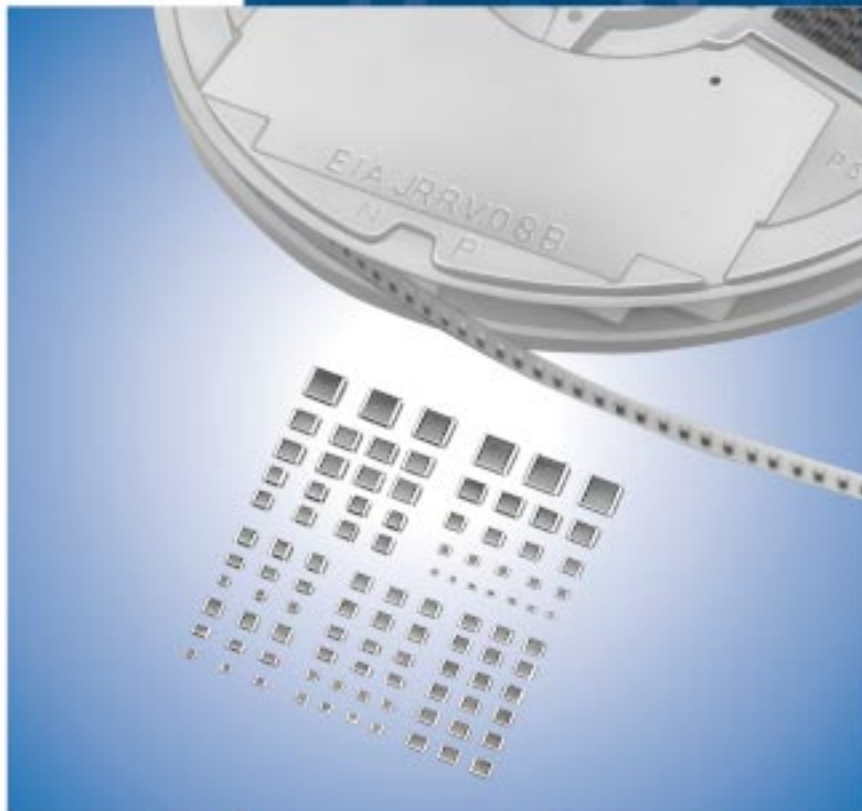


Chip Monolithic Ceramic Capacitors



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● Please refer to "Specifications and Test Methods" at the end of each chapter of **15** – **19** .

● Part Numbering

Chip Monolithic Ceramic Capacitors

(Part Number)

GR	M	18	8	B1	1H	102	K	A01	K
①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩

① Product ID

② Series

Product ID	Code	Series
GR	M	Tin Plated Layer
	4	Only for Information Devices / Tip & Ring
	7	Only for Camera Flash Circuit
ER	B	High Frequency Type
GQ	M	High Frequency for Flow/Reflow Soldering
GM	A	Monolithic Microchip
GN	M	Capacitor Array
LL	L	Low ESL Wide Width Type
	A	Eight-termination Low ESL Type
	M	Ten-termination Low ESL Type
GJ	M	High Frequency Low Loss Type Tin Plated Type
GA	2	for AC250V (r.m.s.)
	3	Safety Standard Recognized Type

③ Dimension (L×W)

Code	Dimension (L×W)	EIA
02	0.4×0.2mm	01005
03	0.6×0.3mm	0201
05	0.5×0.5mm	0202
08	0.8×0.8mm	0303
11	1.25×1.0mm	0504
15	1.0×0.5mm	0402
18	1.6×0.8mm	0603
1D	1.4×1.4mm	
1X	Depends on individual standards.	
21	2.0×1.25mm	0805
22	2.8×2.8mm	1111
31	3.2×1.6mm	1206
32	3.2×2.5mm	1210
3X	Depends on individual standards.	
42	4.5×2.0mm	1808
43	4.5×3.2mm	1812
52	5.7×2.8mm	2211
55	5.7×5.0mm	2220

④ Dimension (T)

Code	Dimension (T)
2	0.2mm
2	2-elements (Array Type)
3	0.3mm
4	4-elements (Array Type)
5	0.5mm
6	0.6mm
7	0.7mm
8	0.8mm
9	0.85mm
A	1.0mm
B	1.25mm
C	1.6mm
D	2.0mm
E	2.5mm
F	3.2mm
M	1.15mm
N	1.35mm
R	1.8mm
S	2.8mm
Q	1.5mm
X	Depends on individual standards.

With the array type GNM series, "Dimension(T)" indicates the number of elements.

Continued on the following page. 

Continued from the preceding page.

⑤ Temperature Characteristics

Temperature Characteristic Codes			Temperature Characteristics			Operating Temperature Range
Code	Public STD Code		Reference Temperature	Temperature Range	Capacitance Change or Temperature Coefficient	
1X	SL *1	JIS	20°C	20 to 85°C	+350 to -1000ppm/°C	-55 to 125°C
2C	CH *1	JIS	20°C	20 to 125°C	0±60ppm/°C	-55 to 125°C
2P	PH *1	JIS	20°C	20 to 85°C	-150±60ppm/°C	-25 to 85°C
2R	RH *1	JIS	20°C	20 to 85°C	-220±60ppm/°C	-25 to 85°C
2S	SH *1	JIS	20°C	20 to 85°C	-330±60ppm/°C	-25 to 85°C
2T	TH *1	JIS	20°C	20 to 85°C	-470±60ppm/°C	-25 to 85°C
3C	CJ *1	JIS	20°C	20 to 125°C	0±120ppm/°C	-55 to 125°C
3P	PJ *1	JIS	20°C	20 to 85°C	-150±120ppm/°C	-25 to 85°C
3R	RJ *1	JIS	20°C	20 to 85°C	-220±120ppm/°C	-25 to 85°C
3S	SJ *1	JIS	20°C	20 to 85°C	-330±120ppm/°C	-25 to 85°C
3T	TJ *1	JIS	20°C	20 to 85°C	-470±120ppm/°C	-25 to 85°C
3U	UJ *1	JIS	20°C	20 to 85°C	-750±120ppm/°C	-25 to 85°C
4C	CK *1	JIS	20°C	20 to 125°C	0±250ppm/°C	-55 to 125°C
5C	C0G *1	EIA	25°C	25 to 125°C	0±30ppm/°C	-55 to 125°C
5G	X8G *1	EIA	25°C	25 to 150°C	0±30ppm/°C	-55 to 150°C
6C	C0H *1	EIA	25°C	25 to 125°C	0±60ppm/°C	-55 to 125°C
6P	P2H *1	EIA	25°C	25 to 85°C	-150±60ppm/°C	-55 to 125°C
6R	R2H *1	EIA	25°C	25 to 85°C	-220±60ppm/°C	-55 to 125°C
6S	S2H *1	EIA	25°C	25 to 85°C	-330±60ppm/°C	-55 to 125°C
6T	T2H *1	EIA	25°C	25 to 85°C	-470±60ppm/°C	-55 to 125°C
7U	U2J *1	EIA	25°C	25 to 85°C	-750±120ppm/°C	-55 to 125°C
B1	B *2	JIS	20°C	-25 to 85°C	±10%	-25 to 85°C
B3	B	JIS	20°C	-25 to 85°C	±10%	-25 to 85°C
C7	X7S	EIA	25°C	-55 to 125°C	±22%	-55 to 125°C
C8	X6S	EIA	25°C	-55 to 105°C	±22%	-55 to 105°C
F1	F *2	JIS	20°C	-25 to 85°C	+30, -80%	-25 to 85°C
F5	Y5V	EIA	25°C	-30 to 85°C	+22, -82%	-30 to 85°C
L8	X8L	EIA	25°C	-55 to 150°C	+15, -40%	-55 to 150°C
R1	R *2	JIS	20°C	-55 to 125°C	±15%	-55 to 125°C
R3	R	JIS	20°C	-55 to 125°C	±15%	-55 to 125°C
R6	X5R	EIA	25°C	-55 to 85°C	±15%	-55 to 85°C
R7	X7R	EIA	25°C	-55 to 125°C	±15%	-55 to 125°C
R9	X8R	EIA	25°C	-55 to 150°C	±15%	-55 to 150°C
9E	ZLM	*3	20°C	-25 to 20°C	-4700+100/-2500ppm/°C	-25 to 85°C
				20 to 85°C	-4700+500/-1000ppm/°C	
W0	-	-	25°C	-55 to 125°C	±10% *4	-55 to 125°C
					+22, -33% *5	

*1 Please refer to table for Capacitance Change under reference temperature.

*2 Capacitance change is specified with 50% rated voltage applied.

*3 Murata Temperature Characteristic Code.

*4 Apply DC350V bias.

*5 No DC bias.

Continued on the following page. 

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●Capacitance Change from each temperature

JIS Code

Murata Code	Capacitance Change from 20°C (%)					
	-55°C		-25°C		-10°C	
	Max.	Min.	Max.	Min.	Max.	Min.
1X	—	—	—	—	—	—
2C	0.82	-0.45	0.49	-0.27	0.33	-0.18
2P	—	—	1.32	0.41	0.88	0.27
2R	—	—	1.70	0.72	1.13	0.48
2S	—	—	2.30	1.22	1.54	0.81
2T	—	—	3.07	1.85	2.05	1.23
3C	1.37	-0.90	0.82	-0.54	0.55	-0.36
3P	—	—	1.65	0.14	1.10	0.09
3R	—	—	2.03	0.45	1.35	0.30
3S	—	—	2.63	0.95	1.76	0.63
3T	—	—	3.40	1.58	2.27	1.05
3U	—	—	4.94	2.84	3.29	1.89
4C	2.56	-1.88	1.54	-1.13	1.02	-0.75

EIA Code

Murata Code	Capacitance Change from 25°C (%)					
	-55°C		-30°C		-10°C	
	Max.	Min.	Max.	Min.	Max.	Min.
5C/5G	0.58	-0.24	0.40	-0.17	0.25	-0.11
6C	0.87	-0.48	0.59	-0.33	0.38	-0.21
6P	2.33	0.72	1.61	0.50	1.02	0.32
6R	3.02	1.28	2.08	0.88	1.32	0.56
6S	4.09	2.16	2.81	1.49	1.79	0.95
6T	5.46	3.28	3.75	2.26	2.39	1.44
7U	8.78	5.04	6.04	3.47	3.84	2.21

⑥Rated Voltage

Code	Rated Voltage
0G	DC4V
0J	DC6.3V
1A	DC10V
1C	DC16V
1E	DC25V
1H	DC50V
2A	DC100V
2D	DC200V
2E	DC250V
YD	DC300V
2H	DC500V
2J	DC630V
3A	DC1kV
3D	DC2kV
3F	DC3.15kV
BB	DC350V (for Camera Flash Circuit)
E2	AC250V
GB	X2; AC250V (Safety Standard Recognized Type GB)
GC	X1/Y2; AC250V (Safety Standard Recognized Type GC)
GD	Y3; AC250V (Safety Standard Recognized Type GD)
GF	Y2, X1/Y2; AC250V (Safety Standard Recognized Type GF)

⑦Capacitance

Expressed by three figures. The unit is pico-farad (pF). The first and second figures are significant digits, and the third figure expresses the number of zeros which follow the two numbers. If there is a decimal point, it is expressed by the capital letter "R". In this case, all figures are significant digits.

Ex.)	Code	Capacitance
	R50	0.5pF
	1R0	1.0pF
	100	10pF
	103	10000pF

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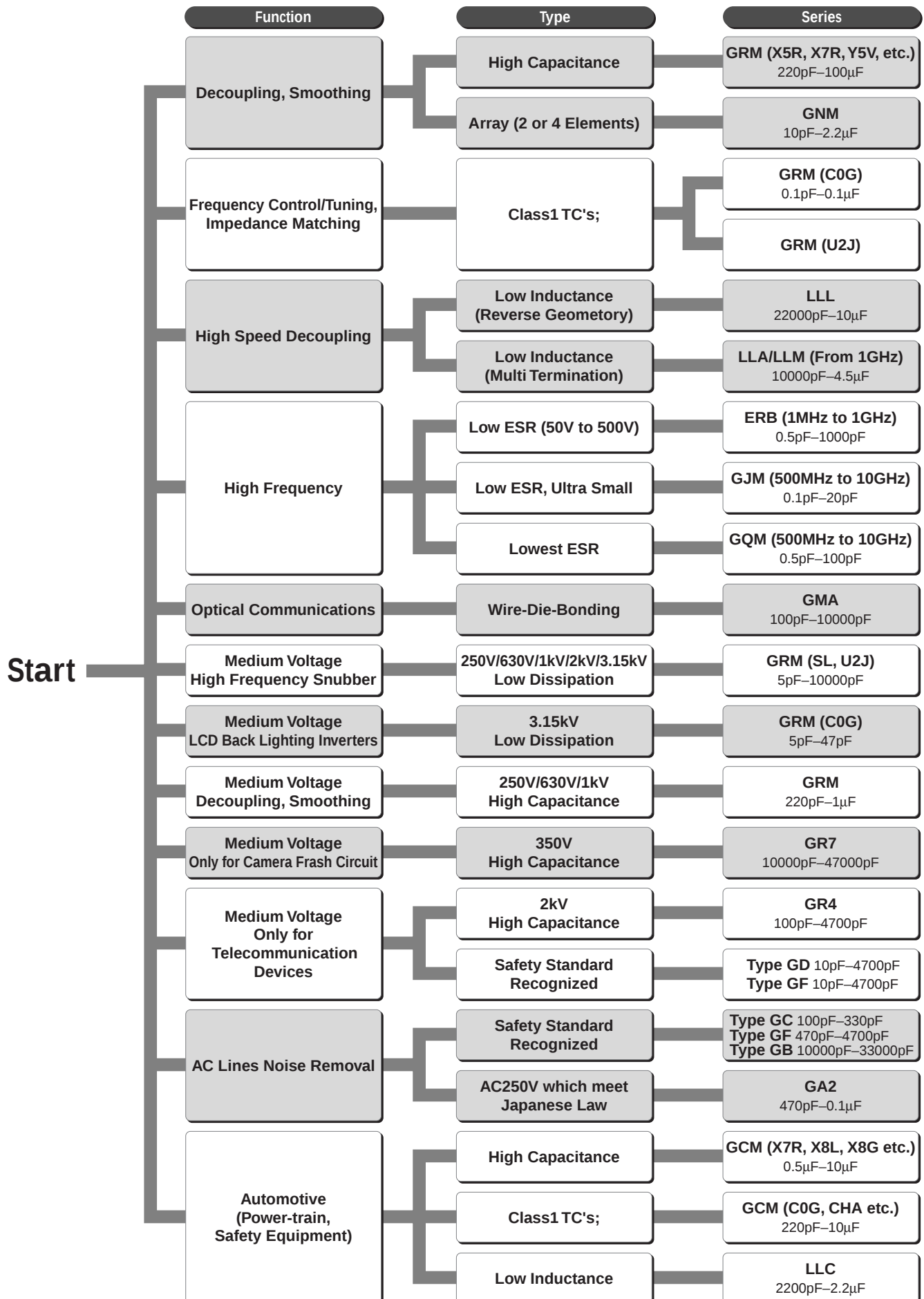
⑧ Capacitance Tolerance

* E24 series is also available.

Expressed by three figures.

Code	Packaging
L	ø178mm Embossed Taping
D	ø178mm Paper Taping
K	ø330mm Embossed Taping
J	ø330mm Paper Taping
E	ø178mm Special Packaging
F	ø330mm Special Packaging
B	Bulk
C	Bulk Case
T	Bulk Tray

Selection Guide of Chip Monolithic Ceramic Capacitors



Chip Monolithic Ceramic Capacitors

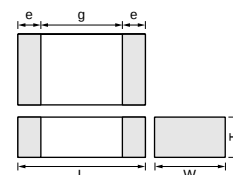
muRata

1

for Flow/Reflow Soldering GRM15/18/21/31 Series

■ Features

1. Terminations are made of metal highly resistant to migration.
2. The GRM series is a complete line of chip ceramic capacitors in 6.3V, 10V, 16V, 25V, 50V, 100V, 200V and 500V ratings. These capacitors have temperature characteristics ranging from C0G to Y5V.
3. A wide selection of sizes is available, from the miniature LxWxT: 1.0x0.5x0.5mm to LxWxT: 3.2x1.6x1.6mm.
GRM18, 21 and GRM31 types are suited to flow and reflow soldering.
GRM15 type is applied to only reflow soldering.



Part Number	Dimensions (mm)				
	L	W	T	e	g min.
GRM155	1.0 ±0.05	0.5 ±0.05	0.5 ±0.05	0.15 to 0.35	0.3
GRM188*	1.6 ±0.1	0.8 ±0.1	0.8 ±0.1	0.2 to 0.5	0.5
GRM216	2.0 ±0.1	1.25 ±0.1	0.6 ±0.1	0.2 to 0.7	0.7
GRM219			0.85 ±0.1		
GRM21A			1.0 +0/-0.2		
GRM21B			1.25 ±0.1		
GRM316	3.2 ±0.15	1.6 ±0.15	0.6 ±0.1	0.3 to 0.8	1.5
GRM319			0.85 ±0.1		
GRM31M			1.15 ±0.1		
GRM31C			1.6 ±0.2		

* Bulk Case : 1.6 ±0.07(L) × 0.8 ±0.07(W) × 0.8 ±0.07(T)

■ Applications

General electronic equipment

Temperature Compensating Type GRM15 Series (1.00x0.50mm) 50/25V

GRM15								
Part Number								
L x W [EIA]	1.00x0.50 [0402]							
TC	C0G (5C)	P2H (6P)	R2H (6R)	S2H (6S)	SL (1X)		T2H (6T)	U2J (7U)
Rated Volt.	50 (1H)	50 (1H)	50 (1H)	50 (1H)	50 (1H)	25 (1E)	50 (1H)	50 (1H)
Capacitance (Capacitance part numbering code) and T (mm) Dimension (T Dimension part numbering code)								
0.30pF(R30)	0.50(5)							
0.40pF(R40)	0.50(5)							
0.50pF(R50)	0.50(5)							
0.60pF(R60)	0.50(5)							
0.70pF(R70)	0.50(5)							
0.75pF(R75)	0.50(5)							
0.80pF(R80)	0.50(5)							
0.90pF(R90)	0.50(5)							
1.0pF(1R0)	0.50(5)							
1.1pF(1R1)	0.50(5)							
1.2pF(1R2)	0.50(5)							
1.3pF(1R3)	0.50(5)							
1.4pF(1R4)	0.50(5)							
1.5pF(1R5)	0.50(5)							
1.6pF(1R6)	0.50(5)							
1.7pF(1R7)	0.50(5)							
1.8pF(1R8)	0.50(5)							
1.9pF(1R9)	0.50(5)							
2.0pF(2R0)	0.50(5)							
2.1pF(2R1)	0.50(5)							
2.2pF(2R2)	0.50(5)							
2.3pF(2R3)	0.50(5)							
2.4pF(2R4)	0.50(5)							
2.5pF(2R5)	0.50(5)							
2.6pF(2R6)	0.50(5)							

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muRata

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Part Number	GRM15							
L x W [EIA]	1.00x0.50 [0402]							
TC	COG (5C)	P2H (6P)	R2H (6R)	S2H (6S)	SL (1X)		T2H (6T)	U2J (7U)
Rated Volt.	50 (1H)	50 (1H)	50 (1H)	50 (1H)	50 (1H)	25 (1E)	50 (1H)	50 (1H)
Capacitance (Capacitance part numbering code) and T (mm) Dimension (T Dimension part numbering code)								
2.7pF(2R7)	0.50(5)							
2.8pF(2R8)	0.50(5)							
2.9pF(2R9)	0.50(5)							
3.0pF(3R0)	0.50(5)	0.50(5)	0.50(5)	0.50(5)			0.50(5)	0.50(5)
3.1pF(3R1)	0.50(5)							
3.2pF(3R2)	0.50(5)							
3.3pF(3R3)	0.50(5)							
3.4pF(3R4)	0.50(5)							
3.5pF(3R5)	0.50(5)							
3.6pF(3R6)	0.50(5)							
3.7pF(3R7)	0.50(5)							
3.8pF(3R8)	0.50(5)							
3.9pF(3R9)	0.50(5)							
4.0pF(4R0)	0.50(5)	0.50(5)	0.50(5)	0.50(5)			0.50(5)	0.50(5)
4.1pF(4R1)	0.50(5)							
4.2pF(4R2)	0.50(5)							
4.3pF(4R3)	0.50(5)							
4.4pF(4R4)	0.50(5)							
4.5pF(4R5)	0.50(5)							
4.6pF(4R6)	0.50(5)							
4.7pF(4R7)	0.50(5)							
4.8pF(4R8)	0.50(5)							
4.9pF(4R9)	0.50(5)							
5.0pF(5R0)	0.50(5)	0.50(5)	0.50(5)	0.50(5)			0.50(5)	0.50(5)
5.1pF(5R1)	0.50(5)							
5.2pF(5R2)	0.50(5)							
5.3pF(5R3)	0.50(5)							
5.4pF(5R4)	0.50(5)							
5.5pF(5R5)	0.50(5)							
5.6pF(5R6)	0.50(5)							
5.7pF(5R7)	0.50(5)							
5.8pF(5R8)	0.50(5)							
5.9pF(5R9)	0.50(5)							
6.0pF(6R0)	0.50(5)	0.50(5)	0.50(5)	0.50(5)			0.50(5)	0.50(5)
6.1pF(6R1)	0.50(5)							
6.2pF(6R2)	0.50(5)							
6.3pF(6R3)	0.50(5)							
6.4pF(6R4)	0.50(5)							
6.5pF(6R5)	0.50(5)							
6.6pF(6R6)	0.50(5)							
6.7pF(6R7)	0.50(5)							
6.8pF(6R8)	0.50(5)							
6.9pF(6R9)	0.50(5)							
7.0pF(7R0)	0.50(5)	0.50(5)	0.50(5)	0.50(5)			0.50(5)	0.50(5)
7.1pF(7R1)	0.50(5)							
7.2pF(7R2)	0.50(5)							
7.3pF(7R3)	0.50(5)							
7.4pF(7R4)	0.50(5)							
7.5pF(7R5)	0.50(5)							
7.6pF(7R6)	0.50(5)							
7.7pF(7R7)	0.50(5)							
7.8pF(7R8)	0.50(5)							

Continued on the following page. 

1

The part numbering code is shown in ().
Dimensions are shown in mm and Rated Voltage in Vdc.

The part numbering code is shown in ().
Dimensions are shown in mm and Rated Voltage in Vdc.

Temperature Compensating Type GRM21 Series (2.00x1.25mm) 200/100/50/25V

Part Number	GRM21										
L x W [EIA]	2.00x1.25 [0805]										
TC	C0G (5C)			P2H (6P)	R2H (6R)	S2H (6S)	SL (1X)			T2H (6T)	U2J (7U)
Rated Volt.	200 (2D)	100 (2A)	50 (1H)	50 (1H)	50 (1H)	50 (1H)	200 (2D)	100 (2A)	50 (1H)	50 (1H)	50 (1H)
Capacitance (Capacitance part numbering code) and T (mm) Dimension (T Dimension part numbering code)											
12pF(120)	0.85(9)	0.85(9)									
15pF(150)	0.85(9)	0.85(9)									
18pF(180)	0.85(9)	0.85(9)									
22pF(220)	0.85(9)	0.85(9)									
27pF(270)	0.85(9)	0.85(9)									
33pF(330)	0.85(9)	0.85(9)									
39pF(390)	0.85(9)	0.85(9)									
47pF(470)	0.85(9)	0.85(9)									
56pF(560)	0.85(9)	0.85(9)									
68pF(680)	1.25(B)										
82pF(820)	1.25(B)										
100pF(101)	1.25(B)										
120pF(121)	1.25(B)						0.85(9)				
150pF(151)	1.25(B)						1.25(B)				
180pF(181)	1.25(B)			0.85(9)			1.25(B)				
220pF(221)	1.25(B)			0.85(9)	0.85(9)		1.25(B)				
270pF(271)				0.85(9)	0.85(9)	0.85(9)	1.25(B)				
330pF(331)				0.85(9)	0.85(9)	0.85(9)	1.25(B)				
390pF(391)				1.25(B)	0.85(9)	0.85(9)	1.25(B)				
470pF(471)				1.25(B)	0.85(9)	0.85(9)	1.25(B)	0.85(9)			
560pF(561)				1.25(B)	1.25(B)	1.25(B)		0.85(9)		1.25(B)	
680pF(681)		0.85(9)			1.25(B)	1.25(B)		0.85(9)		1.25(B)	
820pF(821)		0.85(9)				1.25(B)		1.25(B)	0.60(6)	1.25(B)	0.60(6)
1000pF(102)		0.85(9)						1.25(B)	0.60(6)	1.25(B)	0.60(6)
1200pF(122)		0.85(9)	0.60(6)					1.25(B)	0.60(6)	1.25(B)	0.60(6)
1500pF(152)		0.85(9)	0.60(6)					1.25(B)	0.85(9)	1.25(B)	0.85(9)
1800pF(182)			0.60(6)					1.25(B)	0.85(9)	1.25(B)	0.85(9)
2200pF(222)			0.60(6)						0.85(9)		0.85(9)
2700pF(272)			0.60(6)						1.25(B)		1.25(B)
3300pF(332)			0.60(6)						1.25(B)		1.25(B)
3900pF(392)			0.60(6)								
4700pF(472)			0.60(6)								
5600pF(562)			0.85(9)								
6800pF(682)			0.85(9)								
8200pF(822)			0.85(9)								
10000pF(103)			0.85(9)						0.60(6)		0.60(6)
12000pF(123)			0.85(9)						0.60(6)		0.60(6)
15000pF(153)			0.85(9)						0.60(6)		0.60(6)
18000pF(183)			1.25(B)						0.60(6)		0.60(6)
22000pF(223)			1.25(B)						0.85(9)		0.85(9)
27000pF(273)									0.85(9)		0.85(9)
33000pF(333)									1.00(A)		1.00(A)
39000pF(393)									1.25(B)		1.25(B)
47000pF(473)									1.25(B)		1.25(B)

The part numbering code is shown in ().

Dimensions are shown in mm and Rated Voltage in Vdc.

Temperature Compensating Type GRM31 Series (3.20x1.60mm) 500/200/100/50/25V

Part Number	GRM31													
L x W [EIA]	3.20x1.60 [1206]													
TC	C0G (5C)					C0H (6C)	P2H (6P)	R2H (6R)	S2H (6S)	SL (1X)			T2H (6T)	U2J (7U)
Rated Volt.	500 (2H)	200 (2D)	100 (2A)	50 (1H)	25 (1E)	25 (1E)	50 (1H)	50 (1H)	50 (1H)	200 (2D)	100 (2A)	50 (1H)	50 (1H)	50 (1H)
Capacitance (Capacitance part numbering code) and T (mm) Dimension (T Dimension part numbering code)														
1.0pF(1R0)	1.15(M)													
2.0pF(2R0)	1.15(M)													
3.0pF(3R0)	1.15(M)													
4.0pF(4R0)	1.15(M)													
5.0pF(5R0)	1.15(M)													
6.0pF(6R0)	1.15(M)													
7.0pF(7R0)	1.15(M)													
8.0pF(8R0)	1.15(M)													
9.0pF(9R0)	1.15(M)													
10pF(100)	1.15(M)													
12pF(120)	1.15(M)													
15pF(150)	1.15(M)													
18pF(180)	1.15(M)													
22pF(220)	1.15(M)													
27pF(270)	1.15(M)													
33pF(330)	1.15(M)													
39pF(390)	1.15(M)													
47pF(470)	1.15(M)													
56pF(560)	1.15(M)													
68pF(680)	1.15(M)													
82pF(820)	1.15(M)													
270pF(271)		1.15(M)												
330pF(331)		1.15(M)												
390pF(391)		1.15(M)												
470pF(471)		1.15(M)									0.85(9)			
560pF(561)										1.15(M)	0.85(9)			
680pF(681)							0.85(9)			1.15(M)	0.85(9)			
820pF(821)			0.85(9)				0.85(9)	0.85(9)		1.15(M)	0.85(9)			
1000pF(102)			0.85(9)				1.15(M)	1.15(M)	0.85(9)	1.15(M)	0.85(9)			
1200pF(122)			0.85(9)				1.15(M)	1.15(M)	1.15(M)	1.15(M)	0.85(9)			
1500pF(152)			0.85(9)				1.15(M)	1.15(M)	1.15(M)		0.85(9)			
1800pF(182)			0.85(9)						1.15(M)		0.85(9)			
2200pF(222)			0.85(9)								1.15(M)		1.15(M)	
2700pF(272)			0.85(9)								1.15(M)		1.15(M)	
3300pF(332)			0.85(9)	0.85(9)							1.15(M)		1.15(M)	
3900pF(392)			0.85(9)	0.85(9)							1.15(M)	0.85(9)	1.15(M)	0.85(9)
4700pF(472)			0.85(9)	0.85(9)							1.15(M)	0.85(9)		0.85(9)
5600pF(562)			0.85(9)	0.85(9)								0.85(9)		0.85(9)
6800pF(682)				0.85(9)	0.85(9)	0.85(9)						1.15(M)		1.15(M)
8200pF(822)				0.85(9)	1.15(M)	1.15(M)						1.15(M)		1.15(M)
10000pF(103)				0.85(9)	0.85(9)									
12000pF(123)				0.85(9)										
15000pF(153)				0.85(9)										
18000pF(183)				0.85(9)										
22000pF(223)				0.85(9)										
27000pF(273)				0.85(9)										
33000pF(333)				0.85(9)										
39000pF(393)				1.15(M)										
47000pF(473)				1.15(M)										

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Part Number	GRM31													
L x W [EIA]	3.20x1.60 [1206]													
TC	C0G (5C)					C0H (6C)	P2H (6P)	R2H (6R)	S2H (6S)	SL (1X)			T2H (6T)	U2J (7U)
Rated Volt.	500 (2H)	200 (2D)	100 (2A)	50 (1H)	25 (1E)	25 (1E)	50 (1H)	50 (1H)	50 (1H)	200 (2D)	100 (2A)	50 (1H)	50 (1H)	50 (1H)
Capacitance (Capacitance part numbering code) and T (mm) Dimension (T Dimension part numbering code)														
56000pF(563)				1.60(C)								0.85(9)		0.85(9)
68000pF(683)				1.60(C)								1.15(M)		1.15(M)
82000pF(823)				1.60(C)								1.15(M)		1.15(M)
0.10μF(104)					1.60(C)							1.15(M)		1.15(M)

The part numbering code is shown in ().
Dimensions are shown in mm and Rated Voltage in Vdc.

High Dielectric Constant Type X5R (R6) Characteristics

TC	X5R (R6)									
Part Number	GRM15		GRM18			GRM21		GRM31		
L x W [EIA]	1.00x0.50 [0402]		1.60x0.80 [0603]			2.00x1.25 [0805]		3.20x1.60 [1206]		
Rated Volt.	16 (1C)	10 (1A)	25 (1E)	10 (1A)	6.3 (0J)	10 (1A)	6.3 (0J)	16 (1C)	10 (1A)	6.3 (0J)
Capacitance (Capacitance part numbering code) and T (mm) Dimension (T Dimension part numbering code)										
68000pF(683)		0.50(5)								
0.10μF(104)	0.50(5)	0.50(5)								
0.22μF(224)			0.80(8)							
0.33μF(334)				0.80(8)		0.60(6)				
0.47μF(474)				0.80(8)						
0.68μF(684)				0.80(8)						
1.0μF(105)				0.80(8)	0.80(8)	0.85(9)			0.85(9)	
1.5μF(155)							0.85(9)			
2.2μF(225)						1.25(B)	1.25(B)		0.85(9)	
3.3μF(335)							1.25(B)		1.30(X)	
4.7μF(475)							1.25(B)	1.60(C)	1.60(C)	1.15(M)
10μF(106)									1.60(C)	1.60(C)

The part numbering code is shown in each ().
3.3μF and 4.7μF, 6.3V rated are GRM21 series of L: 2±0.15, W: 1.25±0.15, T: 1.25±0.15.
T: 1.15±0.1mm is also available for GRM31 1.0μF for 16V.
L: 3.2±0.2, W: 1.6±0.2 for GRM31 16V 1.0μF type. Also L: 3.2±0.2, W: 1.6±0.2, T: 1.15±0.15 for GRM31 16V 1.5μF and 2.2μF type.
Dimensions are shown in mm and Rated Voltage in Vdc.

High Dielectric Constant Type X7R (R7) Characteristics

TC	X7R (R7)																			
Part Number	GRM15				GRM18					GRM21					GRM31					
L x W [EIA]	1.00x0.50 [0402]				1.60x0.80 [0603]					2.00x1.25 [0805]					3.20x1.60 [1206]					
Rated Volt.	50 (1H)	25 (1E)	16 (1C)	10 (1A)	100 (2A)	50 (1H)	25 (1E)	16 (1C)	10 (1A)	100 (2A)	50 (1H)	25 (1E)	16 (1C)	10 (1A)	6.3 (0J)	100 (2A)	50 (1H)	25 (1E)	16 (1C)	10 (1A)
Capacitance (Capacitance part numbering code) and T (mm) Dimension (T Dimension part numbering code)																				
220pF (221)	0.50 (5)				0.80 (8)	0.80 (8)														
330pF (331)	0.50 (5)				0.80 (8)	0.80 (8)														
470pF (471)	0.50 (5)				0.80 (8)	0.80 (8)														
680pF (681)	0.50 (5)				0.80 (8)	0.80 (8)														

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The part numbering code is shown in each ().

The tolerance will be changed to L: 3.2 ± 0.2 , W: 1.6 ± 0.2 for GRM31 16V 1.0 μ F type. Also L: 3.2 ± 0.2 , W: 1.6 ± 0.2 , T: 1.15 ± 0.15 for GRM31 16V 1.5 μ F and 2.2 μ F type.

Dimensions are shown in mm and Rated Voltage in Vdc.

High Dielectric Constant Type Y5V (F5) Characteristics

TC	Y5V (F5)																	
Part Number	GRM15				GRM18					GRM21				GRM31				
L x W [EIA]	1.00x0.50 [0402]				1.60x0.80 [0603]					2.00x1.25 [0805]				3.20x1.60 [1206]				
Rated Volt.	50 (1H)	25 (1E)	16 (1C)	10 (1A)	100 (2A)	50 (1H)	25 (1E)	16 (1C)	10 (1A)	50 (1H)	25 (1E)	16 (1C)	10 (1A)	50 (1H)	25 (1E)	16 (1C)	10 (1A)	6.3 (0J)
Capacitance (Capacitance part numbering code) and T (mm) Dimension (T Dimension part numbering code)																		
2200pF (222)	0.50 (5)																	
4700pF (472)	0.50 (5)				0.80 (8)													
10000pF (103)	0.50 (5)					0.80 (8)												
22000pF (223)		0.50 (5)				0.80 (8)												
47000pF (473)		0.50 (5)	0.50 (5)			0.80 (8)												
0.10μF (104)		0.50 (5)	0.50 (5)			0.80 (8)	0.80 (8)			0.85 (9)								
0.22μF (224)			0.50 (5)			0.80 (8)		0.80 (8)		1.25 (B)	0.85 (9)							
0.47μF (474)			0.50 (5)	0.50 (5)			0.80 (8)	0.80 (8)	0.80 (8)	0.85 (9)	1.25 (B)			1.15 (M)				
1.0μF (105)								0.80 (8)	0.80 (8)	0.85 (9)	0.85 (9)	0.85 (9)	0.85 (9)		1.15 (M)	0.85 (9)		
2.2μF (225)											1.25 (B)	1.25 (B)	1.25 (B)			1.15 (M)	0.85 (9)	
4.7μF (475)													1.25 (B)	1.60 (C)	1.15 (M)	1.15 (M)	1.15 (M)	
10μF (106)															1.60 (C)		1.15 (M)	1.15 (M)

The part numbering code is shown in each ().

T: 1.25±0.1mm is also available for GRM21 25V or 16V 1.0μF type.

Dimensions are shown in mm and Rated Voltage in Vdc.

Chip Monolithic Ceramic Capacitors

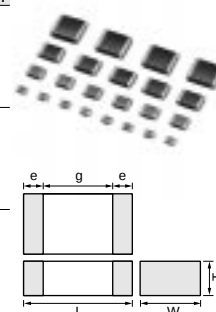


for Reflow Soldering GRM32/43/55 Series

■ Features

1. Terminations are made of metal highly resistant to migration.
2. The GRM series is a complete line of chip ceramic capacitors in 10V, 16V, 25V, 50V, 100V and 200V ratings. These capacitors have temperature characteristics ranging from C0G to Y5V.
3. This series consists of type LxWxT: 3.2x2.5x0.85mm to LxWxT: 5.7x5.0x2.5mm. These are suited to only reflow soldering.

Part Number	Dimensions (mm)			e min.	g min.
	L	W	T		
GRM329	3.2 ±0.3	2.5 ±0.2	0.85 ±0.1	0.3	1.0
GRM32M			1.15 ±0.1		
GRM32N			1.35 ±0.15		
GRM32R			1.8 ±0.2		
GRM32E			2.5 ±0.2		
GRM43M	4.5 ±0.4	3.2 ±0.3	1.15 ±0.1	0.3	2.0
GRM43N			1.35 ±0.15		
GRM43R			1.8 ±0.2		
GRM43D			2.0 ±0.2		
GRM43E			2.5 ±0.2		
GRM55M	5.7 ±0.4	5.0 ±0.4	1.15 ±0.1	0.3	2.0
GRM55N			1.35 ±0.15		
GRM55R			1.6 ±0.2		
GRM55C			1.8 ±0.2		
GRM55D			2.0 ±0.2		
GRM55E			2.5 ±0.2		



■ Applications

General electronic equipment

Temperature Compensating Type GRM32/43/55 Series

Part Number	TC Code (Standard)	Rated Voltage (Vdc)	Capacitance (pF)	Length L (mm)	Width W (mm)	Thickness T (mm)
GRM32N5C2D561JV01	C0G (EIA)	200	560 ±5%	3.20	2.50	1.35
GRM32N5C2D681JV01	C0G (EIA)	200	680 ±5%	3.20	2.50	1.35
GRM32N5C2D821JV01	C0G (EIA)	200	820 ±5%	3.20	2.50	1.35
GRM32N5C2D102JV01	C0G (EIA)	200	1000 ±5%	3.20	2.50	1.35
GRM43R5C2D122JV01	C0G (EIA)	200	1200 ±5%	4.50	3.20	1.80
GRM43R5C2D152JV01	C0G (EIA)	200	1500 ±5%	4.50	3.20	1.80
GRM43R5C2D182JV01	C0G (EIA)	200	1800 ±5%	4.50	3.20	1.80
GRM43R5C2D222JV01	C0G (EIA)	200	2200 ±5%	4.50	3.20	1.80
GRM43R5C2D272JV01	C0G (EIA)	200	2700 ±5%	4.50	3.20	1.80
GRM55N5C2D332JV01	C0G (EIA)	200	3300 ±5%	5.70	5.00	1.35
GRM55R5C2D392JV01	C0G (EIA)	200	3900 ±5%	5.70	5.00	1.80
GRM55R5C2D472JV01	C0G (EIA)	200	4700 ±5%	5.70	5.00	1.80
GRM55R5C2D562JV01	C0G (EIA)	200	5600 ±5%	5.70	5.00	1.80
GRM32N1X2D152JV01	SL (JIS)	200	1500 ±5%	3.20	2.50	1.35
GRM43N1X2D182JV01	SL (JIS)	200	1800 ±5%	4.50	3.20	1.35
GRM43N1X2D222JV01	SL (JIS)	200	2200 ±5%	4.50	3.20	1.35
GRM43R1X2D272JV01	SL (JIS)	200	2700 ±5%	4.50	3.20	1.80
GRM43R1X2D332JV01	SL (JIS)	200	3300 ±5%	4.50	3.20	1.80
GRM43R1X2D392JV01	SL (JIS)	200	3900 ±5%	4.50	3.20	1.80
GRM55N1X2D472JV01	SL (JIS)	200	4700 ±5%	5.70	5.00	1.35
GRM55R1X2D562JV01	SL (JIS)	200	5600 ±5%	5.70	5.00	1.80
GRM55R1X2D682JV01	SL (JIS)	200	6800 ±5%	5.70	5.00	1.80
GRM55R1X2D822JV01	SL (JIS)	200	8200 ±5%	5.70	5.00	1.80
GRM32N1X2A562JZ01	SL (JIS)	100	5600 ±5%	3.20	2.50	1.35
GRM32N1X2A682JZ01	SL (JIS)	100	6800 ±5%	3.20	2.50	1.35
GRM43N1X2A822JZ01	SL (JIS)	100	8200 ±5%	4.50	3.20	1.35
GRM43R1X2A103JZ01	SL (JIS)	100	10000 ±5%	4.50	3.20	1.80
GRM43R1X2A123JZ01	SL (JIS)	100	12000 ±5%	4.50	3.20	1.80
GRM43R1X2A153JZ01	SL (JIS)	100	15000 ±5%	4.50	3.20	1.80
GRM55M1X2A183JZ01	SL (JIS)	100	18000 ±5%	5.70	5.00	1.15
GRM55N1X2A223JZ01	SL (JIS)	100	22000 ±5%	5.70	5.00	1.35
GRM55R1X2A273JZ01	SL (JIS)	100	27000 ±5%	5.70	5.00	1.80
GRM55R1X2A333JZ01	SL (JIS)	100	33000 ±5%	5.70	5.00	1.80
GRM55R1X2A393JZ01	SL (JIS)	100	39000 ±5%	5.70	5.00	1.80

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High Dielectric Constant Type Type GRM32 Series (3.20x2.50mm)

High Dielectric Constant Type Type GRM43 Series (4.50x3.20mm)

Part Number	TC Code (Standard)	Rated Voltage (Vdc)	Capacitance (μF)	Length L (mm)	Width W (mm)	Thickness T (mm)
GRM43RR72A154KA01	X7R (EIA)	100	0.15 ±10%	4.50	3.20	1.80
GRM43RR72A224KA01	X7R (EIA)	100	0.22 ±10%	4.50	3.20	1.80
GRM43DR72A474KA01	X7R (EIA)	100	0.47 ±10%	4.50	3.20	2.00
GRM43DR72A155KA01	X7R (EIA)	100	1.5 ±10%	4.50	3.20	2.00
GRM43ER72A225KA01	X7R (EIA)	100	2.2 ±10%	4.50	3.20	2.50
GRM43DR71H155KA01	X7R (EIA)	50	1.5 ±10%	4.50	3.20	2.00
GRM43ER71H225KA01	X7R (EIA)	50	2.2 ±10%	4.50	3.20	2.50
GRM43ER71E475KA01	X7R (EIA)	25	4.7 ±10%	4.50	3.20	2.50
GRM43RF52A224ZD01	Y5V (EIA)	100	0.22 +80/-20%	4.50	3.20	1.80

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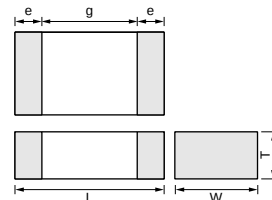
Part Number	TC Code (Standard)	Rated Voltage (Vdc)	Capacitance (μF)	Length L (mm)	Width W (mm)	Thickness T (mm)
GRM55DR61H106KA88	X5R (EIA)	50	10 ±10%	5.70	5.00	2.00
GRM55DR72A105KA01	X7R (EIA)	100	1.0 ±10%	5.70	5.00	2.00
GRM55ER72A475KA01	X7R (EIA)	100	4.7 ±10%	5.70	5.00	2.50
GRM55RR71H105KA01	X7R (EIA)	50	1.0 ±10%	5.70	5.00	1.80
GRM55RR71H155KA01	X7R (EIA)	50	1.5 ±10%	5.70	5.00	1.80
GRM55ER11H475KA01	X7R (EIA)	50	4.7 ±10%	5.70	5.00	2.50
GRM55ER71H475KA01	X7R (EIA)	50	4.7 ±10%	5.70	5.00	2.50
GRM55RF52A474ZA01	Y5V (EIA)	100	0.47 +80/-20%	5.70	5.00	1.80

Chip Monolithic Ceramic Capacitors

Ultra-small GRM02/03 Series

■ Features

1. Small chip size (LxWxT: 0.4x0.2x0.2, 0.6x0.3x0.3 mm)
2. Terminations are made of metal highly resistant to migration.
3. GRM02, GRM03 series is suited to only reflow soldering.
4. Stringent dimensional tolerances allow highly reliable, high speed automatic chip placement on PCBs.
5. GRM02, GRM03 series are suited to miniature micro wave module, portable equipment and high frequency circuits.



Part Number	Dimensions (mm)				
	L	W	T	e	g min.
GRM022	0.4 ±0.02	0.2 ±0.02	0.2 ±0.02	0.07 to 0.14	0.13
GRM033	0.6 ±0.03	0.3 ±0.03	0.3 ±0.03	0.1 to 0.2	0.2

■ Applications

1. Miniature micro wave module
2. Portable equipment
3. High frequency circuit

Part Number	GRM02		GRM03										
L x W	0.4x0.2 [01005]		0.6x0.3 [0201]										
TC	C0G (5C)	C0G (5C)	R2H (6R)	S2H (6S)	T2H (6T)	U2J (7U)		X5R (R6)	X7R (R7)				Y5V (F5)
Rated Volt.	16 (1C)	25 (1E)	25 (1E)	25 (1E)	25 (1E)	50 (1H)	25 (1E)	10 (1A)	25 (1E)	16 (1C)	10 (1A)	6.3 (0J)	10 (1A)
Capacitance (Capacitance part numbering code) and T (mm) Dimension (T Dimension part numbering code)													
0.30pF(R30)		0.3(3)											
0.40pF(R40)		0.3(3)											
0.50pF(R50)		0.3(3)											
0.60pF(R60)		0.3(3)											
0.70pF(R70)		0.3(3)											
0.75pF(R75)		0.3(3)											
0.80pF(R80)		0.3(3)											
0.90pF(R90)		0.3(3)											
1.0pF(1R0)	0.2(2)	0.3(3)											
1.1pF(1R1)		0.3(3)											
1.2pF(1R2)		0.3(3)											
1.3pF(1R3)		0.3(3)											
1.4pF(1R4)		0.3(3)											
1.5pF(1R5)		0.3(3)											
1.6pF(1R6)		0.3(3)											
1.7pF(1R7)		0.3(3)											
1.8pF(1R8)		0.3(3)											
1.9pF(1R9)		0.3(3)											
2.0pF(2R0)	0.2(2)	0.3(3)											
2.1pF(2R1)		0.3(3)											
2.2pF(2R2)		0.3(3)											
2.3pF(2R3)		0.3(3)											
2.4pF(2R4)		0.3(3)											
2.5pF(2R5)		0.3(3)											
2.6pF(2R6)		0.3(3)											
2.7pF(2R7)		0.3(3)											

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Part Number	GRM02	GRM03											
L x W	0.4x0.2 [01005]	0.6x0.3 [0201]											
TC	C0G (5C)	C0G (5C)	R2H (6R)	S2H (6S)	T2H (6T)	U2J (7U)		X5R (R6)	X7R (R7)				Y5V (F5)
Rated Volt.	16 (1C)	25 (1E)	25 (1E)	25 (1E)	25 (1E)	50 (1H)	25 (1E)	10 (1A)	25 (1E)	16 (1C)	10 (1A)	6.3 (0J)	10 (1A)
Capacitance (Capacitance part numbering code) and T (mm) Dimension (T Dimension part numbering code)													
8.0pF(8R0)	0.2(2)	0.3(3)	0.3(3)	0.3(3)	0.3(3)	0.3(3)							
8.1pF(8R1)		0.3(3)											
8.2pF(8R2)		0.3(3)											
8.3pF(8R3)		0.3(3)											
8.4pF(8R4)		0.3(3)											
8.5pF(8R5)		0.3(3)											
8.6pF(8R6)		0.3(3)											
8.7pF(8R7)		0.3(3)											
8.8pF(8R8)		0.3(3)											
8.9pF(8R9)		0.3(3)											
9.0pF(9R0)	0.2(2)	0.3(3)	0.3(3)	0.3(3)	0.3(3)	0.3(3)							
9.1pF(9R1)		0.3(3)											
9.2pF(9R2)		0.3(3)											
9.3pF(9R3)		0.3(3)											
9.4pF(9R4)		0.3(3)											
9.5pF(9R5)		0.3(3)											
9.6pF(9R6)		0.3(3)											
9.7pF(9R7)		0.3(3)											
9.8pF(9R8)		0.3(3)											
9.9pF(9R9)		0.3(3)											
10pF(100)	0.2(2)	0.3(3)	0.3(3)	0.3(3)	0.3(3)	0.3(3)							
12pF(120)	0.2(2)	0.3(3)	0.3(3)	0.3(3)	0.3(3)	0.3(3)							
15pF(150)	0.2(2)	0.3(3)	0.3(3)	0.3(3)	0.3(3)	0.3(3)							
18pF(180)		0.3(3)	0.3(3)	0.3(3)	0.3(3)		0.3(3)						
22pF(220)		0.3(3)	0.3(3)	0.3(3)	0.3(3)		0.3(3)						
27pF(270)		0.3(3)	0.3(3)	0.3(3)	0.3(3)		0.3(3)						
33pF(330)		0.3(3)	0.3(3)	0.3(3)	0.3(3)		0.3(3)						
39pF(390)		0.3(3)	0.3(3)	0.3(3)	0.3(3)		0.3(3)						
47pF(470)		0.3(3)	0.3(3)	0.3(3)	0.3(3)		0.3(3)						
56pF(560)		0.3(3)	0.3(3)	0.3(3)	0.3(3)		0.3(3)						
68pF(680)		0.3(3)	0.3(3)	0.3(3)	0.3(3)		0.3(3)						
82pF(820)		0.3(3)	0.3(3)	0.3(3)	0.3(3)		0.3(3)						
100pF(101)		0.3(3)	0.3(3)	0.3(3)	0.3(3)		0.3(3)		0.3(3)	0.3(3)			
150pF(151)									0.3(3)	0.3(3)			
220pF(221)									0.3(3)	0.3(3)			
330pF(331)									0.3(3)	0.3(3)			
470pF(471)									0.3(3)	0.3(3)			
680pF(681)									0.3(3)	0.3(3)			
1000pF(102)									0.3(3)	0.3(3)			
1500pF(152)								0.3(3)	0.3(3)			0.3(3)	
2200pF(222)								0.3(3)		0.3(3)	0.3(3)	0.3(3)	0.3(3)
3300pF(332)								0.3(3)		0.3(3)	0.3(3)	0.3(3)	
4700pF(472)								0.3(3)			0.3(3)	0.3(3)	0.3(3)
6800pF(682)								0.3(3)			0.3(3)	0.3(3)	
10000pF(103)								0.3(3)			0.3(3)	0.3(3)	0.3(3)

The part numbering code is shown in ().
 Dimensions are shown in mm and Rated Voltage in Vdc.