

# PRODUCT SPECIFICATION

## PRODUCT: CERAMIC DISC CAPACITOR

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

CUSTOMER: \_\_\_\_\_

DOC. NO.: POE-D04-00-E-12

Ver.: 12

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.

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DEVELOPMENT ZONE,CHINA



50V,100V,500V,1KV,2KV Hi-K CERAMIC DISC CAPACITOR FOR DOWN SIZE PRODUCT	POE-D04-00-E-12	Ver: 12 Page: 2 / 16
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### Record of change

Date	Version	Description	page
2008.6.3	1	1. D15-00-E-09 (before) → POE-D04-00-E-01 (1 <sup>st</sup> edition)	
2008.8.22	2	1. Revised diameter 2. Complete lead code 3. Add last SAP code “H” for halogen and Pb free , epoxy resin..	5-7 16-19 8
2008.12.12	3	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.	3-7
2009.8.5	4	1. Change PSA & POE logo to Walsin & POE logo.	
2011/8/24	5	1. Delete the definition about “Old Part No.” 2. Review the diameter dimension code of “Z5U 1KV 332/362” from 060 to be 070. 3. Delete the Part No. of “Z5U 50V/100V 223”.	5-6 7 7
2011/11/25	6	1. Review the item Y5P/Z5U/Z5V 2. Add the Y5U temperature characteristic	7-8 4-15
2012/11/06	7	1. Revise the temp.(TCC): Y5P(-25℃ to 85℃/ to 125℃) & Cap. Change(±10% / ±35%) 2. Review the OP temp. for Y5P: Y5P : -25℃ ~ +105℃(INCLUDING CAPACITOR'S SELF-HEATING MAX.+20℃)	4 12-13
2013/5/6	8	1. Review the Lead diameter φ from 0.60 +/-0.06mm to 0.55+/-0.05mm 2. Review the “DΦ≤6.0mm shall be omitted.” to “DΦ≤060 shall be omitted.” 3. Review the Solderability temperature from 255(+5/-0)℃. to 245±5℃.,Solderability time from 2 ±0.5s to 5±0.5s,	6,9 8 12
2013/10/18	9	Review the packing specification	10
2015/8/4	10	1. Review the temperature range:Y5P(-25℃ to+105℃)Change (-25℃ to+125℃ ) 2. review the high temperature loading:FOR 1000(+48/-0) HOURS AT 85 ± 2℃ (FOR Y5U, Z5U, Z5V) / AT 105 ± 3℃ (ONLY FOR Y5P) AND THEN DRIED FOR 12~24 HOURS AND MEASURED.Change FOR 1000(+48/-0) HOURS AT 85 ± 2℃ (FOR Y5U, Z5U, Z5V) / AT 125 ± 3℃ (ONLY FOR Y5P) AND THEN DRIED FOR 12~24 HOURS AND MEASURED.	11 13
2015/11/5	11	1. Review the Available lead code of Lead Configuration. 2. Modify the contents of the use of epoxy resin for 1KV products 3. Review the Specification and test method 4. Review 8. Cautions & notices 5. Review 9. Drawing of internal structure and material list	5-6 7-8 12-13 14 16
2019/7/26	12	1. Review the Hole-down tape width (W0) from 11.0mm min. to 8.0mm min.	9



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

YP 102 102 K 060 B 20 C 5 B  
 ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩

① Temperature characteristic :

Code	YU(Y5U)	YP(Y5P)	ZU(Z5U)	ZV(Z5V)
Temperature range	-25°C to +85°C	-25°C to +85°C / 85°C to +125°C	+10°C to +85°C	
Cap. change	-56%~+22%	±10% / ±35%	-56%~+22%	-82%~+22%

② Rated voltage (Vdc) :

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

③ Capacitance(pF) :

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

④ Capacitance tolerance : K=±10% 、M=±20% 、Z=+80%-20%

⑤ Nominal body diameter dimension (Ref.to page.7~8 Dφ Code spec.) .

⑥ Code of lead type : Please refer to Item “2.Mechanical”.

⑦ Packing 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

⑧ Length tolerance

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

⑨ Pitch

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		

⑩ Coating code

Code	Description
P	Halogen free and Pb free, phenolic resin
A	
B	Epoxy Resin , Pb free
H	Halogen free and Pb free , epoxy resin

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**2. Mechanical:**

Available lead code, Example:

(unit: mm)

Lead type	SAP P/N (13-17) digits	Pitch (F)	Lead length (L)	Available rated voltage	Packing	Lead configuration
Lead style : B Straight long lead	B20C2	2.5 ± 0.8	20 MIN.	50V,500V, 1KV,2KV	Bulk	
	B20C5	5.0 ± 0.8	20 MIN.			
	B20C6	6.4 ± 1.0	20 MIN.			
	B20C7	7.5 ± 1.0	20 MIN.	50V	Tap. Ammo	
	B20C0	10 ± 1.0	20 MIN.			
	BAND5	5.0 <sup>+0.8</sup> <sub>-0.2</sub>	Taping Spec. (Ref.to page.9)			
BAND2	2.5 ± 0.8					
Lead style : L Straight short lead	L05B2	2.5 ± 0.8	5.0 ± 1.0	50V,500V, 1KV, 2KV	Bulk	
	L4EB5	5.0 ± 0.8	4.5 ± 1.0			
	L05B5	5.0 ± 0.8	5.0 ± 1.0			
	L05B6	6.4 ± 1.0	5.0 ± 1.0			
	L4EB7	7.5 ± 1.0	4.5 ± 1.0			
	L05B7	7.5 ± 1.0	5.0 ± 1.0			
	L4EB0	10 ± 1.0	4.5 ± 1.0			
L05B0	10 ± 1.0	5.0 ± 1.0				
Lead style : H Inside kink lead	H3EA5	5.0 ± 0.8	3.5 ± 0.5	50V,500V, 1KV, 2KV	Bulk	
	H04A5	5.0 ± 0.8	4.0 ± 0.5			
	H4EB5	5.0 ± 0.8	4.5 ± 1.0			
	H05B5	5.0 ± 0.8	5.0 ± 1.0			
	H20C5	5.0 ± 0.8	20 MIN.			
	H3EA7	7.5 ± 1.0	3.5 ± 0.5			
	H04A7	7.5 ± 1.0	4.0 ± 0.5			
	H4EB7	7.5 ± 1.0	4.5 ± 1.0			
	H05B7	7.5 ± 1.0	5.0 ± 1.0			
	H20C7	7.5 ± 1.0	20MIN			
	H3EA0	10 ± 1.0	3.5 ± 0.5			
	H04A0	10 ± 1.0	4.0 ± 0.5			
	H4EB0	10 ± 1.0	4.5 ± 1.0			
	H05B0	10 ± 1.0	5.0 ± 1.0			
	H20C0	10 ± 1.0	20 MIN.			
HAND5	5.0 <sup>+0.8</sup> <sub>-0.2</sub>	Taping SPEC. (Ref.to page.9)	50V,500V, 1KV, 2KV	Tap. Ammo		
Lead style : X Outside kink lead	X3EA5	5.0±0.8	3.5 ± 0.5	50V,500V, 1KV, 2KV	Bulk	
	X3EA7	7.5±1.0				
	X3EA0	10±1.0				
	X04A5	5.0±0.8	4.0 ± 0.5			
	X04A7	7.5±1.0				
	X04A0	10±1.0				
	X05B5	5.0±0.8	5.0 ± 1.0			
	X05B7	7.5±1.0				
X05B0	10±1.0					

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Lead type	SAP P/N (13-17) digits	Pitch (F)	Lead length (L)	Available rated voltage	Packing	Lead configuration
Lead style : D  Vertical kink lead	D04A5	5.0±1.0	4.0 ± 0.5	50V,500V, 1KV, 2KV	Bulk	
	D04A7	7.5±1.0				
	D04A0	10±1.0				
	D3EA5	5.0±0.8	3.5 ± 0.5			
	D3EA7	7.5±1.0				
	D3EA0	10±1.0				
	DAND5	5.0 <sup>+0.8</sup> <sub>-0.2</sub>	Taping SPEC. (Ref.to page.9)		Tap. Ammo	
Lead style : M  Double outside kink lead	M05B5	5.0 ± 0.8	5.0 ± 1.0	50V,500V, 1KV, 2KV	Bulk	
	M05B7	7.5 ± 1.0				
	M05B0	10 ± 1.0				
	M04B5	5.0 ± 0.8	4.0 ± 1.0			
	M04B7	7.5 ± 1.0				
	M04B0	10 ± 1.0				

- ※ Lead diameter  $\phi = 0.55 \pm 0.05$  mm
- ※ Phenolic resin coating for 50V/500V product; Phenolic resin or Epoxy resin coating for 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  $D\phi \geq 11$ mm, only for bulk, but  $D\phi \leq 10$ mm can do Bulk or Taping.

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

T.C. Rate voltage	Y5P (CLASS II, Temperature:-25°C~+85°C, T.C.C.:±10% & +85°C~+125°C, T.C.C.:±35%)																													
	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	130	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	14.5	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									821						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				302					
3300			332									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														
Packing	Taping or Bulk							BULK							Taping or Bulk							Bulk								
Coating	Phenolic Resin														Phenolic Resin or Epoxy Resin							Epoxy Resin								

T.C. Rate voltage	Z5U (CLASS II, Temperature: +10°C~+85°C, T.C.C.: +22~-56%)																							
	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	6.0	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				
1200								122						122						122				
1500								152						152						152				
1800								182						182										
2000		202						202						202										
2200		222						222						222										
2700		272						272													272			
3000		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										
5600										562												562		
6800										682												682		
8200						822															822			
10000						103															103			
Packing	Taping or Bulk												Bulk						Bulk					
Coating	Phenolic Resin												Phenolic Resin or Epoxy Resin						Epoxy Resin					

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T.C.	Y5U (CLASS II, Temperature: -25°C~+85°C, T.C.C.: +22~-56%)																				
Rate voltage	50V,100V					500V					1KV					2KV					
Dp(Code)	050	060	070	080	100	060	070	080	090	100	050	060	070	090	110	060	070	080	090	110	140
D max. (mm)	5.5	6.5	7.5	8.5	10.5	6.5	7.5	8.5	9.5	10.5	6.0	7.0	8.0	10.0	12.0	7.5	8.5	9.5	10.5	12.5	15.5
T max. (mm)	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						
1200											122				122						
1500											152					152					
2000	202																				
2200	222					222						222						222			
2700	272						272						272					272			
3000	302																				
3300	332						332						332						332		
3600	362																				
3900	392						392						392						392		
4700	472							472						472					472		
5000	502																				
5600																				562	
6800								682						682							
8200			822																		
10000			103							103					103					103	
Packing	Taping or Bulk										Bulk					Taping or Bulk					Bulk
Coating	Phenolic Resin										Phenolic Resin or Epoxy Resin					Epoxy Resin					

T.C.	Z5V (CLASS II, Temperature: +10°C~+85°C, T.C.C.: +22~-82%)									
Rate voltage	50V, 100V				500V		1KV		2KV	
Dp(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	122									
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		
10000		103				103			103	
20000			203							
22000				223						
Packing	Taping or Bulk								Bulk	
Coating	Phenolic Resin					Phenolic Resin or Epoxy Resin			Epoxy Resin	

4. Marking:

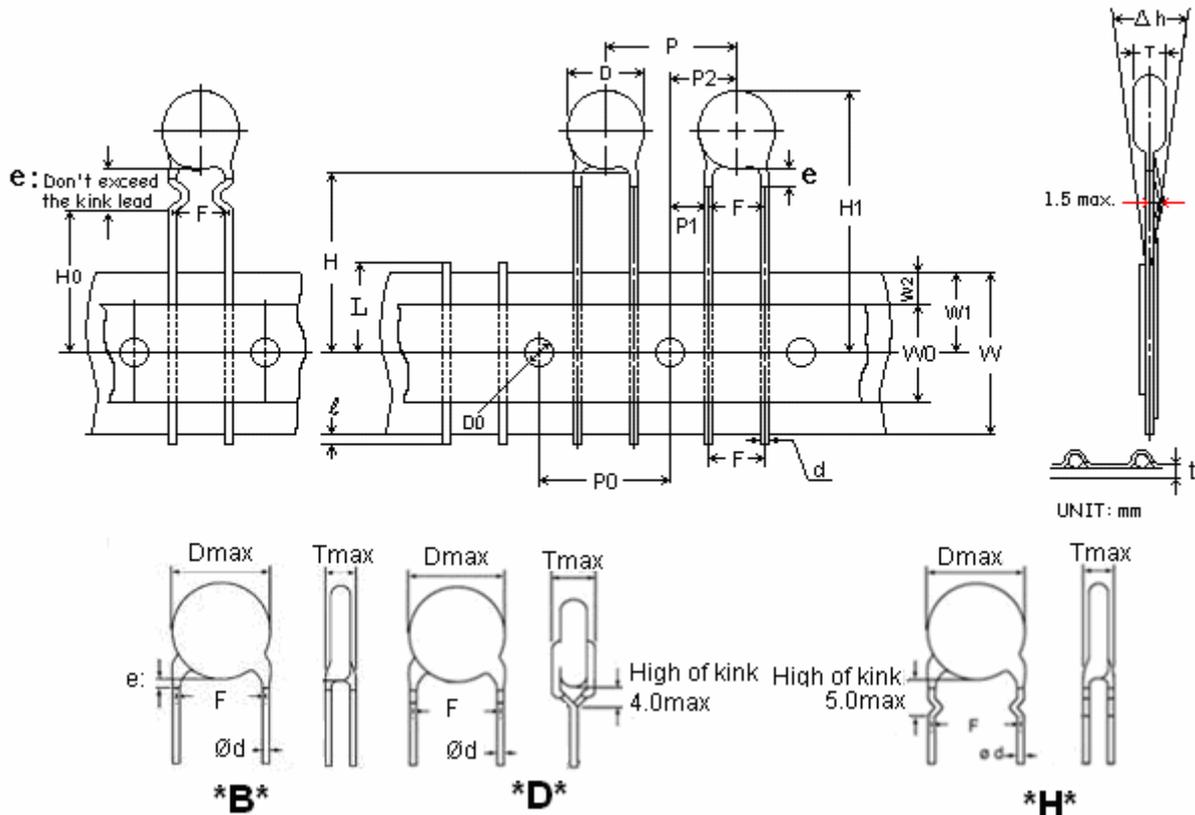
Marking		
Remarks		
(1). Temp. char.	Y5P : Be marked "B"; Z5U(Y5U) : Be marked "E"; Z5V : Shall be omitted	
(2). Rated capacitance	Identified by 3-Figure Code. Ex. 1000pF→"102", 4700pF→"472"	
(3). Rated voltage	50V&100V	Marked with code " " under the rated capacitance.
	500V	No any marking under the rated capacitance.
	1000V&2000V	Marked with code: 1000V→"1KV", 2000V→"2KV"
(4). Capacitance tolerance	K=±10%(for Y5P)、M=±20%(for Z5U&Y5U)、Z=+80%-20%(for Z5V)	
(5). Manufacturer's identification	Shall be marked as "UK", but DΦ≤060 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

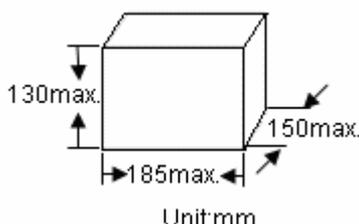
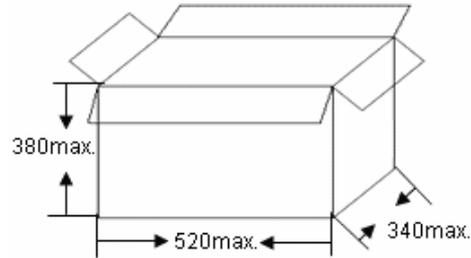
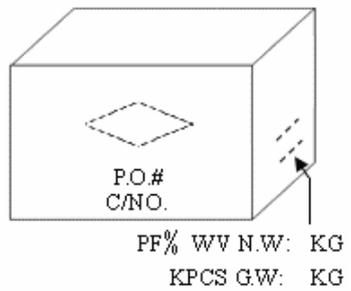
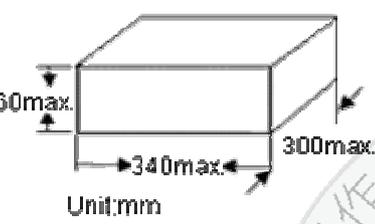
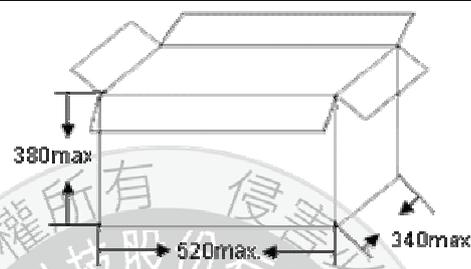
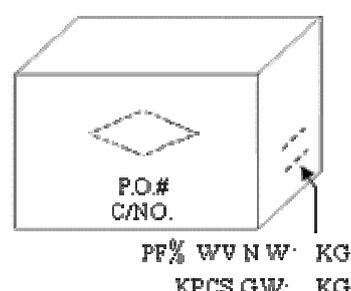


Item	Symbol	Specification		Remarks
		Value	Tolerance	
Body diameter	D	*	max.	See Section "3. Capacitance value vs. rated voltage, product diameter".
Body thickness	T	*	max.	
Lead-wire diameter	d	0.55	±0.05	
Pitch of component	P	12.7	±1.0	
Feed hole pitch	P0	12.7	±0.3	Cumulative pitch error: 1.0mm/20 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	8.0	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.
Feed hole diameter	D0	4.0	±0.2	
Total tape thickness	t	0.7	±0.2	Ground paper: 0.5±0.1 mm
Length of sniped lead	L	11.0	max.	
Coating rundown on leads	e	Please refer to page 6 "e(Coating extension on leads)".		

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## 6. Packing Baggage :

### 6.1 Packing size:

Type	Box	Carton
Bulk	 <p>Unit:mm</p>	 <p>Unit:mm</p>  <p>PF% WV N.W.: KG KPCS G.W.: KG</p>
Ammo taping	 <p>Unit:mm</p>	 <p>Unit:mm</p>  <p>PF% WV N.W.: KG KPCS G.W.: KG</p>

### 6.2 Packing quantity:

Packing type	The code of 14th to 15th in SAP P/N		MPQ (Kpcs/Box)	Remark	
Taping	AN		2	Phenolic resin	
	AN		1.5	Epoxy resin	
Packing type	Lead length	Size code of 10th to 12th in SAP P/N	MPQ (Kpcs/Bag)	Kpcs/Box	Remark
Bulk	Long lead (L ≥ 16mm)	040~070	1	3	Phenolic resin
		080~100	1	2	Phenolic resin
		050~100	1	2	Epoxy resin
		110~120	0.5	1.5	
	Short lead (L < 16mm)	130~140	0.5	1	
		040~060	1	6	
		070~080	1	4	
		090~100	1	3	
		110~140	1	2	

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## 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°C TO 35°C AND RELATIVE HUMIDITY 45% TO 85%. WHEN FAILS A TEST, RETEST BE OPERATED AT THE CONDITIONS OF TEMPERATURE 25°C ± 2°C, 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°C TESTING VOLTAGE: 1.0~5.0 Vrms
OPERATING TEMPERATURE RANGE	Y5P : -25°C ~ +125°C Y5U: -25°C ~ +85°C Z5U & Z5V: +10°C ~ +85°C	
TEMPERATURE RANGE	Y5P : -25°C ~ +125°C (INCLUDING CAPACITOR'S SELF-HEATING MAX.+20°C) Y5U: -25°C ~ +85°C Z5U & Z5V: +10°C ~ +85°C	
DISSIPATION FACTOR (D.F)	Y5P : BELOW 2.5% Z5U & Y5U : BELOW 2.5% Z5V : BELOW 5.0%	AS ABOVE STIPULATION OF CAPACITANCE

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ITEM	POST-TEST REQUIREMENTS	TESTING PROCEDURE
TEMPERATURE CHARACTERISTIC	CAP. CHANGE : Y5P : WITHIN $\pm 10\%$ (-25°C to +85°C) & WITHIN $\pm 35\%$ (85°C to +125°C) Z5U & Y5U : WITHIN -56,+22% Z5V : WITHIN -82,+22%	CAPACITANCE SHALL BE MEASURED AT 25°C. AND CLASSIFIED AS CAP. CHANGE : CLASS Y5P : -25°C ~ +125°C CLASS Y5U : -25°C ~ +85°C CLASS Z5U&Z5V : +10°C ~ +85°C <b>Pre-treatment:</b> Capacitor shall be stored at 125±3°C for 1hour.then placed at 1room condition for 24±2hours
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 245±5°C AND DIPPING TIME 5±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.
	CAP. CHANGE : Y5P : ±5% MAX Z5U & Y5U : ±15% MAX Z5V : ±20%	(A) BODY DIA. ≤ 5.0mm: INTO THE MOLTEN SOLDER OF WHICH TEMPERATURE: 260(+5/-0)°C FOR 3.0±0.5 SECONDS. (B) BODY DIA. > 5.0mm: INTO THE MOLTEN SOLDER OF WHICH TEMPERATURE 260(+5/-0)°C FOR 5~10 SECONDS.
	WITHSTAND VOLTAGE: (BETWEEN TERMINALS) NO ABNORMALITIES	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 °C SOLDERING IRON WATTAGE : 50W MAX. SOLDERING TIME : 3.5 SEC. MAX.
HUMIDITY CHARACTERISTIC (STABLE SITUATION)	APPEARANCE: NO ABNORMALITIES	CAPACITORS SHALL BE SUBJECTED TO A RELATIVE HUMIDITY OF 90 ~ 95% AT 40±2°C FOR 500(+24/-0) HOURS. THEN DRIED FOR 1~2 HOURS AND MEASURED.
	CAP. CHANGE : Y5P : ± 15% MAX Z5U & Y5U : ± 20% MAX Z5V : ± 30% MAX	
	D.F. Y5P : 5% MAX Z5U & Y5U: 5% MAX Z5V : 7.5% MAX	
	INSULATION RESISTANCE : 1000MΩ MIN.	

※ 1 "room condition" Temperature:15~35, Relative humidity: 45~75%, Atmospheric pressure:86~106kPa

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ITEM	POST-TEST REQUIREMENTS	TESTING PROCEDURE
HUMIDITY LOADING	APPEARANCE: NO ABNORAMLITIES	CAPACITORS SHALL BE SUBJECTED TO A RELATIVE HUMIDITY OF 90 ~ 95% AT $40 \pm 2^{\circ}\text{C}$ FOR 500(+24/-0) HOURS WITH RATED VOLTAGE APPLIED WITH 50mA MAX., THEN DRIED FOR 1~2 HOURS AND MEASURED.  Pre-treatment: Capacitor shall be stored at $125 \pm 3^{\circ}\text{C}$ for 1hour.then placed at※ 1room condition for $24 \pm 2$ hours
	CAP. CHANGE : Y5P : $\pm 15\%$ MAX Z5U & Y5U: $\pm 20\%$ MAX Z5V : $\pm 30\%$ MAX	
	D.F. Y5P : 5% MAX Z5U & Y5U : 5% MAX Z5V : 7.5% MAX	
	INSULATION RESISTANCE 500 M $\Omega$ 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 $85 \pm 2^{\circ}\text{C}$ (FOR Y5U, Z5U, Z5V) / AT $125 \pm 3^{\circ}\text{C}$ (ONLY FOR Y5P) AND THEN DRIED FOR 12~24 HOURS AND MEASURED.  Pre-treatment: Capacitor shall be stored at $125 \pm 3^{\circ}\text{C}$ for 1hour.then placed at※ 1room condition for $24 \pm 2$ hours
	CAP. CHANGE : Y5P : $\pm 15\%$ MAX Z5U & Y5U: $\pm 20\%$ MAX Z5V : $\pm 30\%$ MAX	
	D.F. Y5P : 4% MAX Z5U & Y5U: 4% MAX Z5V : 7.5% MAX	
	INSULATION RESISTANCE : 1000 M $\Omega$ MIN.	
TEMPERATURE CYCLING	APPEARANCE : NO ABNORMALITIES	CAPACITORS SHALL BE SUBJECTED TO: $-25 \pm 3^{\circ}\text{C}$ (30 $\pm$ 3min) $\rightarrow$ $25^{\circ}\text{C}$ (3min) $\rightarrow$ $85 \pm 3^{\circ}\text{C}$ (30 $\pm$ 3min) $\rightarrow$ $25^{\circ}\text{C}$ (3min) FOR 5 CYCLE.  Pre-treatment: Capacitor shall be stored at $125 \pm 3^{\circ}\text{C}$ for 1hour.then placed at※ 1room condition for $24 \pm 2$ hours
	CAP. CHANGE : Y5P : $\pm 15\%$ MAX Z5U & Y5U: $\pm 20\%$ MAX Z5V : $\pm 30\%$ MAX	
	D.F. Y5P : 5% MAX Z5U & Y5U: 5% MAX Z5V : 7.5% MAX	
	INSULATION RESISTANCE : 1000 M $\Omega$ MIN.	

※ 1 "room condition" Temperature: 15~35, Relative humidity: 45~75%, Atmospheric pressure: 86~106kPa

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**8. Cautions & notices:**

※**Application:** DC or Low frequency High Voltage circuits.

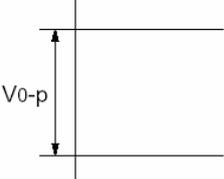
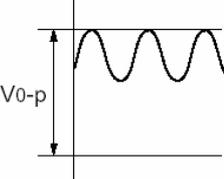
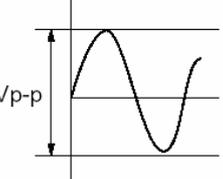
As coupling and decoupling capacitors for such application where higher losses and a reduced capacitance stability are required.

**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  $V_{p-p}$  value of the applied voltage or the  $V_{0-p}$  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
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 150Hz. 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  $\phi 0.1\text{mm}$  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 % for 6 months maximum and use within the period after receiving the capacitors.

**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 PRODUCT 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

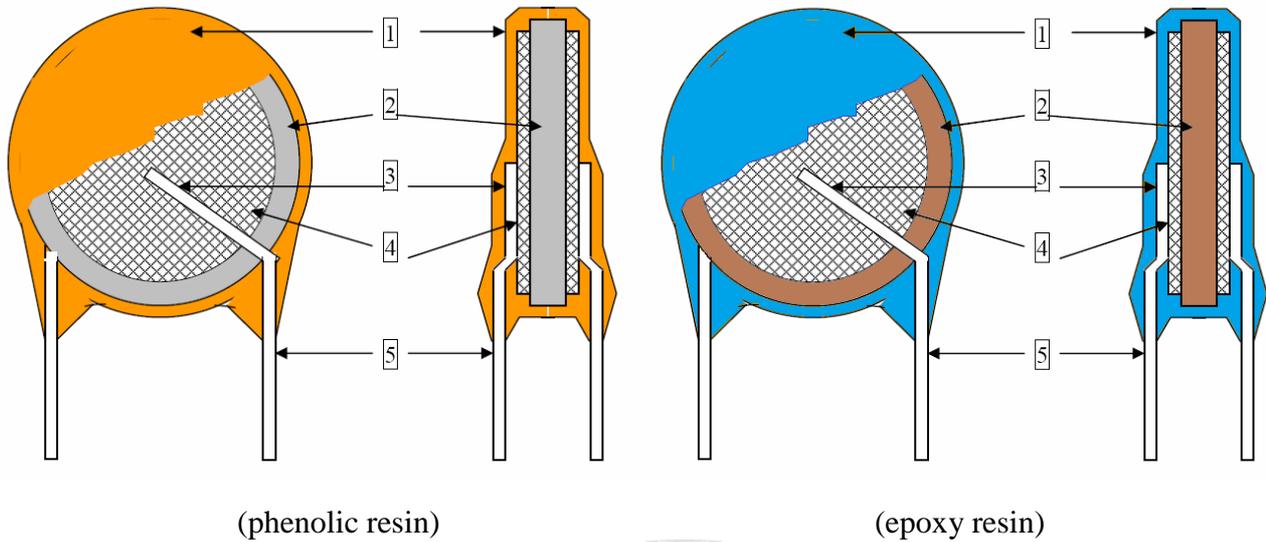
##### Class 2 series:

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.

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9. Drawing of internal structure and material list:



NO.	部位 Part name	材質 Material	構成部份 Component	供應商 Vendor
1	Insulation Coating	Phenolic resin Epoxy resin	Phenolic resin, Filler, Pigment Epoxy resin, SiO <sub>2</sub> , TiO <sub>2</sub>	Namics Kai Hua
2	Dielectric Element	Ceramic	BaTiO <sub>3</sub>	Hua Xing Wang Feng Fenghua
3	Solder	Tin-silver	Sn97.5-Ag2.5	Huajun Haili
4	Electrodes	Ag	Silver, Glass frit	Daejoo Xinguang
5	Leads wire	Tinned copper clad steel wire	Substrate metal: Fe&Cu Surface plating: Sn 100%	Hengtai Wuhu Taililai