muRata

AC250V Type (Which Meet Japanese Low)

■ Features

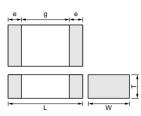
- 1. Chip monolitic ceramic capacitor for AC line.
- A new monolithic structure for small, highcapacitance capable of operating at high-voltage levels.
- 3. Sn-plated external electrodes realize good solderability.
- 4. Only for Reflow soldering.
- 5. Capacitance 0.01 to 0.1 uF for connecting lines and 470 to 4700 pF for connecting line to earth.

Applications

Noise suppression filters for switching power supplies, telephones, facsimiles, modems.

Refference srandard

JIS C 5102 JIS C 5150 The standards of the electrical appliance and material safety law of Japan, separated table 4.



Part Number		Dime	ensions (m	nm)	
Part Number	L	W	Т	e min.	g min.
GA252D	5.7 ±0.4	2.8 ±0.3	2.0 ±0.3	0.3	3.5
GA255D	<u> </u>	5.0 ±0.4	2.0 ±0.3	0.5	

Part Number	Rated Voltage (V)	TC Code	Capacitance	Length L (mm)	Width W (mm)	Thickness T (mm)	Electrode g (mm)	Electrode e (mm)
GA252DB3E2471MY02L	AC250 (r.m.s.)	В	470pF +20,-20%	5.7	2.8	2.0	3.5 min.	0.3 min.
GA252DB3E2102MY02L	AC250 (r.m.s.)	В	1000pF +20,-20%	5.7	2.8	2.0	3.5 min.	0.3 min.
GA252DB3E2222MY02L	AC250 (r.m.s.)	В	2200pF +20,-20%	5.7	2.8	2.0	3.5 min.	0.3 min.
GA252DB3E2472MY02L	AC250 (r.m.s.)	В	4700pF +20,-20%	5.7	2.8	2.0	3.5 min.	0.3 min.
GA252DB3E2103MY02L	AC250 (r.m.s.)	В	10000pF +20,-20%	5.7	2.8	2.0	3.5 min.	0.3 min.
GA252DB3E2223MY02L	AC250 (r.m.s.)	В	22000pF +20,-20%	5.7	2.8	2.0	3.5 min.	0.3 min.
GA252DB3E2473MY02L	AC250 (r.m.s.)	В	47000pF +20,-20%	5.7	2.8	2.0	3.5 min.	0.3 min.
GA255DB3E2104MY02L	AC250 (r.m.s.)	В	0.1µF +20,-20%	5.7	5.0	2.0	3.5 min.	0.3 min.



Specifications and Test Methods

No.	Ite	em	Specification	Test M	lethod			
1	Operating Temperatu	ire Range	−25 to +85°C	-	-			
2	Appearar	nce	No defects or abnormalities.	Visual inspection.				
3	Dimensio	ns	Within the specified dimensions.	Using calipers.				
4	4 Dielectric Strength		No defects or abnormalities.	No failure shall be observed when voltage as table is applied between the terminations for 60 ± 1 s, provided the charge/discharge current is less than 50mA.Nominal CapacitanceTest voltage C≥10,000pFC<10,000pF				
5	Insulation F (I.R.)	Resistance	More than 2,000MΩ	The insulation resistance shall be within 60±5 s of charging.	e measured with 500±50V and			
6	Capacita	nce	Within the specified tolerance.	The capacitance/D.F. shall be me	easured at 20℃ at a frequency of			
7	Dissipatio Factor (D		0.025 max.	1±0.2kHz and a voltage of 1±0.2 • Pretreatment Perform a heat treatment at 150 let sit for 24±2 h at room condit	2V (r.m.s.) D±₁8℃ for 60±5 min_and then			
8	Capacitar Temperat Character	ure	Cap. Change Within ±10%	The range of capacitance chang within -25 to +85°C shall be wit •Pretreatment Perform a heat treatment at 150 let sit for 24±2 h at room condit) ⁺ ₁ 8℃ for 60±5 min and then			
9	9 Discharge Test (Application: Nominal Capacitance C<10,000pF) Appearance		No defects or abnormalities.	As in Fig., discharge is made 50 times at 5 s intervals from the capacitor(Cd) charged at DC voltage of specified. $\begin{array}{c} R^{3} \\ \hline \\ $				
10	10 Adhesive Strength of Termination		No removal of the terminations or other defects shall occur.	Solder the capacitor to the testing in Fig.1 using a eutectic solder. I direction of the arrow. The solder iron or using the reflow method a so that the soldering is uniform a shock.	Then apply 10N force in the ring shall be done either with an and shall be conducted with care			
		Appearance	No defects or abnormalities.	Solder the capacitor to the test jie	g (glass epoxy board).			
		Capacitance	Within the specified tolerance.	The capacitor shall be subjected	•			
11	Vibration Resistance	D.F.	0.025 max.	having a total amplitude of 1.5mr uniformly between the approxima frequency range, from 10 to 55H traversed in approximately 1 min a period of 2 h in each 3 mutually of 6 h).	ate limits of 10 and 55Hz. The z and return to 10Hz, shall be . This motion shall be applied for y perpendicular directions (total			

"Room condition" Temperature : 15 to 35°C, Relative humidity : 45 to 75%, Atmosphere pressure : 86 to 106kPa

Continued on the following page.



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Specifications and Test Methods

Continued from the preceding page.

lo.	Item Specification							Test Method			
			No cracking or	marking de	fects shall (occur.		in Fig.2 using	pacitor to the testing jig (glass of a eutectic solder. Then apply a n in Fig. 3. The soldering shal	a force in the	
2	2 Deflection		Deflection $b \rightarrow 04.5$				an iron or using the reflow method and shall be conducted with care so that the soldering is uniform and free of defects such as heat shock.				
			L×W			sion (mm)			Flexure:	=1	
			(mm) 5.7×2.8	a 4.5	b 8.0	с 3.2	d		Capacitance meter	(in mm)	
			5.7×5.0	4.5	8.0	5.6	1.0			()	
					Fig.2				Fig.3		
3	Solderab Terminati		75% of the termi	inations are t	o be solder	ed evenly and	d continuously.	Immerse the capacitor in a solution of ethanol (JIS-K-8101) rosin (JIS-K-5902) (25% rosin in weight proportion). Immerse in eutectic solder solution for 2±0.5 s at 235±5℃. Immersing speed : 25±2.5mm/s			
		Appearance	No marking def	ects.							
	Humidity	Capacitance Change	Within ±15%					The capacitor shall be subjected to $40\pm2^{\circ}$ C, relative humidity of			
4	Insulation	D.F.	0.05 max.						90 to 98% for 8 h, and then removed in room condition for 16 h until 5 cycles.		
		I.R.	More than 1,000MΩ					unui 5 cycles.			
		Dielectric Strength	Pass the item No.4.								
		Appearance	No marking def	ects.					apacitor as table.	tion at 000 5% for	
		Capacitance Change	Within ±10%					10±1 s. Let s	capacitor in eutectic solder solu it at room condition for 24±2 h peed : 25±2.5mm/s		
	Resistance	D.F.	0.025 max.					Pretreatmen			
5	to Soldering	I.R.	R. More than 2,000MΩ				Perform a heat treatment at $150 \pm 18^{\circ}$ for 60 ± 5 min and then let sit for 24 ± 2 h at room condition.				
	Heat	Dielectric						*Preheating			
		Strength	Pass the item N	No.4.				Step 1	Temperature 100°C to 120°C	Time 1 min	
								2	170°C to 200°C	1 min	
		Appearance	No marking def	ects				Fix the capaci	tor to the supporting jig (glass	epoxy board) show	
		Capacitance Change	Within ±7.5%					in Fig.4 using Perform the fiv	a eutectic solder. ve cycles according to the four		
		D.F.	0.025 max.					 listed in the fo Let sit for 24± 	2 h at room condition, then me	easure.	
		I.R.	More than 2,00	0MΩ				Step	Temperature (°C)	Time (min)	
			,					1	Min. Operating Temp.±3	30±3	
								2	Room Temp. Max. Operating Temp.±2	2 to 3 30±3	
	T							4	Room Temp.	2 to 3	
16 Temperature Cycle		Dielectric Strength	Pass the item N	No.4.				Pretreatmen Perform a he	· · · · ·		

"Room condition" Temperature : 15 to 35°C, Relative humidity : 45 to 75%, Atmosphere pressure : 86 to 106kPa

Continued on the following page.



Specifications and Test Methods

Continued from the preceding page.

No.	Ite	m	Specification	Test Method					
		Appearance	No marking defects.						
	Humidity	Capacitance Change Within ±15%		Sit the capacitor at $40\pm2^{\circ}$ C and relative humidity 90 to 95% for $500\pm^{20}$ h.					
17	(Steady	D.F.	0.05 max.	Remove and let sit for 24±2 h at room condition, then measure. •Pretreatment					
	State)	I.R.	More than 1,000M Ω	Perform a heat treatment at 150 ⁺ _{−1} ^o ^o ^o ^c for 60±5 min and then					
		Dielectric Strength	Pass the item No.4.	let sit for 24 ± 2 h at room condition.					
		Appearance	No marking defects.	Apply voltage and time as Table at 85±2℃. Remove and let sit					
		Capacitance Change	Within ±15%	for 24 \pm 2 h at room condition, then measure. The charge / discharge current is less than 50mA.					
		D.F.	0.05 max.	Nominal Capacitance Test Time Test voltage C≥10,000pF 1,000 ⁺⁴ ₀ h AC300V (r.m.s.)					
18	Life	I.R.	More than 1,000M Ω	C<10,000pF 1,500 ⁻⁴ ^o ₀ h AC500V (r.m.s.)*					
10		Dielectric Strength	Pass the item No.4.	 * Except that once each hour the voltage is increased to AC1,000V (r.m.s.) for 0.1 s • Pretreatment Apply test voltage for 60±5 min at test temperature. Remove and let sit for 24±2 h at room condition. 					
		Appearance	No marking defects.						
		Capacitance Change	Within ±15%	Apply the rated voltage at $40\pm2^{\circ}$ C and relative humidity 90 to 95% for 500 \pm^{24} h.					
19	Humidity Loading	D.F.	0.05 max.	Remove and let sit for 24±2 h at room condition, then measure •Pretreatment					
	Loading	I.R.	More than 1,000MΩ	Apply test voltage for 60±5 min at test temperature.					
		Dielectric Strength	Pass the item No.4.	Remove and let sit for 24 ± 2 h at room condition.					

"Room condition" Temperature : 15 to 35°C, Relative humidity : 45 to 75%, Atmosphere pressure : 86 to 106kPa





Safety Standard Recognized Type GC (UL, IEC60384-14 Class X1/Y2)

Features

- 1. Chip monolitic ceramic capacitor (certified as conforming to safety standards) for AC line.
- 2. A new monolithic structure for small, highcapacitance capable of operating at high-voltage levels.
- 3. Compared to lead type capacitors, this new capacitor is greatly downsized and low-profiled to 1/10 or less in volume, and 1/4 or less in height.
- 4. The type GB can be used as an X2-class capacitor.
- 5. The type GC can be used as an X1-class and Y2-class capacitor.
- 6. +125 degree C guaranteed.
- 7. Only for reflow soldering.

Applications

- Ideal use as Y capacitor or X capacitor for various switching power supply.
- Ideal use as linefilter for MODEM.



				F
•	L	•	W	

Part Number		Dir	nensions (m	nm)	
Part Number	L	W	Т	e min.	g min.
GA355D	5.7 ±0.4	5.0 ±0.4	2.0 ±0.3	0.3	4.0
GA355X	J 5.7 <u>⊥</u> 0.4		2.7 ±0.3	0.3	

Standard Recognition

	Standard No.	Status of R	ecognition	Rated
	Standard No.	Туре GB Тур		Voltage
UL	UL1414	_	◎*	
BSI		_	0	
VDE	EN1400400	0	0	AC250V
SEV	EN132400	0	0	(r.m.s.)
SEMKO		0	0	
EN132400 Class		X2	X1, Y2	

* : Line By Pass only

Part Number	Rated Voltage (V)	TC Code	Capacitance (pF)	Length L (mm)	Width W (mm)	Thickness T (mm)	Electrode g (mm)	Electrode e (mm)
GA355DR7GC101KY02L	AC250 (r.m.s.)	X7R	100 +10,-10%	5.7	5.0	2.0	4.0 min.	0.3 min.
GA355DR7GC151KY02L	AC250 (r.m.s.)	X7R	150 +10,-10%	5.7	5.0	2.0	4.0 min.	0.3 min.
GA355DR7GC221KY02L	AC250 (r.m.s.)	X7R	220 +10,-10%	5.7	5.0	2.0	4.0 min.	0.3 min.
GA355DR7GC331KY02L	AC250 (r.m.s.)	X7R	330 +10,-10%	5.7	5.0	2.0	4.0 min.	0.3 min.
GA355DR7GC471KY02L	AC250 (r.m.s.)	X7R	470 +10,-10%	5.7	5.0	2.0	4.0 min.	0.3 min.
GA355DR7GC681KY02L	AC250 (r.m.s.)	X7R	680 +10,-10%	5.7	5.0	2.0	4.0 min.	0.3 min.
GA355DR7GC102KY02L	AC250 (r.m.s.)	X7R	1000 +10,-10%	5.7	5.0	2.0	4.0 min.	0.3 min.
GA355DR7GC152KY02L	AC250 (r.m.s.)	X7R	1500 +10,-10%	5.7	5.0	2.0	4.0 min.	0.3 min.
GA355DR7GC222KY02L	AC250 (r.m.s.)	X7R	2200 +10,-10%	5.7	5.0	2.0	4.0 min.	0.3 min.
GA355DR7GC332KY02L	AC250 (r.m.s.)	X7R	3300 +10,-10%	5.7	5.0	2.0	4.0 min.	0.3 min.
GA355DR7GC472KY02L	AC250 (r.m.s.)	X7R	4700 +10,-10%	5.7	5.0	2.0	4.0 min.	0.3 min.





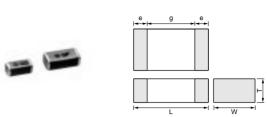
Safety Standard Recognized Type GD (IEC60384-14 Class Y3)

Features

- 1. A new monolithic structure for small, highcapacitance capable of operating at high-voltage levels.
- 2. The type GD can be used as an Y3-class capacitor, and the type GF can be used as an Y2-class capacitor.
- 3. Available for the equipment based on IEC/EN60950 and UL1950.
- 4. +125 degree C guaranteed.
- 5. Only for reflow soldering.

Applications

- Ideal use on line filter and coupling for transformer-less DAA modem.
- Ideal use on line filter for information equipment.



Part Number		Dir	mensions (mm)	
Part Number	L	W	Т	e min.	g min.
GA342D	4.5 ±0.3	2.0 ±0.2	2.0 ±0.3		
GA343D	4.5 ±0.4	3.2 ±0.3	$2.0\pm^{0}_{0.3}$	0.3	Type GD : 2.5
GA352D	5.7 ±0.4	2.8 ±0.3	$2.0\pm^{0}_{0.3}$	0.3	Type GF : 3.5
GA355D	5.7 ±0.4	5.0 ±0.4	$2.0\pm^{0}_{0.3}$		

Standard Recognition

	Standard No.	Status of R	ecognition	Rated
	Standard No.	Type GD	Type GF	Voltage
SEMKO	EN132400	0	0	AC250V
EN132400 Class		Y3	Y2	(r.m.s.)

Part Number	Rated Voltage (V)	TC Code	Capacitance (pF)	Length L (mm)	Width W (mm)	Thickness T (mm)	Electrode g (mm)	Electrode e (mm)
GA342DR7GD101KW02L	AC250 (r.m.s.)	X7R	100 +10,-10%	4.5	2.0	2.0	2.5 min.	0.3 min.
GA342DR7GD151KW02L	AC250 (r.m.s.)	X7R	150 +10,-10%	4.5	2.0	2.0	2.5 min.	0.3 min.
GA342DR7GD221KW02L	AC250 (r.m.s.)	X7R	220 +10,-10%	4.5	2.0	2.0	2.5 min.	0.3 min.
GA342DR7GD471KW02L	AC250 (r.m.s.)	X7R	470 +10,-10%	4.5	2.0	2.0	2.5 min.	0.3 min.
GA342DR7GD102KW02L	AC250 (r.m.s.)	X7R	1000 +10,-10%	4.5	2.0	2.0	2.5 min.	0.3 min.
GA342DR7GD152KW02L	AC250 (r.m.s.)	X7R	1500 +10,-10%	4.5	2.0	2.0	2.5 min.	0.3 min.
GA343DR7GD182KW01L	AC250 (r.m.s.)	X7R	1800 +10,-10%	4.5	3.2	2.0	2.5 min.	0.3 min.
GA343DR7GD222KW01L	AC250 (r.m.s.)	X7R	2200 +10,-10%	4.5	3.2	2.0	2.5 min.	0.3 min.





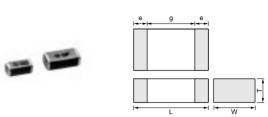
Safety Standard Recognized Type GF (IEC60384-14 Class Y2)

Features

- 1. A new monolithic structure for small, highcapacitance capable of operating at high-voltage levels.
- 2. The type GD can be used as an Y3-class capacitor, and the type GF can be used as an Y2-class capacitor.
- 3. Available for the equipment based on IEC/EN60950 and UL1950.
- 4. +125 degree C guaranteed.
- 5. Only for reflow soldering.

Applications

- Ideal use on line filter and coupling for transformer-less DAA modem.
- Ideal use on line filter for information equipment.



		Dir	nensions (mm)	
Part Number	L	W	T	e min.	g min.
GA342D	4.5 ±0.3	2.0 ±0.2	2.0 ±0.3		
GA343D	4.5 ±0.4	3.2 ±0.3	$2.0 \pm ^{0}_{0.3}$	0.3	Type GD : 2.5
GA352D	5.7 ±0.4	2.8 ±0.3	$2.0\pm^{0}_{0.3}$	0.5	Type GF : 3.5
GA355D	5.7 ±0.4	5.0 ±0.4	$2.0\pm^{0}_{0.3}$		

Standard Recognition

	Standard No.	Status of R	Rated	
	Standard No.	Type GD	Type GF	Voltage
SEMKO	EN132400	0	0	AC250V
EN1324	400 Class	Y3	Y2	(r.m.s.)

Part Number	Rated Voltage (V)	TC Code	Capacitance (pF)	Length L (mm)	Width W (mm)	Thickness T (mm)	Electrode g (mm)	Electrode e (mm)
GA352DR7GF102KW01L	AC250 (r.m.s.)	X7R	1000 +10,-10%	5.7	2.8	2.0	3.5 min.	0.3 min.
GA355DR7GF222KW01L	AC250 (r.m.s.)	X7R	2200 +10,-10%	5.7	5.0	2.0	3.5 min.	0.3 min.



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Safety Standard Recognized Type GB (IEC60384-14 Class X2)

Features

- 1. Chip monolitic ceramic capacitor (certified as conforming to safety standards) for AC line.
- 2. A new monolithic structure for small, highcapacitance capable of operating at high-voltage levels.
- 3. Compared to lead type capacitors, this new capacitor is greatly downsized and low-profiled to 1/10 or less in volume, and 1/4 or less in height.
- 4. The type GB can be used as an X2-class capacitor.
- 5. The type GC can be used as an X1-class and Y2-class capacitor.
- 6. +125 degree C guaranteed.
- 7. Only for reflow soldering.

Applications

- Ideal use as Y capacitor or X capacitor for various switching power supply.
- Ideal use as linefilter for MODEM.



- -⊳ -	g	e •	
			L L
-	L		W

Part Number	Dimensions (mm)							
Part Number	L	W	Т	e min.	g min.			
GA355D	5.7 ±0.4	5.0 ±0.4	2.0 ±0.3	0.3	4.0			
GA355X	5.7 ±0.4		2.7 ±0.3	0.5	4.0			

Standard Recognition

	Standard No.	Status of R	Rated	
	Standard No.	Type GB		Voltage
UL	UL1414	-	◎*	
BSI		_	0	
VDE	EN1400400	0	0	AC250V
SEV	EN132400	0	0	(r.m.s.)
SEMKO		0	0	
EN132400 Class		X2	X1, Y2	

* : Line By Pass only

Part Number	Rated Voltage (V)	TC Code	Capacitance (pF)	Length L (mm)	Width W (mm)	Thickness T (mm)	Electrode g (mm)	Electrode e (mm)
GA355DR7GB103KY02L	AC250 (r.m.s.)	X7R	10000 +10,-10%	5.7	5.0	2.0	4.0 min.	0.3 min.
GA355DR7GB153KY02L	AC250 (r.m.s.)	X7R	15000 +10,-10%	5.7	5.0	2.0	4.0 min.	0.3 min.
GA355DR7GB223KY02L	AC250 (r.m.s.)	X7R	22000 +10,-10%	5.7	5.0	2.0	4.0 min.	0.3 min.
GA355XR7GB333KY06L	AC250 (r.m.s.)	X7R	33000 +10,-10%	5.7	5.0	2.7	4.0 min.	0.3 min.



GA3 Series Specifications and Test Methods

No.	Ite	em	Specification	Test Method			
1	Operating Temperatu	ire Range	-55 to +125℃	-			
2	Appearance No defects or abnormalities.		No defects or abnormalities.	Visual inspection.			
3	Dimensio	ns	Within the specified dimensions.	Using calipers.			
4	Dielectric Strength		No defects or abnormalities.	No failure shall be observed when voltage as table is applied between the terminations for 60±1 s, provided the charge/discharge current is less than 50mA. Type GB DC1075V Type GC/GD/GF AC1500V (r.m.s.)			
5	Insulation F (I.R.)	Resistance	More than 6,000MΩ	The insulation resistance shall be measured with 500 \pm 50V and within 60 \pm 5 s of charging.			
6	Capacita	nce	Within the specified tolerance.	The capacitance/D.F. shall be measured at 20°C at a frequency of			
7	Dissipation Factor (D.F.)		0.025 max.	 1±0.2kHz and a voltage of 1±0.2V (r.m.s.) Pretreatment Perform a heat treatment at 150±18℃ for 60±5 min and then let sit for 24±2 h at room condition. 			
8 Capacitance Temperature Characteristics Cap. Change Within ±15%		1 0	The range of capacitance change compared with the 25℃ value within -55 to +125℃ shall be within the specified range. •Pretreatment Perform a heat treatment at 150 [±] ₁ 8℃ for 60±5 min and then let sit for 24±2 h at room condition.				
		Appearance	No defects or abnormalities.	As in Fig., discharge is made 50 times at 5 s intervals from			
		I.R.	More than 1,000MΩ	the capacitor(Cd) charged at DC voltage of specified.			
9	Discharge Test (Application: Type GC)	Dielectric Strength	Pass the item No.4.	$\begin{array}{c} R3 \\ \hline \\ $			
10	Adhesive of Termin	•	No removal of the terminations or other defect shall occur.	Solder the capacitor to the testing jig (glass epoxy board) shown in Fig.1 using a eutectic solder. Then apply 10N force in the direction of the arrow. The soldering shall be done either with an iron or using the reflow method and shall be conducted with care so that the soldering is uniform and free of defects such as heat shock. $\underbrace{10N, 10\pm 1s}_{Glass \ Epoxy \ Board}$ Fig.1			
		Appearance	No defects or abnormalities.	Solder the capacitor to the test jig (glass epoxy board).			
		Capacitance	Within the specified tolerance.	The capacitor shall be subjected to a simple harmonic motion			
11	Vibration Resistance	D.F.	0.025 max.	 having a total amplitude of 1.5mm, the frequency being varied uniformly between the approximate limits of 10 and 55Hz. The frequency range, from 10 to 55Hz and return to 10Hz, shall be traversed in approximately 1 min. This motion shall be applied for a period of 2 h in each 3 mutually perpendicular directions (total of 6 h). 			

"Room condition" Temperature : 15 to 35°C, Relative humidity : 45 to 75%, Atmosphere pressure : 86 to 106kPa

Continued on the following page.



GA3 Series Specifications and Test Methods

Continued from the preceding page.

lo.	Ite	em	Specification		Test Method		
12	2 Deflection		No cracking or marking defects shall occur.	Solder the capacitor to the testing jig (glass epoxy board) shown in Fig.2 using a eutectic solder. Then apply a force in the direction shown in Fig. 3. The soldering shall be done either with an iron or using the reflow method and shall be conducted with care so that the soldering is uniform and free of defects such as heat shock. $\frac{20}{45}^{50} \frac{\text{Pressurizing}}{\text{speed}:1.0\text{mm/s}}$ Flexure=1 (in mm) Fig.3			
13	Solderab Terminati	-	75% of the terminations is to be soldered evenly and continuously.	rosin (JIS-K-59 Immerse in eu	apacitor in a solution of ethance 302) (25% rosin in weight prop tectic solder solution for 2±0.5 aed : 25±2.5mm/s	ortion).	
		Appearance	No marking defects.		apacitor as table. Immerse the	•	
		Capacitance Change	Within ±10%	 eutectic solder solution at 260±5°C for 10±1 s. Let sit at room condition for 24±2 h, then measure. Immersing speed : 25±2.5mm/s Pretreatment Perform a heat treatment at 150±18°C for 60±5 min and then 			
	Resistance	I.R.	More than 1,000MΩ				
		Dielectric Strength	Pass the item No.4.	*Preheating Step 1 2	Temperature 100°C to 120°C 170°C to 200°C	Time 1 min. 1 min.	
			Na madina dafaata	Fiv the series	tor to the supporting iig (gloss)	anavir haard) ahawa	
		Appearance Capacitance Change	No marking defects. Within ±15%	in Fig.4 using Perform the fiv	tor to the supporting jig (glass of a eutectic solder. ve cycles according to the four lowing table.		
		Capacitance	-	in Fig.4 using Perform the fiv listed in the fo	a eutectic solder. /e cycles according to the four	heat treatments	
		Capacitance Change	Within ±15%	in Fig.4 using Perform the fiv listed in the fo Let sit for 24±	a eutectic solder. /e cycles according to the four lowing table. 2 h at room condition, then me Temperature (°C)	heat treatments pasure. Time (min)	
		Capacitance Change D.F.	Within ±15% 0.05 max.	in Fig.4 using Perform the fiv listed in the fo Let sit for $24\pm$ <u>Step</u> 1 2	a eutectic solder. ve cycles according to the four lowing table. 2 h at room condition, then me Temperature (°C) Min. Operating Temp.±3 Room Temp.	heat treatments pasure. Time (min) <u>30±3</u> 2 to 3	
		Capacitance Change D.F.	Within ±15% 0.05 max.	in Fig.4 using Perform the fiv listed in the fo Let sit for 24± <u>Step</u> <u>1</u> <u>2</u> <u>3</u>	a eutectic solder. ve cycles according to the four lowing table. 2 h at room condition, then me Temperature (°C) Min. Operating Temp.±3 Room Temp. Max. Operating Temp.±2	heat treatments basure. Time (min) 30 ± 3 2 to 3 30 ± 3	
15	Temperature Cycle	Capacitance Change D.F.	Within ±15% 0.05 max.	in Fig.4 using Perform the fiv listed in the fo Let sit for 24± <u>Step</u> 1 2 3 4 •Pretreatmen Perform a he	a eutectic solder. ve cycles according to the four lowing table. 2 h at room condition, then me Temperature (°C) Min. Operating Temp.±3 Room Temp. Max. Operating Temp.±2 Room Temp.	heat treatments Time (min) 30 ± 3 2 to 3 30 ± 3 2 to 3 2 to 3 $60\pm 5 \text{ min and then}$	
15	•	Capacitance Change D.F. I.R. Dielectric	Within ±15% 0.05 max. More than 3,000MΩ Pass the item No.4.	in Fig.4 using Perform the fiv listed in the fo Let sit for 24± <u>Step</u> 1 2 3 4 •Pretreatmen Perform a he	a eutectic solder. ve cycles according to the four lowing table. 2 h at room condition, then me Temperature (°C) Min. Operating Temp. ± 3 Room Temp. Max. Operating Temp. ± 2 Room Temp. At treatment at $150 \pm _{16}$ °C for 6 2 h at room condition. Max. Derating Temp. ± 2 Room Temp. Solde C a treatment at $150 \pm _{16}$ °C for 6 2 h at room condition. C a treatment at $150 \pm _{16}$ °C for 6 C a treatment at $150 \pm _{16}$ °C	heat treatments asure. Time (min) 30 ± 3 2 to 3 30 ± 3 2 to 3 2 to 3 60 ± 5 min and then	
15	Cycle	Capacitance Change D.F. I.R. Dielectric Strength	Within ±15% 0.05 max. More than 3,000MΩ	in Fig.4 using Perform the fiv listed in the fo Let sit for 24± <u>3</u> <u>4</u> •Pretreatmen Perform a he let sit for 24±	a eutectic solder. ve cycles according to the four lowing table. 2 h at room condition, then me Temperature (°C) Min. Operating Temp.±3 Room Temp. Max. Operating Temp.±2 Room Temp. Max. Operating Temp.±2 Room Temp. Max. Operating Temp.±2 Solder 2 h at room condition.	heat treatments asure. Time (min) 30 ± 3 2 to 3 30 ± 3 2 to 3 30 ± 3 2 to 3 60 ± 5 min and then r resist	
	Cycle Humidity (Steady	Capacitance Change D.F. I.R. Dielectric Strength Appearance Capacitance	Within ±15% 0.05 max. More than 3,000MΩ Pass the item No.4.	in Fig.4 using Perform the fiv listed in the fo Let sit for 24± <u>3</u> •Pretreatmen Perform a he let sit for 24± Sit the capacit 500±12 h.	a eutectic solder. ve cycles according to the four lowing table. 2 h at room condition, then me Temperature (°C) Min. Operating Temp.±3 Room Temp. Max. Operating Temp.±2 Room Temp. Max. Operating Temp.±2 Room Temp. Max. Operating Temp.±2 Room Temp. Max. Operating Temp.±2 Room Temp. Solde: Cale Second Second Fig.4 or at 40±2°C and relative humi	heat treatments asure. Time (min) 30 ± 3 2 to 3 30 ± 3 2 to 3 30 ± 3 2 to 3 60 ± 5 min and then r resist dity 90 to 95% for	
15	Cycle	Capacitance Change D.F. I.R. Dielectric Strength Appearance Capacitance Change	Within ±15% 0.05 max. More than 3,000MΩ Pass the item No.4. No marking defects. Within ±15%	in Fig.4 using Perform the fiv listed in the fo Let sit for 24± <u>3</u> •Pretreatmen Perform a he let sit for 24± Sit the capacit 500±12 h.	a eutectic solder. ve cycles according to the four lowing table. 2 h at room condition, then me Temperature (°C) Min. Operating Temp.±3 Room Temp. Max. Operating Temp.±2 Room Temp. Max. Operating Temp.±2 Room Temp. Max. Operating Temp.±2 Solder 2 h at room condition.	heat treatments asure. Time (min) 30 ± 3 2 to 3 30 ± 3 2 to 3 30 ± 3 2 to 3 60 ± 5 min and then r resist dity 90 to 95% for	

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GA3 Series Specifications and Test Methods

Continued from the preceding page.

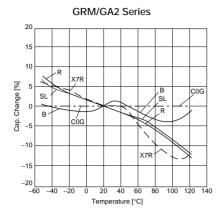
No.	lte	em	Specification	Test Method			
		Appearance Capacitance Change	No marking defects. Within ±20%	Impulse Voltage Each individual capacitor shall be subjected to a 2.5kV (Type GC/GF:5kV)Impulses (the voltage			
		D.F.	0.05 max.	value means zero to peak) for three 1 times. Then the capacitors are 1 applied to life test. 1			
		I.R.	More than $3,000M\Omega$				
17	Life	Dielectric Strength	Pass the item No.4.	Apply voltage as Table for 1,000 h at 125±3°C, relative humidity 50% max. Type Applied voltage GB AC312.5V (r.m.s.), except that once each hour the voltage is increased to AC1,000V (r.m.s.) for 0.1s. GC AC425V (r.m.s.), except that once each hour the voltage is increased to AC1,000V (r.m.s.) for 0.1s. GF Voltage is increased to AC1,000V (r.m.s.) for 0.1s.			
		Appearance	No marking defects.				
		Capacitance Change	Within ±15%	Apply the rated voltage at $40\pm2^{\circ}$ C and relative humidity 90 to 95% for 500 \pm^{-2} ch. Remove and let sit for 24 \pm 2 h at room			
18	Humidity Loading	D.F.	0.05 max.				
	Louding	I.R.	More than 3,000MΩ	condition, then measure.			
		Dielectric Strength	Pass the item No.4.				

"Room condition" Temperature : 15 to 35℃, Relative humidity : 45 to 75%, Atmosphere pressure : 86 to 106kPa

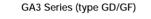


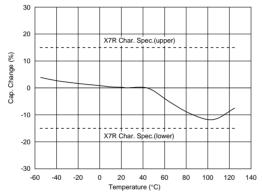
GRM/GA2/GA3 Series Data (Typical Example)

■ Capacitance-Temperature Characteristics



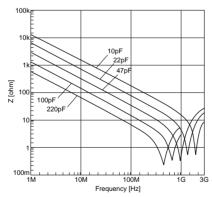
GA3 Series (type GB/GC) 3 2 X7R Char. Spec.(upper) Cap. Change (%) Type G C (≦ 681) Type G B _____ Type G C (102≦ -1 X7R Char. Spec -2 -30 -60 -40 120 140 -20 20 40 60 Temperature (°C) 80 100



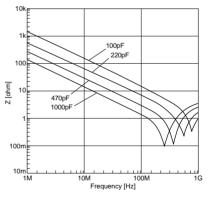


■ Impedance-Frequency Characteristics

GRM Series (SL Characteristics)



GRM Series (R Characteristics)

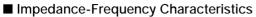


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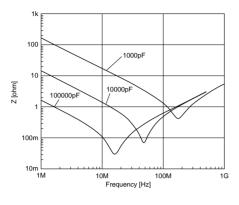


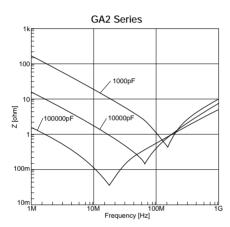
GRM/GA2/GA3 Series Data (Typical Example)

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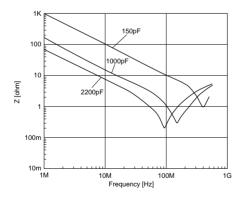


GRM Series (X7R Char. 250V)

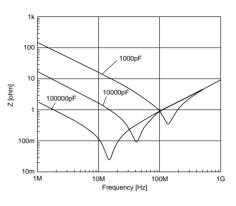




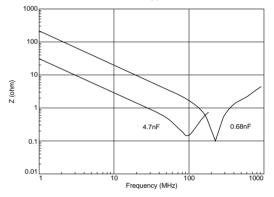
GA3 Series (Type GD)



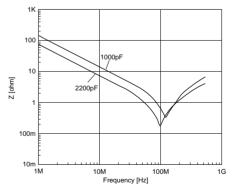
GRM Series (B/X7R Char. 630V)



GA3 Series (Type GC)



GA3 Series (Type GF)



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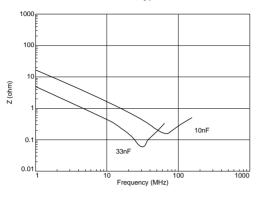


GRM/GA2/GA3 Series Data (Typical Example)

Continued from the preceding page.



GA3 Series (Type GB)



■ Capacitance-AC Voltage Characteristics

