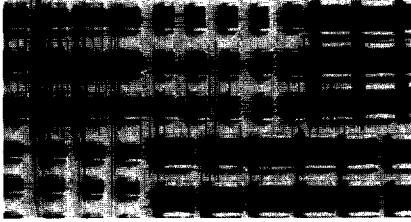


CHIPS, MONOLITHIC CERAMIC CAPACITORS



FEATURES

- Miniature size
- Wide capacitance, T.C., voltage and tolerance range
- Industry standard sizes
- 8 mm and 12 mm tape & reel for auto-placement

- Nickel barrier termination standard – highly resistant to metal migration.
- Largest production volume and capacity in the industry

PART NUMBERING SYSTEM

GRM 40 --- X7R 103 K 050 A D

CAPACITOR TYPE AND SIZE	3-digit code appears as necessary to indicate special thickness requirements. Please consult your local sales office for details.	TEMPERATURE CHARACTERISTICS	CAPACITANCE VALUE	CAPACITANCE TOLERANCE	VOLTAGE	MARKING	PACKAGING												
See below and following pages.		Standard TC's (described herein) COG=0, ±30ppm (Notes 1 & 2) X7R=±15% Z5U=+22, -56% Y5V=+22, -82% (See Note 2 below) P2H=N150±60ppm R2H=N220±60ppm S2H=N330±60ppm T2H=N470±60ppm U2J=N750±120ppm	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 values below 10pF, the letter "R" is used as the decimal point and the last digit becomes significant.	(Note 2) COG: (10pF or less) B=±.1pF ★C=±.25pF ★D=±.5pF F=±1pF for 10pF only (over 10pF) F=±1% G=±2% ★J=±5% ★K=±10% ★X7R:K=±10% ★M=±20% J=±5% on special request ★Z5U:M=±20% ★Z=+80, -20% ★Y5V:Z=+80, -20%	Identified by a three-digit number. 500V available upon request.	★A=Unmarked ★B=EIA Marking ★C=Non-standard	<table border="1"> <thead> <tr> <th>Reel Diameter</th> <th>EIA-481-A</th> </tr> </thead> <tbody> <tr> <td>★ 7" Paper</td> <td>D</td> </tr> <tr> <td>★ 7" Plastic</td> <td>L</td> </tr> <tr> <td>13" Paper</td> <td>J</td> </tr> <tr> <td>13" Plastic</td> <td>K</td> </tr> <tr> <td>Bulk</td> <td>B</td> </tr> </tbody> </table> <p>T/R per EIA-481-1</p>	Reel Diameter	EIA-481-A	★ 7" Paper	D	★ 7" Plastic	L	13" Paper	J	13" Plastic	K	Bulk	B
Reel Diameter	EIA-481-A																		
★ 7" Paper	D																		
★ 7" Plastic	L																		
13" Paper	J																		
13" Plastic	K																		
Bulk	B																		

NOTE 1: T.C. Tolerance (COG)

Capacitance (pF)	T.C. Tolerance (ppm)
10 or over	± 30 (G)
4.0-9.9	± 60 (H)
2.1-3.9	± 120 (J)
.4-2.0	± 250 (K)

NOTE 2: Refer to EIA-RS198 for limitations

★ Available as standard through authorized Murata Erie Distributors.

CHIP DIMENSIONS

DIMENSIONS: in. (mm)	Size	EIA Code	L Length	W Width	T Thickness	g Insulation	e Termination
	★GRM 39	0603	.060±.006 (1.6±0.15)	.030±.006 (0.8±0.15)	Note 1: Thickness varies with capacitance value. See capacitance charts on following pages for thickness.	.020 (0.5)	.014±.006 (0.35±0.15)
	★GRM40	0805	.080±.006 (2.0±0.15)	.050±.006 (1.25±0.15)		.030 (0.75)	.020±.010 (0.5±0.25)
	★GRM42-6	1206	.125±.006 (3.2±0.15)	.063±.006 (1.6±0.15)		.040 (1.0)	.020±.010 (0.5±0.25)
	★GRM42-2	1210	.125±.006 (3.2±0.15)	.100±.006 (2.5±0.15)		.040 (1.0)	.020±.010 (0.5±0.25)
	★★GRM43-2	1812	.180±.012 (4.6±0.3)	.125±.008 (3.2±0.2)		.080 (2.0)	.025±.015 (0.63±0.38)
	★★GRM43-4	1825	.180±.012 (4.6±0.3)	.250±.016 (6.35±0.4)		.080 (2.0)	.025±.015 (0.63±0.38)
	★★GRM44-1	2220*	.220±.012 (5.6±0.3)	.200±.010-.025 (5.1±0.25-0.5)		.080 (2.0)	.025±.015 (0.63±0.38)
	★★GRM44	2225*	.220±.012 (5.6±0.3)	.250±.016 (6.35±0.4)		.080 (2.0)	.025±.015 (0.63±0.38)

*Non EIA-Standard Size

CHIP TERMINATION DIAGRAMS

Nickel Barrier Layer (Standard)	Palladium Silver
GRM Series 	GR Series

★ Available as standard through authorized Murata Electronics Distributors.

★★ Contact your local Murata Electronics Sales Office for standard values in these series.

Note: Other Terminations Available Upon Request. Please Contact Local Sales Office.

MURATA DESIGNATION	GRM 39			GRM 40			GRM 42-6			GRM 42-2		
EIA TYPE DESIGNATION	0603			0805			1206			1210		
WVDC	50	100	200	50	100	200	50	100	200	50	100	200
CAPACITANCE (pF) (NOTE)	1.0											
	10		10									
	100					10						
	1000	560	160		330	750			160			200
	10000											
(μF) .01												
.1												

Note: Capacitance values = EIA 24 Step = 10, 11, 12, 13, 15, 16, 18, 20, 22, 24, 27, 30, 33, 36, 39, 43, 47, 51, 56, 62, 68, 75, 82, 91
For values under 1.0pF and other values not listed, contact your local Murata Electronics Sales Office.

STANDARD THICKNESS/PACKAGING SPECIFICATIONS

Dimensions (mm)		Bulk	Tape			
		Pcs/bag (typical)	Pcs/7 inch (178 mm) reel		Pcs/13 inch (330 mm) reel	
		Plastic	Paper	Embossed	Paper	Embossed
	T: 0.7 ⁺⁰ _{-0.2}	1000	4000	4000	10000	10000
	T: 0.8 ±0.1	1000	4000	N/A	10000	N/A
	T: 1.0 ⁺⁰ _{-0.2}	1000	4000	3000	10000	10000
	T: 1.25 ⁺⁰ _{-0.2} *	1000	N/A	3000	N/A	10000
	T: 1.5 ⁺⁰ _{-0.2}	1000	N/A	2000	N/A	8000

*GRM 40 T = 1.25 ± 0.1

MURATA DESIGNATION	GRM 43-2			GRM 43-4			GRM 44-1			GRM 44		
EIA TYPE DESIGNATION	1812			1825			2220			2225		
WVDC	50	100	200	50	100	200	50	100	200	50	100	200
CAPACITANCE (pF) (NOTE)	1.0											
	10											
	100											
	1000	1000	1000	330	1000	1000	560	1000	1000	820	1000	1300
(μF) .01												
.1												

Note: Capacitance values = EIA 24 Step = 10, 11, 12, 13, 15, 16, 18, 20, 22, 24, 27, 30, 33, 36, 39, 43, 47, 51, 56, 62, 68, 75, 82, 91
For values under 1.0pF and other values not listed, contact your local Murata Electronics Sales Office.

STANDARD THICKNESS/PACKAGING SPECIFICATIONS

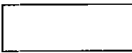




Dimensions (mm)		Bulk	Tape			
		Pcs/bag (typical)	Pcs/7 inch (178 mm) reel		Pcs/13 inch (330 mm) reel	
		Plastic	Paper	Embossed	Paper	Embossed
	T : 1.25 $\begin{smallmatrix} +0 \\ -0.2 \end{smallmatrix}$	1000	N/A	1000	N/A	5000
	T : 1.5 $\begin{smallmatrix} +0 \\ -0.2 \end{smallmatrix}$	1000	N/A	1000	N/A	5000
	T : 2.0 $\begin{smallmatrix} +0 \\ -0.2 \end{smallmatrix}$	1000	N/A	1000	N/A	4000

HIGH DIELECTRIC CONSTANT TYPE X7R

MURATA DESIGNATION	GRM 39					GRM 40					GRM 42-6					GRM 42-2				
EIA TYPE DESIGNATION	0603					0805					1206					1210				
WVDC	16	25	50	100	200	16	25	50	100	200	16	25	50	100	200	16	25	50	100	200
CAPACITANCE (pF) 100			220	220	220			220	220	220			220	220	220					
1000					1800					1800					2200					
(μF) .01																				
.1																				
1.0																				

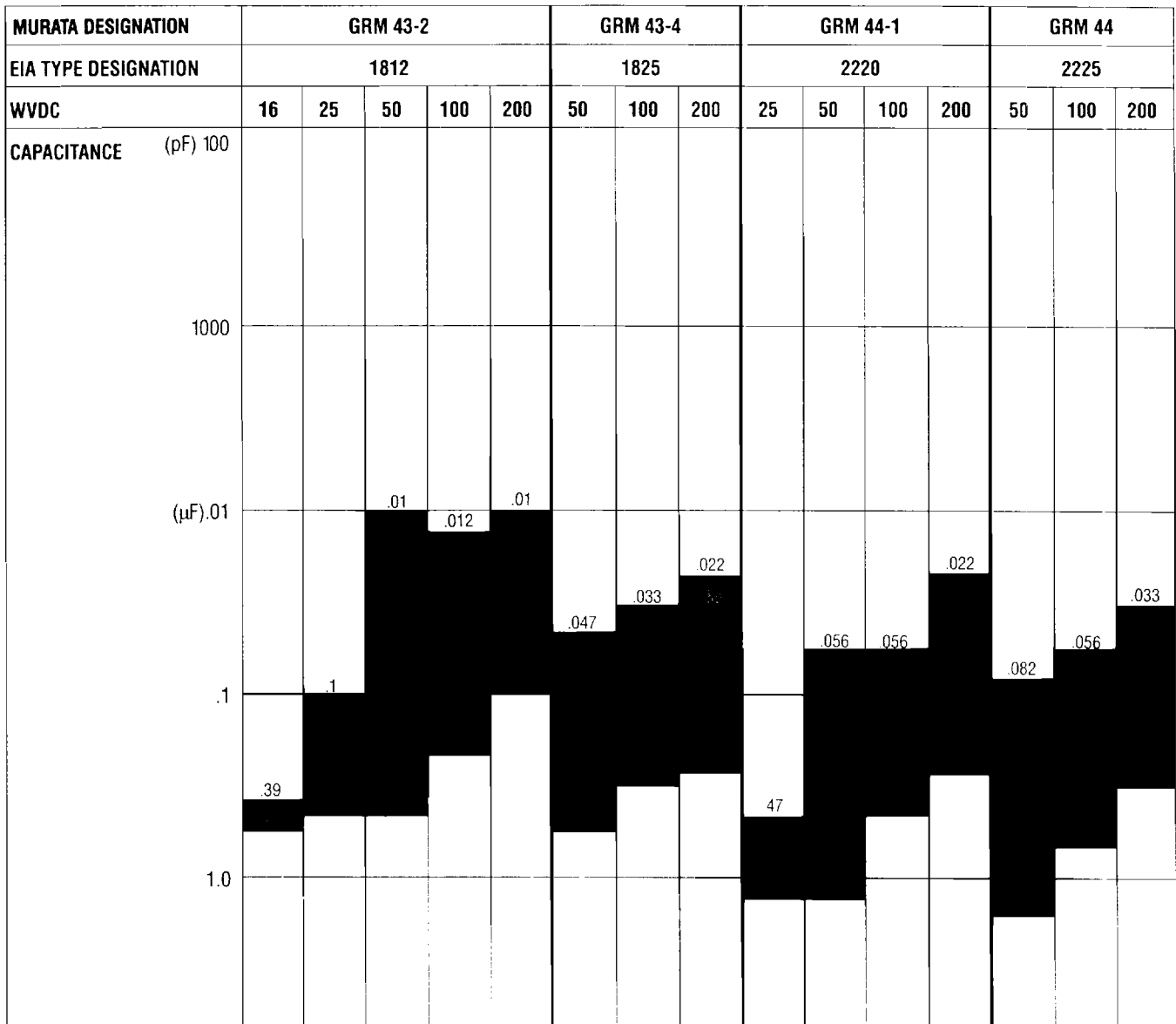
Note: Capacitance values = EIA 12 Step = 10, 12, 15, 18, 22, 27, 33, 39, 47, 56, 68, 82. For values not listed contact your local Murata Electronics Sales Office

STANDARD THICKNESS/PACKAGING SPECIFICATIONS

DIMENSIONS: mm		Bulk	Tape			
		Pcs/bag (typical)	Pcs/7 inch (178 mm) reel		Pcs/13 inch (330 mm) reel	
		Plastic	Paper	Embossed	Paper	Embossed
	T: 0.7 ⁺⁰ / _{-0.2}	1000	4000	4000	10000	10000
	T: 0.8 ± 0.1	1000	4000	N/A	10000	N/A
	T: 1.0 ⁺⁰ / _{-0.2}	1000	4000	3000	10000	10000
	T: 1.25 ⁺⁰ / _{-0.2}	1000	N/A	3000	N/A	10000
	T: 1.5 ⁺⁰ / _{-0.2}	1000	N/A	2000	N/A	8000

*GRM40 T: 1.25 ± .1

HIGH DIELECTRIC CONSTANT TYPE X7R



Note: Capacitance values = EIA 12 Step = 10, 12, 15, 18, 22, 27, 33, 39, 47, 56, 68, 82. For values not listed, contact your local Murata Electronics Sales Office.

STANDARD THICKNESS/PACKAGING SPECIFICATIONS



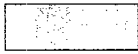

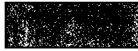
DIMENSIONS: mm		Bulk	Tape			
		Pcs/bag (typical)	Pcs/7 inch (178 mm) reel		Pcs/13 inch (330 mm) reel	
		Plastic	Paper	Embossed	Paper	Embossed
	T: 1.25 ⁺⁰ / _{-0.2}	1000	N/A	1000	N/A	5000
	T: 1.5 ⁺⁰ / _{-0.2}	1000	N/A	1000	N/A	5000
	T: 2.0 ⁺⁰ / _{-0.2}	1000	N/A	1000	N/A	4000

HIGH DIELECTRIC CONSTANT TYPE Z5U

MURATA DESIGNATION	GRM 39			GRM 40			GRM 42-6			GRM 42-2		
EIA TYPE DESIGNATION	0603			0805			1206			1210		
WVDC	50	100	200	50	100	200	50	100	200	50	100	200
CAPACITANCE (pF) 1000		3300			6800	1500						
(μF) .01	.01		N/A									
				.022				.022				
				.033				.047				
							.1					
.1										.15		
1.0												

Note: Capacitance values = EIA 6 Step = 10, 15, 22, 33, 47, 68. For values not listed, contact your local Murata Electronics Sales Office.

STANDARD THICKNESS/PACKAGING SPECIFICATIONS

DIMENSIONS: mm	Tolerance	Bulk	Tape			
		Pcs/bag (typical)	Pcs/7 inch (178 mm) reel		Pcs/13 inch (330 mm) reel	
		Plastic	Paper	Embossed	Paper	Embossed
	T: 0.7 ⁺⁰ / _{-0.2}	1000	4000	4000	10000	10000
	T: 0.8 ± 0.1	1000	4000	N/A	10000	N/A
	T: 1.0 ⁺⁰ / _{-0.2}	1000	4000	3000	10000	10000
	T: 1.25 ⁺⁰ / _{-0.2} *	1000	N/A	3000	N/A	10000
	T: 1.5 ⁺⁰ / _{-0.2}	1000	N/A	2000	N/A	8000

*GRM40T= 1.25 ± .1

HIGH DIELECTRIC CONSTANT TYPE Z5U

MURATA DESIGNATION	GRM 43-2			GRM 43-4			GRM 44-1			GRM 44		
EIA TYPE DESIGNATION	1812			1825			2220			2225		
WVDC	50	100	200	50	100	200	50	100	200	50	100	200
CAPACITANCE (pF) 1000												
(μF) .01												
.1		.068			.1			.1				.1
1.0				.33								
							1.0			1.0		

Note: Capacitance values = EIA 6 Step = 10, 15, 22, 33, 47, 68. For values not listed, contact your local Murata Electronics Sales Office



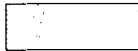


STANDARD THICKNESS/PACKAGING SPECIFICATIONS

DIMENSIONS: mm	Tolerance	Bulk	Tape			
		Pcs/bag (typical)	Pcs/7 inch (178 mm) reel		Pcs/13 inch (330 mm) reel	
		Plastic	Paper	Embossed	Paper	Embossed
	T: 1.25 \pm 0.2	1000	N/A	1000	N/A	5000
	T: 1.5 \pm 0.2	1000	N/A	1000	N/A	5000
	T: 2.0 \pm 0.2	1000	N/A	1000	N/A	4000

MURATA DESIGNATION	GRM 39				GRM 40				GRM 42-6				GRM 42-2			
EIA TYPE DESIGNATION	0603				0805				1206				1210			
WVDC	16	25	50	100	16	25	50	100	16	25	50	100	16	25	50	100
CAPACITANCE (pF) 1000				1200												
(μF) .01				4700				6800								
.033																
.1			.047				.022					.022				
						.068	.047				.068	.047				.047
		.15			.1	.1				.15	.15					
	.22				.22				.22	.22						
									.47							
1.0													.68	1.0	1.0	

Note: Capacitance values = EIA 6 Step = 10, 15, 22, 33, 47, 68. For values not listed, contact your local Murata Electronics Sales Office.

STANDARD THICKNESS/PACKAGING SPECIFICATIONS

DIMENSIONS: mm	Bulk	Tape				
		Pcs/bag (typical)	Pcs/7 inch (178 mm) reel		Pcs/13 inch (330 mm) reel	
			Plastic	Paper	Embossed	Paper
 T: 0.7 ⁺⁰ / _{-0.2}	1000	4000	4000	10000	10000	
 T: 0.8 ± 0.1	1000	4000	N/A	10000	N/A	
 T: 1.0 ⁺⁰ / _{-0.2}	1000	4000	3000	10000	10000	
 T: 1.25 ⁺⁰ / _{-0.2}	1000	N/A	3000	N/A	10000	
 T: 1.5 ⁺⁰ / _{-0.2}	1000	N/A	2000	N/A	8000	

HIGH DIELECTRIC CONSTANT TYPE Y5V

MURATA DESIGNATION	GRM 43-2				GRM 43-4		GRM 44-1			GRM 44		
EIA TYPE DESIGNATION	1812				1825		2220			2225		
WVDC	16	25	50	100	50	100	25	50	100	25	50	100
CAPACITANCE (pF) 1000												
(μF).01												
.1						.1						
1.0					.22							
							1.0				1.0	

Note: Capacitance values = EIA 6 Step = 10, 15, 22, 33, 47, 68. For values not listed, contact your local Murata Electronics Sales Office.

STANDARD THICKNESS/PACKAGING SPECIFICATIONS

DIMENSIONS: mm	Tolerance	Bulk	Tape			
		Pcs/bag (typical)	Pcs/7 inch (178 mm) reel		Pcs/13 inch (330 mm) reel	
		Plastic	Paper	Embossed	Paper	Embossed
	T: 1.25 ⁺⁰ _{-0.2}	1000	N/A	1000	N/A	5000
	T: 1.5 ⁺⁰ _{-0.2}	1000	N/A	1000	N/A	5000
	T: 2.0 ⁺⁰ _{-0.2}	1000	N/A	1000	N/A	4000

CHIPS-GRM Series
 FOR LOW PROFILE AND SUB-PLCC
 HIGH DIELECTRIC CONSTANT TYPE X7R, Y5V

MURATA DESIGNATION	GRM 40-024						GRM 40-037						GRM 40-026					
EIA TYPE DESIGNATION	0805						0805						0805					
MAX THICKNESS	.020						.026						.028					
WVDC	16		25		50		16		25		50		16		25		50	
TEMPERATURE CHARACTERISTIC	X7R	Y5V	X7R	Y5V	X7R	Y5V	X7R	Y5V	X7R	Y5V	X7R	Y5V	X7R	Y5V	X7R	Y5V	X7R	Y5V
CAPACITANCE (pF) 100					220													
1000			2200	2200		1000												
.01 (μF)	.01		.01			.01					.01							
	.027			.033			.033		.015	.022	.018		.027		.033	.015	.022	.012
		.047					.056				.056		.047	.047				.033
.1		.1									.1						.1	
								.15							.15			
1.0								.22										

PACKAGING = Bulk: 1,000 pcs/bag TAPE AND REEL: 4,000 pcs/7" (178mm) Reel, 10,000 pcs/13" (330mm) Reel Paper tape only.

Note: For X7R, Capacitance values = E1A 12 Step = 10, 12, 15, 18, 22, 27, 33, 39, 47, 56, 68, 82.

For Z5U and Y5V, Capacitance values = E1A 6 Step = 10, 15, 22, 33, 47, 68.

For values not listed, please contact your local Murata Electronics Sales Office.

CHIPS-GRM Series
FOR LOW PROFILE AND SUB-PLCC



HIGH DIELECTRIC CONSTANT TYPE X7R, Z5U, Y5V

MURATA DESIGNATION	GRM 42-625				GRM 42-626				GRM 42-224				GRM 42-225				GRM 42-221			GRM 42-226		
EIA TYPE DESIGNATION	1206				1206				1210				1210				1210			1210		
MAXIMUM THICKNESS	.024				.028				.020				.024				.026			.028		
WVDC	16	25			16	25	16	25			16	25			25			25				
TEMPERATURE CHARACTERISTIC	Y5V	X7R	Z5U	Y5V	Y5V	Y5V	Y5V	X7R	Z5U	Y5V	Y5V	X7R	Z5U	Y5V	X7R	Z5U	Y5V	X7R	Z5U	Y5V		
CAPACITANCE (pF) 100																						
1000														1000								
		N/A													N/A		N/A					
.01(μF)								.018														
								.047														
				.056																		
.1			.1																			
1.0																						

PACKAGING = Bulk: 1,000 pcs/bag TAPE AND REEL: 4,000 pcs/7" (178mm) Reel, 10,000 pcs/13" (330mm) Reel Paper tape only.

Note: For X7R, Capacitance values = E1A 12 Step = 10, 12, 15, 18, 22, 27, 33, 39, 47, 56, 68, 82.

For Z5U and Y5V, Capacitance values = E1A 6 Step = 10, 15, 22, 33, 47, 68.

For values not listed, please contact your local Murata Electronics Sales Office.