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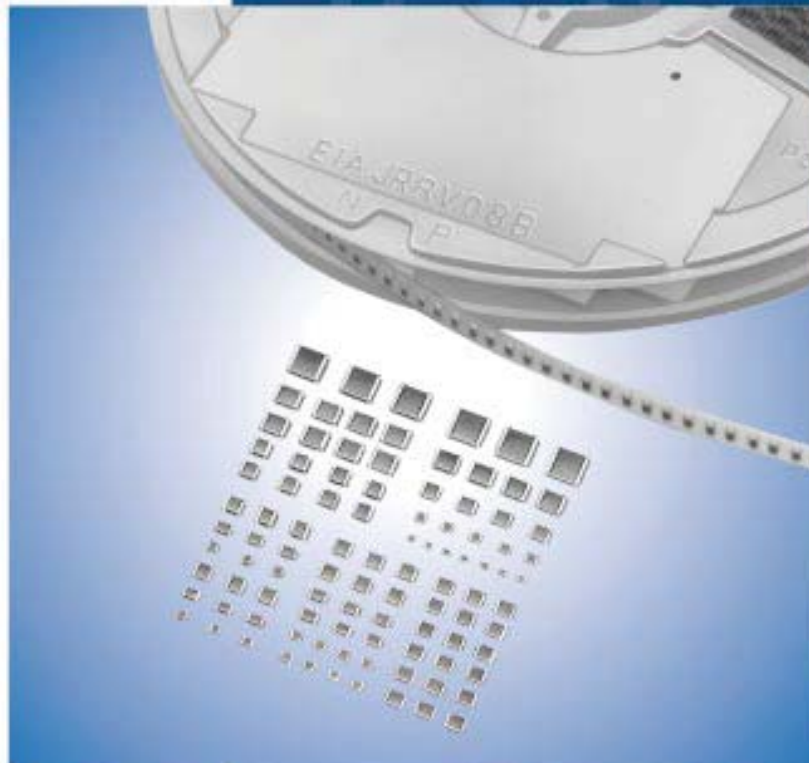
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Chip Monolithic Ceramic Capacitors



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● Please refer to "Specifications and Test Methods" at the end of each chapter of **14** – **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.

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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+1000/-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,*4 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-digit alphanumerics. 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

Code	Capacitance Tolerance	TC	Series	Capacitance Step	
W	±0.05pF	CΔ	GRM/GJM	≤9.9pF	0.1pF
B	±0.1pF	CΔ	GRM/GJM	≤9.9pF	0.1pF
C	±0.25pF	CΔ	GRM/GJM	≤9.9pF	0.1pF
		except CΔ	GRM	≤5pF	* 1pF
D	±0.5pF	CΔ	ERB/QQM	≤5pF	* 1pF
		CΔ	GRM/GJM	5.1 to 9.9pF	0.1pF
		except CΔ	GRM	5.1 to 9.9pF	* 1pF
G	±2%	CΔ	ERB/QQM	5.1 to 9.9pF	* 1pF
		CΔ	GJM	≥10pF	E12 Series
J	±5%	CΔ	GQM	≥10pF	E24 Series
		CΔ-SL	GRM/GA3	≥10pF	E12 Series
K	±10%	B, R, X7R, X5R, ZLM	ERB/QQM/GJM	≥10pF	E24 Series
			GRM/GR7/GA3		E6 Series
M	±20%	Z5U	GR4		E12 Series
		B, R, X7R, X7S	GRM		E3 Series
		X7R	GRM/GMA/LL/LLA/LLM		E6 Series
Z	+80%, -20%	F, Y5V	GA2		E3 Series
R			GRM		E3 Series
Depends on individual standards.					

* E24 series is also available.

⑨ Individual Specification Code

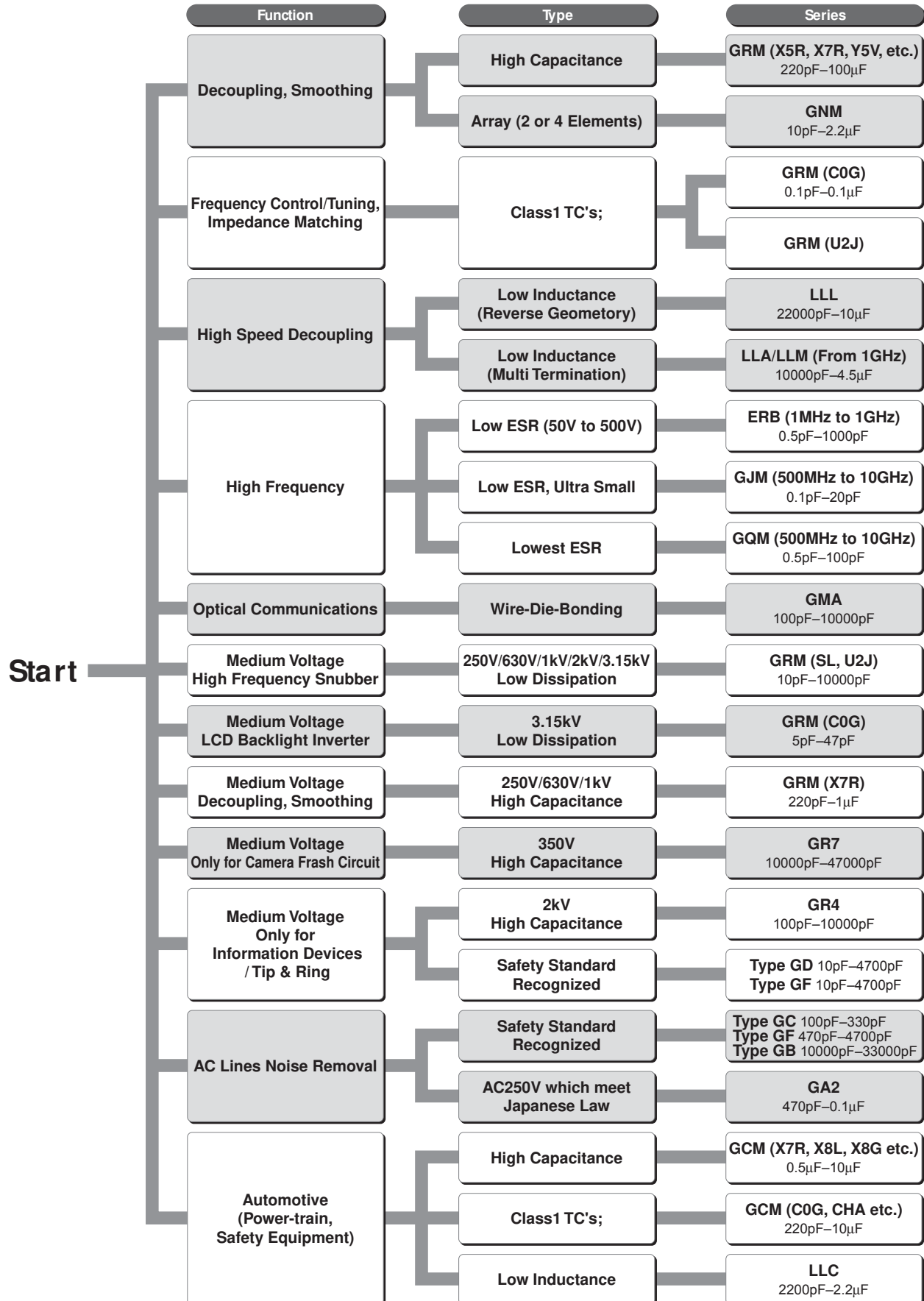
Expressed by three figures.

⑩ Packaging

Code	Packaging
L	ø180mm Embossed Taping
D	ø180mm Paper Taping
K	ø330mm Embossed Taping
J	ø330mm Paper Taping
B	Bulk
C	Bulk Case
T	Bulk Tray

Please check MURATA home page (<http://www.murata.com/index.html>) in case you can not find the part number on the catalog.

Selection Guide of Chip Monolithic Ceramic Capacitors



Chip Monolithic Ceramic Capacitors



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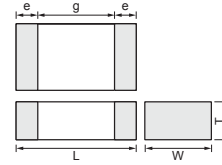
for General Purpose GRM15/18/21/31 Series

■ Features

1. Terminations are made of metal highly resistant to migration.
2. A wide selection of sizes is available, from the miniature LxW: 1.0x0.5mm to LxW: 3.2x1.6mm. GRM18, 21 and GRM31 types are suited to flow and reflow soldering. GRM15 type is applied to only reflow soldering.
3. Smaller size and higher capacitance value
4. High reliability and no polarity
5. Excellent pulse responsibility and noise reduction due to the low impedance at high frequency.
6. Ta replacement

■ Applications

General electronic equipment



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
GRM185	1.6 ±0.1	0.8 ±0.1	0.5 +0/-0.1	0.2 to 0.5	0.5
GRM188*			0.8 ±0.1		
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	3.2 ±0.2	1.6 ±0.2	1.6 ±0.2		

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

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

Part Number	GRM15							
L x W [EIA]	1.0x0.5 [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)								
3.0pF(3R0)	0.5(5)	0.5(5)	0.5(5)	0.5(5)			0.5(5)	0.5(5)
4.0pF(4R0)	0.5(5)	0.5(5)	0.5(5)	0.5(5)			0.5(5)	0.5(5)
5.0pF(5R0)	0.5(5)	0.5(5)	0.5(5)	0.5(5)			0.5(5)	0.5(5)
6.0pF(6R0)	0.5(5)	0.5(5)	0.5(5)	0.5(5)			0.5(5)	0.5(5)
7.0pF(7R0)	0.5(5)	0.5(5)	0.5(5)	0.5(5)			0.5(5)	0.5(5)
8.0pF(8R0)	0.5(5)	0.5(5)	0.5(5)	0.5(5)			0.5(5)	0.5(5)
9.0pF(9R0)	0.5(5)	0.5(5)	0.5(5)	0.5(5)			0.5(5)	0.5(5)
10pF(100)	0.5(5)	0.5(5)	0.5(5)	0.5(5)			0.5(5)	0.5(5)
12pF(120)	0.5(5)	0.5(5)	0.5(5)	0.5(5)	0.5(5)	0.5(5)	0.5(5)	0.5(5)
15pF(150)	0.5(5)	0.5(5)	0.5(5)	0.5(5)	0.5(5)	0.5(5)	0.5(5)	0.5(5)
18pF(180)	0.5(5)	0.5(5)	0.5(5)	0.5(5)	0.5(5)	0.5(5)	0.5(5)	0.5(5)
22pF(220)	0.5(5)	0.5(5)	0.5(5)	0.5(5)	0.5(5)	0.5(5)	0.5(5)	0.5(5)
27pF(270)	0.5(5)	0.5(5)	0.5(5)	0.5(5)	0.5(5)	0.5(5)	0.5(5)	0.5(5)
33pF(330)	0.5(5)		0.5(5)	0.5(5)	0.5(5)	0.5(5)	0.5(5)	0.5(5)
39pF(390)	0.5(5)			0.5(5)	0.5(5)	0.5(5)	0.5(5)	0.5(5)
47pF(470)	0.5(5)				0.5(5)	0.5(5)	0.5(5)	0.5(5)
56pF(560)	0.5(5)				0.5(5)	0.5(5)	0.5(5)	0.5(5)
68pF(680)	0.5(5)				0.5(5)	0.5(5)	0.5(5)	0.5(5)
82pF(820)	0.5(5)				0.5(5)	0.5(5)	0.5(5)	0.5(5)
100pF(101)	0.5(5)				0.5(5)	0.5(5)	0.5(5)	0.5(5)
120pF(121)	0.5(5)				0.5(5)	0.5(5)		0.5(5)
150pF(151)	0.5(5)				0.5(5)	0.5(5)		0.5(5)
180pF(181)	0.5(5)				0.5(5)	0.5(5)		0.5(5)
220pF(221)	0.5(5)					0.5(5)		
270pF(271)	0.5(5)					0.5(5)		

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1

GRM15								
Part Number								
L x W [EIA]	1.0x0.5 [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)								
330pF(331)	0.5(5)					0.5(5)		
390pF(391)	0.5(5)					0.5(5)		
470pF(471)	0.5(5)							
560pF(561)	0.5(5)							
680pF(681)	0.5(5)							
820pF(821)	0.5(5)							
1000pF(102)	0.5(5)							

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

Temperature Compensating Type GRM18 Series (1.60x0.80mm) 100/50V

GRM18														
Part Number														
L x W [EIA]	1.6x0.8 [0603]													
TC	C0G (5C)		P2H (6P)		R2H (6R)		S2H (6S)		SL (1X)		T2H (6T)		U2J (7U)	
Rated Volt.	100 (2A)	50 (1H)	100 (2A)	50 (1H)	100 (2A)	50 (1H)	100 (2A)	50 (1H)	100 (2A)	50 (1H)	100 (2A)	50 (1H)	100 (2A)	50 (1H)
Capacitance (Capacitance part numbering code) and T (mm) Dimension (T Dimension part numbering code)														
0.50pF(R50)	0.8(8)													
3.0pF(3R0)	0.8(8)		0.8(8)		0.8(8)		0.8(8)				0.8(8)			
4.0pF(4R0)	0.8(8)		0.8(8)		0.8(8)		0.8(8)				0.8(8)			
5.0pF(5R0)	0.8(8)		0.8(8)		0.8(8)		0.8(8)				0.8(8)			
6.0pF(6R0)	0.8(8)		0.8(8)		0.8(8)		0.8(8)				0.8(8)			
7.0pF(7R0)	0.8(8)		0.8(8)		0.8(8)		0.8(8)				0.8(8)			
8.0pF(8R0)	0.8(8)		0.8(8)		0.8(8)		0.8(8)				0.8(8)			
9.0pF(9R0)	0.8(8)		0.8(8)		0.8(8)		0.8(8)				0.8(8)			
10pF(100)	0.8(8)		0.8(8)		0.8(8)		0.8(8)				0.8(8)		0.8(8)	
12pF(120)	0.8(8)		0.8(8)		0.8(8)		0.8(8)		0.8(8)		0.8(8)		0.8(8)	
15pF(150)	0.8(8)		0.8(8)		0.8(8)		0.8(8)		0.8(8)		0.8(8)		0.8(8)	
18pF(180)	0.8(8)		0.8(8)		0.8(8)		0.8(8)		0.8(8)		0.8(8)		0.8(8)	
22pF(220)	0.8(8)		0.8(8)		0.8(8)		0.8(8)		0.8(8)		0.8(8)		0.8(8)	
27pF(270)	0.8(8)		0.8(8)		0.8(8)		0.8(8)		0.8(8)		0.8(8)		0.8(8)	
33pF(330)	0.8(8)		0.8(8)	0.8(8)	0.8(8)		0.8(8)		0.8(8)		0.8(8)		0.8(8)	
39pF(390)	0.8(8)		0.8(8)	0.8(8)	0.8(8)	0.8(8)	0.8(8)		0.8(8)		0.8(8)		0.8(8)	
47pF(470)	0.8(8)		0.8(8)	0.8(8)	0.8(8)	0.8(8)	0.8(8)	0.8(8)	0.8(8)		0.8(8)		0.8(8)	
56pF(560)	0.8(8)		0.8(8)	0.8(8)	0.8(8)	0.8(8)	0.8(8)	0.8(8)	0.8(8)		0.8(8)		0.8(8)	
68pF(680)	0.8(8)		0.8(8)	0.8(8)	0.8(8)	0.8(8)	0.8(8)	0.8(8)	0.8(8)		0.8(8)		0.8(8)	
82pF(820)	0.8(8)		0.8(8)	0.8(8)	0.8(8)	0.8(8)	0.8(8)	0.8(8)	0.8(8)		0.8(8)		0.8(8)	
100pF(101)	0.8(8)		0.8(8)	0.8(8)	0.8(8)	0.8(8)	0.8(8)	0.8(8)	0.8(8)		0.8(8)		0.8(8)	
120pF(121)	0.8(8)		0.8(8)	0.8(8)	0.8(8)	0.8(8)	0.8(8)	0.8(8)	0.8(8)		0.8(8)	0.8(8)	0.8(8)	
150pF(151)	0.8(8)			0.8(8)	0.8(8)	0.8(8)		0.8(8)	0.8(8)		0.8(8)	0.8(8)	0.8(8)	
180pF(181)	0.8(8)				0.8(8)			0.8(8)	0.8(8)		0.8(8)	0.8(8)	0.8(8)	
220pF(221)	0.8(8)							0.8(8)	0.8(8)	0.8(8)	0.8(8)	0.8(8)	0.8(8)	0.8(8)
270pF(271)	0.8(8)								0.8(8)	0.8(8)	0.8(8)	0.8(8)	0.8(8)	0.8(8)
330pF(331)	0.8(8)								0.8(8)	0.8(8)	0.8(8)	0.8(8)	0.8(8)	0.8(8)
390pF(391)	0.8(8)								0.8(8)	0.8(8)	0.8(8)	0.8(8)	0.8(8)	0.8(8)
470pF(471)	0.8(8)								0.8(8)	0.8(8)	0.8(8)	0.8(8)	0.8(8)	0.8(8)
560pF(561)	0.8(8)								0.8(8)				0.8(8)	
680pF(681)	0.8(8)								0.8(8)				0.8(8)	
820pF(821)	0.8(8)								0.8(8)				0.8(8)	

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Part Number	GRM18													
L x W [EIA]	1.6x0.8 [0603]													
TC	C0G (5C)		P2H (6P)		R2H (6R)		S2H (6S)		SL (1X)		T2H (6T)		U2J (7U)	
Rated Volt.	100 (2A)	50 (1H)	100 (2A)	50 (1H)	100 (2A)	50 (1H)	100 (2A)	50 (1H)	100 (2A)	50 (1H)	100 (2A)	50 (1H)	100 (2A)	50 (1H)
Capacitance (Capacitance part numbering code) and T (mm) Dimension (T Dimension part numbering code)														
1000pF(102)	0.8(8)													0.8(8)
1200pF(122)		0.8(8)												0.8(8)
1500pF(152)		0.8(8)												0.8(8)
1800pF(182)		0.8(8)												0.8(8)
2200pF(222)		0.8(8)												0.8(8)
2700pF(272)		0.8(8)												0.8(8)
3300pF(332)														0.8(8)
3900pF(392)														0.8(8)
4700pF(472)														0.8(8)
5600pF(562)														0.8(8)
6800pF(682)														0.8(8)
8200pF(822)														0.8(8)
10000pF(103)														0.8(8)

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) 100/50V

Part Number	GRM21													
L x W [EIA]	2.0x1.25 [0805]													
TC	C0G (5C)		P2H (6P)		R2H (6R)		S2H (6S)		SL (1X)		T2H (6T)		U2J (7U)	
Rated Volt.	100 (2A)	50 (1H)	100 (2A)	50 (1H)	100 (2A)	50 (1H)	100 (2A)	50 (1H)	100 (2A)	50 (1H)	100 (2A)	50 (1H)	100 (2A)	50 (1H)
Capacitance (Capacitance part numbering code) and T (mm) Dimension (T Dimension part numbering code)														
33pF(330)				0.6(6)										
39pF(390)				0.6(6)		0.6(6)								
47pF(470)				0.6(6)		0.6(6)		0.6(6)				1.25(B)		
56pF(560)				0.6(6)		0.6(6)		0.6(6)				1.25(B)		
68pF(680)				0.6(6)		0.6(6)		0.6(6)				1.25(B)		
82pF(820)				0.6(6)		0.6(6)		0.6(6)				1.25(B)		
100pF(101)				0.6(6)		0.6(6)		0.6(6)				1.25(B)		
120pF(121)				0.6(6)		0.6(6)		0.6(6)				1.25(B)	0.6(6)	
150pF(151)			0.85(9)	0.6(6)		0.6(6)	0.85(9)	0.6(6)				1.25(B)		
180pF(181)			0.85(9)	0.85(9)	0.85(9)	0.6(6)	0.85(9)	0.6(6)				1.25(B)		
220pF(221)			0.85(9)	0.85(9)	0.85(9)	0.85(9)	0.85(9)	0.6(6)		0.6(6)		1.25(B)		0.6(6)
270pF(271)			0.85(9)	0.85(9)	0.85(9)	0.85(9)	0.85(9)			0.6(6)				0.6(6)
330pF(331)			0.85(9)	0.85(9)	0.85(9)	0.85(9)	0.85(9)			0.6(6)				0.6(6)
390pF(391)			1.25(B)	1.25(B)	0.85(9)	0.85(9)	0.85(9)			0.6(6)				0.6(6)
470pF(471)			1.25(B)	1.25(B)	0.85(9)	0.85(9)	0.85(9)		0.85(9)	0.6(6)			0.85(9)	0.6(6)
560pF(561)				1.25(B)	1.25(B)	0.85(9)	1.25(B)	0.85(9)	0.85(9)	0.6(6)		1.25(B)	0.85(9)	0.6(6)
680pF(681)	0.6(6)					1.25(B)		1.25(B)	0.85(9)	0.6(6)		1.25(B)	0.85(9)	0.6(6)
820pF(821)	0.6(6)							1.25(B)	1.25(B)	0.6(6)		1.25(B)	1.25(B)	0.6(6)
1000pF(102)	0.85(9)								1.25(B)	0.6(6)		1.25(B)	1.25(B)	0.6(6)
1200pF(122)	0.85(9)	0.6(6)							1.25(B)	0.6(6)		1.25(B)	1.25(B)	0.6(6)
1500pF(152)	0.85(9)	0.6(6)							1.25(B)	0.85(9)		1.25(B)	1.25(B)	0.85(9)
1800pF(182)		0.6(6)							1.25(B)	0.85(9)		1.25(B)	1.25(B)	0.85(9)
2200pF(222)		0.6(6)								0.85(9)				0.85(9)
2700pF(272)		0.6(6)								1.25(B)				1.25(B)
3300pF(332)		0.6(6)								1.25(B)				1.25(B)
3900pF(392)		0.6(6)												

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Part Number		GRM21													
L x W [EIA]		2.0x1.25 [0805]													
TC	C0G (5C)		P2H (6P)		R2H (6R)		S2H (6S)		SL (1X)		T2H (6T)		U2J (7U)		
Rated Volt.	100 (2A)	50 (1H)	100 (2A)	50 (1H)	100 (2A)	50 (1H)	100 (2A)	50 (1H)	100 (2A)	50 (1H)	100 (2A)	50 (1H)	100 (2A)	50 (1H)	
Capacitance (Capacitance part numbering code) and T (mm) Dimension (T Dimension part numbering code)															
4700pF(472)		0.6(6)													
5600pF(562)		0.85(9)													
6800pF(682)		0.85(9)													
8200pF(822)		0.85(9)													
10000pF(103)		0.85(9)								0.6(6)					0.6(6)
12000pF(123)		0.85(9)								0.6(6)					0.6(6)
15000pF(153)		0.85(9)								0.6(6)					0.6(6)
18000pF(183)		1.25(B)								0.6(6)					0.6(6)
22000pF(223)		1.25(B)								0.85(9)					0.85(9)
27000pF(273)										0.85(9)					0.85(9)
33000pF(333)										1.0(A)					1.0(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) 100/50/25V

Part Number		GRM31													
L x W [EIA]		3.2x1.6 [1206]													
TC	C0G (5C)			P2H (6P)		R2H (6R)		S2H (6S)		SL (1X)		T2H (6T)		U2J (7U)	
Rated Volt.	100 (2A)	50 (1H)	25 (1E)	100 (2A)	50 (1H)	100 (2A)	50 (1H)	100 (2A)	50 (1H)	100 (2A)	50 (1H)	100 (2A)	50 (1H)	100 (2A)	50 (1H)
Capacitance (Capacitance part numbering code) and T (mm) Dimension (T Dimension part numbering code)															
47pF(470)													0.85(9)		
56pF(560)													0.85(9)		
68pF(680)													0.85(9)		
82pF(820)													0.85(9)		
100pF(101)													1.15(M)		
120pF(121)													1.15(M)		
150pF(151)													1.15(M)		
180pF(181)					0.6(6)								1.15(M)		
220pF(221)					0.6(6)		0.6(6)						1.15(M)		
270pF(271)					0.6(6)		0.6(6)		0.6(6)				1.15(M)		
330pF(331)					0.6(6)		0.6(6)		0.6(6)				1.15(M)		
390pF(391)				0.85(9)			0.6(6)		0.6(6)				1.15(M)		
470pF(471)				0.85(9)					0.6(6)				1.15(M)		
560pF(561)				0.85(9)		0.85(9)		0.85(9)	0.85(9)						
680pF(681)				0.85(9)		0.85(9)	0.85(9)	0.85(9)	0.85(9)						
820pF(821)				0.85(9)		0.85(9)	0.85(9)	0.85(9)	0.85(9)	0.85(9)			1.15(M)	0.85(9)	
1000pF(102)				1.15(M)		1.15(M)	1.15(M)	0.85(9)	0.85(9)	0.85(9)			1.15(M)	0.85(9)	
1200pF(122)				1.15(M)		1.15(M)	1.15(M)	1.15(M)	1.15(M)	0.85(9)			1.15(M)	0.85(9)	
1500pF(152)					1.15(M)		1.15(M)	1.15(M)	1.15(M)	0.85(9)			1.15(M)	0.85(9)	
1800pF(182)	0.85(9)								1.15(M)	0.85(9)			1.15(M)	0.85(9)	
2200pF(222)	0.85(9)									1.15(M)			1.15(M)	1.15(M)	
2700pF(272)	0.85(9)									1.15(M)			1.15(M)	1.15(M)	
3300pF(332)	0.85(9)									1.15(M)			1.15(M)	1.15(M)	
3900pF(392)	0.85(9)									1.15(M)			1.15(M)	1.15(M)	
4700pF(472)	0.85(9)									1.15(M)				1.15(M)	
5600pF(562)	0.85(9)														

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Part Number	GRM31															
L x W [EIA]	3.2x1.6 [1206]															
TC	C0G (5C)			P2H (6P)		R2H (6R)		S2H (6S)		SL (1X)		T2H (6T)		U2J (7U)		
Rated Volt.	100 (2A)	50 (1H)	25 (1E)	100 (2A)	50 (1H)	100 (2A)	50 (1H)	100 (2A)	50 (1H)	100 (2A)	50 (1H)	100 (2A)	50 (1H)	100 (2A)	50 (1H)	
Capacitance (Capacitance part numbering code) and T (mm) Dimension (T Dimension part numbering code)																
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)														
56000pF(563)		1.6(C)									0.85(9)					0.85(9)
68000pF(683)		1.6(C)									1.15(M)					1.15(M)
82000pF(823)		1.6(C)									1.15(M)					1.15(M)
0.10μF(104)			1.6(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]	1.0x0.5 [0402]					1.6x0.8 [0603]					2.0x1.25 [0805]				3.2x1.6 [1206]				
Rated Volt.	50 (1H)	25 (1E)	16 (1C)	10 (1A)	6.3 (0J)	50 (1H)	25 (1E)	16 (1C)	10 (1A)	6.3 (0J)	25 (1E)	16 (1C)	10 (1A)	6.3 (0J)	25 (1E)	16 (1C)	10 (1A)	6.3 (0J)	4 (0G)
Capacitance (Capacitance part numbering code) and T (mm) Dimension (T Dimension part numbering code)																			
1000pF (102)	0.5 (5)	0.5 (5)																	
2200pF (222)	0.5 (5)	0.5 (5)																	
4700pF (472)	0.5 (5)	0.5 (5)																	
10000pF (103)						0.8 (8)													
22000pF (223)			0.5 (5)			0.8 (8)													
33000pF (333)			0.5 (5)	0.5 (5)															
47000pF (473)			0.5 (5)	0.5 (5)															
68000pF (683)			0.5 (5)	0.5 (5)															
0.10μF (104)			0.5 (5)	0.5 (5)			0.8 (8)												
0.15μF (154)				0.5* (5)	0.5* (5)														
0.22μF (224)				0.5* (5)	0.5* (5)		0.8 (8)	0.8 (8)											
0.33μF (334)				0.5* (5)	0.5* (5)														
0.47μF (474)				0.5* (5)	0.5* (5)		0.8* (8)	0.8* (8)											
0.68μF (684)				0.5* (5)	0.5* (5)														

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TC	X5R (R6)																		
Part Number	GRM15					GRM18					GRM21				GRM31				
L x W [EIA]	1.0x0.5 [0402]					1.6x0.8 [0603]					2.0x1.25 [0805]				3.2x1.6 [1206]				
Rated Volt.	50 (1H)	25 (1E)	16 (1C)	10 (1A)	6.3 (0J)	50 (1H)	25 (1E)	16 (1C)	10 (1A)	6.3 (0J)	25 (1E)	16 (1C)	10 (1A)	6.3 (0J)	25 (1E)	16 (1C)	10 (1A)	6.3 (0J)	4 (0G)
Capacitance (Capacitance part numbering code) and T (mm) Dimension (T Dimension part numbering code)																			
1.0μF (105)				0.5* (5)	0.5* (5)			0.8* (8)	0.8* (8)										
2.2μF (225)								0.8* (8)	0.8* (8)	0.8* (8)	1.25* (B)						1.15 (M)		
3.3μF (335)									0.8* (8)		1.25* (B)	1.25* (B)					1.6 (C)		
4.7μF (475)										0.8* (8)	1.25* (B)	1.25* (B)	1.25* (B)		1.6 (C)	1.6 (C)	1.6 (C)		
10μF (106)													1.25* (B)	1.25* (B)	1.6* (C)	1.6 (C)			
15μF (156)																			1.6* (C)
22μF (226)														1.25* (B)					1.6* (C)
47μF (476)																			1.6* (C)
100μF (107)																			1.6* (C) 1.6* (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.

*: Please refer to GRM Series Specifications and Test Methods (2) (P.30).

High Dielectric Constant Type X6S (C8) Characteristics

TC	X6S (C8)										
Part Number	GRM15		GRM18		GRM21				GRM31		
L x W [EIA]	1.0x0.5 [0402]		1.6x0.8 [0603]		2.0x1.25 [0805]				3.2x1.6 [1206]		
Rated Volt.	6.3 (0J)	4 (0G)	6.3 (0J)	4 (0G)	25 (1E)	16 (1C)	6.3 (0J)	4 (0G)	10 (1A)	6.3 (0J)	4 (0G)
Capacitance (Capacitance part numbering code) and T (mm) Dimension (T Dimension part numbering code)											
0.15μF(154)	0.5*(5)										
0.22μF(224)	0.5*(5)										
0.33μF(334)	0.5*(5)										
0.47μF(474)	0.5*(5)										
0.68μF(684)		0.5*(5)	0.8*(8)								
1.0μF(105)		0.5*(5)									
2.2μF(225)			0.8*(8)								
4.7μF(475)				0.8*(8)	1.25*(B)	1.25*(B)					
10μF(106)							1.25*(B)		1.15*(M)		
22μF(226)								1.25*(B)		1.6*(C)	1.6*(C)
47μF(476)											1.6*(C)

The part numbering code is shown in ().

Dimensions are shown in mm and Rated Voltage in Vdc.

*: Please refer to GRM Series Specifications and Test Methods (2) (P.30).

High Dielectric Constant Type X7R (R7) Characteristics

TC	X7R (R7)																					
	GRM15					GRM18					GRM21					GRM31						
Part Number	1.0x0.5 [0402]					1.6x0.8 [0603]					2.0x1.25 [0805]					3.2x1.6 [1206]						
L x W [EIA]	1.0x0.5 [0402]					1.6x0.8 [0603]					2.0x1.25 [0805]					3.2x1.6 [1206]						
Rated Volt.	100	50	25	16	10	100	50	25	16	10	6.3	100	50	25	16	10	6.3	100	50	25	16	10
	(2A)	(1H)	(1E)	(1C)	(1A)	(2A)	(1H)	(1E)	(1C)	(1A)	(0J)	(2A)	(1H)	(1E)	(1C)	(1A)	(0J)	(2A)	(1H)	(1E)	(1C)	(1A)
Capacitance (Capacitance part numbering code) and T (mm) Dimension (T Dimension part numbering code)																						
220pF (221)	0.5 (5)					0.8 (8)																
330pF (331)	0.5 (5)					0.8 (8)																
470pF (471)	0.5 (5)					0.8 (8)																
680pF (681)	0.5 (5)					0.8 (8)																
1000pF (102)	0.5 (5)					0.8 (8)																
1500pF (152)	0.5 (5)					0.8 (8)																
2200pF (222)	0.5 (5)					0.8 (8)																
3300pF (332)	0.5 (5)					0.8 (8)																
4700pF (472)	0.5 (5)	0.5 (5)										0.85 (9)										
6800pF (682)	0.5 (5)	0.5 (5)										0.85 (9)										
10000pF (103)	0.5 (5)	0.5 (5)										1.25 (B)										
15000pF (153)		0.5 (5)	0.5 (5)			0.8 (8)						1.25 (B)										
22000pF (223)		0.5 (5)	0.5 (5)			0.8 (8)						1.25 (B)										
33000pF (333)		0.5 (5)	0.5 (5)	0.5 (5)		0.8 (8)						1.25 (B)										
47000pF (473)		0.5 (5)	0.5 (5)	0.5 (5)		0.8 (8)						1.25 (B)										
68000pF (683)			0.5 (5)	0.5 (5)		0.8 (8)	0.8 (8)											1.15 (M)				
0.10μF (104)			0.5 (5)	0.5 (5)		0.8 (8)	0.8 (8)															
0.15μF (154)							0.8 (8)	0.8 (8)				1.25 (B)								1.15 (M)		
0.22μF (224)							0.8 (8)	0.8 (8)	0.8 (8)			1.0 (A)	1.25 (B)							0.85 (9)		
0.33μF (334)								0.8 (8)	0.8 (8)			1.0 (A)	0.85 (9)	1.25 (B)								
0.47μF (474)							0.8* (8)	0.8 (8)	0.8 (8)	0.8 (8)		1.25 (B)	0.85 (9)							1.15 (M)		
0.68μF (684)									0.8 (8)				0.85 (9)	0.85 (9)								
1.0μF (105)								0.8* (8)	0.8* (8)	0.8* (8)			1.25 (B)	1.25 (B)				1.6 (C)	1.15 (M)	1.15 (M)		
1.5μF (155)													1.25 (B)	1.25 (B)					1.6 (C)	1.15 (M)	1.15 (M)	

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TC	X7R (R7)																							
Part Number	GRM15					GRM18					GRM21					GRM31								
L x W [EIA]	1.0x0.5 [0402]					1.6x0.8 [0603]					2.0x1.25 [0805]					3.2x1.6 [1206]								
Rated Volt.	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)	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)																								
2.2μF (225)											0.8* (8)						1.25* (B)	1.25* (B)					1.6 (C)	1.15 (M)
3.3μF (335)																	1.25* (B)					1.6 (C)	1.6 (C)	
4.7μF (475)																	1.25* (B)	1.25* (B)				1.6 (C)	1.6 (C)	1.6 (C)
10μF (106)																		1.25* (B)	1.25* (B)				1.6* (C)	

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 1.0μF 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.
 *: Please refer to GRM Series Specifications and Test Methods (2) (P.30).

High Dielectric Constant Type X7S (C7) Characteristics

TC	X7S (C7)								
Part Number	GRM18			GRM21			GRM31		
L x W [EIA]	1.6x0.8 [0603]			2.0x1.25 [0805]			3.2x1.6 [1206]		
Rated Volt.	6.3 (0J)			10 (1A)			4 (0G)		
Capacitance (Capacitance part numbering code) and T (mm) Dimension (T Dimension part numbering code)									
2.2μF(225)	0.8*(8)								
3.3μF(335)				1.25*(B)					
22μF(226)							1.6*(C)		

The part numbering code is shown in ().
 Dimensions are shown in mm and Rated Voltage in Vdc.
 *: Please refer to GRM Series Specifications and Test Methods (2) (P.30).

High Dielectric Constant Type Y5V (F5) Characteristics

TC	Y5V (F5)											
Part Number	GRM15				GRM18				GRM21		GRM31	
L x W [EIA]	1.0x0.5 [0402]				1.6x0.8 [0603]				2.0x1.25 [0805]		3.2x1.6 [1206]	
Rated Volt.	50 (1H)	25 (1E)	16 (1C)	10 (1A)	6.3 (0J)	50 (1H)	25 (1E)	50 (1H)	25 (1E)	50 (1H)	6.3 (0J)	
Capacitance (Capacitance part numbering code) and T (mm) Dimension (T Dimension part numbering code)												
1000pF(102)	0.5(5)											
2200pF(222)	0.5(5)											
4700pF(472)	0.5(5)											
10000pF(103)	0.5(5)					0.8(8)						
22000pF(223)		0.5(5)				0.8(8)						
47000pF(473)		0.5(5)	0.5(5)			0.8(8)						
0.10μF(104)		0.5(5)	0.5(5)			0.8(8)		0.85(9)	0.6(6)			
0.22μF(224)			0.5(5)			0.8(8)	0.8(8)		0.85(9)			
0.47μF(474)			0.5(5)	0.5(5)			0.8(8)	0.85(9)	0.6(6)	1.15(M)		
1.0μF(105)				0.5*(5)	0.5*(5)							
100μF(107)											1.6*(C)	

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.
 *: Please refer to GRM Series Specifications and Test Methods (2) (P.30).

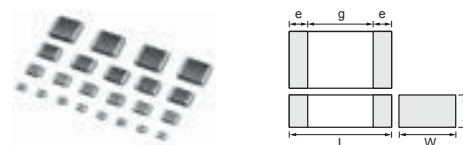
Chip Monolithic Ceramic Capacitors



for General Purpose GRM32 Series

■ Features

1. Terminations are made of metal highly resistant to migration.
2. Smaller size and higher capacitance value
3. High reliability and no polarity
4. Excellent pulse responsibility and noise reduction due to the low impedance at high frequency.
5. Ta replacement



Part Number	Dimensions (mm)				
	L	W	T	e	g min.
GRM329	3.2 ±0.3	2.5 ±0.2	0.85 ±0.1	0.3 min.	1.0
GRM32A			1.0 +0/-0.2		
GRM32M			1.15 ±0.1		
GRM32N			1.35 ±0.15		
GRM32C			1.6 ±0.2		
GRM32R			1.8 ±0.2		
GRM32D			2.0 ±0.2		
GRM32E			2.5 ±0.2		

■ Applications

General electronic equipment

Temperature Compensating Type GRM32 Series

Part Number	TC Code (Standard)	Rated Voltage (Vdc)	Capacitance (pF)	Length L (mm)	Width W (mm)	Thickness T (mm)
GRM3291X2A222JZ01	SL (JIS)	100	2200 ±5%	3.2	2.5	0.85
GRM3291X2A272JZ01	SL (JIS)	100	2700 ±5%	3.2	2.5	0.85
GRM3291X2A332JZ01	SL (JIS)	100	3300 ±5%	3.2	2.5	0.85
GRM32N1X2A562JZ01	SL (JIS)	100	5600 ±5%	3.2	2.5	1.35
GRM32N1X2A682JZ01	SL (JIS)	100	6800 ±5%	3.2	2.5	1.35

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

Part Number	TC Code (Standard)	Rated Voltage (Vdc)	Capacitance (μF)	Length L (mm)	Width W (mm)	Thickness T (mm)
GRM32ER61E226ME15	X5R (EIA)	25	22 ±20%*	3.2	2.5	2.5
GRM32ER61C226ME20	X5R (EIA)	16	22 ±20%*	3.2	2.5	2.5
GRM32ER61C476ME15	X5R (EIA)	16	47 ±20%*	3.2	2.5	2.5
GRM32ER61A226ME20	X5R (EIA)	10	22 ±20%*	3.2	2.5	2.5
GRM32ER61A476ME20	X5R (EIA)	10	47 ±20%*	3.2	2.5	2.5
GRM32DR60J226KA01	X5R (EIA)	6.3	22 ±10%*	3.2	2.5	2.0
GRM32DR60J336ME19	X5R (EIA)	6.3	33 ±20%*	3.2	2.5	2.0
GRM32ER60J476ME20	X5R (EIA)	6.3	47 ±20%*	3.2	2.5	2.5
GRM32ER60J107ME20	X5R (EIA)	6.3	100 ±20%*	3.2	2.5	2.5
GRM32DC81E106KA12	X6S(EIA)	25	10 ±10%	3.2	2.5	2.0
GRM32EC80J476ME64	X6S(EIA)	6.3	47 ±20%*	3.2	2.5	2.5
GRM32EC80G107ME20	X6S(EIA)	4	100 ±20%*	3.2	2.5	2.5
GRM32CR72A684KA01	X7R (EIA)	100	0.68 ±10%	3.2	2.5	1.6
GRM32CR72A105KA35	X7R (EIA)	100	1.0 ±10%	3.2	2.5	1.6
GRM32DR72A155KA35	X7R (EIA)	100	1.5 ±10%	3.2	2.5	2.0
GRM32ER72A225KA35	X7R (EIA)	100	2.2 ±10%*	3.2	2.5	2.5
GRM32ER71H105KA01	X7R (EIA)	50	1.0 ±10%	3.2	2.5	2.5
GRM32DR71H335KA88	X7R (EIA)	50	3.3 ±10%	3.2	2.5	2.0
GRM32ER71H475KA88	X7R (EIA)	50	4.7 ±10%	3.2	2.5	2.5
GRM32DR71E335KA01	X7R (EIA)	25	3.3 ±10%	3.2	2.5	2.0
GRM32DR71E475KA61	X7R (EIA)	25	4.7 ±10%	3.2	2.5	2.0
GRM32DR71E106KA12	X7R (EIA)	25	10 ±10%	3.2	2.5	2.0

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Part Number	TC Code (Standard)	Rated Voltage (Vdc)	Capacitance (μF)	Length L (mm)	Width W (mm)	Thickness T (mm)
GRM32ER71C226ME18	X7R (EIA)	16	22 ±20% *	3.2	2.5	2.5
GRM32ER71A226ME20	X7R (EIA)	10	22 ±20% *	3.2	2.5	2.5
GRM32EF50J107ZE20	Y5V (EIA)	6.3	100 +80/-20% *	3.2	2.5	2.5

*: Please refer to GRM Series Specifications and Test Methods (2) (P.30).

Chip Monolithic Ceramic Capacitors

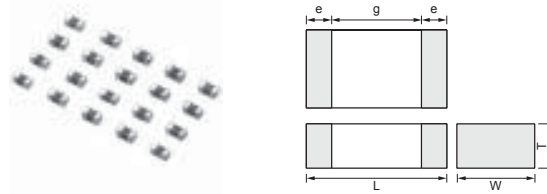


Ultra-small GRM03 Series

3

■ Features

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



Part Number	Dimensions (mm)				
	L	W	T	e	g min.
GRM033	0.6 ±0.03	0.3 ±0.03	0.3 ±0.03	0.1 to 0.2	0.2

■ Applications

1. Miniature microwave module
2. Portable equipment
3. High frequency circuit

Part Number	GRM03											
L x W	0.6x0.3 [0201]											
TC	C0G (5C)	R2H (6R)	S2H (6S)	T2H (6T)	U2J (7U)		X5R (R6)		X6S (C8)	X7R (R7)		
Rated Volt.	25 (1E)	25 (1E)	25 (1E)	25 (1E)	50 (1H)	25 (1E)	10 (1A)	6.3 (0J)	4 (0G)	25 (1E)	16 (1C)	10 (1A)
Capacitance (Capacitance part numbering code) and T (mm) Dimension (T Dimension part numbering code)												
1.0pF(1R0)	0.3(3)	0.3(3)	0.3(3)	0.3(3)								
2.0pF(2R0)	0.3(3)	0.3(3)	0.3(3)	0.3(3)								
3.0pF(3R0)	0.3(3)	0.3(3)	0.3(3)	0.3(3)	0.3(3)							
4.0pF(4R0)	0.3(3)	0.3(3)	0.3(3)	0.3(3)	0.3(3)							
5.0pF(5R0)	0.3(3)	0.3(3)	0.3(3)	0.3(3)	0.3(3)							
6.0pF(6R0)	0.3(3)	0.3(3)	0.3(3)	0.3(3)	0.3(3)							
7.0pF(7R0)	0.3(3)	0.3(3)	0.3(3)	0.3(3)	0.3(3)							
8.0pF(8R0)	0.3(3)	0.3(3)	0.3(3)	0.3(3)	0.3(3)							
9.0pF(9R0)	0.3(3)	0.3(3)	0.3(3)	0.3(3)	0.3(3)							
10pF(100)	0.3(3)	0.3(3)	0.3(3)	0.3(3)	0.3(3)							
12pF(120)	0.3(3)	0.3(3)	0.3(3)	0.3(3)	0.3(3)							
15pF(150)	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)		
150pF(151)										0.3(3)		
220pF(221)										0.3(3)		
330pF(331)										0.3(3)		
470pF(471)										0.3(3)		
680pF(681)										0.3(3)		

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Part Number	GRM03											
L x W	0.6x0.3 [0201]											
TC	C0G (5C)	R2H (6R)	S2H (6S)	T2H (6T)	U2J (7U)		X5R (R6)		X6S (C8)	X7R (R7)		
Rated Volt.	25 (1E)	25 (1E)	25 (1E)	25 (1E)	50 (1H)	25 (1E)	10 (1A)	6.3 (0J)	4 (0G)	25 (1E)	16 (1C)	10 (1A)
Capacitance (Capacitance part numbering code) and T (mm) Dimension (T Dimension part numbering code)												
1000pF(102)										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)
3300pF(332)							0.3(3)				0.3(3)	0.3(3)
4700pF(472)							0.3(3)					0.3(3)
6800pF(682)							0.3(3)					0.3(3)
10000pF(103)							0.3(3)					0.3(3)
15000pF(153)								0.3*(3)				
22000pF(223)								0.3*(3)				
33000pF(333)								0.3*(3)				
47000pF(473)								0.3*(3)				
68000pF(683)								0.3*(3)				
0.10μF(104)								0.3*(3)	0.3(3)			

The part numbering code is shown in ().

Dimensions are shown in mm and Rated Voltage in Vdc.

*: Please refer to GRM Series Specifications and Test Methods (2) (P.30).

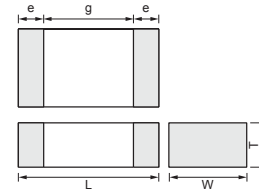
Chip Monolithic Ceramic Capacitors



Tight Tolerance GRM03/15 Series

■ Features

1. Terminations are made of metal highly resistant to migration.
2. A wide selection of sizes is available, from the miniature LxWxT: 0.6x0.3x0.3mm or LxWxT: 1.0x0.5x0.5mm.
3. GRM03 type is a complete line of chip ceramic capacitors in 25V ratings, GRM15 type is a complete line of chip ceramic capacitors in 50V ratings.
4. These capacitors have temperature characteristics ranging C0G.
5. GRM03 and GRM15 type are applied to only reflow soldering.
6. Stringent dimensional tolerances allow highly reliable, high speed automatic chip placement on PCBs.
7. GRM series is available in paper tape and reel packaging for automatic placement.



Part Number	Dimensions (mm)				
	L	W	T	e	g min.
GRM033	0.6 ±0.03	0.3 ±0.03	0.3 ±0.03	0.1 to 0.2	0.2
GRM155	1.0 ±0.05	0.5 ±0.05	0.5 ±0.05	0.15 to 0.35	0.3

■ Applications

General electronic equipment

Temperature Compensating Type GRM03/15 Series

Part Number	GRM03		GRM15	
L x W [EIA]	0.6x0.3 [0201]		1.0x0.5 [0402]	
TC	C0G (5C)		C0G (5C)	
Rated Volt.	25 (1E)		50 (1H)	
Capacitance, Capacitance Tolerance and T Dimension				
0.30pF(R30)	W, B	0.3(3)	0.5(5)	
0.40pF(R40)	W, B	0.3(3)	0.5(5)	
0.50pF(R50)	W, B	0.3(3)	0.5(5)	
0.60pF(R60)	W, B	0.3(3)	0.5(5)	
0.70pF(R70)	W, B	0.3(3)	0.5(5)	
0.80pF(R80)	W, B	0.3(3)	0.5(5)	
0.90pF(R90)	W, B	0.3(3)	0.5(5)	
1.0pF(1R0)	W, B	0.3(3)	0.5(5)	
1.1pF(1R1)	W, B	0.3(3)	0.5(5)	
1.2pF(1R2)	W, B	0.3(3)	0.5(5)	
1.3pF(1R3)	W, B	0.3(3)	0.5(5)	
1.4pF(1R4)	W, B	0.3(3)	0.5(5)	
1.5pF(1R5)	W, B	0.3(3)	0.5(5)	
1.6pF(1R6)	W, B	0.3(3)	0.5(5)	
1.7pF(1R7)	W, B	0.3(3)	0.5(5)	
1.8pF(1R8)	W, B	0.3(3)	0.5(5)	
1.9pF(1R9)	W, B	0.3(3)	0.5(5)	
2.0pF(2R0)	W, B	0.3(3)	0.5(5)	
2.1pF(2R1)	W, B	0.3(3)	0.5(5)	
2.2pF(2R2)	W, B	0.3(3)	0.5(5)	
2.3pF(2R3)	W, B	0.3(3)	0.5(5)	

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Part Number	GRM03	GRM15
L x W [EIA]	0.6x0.3 [0201]	1.0x0.5 [0402]
TC	C0G (5C)	C0G (5C)
Rated Volt.	25 (1E)	50 (1H)

Capacitance, Capacitance Tolerance and T Dimension

2.4pF(2R4) W, B	0.3(3)	0.5(5)
2.5pF(2R5) W, B	0.3(3)	0.5(5)
2.6pF(2R6) W, B	0.3(3)	0.5(5)
2.7pF(2R7) W, B	0.3(3)	0.5(5)
2.8pF(2R8) W, B	0.3(3)	0.5(5)
2.9pF(2R9) W, B	0.3(3)	0.5(5)
3.0pF(3R0) W, B	0.3(3)	0.5(5)
3.1pF(3R1) W, B	0.3(3)	0.5(5)
3.2pF(3R2) W, B	0.3(3)	0.5(5)
3.3pF(3R3) W, B	0.3(3)	0.5(5)
3.4pF(3R4) W, B	0.3(3)	0.5(5)
3.5pF(3R5) W, B	0.3(3)	0.5(5)
3.6pF(3R6) W, B	0.3(3)	0.5(5)
3.7pF(3R7) W, B	0.3(3)	0.5(5)
3.8pF(3R8) W, B	0.3(3)	0.5(5)
3.9pF(3R9) W, B	0.3(3)	0.5(5)
4.0pF(4R0) W, B	0.3(3)	0.5(5)
4.1pF(4R1) W, B	0.3(3)	0.5(5)
4.2pF(4R2) W, B	0.3(3)	0.5(5)
4.3pF(4R3) W, B	0.3(3)	0.5(5)
4.4pF(4R4) W, B	0.3(3)	0.5(5)
4.5pF(4R5) W, B	0.3(3)	0.5(5)
4.6pF(4R6) W, B	0.3(3)	0.5(5)
4.7pF(4R7) W, B	0.3(3)	0.5(5)
4.8pF(4R8) W, B	0.3(3)	0.5(5)
4.9pF(4R9) W, B	0.3(3)	0.5(5)
5.0pF(5R0) W, B	0.3(3)	0.5(5)
5.1pF(5R1) W, B, C	0.3(3)	0.5(5)
5.2pF(5R2) W, B, C	0.3(3)	0.5(5)
5.3pF(5R3) W, B, C	0.3(3)	0.5(5)
5.4pF(5R4) W, B, C	0.3(3)	0.5(5)
5.5pF(5R5) W, B, C	0.3(3)	0.5(5)
5.6pF(5R6) W, B, C	0.3(3)	0.5(5)
5.7pF(5R7) W, B, C	0.3(3)	0.5(5)
5.8pF(5R8) W, B, C	0.3(3)	0.5(5)
5.9pF(5R9) W, B, C	0.3(3)	0.5(5)
6.0pF(6R0) W, B, C	0.3(3)	0.5(5)
6.1pF(6R1) W, B, C	0.3(3)	0.5(5)
6.2pF(6R2) W, B, C	0.3(3)	0.5(5)
6.3pF(6R3) W, B, C	0.3(3)	0.5(5)
6.4pF(6R4) W, B, C	0.3(3)	0.5(5)
6.5pF(6R5) W, B, C	0.3(3)	0.5(5)
6.6pF(6R6) W, B, C	0.3(3)	0.5(5)
6.7pF(6R7) W, B, C	0.3(3)	0.5(5)
6.8pF(6R8) W, B, C	0.3(3)	0.5(5)
6.9pF(6R9) W, B, C	0.3(3)	0.5(5)
7.0pF(7R0) W, B, C	0.3(3)	0.5(5)
7.1pF(7R1) W, B, C	0.3(3)	0.5(5)
7.2pF(7R2) W, B, C	0.3(3)	0.5(5)
7.3pF(7R3) W, B, C	0.3(3)	0.5(5)
7.4pF(7R4) W, B, C	0.3(3)	0.5(5)
7.5pF(7R5) W, B, C	0.3(3)	0.5(5)

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Part Number	GRM03	GRM15
L x W [EIA]	0.6x0.3 [0201]	1.0x0.5 [0402]
TC	C0G (5C)	C0G (5C)
Rated Volt.	25 (1E)	50 (1H)
Capacitance, Capacitance Tolerance and T Dimension		
7.6pF(7R6) W, B, C	0.3(3)	0.5(5)
7.7pF(7R7) W, B, C	0.3(3)	0.5(5)
7.8pF(7R8) W, B, C	0.3(3)	0.5(5)
7.9pF(7R9) W, B, C	0.3(3)	0.5(5)
8.0pF(8R0) W, B, C	0.3(3)	0.5(5)
8.1pF(8R1) W, B, C	0.3(3)	0.5(5)
8.2pF(8R2) W, B, C	0.3(3)	0.5(5)
8.3pF(8R3) W, B, C	0.3(3)	0.5(5)
8.4pF(8R4) W, B, C	0.3(3)	0.5(5)
8.5pF(8R5) W, B, C	0.3(3)	0.5(5)
8.6pF(8R6) W, B, C	0.3(3)	0.5(5)
8.7pF(8R7) W, B, C	0.3(3)	0.5(5)
8.8pF(8R8) W, B, C	0.3(3)	0.5(5)
8.9pF(8R9) W, B, C	0.3(3)	0.5(5)
9.0pF(9R0) W, B, C	0.3(3)	0.5(5)
9.1pF(9R1) W, B, C	0.3(3)	0.5(5)
9.2pF(9R2) W, B, C	0.3(3)	0.5(5)
9.3pF(9R3) W, B, C	0.3(3)	0.5(5)
9.4pF(9R4) W, B, C	0.3(3)	0.5(5)
9.5pF(9R5) W, B, C	0.3(3)	0.5(5)
9.6pF(9R6) W, B, C	0.3(3)	0.5(5)
9.7pF(9R7) W, B, C	0.3(3)	0.5(5)
9.8pF(9R8) W, B, C	0.3(3)	0.5(5)
9.9pF(9R9) W, B, C	0.3(3)	0.5(5)

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

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Chip Monolithic Ceramic Capacitors

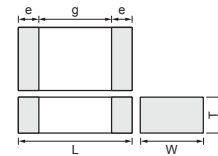


Thin Type

5

■ Features

1. This series is suited to flow and reflow soldering. Capacitor terminations are made of metal highly resistant to migration.
2. Large capacitance values enable excellent bypass effects to be realized.
3. GRM18, 21 and GRM31 types are suited to flow and reflow soldering.
GRM15 and GRM32 types are applied to only reflow soldering.
4. Its thin package makes this series ideally suited for the production of small electronic products and for mounting underneath ICs.



Part Number	Dimensions (mm)				
	L	W	T	e	g min.
GRM15X	1.0 ±0.05	0.5 ±0.05	0.25 ±0.05	0.1 to 0.3	0.4
GRM153			0.3 ±0.03		
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		
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		
GRM329	3.2 ±0.3	2.5 ±0.2	0.85 ±0.1	0.3 min.	1.0
GRM32A			1.0 +0/-0.2		

■ Applications

Thin equipment such as IC cards

Temperature Compensating Type

Part Number	TC Code (Standard)	Rated Voltage (Vdc)	Capacitance (pF)	Length L (mm)	Width W (mm)	Thickness T (mm)	EIA
GRM1535C1H1R0CDD5	C0G (EIA)	50	1.0 ±0.25pF	1.0	0.5	0.3	0402
GRM1535C1H2R0CDD5	C0G (EIA)	50	2.0 ±0.25pF	1.0	0.5	0.3	0402
GRM1535C1H3R0CDD5	C0G (EIA)	50	3.0 ±0.25pF	1.0	0.5	0.3	0402
GRM1535C1H4R0CDD5	C0G (EIA)	50	4.0 ±0.25pF	1.0	0.5	0.3	0402
GRM1535C1H5R0CDD5	C0G (EIA)	50	5.0 ±0.25pF	1.0	0.5	0.3	0402
GRM1535C1H6R0DDD5	C0G (EIA)	50	6.0 ±0.5pF	1.0	0.5	0.3	0402
GRM1535C1H7R0DDD5	C0G (EIA)	50	7.0 ±0.5pF	1.0	0.5	0.3	0402
GRM1535C1H8R0DDD5	C0G (EIA)	50	8.0 ±0.5pF	1.0	0.5	0.3	0402
GRM1535C1H9R0DDD5	C0G (EIA)	50	9.0 ±0.5pF	1.0	0.5	0.3	0402
GRM1535C1H100JDD5	C0G (EIA)	50	10 ±5%	1.0	0.5	0.3	0402
GRM1535C1H120JDD5	C0G (EIA)	50	12 ±5%	1.0	0.5	0.3	0402
GRM1535C1H150JDD5	C0G (EIA)	50	15 ±5%	1.0	0.5	0.3	0402
GRM1535C1H180JDD5	C0G (EIA)	50	18 ±5%	1.0	0.5	0.3	0402
GRM1535C1H220JDD5	C0G (EIA)	50	22 ±5%	1.0	0.5	0.3	0402
GRM1535C1H270JDD5	C0G (EIA)	50	27 ±5%	1.0	0.5	0.3	0402
GRM1535C1H330JDD5	C0G (EIA)	50	33 ±5%	1.0	0.5	0.3	0402
GRM1535C1H390JDD5	C0G (EIA)	50	39 ±5%	1.0	0.5	0.3	0402
GRM1535C1H470JDD5	C0G (EIA)	50	47 ±5%	1.0	0.5	0.3	0402
GRM1535C1H560JDD5	C0G (EIA)	50	56 ±5%	1.0	0.5	0.3	0402
GRM1535C1H680JDD5	C0G (EIA)	50	68 ±5%	1.0	0.5	0.3	0402
GRM1535C1H820JDD5	C0G (EIA)	50	82 ±5%	1.0	0.5	0.3	0402
GRM1535C1H101JDD5	C0G (EIA)	50	100 ±5%	1.0	0.5	0.3	0402

High Dielectric Constant Type

Part Number	TC Code (Standard)	Rated Voltage (Vdc)	Capacitance	Length L (mm)	Width W (mm)	Thickness T (mm)	EIA
GRM15XR71H221KA86	X7R (EIA)	50	220pF ±10%	1.0	0.5	0.25	0402
GRM15XR71H331KA86	X7R (EIA)	50	330pF ±10%	1.0	0.5	0.25	0402
GRM15XR71H471KA86	X7R (EIA)	50	470pF ±10%	1.0	0.5	0.25	0402
GRM15XR71H681KA86	X7R (EIA)	50	680pF ±10%	1.0	0.5	0.25	0402
GRM15XR71H102KA86	X7R (EIA)	50	1000pF ±10%	1.0	0.5	0.25	0402
GRM15XR71H152KA86	X7R (EIA)	50	1500pF ±10%	1.0	0.5	0.25	0402
GRM15XR71E222KA86	X7R (EIA)	25	2200pF ±10%	1.0	0.5	0.25	0402
GRM219R71E105KA88	X7R (EIA)	25	1.0μF ±10%	2.0	1.25	0.85	0805
GRM15XR71C332KA86	X7R (EIA)	16	3300pF ±10%	1.0	0.5	0.25	0402
GRM15XR71C472KA86	X7R (EIA)	16	4700pF ±10%	1.0	0.5	0.25	0402
GRM15XR71C682KA86	X7R (EIA)	16	6800pF ±10%	1.0	0.5	0.25	0402
GRM15XR71C103KA86	X7R (EIA)	16	10000pF ±10%	1.0	0.5	0.25	0402
GRM216C81C105KA12	X6S(EIA)	16	1.0μF ±10%	2.0	1.25	0.6*	0805
GRM316C81C225KA12	X6S(EIA)	16	2.2μF ±10%	3.2	1.6	0.6*	1206
GRM219C81C225KA12	X6S(EIA)	16	2.2μF ±10%	2.0	1.25	0.85*	0805
GRM319C81C475KA12	X6S(EIA)	16	4.7μF ±10%	3.2	1.6	0.85*	1206
GRM219C81A475KE34	X6S(EIA)	10	4.7μF ±10%	2.0	1.25	0.85*	0805
GRM219C80J475KE19	X6S(EIA)	6.3	4.7μF ±10%	2.0	1.25	0.85*	0805
GRM319C80J106KE19	X6S(EIA)	6.3	10μF ±10%	3.2	1.6	0.85*	1206
GRM219C80G106KE19	X6S(EIA)	4	10μF ±10%	2.0	1.25	0.85*	0805
GRM216R61E105KA12	X5R (EIA)	25	1.0μF ±10%	2.0	1.25	0.6*	0805
GRM316R61E225KA12	X5R (EIA)	25	2.2μF ±10%	3.2	1.6	0.6*	1206
GRM219R61E225KA12	X5R (EIA)	25	2.2μF ±10%	2.0	1.25	0.85*	0805
GRM319R61E475KA12	X5R (EIA)	25	4.7μF ±10%	3.2	1.6	0.85*	1206
GRM216R61C105KA88	X5R (EIA)	16	1.0μF ±10%	2.0	1.25	0.6*	0805
GRM316R61C225KA88	X5R (EIA)	16	2.2μF ±10%	3.2	1.6	0.6*	1206
GRM219R61C225KA88	X5R (EIA)	16	2.2μF ±10%	2.0	1.25	0.85*	0805
GRM219R61C475KE15	X5R (EIA)	16	4.7μF ±10%	2.0	1.25	0.85*	0805
GRM319R61C475KA88	X5R (EIA)	16	4.7μF ±10%	3.2	1.6	0.85*	1206
GRM319R61C106KE15	X5R (EIA)	16	10μF ±10%	3.2	1.6	0.85*	1206
GRM216R61A225KE24	X5R (EIA)	10	2.2μF ±10%	2.0	1.25	0.6*	0805
GRM219R61A225KA01	X5R (EIA)	10	2.2μF ±10%	2.0	1.25	0.85*	0805
GRM316R61A335KE19	X5R (EIA)	10	3.3μF ±10%	3.2	1.6	0.6*	1206
GRM219R61A335KE19	X5R (EIA)	10	3.3μF ±10%	2.0	1.25	0.85*	0805
GRM316R61A475KE19	X5R (EIA)	10	4.7μF ±10%	3.2	1.6	0.6*	1206
GRM219R61A475KE34	X5R (EIA)	10	4.7μF ±10%	2.0	1.25	0.85*	0805
GRM319R61A106KE19	X5R (EIA)	10	10μF ±10%	3.2	1.6	0.85*	1206
GRM219R60J475KE19	X5R (EIA)	6.3	4.7μF ±10%	2.0	1.25	0.85*	0805
GRM319R60J106KE19	X5R (EIA)	6.3	10μF ±10%	3.2	1.6	0.85*	1206

*: Please refer to GRM Series Specifications and Test Methods (2) (P.30).

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