 pieces per value. Ordering code 432204407111 for Phycomp brand product, CC02010000000000 for Yageo brand product

0402 sample kits					
NP0 50 V		Y5V 16 V		X7R 50 V	
Capacitance (pF)	Tolerance	Capacitance (pF)	Tolerance	Capacitance (pF)	Tolerance
0.47	±0.25 pF	10 000	±20%	100	±10%
0.68	±0.25 pF	22 000	±20%	150	±10%
1	±0.25 pF	47 000	±20%	220	±10%
1.5	±0.25 pF	100 000	±20%	330	±10%
2.2	±0.25 pF	X5R 25V		470	±10%
3.3	±0.25 pF	Capacitance (pF)	Tolerance	680	±10%
4.7	±0.25 pF	100 000	±10%	1 000	±10%
6.8	±0.50 pF			1 500	±10%
10	±5%			2 200	±10%
15	±5%			3 300	±10%
22	±5%			X7R 25 V	
33	±5%			Capacitance (pF)	Tolerance
47	±5%			4 700	±10%
68	±5%			100 000	±10%
100	±5%			X7R 16 V	
150	±5%			Capacitance (pF)	Tolerance
220	±5%			6 800	±10%
				10 000	±10%
				15 000	±10%
				22 000	±10%

Note: 95 pieces per value. Ordering code 432204409911 for Phycomp brand product, CC04020000000000 for Yageo brand product



MLCC Engineering Design Kits

Sample kits for 0603 / 0805

0603 sample kits							
NP0 50 V		NP0 25 V		X7R 50 V			
Capacitance (pF)	Tolerance	Capacitance (pF)	Tolerance	Capacitance (pF)	Tolerance		
0.47	±0.25 pF	1 000	±5%	100	±10%		
0.68	±0.25 pF	1 500	±5%	150	±10%		
1	±0.25 pF	Y5V 50 V		220	±10%		
1.5	±0.25 pF	Capacitance (pF)	Tolerance	330	±10%		
2.2	±0.25 pF	10 000	±20%	470	±10%		
3.3	±0.25 pF	22 000	±20%	680	±10%		
4.7	±0.25 pF	47 000	±20%	1 000	±10%		
6.8	±0.50 pF	100 000	±20%	1 500	±10%		
10	±5%	Y5V 16 V		2 200	±10%		
15	±5%	Capacitance (pF)	Tolerance	3 300	±10%		
22	±5%	220 000	±20%	4 700	±10%		
33	±5%	470 000	±20%	6 800	±10%		
47	±5%			10 000	±10%		
68	±5%			X7R 25 V			
100	±5%			Capacitance (pF)	Tolerance		
150	±5%			15 000	±10%		
220	±5%			22 000	±10%		
330	±5%			X7R 16 V			
470	±5%			Capacitance (pF)	Tolerance		
680	±5%			33 000	±10%		
				47 000	±10%		
				68 000	±10%		
		100 000	±10%				

Note: 48 pieces per value. Ordering code 432204407121 for Phycomp brand product, CC06030000000000 for Yageo brand product

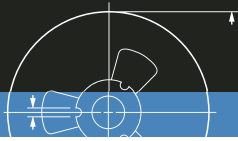
0805 sample kits							
NP0 50 V		NP0 25 V		X7R 50 V			
Capacitance (pF)	Tolerance	Capacitance (pF)	Tolerance	Capacitance (pF)	Tolerance		
0.47	±0.25 pF	3 300	±5%	220	±10%		
0.68	±0.25 pF	4 700	±5%	330	±10%		
1	±0.25 pF	Y5V 50 V		470	±10%		
1.5	±0.25 pF	Capacitance (pF)	Tolerance	680	±10%		
2.2	±0.25 pF	10 000	±20%	1 000	±10%		
3.3	±0.25 pF	22 000	±20%	1 500	±10%		
4.7	±0.25 pF	47 000	±20%	2 200	±10%		
6.8	±0.50 pF	100 000	±20%	3 300	±10%		
10	±5%	220 000	±20%	4 700	±10%		
15	±5%	Y5V 16 V		6 800	±10%		
22	±5%	Capacitance (pF)	Tolerance	10 000	±10%		
33	±5%	470 000	±20%	15 000	±10%		
47	±5%	1 000 000	±20%	22 000	±10%		
68	±5%			33 000	±10%		
100	±5%			47 000	±10%		
150	±5%			68 000	±10%		
220	±5%			100 000	±10%		
330	±5%			X7R 16 V			
470	±5%			Capacitance (pF)	Tolerance		
680	±5%			150 000	±10%		
1 000	±5%			220 000	±10%		
1 500	±5%			330 000	±10%		
2 200	±5%			470 000	±10%		

Note: 48 pieces per value. Ordering code 432204407131 for Phycomp brand product, CC08050000000000 for Yageo brand product



1206 sample kits					
NP0 50 V		NP0 25 V		X7R 50 V	
Capacitance (pF)	Tolerance	Capacitance (pF)	Tolerance	Capacitance (pF)	Tolerance
1	±0.25 pF	10 000	±5%	220	±10%
1.5	±0.25 pF	Y5V 50 V		330	±10%
2.2	±0.25 pF	Capacitance (pF)	Tolerance	470	±10%
3.3	±0.25 pF	100 000	±20%	680	±10%
4.7	±0.25 pF	220 000	±20%	1 000	±10%
6.8	±0.50 pF	470 000	±20%	1 500	±10%
10	±5%	1 000 000	±20%	2 200	±10%
15	±5%			3 300	±10%
22	±5%			4 700	±10%
33	±5%			6 800	±10%
47	±5%			10 000	±10%
68	±5%			15 000	±10%
100	±5%			22 000	±10%
150	±5%			33 000	±10%
220	±5%			47 000	±10%
330	±5%			68 000	±10%
470	±5%			100 000	±10%
680	±5%			150 000	±10%
1 000	±5%			220 000	±10%
1 500	±5%			X7R 16 V	
2 200	±5%			Capacitance (pF)	Tolerance
3 300	±5%			330 000	±10%
4 700	±5%			470 000	±10%
6 800	±5%			680 000	±10%
				1 000 000	±10%

Note: 48 pieces per value. Ordering code 432204407141 for Phycomp brand product, CC12060000000000 for Yageo brand product



MLCC Engineering Design Kits

Sample kits for high capacitance series

High capacitance sample kits								
X5R 0402			X7R 0603			Y5V 0402		
Capacitance	Rated voltage	Tolerance	Capacitance	Rated voltage	Tolerance	Capacitance	Rated voltage	Tolerance
1 μF	6.3 V	$\pm 10\%$	1 μF	16 V	$\pm 10\%$	1 μF	6.3 V	-20% to +80%
1 μF	10 V	$\pm 10\%$	X7R 0805			1 μF	10 V	-20% to +80%
2.2 μF	6.3 V	$\pm 20\%$	Capacitance	Rated voltage	Tolerance	Y5V 0603		
X5R 0603			1 μF	25 V	$\pm 10\%$	Capacitance	Rated voltage	Tolerance
Capacitance	Rated voltage	Tolerance	2.2 μF	16 V	$\pm 10\%$	1 μF	10 V	-20% to +80%
1 μF	16 V	$\pm 10\%$	2.2 μF	25 V	$\pm 10\%$	1 μF	16 V	-20% to +80%
1 μF	25 V	$\pm 10\%$	X7R 1206			2.2 μF	10 V	-20% to +80%
2.2 μF	6.3 V	$\pm 10\%$	Capacitance	Rated voltage	Tolerance	2.2 μF	16 V	-20% to +80%
2.2 μF	10 V	$\pm 10\%$	1 μF	25 V	$\pm 10\%$	4.7 μF	6.3 V	-20% to +80%
2.2 μF	16 V	$\pm 10\%$	2.2 μF	25 V	$\pm 10\%$	Y5V 0805		
4.7 μF	6.3 V	$\pm 10\%$	4.7 μF	25 V	$\pm 10\%$	Capacitance	Rated voltage	Tolerance
4.7 μF	10 V	$\pm 10\%$	10 μF	16 V	$\pm 10\%$	1 μF	16 V	-20% to +80%
10 μF	6.3 V	$\pm 20\%$				1 μF	25 V	-20% to +80%
X5R 0805						1 μF	50 V	-20% to +80%
Capacitance	Rated voltage	Tolerance				2.2 μF	16 V	-20% to +80%
2.2 μF	25 V	$\pm 10\%$				4.7 μF	10 V	-20% to +80%
4.7 μF	6.3 V	$\pm 10\%$				10 μF	10 V	-20% to +80%
4.7 μF	10 V	$\pm 10\%$				Y5V 1206		
4.7 μF	16 V	$\pm 10\%$				Capacitance	Rated voltage	Tolerance
10 μF	6.3 V	$\pm 10\%$				4.7 μF	16 V	-20% to +80%
10 μF	10 V	$\pm 10\%$				10 μF	10 V	-20% to +80%
10 μF	16 V	$\pm 10\%$				10 μF	16 V	-20% to +80%
22 μF	6.3 V	$\pm 20\%$	22 μF	16 V	-20% to +80%			
X5R 1206								
Capacitance	Rated voltage	Tolerance						
4.7 μF	16 V	$\pm 10\%$						
4.7 μF	25 V	$\pm 10\%$						
10 μF	16 V	$\pm 10\%$						
10 μF	25 V	$\pm 10\%$						
22 μF	6.3 V	$\pm 20\%$						

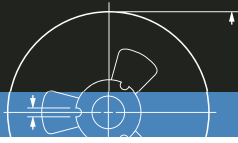
Note: 50 pieces per value. Ordering code 432204510001 for Phycomp brand product, CC88880000000000 for Yageo brand product



High voltage sample kits for PCs segment					
NP0 1808			NP0 1812		
Capacitance	Rated voltage	Tolerance	Capacitance	Rated voltage	Tolerance
10 pF	3 kV	±5%	10 pF	3 kV	±5%
15 pF	3 kV	±5%	15 pF	3 kV	±5%
22 pF	3 kV	±5%	22 pF	3 kV	±5%
33 pF	3 kV	±5%	33 pF	3 kV	±5%
47 pF	3 kV	±5%	47 pF	3 kV	±5%
68 pF	3 kV	±5%	68 pF	3 kV	±5%
100 pF	3 kV	±5%	100 pF	3 kV	±5%
150 pF	3 kV	±5%	150 pF	3 kV	±5%
220 pF	3 kV	±5%	220 pF	3 kV	±5%
X7R 1808			330 pF	3 kV	±5%
Capacitance	Rated voltage	Tolerance	470 pF	3 kV	±5%
470 pF	3 kV	±10%	X7R 1206		
680 pF	3 kV	±10%	Capacitance	Rated voltage	Tolerance
1 nF	3 kV	±10%	1 nF	2 kV	±10%
1.5 nF	3 kV	±10%	1.5 nF	2 kV	±10%
470 pF	2 kV	±10%			
680 pF	2 kV	±10%			
1 nF	2 kV	±10%			
1.5 nF	2 kV	±10%			

Note: 50 pieces per value. Ordering code 432204510011 for Phycomp brand product, HV99990000000000 for Yageo brand product





MLCC Engineering Design Kits

High voltage sample kits for inverter segment

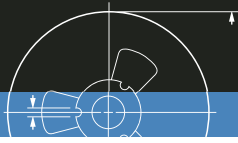
High voltage sample kits for inverter segment		
NPO 1808		
Capacitance	Rated voltage	Tolerance
10 pF	3 kV	±5%
12 pF	3 kV	±5%
15 pF	3 kV	±5%
18 pF	3 kV	±5%
22 pF	3 kV	±5%
27 pF	3 kV	±5%
33 pF	3 kV	±5%
39 pF	3 kV	±5%
47 pF	3 kV	±5%
56 pF	3 kV	±5%
68 pF	3 kV	±5%
82 pF	3 kV	±5%
100 pF	3 kV	±5%
120 pF	3 kV	±5%
150 pF	3 kV	±5%
220 pF	3 kV	±5%

Note: 50 pieces per value. Ordering code 432204510012 for Phycomp brand product, HV88880000000000 for Yageo brand product



High voltage sample kits for general applications					
NP0 1206			X7R 1206		
Capacitance	Rated voltage	Tolerance	Capacitance	Rated voltage	Tolerance
10 pF	1 kV	±5%	10 nF	1 kV	±10%
100 pF	1 kV	±5%	1 nF	2 kV	±10%
1 nF	1 kV	±5%	1 nF	1 kV	±10%
10 pF	2 kV	±5%	X7R 1210		
100 pF	2 kV	±5%	Capacitance	Rated voltage	Tolerance
NP0 1210			1 nF	1 kV	±10%
Capacitance	Rated voltage	Tolerance	10 nF	1 kV	±10%
10 pF	1 kV	±5%	1 nF	2 kV	±10%
100 pF	1 kV	±5%	X7R 1808		
1 nF	1 kV	±5%	Capacitance	Rated voltage	Tolerance
10 pF	2 kV	±5%	10 nF	1 kV	±10%
100 pF	2 kV	±5%	1 nF	3 kV	±10%
NP0 1808			1 nF	1 kV	±10%
Capacitance	Rated voltage	Tolerance	1 nF	2 kV	±10%
10 pF	1 kV	±5%	X7R 1812		
100 pF	1 kV	±5%	Capacitance	Rated voltage	Tolerance
1 nF	1 kV	±5%	10 nF	2 kV	±10%
10 pF	3 kV	±5%	1 nF	1 kV	±10%
100 pF	3 kV	±5%	10 nF	1 kV	±10%
10 pF	2 kV	±5%			
100 pF	2 kV	±5%			
NP0 1812					
Capacitance	Rated voltage	Tolerance			
10 pF	2 kV	±5%			
100 pF	2 kV	±5%			
1 nF	2 kV	±5%			
10 pF	1 kV	±5%			
100 pF	1 kV	±5%			
1 nF	1 kV	±5%			
10 pF	3 kV	±5%			
100 pF	3 kV	±5%			

Note: 50 pieces per value. Ordering code 432204510013 for Phycomp brand product, HV77770000000000 for Yageo brand product



MLCC Engineering Design Kits

High voltage sample kits for safety certification MLCCs

High voltage sample kits for safety certification MLCCs					
NP0 1808 TUV			X7R 1808 TUV		
Capacitance	Safety certification	Tolerance	Capacitance	Safety certification	Tolerance
10 pF	X1 / Y2	±5%	150 pF	X1 / Y2	±10%
22 pF	X1 / Y2	±5%	220 pF	X1 / Y2	±10%
47 pF	X1 / Y2	±5%	330 pF	X1 / Y2	±10%
100 pF	X1 / Y2	±5%	470 pF	X1 / Y2	±10%
150 pF	X1 / Y2	±5%	680 pF	X1 / Y2	±10%
220 pF	X1 / Y2	±5%	1 nF	X1 / Y2	±10%
330 pF	X1 / Y2	±5%	X7R 1808 UL		
NP0 1808 UL			Capacitance	Safety certification	Tolerance
Capacitance	Safety certification	Tolerance	150 pF	X1 / Y2	±10%
10 pF	X1 / Y2	±5%	220 pF	X1 / Y2	±10%
22 pF	X1 / Y2	±5%	330 pF	X1 / Y2	±10%
47 pF	X1 / Y2	±5%	470 pF	X1 / Y2	±10%
100 pF	X1 / Y2	±5%	680 pF	X1 / Y2	±10%
150 pF	X1 / Y2	±5%	1 nF	X1 / Y2	±10%
220 pF	X1 / Y2	±5%	X7R 1812 TUV		
330 pF	X1 / Y2	±5%	Capacitance	Safety certification	Tolerance
NP0 1812 TUV			220 pF	X1 / Y2	±10%
Capacitance	Safety certification	Tolerance	330 pF	X1 / Y2	±10%
10 pF	X1 / Y2	±5%	470 pF	X1 / Y2	±10%
22 pF	X1 / Y2	±5%	680 pF	X1 / Y2	±10%
47 pF	X1 / Y2	±5%	1 nF	X1 / Y2	±10%
100 pF	X1 / Y2	±5%	1.5 nF	X1 / Y2	±10%
150 pF	X1 / Y2	±5%	X7R 1812 UL		
220 pF	X1 / Y2	±5%	Capacitance	Safety certification	Tolerance
NP0 1812 UL			220 pF	X1 / Y2	±10%
Capacitance	Safety certification	Tolerance	330 pF	X1 / Y2	±10%
22 pF	X1 / Y2	±5%	470 pF	X1 / Y2	±10%
47 pF	X1 / Y2	±5%	680 pF	X1 / Y2	±10%
100 pF	X1 / Y2	±5%	1 nF	X1 / Y2	±10%
150 pF	X1 / Y2	±5%	1.5 nF	X1 / Y2	±10%
220 pF	X1 / Y2	±5%	X7R 1808 TUV		
NP0 1808 TUV			Capacitance	Safety certification	Tolerance
Capacitance	Safety certification	Tolerance	470 pF	X2 / Y3	±10%
10 pF	X2 / Y3	±5%	680 pF	X2 / Y3	±10%
22 pF	X2 / Y3	±5%	1 nF	X2 / Y3	±10%
47 pF	X2 / Y3	±5%	1.5 nF	X2 / Y3	±10%
100 pF	X2 / Y3	±5%	X7R 1808 UL		
150 pF	X2 / Y3	±5%	Capacitance	Safety certification	Tolerance
220 pF	X2 / Y3	±5%	220 pF	X2 / Y3	±10%
NP0 1808 UL			470 pF	X2 / Y3	±10%
Capacitance	Safety certification	Tolerance	1 nF	X2 / Y3	±10%
150 pF	X2 / Y3	±5%	1.5 nF	X2 / Y3	±10%

Note: 50 pieces per value. Ordering code 432204510014 for Phycomp brand product, SC99990000000000 for Yageo brand product



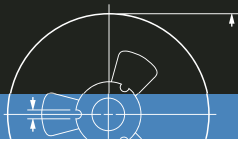
0402 high frequency sample kits		
NPO		
Capacitance	Rated voltage	Tolerance
0.22 pF	50 V	±0.1 pF
0.47 pF	50 V	±0.1 pF
0.68 pF	50 V	±0.1 pF
0.82 pF	50 V	±0.1 pF
1 pF	50 V	±0.25 pF
1.2 pF	50 V	±0.25 pF
1.5 pF	50 V	±0.25 pF
1.8 pF	50 V	±0.25 pF
2.2 pF	50 V	±0.25 pF
2.7 pF	50 V	±0.25 pF
3.3 pF	50 V	±0.25 pF
3.9 pF	50 V	±0.25 pF
4.7 pF	50 V	±0.25 pF
5.6 pF	50 V	±0.5 pF
6.8 pF	50 V	±0.5 pF
8.2 pF	50 V	±0.5 pF

Note: 50 pieces per value. Ordering code 432204409912 for Phycomp brand product, CH040200000000000 for Yageo brand product

0603 high frequency sample kits		
NPO		
Capacitance	Rated voltage	Tolerance
0.22 pF	50 V	±0.1 pF
0.47 pF	50 V	±0.1 pF
0.68 pF	50 V	±0.1 pF
0.82 pF	50 V	±0.1 pF
1 pF	50 V	±0.25 pF
1.2 pF	50 V	±0.25 pF
1.5 pF	50 V	±0.25 pF
1.8 pF	50 V	±0.25 pF
2.2 pF	50 V	±0.25 pF
2.7 pF	50 V	±0.25 pF
3.3 pF	50 V	±0.25 pF
3.9 pF	50 V	±0.25 pF
4.7 pF	50 V	±0.25 pF
5.6 pF	50 V	±0.5 pF
6.8 pF	50 V	±0.5 pF
8.2 pF	50 V	±0.5 pF

Note: 50 pieces per value. Ordering code 432204407122 for Phycomp brand product, CH060300000000000 for Yageo brand product





MLCC Engineering Design Kits

Sample kits for all sizes, all types, E1 series only

All sizes, all types, E1 series only								
General purpose & High capacitance								
0402	NP0 50 V		X7R 50 V		X7R 16 V		Y5V 16 V	
	Capacitance (pF)	Tolerance	Capacitance (pF)	Tolerance	Capacitance (pF)	Tolerance	Capacitance (pF)	Tolerance
	1	±0.25 pF	100	±10%	10 000	±10%	100 000	±20%
	10	±5%	1 000	±10%				
	100	±5%						
0603	NP0 50 V		X7R 50 V		X7R 16 V		Y5V 10 V	
	Capacitance (pF)	Tolerance	Capacitance (pF)	Tolerance	Capacitance (pF)	Tolerance	Capacitance (pF)	Tolerance
	1	±0.25 pF	100	±10%	100 000	±10%	1 000 000	-20% to +80%
	10	±5%	1 000	±10%				
	100	±5%	10 000	±10%				
0805	NP0 50 V		X7R 50 V		X7R 10 V		Y5V 10 V	
	Capacitance (pF)	Tolerance	Capacitance (pF)	Tolerance	Capacitance (pF)	Tolerance	Capacitance (pF)	Tolerance
	1	±0.25 pF	1 000	±10%	1 000 000	±10%	4 700 000	-20% to +80%
	10	±5%	10 000	±10%				
	100	±5%	100 000	±10%				
	1 000	±5%						
1206	NP0 50 V		X7R 50 V		X7R 16 V		Y5V 10 V	
	Capacitance (pF)	Tolerance	Capacitance (pF)	Tolerance	Capacitance (pF)	Tolerance	Capacitance (pF)	Tolerance
	1	±0.25 pF	1 000	±10%	1 000 000	±10%	10 000 000	-20% to +80%
	10	±5%	10 000	±10%				
	100	±5%	100 000	±10%				
	1 000	±5%						

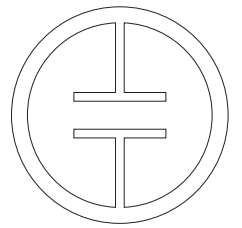
Microwave		
Size	NP0 50 V	
	Capacitance (pF)	Tolerance
0603	1	±0.25 pF
0805	3.3	±0.25 pF
1206	3.9	±0.25 pF

Array (4 x 0603)						
Size	NP0 50 V		X7R 25 V		X7R 16 V	
	Capacitance (pF)	Tolerance	Capacitance (pF)	Tolerance	Capacitance (pF)	Tolerance
0612	100	±5%	10 000	±10%	100 000	±10%
	1 000	±5%				

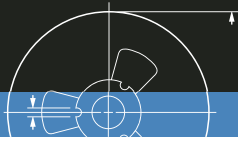
High voltage				
Size	NP0 3 kV		X7R 1 kV	
	Capacitance (pF)	Tolerance	Capacitance (pF)	Tolerance
1808	10	±5%		
1812	100	±5%	10 000	±10%

Note: 48 pieces per value (95 pieces for 0402 and 25 pieces for 1812). Ordering code 432204500581 for Phycomp brand product, CC99990000000000 for Yageo brand product





SMD CERAMIC EMI FILTER CAPACITORS
X2Y[®] PRODUCTS



X2Y[®] Product Selection Charts

SMD ceramic EMI filter capacitors X2Y[®] series

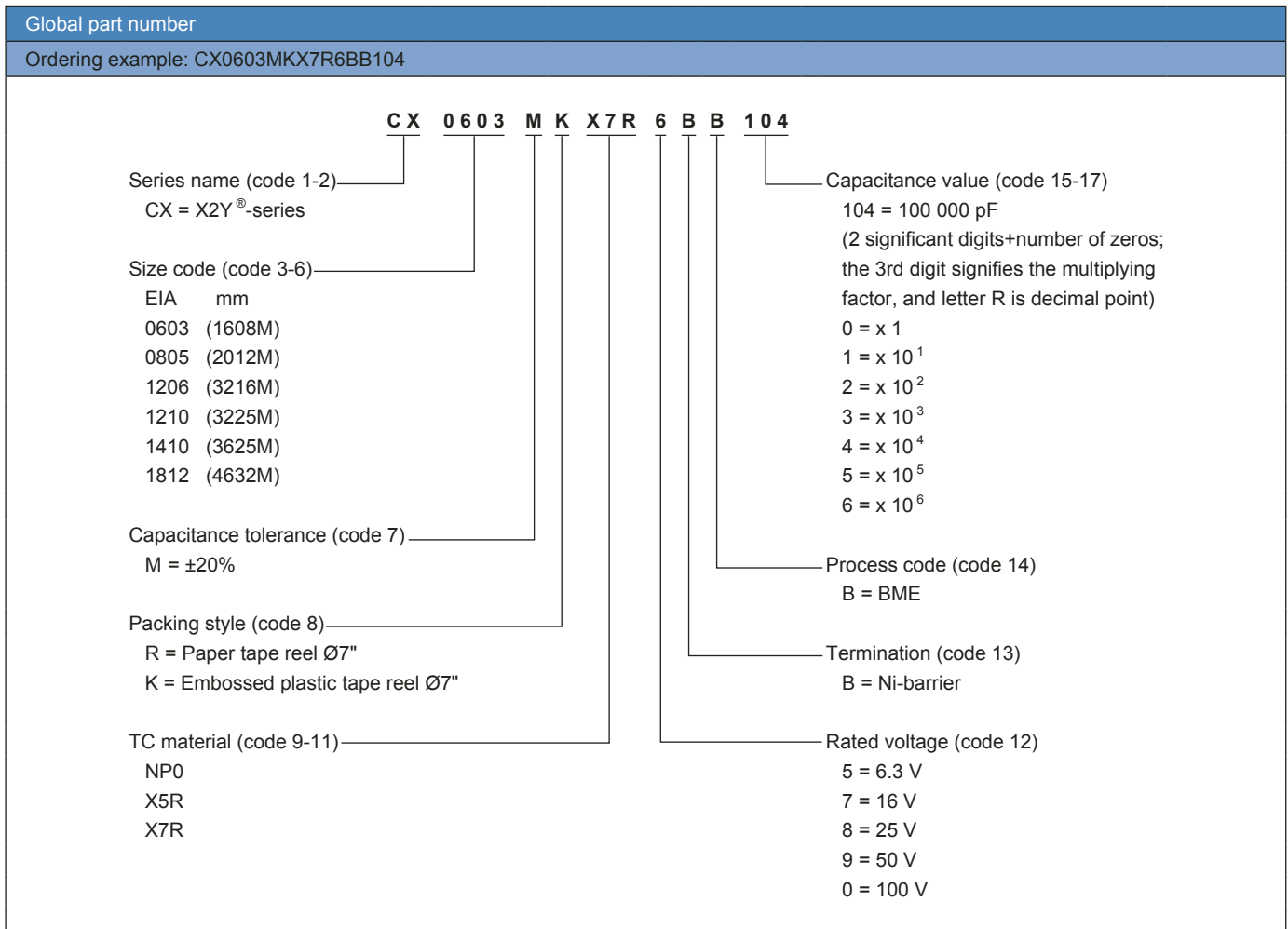
X5R						
Size	Y-Capacitor		X-Capacitor		Thickness (mm)	Global part number
	Capacitance (nF)	Voltage rating (V)	Capacitance (nF)	Voltage rating (V)		
0603	220	10	110	20	0.60	CX 0603 MR X5R 6BB 224
	330	10	165	20	0.60	CX 0603 MR X5R 6BB 334
	470	10	235	20	0.60	CX 0603 MR X5R 6BB 474

NP0						
Size	Y-Capacitor		X-Capacitor		Thickness (mm)	Global part number
	Capacitance (nF)	Voltage rating (V)	Capacitance (nF)	Voltage rating (V)		
0805	0.022	50	0.011	100	0.85	CX 0805 MR NPO 9BB 220
	0.047	50	0.023	100	0.85	CX 0805 MR NPO 9BB 470

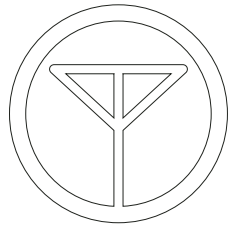
X7R						
Size	Y-Capacitor		X-Capacitor		Thickness (mm)	Global part number
	Capacitance (nF)	Voltage rating (V)	Capacitance (nF)	Voltage rating (V)		
0603	1.5	100	0.75	200	0.60	CX 0603 MR X7R 0BB 152
	2.2	100	1.1	200		CX 0603 MR X7R 0BB 222
	4.7	100	2.4	200		CX 0603 MR X7R 0BB 472
	5.6	50 / 63	2.8	100		CX 0603 MR X7R 9BB 562
	10	50 / 63	5	100		CX 0603 MR X7R 9BB 103
	22	25	11	50		CX 0603 MR X7R 8BB 223
	47	16	24	25		CX 0603 MR X7R 7BB 473
	56	16	28	25		CX 0603 MR X7R 7BB 563
	100	10	50	16		CX 0603 MR X7R 6BB 104
	0805	4.7	100	2.4		200
10		100	5	200	CX 0805 MR X7R 0BB 103	
15		50 / 63	8	100	CX 0805 MR X7R 9BB 153	
18		50 / 63	9	100	CX 0805 MR X7R 9BB 183	
22		25	11	50	CX 0805 MR X7R 8BB 223	
39		25	20	50	CX 0805 MR X7R 8BB 393	
47		16	24	25	CX 0805 MR X7R 7BB 473	
100		16	50	25	CX 0805 MR X7R 7BB 104	
180		10	90	16	CX 0805 MR X7R 6BB 184	
1206	22	100	11	200	1.20	CX 1206 MK X7R 0BB 223
	47	50 / 63	24	100		CX 1206 MK X7R 9BB 473
	100	50 / 63	50	100		CX 1206 MK X7R 9BB 104
	180	25	90	50		CX 1206 MK X7R 8BB 184
	220	16	110	25		CX 1206 MK X7R 7BB 224
	390	16	195	25		CX 1206 MK X7R 7BB 394
	470	16	235	25		CX 1206 MK X7R 7BB 474
1210	47	100	24	200	1.20	CX 1210 MK X7R 0BB 473
	100	50 / 63	50	100	1.20	CX 1210 MK X7R 9BB 104
	220	50 / 63	110	100	1.60	CX 1210 MK X7R 9BB 224
	470	25	235	50	1.60	CX 1210 MK X7R 8BB 474
	560	25	280	50	1.60	CX 1210 MK X7R 8BB 564
1410	1000	16	500	25	1.60	CX 1210 MK X7R 7BB 105
	390	50	195	100	1.30	CX 1410 MK X7R 9BB 394

Note: 1. Special values are available on request
 2. Ordering codes for preferred versions (20% tolerance, 180 mm reel). For packing and tolerance information, see section "Thickness classes and packing quantities" on next page

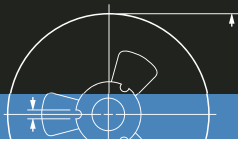




Thickness classes and packing quantities		
Thickness Classification (mm)	Quantity per reel	
	8 mm tape width	
	Ø180mm / 7"	
	Paper	Blister
0.60 ±0.10	4 000	---
0.85 ±0.10	4 000	---
1.20 ±0.15	---	2 500
1.30 ±0.20	---	2 500
1.60 ±0.15	---	2 500



HIGH FREQUENCY PRODUCTS



HF General Information

Specification overview

Function		Application	Frequency	Size* (metric-based)	Unit
Antenna	Chip antenna	Bluetooth	2.45 GHz	2012, 2516, 3012, 3216, 4018, 5010, 5320 6020, 6522, 7355, 7836, 8010, 9520	0.1 mm
				1004, 1204, 1903	mm
		WiFi	2.45 GHz, 5 GHz, 2.45 / 5 GHz	2012, 2516, 3012, 3216, 4018, 5010, 5320 6020, 6522, 7355, 7836, 8010, 9520	0.1 mm
				1004, 1204, 1903	mm
		UHF	433 MHz, 570 MHz, 870 MHz	1204, 1614, 3807	mm
		FM	88-108 MHz	1105, 2405	mm
		WiMAX	2.3-2.7 GHz, 3.3-3.9 GHz	3216, 8010	0.1 mm
		GPS	1.575 GHz	1266	mm
	3216, 5320, 6230			0.1 mm	
	DECT / WCDMA	1.8 / 2 GHz	8868	mm	
GSM	900 MHz / 1.8 GHz	2112	mm		
Patch antenna	GPS	1.575 GHz	1010, 1212, 1313, 1515, 1818, 2525	mm	
	Glonass	1.6 GHz			
	SDARS	2.3 GHz			
Filter	Band pass filter	Bluetooth	2.45 GHz	1608, 2012, 2520	0.1 mm
		WiFi	2.45 GHz, 5 GHz		0.1 mm
	Low pass filter	Bluetooth	2.45 GHz	1608, 2012	0.1 mm
		WiFi	2.45 GHz, 5 GHz		0.1 mm
		WiMAX	2.3-2.7 GHz, 3.3-3.9 GHz		0.1 mm
	Diplexer	WiFi	2.45 / 5 GHz	2012	0.1 mm
Balancer	Balun	Bluetooth	2.45 GHz	1608, 2012	0.1 mm
		WiFi	2.45 GHz, 5 GHz		
		WiMAX	2.3-2.7 GHz, 3.3-3.9 GHz		
	Balanced filter (combo)	Bluetooth	2.45 GHz	2012, 2520	0.1 mm

Note: Measurement of size code: 20 (length) 12 (width) equals to 20 (unit) 12 (unit)



GPS patch antenna (CP)								
Dimensions (mm)	Frequency range	Band width* (MHz)	Gain* (dBic/Max.)	Polarization	Axial ratio	VSWR*	Temp. range (°C)	Packing (Bulk)
12x12x2	1575±2 MHz	4	-1.5	Circular	< 3	< 2.5	-40 to 125	CAN4313422021581B
12x12x4		9	-1					CAN4313422031581B
13x13x4		6	0					CAN4313422991581B
15x15x2		5	1					CAN4313423021581B
15x15x4		8	2					CAN4313423031581B
18x18x2		5	1					CAN4313424021581B
18x18x4		10	4					CAN4313424031581B
25x25x2		10	5					CAN4313425021581B
25x25x4		20	5.5					CAN4313425031581B

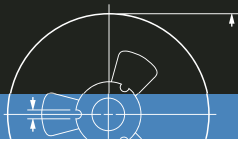
Note: " * " marks that the value depends on the Yageo demoboard

GPS patch antenna (LP)							
Dimensions (mm)	Frequency range	Band width* (MHz)	Gain* (dBi/Max.)	Polarization	VSWR*	Temp. range (°C)	Packing (Bulk)
10x4x4	1575±2 MHz	20	1.61	Linear	< 2.5	-40 to 125	CAN4311441001581K
15x10x4		8	1				CAN4313445011581B
16x06x4							CAN4313446011581B

Note: " * " marks that the value depends on the Yageo demoboard

GPS active module							
Dimensions (mm)	Frequency range	Polarization	LNA Gain* (dB/Max.)	Noise Figure* (dB/Typical)	Current Consumption (mA/Max.)	Temp. range (°C)	Packing (Bulk)
13x13x5.5	1575±2 MHz	Circular	17	1.5	5	-30 to 85	CAN4313434881581B
13x13x7.5			17	1.5	5		CAN4313434861581B
15x15x7.5			15.1	2.5	3		CAN4313434621581B
15x15x7.5			15.1	2.5	3		CAN4313435621581B
16x16x7.5			17	1.5	5		CAN4313435921581B
19x19x5.5			30	1.5	6		CAN4313437951581B
19x19x7.5			30	1.5	6		CAN4313437931581B
21x15x7.5			17	1.5	5		CAN4313435911581B
28x28x5.5			30	1.5	6		CAN4313439921581B
28x28x7.5			30	1.5	6		CAN4313439911581B

Note: " * " marks that the value depends on the Yageo demoboard



HF Product Selection Charts

Chip antenna for FM / UHF / GPS / GSM / WiMAX

FM chip antenna									
Dimensions (mm)	Frequency range*	Band width (MHz)	Gain* (dBi/Max.)	Polarization	Azimuth	VSWR*	Temp. range (°C)	Packing	
								Bulk	Tape
24x5x1.6	88-108 MHz	---	---	Linear	Omni-directional	---	-25 to 85	---	CAN4311050010882K

UHF chip antenna (433 MHz)									
Dimensions (mm)	Frequency range*	Band width (MHz)	Gain* (dBi/Max.)	Polarization	Azimuth	VSWR*	Temp. range (°C)	Packing	
								Bulk	Tape
12x4x1.5	400-500 MHz	> 20	0.5	Linear	Omni-directional	< 3.0	-40 to 125	---	CAN4311129200431K
12x4x1.6							-25 to 85	----	CAN4311029020431K
37.5x6.8x0.9	433 MHz	> 20	0.5	Linear	Omni-directional	< 3.0	-55 to 125	CAN4313121200431B	CAN4311121200431K
	460 MHz							CAN4313121200461B	CAN4311121200461K
	490 MHz							CAN4313121200491B	CAN4311121200491K

UHF chip antenna (870 MHz)									
Dimensions (mm)	Frequency range*	Band width (MHz)	Gain* (dBi/Max.)	Polarization	Azimuth	VSWR*	Temp. range (°C)	Packing	
								Bulk	Tape
12x4x1.0 (P)	800-900 MHz	> 20	0.74	Linear	Omni-directional	< 2.8	-25 to 85	---	CAN4311129100871K
12x4x1.6	800-900 MHz	> 20	0.5			< 2.0	-40 to 125	---	CAN4311129040871K
						CAN4311129050871K			
				CAN4311129060871K					
				CAN4311129070871K					
				CAN4311129080871K					
16.5x14x0.9	790-880 MHz	> 80	-0.25	< 2.5	-55 to 125	CAN4313119000871B	---		

GPS chip antenna										
Dimensions (mm)	Frequency range*	Band width (MHz)	Gain* (dBi/Max.)	Polarization	Azimuth	VSWR*	Temp. range (°C)	Packing		
								Bulk	Tape	
3.2x1.6x1.2 (P)	1.575 GHz	> 100	7.32	Linear	Omni-Directional	< 2.5	-25 to 85	---	CAN4311712151583K	
5.3x2.0x1.2 (P)			3.16			< 2.0		---	CAN4311153141582K	
6.2x3.0x1.5			55			1	< 2.0	-55 to 125	---	CAN4311113011582K
12.5x6.6x0.9			100			1.5	CAN4313114001581B	---		

DECT/WCDMA chip antenna									
Dimensions (mm)	Frequency range*	Band width (MHz)	Gain* (dBi/Max.)	Polarization	Azimuth	VSWR*	Temp. range (°C)	Packing	
								Bulk	Tape
8.8x6.8x0.9	1.88-2.1 GHz	> 100	2.0	Linear	Omni-directional	< 2.0	-55 to 125	---	CAN4311112001881K

WiMAX chip antenna									
Dimensions (mm)	Frequency range*	Band width (MHz)	Gain* (dBi/Max.)	Polarization	Azimuth	VSWR*	Temp. range (°C)	Packing	
								Bulk	Tape
3.2x1.6x1.3	3.3-3.9 GHz	> 100	2.8	Linear	Omni-directional	< 2.0	-25 to 85	---	CAN4311712063503K
10x0.6x1.2	2.3-2.7 GHz		2.0			< 3.0		---	CAN4311861002371K

Note: * * * marks that the value depends on the Yageo demoboard
 " (P) " represents PIFA mode antenna



HF Product Selection Charts

Chip antenna for Dual-band / Triple-band

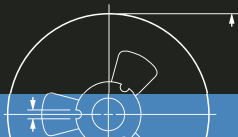
Dual-band WiFi chip antenna									
Dimensions (mm)	Frequency range*	Band width (MHz)	Gain* (dBi/Max.)	Polarization	Azimuth	VSWR*	Temp. range (°C)	Packing	
								Bulk	Tape
8.7x8.0x0.9	2.45 / 5.2 GHz	> 100	3.5 / 1.5	Linear	Omni-directional	< 2.5	-55 to 125	---	CAN4311117002521K

Dual-band chip antenna (900/1800 MHz)									
Dimensions (mm)	Frequency range*	Band width (MHz)	Gain* (dBi/Max.)	Polarization	Azimuth	VSWR*	Temp. range (°C)	Packing	
								Bulk	Tape
12x4.4x1.2	880-960 MHz	> 20	0.5 -1	Linear	Omni-directional	< 3.0	-40 to 125	---	CAN4311116719181K
	1710-1880 MHz	> 170							
21x12x0.9	880-960 MHz	> 30	0.5 -1			< 2.7	-25 to 85	CAN4313118009181B	---
	1710-1880 MHz	> 170							

Triple-band metal antenna (900/1800/1900MHz with cable / connector)									
Dimensions (mm)	Frequency range*	Band width (MHz)	Gain* (dBi/Max.)	Polarization	Azimuth	VSWR*	Temp. range (°C)	Packing	
								Bulk	Tape
35x6x0.4	880-960 MHz	> 80	0.5-1.5	Linear	Omni-directional	< 3.5	-40 to 85	CAN4313330009191B	---
	1850-1990 MHz	> 170	1.5-2.5						

Note: " * " marks that the value depends on the Yageo demoboard





HF Product Selection Charts

Chip antenna for Bluetooth / WiFi

Bluetooth / WiFi antenna								
Dimensions (mm)	Frequency range	Band width* (MHz)	Gain* (dBi/Max.)	Polarization	Azimuth	VSWR*	Temp. range (°C)	Packing (Tape)
2.0x1.2x1.1	2.45 GHz	< 200	2.75	Linear	Omni-directional	< 2.8	-55 to 125	CAN4311714002454K
3.2x1.6x1.2	2.20 GHz		5				-25 to 85	CAN4311712022453K
	2.30 GHz							CAN4311712032453K
	2.40 GHz							CAN4311712042453K
	2.45 GHz							CAN4311712002453K
	2.50 GHz							CAN4311712052453K
	2.60 GHz							CAN4311712062453K
	2.70 GHz							CAN4311712072453K
	2.80 GHz							CAN4311712082453K
2.90 GHz	CAN4311712092453K							
3.2x1.6x1.2 (P)	2.45 GHz		3.48				-25 to 85	CAN4311712112453K
4.0x1.8x1.2			2.97				-55 to 125	CAN4311840052452K
5.0x1.0x1.0	2.30 GHz		2.28				-25 to 85	CAN4311851032453K
	2.40 GHz							CAN4311851042453K
	2.80 GHz							CAN4311851052453K
	3.10 GHz							CAN4311851062453K
	3.30 GHz							CAN4311851072453K
	3.70 GHz							CAN4311851082453K
5.3x2.0x1.3	2.00 GHz		4.1				-25 to 85	CAN4311153002001K
	2.10 GHz							CAN4311153002101K
	2.20 GHz	CAN4311153002201K						
	2.30 GHz	CAN4311153002301K						
	2.40 GHz	CAN4311153002401K						
	2.45 GHz	CAN4311153002451K						
2.50 GHz	CAN4311153002501K							
5.3x2.0x1.2 (P)	2.45 GHz	2.84		CAN4311153232452K				

Note: " * " marks that the value depends on the Yageo demoboard
 " (P) " represents PIFA mode antenna

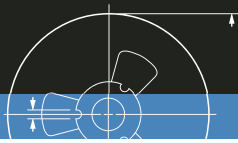


HF Product Selection Charts

Chip antenna for Bluetooth / WiFi

Bluetooth / WiFi chip antenna								
Dimensions (mm)	Frequency range*	Band width (MHz)	Gain* (dBi/Max.)	Polarization	Azimuth	VSWR*	Temp. range (°C)	Packing (Tape)
6.0x2.0x1.0	2.45 GHz	> 200	5.1	Linear	Omni-directional	< 2.8	-25 to 85	CAN4311860052452K
6.5x2.2x1.0			5.57					CAN4311865052452K
7.3x5.5x1.3	2.45 GHz		1.2				-55 to 125	CAN4311111002451K
	2.60 GHz							CAN4311111002601K
	2.70 GHz							CAN4311111002701K
	2.80 GHz							CAN4311111002801K
2.90 GHz	CAN4311111002901K							
7.8x3.6x0.9	2.45 GHz							4.1
	2.60 GHz		CAN4311115002601K					
	2.70 GHz		CAN4311115002701K					
8.0x1.0x1.0	2.10 GHz	3	-25 to 85	CAN4311881012453K				
	2.20 GHz			CAN4311881022453K				
	2.30 GHz			CAN4311881032453K				
	2.45 GHz			CAN4311881042453K				
	2.50 GHz			CAN4311881052453K				
	2.60 GHz			CAN4311881062453K				
	2.70 GHz			CAN4311881072453K				
	2.80 GHz			CAN4311881082453K				
9.5x2.0x1.1	2.70 GHz	2.85	-55 to 125	CAN4311895052452K				
	2.94 GHz			CAN4311895062452K				
	2.79 GHz			CAN4311895072452K				
12x4.0x2.0 (P)	2.45 GHz		6.66			< 2.0	-25 to 85	CAN4311029012451K
19x3.0x3.6 (P)			2.5				-40 to 85	CAN4311093012451K

Note: "*" is the symbol mark that value depends on the Yageo demoboard
 "(P)" represent of PIFA mode antenna



HF Product Selection Charts

Band pass filter and Low pass filter

Band pass filter								
Dimensions (mm)	Frequency range*	Pass band (MHz)	Impedance	Insertion loss	Ripple	VSWR*	Attenuation (Min.)	Packing (Tape)
1.6x0.8x0.65	2.45 GHz	2400-2500	50 ohm	2.4 dB	0.5 dB	< 2.0	30 dB @ 880-960 MHz	CFL4111515012454K
							20 dB @ 1710-1990 MHz	
							8.5 dB @ 2170 MHz	
							30 dB @ 4800-5000 MHz	
							25 dB @ 7200-7500 MHz	
2.0x1.25x1.0	2.45 GHz	2400-2500	50 ohm	2.0 dB	0.6 dB	< 2.0	40 dB @ 1000-1600 MHz	CFL4111714032454K
							40 dB @ 4900 MHz	
							20 dB @ 7500 MHz	
2.0x1.25x0.85	2.45 GHz	2400-2500	50 ohm	1.8 dB	0.5 dB	< 2.0	30 dB @ 880-960 MHz	CFL4111714062454K
							30 dB @ 1710-1990 MHz	
							25 dB @ 4800-5000 MHz	
							30 dB @ 7200-7500 MHz	
2.0x1.25x0.8	5 GHz	5150-5850	50 ohm	1.8 dB	0.5 dB	< 2.0	30 dB @ 2400-2500 MHz	CFL4111714055004K
							20 dB @ 4700 MHz	
2.5x2.0x0.95	2.45 GHz	2400-2500	50 ohm	2.5 dB	0.6 dB	< 2.0	40 dB @ 880-960 MHz	CFL4111713022453K
							30 dB @ 2100 MHz	
							30 dB @ 4800-5000 MHz	
							30 dB @ 7200-7500 MHz	
							40 dB @ 880-960 MHz	
				1.5 dB	30 dB @ 1710-1785 MHz		CFL4111713032453K	
					30 dB @ 1850-1910 MHz			
					20 dB @ 4800-5000 MHz			
					20 dB @ 7200-7500 MHz			
					30 dB @ 1600 MHz			
2.2 dB	35 dB @ 3200 MHz	CFL4111713182453K						
	25 dB @ 4800-5000 MHz							
	30 dB @ 7200-7500 MHz							
	30 dB @ 7200-7500 MHz							

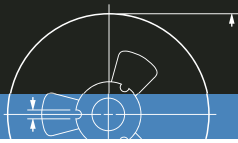
Note: " * " marks that the value depends on the Yageo demoboard

Low pass filter								
Dimensions (mm)	Frequency range*	Pass Band (MHz)	Impedance	Insertion loss	Ripple	VSWR*	Attenuation (Min.)	Packing (Tape)
1.6x0.8x0.65	2.45 GHz	2400-2500	50 ohm	0.45 dB	0.6 dB	< 1.5	25 dB @ 5000 MHz	CFL4111715502454K
							18 dB @ 7500 MHz	
2.0x1.25x0.85	2.45 GHz	2400-2500	50 ohm	0.5 dB	0.6 dB	< 1.8	27 dB @ 5000 MHz	CFL4111714502454K
							25 dB @ 7500 MHz	
	3.5 GHz	3000-4000				< 2.0	25 dB @ 10,000 MHz	CFL4111714503504K
							35 dB @ 6800 MHz	
							30 dB @ 11,000 MHz (Ref.)	

Note: " * " marks that the value depends on the Yageo demoboard



Diplexer						
Dimensions (mm)	Frequency range	Pass band (MHz)	Insertion loss	VSWR	Attenuation (Min.)	Packing (Tape)
2.0x1.25x0.75	2.4 / 5 GHz	2400-2500	< 0.7 dB	< 2.0	17 dB @ 4800-6000 MHz	CFL4111714822504K
		4900-5900	< 1.6 dB		20 dB @ 7200-7500 MHz	
17 dB @ 1800-2500 MHz						
		20 dB @ 10300-10700 MHz (Ref.)				
2.0x1.25x0.85		2400-2500	< 0.65 dB		20 dB @ 4800-6000 MHz	CFL4111714832504K
		4900-5900	< 1.1 dB		20 dB @ 7200-7500 MHz	
					15 dB @ 1800-2400 MHz	
2.0x1.25x0.85		2400-2500	< 0.7 dB		20 dB @ 2400-2500 MHz	CFL4111714852504K
		4900-5900	< 0.9 dB		20 dB @ 4900-5900 MHz	
		2400-2500	< 0.6 dB		20 dB @ 2400-2500 MHz	CFL4111714862504K
	4900-5900	< 0.9 dB	25 dB @ 2400-2500 MHz			
2.0x1.25x0.9	2400-2500	< 0.5 dB	20 dB @ 4800-6000 MHz	CFL4111714882504K		
	4900-5900	< 0.9 dB	20 dB @ 7200-7500 MHz			
			25 dB @ 1800-2500 MHz			
		25 dB @ 9800-11800 MHz (Ref.)				



HF Product Selection Charts

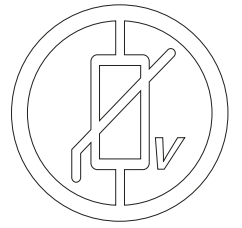
Balun and Balanced filter

Balun									
Dimensions (mm)	Frequency range*	Pass band (MHz)	Impedance	Insertion loss	Ripple	VSWR*	Amplitude balance	Phase differential	Packing (Tape)
2.0x1.25x0.80	2.45 GHz	2400-2500	50/50 ohm	< 1.0 dB	0.6 dB	< 2.0	2.0 dB	180°±10°	CBA4711714002454K
			50/100 ohm						CBA4711714012454K
			50/200 ohm						CBA4711714022454K
	5 GHz	4900-5900	50/100 ohm	< 1.2 dB	0.6 dB		2.0 dB		CBA4711714015004K

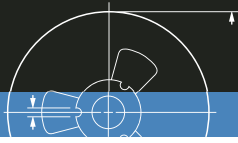
Note: " * " marks that the value depends on the Yageo demoboard

Balanced filter (combo)													
Dimensions (mm)	Frequency range*	Pass band (MHz)	Unbalanced impedance	Balanced impedance	Insertion loss	Amplitude balance	Phase differential	Attenuation (MHz/Min.)	Packing (Tape)				
2.0x1.2x0.9	2.45 GHz	2400-2500	50 ohm	Conjugate match to CSR BC03/04/05 series	< 3.5 dB	< 1.0 dB	180°±10°	40 dB @ 880-960	CBA4711714982454K				
								25 dB @ 1300-1600					
								35 dB @ 4800-5000					
								30 dB @ 7200-7500					
								40 dB @ 880-960	CBA4711714672454K				
							25 dB @ 1300-1600						
							30 dB @ 4800-5000						
							25 dB @ 7200-7500						
2.0x1.2x0.8	2.45 GHz	2400-2500	50 ohm	Conjugate match to CSR BC03/04/05 series	< 3.5 dB	< 1.3 dB	180°±13°	40 dB @ 880-960	CBA4711814572454K				
								25 dB @ 1300-1600					
								35 dB @ 4800-5000					
								25 dB @ 7200-7500					
												40 dB @ 880-960	CBA4711814472454K
											25 dB @ 1300-1600		
											30 dB @ 4800-5000		
											25 dB @ 7200-7500		
												35 dB @ 880-960	CBA4711514372454K
											30 dB @ 1710-1880		
							20 dB @ 1880-1990						
							30 dB @ 4800-5000						
								35 dB @ 880-960	CBA4711514312454K				
							30 dB @ 1710-1880						
							20 dB @ 1880-1990						
							30 dB @ 4800-5000						
2.5x2.0x1.2	2.45 GHz	2400-2500	50 ohm	Conjugate match to CSR BC02/03 series	< 3.5 dB	< 1.0 dB	180°±5°	48 dB @ 880-960	CBA4711713932453K				
								48 dB @ 1710-1880					
								40 dB @ 1880-1990					
								20 dB @ 2110-2170					
								20 dB @ 4800-5000					
								20 dB @ 7200-7500					





MULTILAYER CHIP VARISTORS



MLV Product Selection Charts

Case dimensions and specification for 0402

Case dimensions		Dimensions in mm						
	Case size designation	L ₁	W	T _{min}	T _{max}	L ₂ / L _{3 min}	L ₂ / L _{3 max}	L _{4 min}
	Inch-based							
	0402	1.0 ±0.10	0.5 ±0.10	0.45	0.55	0.15	0.30	0.40
	0603	1.6 ±0.20	0.8 ±0.10	0.70	0.90	0.20	0.60	0.40
	0805	2.0 ±0.10	1.25 ±0.10	0.70	0.90	0.25	0.75	0.55
	1206	3.2 ±0.15	1.6 ±0.15	0.70	0.90	0.25	0.75	1.40

Size 0402								
Global Part Number	Varistor voltage/ Breakdown voltage	Max. continuous voltage/ Working voltage	Clamping voltage	Peak current	Leakage current / R.T. (15 to 35 °C)		Capacitance @ 1 V (rms)	
	DC @ 1 mA	DC	8/20 μs @ 1A	8/20 μs	Voltage	Current	(pF)	
	(V)	(V / Max.)	(V / Max.)	(A / Max.)	(V)	(μA)	1 KHz	1 MHz
VRS0402SR55R220N	10 to 14	5.5	22	2	3	3	22	12
VRS0402SR55R330N	10 to 14	5.5	22	4		3	33	20
VRS0402SR55R500N	10 to 14	5.5	22	6		3	50	30
VRS0402SR55R101N	10 to 14	5.5	22	10		3	100	60
VRS0402MR55R101N	7.2 to 10.8	5.5	15	10		3	100	60
VRS0402MR55R201N	7.2 to 10.8	5.5	15	15		3	200	130
VRS0402MR55R361N	7.2 to 10.8	5.5	15	20		3	360	220
VRS0402MR55R481N	7.2 to 10.8	5.5	15	20		3	480	290
VRS0402MR55R651N	7.2 to 10.8	5.5	14	30		3	650	390
VRS0402KR090500N	10.8 to 13.2	9	22	6		3	50	30
VRS0402LR090201N	10.2 to 13.8	9	22	15		3	200	120
VRS0402SR140500N	18 to 24	14	38	7		3	50	30
VRS0402SR140101N	18 to 24	14	38	15		3	100	60
VRS0402SR140121N	18 to 24	14	38	15		3	120	72
VRS0402MR140161N	14.4 to 21.6	14	35	20		3	160	96
VRS0402KR140161N	16.2 to 19.8	14	33	20		3	160	96
VRS0402LR140251N	15.3 to 20.7	14	33	20		3	250	150
VRS0402SR180010N	90 to 135	18	250	1		0.3	---	1
VRS0402SR180030N	50 to 80	18	130	1		0.3	3	2
VRS0402SR180050N	50 to 80	18	130	2		0.3	5	3
VRS0402SR180100N	24 to 32	18	50	3		0.3	10	5.5
VRS0402SR180150N	24 to 32	18	50	3		0.3	15	9
VRS0402SR180270N	24 to 32	18	50	4		0.3	27	15
VRS0402SR180400N	24 to 32	18	50	4		0.3	40	22
VRS0402SR180500N	24 to 32	18	50	4		0.3	50	30
VRS0402KR180820N	21.6 to 26.4	18	45	10		0.3	82	50
VRS0402SR180121N	24 to 32	18	50	15	0.3	120	72	



MLV Product Selection Charts

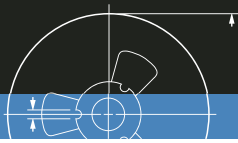
Specification for 0603 to 1206

Size 0603								
Global Part Number	Varistor voltage/ Breakdown voltage	Max. continuous voltage/ Working voltage	Clamping voltage	Peak current	Leakage current / R.T. (15 to 35 °C)		Capacitance @ 1 V (rms)	
	DC @ 1 mA	DC	8/20 μ s @ 1A	8/20 μ s	Voltage	Current	(pF)	
	(V)	(V / Max.)	(V / Max.)	(A / Max.)	(V)	(μ A)	1 KHz	1 MHz
VRS0603MR33R152N	5 to 7	3.3	12	30	3	5	1500	900
VRS0603SR55R181N	10 to 14	5.5	20	20	3	3	180	100
VRS0603MR55R301N	7.2 to 10.8	5.5	15	30	3	3	300	180
VRS0603MR55R361N	7.2 to 10.8	5.5	15	30	3	3	360	180
VRS0603SR55R471N	10 to 14	5.5	19	30	3	3	470	280
VRS0603MR55R681N	7.2 to 10.8	5.5	15	30	3	3	680	410
VRS0603MR55R751N	7.2 to 10.8	5.5	15	30	3	3	750	450
VRS0603MR55R901N	7.2 to 10.8	5.5	15	30	3	3	900	540
VRS0603SR090090N	18 to 24	9	36	3	3	3	9	5.5
VRS0603LR140361N	15.3 to 20.7	14	33	30	3	3	360	216
VRS0603SR180030N	50 to 80	18	130	1	3	0.3	3	2
VRS0603SR180050N	50 to 80	18	130	2	3	0.3	5	3
VRS0603SR180100N	24 to 32	18	50	5	3	0.3	10	6
VRS0603SR180150N	24 to 32	18	50	3	3	0.3	15	10
VRS0603SR180121N	24 to 32	18	50	20	3	0.3	120	72
VRS0603KR180151N	21.6 to 26.4	18	44	20	3	0.3	150	90
VRS0603KR180301N	21.6 to 26.4	18	44	20	3	0.3	300	180
VRS0603KR220241N	24.3 to 29.7	22	46	20	3	0.3	240	144
VRS0603KR260251N	29.7 to 36.3	26	58	20	3	0.3	250	160
VRS0603KR300121N	35.1 to 42.9	30	70	20	3	0.3	120	72
VRS0603KR310161N	35.1 to 42.9	31	70	20	3	0.3	160	96
VRS0603KR380101N	42.3 to 51.7	38	85	15	3	0.3	100	60
VRS0603KR450800N	50.4 to 61.6	45	100	10	3	0.3	80	48
VRS0603SR111300N	130 to 160	110	300	5	3	0.3	30	18

Size 0805								
Global Part Number	Varistor voltage/ Breakdown voltage	Max. continuous voltage/ Working voltage	Clamping voltage	Peak current	Leakage current / R.T. (15 to 35 °C)		Capacitance @ 1 V (rms)	
	DC @ 1 mA	DC	8/20 μ s @ 1A	8/20 μ s	Voltage	Current	(pF)	
	(V)	(V / Max.)	(V / Max.)	(A / Max.)	(V)	(μ A)	1 KHz	1 MHz
VRS0805MR55R112N	7.2 to 10.8	5.5	18	40	1	35	1100	660
VRS0805MR55R302N	7.2 to 10.8	5.5	17.5	120		35	3000	1800
VRS0805MR55R701N	7.2 to 10.8	5.5	17	30		10	700	420
VRS0805LR120551N	13.6 to 18.4	12	27	40		25	550	330
VRS0805KR140601N	16.2 to 19.8	14	29	40		15	600	360
VRS0805KR180551N	21.6 to 26.4	18	42	100		10	550	330
VRS0805SR300161N	37.0 to 46.0	30	72	30		10	160	96
VRS0805KR380201N	42.3 to 51.7	38	77	80		10	200	120

Size 1206								
Global Part Number	Varistor voltage/ Breakdown voltage	Max. continuous voltage/ Working voltage	Clamping voltage	Peak current	Leakage current / R.T. (15 to 35 °C)		Capacitance @ 1 V (rms)	
	DC @ 1 mA	DC	8/20 μ s @ 1A	8/20 μ s	Voltage	Current	(pF)	
	(V)	(V / Max.)	(V / Max.)	(A / Max.)	(V)	(μ A)	1 KHz	1 MHz
VRS1206MR180901N	19.2 to 28.8	18	50	150	3	0.3	900	540
VRS1206KR380501N	42.3 to 51.7	38	77	180	3	0.3	500	300
VRS1206SR420112N	46 to 60	42	92	180	3	0.3	1100	660





MLV Product Selection Charts

Ordering information for 0402 to 1206

Global part number

Ordering example: VRS0402KR55R680N

<p>Series name (code 1-2) ————</p> <p>VR = Varistor</p> <p>Chip type (code 3) ————</p> <p>S = Single chip</p> <p>Size code (code 4-7) ————</p> <p>0402 0603 0805 1206</p> <p>Varistor voltage tolerance (code 8) ————</p> <p>K = ±10% L = ±15% M = ±20 % S = Special range</p> <p>Packing style (code 9) ————</p> <p>R = paper tape reel Ø7 inch</p>	<p>VR S 0402 K R 55R 680 N</p>	<p>Process code (code 16)</p> <p>N = Normal</p> <p>Capacitance value (code 13-15)</p> <p>680 = 68 pF (2 significant digits+number of zeros; the 3rd digit signifies the multiplying factor, and letter R is decimal point)</p> <p>0 = x 1 1 = x 10¹</p> <p>Working voltage (code 10-12)</p> <p>33R = 3.3 V 55R = 5.5 V 090 = 9 V 110 = 11 V 120 = 12 V 140 = 14 V 150 = 15 V 160 = 16 V 180 = 18 V 220 = 22 V 260 = 26 V 300 = 30 V 310 = 31 V 380 = 38 V 420 = 42 V 450 = 45 V 560 = 56 V 680 = 68 V 111 = 110 V</p>
--	---------------------------------------	--

Thickness classification and packing quantities		
Type	Thickness classification (mm)	8 mm tape width per reel
		180 mm / 7"
		Paper
0402	0.50 ±0.05	10 000
0603	0.80 ±0.10	4 000
0805	0.80 ±0.10	4 000
1206	0.80 ±0.10	4 000



YAGEO - A GLOBAL COMPANY

ASIA

Beijing, China Tel. +86 10 851 20810 Fax. +86 10 851 20200	Dongguan, China Tel. +86 769 8772 0275 Fax. +86 769 8791 0053	Hong Kong, China Tel. +852 2342 6833 Fax. +852 2342 6588	Mudu, China Tel. +86 512 6651 8889 Fax. +86 512 6651 9889
Qingdao, China Tel. +86 157 2525 4907 Fax. +86 512 6825 5568 x 2688	Suzhou, China Tel. +86 512 6825 5568 Fax. +86 512 6825 5386	Wuhan, China Tel. +86 27 5983 8939 Fax. +86 27 5983 8939	Saitama, Japan Tel. +81 48 795 8953 Fax. +81 48 795 8954
Kyunggi-Do, Korea Tel. +82 31 712 4797 Fax. +82 31 712 5866	Kuala Lumpur, Malaysia Tel. +60 3 8063 8864 Fax. +60 3 8063 7376	Singapore Tel. +65 6244 7800 Fax. +65 6244 4943	Taipei, Taiwan Tel. +886 2 2917 7555 Fax. +886 2 2917 4286

EUROPE

Roermond, Benelux Tel. +31 475 385 555 Fax. +31 475 385 589	Suresnes, France Tel. +33 1 46 14 87 91 Fax. +33 1 46 14 87 92	Hamburg, Germany Tel. +49 4121 870 189 Fax. +49 4121 870 271	Szombathely, Hungary Tel. +36 30 3777 441 Fax. +36 94 517 701
Milan, Italy Tel. +39 02 6129 1017 Fax. +39 02 6601 7490	Moscow, Russian Federation Tel. +7 916 625 92 38 Fax. +7 498 610 07 07	Barcelona, Spain Tel. +34 93 212 3929 Fax. +39 02 6601 7490	Berkshire, UK Tel. +44 7767 346 607 Fax. +31 475 385 589

NORTH AMERICA

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

For more detailed and always up-to-date contact details of sales offices, distributors and representatives, please go to our website 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.