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**GRM Series Tip and Ring Capacitors**

- Ideal for Leaded Film Capacitor Replacement to Save Space
- Designed for Tip and Ring Circuit of FAX/Modem, Cable Modem, ISDN Modem
- Max. Thickness: 0.08" (2 mm) That Fits in PCMCIA Card
- D.F.: 2.5% Max. (1±0.1 KHz @ 1 ± 0.2 Vrms)
- L.R.: 100 Gohm or 1 Gohm mF (Whichever is Less)
- Dielectric Strength: 120% of Rated Voltage for 5 Sec. (50 mA Max. Charge Current)
- See Section at Left for Art and Dimensions

Stock No.	Mfr.'s Type	EIA Size	Cap. (pF)	WVDC	Tol. (%)	EACH*
231-1400	GRM43-2X7R334K250AL	1812	330000	250	10	.87
231-1405	GRM43-2X7R474K250AL	1812	470000	250	10	1.31
231-1415	GRM44-1X7R474K250AL	2220	470000	250	10	2.79
231-1420	GRM44-1X7R105K250AL	2220	1.0 mF	250	10	2.50

\*Sold in multiples of 100 only.

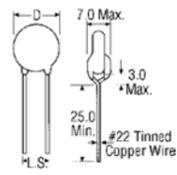
**GRM Series Monolithic Ceramic High Capacitors**

- Applications: Decoupling and Bypassing
- Features: Low ESR, Non Polarity, High Reliability and Base Metal Inner Electrode
- Market: Cellular, Computer, AV, etc.
- See Section at Left for Art and Dimensions

Stock No.*	Mfr.'s Type	EIA Size	Cap. (pF)	WVDC	Tol. (%)
231-6000	GRM220Y5V105Z010AD	0603	1.0 mF	10	+22 -82
231-6002	GRM230Y5V106Z010AL	1206	10.0 mF	10	+22 -82
231-6008	GRM235Y5V106Z016AL	1210	10.0 mF	16	+22 -82
231-6012	GRM235Y5V226Z010AL	1210	22.0 mF	10	+22 -82
231-6014	GRM235Y5V475Z050AL	1210	4.7 mF	50	+22 -82
231-6016	GRM235Y5V685Z016AL	1210	6.8 mF	16	+22 -82

\*Sold in multiples of 100 only.

**KH Type Safety Ceramic Capacitors**



Used for across the line or line by-pass applications. Available in ammo pack for automatic insertion as custom order. Call for price and delivery. **Temperature Range:** -25°C to +125°C.

Stock No.	Mfr.'s Type	Cap. (pF)	VAC	Tol. (%)	Dim. (In.)		EACH
					Dia.	L.S.	
711-1416	DE0807B101K-KH	100	250	10	.315	.295	.53 .30
711-1418	DE0807B221K-KH	220	250	10	.315	.295	.48 .28
711-1420	DE0807B471K-KH	470	250	10	.315	.295	.16 .13
711-1422	DE0807E102M-KH	1000	250	20	.315	.295	.20 .18
711-1423	DE0907E152M-KH	1500	250	20	.354	.295	.21 .17
711-1424	DE1007E222M-KH	2200	250	20	.393	.295	.63 .36
711-1425	DE1207E332M-KH	3300	250	20	.472	.295	.24 .19
711-1426	DE1307E472M-KH	4700	250	20	.512	.295	.85 .50

**Chip Ceramic Capacitors**

These kits are specifically designed to aid the design engineer in prototyping applications. Each kit contains a wide selection of commonly used values and sizes that meet a variety of circuit design requirements.

**Capacitors**

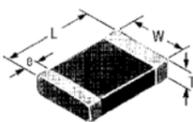
Stock No.	Mfr.'s Type	Description	Pieces Each	Values Per Kit	Temp. Coefficient	Volts
711-2000	KIT-GRM36	GRM36 0402 Ceramic Chip	20	36	COG	50
			20	16	X7R	50
			20	5	Y5V	50
711-2002	KIT-GRM39	GRM39 0603 Ceramic Chip	50	13	COG	100
			50	15	COG	50
			50	11	X7R	50
			50	3	X7R	25
			50	8	Y5V	50
			50	4	Y5V	16
711-2004	KIT-GRM40	GRM40 0805 Ceramic Chip	50	29	COG	50
			100	22	X7R	50
			100	6	Z5U	50
711-2006	KIT-GRM42-6	GRM42-6 1206 Ceramic Chip	50	24	COG	50
			100	31	X7R	50
			100	5	Z5U	50
711-2008	KIT-GRM40-TC	GRM40-TC 0805 Ceramic Chip	50	20	P2H	50
			50	20	R2H	50
			50	20	S2H	50
			50	20	T2H	50
			50	20	V2J	50
711-2009	KIT-GRM42-6-TC	GRM42-6-TC 1206 Ceramic Chip	50	19	P2H	50
			50	19	R2H	50
			50	19	S2H	50
			50	19	T2H	50
			50	19	V2J	50
711-2010	KIT-GRM-TA	GRM-TA 0603 Ceramic Chip 1206 Ceramic Chip 1210 Ceramic Chip 1812 Ceramic Chip	25	43	X7R	16
			25	43	Y5V	16
			50			
			50			
			50			

**Safety Capacitor Kits**

**Safety Standard Capacitors**  
711-2029. Kit-Safety-KHKX. 15 pieces each of 20 values ..... EACH 215.05

**Chip Safety Standard Capacitors**  
711-2030. Kit-Safety-GHM3000. 11 values ..... EACH 236.15

**GRM Series Chip Capacitors**



Dimensions — mm

Type	Length L	Width W	Thickness T	e Min. Termination
GRM36	1.0 ± 0.05	0.50 ± 0.05	0.50 ± 0.05	0.15 - 0.3
GRM39	1.6 ± 0.10	0.80 ± 0.10	0.80 ± 0.10	0.20 - 0.5
GRM40	2.0 ± 0.10	1.25 ± 0.10	0.60 ± 0.10 0.85 ± 0.10 1.25 ± 0.10	0.20 - 0.7
GRM42-6	3.2 ± 0.15	1.60 ± 0.15	0.85 ± 0.10 1.15 ± 0.10 1.60 ± 0.20	0.30 - 0.8
GRM42-2	3.2 ± 0.30	2.50 ± 0.20	1.15 ± 0.10 1.35 ± 0.15 1.80 ± 0.20 2.50 ± 0.20	0.3 min.

Non-polarized and miniature size chip capacitors have uniform dimensions and configuration. Flow and reflow solderable. Nickel barrier termination is highly resistant to metal migration. They have minimum series inductance.

Stock No.*	Mfr.'s Type	EIA Size	Cap. (pF)	WVDC	Tol. (%)
231-1354	GRM36C0G010C050AQ	0402	1	50	.25PF
231-1356	GRM36C0G020C050AQ	0402	2	50	.25PF
231-1358	GRM36C0G040C050AQ	0402	4	50	.25PF
231-1360	GRM36C0G050C050AQ	0402	5	50	.25PF

\*Sold in multiples of 100 only.

Stock No.*	Mfr.'s Type	EIA Size	Cap. (pF)	WVDC	Tol. (%)
231-1362	GRM36C0G150J050AQ	0402	15	50	5
231-1364	GRM36C0G220J050AQ	0402	22	50	5
231-1366	GRM36C0G330J050AQ	0402	33	50	5
231-1368	GRM36C0G390J050AQ	0402	39	50	5
231-1370	GRM36C0G470J050AQ	0402	47	50	5
231-1372	GRM36C0G680J050AQ	0402	68	50	5
231-1374	GRM36C0G101J050AQ	0402	100	50	5
231-1376	GRM36X7R822K016AQ	0402	8200	16	10
231-1378	GRM36X7R103K016AQ	0402	10000	16	10
231-1382	GRM36X7R682K025AQ	0402	6800	25	10
231-1384	GRM36X7R102K050AQ	0402	10000	50	10
231-1386	GRM36X7R152K050AQ	0402	1500	50	10
231-1390	GRM36X7R222K050AQ	0402	2200	50	10
231-1392	GRM36X7R332K050AQ	0402	3300	50	10
231-1200	GRM39Y5V104Z016AD	0603	10000	16	-20 +80
231-0100	GRM39C0G100C050AD	0603	10	50	.25PF
231-0102	GRM39C0G150J050AD	0603	15	50	5
231-0104	GRM39C0G180J050AD	0603	18	50	5
231-0106	GRM39C0G220J050AD	0603	22	50	5
231-0108	GRM39C0G270J050AD	0603	27	50	5
231-0110	GRM39C0G330J050AD	0603	33	50	5
231-0112	GRM39C0G470J050AD	0603	47	50	5
231-0114	GRM39C0G680J050AD	0603	68	50	5
231-0116	GRM39C0G101J050AD	0603	82	50	5
231-0118	GRM39X7R331K050AD	0603	330	50	10
231-0120	GRM39X7R471K050AD	0603	470	50	10
231-0122	GRM39X7R102K050AD	0603	1000	50	10
231-0124	GRM39X7R103K050AD	0603	10000	50	10
231-0126	GRM39X7R223K016AD	0603	22000	16	10
231-0128	GRM39X7R223K025AD	0603	22000	25	10
231-0130	GRM39X7R473K016AD	0603	47000	16	10
231-0132	GRM39Y5V103Z050AD	0603	10000	50	-20 +80
231-0134	GRM39Y5V473Z016AD	0603	47000	16	-20 +80
231-0136	GRM39Y5V473Z050AD	0603	47000	50	-20 +80
231-0138	GRM39Y5V104Z025AD	0603	100000	25	-20 +80
231-0140	GRM40C0G100C050AD	0805	10	50	.25PF
231-0142	GRM40C0G220J050AD	0805	22	50	5

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Stock No.*	Mfr.'s Type	EIA Size	Cap. (pF)	WVDC	Tol. (%)
231-0144	GRM40C0G270J050AD	0805	27	50	5
231-0146	GRM40C0G330J050AD	0805	33	50	5
231-0148	GRM40C0G470J050AD	0805	47	50	5
231-0150	GRM40C0G560J050AD	0805	56	50	5
231-0152	GRM40C0G680J050AD	0805	68	50	5
231-0154	GRM40C0G101J050AD	0805	100	50	5
231-0156	GRM40C0G151J050AD	0805	150	50	5
231-0158	GRM40C0G221J050AD	0805	220	50	5
231-0160	GRM40C0G271J050AD	0805	270	50	5
231-0162	GRM40C0G331J050AD	0805	330	50	5
231-0164	GRM40C0G471J050AD	0805	470	50	5
231-0166	GRM40C0G102J050AD	0805	1000	50	5
231-0172	GRM40X7R472K050AD	0805	4700	50	10
231-0174	GRM40X7R103K050AD	0805	10000	50	10
231-0176	GRM40X7R223K050AD	0805	22000	50	10
231-0178	GRM40X7R473K050AD	0805	47000	50	10
231-0180	GRM40X7R104K025BL	0805	100000	25	10
231-0182	GRM40Z5U104M050AD	0805	100000	50	20
231-0184	GRM42-6C0G220J050AD	1206	22	50	5
231-0186	GRM42-6C0G270J050AD	1206	27	50	5
231-0188	GRM42-6C0G330J050AD	1206	33	50	5
231-0190	GRM42-6C0G470J050AD	1206	47	50	5
231-0192	GRM42-6C0G101J050AD	1206	100	50	5
231-0194	GRM42-6C0G221J050AD	1206	220	50	5
231-0196	GRM42-6C0G331J050AD	1206	330	50	5
231-0198	GRM42-6C0G471J050AD	1206	470	50	5
231-0200	GRM42-6C0G102J050AD	1206	1000	50	5
231-0202	GRM42-6C0G222J050AD	1206	2200	50	5
231-0204	GRM42-6X7R102K050AD	1206	1000	50	10
231-0206	GRM42-6X7R103K050AD	1206	10000	50	10
231-0208	GRM42-6X7R473K050AD	1206	47000	50	10
231-0210	GRM42-6X7R104K050AD	1206	100000	50	10
231-0212	GRM42-6Y5V105Z016AL	1206	1000000	16	-20 +80
231-0214	GRM42-6Z5U147M050AD	1206	470000	50	20
231-0216	GRM42-6Z5U104M050AD	1206	100000	50	20
231-0218	GRM42-2X7R104K050AL	1210	100000	50	10
231-0220	GRM42-2X7R224K050AL	1210	220000	50	10

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