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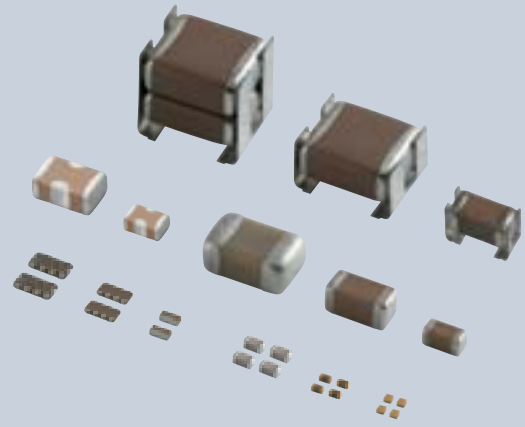
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# Chip Monolithic Ceramic Capacitors



2016

### **EU RoHS Compliant**

- All the products in this catalog comply with EU RoHS.
- EU RoHS is "the European Directive 2011/65/EU on the Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment."
- For more details, please refer to our website 'Murata's Approach for EU RoHS' (<http://www.murata.com/en-eu/support/compliance/rohs>).

### **Qualified Standards**

- The products listed here have been produced by ISO 9001 certified factory.

<Plant>

- Fukui Murata Mfg. Co., Ltd.
- Izumo Murata Mfg. Co., Ltd.
- Murata Electronics Singapore (Pte.) Ltd.
- Wuxi Murata Electronics Co., Ltd.
- PHILIPPINE MANUFACTURING CO. OF MURATA, INC.

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# Explanation of Symbols in This Catalog



Links are provided to the latest information from the PDF version of the catalog, which is available on the web.

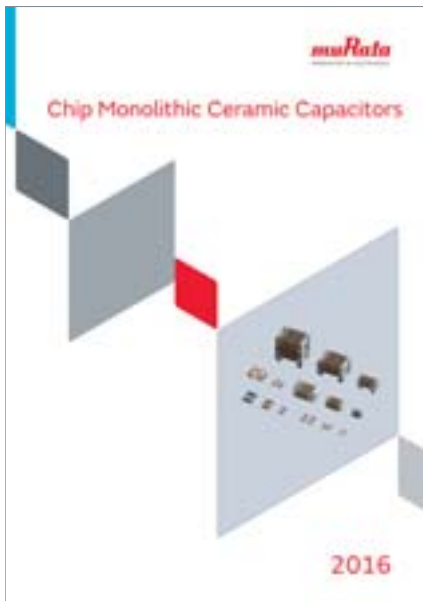
	<p>For applications that do not require a particular reliability, such as general equipment.</p>		<p>No DC bias characteristics                  Polymer capacitor is no capacitance change with DC bias due to aluminum oxidized film for dielectric.</p>
	<p>Infotainment for Automotive                  The product for entertainment equipment like car navigations, car audios, and body control equipment like wipers, power windows.</p>		<p>Low-inductance product suitable for noise suppression.                  This product has extremely low ESL and is suitable for suppression of noise, including high frequencies.                  This product can also be used as a low-ESL, high-performance bypass capacitor.</p>
	<p>Powertrain/Safety for Automotive                  Products use for applications (running, turning, stopping, and safety devices) that particularly concern human life, such as in devices for automotive.</p>		<p>Product for bonding                  Since gold is used for the external electrodes, the capacitor can be mounted by die bonding/wire bonding.</p>
	<p>Medical-grade products for Implanted Medical Devices                  These products are intended for use in implanted medical devices such as cardiac pacemakers, cochlear implants, insulin pumps, and gastric electrostimulators. They are suitable for use in non-critical circuits.*1                  *1 Non-critical circuits                  This term refers to circuits in implanted medical devices that are not directly linked to life support, i.e. circuits that will not directly endanger the life of the patient should the functionality of the device be reduced or halted by failure of the circuit.</p>		<p><b>Derating 1</b>                  This product is suitable when a voltage continuously applied to a capacitor in an operating circuit, is used below (derated) the rated voltage of the capacitor. This model guarantees the test conditions in the endurance test, at a rated voltage x 100% at the maximum operating temperature. A reliability assurance level equivalent to a common product can be secured, by using this product within the voltage and temperature derated conditions recommended in the figure below.</p>
	<p>AEC-Q200 compliant product</p>		<p>Recommended Conditions of the Derating Operating Voltage and Temperature</p>
	<p>Safety Standard Certified Product                  Products that acquired safety standard certification IEC60384-14 and products based on the Electrical Appliance and Material Safety Law of Japan.</p>		<p><b>Derating 2</b>                  When the product temperature exceeds 105°C, please use this product within the voltage and temperature derated conditions in the figure below.</p>
	<p>Low dissipation for high frequency                  By devising ceramic materials and electrode materials, low dissipation is achieved in frequency bands of VHF, UHF, and microwave or beyond.</p>		<p><b>Derating 3</b>                  Please apply the derating curve according to the operating temperature.                  Please refer to detailed specifications sheet for details.</p>
	<p>Low inductance                  This capacitor is designed so that the parasitic inductance component (ESL) that the capacitor has on the high frequency side becomes lower.</p>		<p>Fail safe product                  This capacitor is designed to prevent failures as much as possible by short mode.</p>
	<p>Fail safe product                  This capacitor is designed to prevent failures as much as possible by short mode.</p>		<p>Product resistant to deflection cracking                  This capacitor is designed to prevent failures as much as possible by short mode caused by cracking when there is board deflection.</p>
	<p>Product resistant to deflection cracking                  This capacitor is designed to prevent failures as much as possible by short mode caused by cracking when there is board deflection.</p>		<p>Product with solder cracking suppression                  This capacitor is configured with metal terminals and leads connected to the chip. The metal terminals and leads relieve the stress from expansion and contraction of the solder, to suppress solder cracking.</p>
	<p>Product with solder cracking suppression                  This capacitor is configured with metal terminals and leads connected to the chip. The metal terminals and leads relieve the stress from expansion and contraction of the solder, to suppress solder cracking.</p>		<p>Product suitable for acoustic noise reduction and low distortion                  This product suppresses acoustic noise, which occurs when a ceramic capacitor is used, by devising the materials and configuration.</p>
	<p>Product suitable for acoustic noise reduction and low distortion                  This product suppresses acoustic noise, which occurs when a ceramic capacitor is used, by devising the materials and configuration.</p>		

# Selection Guide for Capacitors

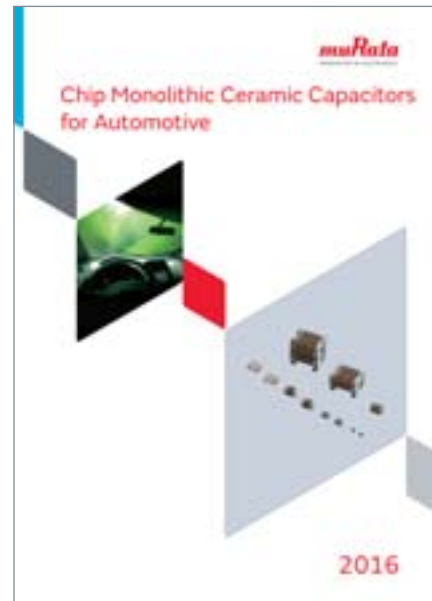
		AEC-Q200	Safety standard	High Q	Low ESL	Anti-noise	Fail safe	Deflecting crack	Soldering crack	Effective Cap	EMI FIL®	Other
General	GRM P24											
	GRM WEB											For LED backlight only
	GA2 WEB											
	GA3 WEB											
	GJM P91											
	GMA P113											Wire bondable
	GMD P116											Wire bondable
	GQM P119											
	GR3 P130											
	GR4 WEB											For communication / information devices
	GR7 WEB											Limited to camera flashes
	GRJ P132											
	KR3 P147											
	KRM P144											
	LLA P136											
	LLL P138											
	LLM P140											
	LLR P142											
	NFM P150											
	DE1 WEB											
	DE2 WEB											
	DEJ WEB											
	DHR WEB											
	RDE WEB											
	DHK WEB											
	DHS WEB											
	ECAS WEB											
Medical Device	GCH P152											For Implanted Medical Devices
Info-tainment	GRT WEB											
Power-train	GCM WEB											
	GC3 WEB											
	GCD WEB											
	GCE WEB											
	GCG WEB											Limited to conductive glue mounting
	GCJ WEB											
	KC3 WEB											
	KCA WEB											
	KCM WEB											
	NFM WEB											
	DE6 WEB											
	RCE WEB											
	RH WEB											

# Catalog information

Catalog relates to a multilayer ceramic capacitor is below.



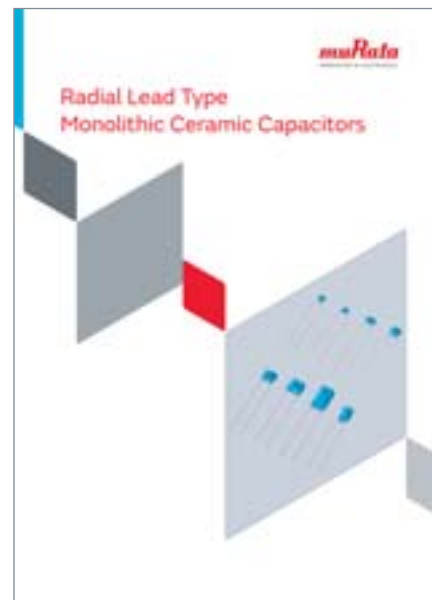
**Chip Monolithic Ceramic Capacitors**  
Cat No. C02E-20



**Chip Monolithic Ceramic Capacitors for Automotive**  
Cat No. C03E-9



**Safety Certified Ceramic Capacitors/ High Voltage Ceramic Capacitors**  
Cat No. C85E-5



**Radial Lead Type Monolithic Ceramic Capacitors**  
Cat No. C49E-23

● Part Numbering

Chip Monolithic Ceramic Capacitors for General



(Part Number)



① Product ID ② Series

Product ID	Code	Series
GC	H	For implantable medical devices (Non-critical circuits)
GJ	M	High Q type for high frequency
GM	A	Wire bondable vertical electrode type
	D	Wire bondable/AuSn solderable type
GQ	M	High Q type for high frequency and high power
GR	3	High effective capacitance & High allowable ripple current
	J	Soft termination type
	M	General purpose products
KR	3	Metal terminal type/High effective capacitance & High allowable ripple current
	M	Metal terminal type
LL	A	8 terminal low ESL type
	L	LW reversed low ESL type
	M	10 terminal low ESL type
	R	ESR controlled low ESL type

③ Chip Dimensions (LxW)

Code	Dimensions (LxW)	EIA
02	0.4x0.2mm	01005
0D	0.38x0.38mm	015015
03	0.6x0.3mm	0201
05	0.5x0.5mm	0202
08	0.8x0.8mm	0303
1U	0.6x1.0mm	02404
15	1.0x0.5mm	0402
18	1.6x0.8mm	0603
21	2.0x1.25mm	0805
22	2.8x2.8mm	1111
31	3.2x1.6mm	1206
32	3.2x2.5mm	1210
42	4.5x2.0mm	1808
43	4.5x3.2mm	1812
55	5.7x5.0mm	2220

Continued on the following page. ↗



(Part Number)

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

Continued from the preceding page. ↘

④ Height Dimension (T) (Except KR□)

Code	Dimension (T)
1	0.125mm
2	0.2mm
3	0.3mm
4	0.4mm
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
M	1.15mm
Q	1.5mm
S	2.8mm
X	Depends on individual standards.

④ Height Dimension (T) (KR□ Only)

Code	Dimension (T)
E	1.8mm
F	1.9mm
K	2.7mm
L	2.8mm
Q	3.7mm
T	4.8mm
W	6.4mm

⑤ Temperature Characteristics

Temperature Characteristic Codes		Temperature Characteristics				Operating Temperature Range	Capacitance Change Each Temperature (%)					
Code	Public STD Code	Reference Temperature	Temperature Range	Capacitance Change or Temperature Coefficient	-55°C		*4		-10°C			
					Max.		Min.	Max.	Min.	Max.	Min.	
1X	SL	JIS	20°C	20 to 85°C	+350 to -1000ppm/°C	-55 to 125°C	-	-	-	-	-	-
2C	CH	JIS	20°C	20 to 125°C	0±60ppm/°C	-55 to 125°C	0.82	-0.45	0.49	-0.27	0.33	-0.18
3C	CJ	JIS	20°C	20 to 125°C	0±120ppm/°C	-55 to 125°C	1.37	-0.9	0.82	-0.54	0.55	-0.36
3U	UJ	JIS	20°C	20 to 85°C	-750±120ppm/°C	-25 to 85°C	-	-	4.94	2.84	3.29	1.89
4C	CK	JIS	20°C	20 to 125°C	0±250ppm/°C	-55 to 125°C	2.56	-1.88	1.54	-1.13	1.02	-0.75
5C	C0G	EIA	25°C	25 to 125°C	0±30ppm/°C	-55 to 125°C	0.58	-0.24	0.4	-0.17	0.25	-0.11
5G	X8G	*2	25°C	25 to 150°C	0±30ppm/°C	-55 to 150°C	0.58	-0.24	0.4	-0.17	0.25	-0.11
7U	U2J	EIA	25°C	25 to 125°C *3	-750±120ppm/°C	-55 to 125°C	8.78	5.04	6.04	3.47	3.84	2.21
B1	B *1	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	-	-	-	-	-	-
D7	X7T	EIA	25°C	-55 to 125°C	+22%, -33%	-55 to 125°C	-	-	-	-	-	-
D8	X6T	EIA	25°C	-55 to 105°C	+22%, -33%	-55 to 105°C	-	-	-	-	-	-
E7	X7U	EIA	25°C	-55 to 125°C	+22%, -56%	-55 to 125°C	-	-	-	-	-	-
R1	R *1	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	-	-	-	-	-	-

\*1 Capacitance change is specified with 50% rated voltage applied.  
 \*2 Murata Temperature Characteristic Code.  
 \*3 Rated Voltage 100Vdc max: 25 to 85°C  
 \*4 -25°C (Reference Temperature 20°C) / -30°C (Reference Temperature 25°C)

Continued on the following page. ↗

(Part Number)

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

Continued from the preceding page. ↘

⑥ Rated Voltage

Code	Rated Voltage
OE	DC2.5V
OG	DC4V
OJ	DC6.3V
1A	DC10V
1C	DC16V
1E	DC25V
1H	DC50V
1J	DC63V
1K	DC80V
2A	DC100V
2D	DC200V
2E	DC250V
2W	DC450V
2H	DC500V
2J	DC630V
3A	DC1kV
3D	DC2kV
3F	DC3.15kV
YA	DC35V

⑦ Capacitance

Expressed by three-digit alphanumerics. The unit is picofarad (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. If any alphabet, other than "R", is included, this indicates the specific part number is a non-standard part.

Ex.)

Code	Capacitance
R50	0.50pF
1R0	1.0pF
100	10pF
103	10000pF

⑧ Capacitance Tolerance

Code	Capacitance Tolerance
B	±0.1pF
C	±0.25pF
D	±0.5pF (Less than 10pF) ±0.5% (10pF and over)
F	±1%
G	±2%
J	±5%
K	±10%
M	±20%
W	±0.05pF

⑨ Individual Specification Code (Except LLR)

Expressed by three figures.

⑨ ESR (LLR Only)

Code	ESR
E01	100mΩ
E03	220mΩ
E05	470mΩ
E07	1000mΩ

⑩ Packaging

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

Please contact us if you find any part number not provided in this table.

### 3 Terminal Low ESL Monolithic Ceramic Capacitors

WEB 

(Part Number)

NF	M	3D	CC	102	R	1H	3	L
①	②	③	④	⑤	⑥	⑦	⑧	⑨

#### ① Product ID ② Series

Product ID	Series
NFM	3 Terminal Low ESL Type

#### ③ Dimensions (LxW)

Code	Dimensions (LxW)	EIA
15	1.0x0.5mm	0402
18	1.6x0.8mm	0603
21	2.0x1.25mm	0805
3D	3.2x1.25mm	1205
31	3.2x1.6mm	1206
41	4.5x1.6mm	1806

#### ④ Features

Code	Features	
CC	For General	For Signal Lines
PC		For Large Current
PS		High Insertion Loss Type for Large Current
KC		For Very Large Current

#### ⑤ Capacitance

Expressed by three figures. The unit is in pico-farad (pF). The first and second figures are significant digits, and the third figure expresses the number of zeros that follow the two figures.

#### ⑥ Characteristics

Code	Capacitance Temperature Characteristics
B	±10%, ±12.5%, +10/-13%
C	±22%
D	+22/-33%
F	+30/-80%, +30/-84%
R	±15%, +15/-18%

#### ⑦ Rated Voltage

Code	Rated Voltage
0E	2.5V
0G	4V
0J	6.3V
1A	10V
1C	16V
1E	25V
1H	50V
2A	100V

#### ⑧ Electrode

Code	Electrode
3	Sn Plating

#### ⑨ Packaging

Code	Packaging
B	Bulk
L	Embossed Taping (ø180mm Reel)
D	Paper Taping (ø180mm Reel)

# Capacitance Table

p00 Each number in the Part Number List refers to the page number printed at the bottom of the page.

## How to read the Capacitance Table

L×W (mm)	0.4×0.2		0.6		
T max. (mm)	0.22		0		
Rated Voltage (Vdc)	25		50		
Cap. / TC Code	COG	CΔ	COG	CK	CJ
0.10pF					
0.20pF	p92	p95	p98	p98	
1.0pF	p92	p95		p98	
2.0pF	p92	p95		p98	
3.0pF	p92	p95			p98

→ The values can be narrowed down in the order of size, rated voltage, and temperature characteristics.

→ Refers to the page of the part number list.  
 Check the part number list for the applicable product number.

## Temperature Characteristics Table

The Table is colored by temperature characteristic codes.  
 Refer to the following Table for the meaning of each code.

EIA:	COG	U2J	X7R	X7S	X7T	X7U	X6S	X6T	X5R
JIS:	CK	CJ	CH	SL	UJ	R	B		
Murata Temperature Characteristic:	X8G								

Temperature Characteristic Codes		Temperature Characteristics			Operating Temperature Range	Capacitance Change Each Temperature (%)					
Public STD Code	Reference Temperature	Temperature Range	Capacitance Change or Temperature Coefficient	-55°C		*3		-10°C			
				Max.		Min.	Max.	Min.	Max.	Min.	
COG	EIA	25°C	25 to 125°C	0±30ppm/°C	-55 to 125°C	0.58	-0.24	0.4	-0.17	0.25	-0.11
CK	JIS	20°C	20 to 125°C	0±250ppm/°C	-55 to 125°C	2.56	-1.88	1.54	-1.13	1.02	-0.75
CJ	JIS	20°C	20 to 125°C	0±120ppm/°C	-55 to 125°C	1.37	-0.9	0.82	-0.54	0.55	-0.36
CH	JIS	20°C	20 to 125°C	0±60ppm/°C	-55 to 125°C	0.82	-0.45	0.49	-0.27	0.33	-0.18
SL	JIS	20°C	20 to 85°C	+350 to -1000ppm/°C	-55 to 125°C	-	-	-	-	-	-
U2J	EIA	25°C	25 to 125°C *2	-750±120ppm/°C	-55 to 125°C	8.78	5.04	6.04	3.47	3.84	2.21
UJ	JIS	20°C	20 to 85°C	-750±120ppm/°C	-25 to 85°C	-	-	4.94	2.84	3.29	1.89
X8G	*1	25°C	25 to 150°C	0±30ppm/°C	-55 to 150°C	0.58	-0.24	0.4	-0.17	0.25	-0.11
X7R	EIA	25°C	-55 to 125°C	±15%	-55 to 125°C	-	-	-	-	-	-
X7S	EIA	25°C	-55 to 125°C	±22%	-55 to 125°C	-	-	-	-	-	-
X7T	EIA	25°C	-55 to 125°C	+22%, -33%	-55 to 125°C	-	-	-	-	-	-
X7U	EIA	25°C	-55 to 125°C	+22%, -56%	-55 to 125°C	-	-	-	-	-	-
R	JIS	20°C	-55 to 125°C	±15%	-55 to 125°C	-	-	-	-	-	-
X6S	EIA	25°C	-55 to 105°C	±22%	-55 to 105°C	-	-	-	-	-	-
X6T	EIA	25°C	-55 to 105°C	+22%, -33%	-55 to 105°C	-	-	-	-	-	-
X5R	EIA	25°C	-55 to 85°C	±15%	-55 to 85°C	-	-	-	-	-	-
B	JIS	20°C	-25 to 85°C	±10%	-25 to 85°C	-	-	-	-	-	-

\*1 Murata Temperature Characteristic Code.

\*2 Rated Voltage 100Vdc max: 25 to 85°C

\*3 -25°C (Reference Temperature 20°C) / -30°C (Reference Temperature 25°C)

Note Please read rating and CAUTION (for storage, operating, rating, soldering, mounting and handling) in this catalog to prevent smoking and/or burning, etc.  
This catalog has only typical specifications. Therefore, please approve our product specifications or transact the approval sheet for product specifications before ordering.

Capacitance Table

p00 Each number in the Part Number List refers to the page number printed at the bottom of the page.

GRM Series Temperature Compensating Type

p00 ← Part Number List JIS: CK C.J CH SL UJ EIA: COG U2J

L×W (mm)	0.4×0.2								0.6×0.3								1.0×0.5						1.6×0.8					
	0.22				0.33				0.55				10		0.5				0.9									
	50		25		16		100		50		25		100		50		10		50		10		100					
Rated Voltage (Vdc)	COG	CA	COG	CH	COG	CH	COG	CA	COG	CA	COG	CA	COG	CA	SL	U2J	UJ	SL	U2J	UJ	SL	U2J	UJ	COG	CA			
Cap. / TC Code																												
0.10pF							p32	p35	p38	p41					p45	p48	p52	p55										
0.20pF	p25	p28					p32	p35	p38	p41					p45	p48	p52	p55										
0.50pF	p25	p28					p32	p35	p38	p41					p45	p49	p52	p55										
1.0pF	p25	p28					p32	p35	p38	p41					p45	p49	p52	p56										
2.0pF	p25	p28					p32	p35	p38	p42					p46	p49	p52	p56										
3.0pF	p25	p29					p32	p35	p39	p42					p46	p49	p53	p56										
4.0pF	p26	p29					p33	p36	p39	p42					p46	p49	p53	p56										
5.0pF	p26	p29					p33	p36	p39	p43					p46	p50	p53	p57										
6.0pF	p26	p30					p33	p36	p40	p43					p47	p50	p53	p57										
7.0pF	p27	p30					p34	p37	p40	p43					p47	p50	p54	p57										
8.0pF	p27	p30					p34	p37	p40	p44					p47	p51	p54	p58										
9.0pF	p27	p31					p34	p37	p41	p44					p48	p51	p55	p58										
10pF	p28	p31					p35	p38	p41	p44					p48	p52	p55	p59										
11pF	p28	p31																						p59	p63			
12pF	p28	p31						p35	p38	p41	p44					p48	p52	p55	p59									
13pF	p28	p31																										
15pF	p28	p31						p35	p38	p41	p44					p48	p52	p55	p59									
16pF	p28	p31																										
17pF	p28	p31																										
18pF	p28	p31							p41	p45						p48	p52	p55	p59									
19pF	p28	p31																										
20pF	p28	p31																										
21pF	p28	p31																										
22pF	p28	p31							p41	p45						p48	p52	p55	p59									
23pF	p28	p31																										
24pF	p28	p31																										
27pF	p28	p31							p41	p45						p48	p52	p55	p59									
30pF	p28	p31																										
33pF	p28	p31							p41	p45						p48	p52	p55	p59									
36pF	p28	p31																										
39pF	p28	p31							p41	p45						p48	p52	p55	p59									
43pF	p28	p31																										
47pF	p28	p31							p41	p45						p48	p52	p55	p59									
51pF	p28	p31																										
56pF	p28	p31							p41	p45						p48	p52	p55	p59									
62pF	p28	p31																										
68pF	p28	p31							p41	p45						p48	p52	p55	p59									
75pF	p28	p31																										
82pF	p28	p31							p41	p45						p48	p52	p55	p59									
91pF	p28	p31																										
100pF	p28	p31							p41	p45						p48	p52	p55	p59									
120pF			p31	p31	p31	p31			p41	p45							p55	p59										
150pF			p31	p31	p31	p32			p41	p45							p55	p59										
180pF			p31	p31	p31	p32			p41	p45							p55	p59										
220pF			p31	p31	p31	p32			p41	p45							p55	p59										
270pF											p45	p45					p55	p59										
330pF											p45	p45					p55	p59										
390pF											p45	p45					p55	p59										
470pF											p45	p45					p55	p59										
560pF											p45	p45					p55	p59										
680pF											p45	p45					p55	p59										
820pF											p45	p45					p55	p59										
910pF											p45																	
1000pF											p45	p45					p55	p59										
1200pF																		p59	p59	p59								
1500pF																		p59	p59	p59								
1800pF																		p59	p59	p59								
2200pF																		p59	p59	p59	p59	p59	p59					
2700pF																		p59	p59	p59	p59	p59	p59					
3300pF																		p59	p59	p59	p59	p59	p59					
3900pF																		p59	p59	p59	p59	p59	p59					
4700pF																		p59	p59	p59	p59	p59	p59					
5600pF																							p59	p59	p59			
6800pF																							p59	p59	p59			
8200pF																							p59	p59	p59			
10000pF																							p59	p59	p59			
12000pF																												
15000pF																												
18000pF																												
22000pF																												
27000pF																												
33000pF																												
39000pF																												
47000pF																												
56000pF																												
68000pF																												
82000pF																												
0.10μF																												
0.12μF																												

The indication for every 0.1 pF has been omitted for less than 10 pF. Refer to the Part Number List for details.

Continued on the following page.



separate volume 1

# Capacitance Table

p00 Each number in the Part Number List refers to the page number printed at the bottom of the page.

(→ GRM Series Temperature Compensating Type)

L×W (mm)	1.6×0.8						2.0×1.25																						
	0.9						0.7				0.95						1.0												
T max. (mm)	0.9						0.7				0.95						1.0												
Rated Voltage (Vdc)	50			10			100		50		50			10			250		200										
Cap. / TC Code	COG	CA	SL	U2J	UJ	SL	U2J	UJ	COG	CH	COG	CH	SL	U2J	UJ	COG	CH	SL	U2J	UJ	SL	U2J	UJ	COG	U2J	COG	U2J		
0.10pF																													
0.20pF																													
0.50pF	p66	p69																											
1.0pF	p66	p70																											
2.0pF	p66	p70																											
3.0pF	p67	p70																											
4.0pF	p67	p70																											
5.0pF	p67	p71																											
6.0pF	p68	p71																											
7.0pF	p68	p71																											
8.0pF	p68	p72																											
9.0pF	p69	p72																											
10pF	p69	p73																								p74	p75		
11pF																													
12pF	p69	p73																								p74	p75		
13pF																													
15pF	p69	p73																								p74	p75		
16pF																													
17pF																													
18pF	p69	p73																								p74	p75		
19pF																													
20pF																													
21pF																													
22pF	p69	p73																								p74	p75		
23pF																													
24pF																													
27pF	p69	p73																								p74	p75		
30pF																													
33pF	p69	p73																								p74	p75		
36pF																													
39pF	p69	p73																								p74	p75		
43pF																													
47pF	p69	p73																								p74	p75		
51pF																													
56pF	p69	p73																								p74	p75		
62pF																													
68pF	p69	p73																								p74	p75		
75pF																													
82pF	p69	p73																								p74	p75		
91pF																													
100pF	p69	p73							p73	p74																p74	p74	p75	p75
120pF	p69	p73							p73	p74																p74	p74	p75	p75
150pF	p69	p73							p73	p74	p74	p74														p74	p74	p75	p75
180pF	p69	p73							p73	p74																p74	p74	p75	p75
220pF	p69	p73							p73	p74																p74	p74	p75	p75
270pF	p69	p73							p73	p74																p74	p74	p75	p75
330pF	p69	p73							p73	p74																p74	p74	p75	p75
390pF	p69	p73							p73	p74																p74	p74		p75
470pF	p69	p73							p73	p74																p74	p75		p75
560pF	p69	p73							p73	p74																p74	p75		p75
680pF	p69	p73							p73	p74																p74	p75		p75
820pF	p69	p73							p73	p74																p74	p75		p75
910pF																													
1000pF	p69	p73			p73				p73	p74																p74	p75		p75
1200pF	p69	p73	p73	p73	p73				p73	p74	p74	p74														p74	p75		p75
1500pF	p69	p73	p73	p73	p73				p73	p74	p74	p74														p74	p75		p75
1800pF	p69	p73	p73	p73	p73				p74	p74	p74	p74														p74	p75		p75
2200pF	p69	p73	p73	p73	p73				p74	p74	p74	p74														p74	p75		p75
2700pF	p69	p73	p73	p73	p73				p74	p74	p74	p74														p74			
3300pF	p69	p73	p73	p73	p73				p74	p74	p74	p74																	
3900pF	p69	p73	p73	p73	p73						p74	p74																	
4700pF	p69	p73	p73	p73	p73						p74	p74																	
5600pF	p69	p73	p73	p73	p73																					p74	p74		
6800pF	p69	p73	p73	p73	p73																					p74	p74		
8200pF	p69	p73	p73	p73	p73																					p74	p74		
10000pF	p69	p73	p73	p73	p73																					p74	p74		
12000pF							p73	p73	p73				p74	p74	p74	p74	p74												
15000pF							p73	p73	p73				p74	p74	p74	p74	p74												
18000pF							p73	p73	p73				p74	p74	p74														
22000pF							p73	p73	p73																	p74	p74	p74	
27000pF																									p74	p74	p74		
33000pF																													
39000pF																													
47000pF																													
56000pF																										p74	p74	p74	
68000pF																													
82000pF																													
0.10μF																													
0.12μF																													

separate

2

Continued on the following page.



# Capacitance Table

p00 Each number in the Part Number List refers to the page number printed at the bottom of the page.

## (→ GRM Series Temperature Compensating Type)

p00 ← Part Number List JIS: **CK** **CJ** **CH** **SL** **UJ** EIA: **COG** **U2J**

L×W (mm)	3.2×1.6																						
T max. (mm)	1.0								1.25				1.8										
Rated Voltage (Vdc)	500	250	200	1000	630	500	250	200	100	50				1000	630	500	250						
Cap. / TC Code	U2J	COG	U2J	U2J	COG	U2J	COG	U2J	COG	UH	COG	CH	SL	U2J	UJ	COG	U2J	COG	U2J	U2J	COG	U2J	
0.10pF																							
0.20pF																							
0.50pF																							
1.0pF																							
2.0pF																							
3.0pF																							
4.0pF																							
5.0pF																							
6.0pF																							
7.0pF																							
8.0pF																							
9.0pF																							
10pF		p77																					
11pF																							
12pF		p77																					
13pF																							
15pF		p77																					
16pF																							
17pF																							
18pF		p77																					
19pF																							
20pF																							
21pF																							
22pF		p77																					
23pF																							
24pF																							
27pF		p77																					
30pF																							
33pF		p77																					
36pF																							
39pF		p77																					
43pF																							
47pF		p77																					
51pF																							
56pF		p77																					
62pF																							
68pF		p77																					
75pF																							
82pF		p77																					
91pF																							
100pF		p77																					
120pF		p77																					
150pF		p77																					
180pF		p77																					
220pF		p77																					
270pF		p77																					
330pF		p77																					
390pF		p77	p77																				
470pF		p77	p77			p77	p77																
560pF		p77	p77			p77	p77																
680pF		p77	p77			p77	p77	p78		p78													
820pF		p77	p77					p78		p78											p78	p78	
910pF																							
1000pF		p77	p77					p78		p78											p78	p78	
1200pF		p77	p77																				
1500pF		p77	p77																				
1800pF		p77	p77																				
2200pF		p77	p77					p78															
2700pF			p77	p77	p77			p78		p78													
3300pF			p77	p77	p77					p78												p78	
3900pF			p77	p77	p77																	p78	p78
4700pF			p77	p77	p77																	p78	p78
5600pF			p77	p77	p77																		
6800pF			p77																				
8200pF												p78	p78	p78									
10000pF												p78	p78	p78									
12000pF												p78	p78										
15000pF																							
18000pF																						p78	p78
22000pF																							p78
27000pF																							
33000pF																							
39000pF																							
47000pF																							
56000pF																							
68000pF																							
82000pF																							
0.10μF																							
0.12μF																							

Continued on the following page.



# Capacitance Table

**p00** Each number in the Part Number List refers to the page number printed at the bottom of the page.

## (→ GRM Series Temperature Compensating Type)

**p00** ← Part Number List      JIS: **CK** **CJ** **CH** **SL** **UJ**      EIA: **COG** **U2J**

L×W (mm)	3.2×1.6								3.2×2.5								4.5×2.0		4.5×3.2											
	1.8								1.0		1.25		1.5		2.0		1.0		1.5											
	100		50		25		16		2000	630	500	2000	1000	630	500	1000	630	500	250	1000	630	500	250	3150	1000	630	500			
Rated Voltage (Vdc)	COG	CH	COG	CH	COG	CH	COG	CH	U2J	U2J	U2J	U2J	U2J	U2J	U2J	U2J	U2J	U2J	U2J	U2J	U2J	U2J	U2J	U2J	U2J	U2J	U2J	U2J	U2J	U2J
Cap. / TC Code																														
0.10pF																														
0.20pF																														
0.50pF																														
1.0pF																														
2.0pF																														
3.0pF																														
4.0pF																														
5.0pF																														
6.0pF																														
7.0pF																														
8.0pF																														
9.0pF																														
10pF																														
11pF																														
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19pF																														
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23pF																														
24pF																														
27pF																														
30pF																														
33pF																														
36pF																														
39pF																														
43pF																														
47pF																														
51pF																														
56pF																														
62pF																														
68pF																														
75pF																														
82pF																														
91pF																														
100pF																														
120pF																														
150pF																														
180pF																														
220pF																														
270pF																														
330pF																														
390pF																														
470pF																														
560pF																														
680pF																														
820pF																														
910pF																														
1000pF																														
1200pF																														
1500pF																														
1800pF																														
2200pF																														
2700pF																														
3300pF																														
3900pF																														
4700pF																														
5600pF																														
6800pF																														
8200pF																														
10000pF																														
12000pF																														
15000pF																														
18000pF																														
22000pF																														
27000pF																														
33000pF																														
39000pF																														
47000pF																														
56000pF																														
68000pF	p78	p78	p78	p78																										
82000pF	p78	p78	p78	p78																										
0.10μF	p78	p78	p78	p78																										
0.12μF	p78				p78	p78	p78	p78																						

Continued on the following page. ↗

# Capacitance Table

**p00** Each number in the Part Number List refers to the page number printed at the bottom of the page.

## (→ GRM Series Temperature Compensating Type)

p00 ← Part Number List	JIS: <b>CK</b> <b>CJ</b> <b>CH</b> <b>SL</b> <b>UJ</b>			EIA: <b>COG</b> <b>U2J</b>					
	4.5×3.2			5.7×5.0					
L×W (mm)	4.5×3.2			1.5			2.0		
T max. (mm)	2.0			1.5			2.0		
Rated Voltage (Vdc)	1000	630	500	1000	630	500	1000	630	500
Cap. / TC Code	U2J	U2J	U2J	U2J	U2J	U2J	U2J	U2J	U2J
0.10pF									
0.20pF									
0.50pF									
1.0pF									
2.0pF									
3.0pF									
4.0pF									
5.0pF									
6.0pF									
7.0pF									
8.0pF									
9.0pF									
10pF									
11pF									
12pF									
13pF									
15pF									
16pF									
17pF									
18pF									
19pF									
20pF									
21pF									
22pF									
23pF									
24pF									
27pF									
30pF									
33pF									
36pF									
39pF									
43pF									
47pF									
51pF									
56pF									
62pF									
68pF									
75pF									
82pF									
91pF									
100pF									
120pF									
150pF									
180pF									
220pF									
270pF									
330pF									
390pF									
470pF									
560pF									
680pF									
820pF									
910pF									
1000pF									
1200pF									
1500pF									
1800pF									
2200pF									
2700pF									
3300pF									
3900pF	p79								
4700pF	p79								
5600pF				p79					
6800pF				p79					
8200pF							p79		
10000pF							p79		
12000pF									
15000pF		p79	p79						
18000pF		p79	p79						
22000pF		p79	p79						
27000pF					p79	p79			
33000pF								p79	p79
39000pF								p79	p79
47000pF								p79	p79
56000pF									
68000pF									
82000pF									
0.10μF									
0.12μF									

# Capacitance Table

p00 Each number in the Part Number List refers to the page number printed at the bottom of the page.

## GRM Series High Dielectric Constant Type

p00 ← Part Number List    JIS: R B    EIA: X7R X7S X7T X7U X6S X6T X5R

L×W (mm)	0.4×0.2										0.6×0.3										1.0×0.5										
	0.22										0.33										0.22										
T max. (mm)																															
Rated Voltage (Vdc)	16	10	6.3	4	2.5	50	35	25	16	10	6.3	4	10	6.3	4	16	10	6.3	4	10	6.3	4	10	6.3	4						
Cap. / TC Code	X7R	X7R	X5R, B	X5R, B	X6T	X5R	X6T	X7R	B	X5R	X7R, R	X6S	X5R, B	X7Δ, R	X6S	X5R, B	X7Δ, R	X5R, B	X7R, R	X6S	X5R, B	X6S	X5R, B	X6S	X5R, B	X7T	X6Δ				
100pF	p80	p80	p80	p80				p81	p81		p81																				
150pF	p80	p80	p80	p80				p81	p81		p81																				
220pF	p80	p80	p80	p80				p81	p81		p81																				
330pF	p80	p80	p80	p80				p81	p81		p81																				
470pF	p80	p80	p80	p80				p81	p81		p81																				
680pF		p80	p80	p80				p81	p81		p81																				
820pF		p80																													
1000pF	p80	p80	p80	p80	p80			p81	p81		p81	p81		p81																	
1500pF			p80	p80	p80	p80		p81	p81		p81	p81		p81																	
2200pF			p80	p80	p80	p80					p81					p82															
3300pF			p80	p80	p80	p80					p81					p82															
4700pF			p80	p80	p80	p80					p81					p82	p82	p82	p82	p82				p82							
6800pF			p80	p80	p80	p80					p81					p82	p82	p82	p82	p82				p82							
10000pF			p80	p80	p80	p80					p81					p81	p81	p81					p82	p82							
15000pF				p80		p80										p81	p82		p82	p82			p82	p82							
22000pF				p80		p80										p81	p82		p82	p82			p82	p82							
33000pF				p80		p81										p81	p82		p82	p82			p82	p82							
47000pF				p80		p81										p82	p82		p82	p82			p82	p82							
68000pF				p80		p81										p82	p82		p82	p82			p82	p82							
0.10μF				p80	p80	p81	p81			p81			p81	p81	p81	p81	p82	p82	p82			p82				p82	p83	p83	p83	p83	
0.15μF																										p82	p83	p83	p83	p83	
0.22μF																										p82	p82	p82	p82	p82	
0.33μF																															
0.47μF																												p83	p83		p83
0.68μF																															
1.0μF																												p83		p83	
2.2μF																															
4.7μF																															
10μF																															
22μF																															
47μF																															
100μF																															
150μF																															
220μF																															

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# Capacitance Table

p00 Each number in the Part Number List refers to the page number printed at the bottom of the page.

(→ GRM Series High Dielectric Constant Type)

p00 ← Part Number List    JIS: R B    EIA: X7R X7S X7T X7U X6S X6T X5R

L×W (mm)	1.0×0.5																														
	0.22		0.3				0.33				0.55																				
T max. (mm)	2.5		50		25		16		10		10		6.3		4		100		50		35		25		16		10				
Rated Voltage (Vdc)	X5R	X7T	X7R,R	B	X7R	B	X7R	B	X5R	X5R,B	X6T	X5R,B	X6T	X7R	X7R,R	X6S	X5R,B	X6S	X5R	X7R,R	X6S	X5R,B	X7R,R	X6S	X5R,B	X7R	X6S				
Cap. / TC Code	X5R	X7T	X7R,R	B	X7R	B	X7R	B	X5R	X5R,B	X6T	X5R,B	X6T	X7R	X7R,R	X6S	X5R,B	X6S	X5R	X7R,R	X6S	X5R,B	X7R,R	X6S	X5R,B	X7R	X6S				
100pF																															
150pF																															
220pF			p83 p83	p83										p83	p83 p84		p84														
330pF			p83 p83	p83										p83	p83 p84		p84														
470pF			p83 p83	p83										p83	p83 p84		p84														
680pF			p83 p83	p83										p83	p83 p84		p84														
820pF																															
1000pF			p83 p83	p83										p83	p83 p84		p84														
1500pF			p83 p83	p83										p83	p83 p84		p84														
2200pF					p83	p83								p83	p83 p84		p84			p84		p84									
3300pF							p83	p83						p83	p83 p84		p84														
4700pF							p83	p83						p83	p84 p84		p84									p85					
6800pF							p83	p83																							
10000pF															p84 p84		p84							p84 p84	p84	p85	p85				
15000pF									p83															p84 p84	p84						
22000pF									p83															p84 p84	p84						
33000pF										p83														p84 p84	p84						
47000pF															p84	p84	p84							p84 p84	p84						
68000pF															p84	p84	p84							p84 p84	p84	p84 p85 p85					
0.10μF		p83													p84		p84 p84							p84	p84 p85						
0.15μF																											p85				
0.22μF		p83																							p84	p84	p84	p84	p85	p85	p85
0.33μF																															
0.47μF																										p84	p84	p85	p85	p85	
0.68μF																															
1.0μF	p83									p83 p83	p83	p83 p83	p83												p84 p85	p85 p85	p85	p85			
2.2μF																															
4.7μF																															
10μF																															
22μF																															
47μF																															
100μF																															
150μF																															
220μF																															

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# Capacitance Table

p00 Each number in the Part Number List refers to the page number printed at the bottom of the page.

(→ GRM Series High Dielectric Constant Type)

p00 ← Part Number List    JIS: R B    EIA: X7R X7S X7T X7U X6S X6T X5R

L×W (mm)	1.0×0.5																	1.6×0.8										
	0.55							0.6						0.65		0.7					0.5							
T max. (mm)	0.55							0.6						0.65		0.7					0.5							
Rated Voltage (Vdc)	10	6.3			4			35	25	16	6.3	4	2.5	10	6.3	25	16	10	6.3	4	2.5	25	16	6.3	4			
Cap. / TC Code	X5R, B	X7R	X6S	X5R, B	X7R	X6S	X5R	X5R	X6S	X6S	X5R, B	X6T	X5R	X6S	X5R	X6S	X5R	X6S	X7S	X6S	X7S	X5R	X5R	X5R, B	X5R, B	X5R	X5R	
100pF																												
150pF																												
220pF																												
330pF																												
470pF																												
680pF																												
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4700pF																												
6800pF																												
10000pF																												
15000pF																												
22000pF																												
33000pF	p85																											
47000pF																												
68000pF																												
0.10μF	p85			p85																								
0.15μF	p85 p85			p85 p85																								
0.22μF	p85 p85		p85	p85 p85		p85																						
0.33μF	p85 p85			p85 p85																								
0.47μF	p85 p85			p85 p85																								
0.68μF	p85 p85			p85 p85																								
1.0μF	p85 p85	p85		p85 p85	p85			p85	p85	p85	p85														p86	p86	p86	p86
2.2μF	p85		p85	p85												p86	p86	p86	p86	p86	p86							
4.7μF														p85	p85	p85	p85	p86	p86	p86								
10μF																							p86	p86				
22μF																										p86	p86	
47μF																												
100μF																												
150μF																												
220μF																												

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# Capacitance Table

p00 Each number in the Part Number List refers to the page number printed at the bottom of the page.

(→ GRM Series High Dielectric Constant Type)

p00 ← Part Number List    JIS: R B    EIA: X7R X7S X7T X7U X6S X6T X5R

L×W (mm)	1.6×0.8																								
	0.55					0.9							0.95				1.0								
T max. (mm)	0.55					0.9							0.95				1.0								
Rated Voltage (Vdc)	16	10	6.3	250	200	50	35	25	16	10	6.3	4	25	16	10	50	35								
Cap. / TC Code	X5R	X6S	X5R	X7T	X6S	X7R	X7R	X5R, B	X7R	X7R	X5R, B	X7R	X5R	X6S	X5R, B	X7R	X5R	X6S	X5R, B	X7S	X5R, B	X5R	X6S	X5R	
100pF																									
150pF																									
220pF						p86	p86																		
330pF						p86	p86																		
470pF						p86	p86																		
680pF						p86	p86																		
820pF																									
1000pF						p86	p86																		
1500pF						p86	p86																		
2200pF						p86	p86																		
3300pF																									
4700pF																									
6800pF																									
10000pF																									
15000pF																									
22000pF																									
33000pF																									
47000pF																									
68000pF																									
0.10μF																									
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0.22μF																									
0.33μF																									
0.47μF																									
0.68μF																									
1.0μF																									
2.2μF																									
4.7μF	p86	p86	p86	p86	p86																				
10μF																									
22μF																									
47μF																									
100μF																									
150μF																									
220μF																									

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# Capacitance Table

p00 Each number in the Part Number List refers to the page number printed at the bottom of the page.

(→ GRM Series High Dielectric Constant Type)

p00 ← Part Number List    JIS: R B    EIA: X7R X7S X7T X7U X6S X6T X5R

L×W (mm)	1.6×0.8										2.0×1.25																								
	1.0										0.7	0.95									1.0														
T max. (mm)	1.0										0.7	0.95									1.0														
Rated Voltage (Vdc)	25			16			10			6.3			4			16	50	35	25			16			10			6.3			4			2.5	500
Cap. / TC Code	X7S	X6S	X5R	X7S	X6S	X7T	X7T	X5R, B	X6S	X5R, B	X6S	X5R, B	X6S	X5R	X7R	X6S	X5R, B	X7R	X6S	X5R, B	X7R	X6S	X5R, B	X7Δ	X5R, B	X6S	X5R, B	X6S	X5R	X6T	X7R				
100pF																																			
150pF																																			
220pF																																			
330pF																																			
470pF																																			
680pF																																			
820pF																																			
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0.15μF																																			
0.22μF																																			
0.33μF																																			
0.47μF																																			
0.68μF																																			
1.0μF																																			
2.2μF		<span style="background-color: #800000; color: white;">p87</span>	<span style="background-color: #0000FF; color: white;">p87</span>																																
4.7μF		<span style="background-color: #0000FF; color: white;">p87</span>																																	
10μF			<span style="background-color: #800000; color: white;">p87</span>																																
22μF				<span style="background-color: #0000FF; color: white;">p87</span>	<span style="background-color: #0000FF; color: white;">p87</span>	<span style="background-color: #008000; color: white;">p87</span>																													
47μF																																			
100μF																																			
150μF																																			
220μF																																			

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# Capacitance Table

p00 Each number in the Part Number List refers to the page number printed at the bottom of the page.

(→ GRM Series High Dielectric Constant Type)

p00 ← Part Number List    JIS: R B    EIA: X7R X7S X7T X7U X6S X6T X5R

L×W (mm)	2.0×1.25																											
T max. (mm)	1.0				1.35				1.4					1.45														
Rated Voltage (Vdc)	250	200	35	25	16	50	25	16	50	25	16	10	6.3	4	500	250	200	50										
Cap. / TC Code	X7R	X7R	X6S	X7S	X6S	X7S	X5R	X5R, B	X6S	X5R, B	X7R	X5R, B	X5R, B	X7R, R	X5R, B	X7R	X6S	X7R	B	X7R	X6S	X7U	X6S	X7R	X7R	X7R	X7S	
100pF																												
150pF																												
220pF																												
330pF																												
470pF																												
680pF																												
820pF																												
1000pF	p87	p87																										
1500pF	p87	p87																										
2200pF	p87	p87																										
3300pF	p87	p87																										
4700pF	p87	p87																										
6800pF	p87	p87																										
10000pF																									p88	p88	p88	
15000pF																										p88	p88	
22000pF																										p88	p88	
33000pF																												
47000pF																												
68000pF																												
0.10μF																												
0.15μF																												
0.22μF																												
0.33μF																												
0.47μF																												
0.68μF																												
1.0μF								p87	p87																			
2.2μF										p87	p88																	
4.7μF																												
10μF																												
22μF																												
47μF																												
100μF																												
150μF																												
220μF																												

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# Capacitance Table

p00 Each number in the Part Number List refers to the page number printed at the bottom of the page.

(→ GRM Series High Dielectric Constant Type)

p00 ← Part Number List    JIS: R B    EIA: X7R X7S X7T X7U X6S X6T X5R

L×W (mm)	2.0×1.25															3.2×1.6												
	1.45															0.95				1.0	1.25							
T max. (mm)																												
Rated Voltage (Vdc)	50	35				25			16			10			6.3	4			2.5	35	16	10	6.3	630	1000	630	500	
Cap. / TC Code	X6S	X7S	X6S	X5R	X7S	X6S	X5R	X7S	X6S	X5R	X7T	X6S	X5R	X7T	X5R,B	X6S	X5R,B	X6S	X5R	X5R,B	X5R,B	X6S	X5R,B	X7R	X7R	X7R	X7R	
100pF																												
150pF																												
220pF																												
330pF																												
470pF																												
680pF																												
820pF																												
1000pF																												
1500pF																												
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68000pF																												
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0.47μF																												
0.68μF																												
1.0μF																												
2.2μF																												
4.7μF	p88	p88			p88																							
10μF			p88	p88	p88	p88		p88															p88	p88	p88			
22μF							p88		p88	p88	p88	p88	p88	p88									p88	p88	p88	p88	p88	p88
47μF														p88	p88	p88	p88											
100μF																												
150μF																												
220μF																												

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# Capacitance Table

p00 Each number in the Part Number List refers to the page number printed at the bottom of the page.

(→ GRM Series High Dielectric Constant Type)

p00 ← Part Number List    JIS: R B    EIA: X7R X7S X7T X7U X6S X6T X5R

L×W (mm)	3.2×1.6																										
	1.25				1.8												1.9										
T max. (mm)	250	200	50	25	1000	630	500	250	200	100	50	25	16	10	6.3	4	100	25									
Rated Voltage (Vdc)	X7R	X7R	X7R	B	X5R	X7R	X7R	X7R	X7R	X7R	X7R	X5R,B	X7R	X5R,B	X7R	X6S	X5R,B	X7R	X5R,B	X7Δ	X6S	X5R,B	X7U	X6S	X7R	X6S	
Cap. / TC Code	X7R	X7R	X7R	B	X5R	X7R	X7R	X7R	X7R	X7R	X7R	X5R,B	X7R	X5R,B	X7R	X6S	X5R,B	X7R	X5R,B	X7Δ	X6S	X5R,B	X7U	X6S	X7R	X6S	
100pF																											
150pF																											
220pF																											
330pF																											
470pF																											
680pF																											
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100μF																											
150μF																											
220μF																											

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