

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		Des	cription		page
2008.6.3	1	1. D08-00-E-14 (before		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*	CH102020X070 CH102820X080*	SL102201X100*	SL102201X080*	
		CH102820X100*	CH102820A080*	SL102221X100*	SL102201X080* SL102221X080*	
		2. Complete lead code	12/12/12	SL102221X100*	SL102221X080**	
		3.Add last SAP code '		b free, epoxy resin		
2008.12.12	3		to 17 th codes of SAP	P/N.		5-9
		2. Page layout adjus		A		
2000 0 10			when the coating resin	_	ее Ероху.	
2009.8.19	4	1 Change PSA & POE 2. Operating temperature			25°C ~ +125°C	13
					ge from $+85^{\circ}$ C to $+125^{\circ}$ C	15
			rature didn't change).	crature Loading chang	ge Holli 103 (to 1123 (
2010.8.24	5			60 to 070 for P/N CH	500V 62pF&68pF&75pF.	8
			Code of diameter dim			9
2012/5/10	6	1). Review the size Do	of the item CH/500	1/121&151 from "100	" to be "080";	8
		2). Review the size Do	p for the item CH/100		be "070", CH/1000V/101	8
		from "100" to be '	·070".			
2012/12/5	7	Add 8.6. Ambient Ter				18-19
2013/5/6	8		diameter φ from 0.60			7,10
			6.0mm shall be omitt		If be omitted." $45\pm5^{\circ}\mathbb{C}$, Solderability time	9 13
		from 2 ± 0.5 s to 5 :	• •	om 233(±3/-0) € to 2	A3±3 C > Solderability time	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
			nts of the temperature			5,
		2. Delete the definit	ion about"Old Part No).".		6,7
			391 pF (Code of d	iameter dimension i	s 110&120) for P/N CH	8
2015/9/23	11	50V&100V. 4. Delete 82 pF &10	00 nF (Codo of diama	tor dimension is 070)	and 120 pF &150 pF (Code	8
2013/9/23	11		nsion is 080) for P/N (and 120 pr &130 pr (Code	8
					070) for P/N CH 1KV.	8
		6. Delete 4pF~22pI	F (Code of diameter	dimension is 060)	and 24pF~47pF (Code of	
		diameter dimensi	on is 070) for P/N CH	2KV.		
201 6 /2 /2	10		able lead code of Lead		0111	6-7 17-18
2016/3/2	12		ient Temp of Allowab		UVdc to 2kVdc)	17-18
		J. Keview 9. Drawii	ng of internal structure	and material fist		-/



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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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2	Mechanical	6/19~7/19
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8	Cautions & notices	15/19~18/19
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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.
	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		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	L05B7	7.5 ± 1.0	5.0 ± 1.0 5.0 ± 1.0	50X/9-100X/ 500X/	Bulk	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \
Straight short 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	D04A0	10±1.0	5.5			\vee \vee $ \cap $
				50V&100V, 500V,	Bulk	()
	D3EA5	5.0±0.8	25.05	1KV, 2KV		
short lead	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			Bulk	x l \ \	y y
kink lead	M04B0	4.0 ± 1.0			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				11	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	360							360 390					360 390				360 390			
39 47	390 470							470					470				470			
51	510							510					510				510			
56	560							560					560				560			
68	680							680	. +	-	1-		680				680			
75	750							750	7 生		13			750			750			
82	820						1.3	820	1		À	180,		820			820			
100	101							101	. п	1.75		7600		101				101		
120		121				A	(())	, 7	121	7 17	`	X -	217	121					121	
150		151				1,	1, 1	√-}ב	151	101	S.	A. 3	1/2	\	151				151	
180 200		181	201			1241	X 1	\mathcal{T}		181 201			7		181	201			181 201	
220			221			177714	/ ti			221		7 ==	, 75	1		221			221	
240			241				1	7		221	241	A)y i							241	
270				271	- 1		拓基				271	AT							271	
300				301							301									301
330				331						ì	331									331
360				361				PASSI	ve sv	STEM	ALLEA	361								
390				391	451	8						391								
470					471	501	2						\circ ι							1
500 510						501 511		_				-8	5 .5	9						
560						561	V V					, î	10	9/						
680						301	681	, , ,				6	76							
750						16	751	/				S.	1587	1						
820						1.	821		5		.(0		16							
PACKING			TAP	ING or B	ULK		3//	/>	TAP	NG or B	ULK	· VII	5/	TAPING	or BULI	K	TAP	ING or E	ULK	BULK
COATING						Phenol	ic resin						Pheno	lic resin	or Epoxy	Resin		Epoxy	Resin	

4. Marking:

i. Mai Kilig.		
		SL
Marking	(2)	47 J (4) 1 KV (6)
Remarks		UK — (s)
(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: \pm 0.5pF (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



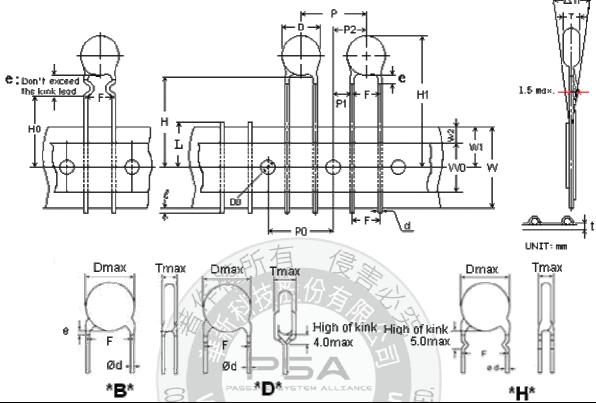
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5. Taping specifications:

- * 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	$\Omega_{c}T$	*	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	Н	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)".					

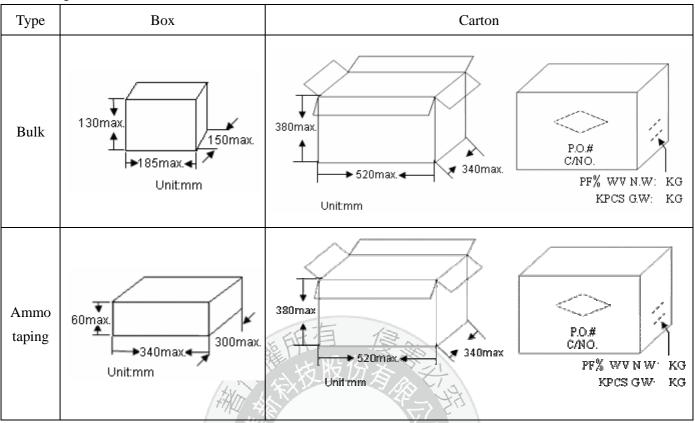
6. Packing Baggage:



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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	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	CEDURI	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 = CAPACI T1 = TEMPEI T2 = TEMPEI	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 BENDING STRENGTH: NO BREAKDOWN	WIRE DIA.0. 10±1 SECON WIRE DIA.0. 10±1 SECON WIRE DIA.0. WIRE DIA.0.	DS. 6 M/M. DS 5 mm, L	LOADIN	IG WEIG	GHT 1.0 HT 0.25	KGS, F		
	APPEARANCE : NO ABNORMALITIES CAP.CHANGE : WITHIN ±2.5% OR ±0.25PF,	(BENDING B LEAD WIRE TO 2.0 M/M I (A) BODY DI WHICH T SECOND (B) BODY DI	OR TEF FORM E A. ≦ 5.0 FEMPE OS.	RMINAL BODY. Imm: INT RATURE	S SHAL TO THE E: 260(-	L BE IM MOLTE +5/-0)°	MERSI N SOLE C FOR 3	DER OF 3.0±0.5	
SOLDERING HEAT RESISTANCE	WITHIN ±2.5% OR ±0.25PF, WHICHEVER IS LARGE. WITHSTAND VOLTAGE: (BETWEEN TERMINALS) NO ABNORMALITIES	(B) BODY DIA. > 5.0mm: INTO THE MOLTEN SOLDER OF WHICH TEMPERATURE 260(+5/-0)°C FOR 5~10 SECONDS. THEN LEAVE AT STANDARD TEST CONDITIONS FOR 1~2 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.							
SOLDERABILITY	LEAD WIRE SHALL BE SOLDERED OVER 75% OF THE CIRCUMFERENTIAL DIRECTION.	SOLDERING TIME: 3.5 SEC. MAX. TO COMPLY WITH JIS-C-5102 8.4 SOLDER TEMPERATURE245±5°C AND DIPPING TIME 5±0.5 SECONDS FLUX: WEIGHT RATIO OF ROSIN 25%							



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 $\geq 100 + 10 \times C / 3$ 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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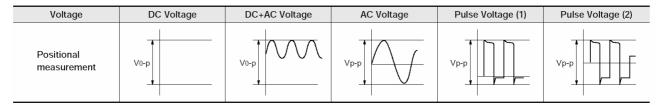
8. Cautions & notices:

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.

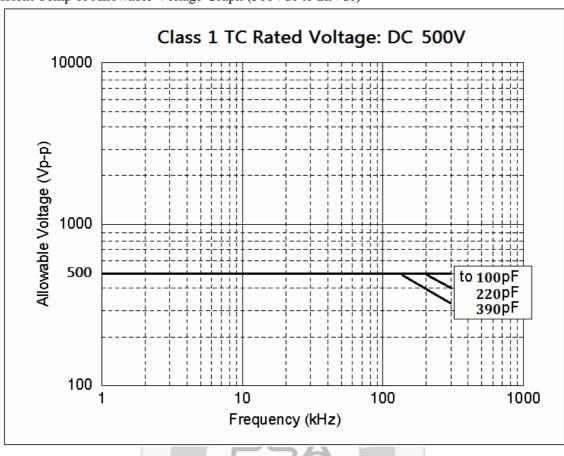
Do not vibrate the PCB/PWB directly.

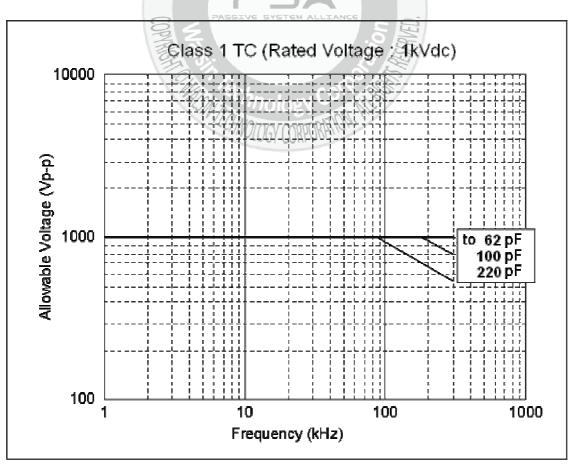
Excessive ultrasonic cleaning may lead to fatigue destruction of the lead wires.



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)



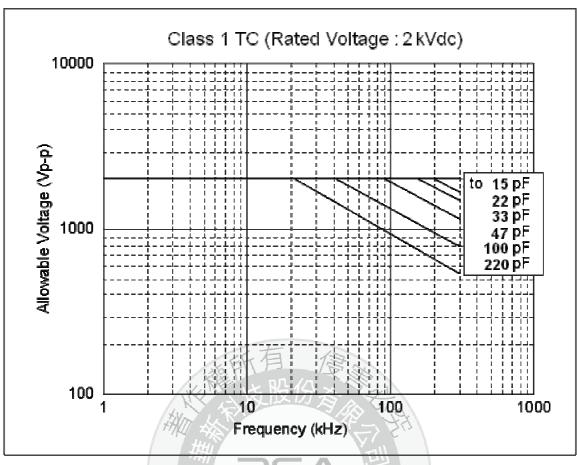


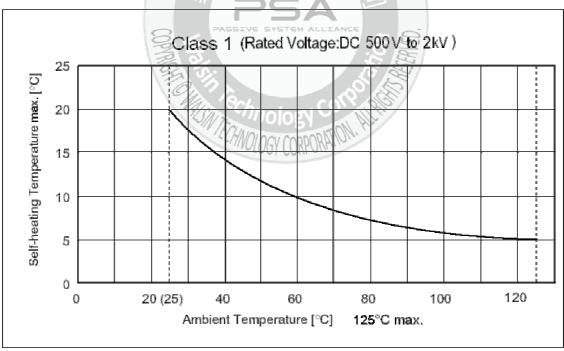


 $50\text{V},\,100\text{V},\,500\text{V},\,1\text{K}\text{V},\,2\text{K}\text{V}$ temperature compensating ceramic disc capacitor

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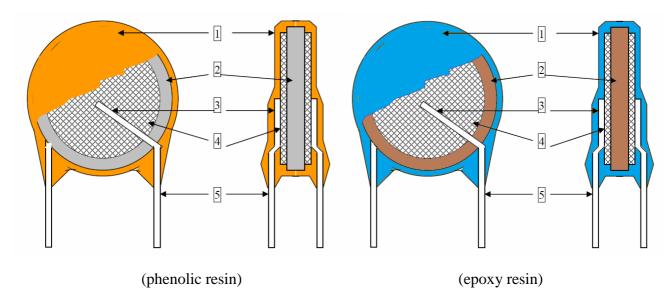
The ambient temperature and the surface temperature of capacitor must be 125° C or lower. (Including self-heating.)



 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 wire	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



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6	Specification and test method	9/16~11/15
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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	# PSA	
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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 S S S S S S S S S S S S S S S S S S		
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.



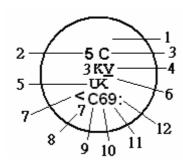
3. Capacitance value vs. Rate voltage, product diameter:

				SL
	cturing product Rate voltage, product dia		Photo	283 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	. SX	
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	3	5
68 75	是心	680		750
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:



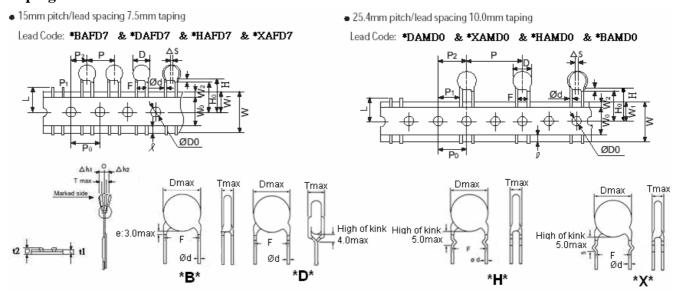
1. Temperature characteristic	2. Nominal capacitance	3. Capacitance tolerance	4. Rated voltage	5. Manufacturer's identification	6. Halogen and Pb free				
SL: No marking	Identified by 3-figure code 1. when Cap.≥100pF Ex. 120pF → "121" 2. When Cap<100pF, marked actual Cap. value. Ex. 22pF→"22"	J: ±5% (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.				
	后有 急								
Definition of date	code marking:	ь DЛ //1	(196)						
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	/ _V 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	B 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 ALL	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.			
Deviation across tape	∆h1		2.0 max.		
Deviation across tape	△h2	2.0 max.			
Portion to cut in case of defect	L	11.0 max.			
Hole-down tape width	W0	0 11.5min			
Hole-down tape distortion	W2	1.5±1.5			
Coating extension on leads	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"			



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 TERMIN NO ABNORMALITI		2 TIMES OF THE RATED VOLTAGE. TEST VOLTAGE: 6KVDC, 1~5 SEC, WITH 50mA MAX. CHARGING CURRENT	
WITHSTAND VOLTAGEN	VOLTAGEN BETWEEN TERMINAL AND ENCLOSURE: NO ABNORMALITIES INSULATION RESISTANCE 10000 MΩ MIN TOLERANCE:		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 SHALL BE MEASURED AT 60±5 SECONDS AFTER RATED VOLTAGE APPLIED. RATED VOLTAGE: 500VDC	
CAPACITANCE			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				
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 STRENGT NO BREAKDOWN	гн:	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	APPEARANCE: NO ABNORMALITIES CAP.CHANGE: SL 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
SOLDERABILITY	(BETWEEN TERMINALS) NO ABNORMALITIES LEAD WIRE SHALL BE SOLDERED OVER 75% OF THE CIRCUMFERENTIAL DIRECTION.	TEMPERATURE OF IRON-TIP: 350~400 ℃ SOLDERING IRON WATTAGE: 50W MAX. SOLDERING TIME: 3.5 SEC. MAX. TO COMPLY WITH JIS-C-5102 8.4 SOLDER TEMPERATURE 245±5℃ 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.	

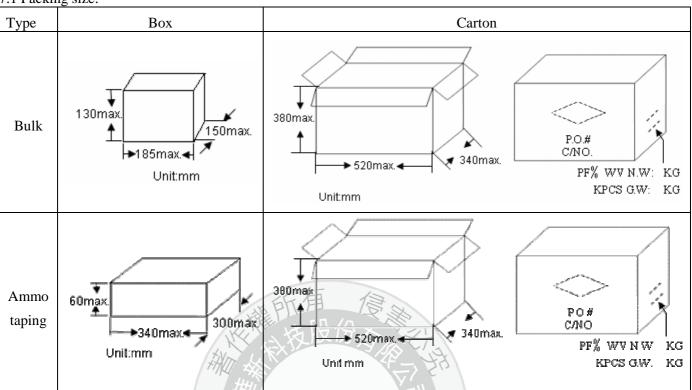


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7. Packing Baggage:

7.1 Packing size:



7.2 Packing quantity:

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

Packing type	MPQ (Kpcs/Bag)
Bulk	1



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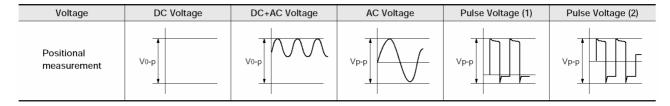
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8. Notices:

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 Ø0.1mm in conditions where the capacitor is not affected by radiant heat from other components or surrounding ambient fluctuations.

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

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.

PASSIVE SYSTEM ALLIANCE

8.8 Rating

Capacitance change of capacitor

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

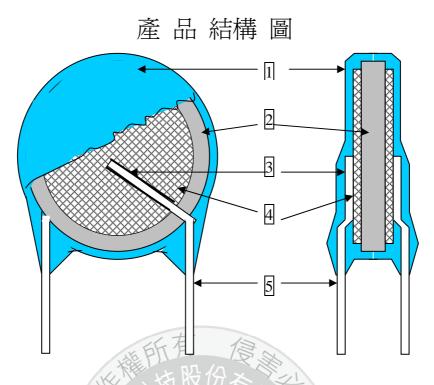
Capacitance might change a little depending on the surrounding temperature or an applied voltage.

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		OP 4 PASSI	1.EF-150C VE SYSTEM ALLIANCE 2.EF-150(HF)	Epoxy resin、Pigment (Blue / UL 94 V-0 /)	
1	Insulation Coating	Epoxy polymer Epoxy polymer	3.PCE-210	The minimum thickness of coating	
		0,0	2.PCE-300(HF)	(reinforced insulation) is 0.4mm	
2	Dielectric Element	Ceramic//	nologsico	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	
	Electrodes	Licetrodes 71g	2.SP-260PL		
5	Leads wire	Tinned copper clad	0.55±0.05 mm	Substrate metal: Fe & Cu	
	Leads wife	steel wire	0.33_0.03 11111	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,	
2013/10/18	7	Review the packing specification	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	
_ 515, 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
201111		Nevicw 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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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 Dφ 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. CHARLOCAL
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	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	↑ -	
	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		
Zead style 11	X3EA0	10 ± 1.0	3.5 ± 0.5	Bulk	()	
Outside kink	X04A0	10 ± 1.0	4.0 ± 0.5		×1/2 ~ 5 / 1/8	
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.



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

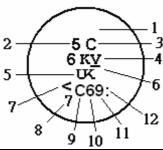
3.1 \ 6KV:

	eturing product Rate voltage, product diar		SL 687 687 7 CZD:
T.C.	SL (CLASS	I , Temperature:+20°C ~+85°C , T.C.C.: +350 ~	-1000ppm)
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	180		
20	200	2.右	
22	220	五月 180	
27 30	300	300	
33	330	330	
39	390	390	
47		470	470
51		510	510
56		560	560
62			
68			680
82	PASS	IVE SYSTEM ALLIANCE	820
100	9.5		101
φd (mm)	桑 奇	0.55±0.05	
CKING	Q1 TO.	TAPING or BULK	/
COATING	100	Epoxy Resin	F



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

4. Marking:



1. Temperature characteristic 2. Nominal capacitance characteristic 2. Nominal capacitance characteristic 2. Nominal capacitance characteristic 3. Capacitance tolerance 4. Rated voltage 5. Manufacturer's identification Pb free 6. Halogen and Pb free Shall be marked as "\u00ac", but when the code of body diameter dimension ≤060 shall be omitted. The polymarked actual Cap. value Ex. 6pF→"6" Definition of date code marking: 7. Supplier of Epoxy 8. No. of test equipment Example 1. Identified by 3-figure code when Cap≥100pF Ex. 120pF → "121" 9. Factory of manufacture 9. Factory of manufacture 1. Vear of manufacture by month 1. Week of manufacture by month 1. 2. Week of manufacture by month 1. 2. 2. 2012, September, O: October, Week 3: : week 4: 'week 4: 'week 5: ; 1. No. 12		9 10				
SL: No marking Code when Cap≥100pF Ex. 120pF → "121" J: ±5% (For above 10pF) I0pF) Godo of body diameter dimension ≤060 shall be omitted. Sinant be marked as "∪", but when the code of body diameter dimension ≤060 shall be omitted. Sinant be marked as "∪", but when the code of body diameter dimension ≤060 shall be omitted. Sinant be marked as "∪", but when the code of body diameter dimension ≤060 shall be omitted. Sinant be marked as "∪", but when the code of body diameter dimension ≤060 shall be omitted. Sinant be marked as "∪", but when the code of body diameter dimension ≤060 shall be omitted. Sinant be marked as "∪", but when the code of body diameter dimension ≤060 shall be omitted. Sinant be marked as "∪", but when the code of body diameter dimension ≤060 shall be omitted. Sinant be marked as "∪", but when the code of body diameter dimension ≤060 shall be omitted. Sinant be marked as "∪", but when the code of body diameter dimension ≤060 shall be omitted. Sinant be marked as "∪", but when the code of body diameter dimension ≤060 shall be omitted. Sinant be marked as "∪", but when the code of body diameter dimension ≤060 shall be omitted. Sinant be marked as "∪", but when the code of body diameter dimension ≤060 shall be omitted. Sinant be marked as "∪", but when the code of body diameter dimension ≤060 shall be omitted. Sinant be marked as "∪", but when the code of body diameter dimension ≤060 shall be omitted. Sinant be marked as "∪", but when the code of body diameter dimension ≤060 shall be omitted. Sinant be marked as "∪", but when the code of body diameter dimension ≤060 shall be omitted. Sinant be marked as "∪", but when the code of body diameter dimension ≤060 shall be omitted. Sinant be marked as "∪", but when the code of body diameter dimension ≤060 shall be omitted. Sinant be marked as "∪", but when the code of body diameter dimension ≤060 shall be omitted. Sinant be marked as "∪", but when the code of body dimension ≤060 shall be omitted. Sin	-	2. Nominal capacitance	-			_
7. Supplier of Epoxy 8. No. of test equipment 9. Factory of manufacture 10. Year of manufacture 11. Month of manufacture by month 12. Week of manufacture by month 12. Vear of manufacture 13. Week of manufacture by month 12. Vear of manufacture 13. Week of manufacture by month 12. Vear of manufacture 13. Week of manufacture 14. 2011, 25. 2012, 35. 2013, 45. 2014, 55. 2015, 65. 2016, 15. November, week 45. Week 55. September 16. Vear of manufacture 17. Week of manufacture 18. No. 10 week 15. September, week 25. September, week 35. September, week 45. Week 45. Week 55. September 18. No. 10 week 15. September, week 35. September, week 45. Sept	code when Cap.≥100pF Ex. 120pF →"121" No marking 2. When Cap<100pF, marked actual Cap. value		(For above	Be marked	"K", but when the code of body diameter dimension ≤060 shall be	and Pb free, there is a
7. Supplier of Epoxy 8. No. of test equipment			11+			
7.Supplier of Epoxy 8.No. of test equipment 9.Factory of manufacture 10.Year of manufacture	Definition of date	code marking:	所归	景。是		
1~9: No.1~No.9, 2:2012, September, week 1: - week 2: week 2: week 3: : week 3: : week 4: week 4: week 4: week 5: ; 1~9: No.10, K: No.11, No.10, No.11, No.12, No.12, No.12, week 5: ; week 5: ;	^ ^	8.No. of test equipment		\sim \sim		manufacture
		J : No.10,		2:2012, 3:2013, 4:2014, 5:2015, 6:2016,	September, O: October, N: November,	week 2: ' week 3: : week 4: '



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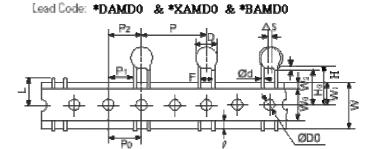
5. Taping Format:

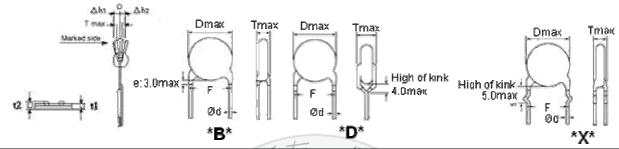
• 15mm pitch/lead spacing 7.5mm taping

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









POE Part Number		*BAFD7	*DAFD7 *XAFD7	*BAMD0 *DAMD0 *XAMD0
Item	Symbol	Dimensions (mm)	Dimensions (mm)	Dimensions (mm)
Pitch of component	/// /P	15.0	77.15.0	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 SY 7.5±1.5 LIANCE	7.5±1.5	12.7 ± 1.5
Length from hole center to lead	号PI	3.75±1.0	3.75±1.0	7.7±1.5
Body diameter	一 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	CCANOLOGY 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	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	∆h1		2.0 max.	
Deviation across tape	△h2	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"		



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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 REQUIREMENTS	TESTING PROCEDURE		
APPEARANCE STRUCTURE SIZE	NO ABNORMALITIES	AS STATED IN SECTION 3.1 & 3.2		
MARKING		AS STATED IN SECTION 4		
	BETWEEN TERMINALS: NO ABNORMALITIES	RATED VOLTAGE 6KVDC: 150% OF THE RATED VOLTAGE FOR 1 TO 5 SECONDS.(TEST VOLTAGE: 9000VDC, 1~5 SEC), WITH 50mA MAX. CHARGING CURRENT		
WITHSTAND VOLTAGEN	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 ΜΩ ΜΙΝ	INSULATION RESISTANCE SHALL BE MEASURED AT 60±5 SECONDS AFTER RATED VOLTAGE APPLIED. RATED VOLTAGE: 500VDC		
CAPACITANCE	TOLERANCE : J : ±5% , K : ±10%	TESTING FREQUENCY: 1MHZ \pm 20 % TESTING TEMPERATURE: 25 \pm 2°C TESTING VOLTAGE: 1.0 \pm 0.2 VRMS		
OPERATING TEMPERATURE RANGE		ERATURE RANGE : -25° C TO $+125^{\circ}$ C TEMPERATURE RISE OF $+20^{\circ}$ C)		
Q FACTOR)	30PF&Above Below 30PF \geq 1000 \geq 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 4: $85^{\circ}\mathbb{C}$ STEP 4: $85^{\circ}\mathbb{C}$ 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 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 SOLDER OF WHICH TEMPERATURE 350±10°C FOR 3±0.5 SECONDS THEN LEAVE AT STANDARD TEST CONDITIONS FOR 24±2 HOURS, THEN MEASURED.
SOLDERABILITY	LEAD WIRE SHALL BE PASSIVE S 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%
	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	, 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.	
	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		
	APPEARANCE : NO ABNORMALITIES	司意動	
нідн	CAP.CHANGE : WITHIN ±3 % OR ±0.3PF, WHICHEVER IS LARGE.	150% RATED VOLTAGE WITH 50mA max.	
TEMPERATURE LOADING	Q FACTOR: SL: LESS THAN 10PF => $Q \ge 200 + 10 \times C$	FOR 1000(+48/-0) HOURS AT 125±2°C AND TH DRIED FOR 1~2 HOURS AND MEASURED.	
	MORE THAN 10PF AND LESS THAN 30PF =>Q \geq 275 +5 × C/2		
	MORE THAN 30PF => $Q \ge 350$ INSULATION RESISTANCE: 1000 M Ω MIN.	Ology Core ATOM, ALLEGATION	

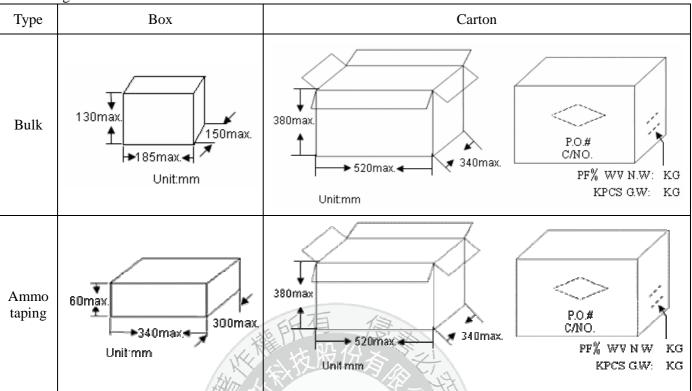


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7. Packing Baggage:

7.1 Packing size:



7.2 Packing quantity:

Packing type	The code of 14th to15th in SAP P/N	MPQ (Kpcs/Box)	
Toning	AF	是 %1	
Taping	AM	0.5	

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.

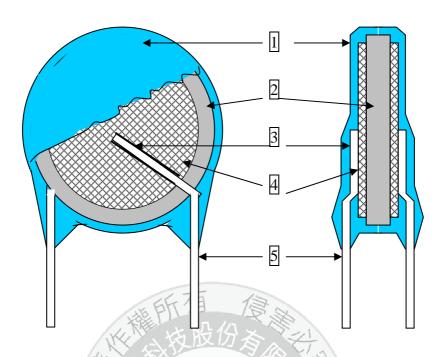


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9.Drawing of internal structure and material list:

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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        CH102100J050BAND5P
        CH102120J050BAND5P
        CH500050C040B20C2P
        CH500100J040B20C2P

        CH500101J070B20C5P
        CH500120J040B20C2P
        CH50112R7C050B20C5P
        CH501330J050B20C5P

        CH501330J050B20C6P
        CH101240J040HAND5P
        CH101240J040BAND5P
        CH5016R8C050B20C5P

        CH501100J050B20C5P
        CH501120J050B20C5P
        CH501150J050B20C5P
        CH501150J050B20C5P

        CH501220J050B20C5P
        CH501270J050B20C5P
        CH5000560J050B20C5P
        CH5000680J060B20C5P

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        CH5001010C050B4EA5P

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        CH500121J080B20C5P
        CH500150J040B20C2P

        CH500220J040BAND5P
        CH500220J040B20C2P
        CH500240J040B20C2P
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