

PRODUCT SELECTION GUIDE 2002

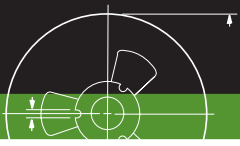
MULTILAYER CERAMIC CAPACITORS

RESISTOR CHIPS

HF PRODUCTS

Chip
Capacitors

Chip Resistors
+ HF Products



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 (preferred)**
This unique number is an easily-readable 15-digit code.
- **12-digit 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 delivery details can be obtained from the Phycomp 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 Sept. 2000 for MLCCs, and IEC 60115-8, amendment 1 of July 2000 for R-chip, values for length and width should be in millimetres 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 below shows the relation between inch-based case sizes versus the recommended metric case size designators.

Case size cross-reference	
Case size designation	
Inch-based	Metric
0201	0603M
0402	1005M
0508	1220M
0603	1608M
0612	1632M
0805	2012M
1206	3216M
1210	3225M
1812	4532M

CD-ROM

The CD-ROM at the end of this product selection guide provides detailed data sheets for the individual product ranges, application notes and a copy of this Product Selection Guide in PDF format. A later version of any product information may be available from our website: www.phycomp-components.com

Contacting us

Contact details about the global Phycomp sales organisation can be found on the backcover of this catalogue. For most up-to-date information, as well as contact details of our franchised distributors, please refer to our website: www.phycomp-components.com

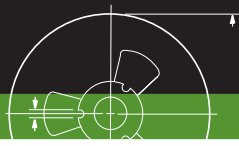


TABLE OF CONTENTS

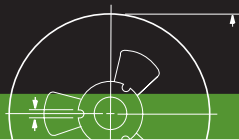
						Page	
General information						3	
Quick reference data						6	
Case dimensions						7	
Product selection charts - Multilayers Ceramic Capacitors (MLCCs)						8	
Discrete MLCCs						8	
Major features						8	
TC code		Cap. range		Voltage range		Other	
NP0	General purpose	270 pF to 33 nF	16 V			8	
	General purpose	150 pF to 22 nF	25 V			10	
	General purpose	0.47 pF to 22 nF	50 V			12	
	General purpose	10 pF to 22 nF	100 V			14	
	High voltage	10 pF to 5.6 nF	200 V, 500 V			16	
	High voltage	3.3 pF to 1.5 nF	1 kV to 4 kV			18	
	Microwave	0.47 pF to 120 pF	50 V	3 GHz		20	
	X5R	General purpose	68 nF to 47 μF	6.3 V, 10 V			22
		General purpose	27 nF to 2.2 μF	10 V			24
	X7R	General purpose	3.3 nF to 4.7 μF	16 V, 25 V			26
		General purpose	100 pF to 1 μF	50 V, 100 V			28
		High voltage	220 pF to 150 nF	200 V, 500 V			30
		High voltage	470 pF to 10 nF	1 kV, 2 kV			32
		Low inductance	10 nF to 220 nF	16 V to 50 V	<600 pH		33
		General purpose	220 nF to 100 μF	6.3 V, 10 V			34
	Y5V	General purpose	10 nF to 10 μF	16 V to 50 V			36
		General purpose	10 nF to 1 μF	25 V, 50 V			38
	C-Arrays						
	NP0	2-C arrays	10 pF to 1 nF	16 V to 50 V	2-fold		40
		2-C arrays	100 pF tot 150 nF	10 V to 50 V	2-fold		42
		4-C arrays	10 pF to 1 nF	50 V	4-fold		44
4-C arrays		10 nF to 100 nF	16 V	4-fold		46	
		220 pF to 68 nF	25 V, 50 V	4-fold		48	
4-C arrays		10 nF to 100 nF	25 V	4-fold		50	
Discrete Feedthrough MLCCs							
NP0	Feedthrough capacitors	47 pF to 1 nF	50 V			52	
	Feedthrough capacitors	4.7 nF to 1 μF	16 V to 50 V			53	
Feedthrough Arrays							
NP0	Feedthrough 4-C arrays	47 pF to 470 pF	50 V	4-fold		54	
	Feedthrough 4-C arrays	1 nF to 10 nF	50 V	4-fold		55	
Ultra Small MLCCs							
NP0	Ultra small MLCCs	1 pF to 100 pF	25 V, 50 V	smallest size		56	
	Ultra small MLCCs	47 pF to 3.3 nF	16 V to 50 V	smallest size		58	
EMI Filter Capacitors							
NP0	Filter capacitors X2Y	33 pF to 100 pF	100 V			60	
	Filter capacitors X2Y	10 nF to 1 μF	10 V to 63 V			60	
	Filter capacitors X2Y	220 nF to 4.7 μF	16 V			60	
Engineering Design Kits							
0201 and 0402	General purpose	1 pF to 100 nF		NP0, X7R, Y5V		62	
	General purpose	0.47 pF to 1 μF		NP0, X7R, Y5V		63	
	General purpose	0.47 pF to 1 μF		NP0, X7R, Y5V		64	
	All sizes, all types, E1 series only	1 pF to 10 μF		NP0, X7R, Y5V		65	
12NC cross reference						66	
Description cross reference						67	
MLCC competitor cross reference						68	



TABLE OF CONTENTS

						Page
General information						70
Program survey						72
Product selection charts - Resistor chips (R-Chips)						74
Major features						
General		Power	Resistance range	Voltage range	Tolerance	
	General purpose and precision	0.05 W to 0.25 W	1 Ω to 10 M Ω	15 V to 200 V	1%, 5%	74
	High precision	0.063 W to 0.25 W	90 Ω to 2.74 M Ω	150 V, 200 V	0.1%, 0.25%, 0.5%	75
	High precision	0.063 W	100 Ω to 1 M Ω	50 V	0.1%, 0.25%, 0.5%	76
	High precision – high stability	0.250 W	10 Ω to 1 M Ω	200 V	0.05% to 1%	76
	High precision – high stability	0.125 W	10 Ω to 1 M Ω	150 V, 200 V	0.05% to 1%	77
	High precision – high stability	0.063 W, 0.1 W	10 Ω to 332 k Ω	50 V, 75 V	0.05% to 1%	78
	Arrays	0.063 W	10 Ω to 1 M Ω	50 V	1%, 5%	79
	R-Networks	0.031 W	10 Ω to 100 k Ω	25 V	1%, 5%	80
	RC-network	0.063 W	10 Ω to 1 k Ω	25 V	5%	80
Power						
	Power	0.5 W, 1.0 W	1 Ω to 10 M Ω	200 V, 250 V	1%, 5%	81
	Power – low ohmic	0.3 W to 1.0 W	0.01 Ω to 0.976 Ω	200 V, 250 V	1%, 5%	82
	Power - high voltage	1.0 W	4.7 M Ω to 16 M Ω	250 V	5%	83
	Metal strip	1.0 W	1 m Ω to 10 m Ω	250 V	1%, 5%	83
Application specific						
	High voltage	0.125 W, 0.25 W	100 k Ω to 27 M Ω	300 V, 400 V	1%, 5%	83
	High ohmic	0.1 W to 0.25 W	11 M Ω to 100 M Ω	50 V to 200 V	5%	84
	Low ohmic	0.063 W to 0.25 W	0.01 Ω to 0.976 Ω	50 V to 200 V	1%, 5%	84
	Trimmable	0.063 W to 0.25 W	1 Ω to 10 M Ω	50 V to 200 V	0/-20%, 0/-30%	85
	Surge	0.25 W	1 Ω to 100 k Ω	200 V	5%	85
	Fusible	0.063 W, 0.125 W	1 Ω to 510 Ω	50 V, 200 V	5%	85
	NiAu terminations	0.63 W to 0.25 W	1 Ω to 10 M Ω	50 V to 200 V	1%, 5%	86
Engineering Design Kits						87
Chip resistor competitor cross reference						88
Part number cross reference						89
12NC cross reference						92
HF Products						96
	Antennas	-	421 MHz to 5.2 GHz	-	6 MHz to 200 MHz bandwidth	96
	Attenuators	40 mW	DC to 2.5 GHz	1 to 20 dB	0.2 dB, 0.3 dB	97
CD-ROM						



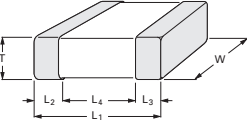


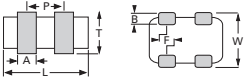
MLCC GENERAL INFORMATION

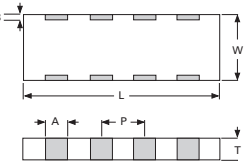
Quick reference data

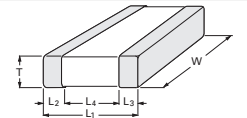
Quick reference data		
Rated voltage	NP0 (CG)	16 V, 25 V, 50 V, 100 V, 500 V, 1 kV, 2 kV, 3 kV, 4 kV
	X5R (BJ)	6.3 V, 10 V
	X7R (2R)	10 V, 16 V, 25 V, 50 V, 100 V, 200 V, 500 V, 1 kV, 2 kV
	Y5V (2F)	6.3 V, 0 V, 16 V, 25 V, 50 V
	Z5U (2E)	25 V, 50 V
Tolerance	NP0 <10 pF	±0.1 pF, ±0.25 pF, ±0.5 pF
	NP0 ≥10 pF	±1%, ±2%, ±5%
	X5R	±10%, ±20%
	X7R	±5%, ±10%
	Y5V	±20%, -20 to +80%
	Z5U	±20%, -20 to +80%
Dissipation factor	NP0 <10 pF	≤10(3/C + 0.7)10 ⁻⁴ ; max. 30.10 ⁻⁴
	NP0 ≥10 pF	≤10.10 ⁻⁴
	X5R 6.3 V	≤7%
	X5R 10 V	≤5%
	X7R 10 V	≤5%
	X7R 16 V	≤3.5%
	X7R ≥25 V	≤2.5%
	Y5V 10 V	≤12.5%
	Y5V 16 V	≤9% or ≤12.5% depending on capacitance value
	Y5V ≥25 V	≤5% or ≤7% depending on capacitance value
	Z5U 16 V	≤9%
	Z5U 25 V	≤6%
Z5U 50 V	≤4%	
Temperature coefficient	NP0 16 V	0 ±60 ppm/K
	NP0 >16 V	0 ±30 ppm/K
Temperature characteristic	X5R	±15%
	X7R	±15%
	Y5V	+22 to -82%
	Z5U	+22 to -56%
Climatic category	NP0	-55 to +125 °C
	X5R	-55 to +85 °C
	X7R	-55 to +125 °C
	Y5V	-25 to +85 °C
	Z5U	+10 to +85 °C
Measuring conditions	NP0 <1000 pF	1 V, 1 MHz
	NP0 ≥1000 pF	1 V, 1 kHz
	X5R < 22 μF	1 V, 1 kHz
	X5R ≥ 22 μF	1 V, 120 Hz
	X7R	1 V, 1 kHz
	Y5V	1 V, 1 kHz
	Z5U	0.5 V, 1 kHz

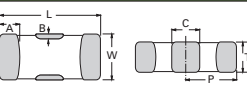


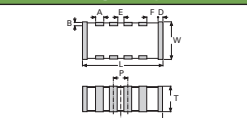
Case dimensions									
Discrete capacitors									
	Case size designation		Dimensions in mm						
	inch-based	Metric	L ₁	W	T _{min}	T _{max}	L ₂ , L _{3min}	L ₂ , L _{3max}	L _{4min}
	0201	0603M	0.6 ±0.03	0.3 ±0.03	0.27	0.33	0.10	0.20	0.20
0402	1005M	1.0 ±0.05	0.5 ±0.05	0.45	0.55	0.20	0.30	0.40	
0603	1608M	1.6 ±0.10	0.8 ±0.07	0.73	0.87	0.20	0.60	0.40	
0805	2012M	2.0 ±0.10	1.25 ±0.10	0.50	1.35	0.25	0.75	0.55	
1206	3216M	3.2 ±0.15	1.6 ±0.15	0.50	1.75	0.25	0.75	1.40	
1210	3225M	3.2 ±0.20	2.5 ±0.20	0.50	1.80	0.25	0.75	1.40	
1812	4532M	4.5 ±0.20	3.2 ±0.20	0.50	1.80	0.25	0.75	2.20	

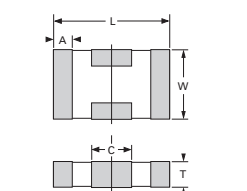
2-C arrays									
	Case size designation		Dimensions in mm						
	inch-based	Metric	L	W	T	A	P	B	F
	0405	1012M	1.37 ±0.15	1.0 ±0.15	0.65 ±0.10	0.25 ±0.1	0.64 ±0.1	0.20 ±0.1	0 ±0.1

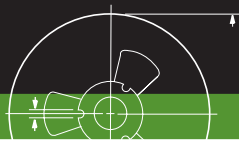
4-C arrays									
	Case size designation		Dimensions in mm						
	inch-based	Metric	L	W	T _{min}	T _{max}	A	B	P
	0508 (4 x 0402)	1220M (4 x 0402)	2.0 ±0.15	1.25 ±0.15	0.50	0.70	0.28 ±0.10	0.2 ±0.10	0.5 ±0.10
0612 (4 x 0603)	1632M (4 x 0603)	3.2 ±0.15	1.6 ±0.15	0.50	1.20	0.4 ±0.10	0.3 ±0.20	0.8 ±0.10	

Discrete capacitors (Low-inductance types only)									
	Case size designation		Dimensions in mm						
	inch-based	Metric	L ₁	W	T _{min}	T _{max}	L ₂ , L _{3min}	L ₂ , L _{3max}	L _{4min}
	0508	1220M	1.25 ±0.20	2.0 ±0.20	0.75	0.95	0.13	0.46	0.38
0612	1632M	1.6 ±0.20	3.2 ±0.20	0.75	0.95	0.13	0.46	0.50	

Feedthrough capacitors									
	Case size designation		Dimensions in mm						
	inch-based	Metric	L	W	T	A	B	C	P
	1206	3216M	3.2 ±0.20	1.6 ±0.20	0.8 ±0.10	0.5 ±0.20	0.3 ±0.15	0.9 ±0.20	1.6 ±0.15

Feedthrough capacitor arrays												
	Case size designation		Dimensions in mm									
	inch-based	Metric	L	W	T	A	B	C	D	E	F _{min}	P
	0612 (4 x 0603)	1632M (4 x 0603)	3.2 ±0.15	1.6 ±0.15	0.8 ±0.10	0.36 ±0.10	0.3 ±0.20	1.65 ±0.15	0.2 ±0.15	0.27 ±0.10	0.15	0.63 ±0.10

Filter capacitors X2Y									
	Case size designation		Dimensions in mm						
	inch-based	Metric	L	W	T _{min}	T _{max}	A _{min}	A _{max}	C
	0603	1608M	1.6 ±0.15	0.8 ±0.10	0.50	0.70	0.25	0.50	0.40 ±0.2
0805	2012M	2.0 ±0.15	1.25 ±0.15	0.75	0.95	0.25	0.55	0.60 ±0.2	
1206	3216M	3.2 ±0.20	1.6 ±0.20	0.80	1.35	0.25	0.65	1.20 ±0.3	
1210	3225M	3.2 ±0.20	2.5 ±0.20	1.10	1.70	0.25	0.65	1.20 ±0.3	
1812	4532M	4.5 ±0.20	3.2 ±0.20	1.10	1.70	0.25	0.65	1.30 ±0.3	



PRODUCT SELECTION CHART

NPO - 16 V, general purpose

NPO - 16 V					
General purpose					
Capacitance (pF)	Last two digits of 12NC	0402	0603	0805	1206
270	42				
330	43	0.5 ±0.05			
390	44				
470	45				
560	-				
680	-				
820	-				
1 000	-				
1 200	-				
1 500	-				
1 800	53				
2 200	54		0.8 ±0.07		
2 700	55				
3 300	56				
3 900	-				
4 700	-				
5 600	59				
6 800	61			0.85 ±0.10	
8 200	62				
10 000	63				
12 000	64				0.6 ±0.10
15 000	65				
18 000	66				0.85 ±0.10
22 000	67				
27 000	68				
33 000	69				1.15 ±0.10
Tape width		8 mm			

Note 1: Case size designators are inch-based; see General Information section for metric-based case size designators.

Note 2: Values in shaded cells indicate thickness class.



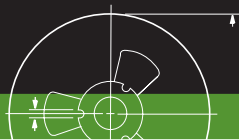
PRODUCT SELECTION CHART

NPO - 16 V, general purpose

Thickness classes and packing quantities							
Thickness class (mm)	8 mm tape width quantity per reel				Quantity per bulk case		
	180 mm / 7"	180 mm / 7"	330 mm / 13"	330 mm / 13"			
	Paper	Blister	Paper	Blister	0402	0603	0805
0.5 ± 0.05	10 000	-	50 000	-	50 000	-	-
0.6 ± 0.10	4 000	-	20 000	-	-	-	-
0.8 ± 0.07	4 000	-	15 000	-	-	15 000	-
0.85 ± 0.10	4 000	-	15 000	-	-	-	8 000
1.15 ± 0.10	-	3 000	-	10 000	-	-	-

Ordering information								
Clear text code (preferred)								
0603CH271J7B200 (example)								
0603	CH	271	J	7	B	2	0	0
Size code	Temp. char.	Cap. in pF	Tolerance	Voltage	Termination	Packing	Marking	Range identifier
0402 0603 0805 1206	CH = NPO	271 = 270 pF The third digit signifies the multiplying factor: 1 = x 10 2 = x 100 3 = x 1000	G = ±2% J = ±5%	7 = 16 V	B = NiSn	2 = 180 mm / 7" paper 3 = 330 mm / 13" paper B = 180 mm / 7" blister F = 330 mm / 13" blister P = bulk case	0 = no marking	0 = conv. ceramic

Ordering code 12NC	
<p>2 2 X X X X X X X 1 X X X</p> <p>Carrier tape 22 = blister 38 = paper 54 = bulk</p> <p>Voltage 78 = 16 V</p> <p>Size 7 = 0402 6 = 0603 0 = 0805 1 = 1206</p>	<p>Capacitance value see selection chart</p> <p>Tolerance 4 = ±2% 5 = ±5%</p> <p>Packing 1 = 180 mm / 7" reel 5 = 330 mm / 13" reel 4 = bulk case</p>



PRODUCT SELECTION CHART

NPO - 25 V, general purpose

NPO - 25 V						
General purpose						
Capacitance (pF)	Last two digits of 12NC	0402	0603	0805	1206	1210
150	38					
180	39	0.5 ±0.05				
220	41					
270	42					
330	-					
390	-					
470	-					
560	-					
680	-					
820	48					
1 000	49		0.8 ±0.07			
1 200	51					
1 500	52					
1 800	-					
2 200	-					
2 700	-					
3 300	56			0.85 ±0.1		
3 900	57			1.25 ±0.1		
4 700	58					
5 600	-					
6 800	-					
8 200	62				0.85 ±0.1	
10 000	63					
12 000	64					
15 000	65					0.5 to 1.0
18 000	66					
22 000	67					0.9 to 1.3
Tape width				8 mm		

Note 1: Case size designators are inch-based; see General Information section for metric-based case size designators.

Note 2: Values in shaded cells indicate thickness class.



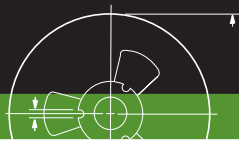
PRODUCT SELECTION CHART

NPO - 25 V, general purpose

Thickness classes and packing quantities							
Thickness class (mm)	8 mm tape width quantity per reel				Quantity per bulk case		
	180 mm / 7"	180 mm / 7"	330 mm / 13"	330 mm / 13"			
	Paper	Blister	Paper	Blister	0402	0603	0805
0.5 ±0.05	10 000	-	50 000	-	50 000	-	-
0.8 ±0.07	4 000	-	15 000	-	-	15 000	10 000
0.85 ±0.1	4 000	-	15 000	-	-	-	8 000
0.5 to 1.0	-	4 000	-	10 000	-	-	-
0.9 to 1.3	-	3 000	-	10 000	-	-	-
1.25 ±0.1	-	3 000	-	10 000	-	-	5 000

Ordering information								
Clear text code (preferred)								
0603CG102J8B200 (example)								
0603	CG	102	J	8	B	2	0	0
Size code	Temp. char.	Cap. in pF	Tolerance	Voltage	Termination	Packing	Marking	Range identifier
0402 0603 0805 1206 1210	CG = NP0	102 = 1000 pF The third digit signifies the multiplying factor: 1 = x 10 2 = x 100 3 = x 1000	F = ±1% G = ±2% J = ±5%	8 = 25 V	B = NiSn	2 = 180 mm / 7" paper 3 = 330 mm / 13" paper B = 180 mm / 7" blister F = 330 mm / 13" blister P = bulk case	0 = no marking	0 = conv. ceramic

Ordering code 12NC	
<p>2 2 X X X X X X 1 X X X</p> <p>Carrier tape 22 = blister 38 = paper 54 = bulk</p> <p>Voltage 91 = 25 V</p> <p>Size 7 = 0402 6 = 0603 0 = 0805 1 = 1206 2 = 1210</p>	<p>Capacitance value see selection chart</p> <p>Tolerance 3 = ±1% 4 = ±2% 5 = ±5%</p> <p>Packing 1 = 180 mm / 7" reel 5 = 330 mm / 13" reel 4 = bulk case</p>



PRODUCT SELECTION CHART

NPO - 50 V, general purpose

NPO - 50 V								
General purpose								
Capacitance (pF)	Last three digits of 12NC	0402	0603	0805	1206	1210	1812	
0.47	477							
0.56	567							
0.68	687							
0.82	827							
1.0	108							
1.2	128							
1.5	158							
1.8	188							
2.2	228							
2.7	278							
3.3	338							
3.9	398							
4.7	478							
5.6	568							
6.8	688							
8.2	828							
10	109	0.5 ±0.05						
12	129							
15	159							
18	189		0.8 ±0.07					
22	229							
27	279							
33	339			0.6 ±0.1				
39	399							
47	479							
56	569				0.6 ±0.1			
68	689							
82	829							
100	101							
120	121							
150	151							
180	181							
220	221							
270	271							
330	331							
390	391							
470	471							
560	561							
680	681					0.5 to 1.0		
820	821							
1 000	102							
1 200	122							
1 500	152			0.85 ±0.1				
1 800	182							
2 200	222						0.5 to 1.0	
2 700	272			1.25 ±0.1				
3 300	332							
3 900	392				0.85 ±0.1			
4 700	472							
5 600	562				1.15 ±0.1			
6 800	682							
8 200	822							
10 000	103							
12 000	123							
15 000	153							
18 000	183							
22 000	223						0.9 to 1.3	
Tape width		8 mm					12 mm	

Note 1: Case size designators are inch-based; see General Information section for metric-based case size designators.

Note 2: Values in shaded cells indicate thickness class.



PRODUCT SELECTION CHART

NPO - 50 V, general purpose

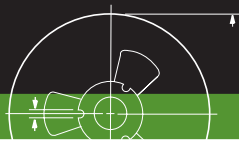
Thickness classes and packing quantities								
Thickness class (mm)	8 mm tape width quantity per reel				12 mm tape width quantity per reel	Quantity per bulk case		
	180 mm / 7"	180 mm / 7"	330 mm / 13"	330 mm / 13"	180 mm / 7" blister			
	Paper	Blister	Paper	Blister	1812	0402	0603	0805
0.5 ±0.05	10 000	-	50 000	-	-	50 000	-	-
0.6 ±0.1	4 000	-	20 000	-	-	-	-	10 000
0.8 ±0.07	4 000	-	15 000	-	-	-	15 000	-
0.85 ±0.1	4 000	-	15 000	-	-	-	-	8 000
0.5 to 1.0	-	4 000	-	10 000	2 000	-	-	-
0.9 to 1.3	-	3 000	-	10 000	1 500	-	-	-
1.15 ±0.1	-	3 000	-	10 000	-	-	-	-
1.25 ±0.1	-	3 000	-	10 000	-	-	-	5 000

Ordering information								
Clear text code (preferred)								
0805CG102J9B200 (example)								
0805	CG	102	J	9	B	2	0	0
Size code	Temp. char.	Cap. in pF	Tolerance	Voltage	Termination	Packing	Marking	Range identifier
0402 ⁽¹⁾ 0603 ⁽¹⁾ 0805 ⁽¹⁾ 1206 ⁽¹⁾ 1210 1812	CG = NP0	102 = 1000 pF The third digit signifies the multiplying factor: 8 = x 0.01 9 = x 0.1 0 = x 1 1 = x 10 2 = x 100 3 = x 1000	B = ±0.1 pF C = ±0.25 pF D = ±0.5 pF F = ±1% G = ±2% J = ±5%	9 = 50 V	B = NiSn	2 = 180 mm / 7" paper 3 = 330 mm / 13" paper B = 180 mm / 7" blister F = 330 mm / 13" blister P = bulk	0 = no marking	0 = conv. ceramic

Note 1: ±1% only available in 0402, 0603, 0805 and 1206.

Ordering code 12NC	
<p>2 2 X X X X X X X X</p> <p>Carrier tape 22 = blister 38 = paper 54 = bulk</p> <p>Voltage 86 = 50 V</p> <p>Size 9 = 0402 7 = 0603 1 = 0805 3 = 1206 2 = 1210 5 = 1812</p>	<p>Capacitance value see selection chart</p> <p>Tolerance 4 = ±0.1 pF for 0.47 pF ≤ C < 5 pF ±0.25 pF for 5 pF ≤ C < 10 pF ±2% for C ≥ 10 pF 5 = ±0.25 pF for C < 5 pF ±0.5 pF for 5 pF ≤ C < 10 pF ±5% for C ≥ 10 pF 8 = ±0.1 pF for 5 pF ≤ C < 10 pF (see note 1) ±1% for C ≥ 10 pF</p> <p>Packing 1 = 180 mm / 7" reel 7 = 330 mm / 13" reel 4 = bulk case</p>

Note 1: ±1% only available in 0402, 0603, 0805 and 1206.



PRODUCT SELECTION CHART

NPO - 100 V, general purpose

NPO - 100 V							
General purpose							
Capacitance (pF)	Last two digits of 12NC	0603	0805	1206	1210	1812	
10	23						
12	24						
15	25						
18	26						
22	27						
27	28						
33	29						
39	31						
47	32						
56	33						
68	34						
82	35						
100	36						
120	37	0.8 ±0.07	0.6 ±0.1	0.6 ±0.1			
150	38						
180	39						
220	41						
270	42						
330	43						
390	44						
470	45						
560	46						
680	47						
820	48						
1 000	49						
1 200	51						
1 500	52		0.85 ±0.1				
1 800	53						
2 200	54		1.25 ±0.1				
2 700	55						
3 300	56						
3 900	57			0.85 ±0.1			
4 700	58						
5 600	59			1.15 ±0.1			
6 800	61						
8 200	62				0.5 to 1.0		
10 000	63						
12 000	64					0.5 to 1.0	
15 000	65						
18 000	66					0.9 to 1.3	
22 000	67						
Tape width		8 mm				12 mm	

Note 1: Case size designators are inch-based; see General Information section for metric-based case size designators.

Note 2: Values in shaded cells indicate thickness class.



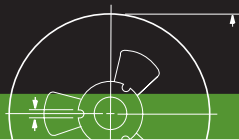
PRODUCT SELECTION CHART

NPO - 100 V, general purpose

Thickness classes and packing quantities							
Thickness class (mm)	8 mm tape width quantity per reel				12 mm tape width quantity per reel	Quantity per bulk case	
	180 mm / 7"	180 mm / 7"	330 mm / 13"	330 mm / 13"	180 mm / 7"		
	Paper	Blister	Paper	Blister	1812	0603	0805
0.6 ±0.1	4 000	-	20 000	-	-	-	10 000
0.8 ±0.07	4 000	-	15 000	-	-	15 000	-
0.85 ±0.1	4 000	-	15 000	-	-	-	8 000
0.5 to 1.0	-	4 000	-	10 000	2 000	-	-
0.9 to 1.3	-	3 000	-	10 000	1 500	-	-
1.15 ±0.1	-	3 000	-	10 000	-	-	-
1.25 ±0.1	-	3 000	-	10 000	-	-	5 000

Ordering information								
Clear text code (preferred)								
0805CG102G0B200 (example)								
0805	CG	102	G	0	B	2	0	0
Size code	Temp. char.	Cap. in pF	Tolerance	Voltage	Termination	Packing	Marking	Range identifier
0603 0805 1206 1210 1812	CG = NP0	102 = 1000 pF The third digit signifies the multiplying factor: 0 = x 1 1 = x 10 2 = x 100 3 = x 1000	G = ±2% J = ±5%	0 = 100 V	B = NiSn	2 = 180 mm / 7" paper 3 = 330 mm / 13" paper B = 180 mm / 7" blister F = 330 mm / 13" blister P = bulk case	0 = no marking	0 = conv. ceramic

Ordering code 12NC	
<p>2 2 X X X X X X X 1 X X X</p> <p>Carrier tape 22 = blister 38 = paper 54 = bulk</p> <p>Voltage 60 = 100 V</p> <p>Size 6 = 0603 0 = 0805 1 = 1206 2 = 1210 4 = 1812</p>	<p>Capacitance value see selection chart</p> <p>Tolerance 4 = ±2% 5 = ±5%</p> <p>Packing 1 = 180 mm / 7" reel 5 = 330 mm / 13" reel 4 = bulk case</p>



PRODUCT SELECTION CHART

NPO - 200 V and 500 V, high voltage

NPO - 200 V and 500 V									
High voltage									
Capacitance (pF)	Last two digits of 12NC	200 V				500 V			
		0805	1206	1210	1812	1206	1210	1812	
10	23								
12	24								
15	25								
18	26								
22	27								
27	28								
33	29								
39	31								
47	32	0.6 ±0.1	0.6 ±0.1			0.6 ±0.1			
56	33								
68	34								
82	35								
100	36								
120	37								
150	38								
180	39						0.8 to 1.0		
220	41								
270	42								
330	43	0.85 ±0.1				0.85 ±0.1			
390	44								
470	45		0.85 ±0.1						
560	46	1.25 ±0.1							
680	47					1.15 ±0.1			
820	48								
1 000	49								
1 200	51						0.9 to 1.3		
1 500	52		1.15 ±0.1						
1 800	53			0.8 to 1.0			1.2 to 1.75		
2 200	54								
2 700	55			0.9 to 1.3				0.9 to 1.3	
3 300	56								
3 900	57				0.8 to 1.0				
4 700	58				0.9 to 1.3				
5 600	59								
Tape width		8 mm			12 mm		8 mm		12 mm

Note 1: Case size designators are inch-based; see General Information section for metric-based case size designators.

Note 2: Values in shaded cells indicate thickness class.



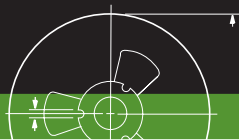
PRODUCT SELECTION CHART

NPO - 200 V and 500 V, high voltage

Thickness classes and packing quantities						
Thickness class (mm)	8 mm tape width quantity per reel				12 mm tape width quantity per reel	Quantity per bulk case
	180 mm / 7"	180 mm / 7"	330 mm / 13"	330 mm / 13"	180 mm / 7" blister	
	Paper	Blister	Paper	Blister	1812	
0.6 ±0.1	4 000	-	20 000	-	-	10 000
0.85 ±0.1	4 000	-	15 000	-	-	8 000
0.8 to 1.0	-	4 000	-	10 000	2 000	-
0.9 to 1.3	-	3 000	-	10 000	1 500	-
1.15 ±0.1	-	3 000	-	10 000	-	-
1.25 ±0.1	-	3 000	-	10 000	-	5 000
1.2 to 1.75	-	2 500	-	10 000	1 200	-

Ordering information								
Clear text code (preferred)								
1206CG102GBB200 (example)								
1206	CG	102	G	B	B	2	0	0
Size code	Temp. char.	Cap. in pF	Tolerance	Voltage	Termination	Packing	Marking	Range identifier
0805 1206 1210 1812	CG = NP0	102 = 1000 pF The third digit signifies the multiplying factor: 0 = x 1 1 = x 10 2 = x 100 3 = x 1000	G = ±2% J = ±5%	B = 200 V D = 500 V	B = NiSn	2 = 180 mm / 7" paper 3 = 330 mm / 13" paper B = 180 mm / 7" blister F = 330 mm / 13" blister P = bulk case	0 = no marking	0 = conv. ceramic

Ordering code 12NC	
<p>2 2 X X X X X X 1 X X X</p> <p>Carrier tape 22 = blister 38 = paper 54 = bulk</p> <p>Voltage 93 = 200 V 97 = 500 V</p> <p>Size 0 = 0805 1 = 1206 2 = 1210 4 = 1812</p>	<p>Capacitance value see selection chart</p> <p>Tolerance 4 = ±2% 5 = ±5%</p> <p>Packing 1 = 180 mm / 7" reel 5 = 330 mm / 13" reel 4 = bulk case</p>



PRODUCT SELECTION CHART

NPO - 1 kV to 4 kV, high voltage

NPO - 1 kV to 4 kV								
High voltage								
Capacitance (pF)	Last two digits of 12NC	1 kV		2 kV	3 kV		4 kV	
		1206	1812	1206	1808	1812	1808	1812
3.3	16							
3.9	17							
4.7	18							
5.6	19							
6.8	21							
8.2	22							
10	23							
12	24							
15	25						1.2 to 1.75	
18	26				0.9 to 1.3			
22	27							1.2 to 1.75
27	28							
33	29							
39	31							
47	32			0.9 to 1.3		0.9 to 1.3		
56	33							
68	34							
82	35							
100	36							
120	37							
150	38							
180	39							
220	41	0.9 to 1.3						
270	42		0.5 to 1.0					
330	43							
390	44							
470	45							
560	46							
680	47							
820	48							
1 000	49							
1 200	51		0.9 to 1.3					
1 500	52							
Tape width		8 mm	12 mm	8 mm	12 mm			

Note 1: Case size designators are inch-based; see General Information section for metric-based case size designators.

Note 2: Values in shaded cells indicate thickness class.



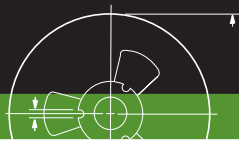
PRODUCT SELECTION CHART

NPO - 1 kV to 4 kV, high voltage

Thickness classes and packing quantities				
Thickness class (mm)	8 mm tape width quantity per reel		12 mm tape width quantity per reel	
	180 mm / 7" blister		180 mm / 7" blister	
	1206		1808	1812
0.5 to 1.0	-		-	2 000
0.9 to 1.3	3 000		1 500	1 500
1.2 to 1.75	-		1 000	1 000

Ordering information								
Clear text code (preferred)								
1206CG220JFBB00 (example)								
1206	CG	220	J	F	B	B	0	0
Size code	Temp. char.	Cap. in pF	Tolerance	Voltage	Termination	Packing	Marking	Range identifier
1206 1808 1812	CG = NP0	220 = 22 pF The third digit signifies the multiplying factor: 0 = x 1 1 = x 10 2 = x 100	J = ±5%	E = 1 kV F = 2 kV G = 3 kV H = 4 kV	B = NiSn	B = 180 mm / 7" blister	0 = no marking	0 = conv. ceramic

Ordering code 12NC	
<p>2 2 X X X X X X 1 X X X</p> <p>Carrier tape 50 = blister</p> <p>Voltage 00 = 1 kV 02 = 2 kV 04 = 3 kV 50 = 4 kV</p> <p>Size 1 = 1206 3 = 1808 4 = 1812</p>	<p>Capacitance value see selection chart</p> <p>Tolerance 5 = ±5%</p> <p>Packing 1 = 180 mm / 7" reel</p>



PRODUCT SELECTION CHART

NPO - 50 V, microwave

NPO - 50 V				
Microwave				
Capacitance (pF)	Last two digits of 12NC	0603	0805	1206
0.47	05			
0.56	06			
0.68	07			
0.82	08			
1.0	09			
1.2	11			
1.5	12			
1.8	13			
2.2	14			
2.7	15			
3.3	16			
3.9	17	0.8 ±0.07	0.6 ±0.1	0.6 ±0.1
4.7	18			
5.6	19			
6.8	21			
8.2	22			
10	23			
12	24			
15	25			
18	26			
22	27			
27	28			
33	29			
39	31			
47	32			
56	33			
68	34			
82	35			
100	36			
120	37			
Tape width		8 mm		

Note 1: Case size designators are inch-based; see General Information section for metric-based case size designators.
Note 2: Values in shaded cells indicate thickness class.



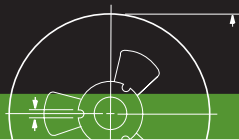
PRODUCT SELECTION CHART

NPO - 50 V, microwave

Thickness classes and packing quantities				
Thickness class (mm)	8 mm tape width quantity per reel		Quantity per bulk case	
	180 mm / 7"	330 mm / 13"		
	Paper	Paper	0603	0805
0.6 ±0.1	4 000	20 000	-	10 000
0.8 ±0.07	4 000	15 000	15 000	-

Ordering information								
Clear text code (preferred)								
0805CG100G9B20M (example)								
0805	CG	100	G	9	B	2	0	M
Size code	Temp. char.	Cap. in pF	Tolerance	Voltage	Termination	Packing	Marking	Range identifier
0603 0805 1206	CG = NP0	100 = 100 pF The third digit signifies the multiplying factor: 8 = x 0.01 9 = x 0.1 0 = x 1 1 = x 10	B = ±0.1 pF C = ±0.25 pF D = ±0.5 pF F = ±1% G = ±2% J = ±5%	9 = 50 V	B = NiSn	2 = 180 mm / 7" paper 3 = 330 mm / 13" paper P = bulk case	0 = no marking	M = microwave

Ordering code 12NC	
<p>2 2 X X X X X X X 1 X X X</p>	<p>Carrier tape 38 = paper 54 = bulk</p> <p>Size 578 = 0603 574 = 0805 576 = 1206</p> <p>Capacitance value see selection chart</p> <p>Tolerance 0 = ±0.1 pF for C < 10 pF 1 = ±0.25 pF for C < 10 pF 2 = ±0.5 pF for 5 pF ≤ C < 10 pF 3 = ±1% for C ≥ 10 pF 4 = ±2% for C ≥ 10 pF 5 = ±5% for C ≥ 10 pF</p> <p>Packing 1 = 180 mm / 7" reel 5 = 330 mm / 13" reel 4 = bulk case</p>



PRODUCT SELECTION CHART

X5R - 6.3 V and 10 V, general purpose

X5R - 6.3 V and 10 V													
General purpose													
Capacitance (nF)	Last two digits of 12NC	6.3 V					10 V						
		0402	0603	0805	1206	1210	1812	0603	0805	1206	1210	1812	
68	47	0.5 ±0.05											
100	49												
150	52												
220	54												
330	56							0.8 ±0.07					
470	58												
680	61		0.8 ±0.07										
1 000	63												
1 500	65												
2 200	67								1.25 ±0.1				
3 300	69			1.25 ±0.1									
4 700	72				1.6 ±0.2					1.6 ±0.2			
6 800	74												
10 000	76				1.6 ±0.2						2.5 ±0.2		
15 000	78												
22 000	81					2.5 ±0.2						2.5 ±0.2	
33 000	83												
47 000	85							2.5 ±0.2					
Tape width		8 mm					12 mm		8 mm			12 mm	

Note 1: Case size designators are inch-based; see General Information section for metric-based case size designators.

Note 2: Values in shaded cells indicate thickness class.



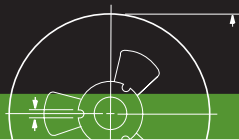
PRODUCT SELECTION CHART

X5R - 6.3 V and 10 V, general purpose

Thickness classes and packing quantities								
Thickness class (mm)	8 mm tape width quantity per reel				12 mm tape width quantity per reel	Quantity per bulk case		
	180 mm / 7"	180 mm / 7"	330 mm / 13"	330 mm / 13"	180 mm / 7"			
	Paper	Blister	Paper	Blister	Blister	0402	0603	0805
0.5 ± 0.05	10 000	-	50 000	-	-	50 000	-	-
0.8 ± 0.07	4 000	-	15 000	-	-	-	15 000	-
1.25 ± 0.1	-	3 000	-	10 000	-	-	-	5 000
1.6 ± 0.2	-	2 500	-	8 000	-	-	-	-
2.5 ± 0.2	-	-	-	-	1 000	-	-	-

Ordering information								
Clear text code (preferred)								
06032B334M6B20D (example)								
0603	2B	334	M	6	B	2	0	D
Size code	Temp. char.	Cap. in pF	Tolerance	Voltage	Termination	Packing	Marking	Range identifier
0402 0603 0805 1206 1210 1812	2B = X5R	334 = 330 000 pF The third digit signifies the multiplying factor: 4 = x 10 000 5 = x 100 000 6 = x 1 000 000	K = ±10% M = ±20%	5 = 6.3 V 6 = 10 V	B = NiSn	2 = 180 mm / 7" paper 3 = 330 mm / 13" paper B = 180 mm / 7" blister F = 330 mm / 13" blister P = bulk case	0 = no marking	D = BME

Ordering code 12NC	
<p>2 2 X X X X X X X 3 X X X</p>	<p>Carrier tape 38 = paper (10 V) 22 = blister (10 V) 50 = blister (6.3 V) 55 = paper (6.3 V) 54 = bulk</p> <p>Voltage 20 = 6.3 V 24 = 10 V</p> <p>Size 7 = 0402 6 = 0603 0 = 0805 1 = 1206 2 = 1210 4 = 1812</p> <p>Capacitance value see selection chart</p> <p>Tolerance 6 = ±10% 7 = ±20%</p> <p>Packing 1 = 180 mm / 7" reel 5 = 330 mm / 13" reel 4 = bulk case</p>



PRODUCT SELECTION CHART

X7R - 10 V, general purpose

X7R - 10 V					
General purpose					
Capacitance (pF)	Last two digits of 12NC	0402	0603	0805	1206
27 000	42	0.5 ±0.05			
33 000	-				
39 000	-	0.5 ±0.05			
47 000	45				
56 000	-				
68 000	-				
82 000	-				
100 000	-				
120 000	-				
150 000	52				
180 000	53		0.8 ±0.07		
220 000	54			0.6 ±0.1	
270 000	55				
330 000	56				
390 000	57			0.85 ±0.1	
470 000	58				
560 000	59				
680 000	61			1.25 ±0.1	
820 000	62				
1 000 000	63				0.85 ±0.1
1 200 000	64				
1 500 000	65				
1 800 000	66				1.15 ±0.1
2 200 000	67				
Tape width		8 mm			

Note 1: Case size designators are inch-based; see General Information section for metric-based case size designators.

Note 2: Values in shaded cells indicate thickness class.



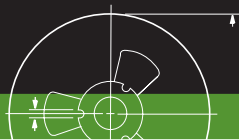
PRODUCT SELECTION CHART

X7R - 10 V, general purpose

Thickness classes and packing quantities							
Thickness class (mm)	8 mm tape width quantity per reel				Quantity per bulk case		
	180 mm / 7"	180 mm / 7"	330 mm / 13"	330 mm / 13"			
	Paper	Blister	Paper	Blister	0402	0603	0805
0.5 ±0.05	10 000	-	50 000	-	50 000	-	-
0.6 ±0.1	4 000	-	20 000	-	-	-	10 000
0.8 ±0.07	4 000	-	15 000	-	-	15 000	-
0.85 ±0.1	4 000	-	15 000	-	-	-	8 000
1.15 ±0.1	-	3 000	-	10 000	-	-	-
1.25 ±0.1	-	3 000	-	10 000	-	-	5 000

Ordering information								
Clear text code (preferred)								
06032R154K6BB0D (example)								
0603	2R	154	K	6	B	B	0	D
Size code	Temp. char.	Cap. in pF	Tolerance	Voltage	Termination	Packing	Marking	Range identifier
0603 0805 1206	2R = X7R	154 = 150 000 pF The third digit signifies the multiplying factor: 4 = x 10 000 5 = x 100 000	K = ±10%	6 = 10 V	B = NiSn	2 = 180 mm / 7" paper 3 = 330 mm / 13" paper B = 180 mm / 7" blister F = 330 mm / 13" blister P = bulk case	0 = no marking	D = BME

Ordering code 12NC	
<p>2 2 X X X X X X X 5 X X X</p> <p>Carrier tape 22 = blister 38 = paper 54 = bulk</p> <p>Voltage 24 = 10 V</p> <p>Size 6 = 0603 0 = 0805 1 = 1206</p>	<p>Capacitance value see selection chart</p> <p>Tolerance 6 = ±10%</p> <p>Packing 1 = 180 mm / 7" reel 5 = 330 mm / 13" reel 4 = bulk case</p>



PRODUCT SELECTION CHART

X7R - 16 V and 25 V, general purpose

X7R - 16 V and 25 V											
General purpose											
Capacitance (pF)	Last two digits of 12NC	16 V					25 V				
		0402	0603	0805	1206	1210	0402	0603	0805	1206	1210
3 300	29										
3 900	31						0.5 ±0.05				
4 700	32										
5 600	33										
6 800	34										
8 200	35										
10 000	36	0.5 ±0.05									
12 000	37										
15 000	38										
18 000	39						0.8 ±0.07		0.6 ±0.1		
22 000	41										
27 000	42										
33 000	43										
39 000	44										
47 000	45		0.8 ±0.07								
56 000	46			0.6 ±0.1							
68 000	47								0.85 ±0.1		
82 000	48										
100 000	49										
120 000	51										
150 000	52			0.85 ±0.1						0.85 ±0.1	
180 000	53										
220 000	54										
270 000	55				0.85 ±0.1						
330 000	56									1.15 ±0.1	0.5 to 1.0
390 000	57			1.25 ±0.1							
470 000	58										0.9 to 1.3
560 000	59										
680 000	61				1.15 ±0.1						
820 000	62										
1 000 000	63										1.2 to 1.75
4 700 000	72					1.9 ±0.2					
Tape width		8 mm					8 mm				

Note 1: Case size designators are inch-based; see General Information section for metric-based case size designators.

Note 2: Values in shaded cells indicate thickness class.



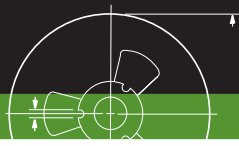
PRODUCT SELECTION CHART

X7R - 16 V and 25 V, general purpose

Thickness classes and packing quantities								
Thickness class (mm)	8 mm tape width quantity per reel				12 mm tape width quantity per reel	Quantity per bulk case		
	180 mm / 7"	180 mm / 7"	330 mm / 13"	330 mm / 13"	180 mm / 7" blister			
	Paper	Blister	Paper	Blister	1812	0402	0603	0805
0.5 ±0.05	10 000	-	50 000	-	-	50 000	-	-
0.6 ±0.1	4 000	-	20 000	-	-	-	-	10 000
0.8 ±0.07	4 000	-	15 000	-	-	-	15 000	-
0.85 ±0.1	4 000	-	15 000	-	-	-	-	8 000
0.5 to 1.0	-	3 000	-	10 000	-	-	-	-
0.9 to 1.3	-	3 000	-	10 000	1 500	-	-	-
1.15 ±0.1	-	3 000	-	10 000	-	-	-	-
1.25 ±0.1	-	3 000	-	10 000	-	-	-	5 000
1.2 to 1.75	-	2 000	-	-	-	-	-	-
1.9 ±0.2	-	-	-	-	2 000	-	-	-

Ordering information								
Clear text code (preferred)								
12062R104K8BB0D (example)								
1206	2R	104	K	8	B	B	0	D
Size code	Temp. char.	Cap. in pF	Tolerance	Voltage	Termination	Packing	Marking	Range identifier
0402 0603 0805 1206 1210 1812	2R = X7R	104 = 100 000 pF The third digit signifies the multiplying factor: 1 = x 10 2 = x 100 3 = x 1 000 4 = x 10 000 5 = x 100 000	J = ±5% K = ±10%	7 = 16 V 8 = 25 V	B = NiSn	2 = 180 mm / 7" paper 3 = 330 mm / 13" paper B = 180 mm / 7" blister F = 330 mm / 13" blister P = bulk case	0 = no marking	D = BME

Ordering code 12NC	
<p>2 2 X X X X X X X X 5 X X X X</p> <p>Carrier tape 22 = blister 38 = paper 54 = bulk</p> <p>Voltage 78 = 16 V 91 = 25 V</p> <p>Size 7 = 0402 6 = 0603 0 = 0805 1 = 1206 2 = 1210</p>	<p>Capacitance value see selection chart</p> <p>Tolerance 5 = ± 5% 6 = ±10%</p> <p>Packing 1 = 180 mm / 7" reel 5 = 330 mm / 13" reel 4 = bulk case</p>



PRODUCT SELECTION CHART

X7R - 50 V and 100 V, general purpose

X7R - 50 V and 100 V												
General purpose												
Capacitance (pF)	Last two digits of 12NC	50 V						100 V				
		0402	0603	0805	1206	1210	1812	0805	1206	1210	1812	
100	09											
120	11											
150	12											
180	13											
220	14											
270	15											
330	16											
390	17											
470	18											
560	19	0.5 ±0.05										
680	21											
820	22											
1 000	23											
1 200	24											
1 500	25							0.6 ±0.1				
1 800	26		0.8 ±0.07									
2 200	27											
2 700	28			0.6 ±0.1								
3 300	29								0.85 ±0.1			
3 900	31				0.85 ±0.1							
4 700	32											
5 600	33											
6 800	34											
8 200	35											
10 000	36											
12 000	37											
15 000	38							0.85 ±0.1				
18 000	39											
22 000	41											
27 000	42											
33 000	43					0.5 to 1.0						
39 000	44			0.85 ±0.1								
47 000	45											
56 000	46											
68 000	47											
82 000	48			1.25 ±0.1				1.15 ±0.1	0.5 to 1.0			
100 000	49											
120 000	51									0.9 to 1.3		
150 000	52											
180 000	53				1.15 ±0.1	0.9 to 1.3					0.9 to 1.3	
220 000	54						0.9 to 1.3					
270 000	55											
330 000	56											
390 000	57											
470 000	58										1.2 to 1.75	
560 000	59											
680 000	61											
820 000	62						1.2 to 1.75					
1 000 000	63											
Tape width		8 mm						12 mm		8 mm		12 mm

Note 1: Case size designators are inch-based; see General Information section for metric-based case size designators.

Note 2: Values in shaded cells indicate thickness class.



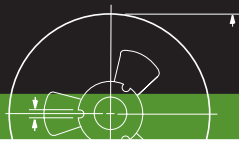
PRODUCT SELECTION CHART

X7R - 50 V and 100 V, general purpose

Thickness classes and packing quantities								
Thickness class (mm)	8 mm tape width quantity per reel				12 mm tape width quantity per reel	Quantity per bulk case		
	180 mm / 7"	180 mm / 7"	330 mm / 13"	330 mm / 13"	180 mm / 7" blister			
	Paper	Blister	Paper	Blister	1812	0402	0603	0805
0.5 ±0.05	10 000	-	50 000	-	-	50 000	-	-
0.6 ±0.1	4 000	-	20 000	-	-	-	-	10 000
0.8 ±0.07	4 000	-	15 000	-	-	-	15 000	-
0.85 ±0.1	4 000	-	15 000	-	-	-	-	8 000
0.5 to 1.0	-	3 000	-	10 000	-	-	-	-
0.9 to 1.3	-	3 000	-	10 000	1 500	-	-	-
1.15 ±0.1	-	3 000	-	10 000	-	-	-	-
1.25 ±0.1	-	3 000	-	10 000	-	-	-	5 000
1.2 to 1.75	-	-	-	-	1 200	-	-	-

Ordering information								
Clear text code (preferred)								
18122R104K0BB0D (example)								
1812	2R	104	K	0	B	B	0	D
Size code	Temp. char.	Cap. in pF	Tolerance	Voltage	Termination	Packing	Marking	Range identifier
0402	2R = X7R	104 = 100 000 pF	J = ± 5%	9 = 50 V	B = NiSn	2 = 180 mm / 7" paper	0 = no marking	D = BME
0603		The third digit	K = ±10%	0 = 100 V		3 = 330 mm / 13" paper		
0805		signifies the				B = 180 mm / 7" blister		
1206		multiplying				F = 330 mm / 13" blister		
1210		factor:				P = bulk case		
1812		1 = x 10						
		2 = x 100						
		3 = x 1 000						
		4 = x 10 000						
		5 = x 100 000						

Ordering code 12NC	
<p>2 2 X X X X X X 5 X X X</p>	<p>Carrier tape 22 = blister 38 = paper 54 = bulk</p> <p>Voltage 58 = 50 V 60 = 100 V</p> <p>Size 7 = 0402 6 = 0603 0 = 0805 1 = 1206 2 = 1210 4 = 1812</p>
<p>Capacitance value see selection chart</p> <p>Tolerance 5 = ± 5% 6 = ±10%</p> <p>Packing 1 = 180 mm / 7" reel 5 = 330 mm / 13" reel 4 = bulk case</p>	



PRODUCT SELECTION CHART

X7R - 200 V and 500 V, high voltage

X7R - 200 V and 500 V									
High voltage									
Capacitance (pF)	Last two digits of 12NC	200 V				500 V			
		0805	1206	1210	1812	1206	1210	1812	
220	14								
270	15								
330	16								
390	17								
470	18								
560	19								
680	21								
820	22								
1 000	23								
1 200	24	0.85 ±0.1				1.15 ±0.1			
1 500	25								
1 800	26								
2 200	27								
2 700	28								
3 300	29		0.85 ±0.1						
3 900	31								
4 700	32								
5 600	33						0.9 to 1.3		
6 800	34	1.25 ±0.1							
8 200	35								
10 000	36								
12 000	37							0.9 to 1.3	
15 000	38								
18 000	39								
22 000	41		1.15 ±0.1						
27 000	42								
33 000	43								
39 000	44			0.9 to 1.3					
47 000	45								
56 000	46								
68 000	47				0.9 to 1.3				
82 000	48								
100 000	49								
120 000	-								
150 000	52				0.9 to 1.3				
Tape width		8 mm			12 mm		8 mm		12 mm

Note 1: Case size designators are inch-based; see General Information section for metric-based case size designators.

Note 2: Values in shaded cells indicate thickness class.



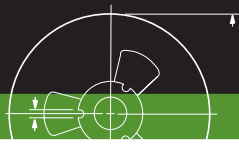
PRODUCT SELECTION CHART

X7R - 200 V and 500 V, high voltage

Thickness classes and packing quantities						
Thickness class (mm)	8 mm tape width quantity per reel				12 mm tape width quantity per reel	Quantity per bulk case
	180 mm / 7"	180 mm / 7"	330 mm / 13"	330 mm / 13"	180 mm / 7" blister	
	Paper	Blister	Paper	Blister	1812	
0.85 ±0.1	4 000		15 000		-	8 000
0.9 to 1.3	-	3 000	-	10 000	1 500	-
1.15 ±0.1	-	3 000	-	10 000	-	-
1.25 ±0.1	-	3 000	-	10 000	-	5 000

Ordering information								
Clear text code (preferred)								
18122R104KBBB0D (example)								
1812	2R	104	K	B	B	B	0	D
Size code	Temp. char.	Cap. in pF	Tolerance	Voltage	Termination	Packing	Marking	Range identifier
0805 1206 1210 1812	2R = X7R	104 = 100 000 pF The third digit signifies the multiplying factor: 1 = x 10 2 = x 100 3 = x 1 000 4 = x 10 000	J = ± 5% K = ±10%	B = 200 V D = 500 V	B = NiSn	2 = 180 mm / 7" paper 3 = 330 mm / 13" paper B = 180 mm / 7" blister F = 330 mm / 13" blister P = bulk case	0 = no marking	D = BME

Ordering code 12NC	
<p>2 2 X X X X X X X 5 X X X</p> <p>Carrier tape 22 = blister 38 = paper 54 = bulk</p> <p>Voltage 93 = 200 V 97 = 500 V</p> <p>Size 0 = 0805 1 = 1206 2 = 1210 4 = 1812</p>	<p>Capacitance value see selection chart</p> <p>Tolerance 5 = ± 5% 6 = ±10%</p> <p>Packing 1 = 180 mm / 7" reel 5 = 330 mm / 13" reel 4 = bulk case</p>



PRODUCT SELECTION CHART

X7R - 1 kV and 2 kV, high voltage

X7R - 1 kV and 2 kV						
High voltage						
Capacitance (pF)	Last two digits of 12NC	1 kV			2 kV	
		1206	1808	1812	1808	1812
470	18					
560	19					
680	21					
820	22					
1 000	23				1.2 to 1.75	
1 200	24	0.9 to 1.3	1.2 to 1.75			
1 500	25					
1 800	26					
2 200	27					1.2 to 1.75
2 700	28					
3 300	29			1.2 to 1.75		
3 900	31					
4 700	32					
5 600	33					
6 800	34					
8 200	35					
10 000	36					
Tape width		8 mm	12 mm		12 mm	

Note 1: Case size designators are inch-based; see General Information section for metric-based case size designators.

Note 2: Values in shaded cells indicate thickness class.

Thickness classes and packing quantities				
Thickness class (mm)	8 mm tape width quantity per reel		12 mm tape width quantity per reel	
	180 mm / 7" blister	330 mm / 13" blister	180 mm / 7" blister	
	1206	1206	1808	1812
0.9 to 1.3	3 000	10 000	-	-
1.2 to 1.75	-	-	1 000	1 000

Ordering information								
Clear text code (preferred)								
12062R102KEBB0D (example)								
1206	2R	102	K	E	B	B	0	D
Size code	Temp. char.	Cap. in pF	Tolerance	Voltage	Termination	Packing	Marking	Range identifier
1206 1808 1812	2R = X7R	102 = 1000 pF The third digit signifies the multiplying factor: 1 = x 10 2 = x 100 3 = x 1000	K = ±10%	E = 1 kV F = 2 kV	B = NiSn	B = 180 mm / 7" blister F = 330 mm / 13" blister	0 = no marking	D = BME

Ordering code 12NC	
<p>2 2 X X X X X X</p> <p>Carrier tape 50 = blister</p> <p>Voltage 00 = 1 kV 02 = 2 kV</p> <p>Size 1 = 1206 3 = 1808 4 = 1812</p>	<p>X 5 X X X X</p> <p>Capacitance value see selection chart</p> <p>Tolerance 6 = ±10%</p> <p>Packing 1 = 180 mm / 7" reel 5 = 330 mm / 13" reel</p>

PRODUCT SELECTION CHART

X7R - 16 V to 50 V, low inductance

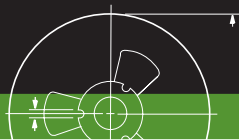
X7R - 16 V to 50 V				
Low inductance				
Capacitance (pF)	Last two digits of 12NC	16 V	25 V	50 V
		0508	0508	0612
10 000	36			
12 000	37			
15 000	38			
18 000	39			
22 000	41			
27 000	42			
33 000	43		0.85 ±0.1	0.85 ±0.1
39 000	44			
47 000	45			
56 000	46			
68 000	47			
82 000	48			
100 000	49			
120 000	51			
150 000	52	0.85 ±0.1		
180 000	53			
220 000	54			
Tape width		8 mm		

Note 1: Case size designators are inch-based; see General Information section for metric-based case size designators.
Note 2: Values in shaded cells indicate thickness class.

Thickness classes and packing quantities		
Thickness class (mm)	8 mm tape width quantity per reel	
	180 mm / 7"	330 mm / 13"
	Paper	Paper
0.85 ±0.1	4 000	15 000

Ordering information								
Clear text code (preferred)								
0612R103K9BB0L (example)								
0612	2R	103	K	9	B	B	0	L
Size code	Temp. char.	Cap. in pF	Tolerance	Voltage	Termination	Packing	Marking	Range identifier
0508 0612	2R = X7R	103 = 10 000 pF The third digit signifies the multiplying factor: 3 = x 1 000 4 = x 10 000	K = ±10%	7 = 16 V 8 = 25 V 9 = 50 V	B = NiSn	2 = 180 mm / 7" paper 3 = 330 mm / 13" paper	0 = no marking	L = low inductance

Ordering code 12NC	
2 2 X X X X X X X 5 X X X	
Carrier tape 55 = paper	Capacitance value see selection chart
Voltage 08 = 16 V 07 = 25 V 06 = 50 V	Tolerance 6 = ±10%
Size 1 = 0508 0 = 0612	Packing 1 = 180 mm / 7" reel 5 = 330 mm / 13" reel



PRODUCT SELECTION CHART

Y5V - 6.3 V and 10 V, general purpose

Y5V - 6.3 V and 10 V												
General purpose												
Capacitance (nF)	Last two digits of 12NC	6.3 V					10 V					
		0402	0603	0805	1206	1210	1812	0402	0603	0805	1206	1812
220	54							0.5 ±0.05				
330	-											
470	58	0.5 ±0.05							0.8 ±0.07			
680	-											
1 000	63								0.8 ±0.07			
1 500	65											
2 200	67		0.8 ±0.07									
3 300	69									1.25 ±0.1	1.15 ±0.1	
4 700	72											
6 800	74											
10 000	76			1.25 ±0.1								
15 000	78										1.6 ±0.15	
22 000	81				1.6 ±0.15							
33 000	-											
47 000	85					2.0 ±0.2						2.5 ±0.2
68 000	-											
100 000	89						2.5 ±0.2					
Tape width		8 mm										

Note 1: Case size designators are inch-based; see General Information section for metric-based case size designators.
Note 2: Values in shaded cells indicate thickness class.



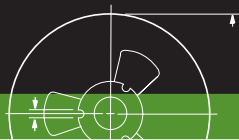
PRODUCT SELECTION CHART

Y5V - 6.3 V and 10 V, general purpose

Thickness classes and packing quantities						
Thickness class (mm)	8 mm tape width quantity per reel				Quantity per bulk case	
	180 mm / 7"	180 mm / 7"	330 mm / 13"	330 mm / 13"		
	Paper	Blister	Paper	Blister	0603	0805
0.5 ±0.05	10 000	-	50 000	-	50 000	-
0.8 ±0.07	4 000	-	15 000	-	15 000	-
0.85 ±0.1	4 000	-	15 000	-	-	-
1.15 ±0.1	-	3 000	-	10 000	-	-
1.25 ±0.1	-	3 000	-	10 000	-	5 000
1.6 ±0.15	-	2 500	-	7 000	-	-
2.0 ±0.2	-	10 000	-	-	-	-
2.5 ±0.2	-	10 000	-	-	-	-

Ordering information								
Clear text code (preferred)								
12062F105Z6BB0D (example)								
1206	2F	105	Z	6	B	B	0	D
Size code	Temp. char.	Cap. in pF	Tolerance	Voltage	Termination	Packing	Marking	Range identifier
0603 0805 1206	2F = Y5V	105 = 1 000 000 pF The third digit signifies the multiplying factor: 5 = x 100 000 6 = x 1 000 000	Z = -20 to +80%	5 = 6.3 V 6 = 10 V	B = NiSn	2 = 180 mm / 7" paper 3 = 330 mm / 13" paper B = 180 mm / 7" blister F = 330 mm / 13" blister P = bulk case	0 = no marking	D = BME

Ordering code 12NC	
<p>2 2 X X X X X X X 9 X X X X</p>	<p>Carrier tape 22 = blister 38 = paper 50 = blister (6.3 V) 54 = bulk</p> <p>Voltage 20 = 6.3 V 24 = 10 V</p> <p>Size 7 = 0402 6 = 0603 0 = 0805 1 = 1206 2 = 1210 4 = 1812</p> <p>Capacitance value see selection chart</p> <p>Tolerance 8 = -20 to +80%</p> <p>Packing 1 = 180 mm / 7" reel 5 = 330 mm / 13" reel 4 = bulk case</p>



PRODUCT SELECTION CHART

Y5V - 16 V to 50 V, general purpose

Y5V - 16 V and 25 V										
General purpose										
Capacitance (nF)	Last two digits of 12NC	16 V					25 V			
		0402	0603	0805	1206	1210	0603	0805	1206	1210
10	36									
15	38									
22	41									
33	43	0.5 ±0.05					0.8 ±0.07			
47	45									
68	47									
100	49							0.6 ±0.1		
150	52							0.85 ±0.1	0.6 ±0.1	
220	54									
330	56		0.8 ±0.07							
470	58			0.85 ±0.1				1.25 ±0.1	0.85 ±0.1	
680	61									
1 000	63			1.25 ±0.1	0.85 ±0.1				1.15 ±0.1	
1 500	65									
2 200	67									
3 300	69				1.15 ±0.1					
4 700	72									
10 000	76					1.2 to 1.75				1.5 ±0.1
Tape width		8 mm					8 mm			

Note 1: Case size designators are inch-based; see General Information section for metric-based case size designators.

Note 2: Values in shaded cells indicate thickness class.

Y5V - 50 V				
General purpose				
Capacitance (pF)	Last two digits of 12NC	50 V		
		0603	0805	1206
10 000	05			
15 000	06			
22 000	07			
33 000	08	0.8 ±0.07	0.6 ±0.1	
47 000	09			
68 000	11			
100 000	12			
150 000	13			0.6 ±0.1
220 000	14		0.85 ±0.1	
330 000	15			0.85 ±0.1
470 000	16			
680 000	17			
1 000 000	18			1.15 ±0.1
Tape width		8 mm		

Note 1: Case size designators are inch-based; see General Information section for metric-based case size designators.

Note 2: Values in shaded cells indicate thickness class.



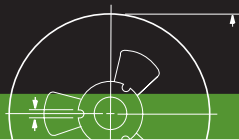
PRODUCT SELECTION CHART

Y5V - 16 V to 50 V, general purpose

Thickness classes and packing quantities								
Thickness class (mm)	8 mm tape width quantity per reel				12 mm tape width quantity per reel	Quantity per bulk case		
	180 mm / 7"	180 mm / 7"	330 mm / 13"	330 mm / 13"	180 mm / 7"			
	Paper	Blister	Paper	Blister	Blister	0402	0603	0805
0.5 ±0.05	10 000	-	50 000	-	-	50 000	-	-
0.6 ±0.1	4 000	-	20 000	-	-	-	-	10 000
0.8 ±0.07	4 000	-	15 000	-	-	-	15 000	-
0.85 ±0.1	4 000	-	15 000	-	-	-	-	8 000
1.15 ±0.1	-	3 000	-	10 000	-	-	-	-
1.25 ±0.1	-	3 000	-	10 000	-	-	-	5 000
1.5 ±0.1	-	3 000	-	-	-	-	-	-
1.2 to 1.75	-	-	-	-	1 200	-	-	-

Ordering information								
Clear text code (preferred)								
12062F684M8BB0D (example)								
1206	2F	684	M	8	B	B	0	D
Size code	Temp. char.	Cap. in pF	Tolerance	Voltage	Termination	Packing	Marking	Range identifier
0402 0603 0805 1206	2F = Y5V	684 = 680 000 pF The third digit signifies the multiplying factor: 2 = x 100 3 = x 1 000 4 = x 10 000 5 = x 100 000	M = ±20% Z = -20 to +80%	7 = 16 V 8 = 25 V 9 = 50 V	B = NiSn	2 = 180 mm / 7" paper 3 = 330 mm / 13" paper B = 180 mm / 7" blister F = 330 mm / 13" blister P = bulk case	0 = no marking	D = BME

Ordering code 12NC	
2 2 X X X X X X X 9 X X X	
Carrier tape 22 = blister 38 = paper 54 = bulk	Capacitance value see selection chart
Voltage 78 = 16 V 91 = 25 V 58 = 50 V	Tolerance 7 = ±20% 8 = -20 to +80%
Size 7 = 0402 6 = 0603 0 = 0805 1 = 1206 2 = 1210	Packing 1 = 180 mm / 7" reel 5 = 330 mm / 13" reel 4 = bulk case



PRODUCT SELECTION CHART

Z5U - 25 V and 50 V, general purpose

Z5U - 25 V and 50 V						
General purpose						
Capacitance (pF)	Last two digits of 12NC	25 V		50 V		
		0603	1206	0805	1206	1210
10 000	36					
22 000	41					
47 000	45	0.8 ±0.07		0.6 ±0.1	0.6 ±0.1	
100 000	49					
220 000	54			1.25 ±0.1		0.5 to 1.0
470 000	58		1.15 ±0.1			
1 000 000	63					0.9 to 1.3
Tape width		8 mm			8 mm	

Note 1: Case size designators are inch-based; see General Information section for metric-based case size designators.

Note 2: Values in shaded cells indicate thickness class.



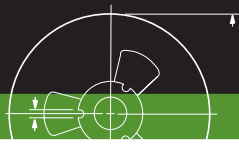
PRODUCT SELECTION CHART

Z5U - 25 V and 50 V, general purpose

Thickness classes and packing quantities						
Thickness class (mm)	8 mm tape width quantity per reel				Quantity per bulk case	
	180 mm / 7"	180 mm / 7"	330 mm / 13"	330 mm / 13"		
	Paper	Blister	Paper	Blister	0603	0805
0.6 ±0.1	4 000	-	20 000	-	-	10 000
0.8 ±0.07	4 000	-	15 000	-	15 000	-
0.5 to 1.0	-	4 000	-	10 000	-	-
0.9 to 1.3	-	3 000	-	10 000	-	-
1.15 ±0.1	-	3 000	-	10 000	-	-
1.25 ±0.1	-	3 000	-	10 000	-	5 000

Ordering information								
Clear text code (preferred)								
06032E104Z8B20D (example)								
0603	2E	104	Z	8	B	2	0	D
Size code	Temp. char.	Cap. in pF	Tolerance	Voltage	Termination	Packing	Marking	Range identifier
0603 0805 1206 1210	2E = Z5U	104 = 100 000 pF The third digit signifies the multiplying factor: 3 = x 1 000 4 = x 10 000 5 = x 100 000	M = ±20% Z = -20 to +80%	8 = 25 V 9 = 50 V	B = NiSn	2 = 180 mm / 7" paper 3 = 330 mm / 13" paper B = 180 mm / 7" blister F = 330 mm / 13" blister P = bulk case	0 = no marking	D = BME

Ordering code 12NC	
<p>2 2 X X 6 2 X X 8 X X X</p>	<p>Carrier tape 22 = blister 38 = paper 54 = bulk</p> <p>Size 5 = 0603 (25 V) 0 = 0805 (50 V) 1 = 1206 (50 V) 7 = 1206 (25 V) 2 = 1210 (50 V)</p> <p>Capacitance value see selection chart</p> <p>Tolerance 7 = ±20% 8 = -20 to +80%</p> <p>Packing 1 = 180 mm / 7" reel 5 = 330 mm / 13" reel 4 = bulk case</p>



PRODUCT SELECTION CHART

NPO - 16 V to 50 V, 2-C arrays

NPO - 16 V to 50 V				
2-C arrays				
Capacitance (pF)	Last two digits of 12NC	0405		
		16 V	25 V	50 V
10	23			
12	24			
15	25			
18	26			
22	27			
27	28			
33	29			
39	31			
47	32			
56	33			0.65 ±0.1
68	34			
82	35			
100	36			
120	37			
150	38			
180	39			
220	41			
270	42			
330	43			
390	44			
470	45		0.65 ±0.1	
560	46			
680	47	0.65 ±0.1		
820	48			
1 000	49			

Note 1: Case size designators are inch-based; see General Information section for metric-based case size designators.
Note 2: Values in shaded cells indicate thickness class.



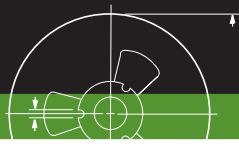
PRODUCT SELECTION CHART

NPO - 16 V to 50 V, 2-C arrays

Thickness classes and packing quantities		
Thickness class (mm)	8 mm tape width quantity per reel	
	180 mm / 7"	330 mm / 13"
	Paper	Paper
0.65 ±0.1	4 000	15 000

Ordering information								
Clear text code (preferred)								
0405CG271J7B200 (example)								
0405	CG	271	J	7	B	2	0	0
Size code	Temp. char.	Cap. in pF	Tolerance	Voltage	Termination	Packing	Marking	Range identifier
0405	CG = NPO	271 = 270 pF The third digit signifies the multiplying factor: 0 = x 1 1 = x 10 2 = x 100	J = ±5% K = ±10%	7 = 16 V 8 = 25 V 9 = 50 V	B = NiSn	2 = 180 mm / 7" paper 3 = 330 mm / 13" paper P = bulk case	0 = no marking	0 = conv. ceramic

Ordering code 12NC	
<p>2 2 X X X X 2 X 1 X X X</p> <p>Carrier tape 55 = paper 56 = bulk</p> <p>Voltage 70 = 16 V 72 = 25 V 74 = 50 V</p>	<p>Capacitance value see selection chart</p> <p>Tolerance 5 = ±5% 6 = ±10%</p> <p>Packing 1 = 180 mm / 7" reel 5 = 330 mm / 13" reel 4 = bulk case</p>



PRODUCT SELECTION CHART

X7R - 10 V to 50 V, 2-C arrays

X7R - 10 V to 50 V					
2-C arrays					
Capacitance (pF)	Last two digits of 12NC	0405			
		10 V	16 V	25 V	50 V
100	09				
120	11				
150	12				
180	13				
220	14				
270	15				
330	16				
390	17				
470	18				
560	19				
680	21				
820	22				0.65 ±0.1
1 000	23				
1 200	24				
1 500	25				
1 800	26				
2 200	27				
2 700	28				
3 300	29				
3 900	31				
4 700	32				
5 600	33				
6 800	34				
8 200	35				
10 000	36				
12 000	37				
15 000	38			0.65 ±0.1	
18 000	39				
22 000	41				
27 000	42				
33 000	43				
39 000	44		0.65 ±0.1		
47 000	45				
56 000	46				
68 000	47				
82 000	48				
100 000	49				
120 000	51	0.65 ±0.1			
150 000	52				

Note 1: Case size designators are inch-based; see General Information section for metric-based case size designators.

Note 2: Values in shaded cells indicate thickness class.



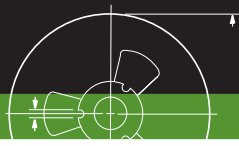
PRODUCT SELECTION CHART

X7R - 10 V to 50 V, 2-C arrays

Thickness classes and packing quantities		
Thickness class (mm)	8 mm tape width quantity per reel	
	180 mm / 7"	330 mm / 13"
	Paper	Paper
0.65 ±0.1	4 000	15 000

Ordering information								
Clear text code (preferred)								
04052R473J7B20D (example)								
0405	2R	473	J	7	B	2	0	D
Size code	Temp. char.	Cap. in pF	Tolerance	Voltage	Termination	Packing	Marking	Range identifier
0405	2R = X7R	473 = 47 000 pF The third digit signifies the multiplying factor: 1 = x 10 2 = x 100 3 = x 1 000 4 = x 10 000	J = ±5% K = ±10%	6 = 10 V 7 = 16 V 8 = 25 V 9 = 50 V	B = NiSn	2 = 180 mm / 7" paper	0 = no marking	D = BME

Ordering code 12NC	
<p>2 2 X X X X 2 X 1 X X X</p> <p>Carrier tape 55 = paper 56 = bulk</p> <p>Voltage 79 = 10 V 70 = 16 V 72 = 25 V 74 = 50 V</p>	<p>Capacitance value see selection chart</p> <p>Tolerance 5 = ±5% 6 = ±10%</p> <p>Packing 1 = 180 mm / 7" reel 5 = 330 mm / 13" reel 4 = bulk case</p>



PRODUCT SELECTION CHART

NPO - 50 V, 4-C arrays

NPO - 50 V			
4-C arrays			
Capacitance (pF)	Last two digits of 12NC	50 V	
		0508 (4 x 0402)	0612 (4 x 0603)
10	23		
12	24		
15	25		
18	26		
22	27		
27	28		
33	29		
39	31		
47	32	0.6 ±0.1	0.8 ±0.1
56	33		
68	34		
82	35		
100	36		
120	37		
150	38		
180	39		
220	41		
270	42		
330	43		
390	44		
470	45		
560	46		
680	47		
820	48		
1 000	49		
Tape width		8 mm	

Note 1: Case size designators are inch-based; see General Information section for metric-based case size designators.

Note 2: Values in shaded cells indicate thickness class.

Note 3: On request, 0805 also available in 0.85 ±0.1 mm.



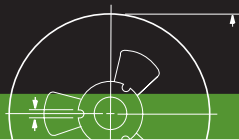
PRODUCT SELECTION CHART

NPO - 50 V, 4-C arrays

Thickness classes and packing quantities	
Thickness class (mm)	8 mm tape width quantity per reel
	180 mm / 7"
	Paper
0.6 ±0.1	4 000
0.8 ±0.1	4 000

Ordering information								
Clear text code (preferred)								
0508CG221J9B100 (example)								
0508	CG	221	J	9	B	1	0	0
Size code	Temp. char.	Cap. in pF	Tolerance	Voltage	Termination	Packing	Marking	Range identifier
0508 (4 x 0402) 0612 (4 x 0603)	CG = NP0	221 = 220 pF The third digit signifies the multiplying factor: 0 = x 1 1 = x 10 2 = x 100	J = ± 5% K = ±10%	9 = 50 V	B = NiSn	2 = 180 mm / 7" paper	0 = no marking	0 = conv. ceramic

Ordering code 12NC	
<p>2 2 X X X X X X X 1 X X X</p> <p>Carrier tape 55 = paper</p> <p>Voltage 14 = 50 V</p> <p>Size 7 = 0508 (4 x 0402) 6 = 0612 (4 x 0603)</p>	<p>Capacitance value see selection chart</p> <p>Tolerance 5 = ± 5% 6 = ±10%</p> <p>Packing 1 = 180 mm / 7" reel</p>



PRODUCT SELECTION CHART

X7R - 16 V, 4-C arrays

X7R - 16 V			
Capacitance		4-C arrays	
(pF)	Last two digits of 12NC	16 V	
		0508 (4 x 0402)	0612 (4 x 0603)
10 000	36		
15 000	38		
22 000	41	0.6 ±0.1	0.8 ±0.1
33 000	43		
47 000	45		
68 000	47		
100 000	49		
Tape width		8 mm	

Note 1: Case size designators are inch-based; see General Information section for metric-based case size designators.

Note 2: Values in shaded cells indicate thickness class.

Note 3: On request, 0805 also available in 0.85 ±0.1 mm.



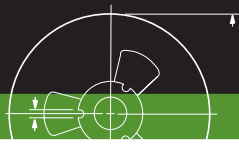
PRODUCT SELECTION CHART

X7R - 16 V, 4-C arrays

Thickness classes and packing quantities	
Thickness class (mm)	8 mm tape width quantity per reel
	180 mm / 7"
	Paper
0.6 ±0.1	4 000
0.8 ±0.1	4 000

Ordering information								
Clear text code (preferred)								
06122R103K7B10D (example)								
0612	2R	103	K	7	B	1	0	D
Size code	Temp. char.	Cap. in pF	Tolerance	Voltage	Termination	Packing	Marking	Range identifier
0508 (4 x 0402) 0612 (4 x 0603)	2R = X7R	103 = 10 000 pF The third digit signifies the multiplying factor: 3 = x 1 000 4 = x 10 000	K = ±10%	7 = 16 V	B = NiSn	2 = 180 mm / 7" paper	0 = no marking	D = BME

Ordering code 12NC	
<p>2 2 X X X X X X X 5 X X X X</p> <p>Carrier tape 55 = paper</p> <p>Voltage 10 = 16 V</p> <p>Size 7 = 0508 (4 x 0402) 6 = 0612 (4 x 0603)</p>	<p>Capacitance value see selection chart</p> <p>Tolerance 6 = ±10%</p> <p>Packing 1 = 180 mm / 7" reel</p>



PRODUCT SELECTION CHART

X7R - 25 V and 50 V, 4-C arrays

X7R - 25 V and 50 V				
4-C arrays				
Capacitance (pF)	Last two digits of 12NC	25 V	50 V	50 V
		0612 (4 x 0603)	0508 (4 x 0402)	0612 (4 x 0603)
220	14			
330	16			
470	18			
680	21			
1 000	23		0.6 ±0.1	
1 500	25			0.8 ±0.1
2 200	27			
3 300	29			
4 700	32			
6 800	34			
10 000	36			
15 000	38			
22 000	41	0.8 ±0.1		
33 000	43			
47 000	45			
68 000	47	1.2 ±0.1		
Tape width		8 mm		

Note 1: Case size designators are inch-based; see General Information section for metric-based case size designators.

Note 2: Values in shaded cells indicate thickness class.



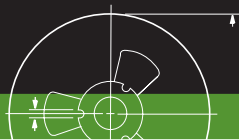
PRODUCT SELECTION CHART

X7R - 25 V and 50 V, 4-C arrays

Thickness classes and packing quantities		
Thickness class (mm)	8 mm tape width quantity per reel	
	180 mm / 7"	180 mm / 7"
	Paper	Blister
0.6 ±0.1	4 000	-
0.8 ±0.1	4 000	-
1.2 ±0.1	-	3 000

Ordering information								
Clear text code (preferred)								
06122R104K7B20D (example)								
0612	2R	104	K	7	B	2	0	D
Size code	Temp. char.	Cap. in pF	Tolerance	Voltage	Termination	Packing	Marking	Range identifier
0508 (4x 0402) 0612 (4 x 0603)	2R = X7R	104 = 100 000 pF The third digit signifies the multiplying factor: 1 = x 10 2 = x 100 3 = x 1 000 4 = x 10 000	K = ±10% M = ±20%	8 = 25 V 9 = 50 V	B = NiSn	2 = 180 mm / 7" paper B = 180 mm / 7" blister	0 = no marking	D = BME

Ordering code 12NC	
<p>2 2 X X X X X X X 5 X X X</p> <p>Carrier tape 50 = blister 55 = paper</p> <p>Voltage 12 = 25 V 14 = 50 V</p> <p>Size 6 = 0612 (4 x 0603) 7 = 0508 (4 x 0402)</p>	<p>Capacitance value see selection chart</p> <p>Tolerance 6 = ±10% 7 = ±20%</p> <p>Packing 1 = 180 mm / 7" reel</p>



PRODUCT SELECTION CHART

Y5V - 25 V, 4-C arrays

Y5V - 25 V		
4-C arrays		
Capacitance (pF)	Last two digits of 12NC	0612 (4 x 0603)
10 000	36	
22 000	41	
47 000	45	0.6 ±0.1
100 000	49	
Tape width		8 mm

Note 1: Case size designators are inch-based; see General Information section for metric-based case size designators.

Note 2: Values in shaded cells indicate thickness class.



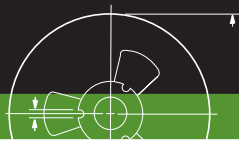
PRODUCT SELECTION CHART

Y5V - 25 V, 4-C arrays

Thickness classes and packing quantities	
Thickness class (mm)	8 mm tape width quantity per reel
	180 mm / 7"
	Paper
0.6 ±0.1	4 000

Ordering information								
Clear text code (preferred)								
06122F104Z8B20D (example)								
0612	2F	104	Z	8	B	2	0	D
Size code	Temp. char.	Cap. in pF	Tolerance	Voltage	Termination	Packing	Marking	Range identifier
0612 (4 x 0603)	2F = Y5V	104 = 100 000 pF The third digit signifies the multiplying factor: 3 = 1 000 4 = 10 000	Z = -20 to +80%	8 = 25 V	B = NiSn	2 = 180 mm / 7" paper	0 = no marking	D = BME

Ordering code 12NC	
<p>2 2 X X X X X X X 9 X X X</p>	
Carrier tape 55 = paper	Capacitance value see selection chart
Voltage 12 = 25 V	Tolerance 8 = -20 to +80%
Size 6 = 0612 (4 x 0603)	Packing 1 = 180 mm / 7" reel



PRODUCT SELECTION CHART

NPO - 50 V, feedthrough capacitors

NPO - 50 V		
Feedthrough capacitors		
Capacitance (pF)	Last two digits of 12NC	1206
47	32	
68	34	
100	36	
150	38	
220	41	0.8 ±0.1
330	43	
470	45	
680	47	
1 000	49	
Tape width		8 mm

Note 1: Case size designators are inch-based; see General Information section for metric-based case size designators.

Note 2: Values in shaded cells indicate thickness class.

Thickness classes and packing quantities	
Thickness class (mm)	8 mm tape width quantity per reel
	180 mm / 7"
	Paper
0.8 ±0.1	4 000

Ordering information								
Clear text code (preferred)								
1206CG102J9B20F (example)								
1206	CG	102	J	9	B	2	0	F
Size code	Temp. char.	Cap. in pF	Tolerance	Voltage	Termination	Packing	Marking	Range identifier
1206	CG = NPO	102 = 1000 pF The third digit signifies the multiplying factor: 0 = x 1 1 = x 10 2 = x 100	J = ± 5% K = ±10%	9 = 50 V	B = NiSn	2 = 180 mm / 7" paper	0 = no marking	F = feedthrough

Ordering code 12NC	
2 2 X X X X X X 1 X X X	
Carrier tape 55 = paper	Capacitance value see selection chart
Voltage 23 = 50 V	Tolerance 5 = ± 5% 6 = ±10%
Size 1 = 1206	Packing 1 = 180 mm / 7" reel



PRODUCT SELECTION CHART

X7R - 16 V to 50 V, feedthrough capacitors

X7R - 16 V to 50 V				
Feedthrough capacitors				
Capacitance (pF)	Last two digits of 12NC	16 V	25 V	50 V
		1206	1206	1206
4 700	32			
6 800	34			0.8 ±0.1
10 000	36			
15 000	38			
22 000	41			
33 000	43			
47 000	45		0.8 ±0.1	
68 000	47			
100 000	49			
680 000	61	1.2 ±0.15		
1 000 000	63			
Tape width		8 mm		

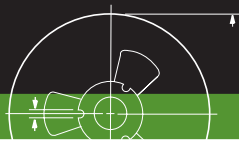
Note 1: Case size designators are inch-based; see General Information section for metric-based case size designators.

Note 2: Values in shaded cells indicate thickness class.

Thickness classes and packing quantities				
Thickness class (mm)	8 mm tape width quantity per reel		8 mm tape width quantity per reel	
	180 mm / 7"		180 mm / 7"	
	Paper		Blister	
0.8 ±0.1	4 000		-	
1.2 ±0.1	-		3 000	

Ordering information								
Clear text code (preferred)								
12062R104K9BB0F (example)								
1206	2R	104	K	9	B	B	0	F
Size code	Temp. char.	Cap. in pF	Tolerance	Voltage	Termination	Packing	Marking	Range identifier
1206	2R = X7R	104 = 100 000 pF The third digit signifies the multiplying factor: 2 = x 100 3 = x 1 000 4 = x 10 000 5 = x 100 000	K = ±10% M = ±20%	7 = 16 V 8 = 25 V 9 = 50 V	B = NiSn	2 = 180 mm / 7" paper B = 180 mm / 7" blister	0 = no marking	F = feedthrough

Ordering code 12NC	
<p>2 2 X X X X X X 5 X X X</p> <p>Carrier tape 50 = blister 55 = paper</p> <p>Voltage 53 = 16 V 52 = 25 V 23 = 50 V</p> <p>Size 1 = 1206</p>	<p>Capacitance value see selection chart</p> <p>Tolerance 6 = ±10% 7 = ±20%</p> <p>Packing 1 = 180 mm / 7" reel</p>



PRODUCT SELECTION CHART

NPO - 50 V, feedthrough 4-C arrays

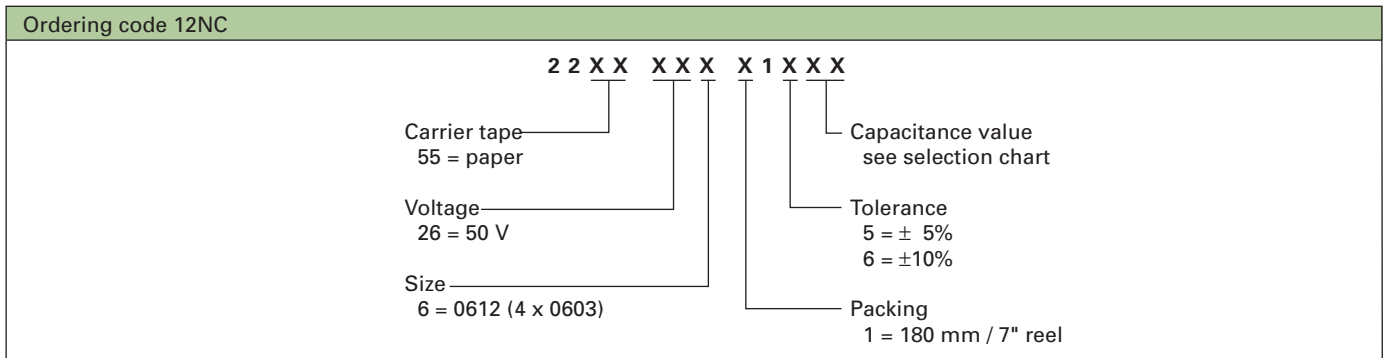
NPO - 50 V		
Feedthrough 4-C arrays		
Capacitance (pF)	Last two digits of 12NC	0612 (4 x 0603)
47	32	
56	33	
68	34	
82	35	
100	36	
120	37	0.8 ±0.1
150	38	
180	39	
220	41	
270	42	
330	43	
390	44	
470	45	
Tape width		8 mm

Note 1: Case size designators are inch-based; see General Information section for metric-based case size designators.

Note 2: Values in shaded cells indicate thickness class.

Thickness classes and packing quantities	
Thickness class (mm)	8 mm tape width quantity per reel
	180 mm / 7"
	Paper
0.8 ±0.1	4 000

Ordering information								
Clear text code (preferred)								
0612CG101J9B20F (example)								
0612	CG	101	J	9	B	2	0	F
Size code	Temp. char.	Cap. in pF	Tolerance	Voltage	Termination	Packing	Marking	Range identifier
0612 (4 x 0603)	CG = NPO	101 = 100 pF The third digit signifies the multiplying factor: 0 = x 1 1 = x 10	J = ± 5% K = ±10%	9 = 50 V	B = NiSn	2 = 180 mm / 7" paper	0 = no marking	F = feedthrough



PRODUCT SELECTION CHART

X7R - 50 V, feedthrough 4-C arrays

X7R - 50 V		
Feedthrough 4-C arrays		
Capacitance (pF)	Last two digits of 12NC	0612 (4 x 0603)
1 000	23	
1 500	25	
2 200	27	
3 300	29	0.8 ±0.1
4 700	32	
6 800	34	
10 000	36	
Tape width		8 mm

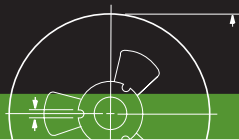
Note 1: Case size designators are inch-based; see General Information section for metric-based case size designators.

Note 2: Values in shaded cells indicate thickness class.

Thickness classes and packing quantities	
Thickness class (mm)	8 mm tape width quantity per reel
	180 mm / 7"
	Paper
0.8 ±0.1	4 000

Ordering information								
Clear text code (preferred)								
06122R102K9B20G (example)								
0612	2R	102	K	9	B	2	0	G
Size code	Temp. char.	Cap. in pF	Tolerance	Voltage	Termination	Packing	Marking	Range identifier
0612 (4 x 0603)	2R = X7R	102 = 1 000 pF The third digit signifies the multiplying factor: 2 = x 100 3 = x 1 000	K = ±10% M = ±20%	9 = 50 V	B = NiSn	2 = 180 mm / 7" paper	0 = no marking	G = FTC BME

Ordering code 12NC	
<p>2 2 X X X X X X X 5 X X X</p> <p>Carrier tape 55 = paper</p> <p>Voltage 26 = 50 V</p> <p>Size 6 = 0612 (4 x 0603)</p>	<p>Capacitance value see selection chart</p> <p>Tolerance 6 = ±10% 7 = ±20%</p> <p>Packing 1 = 180 mm / 7" reel</p>



PRODUCT SELECTION CHART

NPO - 25 V and 50 V, ultra small MLCCs

NPO - 25 V		
Ultra small MLCCs		
Capacitance (pF)	Last three digits of 12NC	0201
27	28	
33	29	
39	31	
47	32	0.3 ±0.03
56	33	
68	34	
82	35	
100	36	
Tape width		8 mm

Note 1: Case size designators are inch-based; see General Information section for metric-based case size designators.

Note 2: Values in shaded cells indicate thickness class.

NPO - 50 V		
Ultra small MLCCs		
Capacitance (pF)	Last three digits of 12NC	0201
1.0	108	
1.2	128	
1.5	158	
1.8	188	
2.2	228	
2.7	278	
3.3	338	
3.9	398	
4.7	478	0.3 ±0.03
5.6	568	
6.8	688	
8.2	828	
10	109	
12	129	
15	159	
18	189	
22	229	
Tape width		8 mm

Note 1: Case size designators are inch-based; see General Information section for metric-based case size designators.

Note 2: Values in shaded cells indicate thickness class.

Note 3: on request, 1 pF to 10 pF also available in E24.

Thickness classes and packing quantities			
Thickness class (mm)	8 mm tape width quantity per reel		Quantity per bulk case
	180 mm / 7"	330 mm / 13"	
	Paper	Paper	
0.3 ±0.03	15 000	t.b.d.	0201 t.b.d.



PRODUCT SELECTION CHART

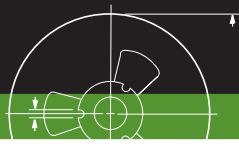
NPO - 25 V and 50 V, ultra small MLCCs

Ordering information NPO - 25 V								
Clear text code (preferred)								
0201CG101J8B200 (example)								
0201	CG	101	J	8	B	2	0	0
Size code	Temp. char.	Cap. in pF	Tolerance	Voltage	Termination	Packing	Marking	Range identifier
0201	CG = NPO	101 = 100 pF The third digit signifies the multiplying factor: 1 = x 10 2 = x 100 3 = x 1 000	G = ±2% J = ±5%	8 = 25 V	B = NiSn	2 = 180 mm / 7" paper 3 = 330 mm / 7" paper P = bulk case	0 = no marking	0 = conv. ceramic

Ordering code 12NC	
<p>2 2 X X X X X X 1 X X X</p>	<p>Carrier tape 38 = paper 54 = bulk</p> <p>Voltage 91 = 25 V</p> <p>Size 8 = 0201</p>
	<p>Capacitance value see selection chart</p> <p>Tolerance 4 = ±2% 5 = ±5%</p> <p>Packing 1 = 180 mm / 7" reel 7 = 330 mm / 13" reel 4 = bulk case</p>

Ordering information NPO - 50 V								
Clear text code (preferred)								
0201CG479J9B200 (example)								
0201	CG	479	J	9	B	2	0	0
Size code	Temp. char.	Cap. in pF	Tolerance	Voltage	Termination	Packing	Marking	Range identifier
0201	CG = NPO	479 = 4.7 pF The third digit signifies the multiplying factor: 9 = x 0.1 0 = x 1	C = ±0.25 pF D = ±0.5 pF G = ±2% J = ±5%	9 = 50 V	B = NiSn	2 = 180 mm / 7" paper 3 = 330 mm / 7" paper P = bulk case	0 = no marking	0 = conv. ceramic

Ordering code 12NC	
<p>2 2 X X X X X X X X X X</p>	<p>Carrier tape 38 = paper 54 = bulk</p> <p>Voltage 86 = 50 V</p> <p>Size 8 = 0201</p>
	<p>Capacitance value see selection chart</p> <p>Tolerance 4 = ±2% for C ≥ 10 pF = ±0.25 pF for C < 10 pF 5 = ±5% for C ≥ 10 pF = ±0.5 pF for 5 pF < C < 10 pF = ±0.25 pF for C < 5 pF</p> <p>Packing 1 = 180 mm / 7" reel 7 = 330 mm / 13" reel 4 = bulk case</p>



PRODUCT SELECTION CHART

X7R - 16 V to 50 V, ultra small MLCCs

X7R - 16 V to 50 V				
Ultra small MLCCs				
Capacitance (pF)	Last two digits of 12NC	16 V	25 V	50 V
		0201	0201	0201
47	05			
56	06			
68	07			
82	08			
100	09			
120	11			
150	12			0.3 ±0.03
180	13			
220	14			
270	15			
330	16			
390	17			
470	18			
560	19			
680	21			
820	22		0.3 ±0.03	
1 000	23			
1 200	24			
1 500	25			
1 800	26			
2 200	27	0.3 ±0.03		
2 700	28			
3 300	29			
Tape width		8 mm		

Note 1: Case size designators are inch-based; see General Information section for metric-based case size designators.

Note 2: Values in shaded cells indicate thickness class.



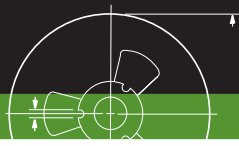
PRODUCT SELECTION CHART

X7R - 16 V to 50 V, ultra small MLCCs

Thickness classes and packing quantities			
Thickness class (mm)	8 mm tape width quantity per reel		
	180 mm / 7"	330 mm / 13"	Quantity per bulk case
	Paper	Paper	0201
0.3 ±0.03	15 000	t.b.d.	t.b.d.

Ordering information								
Clear text code (preferred)								
02012R102J8B20D (example)								
0201	2R	102	J	7	B	2	0	D
Size code	Temp. char.	Cap. in pF	Tolerance	Voltage	Termination	Packing	Marking	Range identifier
0201	2R = X7R	102 = 1 000 pF The third digit signifies the multiplying factor: 0 = x 1 1 = x 10 3 = x 100	J = ± 5% K = ±10%	7 = 16 V 8 = 25 V 9 = 50 V	B = NiSn	2 = 180 mm / 7" paper 3 = 330 mm / 13" paper P = bulk case	0 = no marking	D = BME

Ordering code 12NC	
<p>2 2 X X X X X X X X</p> <p>Carrier tape 38 = paper 54 = bulk</p> <p>Voltage 78 = 16 V 91 = 25 V 58 = 50 V</p> <p>Size 8 = 0201</p>	<p>Capacitance value see selection chart</p> <p>Tolerance 5 = ± 5% 6 = ±10%</p> <p>Packing 1 = 180 mm / 7" reel 5 = 330 mm / 13" reel 4 = bulk case</p>



PRODUCT SELECTION CHART

NP0, X7R and Y5V - X2Y series EMI filter capacitors

NP0					
Size	y-capacitor		x-capacitor		Thickness (mm)
	Capacitance (pF)	U _R (V)	Capacitance (pF)	U _R (V)	
0603	33	100	17	200	0.60
0603	100	100	50	200	0.60
0805	33	100	17	200	0.85
0805	100	100	50	200	0.85

Note 1: Case size designators are inch-based; see General Information section for metric-based case size designators.

X7R					
Size	y-capacitor		x-capacitor		Thickness (mm)
	Capacitance (nF)	U _R (V)	Capacitance (nF)	U _R (V)	
0603	10	25	5	50	0.60
0603	100	10	50	16	0.60
0805	10	63	5	100	0.85
0805	100	16	50	25	0.85
1206	100	63	50	100	1.20
1206	180	25	90	50	1.20
1206	470	16	235	25	1.20
1210	220	63	110	100	1.60
1210	560	25	280	50	1.60
1210	1 000	16	500	25	1.60
1812	470	63	235	100	1.60

Note 1: Case size designators are inch-based; see General Information section for metric-based case size designators.

Y5V					
Size	y-capacitor		x-capacitor		Thickness (mm)
	Capacitance (nF)	U _R (V)	Capacitance (nF)	U _R (V)	
0603	220	16	110	25	0.60
0805	470	16	235	25	0.85
1206	2 200	16	1 100	25	1.20
1210	4 700	16	2 350	25	1.60

Note 1: Case size designators are inch-based; see General Information section for metric-based case size designators.

Thickness classes and packing quantities					
Thickness class (mm)	8 mm tape width quantity per reel				12 mm tape width quantity per reel
	0603 to 1210				1812
	180 mm / 7"		330 mm / 13"		180 mm / 7"
	Paper	Blister	Paper	Blister	Blister
0.6 ±0.1	4 000	-	25 000	-	-
0.85±0.1	4 000	-	15 000	-	-
1.2±0.15	-	2 500	-	10 000	-
1.6 ±0.15	-	2 500	-	7 000	1 200



PRODUCT SELECTION CHART

NP0, X7R and Y5V - X2Y series EMI filter capacitors

Ordering information						
Clear text code to 12NC cross reference						
TC	Size	y-capacitor			CTC ordering code	12NC ordering code
		Capacitance	Tolerance %	U _R (V)		
NP0	0603	33 pF	±10	100	X 0603 KR NP0 0BN 330	2259 096 11629
NP0	0603	47 pF	±10	100	X 0603 KR NP0 0BN 470	2259 096 11632
NP0	0603	100 pF	±10	100	X 0603 KR NP0 0BN 101	2259 096 11636
NP0	0805	33 pF	±10	100	X 0805 KR NP0 0BN 330	2259 090 11629
NP0	0805	47 pF	±10	100	X 0805 KR NP0 0BN 470	2259 090 11632
NP0	0805	100 pF	±10	100	X 0805 KR NP0 0BN 101	2259 090 11636
X7R	0603	10 nF	±10	25	X 0603 KR X7R 8BB 103	2259 076 15636
X7R	0603	22 nF	±10	25	X 0603 KR X7R 8BB 223	2259 076 15641
X7R	0603	47 nF	±10	16	X 0603 KR X7R 7BB 473	2259 056 15645
X7R	0603	100 nF	±10	10	X 0603 KR X7R 6BB 104	2259 056 15649
X7R	0805	10 nF	±10	100	X 0805 KR X7R 0BB 103	2259 090 15636
X7R	0805	15 nF	±10	100	X 0805 KR X7R 0BB 153	2259 090 15638
X7R	0805	39 nF	±10	25	X 0805 KR X7R 8BB 393	2259 070 15644
X7R	0805	47 nF	±10	16	X 0805 KR X7R 7BB 473	2259 060 15645
X7R	0805	100 nF	±10	16	X 0805 KR X7R 7BB 104	2259 060 15649
X7R	1206	22 nF	±10	100	X 1206 KK X7R 0BB 223	2259 091 25641
X7R	1206	47 nF	±10	63	X 1206 KK X7R 9BB 473	2259 081 25645
X7R	1206	100 nF	±10	63	X 1206 KK X7R 9BB 104	2259 081 25649
X7R	1206	180 nF	±10	25	X 1206 KK X7R 8BB 184	2259 071 25653
X7R	1206	470 nF	±10	16	X 1206 KK X7R 7BB 474	2259 061 25658
X7R	1210	100 nF	±10	100	X 1210 KK X7R 0BB 104	2259 092 25649
X7R	1210	220 nF	±10	63	X 1210 KK X7R 9BB 224	2259 082 25654
X7R	1210	560 nF	±10	25	X 1210 KK X7R 8BB 564	2259 072 25659
X7R	1210	1000 nF	±10	16	X 1210 KK X7R 7BB 105	2259 062 25663
X7R	1812	220 nF	±10	100	X 1812 KK X7R 0BB 224	2259 094 25654
X7R	1812	270 nF	±10	100	X 1812 KK X7R 0BB 274	2259 094 25655
X7R	1812	330 nF	±10	100	X 1812 KK X7R 0BB 334	2259 094 25656
X7R	1812	470 nF	±10	63	X 1812 KK X7R 9BB 474	2259 084 25658
X7R	1812	680 nF	±10	25	X 1812 KK X7R 8BB 684	2259 074 25661
Y5V	0603	220 nF	+20%/-80%	16	X 0603 ZR Y5V 7BB 244	2259 066 19854
Y5V	0805	470 nF	+20%/-80%	16	X 0805 ZR Y5V 7BB 474	2259 060 19858
Y5V	1206	2.2 µF	+20%/-80%	16	X 1206 ZK Y5V 7BB 225	2259 061 19867
Y5V	1210	4.7 µF	+20%/-80%	16	X 1210 ZK Y5V 7BB 475	2259 062 19872

Note: X2Y products are coded according to the properties of the y-capacitors.

Clear text code (CTC)

X 0805 K K X7R 9 B B 104

Series name _____
X = X2Y series

Size code, inches (mm) _____
0603 (1608)
0805 (2012)
1206 (3216)
1210 (3225)
1812 (4532)

Capacitance tolerance _____
K = ±10%
Z = -20 to 80%

Packing _____
R = paper; 180 mm / 7"
P = paper; 330 mm / 13" reel
K = blister; 330 mm / 13" reel

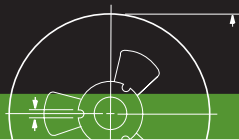
Temperature characteristic _____
NP0
X7R
Y5V

Capacitance value pF
223 = 22 000 pF
The third digit signifies the multiplying factor:
0 = x 1 4 = x 10 000
1 = x 10 5 = x 100 000
2 = x 100 6 = x 1 000 000
3 = x 1 000

B = X7R/Y5V
N = NP0

Termination material
B = NiSn

Rated voltage
6 = 10 V
7 = 16 V
8 = 25 V
9 = 50 V / 63 V
0 = 100 V



ENGINEERING DESIGN KITS

0201 and 0402 sample kits

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

100 pieces per value; Ordering code:4322 044 07111.

0402 sample kit			
NP0 50 V		X7R 50 V	
Capacitance (pF)	Tolerance	Capacitance (pF)	Tolerance
0.47	±0.25 pF	100	±10%
0.68	±0.25 pF	150	±10%
1	±0.25 pF	220	±10%
1.5	±0.25 pF	330	±10%
2.2	±0.25 pF	470	±10%
3.3	±0.25 pF	680	±10%
4.7	±0.25 pF	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%	X7R 16 V	
100	±5%	Capacitance (pF)	Tolerance
150	±5%	6 800	±10%
220	±5%	10 000	±10%
		15 000	±10%
		22 000	±10%
Y5V 16 V			
Capacitance (pF)	Tolerance		
10 000	±20%		
22 000	±20%		
47 000	±20%		
100 000	±20%		

95 pieces per value; Ordering code:4322 044 09911.



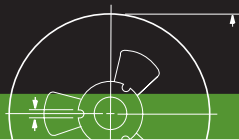
0603 sample kit					
NP0 50 V		NP0 25 V		X7R 16 V	
Capacitance (pF)	Tolerance	Capacitance (pF)	Tolerance	Capacitance (pF)	Tolerance
0.47	±0.25 pF	1 000	±5%	33 000	±10%
0.68	±0.25 pF	1 500	±5%	47 000	±10%
1	±0.25 pF	X7R 50 V		68 000	±10%
1.5	±0.25 pF	Capacitance (pF)	Tolerance	100 000	±10%
2.2	±0.25 pF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

48 pieces per value; Ordering code: 4322 044 07121.

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

48 pieces per value; Ordering code: 4322 044 07131.





ENGINEERING DESIGN KITS

1206 sample kit

1206 sample kit					
NP0 50 V		NP0 25 V		X7R 16 V	
Capacitance (pF)	Tolerance	Capacitance (pF)	Tolerance	Capacitance (pF)	Tolerance
0.47	±0.25 pF	10 000	±5%	330 000	±10%
0.68	±0.25 pF	X7R 50 V		470 000	±10%
1	±0.25 pF	Capacitance (pF)	Tolerance	680 000	±10%
1.5	±0.25 pF	220	±10%	1 000 000	±10%
2.2	±0.25 pF	330	±10%	Y5V 50 V	
3.3	±0.25 pF	470	±10%	Capacitance (pF)	Tolerance
4.7	±0.25 pF	680	±10%	100 000	±20%
6.8	±0.50 pF	1 000	±10%	220 000	±20%
10	±5%	1 500	±10%	470 000	±20%
15	±5%	2 200	±10%	1 000 000	±20%
22	±5%	3 300	±10%		
33	±5%	4 700	±10%		
47	±5%	6 800	±10%		
68	±5%	10 000	±10%		
100	±5%	15 000	±10%		
150	±5%	22 000	±10%		
220	±5%	33 000	±10%		
330	±5%	47 000	±10%		
470	±5%	68 000	±10%		
680	±5%	100 000	±10%		
1 000	±5%	150 000	±10%		
1 500	±5%	220 000	±10%		
2 200	±5%				
3 300	±5%				
4 700	±5%				
6 800	±5%				

48 pieces per value; Ordering code: 4322 044 07141.



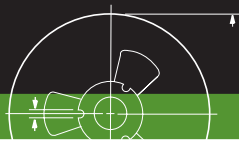
all sizes, all types, E1 series only			
0402		0805	
NP0 50 V		NP0 50 V	
Capacitance (pF)	Tolerance	Capacitance (pF)	Tolerance
1	±0.25 pF	1	±0.25 pF
10	±5%	10	±5%
100	±5%	100	±5%
X7R 50 V		1 000	±5%
Capacitance (pF)	Tolerance	X7R 50 V	
100	±10%	Capacitance (pF)	Tolerance
1 000	±10%	1 000	±10%
X7R 16 V		10 000	±10%
Capacitance (pF)	Tolerance	100 000	±10%
10 000	±10%	X7R 10 V	
Y5V 16 V		Capacitance (pF)	Tolerance
Capacitance (pF)	Tolerance	1 000 000	±10%
100 000	±20%	Y5V 10 V	
		Capacitance (pF)	Tolerance
		4 700 000	-20/+80%

0603		1206	
NP0 50 V		NP0 50 V	
Capacitance (pF)	Tolerance	Capacitance (pF)	Tolerance
1	±0.25 pF	1	±0.25 pF
10	±5%	10	±5%
100	±5%	100	±5%
X7R 50 V		1 000	±5%
Capacitance (pF)	Tolerance	X7R 50 V	
100	±10%	Capacitance (pF)	Tolerance
1 000	±10%	1 000	±10%
10 000	±10%	10 000	±10%
X7R 16 V		100 000	±10%
Capacitance (pF)	Tolerance	X7R 16 V	
100 000	±10%	Capacitance (pF)	Tolerance
Y5V 10 V		1 000 000	±10%
Capacitance (pF)	Tolerance	Y5V 10 V	
1 000 000	-20/+80%	Capacitance (pF)	Tolerance
		10 000 000	-20/+80%

Microwave 50 V				
Capacitance (pF)	Tolerance	Voltage	Size	Dillectric
1	±0,25 pF	50 V	0603	NP0
10	±5%	50 V	0805	NP0
100	±5%	50 V	1206	NP0
Array (4 x 0603)				
Capacitance (pF)	Tolerance	Voltage	Size	Dillectric
100	±5%	50 V	1206	NP0
1 000	±5%	50 V	1206	NP0
10 000	±10%	25 V	1206	X7R
100 000	±10%	16 V	1206	X7R
High voltage				
Capacitance (pF)	Tolerance	Voltage	Size	Dillectric
10	±5%	3 kV	1808	NP0
100	±5%	3 kV	1812	NP0
10 000	±10%	1 kV	1812	X7R

48 Pieces per value (95 pieces for 0402 and 25 pieces for 1812); Ordering code: 4322 045 00581.





12NC CROSS REFERENCE

12NC to description cross reference

12NC to description cross reference					
12NC	Description	Page	12NC	Description	Page
2222 20. .9. . .	Y5V 6.3 V, General purpose	34	2250 52. .5. . .	X7R 25 V, Feedthrough capacitors	53
2222 24. .3. . .	X5R 10 V, General purpose	22	2250 53. .5. . .	X7R 16 V, Feedthrough capacitors	53
2222 24. .5. . .	X7R 10 V, General purpose	24	2254 20. .9. . .	Y5V 6.3 V, General purpose	34
2222 24. .9. . .	Y5V 10 V, General purpose	34	2254 24. .5. . .	X7R 10 V, General purpose	24
2222 58. .5. . .	X7R 50 V, General purpose	28	2254 24. .9. . .	Y5V 10 V, General purpose	34
2222 58. .9. . .	Y5V 50 V, General purpose	36	2254 574 .1. . .	NP0 50 V, Microwave	20
2222 60. .1. . .	NP0 100 V, General purpose	14	2254 576 .1. . .	NP0 50 V, Microwave	20
2222 60. .5. . .	X7R 100 V, General purpose	28	2254 578 .1. . .	NP0 50 V, Microwave	20
2222 62. .8. . .	Z5U 25 V and 50 V, General purpose	38	2254 58. .5. . .	X7R 50 V, Ultra small MLCCs	58
2222 78. .1. . .	NP0 16 V, General purpose	8	2254 58. .5. . .	X7R 50 V, General purpose	28
2222 78. .5. . .	X7R 16 V, General purpose	26	2254 58. .9. . .	Y5V 50 V, General purpose	36
2222 78. .9. . .	Y5V 16 V, General purpose	36	2254 60. .1. . .	NP0 100 V, General purpose	14
2222 86.	NP0 50 V, General purpose	12	2254 60. .5. . .	X7R 100 V, General purpose	28
2222 91. .1. . .	NP0 25 V, General purpose	10	2254 62. .8. . .	Z5U 25 V and 50 V, General purpose	38
2222 91. .5. . .	X7R 25 V, General purpose	26	2254 78. .5. . .	X7R 16 V, Ultra small MLCCs	58
2222 91. .9. . .	Y5V 25 V, General purpose	36	2254 78. .1. . .	NP0 16 V, General purpose	8
2222 93. .1. . .	NP0 200 V, High voltage	16	2254 78. .5. . .	X7R 16 V, General purpose	26
2222 93. .5. . .	X7R 200 V, High voltage	30	2254 78. .9. . .	Y5V 16 V, General purpose	36
2222 97. .1. . .	NP0 500 V, High voltage	16	2254 86.	NP0 50 V, General purpose	12
2222 97. .5. . .	X7R 500 V, High voltage	30	2254 86.	NP0 50 V, Ultra small MLCCs	56
2238 20. .9. . .	Y5V 6.3 V, General purpose	34	2254 91.	NP0 25 V, Ultra small MLCCs	56
2238 24. .3. . .	X5R 10 V, General purpose	22	2254 91. .5. . .	X7R 25 V, Ultra small MLCCs	58
2238 24. .5. . .	X7R 10 V, General purpose	24	2254 91. .1. . .	NP0 25 V, General purpose	10
2238 24. .9. . .	Y5V 10 V, General purpose	34	2254 91. .5. . .	X7R 25 V, General purpose	28
2238 574 .1. . .	NP0 50 V, Microwave	20	2254 91. .9. . .	Y5V 25 V, General purpose	36
2238 576 .1. . .	NP0 50 V, Microwave	20	2254 93. .1. . .	NP0 200 V, High voltage	16
2238 578 .1. . .	NP0 50 V, Microwave	20	2254 93. .5. . .	X7R 200 V, High voltage	30
2238 58. .5. . .	X7R 50 V, Ultra small MLCCs	58	2254 97. .1. . .	NP0 500 V, High voltage	16
2238 58. .5. . .	X7R 50 V, General purpose	28	2254 97. .5. . .	X7R 500 V, High voltage	30
2238 58. .9. . .	Y5V 50 V, General purpose	36	2255 06. .5. . .	X7R 50 V, Low inductance	33
2238 60. .1. . .	NP0 100 V, General purpose	14	2255 07. .5. . .	X7R 25 V, Low inductance	33
2238 60. .5. . .	X7R 100 V, General purpose	28	2255 08. .5. . .	X7R 16 V, Low inductance	33
2238 62. .8. . .	Z5U 25 V and 50 V, General purpose	38	2255 10. .5. . .	X7R 16 V, 4-C arrays	46
2238 78. .5. . .	X7R 16 V, Ultra small MLCCs	58	2255 12. .5. . .	X7R 25 V, 4-C arrays	48
2238 78. .1. . .	NP0 16 V, General purpose	8	2255 12. .9. . .	Y5V 25 V, 4-C arrays	50
2238 78. .5. . .	X7R 16 V, General purpose	26	2255 14. .1. . .	NP0 50 V, 4-C arrays	44
2238 78. .9. . .	Y5V 16 V, General purpose	36	2255 14. .5. . .	X7R 50 V, 4-C arrays	48
2238 86.	NP0 50 V, General purpose	12	2255 20. .3. . .	X5R 6.3 V, General purpose	22
2238 86.	NP0 50 V, Ultra small MLCCs	56	2255 23. .1. . .	NP0 50 V, Feedthrough capacitors	52
2238 91.	NP0, 25 V, Ultra small MLCCs	56	2255 23. .5. . .	X7R 50 V, Feedthrough capacitors	53
2238 91. .5. . .	X7R 25 V, Ultra small MLCCs	58	2255 26. .1. . .	NP0 50 V, Feedthrough 4-C arrays	54
2238 91. .1. . .	NP0 25 V, General purpose	10	2255 26. .5. . .	X7R 50 V, Feedthrough 4-C arrays	55
2238 91. .5. . .	X7R 25 V, General purpose	26	2255 52. .5. . .	X7R 25 V, Feedthrough capacitors	53
2238 91. .9. . .	Y5V 25 V, General purpose	36	2255 53. .5. . .	X7R 16 V, Feedthrough capacitors	53
2238 93. .1. . .	NP0 200 V, High voltage	16	2255 702 .1. . .	NP0 16 V, 2-C arrays	40
2238 93. .5. . .	X7R 200 V, High voltage	30	2255 702 .5. . .	X7R 16 V, 2-C arrays	42
2238 97. .1. . .	NP0 500 V, High voltage	16	2255 722 .1. . .	NP0 25 V, 2-C arrays	40
2238 97. .5. . .	X7R 500 V, High voltage	30	2255 722 .5. . .	X7R 25 V, 2-C arrays	42
2250 00. .1. . .	NP0 1 kV, High voltage	18	2255 742 .1. . .	NP0 50 V, 2-C arrays	40
2250 00. .5. . .	X7R 1 kV, High voltage	32	2255 742 .5. . .	X7R 50 V, 2-C arrays	42
2250 01.	NP0 2 kV, High voltage	18	2255 792 .5. . .	X7R 10 V, 2-C arrays	42
2250 02. .5. . .	X7R 2 kV, High voltage	32	2259	NP0, X7R and Y5V EMI filters	60
2250 04. .1. . .	NP0 3 kV, High voltage	18	4322 044 07111	MLCC sample kit, 0201	62
2250 12. .5. . .	X7R 25 V, 4-C arrays	48	4322 044 07121	MLCC sample kit, 0603	63
2250 14. .5. . .	X7R 50 V, 4-C arrays	48	4322 044 07131	MLCC sample kit, 0805	63
2250 20. .3. . .	X5R 6.3 V, General purpose	22	4322 044 07141	MLCC sample kit, 1206	64
2250 20. .9. . .	Y5V 6.3 V, General purpose	34	4322 044 09911	MLCC sample kit, 0402	62
2250 23. .5. . .	X7R 50 V, Feedthrough capacitors	53	4322 045 00581	MLCC sample kit, all sizes	65
2250 50. .1. . .	NP0 4 kV, High voltage	18			

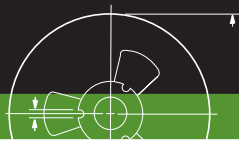


DESCRIPTION CROSS REFERENCE

Description to 12NC cross reference

12NC to description cross reference					
Description	12NC	Page	Description	12NC	Page
NP0 16 V, General purpose	2222 78. .1 . . .	8	Y5V 6.3 V, General purpose	2222 20. .9 . . .	34
NP0 16 V, General purpose	2238 78. .1 . . .	8	Y5V 6.3 V, General purpose	2238 20. .9 . . .	34
NP0 16 V, General purpose	2254 78. .1 . . .	8	Y5V 6.3 V, General purpose	2250 20. .9 . . .	34
NP0 25 V, General purpose	2222 91. .1 . . .	10	Y5V 6.3 V, General purpose	2254 20. .9 . . .	34
NP0 25 V, General purpose	2238 91. .1 . . .	10	Y5V 10 V, General purpose	2222 24. .9 . . .	34
NP0 25 V, General purpose	2254 91. .1 . . .	10	Y5V 10 V, General purpose	2238 24. .9 . . .	34
NP0 50 V, General purpose	2222 86.	12	Y5V 10 V, General purpose	2254 24. .9 . . .	34
NP0 50 V, General purpose	2238 86.	12	Y5V 16 V, General purpose	2222 78. .9 . . .	36
NP0 50 V, General purpose	2254 86.	12	Y5V 16 V, General purpose	2238 78. .9 . . .	36
NP0 100 V, General purpose	2222 60. .1 . . .	14	Y5V 16 V, General purpose	2254 78. .9 . . .	36
NP0 100 V, General purpose	2238 60. .1 . . .	14	Y5V 25 V, General purpose	2222 91. .9 . . .	36
NP0 100 V, General purpose	2254 60. .1 . . .	14	Y5V 25 V, General purpose	2238 91. .9 . . .	36
NP0 200 V, High voltage	2222 93. .1 . . .	16	Y5V 25 V, General purpose	2254 91. .9 . . .	36
NP0 200 V, High voltage	2238 93. .1 . . .	16	Y5V 50 V, General purpose	2222 58. .9 . . .	36
NP0 200 V, High voltage	2254 93. .1 . . .	16	Y5V 50 V, General purpose	2238 58. .9 . . .	36
NP0 500 V, High voltage	2222 97. .1 . . .	16	Y5V 50 V, General purpose	2254 58. .9 . . .	36
NP0 500 V, High voltage	2238 97. .1 . . .	16	Z5U 25 V and 50 V, General purpose	2222 62. .8 . . .	38
NP0 500 V, High voltage	2254 97. .1 . . .	16	Z5U 25 V and 50 V, General purpose	2238 62. .8 . . .	38
NP0 1 kV, High voltage	2250 00. .1 . . .	18	Z5U 25 V and 50 V, General purpose	2254 62. .8 . . .	38
NP0 2 kV, High voltage	2250 02. .1 . . .	18	NP0 16 V, 2-C arrays	2255 702 .1 . . .	40
NP0 3 kV, High voltage	2250 04. .1 . . .	18	NP0 25 V, 2-C arrays	2255 722 .1 . . .	40
NP0 4 kV, High voltage	2250 50. .1 . . .	18	NP0 50 V, 2-C arrays	2255 742 .1 . . .	40
NP0 50 V, Microwave	2238 578 .1 . . .	20	X7R 10 V, 2-C arrays	2255 792 .5 . . .	42
NP0 50 V, Microwave	2254 578 .1 . . .	20	X7R 16 V, 2-C arrays	2255 702 .5 . . .	42
NP0 50 V, Microwave	2238 574 .1 . . .	20	X7R 25 V, 2-C arrays	2255 722 .5 . . .	42
NP0 50 V, Microwave	2254 574 .1 . . .	20	X7R 50 V, 2-C arrays	2255 742 .5 . . .	42
NP0 50 V, Microwave	2238 576 .1 . . .	20	NP0 50 V, 4-C arrays	2255 14. .1 . . .	44
NP0 50 V, Microwave	2254 576 .1 . . .	20	X7R 16 V, 4-C arrays	2255 10. .5 . . .	46
X5R 6.3 V, General purpose	2250 20. .3 . . .	22	X7R 25 V, 4-C arrays	2250 12. .5 . . .	48
X5R 6.3 V, General purpose	2255 20. .3 . . .	22	X7R 25 V, 4-C arrays	2255 12. .5 . . .	48
X5R 10 V, General purpose	2222 24. .3 . . .	22	X7R 50 V, 4-C arrays	2250 14. .5 . . .	48
X5R 10 V, General purpose	2238 24. .3 . . .	22	X7R 50 V, 4-C arrays	2255 14. .5 . . .	48
X7R 10 V, General purpose	2222 24. .5 . . .	24	Y5V 25 V, 4-C arrays	2255 12. .9 . . .	50
X7R 10 V, General purpose	2238 24. .5 . . .	24	NP0 50 V, Feedthrough capacitors	2255 23. .1 . . .	52
X7R 10 V, General purpose	2254 24. .5 . . .	24	X7R 16 V, Feedthrough capacitors	2250 53. .5 . . .	53
X7R 16 V, General purpose	2222 78. .5 . . .	26	X7R 16 V, Feedthrough capacitors	2255 53. .5 . . .	53
X7R 16 V, General purpose	2238 78. .5 . . .	26	X7R 25 V, Feedthrough capacitors	2250 52. .5 . . .	53
X7R 16 V, General purpose	2254 78. .5 . . .	26	X7R 25 V, Feedthrough capacitors	2255 52. .5 . . .	53
X7R 25 V, General purpose	2222 91. .5 . . .	26	X7R 50 V, Feedthrough capacitors	2250 23. .5 . . .	53
X7R 25 V, General purpose	2238 91. .5 . . .	26	X7R 50 V, Feedthrough capacitors	2255 23. .5 . . .	53
X7R 25 V, General purpose	2254 91. .5 . . .	26	NP0 50 V, Feedthrough 4-C arrays	2255 26. .1 . . .	54
X7R 50 V, General purpose	2222 58. .5 . . .	28	X7R 50 V, Feedthrough 4-C arrays	2255 26. .5 . . .	55
X7R 50 V, General purpose	2238 58. .5 . . .	28	NP0 25 V, Ultra small MLCCs	2238 91.	56
X7R 50 V, General purpose	2254 58. .5 . . .	28	NP0 25 V, Ultra small MLCCs	2254 91.	56
X7R 100 V, General purpose	2222 60. .5 . . .	28	NP0 50 V, Ultra small MLCCs	2238 86.	56
X7R 100 V, General purpose	2238 60. .5 . . .	28	NP0 50 V, Ultra small MLCCs	2254 86.	56
X7R 100 V, General purpose	2254 60. .5 . . .	28	X7R 16 V, Ultra small MLCCs	2238 78. .5 . . .	58
X7R 200 V, High voltage	2222 93. .5 . . .	30	X7R 16 V, Ultra small MLCCs	2254 78. .5 . . .	58
X7R 200 V, High voltage	2238 93. .5 . . .	30	X7R 25 V, Ultra small MLCCs	2238 91. .5 . . .	58
X7R 200 V, High voltage	2254 93. .5 . . .	30	X7R 25 V, Ultra small MLCCs	2254 91. .5 . . .	58
X7R 500 V, High voltage	2222 97. .5 . . .	30	X7R 50 V, Ultra small MLCCs	2238 58. .5 . . .	58
X7R 500 V, High voltage	2238 97. .5 . . .	30	X7R 50 V, Ultra small MLCCs	2254 58. .5 . . .	58
X7R 500 V, High voltage	2254 97. .5 . . .	30	NP0, X7R and Y5V EMI filters	2259	60
X7R 1 kV, High voltage	2250 00. .5 . . .	32	MLCC sample kit 0201	4322 044 07111	62
X7R 2 kV, High voltage	2250 01. .5 . . .	32	MLCC sample kit 0402	4322 044 09911	62
X7R 16 V, Low inductance	2255 08. .5 . . .	33	MLCC sample kit 0603	4322 044 07121	63
X7R 25 V, Low inductance	2255 07. .5 . . .	33	MLCC sample kit 0805	4322 044 07131	63
X7R 50 V, Low inductance	2255 06. .5 . . .	33	MLCC sample kit 1206	4322 044 07141	64
			MLCC sample kit, all sizes	4322 045 00581	65





COMPETITOR CROSS REFERENCE

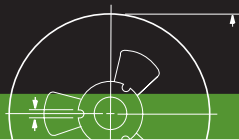
MLCC cross reference

Manufacturer	Yageo	Phycomp	AVX	Kemet	Murata	NIC	Panasonic	Rohm	Samsung	TDK	Vishay Vitramon
1 Series	CC	-	-	C	GRM	NMC	ECU	MCH	CL	CC	VJ
Case size											
0402	0402	0402	0402	0402	36	0402	Q	15	5	0402	0402
2 0603	0603	0603	0603	0603	39	0603	V	18	10	0603	0603
0805	0805	0805	0805	0805	40	0805	N/G	21	21	0805	0805
1206	1206	1206	1206	1206	42-6	1206	M/H	31	31	1206	1206
Temperature coefficient											
NP0	NP0	CG	A	G	C0G	NP0	C	A	C	NP0	A
3 X7R	X7R	2R	C	R	X7R	X7R	B	C	B	X7R	X
Z5U	Z5U	2E	E	U	Z5U	Z5U	-	E	E	Z5U	U
Y5V	Y5V	2F	G	V	Y5V	Y5V	F	F	F	Y5V	-
4 Nominal capacitance	(examples)										
	0.01 μ F = 103		470 pF = 471			2.2 pF = 2R2			0.5 pF = 0R5		
5 Capacitance tolerance		B	C	D	F	G	J	K	M	Z	
		± 0.1 pF	± 0.25 pF	± 0.50 pF	$\pm 1.0\%$	$\pm 2.0\%$	$\pm 5.0\%$	$\pm 10\%$	$\pm 20\%$	80% - 20%	
6 Rated voltage											
16 V	7	7	Y	4	016	16	1C	3	O	C	-
25 V	8	8	3	3	025	25	1E	2	A	E	X
50 V	9	9	5	5	050	50	1H	5	B	H	A
100 V	0	0	1	1	100	100	-	-	C	-	B
7 Termination											
NiBar	B	B	T	C	(GRM)	-	-	(MCH)	N	-	X
AgPd	-	-	1	-	(GR)	-	-	(MC)	-	-	F
8 Packing											
Bulk	-	-	B	-	B	-	X	-	B	B	B
Paper tape 7" reel	R	2	N	-	D	-	V	K	C	-	C
Paper tape 13" reel	P	3	S	-	J	-	Y	L	D	-	P
Blister tape 7" reel	K	B	M	-	L	-	W	P	E	T	T
Blister tape 13" reel	F	F	R	-	K	-	Z	Q	F	-	R
Bulk cassette	C	P	7	-	-	-	C	C	P	M	-

Company	Sample P/N	Description	MLCC	0402	20%	25 V	Y5V	NiBar		22nF
Yageo	CC0402MRY5V7BN223	1	2	5	8	3	6	7	BME	4
		CC	0402	M	R	Y5V	8	B	B	223
Phycomp	04022F223M8B20D	2	3	4	5	6	7	8	BME	
		0402	2F	223	M	8	B	2	D	
AVX	04023E223AT2	2	6	3	4	-	7	8		
		0402	3	E	223	A	T	2		
Kemet	C0402C223M3VAC	1	2	Std.	4	5	6	3	N/A	7
		C	0402	C	223	M	3	V	A	C
Murata	GRM36Y5V223M016D	1	2	3	4	5	6	7		
		GRM	36	Y5V	223	M	025	D		
Panasonic	ECUE1E223MFQ	1	8	6	4	5	3	2		
		ECU	E	1E	223	M	F	Q		
Rohm	MCH15016F223ZK	1	2	6	3	4	5	8		
		MCH	15	025	F	223	M	K		
Vishay Vitramon	VJ0402-223MXXC	1	2	3	4	5	7	6	8	
		VJ	0402	-	223	M	X	X	C	







GENERAL INFORMATION

Standard series of values in a decade according to IEC 63

E6 series:	10	15	22	33	47	68						
E12 series:	10	12	15	18	22	27	33	39	47	56	68	82
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	769	787	806	825	845	866	887	909	931	953	976

Ordering information 12NC

The first 8 or 9 digits of the 12 digit catalogue number are given under "Ordering information - preferred types" (see following pages).

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

Example:

0.02 Ω = 0200 or 200
 0.3 Ω = 3007 or 307
 1 Ω = 1008 or 108
 33 k Ω = 3303 or 333
 10 M Ω = 1006 or 106

Last digit of 12NC	
Resistance	Last digit
0.01 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 k Ω	2
10 to 97.6 k Ω	3
100 to 976 k Ω	4
1 to 9.76 M Ω	5
10 to 97.6 M Ω	6

Case size dimensions



Size code	L (mm)	W (mm)	T (mm)	Mass (g)
0201	0.6	0.3	0.3	0.02
0402	1.0	0.5	0.35	0.06
0603	1.6	0.8	0.45	0.20
0805	2.0	1.25	0.55	0.55
1206	3.2	1.6	0.55	1.0
1210	3.1	2.6	0.55	1.67
1218	3.0	4.6	0.44	3.0
2010	5.0	2.5	0.55	2.5
2512	6.4	3.1	0.55	4.25



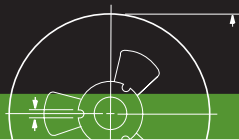
Ordering information - Clear text code (North America ONLY)

	1-2	3-6	7-8	9-12	13	14	15-16	17	
	X	X	X	X	X	X	X	X	
Series	Name (code 1-2)								Packing (code 17)
9C	Thick film chip resistors								T 5K paper
9T	Thin film chip resistors								3 10K paper
									4 20K paper
									5 4K blister
									6 5K blister
									7 50K paper
									P 25K bulk case
Size code (standard resistors, code 3-6)									Special coding (code 15-16)
0201	0201 (0603)								HF SnPb
0402	0402 (1005)								PF 100% Sn 2372
0603	0603 (1608)								AF NiAu
0805	0805 (2012)								
1206	1206 (3216)								TCR (code 14)
1210	1210 (3225)								A ±25 ppm/°C
1218	1218 (3248)								B ±50 ppm/°C
2010	2010 (5025)								K ±100 ppm/°C
2512	2512 (6432)								L ±200 ppm/°C
AC34	0603 (1608) 4R concave array								E ±250 ppm/°C
AV34	0603 (1608) 4R convex array								M ±300 ppm/°C
AV22	0402 (1005) 2R convex array								G ±500 ppm/°C
AV24	0402 (1005) 4R convex array								P ±750 ppm/°C
AV28	0402 (1005) 8R convex array								H ±1000 ppm/°C
RN31	10P8R in convex network								I ±1500 ppm/°C
RC21	10P4C4R in 1608 concave network								J ±2000 ppm/°C
FR01	1206 (3216) Fusible								N ±3000 ppm/°C
FR21	0603 (1608) Fusible								- Base on spec.
SR01	1206 (3216) Surge								
VR01	1206 (3216) High voltage 5%								Tolerance (code 13)
VR02	1206 (3216) High voltage 1%								A ±0.05%
VR11	0805 (2012) High voltage 5%								B ±0.1%; ±0.2 dB
VR12	0805 (2012) High voltage 1%								C ±0.25%; ±0.3 dB
VR21	2512 (6432) High voltage 5%								D ±0.5 %; ±0.5 dB
MR22	2512 (6432) Power metal strip								F ±1%; ±1 dB
V321	0404 (1010) RF attenuator								G ±2%; ±2 dB
									J ±5%
									K ±10%
									N ±20%; 0/-20%
									R ±30%; 0/-30%
Power rating (code 7-8)									
1A	1/16 W	0.063 W							
1A	1/10 W	0.10 W	← upgraded from 1/16 W (0603)						
2A	1/8 W	0.125 W							
3A	1/4 W	0.250 W							
4A	1/10 W	0.10 W							
5A	1/3 W	0.33 W							
7A	1/20 W	0.05 W							
8A	1/32 W	0.03125 W							
12	1/2 W	0.5 W							
1W	1 W	1 W							
Resistance value (code 9-12)									
0R00	Jumper								
R0XX	< 0.1R								
RXXX	0.1R - 0.976R								
XRXX	1R - 9.76R								
XXRX	10R - 97.6R								
XXX0	100R - 976R								
XXX1	1K - 9.76K								
XXX2	10K - 97.6K								
XXX3	100K - 976K								
XXX4	1M - 9.76M								
XXX5	10M - 97.6M								
XXX6	100M+								
XXdB	1 - 20 dB								
NXXX	RCB210								

dB values apply to Attenuators

Right values apply to trimmable resistors

Example:
R-chip 0603 (RC22H), 10R0, 1%, 5K reel = 9C06031A10R0FKHFT



PROGRAM SURVEY

General Purpose / Precision Resistors

	SMD					R-Array (note)				R-network	RC-network
	Thick film										
	1206	0805	0603	0402	0201	4 x 0603	8 x 0402	4 x 0402	2 x 0402	1206	1608
5%	RC01	RC11	RC21	RC31	RC41	ARC241 ARV241	ARV381	ARV341	ARV321	RNA310	RCB210
1% (TC200)				RC32	RC42	ARV242	ARV382	ARV342	ARV322	RNA310	
1% (TC100)	RC02H	RC12H	RC22H			ARC242					
1% (TC50)	RC02G	RC12G									

TC = Temperature coefficient ; ARC = conCave type termination; ARV = conVex type termination.

High Precision Resistors

	Thick film				Thin film					
		0.5%	0.25%	0.1%		1%	0.5%	0.25%	0.1%	0.05%
1210					TC50	TF520	TF521	TF522	TF523	TF524
					TC25	TF510	TF511	TF512	TF513	TF514
1206	TC100		RC04H	RC05H	TC50	TF020	TF021	TF022	TF023	TF024
	TC50	RC03G	RC04G	RC05G	TC25	TF010	TF011	TF012	TF013	TF014
0805	TC100		RC14H	RC15H	TC50	TF120	TF121	TF122	TF123	TF124
	TC50	RC13G	RC14G	RC15G	TC25	TF110	TF111	TF112	TF113	TF114
0603	TC100	RC23H	RC24H	RC25H	TC50	TF220	TF221	TF222	TF223	TF224
					TC25	TF210	TF211	TF212	TF213	TF214
0402	TC200	RC33			TC50	TF320	TF321	TF322	TF323	TF324
					TC25	TF310	TF311	TF312	TF313	TF314

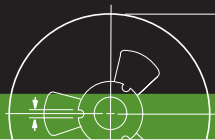


Power Resistors		
P _{nom} at 70 °C	SMD	
	Thick film	
	5%	1%
0.33 W	PRC101	PRC102
	LPRC101	LPRC102
0.5 W	PRC111	PRC111
	LPRC111	LPRC111
1.0 W	PRC201	PRC201
	LPRC201	LPRC201
	PRC221	PRC221
	LPRC221	LPRC221
	VPRC221	
	SMD	
	Metal strip	
	5%	1%
	MPRC221	MPRC221

Application Specific Resistors				
	1206	0805	0603	0402
High ohmic / High voltage	HRC01	HRC11	HRC21	
Low ohmic	LRC01(5%) - LRC02 (1%)	LRC11/11P - LRC12/12P	LRC21(5%) - LRC22 (1%)	
Fusible	FRC01		FRC21	
Surge	SRC01			
Trimmable	RC02TR	RC12TR	RC22TR	RC32TR
High voltage	VRC01(5%) - VRC02 (1%)	VRC11(5%) - VRC12 (1%)		
NiAu - termination*	RC01 - RC02H	RC11 - RC12	RC21 - RC22H	RC31/RC32

* = Special termination for hybrid board gluing / replace AgPd termination.





PRODUCT SELECTION CHART

General purpose and precision

General purpose and Precision													
Series	RC01	RC02G	RC02H	RC11	RC12G	RC12H	RC21	RC22H	RC31	RC32	RC41	RC42	
Case size	1206			0805			0603		0402		0201		
Tolerance	5%	1%		5%	1%		5%	1%	5%	1%	5%	1%	
Power P ₇₀	0.25 W			0.125 W			0.1 W		0.063 W		0.05 W		
Temp range (°C)	-55 to 155			-55 to 155			-55 to 155		-55 to 125		-55 to 125		
U _{max}	200 V			150 V			50 V		50 V		15 V		
E-Series	E24	E24/E96		E24	E24/E96		E24	E24/E96	E24	E24/E96	E24	E24/E96	
Resistance range including temperature coefficient (TC)	0 Ω	jumper		jumper		jumper		jumper		jumper		jumper	
	0.1 Ω	1 Ω		1 Ω		1 Ω		1 Ω		1 Ω		1 Ω	
	1 Ω	TC 0/+500		TC 0/+500		TC 0/+500		TC 0/+500		TC 0/+500		TC 0/+500	
	10 Ω	90 Ω		90 Ω		90 Ω		90 Ω		90 Ω		90 Ω	
	100 Ω	90 Ω		90 Ω		90 Ω		90 Ω		90 Ω		90 Ω	
	1 kΩ	TC 200		TC 50		TC 100		TC 200		TC 200		TC 200	
	10 kΩ	TC 200		TC 50		TC 100		TC 200		TC 200		TC 200	
	100 kΩ	TC 200		TC 50		TC 100		TC 200		TC 200		TC 200	
	1 MΩ	TC 200		TC 50		TC 100		TC 200		TC 200		TC 200	
	10 MΩ	2.74 MΩ		2.74 MΩ		2.74 MΩ		2.74 MΩ		2.74 MΩ		2.74 MΩ	
100 MΩ	10 MΩ		10 MΩ		10 MΩ		10 MΩ		10 MΩ		10 MΩ		
Remarks													

Ordering information - Phycomp world wide - preferred types												
Series	RC01	RC02G	RC02H	RC11	RC12G	RC12H	RC21	RC22H	RC31	RC32	RC41	RC42
Range	E24 5% 1 Ω-10 MΩ	E24/E96 1% 90 Ω-2.74 MΩ	E24/E96 1% 1 Ω-10 MΩ	E24 5% 1 Ω-10 MΩ	E24/E96 1% 90 Ω-2.74 MΩ	E24/E96 1% 1 Ω-10 MΩ	E24 5% 1 Ω-10 MΩ	E24/E96 1% 1 Ω-10 MΩ	E24 5% 1 Ω-10 MΩ	E24/E96 1% 1 Ω-10 MΩ	E24 5% 10 Ω-1 MΩ	E24/E96 1% 10 Ω-1 MΩ
Packing	paper tape	paper tape	paper tape	paper tape	paper tape	paper tape	paper tape	paper tape	paper tape	paper tape	paper tape	paper tape
Quantity	5 000	2322 711 61...	2322 722 2...	2322 724 6...	2322 730 61...	2322 732 6...	2322 734 6...	2322 702 60...	2322 704 6...	---	---	---
	10 000	2322 711 51...	2322 722 3...	2322 724 7...	2322 730 71...	2322 732 7...	2322 734 7...	2322 702 70...	2322 704 7...	2322 705 70...	2322 706 7...	2322 803 70...
	20 000	2322 711 81...	---	2322 724 8...	2322 730 81...	---	2322 734 8...	2322 702 81...	2322 704 8...	---	---	---
	50 000	---	---	---	---	---	---	---	---	2322 705 87...	2322 706 8...	---
Jumper	5 000	2322 711 91032	---	2322 724 92006	2322 730 91002	---	2322 734 92006	2322 702 96001	2322 704 92006	---	---	---
	10 000	2322 711 91005	---	2322 724 92007	2322 730 91003	---	2322 734 92007	2322 702 97001	2322 704 92007	2322 705 91001	---	2322 803 91001
	20 000	2322 711 92004	---	---	2322 730 92002	---	---	2322 702 92002	---	---	---	---
	50 000	---	---	---	---	---	---	---	---	2322 705 91007	---	---

For ordering rules: See page 70 for E24/E96 values and the last 4 or 3 digits of the 12NC catalogue number.

Ordering information - Phycomp North America - preferred types												
Series	RC01	RC02G	RC02H	RC11	RC12G	RC12H	RC21	RC22H	RC31	RC32	RC41	RC42
Range	E24 5% 1 Ω-10 MΩ	E24/E96 1% 90 Ω-2.74 MΩ	E24/E96 1% 1 Ω-10 MΩ	E24 5% 1 Ω-10 MΩ	E24/E96 1% 90 Ω-2.74 MΩ	E24/E96 1% 1 Ω-10 MΩ	E24 5% 1 Ω-10 MΩ	E24/E96 1% 1 Ω-10 MΩ	E24 5% 1 Ω-10 MΩ	E24/E96 1% 1 Ω-10 MΩ	E24 5% 10 Ω-1 MΩ	E24/E96 1% 10 Ω-1 MΩ
Packing	paper tape	paper tape	paper tape	paper tape	paper tape	paper tape	paper tape	paper tape	paper tape	paper tape	paper tape	paper tape
Quantity	5 000	9C12063A...J.HFT	9C12063A...FBHFT	9C12063A...FHF3	9C08052A...J.HFT	9C08052A...FBHFT	9C08052A...FHF3	9C06031A...J.HFT	9C06031A...FHF3	---	---	---
	10 000	9C12063A...J.HF3	9C12063A...FBHF3	9C12063A...FHF3	9C08052A...J.HF3	9C08052A...FBHF3	9C08052A...FHF3	9C06031A...J.HF3	9C06031A...FHF3	9C04021A...J.HF3	9C04021A...FHF3	9C02017A...FHF3
	20 000	9C12063A...J.HF4	9C12063A...FBHF4	9C12063A...FHF4	9C08052A...J.HF4	9C08052A...FBHF4	9C08052A...FHF4	9C06031A...J.HF4	9C06031A...FHF4	---	---	---
	50 000	---	---	---	---	---	---	---	---	9C04021A...J.HF7	9C04021A...FHF7	---
Jumper	5 000	9C12063AOR00...HFT	---	9C12063AOR00...HFT	9C08052AOR00...HFT	---	9C08052AOR00...HFT	9C06031AOR00...HFT	9C06031AOR00...HFT	---	---	---
	10 000	9C12063AOR00...HF3	---	9C12063AOR00...HF3	9C08052AOR00...HF3	---	9C08052AOR00...HF3	9C06031AOR00...HF3	9C06031AOR00...HF3	9C04021AOR00...HF3	---	9C02017AOR00...HF3
	20 000	9C12063AOR00...HF4	---	---	9C08052AOR00...HF4	---	---	9C06031AOR00...HF4	---	---	---	---
	50 000	---	---	---	---	---	---	---	---	9C04021AOR00...HF7	---	---

For ordering rules: See page 70 for E24/E96 values and the last 4 or 3 digits for the resistance value; see page 71 for the TC values in clear text code.



PRODUCT SELECTION CHART

High precision

High precision										
Series	RC03G	RC04G	RC04H	RC05G	RC05H	RC13G	RC14G	RC14H	RC15G	RC15H
Case size	1206					0805				
Tolerance	0.5%	0.25%		0.1%		0.5%	0.25%		0.1%	
Power P ₇₀	0.25 W	0.125 W			0.125 W	0.1 W				
Temp range (°C)	-55 to 125					-55 to 125				
U _{max}	200 V					150 V				
E-Series	E24/E96					E24/E96				
Resistance range including temperature coefficient (TC)										
0 Ω										
0.1 Ω										
1 Ω										
10 Ω	90 Ω	90 Ω	100 Ω	90 Ω	100 Ω	90 Ω	90 Ω	100 Ω	90 Ω	100 Ω
100 Ω										
1 kΩ										
10 kΩ	TC 50	TC 50	TC 100	TC 50	TC 100	TC 50	TC 50	TC 100	TC 50	TC 100
100 kΩ										
1 MΩ										
10 MΩ	2.74 MΩ	2.74 MΩ	1 MΩ	2.74 MΩ	1 MΩ	2.74 MΩ	2.74 MΩ	1 MΩ	2.74 MΩ	1 MΩ
100 MΩ										
Remarks	thick-film technology									

Ordering information - Phycomp world wide - preferred types

Series	RC03G	RC04G	RC04H	RC05G	RC05H	RC13G	RC14G	RC14H	RC15G	RC15H
Range	E24/E96 0.5%	E24/E96 0.25%	E24/E96 0.25%	E24/E96 0.1%	E24/E96 0.1%	E24/E96 0.5%	E24/E96 0.25%	E24/E96 0.25%	E24/E96 0.1%	E24/E96 0.1%
	90 Ω-2.74 MΩ	90 Ω-2.74 MΩ	100 Ω-1 MΩ	90 Ω-2.74 MΩ	100 Ω-1 MΩ	90 Ω-2.74 MΩ	90 Ω-2.74 MΩ	100 Ω-1 MΩ	90 Ω-2.74 MΩ	100 Ω-1 MΩ
Packing	paper tape	paper tape	paper tape	paper tape	paper tape	paper tape	paper tape	paper tape	paper tape	paper tape
Quantity 5 000	2322 725 2....	2322 707 2....	2350 541 0....	2322 708 2....	2350 542 0....	2322 738 2....	2322 709 2....	2350 544 0....	2322 710 2....	2350 545 0....

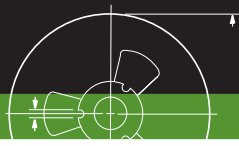
For ordering rules: See page 70 for E24/E96 values and the last 4 or 3 digits of the 12NC catalogue number.

Ordering information - Phycomp North America - preferred types

Series	RC03G	RC04G	RC04H	RC05G	RC05H	RC13G	RC14G	RC14H	RC15G	RC15H
Range	E24/E96 0.5%	E24/E96 0.25%	E24/E96 0.25%	E24/E96 0.1%	E24/E96 0.1%	E24/E96 0.5%	E24/E96 0.25%	E24/E96 0.25%	E24/E96 0.1%	E24/E96 0.1%
	90 Ω-2.74 MΩ	90 Ω-2.74 MΩ	100 Ω-1 MΩ	90 Ω-2.74 MΩ	100 Ω-1 MΩ	90 Ω-2.74 MΩ	90 Ω-2.74 MΩ	100 Ω-1 MΩ	90 Ω-2.74 MΩ	100 Ω-1 MΩ
Packing	paper tape	paper tape	paper tape	paper tape	paper tape	paper tape	paper tape	paper tape	paper tape	paper tape
Quantity 5 000	9C12063A...DBHFT	9C12062A...CBHFT	9C12062A...CKHFT	9C12062A...BBHFT	9C12062A...BKHFT	9C08052A...DBHFT	9C08051A...CBHFT	9C08051A...CKHFT	9C08051A...BBHFT	9C08051A...CKHFT

For ordering rules: See page 70 for E24/E96 values and the last 4 or 3 digits for the resistance value; see page 71 for the TC values in clear text code.





PRODUCT SELECTION CHART

High precision / High precision - high stability

	High precision				High precision – High stability				
Series	RC23H	RC24H	RC25H	RC33	TF510/520	TF511/521	TF512/522	TF513/523	TF514/524
Case size	0603			0402	1210				
Tolerance	0.5 %	0.25 %	0.1 %	0.5 %	1.0 %	0.5 %	0.25 %	0.1 %	0.05 %
Power P ₇₀	0.063 W			0.063 W	0.250 W				
Temp range (°C)	-55 to 125			-55 to 125	-55 to 125				
U _{max}	50 V			50 V	200 V				
E-Series	E24/E96			E24/E96	E24/E96				
Resistance range including temperature coefficient (TC)									
0 Ω									
0.1 Ω									
1 Ω									
10 Ω					10 Ω	10 Ω	10 Ω	10 Ω	10 Ω
100 Ω	100 Ω	100 Ω	100 Ω	100 Ω					
1 kΩ									
10 kΩ	TC 100	TC 100	TC 100	TC 200	TC 25 / TC 50	TC 25 / TC 50	TC 25 / TC 50	TC 25 / TC 50	TC 25 / TC 50
100 kΩ									
1 MΩ									
10 MΩ	1 MΩ	1 MΩ	1 MΩ	1 MΩ	1 MΩ	1 MΩ	1 MΩ	1 MΩ	1 MΩ
100 MΩ									
Remarks	thick-film technology				thin-film technology				

Ordering information - Phycomp world wide - preferred types									
Series	RC23H	RC24H	RC25H	RC33	TF510/520	TF511 /521	TF512/522	TF513/523	TF514/524
Range	E24/E96 0.5% 100 Ω-1 MΩ	E24/E96 0.25% 100 Ω-1 MΩ	E24/E96 0.1% 100 Ω-1 MΩ	E24/E96 0.5% 100 Ω-1 MΩ	E24/E96 1% 10 Ω-1 MΩ	E24/E96 0.5% 10 Ω-1 MΩ	E24/E96 0.25% 10 Ω-1 MΩ	E24/E96 0.1% 10 Ω-1 MΩ	E24/E96 0.05% 10 Ω-1 MΩ
Packing	paper tape	paper tape	paper tape	paper tape	paper tape	paper tape	paper tape	paper tape	paper tape
Quantity 5 000	2350 546 0....	2350 547 0....	2350 548 0....	---	---	---	---	---	---
10 000	---	---	---	2350 549 7....	---	---	---	---	---
5 000 TC 25	---	---	---	---	2390 612 7....	2390 612 6....	2390 612 5....	2390 612 4....	2390 612 3....
5 000 TC 50	---	---	---	---	2390 412 7....	2390 412 6....	2390 412 5....	2390 412 4....	2390 412 3....

For ordering rules: See page 70 for E24/E96 values and the last 4 or 3 digits of the 12NC catalogue number.

Ordering information - Phycomp North America - preferred types									
Series	RC23H	RC24H	RC25H	RC33	TF510/520	TF511 /521	TF512/522	TF513/523	TF514/524
Range	E24/E96 0.5% 100 Ω-1 MΩ	E24/E96 0.25% 100 Ω-1 MΩ	E24/E96 0.1% 100 Ω-1 MΩ	E24/E96 0.5% 100 Ω-1 MΩ	E24/E96 1% 10 Ω-1 MΩ	E24/E96 0.5% 10 Ω-1 MΩ	E24/E96 0.25% 10 Ω-1 MΩ	E24/E96 0.1% 10 Ω-1 MΩ	E24/E96 0.05% 10 Ω-1 MΩ
Packing	paper tape	paper tape	paper tape	paper tape	paper tape	paper tape	paper tape	paper tape	paper tape
Quantity 5 000	9C06031A...DKHFT	9C06031A...CKHFT	9C06031A...BKHFT	---	---	---	---	---	---
10 000	---	---	---	9C04021A...DLHFT	---	---	---	---	---
5 000 TC 25	---	---	---	---	9T12103A...FAHFT	9T12103A...DAHFT	9T12103A...CAHFT	9T12103A...BAHFT	9T12103A...AAHFT
5 000 TC 50	---	---	---	---	9T12103A...FBHFT	9T12103A...BBHFT	9T12103A...CBHFT	9T12103A...BBHFT	9T12103A...ABHFT

For ordering rules: See page 70 for E24/E96 values and the last 4 or 3 digits for the resistance value; see page 71 for the TC values in clear text code.



PRODUCT SELECTION CHART

High precision - high stability

High precision – High stability										
Series	TF010/020	TF011/021	TF012/022	TF013/023	TF014/024	TF110/120	TF111/121	TF112/122	TF113/123	TF114/124
Case size	1206					0805				
Tolerance	1.0 %	0.5 %	0.25 %	0.1 %	0.05 %	1.0 %	0.5 %	0.25 %	0.1 %	0.05 %
Power P ₇₀	0.125 W					0.125 W				
Temp range (°C)	-55 to 125					-55 to 125				
U _{max}	200 V					150 V				
E-Series	E24/E96					E24/E96				
Resistance range including temperature coefficient (TC)										
0 Ω										
0.1 Ω										
1 Ω										
10 Ω	10 Ω	10 Ω	10 Ω	10 Ω	10 Ω	10 Ω	10 Ω	10 Ω	10 Ω	10 Ω
100 Ω										
1 kΩ	TC 25 / TC 50	TC 25 / TC 50	TC 25 / TC 50	TC 25 / TC 50	TC 25 / TC 50	TC 25 / TC 50	TC 25 / TC 50	TC 25 / TC 50	TC 25 / TC 50	TC 25 / TC 50
10 kΩ										
100 kΩ										
1 MΩ	1 MΩ	1 MΩ	1 MΩ	1 MΩ	1 MΩ	1 MΩ	1 MΩ	1 MΩ	1 MΩ	1 MΩ
10 MΩ										
100 MΩ										
Remarks	thin-film technology									

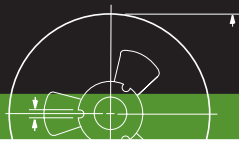
Ordering information - Phycomp world wide - preferred types										
Series	TF010/020	TF011/021	TF012/022	TF013/023	TF014/024	TF110/120	TF111/121	TF112/122	TF113/123	TF114/124
Range	E24/E96 1.0% 10 Ω-1 MΩ	E24/E96 0.5% 10 Ω-1 MΩ	E24/E96 0.25% 10 Ω-1 MΩ	E24/E96 0.1% 10 Ω-1 MΩ	E24/E96 0.05% 10 Ω-1 MΩ	E24/E96 1% 10 Ω-1 MΩ	E24/E96 0.5% 10 Ω-1 MΩ	E24/E96 0.25% 10 Ω-1 MΩ	E24/E96 0.1% 10 Ω-1 MΩ	E24/E96 0.05% 10 Ω-1 MΩ
Packing	paper tape	paper tape	paper tape	paper tape	paper tape	paper tape	paper tape	paper tape	paper tape	paper tape
QTY	5 000 TC 25 2390 611 7....	2390 611 6....	2390 611 5....	2390 611 4....	2390 611 3....	2390 601 7...	2390 601 6...	2390 601 5...	2390 601 4...	2390 601 3...
	5 000 TC 50 2390 411 7....	2390 411 6....	2390 411 5....	2390 411 4....	2390 411 3....	2390 401 7...	2390 401 6...	2390 401 5...	2390 401 4...	2390 401 3...

For ordering rules: See page 70 for E24/E96 values and the last 4 or 3 digits of the 12NC catalogue number.

Ordering information - Phycomp North America - preferred types										
Series	TF010/020	TF011/021	TF012/022	TF013/023	TF014/024	TF110/120	TF111/121	TF112/122	TF113/123	TF114/124
Range	E24/E96 1.0% 10 Ω-1 MΩ	E24/E96 0.5% 10 Ω-1 MΩ	E24/E96 0.25% 10 Ω-1 MΩ	E24/E96 0.1% 10 Ω-1 MΩ	E24/E96 0.05% 10 Ω-1 MΩ	E24/E96 1% 10 Ω-1 MΩ	E24/E96 0.5% 10 Ω-1 MΩ	E24/E96 0.25% 10 Ω-1 MΩ	E24/E96 0.1% 10 Ω-1 MΩ	E24/E96 0.05% 10 Ω-1 MΩ
Packing	paper tape	paper tape	paper tape	paper tape	paper tape	paper tape	paper tape	paper tape	paper tape	paper tape
QTY	5 000 TC 25 9T12062A...FAHFT	9T12062A...DAHFT	9T12062A...CAHFT	9T12062A...BAHFT	9T12062A...AAHFT	9T08052A...FAHFT	9T08052A...DAHFT	9T08052A...CAHFT	9T08052A...BAHFT	9T08052A...AAHFT
	5 000 TC 50 9T12062A...FBHFT	9T12062A...DBHFT	9T12062A...CBHFT	9T12062A...BBHFT	9T12062A...ABHFT	9T08052A...FBHFT	9T08052A...DBHFT	9T08052A...CBHFT	9T08052A...BBHFT	9T08052A...ABHFT

For ordering rules: See page 70 for E24/E96 values and the last 4 or 3 digits for the resistance value; see page 71 for the TC values in clear text code.





PRODUCT SELECTION CHART

High precision - high stability

High precision – High stability										
Series	TF210/220	TF211/221	TF212/222	TF213/223	TF214/224	TF310/320	TF311/321	TF312/322	TF313/323	TF314/324
Case size	0603					0402				
Tolerance	1.0 %	0.5 %	0.25 %	0.1 %	0.05 %	1.0 %	0.5 %	0.25 %	0.1 %	0.05 %
Power P ₇₀	0.1 W					0.063 W				
Temp range (°C)	-55 to 125					-55 to 125				
U _{max}	75 V					50 V				
E-Series	E24/E96					E24/E96				
Resistance range including temperature coefficient (TC)										
0 Ω										
0.1 Ω										
1 Ω										
10 Ω	10 Ω	10 Ω	10 Ω	10 Ω	10 Ω	10 Ω	10 Ω	10 Ω	10 Ω	10 Ω
100 Ω										
1 kΩ	TC 25 / TC 50	TC 25 / TC 50	TC 25 / TC 50	TC 25 / TC 50	TC 25 / TC 50	TC 25 / TC 50	TC 25 / TC 50	TC 25 / TC 50	TC 25 / TC 50	TC 25 / TC 50
10 kΩ										
100 kΩ						100 kΩ	100 kΩ	100 kΩ	100 kΩ	100 kΩ
1 MΩ	332 kΩ	332 kΩ	332 kΩ	332 kΩ	332 kΩ					
10 MΩ										
100 MΩ										
Remarks	thin-film technology									

Ordering information - Phycomp world wide - preferred types										
Series	TF210/220	TF211/221	TF212/222	TF213/223	TF214/224	TF310/320	TF311/321	TF312/322	TF313/523	TF314/324
Range	E24/E96 1.0% 10 Ω-332 kΩ	E24/E96 0.5% 10 Ω-332 kΩ	E24/E96 0.25% 10 Ω-332 kΩ	E24/E96 0.1% 10 Ω-332 kΩ	E24/E96 0.05% 10 Ω-332 kΩ	E24/E96 1% 10 Ω-100 kΩ	E24/E96 0.5% 10 Ω-100 kΩ	E24/E96 0.25% 10 Ω-100 kΩ	E24/E96 0.1% 10 Ω-100 kΩ	E24/E96 0.05% 10 Ω-100 kΩ
Packing	paper tape	paper tape	paper tape	paper tape	paper tape	paper tape	paper tape	paper tape	paper tape	paper tape
QTY	5 000 TC 25 2390 604 7....	5 000 TC 25 2390 604 6....	5 000 TC 25 2390 604 5....	5 000 TC 25 2390 604 4....	5 000 TC 25 2390 604 3....	---	---	---	---	---
	10 000 TC 25 ---	10 000 TC 25 ---	10 000 TC 25 ---	10 000 TC 25 ---	10 000 TC 25 ---	2390 607 7....	2390 607 6....	2390 607 5....	2390 607 4....	2390 607 3....
	10 000 TC 50 ---	10 000 TC 50 ---	10 000 TC 50 ---	10 000 TC 50 ---	10 000 TC 50 ---	2390 407 7....	2390 407 6....	2390 407 5....	2390 407 4....	2390 407 3....

For ordering rules: See page 70 for E24/E96 values and the last 4 or 3 digits of the 12NC catalogue number.

Ordering information - Phycomp North America - preferred types										
Series	TF210/220	TF211/221	TF212/222	TF213/223	TF214/224	TF310/320	TF311/321	TF312/322	TF313/323	TF314/324
Range	E24/E96 1.0% 10 Ω-332 kΩ	E24/E96 0.5% 10 Ω-332 kΩ	E24/E96 0.25% 10 Ω-332 kΩ	E24/E96 0.1% 10 Ω-332 kΩ	E24/E96 0.05% 10 Ω-332 kΩ	E24/E96 1% 10 Ω-100 kΩ	E24/E96 0.5% 10 Ω-100 kΩ	E24/E96 0.25% 10 Ω-100 kΩ	E24/E96 0.1% 10 Ω-100 kΩ	E24/E96 0.05% 10 Ω-100 kΩ
Packing	paper tape	paper tape	paper tape	paper tape	paper tape	paper tape	paper tape	paper tape	paper tape	paper tape
QTY	5 000 TC 25 9T06034A...FAHFT	5 000 TC 25 9T06034A...DAHFT	5 000 TC 25 9T06034A...CAHFT	5 000 TC 25 9T06034A...BAHFT	5 000 TC 25 9T06034A...AAHFT	---	---	---	---	---
	5 000 TC 50 9T06034A...FBHFT	5 000 TC 50 9T06034A...DBHFT	5 000 TC 50 9T06034A...CBHFT	5 000 TC 50 9T06034A...BBHFT	5 000 TC 50 9T06034A...ABHFT	---	---	---	---	---
	10 000 TC 25 ---	10 000 TC 25 ---	10 000 TC 25 ---	10 000 TC 25 ---	10 000 TC 25 ---	9T04021A...FAHF3	9T04021A...DAHf3	9T04021A...CAHF3	9T04021A...BAHF3	9T04021A...AAHF3
	10 000 TC 50 ---	10 000 TC 50 ---	10 000 TC 50 ---	10 000 TC 50 ---	10 000 TC 50 ---	9T04021A...FBHF3	9T04021A...DBHF3	9T04021A...CBHF3	9T04021A...BBHF3	9T04021A...ABHF3

For ordering rules: See page 70 for E24/E96 values and the last 4 or 3 digits for the resistance value; see page 71 for the TC values in clear text code.



PRODUCT SELECTION CHART

Arrays

Arrays											
Series	ARC241	ARV241	ARC242	ARV242	ARV321	ARV322	ARV341	ARV342	ARV381	ARV382	
Case size	4 x 0603 (3.2 x 1.6 mm)				2 x 0402 (1.0 x 1.0 mm)		4 x 0402 (2.0 x 1.0 mm)		8 x 0402 (4.0 x 1.6 mm)		
Tolerance	5 %		1 %		5 %	1 %	5 %	1 %	5 %	1 %	
Power P ₇₀	0.063 W				0.063 W		0.063 W		0.063 W		
Temp range (°C)	-55 to 155				-55 to 125		-55 to 125		-55 to 125		
U _{max}	50 V				50 V		50 V		50 V		
E-Series	E24		E96		E24	E96	E96	E24	E24		
Resistance range including temperature coefficient (TC)	0 Ω	jumper	jumper		jumper		jumper		jumper		
	0.1 Ω										
	1 Ω										
	10 Ω	10 Ω	10 Ω	10 Ω	10 Ω	10 Ω	10 Ω	10 Ω	10 Ω	10 Ω	
	100 Ω										
	1 kΩ	TC 200	TC 200	TC 100	TC 200	TC 200	TC 200	TC 300	TC 300	TC 200	TC 200
	10 kΩ										
	100 kΩ										
	1 MΩ	1 MΩ	1 MΩ	1 MΩ	1 MΩ	1 MΩ	1 MΩ	1 MΩ	1 MΩ	100 kΩ	100 kΩ
	10 MΩ										
100 MΩ											
Remarks	Concave terminations	Convex terminations	Concave terminations	Convex terminations	Convex terminations	Convex terminations	Convex terminations	Convex terminations	Convex terminations	Convex terminations	

Note: On request, ARC241 and ARC242 also available in values < 10 Ω.

Ordering information - Phycomp world wide - preferred types

Series	ARC241	ARV241	ARC242	ARV242	ARV321	ARV322	ARV341	ARV342	ARV381	ARV382
Range	E24 5% 10 Ω-1 MΩ	E24 5% 10 Ω-1 MΩ	E96 1% 10 Ω-1 MΩ	E24/E96 1% 10 Ω-1 MΩ	E24 5% 10 Ω-1 MΩ	E24/E96 1% 10 Ω-1 MΩ	E96 5% 10 Ω-1 MΩ	E24 1% 10 Ω-1 MΩ	E24 5% 10 Ω-100 kΩ	E24 1% 10 Ω-100 kΩ
Packing	paper tape	paper tape	paper tape	paper tape	paper tape	paper tape	paper tape	paper tape	paper tape	paper tape
Quantity 5 000	2350 034 10....	2350 035 10....	2350 024 1....	2350 023 1....	---	---	2350 033 10....	2350 023 1....	2350 053 10....	2350 043 1....
10 000	---	---	---	---	2350 013 11....	.2350 013 2....	2350 033 11....	2350 023 2....	---	---
Jumper 5 000	2350 034 91001	2350 035 91001	---	---	2350 013 91002	---	2350 033 91002	---	2350 053 91001	---
10 000	---	---	---	---	2530 013 91001	---	2350 033 91001	---	---	---

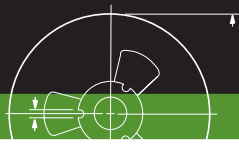
For ordering rules: See page 70 for E24/E96 values and the last 4 or 3 digits of the 12NC catalogue number.

Ordering information - Phycomp North America - preferred types

Series	ARC241	ARV241	ARC242	ARV242	ARV321	ARV322	ARV341	ARV342	ARV381	ARV382
Range	E24 5% 10 Ω-1 MΩ	E24 5% 10 Ω-1 MΩ	E96 1% 10 Ω-1 MΩ	E24/E96 1% 10 Ω-1 MΩ	E24 5% 10 Ω-1 MΩ	E24/E96 1% 10 Ω-1 MΩ	E96 5% 10 Ω-1 MΩ	E24 1% 10 Ω-1 MΩ	E24 5% 10 Ω-100 kΩ	E24 1% 10 Ω-100 kΩ
Packing	paper tape	paper tape	paper tape	paper tape	paper tape	paper tape	paper tape	paper tape	paper tape	paper tape
Quantity 5 000	9CAC341A....JLHFT	9CAV341A....JLHFT	9CAC341A....FKHFT	9CAV341A....FKHFT	---	---	9CAV241A....JMHFT	9CAV241A....FMHFT	9CAV281A....JLHFT	9CAV281A....FLHFT
10 000	---	---	---	---	9CAV221A....JLHF3	9CAV221A....FKHF3	9CAV241A....JMHF3	9CAV241A....FMHF3	---	---
Jumper 5 000	9CAC341AOR00-HFT	9CAV341AOR00-HFT	---	---	9CAV221AOR00-HFT	---	9CAV241AOR00-HFT	---	9CAV281AOR00-HFT	---
10 000	---	---	---	---	9CAV221AOR00-HF3	---	9CAV241AOR00-HF3	---	---	---

For ordering rules: See page 70 for E24/E96 values and the last 4 or 3 digits for the resistance value; see page 71 for the TC values in clear text code.





PRODUCT SELECTION CHART

R-networks / RC-networks

	R-Networks		RC-Networks	
Series	RNA310	RNA310	RCB210	
Case size	8R-Network (3.3 x 1.6 mm)		RC-Network (5.1 x 3.4 mm)	
Tolerance	5 %	1 %	5 %	
Power P ₇₀	0.031 W		0.063 W	
Temp range (°C)	-55 to 125		-55 to 85	
U _{max}	25 V		25 V	
E-Series	E24	E24/E96	E6	
Resistance range including temperature coefficient (TC)	0 Ω	jumper	10 Ω	
	0.1 Ω			
	1 Ω			
	10 Ω	10 Ω		
	100 Ω	TC 0/+500		TC 200
	1 kΩ	TC 200		TC 200
	10 kΩ			1 kΩ
	100 kΩ	100 kΩ		
	1 MΩ			
	10 MΩ			
	100 MΩ			
	Remarks	Convex terminations		Concave terminations

Ordering information - Phycomp world wide - preferred types

Series	RNA310	RNA310	RCB210
Range	E24	E24 / E96	E6
	5%	1%	5%
	10 Ω-100 kΩ	10 Ω-100 kΩ	10 Ω-1 kΩ
Packing	paper tape	paper tape	blister tape
Quantity 5 000	2350 230 10..	2350 230 2....	2350 321 2... see table (*)
Jumper 5 000	2350 230 91001	---	---

For ordering rules: See page 70 for E24/E96 values and the last 4 or 3 digits of the 12NC catalogue number.

Ordering information - Phycomp North America - preferred types

Series	RNA310	RNA310	RCB210
Range	E24	E24 / E96	E6
	5%	1%	5%
	10 Ω-100 kΩ	10 Ω-100 kΩ	10 Ω-1 kΩ
Packing	paper tape	paper tape	blister tape
Quantity 5 000	9CRN318A...JLHFT	9CRN318A...FLHFT	9CRC211A...JHF6 see table (*)
Jumper 5 000	9CRN318AOR00-HFT	---	---

For ordering rules: See page 70 for E24/E96 values and the last 4 or 3 digits for the resistance value; see page 71 for the TC values in clear text code.

RC networks R and C values for 12NCs and CTC codes for North America							
12NC (*)	R (Ω)	C (pF)	NA(**)	12NC (*)	R (Ω)	C (pF)	NA(**)
2350 321 20001	33	180	N001	2350 321 20043	10	22	N043
2350 321 20002	22	100	N002	2350 321 20044	10	47	N044
2350 321 20003	100	47	N003	2350 321 20045	1k	10	N045
2350 321 20004	22	10	N004	2350 321 20046	220	10	N046
2350 321 20005	47	22	N005	2350 321 20047	470	10	N047
2350 321 20006	22	22	N006	2350 321 20048	22	180	N048
2350 321 20007	22	47	N007	2350 321 20049	47	180	N049
2350 321 20008	47	47	N008	2350 321 20051	4.7k	180	N051
2350 321 20009	47	100	N009	2350 321 20052	100	180	N052
2350 321 20011	100	100	N011	2350 321 20053	82	100	N053
2350 321 20012	220	22	N012	2350 321 20054	68	10	N054
2350 321 20013	220	47	N013	2350 321 20055	22	15	N055
2350 321 20014	220	100	N014	2350 321 20056	33	15	N056
2350 321 20015	470	22	N015	2350 321 20057	47	15	N057
2350 321 20016	470	47	N016	2350 321 20058	68	15	N058
2350 321 20017	470	100	N017	2350 321 20059	100	15	N059
2350 321 20018	1k	22	N018	2350 321 20061	33	22	N061
2350 321 20019	1k	47	N019	2350 321 20062	68	22	N062
2350 321 20021	100k	22	N021	2350 321 20063	10	33	N063
2350 321 20022	33	47	N022	2350 321 20064	15	33	N064
2350 321 20023	33	33	N023	2350 321 20065	68	33	N065
2350 321 20024	100	33	N024	2350 321 20066	15	47	N066
2350 321 20025	1k	33	N025	2350 321 20067	68	47	N067
2350 321 20026	47	33	N026	2350 321 20068	15	100	N068
2350 321 20027	2.2k	47	N027	2350 321 20069	68	100	N069
2350 321 20028	82k	33	N028	2350 321 20071	180	180	N071
2350 321 20029	22	33	N029	2350 321 20072	68	27	N072
2350 321 20031	15k	47	N031	2350 321 20073	75	47	N073
2350 321 20032	33	10	N032	2350 321 20074	33	220	N074
2350 321 20033	47	10	N033	2350 321 20075	47	220	N075
2350 321 20034	330	100	N034	2350 321 20076	100	22	N076
2350 321 20035	10	10	N035	2350 321 20077	1k	100	N077
2350 321 20036	15	15	N036	2350 321 20078	47k	100	N078
2350 321 20037	10	15	N037	2350 321 20079	33	100	N079
2350 321 20038	15	10	N038	2350 321 20081	68	180	N081
2350 321 20039	27	47	N039	2350 321 20082	15	22	N082
2350 321 20041	100	10	N041	2350 321 20083	150	10	N083
2350 321 20042	10	100	N042				



PRODUCT SELECTION CHART

Power / Power - low ohmic

Power								
Series	PRC101		PRC111		PRC201		PRC221	
Case size	1210		2010		1218		2512	
Tolerance	5%	1%	5%	1%	5%	1%	5%	1%
Power P ₇₀	0.33 W		0.5 W		1.0 W		1.0 W	
Temp range (°C)	-55 to 125		-55 to 125		-55 to 125		-55 to 125	
U _{max}	200 V		200 V		200 V		250 V	
E-Series	E24	E96	E24	E96	E24	E96	E24	E96
Resistance range including temperature coefficient (TC)	0 Ω	jumper	jumper		jumper		jumper	
	0.1 Ω							
	1 Ω		1 Ω	1 Ω	1 Ω	1 Ω	1 Ω	1 Ω
	10 Ω	TC 200	100 Ω	TC 300 TC 200	TC 300 TC 200	TC 200	TC 200	TC 300 TC 200
	100 Ω	TC 100	TC 100	TC 100	TC 100	TC 100	TC 100	TC 100
	1 kΩ							
	10 kΩ							
	100 kΩ							
	1 MΩ							
	10 MΩ	TC 200	TC 200 2.2 MΩ	TC 200 10 MΩ	TC 200 10 MΩ	1 MΩ	1 MΩ	TC 200 10 MΩ
100 MΩ	22 MΩ							
SURGE POWER ON REQUEST								
Remarks					Termination on the long sides improves heat transfer and reduces stress			

Ordering information - Phycomp world wide - preferred types

Series	PRC101		PRC111		PRC201		PRC221	
Range	E24 5% 1 Ω-22 MΩ	E96 1% 100 Ω-2.2 MΩ	E24 5% 1 Ω-10 MΩ	E96 1% 1 Ω-10 MΩ	E24 5% 1 Ω-1 MΩ	E96 1% 1 Ω-1 MΩ	E24 5% 1 Ω-10 MΩ	E96 1% 1 Ω-10 MΩ
Packing	paper tape	paper tape	blister tape	blister tape	blister tape	blister tape	blister tape	blister tape
Quantity	4 000	---	2322 760 60...	2322 761 6...	---	---	2322 762 60...	2322 763 6...
	5 000	2390 735 70...	2390 735 3...	---	---	2322 735 60...	2322 735 2...	---
Jumper	4 000	---	2322 760 90003	---	---	---	2322 762 90000	---
	5 000	2390 735 90001	---	---	---	2322 735 90006	---	---

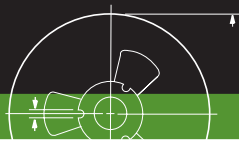
For ordering rules: See page 70 for E24/E96 values and the last 4 or 3 digits of the 12NC catalogue number.

Ordering information - Phycomp North America - preferred types

Series	PRC101		PRC111		PRC201		PRC221	
Range	E24 5% 1 Ω-22 MΩ	E96 1% 100 Ω-2.2 MΩ	E24 5% 1 Ω-10 MΩ	E96 1% 1 Ω-10 MΩ	E24 5% 1 Ω-1 MΩ	E96 1% 1 Ω-1 MΩ	E24 5% 1 Ω-10 MΩ	E96 1% 1 Ω-10 MΩ
Packing	paper tape	paper tape	blister tape	blister tape	blister tape	blister tape	blister tape	blister tape
Quantity	4 000	---	9C1201012...F.HF5	9C1201012...J.HF5	---	---	9C25121W...J.HF5	9C25121W...F.HF5
	5 000	9C12105A...J.HFT	9C12105A...F.HFT	---	---	9C12181W...J.HF6	9C12181W...F.HF6	---
Jumper	4 000	---	9C1201120R00..HF5	---	---	---	9C25121W0R00..HF5	---
	5 000	9C12105A0R00..HFT	---	---	---	9C12181W0R00..HF6	---	---

For ordering rules: See page 70 for E24/E96 values and the last 4 or 3 digits for the resistance value; see page 71 for the TC values in clear text code.





PRODUCT SELECTION CHART

Power - low ohmic

Power - low ohmic								
Series	LPRC101		LPRC111		LPRC201		LPRC221	
Case size	2512		2010		1218		2512	
Tolerance	5%	1%	5%	1%	5%	1%	5%	1%
Power P ₇₀	0.33 W		0.5 W		1.0 W		1.0 W	
Temp range (°C)	-55 to 125		-55 to 125		-55 to 125		-55 to 125	
U _{max}	200 V		200 V		200 V		250 V	
E-Series	E24	E96	E24	E96	E24	E96	E24	E96
Resistance range including temperature coefficient (TC)	0 Ω	0.01 Ω	0.01 Ω	0.01 Ω	0.01 Ω	0.02 Ω	0.01 Ω	0.05 Ω
	0.1 Ω	TC 2000 to TC 300	TC 2000 to TC 300	TC 2000 to TC 300	TC 2000 to TC 300	TC 2000 to TC 250	TC 2000 to TC 250	TC 1500 to TC 75
	1 Ω	0.976 Ω	0.976 Ω	0.976 Ω	0.976 Ω	0.976 Ω	0.976 Ω	0.976 Ω
	10 Ω							
	100 Ω							
	1 kΩ							
	10 kΩ							
	100 kΩ							
	1 MΩ							
	10 MΩ							
100 MΩ								
SURGE POWER ON REQUEST								
Remarks					Termination on the long sides improves heat transfer and reduces stress			

Ordering information - Phycomp world wide - preferred types

Series	LPRC101		LPRC111		LPRC201		LPRC221	
Range	E24 5%	E24/E96 1%	E24 5%	E24/E96 1%	E24 5%	E24/E96 1%	E24 5%	E24/E96 1%
	0.01 Ω-0.976 Ω	0.01 Ω-0.976 Ω	0.01 Ω-0.976 Ω	0.02 Ω-0.976 Ω	0.01 Ω-0.976 Ω	0.02 Ω-0.976 Ω	0.01 Ω-0.976 Ω	0.05 Ω-0.976 Ω
Packing	paper tape	paper tape	blister tape	blister tape	blister tape	blister tape	blister tape	blister tape
Quantity	4 000	---	2322 760 90..0/60..7	2322 761 90..0/6...7	---	---	2322 762 90..0/60..7	2322 763 90..0/6...7
	5 000	2390 735 90..0/60..7	2390 735 3...0	---	---	2322 735 60...7	2322 735 2....7	---
Jumper	4 000	---	---	---	---	---	---	---
	5 000	---	---	---	---	---	---	---

For ordering rules: See page 70 for E24/E96 values and the last 4 or 3 digits of the 12NC catalogue number.

Ordering information - Phycomp North America - preferred types

Series	LPRC101		LPRC111		LPRC201		LPRC221	
Range	E24 5%	E24/E96 1%	E24 5%	E24/E96 1%	E24 5%	E24/E96 1%	E24 5%	E24/E96 1%
	0.01 Ω-0.976 Ω	0.01 Ω-0.976 Ω	0.01 Ω-0.976 Ω	0.02 Ω-0.976 Ω	0.01 Ω-0.976 Ω	0.02 Ω-0.976 Ω	0.01 Ω-0.976 Ω	0.05 Ω-0.976 Ω
Packing	paper tape	paper tape	blister tape	blister tape	blister tape	blister tape	blister tape	blister tape
Quantity	4 000	9C12105A...J.HFT	9C12105A...F.HFT	9C1201012...F.HF5	9C121012...J.HF5	---	---	9C25121W...J.HF5
	5 000	---	---	---	---	9C12181W...J.HF6	9C12181W...F.HF6	---
Jumper	4 000	---	---	---	---	---	---	---
	5 000	---	---	---	---	---	---	---

For ordering rules: See page 70 for E24/E96 values and the last 4 or 3 digits for the resistance value; see page 71 for the TC values in clear text code.



PRODUCT SELECTION CHART

Power, high voltage / Metal strip / High voltage

	High voltage	Metal strip		High voltage					
Series	VPRC221	MPRC221		VRC01	VRC02	VRC11	VRC12		
Case size	2512	2512		1206		0805			
Tolerance	5%	5%	1%	5%	1%	5%	1%		
Power P ₇₀	1.0 W	1.0 W		0.25 W		0.125 W			
Temp range (°C)	-55 to 125	-55 to 155		-55 to 125		-55 to 125			
U _{max}	250 V	250 V		400 V		300 V			
E-Series	E24	1 mΩ - 10 mΩ		E24	E96	E24	E96		
Resistance range including temperature coefficient (TC)	0 Ω 0.1 Ω 1 Ω 10 Ω 100 Ω 1 kΩ 10 kΩ 100 kΩ 1 MΩ 10 MΩ 100 MΩ								
								1-2 mΩ TC200	1-2 mΩ TC200
								3-10 mΩ TC75	3-10 mΩ TC75
Remarks	Max. overload voltage 2500 V for 1 min.	Metal strip		Max. overload voltage 400 V for 1 min.		Max. overload voltage 300 V for 1 min.			

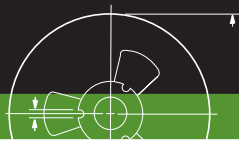
Ordering information - Phycomp world wide - preferred types								
Series	VPRC221	MPRC221		VRC01	VRC02	VRC11	VRC12	
Range	E24	5%	1%	E24	E96	E24	E96	
	5%							5%
	4.7 MΩ-16 MΩ	1 mΩ - 10 mΩ	1 mΩ - 10 mΩ	100 kΩ-27 MΩ	100 kΩ-10 MΩ	100 kΩ - 10 MΩ	100 kΩ-10 MΩ	
Packing	blister tape	blister tape	blister tape	paper tape	paper tape	paper tape	paper tape	
Quantity	4 000	2322 762 98...	2322 762 94..0	2322 763 95..0	---	---	2322 792 61....	2322 793 6....
	5 000	---	---	---	2322 790 61...	2322 791 6....	---	---

For ordering rules: See page 70 for E24/E96 values and the last 4 or 3 digits of the 12NC catalogue number.

Ordering information - Phycomp North America - preferred types								
Series	VPRC221	MPRC221		VRC01	VRC02	VRC11	VRC12	
Range	E24	5%	1%	E24	E96	E24	E96	
	5%							5%
	4.7 MΩ-16 MΩ	1 mΩ - 10 mΩ	1 mΩ - 10 mΩ	100 kΩ-27 MΩ	100 kΩ-10 MΩ	100 kΩ - 10 MΩ	100 kΩ-10 MΩ	
Packing	blister tape	blister tape	blister tape	paper tape	paper tape	paper tape	paper tape	
Quantity	4 000	9CVR211W...JLHF5	9CMR221W...J.HF5	9CMR221W...F.HF5	---	---	---	---
	5 000	---	---	---	9CVR013A...JMHFT	9CVR023A...FMHFT	9CVR112A...JMHFT	9CVR122A...FMHFT

For ordering rules: See page 70 for E24/E96 values and the last 4 or 3 digits for the resistance value; see page 71 for the TC values in clear text code.





PRODUCT SELECTION CHART

High ohmic / Low ohmic

Series	High ohmic			Low ohmic							
	HRC01	HRC11	HRC21	LRC01	LRC02	LRC11	LRC12	LRC11P	LRC12P	LRC21	LRC22
Case size	1206	0805	0603	1206		0805		0805		0603	
Tolerance	5%	5%	5%	5%	1%	5%	1%	5%	1%	5%	1%
Power P ₇₀	0.25 W	0.125 W	0.1 W	0.25 W		0.125 W	0.1 W	0.25 W		0.063 W	
Temp range (°C)	-55 to 125	-55 to 125	-55 to 155	-55 to 125		-55 to 125		-55 to 125		-55 to 155	
U _{max}	200 V	150 V	50 V	200 V		150 V		150 V		50 V	
E-Series	E24	E24	E24	E24	E96	E24	E96	E24	E96	E24	E96
Resistance range including temperature coefficient (TC)	0 Ω			0.01 Ω	0.01 Ω	0.02 Ω	0.02 Ω	0.02 Ω	0.02 Ω	0.1 Ω	0.1 Ω
	0.1 Ω			TC 1500 to TC 75	TC 1500 to TC 75	TC 1500 to TC 75	TC 1500 to TC 75	TC 1500 to TC 75	TC 1500 to TC 75	TC 600 to TC 300	TC 600 to TC 300
	1 Ω			0.976 Ω	0.976 Ω	0.976 Ω	0.976 Ω	0.976 Ω	0.976 Ω	0.976 Ω	0.976 Ω
	10 Ω										
	100 Ω										
	1 kΩ										
	10 kΩ										
100 kΩ											
1 MΩ											
10 MΩ	11 MΩ	11 MΩ	11 MΩ								
100 MΩ	TC 250	TC 300	TC 300 22 MΩ								
100 MΩ	100 MΩ	100 MΩ									
Remarks											

Ordering information - Phycomp world wide - preferred types												
Series	HRC01	HRC11	HRC21	LRC01	LRC02	LRC11	LRC12	LRC11P	LRC12P	LRC21	LRC22	
Range	E24 5% 11 MΩ-100 MΩ	E24 5% 11 MΩ-100 MΩ	E24 5% 11 MΩ-22 MΩ	E24 5% 0.01 Ω-0.976 Ω	E96 1% 0.01 Ω-0.976 Ω	E24 5% 0.02 Ω-0.976 Ω	E96 1% 0.02 Ω-0.976 Ω	E24 5% 0.02 Ω-0.976 Ω	E96 1% 0.02 Ω-0.976 Ω	E24 5% 0.1 Ω-0.976 Ω	E96 1% 0.1 Ω-0.976 Ω	
Packing	paper tape	paper tape	paper tape	paper tape	paper tape	paper tape	paper tape	paper tape	paper tape	paper tape	paper tape	
Quantity	5 000	2350 520 10...	2350 521 10...	2350 522 10...	2350 510 10...	2350 510 12...	2350 511 10...	2350 510 12...	2350 511 15...	2350 511 17...	2350 512 10...	2350 512 12...
5 000	for 100 MΩ 2350 520 91001	for 100 MΩ 2350 521 91001										

For ordering rules: See page 70 for E24/E96 values and the last 4 or 3 digits of the 12NC catalogue number.

Ordering information - Phycomp North America - preferred types												
Series	HRC01	HRC11	HRC21	LRC01	LRC02	LRC11	LRC12	LRC11P	LRC12P	LRC21	LRC22	
Range	E24 5% 11 MΩ-100 MΩ	E24 5% 11 MΩ-100 MΩ	E24 5% 11 MΩ-22 MΩ	E24 5% 0.01 Ω-0.976 Ω	E96 1% 0.01 Ω-0.976 Ω	E24 5% 0.02 Ω-0.976 Ω	E96 1% 0.02 Ω-0.976 Ω	E24 5% 0.02 Ω-0.976 Ω	E96 1% 0.02 Ω-0.976 Ω	E24 5% 0.1 Ω-0.976 Ω	E96 1% 0.1 Ω-0.976 Ω	
Packing	paper tape	paper tape	paper tape	paper tape	paper tape	paper tape	paper tape	paper tape	paper tape	paper tape	paper tape	
Quantity	5 000	9C12063A...JEHFT	9C08052A...JEHFT	9C06031A...JMHT	9C12063A...JHFT	9C12063A...FHFT	9C08052A...JHFT	9C08051A...FHFT	9C08053A...FHFT	9C08053A...FHFT	9C06031A...JHFT	9C06031A...FHFT

For ordering rules: See page 70 for E24/E96 values and the last 4 or 3 digits for the resistance value; see page 71 for the TC values in clear text code.



PRODUCT SELECTION CHART

Trimvable / Surge / Fusible

	Trimvable				Surge	Fusible	
Series	RC02TR	RC12TR	RC22TR	RC32TR	SRC01	FRC01	FRC21
Case size	1206	0805	0603	0402	1206	1206	0603
Tolerance					5%	5%	5%
Power P ₇₀	0.25 W	0.125 W	0.063 W	0.063 W	0.25 W	0.125 W	0.063 W
Temp range (°C)	-55 to 155	-55 to 155	-55 to 125	-55 to 125	-55 to 155	-55 to 125	-55 to 155
U _{max}	200 V	150 V	50 V	50 V	200 V	200 V	50 V
E-Series	E24	E24	E24	E24	E24	E24/E96	E24
Resistance range including temperature coefficient (TC)							
0 Ω							
0.1 Ω							
1 Ω	1 Ω	1 Ω	1 Ω	1 Ω	1 Ω	1 Ω	1 Ω
10 Ω	TC 0/+500	TC 0/+500	TC 0/+500	TC 0/+500	TC 200	TC 250 4.7 Ω	TC 0/+500
100 Ω	TC 100	TC 100	TC 100	TC 100		TC 200	TC 200
1 kΩ					TC 200	TC 200	TC 200
10 kΩ	100 kΩ	10 MΩ	10 MΩ	10 MΩ			
100 kΩ					10 MΩ	10 MΩ	10 MΩ
1 MΩ	10 MΩ	10 MΩ	10 MΩ	10 MΩ			
10 MΩ					10 MΩ	10 MΩ	10 MΩ
100 MΩ	10 MΩ	10 MΩ	10 MΩ	10 MΩ			
Remarks					Tolerance 0 / -20% and 0 / -30%		

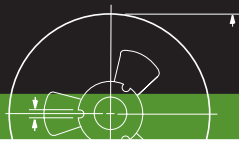
Ordering information - Phycomp world wide - preferred types							
Series	RC02TR	RC12TR	RC22TR	RC32TR	SRC01	FRC01	FRC21
Range	E24 1 Ω -10 MΩ	E24 1 Ω -10 MΩ	E24 1 Ω -10 MΩ	E24 1 Ω -10 MΩ	E24 5% 1 Ω -100 kΩ	E24/E96 5% 1 Ω -510 kΩ	E24 5% 1 Ω -240 kΩ
Packing	paper tape	paper tape	paper tape	paper tape	paper tape	paper tape	paper tape
Quantity	5 000 0/-20% 5 000 0/-30%	2350 500 11... 2350 501 11...	2350 501 11... 2350 511 10...	2350 502 11... 2350 502 10...	2350 503 21... 2350 503 2...	---	---
Europe	5 000	2322 724 94...	2322 734 94...	on request	---	---	---
Quantity	5 000	---	---	---	2350 550 10...	2322 750 6....	2322 756 60...

For ordering rules: See page 70 for E24/E96 values and the last 4 or 3 digits of the 12NC catalogue number.

Ordering information - Phycomp North America - preferred types							
Series	RC02TR	RC12TR	RC22TR	RC32TR	SRC01	FRC01	FRC21
Range	E24 1 Ω -10 MΩ	E24 1 Ω -10 MΩ	E24 1 Ω -10 MΩ	E24 1 Ω -10 MΩ	E24 5% 1 Ω -100 kΩ	E24/E96 5% 1 Ω -510 kΩ	E24 5% 1 Ω -240 kΩ
Packing	paper tape	paper tape	paper tape	paper tape	paper tape	paper tape	paper tape
Quantity	5 000 0/-20% 5 000 0/-30%	9C12063A...N.HFT 9C12063A...R.HFT	9C08052A...N.HFT 9C08052A...R.HFT	9C06031A...N.HFT 9C06031A...R.HFT	9C04021A...N.HFT 9C04021A...R.HFT	---	---
Quantity	5 000	---	---	---	9CSR013A...JLHFT	9CFR012A...J.HFT	9CFR211A...J.HFT

For ordering rules: See page 70 for E24/E96 values and the last 4 or 3 digits for the resistance value; see page 71 for the TC values in clear text code.





PRODUCT SELECTION CHART

NiAu terminations

NiAu terminations								
Series	RC01	RC02H	RC11	RC12	RC21	RC22H	RC31	RC32
Case size	1206		0805		0603		0402	
Tolerance	5%	1%	5%	1%	5%	1%	5%	1%
Power P ₇₀	0.25 W		0.125 W		0.063 W		0.063 W	
Temp range (°C)	-55 to 155		-55 to 155		-55 to 155		-55 to 155	
U _{max}	200 V		150 V		50 V		50 V	
E-Series	E24	E24/E96	E24	E96	E24	E96	E24	E96
Resistance range including temperature coefficient (TC)								
0 Ω								
0.1 Ω								
1 Ω	1 Ω	1 Ω	1 Ω	1 Ω	1 Ω	1 Ω	1 Ω	6.8 Ω
10 Ω	TC 0/+500	TC 0/+500	TC 0/+500	TC 0/+500	TC 0/+500	TC 0/+500	TC 0/+500	TC 0/+500
100 Ω								
1 kΩ	TC 200	TC 200	TC 200	TC 200	TC 200	TC 200	TC 200	TC 200
10 kΩ								
100 kΩ								
1 MΩ								
10 MΩ								
100 MΩ	10 MΩ	10 MΩ	10 MΩ	10 MΩ	10 MΩ	10 MΩ	10 MΩ	10 MΩ
Remarks	Special terminations for hybrid board gluing / replaces AgPd terminations							

Ordering information - Phycomp world wide - preferred types								
Series	RC01	RC02H	RC11	RC12	RC21	RC22H	RC31	RC32
Range	E24 5% 1 Ω -10 MΩ	E24/E96 1% 1 Ω -10 MΩ	E24 5% 1 Ω -10 MΩ	E96 1% 1 Ω -10 MΩ	E24 5% 1 Ω -10 MΩ	E96 1% 1 Ω -10 MΩ	E24 5% 1 Ω -10 MΩ	E96 1% 6.8 Ω -10 MΩ
Packing	paper tape	paper tape	paper tape	paper tape	paper tape	paper tape	paper tape	paper tape
Quantity	5 000 2322 711 11...	2322 729 1...	2322 730 11...	2322 734 1...	2322 702 11...	2322 704 1...	---	---
	10 000 2322 711 12...	2322 729 2....	2322 730 12...	2322 734 2....	2322 702 12...	2322 704 2....	2322 705 12...	2322 706 2....

For ordering rules: See page 70 for E24/E96 values and the last 4 or 3 digits of the 12NC catalogue number.

Ordering information - Phycomp North America - preferred types								
Series	RC01	RC02H	RC11	RC12	RC21	RC22H	RC31	RC32
Range	E24 5% 1 Ω -10 MΩ	E24/E96 1% 1 Ω -10 MΩ	E24 5% 1 Ω -10 MΩ	E96 1% 1 Ω -10 MΩ	E24 5% 1 Ω -10 MΩ	E96 1% 1 Ω -10 MΩ	E24 5% 1 Ω -10 MΩ	E96 1% 6.8 Ω -10 MΩ
Packing	paper tape	paper tape	paper tape	paper tape	paper tape	paper tape	paper tape	paper tape
Quantity	5 000 9C12063A...J.AFT	9C12063A...F.AFT	9C08052A...J.AFT	---	9C06031A...J.AFT	9C06031A...F.AFT	---	---
	10 000 ---	---	---	---	9C06031A...J.AF3	---	9C04021A...J.AF3	9C04021A...F.AF3

For ordering rules: See page 70 for E24/E96 values and the last 4 or 3 digits for the resistance value; see page 71 for the TC values in clear text code.



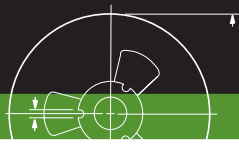
Sample kit data					
Phycomp order code: 3322 073	30092	30095	30093	30096	30094
Type	RC01	RC01	RC11	RC11	RC21
Size	1206	1206	0805	0805	0603
Series	E6+jumper	E24+jumper	E6+jumper	E24+jumper	E6+jumper
Tolerance	5%	5%	5%	5%	5%
Resistor Range	1 Ω - 10 MΩ	1 Ω - 10 MΩ	1 Ω - 10 MΩ	1 Ω - 10 MΩ	1 Ω - 10 MΩ
Resistance Values	38	170	38	170	38
Resistor pieces	50	50	50	50	50
Maximum Wattage	1/4 W	1/4 W	1/10 W	1/10 W	1/16 W
Temp Coeff (ppm)	± 200	± 200	± 200	± 200	± 200
Maximum Voltage	200	200	150	150	50

Sample kit data				
Phycomp order code: 3322 073	30098	30099	30101	30107
Type	RC02H	RC12H	RC22H	RC32H
Size	1206	0805	0603	0402
Series	E24+jumper	E24+jumper	E24+jumper	E12+jumper
Tolerance	1%	1%	1%	1%
Resistor Range	1 Ω - 10 MΩ	1 Ω - 10 MΩ	1 Ω - 10 MΩ	10 Ω - 1 MΩ
Resistance Values	170	170	170	62
Resistor pieces	50	50	50	100
Maximum Wattage	1/4 W	1/10 W	1/16 W	1/16 W
Temp Coeff (ppm)	± 100	± 100	± 100	± 200
Maximum Voltage	200	150	50	50

Sample kit data				
Phycomp order code: 3322 073	30097	30104	30105	30106
Type	RC21	RC31	RC31	RC31
Size	0603	0402	0402	0402
Series	E24+jumper	E12+jumper	E24-E12	E24+jumper
Tolerance	5%	5%	5%	5%
Resistor Range	1 Ω - 10 MΩ	10 Ω - 2M2 Ω	10 Ω - 2M2 Ω	10 Ω - 2M2 Ω
Resistance Values	170	62	62	122
Resistor pieces	50	100	100	100
Maximum Wattage	1/16 W	1/16 W	1/16 W	1/16 W
Temp Coeff (ppm)	± 200	± 200	± 200	± 200
Maximum Voltage	50	50	50	50

Sample kit data				
Phycomp order code: 3322 073	30108	30109	30102	30103
Type	RC32H	RC32H	ARC241	ARC241
Size	0402	0402	0603X4	0603X4
Series	E24-E12	E24+jumper	E6+jumper	E12+jumper
Tolerance	1%	1%	5%	5%
Resistor Range	10 Ω - 1 MΩ	10 Ω - 1 MΩ	10 Ω - 1 MΩ	10 Ω - 1 MΩ
Resistance Values	61	122	32	62
Resistor pieces	100	100	50	50
Maximum Wattage	1/16 W	1/16 W	1/16 W	1/16 W
Temp Coeff (ppm)	± 200	± 200	± 200	± 200
Maximum Voltage	50	50	50	50





COMPETITOR CROSS REFERENCE

Chip resistor cross reference

Manufacturer		Yageo	Vitrohm	Phycomp	AVX	BC Comp	Kamaya	KOA	Panasonic	Rohm	Vishay	Vishay dale	
1	Series	RC	RGC	RC	CR	DC.	RMC	RM73/RK73	ERJ	MCR	D	CR/CRCW	
2	0402 1/16 W	0402	512-0	31	05	-	RMC	1E	2GE	01	10	0402	
	0603 1/16 W	0603	513-0	21/22H	10	DCT 0603	1/16	1J	3GS	03	11	0603	
	0805 1/10 W	0805	503-0	11/12H	21	DCU 0805	1/10	2A	6GE	10	12	0805	
	0805 1/8 W	0805	503-0	11/12H	-	DCU 0805	1/8	2A	-	-	12	0805	
	1206 1/8 W	1206	502-0	01/02H	32	DCA 1206	-	2B	8GE	18	25	1206	
	1206 1/4 W	1206	502-0	01/02H	-	DCA 1206	-	2B	8GC	-	25	1206	
	1210 1/4 W	1210	507-0	-	-	-	1/4	2E	14	25	-	1210	
	2010 1/2 W	2010	508-0	-	-	-	1/2	2H	12(1812)	50	-	2010	
	2512 1 W	2512	509-0	-	63	-	1	3A	1W	100	-	2512	
3	Tolerance	K ±10%		J ±5%		G ±2%		F ±1%					
4	Nominal resistance value	3-digit code 103 = 10k, 471 = 470R						4-digit code 1002 = 10k, 1471 = 1k47					
5	Packing												
	Paper tape	R	7A	-	T	PA	TP	TD	V	EZH	-	RT1	
	Plastic tape	K	7D	-	H	-	TE	TE	U	JZH	-	RT2	
	7" Reel	07	7A	-	-	PA	-	-	-	-	-	-	
	10" Reel	10	-	-	D	-	-	-	-	FHZ	-	RT3	
	13" Reel	13	7Q	-	S	-	-	-	-	QZH	-	-	
Cassette	C	-	-	-	-	-	-	-	-	PZHI	-	-	
6	Marking (except 0402)												
	Top	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	

Company	Sample P/N	Description	Chip resistor			0603	1K47	1%
Yageo	RC0603FR-071K47	1	2	3	5	5	4	
		RC	0603	F	R	07	1K47	
Vitrohm	513-0 1K47 1% 7A	1	2	4	3	5		
			513-0	1K47	1%	7A		
AVX	CR10-1471F-T	1	2	4	3	5		
		CR	10	1471	F	T		
KOA	RK73H1JT1471F	1	-	2	5	4	3	
		RK73	H	1J	T	1471	F	
Panasonic	ERJ3ENF1471V	1	2	6	3	4	5	
		ERJ	3E	N	F	1471	V	
Rohm	MCR3EZHF1471	1	2	5	3	4		
		MCR	3	EZH	F	1471		
Vishay	D11 1K47 1% 7"	1	2	4	3	5		
		D	11	1K47	1%	7"		
Vishay Dale	CRCW06031471FRT1	1	2	4	3	5		
		CRCW	0603	1471	F	RT1		

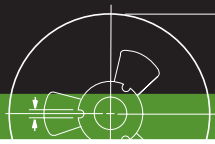


PART NUMBER CROSS REFERENCE

Part number to 12NC cross reference

Part number to 12NC cross reference									
P/N	12NC	Description	Size	Tol	Power	Qty	Reel size	TC	Page
RC01	232271161...	General 1206 5% Reel (7inch)	1206	5%	0.250	5 000	7"	-	74
RC01	232271151...	General 1206 5% Reel (10inch)	1206	5%	0.250	10 000	10"	-	74
RC01	232271181...	General 1206 5% Reel (13inch)	1206	5%	0.250	20 000	13"	-	74
RC01	232271191032	General 1206 5% Reel (7inch)	1206	jumper	0.250	5 000	7"	-	74
RC01	232271191005	General 1206 5% Reel (10inch)	1206	jumper	0.250	10 000	10"	-	74
RC01	232271192004	General 1206 5% Reel (13inch)	1206	jumper	0.250	20 000	13"	-	74
RC02G	23227222....	General 1206 1% Reel (7inch) TC50	1206	1%	0.250	5 000	7"	50	74
RC02G	23227223....	General 1206 1% Reel (10inch) TC50	1206	1%	0.250	10 000	10"	50	74
RC02H	23227246....	General 1206 1% Reel (7inch)	1206	1%	0.250	5 000	7"	-	74
RC02H	23227247....	General 1206 1% Reel (10inch)	1206	1%	0.250	10 000	10"	-	74
RC02H	23227248....	General 1206 1% Reel (13inch)	1206	1%	0.250	20 000	13"	-	74
RC02H	232272492006	General 1206 1% Reel (7inch)	1206	jumper	0.250	5 000	7"	-	74
RC02H	232272492007	General 1206 1% Reel (10inch)	1206	jumper	0.250	10 000	10"	-	74
RC11	232273061...	General 0805 5% Reel (7inch)	0805	5%	0.125	5 000	7"	-	74
RC11	232273071...	General 0805 5% Reel (10inch)	0805	5%	0.125	10 000	10"	-	74
RC11	232273081...	General 0805 5% Reel (13inch)	0805	5%	0.125	20 000	13"	-	74
RC11	232273091002	General 0805 5% Reel (7inch)	0805	jumper	0.125	5 000	7"	-	74
RC11	232273091003	General 0805 5% Reel (10inch)	0805	jumper	0.125	10 000	10"	-	74
RC11	232273092002	General 0805 5% Reel (13inch)	0805	jumper	0.125	20 000	13"	-	74
RC12G	23227326....	General 0805 1% Reel (7inch) TC50	0805	1%	0.125	5 000	7"	50	74
RC12G	23227327....	General 0805 1% Reel (10inch) TC50	0805	1%	0.125	10 000	10"	50	74
RC12H	23227346....	General 0805 1% Reel (7inch)	0805	1%	0.125	5 000	7"	-	74
RC12H	23227347....	General 0805 1% Reel (10inch)	0805	1%	0.125	10 000	10"	-	74
RC12H	23227348....	General 0805 1% Reel (13inch)	0805	1%	0.125	20 000	13"	-	74
RC12H	232273492006	General 0805 1% Reel (7inch)	0805	jumper	0.125	5 000	7"	-	74
RC12H	232273492007	General 0805 1% Reel (10inch)	0805	jumper	0.125	10 000	10"	-	74
RC21	232270260...	General 0603 5% Reel (7inch)	0603	5%	0.100	5 000	7"	-	74
RC21	232270270...	General 0603 5% Reel (10inch)	0603	5%	0.100	10 000	10"	-	74
RC21	232270281...	General 0603 5% Reel (13inch)	0603	5%	0.100	20 000	13"	-	74
RC21	232270296001	General 0603 5% Reel (7inch)	0603	jumper	0.100	5 000	7"	-	74
RC21	232270297001	General 0603 5% Reel (10inch)	0603	jumper	0.100	10 000	10"	-	74
RC21	232270292002	General 0603 5% Reel (13inch)	0603	jumper	0.100	20 000	13"	-	74
RC22H	23227046....	General 0603 1% Reel (7inch)	0603	1%	0.100	5 000	7"	-	74
RC22H	23227047....	General 0603 1% Reel (10inch)	0603	1%	0.100	10 000	10"	-	74
RC22H	23227048....	General 0603 1% Reel (13inch)	0603	1%	0.100	20 000	13"	-	74
RC22H	232270492006	General 0603 1% Reel (7inch)	0603	jumper	0.100	5 000	7"	-	74
RC22H	232270492007	General 0603 1% Reel (10inch)	0603	jumper	0.100	10 000	10"	-	74
RC31	232270570...	General 0402 5% Reel (7inch)	0402	5%	0.063	10 000	7"	-	74
RC31	232270587...	General 0402 5% Reel (10inch)	0402	5%	0.063	5 000	10"	-	74
RC31	232270591001	General 0402 5% Reel (7inch)	0402	jumper	0.063	10 000	7"	-	74
RC31	232270591007	General 0402 5% Reel (10inch)	0402	jumper	0.063	5 000	10"	-	74
RC32	23227067....	General 0402 1% Reel (7inch)	0402	1%	0.063	10 000	7"	-	74
RC32	23227068....	General 0402 1% Reel (10inch)	0402	1%	0.063	5 000	10"	-	74
RC41	232280370...	General 0201 5% Reel (7inch)	0201	5%	0.050	10 000	7"	-	74
RC41	232280391001	General 0201 5% Reel (7inch)	0201	jumper	0.050	10 000	7"	-	74
RC42	23228047....	General 0201 1% Reel (7inch)	0201	1%	0.050	10 000	7"	-	74
RC03G	23227252....	High-precision 1206 0.5% Reel (7inch) TC50	1206	0.5%	0.250	5 000	7"	50	75
RC04G	23227072....	High-precision 1206 0.25% Reel (7inch) TC50	1206	0.25%	0.125	5 000	7"	50	75
RC04H	23505410....	High-precision 1206 0.25% Reel (7inch) TC100	1206	0.25%	0.250	5 000	7"	100	75
RC05G	23227082....	High-precision 1206 0.1% Reel (7inch) TC50	1206	0.1%	0.125	5 000	7"	50	75
RC05H	23505420....	High-precision 1206 0.1% Reel (7inch) TC100	1206	0.1%	0.125	5 000	7"	100	75
RC13G	23227382....	High-precision 0805 0.5% Reel (7inch) TC50	0805	0.5%	0.125	5 000	7"	50	75
RC14G	23227092....	High-precision 0805 0.25% Reel (7inch) TC50	0805	0.25%	0.100	5 000	7"	50	75
RC14H	23505480....	High-precision 0805 0.25% Reel (7inch) TC100	0805	0.25%	0.100	5 000	7"	100	75
RC15G	23227102....	High-precision 0805 0.1% Reel (7inch) TC50	0805	0.1%	0.100	5 000	7"	50	75
RC15H	23505450....	High-precision 0805 0.1% Reel (7inch) TC100	0805	0.1%	0.100	5 000	7"	100	75
RC23H	23505460....	High-precision 0603 0.5% Reel (7inch) TC100	0603	0.5%	0.063	5 000	7"	100	76
RC24H	23505470....	High-precision 0603 0.25% Reel (7inch) TC100	0603	0.25%	0.063	5 000	7"	100	76
RC25H	23505480....	High-precision 0603 0.1% Reel (7inch) TC100	0603	0.1%	0.063	5 000	7"	100	76
RC33	23505497....	High-precision 0402 0.5% Reel (7inch) TC200	0402	0.5%	0.063	5 000	7"	200	76
TF510	23906127....	High-precision Thin Film 1210 1.0% Reel (7inch) TC25	1210	1.0%	0.250	5 000	7"	25	76
TF520	23904127....	High-precision Thin Film 1210 1.0% Reel (7inch) TC50	1210	1.0%	0.250	5 000	7"	50	76
TF511	23906126....	High-precision Thin Film 1210 0.5% Reel (7inch) TC25	1210	0.5%	0.250	5 000	7"	25	76
TF521	23904126....	High-precision Thin Film 1210 0.5% Reel (7inch) TC50	1210	0.5%	0.250	5 000	7"	50	76
TF512	23906125....	High-precision Thin Film 1210 0.25% Reel (7inch) TC25	1210	0.25%	0.250	5 000	7"	25	76
TF522	23904125....	High-precision Thin Film 1210 0.25% Reel (7inch) TC50	1210	0.25%	0.250	5 000	7"	50	76
TF513	23906124....	High-precision Thin Film 1210 0.1% Reel (7inch) TC25	1210	0.1%	0.250	5 000	7"	25	76
TF523	23904124....	High-precision Thin Film 1210 0.1% Reel (7inch) TC50	1210	0.1%	0.250	5 000	7"	50	76
TF514	23906123....	High-precision Thin Film 1210 0.05% Reel (7inch) TC25	1210	0.05%	0.250	5 000	7"	25	76





PART NUMBER CROSS REFERENCE

Part number to 12NC cross reference

Part number to 12NC cross reference									
P/N	12NC	Description	Size	Tol	Power	Qty	Reel size	TC	Page
TF524	23904123....	High-precision Thin Film 1210 0.05% Reel (7inch) TC50	1210	0.05%	0.250	5 000	7"	50	76
TF010	23906117....	High-precision Thin Film 1206 1.0% Reel (7inch) TC25	1206	1.0%	0.125	5 000	7"	25	77
TF020	23904117....	High-precision Thin Film 1206 1.0% Reel (7inch) TC50	1206	1.0%	0.125	5 000	7"	50	77
TF011	23906116....	High-precision Thin Film 1206 0.5% Reel (7inch) TC25	1206	0.5%	0.125	5 000	7"	25	77
TF021	23904116....	High-precision Thin Film 1206 0.5% Reel (7inch) TC50	1206	0.5%	0.125	5 000	7"	50	77
TF012	23906115....	High-precision Thin Film 1206 0.25% Reel (7inch) TC25	1206	0.25%	0.125	5 000	7"	25	77
TF022	23904115....	High-precision Thin Film 1206 0.25% Reel (7inch) TC50	1206	0.25%	0.125	5 000	7"	50	77
TF013	23906114....	High-precision Thin Film 1206 0.1% Reel (7inch) TC25	1206	0.1%	0.125	5 000	7"	25	77
TF023	23904114....	High-precision Thin Film 1206 0.1% Reel (7inch) TC50	1206	0.1%	0.125	5 000	7"	50	77
TF014	23906113....	High-precision Thin Film 1206 0.05% Reel (7inch) TC25	1206	0.05%	0.125	5 000	7"	25	77
TF024	23904113....	High-precision Thin Film 1206 0.05% Reel (7inch) TC50	1206	0.05%	0.125	5 000	7"	50	77
TF110	23906017....	High-precision Thin Film 0805 1.0% Reel (7inch) TC25	0805	1.0%	0.125	5 000	7"	25	77
TF120	23904017....	High-precision Thin Film 0805 1.0% Reel (7inch) TC50	0805	1.0%	0.125	5 000	7"	50	77
TF111	23906016....	High-precision Thin Film 0805 0.5% Reel (7inch) TC25	0805	0.5%	0.125	5 000	7"	25	77
TF121	23904016....	High-precision Thin Film 0805 0.5% Reel (7inch) TC50	0805	0.5%	0.125	5 000	7"	50	77
TF112	23906015....	High-precision Thin Film 0805 0.25% Reel (7inch) TC25	0805	0.25%	0.125	5 000	7"	25	77
TF122	23904015....	High-precision Thin Film 0805 0.25% Reel (7inch) TC50	0805	0.25%	0.125	5 000	7"	50	77
TF113	23906014....	High-precision Thin Film 0805 0.1% Reel (7inch) TC25	0805	0.1%	0.125	5 000	7"	25	77
TF123	23904014....	High-precision Thin Film 0805 0.1% Reel (7inch) TC50	0805	0.1%	0.125	5 000	7"	50	77
TF114	23906013....	High-precision Thin Film 0805 0.05% Reel (7inch) TC25	0805	0.05%	0.125	5 000	7"	25	77
TF124	23904013....	High-precision Thin Film 0805 0.05% Reel (7inch) TC50	0805	0.05%	0.125	5 000	7"	50	77
TF210	23906047....	High-precision Thin Film 0603 1.0% Reel (7inch) TC25	0603	1.0%	0.063	5 000	7"	25	78
TF220	23904047....	High-precision Thin Film 0603 1.0% Reel (7inch) TC50	0603	1.0%	0.063	5 000	7"	50	78
TF211	23906046....	High-precision Thin Film 0603 0.5% Reel (7inch) TC25	0603	0.5%	0.063	5 000	7"	25	78
TF221	23904046....	High-precision Thin Film 0603 0.5% Reel (7inch) TC50	0603	0.5%	0.063	5 000	7"	50	78
TF212	23906045....	High-precision Thin Film 0603 0.25% Reel (7inch) TC25	0603	0.25%	0.063	5 000	7"	25	78
TF222	23904045....	High-precision Thin Film 0603 0.25% Reel (7inch) TC50	0603	0.25%	0.063	5 000	7"	50	78
TF213	23906044....	High-precision Thin Film 0603 0.1% Reel (7inch) TC25	0603	0.1%	0.063	5 000	7"	25	78
TF223	23904044....	High-precision Thin Film 0603 0.1% Reel (7inch) TC50	0603	0.1%	0.063	5 000	7"	50	78
TF214	23906043....	High-precision Thin Film 0603 0.05% Reel (7inch) TC25	0603	0.05%	0.063	5 000	7"	25	78
TF224	23904043....	High-precision Thin Film 0603 0.05% Reel (7inch) TC50	0603	0.05%	0.063	5 000	7"	50	78
TF310	23906077....	High-precision Thin Film 0402 1.0% Reel (7inch) TC25	0402	1.0%	0.063	10 000	7"	25	78
TF320	23904077....	High-precision Thin Film 0402 1.0% Reel (7inch) TC50	0402	1.0%	0.063	10 000	7"	50	78
TF311	23906076....	High-precision Thin Film 0402 0.5% Reel (7inch) TC25	0402	0.5%	0.063	10 000	7"	25	78
TF321	23904076....	High-precision Thin Film 0402 0.5% Reel (7inch) TC50	0402	0.5%	0.063	10 000	7"	50	78
TF312	23906075....	High-precision Thin Film 0402 0.25% Reel (7inch) TC25	0402	0.25%	0.063	10 000	7"	25	78
TF322	23904075....	High-precision Thin Film 0402 0.25% Reel (7inch) TC50	0402	0.25%	0.063	10 000	7"	50	78
TF313	23906074....	High-precision Thin Film 0402 0.1% Reel (7inch) TC25	0402	0.1%	0.063	10 000	7"	25	78
TF323	23904074....	High-precision Thin Film 0402 0.1% Reel (7inch) TC50	0402	0.1%	0.063	10 000	7"	50	78
TF314	23906073....	High-precision Thin Film 0402 0.05% Reel (7inch) TC25	0402	0.05%	0.063	10 000	7"	25	78
TF324	23904073....	High-precision Thin Film 0402 0.05% Reel (7inch) TC50	0402	0.05%	0.063	10 000	7"	50	78
ARC241	235003410....	Array 4x0603 5% Reel (7inch) concave	1206	5%	0.063	5 000	7"	200	79
ARC241	235003491001	Array 4x0603 5% Reel (7inch) concave	1206	jumper	0.063	5 000	7"	-	79
ARV241	235003510....	Array 4x0603 5% Reel (7inch) concex	1206	5%	0.063	5 000	7"	200	79
ARV241	235003591001	Array 4x0603 5% Reel (7inch) concex	1206	jumper	0.063	5 000	7"	-	79
ARC242	23500241....	Array 4x0603 1% Reel (7inch) concave	1206	1%	0.063	5 000	7"	100	79
ARV242	23500251....	Array 4x0603 1% Reel (7inch) convex	1206	1%	0.063	5 000	7"	200	79
ARV321	235001311....	Array 2x0402 5% Reel (10inch) convex	0202	5%	0.063	10 000	10"	200	79
ARV321	235001391002	Array 2x0402 5% Reel (7inch) convex	0202	jumper	0.063	5 000	7"	-	79
ARV321	235001391001	Array 2x0402 5% Reel (10inch) convex	0202	jumper	0.063	10 000	10"	-	79
ARV322	23500132....	Array 2x0402 1% Reel (7inch) convex	0202	1%	0.063	10 000	7"	100	79
ARV341	235003310....	Array 4x0402 5% Reel (7inch) convex	0402	5%	0.063	5 000	7"	300	79
ARV341	235003311....	Array 4x0402 5% Reel (10inch) convex	0402	5%	0.063	10 000	10"	300	79
ARV341	235003391002	Array 4x0402 5% Reel (7inch) convex	0402	jumper	0.063	5 000	7"	-	79
ARV341	235003391001	Array 4x0402 5% Reel (10inch) convex	0402	jumper	0.063	10 000	10"	-	79
ARV342	23500231....	Array 4x0402 1% Reel (7inch) convex	0402	1%	0.063	5 000	7"	300	79
ARV342	23500232....	Array 4x0402 1% Reel (7inch) convex	0402	1%	0.063	10 000	10"	300	79
ARV381	235005310....	Array 8x0402 5% Reel (7inch) convex	1608	5%	0.063	5 000	7"	200	79
ARV381	235005391001	Array 8x0402 5% Reel (7inch) convex	1608	jumper	0.063	5 000	7"	-	79
ARV382	23500431....	Array 8x0402 1% Reel (7inch) convex	1608	1%	0.063	5 000	7"	200	79
RNA310	235023010....	8R-network 5% Reel (7inch) convex	1206	5%	0.031	5 000	7"	-	80
RNA310	235023091001	8R-network 5% Reel (7inch) convex	1206	jumper	0.031	5 000	7"	-	80
RNA310	23502302....	8R-network 1% Reel (7inch) convex	1206	1%	0.031	5 000	7"	-	80
RBC210	23503122....	Network 4R4C 5% (7inch) concave	1608	5%	0.062	5 000	7"	200	80
PRC101	2390 735 70....	1210 power resistor 5% (7inch)	1210	5%	0.330	5 000	7"	-	81
PRC101	2390 735 90001	1210 power resistor 5% (7inch)	1210	jumper	0.330	5 000	7"	-	81
PRC102	2390 735 3....	1210 power resistor 1% (7inch)	1210	1%	0.330	5 000	7"	-	81
PRC111	232276060....	2010 power resistor 5% (10 inch)	2010	5%	0.500	4 000	10"	-	81
PRC111	232276090003	2010 power resistor 5% (10inch)	2010	jumper	0.500	4 000	10"	-	81

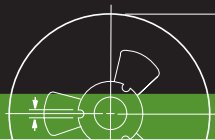


PART NUMBER CROSS REFERENCE

Part number to 12NC cross reference

Part number to 12NC cross reference									
P/N	12NC	Description	Size	Tol	Power	Qty	Reel size	TC	Page
PRC111	23227616....	2010 power resistor 1% (10inch)	2010	1%	0.500	4 000	10"	-	81
PRC201	232273560...	1218 power resistor 5% (10inch)	1218	5%	1.000	5 000	10"	-	81
PRC201	232273590006	1218 power resistor 5% (10inch)	1218	jumper	1.000	5 000	10"	-	81
PRC201	23227352....	1218 power resistor 5% (10inch)	1218	1%	1.000	5 000	10"	-	81
PRC221	232276260...	2512 power resistor 5% (10inch)	2512	5%	1.000	4 000	10"	-	81
PRC221	232276290000	2512 power resistor 5% (10inch)	2512	jumper	1.000	4 000	10"	-	81
PRC221	23227636....	2512 power resistor 1% (10inch)	2512	1%	1.000	4 000	10"	-	81
LPRC101	2390 735 70....	1210 power resistor 5% (7inch)	1210	5%	0.330	5 000	7"	-	82
LPRC102	2390 735 3....	1210 power resistor 1% (7inch)	1210	1%	0.330	5 000	7"	-	82
LPRC111	232276090..0	2010 power resistor 5% (10inch) low ohmic	2010	5%	0.500	4 000	10"	-	82
LPRC111	232276060...7	2010 power resistor 5% (10 inch) low ohmic	2010	5%	0.500	4 000	10"	-	82
LPRC111	232276190..0	2010 power resistor 1% (10inch) low ohmic	2010	1%	0.500	4 000	10"	-	82
LPRC111	23227616...7	2010 power resistor 1% (10inch) low ohmic	2010	1%	0.500	4 000	10"	-	82
LPRC201	232273560...	1218 power resistor 5% (10 inch) low ohmic	1218	5%	1.000	5 000	10"	-	82
LPRC201	23227352....	1218 power resistor 1% (10inch) low ohmic	1218	1%	1.000	5 000	10"	-	82
LPRC221	232276290..0	2512 power resistor 5% (10inch) low ohmic	2512	5%	1.000	4 000	10"	-	82
LPRC221	232276260...7	2512 power resistor 5% (10 inch) low ohmic	2512	5%	1.000	4 000	10"	-	82
LPRC221	232276390..0	2512 power resistor 1% (10inch) low ohmic	2512	1%	1.000	4 000	10"	-	82
LPRC221	23227636...7	2512 power resistor 1% (10inch) low ohmic	2512	1%	1.000	4 000	10"	-	82
VPRC221	232276298...	2512 high voltage power resistor 5% (10inch)	2512	5%	1.000	4 000	10"	200	83
MPRC221	232276294..0	2512 power metal strip resistor 5% (10inch)	2512	5%	1.000	4 000	10"	-	83
MPRC221	232276395..0	2512 power metal strip resistor 1% (10inch)	2512	1%	1.000	4 000	10"	-	83
VRC01	232279061...	High voltage resistor 1206 5% (7inch)	1206	5%	0.250	5 000	7"	300	83
VRC02	23227916....	High voltage resistor 1206 1% (7 inch)	1206	1%	0.250	5 000	7"	300	83
VRC11	232279261...	High voltage resistor 0805 5% (7inch)	0805	5%	0.125	5 000	7"	300	83
VRC12	23227936....	High voltage resistor 0805 1% (7inch)	0805	1%	0.125	5 000	7"	300	83
HRC01	235052010...	High Ohmic resistor 1206 5% (7inch)	1206	5%	0.250	5 000	7"	250	84
HRC01	235052091001	High Ohmic resistor 1206 5% - 100M (7inch)	1206	5%	0.250	5 000	7"	250	84
HRC11	235052110...	High Ohmic resistor 0805 5% (7inch)	0805	5%	0.125	5 000	7"	250	84
HRC11	235052191001	High Ohmic resistor 0805 5% - 100M (7inch)	0805	5%	0.125	5 000	7"	250	84
HRC21	235052210...	High Ohmic resistor 0603 5% (7inch)	0603	5%	0.100	5 000	7"	300	84
LRC01	235051010...	Low Ohmic resistor 1206 5% (7inch)	1206	5%	0.250	5 000	7"	-	84
LRC02	235051012...	Low Ohmic resistor 1206 1% (7inch)	1206	1%	0.250	5 000	7"	-	84
LRC11	235051110...	Low Ohmic resistor 0805 5% (7inch)	0805	5%	0.125	5 000	7"	-	84
LRC12	235051112...	Low Ohmic resistor 0805 1% (7inch)	0805	1%	0.100	5 000	7"	-	84
LRC11P	235051115...	Low Ohmic resistor 0805 5% power (7inch)	0805	5%	0.250	5 000	7"	-	84
LRC12P	235051117...	Low Ohmic resistor 0805 1% power (7inch)	0805	1%	0.250	5 000	7"	-	84
LRC21	235051210...	Low Ohmic resistor 0603 5% (7inch)	0603	5%	0.063	5 000	7"	-	84
LRC22	235051212...	Low Ohmic resistor 0603 1% (7inch)	0603	1%	0.063	5 000	7"	-	84
RC02TR	235050011...	Trimmable resistor 1206 0/-20% (7inch)	1206	0/-20	0.250	5 000	7"	-	85
RC02TR	235050010...	Trimmable resistor 1206 0/-30% (7inch)	1206	0/-30	0.250	5 000	7"	-	85
RC02TR	232272494.	Trimmable resistor 1206 (Europe style) (7inch)	1206	-	0.250	5 000	7"	-	85
RC12TR	235050111...	Trimmable resistor 0805 0/-20% (7inch)	0805	0/-20	0.125	5 000	7"	-	85
RC12TR	235051110...	Trimmable resistor 0805 0/-30% (7inch)	0805	0/-30	0.125	5 000	7"	-	85
RC12TR	232273494...	Trimmable resistor 0805 (Europe style) (7inch)	0805	-	0.125	5 000	7"	-	85
RC22TR	235050211...	Trimmable resistor 0603 0/-20% (7inch)	0603	0/-20	0.063	5 000	7"	-	85
RC22TR	235050210...	Trimmable resistor 0603 0/-30% (7inch)	0603	0/-30	0.063	5 000	7"	-	85
RC32TR	235050321...	Trimmable resistor 0402 0/-20% (7inch)	0402	0/-20	0.063	10 000	7"	-	85
RC32TR	23505032...	Trimmable resistor 0402 0/-30% (7inch)	0402	0/-30	0.063	10 000	7"	-	85
SRC01	235055010...	Surge resistor 1206 5% (7inch)	1206	5%	0.250	5 000	7"	200	85
FRC01	23227506....	Fuse resistor 1206 5% (7inch)	1206	5%	0.125	5 000	7"	-	85
FRC21	232275660...	Fuse resistor 0603 5% (7inch)	0603	1%	0.063	5 000	7"	-	85
RC01	232271111...	General 1206 5% Reel - NiAu termination (7inch)	1206	5%	0.250	5 000	7"	-	86
RC01	232271112...	General 1206 5% Reel - NiAu termination (10inch)	1206	5%	0.250	10 000	10"	-	86
RC02H	23227291....	General 1206 1% Reel - NiAu termination (7inch)	1206	1%	0.250	5 000	7"	-	86
RC02H	23227292....	General 1206 1% Reel - NiAu termination (10inch)	1206	1%	0.250	10 000	10"	-	86
RC11	232273011....	General 0805 5% Reel - NiAu termination (7inch)	0805	5%	0.125	5 000	7"	-	86
RC11	232273012....	General 0805 5% Reel - NiAu termination (10inch)	0805	5%	0.125	10 000	10"	-	86
RC12	23227341....	General 0805 1% Reel - NiAu termination (7inch)	0805	1%	0.125	5 000	7"	-	86
RC12	23227342....	General 0805 1% Reel - NiAu termination (10inch)	0805	1%	0.125	10 000	10"	-	86
RC21	232270211...	General 0603 5% Reel - NiAu termination (7inch)	0603	5%	0.063	5 000	7"	-	86
RC21	232270212...	General 0603 5% Reel - NiAu termination (10inch)	0603	5%	0.063	10 000	10"	-	86
RC22H	23227041....	General 0603 1% Reel - NiAu termination (7inch)	0603	1%	0.063	5 000	7"	-	86
RC22H	23227042....	General 0603 1% Reel - NiAu termination (10inch)	0603	1%	0.063	10 000	10"	-	86
RC31	232270512...	General 0402 5% Reel - NiAu termination (7inch)	0402	-	0.063	10 000	7"	-	86
RC32	23227062....	General 0402 1% Reel - NiAu termination (7inch)	0402	5%	0.063	10 000	7"	-	86
Sample kits	332207330...	Samples kits	-	1%	-	-	-	-	87
ATV321	235070310...	Attenuator 50Ω - 1 to 20 dB	0404	-	0.040	5 000	7"	-	97
ATV321	235070311...	Attenuator 50Ω - 1 to 20 dB	0404	-	0.040	10 000	10"	-	97





12NC CROSS REFERENCE

12NC to part number cross reference

12NC to part number cross reference									
12NC	P/N	Description	Size	Tol	Power	Qty	Reel size	TC	Page
232270292002	RC21	General 0603 5% Reel (13inch)	0603	jumper	0.100	20 000	13"	-	74
232270296001	RC21	General 0603 5% Reel (7inch)	0603	jumper	0.100	5000	7"	-	74
232270297001	RC21	General 0603 5% Reel (10inch)	0603	jumper	0.100	10 000	10"	-	74
232270492006	RC22H	General 0603 1% Reel (7inch)	0603	jumper	0.100	5 000	7"	-	74
232270492007	RC22H	General 0603 1% Reel (10inch)	0603	jumper	0.100	10 000	10"	-	74
232270591001	RC31	General 0402 5% Reel (7inch)	0402	jumper	0.063	10 000	7"	-	74
232270591007	RC31	General 0402 5% Reel (10inch)	0402	jumper	0.063	5 0000	10"	-	74
232271191005	RC01	General 1206 5% Reel (10inch)	1206	jumper	0.250	10 000	10"	-	74
232271191032	RC01	General 1206 5% Reel (7inch)	1206	jumper	0.250	5 000	7"	-	74
232271192004	RC01	General 1206 5% Reel (13inch)	1206	jumper	0.250	20 000	13"	-	74
232272492006	RC02H	General 1206 1% Reel (7inch)	1206	jumper	0.250	5 000	7"	-	74
232272492007	RC02H	General 1206 1% Reel (10inch)	1206	jumper	0.250	10 000	10"	-	74
232273091002	RC11	General 0805 5% Reel (7inch)	0805	jumper	0.125	5 000	7"	-	74
232273091003	RC11	General 0805 5% Reel (10inch)	0805	jumper	0.125	10 000	10"	-	74
232273092002	RC11	General 0805 5% Reel (13inch)	0805	jumper	0.125	20 000	13"	-	74
232273492006	RC12H	General 0805 1% Reel (7inch)	0805	jumper	0.125	5 000	7"	-	74
232273492007	RC12H	General 0805 1% Reel (10inch)	0805	jumper	0.125	10 000	10"	-	74
232273590006	PRC201	1218 power resistor 5% (10inch)	1218	jumper	1.000	5 000	10"	-	81
232276090003	PRC111	2010 power resistor 5% (10inch)	2010	jumper	0.500	4000	10"	-	81
232276290000	PRC221	2512 power resistor 5% (10inch)	2512	jumper	1.000	4000	10"	-	81
232280391001	RC41	General 0201 5% Reel (7inch)	0201	jumper	0.050	10 000	7"	-	74
235001391001	ARV321	Array 2x0402 5% Reel (10inch) convex	0202	jumper	0.063	10 000	10"	-	79
235001391002	ARV321	Array 2x0402 5% Reel (7inch) convex	0202	jumper	0.063	5 000	7"	-	79
235003391001	ARV341	Array 4x0402 5% Reel (10inch) convex	0402	jumper	0.063	10 000	10"	-	79
235003391002	ARV341	Array 4x0402 5% Reel (7inch) convex	0402	jumper	0.063	5 000	7"	-	79
235003491001	ARC241	Array 4x0603 5% Reel (7inch) concave	1206	jumper	0.063	5 000	7"	-	79
235003591001	ARV241	Array 4x0603 5% Reel (7inch) concex	1206	jumper	0.063	5 000	7"	-	79
235005391001	ARV381	Array 8x0402 5% Reel (7inch) convex	1608	jumper	0.063	5 000	7"	-	79
235023091001	RNA310	8R-network 5% Reel (7inch) convex	1206	jumper	0.031	5 000	7"	-	80
235052091001	HRC01	High Ohmic resistor 1206 5% - 100M (7inch)	1206	5%	0.250	5 000	7"	250	84
235052191001	HRC11	High Ohmic resistor 0805 5% - 100M (7inch)	0805	5%	0.125	5 000	7"	250	84
232270211...	RC21	General 0603 5% Reel - NiAu termination (7inch)	0603	5%	0.063	5 000	7"	-	86
232270212...	RC21	General 0603 5% Reel - NiAu termination (10inch)	0603	5%	0.063	10 000	10"	-	86
232270260...	RC21	General 0603 5% Reel (7inch)	0603	5%	0.100	5 000	7"	-	74
232270270...	RC21	General 0603 5% Reel (10inch)	0603	5%	0.100	10 000	10"	-	74
232270281...	RC21	General 0603 5% Reel (13inch)	0603	5%	0.100	20 000	13"	-	74
23227041....	RC22H	General 0603 1% Reel - NiAu termination (7inch)	0603	1%	0.063	5 000	7"	-	86
23227042....	RC22H	General 0603 1% Reel - NiAu termination (10inch)	0603	1%	0.063	10 000	10"	-	86
23227046....	RC22H	General 0603 1% Reel (7inch)	0603	1%	0.100	5 000	7"	-	74
23227047....	RC22H	General 0603 1% Reel (10inch)	0603	1%	0.100	10 000	10"	-	74
23227048....	RC22H	General 0603 1% Reel (13inch)	0603	1%	0.100	20 000	13"	-	74
232270512...	RC31	General 0402 5% Reel - NiAu termination (7inch)	0402	5%	0.063	10 000	7"	-	86
232270570...	RC31	General 0402 5% Reel (7inch)	0402	5%	0.063	10 000	7"	-	74
232270587...	RC31	General 0402 5% Reel (10inch)	0402	5%	0.063	5 0000	10"	-	74
23227062....	RC32	General 0402 1% Reel - NiAu termination (7inch)	0402	1%	0.063	10 000	7"	-	86
23227067....	RC32	General 0402 1% Reel (7inch)	0402	1%	0.063	10 000	7"	-	74
23227068....	RC32	General 0402 1% Reel (10inch)	0402	1%	0.063	5 0000	10"	-	74
23227072....	RC04G	High-precision 1206 0.25% Reel (7inch) TC50	1206	0.25%	0.125	5 000	7"	50	75
23227082....	RC05G	High-precision 1206 0.1% Reel (7inch) TC50	1206	0.1%	0.125	5 000	7"	50	75
23227092....	RC14G	High-precision 0805 0.25% Reel (7inch) TC50	0805	0.25%	0.100	5 000	7"	50	75
23227102....	RC15G	High-precision 0805 0.1% Reel (7inch) TC50	0805	0.1%	0.100	5 000	7"	50	75
232271111...	RC01	General 1206 5% Reel - NiAu termination (7inch)	1206	5%	0.250	5 000	7"	-	86
232271112...	RC01	General 1206 5% Reel - NiAu termination (10inch)	1206	5%	0.250	10 000	10"	-	86
232271151...	RC01	General 1206 5% Reel (10inch)	1206	5%	0.250	10 000	10"	-	74
232271161...	RC01	General 1206 5% Reel (7inch)	1206	5%	0.250	5 000	7"	-	74
232271181...	RC01	General 1206 5% Reel (13inch)	1206	5%	0.250	20 000	13"	-	74
23227222....	RC02G	General 1206 1% Reel (7inch) TC50	1206	1%	0.250	5 000	7"	50	74
23227223....	RC02G	General 1206 1% Reel (10inch) TC50	1206	1%	0.250	10 000	10"	50	74
23227246....	RC02H	General 1206 1% Reel (7inch)	1206	1%	0.250	5 000	7"	-	74
23227247....	RC02H	General 1206 1% Reel (10inch)	1206	1%	0.250	10 000	10"	-	74
23227248....	RC02H	General 1206 1% Reel (13inch)	1206	1%	0.250	20 000	13"	-	74
232272494.	RC02TR	Trimmable resistor 1206 (Europe style) (7inch)	1206	-	0.250	5 000	7"	-	85
23227252....	RC03G	High-precision 1206 0.5% Reel (7inch) TC50	1206	0.5%	0.250	5 000	7"	50	75
23227291....	RC02H	General 1206 1% Reel - NiAu termination (7inch)	1206	1%	0.250	5 000	7"	-	86
23227292....	RC02H	General 1206 1% Reel - NiAu termination (10inch)	1206	1%	0.250	10 000	107"	-	86
232273011....	RC11	General 0805 5% Reel - NiAu termination (7inch)	0805	5%	0.125	5 000	7"	-	86
232273012....	RC11	General 0805 5% Reel - NiAu termination (10inch)	0805	5%	0.125	10 000	10"	-	86
232273061...	RC11	General 0805 5% Reel (7inch)	0805	5%	0.125	5 000	7"	-	74
232273071...	RC11	General 0805 5% Reel (10inch)	0805	5%	0.125	10 000	10"	-	74

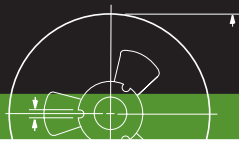


12NC CROSS REFERENCE

12NC to part number cross reference

12NC to part number cross reference									
12NC	P/N	Description	Size	Tol	Power	Qty	Reel size	TC	Page
232273081...	RC11	General 0805 5% Reel (13inch)	0805	5%	0.125	20 000	13"	-	74
23227326....	RC12G	General 0805 1% Reel (7inch) TC50	0805	1%	0.125	5 000	7"	50	74
23227327....	RC12G	General 0805 1% Reel (10inch) TC50	0805	1%	0.125	10 000	10"	50	74
23227341....	RC12	General 0805 1% Reel - NiAu termination (7inch)	0805	1%	0.125	5 000	7"	-	86
23227342....	RC12	General 0805 1% Reel - NiAu termination (10inch)	0805	1%	0.125	10 000	10"	-	86
23227346....	RC12H	General 0805 1% Reel (7inch)	0805	1%	0.125	5 000	7"	-	74
23227347....	RC12H	General 0805 1% Reel (10inch)	0805	1%	0.125	10 000	10"	-	74
23227348....	RC12H	General 0805 1% Reel (13inch)	0805	1%	0.125	20 000	13"	-	74
232273494...	RC12TR	Trimmable resistor 0805 (Europe style) (7inch)	0805	-	0.125	5 000	7"	-	85
23227352....	PRC201	1218 power resistor 5% (10inch)	1218	1%	1.000	5 000	10"	-	81
23227352....	LPRC201	1218 power resistor 1% (10inch) low ohmic	1218	1%	1.000	5 000	10"	-	82
232273560...	PRC201	1218 power resistor 5% (10inch)	1218	5%	1.000	5 000	10"	-	83
232273560...	LPRC201	1218 power resistor 5% (10 inch) low ohmic	1218	5%	1.000	5 000	10"	-	82
23227382....	RC13G	High-precision 0805 0.5% Reel (7inch) TC50	0805	0.5%	0.125	5 000	7"	50	75
23227506....	FRC01	Fuse resistor 1206 5% (7inch)	1206	5%	0.125	5 000	7"	-	85
232275660...	FRC21	Fuse resistor 0603 5% (7inch)	0603	1%	0.063	5 000	7"	-	85
232276060...	PRC111	2010 power resistor 5% (10 inch)	2010	5%	0.500	4 000	10"	-	81
232276060...7	LPRC111	2010 power resistor 5% (10 inch) low ohmic	2010	5%	0.500	4 000	10"	-	82
232276090.0	LPRC111	2010 power resistor 5% (10inch) low ohmic	2010	5%	0.500	4 000	10"	-	82
23227616....	PRC111	2010 power resistor 1% (10inch)	2010	1%	0.500	4 000	10"	-	81
23227616...7	LPRC111	2010 power resistor 1% (10inch) low ohmic	2010	1%	0.500	4 000	10"	-	82
232276190.0	LPRC111	2010 power resistor 1% (10inch) low ohmic	2010	1%	0.500	4 000	10"	-	82
232276260...	PRC221	2512 power resistor 5% (10inch)	2512	5%	1.000	4 000	10"	-	81
232276260...7	LPRC221	2512 power resistor 5% (10 inch) low ohmic	2512	5%	1.000	4 000	10"	-	82
232276290.0	LPRC221	2512 power resistor 5% (10inch) low ohmic	2512	5%	1.000	4 000	10"	-	82
232276294.0	MPRC221	2512 power metal strip resistor 5% (10inch)	2512	5%	1.000	4 000	10"	-	83
232276298...	VPRC221	2512 high voltage power resistor 5% (10inch)	2512	5%	1.000	4 000	10"	200	83
23227636....	PRC221	2512 power resistor 1% (10inch)	2512	1%	1.000	4 000	10"	-	81
23227636...7	LPRC221	2512 power resistor 1% (10inch) low ohmic	2512	1%	1.000	4 000	10"	-	82
232276390.0	LPRC221	2512 power resistor 1% (10inch) low ohmic	2512	1%	1.000	4 000	10"	-	82
232276395.0	MPRC221	2512 power metal strip resistor 1% (10inch)	2512	1%	1.000	4 000	10"	-	83
232279061...	VRC01	High voltage resistor 1206 5% (7inch)	1206	5%	0.250	5 000	7"	300	83
23227916....	VRC02	High voltage resistor 1206 1% (7 inch)	1206	1%	0.250	5 000	7"	300	83
232279261...	VRC11	High voltage resistor 0805 5% (7inch)	0805	5%	0.125	5 000	7"	300	83
23227936....	VRC12	High voltage resistor 0805 1% (7inch)	0805	1%	0.125	5 000	7"	300	83
232280370...	RC41	General 0201 5% Reel (7inch)	0201	5%	0.050	10 000	7"	-	74
23228047....	RC42	General 0201 1% Reel (7inch)	0201	1%	0.050	10 000	7"	-	74
235001311...	ARV321	Array 2x0402 5% Reel (10inch) convex	0202	5%	0.063	10 000	10"	200	79
23500132....	ARV322	Array 2x0402 1% Reel (7inch) convex	0202	1%	0.063	10 000	7"	100	79
23500231....	ARV342	Array 4x0402 1% Reel (7inch) convex	0402	1%	0.063	5 000	7"	300	79
23500232....	ARV342	Array 4x0402 1% Reel (7inch) convex	0402	1%	0.063	10 000	10"	300	79
23500241....	ARC242	Array 4x0603 1% Reel (7inch) concave	1206	1%	0.063	5 000	7"	100	79
23500251....	ARV242	Array 4x0603 1% Reel (7inch) convex	1206	1%	0.063	5 000	7"	200	79
235003310...	ARV341	Array 4x0402 5% Reel (7inch) convex	0402	5%	0.063	5 000	7"	300	79
235003311...	ARV341	Array 4x0402 5% Reel (10inch) convex	0402	5%	0.063	10 000	10"	300	79
235003410...	ARC241	Array 4x0603 5% Reel (7inch) concave	1206	5%	0.063	5 000	7"	200	79
235003510...	ARV241	Array 4x0603 5% Reel (7inch) concex	1206	5%	0.063	5 000	7"	200	79
23500431....	ARV382	Array 8x0402 1% Reel (7inch) convex	1608	1%	0.063	5 000	7"	200	79
235005310...	ARV381	Array 8x0402 5% Reel (7inch) convex	1608	5%	0.063	5 000	7"	200	79
235023010...	RNA310	8R-network 5% Reel (7inch) convex	1206	5%	0.031	5 000	7"	-	80
23502302....	RNA310	8R-network 1% Reel (7inch) convex	1206	1%	0.031	5 000	7"	-	80
23503122....	RCB210	Network 4R4C 5% (7inch) concave	1608	5%	0.062	5 000	7"	200	80
235050010...	RC02TR	Trimmable resistor 1206 0/-30% (7inch)	1206	0/-30	0.250	5 000	7"	-	85
235050011...	RC02TR	Trimmable resistor 1206 0/-20% (7inch)	1206	0/-20	0.250	5 000	7"	-	85
235050111...	RC12TR	Trimmable resistor 0805 0/-20% (7inch)	0805	0/-20	0.125	5 000	7"	-	85
235050210...	RC22TR	Trimmable resistor 0603 0/-30% (7inch)	0603	0/-30	0.063	5 000	7"	-	85
235050211...	RC22TR	Trimmable resistor 0603 0/-20% (7inch)	0603	0/-20	0.063	5 000	7"	-	85
23505032....	RC32TR	Trimmable resistor 0402 0/-30% (7inch)	0402	0/-30	0.063	10 000	7"	-	85
235050321...	RC32TR	Trimmable resistor 0402 0/-20% (7inch)	0402	0/-20	0.063	10 000	7"	-	85
235051010...	LRC01	Low Ohmic resistor 1206 5% (7inch)	1206	5%	0.250	5 000	7"	-	84
235051012...	LRC02	Low Ohmic resistor 1206 1% (7inch)	1206	1%	0.250	5 000	7"	-	84
235051110...	LRC11	Low Ohmic resistor 0805 5% (7inch)	0805	5%	0.125	5 000	7"	-	84
235051110...	RC12TR	Trimmable resistor 0805 0/-30% (7inch)	0805	0/-30	0.125	5 000	7"	-	85
235051112...	LRC12	Low Ohmic resistor 0805 1% (7inch)	0805	1%	0.100	5 000	7"	-	84
235051115...	LRC11P	Low Ohmic resistor 0805 5% power (7inch)	0805	5%	0.250	5 000	7"	-	84
235051117...	LRC12P	Low Ohmic resistor 0805 1% power (7inch)	0805	1%	0.250	5 000	7"	-	84
235051210...	LRC21	Low Ohmic resistor 0603 5% (7inch)	0603	5%	0.063	5 000	7"	-	84
235051212...	LRC22	Low Ohmic resistor 0603 1% (7inch)	0603	1%	0.063	5 000	7"	-	84
235052010...	HRC01	High Ohmic resistor 1206 5% (7inch)	1206	5%	0.250	5 000	7"	250	84





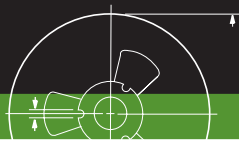
12NC CROSS REFERENCE

12NC to part number cross reference

12NC to part number cross reference									
12NC	P/N	Description	Size	Tol	Power	Qty	Reel size	TC	Page
235052110...	HRC11	High Ohmic resistor 0805 5% (7inch)	0805	5%	0.125	5 000	7"	250	84
235052210...	HRC21	High Ohmic resistor 0603 5% (7inch)	0603	5%	0.100	5 000	7"	300	84
23505410....	RC04H	High-precision 1206 0.25% Reel (7inch) TC100	1206	0.25%	0.250	5 000	7"	100	75
23505420....	RC05H	High-precision 1206 0.1% Reel (7inch) TC100	1206	0.1%	0.125	5 000	7"	100	75
23505440....	RC14H	High-precision 0805 0.25% Reel (7inch) TC100	0805	0.25%	0.100	5 000	7"	100	75
23505450....	RC15H	High-precision 0805 0.1% Reel (7inch) TC100	0805	0.1%	0.100	5 000	7"	100	75
23505460....	RC23H	High-precision 0603 0.5% Reel (7inch) TC100	0603	0.5%	0.063	5 000	7"	100	76
23505470....	RC24H	High-precision 0603 0.25% Reel (7inch) TC100	0603	0.25%	0.063	5 000	7"	100	76
23505480....	RC25H	High-precision 0603 0.1% Reel (7inch) TC100	0603	0.1%	0.063	5 000	7"	100	76
23505497....	RC33	High-precision 0402 0.5% Reel (7inch) TC200	0402	0.5%	0.063	5 000	7"	200	76
235055010...	SRC01	Surge resistor 1206 5% (7inch)	1206	5%	0.250	5 000	7"	200	85
235070310...	ATV321	Attenuator 50Ω - 1 to 20 dB	0404	-	0.040	5 000	7"	-	97
235070311...	ATV321	Attenuator 50Ω - 1 to 20 dB	0404	-	0.040	10 000	10"	-	97
2390 735 3....	PRC102	1210 power resistor 1% (7inch)	1210	1%	0.330	5 000	7"	-	81
2390 735 3....	LPRC102	1210 power resistor 1% (7inch)	1210	1%	0.330	5 000	7"	-	82
2390 735 70....	PRC101	1210 power resistor 5% (7inch)	1210	5%	0.330	5 000	7"	-	81
2390 735 70....	LPRC101	1210 power resistor 5% (7inch)	1210	5%	0.330	5 000	7"	-	82
2390 735 90001	PRC101	1210 power resistor 5% (7inch)	1210	jumper	0.330	5 000	7"	-	81
23904013....	TF124	High-precision Thin Film 0805 0.05% Reel (7inch) TC50	0805	0.05%	0.125	5 000	7"	50	77
23904014....	TF123	High-precision Thin Film 0805 0.1% Reel (7inch) TC50	0805	0.1%	0.125	5 000	7"	50	77
23904015....	TF122	High-precision Thin Film 0805 0.25% Reel (7inch) TC50	0805	0.25%	0.125	5 000	7"	50	77
23904016....	TF121	High-precision Thin Film 0805 0.5% Reel (7inch) TC50	0805	0.5%	0.125	5 000	7"	50	77
23904017....	TF120	High-precision Thin Film 0805 1.0% Reel (7inch) TC50	0805	1.0%	0.125	5 000	7"	50	77
23904043....	TF224	High-precision Thin Film 0603 0.05% Reel (7inch) TC50	0603	0.05%	0.063	5 000	7"	50	78
23904044....	TF223	High-precision Thin Film 0603 0.1% Reel (7inch) TC50	0603	0.1%	0.063	5 000	7"	50	78
23904045....	TF222	High-precision Thin Film 0603 0.25% Reel (7inch) TC50	0603	0.25%	0.063	5 000	7"	50	78
23904046....	TF221	High-precision Thin Film 0603 0.5% Reel (7inch) TC50	0603	0.5%	0.063	5 000	7"	50	78
23904047....	TF220	High-precision Thin Film 0603 1.0% Reel (7inch) TC50	0603	1.0%	0.063	5 000	7"	50	78
23904073....	TF324	High-precision Thin Film 0402 0.05% Reel (7inch) TC50	0402	0.05%	0.063	10 000	7"	50	78
23904074....	TF323	High-precision Thin Film 0402 0.1% Reel (7inch) TC50	0402	0.1%	0.063	10 000	7"	50	78
23904075....	TF322	High-precision Thin Film 0402 0.25% Reel (7inch) TC50	0402	0.25%	0.063	10 000	7"	50	78
23904076....	TF321	High-precision Thin Film 0402 0.5% Reel (7inch) TC50	0402	0.5%	0.063	10 000	7"	50	78
23904077....	TF320	High-precision Thin Film 0402 1.0% Reel (7inch) TC50	0402	1.0%	0.063	10 000	7"	50	78
23904113....	TF024	High-precision Thin Film 1206 0.05% Reel (7inch) TC50	1206	0.05%	0.125	5 000	7"	50	77
23904114....	TF023	High-precision Thin Film 1206 0.1% Reel (7inch) TC50	1206	0.1%	0.125	5 000	7"	50	77
23904115....	TF022	High-precision Thin Film 1206 0.25% Reel (7inch) TC50	1206	0.25%	0.125	5 000	7"	50	77
23904116....	TF021	High-precision Thin Film 1206 0.5% Reel (7inch) TC50	1206	0.5%	0.125	5 000	7"	50	77
23904117....	TF020	High-precision Thin Film 1206 1.0% Reel (7inch) TC50	1206	1.0%	0.125	5 000	7"	50	77
23904123....	TF524	High-precision Thin Film 1210 0.05% Reel (7inch) TC50	1210	0.05%	0.250	5 000	7"	50	76
23904124....	TF523	High-precision Thin Film 1210 0.1% Reel (7inch) TC50	1210	0.1%	0.250	5 000	7"	50	76
23904125....	TF522	High-precision Thin Film 1210 0.25% Reel (7inch) TC50	1210	0.25%	0.250	5 000	7"	50	76
23904126....	TF521	High-precision Thin Film 1210 0.5% Reel (7inch) TC50	1210	0.5%	0.250	5 000	7"	50	76
23904127....	TF520	High-precision Thin Film 1210 1.0% Reel (7inch) TC50	1210	1.0%	0.250	5 000	7"	50	76
23906013....	TF114	High-precision Thin Film 0805 0.05% Reel (7inch) TC25	0805	0.05%	0.125	5 000	7"	25	77
23906014....	TF113	High-precision Thin Film 0805 0.1% Reel (7inch) TC25	0805	0.1%	0.125	5 000	7"	25	77
23906015....	TF112	High-precision Thin Film 0805 0.25% Reel (7inch) TC25	0805	0.25%	0.125	5 000	7"	25	77
23906016....	TF111	High-precision Thin Film 0805 0.5% Reel (7inch) TC25	0805	0.5%	0.125	5 000	7"	25	77
23906017....	TF110	High-precision Thin Film 0805 1.0% Reel (7inch) TC25	0805	1.0%	0.125	5 000	7"	25	77
23906043....	TF214	High-precision Thin Film 0603 0.05% Reel (7inch) TC25	0603	0.05%	0.063	5 000	7"	25	78
23906044....	TF213	High-precision Thin Film 0603 0.1% Reel (7inch) TC25	0603	0.1%	0.063	5 000	7"	25	78
23906045....	TF212	High-precision Thin Film 0603 0.25% Reel (7inch) TC25	0603	0.25%	0.063	5 000	7"	25	78
23906046....	TF211	High-precision Thin Film 0603 0.5% Reel (7inch) TC25	0603	0.5%	0.063	5 000	7"	25	78
23906047....	TF210	High-precision Thin Film 0603 1.0% Reel (7inch) TC25	0603	1.0%	0.063	5 000	7"	25	78
23906073....	TF314	High-precision Thin Film 0402 0.05% Reel (7inch) TC25	0402	0.05%	0.063	10 000	7"	25	78
23906074....	TF313	High-precision Thin Film 0402 0.1% Reel (7inch) TC25	0402	0.1%	0.063	10 000	7"	25	78
23906075....	TF312	High-precision Thin Film 0402 0.25% Reel (7inch) TC25	0402	0.25%	0.063	10 000	7"	25	78
23906076....	TF311	High-precision Thin Film 0402 0.5% Reel (7inch) TC25	0402	0.5%	0.063	10 000	7"	25	78
23906077....	TF310	High-precision Thin Film 0402 1.0% Reel (7inch) TC25	0402	1.0%	0.063	10 000	7"	25	78
23906113....	TF014	High-precision Thin Film 1206 0.05% Reel (7inch) TC25	1206	0.05%	0.125	5 000	7"	25	77
23906114....	TF013	High-precision Thin Film 1206 0.1% Reel (7inch) TC25	1206	0.1%	0.125	5 000	7"	25	77
23906115....	TF012	High-precision Thin Film 1206 0.25% Reel (7inch) TC25	1206	0.25%	0.125	5 000	7"	25	77
23906116....	TF011	High-precision Thin Film 1206 0.5% Reel (7inch) TC25	1206	0.5%	0.125	5 000	7"	25	77
23906117....	TF010	High-precision Thin Film 1206 1.0% Reel (7inch) TC25	1206	1.0%	0.125	5 000	7"	25	77
23906123....	TF514	High-precision Thin Film 1210 0.05% Reel (7inch) TC25	1210	0.05%	0.250	5 000	7"	25	76
23906124....	TF513	High-precision Thin Film 1210 0.1% Reel (7inch) TC25	1210	0.1%	0.250	5 000	7"	25	76
23906125....	TF512	High-precision Thin Film 1210 0.25% Reel (7inch) TC25	1210	0.25%	0.250	5 000	7"	25	76
23906126....	TF511	High-precision Thin Film 1210 0.5% Reel (7inch) TC25	1210	0.5%	0.250	5 000	7"	25	76
23906127....	TF510	High-precision Thin Film 1210 1.0% Reel (7inch) TC25	1210	1.0%	0.250	5 000	7"	25	76
332207330...	Sample kits	Samples kits	-	-	-	-	-	-	87







PRODUCT SELECTION CHART

HF products - Antennas

Description	UHF antenna ceramic	TDMA antenna ceramic	Dual-band antenna (900/1800 MHz) PCB	Dual-band antenna (900/1800 MHz) ceramic	Triple-band antenna (900/1800/1900 MHz) PCB vertical	GPS antenna (CP mode) (1.575 GHz)	GPS antenna (CP mode) (1.575 GHz)	GPS antenna (LP mode) (1.575 GHz)	DECT/WCDMA antenna
Dimensions (mm)	37.5x6.8x0.9	16.5x14x0.9	24x10x6	21x12x0.9	30x9.4x0.8	12x12x4	18x18x4	12,5x6.6x0.9	8.8x6.8x0.9
Frequency range	421 to 445 MHz	850 to 950 MHz	880 to 960 MHz 1710 to 1880 MHz	880 to 960 MHz 1710 to 1880 MHz	880 to 960 MHz 1710 to 1880 MHz	1.580 GHz	1.580 GHz	1.597 GHz	1.88 to 2.1 GHz
Bandwidth (MHz)	20 MHz	80 MHz	80 MHz 170 MHz	80 MHz 170 MHz	80 MHz 170 MHz	6 MHz	6 MHz	100 MHz	100 MHz
Gain (dBi max)	0.5	1.5	0 to 0.5 0.5 to 1	0 to 0.5 0.5 to 1	0 to 0.5 0.5 to 1	3	4	1.5	2
Polarization	Linear	Linear	Linear	Linear	Linear	Right-hand circular polarization	Right-hand circular polarization	Linear	Linear
Azimuth	Omn-directional	Omn-directional	Omn-directional	Omn-directional	Omn-directional	-	-	Omn-directional	Omn-directional
VSWR	<2.0	<2.0	<2.7	<2.7	<2.5	<2.5	<2.5	<2.0	<2
Temp range (°C)	-55 to 125	-55 to 125	-55 to 125	-55 to 125	-55 to 125	-55 to 125	-55 to 125	-55 to 125	-55 to 125

Packing									
Bulk	4313 121 200043	4313 119 00087	4313 316 00918	4313 118 00918	4313 324 00918	4313 213 06158	4313 423 06158	4313 114 00158	---
Tape 1000 pcs	---	4311 119 00087	---	4311 118 00918	---	---	---	---	4311 112 00188
Tape 2500 pcs	4311 121 20043	---	---	---	---	---	---	---	---

Description	Bluetooth antenna - long shape			Bluetooth antenna				HyperLan 5.265 GHz	Bluetooth/WLAN IEE802.11 Antenna FR4 w/cable conn.	Dual-band WLAN 2.45 / 5.2 GHz	Bluetooth/WLAN IEE802.11 Antenna FR4 w/cable conn.
	8x3.5x0.9	8x3.5x0.9	8x3.5x0.9	7.3x5.5x1.3	7.3x5.5x1.3	7.3x5.5x1.3	7.3x5.5x1.3	12x12x4	28x5.6x0.8	8.7x8x0.9	28x5.6x0.4
Dimensions (mm)	8x3.5x0.9	8x3.5x0.9	8x3.5x0.9	7.3x5.5x1.3	7.3x5.5x1.3	7.3x5.5x1.3	7.3x5.5x1.3	12x12x4	28x5.6x0.8	8.7x8x0.9	28x5.6x0.4
Frequency range (GHz)	2.45	2.60	2.70	2.45	2.60	2.70	2.80	5.150 to 5.350	2.4 - 2.5	2.45/ 5.2	2.4-2.5/ 5.1-5.3
Bandwidth (MHz)	> 100	> 100	> 100	> 100	> 100	> 100	> 100	200	100	> 100	100/ 200
Gain (dBi max)	0	0	0	1.2	1.2	1.2	1.2	3	1	0	1
Polarization	Linear	Linear	Linear	Linear	Linear	Linear	Linear	Linear	Linear	Linear	Linear
Azimuth	Omn-directional	Omn-directional	Omn-directional	Omn-directional	Omn-directional	Omn-directional	Omn-directional	-	Omn-directional	Omn-directional	Omn-directional
VSWR	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.5	<2.0	<2.5
Temp range (°C)	-55 to 125	-55 to 125	-55 to 125	-55 to 125	-55 to 125	-55 to 125	-55 to 125	-55 to 125	-55 to 125	-55 to 125	-55 to 125

Packing											
Bulk	4313 115 00245	4313 115 00260	4313 115 00270	4313 111 00245	4313 111 00260	4313 111 00270	4313 111 00280	4313 222 00520	4313 325 00245	4313 117 00252	4313 326 00252
Tape 1000 pcs	4311 115 00245	4311 115 00260	4311 115 00270	4311 111 00245	4311 111 00260	4311 111 00270	4311 111 00280	---	---	4311 117 00252	---
Tape 4000 pcs	4312 115 00245	4312 115 00260	4312 115 00270	4312 111 00245	4312 111 00260	4312 111 00270	4312 111 00280	---	---	---	---



PRODUCT SELECTION CHART

HF products - Attenuators

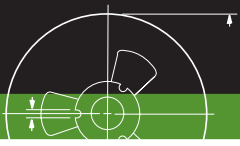
		Attenuator
Series		ATV321
Case size		0404
Attenuation range		1 dB / 20 dB
Attenuation tolerance	1 to 5 dB	± 0.3 dB / ± 0.2 dB
	6 to 10 dB	± 0.5 dB / ± 0.3 dB
	15 dB	± 1 dB / ± 0.5 dB
	20 dB	± 2 dB / ± 1.0 dB
Frequency range	1 to 10 dB	DC tot 2.5 GHz
	15 and 20 dB	DC to 2.0 GHz
Maximum permissible voltage (V)		50
Power rating (mW)		40
Temp range (°C)		-55 to 125

Ordering information - Phycomp world wide - preferred types		
Series		ATV321
Packing		paper tape
Quantity	5 000	2350 703 10...
	10 000	2350 703 11...
Remark		for last three digits see table 12NC

Ordering information - Phycomp North America - preferred types		
Series		ATV321
Packing		paper tape
Quantity	5 000	9CV3218Axxxxx-HFT
	10 000	9CV3218Axxxxx-HF3
Remark		for xxxxx see table NA code

Attenuation						
Value (dB)	Standard			Optional		
	Tolerance (dB)	12NC	NA code	Tolerance (dB)	12NC	NA code
1	± 0.3	012	01dBC	± 0.2	011	01dBB
2	± 0.3	022	02dBC	± 0.2	021	02dBB
3	± 0.3	032	03dBC	± 0.2	031	03dBB
4	± 0.3	042	04dBC	± 0.2	041	04dBB
5	± 0.3	052	05dBC	± 0.2	051	05dBB
6	± 0.5	063	06dBD	± 0.3	062	06dBC
7	± 0.5	073	07dBD	± 0.3	072	07dBC
8	± 0.5	083	08dBD	± 0.3	082	08dBC
9	± 0.5	093	09dBD	± 0.3	092	09dBC
10	± 0.5	103	10dBD	± 0.3	102	10dBC
15	± 1.0	154	15dBF	± 0.5	153	15dBD
20	± 2.0	205	20dBG	± 1.0	204	20dBF





NOTES





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