

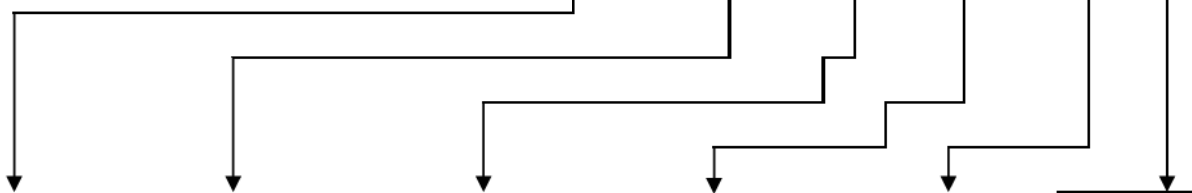
**CIC**<sup>®</sup>**CIC COMPONENTS IND.CO.,LTD****CERAMIC DISC CAPACITOR**

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● **Explanations Of Ordering Code**

**DESCRIPTION : C/C NPO 100PF 50V 5% 5 X 7**

**SYNTON CODE : C/C NPO 101 J 50V 5 X 7**



<u>Dielectric</u>	<u>Capacitance</u>	<u>Tolerance</u>	<u>Voltage</u>	<u>Pitch</u>	<u>Lead</u>
NPO	<u>value</u>	B : ±0.10PF	16V	2.5 ±0.8mm	<u>Length</u>
SL		C : ±0.25PF	25V	5 ±0.8 mm	3 ±0.8mm
Y5E	3 Digits :	D : ±0.5PF	50V	6.35 ±0.8 mm	5 ±0.8 mm
Y5P	5R1 : 5.1PF	F : ±1%	100V	7.52 ±0.8 mm	7 ±0.8 mm
Y5U	100 : 10PF	G : ±2%	250V	10 ±0.8 mm	10 ±0.8 mm
Y5V	101 : 100PF	J : ±5%	500V		25 ±3.0 mm
Z5U	102 : 1NF :	K : ±10%	1KV		
Z5V	1000PF	M : ±20%	2KV		
		Z : +80-20%	3KV		
	103 : 10NF :	P : +100-0%	4KV		
	10000PF		6KV		
	104 : 0.1UF :				
	100000PF				
	105 : 1UF :				
	1000000PF				
					Packing :
					Bulk
					Tape

APPROVED	CHECKED	DESIGNED	REMARK	DOCUMENT NO.
Carol	May	Chen	07/01RE:P1	0201010149

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● **50/100V/500V Series**

W.V. (DC)	TEMP.Char./Capacitance range(PF)					DIA (mm)
	NPO	SL	(Y5E)(Y5P)	(Z5U)	(Z5V)	
50V/100V	0.5~47	33~150	100~2200	1000~5000	3300~10000	5±1
	47 ~68	180~220	3300	5600~6800		6±1
	75~100	250~330	3500	7500~10000	12000~22000	7±1
	120~150	390	4700~6800			8±1
	180~200	470~560				9±1
	220~270	680~820	7500~10000	20000~22000		10±1
	300~330					12±1
	470					14±1
500V	0.5~15	22~68	100~1000	1000~1200		5±1
	18 ~33	82~120	1200~1500	1500~2200	3300~5000	6±1
	39~56	150~220	1800~3900	2700~4700	5600~6800	7±1
	68~82	270~330	2700~3000	5600~6800	8200~10000	8±1
	100~120	390~470	3300~3900	8200~10000		9±1
	150~180	680~820	4700~5000			10±1
	200~220		5600~6800	12000~15000	15000~22000	12±1
			8200~10000	18000~22000	27000~47000	14±1
					100000	16±1

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● **Semi-Conductive Series**

W.V. (DC)	TEMP.Char./Capacitance range(PF)			DIA (mm)
	(Y5P)	(Y5U)	(Y5V)	
12V/16V		100000	100000	6±1
			220000	8±1
25V	10000	1000	10000~22000	3.5±1
	22000	47000		5±1
	33000		100000	6±1
	47000			6.5±1
		100000		7±1
	68000			8±1
	100000			10±1
50V		10000	10000~22000	3.5±1
	10000	22000	47000	4.5±1
	15000	33000~47000		5±1
	22000		100000	6±1
	33000~47000	100000		8±1
	100000			12.5±1
100V			100000	7±1

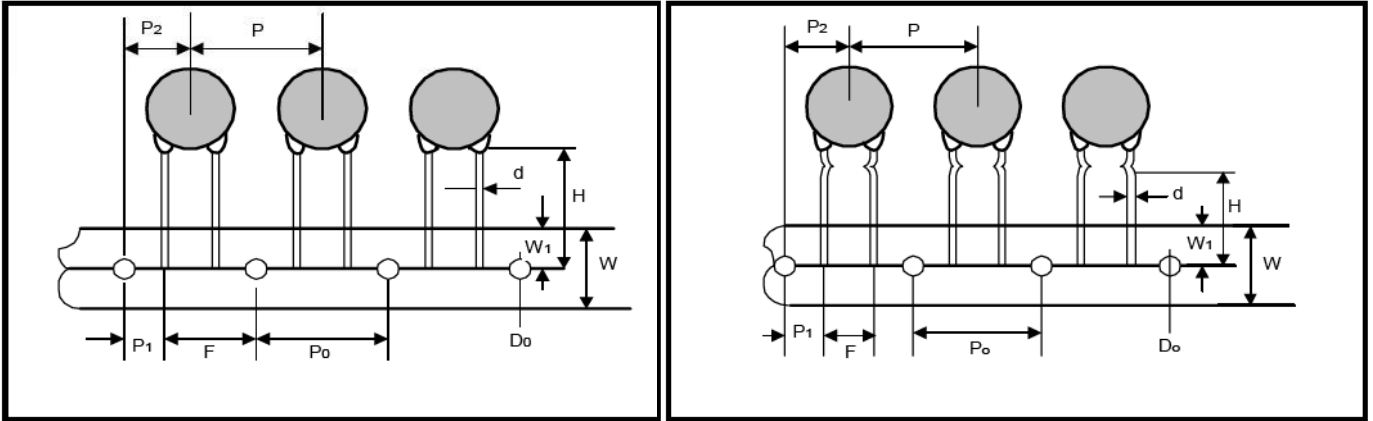
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### ● Taping Dimensions

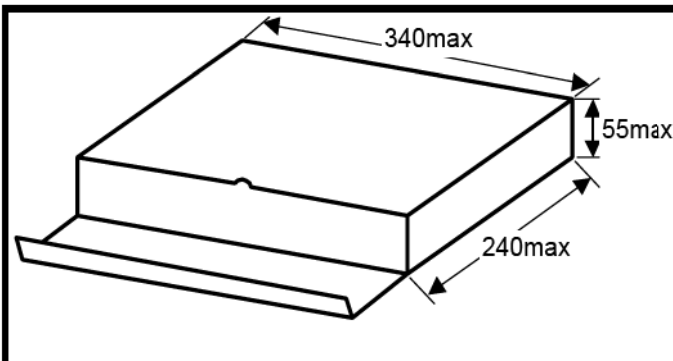


### Formed Leads and Taping

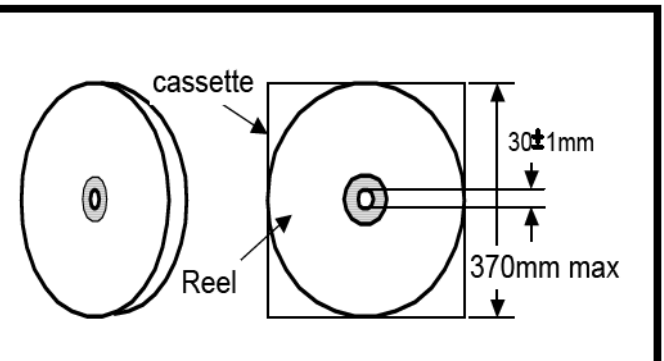
Units : mm(inch)

Symbol	Dimensions	Remarks
P	12.7±1(0.500±0.039)	Less than 2 mm of cumulative error per 20 pitches
P <sub>0</sub>	12.7±0.3(0.500±0.012)	
P <sub>1</sub>	3.85±0.5(0.152±0.020)	
P <sub>2</sub>	6.35±1(0.250±0.039)	
F	5±0.8(0.197±0.031)	
W	18±0.5(0.709-0.020)	
W <sub>1</sub>	9±0.5(0.354-0.020)	
H	20+1.5-1.0(0.787+0.059-0.039)	
ØD <sub>0</sub>	4±2(0.157±0.008)	
Ød	0.6+0.06-0.05(0.024+0.002-0.002)	

### AMMO-PACK



### REEL-PACK



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### ● Reliability Data

No	ITEM	CLASS I	CLASS II	CLASS III	Measuring Condition				
1	Operating Temperature Range	-25°C~+85°C	B:+25°C~+85°C E&F: -25°C~+85°C	F: -25°C~+85°C (Y5V)					
2	Temperature Characteristics	CH:0±60ppm/°C SL:+350 -1000ppm/°C	B: ±10% E:+22%-56% F:+22%-82%	+22% -82%	Retain the sample for 30 minutes at the temperature specified below in the sequence listed in the table. Then measure the capacitance in each step after thermal equilibrium at each temperature is reached.				
					Step1	Step2	Step3	Step4	Step5
					Room Temp	Operating Temp(min)	Room Temp	Operating Temp(min)	Room Temp
					25±2°C	-25±3°C +10±2°C	25±2°C	85±2°C	25±2°C
					Note that step fan2 do not apply for the SL characteristics.				
3	Capacitance	Within the specified tolerance			Shall be measured 25±2°C normal temperature at the frequency and voltage				
4	Q or Dissipation Factor (tan δ)	C≥30pF; Q≥1000 C<30pF;Q≥400+20·C (C is nominal capacitance)	B&E:tan δ ≤ 0.025 F: tan δ ≤ 0.05	F: tan δ ≤ 0.05	ClassI:1MHz±20%, 1±0.2Vrms ClassII:1KHz±10%, 1±0.2Vrms ClassIII:1KHz±20%, 0.5±0.05Vrms				
5	Withstanding Voltage	No defects			Applied: Rated voltage:3 (class I) Rated voltage:2.5 (class II) Rated voltage:2 (class III) Duration:1 to 5 sec. The charge/discharge current is less than 50mA.				
6	Insulation Resistance	More than 10GΩ	More than 10GΩ or 200ΩF, whichever is less	More than 1GΩ or 20ΩF, whichever is less	Apply rated voltage for 1 minute at 25±2°C and 70% R.H. max. 16Vdc product: Measurement voltage is 25Vdc				
7	Pull Test (Tensile stress)	Termination not to be broken or loosened			Fix the capacitor, apply the tensile stress listed below in the terminal extraction direction until the designated value is reached. Then retain the capacitor for 10±0.1 seconds as is.				
		Nominal wire diameter		0.5 mm	0.6 mm				
		Tensile stress		5N	10N				
8	Solderability of Leads	At least three-fourths of the immersed surface in the circumference direction is covered with new solder.			Solder temperature: 230±5°C Dipping: 3±0.5 sec. (Flux shall be used)				
9	Resistance to Solder Heat	ΔC	±2.5%or±0.25pF (Whichever is greater)	B : ±5% E : ±15% F : ±20%	F : ±30% (Y5V)	The lead wire immersed in the melted solder 1.5mm to 2mm from the capacitor body.			
		Withstanding voltage	No defects			CLASSI,II	CLASSIII		
		Exterior	No abnormalities			Solder temperature	350±10°C	260±5°C	
		Duration				3±0.5sec	5±0.5sec		
					The measurements after testing must be taken after leaving the sample for 12 to 24 hours under normal temperature and humidity conditions.				

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No	ITEM	CLASS I	CLASS II	CLASS III	Measuring Condition													
10	Thermal shock	$\Delta C$	$\pm 2.5\%$ or $\pm 0.25\text{pF}$ (Whichever is greater)	B : $\pm 5\%$ E : $\pm 15\%$ F : $\pm 20\%$	F : $\pm 30\%$ (Y5V)	<p>Fix the capacitor to the supporting jig in the same manner and under the same conditions as(10). Perform the five cycles according to the four heat treatments listed in the following table.</p> <table border="1"> <thead> <tr> <th>Step 1</th> <th>Step 2</th> <th>Step 3</th> <th>Step 4</th> </tr> </thead> <tbody> <tr> <td>Operating Temp(min)</td> <td>Room Temp</td> <td>Operating Temp(max)</td> <td>Room Temp</td> </tr> <tr> <td>30<math>\pm</math>3</td> <td>15</td> <td>30<math>\pm</math>3</td> <td>15</td> </tr> </tbody> </table> <p>The measurements after testing must be taken after leaving the sample for 12 to 24 hours under normal temperature and humidity conditions.</p>	Step 1	Step 2	Step 3	Step 4	Operating Temp(min)	Room Temp	Operating Temp(max)	Room Temp	30 $\pm$ 3	15	30 $\pm$ 3	15
		Step 1	Step 2	Step 3	Step 4													
		Operating Temp(min)	Room Temp	Operating Temp(max)	Room Temp													
		30 $\pm$ 3	15	30 $\pm$ 3	15													
		Q/D.F.	$C \geq 30\text{pF}$ : $Q \geq 1000$ $C < 30\text{pF}$ : $Q \geq 400+20 \cdot C$ C is nominal capacitance	B&E: $\tan \delta \leq 0.025$ F : $\tan \delta \leq 0.05$	F : $\tan \delta \leq 0.05$ (Y5V)													
I.R.	More than $10G\Omega$	More than $10G\Omega$ or $20\Omega$ ·F, whichever is less	More than $10G\Omega$ or $20\Omega$ ·F, whichever is less															
Withstanding voltage	No defects																	
Exterior	No abnormalities																	
11	Moisture resistance (steady state)	$\Delta C$	$\pm 5\%$ or $\pm 0.5\text{pF}$ (Whichever is greater)	B : $\pm 10\%$ E : $\pm 20\%$ F : $\pm 30\%$	F : $\pm 30\%$ (Y5V)	<p>Temperature: <math>40 \pm 2^\circ\text{C}</math> Humidity 90 to 95% R.H. Duration: 500+24-0 Hrs.</p> <p>The measurements after testing must be taken after leaving the sample for 1 to 2 hours under normal temperature and humidity conditions.</p> <p>*Perform a heat treatment at <math>40 \pm 2^\circ\text{C}</math> for 1 hours. Remove and let sit for 1 to 2 hours at normal temperature and humidity conditions. Perform the initial measurement</p>												
		Q/D.F.	$C \geq 30\text{pF}$ : $Q \geq 350$ $10\text{pF} < C < 30\text{pF}$ : $Q \geq 275+5/2 \cdot C$ $C \leq 10\text{pF}$ : $Q \geq 200+10 \cdot C$	B&E: $\tan \delta \leq 0.05$ F : $\tan \delta \leq 0.075$	F : $\tan \delta \leq 0.075$ (Y5V)													
		I.R.	More than $1G\Omega$	More than $1G\Omega$ or $20\Omega$ ·F, whichever is less	More than $500M\Omega$ or $10\Omega$ ·F, whichever is less													
		Withstanding voltage	No defects															
		Exterior	No abnormalities															
12	High Temperature loading	$\Delta C$	$\pm 5\%$ or $\pm 0.5\text{pF}$ (Whichever is greater)	B : $\pm 10\%$ E : $\pm 20\%$ F : $\pm 30\%$	F : $\pm 30\%$ (Y5V)	<p>Applied Voltage: Rated voltage·2(CLASSI,II) Rated voltage·1.25(CLASSIII)</p> <p>Temperature: <math>85 \pm 2^\circ\text{C}</math> Duration: 1000+48-0 Hrs. The charge/discharge current is less than 10mA The measurements after testing must be taken after leaving the sample for 12 to 24 hours under normal temperature and humidity conditions.</p> <p>*Perform a heat treatment at <math>85 \pm 2^\circ\text{C}</math> for 1 hours. Remove and let sit for 12 to 24 hours at normal temperature and humidity conditions. Perform the initial measurement</p>												
		Q/D.F.	$C \geq 30\text{pF}$ : $Q \geq 350$ $10\text{pF} < C < 30\text{pF}$ : $Q \geq 275+5/2 \cdot C$ $C \leq 10\text{pF}$ : $Q \geq 200+10 \cdot C$	B&E: $\tan \delta \leq 0.05$ F : $\tan \delta \leq 0.075$	F : $\tan \delta \leq 0.075$ (Y5V)													
		I.R.	More than $1G\Omega$	More than $1G\Omega$ or $20\Omega$ ·F, whichever is less	More than $500M\Omega$ or $10\Omega$ ·F, whichever is less													
		Withstanding voltage	No defects															
		Exterior	No abnormalities															

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● **1KV Series**

W.V. (DC)	TEMP.Char./Capacitance range(PF)					DIA (mm)
	NPO	SL	(Y5E)(Y5P)	(Z5U)	(Z5V)	
1KV	1~10	30~56	100~470	1000~1200		5±1
	12 ~33	68~100	500~680	1500~2200		6±1
	39~50	120~150	820~1000	2700~3300		7±1
	56~68	180~220	1500~1800	3900	4700~6800	8±1
	79~90	270~330	2000~2200	4700~5600	8200~10000	9±1
	100~120	350~390	2700~3300	6800	12000	10±1
				8200~10000	15000	11±1
	150~180	470~560	3900~4700	12000		12±1
	200~220	680~820	5000~6800	15000	18000~22000	14±1
					100000	21±1

● **2KV Series(Epoxy Coating)**

W.V. (DC)	TEMP.Char./Capacitance range(PF)					DIA (mm)
	NPO	SL	(Y5E)(Y5P)	(Z5U)	(Z5V)	
2KV	1~20	15~56	100~470	1000~1200		5±1
	22 ~30	68~100	560~820	1500~2200	3300~3900	6±1
	33~39	120~150	1000~1200	2700~3300	4700~5000	7±1
	47~50	180	1500	3500~3900	5600~6800	8±1
	56~68	200~220	1800~2200	4700~5600	8200	9±1
	75~82	270~300	2700		10000	10±1
	90~100	330	3000~3300	6800	12000	11±1
	110~120					12±1
	150	390	3900	8200~10000		13±1
			4700~5600			14±1



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● **3KV Series(Epoxy Coating)**

W.V. (DC)	TEMP.Char./Capacitance range(PF)					DIA (mm)
	NPO	SL	(Y5E)(Y5P)	(Z5U)	(Z5V)	
3KV	1~18	15~47	100~470	1000~1200	1800~2200	6±1
	20~30	50~68	680~820	1500	2700~3300	7±1
	33~39	82~100	1000	1800~2000	3900	8±1
	47~56	120	1200	2200~2700	4700~5600	9±1
	62~68	150~180	1500	3000~3300		10±1
	75~82	200~220	1800		6800~8200	11±1
	90~100	270	2000~2200	3900~4700	10000	12±1
	110~120	300~330				13±1
	150		2700~3300	5000~6800		14±1

● **6KV,10KV Series(Epoxy Coating)**

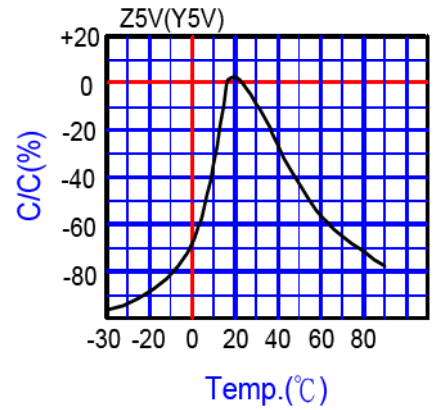
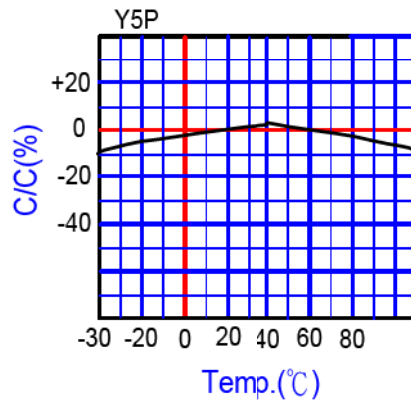
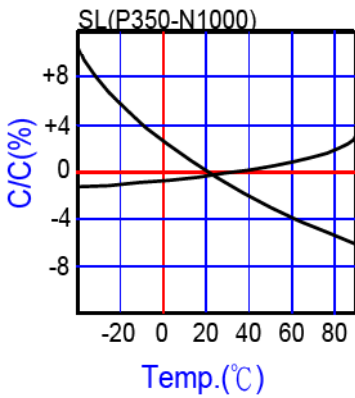
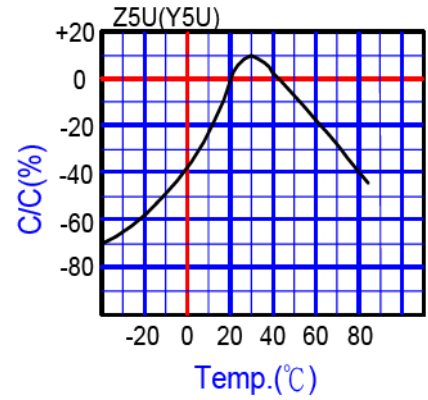
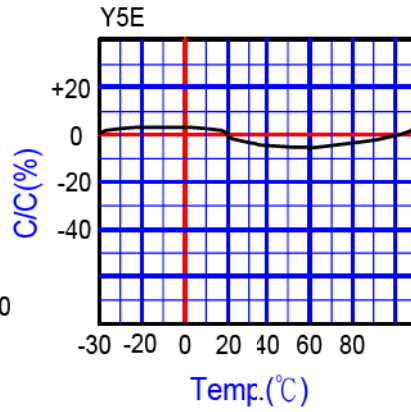
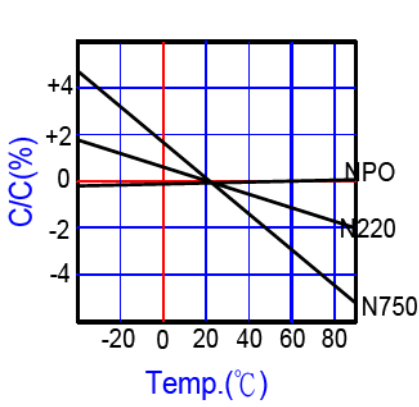
W.V. (DC)	TEMP.Char./Capacitance range(PF)			DIA (mm)
	SL	(Y5E)(Y5P)	(Z5U)	
6KV	5~22	100~330		6±1
	27~39	390~500		7±1
	47~56	560~680	1000	8±1
	68			9±1
	82	820	1500	10±1
			2200	11±1
	100~120	1000		12±1
		1500		13±1
	150			14±1
		3300	15±1	
10KV		100~120		7±1
		150~180		8±1
		200~220		10±1
		270~330		12±1
		470~560		13±1
		680		14±1

Temperature Dependency of Capacitance (Approx. Values)

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### ● Medium-High Voltage Capacitors

No	ITEM	CLASS I	CLASS II	Measuring Condition				
1	Operating Temperature Range	-25°C~+85°C	B:+25°C~+85°C E&F:-25°C~+85°C					
2	Temperature Characteristics	CH:0±60ppm/°C SL:+350-1000ppm/°C	B: ±10% E:+22%-56% F:+30%-32%	Retain the sample for 30 minutes at the temperature specified below in the sequence listed in the table. Then measure the capacitance in each step after thermal equilibrium at each temperature is reached.				
				Step1	Step2	Step3	Step4	Step5
				Room Temp	Operating Temp(min)	Room Temp	Operating Temp(min)	Room Temp
				25±2°C	- 25±3°C +10±2°C	25±2°C	85±2°C	25±2°C
Note that step fan2 do not apply for the SL characteristics.								
3	Capacitance	Within the specified tolerance		Shall be measured 25±2°C normal temperature at the frequency and voltage				
4	Q or Dissipation Factor (tan δ)	C ≥ 30pF; Q ≥ 1000 C < 30pF; Q ≥ 400+20·C (C is nominal capacitance)	B&E: tan δ ≤ 0.025 F: tan δ ≤ 0.05	Class I: 1MHz±20%, 1±0.2Vrms Class II: 1KHz±10%, 1±0.2Vrms				
5	Withstanding Voltage	Between Terminals		Applied: Rated voltage 2 (class I) Rated voltage 1.5 (class II) Duration: 60 sec. The charge/discharge current is less than 50mA.				
		Between Terminals and body		Applied voltage: 1.3KVDC Duration: 60 sec.				
6	Insulation Resistance	More than 10GΩ or 200Ω·F, whichever is less		Apply 500VDC for 1 minute at 25±2°C and 70% R.H. max.				
7	Strength of termination	Termination not to be broken or loosened		Fix the capacitor, apply the tensile stress listed below in the terminal extraction direction until the designated value is reached. Then retain the capacitor for 10±0.1 seconds as is.				
				<table border="1"> <tr> <td>Nominal wire diameter</td> <td>0.6 mm</td> <td>0.7 mm</td> </tr> <tr> <td>Tensile stress</td> <td>10N</td> <td>10N</td> </tr> </table>	Nominal wire diameter	0.6 mm	0.7 mm	Tensile stress
Nominal wire diameter	0.6 mm	0.7 mm						
Tensile stress	10N	10N						
8	Solderability of Leads	At least three-fourths of the immersed surface in the circumference direction is covered with new solder.		Solder temperature: 230±5°C Dipping: 3±0.5 sec. (Flux shall be used)				
9	Resistance to Solder Heat	ΔC	±2.5% or ±0.25pF (Whichever is greater)	The lead wire immersed in the melted solder 1.5mm to 2mm from the capacitor body. Solder temperature: 350±10°C Dipping: 3±0.5 sec. The measurements after testing must be taken after leaving the sample for 12 to 24 hours under normal temperature and humidity conditions.				
		Withstanding voltage	No defects					
		Exterior	No abnormalities					

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