Multi-Layer Ceramic Capacitor

## NP0(C0G) & X7R Mid-High Voltage Dielectrics

#### Features

- A monolithic structure ensures high reliability and mechanical strength.
- High capacitance density.
- Suitable for high speed SMT placement on PCBs.
- Ni barrier termination highly resistance to migration.
- Rated Voltage from 200VDC to 3,000VDC.
- Lead-free termination is in compliance with the requirement of green plan and ROHS.

#### Applications

- Input filtering circuit of modem and LAN interface.
- DC-DC Converters
- Backlighting inverters of LCD screen.
- Switching circuit.
- General high voltage circuit.

#### Mid-High Voltage C0G(NP0) & X7R Dielectric Characteristics

	COG (NP0)	X7R				
Capacitance Range	4.7pF to 2.2nF	100pF to 1.0uF				
Size (mm)	2012 3216 4520	2012 3216 4520 4532				
(EIA inch)	(0805) (1206) (1808)	(0805) (1206) (1808) (1812)				
Test Voltage	1.0 ± 0.2Vrms	1.0 ± 0.2Vrms				
Test Frequency	$1.0 \pm 0.2$ MHz for cap $\leq 1,000$ pF,	1.0 ± 0.2KHz				
	1.0 ± 0.2KHz for cap>1,000pF					
Capacitance Tolerance	± 10%					
	± 0.50pF for 5pF $\leq$ cap $<$ 10pF					
	± 5%, ± 10% for cap≧10pF					
Operating Temperature Range	-55℃ to +125℃	-55℃ to +125℃				
Maximum Capacitance Change	0 ± 30 ppm/°C (EIA C0G)	± 15 %				
Rated Voltage	200/250, 500/630, 1K, 2K & 3K VDC	200/250, 500/630, 1K & 2K VDC				
Dissipation Factor (DF)	0.1% max. for cap>30pF	2.5%				
	1/(400 + 20 x C) for cap ≤ 30pF, C in pF					
Insulation Resistance(+25°C, RVDC)	10,000 MΩ minimum	10,000 M $\Omega$ minimum				
Insulation Resistance (Maximum	1,000 M $\Omega$ min. or 50 $\Omega$ -F min., whichever	r 1,000 MΩ min. or 50Ω-F min.,				
operating temperature, RVDC)	is smaller	whichever is smaller				

Note : Capacitors above 500WVDC may require a surface coating to prevent external arcing.



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### Multi-Layer Ceramic Capacitor

#### Product Range and Thickness

CLASS		Class I											
TYPE				M	lid-High	Nolta	ge						
T.C.					C0G	(NP0)							
SIZE		20	12			32	16					4520	
(EIA)		(08	605)			(12	06)				(	1808	5)
RV	200/2	250V	500V/630V	200/250V 500V/630V			1KV 2KV			3KV			
4.7 p											F	G	Η
5.6 p											F	G	Н
6.8 p											F	G	Н
8.2 p											F	G	Н
10 p	С	E	I	E	Е	-	ш	F	ш	G	F	G	Н
12 p	С	Е	I	E	Е	-	ш	ш	ш	G	F	G	Η
15 p	С	Е	I	E	Е		Е	F	Е	G	F	G	Н
18 p	С	Е	I	Е	Е	I	Е	F	Е	G	F	G	Н
22 p	С	Е	1	E	Е	1	Е	F	Е	G	F	G	Н
27 p	С	E	I	E	Е	1	E	F	Е	G	F	G	Н
33 p	С	Е	I	E	Е	F	-	=	F	G	F	G	Н
39 p	С	Е	I	E	Е	F	-	=	F	G	F	G	Н
47 p	С	Е	I	E	Е	F	-	=	F	G	F	G	Н
56 p	С	Е	I	E	Е	F	I	=	F	G	F	G	Н
68 p	С	Е	I	E	E	F	I	=	F	G	F	G	Н
82 p	С	Е	I	E	Е	F		=	F	G	F	G	Н
100 p	С	Е	I	E	Е	F	-	=	F	G	F	G	Н
120 p	С	Е	I	E	Е		-	=	F	G	F		L
150 p	E	=	I	E	Е			=	F	G	F		L
180 p	E	=	I	E	Е		I	=	F	G		L	
220 p	Е	G	1	E	Е		I	=	F	G		L	
270 p	Е	G	I	E	1	F	I	=		L		L	
330 p	Е	G	I	E	- 1	F		=					
390 p	E	G	1	E	- 1	F	I	=					
470 p	Е	G	I	1	1	F	I	=					
560 p	E	G		1	(	3							
680 p	Е	G		I	(	3							
820 p	Е	G		F	(	3							
1.0 n				L	[ [	-						_	
1.2 n				1									
1.5 n				1									
1.8 n				G									
2.2 n				G									
2.7 n													
3.3 n													

- Non-standard capacitance or thickness is available on request
- The thickness might be changed due to technology improvement.
- Capacitors above 500WVDC may require a surface coating to prevent external arcing.

Thick	mess (mm)	Thick	kness (mm)	Thickness (mm)		ness (mm) Thick		Thickness (mm)		
Code	Class	Code	Class	Code	Class	Code	Class	Code	Class	
А	0.30+/-0.03	М	0.70+/-0.15	I	0.95+/-0.15	Н	1.50+/-0.20	N	2.00+/-0.20	
В	0.50+/-0.05	D	0.80+/-0.10	F	1.15+/-0.20	Р	2.50+/-0.20	R	3.20+/-0.20	
C	0.60+/-0.15	E	0.85+/-0.15	G	1.25+/-0.20	Ĺ	1.60+/-0.20			

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### Multi-Layer Ceramic Capacitor

#### **Product Range and Thickness**

CLASS		Class II																	
TYPE							Mid-⊦	ligh V	oltage	•									
1.0.	20	10		20	16			X/R		45	20				4500				
	20	05)		32	10					40/	20				4032			_	
	200/250\/	500\//630\/	200/250\/	500\//630\/	14	(V	2k	N	21	(10)	00) 34	N	100\/			) (630\/	2K	V	3K1/
47 n	200/2001	500 0/050 0	200/200	500 0/050 0	- 11	<b>\</b> V	21	(V	21	τv	51	<b>ν</b>	1000	200/230 V	500 0	000 v	21	•	511.0
56 p																		-	
68 p																		-	
82 p																		-	
100 p											F	-							
120 p											F	-							
150 p											F	-							
180 p	E	E	E	E	Е	G	Е	G	F	Н	G	Ν							
220 p	E	E	E	E	Е	G	Е	G	F	Н	G	Ν							
270 p	E	E	Е	E	Е	G	Е	G	F	Н	G	Ν							
330 p	E	E	E	E	Е	G	Е	G	F	Н	G	Ν						_	
390 p	E	E	E	E	E	G	E	G	F	H	G	Ν						_	
470 p	E	E	E	E	E	G	E	G	F	H	G	N					G	L	
560 p	E	E	E	E	F	G	F	G	F	<u>H</u>	G	N					G	L	
680 p	E F	E		E	F	G	G	<u> </u>	F	<u> H</u>	G	N					G	누	
820 p	E	E	E	E	+	G	G		+	H	G	N					G	<u> </u>	N
1.0 n	E	E	E	E	F	G	L	-	GI		G	N					E	H	N
1.2 n	E	E F	E	E	F	G			н	IN N	G	IN N					G	는	N N
1.5 N	E	E	E	E	9 0					IN N	G	IN N					G	÷	N N
1.011 2.2 n	E	E		 	6					N	9	IN					9	-	N
2.2 II 2.7 n	E	F	E	F	0	L				IN							_		N
3.3 n	F	F	 F	F														-	IN
3.9 n	F		F	F														$\rightarrow$	
4.7 n	E		E	E														-	
5.6 n	G		Е	Е															
6.8 n	G		Е	E															
8.2 n	G		E	F															
10 n	G		Е	F										G	(	÷			
12 n	G		E	F										G	(	3			
15 n			E	L										G	(	3		$\downarrow$	
18 n			F	L										G	(	3		$\downarrow$	
22 n			F	L										G	(	÷		+	
27 n			F	L										G		j I		+	
33 n			F	L										G	G			+	
39 n			F											G	G			+	
47 II 56 n			r											G	1			+	
68 n														G		N		+	
100 n													G	G		N		+	
150 n													G	N	-			+	
220 n													G	N				+	
330 n													G	N				1	
470 n													LN	N				T	
<u>680 n</u>													LN						
I.0 u													LN						

• Non-standard capacitance or thickness is available on request

The thickness might be changed due to technology improvement.
Capacitors above 500WVDC may require a surface coating to prevent external arcing.

Typical Tolerance

Thick	iness (mm)	Thick	kness (mm)	Thick	mess (mm)	Thick	kness (mm)	Thickness (mm)		
Code	Class	Code	Class	Code	Class	Code	Class	Code	Class	
А	0.30+/-0.03	М	0.70+/-0.15		0.95+/-0.15	Н	1.50+/-0.20	N	2.00+/-0.20	
В	0.50+/-0.05	D	0.80+/-0.10	F	1.15+/-0.20	Р	2.50+/-0.20	R	3.20+/-0.20	
C	0.60+/-0.15	E	0.85+/-0.15	G	1.25+/-0.20	L	1.60+/-0.20			

#### **Special Tolerance**

Thic	kness (mm)	Thic	kness (mm)	Thic	Thickness (mm)		kness (mm)	Thickness (mm)			
Code	Class	Code	Class	Code	Class	Code	Class	Code	Class		
<u>G</u> 1.25 -0.20/+0.30 <u>L</u> 1.60 -0.20/+0.30 <u>N</u> 2.00+/-0.30 <u>P</u> 2.50+/-0.30 <u>R</u> 3.20+/-0.30											
For Con	or Construct Teleronee of dimensions will be enlarged										

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For Cap $\geq 1\mu$ F, Tolerance of dimensions will be enlarged.



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### Multi-Layer Ceramic Capacitor



	Thicknoss				Amou	nt per reel		
	THICKNESS		180	mm (7")	250	mm (10")	330	mm (13")
Code	Spec	Size(EIA)	Paper	Embossed	Paper	Embossed	Paper	Embossed
A	0.30+/-0.03	0603 (0201)	15K					
В	0.50+/-0.05	1005 (0402)	10K				50K	
C	$0.60 \pm -0.15$	2012 (0805)	4K		10K		15K	
0	0.0017 0.10	3216 (1206)	4K		10K		15K	
D	0.80+/-0.10	1608 (0603)	4K		10K		15K	
D*	0.80+0.15/ -0.10	1608 (0603)	4K		10K		15K	
		2012 (0805)	4K		10K		15K	
F	0.85+/-0.15	3216 (1206)	4K		10K		15K	
-		3225 (1210)		3K				10K
		4532 (1812)		1K				
1	0.95+/-0.15	2012 (0805)		3K				
•	0.0017 0.10	3216(1206)		3K				
F	1.15+/-0.20	3216 (1206)		3K				10K
•		4520 (1808)		3K				
		2012 (0805)		2K/3K				10K
		3216 (1206)		3K				10K
G	1.25 +/-0.20	3225 (1210)		3K				
		4520 (1808)		3K				
		4532 (1812)		1K				
_		2012 (0805)		2K/3K				10K
<u>G</u>	1.25+0.3/-0.2	3216 (1206)		3K				10K
		3225(1210)		3K				
		3225 (1210)		2K				
Н	1.50+/-0.20	4520 (1808)		2K				
		4532 (1812)		1K				
		3216 (1206)		2K				
1	1 60+/-0 20	3225 (1210)		2K				
<b>L</b>	1.0017 0.20	4520 (1808)		2K				
		4532 (1812)		1K				
		3216 (1206)		2K				
1	1 60+0 30/-0 20	3225 (1210)		2K				
<u> </u>	1.0010.00/ 0.20	4520 (1808)		2K				
		4532 (1812)		1K				
		3216 (1206)		2K/3K				
N	2 00+/-0 20	3225 (1210)		2K				
	2.0017 0.20	4520 (1808)		1K				
		4532 (1812)		1K				
<u>N</u>	2.00+/-0.30	3225 (1210)		2K				
Р	2.50+/-0.20	3225 (1210)		500pcs/1K				
<u>P</u>	2.50+/-0.30	3225 (1210)		500pcs/1K				
R	3.20+/-0.20			500pcs				
<u>R</u>	3.20+/-0.30			500pcs				

\*: For some products, the thickness spec can be 0.8+0.15/-0.1mm.



### Multi-Layer Ceramic Capacitor

### ■ Mid-High Voltage C0G(NP0) Specifications

NI -			Specification					To a Martha d
NO.	Item			Specification				lest Method
1	Operating Tempera	ture Range	-55°C to 125°C	)				-
2	Rated Voltage		200/250VDC, 2000VDC and	500/630VDC, 1 3000VDC	1000VDC,		The rate voltage, capacito	d voltage is defined as the maximum which may be applied continuously to the r.
3	Appearance		No defects or	abnormalities.			Visual in	spection
4	Dimensions		Within the spe	cified dimensio	on.		Using ca	alipers
5	Dielectric Strength	(Flash)	No derects of abnormalities.				No failur rated vol for 1 to 5 current is *150% fo 120% fo	e shall be observed when 250%* of the ltage is applied between the terminations 5 seconds, the charge and discharge s less than 50mA. or 500VDC; or 1KVDC, 2KVDC&3KVDC
6	Insulation Resistan	ce ( I.R.)	Rated Voltage:	To apply rated	I.R. $\geq 10G$ or		The insu	lation resistance shall be measured with a
			<500V Rated Voltage: ≥500V	voltage. To apply 500V.	$R_{C_R} \ge 500\Omega$ -F (whichever is smaller)		and 75%	SRH max, and within 1 minute of charging.
7	Capacitance		Within the spe	cified tolerance	). ).		The cap	acitance/D.F. shall be measured at $25^{\circ}$ at
8	Dissipation Factor	( D.F.)	lf C>30pF, DI	5≦0.1%			the frequ	Jency and voltage shown in the tables.
			lf C≦30pF, DI	F≦1/(400+20C	), C in pF		Freque	C = 1,000pr         C > 1,000pr           ency         1.0±0.2MHz         1.0±0.2KHz           ge         1.0±0.2Vrms         1.0±0.2Vrms
9	Capacitance Tempe	erature	Capacitance change within 0±30ppm/℃					ature compensating type: The capacitance
	Characteristics		under operatir	ng temperature	range.		value at	$25^{\circ}$ and $85^{\circ}$ shall be measured and
						T.C.= $(C_8)$	<sub>25</sub> -C <sub>25</sub> )/C <sub>25</sub> *∆T*10 <sup>6</sup> (PPM/°C)	
10	Termination Streng	th	No removal of	the termination	ns or markin	g	Apply a	parallel force of 5N to a PCB mounted
11	Deflection (Bending	g Strength)	Appearance: I defects. Capacitance c (whichever is	No cracking or i hange: within ± larger)	marking ±5% or ± 0.5	δpF.	Solder the boards) Then ap The sold and shall soldering heat sho	The capacitor to the test jig (glass epoxy shown in Fig. a. using a eutectic solder. ply a force in the direction shown in Fig. b. lering shall be done with the reflow method I be conducted with care so that the g is uniform and free of defects such as tock.
			(Unit in mm) b t t t t t t t t t t t t t	¢4.5 40 t:1.6mm	Size         a           2012         1.2           3216         2.2           4520         3.5           4532         3.5	b 4.0 5.0 7.0 7.0	C           1.65           2.0           2.5           3.7	$\begin{array}{c} 20 \\ 10 \\ 10 \\ 10 \\ 10 \\ 10 \\ 10 \\ 10 \\$
12	Solderability of Ter	mination	90% of the ter	minations is to	be soldered	ł	Immerse	the test capacitor into a methanol solution
			evenly and co	ntinuously.			containir to 180℃ molten s	ang rosin for 3 to 5 seconds, preheat it 150 for 2 to 3 minutes and immerse it into solder of $230 \pm 5^{\circ}$ for 5±1seconds.
13	Resistance to Ap	pearance	No marking de	efects		I	Preheat	the capacitor at 120 to $150^{\circ}$ C * for 1 minute.
	Soldering Heat Ca	o. Change	NP0 within ±2	.5% or ±0.25pF	. (whicheve	r is	Immerse at 270+5	the capacitor in an eutectic solder solution $\delta^{\circ}$ for 10±1 seconds. Let sit at room
			larger)	=<0.1%		_	tempera	ture for 24±2 hours, then measure.
			lf C≦30pF, DI	F≦1/(400+20C	), C in pF		* Prehea	at 150 to 200 $^\circ\!\!\mathbb{C}$ for size $\geq$ 3216.
	I.R.		I.R.≧10,000M ( whichever is	lΩ or R <sub>i</sub> C <sub>R</sub> ≧50 smaller)	0Ω-F.			

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#### Continued from previous page.

14	Temperature	Appearance	No marking defects	Solder the capacitor to supporting jig (glass epoxy
	(Thermal	Cap. Change	NP0 within ±2.5% or ±0.25pF. (whichever is larger)	four heat treatments listed in the following table. Let sit for $24+2hrs$ at room temperature, then measure
	Shocky	D.F.	If $C > 30pF$ , $DF \le 0.1\%$ If $C \le 30pF$ , $DF \le 1/(400+20C)$ , C in pF	Stop 1: Minimum operating temperature 20+2min
		I.R.	More than 10,000M $\Omega$ or R <sub>i</sub> C <sub>R</sub> >500 $\Omega$ -F ( whichever is smaller )	Step 1: Minimum operating temperatureS0±SiminStep 2: Room temperature2~3 minStep 3: Maximum operating temperature30±3minStep 4: Room temperature2~3min
15	Humidity Test	Appearance	No marking defects	Sits the capacitor at $40\pm2^{\circ}$ and 90 to 95%
	(Steady State)	Cap. Change	NP0 within ±7.5% or ±0.75pF. (whichever is larger)	24±2 hours at room temperature, then measure. The charge/discharge current is less than 50mA.
		D.F.	If C>30pF, DF≦0.5% If C≦30pF, DF≦1/(100+10xC/3), C in pF	
		I.R.	More than 500M $\Omega$ or R <sub>i</sub> C <sub>R</sub> $\ge$ 25 $\Omega$ -F. (whichever is smaller)	
16	High Temperature	Appearance	No marking defects	Apply 200%* of the rated voltage for 500±12 hours at the maximum operating temperature $\pm 3\%$ Let
	Temperature Load (Life Test)	Cap. Change	NP0 within ±7.5% or ±0.75pF (whichever is large)	sit for $24\pm 2$ hours at room temperature, then measure. The charge/discharge current is less than
		D.F.	If C>30pF, DF $\leq$ 0.3% If 10pF < C $\leq$ 30pF, DF $\leq$ 1/(275+5xC/2) If C $\leq$ 10pF, DF $\leq$ 1/(200+10C), C in pF	50mA. * 150% for 500VDC; 120% for 1000VDC, 2000VDC, 3000VDC
	Ī	I.R.	More than 1 G $\Omega$ or R <sub>i</sub> C <sub>R</sub> $\geq$ 50 $\Omega$ -F (whichever is smaller)	



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### Multi-Layer Ceramic Capacitor

### Mid-High Voltage X7R Specifications

No	lte	m		Specification	1			Test Method		
1	Operating Tem	perature Range	-55℃ to 125℃					-		
				F00/000 /F 6				<b>-</b>		
2	Rated Voltage		200/250VDC,	500/630VDC, 1	1000VI	DC,		The rated voltage is defined as the maximum voltage, which may be applied continuously to the		
			2000 0 DC					capacitor.		
3	Appearance		No defects or	abnormalities.			Ň	Visual inspection		
4	Dimensions		Within the spe	cified dimensio	n.		l	Using calipers		
5	Dielectric Stren	gth (Flash)	No defects or	abnormalities.			I	No failure shall be observed when 250%* of the		
							1	rated voltage is applied between the terminations		
							1	for 1 to 5 seconds, the charge and discharge		
							3	*150% for 500VDC. 120% for 1000VDC&2000VE		
6	Insulation Resis	stance (I.R.)	Rated Voltage:	To apply rated	I.R. ≧1	0G or	-	The insulation resistance shall be measured with		
			<500V	voltage.	$R_iC_R \ge 5$	00 <b>Ω-</b> F	[	DC voltage not exceeding the rated voltage at 25		
			Rated Voltage:	To apply 500V.	(whiche	ver is	ć	and 75%RH max, and within 1 minute of charging		
7	Canacitance		≧500V Within the sne	L cified tolerance	smaller)	00 ho		The capacitance/D E shall be measured at $25^{\circ}$		
	Dissination Fac	tor (DE)	2.5% maximu	m	, ut 1,0	00110	f	frequency $1.0\pm0.2$ KHz and voltage $1.0\pm0.2$ Vrms.		
0			2.5 /6 maximu			field	-	The render of conscitence change compared with		
9	Characteristics	inperature	tolerance as f	ollowing table.	le spec	meu		$25^{\circ}$ value over the temperature ranges shown in		
			Reference ter	nperature 25℃.			t	the table should be within the specified ranges.		
			Char. T	emp. Range	Cap.	Chang	ge			
			X7R -55℃ to 125℃ ± 15%							
10	Termination Str	ength	No removal of	the terminatior	ns or m	arkin	a /	Apply a parellel force of 5N to a PCB mounted		
		5	defect.					sample for 10±1sec.		
11	Deflection (Ben	ding Strength)	Appearance: No cracking or marking					Solder the capacitor to the test jig (glass epoxy		
			defects.					boards) shown in Fig. a. using a eutectic solder then let sit for 48+4 hours. Then apply a force in t		
			Capacitance		12.070			direction shown in Fig. b. The soldering shall be		
							C	done with the reflow method and shall be		
								conducted with care so that the soldering is uniform		
			(Lipit in mm)				Ċ			
				φ4.5				Pressurizing speed : 1.0mm/se		
					Size	а	b	C R230 ← Pressurize		
			© ⊂ ⊂ ⊂ ⊂	40	2012	1.2	4.0	1.65		
					3216	2.2	5.0			
			↓ 100	`>	4532	3.5	7.0	3.7 Capacitance Meter		
			Fia.	t :1.6mm a.				$\frac{1}{ \langle \neg \neg \rangle} \langle \neg \neg \rangle $ Fig. b		
12	Solderability of	Termination	90% of the ter	minations is to	be sol	dered	I	Immerse the test capacitor into a methanol solution		
			evenly and co	ntinuously.			C	containing rosin for 3 to 5 seconds, preheat it 150		
								to $180^{\circ}$ for 2 to 3 minutes and immerse it into		
13	Resistance to	Annearance	No marking d	ofects				Preheat the capacitor at 120 to $150^{\circ}$ for 1 minut		
	Soldering Heat	Can Change	Within ±7.5%	510015			— i	Immerse the capacitor in an eutectic solder solution		
	_		2.5% movimu	~				at 270 $\pm$ 5°C for 10 $\pm$ 1 seconds. Let sit at room		
		D.r.	2.5% maximu	111 10 <b>D</b> 0 -> <b>F</b> (			t	temperature for $48\pm4$ hours, then measure.		
		I.K.	I.K.≧10,000N (whicheveris	1\2_OF K <sub>i</sub> C <sub>R</sub> ≧50 smaller)	UU\2-F		ľ	Fielded 150 to 200 $\cup$ for SiZe $\ge 3216$ .		
							Initial measurement : perform a heat treatment at			
							·	150+0/-10 $^\circ\!\!{\rm C}$ for one hour and then let sit for 48±4		
							ľ	hours at room temperature. Perform the initial		
			1				l l	measurement.		

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### Multi-Layer Ceramic Capacitor

#### Continued from previous page.

14	Temperature	Appearance	No marking defects	Solder the capacitor to supporting jig (glass epoxy
	Cycle	Cap. Change	Within ±7.5%	board) and perform the five cycles according to the
	Shock)	D.F.	2.5% maximum	sit for 48±4hrs at room temperature, then measure.
		I.R.	More than 10,000M $\Omega~$ or $\rm R_iC_R>500\Omega$ -F ( whichever is smaller )	Step 1: Minimum operating temperature30±3minStep 2: Room temperature2~3 minStep 3: Maximum operating temperature30±3minStep 4: Room operating temperature2~3min
				Initial measurement : perform a heat treatment at $150+0/-10^{\circ}$ for one hour and then let sit for $48\pm4$ hours at room temperature. Perform the initial measurement.
15	Humidity Test (Steady State)	Appearance	No marking defects	Sits the capacitor at 40±2°C and 90 to 95%
		Cap. Change	Within ±12.5%	humidity for 500±12 hours. Remove and let sit for 48+4 hours at room temperature, then measure
		D.F.	5% maximum	The charge/discharge current is less than 50mA.
		I.R.	More than 500M $\Omega$ or $R_i C_R \ge 25 \Omega$ -F. (whichever is smaller)	Initial measurement : perform a heat treatment at $150+0/-10^{\circ}$ for one hour and then let sit for $48\pm4$
		Dielectric Strength	No failure	hours at room temperature. Perform the initial measurement.
16	High	Appearance	No marking defects	Apply 200%* of the rated voltage for 500±12 hours
	Temperature	Cap. Change	Within ±12.5%	at the maximum operating temperature $\pm 3^{\circ}$ . Let
	(Life Test)	D.F.	5% maximum	measure. The charge/discharge current is less than
		I.R.	More than 1 G $\Omega$ or $R_iC_R \ge 50 \Omega$ -F. (whichever is smaller)	50mA. * 150% for 500V. 120% for 1000VDC&2000VDC
				Pre-treatment: Apply the rated voltage for 1 hr at maximum operating temperature $\pm 3^{\circ}$ C. Remove and let sit for $48\pm 4$ hours, then perform the initial measurement.



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