

6KV Hi-K CERAMIC DISC CAPACITOR

POE-D29-00-E-05

Ver:05

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# PRODUCT SPECIFICATION

**PRODUCT: CERAMIC DISC CAPACITOR**

**TYPE: 6KV HI-K CERAMIC CAPACITOR  
(Y5P&Y5U&Y5V)**

**CUSTOMER:**

**DOC. NO.: POE-D29-00-E-05**

**Ver.: 05**

**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,  
HUANGPU DISTRICT ,GUANG ZHOU,CHINA

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

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**Record of change**

<b>Date</b>	<b>Version</b>	<b>Description</b>	<b>page</b>
2020.4.18	00	1. First edition.	
2021/6/22	01	1. Add the YV(Y5V) type	
2021/9/9	02	1. Delete Walsin & POE logo.	1
2022/1/8	03	1. Add "Soldering Recommendation"	14
2022/4/21	04	1. Add 8.8 List of substances that affect the insulation strength of coating	13
2025/7/6	05	1. Review the Packing quantity	11
		2. Review the Drawing of Internal Structure and material list	15





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**1. Part number for SAP system:**

Y P 602 102 K 100 B 20 C 0 H  
 (1) (2) (3) (4) (5) (6) (7) (8) (9) (10)

(1)Temperature Characteristic : YP=Y5P , YU=Y5U , YV=Y5V

(2)Rate Voltage : 602=6KVDC

(3)Rate Capacitance : ex. 221=220pF, 102=1000pF

(4)Tolerance of Capacitance : K= ±10%, M= ±20%

(5) Nominal body diameter dimension .

(6)Lead Style : Refer to “2. Mechanical”.

(7)Packing mode and lead length (identified by 2-figure code) :

Taping Code	Description
AF	Ammo box and product pitch : 15.0 mm (Lead space7.5mm)
AM	Ammo box and product pitch : 25.4 mm (Lead space10mm or 7.5mm)
AS	Ammo box and product pitch : 15.0 mm (Lead space10mm)

Bulk Code	Description
3E	Lead length : 3.5mm
04	Lead length : 4.0mm
4E	Lead length : 4.5mm
20	Lead length : 20.0mm

(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)Lead Pitch :

Code	Description
7	7.5 ±1mm
M	7.5±0.5 mm
0	10.0 ±1mm
A	10±0.5 mm

(10)Epoxy Resin Code :

Code	Description
H	Halogen and Pb free , epoxy resin.

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**2. Mechanical**

Available lead code (Epoxy Resin Coating)- (unit: mm)

Lead type	SAP P/N (13-17)digits	Lead space (F)	Lead Length (L)	Packing	Lead Configuration
Lead style : L or B Type L or B Straight long lead	L03B7	7.5 ± 1.0	3.0 ± 1.0	Bulk	
	L4EB7	7.5 ± 1.0	4.5 ± 1.0		
	L05B7	7.5 ± 1.0	5.0 ± 1.0		
	L03B0	10 ± 1.0	3.0 ± 1.0		
	L4EB0	10 ± 1.0	4.5 ± 1.0		
	L05B0	10 ± 1.0	5.0 ± 1.0		
	B20C7	7.5 ± 1.0	20 min.		
	B20C0	10 ± 1.0	20 min.		
	BAFD7	7.5 ± 1.0	Refer to "4. Taping format"		
	BAMD7	7.5 ± 1.0			
BAMD0	10 ± 1.0				
Lead style : G Type G Straight lead	G03A7	7.5 ± 1.0	3.0 ± 0.5	Bulk	
	G3EA7	7.5 ± 1.0	3.5 ± 0.5		
	G04A7	7.5 ± 1.0	4.0 ± 0.5		
	G03A0	10 ± 1.0	3.0 ± 0.5		
	G3EA0	10 ± 1.0	3.5 ± 0.5		
	G04A0	10 ± 1.0	4.0 ± 0.5		
	GAFD7	7.5 ± 1.0	Refer to "4. Taping format"		
	GAMD7	7.5 ± 1.0			
GAMD0	10 ± 1.0				
Lead style : D Type D Vertical kink lead	D03A7	7.5 ± 1.0	3.0 ± 0.5	Bulk	
	D3EA7	7.5 ± 1.0	3.5 ± 0.5		
	D04A7	7.5 ± 1.0	4.0 ± 0.5		
	D03A0	10 ± 1.0	3.0 ± 0.5		
	D3EA0	10 ± 1.0	3.5 ± 0.5		
	D04A0	10 ± 1.0	4.0 ± 0.5		
	D20C7	7.5 ± 1.0	20 min.		
	D20C0	10 ± 1.0	20 min.		
	DAFD7	7.5 ± 1.0	Refer to "4. Taping format"		
	DAMD7	7.5 ± 1.0			
DAMD0	10 ± 1.0				
Lead style : X Type X Outside kink lead	X03A7	7.5 ± 1.0	3.0 ± 0.5	Bulk	
	X3EA7	7.5 ± 1.0	3.5 ± 0.5		
	X04A7	7.5 ± 1.0	4.0 ± 0.5		
	X05B7	7.5 ± 1.0	5.0 ± 1.0		
	X03A0	10 ± 1.0	3.0 ± 0.5		
	X3EA0	10 ± 1.0	3.5 ± 0.5		
	X04A0	10 ± 1.0	4.0 ± 0.5		
	X05B0	10 ± 1.0	5.0 ± 1.0		
	XAFD7	7.5 ± 1.0	Refer to "4. Taping format"		
	XAMD7	7.5 ± 1.0			
XAMD0	10 ± 1.0				

\* Lead diameter Φd: 0.55+/-0.05mm

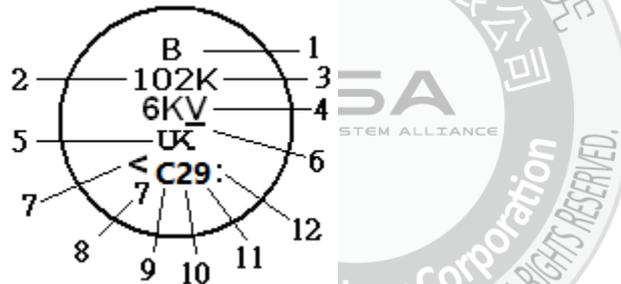
\* e (Coating extension on leads): 3.0mmMax for straight lead style; Not exceed the kink for kink lead.

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**3. Part numbering/T.C/Capacitance/ Tolerance/Diameter :**

SAP P/N	T.C.	Capacitance(pF)	Tolerance	Dimension (unit:mm)			
				D(max.)	T(max.)	F	Φd
YP602101K060*	Y5P	100 pF	±10%	7.0	5.0	7.5±1 or 10±1	0.55+/-0.05
YP602151K060*		150 pF		7.0			
YP602221K060*		220 pF		7.0			
YP602331K060*		330 pF		7.0			
YP602471K070*		470 pF		8.0			
YP602561K080*		560 pF		9.0			
YP602681K080*		680 pF		9.0			
YP602102K100*		1000 pF		11.0			
YU602102M070*		Y5U		1000 pF			
YU602152M080*	1500 pF		9.0				
YU602222M090*	2200 pF		10.0				
YU602332M110*	3300 pF		12.0				
YU602392M120*	3900 pF		13.0				
YU602472M130*	4700 pF		14.0				
YV602102M060*	Y5V	1000pF		7.0	5.5	7.5±1 or 10±1	0.55+/-0.05
YV602152M070*		1500pF		8.0			
YV602222M080*		2200pF		9.0			
YV602332M100*		3300pF		11.0			
YV602472M110*		4700pF		12.0			

**4. Marking :**



1. Temperature characteristic	2. Nominal capacitance	3. Capacitance tolerance	4. Rated voltage	5. Manufacturer's identification	6. Halogen and Pb free
Y5P : Be marked "B" Y5U : Be marked "E" Y5V : Shall be omitted	Identified by 3-figure code when Cap.≥100pF Ex. 1000pF → "102"	K: ±10% (For Y5P) M: ±20% (For Y5U /Y5V)	6000V : Be marked "6KV"	Shall be marked as "UK", but when the code of body diameter dimension ≤060 shall be omitted.	When the epoxy resin is Halogen and Pb free, there is a "-" marking.
Definition of date code marking:					
7. Supplier of Epoxy	8. No. of test equipment	9. Factory of manufacture	10. Year of manufacture	11. Month of manufacture	12. Week of manufacture by month
< :K-company , : P-company	1~9: No.1~No.9, J: No.10, K: No.11, L: No.12 .....	C: Factory of POEGZ	1:2021, 2:2022, 3:2023, 4:2024, 5:2025, 6:2026, ...	1~9:January~ September, O: October, N: November, D: December	week 1: - week 2: · week 3: : week 4: · week 5: ;

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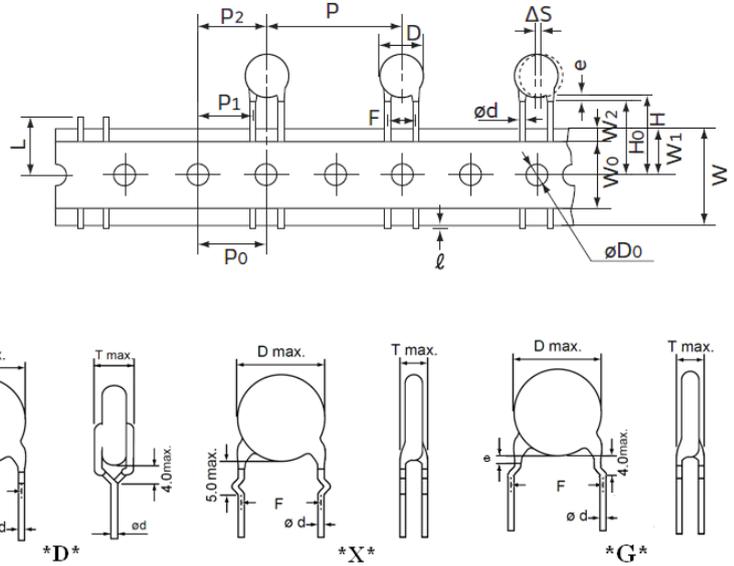
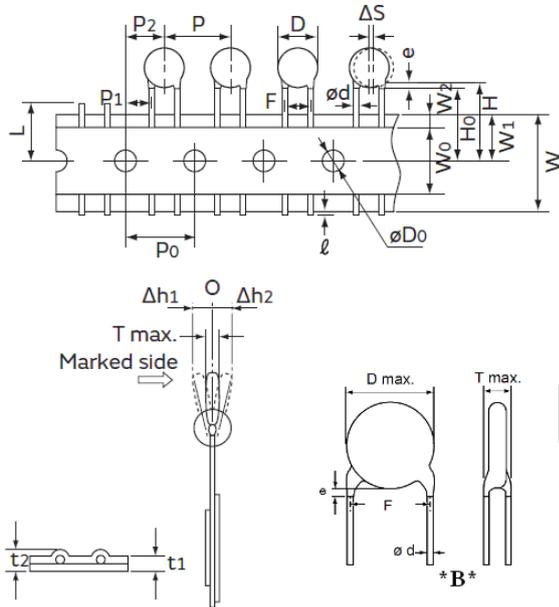
**5. Taping Format**

• 15 mm pitch/lead spacing 7.5mm taping

Lead Code: \*BAFD7 & \*DAFD7 & \*XAFD7 & \*GAFD7

• 25.4mm pitch/lead spacing 7.5mm & 10.0mm taping

Lead Code: \*BAMD\* & \*DAMD\* & \*XAMD\* & \*GAMD\*



POE Part Number		*BAFD7 / *DAFD7 *XAFD7 / *GAFD7	*BAMD7 / *DAMD7 *XAMD7 / *GAMD7	*BAMD0 / *DAMD0 *XAMD0 / *GAMD0
Item	Symbol	Dimensions (mm)	Dimensions (mm)	Dimensions (mm)
Pitch of component	P	15.0±1.0	25.4±2.0	25.4±2.0
Pitch of sprocket	P0	15.0±0.3	12.7±0.3	12.7±0.3
Lead spacing	F	7.5±1.0	7.5±1.0	10.0±1.0
Length from hole center to component center	P2	7.5±1.5	12.7±1.5	12.7 ± 1.5
Length from hole center to lead	P1	3.75±1.0	8.95±1.0	7.7±1.5
Body diameter	D	See the “3. Part numbering/T.C/Capacitance/ Tolerance/Diameter”		
Deviation along tape, left or right	Δ S	0±2.0		
Carrier tape width	W	18.0 +1/-0.5		
Position of sprocket hole	W1	9.0±0.5		
Lead distance between the kink and center of sprocket hole	H0	18.0+2.0/-0 (For: *DAFD7 / *XAFD7/ *GAFD7)	18.0+2.0/-0 (For: *DAMD7 / *XAMD7 / *GAMD7)	18.0+2.0/-0 (For: *DAMD0 / *XAMD0 / *GAMD0)
Lead distance between the bottom of body and the center of sprocket hole	H	20.0+1.5/-1.0 (For: *BAFD7)	20.0+1.5/-1.0 (For: *BAMD7)	20.0+1.5/-1.0 (For: *BAMD0)
Length from the terminal of the lead wire to the edge of carrier tape	ℓ	2.0max (Or the end of lead wire may be inside the tape.)		
Diameter of sprocket hole	D0	4.0±0.2		
Lead diameter	φd	0.55±0.05		
Total tape thickness	t1	0.6±0.3		
Total thickness, tape and lead wire	t2	1.5 max.		
Deviation across tape	Δ h1 Δ h2	2.0 max.		
Portion to cut in case of defect	L	11.0 max.		
Hole-down tape width	W0	8.0 min		
Hole-down tape distortion	W2	1.5±1.5		
Coating extension on leads	e	3.0 max for straight lead style; Not exceed the kink leads for kink lead.		
Body thickness	T	See the “3. Part numbering/T.C/Capacitance/ Tolerance/Diameter”		

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**6. Specification and test method:**

6.1 SCOPE: THIS SPECIFICATION APPLIES TO HIGH VOLTAGE CONSTANT, 6KV CERAMIC CAPACITOR.

6.2 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.

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

6.4 TEST ITEMS:

ITEM	POST-TEST REQUIREMENTS	TESTING PROCEDURE
TEMP. RANGE	OPERATING TEMPERATURE : -25°C to +125°C	
APPEARANCE STRUCTURE SIZE	NO ABNORMALITIES	
MARKING		AS ITEM 4.MARKING.
WITHSTAND VOLTAGEN	BETWEEN TERMINALS: NO ABNORMALITIES	TEST VOLTAGE : 9KVDC, 1~5 SEC, WITH 50mA MAX. CHARGING CURRENT Pre-treatment: Capacitor shall be stored at 125±3°C for 1hour.then placed at※ room condition for 24±2hours
	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 OF RATED VOLTAGE BETWEEN TERMINALS AND ENCLOSURE FOR 1~5 SEC) Pre-treatment: Capacitor shall be stored at 125±3°C for 1hour.then placed at※ room condition for 24±2hours
INSULATION RESISTANCE	10000 MΩ MIN	INSULATION RESISTANCE SHALL BE MEASURED AT 60±5 SECONDS AFTER RATED VOLTAGE APPLIED. RATED VOLTAGE : 500VDC Pre-treatment: Capacitor shall be stored at 125±3°C for 1hour.then placed at※ room condition for 24±2hours
CAPACITANCE	TOLERANCE : K : ±10% M : ±20%	TESTING FREQUENCY : 1 KHZ ± 20% TESTING TEMPERATURE : 25 ± 2°C, TESTING VOLTAGE : 1.0VRMS
DISSIPATION FACTOR( D.F. )	Y5P : < 2.5% Y5U : BELOW 2.5% Y5V : BELOW 5.0%	Pre-treatment: Capacitor shall be stored at 125±3°C for 1hour.then placed at※ room condition for 24±2hours
TEMPERATURE CHARACTERISTIC	CAP. CHANGE: Y5P : WITHIN ± 10% (-25°C to +85°C) & WITHIN ± 35% ( 85°C to +125°C) Y5U : WITHIN +22,-56% Y5V : WITHIN +22%, -82%	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 Y5V : -25°C ~ +85°C Pre-treatment: Capacitor shall be stored at 125±3°C for 1hour.then placed at※ room condition for 24±2hours

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

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ITEM	POST-TEST REQUIREMENTS	TESTING PROCEDURE
TERMINAL STRENGTH	TENSIBLE STRENGTH : NO BREAKDOWN	WIRE DIA. 0.5mm, LOADING WEIGHT 0.5KG FOR 10±1 SECONDS. WIRE DIA. 0.6mm, LOADING WEIGHT 1.0KG FOR 10±1 SECONDS.
	BENDING STRENGTH : NO BREAKDOWN.	WIRE DIA.0.5 M/M, LOADING WEIGHT 0.25KG WIRE DIA.0.6 M/M, LOADING WEIGHT 0.5KG (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 BE IMMERSUED UP TO 2.0 M/M FORM BODY. INTO THE MOLTEN SOLDER OF WHICH TEMPERATURE: 260(+5/-0)°C FOR 5~10 SECONDS.THEN LEAVE AT STANDARD TEST CONDITIONS FOR 4~24 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.
	CAP. CHANGE : Y5P : ±5% MAX Y5U : ±15% MAX Y5V : ± 20% MAX	
	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°C FOR 500(+24/-0) HOURS. THEN DRIED FOR 1~2 HOURS AND MEASURED.  Pre-treatment: Capacitor shall be stored at125±3°C for 1hour.then placed at※ <sup>1</sup> room condition for 24±2hours  Post-treatment: Capacitor should be stored for 24±2 hrs. at * <sup>1</sup> room condition
	CAP. CHANGE : Y5P : ± 10% MAX Y5U : ± 20% MAX Y5V : ± 30% MAX	
	D.F.: Y5P : 5% MAX Y5U : 5% MAX Y5V : 7.5% MAX	
	INSULATION RESISTANCE: 1000MΩ MIN.	
HUMIDITY LOADING	APPEARANCE : NO ABNORAMLITIES	CAPACITORS SHALL BE SUBJECTED TO A RELATIVE HUMIDITY OF 90 ~ 95% AT 40 ± 2°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 at125±3°C for 1hour.then placed at※ <sup>1</sup> room condition for 24±2hours  Post-treatment: Capacitor should be stored for 24±2 hrs. at * <sup>1</sup> room condition
	CAP. CHANGE : Y5P : ±10% MAX Y5U : ±20% MAX Y5V : ± 30% MAX	
	D.F.: Y5P : 5% MAX Y5U : 5% MAX Y5V : 7.5% MAX	
	INSULATION RESISTANCE: 500 MΩ MIN	

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

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ITEM	POST-TEST REQUIREMENTS	TESTING PROCEDURE
<b>HIGH TEMPERATURE LOADING</b>	APPEARANCE: NO ABNORMALITIES	<p>CAPACITORS SHALL BE SUBJECTED TO A TEST OF 150% RATED VOLTAGE WITH 50mA MAX. FOR 1000(+48/-0) HOURS AT <math>125 \pm 2^{\circ}\text{C}</math> AND THEN DRIED FOR <math>24 \pm 2</math> HOURS AND MEASURED.</p> <p><b>Pre-treatment:</b> Capacitor shall be stored at <math>125 \pm 3^{\circ}\text{C}</math> for 1hour.then placed at※<sup>1</sup>room condition for <math>24 \pm 2</math>hours</p> <p><b>Post-treatment:</b> Capacitor should be stored for <math>24 \pm 2</math> hrs. at *<sup>1</sup>room condition</p>
	CAP. CHANGE : Y5P : $\pm 10\%$ MAX Y5U : $\pm 20\%$ MAX Y5V : $\pm 30\%$ MAX	
	D.F. : Y5P : 4% MAX Y5U : 4% MAX Y5V : 7.5% MAX	
	INSULATION RESISTANCE : 1000 MΩ MIN.	
<b>TEMPERATURE CYCLING</b>	APPEARANCE : NO ABNORMALITIES	<p>CAPACITORS SHALL BE SUBJECTED TO : -<math>25 \pm 3^{\circ}\text{C}</math> (30±3min)→<math>25^{\circ}\text{C}</math> (3min)→<math>85 \pm 3^{\circ}\text{C}</math> (30±3min) →<math>25^{\circ}\text{C}</math> (3min) FOR 5 CYCLE</p> <p><b>Pre-treatment:</b> Capacitor shall be stored at <math>125 \pm 3^{\circ}\text{C}</math> for 1hour.then placed at※<sup>1</sup>room condition for <math>24 \pm 2</math>hours</p> <p><b>Post-treatment:</b> Capacitor should be stored for <math>24 \pm 2</math> hrs. at *<sup>1</sup>room condition</p>
	CAP. CHANGE: Y5P : $\pm 10\%$ MAX Y5U : $\pm 20\%$ MAX Y5V : $\pm 30\%$ MAX	
	D.F.: Y5P : 5% MAX Y5U : 5% MAX Y5V : 7.5% MAX	
	INSULATION RESISTANCE: 1000 MΩ MIN.	

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

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**7. Packing Baggage :**

7.1 Packing size:

Type	Box	Carton
Bulk	<p style="text-align: center;">Unit:mm</p>	<p style="text-align: center;">Unit:mm</p> <p style="text-align: right;">PF% WV N.W: KG KPCS GW: KG</p>
Ammo taping	<p style="text-align: center;">Unit:mm</p>	<p style="text-align: center;">Unit:mm</p> <p style="text-align: right;">PF% WV N.W: KG KPCS GW: KG</p>

7.2 Packing quantity:

Packing type	The code of 14th to 15th in SAP P/N	MPQ(Kpcs/Box)
Taping	AF	1
	AS	1
	AM (The size code $\leq 11$ )	1
	AM (The size code $\geq 12$ )	0.5

Packing type	Lead length	Size code of 10th to 12th in SAP P/N	MPQ (Kpcs/Bag)	Kpcs/Box
Bulk	Long lead ( $L \geq 16\text{mm}$ )	060~100	1	2
		110~120	0.5	1.5
		130	0.5	1
	Short lead ( $L < 16\text{mm}$ )	060	1	6
		070~080	1	4
		090~100	1	3
		110~130	1	2

## 8. Notices:

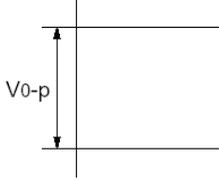
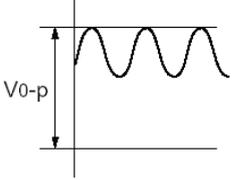
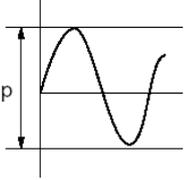
※**Application:** DC or Low frequency High Voltage circuits.

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

### 8.1 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			

### 8.2 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  $\phi 0.1\text{mm}$  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.)

### 8.3 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.

### 8.4 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.

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### 8.5 Vibration and impact

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

### 8.6 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.

### 8.7 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.

### 8.8 List of substances that affect the insulation strength of coating :

#### Epoxy resin solvent

Category	Model		
Ketone	Acetone	Butanone	Cyclohexanone
Esters	Ethyl acetate	Dibutyl phthalate	
Chlorinated hydrocarbons	Dichloromethane		

#### Epoxy resin thinner

Category		Model	
Reactive diluentactivated thinner	Simple function group	HK-66 (Alkyl glycidyl ether)	
		501 (Butyl glycidyl ether)	
		690 (Phenyl Glycidyl Ether )	
		AGE (C12-14Aliphatic Polyalcohol Glycidyl Ether)	
		692 (Benzyl Glycidyl Ether)	
	Two functional groups	D-678 ( Neopentyl glycol diglycidyl ether )	
		622 (1,4-Butanediol diglycidyl ether)	
		669 (Ethylene glycol diglycidyl ether)	
		X-632 (Polypropylene glycol diglycidyl ether)	
		X-652 (1,6-Hexadiol diglycidyl ether)	
Non-activated thinner	D-691Epoxypropane o-methylphenyl ether		
	Anhydrous ethanol	Toluene	
	Ethyl acetate	Dimethylbenzene	
	Dimethyl formamide	Butyl acetate	
	Acetone	Styrene	
	Polyol	Benzyl alcohol	

**Note: The above substances should not contact the coating of the product body, otherwise it will affect the insulation strength of the product**

## 9. Soldering Recommendation:

### 9.1 Wave Soldering Profile:

- Temperature conditions of the flow is recommended as shown in the chart
- Must implement the pre-heat
- Maximum peak flow temperature is recommended 265°C
- Time “T” implement in the chart recommended within 20 sec. if temperature exceed 200°C
- Take care with the flow solder not to touch the capacitor body directly at mounting

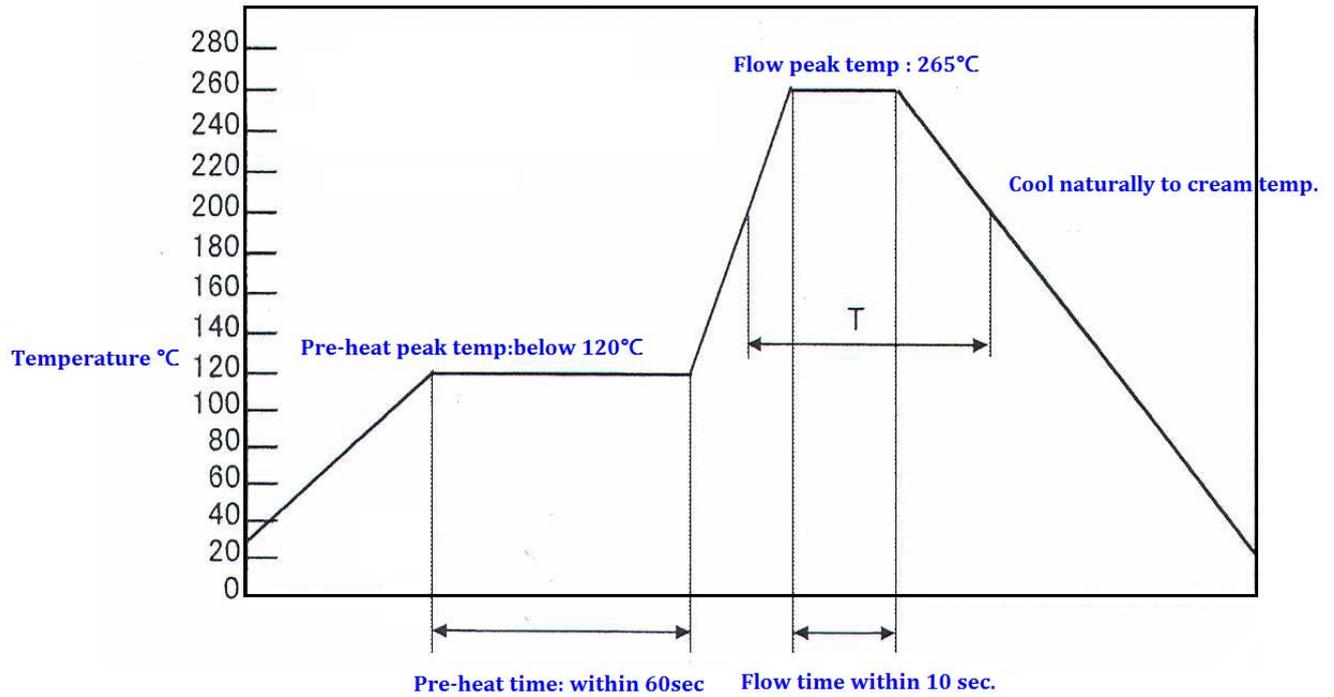


Chart to show flow recommended temp

### 9.2 Recommended Reworking Conditions with Soldering Iron :

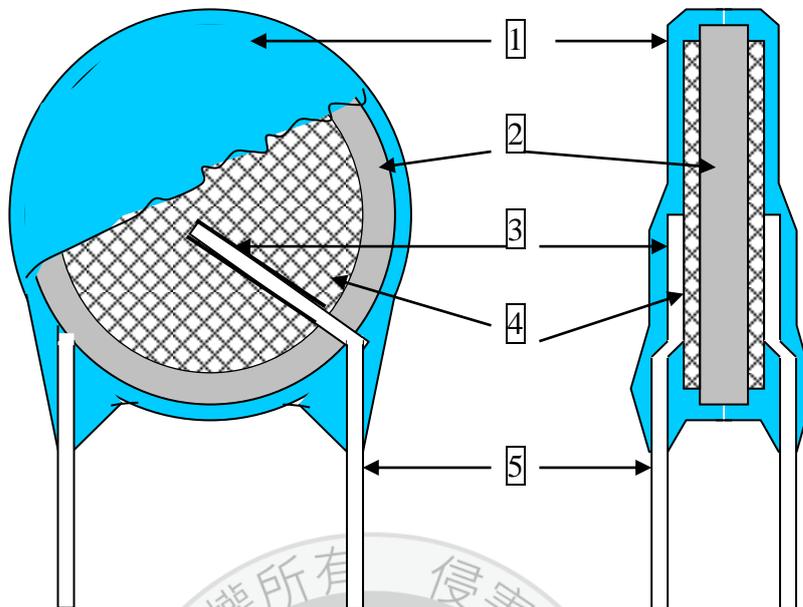
- Temperature of iron-tip: 400 degrees C. max.
- Soldering iron wattage: 50W max.
- Soldering time: 3.5 sec. max.
- Distance from coating body: 2 mm (min.)

### 9.3 Reflow-Soldering : Lead Ceramic Cap. should not be soldered by reflow-soldering.

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10. Drawing of internal structure and material list :

產品結構圖



Remarks :

No.	Material	Description
1	Insulation Coating	Epoxy resins
2	Dielectric Element	Ceramic
3	Solder	Tin-Silver alloy
4	Electrodes	Silver [Ag]
5	Leads wire	Solder coated CP wire (Solder : Tin-Silver alloy)