PRODUCT SPECIFICATION

PRODUCT: CERAMIC DISC CAPACITOR

TYPE: 50V, 100V, 500V, 1KV, 2KV HI-K CERAMIC CAPACITOR DOWN SIZE PRODUCT

CUSTOMER: _____

DOC. NO.: POE-D04-00-E-04

Ver.: 4

APPROVED BY CUSTOMER

VENDOR：

☐ **WALSIN TECHNOLOGY CORPORATION**

566-1, KAO SHI ROAD,YANG-MEI
TAO-YUAN, TAIWAN

☐ **PAN OVERSEAS (GUANGZHOU) ELECTRONIC CO.,LTD.**

NO.277,HONG MING ROAD,EASTERN SECTION,
GUANG ZHOU ECONOMIC AND TECHNOLOGY
DEVELOPMENT ZONE,CHINA

MAKER：PAN OVERSEAS (GUANGZHOU) ELECTRONIC CO.,LTD.

NO.277,HONG MING ROAD,EASTERN SECTION,
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DEVELOPMENT ZONE,CHINA

Record of change

<table>
<tr><th>Date</th><th>Version</th><th>Description</th><th>page</th></tr>
<tr><td>2008.6.3</td><td>1</td><td>1. D15-00-E-09 (before) → POE-D04-00-E-01 (1st edition)</td><td></td></tr>
<tr><td>2008.8.22</td><td>2</td><td>1. Revised diameter as below
<table>
<tr><th>Before</th><th>After</th><th>Before</th><th>After</th></tr>
<tr><td>YP500682X080*</td><td>YP500682X090*</td><td>ZU102123X140*</td><td>not available</td></tr>
<tr><td>YP501332X080*</td><td>YP501332X090*</td><td>ZU102153X140*</td><td>not available</td></tr>
<tr><td>YP501392X100*</td><td>YP501392X090*</td><td>ZU102183X140*</td><td>not available</td></tr>
<tr><td>YP501562X110*</td><td>YP501562X100*</td><td>ZU102223X140*</td><td>not available</td></tr>
<tr><td>YP202182X100*</td><td>YP202182X090*</td><td>ZU202122X070*</td><td>ZU202122X060*</td></tr>
<tr><td>YP202202X120*</td><td>YP202202X090*</td><td>ZV500122X050*</td><td>not available</td></tr>
<tr><td>YP202222X120*</td><td>YP202222X090*</td><td>ZV500502X050*</td><td>not available</td></tr>
<tr><td>YP202272X120*</td><td>YP202272X100*</td><td>ZV500562X050*</td><td>not available</td></tr>
<tr><td>YP202392X140*</td><td>YP202392X120*</td><td>ZV500682X060*</td><td>not available</td></tr>
<tr><td>ZU500122X040*</td><td>ZU500122X050*</td><td>ZV500822X060*</td><td>not available</td></tr>
<tr><td>ZU500152X040*</td><td>ZU500152X050*</td><td>ZV500153X060*</td><td>not available</td></tr>
<tr><td>ZU500182X040*</td><td>ZU500182X050*</td><td>ZV500183X070*</td><td>not available</td></tr>
<tr><td>ZU500332X050*</td><td>ZU500332X040*</td><td>ZV101122X050*</td><td>not available</td></tr>
<tr><td>ZU500362X050*</td><td>ZU500362X040*</td><td>ZV101502X050*</td><td>not available</td></tr>
<tr><td>ZU500392X050*</td><td>ZU500392X040*</td><td>ZV101562X050*</td><td>not available</td></tr>
<tr><td>ZU500472X050*</td><td>ZU500472X040*</td><td>ZV101682X060*</td><td>not available</td></tr>
<tr><td>ZU501122X040*</td><td>ZU501122X050*</td><td>ZV101822X060*</td><td>not available</td></tr>
<tr><td>ZU501152X040*</td><td>ZU501152X050*</td><td>ZV101153X060*</td><td>not available</td></tr>
<tr><td>ZU101152X040*</td><td>ZU101152X050*</td><td>ZV101183X070*</td><td>not available</td></tr>
<tr><td>ZU101182X040*</td><td>ZU101182X050*</td><td>ZV102102X060*</td><td>not available</td></tr>
<tr><td>ZU101332X050*</td><td>ZU101332X040*</td><td>ZV102332X060*</td><td>not available</td></tr>
<tr><td>ZU101362X050*</td><td>ZU101362X040*</td><td>ZV102362X080*</td><td>not available</td></tr>
<tr><td>ZU101392X050*</td><td>ZU101392X040*</td><td>ZV102562X080*</td><td>not available</td></tr>
<tr><td>ZU101472X050*</td><td>ZU101472X040*</td><td>ZV102682X100*</td><td>not available</td></tr>
<tr><td>ZU102123X140*</td><td>not available</td><td>ZV102822X100*</td><td>not available</td></tr>
</table>
2. Complete lead code
3.Add last SAP code “ H” for halogen and Pb free , epoxy resin..</td><td>5-7

16-19
8</td></tr>
<tr><td>2008.12.12</td><td>3</td><td>1.Complete lead code of SAP P/N
2. Page layout adjustment.
3. Added marking when the coating resin is Halogen and Pb free Epoxy.</td><td>3-7</td></tr>
<tr><td>2009.9.14</td><td>4</td><td>1. Change PSA & POE logo to Walsin & POE logo.
2. Add remark of Lead-wire protrusion：Or the end of lead wire may be inside the tape.</td><td></td></tr>
</table>

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1. Part number for SAP system(total eighteen code)：

YP ❶ 102 ❷ 102 ❸ K ❹ 060 ❺ B ❻ 20 ❼ C ❽ 5 ❾ B ❿

❶ Temperature characteristic：

Code	YP(Y5P)	ZU(Z5U)	ZV(Z5V)
Operating temperature	-25℃ to +85℃	+10℃ to +85℃	
Cap. change	±10%	-56%~+22%	-82%~+22%

❷ Rated voltage (Vdc)：

Voltage	50V	100V	500V	1000V	2000V
Code	500	101	501	102	202

❸Capacitance(pF)：

Capacitors (pF)	100	470	1000	2200	4700
Code	101	471	102	222	472

❹Capacitance tolerance：K=±10%、M=±20%、Z=+80%-20%

❺ Nominal body diameter dimension：

Diameter size	4mm	5mm	6mm	7mm	8mm	9mm	10mm	11mm	12mm	13mm	14mm
Code	040	050	060	070	080	090	100	110	120	130	140

❻ Code of lead type：Please refer to Item “2.Mechanical”.

❼Packing mode and lead’s length (identified by 2-figure code)

Taping Code	Description
AN	Ammo / Pitch of component:12.7 mm

Bulk Code	Description
3E	Lead’s length L：3.5mm
04	Lead’s length L：4.0mm
4E	Lead’s length L：4.5mm
20	Lead’s length L：20mm

❽Length tolerance

Code	Description
A	±0.5 mm(Only for short kink lead code “D / X / H”)
B	±1.0 mm
C	Min.
D	Taping special purpose

❾Pitch

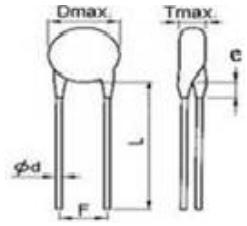
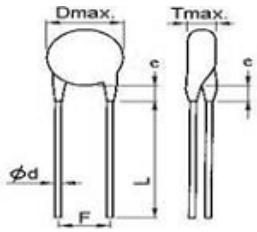
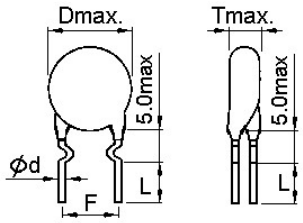
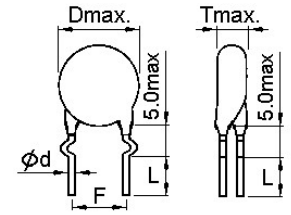
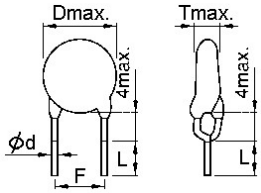
Code	Description		Code	Description
5	5.0±0.8mm (For Bulk)		7	7.5 ±1mm
5	5.0+0.8mm-0.2mm (For Taping)		0	10.0 ±1mm
2	2.5 ±0.8 mm			

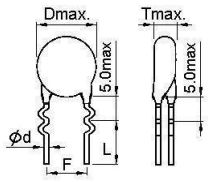
❿Coating code

Code	Description
P	Phenolic resin -Pb free, voltage≦1kV
A	Halogen free and Pb free, phenolic resin, voltage≦1kV
B	Epoxy Resin , Pb free, voltage≧2kV
H	Halogen free and Pb free , epoxy resin, voltage≧2kV

2. Mechanical:

Available lead code: (unit: mm)

Lead type	SAP P/N (13-17) digits	Old P/N Refer to "2.1 Old P/N"	Pitch (F)	Lead length (L)	Available rated voltage	Packing	Lead configuration
Lead style：B Straight long lead	B20C2	5	2.5 ± 0.8	20 MIN.	50V	Bulk	
	B20C5	6	5.0 ± 0.8	20 MIN.	50V,500V, 1KV,2KV		
	B20C6	7	6.4 ± 1.0	20 MIN.			
	B20C7	W4	7.5 ± 1.0	20 MIN.			
	B20C0	C	10 ± 1.0	20 MIN.			
	BAND5	G	$5.0^{+0.8}_{-0.2}$	Taping Spec. (Ref.to page.9)		Tap. Ammo	
	BAND2	F	2.5 ± 0.8		50V		
Lead style：L Straight short lead	L05B2	1	2.5 ± 0.8	5.0 ± 1.0		Bulk	
	L4EB5	A5	5.0 ± 0.8	4.5 ± 1.0	50V,500V, 1KV, 2KV		
	L05B5	2	5.0 ± 0.8	5.0 ± 1.0			
	L05B6	P14	6.4 ± 1.0	5.0 ± 1.0			
	L4EB7	A7	7.5 ± 1.0	4.5 ± 1.0			
	L05B7	P16	7.5 ± 1.0	5.0 ± 1.0			
	L4EB0	A0	10 ± 1.0	4.5 ± 1.0			
	L05B0	A	10 ± 1.0	5.0 ± 1.0			
Lead style：H Inside kink lead	H3EA5	H1	5.0 ± 0.8	3.5 ± 0.5	50V,500V, 1KV, 2KV	Bulk	
	H04A5	B5	5.0 ± 0.8	4.0 ± 0.5			
	H4EB5	H5	5.0 ± 0.8	4.5 ± 1.0			
	H05B5	8	5.0 ± 0.8	5.0 ±1.0			
	H20C5	9	5.0 ± 0.8	20 MIN.			
	H3EA7	H2	7.5 ± 1.0	3.5 ± 0.5			
	H04A7	B7	7.5 ± 1.0	4.0 ± 0.5			
	H4EB7	H7	7.5 ± 1.0	4.5 ± 1.0			
	H05B7	T3	7.5 ± 1.0	5.0 ±1.0			
	H20C7		7.5 ± 1.0	20MIN			
	H3EA0	H3	10 ± 1.0	3.5 ± 0.5			
	H04A0	B0	10 ± 1.0	4.0 ± 0.5			
	H4EB0	H0	10 ± 1.0	4.5 ± 1.0			
	H05B0	B	10 ± 1.0	5.0 ±1.0			
	H20C0	T4	10 ± 1.0	20 MIN.			
	HAND5	H	$5.0^{+0.8}_{-0.2}$	Taping SPEC. (Ref.to page.9)	50V,500V, 1KV, 2KV	Tap. Ammo	
Lead style：X Outside kink lead	X3EA5	Q1	5.0±0.8	3.5 ± 0.5	50V,500V, 1KV, 2KV	Bulk	
	X3EA7	Q2	7.5±1.0				
	X3EA0	Q3	10±1.0				
	X04A5	X5	5.0±0.8	4.0 ± 0.5			
	X04A7	X7	7.5±1.0				
	X04A0	X0	10±1.0				
	X05B5	X1	5.0±0.8	5.0 ± 1.0			
	X05B7	X2	7.5±1.0				
	X05B0	X3	10±1.0				
Lead style：D Vertical kink short lead	D04A5	D5	5.0±1.0	4.0 ± 0.5	50V,500V, 1KV, 2KV	Bulk	
	D04A7	D7	7.5±1.0				
	D04A0	D0	10±1.0				
	D3EA5	D1	5.0±0.8	3.5 ± 0.5			
	D3EA7	D2	7.5±1.0				
	D3EA0	D3	10±1.0				
	DAND5	D	$5.0^{+0.8}_{-0.2}$	Taping SPEC. (Ref.to page.9)		Tap. Ammo	

Lead type	SAP P/N (13-17) digits	Old P/N Refer to "2.1 Old P/N"	Pitch (F)	Lead length (L)	Available rated voltage	Packing	Lead configuration
Lead style：M Double outside kink lead	M05B5	M6	5.0 ± 0.8	5.0 ± 1.0	50V,500V, 1KV, 2KV	Bulk	
	M05B7	M4	7.5 ± 1.0				
	M05B0	M5	10 ± 1.0				
	M04B5	M6	5.0 ± 0.8	4.0 ± 1.0			
	M04B7	M4	7.5 ± 1.0				
	M04B0	M5	10 ± 1.0				

※ Lead diameter φ= 0.6 +/-0.06 mm

※ Phenolic resin coating for 50V/500V/1KV product; Epoxy resin coating for 2KV product.

※ **e** (Coating **extension** on leads):

For straight lead style: 1.5mmMax when the rated voltage is 50Vdc & 100Vdc;
2.0mmMax when the rated voltage is 500Vdc and 1KVdc;
3.0mmMax when the rated voltage is 2KVdc.

For kink lead style: not exceed the kink.

※When Dφ≥11mm, only for bulk, but Dφ≤10mm can do Bulk or Taping.

2.1 Old P/N：

(Ex.) **B M 6 102 K L 7 F**

(1) (2) (3) (4) (5) (6) (7) (8)

(1)Temperature characteristic (identified code)：

Code	B(Y5P)	E(Z5U)	F(Z5V)
Operating temperature	-25℃ to +85℃	+10℃ to +85℃	
Cap. change	±10%	-56%~+22%	-82%~+22%

(2)Rated voltage(identified by code)

(3)Nominal body diameter dimension

(4)Capacitance (identified by 3-figure code)

(5)Capacitance tolerance (identified by code)

(6)Lead style (configuration) (identified by code):

L: straight long lead; S: straight short lead; D: vertical kink lead;X: outside kink lead; H: inside kink lead

(7)Lead Space:

5=5±0.8(Bulk), 5=+0.8-0.2mm(Taping), 7=7.5 ± 1.0 mm, 0=10 ± 1.0 mm

(8)Taping type or other code:

Code	Pitch component
H	12.7mm
No code	BULK

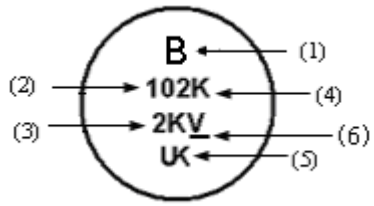
3. Capacitance value vs. rated voltage, product diameter:

T.C.	Y5P (CLASS Ⅱ, Temperature:-25℃~+85℃, T.C.C.:±10%)																											
Rate voltage	50V, 100V							500V									1KV						2KV					
Dφ (Code)	040	050	060	070	080	090	100	040	050	060	070	080	090	100	110	130	050	060	070	080	100	120	060	080	090	100	120	140
D max. (mm)	4.5	5.5	6.5	7.5	8.5	9.5	11.0	4.5	5.5	6.5	7.5	9.0	10.0	11.0	12.0	14.0	6.0	7.0	8.0	9.0	11.0	13.0	7.5	9.5	10.5	11.5	13.5	15.5
T max. (mm)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
100	101							101									101						101					
120	121							121									121						121					
150	151							151									151						151					
180	181							181									181						181					
200	201							201									201						201					
220	221							221									221						221					
240	241							241									241						241					
270	271							271									271						271					
330	331							331									331						331					
390	391							391									391						391					
470	471							471									471						471					
560	561							561									561						561					
680	681							681										681					681					
820	821								821									820						821				
1000	102								102									102						102				
1200		122								122									122						122			
1500		152								152									152						152			
1800		182									182									182					182			
2000		202									202									202					202			
2200		222									222									222					222			
2700			272									272									272					272		
3000			302									302									302							
3300			332										332								332							
3900				392									392									392					392	
4700				472										472								472						472
5000					502									502														
5600					562									562														
6800						682									682													
8200							822									822												
10000							103									103												

T.C.	Z5U (CLASS Ⅱ, Temperature: +10℃~+85℃, T.C.C.: +22~-56%)																							
Rate voltage	50V,100V						500V						1KV					2KV						
Dφ(Code)	040	050	060	070	080	100	040	050	060	070	090	050	060	070	090	100	060	070	080	090	110	130
D max. (mm)	4.5	5.5	6.5	7.5	8.5	10.5	4.5	5.5	6.5	7.5	9.5	6	7.0	8.0	10.0	11.0	7.5	8.5	9.5	10.5	12.5	14.5
T max. (mm)	3.5	3.5	3.5	3.5	3.5	3.5	4.0	4.0	4.0	4.0	4.0	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
1000	102						102					102					102					
1200	122							122				122					122					
1500	152							152				152						152				
1800	182							182				182						182				
2000	202							202				202						202				
2200	222							222				222						222				
2700	272							272					272						272			
3000	302								302				302						302			
3300	332								332				332						332			
3600	362								362				362							362		
3900	392								392					392						392		
4700	472									472				472						472		
5000		502								502				502							502	
5600			562							562					562						562	
6800			682							682					682						682	
8200			822								822					822						822
10000				103							103					103						103
12000					123																	
15000					153																	
18000						183																
22000						223																
47000																						

T.C.	Z5V (CLASS Ⅱ, Temperature: +10℃~+85℃, T.C.C.: +22~-82%)								
Rate voltage	50V, 100V				500V	1KV			2KV
Dφ(Code)	**050**	**060**	**070**	**080**	**080**	**060**	**080**	**100**	**120**
D max. (mm)	**5.5**	**6.5**	**7.5**	**8.5**	**9.0**	**7.0**	**9.0**	**11.0**	**13.5**
T max. (mm)	3.5	3.5	3.5	3.5	4.0	4.5	4.5	4.5	4.5
1000	**102**								
1200	~~**152**~~								
1500	~~**152**~~					**152**			
1800	~~**182**~~					**182**			
2000	~~**202**~~					**202**			
2200	~~**222**~~					**222**			
2700	~~**272**~~					**272**			
3000	~~**302**~~					**302**			
3300	~~**332**~~								
3600	~~**362**~~								
3900	~~**392**~~						**392**		
4700	**472**						**472**		
5000							**502**		
5600									
6800									
8200									
10000		**103**			**103**			**103**	**103**
15000									
18000									
20000			**203**						
22000				**223**					
33000									
47000									

4. Marking:

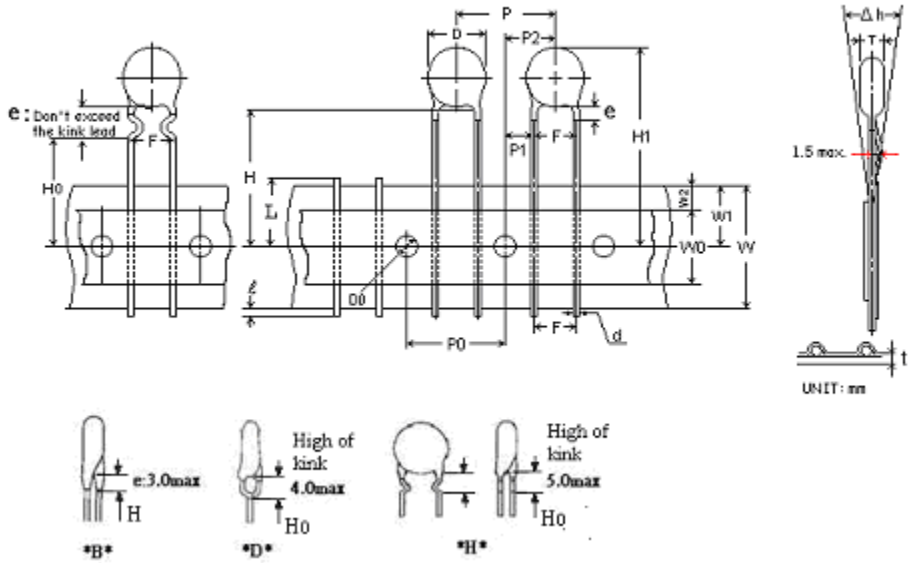
Remarks \ Marking	
(1). Temp. char.	Y5P：Be marked “B” Z5U：Be marked “E” Z5V：Shall be omitted
(2). Rated capacitance	Identified by 3-Figure Code. Ex. 1000pF→"102"，4700pF→"472"
(3). Rated voltage	50V&100V: Marked with code “_” under the rated capacitance. 500V: No any marking under the rated capacitance. 1000V&2000V: Marked with code: 1000V→"1KV"，2000V→"2KV"
(4). Capacitance tolerance	K=±10%(for Y5P)、M=±20%(for Z5U)、Z=+80%-20%(for Z5V)
(5). Manufacturer’s identification	Shall be marked as "UK", but DΦ≤6.0 mm shall be omitted.
(6). Halogen and Pb free	There is a “_”marking under the code “V” when the coating resin is Halogen free and Pb free Epoxy.

5. Taping specifications:

* Lead spacing: **F**=5.0 $^{+0.8}_{-0.2}$ **(mm)**

- **12.7mm pitch/lead spacing 5.0mm taping**

Lead code: *BAND5 & *DAND5 & *HAND5



Item		Symbol	Specification		Remarks
			Value	Tolerance	
Body diameter		D	*	max.	See Section "3. Capacitance value vs. rated voltage, product diameter".
Body thickness		T	*	max.	
Lead-wire diameter		d	0.6	+/-0.06	
Pitch of component		P	12.7	±1.0	
Feed hole pitch		P0	12.7	±0.3	Cumulative pitch erroe:1.0mm/20 pitch
Feed hole center to lead		P1	3.85	±0.7	To be measured at bottom of clinch
Hole center to component center		P2	6.35	±1.3	
Lead-to-lead distance		F	5.0	+0.8,-0.2	
Component alignment, F-R		△h	0	±2.0	
Tape width		W	18.0	+1.0,-0.5	
Hole-down tape width		W0	11.0	min.	
Hole position		W1	9.0	+0.75,-0.5	
Hole-down tape position		W2	3.0	max.	
Height of component form tape center	For straight lead type	H	20.0	+1.0 -0.5	
	For kinked lead type	H0	16.0	±0.5	
Component height		H1	32.25	max.	
Lead-wire protrusion		ℓ	2.0	max.	Or the end of lead wire may be inside the tape.
Food hole diameter		D0	4.0	±0.2	
Total tape thickness		t	0.7	±0.2	Ground paper:0.5±0.1mm
Length of sniped lead		L	11.0	max.	
Coating rundown on leads		e	3.0 max for straight lead style; Not exceed the kink leads for kink lead.		

6. Packaging:

6-1.Pakaging Styles

Bulk：1000pcs/bag

Taping：2000pcs/box for Ammo

7. Specification and test method:

7.1 SCOPE: THIS SPECIFICATION APPLIES TO HI-K CERAMIC TYPE CAPACITOR.

7.2 TEST CONDITIONS :

UNLESS OTHERWISE SPECIFIED, ALL TESTS SHALL BE OPERATED AT THE STANDARD TEST CONDITIONS OF TEMPERATURE 5℃ TO 35℃ AND RELATIVE HUMIDITY 45% TO 85%. WHEN FAILS A TEST, RETEST BE OPERATED AT THE CONDITIONS OF TEMPERATURE 25℃ ± 2℃, RELATIVE HUMIDITY OF 60% TO 70% AND BAROMETRIC PRESSURE 860 TO 1060 MBAR.

7.3 HANDLE PROCEDURE : TO AVOID UNEXPECTED TESTING RESULTS FROM OCCURRING, THE TESTED CAPACITOR MUST BE KEPT AT ROOM TEMPERATURE FOR AT LEAST 30 MINUTES AND COMPLETELY DISCHARGED.

7.4 TEST ITEMS :

ITEM	POST-TEST REQUIREMENTS	TESTING PROCEDURE
APPEARANCE STRUCTURE SIZE	NO ABNORMALITIES	AS STATED IN SECTION 3.
MARKING		AS STATED IN SECTION 4
WITHSTAND VOLTAGE	BETWEEN TERMINALS: NO ABNORMALITIES	A. BELOW 1KV: 250% RATED VOLTAGE WITH 50MA MAX. CHARGING CURRENT FOR 1～5 SEC. B. 1KV & ABOVE: 200% RATED VOLTAGE WITH 50mA MAX. CHARGING CURRENT FOR 1～5 SEC.
	BETWEEN TERMINAL AND ENCLOSURE : NO ABNORMALITIES	SMALL METALLIC BALLS WITH 1mm DIAMETERS SHALL BE PUT ON A VESSEL AND THE TEST CAPACITOR SHALL BE SUBMERGED EXCEPT 2mm FROM THE TOP OF ITS COMPONENT BODY. THE TEST VOLTAGE SHALL BE APPLIED BETWEEN THE SHORT-CIRCUITED TERMINALS AND THE METALLIC BALLS. (APPLY 1.3KV DC VOLTAGE BETWEEN TERMINALS AND ENCLOSURE FOR 1～5 SEC)
INSULATION RESISTANCE	10000 MΩ MIN	INSULATION RESISTANCE SHALL BE MEASURED AT 60±5 SECONDS AFTER RATED VOLTAGE APPLIED. RATED VOLTAGE :100V =100V 500V & ABOVE = 500V
CAPACITANCE	TOLERANCE : K : ±10%　M : ±20% Z : +80-20%	TESTING FREQUENCY: 1 KHZ ± 20% TESTING TEMPERATURE: 25 ± 2℃ TESTING VOLTAGE: 1.0～5.0 Vrms
TEMPERATURE RANGE	Y5P: -25℃ ～ +85℃ Z5U & Z5V: +10℃ ～ +85℃	
DISSIPATION FACTOR (D.F)	Y5P : BELOW 2.5% Z5U : BELOW 2.5% Z5V : BELOW 5.0%	AS ABOVE STIPULATION OF CAPACITANCE

ITEM	POST-TEST REQUIREMENTS	TESTING PROCEDURE
TEMPERATURE CHARACTERISTIC	CAP. CHANGE : Y5P : WITHIN ± 10% Z5U : WITHIN -56,+22% Z5V : WITHIN -82,+22%	CAPACITANCE SHALL BE MEASURED AT 25℃. AND CLASSIFIED AS CAP. CHANGE : CLASS Y5 : -25℃ ～ +85℃ CLASS Z5 : +10℃ ～ +85℃
TERMINAL STRENGTH	TENSILE STRENGTH : NO BREAKDOWN	WIRE DIA.0.5 M/M, LOADING WEIGHT 0.5KG FOR 10±1 SECONDS WIRE DIA.0.6 M/M, LOADING WEIGHT 1.0KG FOR 10±1 SECONDS
	BENDING STRENGTH : NO BREAKDOWN	WIRE DIA.0.5 M/M, LOADING WEIGHT 0.25 KG WIRE DIA.0.6 M/M, LOADING WEIGHT 0.5 KG (BENDING BACK AND FORTH 90 DEGREE TWICE)
SOLDERABILITY	LEAD WIRE SHALL BE SOLDERED OVER 3/4 OF THE CIRCUMFERENTIAL DIRECTION.	TO COMPLY WITH JIS-C-5102 8.4 SOLDER TEMPERATURE 255(+5/-0)℃ AND DIPPING TIME 2±0.5 SECONDS. FLUX : WEIGHT RATIO OF POSIN 25%
SOLDERING HEAT RESISTANCE	APPEARANCE : NO ABNORMALITIES	LEAD WIRE OR TERMINALS SHALL IMMERSE UP TO 2.0 M/M FORM BODY. (A) BODY DIA.≦5.0mm: INTO THE MOLTEN SOLDER OF WHICH TEMPERATURE: 260(+5/-0)℃ FOR 3.0±0.5 SECONDS. (B) BODY DIA.＞5.0mm: INTO THE MOLTEN SOLDER OF WHICH TEMPERATURE 260(+5/-0)℃ FOR 5~10 SECONDS. THEN LEAVE AT STANDARD TEST CONDITIONS FOR 24±2 HOURS, THEN MEASURED. ※WHEN SOLDERING CAPACITOR WITH A SOLDERING IRON, IT SHOULD BE PERFORMED IN FOLLOWING CONDITIONS. TEMPERATURE OF IRON-TIP: 350~400 ℃ SOLDERING IRON WATTAGE : 50W MAX. SOLDERING TIME : 3.5 SEC. MAX.
	CAP. CHANGE : Y5P : ±5% MAX Z5U : ±15% MAX Z5V : ±20%	
	WITHSTAND VOLTAGE: (BETWEEN TERMINALS) NO ABNORMALITIES	
HUMIDITY CHARACTERISTIC (STABLE SITUATION)	APPEARANCE: NO ABNORMALITIES	CAPACITORS SHALL BE SUBJECTED TO A RELATIVE HUMIDITY OF 90 ～ 95% AT 40±2℃ FOR 500(+24/-0) HOURS. THEN DRIED FOR 1～2 HOURS AND MEASURED.
	CAP. CHANGE : Y5P : ± 10% MAX Z5U : ± 20% MAX Z5V : ± 30% MAX	
	D.F. Y5P : 5% MAX Z5U : 5% MAX Z5V : 7.5% MAX	
	INSULATION RESISTANCE : 1000MΩ MIN.	

ITEM	POST-TEST REQUIREMENTS	TESTING PROCEDURE
HUMIDITY LOADING	APPEARANCE: NO ABNORAMLITIES	CAPACITORS SHALL BE SUBJECTED TO A RELATIVE HUMIDITY OF 90 ～ 95% AT 40 ± 2℃ FOR 500(+24/-0) HOURS WITH RATED VOLTAGE APPLIED WITH 50mA MAX., THEN DRIED FOR 1～2 HOURS AND MEASURED.
	CAP. CHANGE : Y5P : ±10% MAX Z5U : ±20% MAX Z5V : ±30% MAX	
	D.F. Y5P : 5% MAX Z5U : 5% MAX Z5V : 7.5% MAX	
	INSULATION RESISTANCE 500 MΩ MIN.	
HIGH TEMPERATURE LOADING	APPEARANCE : NO ABNORMALITIES	CAPACITORS SHALL BE SUBJECTED TO A TEST OF (A) BELOW 1KV: 200% RATED VOLTAGE WITH 50mA MAX. (B) 1KV & ABOVE: 150% RATED VOLTAGE WITH 50mA MAX. FOR 1000(+48/-0) HOURS AT 85 ± 2℃ (FOR Y5P, Z5U, Z5V) AND THEN DRIED FOR 12～24 HOURS AND MEASURED.
	CAP. CHANGE : Y5P : ±10% MAX Z5U : ±20% MAX Z5V : ±30% MAX	
	D.F. Y5P : 4% MAX Z5U : 4% MAX Z5V : 7.5% MAX	
	INSULATION RESISTANCE : 1000 MΩ MIN.	
TEMPERATURE CYCLING	APPEARANCE : NO ABNORMALITIES	CAPACITORS SHALL BE SUBJECTED TO: -25±3℃(30±3min) → 25℃(3min) → 85±3℃(30±3min) → 25℃(3min) FOR 5 CYCLE.
	CAP. CHANGE : Y5P : ±10% MAX Z5U : ±20% MAX Z5V : ±30% MAX	
	D.F. Y5P : 5% MAX Z5U : 5% MAX Z5V : 7.5% MAX	
	INSULATION RESISTANCE : 1000 MΩ MIN.	

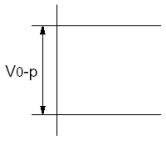
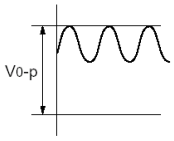
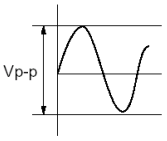
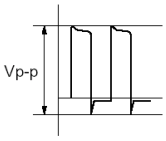
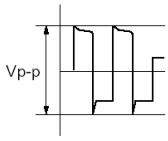
8. Cautions & notices:

8.1. Caution (Rating)

I. Operating Voltage

When DC-rated capacitors are to be used in AC or ripple current circuits, be sure to maintain the Vp-p value of the applied voltage or the Vo-p which contains DC bias within the rated voltage range.

When the voltage is applied to the circuit, starting or stopping may generate irregular voltage for a transit period because of resonance or switching. Be sure to use a capacitor with a rated voltage range that includes these irregular voltages.

Voltage	DC Voltage	DC+AC Voltage	AC Voltage	Pulse Voltage (1)	Pulse Voltage (2)
Positional measurement					

II. Operating Temperature and Self-generated Heat

Keep the surface temperature of a capacitor below the upper limit of its rated operating temperature range. Be sure to take into account the heat generated by the capacitor itself. When the capacitor is used in a high frequency current, pulse current or similar current, it may self-generate heat due to dielectric loss. The frequency of the applied sine wave voltage should be less than 100kHz. The applied voltage load (*) should be such that the capacitor's self-generated heat is within 20°C at an atmosphere temperature of 25°C. When measuring, use a thermocouple of small thermal capacity-K of ø0.1mm in conditions where the capacitor is not affected by radiant heat from other components or surrounding ambient fluctuations.

Excessive heat may lead to deterioration of the capacitor's characteristics and reliability. (Never attempt to perform measurement with the cooling fan running. Otherwise, accurate measurement cannot be ensured.)

III. Fail-Safe

When capacitor is broken, failure may result in a short circuit. Be sure to provide an appropriate fail-safe function like a fuse on your product if failure would follow an electric shock, fire or fume.

8.2. Caution (Storage and operating condition)

I. Operating and storage environment

The insulating coating of capacitors does not form a perfect seal; therefore, do not use or store capacitors in a corrosive atmosphere, especially where chloride gas, sulfide gas, acid, alkali, salt or the like are present. And avoid exposure to moisture. Before cleaning, bonding or molding this product, verify that these processes do not affect product quality by testing the performance of a cleaned, bonded or molded product in the intended equipment. Store the capacitors where the temperature and relative humidity do not exceed –10 to 40 degrees centigrade and 15 to 85 %.

Use capacitors within 6 months.

FAILURE TO FOLLOW THE ABOVE CAUTIONS MAY RESULT, WORST CASE, IN A SHORT CIRCUIT AND CAUSE FUMING OR PARTIAL DISPERSION WHEN THE PRODUCT IS USED.

8.3.Caution (Soldering and Mounting)

I. Vibration and impact

Do not expose a capacitor or its leads to excessive shock or vibration during use.

II. Soldering

When soldering this product to a PCB/PWB, do not exceed the solder heat resistance specification of the capacitor.

Subjecting this product to excessive heating could melt the internal junction solder and may result in thermal shocks that can crack the ceramic element. When soldering capacitor with a soldering iron, it should be performed in following conditions.

Temperature of iron-tip: 400 degrees C. max.

Soldering iron wattage : 50W max.

Soldering time : 3.5 sec. max.

FAILURE TO FOLLOW THE ABOVE CAUTIONS MAY RESULT, WORST CASE, IN A SHORT CIRCUIT AND CAUSE FUMING OR PARTIAL DISPERSION WHEN THE PRODUCT IS USED.

8.4. Caution (Handling)

Vibration and impact

Do not expose a capacitor or its leads to excessive shock or vibration during use.

FAILURE TO FOLLOW THE ABOVE CAUTIONS MAY RESULT, WORST CASE, IN A SHORT CIRCUIT AND CAUSE FUMING OR PARTIAL DISPERSION WHEN THE PRDUCT IS USED.

8.5. Notice

8.5.1. Notice (Soldering and Mounting)

Cleaning (ultrasonic cleaning)

To perform ultrasonic cleaning, observe the following conditions.

Rinse bath capacity : Output of 20 watts per liter or less.

Rinsing time : 5 min. maximum.

Do not vibrate the PCB/PWB directly.

Excessive ultrasonic cleaning may lead to fatigue destruction of the lead wires.

8.5.2. Notice (Rating)

Capacitance change of capacitor

Class 2 series:

Capacitors have an aging characteristic, whereby the capacitor continually decreases its capacitance slightly if the capacitor is left on for a long time. Moreover, capacitance might change greatly depending on the surrounding temperature or an applied voltage. So, it is not likely to be suitable for use in a time constant circuit.

Please contact us if you need detailed information.