

MONOLITHIC CERAMIC CAPACITORS CERAMIC CHIP-COG TYPE GRM SERIES



FEATURES

- Miniature size
- No Polarity
- Nickel Barrier Termination Standard – highly resistant to metal migration
- Uniform dimensions and configuration
- Flow for GRM39, 40, 42-6 and Reflow Solderable
- Minimum series inductance
- Tape and Reel Packaging
- Wide selection of capacitance values and voltages

- Largest production capacity and volume in the world

DIMENSIONS: mm

	Size	EIA Code	L Length	W Width	T Thickness	g (min.) Insulation	e (min.) Termination
	GRM36	0402	1.0 ± 0.05	0.5 ± 0.05	0.5 ± 0.05	0.3	0.1
	GRM39	0603	1.6 ± 0.1	0.80 ± 0.1	0.8 ± 0.1	0.5	0.35 ± 0.15
	GRM40	0805	2.0 ± 0.15	1.25 ± 0.15	1.40 max.	0.75	0.5 ± 0.25
	GRM42-6	1206	3.2 ± 0.15	1.6 ± 0.15	1.25 max.	1.0	0.55 ± 0.25
	GRM42-2	1210	3.2 ± 0.15	2.5 ± 0.15	1.5 max.	1.0	0.5 ± 0.25
	GRM43-2	1812	4.6 ± 0.3	3.2 ± 0.2	2.75 max.	2.0	0.25
	GRM44-1	2220	5.6 ± 0.3	5.1 + 0.25 – 0.5	2.75 max.	2.0	0.25

SPECIFICATIONS

Type	Rated Voltage/Temperature Characteristics/Capacitance Value		
	COG		
	50V	100V	200V
GRM36	1.0 ~ 160pF	—	—
GRM39	1.0 ~ 510pF	1.0 ~ 160pF	1.0 ~ 10pF
GRM40	1.0 ~ 2400pF	1.0 ~ 680pF	1.0 ~ 220pF
GRM42-6	1.0 ~ 6200pF	1.0 ~ 2200pF	1.0 ~ 470pF
GRM42-2	100 ~ 7500pF	100 ~ 4300pF	100 ~ 1000pF
GRM43-2	1000pF ~ .013µF	1000pF ~ .012µF	330pF ~ 2700pF
GRM44-1	1000pF ~ .049µF	1000pF ~ .030µF	1000pF ~ 6200pF

PART NUMBERING SYSTEM

CAPACITOR TYPE AND SIZE		3-DIGIT CODE	TEMPERATURE CHARACTERISTICS	CAPACITANCE VALUE	CAPACITANCE TOLERANCE	VOLTAGE	MARKING	PACKAGING																
GRM40		---	COG	101	J	050	A	D																
		appears as necessary to indicate special thickness requirements. Please consult your local sales office for details.	COG P2H R2H S2H T2H U2J SL	Expressed in picofarads and identified by a three-digit number. First two digits represent significant figures. Last digit specifies the number of zeros to follow. For fractional values below 10pF, the letter "R" is used as the decimal point and the last digit becomes significant.	5pF or less C = ± 25pF >5pF ≤ 10pF D = ± .5pF >10pF J = ± 5% K = 10%	Identified by a three-digit number.	A = Unmarked	<table border="1"> <thead> <tr> <th>Reel Diameter / Tape Material</th> <th>Code</th> </tr> </thead> <tbody> <tr> <td>7" Paper Tape</td> <td>D</td> </tr> <tr> <td>7" Plastic Tape</td> <td>L</td> </tr> <tr> <td>13" Paper Tape</td> <td>J</td> </tr> <tr> <td>13" Plastic Tape</td> <td>K</td> </tr> <tr> <td>Bulk</td> <td>B</td> </tr> <tr> <td>Bulk Cassette</td> <td>C</td> </tr> <tr> <td>7" Paper 2mm pitch</td> <td>Q</td> </tr> </tbody> </table>	Reel Diameter / Tape Material	Code	7" Paper Tape	D	7" Plastic Tape	L	13" Paper Tape	J	13" Plastic Tape	K	Bulk	B	Bulk Cassette	C	7" Paper 2mm pitch	Q
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For more detailed information regarding this product line, see Catalog No. C22-C. To receive additional information on Murata Products call 1-800-831-9172.

MONOLITHIC CERAMIC CAPACITORS CERAMIC CHIP – TEMPERATURE COMPENSATING TYPE GRM SERIES



Innovator in Electronics

CAPACITORS



FEATURES

- Miniature size
- No Polarity
- Nickel Barrier Termination Standard – highly resistant to metal migration
- Uniform dimensions and configuration
- Flow for GRM39, 40, 42-6 and Reflow Solderable
- Minimum series inductance
- Tape and Reel Packaging
- Wide selection of capacitance values and voltages

- Largest production capacity and volume in the world

DIMENSIONS: mm

	Size	EIA Code	L Length	W Width	T Thickness	g (min.) Insulation	e (min.) Termination
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	GRM39	0603	1.6 ± 0.1	0.80 ± 0.1	0.8 ± 0.1	0.5	0.35 ± 0.15
	GRM40	0805	2.0 ± 0.15	1.25 ± 0.15	1.40 max.	0.75	0.5 ± 0.25
	GRM42-6	1206	3.2 ± 0.15	1.6 ± 0.15	1.25 max.	1.0	0.55 ± 0.25
	GRM42-2	1210	3.2 ± 0.15	2.5 ± 0.15	1.5 max.	1.0	0.5 ± 0.25
	GRM43-2	1812	4.6 ± 0.3	3.2 ± 0.2	2.75 max.	2.0	0.25
	GRM44-1	2220	5.6 ± 0.3	5.1 + 0.25 – 0.5	2.75 max.	2.0	0.25

SPECIFICATIONS

Type	Temperature Characteristics/Capacitance Value											
	P2H		R2H		S2H		T2H		U2J		SL	
	50V	100V	50V	100V	50V	100V	50V	100V	50V	100V	50V	100V
GRM39	1.0 ~ 160pF	1.0 ~ 120pF	1.0 ~ 160pF	1.0 ~ 150pF	1.0 ~ 220pF	1.0 ~ 120pF	1.0 ~ 390pF	1.0 ~ 39pF	1.0 ~ 750pF	1.0 ~ 430pF	1.0 ~ 750pF	1.0 ~ 430pF
GRM40	1.0 ~ 620pF	1.0 ~ 470pF	1.0 ~ 750pF	1.0 ~ 560pF	1.0 ~ 820pF	1.0 ~ 620pF	1.0 ~ 1800pF	1.0 ~ 220pF	1.0 ~ 3300pF	1.0 ~ 2000pF	1.0 ~ 3300pF	1.0 ~ 2000pF
GRM42-6	1.0 ~ 1600pF	1.0 ~ 1300pF	1.0 ~ 1600pF	1.0 ~ 1600pF	1.0 ~ 2000pF	1.0 ~ 1600pF	1.0 ~ 4300pF	1.0 ~ 510pF	1.0 ~ 8200pF	1.0 ~ 4700pF	1.0 ~ 8200pF	1.0 ~ 4900pF

PART NUMBERING SYSTEM

CAPACITOR TYPE AND SIZE	3-DIGIT CODE	TEMPERATURE CHARACTERISTICS	CAPACITANCE VALUE	CAPACITANCE TOLERANCE	VOLTAGE	MARKING	PACKAGING																
	appears as necessary to indicate special thickness requirements. Please consult your local sales office for details.	COG P2H R2H S2H T2H U2J SL	Expressed in picofarads and identified by a three-digit number. First two digits represent significant figures. Last digit specifies the number of zeros to follow. For fractional values below 10pF, the letter "R" is used as the decimal point and the last digit becomes significant.	5pF or less C = ±.25pF >5pF ≈ 10pF D = ±.5pF >10pF J = ±5%	Identified by a three-digit number.	A = Unmarked	<table border="1"> <thead> <tr> <th>Reel Diameter / Tape Material</th> <th>Code</th> </tr> </thead> <tbody> <tr> <td>7" Paper Tape</td> <td>D</td> </tr> <tr> <td>7" Plastic Tape</td> <td>L</td> </tr> <tr> <td>13" Paper Tape</td> <td>J</td> </tr> <tr> <td>13" Plastic Tape</td> <td>K</td> </tr> <tr> <td>Bulk</td> <td>B</td> </tr> <tr> <td>Bulk Cassette</td> <td>C</td> </tr> <tr> <td>7" Paper 2mm pitch</td> <td>Q</td> </tr> </tbody> </table>	Reel Diameter / Tape Material	Code	7" Paper Tape	D	7" Plastic Tape	L	13" Paper Tape	J	13" Plastic Tape	K	Bulk	B	Bulk Cassette	C	7" Paper 2mm pitch	Q
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For more detailed information regarding this product line, see Catalog No. C-22-C. To receive additional information on Murata Products call 1-800-831-9172.

MONOLITHIC CERAMIC CAPACITORS CERAMIC CHIP-HIGH DIELECTRIC CONSTANT TYPE X7R,Y5V GRM SERIES



FEATURES

- Miniature size
- No Polarity
- Nickel Barrier Termination Standard – highly resistant to metal migration
- Uniform dimensions and configuration
- Flow for GRM39, 40, 42-6 and Reflow Solderable
- Minimum series inductance
- Tape and Reel Packaging
- Wide selection of capacitance values and voltages

- Largest production capacity and volume in the world



DIMENSIONS: mm

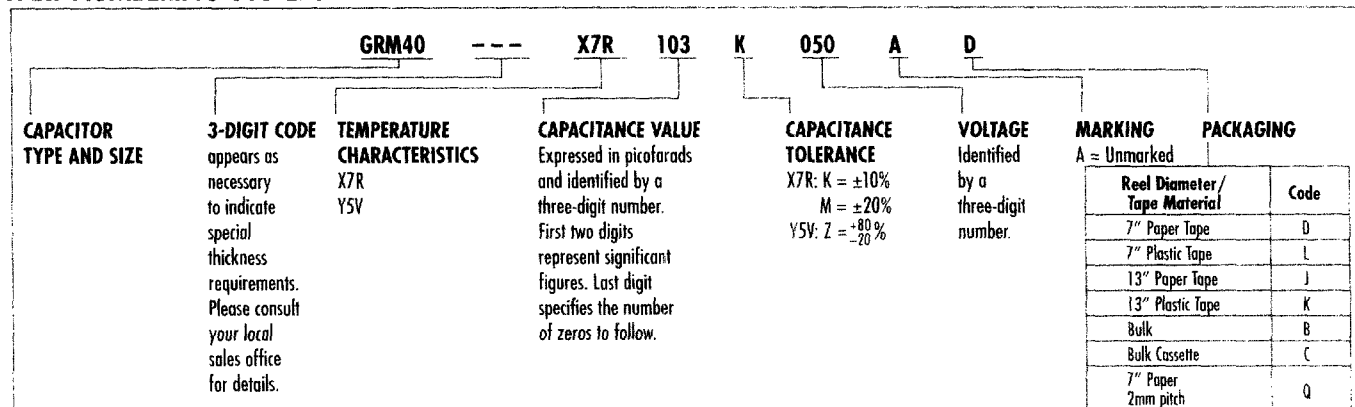
Size	EIA Code	L Length	W Width	T Thickness	g (min.) Insulation	e (min.) Termination
GRM36	0402	1.0 ± 0.05	0.5 ± 0.05	0.5 ± 0.05	0.3	0.1
GRM39	0603	1.6 ± 0.1	0.80 ± 0.1	0.8 ± 0.1	0.5	0.35 ± 0.15
GRM40	0805	2.0 ± 0.15	1.25 ± 0.15	1.40 max.	0.75	0.5 ± 0.25
GRM42-6	1206	3.2 ± 0.15	1.6 ± 0.15	1.25 max.	1.0	0.55 ± 0.25
GRM42-2	1210	3.2 ± 0.15	2.5 ± 0.15	1.5 max.	1.0	0.5 ± 0.25
GRM43-2	1812	4.6 ± 0.3	3.2 ± 0.2	2.75 max.	2.0	0.25
GRM44-1	2220	5.6 ± 0.3	5.1 + 0.25 - 0.5	2.75 max.	2.0	0.25

SPECIFICATIONS

Type	Temperature Characteristics/Rated Voltage/Capacitance Value										
	X7R					Y5V					
	10V	16V	25V	50V	100V	200V	10V	16V	25V	50V	100V
GRM36	—	8200pF ~ .022µF	4700pF ~ 6800pF	220pF ~ 3900pF	—	—	—	.033µF ~ .11µF	.022µF	1000pF ~ .015µF	—
GRM39	.12µF ~ .22µF	.012µF ~ .1µF	3900pF ~ .047µF	220pF ~ .018µF	220pF ~ 3400pF	220pF ~ 1800pF	.47µF ~ 1.0µF	.033µF ~ .22µF	1000pF ~ .15µF	1000pF ~ .068µF	1200pF ~ 4700pF
GRM40	.56µF ~ 1.0µF	.015µF ~ .47µF	2000pF ~ .15µF	220pF ~ .1µF	220pF ~ .015µF	220pF ~ .01µF	2.2µF	.1µF ~ 2.2µF	2200pF ~ .33µF	2200pF ~ .22µF	1000pF ~ .022µF
GRM42-6	2.2µF ~ 4.7µF	.1µF ~ 1.0µF	.022µF ~ .33µF	1000pF ~ .15µF	1000pF ~ .039µF	1000pF ~ .022µF	4.7µF*	.15µF ~ 4.7µF	.068µF ~ 1.5µF	.01µF ~ .47µF	.01µF ~ .057µF
GRM42-2	—	.12µF ~ 1.5µF	.022µF ~ .33µF	.068µF ~ .22µF	.027µF ~ .1µF	1500pF ~ .047µF	—	.68µF ~ 2.2µF	1.0µF ~ 1.5µF	.68µF	.047µF ~ .12µF
GRM43-2	—	.39µF ~ .56µF	.1µF ~ .56µF	.01µF ~ .47µF	.012µF ~ .22µF	.01µF ~ .15µF	—	3.3µF	1.5µF	1.5µF	.15µF ~ .33µF
GRM44-1	—	—	.47µF ~ 1.2µF	0.56µF ~ 1.2µF	.056µF ~ .56µF	.022µF ~ .27µF	—	—	2.2µF	4.7µF	.33µF ~ .68µF

*4T dimension = 1.6 ± .2mm

PART NUMBERING SYSTEM



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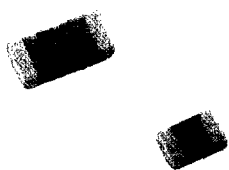
MONOLITHIC CERAMIC CAPACITORS

CERAMIC CHIP – NICKEL BARRIER TERMINATION THIN TYPE

GRM SERIES



CAPACITORS



FEATURES

- This series is suited to flow and reflow soldering. Capacitor terminations are made of metal highly resistant to migration.
- Large capacitance values enable excellent by-pass effects to be realized.
- Its thin package makes this series ideally suited for the production of small electronic products and for mounting underneath ICs.

APPLICATIONS

- Thin equipment such as IC cards

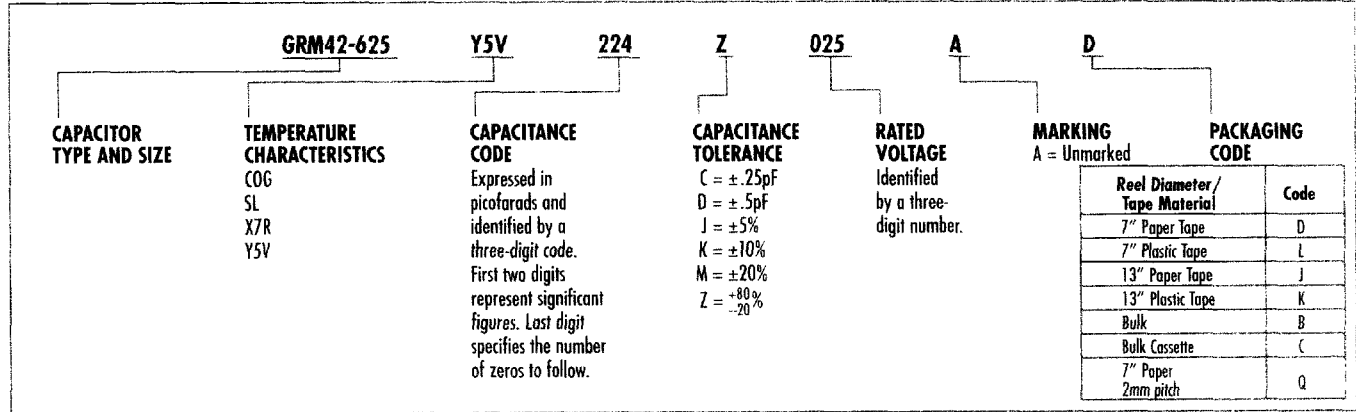
DIMENSIONS: mm

	Size	L Length	W Width	T Thickness	g (min.) Insulation	e (min.) Termination
	GRM40-024	2.0 ± 0.1	1.25 ± 0.1	0.5 max.	0.7	0.2
	GRM42-625	3.2 ± 0.15	1.6 ± 0.15	0.6 max.	1.5	0.3

SPECIFICATIONS

Type	Rated Voltage	Temperature Characteristics/Capacitance Value			
		COG	SL	X7R	Y5V
GRM40-024	50V	0.5 ~ 360	220 ~ 470	220 ~ 6800	10000
	25V	—	—	8200 ~ 10000	15000 ~ 33000
	16V	—	—	12000 ~ 27000	47000 ~ 100000
GRM42-625	25V	—	—	—	150000 ~ 220000

PART NUMBERING SYSTEM

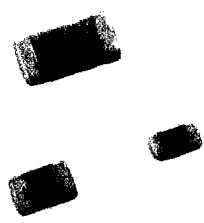


For more detailed information regarding this product line, see Catalog No. C-22-C. To receive additional information on Murata Products call 1-800-831-9172.

MONOLITHIC CERAMIC CAPACITORS CERAMIC CHIP – TANTALUM REPLACEMENT TYPE GRM SERIES



Innovator in Electronics



These new monolithic ceramic chip capacitors are specifically designed to replace tantalum and aluminum electrolytic capacitors in a variety of applications. The high frequency performance of these devices make them particularly suitable for use in secondary suppression circuits in switching power supplies and other circuits with high frequency performance requirements.

Lower ESR yields lower net impedance at higher frequencies. Thus a lower value of ceramic capacitance may be sufficient in bypassing and decoupling circuits.

Greater surface mounting flexibility and long-term reliability of ceramic capacitor adds to their overall performance vs. ratio as compared to electrolytics.

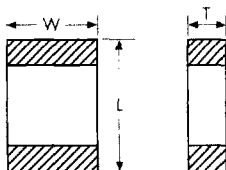
FEATURES*

- Lower equivalent series resistance
- Lower dissipation factor
- Higher insulation resistance
- Higher break-down voltage
- No polarity considerations
- Long term dielectric stability
- Wider solder profile capability
- Solvent wash compatibility

*When compared to electrolytic capacitors

DIMENSIONS: mm

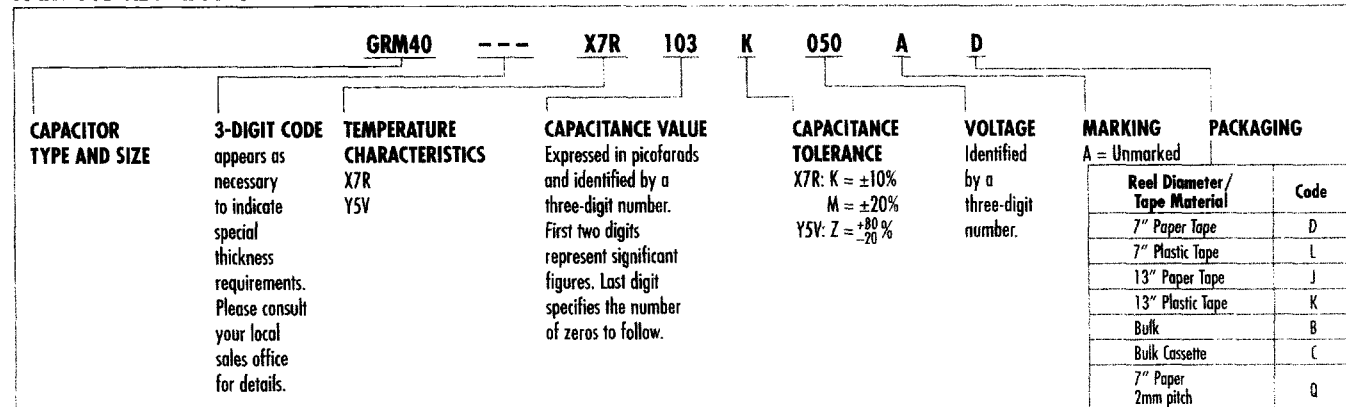
Type	EIA Code	L Length	W Width	T Thickness
GRM39	0603	1.6 ± 0.1	0.8 ± 0.1	0.8 ± 0.1
GRM40	0805	2.0 ± 0.15	1.25 ± 0.15	1.35 max.
GRM42-6	1206	3.2 ± 0.15	1.6 ± 0.15	1.25 max.



SPECIFICATIONS

Type	Rated Voltage	Temperature Characteristics/Capacitance Value		
		X7R	X5R	Y5V
GRM39	10V	—	—	0.47μF ~ 1.0μF
	16V	0.1μF		0.22μF
	25V	—		0.1μF
GRM40	10V	1.0μF	—	2.2μF
	16V	0.22μF		0.47μF ~ 2.2μF
	25V	0.1μF		—
	50V	—		0.1μF ~ 0.22μF
GRM42-6	10V	1.0μF ~ 2.2μF	4.7μF	—
	16V	—	0.47μF	2.2μF ~ 4.7μF

PART NUMBERING SYSTEM

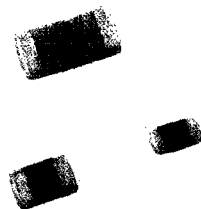


For more detailed information regarding this product line, see Catalog No. C-22-C. To receive additional information on Murata Products call 1-800-831-9172.

MONOLITHIC CERAMIC CAPACITORS CERAMIC CHIP – TANTALUM REPLACEMENT TYPE GRM SERIES



CAPACITORS



FEATURES

- Large capacitance at low cost because of the use of base-metal materials
- Terminations are made of metal highly resistant to migrations.
- Heat generation is low at high frequency because of low dielectric loss.
- Compared with aluminum electrolytic capacitors, capacitance can be lower to obtain the same smoothing performance.

- Ceramic capacitor has no polarity and ensures long life time. Ideal replacement for tantalum capacitors.

APPLICATIONS

- DC-DC converter
- Noise elimination for LCD bias circuit (Use for only alumina, paper or glass epoxy board.)

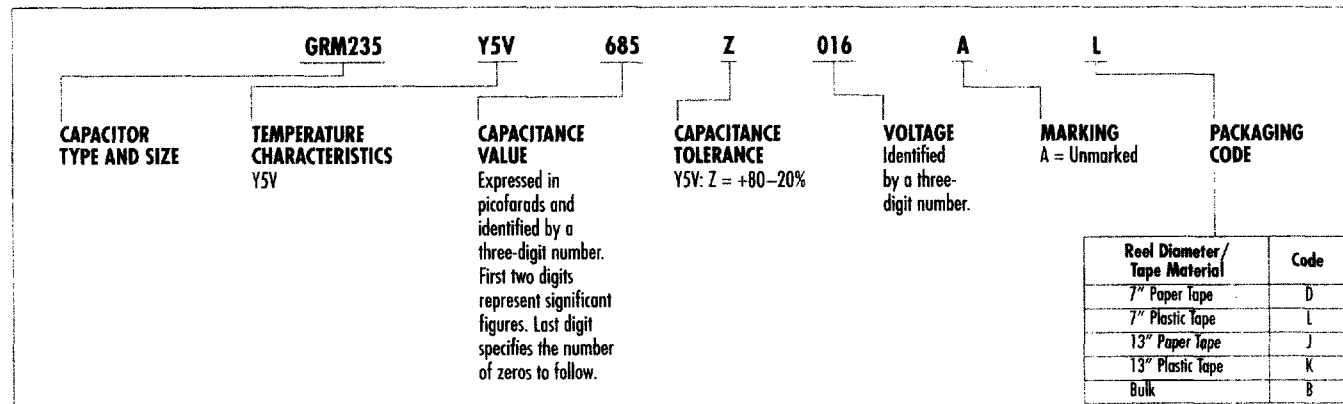
DIMENSIONS: mm

Type	EIA Code	L Length	W Width	T Thickness	e	g
GRM220	0603	1.6 ± 0.1	0.8 ± 0.1	Please refer to the Specifications table.	0.2 ~ 0.5	0.5 min.
GRM230	1206	3.2 ± 0.15	1.6 ± 0.15		0.3 ~ 0.8	1.5 min.
GRM235	1210	3.2 ± 0.3	2.5 ± 0.2		0.3 min.	1.0 min.

SPECIFICATIONS

Type	Thickness T (mm)	Capacitance Range/DC Rated Voltage (V)					Capacitance Tolerance
		100	50	25	16	10	
GRM220	0.8 ± 0.1	—	—	—	—	1 μF	Z: +80% -20%
GRM230	1.15 ± 0.1	—	—	—	4.7 μF	10 μF	
GRM235	1.15 ± 0.1	—	—	—	—	—	
	1.35 ± 0.15	—	—	6.8 μF	6.8 μF ~ 10 μF	22 μF	
	1.8 ± 0.2	1 μF	4.7 μF	10 μF	—	—	

PART NUMBERING SYSTEM



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MONOLITHIC CERAMIC CAPACITORS CERAMIC CHIP – 2000V SURGE SUPPRESSION GRM SERIES



Murata Electronics announces a specialty 2000 volt surge suppression chip capacitor developed from Murata's original multi-layer process technology and ceramic materials. E.I.A. 1808 surface mountable size makes this capacitor especially suited for applications where small size (compared to thru-hole capacitors) and reliable performance are a criteria.

- continuous, 2250 volt surge capability
- Long profile (4.6mm) reduces risk of high voltage spark over
- Small size: 4.6 x 2.0mm
- Tested to IEEE std. 802.3, 2,250VDC for 60 seconds
- Popular values: 15pF, COG, 27pF COG, 68pF COG, 150pF X7R, 220pF X7R, 470pF X7R

FEATURES

- High voltage rating: 1000VDC

DIMENSIONS: mm

GRM43		
Length	L	4.6 ± 0.3
Width	W	2.0 ± 0.2
Insulation	g min.	2.0
Termination	e min.	0.25

SPECIFICATIONS

Type	Rated Voltage	Temperature Characteristics/Capacitance Value	
		COG	X7R
GRM43	1000V	15pF ~ 150pF	150pF ~ 1000pF

PART NUMBERING SYSTEM

GRM43	COG	151	K	XKV	A	L																
CAPACITOR TYPE AND SIZE GRM – Nickel Barrier Plated Tin (Standard)	TEMPERATURE CHARACTERISTICS Standard TC's COG = 0 ± 30ppm X7R = ±15%	CAPACITANCE VALUE Identified by a three-digit code. First two digits represent significant figures. Last digit specifies the number of zeros to follow. 150 = 15pF 270 = 27pF 680 = 68pF 151 = 150pF	CAPACITANCE TOLERANCE COG: J = ±5% K = ±10% X7R: K = ±10% M = ±20%	VOLTAGE Identified by a three-digit code. X = 2250VDC surge	MARKING A = Unmarked	PACKAGING																
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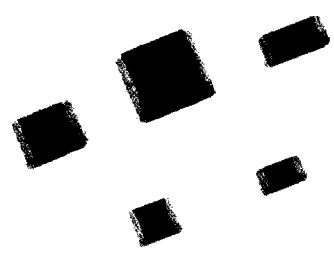
Some values cannot be taped. Consult your local MENA Sales Office for additional marking and packaging information.

For more detailed information regarding this product line, see Catalog No. C-22-C. To receive additional information on Murata Products call 1-800-831-9172.

MONOLITHIC CERAMIC CAPACITORS CERAMIC CHIP – 500 VOLT & 1000 VOLT RATED COG & X7R TYPE GRM SERIES



CAPACITORS



These new surface mount components are designed to meet the growing demand for miniature, reliable chip capacitors, especially where high volume automation is required. Applications include solid state relays, telecom, instrumentation, modems, computer peripherals, and others.

BENEFITS

- Compatible with SMT equipment
- Improves long term reliability
- Suitable for harsh environments

FEATURES

- Standard E.I.A. sizes
- Up to 2X rated voltage tested
- -55°C to +125°C rated

DIMENSIONS: mm

		*EIA PREFERRED SIZE						
		Size	EIA Code	L Length	W Width	T Thickness	g (min.) Insulation	e (min.) Termination
	GRM42-6	1206	3.2 ± 0.2	1.5 ± 0.2	1.25 max.	1.0	0.5 ± 0.25	
	GRM42-2	1210	3.2 ± 0.2	2.5 ± 0.2	1.5 max.	1.0	0.5 ± 0.25	
	GRM43	1808	4.6 ± 0.3	2.0 ± 0.2	2.0 max.	2.0	0.25	
	GRM43-2	1812	4.6 ± 0.3	3.2 ± 0.2	2.75 max.	2.0	0.25	
	GRM44-1	2220	5.6 ± 0.3	5.1 ^{+0.25} _{-0.5}	2.75 max.	2.0	0.25	

SPECIFICATIONS

Type	Rated Voltage	Temperature Characteristics/Capacitance Value	
		COG	X7R
GRM42-6	500V	5pF ~ 470pF	500pF ~ 6800pF
GRM42-2	500V	100pF ~ 1000pF	1000pF ~ .015pF
GRM43	500V	200pF ~ 1200pF	5000pF ~ .020pF
	1000V	10pF ~ 270pF	800pF ~ 3900pF
GRM43-2	500V	500pF ~ 2700pF	.01μF ~ .047μF
	1000V	100pF ~ 560pF	1000pF ~ .01μF
GRM44-1	500V	1000pF ~ 7500pF	.020μF ~ 12μF
	1000V	500pF ~ 1500pF	.01μF ~ .027μF

PART NUMBERING SYSTEM

GRM42-2	-	X7R	103	K	500	A	L																	
CAPACITOR TYPE AND SIZE GRM-Nickel Barrier Plated Tin (Standard) GR-Palladium-Silver (Non-preferred)	TWO OR 3-DIGIT code appears as necessary to indicate special thickness requirements. Please consult your local MENA Sales Office for details.	TEMPERATURE CHARACTERISTICS Standard TC's COG = 0±30ppm X7R = ±15%	CAPACITANCE VALUE Identified by a three-digit code. First two digits represent significant figures. Last digit specifies the number of zeros to follow. For fractional values below 10pF, the letter "R" is used as the decimal point and the last digit becomes significant.	CAPACITANCE TOLERANCE COG: (10pF or less) C = ±.25pF D = ±.5pF (Over 10pF) J = ±5% K = ±10% X7R: K = ±10%	VOLTAGE Identified by a three-digit number. Others available upon request. (1,000 volts codes as 1KV)	MARKING A = Unmarked	PACKAGING																	
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Some values cannot be taped. Consult your local MENA Sales Office for additional marking and packaging information.

For more detailed information regarding this product line, see Catalog No. C-22-C. To receive additional information on Murata Products call 1-800-831-9172