

50V, 100V, 500V, 1KV, 2KV TEMPERATURE COMPENSATING CERAMIC DISC CAPACITOR

POE-D01-00-E-16

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PRODUCT SPECIFICATION

PRODUCT: CERAMIC DISC CAPACITOR

TYPE: 50V, 100V, 500V, 1KV, 2KV, TEMPERATURE COMPENSATING CAPACITOR

CUSTOMER:

DOC. NO.: POE-D01-00-E-16

Ver.: 16

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, GUANG ZHOU ECONOMIC AND TECHNOLOGY DEVELOPMENT ZONE, CHINA





POE



50V, 100V, 500V, 1KV, 2KV temperature compensating ceramic disc capacitor

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Record of change

Date	Version	Description				
2008.6.3	1	1. D08-00-E-14 (before	re) → POE-D01-00-	-E-01 (1 st edition)		
2008.8.22	2	1.Revised diameter as		-		
		Before	Now	Before	Now	
		CH5000R5X040*	not available	SL500181X060*	SL500181X050*	8-9
		CH1010R5X040*	not available	SL500241X070*	SL500241X060*	0 /
		CH501360X050*	CH501360X060*	SL500361X080*	SL500361X070*	
		CH501620X080*	CH501620X060*	SL500391X080*	SL500391X070*	
		CH501680X080*	CH501680X060*	SL101181X060*	SL101181X050*	
		CH501750X080*	CH501750X060*	SL101241X070*	SL101241X060*	
		CH501820X080*	CH501820X070*	SL101361X080*	SL101361X070*	
		CH501101X080*	CH501101X070*	SL101391X080*	SL101391X070*	
		CH102080X060*	CH102080X050*	SL102680X060*	SL102680X050*	6-7
		CH102100X060*	CH102100X050*	SL102121X100*	SL102121X060*	5
		CH102120X060*	CH102120X050*	SL102151X100*	SL102151X070*	
		CH102620X080*	CH102620X070*	SL102181X100*	SL102181X070*	
		CH102820X100*	CH102820X080*	SL102201X100*	SL102201X080*	
		/.v	出版作	SL102221X100*	SL102221X080*	
		2. Complete lead code 3.Add last SAP code '		Pb free, epoxy resin		
2008.12.12	3	 Complete the 13th to 17th codes of SAP P/N. Page layout adjustment. Added Marking when the coating resin is Halogen and PB free Epoxy. 				5-9
2009.8.19	4	1 Change PSA & POE logo to Walsin & POE logo. 2. Operating temperature range change from -25°C ~ +85°C to -25°C ~ +125°C, and the loading temperature of High Temperature Loading change from +85°C to +125°C (but the T.C.C temperature didn't change).				13 15
2010.8.24	5	1. Change the diame		60 to 070 for P/N CH	500V 62pF&68pF&75pF. SL 1KV.	8
2012/5/10	6	 Review the size Dφ of the item CH/500V/121&151 from "100" to be "080"; Review the size Dφ for the item CH/1000V/820 from "080" to be "070", CH/1000V/101 from "100" to be "070". 				8
2012/12/5	7	Add 8.6. Ambient Ter	np of Allowable Volta	age Graph (500Vdc to	2kVdc)	18-19
2013/5/6	8	1. Review the Lead	diameter φ from 0.60	+/-0.06mm to 0.55+/-	0.05mm	7,10
					ll be omitted." 45±5°C , Solderability time	9 13
2013/10/18	9	Review the packing				11
2015/8/31	10		of the use of epoxy re	sin for 1KV products		8-9
		2. Delete the definit	nts of the temperature ion about"Old Part No 391 pF (Code of d	o.".	s 110&120) for P/N CH	5, 6,7 8 8
2015/9/23	11	of diameter dimer 5. Delete 56 pF &68 6. Delete 4pF~22pl	nsion is 080) for P/N of RpF~100pF (Code of of the code)	CH 500V. liameter dimension is dimension is 060)	and 120 pF &150 pF (Code 070) for P/N CH 1KV. and 24pF~47pF (Code of	8
2016/3/2	12	Review the Available lead code of Lead Configuration. Review 8.6. Ambient Temp of Allowable Voltage Graph (500Vdc to 2kVdc) Review 9. Drawing of internal structure and material list				6-7 17-18 19



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Date	Version		Desc	cription	page
		1. Revised diameter	as below:		9
		Before	Now		
		SL202181J100*	SL202181J080*		
		SL202201J100*	SL202201J080*		
2016/5/3	13	SL202221J100*	SL202221J080*		
		SL202241J100*	SL202241J080*		
		SL202271J100*	SL202271J080*		
		SL202301J120*	SL202301J110*		
		SL202331J120*	SL202331J110*		
2016/11/3	14	1. Delete "CH" serie	s.		5,8,12~13
2016/12/21	15	1. Revised the produ	ct diameter for SL 50V	√~500V	8
2017/9/27	16	2. Delete 8pF~15pF	(Code of diameter dim	nension is 040) for P/N SL 50V&100V. nension is 050) for P/N SL 500V. mension is 050) for P/N SL 1KV.	8





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

• Temperature characteristic:

SL: +350~-1000ppm/°C

2 Rated voltage (Vdc):

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

3Capacitance(pF):

Capacitors (pF)	47	100	330	470	820
Code	470	101	331	471	821

QCapacitance tolerance : D: ± 0.5 pF (For6~10pF) \ J: $\pm 5\%$ (For above 10pF)

5 Nominal body diameter dimension:

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

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

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

Taping Code	Description > 7
AN	Ammo / Pitch of component:12.7 mm
	14417 - 33

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

8 Length tolerance

zengui tolerance	
Code	Description
A	±0.5 mm(Only for short kink lead code)
В	±1.0 mm/ OGV CORPORALLO
С	Min.
D	Taping special purpose

9Pitch

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		

Coating code

Code	Description
P	Phenolic resin -Pb free
A	Halogen free and Pb free, phenolic resin
В	Epoxy Resin, Pb free
Н	Halogen free and Pb free, epoxy resin



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2. Mechanical:

Available lead code: (unit: mm)

Available lead	SAP P/N (13-17) digits	Pitch (F)	Lead length (L)	Available rated voltage	Packing	Lead configuration
	B20C2	2.5 ± 0.8	20 MIN.	50V&100V		D max. T max.
Ī	B20C5	5.0 ± 0.8	20 MIN.			
	B20C6	6.4 ± 1.0	20 MIN.	50110 10011 50011	Bulk	
Lead style: B	B20C0	10 ± 1.0	20 MIN.	50V&100V, 500V, 1KV,2KV		()
Straight long	B20C7	7.5 ± 1.0	20 MIN.	1K V,2K V		
lead -	BAND5	5.0 +0.8 -0.2	Taping Spec. (Ref.		Tap. Ammo	
	BAND2	2.5 ± 0.8	to page.10)	50V&100V	тар. Аншо	Ø d→
_	L05B2	2.5 ± 0.8	5.0 ± 1.0			D max. T max.
-	L05B5	5.0 ± 0.8	5.0 ± 1.0			
T 1 1 T	L05B0 L05B6	10 ± 1.0 6.4 ± 1.0	5.0 ± 1.0 5.0 ± 1.0	-		V 1
Lead style : L Straight short	L05B7	7.5 ± 1.0	5.0 ± 1.0 5.0 ± 1.0	50X/9-100X/ 500X/	Bulk	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \
lead	L4EB5	5.0 ± 0.8	4.5 ± 1.0	50V&100V, 500V, 1KV, 2KV	Duik	
lead	L4EB7	7.5 ± 1.0	4.5 ± 1.0	1K V, 2K V		°₹∯- F →Ñ ₹─∭ Ĭ
	L4EB0	10 ± 1.0	4.5 ± 1.0	15		ø d- - L
	H3EA5	5.0 ± 0.8	3.5 ± 0.5	12 SX		, <u>a</u> , <u>a </u>
	H04A5	5.0 ± 0.8	4.0 ± 0.5	10 2 1		
	H4EB5	5.0 ± 0.8	4.5 ± 1.0	50V&100V, 500V,	Bulk	
_	H05B5	5.0 ± 0.8	5.0 ± 1.0	1KV	42/	
-	H20C5	5.0 ± 0.8	20 MIN.	$\langle \nabla \rangle$	512	D max.
Lead style : H	HAND5	5.0 +0.8 -0.2	Taping SPEC. (Ref. to page 10)		Tap. Ammo	
T .1 1. 1	H05B7	7.5 ± 1.0	5.0 ±1.0			., \ \
Inside kink	H05B0 H20C0	10 ± 1.0 10 ± 1.0	$5.0 \pm 1.0 = 549$ 20 MIN.	TEM ALLIANCE		S T T T T T T T T T T T T T T T T T T T
lead _	H04A7	7.5 ± 1.0	4.0 ± 0.5			\$ -
	H04A0	10 ± 1.0	4.0 ± 0.5	50V&100V, 500V,	Bulk	ø d- - L
	H3EA7	7.5 ± 1.0	3.5 ± 0.5	1KV,2KV	85	
<u>_</u>	H3EA0	10 ± 1.0	3.5 ± 0.5	0.4100		
-	H4EB7	7.5 ± 1.0	4.5 ± 1.0	Ogy		
	H4EB0	10 ± 1.0	4.5/±1.0	CORRORATION		
-	X3EA5	5.0±0.8	25 . 0.5	CORPONIA		
_	X3EA7	7.5±1.0	3.5 ± 0.5			D max. T max. → →
-	X3EA0	10±1.0				
Lead style: X	X04A5	5.0±0.8		50V&100V, 500V,		()
Outside kink	X04A7	7.5±1.0	4.0 ± 0.5	1KV, 2KV	Bulk	× 1 \
lead	X04A0	10±1.0				S. T.
	X05B5	5.0±0.8				
Ī	X05B7	7.5±1.0	5.0 ± 1.0			Ød- -ød <u> </u> L
ľ	X05B0	10±1.0				
	D04A5	5.0±1.0				D max. T max,
	D04A7	7.5±1.0	4.0 ± 0.5			1 max
Lead style : D Vertical kink short lead	D04A0	10±1.0	5.5			\vee \vee $ \cap $
				50V&100V, 500V,	Bulk	()
	D3EA5	5.0±0.8	25.05	1KV, 2KV		
	D3EA7	7.5±1.0	3.5 ± 0.5	, ,		¥ ¥ ¥
	D3EA0	10±1.0]		
	DAND5	5.0 ^{+0.8} -0.2	Taping SPEC.		Tap. Ammo	Ø d→
		-0.2	(Ref. to page.10)		1	



 $50\text{V},\,100\text{V},\,500\text{V},\,1\text{K}\text{V},\,2\text{K}\text{V}$ temperature compensating ceramic disc capacitor

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Lead type	SAP P/N (13-17) digits	Lead length (L)	Available rated voltage	Packing	Lead configu	ration
	M05B5				D max.	T max.
	M05B7	5.0 ± 1.0	50V&100V, 500V, 1KV, 2KV			
	M05B0					
Lead style: M	M04B5					
Double outside	M04B7	4.0 ± 1.0		Bulk	x l \ \	y y
kink lead	M04B0				F _Ø d	

- % Lead diameter ϕ = 0.55 +/-0.05mm
- ** Phenolic resin coating for 50V/500V/1KV product; Epoxy resin coating for 1KV or 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.





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

T.C										S	L									
Rate voltage			5	0V/100	V					500V				1 F	ζV			2H	ζV	
Dφ	040	050	060	070	080	090	100	050	060	070	080	100	050	060	070	080	060	070	080	110
D max. (mm)	5.0	6.0	7.0	8.0	9.0	10.0	11.0	6.0	7.0	8.0	9.0	11.0	6.0	7.0	8.0	9.0	7.5	8.5	9.5	12.5
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	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
2 3																				
4																				
5																				
6																				
7																				
8																				
10 12																				
15	150												150				150			
18	180							180					180				180			
20	200							200					200				200			
22	220							220					220				220			
24	240							240					240				240			
27	270							270					270				270			
30	300							300					300				300			
33	330							330					330				330			
36 39	360 390							360 390					360 390				360 390			
47	470							470					470				470			
51	510							510					510				510			
56	560							560					560				560			
68	680							680	. +		1-		680				680			
75	750							750	7年		1/3			750			750			
82	820						13	820			10	186		820			820			
100	101						1	101		1. <i>//</i>		T.C.,		101				101		
120		121				-/-	(())	, ,	121	7 / 7	`.X\		21	121	454				121	
150 180		151 181					V, /	\\.	151	181	S.	2	1/2		151 181				151 181	
200		161	201			1241				201		\sim	77	12	101	201			201	
220			221			17714	/ 43	3		221		:=	7	1		221			221	
240			241				آ رايل	7			241	By /							241	
270				271	1		拟	7			271	15		- V					271	
300			-	301			-11				301	- 1.5								301
330				331							331_									331
360				361				PASSI	VC SY	STEM	ALLEA	361								
390				391	471	6	4					391								
470 500					471	501	4						O 1	=						
510						511	9						3 .6	2						
560						561	10					, f	70	4/						
680						1	681					6	76	7						
750						16	751	16				NO Z	150	7						
820						1	821		h		\mathbf{C}^{O}		16							
PACKING			TAP	ING or B	ULK		13/1	/55	TAP	NG or B	ULK	11/	· / ·	TAPING	or BULI	ζ	TAP	ING or E	ULK	BULK
COATING						Phenol	ic resin						Pheno	lic resin	or Epoxy	Resin		Epoxy	Resin	

4. Marking:

i. Marking:		
		SL
Marking	(2)	(4) (4)
Remarks	(3)	1 KV (6)
(1). Temp. char.	SL: No markir	ng.
(2). Rated capacitance	Identified by 3-	Figure Code. Ex. 47pF→"47",470pF→"471"
	50V&100V	Marked with code "" under the rated capacitance.
(3). Rated voltage	500V	No any marking under the rated capacitance.
	1000V&2000V	Marked with code: 1000V→"1KV", 2000V→"2KV"
(4). Capacitance tolerance	C: ±0.25pF (Fo	r below 5pF) \cdot D: ± 0.5 pF (For6~10pF) \cdot J: $\pm 5\%$ (For above 10pF)
(5). Manufacturer's identification	Shall be marked	d as "♥", but DΦ≤060 shall be omitted.
(6). Halogen and Pb free	There is a "" Pb free Epoxy.	marking under the code "V" when the coating resin is Halogen and



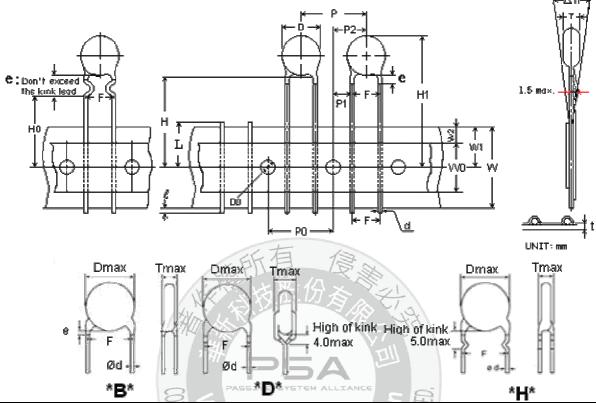
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5. Taping specifications:

- * Lead spacing: $F=5.0^{+0.8}_{-0.2}$ (mm)
 - 12.7mm pitch/lead spacing 5.0mm taping Lead code: *BAND5 & *DAND5 & *HAND5



Item	景台	Symbol	Spec	cification	Remarks			
Item	至 5	Symbol	Value	Tolerance	Kemarks			
Body diameter	0.7	D	*	max.	See Section"3. Capacitance value vs. rated			
Body thickness	1/1/2	O _C T	*	max.	voltage, product diameter".			
Lead-wire diameter	28/10	dn	0.55	±0.05				
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		PÍ	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	For straight lead type	H	20.0	+1.0 -0.5				
center	For kinked lead type	H0	16.0	±0.5				
Component height		H1	32.25	max.				
Lead-wire protrusion		1	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	Please refer to page 6 "e(Coating extension on leads)".					

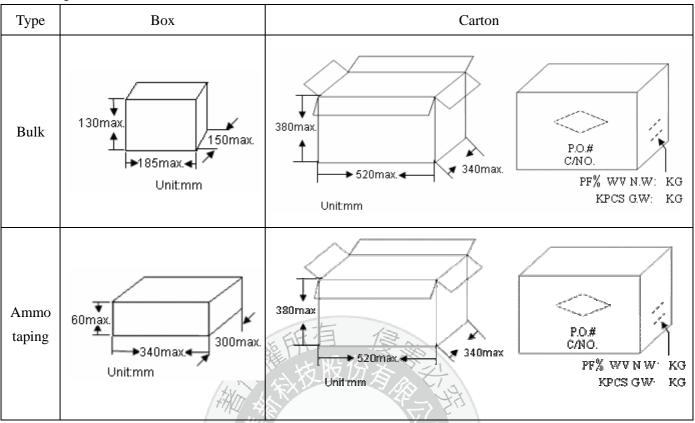
6. Packing Baggage:



 $50\text{V},\,100\text{V},\,500\text{V},\,1\text{K}\text{V},\,2\text{K}\text{V}$ temperature compensating ceramic disc capacitor

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6.1 Packing size:



6.2 Packing quantity:

Packing Type	The	e code of 14th to15th in SAP P/N	MPQ (Kpcs/Box)	Remark	
Tanina		AN C	(2)	7	Phenolic resin	
Taping		AN A	ogy 111 1.5		Epoxy resin	
Packing Type	Lead length	Size code of 10th to 12th/00/ in SAP P/N	MPQ (Kpcs/Bag)	Kpcs/Box	Remark	
		040~070	1	3	Phenolic resin	
	Long lead	080~100	1	2	Phenolic resin	
	(L≧16mm)	050~100	1	2	Epoxy resin	
Bulk		110~120	0.5	1.5		
Duik		040~060	1	6		
	Short lead	070~080	1	4		
	(L < 16mm)	090~100	1	3		
		110~120	1	2		



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7. Specification and test method:

7.1 SCOPE: THIS SPECIFICATION APPLIES TO TEMPERATURE COMPENSATING CERAMIC DISC 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 \pm 2°C, RELATIVE HUMIDITY OF 60% TO 70% AND BAROMETRIC PRESSURE 860 TO 1060 MBAR.

7.3 HANDLE PROCEDURE: TO AVOID UNEXPECT 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 SECTION 3.					
MARKING	横手	AS STATED IN SECTION 4					
	BETWEEN TERMINALS: NO ABNORMALITIES	A. BELOW 1KV: 300% 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.					
WITHSTAND VOLTAGE	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)					
INSULATION RESISTANCE	10000 MΩ MIN	INSULATION RESISTANCE SHALL BE MEASURED AT 60±5 SECONDS AFTER APPLIED VOLTAGE (RATED) RATED VOLTAGE: 50V=50V, 100V=100V, 500V & ABOVE=500V					
CAPACITANCE	TOLERANCE: C: ±0.25PF D: ±0.50PF J: ±5% K: ±10%	TESTING FREQUENCY : 1 MHZ ± 20% TESTING VOLTAGE : 1.0 VRMS					
OPERATING TEMPERATURE RANGE	-25°C ~ +125°C						
Q FACTOR	$ \begin{array}{c c} 30 \text{ PF} \\ \& \text{ ABOVE} \end{array} \hspace{0.5cm} Q \geq 1000 \\ \hline \text{BELOW} \\ 30 \text{PF} \hspace{0.5cm} Q \geq 400 + 20 \times C \\ \end{array} $	- AS ABOVE STIPULATION OF CAPACITANCE					



50V, 100V, 500V, 1KV, 2KV TEMPERATURE COMPENSATING CERAMIC DISC CAPACITOR POE-D01-00-E-16 Page: 12 of 19

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ITEM	POST-TEST REQUIREMENTS		TEST	ING	PROC	EDURI	E		
		ACCORDING TO STEP 1 TO 5 IN ORDER, MEASURED CAPACITANCE WHEN TEMPERATURE REACH BALANCE AND TEMPERATURE COEFFICIENT SHALL BE CALCULATED ON THE FOLLOWING FORMULA: PPM/°C =(C2-C1)×10E6/C1(T2-T1)							
	TEMPERATURE COEFFICIENT : SL :+350~-1000 ppm/°C	Step	1	2	3	4	5		
	FOR (+20°C ~+85°C)	Temp. (°C)	25±2	20±3	25±2	85±2	25±2		
TEMPERATURE CHARACTERISTIC		NOTE : C1 = C2 = CAPAC! T1 = TEMPE! T2 = TEMPE!	ITANCE RATURI	E AS STE E AS STI	EP 2 OR 4 EP 3	4			
	CAPACITANCE TOLERANCE : WITHIN ±0.2% OR ±0.05PF, WHICHEVER IS LARGE	T2 = TEMPERATURE AS STEP 2 OR 4 ACCORDING TO ABOVE STEP 1,3 & 5, CAPACITANCE TOLERANCE SHALL BE CALCULATED ON THE FOLLOWING FORMULA: △C%=(G - S)/C1 NOTE: G = GREATEST CAPACITANCE AS TESTING RESULT OF STEP 1,3 & 5 S = LEAST CAPACITANCE AS TESTING RESULT OF STEP 1,3 & 5 C1 = CAPACITANCE AS STEP 3							
TERMINAL STRENGTH	TENSIBLE STRENGTH: NO BREAKDOWN PASSIVE SYS	WIRE DIA.0.5 M/M. LOADING WEIGHT 0.5 KGS, FOR 10±1 SECONDS. WIRE DIA.0.6 M/M. LOADING WEIGHT 1.0 KGS, FOR 10±1 SECONDS.							
STRENGTH	BENDING STRENGTH : NO BREAKDOWN	WIRE DIA.0. WIRE DIA.0. (BENDING B	6 mm, L	OADING	G WEIG	HT 0.5 I	KGS.	E)	
	APPEARANCE: NO ABNORMALITIES	LEAD WIRE OR TERMINALS SHALL BE IMMERSED UP TO 2.0 M/M FORM BODY. (A) BODY DIA. ≤ 5.0mm: INTO THE MOLTEN SOLDER OF WHICH TEMPERATURE: 260(+5/-0)°C FOR 3.0±0.5							
SOLDERING	CAP.CHANGE : WITHIN ±2.5% OR ±0.25PF, WHICHEVER IS LARGE.	SECONDS. (B) BODY DIA. > 5.0mm: INTO THE MOLTEN SOLDER OF WHICH TEMPERATURE 260(+5/-0)°C FOR 5~10 SECONDS.							
HEAT RESISTANCE	WITHSTAND VOLTAGE: (BETWEEN TERMINALS) NO ABNORMALITIES	THEN LEAVE AT STANDARD TEST CONDITIONS FOR 1~2 HOURS, THEN MEASURED. **WHEN SOLDERING CAPACITOR WITH A SOLDERING							
	TO THE COMPANIES	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.							
SOLDERABILITY LEAD WIRE SHALL BE SOLDERED OVER 75% OF THE CIRCUMFERENTIAL DIRECTION. SOLDERABILITY LEAD WIRE SHALL BE SOLDERABILITY TO COMPLY WITH JIS-C-5102 8.4 SOLDER TEMPERATURE245±5°C AND DIPPING TIME 5±0. SECONDS FLUX: WEIGHT RATIO OF ROSIN 25%					±0.5				



50V, 100V, 500V, 1KV, 2KV TEMPERATURE COMPENSATING CERAMIC DISC CAPACITOR POE-D01-00-E-16 Page: 13 of 19

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ITEM	POST-TEST REQUIREMENTS	TESTING PROCEDURE
HUMIDITY CHARACTERISTIC	APPEARANCE: NO ABNORMALITIES CAP. CHANGE: SL: WITHIN $\pm 5\%$ OR ± 0.5 PF, WHICHEVER IS LARGE Q FACTOR: SL: LESS THAN 10 PF ==> Q $\geq 200 + 10 \times C$ MORE THAN 10 PF AND LESS THAN 30 PF => Q $\geq 275 + 5 \times C / 2$ MORE THAN 30 PF => Q ≥ 350	CAPACITORS SHALL BE SUBJECTED TO A RELATIVE HUMIDITY OF 90 \sim 95% AT 40 ± 2°C FOR 500(+24/-0) HOURS, THEN DRIED FOR 1 \sim 2 HOURS AND MEASURED.
	INSULATION RESISTANCE : $1000 \text{M}\Omega$ MIN.	
HUMIDITY LOADING	APPEARANCE : NO ABNORMALITIES CAP.CHANGE : SL : WITHIN $\pm 7.5\%$ OR ± 0.75 PF, WHICHEVER IS LARGE Q FACTOR : SL : LESS THAN 30 PF => Q $\geq 100 + 10 \times \text{C} / 3$ MORE THAN 30 PF => Q ≥ 200 INSULATION RESISTANCE : ± 500 MΩ MIN.	CAPACITORS SHALL BE SUBJECTED TO A RELATIVE HUMIDITY OF 90 ~ 95% AT 40±2°C FOR 500(+24/-0) HOURS WITH RATED VOLTAGE APPLIED (LESS THAN 50mA), THAN DRIED FOR 1~2 HOURS AND MEASURED.
HIGH TEMPERATURE LOADING	APPEARANCE: NO ABNORMALITIES CAP. CHANGE: SL: WITHIN ±3% OR ±0.3PF, WHICHEVER IS LARGE Q FACTOR: SL: LESS THAN 10PF => Q \geq 200 + 10 × C MORE THAN 10PF & LESS THAN 30PF => Q \geq 275 + 5 × C / 2 MORE THAN 30PF => Q \geq 350 INSULATION RESISTANCE: 1000M Ω MIN.	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 125°C ± 2°C (FOR CH & SL) AND THEN DRIED FOR 1~2 HOURS AND MEASURED.



50V, 100V, 500V, 1KV, 2KV TEMPERATURE COMPENSATING CERAMIC DISC CAPACITOR POE-D01-00-E-16 Page: 14 of 19

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ITEM	POST-TEST REQUIREMENTS	TESTING PROCEDURE
	APPEARANCE :	CAPACITORS SHALL BE SUBJECTED TO:
	NO ABNORMALITIES	$-25\pm3^{\circ}\mathbb{C}(30\pm3\min) \rightarrow 25^{\circ}\mathbb{C}(3\min) \rightarrow 125\pm3^{\circ}\mathbb{C}(30\pm3\min) \rightarrow$ 25°\mathcal{C}(3\text{min}) FOR 5 CYCLE.
	CAP. CHANGE :	
	WITHIN ±5% OR ±0.5PF,	
TEMPERATURE	WHICHEVER IS LARGE	
CYCLING	D.F.	
	$C < 30pF : Q \ge 275 + (5/2)C$	
	$C \ge 30 pF : Q \ge 350$	
	INSULATION RESISTANCE :	
	1000 MΩ MIN.	





50V, 100V, 500V, 1KV, 2KV TEMPERATURE COMPENSATING CERAMIC DISC CAPACITOR POE-DO

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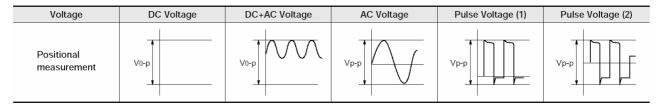
8. Cautions & notices:

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.



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 \emptyset 0.1mm 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 % 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.



50V, 100V, 500V, 1KV, 2KV TEMPERATURE COMPENSATING CERAMIC DISC CAPACITOR POE-D01-00-E-16 Page: 16 of 19

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.

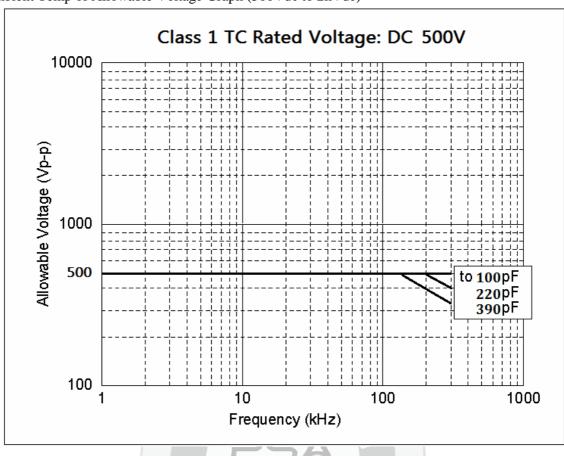
Do not vibrate the PCB/PWB directly.

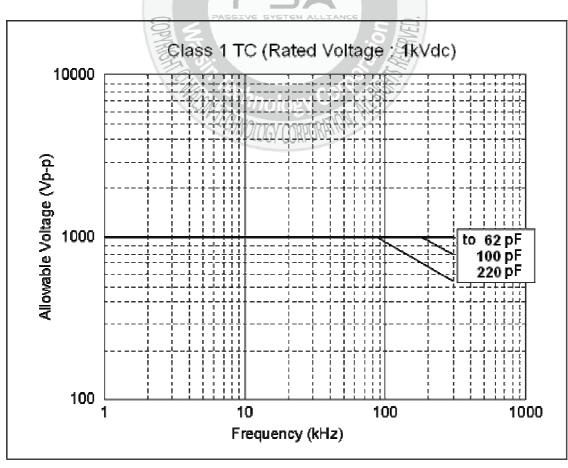
Excessive ultrasonic cleaning may lead to fatigue destruction of the lead wires.



50V, 100V, 500V, 1KV, 2KV TEMPERATURE COMPENSATING CERAMIC DISC CAPACITOR POE-D01-00-E-16 Ver: 16
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8.6. Ambient Temp of Allowable Voltage Graph (500Vdc to 2kVdc)



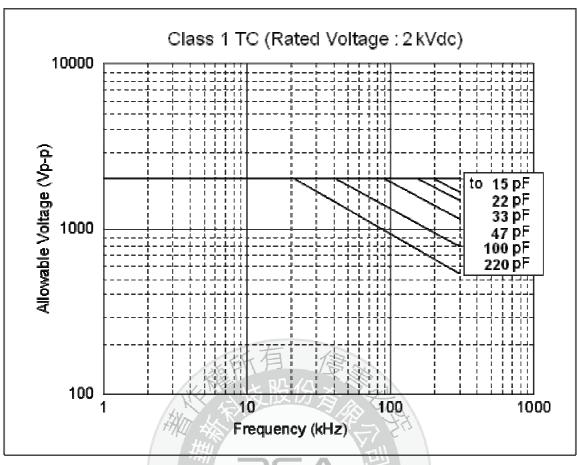


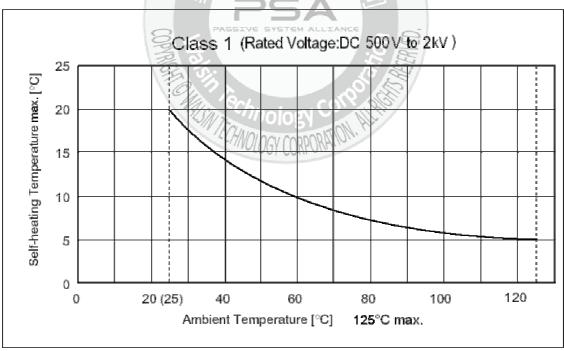


 $50\text{V},\,100\text{V},\,500\text{V},\,1\text{K}\text{V},\,2\text{K}\text{V}$ temperature compensating ceramic disc capacitor

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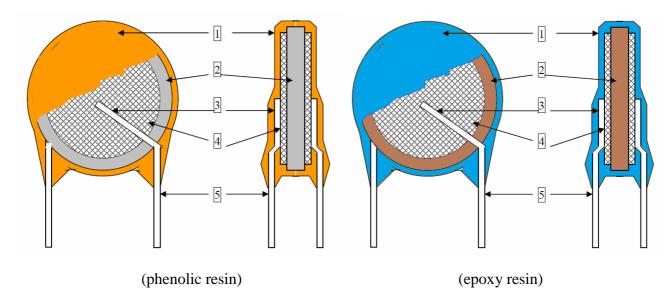
The ambient temperature and the surface temperature of capacitor must be 125° C or lower. (Including self-heating.)



 50V, 100V, 500V, 1KV, 2KV TEMPERATURE COMPENSATING CERAMIC DISC CAPACITOR
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9. Drawing of internal structure and material list:



		ELE	有 母	
NO.	部位	材質	構成部份	供應商
NO.	Part name	Material	Component	Vendor
1	Insulation Coating	Phenolic resin	Phenolic resin, Filler, Pigment	Namics
1	Insulation Coating	Epoxy resin	Epoxy resin, SiO2, TiO2	Kai Hua
			SA	Hua Xing
2	Dielectric Element	Ceramic	BaTiO3	Wang Feng
		多可		Fenghua
3	Solder	Tin-silver	Sn97.5-Ag2.5	Huajun
3	Solder	Till-suver	31197.3-Agz.3	Haili
4	Electrodes	A a LECHNO	OGY CORP Silver, Glass frit	Daejoo
4	Electrodes	Ag	our com Suver, Grass IIII	Xinguang
5	Leads wire	Tinned copper	Substrate metal:Fe&Cu	Hengtai
5	Leaus wife	clad steel wire	Surface plating:Sn 100%	Wuhu Taililai



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PRODUCT SPECIFICATION

PRODUCT: CERAMIC DISC CAPACITOR

TYPE: 3KV TEMPERATURE COMPENSATING CERAMIC CAPACITOR

CUSTOMER:

DOC. NO.: POE-D02-00-E-09

Ver.: 9

APPROVED BY CUSTOMER



■ 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, GUANG ZHOU ECONOMIC AND TECHNOLOGY DEVELOPMENT ZONE,CHINA





POE



3KV TEMPERATURE COMPENSATING CERAMIC CAPACITOR POE-D02-00-E-09 Page: 2 of 15

Record of change

Date	Version	Description	page
2008.6.3	1	1. F03-00-F-09 (before) → POE-F02-00-F-01 (1 st edition)	
2008.8.22	2	1. Complete lead code	5-16
		2. Add last SAP code "H" for halogen and Pb free, epoxy resin	2,10
		3. Remove F(PITCH)=5.0+/-0.8 mm for 3 KV (all lead type)	15
2008.12.12	3	 Complete the 13th to 17th codes of SAP P/N. Page layout adjustment. 	4-5
		3. Added Marking when the coating resin is Halogen and Pb free Epoxy.	
2009/8/19	4.	1. Change PSA & POE logo to Walsin & POE logo.	
		2. capacity list → product range	6
2010/9/9	5	 Review "but Dφ≤6.0 mm shall be omitted." to "but when the code of body diameter dimension ≤060 shall be omitted." Add date code on marking (item 7~12). 	7
2013/5/6	6	 Review the Lead diameter φ from 0.60 +/-0.06mm to 0.55+/-0.05mm Review the Solderability temperature from 235±5°C to 245±5°C, solderability time from 2±0.5s to 5±0.5s. 	5,6,8 10
2013/10/18	7	Review the packing specification	11
2016/3/2	8	 Review the Available lead code of Lead Configuration. Delete the definition about "Old Part No." Delete 6pF~22pF (Code of diameter dimension is 060), 24pF (Code of diameter dimension is 070), 27pF~30pF (Code of diameter dimension is 080) and 33pF (Code of diameter dimension is 090) for P/N CH 3KV. 	0
		4. Review 9. Drawing of internal structure and material list	15
2016/11/3	9	 Delete "CH" series. Delete 5pF~8pF (Code of diameter dimension is 060) for P/N SL 3KV. 	4,6,7,10~13,15 6



3KV TEMPERATURE COMPENSATING CERAMIC CAPACITOR POE-D02-00-E-09 Ver: 9 Page: 3 of 15

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7	Packing specification	12/15
8	Notices	13/15~14/15
9	Drawing of internal structure and material list	15/15
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3KV TEMPERATURE COMPENSATING CERAMIC CAPACITOR	POE-D02-00-E-09	Ver: 9 Page: 4 of 15	

1. Part number for SAP system:

<u>SL</u> <u>302</u> <u>100</u> <u>J</u> <u>060</u> <u>B</u> <u>20</u> <u>C</u> <u>7</u> <u>H</u> (1) (2) (3) (4) (5) (6) (7) (8) (9) (10)

(1)Temperature Characteristic : SL:+350~-1000ppm/°C

(2)Rate Voltage(identified by 3-figure code): 302=3KVDC

(3)Rate Capacitance (identified by code) : ex. 100=10pF, 101=100pF

(4) Tolerance of Capacitance : $J = \pm 5\%$ (For above 10pF)

(5)Nominal body diameter dimension (Ref.to page.6 D ϕ Code spec.) .

(6)Lead Style: Refer to "2. Mechanical".

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

Taping Code	Description
AF	Box and Pitch: 15.0 mm
AM	Box and Pitch: 25.4 mm

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 kink lead type)
В	±1.0 mm/
С	MIN.
D	Taping special purpose

(9)Lead Pitch:

Code	Description
7	7.5±1 mm
0	10±1 mm

(10)Epoxy Resin Code:

Code	Description
В	Pb free, Epoxy Resin
Н	Halogen and Pb free, epoxy resin.



3KV TEMPERATURE COMPENSATING CERAMIC CAPACITOR POE-D02-00-E-09 Ver: 9 Page: 5 of 15

2. Mechanical:

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

Available lead code (Epoxy Resin Coating)- (unit: mm)							
Lead type	SAP P/N (13-17)digits	Pitch (F)	Lead Length (L)	Packing	Lead Configuration		
	B20C7	7.5 ± 1.0	20 MIN.	D11-	D max. T max.		
	B20C0	10 ± 1.0	20 MIN.	Bulk			
Lead style: B Straight long lead	BAFD7	7.5 ± 1.0	Refer to "5. Taping	Т А	* The F		
	BAMD0	10 ± 1.0	format"	Tap. Ammo	Ø d-		
	L03B7	7.5 ± 1.0	3.0 ± 1.0		D max. T max.		
	L4EB7	7.5 ± 1.0	4.5 ± 1.0				
	L05B7	7.5 ± 1.0	5.0 ± 1.0				
Lead style: L	L10B7	7.5 ± 1.0	10.0 ± 1.0				
Straight short	L03B0	10 ± 1.0	3.0 ± 1.0	Bulk			
lead	L4EB0	10 ± 1.0	4.5 ± 1.0		• !		
	L05B0	10 ± 1.0	5.0 ± 1.0		1 F T		
	L10B0	10 ± 1.0	10.0 ± 1.0		ø d- - - -		
	X3EA7	7.5 ± 1.0	3.5 ± 0.5		D max. T max.		
	X04A7	7.5 ± 1.0	4.0 ± 0.5	4			
T 1 . 1 . X	X05B7	7.5 ± 1.0	5.0 ± 1.0	11			
Lead style: X	X3EA0	10 ± 1.0	3.5 ± 0.5	Bulk			
Outside kink	X04A0	10±1.0	4.0 ± 0.5	154	× 1 \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \		
lead	X05B0	10 ± 1.0	5.0 ± 1.0	7 513	3		
	XAFD7	7.5 ± 1.0	Refer to "5. Taping	7111			
	XAMD0	$\frac{7.3 \pm 1.0}{10 \pm 1.0}$	format"	Tap. Ammo	ød+ +ød L		
	D3EA7	7.5 ± 1.0	SSIVE 3.5 ± 0.5 LLIANCE		D max. T max,		
	D04A7	7.5 ± 1.0 7.5 ± 1.0			D max.		
			4.0 ± 0.5	Bulk			
Lead style: D	D3EA0	10 ± 1.0	3.5 ± 0.5	* 5	()		
Vertical kink	D04A0	10 ± 1.0	4.0 ± 0.5		\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \		
short lead	DAFD7	7.5 ± 1.0	901	03	The second secon		
Short read	DAMD0	10 ± 1.0	Refer to "5. Taping format"	Tap. Ammo	Ød-J- L Jed		
Lead style: H	НЗЕА0	10.0±1.0	3.5±0.5 mm	Bulk	D max.		
Inside kink	HAFD0				* + \		
lead	HAMD0	Refer to "5	. Taping format"	Tap. Ammo	X P O D D D D D D D D D D D D D D D D D D		
Lead style: M Double outside kink lead	M04B7	7.5 ± 1.0	4.0 ± 1.0	D11	D max.		
	M04B0	10 ± 1.0	4.0 ± 1.0	Bulk	F _Ø d ₊		

^{*} Lead diameter Φd: 0.55+/-0.05mm

^{*} Coating extension on leads): 3.0mmMax for straight lead lead style, not exceed the kink for kink lead.



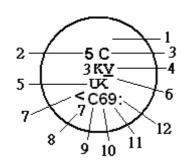
3. Capacitance value vs. Rate voltage, product diameter:

				SL
	cturing product Rate voltage, product dia		Photo	683 3KV K CZP02
T.C.	SL (CLASS	I , Temperature:+20°C ~+85°	°C, T.C.C.: +3:	50 ~ -1000ppm)
Rate voltage		3KV		
Dφ(Code)	060	070		080
D max. (mm)	7.5	8.5		9.5
T max. (mm)	5.0	5.0		5.0
2	2.0	2.0		2.0
3				
4				
5				
6				
7				
8				
10	100			
12 15	120 150			
18	180			
20	200	元右 15		
22	220	PIT A	.DX	
24	240		160	
27	270	场版份态	1	
30	300	X		
33	330		F _ \	7
36	360			1
39	390		711	
47	-747	470		
51		510		
56	PAS	SIVE SYSTEM A560 IAN	NCE	9
62	85	620	5	5
68 75	是心	680		770
82	0.		0 3	750 820
100	0,0		£ (C)	820 101
φd (mm)	ASNIT	Chnolog.5 5±0.05	HIHE	101
ACKING	100	TAPING or B	ULK	
COATING		Epoxy Resi	n	



3KV TEMPERATURE COMPENSATING CERAMIC CAPACITOR	POE-D02-00-E-09	Ver: 9 Page: 7 of 15
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4. Marking:



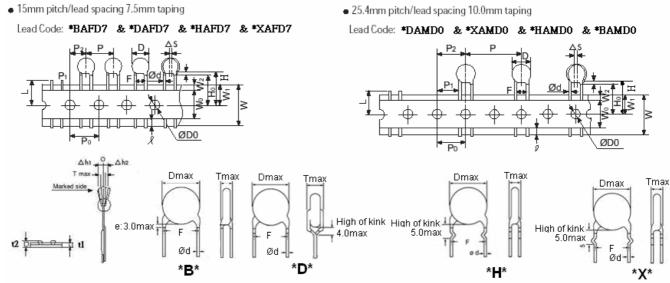
1. Temperature characteristic	2. Nominal capacitance	3. Capacitance tolerance	4. Rated voltage	5. Manufacturer's identification	6. Halogen and Pb free
SL: No marking	Identified by 3-figure code 1. when Cap.≥100pF Ex. 120pF →"121" 2. When Cap<100pF, marked actual Cap. value. Ex. 22pF→"22"	J: ±5% (For above 10pF)	3000V : Be marked "3kV"	Shall be marked as "以", but when the code of body diameter dimension ≤060 shall be omitted.	When the epoxy resin is Halogn and Pb free, there is a "-"marking.
	/.٧.	断月点	# ~		
Definition of date	e code marking:	DI //	(1)		
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	1:2011, 2:2012, 3:2013, 4:2014, 5:2015, 6:2016, 7:2017,···	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:



POE Part Number	*BAFD7	*DAFD7 *HAFD7 *XAFD7	*BAMD0 *DAMD0 *HAMD0 *XAMD0		
Item	Symbol	Dimensions (mm)	Dimensions (mm)	Dimensions (mm)	
Pitch of component	P	15.0	15.0	25.4	
Pitch of sprocket	/√P0	15.0±0.3	15.0±0.3	12.7±0.3	
Lead spacing	/////F 4/	7.5±1.0	7.5±1.0	10.0±1.0	
Length from hole center to component center	P2	7.5±1.5	7.5±1.5	12.7 ± 1.5	
Length from hole center to lead	P1	3.75±1.0	3.75±1.0	7.7±1.5	
Body diameter	3 D =	See the "3. Capacitance v	alue vs. Rate vo	oltage, product diameter"	
Deviation along tape, left or right	$\triangle S$	10,	0±2.0		
Carrier tape width	W.	Jie.	18.0 +1/-0.5		
Position of sprocket hole	W1		9.0±0.5		
Lead distance between the kink and center of sprocket hole	но	ECHNOLOGY CORPORATION. ALLEN	18.0+2.0/-0	18.0+2.0/-0 For: *DAMD0 *HAMD0 *XAMD0	
Lead distance between the bottom of body and the center of sprocket hole	Н	20.0+1.5/-1.0		20.0+1.5/-1.0 For: *BAMD0	
Protrusion length	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.			
Daviation agrees tane	∆h1		2.0 max.		
Deviation across tape	△h2	2.0 max.			
Portion to cut in case of defect	rtion to cut in case of defect L 11.0 max.				
Hole-down tape width W0 11.5mi			11.5min		
Hole-down tape distortion	W2	72 1.5±1.5			
Coating extension on leads e 3.0 max for straight lead style; Not exceed the kink leads for kink leads			the kink leads for kink lead.		
Body thickness	T	See the "3. Capacitance value vs. Rate voltage, product diameter"			



3KV TEMPERATURE COMPENSATING CERAMIC CAPACITOR	POE-D02-00-E-09	Ver: 9 Page: 9 of 15	
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6. Specification and test method:

6.1 SCOPE: THIS SPECIFICATION APPLIES TO TEMPERATURE COMPENSATING CONSTANT, 3KV 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 \pm 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 REQU	UIREMENTS	TESTING PROCEDURE	
APPEARANCE STRUCTURE SIZE	NO ABNORMALITIES			
MARKING		15	AS STATED IN SECTION 4	
	BETWEEN TERMINAL S: NO ABNORMALITIES BETWEEN TERMINAL AND ENCLOSURE: NO ABNORMALITIES 10000 MΩ MIN		2 TIMES OF THE RATED VOLTAGE. TEST VOLTAGE: 6KVDC, 1~5 SEC, WITH 50mA MAX. CHARGING CURRENT	
WITHSTAND VOLTAGEN			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)	
INSULATION RESISTANCE			INSULATION RESISTANCE SHALL BE MEASURED AT 60±5 SECONDS AFTER RATED VOLTAGE APPLIED. RATED VOLTAGE: 500VDC	
CAPACITANCE	TOLERANCE : J : ±5%, K : ±10%		TESTING FREQUENCY: $1 \text{MHZ} \pm 20 \%$ TESTING TEMPERATURE: $25 \pm 2^{\circ}\text{C}$ TESTING VOLTAGE: $1.0 \pm 0.2 \text{ VRMS}$	
TEMPERATURE RANGE	OPERATING TEMPERATURE : $-25^{\circ}\text{C} \sim +125^{\circ}\text{C}$			
Q FACTOR)		ELOW 30PF 400+20×C	AS ABOVE STIPULATION OF CAPACITANCE	
TERMINAL	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	
STRENGTH	BENDING STRENGTH: NO BREAKDOWN		WIRE DIA.0.5mm, LOADING WEIGHT 0.25 KG. WIRE DIA.0.6mm, LOAIDNG WEIGHT 0.5 KG. (BENDING BACK AND FORTH 90 DEGREE TWICE)	



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ITEM	POST-TEST REQUIREMENTS	TESTING PROCEDURE
TEMPERATURE	TEMPERTURE COEFFICIENT: SL: +350 ~ -1000PPM/°C	ACCORDING TO STEP 1 TO 5 IN ORDER, MEASURED CAPACITANCE WHEN TEMPERATURE REACH BALANCE AND TEMPERATURE COEFFICIENT SHALL BE CALCULATED ON THE FOLLOWING FORMULA: PPM/°C = (C2-C1)×10E6/C1(T2-T1) STEP 1,3,5: 25°C STEP 4: 85°C STEP 2: CH:-25°C; SL:20°C NOTE: C1 = CAPACITANCE AS STEP 3 C2 = CAPACITANCE AS STEP 2 OR 4 T1 = TEMPERATURE AS STEP 3 T2 = TEMPERATURE AS STEP 2 OR 4
CHARACTERISTIC	CAPACITANCE TOLERANCE: SL: WITHIN ±0.2% OR ±0.05PF, WHICHEVER IS LARGE	ACCORDING TO ABOVE STEP 1,3 & 5, CAPACITANCE TOLERANCE SHALL BE CALCULATED ON THE FOLLOWING FORMULA: △C%=(G - S)/C1 NOTE: G = GREATEST CAPACITANCE AS TESTING RESULT OF STEP 1,3 & 5 S = LEAST CAPACITANCE AS TESTING RESULT OF STEP 1,3 & 5 C1 = CAPACITANCE AS STEP 3
SOLDERING HEAT RESISTANCE	WITHIN ±2.5% OR ±0.25PF, WHICHEVER IS LARGE.	LEAD WIRE OR TERMINALS SHALL IMMERSE 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 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.
SOLDERABILITY	LEAD WIRE SHALL BE SOLDERED OVER 75% 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%



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ITEM	POST-TEST REQUIREMENTS	TESTING PROCEDURE
	APPEARANCE: NO ABNORMALITIES	
	CAP.CHANGE: SL WITHIN ±5% OR ±0.5PF, WHICHEVER IS LARGE.	
HUMIDITY CHARACTERISTIC (STABLE SITUATION)	\overline{Q} FACTOR: SL LESS THAN 10PF => $\overline{Q} \ge 200 + 10 \times C$ MORE THAN 10PF AND LESS THAN 30PF => $\overline{Q} \ge 275 + 5 \times C/2$ MORE THAN 30PF => $\overline{Q} \ge 350$ INSULATION RESISTANCE: 1000MΩ MIN.	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.
HUMIDITY LOADING	APPEARANCE: NO ABNORAMLITIES CAP.CHANGE: SL WITHIN $\pm 7.5\%$ OR ± 0.75 PF, WHICHEVER IS LARGE: Q FACTOR: SL LESS THAN 30 PF => Q $\geq 100 + 10 \times \text{C/3}$ MORE THAN 30 PF => Q ≥ 200 INSULATION RESISTANCE: $500 \text{ M}\Omega \text{ MIN}$	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.
	APPEARANCE: NO ABNORMALITIES CAP.CHANGE: WITHIN ±3% OR ±0.3PF, WHICHEVER IS LARGE.	COTO TO SERVICE OF THE SERVICE OF TH
HIGH TEMPERATURE LOADING	Q FACTOR: SL: LESS THAN 10PF ==> $Q \ge 200 + 10 \times C$ MORE THAN 10PF AND LESS THAN 30PF ==> $Q \ge 275 + 5 \times C/2$ MORE THAN 30PF ==> $Q \ge 350$	150% RATED VOLTAGE WITH 50mA max. FOR 1000(+48/-0) HOURS AT 125±3°C AND THEN DRIED FOR 1~2 HOURS AND MEASURED.
	INSULATION RESISTANCE: $1000~\text{M}\Omega$ MIN.	

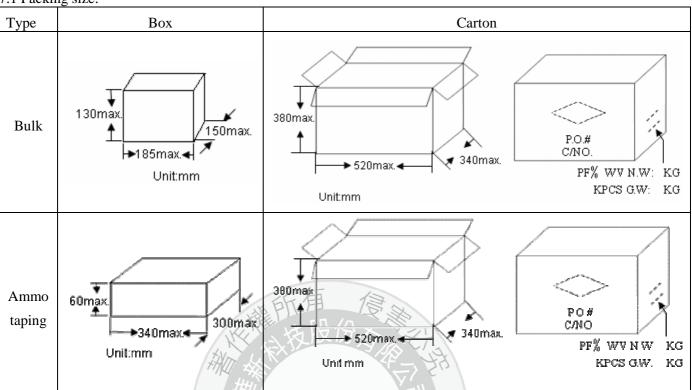


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7. Packing Baggage:

7.1 Packing size:



7.2 Packing quantity:

Packing type	The code of 14th to15th in SAP P/N	MPQ (Kpcs/Box)
Tonina	AF	1 echno
Taping	AM	0.50/1010

Packing type	MPQ (Kpcs/Bag)
Bulk	1



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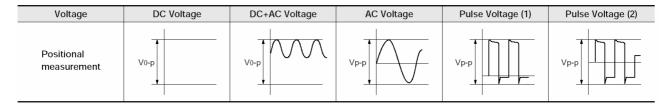
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8. Notices:

8.1 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.



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 \emptyset 0.1mm 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.)

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.



3KV TEMPERATURE COMPENSATING CERAMIC CAPACITOR POE-D02-00-E-09 Ver: 9 Page: 14 of 15

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.

PASSIVE SYSTEM ALLIANCE

8.8 Rating

Capacitance change of capacitor

I. Class 1 series (Temp. Char. SL)

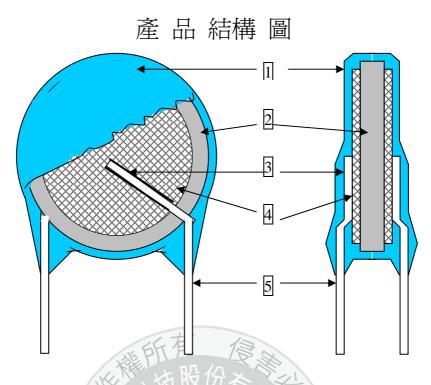
Capacitance might change a little depending on the surrounding temperature or an applied voltage.

Please contact us if you intend to use this product in a strict time constant circuit.



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9.Drawing of internal structure and material list:



Remarks:

No.	Part name	Material	Model/Type	Component	
1	Insulation Coating	Epoxy polymer	1.EF-150C VE SYSTEM ALLIANCE 2.EF-150(HF)	Epoxy resin、Pigment (Blue / UL 94 V-0 /)	
			3.PCE-210	The minimum thickness of coating	
			2.PCE-300(HF)	(reinforced insulation) is 0.4mm	
2	Dielectric Element	Ceramic//	nologsLCO	BaTiO ₃	
3	Solder	Tin-silver	Sn96.5-Ag3-Cu0.5	Sn96.5-Ag3-Cu0.5	
4	Electrodes	Ag	1.SP-160PL	Silver · Glass frit	
			2.SP-260PL	6.1	
5	Leads wire	Tinned copper clad steel wire	0.55±0.05 mm	Substrate metal: Fe & Cu Surface plating: Sn 100%(3~7μm)	

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PRODUCT SPECIFICATION

PRODUCT: CERAMIC DISC CAPACITOR

TYPE: 6KV TEMPERATURE COMPENSATING CERAMIC CAPACITOR

CUSTOMER:

DOC. NO.: POE-D03-00-E-09

Ver.: 9

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, GUANG ZHOU ECONOMIC AND TECHNOLOGY DEVELOPMENT ZONE,CHINA







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Record of change

Date	Version	Description	page
2008.6.3	1	1. D14-00-E-06 (before) \rightarrow POE-D03-00-E-01(1 st edition)	
2008.8.22	2	1. Complete lead code	5-6
		3. Add last SAP code "H" for halogen and Pb free, epoxy resin.	2
2008.12.12	3	1. Complete the 13 th to 17 th codes of SAP P/N.	
		2. Page layout adjustment.	4-5
		3. Added marking when the coating resin is Halogen and Pb free	
		Epoxy.	
2009/8/19	4	1. Change PSA & POE logo to Walsin & POE logo.	all
		2. Revised WITHSTAND VOLTAGEN and operating temperature	9
		from -25°C ~+85°C to -25°C ~+125°C	
		3. capacity list → product range	6
2010/9/9	5	1. Review "but Dφ≤6.0 mm shall be omitted." to "but when the code of	7
		body diameter dimension ≤060 shall be omitted."	
		2. Delete "1.5000V : Be marked "5kV""	7
		3. Add date code on marking (item 7~12).	7
2013/5/6	6	1. Review the Lead diameter φ from 0.60 +/-0.06mm to 0.55+/-0.05mm	5,6,8
		2. Review the Solderability temperature from 235±5°C to 245±5.	10
		$^{\circ}$ C, Solderability time from 2 ± 0.5 s to 5 ± 0.5 s,	
2012/10/19	7	Davious the models amosification	11
2013/10/18	/	Review the packing specification	11
		Review the Available lead code of Lead Configuration.	5
		2. Delete the definition about "Old Part No."	5,6
2016/3/2	8	3. Delete 6pF~18pF (Code of diameter dimension is 060), 22pF~27pF (Code of	6
_ 5 2 5, 5, 2	Ü	diameter dimension is 080), 30pF~39pF (Code of diameter dimension is 090)	
		 and 47pF (Code of diameter dimension is 110) for P/N CH 6KV. 4. Review 9. Drawing of internal structure and material list 	15
		Neview 9. Drawing of internal structure and material list Delete "CH" series.	4,6,7,9~11,14,15
2016/11/3	9	 Delete 2pF~8pF (Code of diameter dimension is 060) for P/N SL 6KV. 	6



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6	Specification and test method	9/15~11/15
7	Packing specification	12/15
8	Notices	13/15~14/15
9	Drawing of internal structure and material list	15/15
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	特性 + 10 1 2 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3	
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6KV TEMPERATURE COMPENSATING CERAMIC CAPACITOR POE-D03-00-E-09 Ver: 9 Page: 4/15

1. Part number for SAP system:

<u>SL</u> <u>6 0 2</u> <u>0 5 0</u> <u>C</u> <u>0 6 0</u> <u>B</u> <u>2 0</u> <u>C</u> <u>7</u> <u>H</u> (1) (2) (3) (4) (5) (6) (7) (8) (9) (10)

(1) Temperature Characteristic : SL:+350~-1000ppm/°C

(2)Rate Voltage(identified by 3-figure code): 602=6KVDC

(3)Rate Capacitance (identified by code) : ex. 100=10pF, 101=100pF

(4) Tolerance of Capacitance : $J = \pm 5\%$ (For above 10pF)

(5) Nominal body diameter dimension (Ref. to page. 6 Do Code spec.) .

(6)Lead Style: Refer to "2. Mechanical".

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

Taping Code	Description
AF	Box and Pitch: 15.0 mm
AM	Box and Pitch: 25.4 mm

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 kink lead type)
В	±1.0 mm
С	MIN. CHARLOS
D	Taping special purpose

(9)Lead Pitch:

Code	Description
7	7.5±1 mm
0	10±1 mm

(10) Epoxy Resin Code:

Code	Description
В	Pb free, Epoxy Resin
Н	Halogen and Pb free, epoxy resin.



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2. Mechanical:

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

Available lea	iu coue (Epox)	Kesiii Coat	Available lead code (Epoxy Resin Coating)- (unit: mm)					
Lead type	SAP P/N (13-17)digits	Pitch (F)	Lead Length (L)	Packing	Lead Configuration			
	B20C7	7.5 ± 1.0	20 MIN.	וו ת	D max. T max.			
	B20C0	10 ± 1.0	20 MIN.	Bulk				
Lead style: B Straight long lead	BAFD7	7.5 ± 1.0	Refer to "5. Taping	Tap. Ammo	* The F			
	BAMD0	10 ± 1.0	format"	rap. Allillio	ø d→			
	L03B7	7.5 ± 1.0	3.0 ± 1.0		D max. T max.			
	L4EB7	7.5 ± 1.0	4.5 ± 1.0					
I and stade ! I	L05B7	7.5 ± 1.0	5.0 ± 1.0					
Lead style: L	L10B7	7.5 ± 1.0	10.0 ± 1.0		()			
G. 11.1	L03B0	10 ± 1.0	3.0 ± 1.0	Bulk	, \ \ \ \			
Straight short	L4EB0	10 ± 1.0	4.5 ± 1.0		• +			
lead	L05B0	10 ± 1.0	5.0 + 1.0	7	1			
	L10B0	10 ± 1.0	10.0 ± 1.0		Ø d- - L			
	X3EA7	7.5 ± 1.0	3.5 ± 0.5	12 5/2	D max. T max.			
	X04A7	7.5 ± 1.0	4.0 ± 0.5	144				
Lead style: X	X05B7	7.5 ± 1.0	5.0 ± 1.0	V 11				
	X3EA0	10 ± 1.0	3.5 ± 0.5	Bulk	* 1			
Outside kink	X04A0	10 ± 1.0	4.0 ± 0.5					
lead	X05B0	10 ± 1.0	PASSI 5.0 ± 1.0 M ALLI	ANCE	5.0 max			
Touc	XAFD7	7.5 ± 1.0	Refer to "5. Taping					
	XAMD0	10±1.0	format"	Tap. Ammo	ød- -ød <u>L</u>			
	D3EA7	7.5 ± 1.0	3.5 ± 0.5		D max. T max,			
	D04A7	7.5 ± 1.0	4.0 ± 0.5					
Lead style: D	D3EA0	10 ± 1.0	3.5 ± 0.5	Bulk				
	D04A0	10 ± 1.0	$//(2.0 \pm 0.5)$	M. Hr.	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \			
Vertical kink	DAFD7	7.5 ± 1.0	CYTIVULOGY MRPCIRA	10	T T T T T T T T T T T T T T T T T T T			
short lead	DAMD0	10 ± 1.0	Refer to "5. Taping format"	Tap. Ammo	0 d→			
Lead style: H Inside kink lead	НЗЕА0	10.0±1.0	3.5±0.5 mm	Bulk	D max. T max.			

^{*} Lead diameter Φ d: 0.55+/-0.05mm

 $^{*\} Coating\ \textbf{extension}\ on\ leads): 3.0 mmMax\ for\ straight\ lead\ lead\ style,\ not\ exceed\ the\ kink\ for\ kink\ lead.$

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



6KV TEMPERATURE COMPENSATING CERAMIC CAPACITOR POE-D03-00-E-09 Ver: 9 Page: 6/15

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

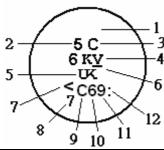
3.1 \ 6KV:

	cturing product Rate voltage, product dian		Photo	SL 68J 68V 50CZU:
T.C.	SL (CLASS	I , Temperature:+ 20° C ~+ 85° C ,	, T.C.C.: +350 ~ -1000 ₁	ppm)
Rate voltage		6KV		
Dφ(Code)	060	080		090
D max. (mm)	7.5	9.5		10.5
T max. (mm)	5.0	5.0		5.0
2				
3				
5				
6				
7				
8				
10	100			
12	120			
15	150			
18 20	180 200			
22	220	2.右 6		
27	270	THE S	136	
30	300	300	163	
33	330	330	\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	
39	390	390	0 6/3/	
47	FAVIT SEC	470	-1441=	470
51		510	V7 9'	510
56	454	560		560
62				
68				680
82	PASS	SIVE SYSTEM ALLIANC	€	820
100	85	0.55		101
φd (mm)	(元)	0.55±0.05		
CKING	1 S. T.	TAPING or BUI	LK	
COATING	10.5	Epoxy Resin	0.65	



6KV TEMPERATURE COMPENSATING CERAMIC CAPACITOR POE-D03-00-E-09 Ver: 9 Page: 7/15

4. Marking:



9 10							
2. Nominal capacitance	3. Capacitance tolerance	4. Rated voltage	5. Manufacturer's identification	6. Halogen and Pb free			
1.Identified by 3-figure code when Cap.≥100pF Ex. 120pF →"121" 2. When Cap<100pF, marked actual Cap. value Ex. 6pF→"6"	J: ±5% (For above 10pF)	6000V : Be marked "6kV"	Shall be marked as "以", but when the code of body diameter dimension ≤060 shall be omitted.	When the epoxy resin is Halogn and Pb free, there is a "_"marking.			
e code marking:	即为	景泉					
8.No. of test equipment	9.Factory of manufacture	10. Year of manufacture	11.Month of manufacture	12.Week of manufacture by month			
1~9: No.1~No.9, J: No.10, K: No.11, L: No.12	C: Factory of	4.71114	1~9:January~ September, O: October, N: November, D: December	week 1: - week 2: ' week 3: : week 4: ' week 5: ;			
	2. Nominal capacitance 1.Identified by 3-figure code when Cap.≥100pF Ex. 120pF →"121" 2. When Cap<100pF, marked actual Cap. value Ex. 6pF→"6" 2 code marking: 8.No. of test equipment 1~9: No.1~No.9, J: No.10,	2. Nominal capacitance 1. Identified by 3-figure code when Cap.≥100pF Ex. 120pF →"121" 2. When Cap<100pF, marked actual Cap. value Ex. 6pF→"6" 2. code marking: 2. Capacitance tolerance J: ±5% (For above 10pF) 2. Code marking: 3. Capacitance tolerance J: ±5% (For above 10pF) Proceeded Tolerance CF above 10pF) CF Code marking: 2. Capacitance tolerance J: ±5% (For above 10pF) CF Code marking: CF Code marking: 1~9: No.1~No.9, J: No.10, CF Factory of manufacture	2. Nominal capacitance 1. Identified by 3-figure code when Cap.≥100pF Ex. 120pF →"121" 2. When Cap<100pF, marked actual Cap. value Ex. 6pF→"6" 3. Capacitance tolerance 4. Rated voltage 4. Rated voltage 5. Ex. 120pF → "121" For above 10pF) 8. No. of test equipment 9. Factory of manufacture 1. 2011, 2. 2012, 3. Capacitance voltage 4. Rated voltage 6. Coolerance 1. Ex. 120pF → "121" 1. Ex. 120pF → "121" 2. Ex. 120pF → "121" 3. Capacitance voltage 4. Rated voltage 1. Tey. No. 10 ← Section of Manufacture 1. Ex. 120pF → "121" 1. Ex. 120pF → "121" 2. Ex. 120pF → "121" 3. Capacitance voltage 4. Rated voltage 1. Tey. No. 10 ← Section of Manufacture 1. Ex. 120pF → "121" 1. Ex. 120pF → "121" 2. Ex. 120pF → "121" 3. Capacitance voltage 4. Rated voltage 1. Tey. No. 10 ← Section of Manufacture 1. Ex. 120pF → "121" 2. Ex. 120pF → "121" 3. Capacitance voltage 4. Rated voltage 4. Rated voltage 1. Ex. 120pF → "121" 2. Ex. 120pF → "121" 3. Capacitance Tolerance Tolera	2. Nominal capacitance tolerance description of the code of tolerance tolerance description of the code of tolerance description of the code of tolerance description of tolerance description of the code of tolerance description of tolerance desc			



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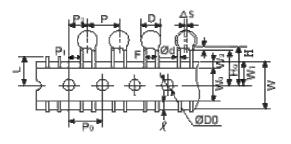
5. Taping Format:

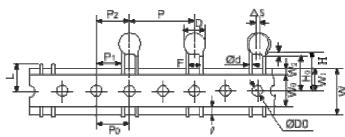
• 15mm pitch/lead spacing 7.5mm taping

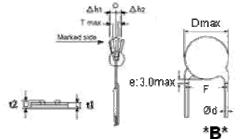
Lead Code: *BAFD? & *DAFD? & *XAFD?

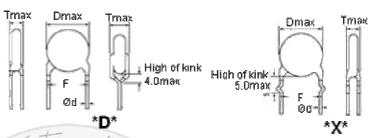












POE Part Number	A REPORT OF THE PROPERTY OF TH	BAFD7	*DAFD7 *XAFD7	*BAMD0 *DAMD0 *XAMD0
Item	Symbol	Dimensions (mm)	Dimensions (mm)	Dimensions (mm)
Pitch of component	/// /P	15.0	15.0	25.4
Pitch of sprocket	P0	15.0±0.3	15.0±0.3	12.7±0.3
Lead spacing	F	7.5±1.0	7.5±1.0	10.0±1.0
Length from hole center to component center	P2	PASSIVE SY7.5±1.5_LIANCE	7.5±1.5	12.7 ± 1.5
Length from hole center to lead	€ P1	3.75±1.0	3.75±1.0	7.7±1.5
Body diameter	多D 。	See the "3. Capacitance v	value vs. Rate vo	oltage, product diameter"
Deviation along tape, left or right	△S		0±2.0	
Carrier tape width	W	ech con	18.0 +1/-0.5	
Position of sprocket hole	W1 //	Mology	9.0±0.5	
Lead distance between the kink and center of sprocket hole	НО	CLHNOLOGY CORPORATION	18.0+2.0/-0	18.0+2.0/-0 For: *DAMD0 *XAMD0
Lead distance between the bottom of body and the center of sprocket hole	Н	20.0+1.5/-1.0		20.0+1.5/-1.0 For: *BAMD0
Protrusion length	R	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	<u>△</u> h1 <u>△</u> h2	2.0 max. 2.0 max.		
Portion to cut in case of defect L		11.0 max.		
Hole-down tape width	W0 11.5min			
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. Capacitance value vs. Rate voltage, product diameter"		



6KV TEMPERATURE COMPENSATING CERAMIC CAPACITOR POE-D03-00-E-09 Ver: 9 Page: 9 /15

6. Specification and test method:

6.1 SCOPE: THIS SPECIFICATION APPLIES TO TEMPERATURE COMPENSATING CONSTANT, 3KV 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 \pm 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		
APPEARANCE STRUCTURE SIZE	NO ABNORMALITIES	AS STATED IN SECTION 3.1 & 3.2		
MARKING	BETWEEN TERMINALS: NO ABNORMALITIES	AS STATED IN SECTION 4 RATED VOLTAGE 6KVDC: 150% OF THE RATED VOLTAGE FOR 1 TO 5 SECONDS.(TEST VOLTAGE: 9000VDC, 1~5 SEC), WITH 50mA MAX. CHARGING		
WITHSTAND VOLTAGEN	BETWEEN TERMINAL AND ENCLOSURE : NO ABNORMALITIES	CURRENT 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)		
INSULATION RESISTANCE	10000 ΜΩ ΜΙΝ	INSULATION RESISTANCE SHALL BE MEASURED AT 60±5 SECONDS AFTER RATED VOLTAGE APPLIED. RATED VOLTAGE: 500VDC		
CAPACITANCE TOLERANCE : $J: \pm 5\%$, $K: \pm 10\%$		TESTING FREQUENCY: 1MHZ \pm 20 % TESTING TEMPERATURE: $25 \pm 2^{\circ}\mathbb{C}$ TESTING VOLTAGE: 1.0 ± 0.2 VRMS		
OPERATING TEMPERATURE RANGE		ERATURE RANGE : -25°C TO +125°C TEMPERATURE RISE OF +20°C)		
Q FACTOR)	30PF&Above Below 30PF ≥1000 ≥400+20×	AS ABOVE STIPULATION OF CAPACITANCE		
TEMPERATURE CHARACTERISTIC	Temperature coefficient: SL: +350 ~ -1000ppm/°C (+20°C ~+85°C) CAPACITANCE TOLERANCE: SL WITHIN ±0.2% OR ±0.05PF, WHICHEVER IS LARGE	ACCORDING TO STEP 1 TO 5 IN ORDER, MEASURED CAPACITANCE WHEN TEMPERATURE REACH BALANCE AND TEMPERATURE COEFFICIENT SHALL BE CALCULATED ON THE FOLLOWING FORMULA: $PPM^{\circ}\mathbb{C} = (C2-C1)\times10E6/C1(T2-T1)$ STEP 1,3,5: $25^{\circ}\mathbb{C}$ STEP 2: $-25^{\circ}\mathbb{C}$, $SL(+20^{\circ}\mathbb{C})$ NOTE: $C1 = CAPACITANCE$ AS STEP 3 $C2 = CAPACITANCE$ AS STEP 2 OR 4 $T1 = TEMPERATURE$ AS STEP 3 $T2 = TEMPERATURE$ AS STEP 2 OR 4 $ACCORDING$ TO ABOVE STEP 1,3 & 5, CAPACITANCE TOLERANCE SHALL BE CALCULATED ON THE FOLLOWING FORMULA: $\triangle \mathbb{C} \% = (G - S)/C1$ NOTE: $G = GREATEST$ CAPACITANCE AS TESTING RESULT OF STEP 1,3 & 5 $S = LEAST$ CAPACITANCE AS TESTING RESULT OF STEP 1,3 & 5 $C1 = CAPACITANCE$ AS STEP 3		



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ITEM	POST-TEST REQUIREMENTS	TESTING PROCEDURE		
TERMINAL	TENSIBLE STRENGTH: NO BREAKDOWN	WIRE DIA.0.6mm, LOADING WEIGHT 1.0KG FOR 10±1 SECONDS		
STRENGTH	BENDING STRENGTH: NO BREAKDOWN	WIRE DIA.0.6mm, LOAIDNG WEIGHT 0.5 KG. (BENDING BACK AND FORTH 90 DEGREE TWICE)		
	APPEARANCE: NO ABNORMALITIES	AS SHOWN IN FIGURE, THE LEAD WIRES SHOULD BE IMMERSED IN THE MOLTEN SOLDER UP TO 1.5 TO 2.0mm FROM THE ROOT OF TERMINAL. Capacitor body		
SOLDERING HEAT	CAP.CHANGE: SL WITHIN ±2.5% OR ±0.25PF, WHICHEVER IS LARGE.	1.5~2mm Solder (A) BODY DIA. ≤ 6.3mm:INTO THE MOLTEN SOLDER		
RESISTANCE	WITHSTAND VOLTAGE: (BETWEEN TERMINALS) NO ABNORMALITIES	OF WHICH TEMPERATURE: 270±5°C FOR 3±0.5 SECONDS. (B) BODY DIA. > 6.3mm:INTO THE MOLTEN SOLDE OF WHICH TEMPERATURE 350±10°C FOR 3±0.5 SECONDS THEN LEAVE AT STANDARD TEST CONDITIONS FOR 24±2 HOURS, THEN MEASURED.		
SOLDERABILITY SOLDERED OVER 75% OF THE CIRCUMFERENTIAL DIRECT		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%		
	APPEARANCE: NO ABNORMALITIES	Ology Core Hilliams		
HUMIDITY	CAP.CHANGE: SL WITHIN ±5% OR ±0.5PF, WHICHEVER IS LARGE.	CAPACITORS SHALL BE SUBJECTED TO A RELATIVE		
CHARACTERISTI C(STABLE SITUATION)	O EVCTOB. SI	HUMIDITY OF 90 \sim 95% AT 40±2°C FOR 500(+24/-0) HOURS. THEN DRIED FOR 1 \sim 2 HOURS AND MEASURED.		
	INSULATION RESISTANCE: 1000ΜΩ MIN.			



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ITEM	POST-TEST REQUIREMENTS	TESTING PROCEDURE	
HUMIDITY LOADING	APPEARANCE: NO ABNORAMLITIES	F, CAPACITORS SHALL BE SUBJECTED TO A RELATIVE HUMIDITY OF 90 ~ 95% AT 40 ± 2°C FOR500(+24/-0) HOURS WITH RATED VOLTAGE APPLIED WITH 50mA MAX. THEN DRIED FOR 1~2 HOURS AND MEASURED.	
	CAP.CHANGE: SL WITHIN ±7.5 % OR ±0.75PF, WHICHEVER IS LARGE.		
	Q FACTOR: SL LESS THAN 30PF => $Q \ge 100 + 10 \times C/3$ MORE THAN 30PF => $Q \ge 200$		
	INSULATION RESISTANCE: 500 MΩ MIN		
HIGH TEMPERATURE LOADING	APPEARANCE : NO ABNORMALITIES	10000000000000000000000000000000000000	
	CAP.CHANGE : WITHIN ±3 % OR ±0.3PF, WHICHEVER IS LARGE.	150% RATED VOLTAGE WITH 50mA max.	
	Q FACTOR: SL: LESS THAN 10PF => $Q \ge 200 + 10 \times C$	FOR 1000(+48/-0) HOURS AT 125±2°C AND THEN DRIED FOR 1~2 HOURS AND MEASURED.	
	MORE THAN 10PF AND LESS THAN 30PF =>Q $\ge 275 + 5 \times C/2$		
	MORE THAN 30PF => Q ≥ 350 INSULATION RESISTANCE:	plogy Cort Higher	
	1000 MΩ MIN.	DA COBBOKATION	

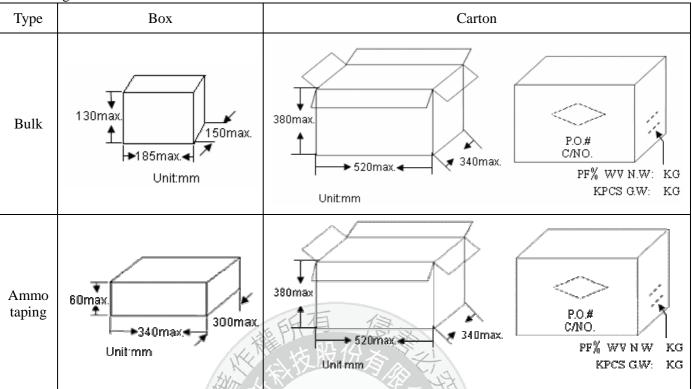


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7. Packing Baggage:

7.1 Packing size:



7.2 Packing quantity:

Packing type The code of 14th to15th in SAP P/N		MPQ (Kpcs/Box)
Toning	AF	32. 32.
Taping	AM	0.05

Packing type	MPQ	(Kpcs/Bag)
Bulk		1



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8. Notices:

8.1 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	Vo-p	Vo-p	Vp-p	Vp-p	Vp-p

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 \emptyset 0.1mm 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.)

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.

8.5 Vibration and impact

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



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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 Rating

Capacitance change of capacitor

I. Class 1 series (Temp. Char. SL)

Capacitance might change a little depending on the surrounding temperature or an applied voltage.

Please contact us if you intend to use this product in a strict time constant circuit.



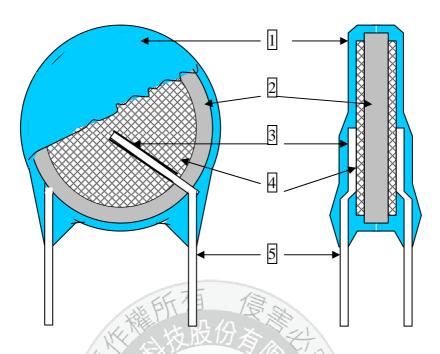


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9.Drawing of internal structure and material list:

產品結構圖



Remarks:

No.	Part name	Material	Model/Type	Component
1	Insulation Coating	Epoxy polymer	1.EF-150C ALLIANCE 2.EF-150(HF) 3.PCE-210 2.PCE-300(HF)	Epoxy resin、Pigment (Blue / UL 94 V-0 /) The minimum thickness of coating (reinforced insulation) is 0.4mm
2	Dielectric Element	Ceramic	hnology Coro	BaTiO ₃
3	Solder	Tin-silver	Sn96.5-Ag3-Cu0.5	Sn96.5-Ag3-Cu0.5
4	Electrodes	Ag	1.SP-160PL 2.SP-260PL	Silver · Glass frit
5	Leads wire	Tinned copper clad steel wire	0.55±0.05 mm	Substrate metal: Fe & Cu Surface plating: Sn 100%(3~7μm)

Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

Walsin:

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YP202102K080D04A7H YP102221K050L20C5H YP102471K050B20C5H YP501152K060HAND5P
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                                                         SL102221J080HAND5P
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