PRODUCT SPECIFICATION

PRODUCT: CERAMIC DISC CAPACITOR

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

CUSTOMER: _____

DOC. NO.: POE-D04-00-E-18

Ver.: 18

APPROVED BY CUSTOMER

VENDOR：
☐ **WALSIN TECHNOLOGY CORPORATION** 566-1, KAO SHI ROAD,YANG-MEI TAO-YUAN, TAIWAN ☐ **PAN OVERSEAS (GUANGZHOU) ELECTRONIC CO.,LTD.** NO.277,HONG MING ROAD,EASTERN SECTION, HUANGPU DISTRICT ,GUANG ZHOU,CHINA
MAKER：
☐ **PAN OVERSEAS (GUANGZHOU) ELECTRONIC CO.,LTD.** NO.277,HONG MING ROAD,EASTERN SECTION, HUANGPU DISTRICT ,GUANG ZHOU,CHINA

Record of change

Date	Version	Description	page
2008.6.3	1	1. D15-00-E-09 (before) → POE-D04-00-E-01 (1st edition)	
2008.8.22	2	1. Revised diameter 2. Complete lead code 3. Add last SAP code " H" for halogen and Pb free , epoxy resin..	5-7 16-19 8
2008.12.12	3	1.Complete lead code of SAP P/N 2. Page layout adjustment. 3. Added marking when the coating resin is Halogen and Pb free Epoxy.	3-7
2009.8.5	4	1. Change PSA & POE logo to Walsin & POE logo.	
2011/8/24	5	1. Delete the definition about "Old Part No." 2. Review the diameter dimension code of "Z5U 1KV 332/362" from 060 to be 070. 3. Delete the Part No. of "Z5U 50V/100V 223".	5-6 7 7
2011/11/25	6	1. Review the item Y5P/Z5U/Z5V 2. Add the Y5U temperature characteristic	7-8 4-15
2012/11/06	7	1. Revise the temp.(TCC): Y5P(-25℃ to 85℃/ to 125℃) & Cap. Change(±10% / ±35%) 2. Review the OP temp. for Y5P: Y5P : -25℃ ～ +105℃(INCLUDING CAPACITOR'S SELF-HEATING MAX.+20℃)	4 12-13
2013/5/6	8	1. Review the Lead diameter φ from 0.60 +/-0.06mm to 0.55+/-0.05mm 2. Review the "DΦ≤6.0mm shall be omitted." to " DΦ≤060 shall be omitted." 3. Review the Solderability temperature from 255(+5/-0)℃ to 245±5℃.,Solderability time from 2 ±0.5s to 5±0.5s,	6,9 8 12
2013/10/18	9	Review the packing specification	10
2015/8/4	10	1. Review the temperature range:Y5P(-25℃to+105℃)Change（-25℃to+125℃） 2. review the high temperature loading:FOR 1000(+48/-0) HOURS AT 85 ± 2℃ (FOR Y5U, Z5U, Z5V) / AT 105 ± 3℃(ONLY FOR Y5P) AND THEN DRIED FOR 12～24 HOURS AND MEASURED.Change FOR 1000(+48/-0) HOURS AT 85 ± 2℃ (FOR Y5U, Z5U, Z5V) / AT 125 ± 3℃(ONLY FOR Y5P) AND THEN DRIED FOR 12～24 HOURS AND MEASURED.	11 13
2015/11/5	11	1. Review the Available lead code of Lead Configuration. 2. Modify the contents of the use of epoxy resin for 1KV products 3. Review the Specification and test method 4. Review 8. Cautions & notices 5. Review 9. Drawing of internal structure and material list	5-6 7-8 12-13 14 16
2019/7/26	12	1. Review the Hole-down tape width (W0) from 11.0mm min. to 8.0mm min.	9
2021/4/22	13	1. Review the diameter dimension code of "Y5P 50V 682" from 090 to be 100.	7
2021/9/9	14	1. Delete Walsin & POE logo.	1
2022/1/8	15	1. Add "Soldering Recommendation"	17
2022/4/19	16	1. Add 8.5.3 List of substances that affect the insulation strength of coating	16
2023/6/15	17	1. The last code "B" is changed from "Epoxy Resin , Pb free" to "Halogen free and Pb free , epoxy resin ".	4,8
2023/1/4	18	1. Add "AF" taping type.	4,10,11

Table of Contents

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

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

❶ Temperature characteristic：

Code	YU(Y5U)	YP(Y5P)	ZU(Z5U)	ZV(Z5V)
Temperature range	-25℃ to +85℃	-25℃to +85℃/ 85℃to +125℃	+10℃ to +85℃	
Cap. change	-56%~+22%	±10% / ±55%	-56%~+22%	-82%~+22%

❷ Rated voltage (Vdc)：

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

❸Capacitance(pF)：

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

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

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

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

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

Taping Code	Description
AN	Ammo / Pitch of component:12.7 mm (For Dφ Code≧120))
AF	Ammo / Pitch of component:12.7 mm (For voltage≧2KV/ Dφ Code≧060)

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

❽Length tolerance

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

❾Pitch

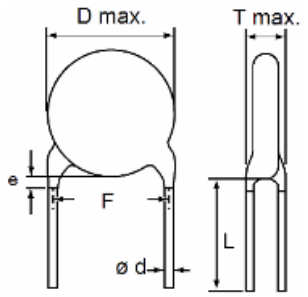
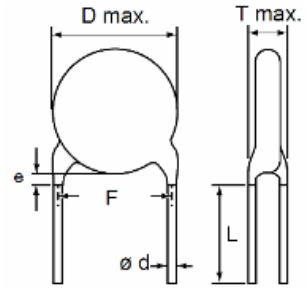
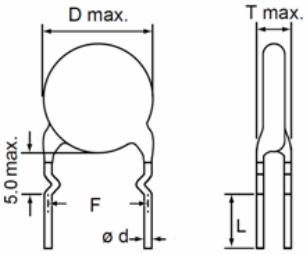
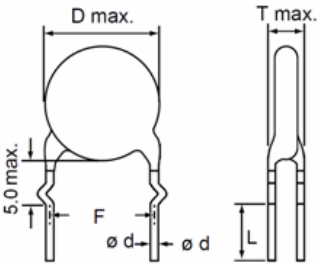
Code	Description		Code	Description
5	5.0±0.8mm (For Bulk)		7	7.5 ±1mm
5	5.0+0.8mm-0.2mm (For Taping)		0	10.0 ±1mm
2	2.5 ±0.8 mm			

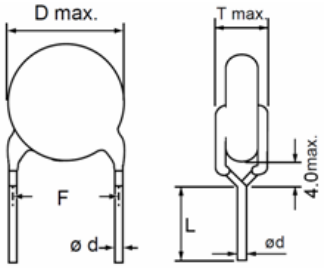
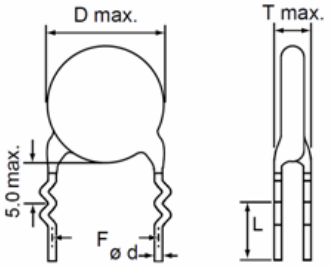
❿Coating code

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

2. Mechanical:

Available lead code, Example: (unit: mm)

Lead type	SAP P/N (13-17) digits	Pitch (F)	Lead length (L)	Available rated voltage	Packing	Lead configuration
Lead style：B Straight long lead	B20C2	2.5 ± 0.8	20 MIN.	50V	Bulk	
	B20C5	5.0 ± 0.8	20 MIN.	50V,500V, 1KV,2KV		
	B20C6	6.4 ± 1.0	20 MIN.			
	B20C7	7.5 ± 1.0	20 MIN.			
	B20C0	10 ± 1.0	20 MIN.			
	BAND5	5.0 $^{+0.8}_{-0.2}$	Taping SPEC. (Ref.to page.9~10)		Tap. Ammo	
	BAFD7	7.5±1.0		1KV,2KV(Dφ≧060)		
	BAND2	2.5 ± 0.8		50V		
Lead style：L Straight short lead	L05B2	2.5 ± 0.8	5.0 ± 1.0	50V,500V, 1KV, 2KV	Bulk	
	L4EB5	5.0 ± 0.8	4.5 ± 1.0			
	L05B5	5.0 ± 0.8	5.0 ± 1.0			
	L05B6	6.4 ± 1.0	5.0 ± 1.0			
	L4EB7	7.5 ± 1.0	4.5 ± 1.0			
	L05B7	7.5 ± 1.0	5.0 ± 1.0			
	L4EB0	10 ± 1.0	4.5 ± 1.0			
	L05B0	10 ± 1.0	5.0 ± 1.0			
Lead style：H Inside kink lead	H3EA5	5.0 ± 0.8	3.5 ± 0.5	50V,500V, 1KV, 2KV	Bulk	
	H04A5	5.0 ± 0.8	4.0 ± 0.5			
	H4EB5	5.0 ± 0.8	4.5 ± 1.0			
	H05B5	5.0 ± 0.8	5.0 ±1.0			
	H20C5	5.0 ± 0.8	20 MIN.			
	H3EA7	7.5 ± 1.0	3.5 ± 0.5			
	H04A7	7.5 ± 1.0	4.0 ± 0.5			
	H4EB7	7.5 ± 1.0	4.5 ± 1.0			
	H05B7	7.5 ± 1.0	5.0 ±1.0			
	H20C7	7.5 ± 1.0	20MIN			
	H3EA0	10 ± 1.0	3.5 ± 0.5			
	H04A0	10 ± 1.0	4.0 ± 0.5			
	H4EB0	10 ± 1.0	4.5 ± 1.0			
	H05B0	10 ± 1.0	5.0 ±1.0			
	H20C0	10 ± 1.0	20 MIN.			
	HAND5	5.0 $^{+0.8}_{-0.2}$	Taping SPEC. (Ref.to page.9~10)	50V,500V, 1KV, 2KV	Tap. Ammo	
	HAFD7	7.5 ± 1.0		1KV,2KV(Dφ≧060)		
Lead style：X Outside kink lead	X3EA5	5.0±0.8	3.5 ± 0.5	50V,500V, 1KV, 2KV	Bulk	
	X3EA7	7.5±1.0				
	X3EA0	10±1.0				
	X04A5	5.0±0.8	4.0 ± 0.5			
	X04A7	7.5±1.0				
	X04A0	10±1.0				
	X05B5	5.0±0.8	5.0 ± 1.0			
	X05B7	7.5±1.0				
	X05B0	10±1.0				
	XAND5	5.0 $^{+0.8}_{-0.2}$	Taping SPEC. (Ref.to page.9~10)	50V,500V, 1KV, 2KV	Tap. Ammo	
	XAFD7	7.5 ± 1.0		1KV,2KV(Dφ≧060)		

Lead type	SAP P/N (13-17) digits	Pitch (F)	Lead length (L)	Available rated voltage	Packing	Lead configuration
Lead style：D Vertical kink lead	D04A5	5.0±0.8	4.0 ± 0.5	50V,500V, 1KV, 2KV	Bulk	
	D04A7	7.5±1.0				
	D04A0	10±1.0				
	D3EA5	5.0±0.8	3.5 ± 0.5			
	D3EA7	7.5±1.0				
	D3EA0	10±1.0				
	D20C5	5.0 ± 0.8	20 MIN.	1KV, 2KV		
	DAND5	5.0 $^{+0.8}_{-0.2}$	Taping SPEC. (Ref.to page.9~10)	50V,500V, 1KV, 2KV	Tap. Ammo	
	DAFD7	7.5 ± 1.0		1KV,2KV(Dφ≧060)		
Lead style：M Double outside kink lead	M05B5	5.0 ± 0.8	5.0 ± 1.0	50V,500V, 1KV, 2KV	Bulk	
	M05B7	7.5 ± 1.0				
	M05B0	10 ± 1.0				
	M04B5	5.0 ± 0.8	4.0 ± 1.0			
	M04B7	7.5 ± 1.0				
	M04B0	10 ± 1.0				

※ Lead diameter φ= 0.55 +/-0.05 mm
※ Phenolic resin coating for 50V/500V product; Phenolic resin or Epoxy resin coating for 1KV product; Epoxy resin coating for 2KV product.
※ **e** (Coating **extension** on leads):
For straight lead style: 1.5mmMax when the rated voltage is 50Vdc & 100Vdc;
2.0mmMax when the rated voltage is 500Vdc and 1KVdc;
3.0mmMax when the rated voltage is 2KVdc.
For kink lead style: not exceed the kink.

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

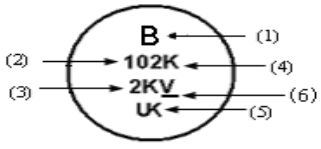
T.C.	Y5P (CLASS Ⅱ, Temperature:-25℃~+85℃, T.C.C.:±10% & +85℃~+125℃, T.C.C.:±55%)																											
Rate voltage	50V, 100V						500V									1KV						2KV						
Dφ (Code)	040	050	060	070	080	100	040	050	060	070	080	090	100	110	130	050	060	070	080	100	120	060	080	090	100	130	140
D max. (mm)	4.5	5.5	6.5	7.5	8.5	11.0	4.5	5.5	6.5	7.5	9.0	10.0	11.0	12.0	14.0	6.0	7.0	8.0	9.0	11.0	13.0	7.5	9.5	10.5	11.5	14.5	15.5
T max. (mm)	3.5	3.5	3.5	3.5	3.5	3.5	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
100	101						101									101						101						
120	121						121									121						121						
150	151						151									151						151						
180	181						181									181						181						
200	201						201									201						201						
220	221						221									221						221						
240	241						241									241						241						
270	271						271									271						271						
330	331						331									331						331						
390	391						391									391						391						
470	471						471									471						471						
560	561						561									561						561						
680	681						681										681					681						
820	821							821									821						821					
1000	102							102									102						102					
1200		122							122									122						122				
1500		152							152									152						152				
1800		182								182									182					182				
2000		202								202									202					202				
2200		222								222									222					222				
2700			272								272									272						272		
3000			302								302									302								
3300			332									332								332							332	
3900				392								392									392						392	
4700				472									472								472							472
5000					502								502															
5600					562								562															
6800						682								682														
8200						822									822													
10000						103									103													
Packing	Taping or Bulk						Taping or Bulk							Bulk		Taping or Bulk						Taping or Bulk					Bulk	
Coating	Phenolic Resin															Phenolic Resin or Epoxy Resin						Epoxy Resin						

T.C.	Z5U (CLASS Ⅱ, Temperature: +10℃~+85℃, T.C.C.: +22~-56%)																						
Rate voltage	50V,100V						500V					1KV					2KV						
Dφ(Code)	040	050	060	070	080	100	040	050	060	070	090	050	060	070	090	100	060	070	080	090	110	130
D max. (mm)	4.5	5.5	6.5	7.5	8.5	10.5	4.5	5.5	6.5	7.5	9.5	6.0	7.0	8.0	10.0	11.0	7.5	8.5	9.5	10.5	12.5	14.5
T max. (mm)	3.5	3.5	3.5	3.5	3.5	3.5	4.0	4.0	4.0	4.0	4.0	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
1000								102				102					102					
1200								122				122					122					
1500								152				152						152				
1800								182				182										
2000	202							202				202										
2200	222							222				222						222				
2700	272							272						272					272			
3000	302													302								
3300	332								332					332					332			
3600	362								362					362						362		
3900	392								392					392						392		
4700	472									472				472						472		
5000		502												502								
5600										562											562	
6800										682					682						682	
8200			822													822						822
10000				103							103					103						103
Packing	Taping or Bulk																					Bulk
Coating	Phenolic Resin											Phenolic Resin or Epoxy Resin					Epoxy Resin					

T.C.	Y5U (CLASS Ⅱ, Temperature: -25℃~+85℃, T.C.C.: +22~-56%)																				
Rate voltage	50V,100V					500V					1KV					2KV					
Dφ(Code)	050	060	070	080	100	060	070	080	090	100	050	060	070	090	110	060	070	080	090	110	140
D max. (mm)	5.5	6.5	7.5	8.5	10.5	6.5	7.5	8.5	9.5	10.5	6.0	7.0	8.0	10.0	12.0	7.5	8.5	9.5	10.5	12.5	15.5
T max. (mm)	3.5	3.5	3.5	3.5	3.5	4.0	4.0	4.0	4.0	4.0	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
1000						102					102					102					
1200											122					122					
1500											152						152				
2000	202																				
2200	222					222						222						222			
2700	272						272						272					272			
3000	302																				
3300	332						332						332						332		
3600	362																				
3900	392						392						392						392		
4700	472							472						472					472		
5000	502																				
5600																				562	
6800									682					682							
8200			822																		
10000			103							103					103						103
Packing	Taping or Bulk														Bulk	Taping or Bulk					Bulk
Coating	Phenolic Resin										Phenolic Resin or Epoxy Resin					Epoxy Resin					

T.C.	Z5V (CLASS Ⅱ, Temperature: +10℃~+85℃, T.C.C.: +22~-82%)								
Rate voltage	50V, 100V				500V	1KV			2KV
Dφ(Code)	050	060	070	080	080	060	080	100	120
D max. (mm)	5.5	6.5	7.5	8.5	9.0	7.0	9.0	11.0	13.5
T max. (mm)	3.5	3.5	3.5	3.5	4.0	4.5	4.5	4.5	4.5
1000	102								
1200	122								
1500	152					152			
1800	182					182			
2000	202					202			
2200	222					222			
2700	272					272			
3000	302					302			
3300	332								
3600	362								
3900	392						392		
4700	472						472		
5000							502		
10000		103			103			103	103
20000			203						
22000				223					
Packing	Taping or Bulk								
Coating	Phenolic Resin					Phenolic Resin or Epoxy Resin			Epoxy Resin

4. Marking:

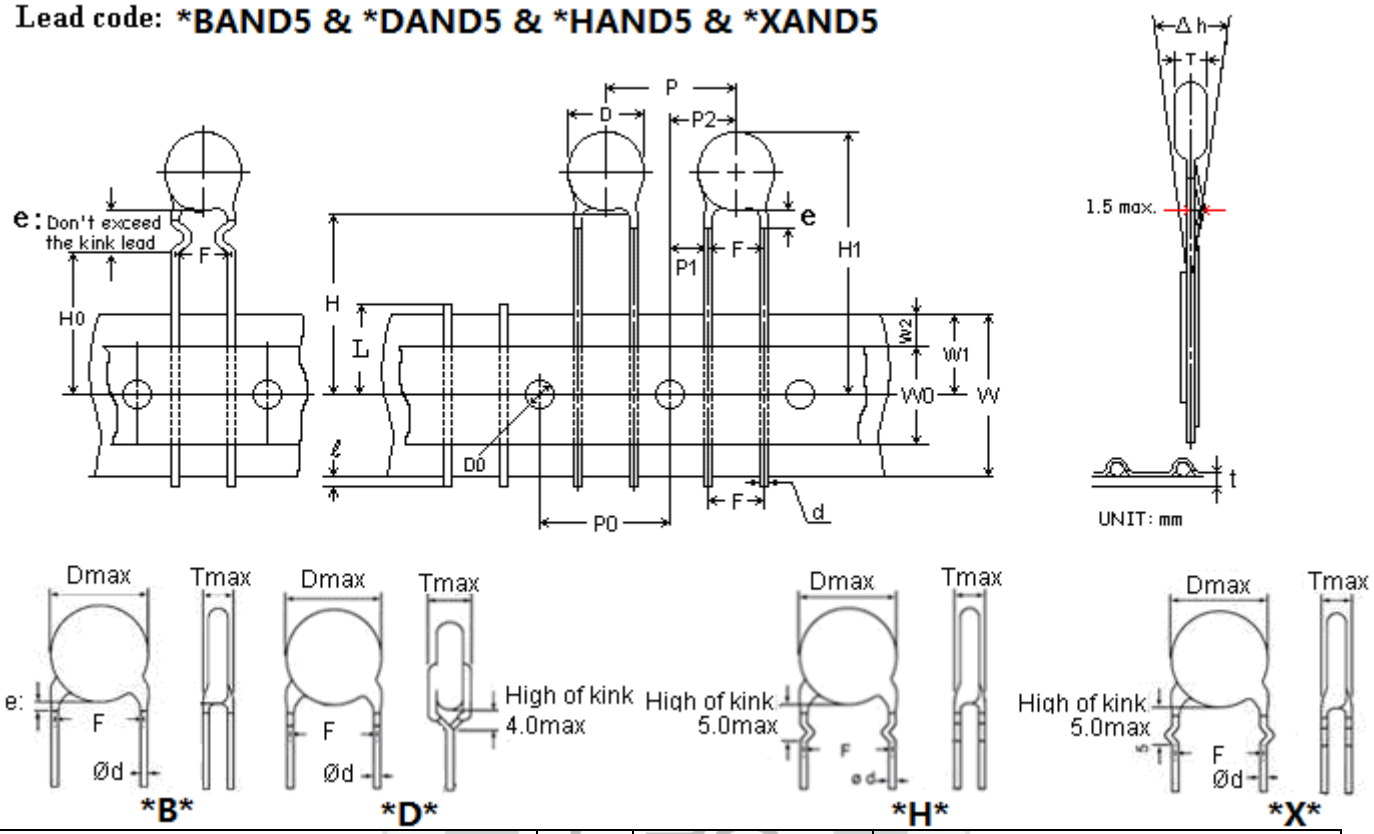
Marking / Remarks		
(1). Temp. char.	Y5P：Be marked “B”； Z5U(Y5U)：Be marked “E”; Z5V：Shall be omitted	
(2). Rated capacitance	Identified by 3-Figure Code. Ex. 1000pF→"102"，4700pF→"472"	
(3). Rated voltage	50V&100V	Marked with code “__” under the rated capacitance.
	500V	No any marking under the rated capacitance.
	1000V&2000V	Marked with code: 1000V→"1KV"，2000V→"2KV"
(4). Capacitance tolerance	K=±10%(for Y5P)、M=±20%(for Z5U&Y5U)、Z=+80%-20%(for Z5V)	
(5). Manufacturer’s identification	Shall be marked as "UK", but DΦ≤060 shall be omitted.	
(6). Halogen and Pb free	There is a “__”marking under the code “V” when the coating resin is Halogen free and Pb free Epoxy. (For the last code “H” and ”B” of the SAP P/N)	

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 & *XAND5

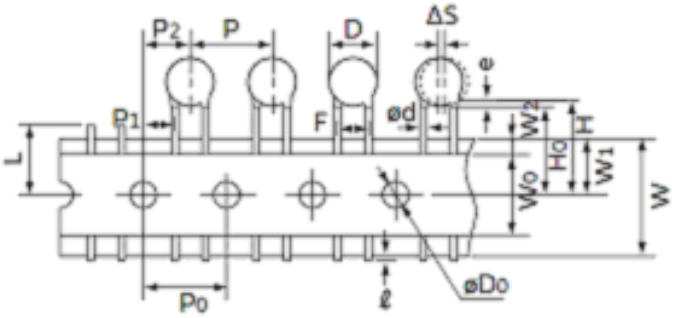


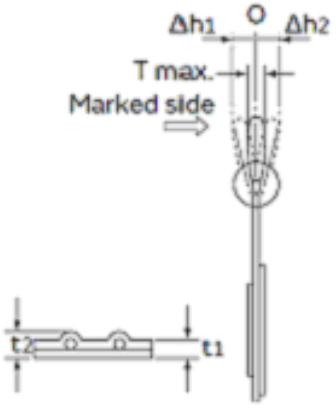
B *D* *H* *X*

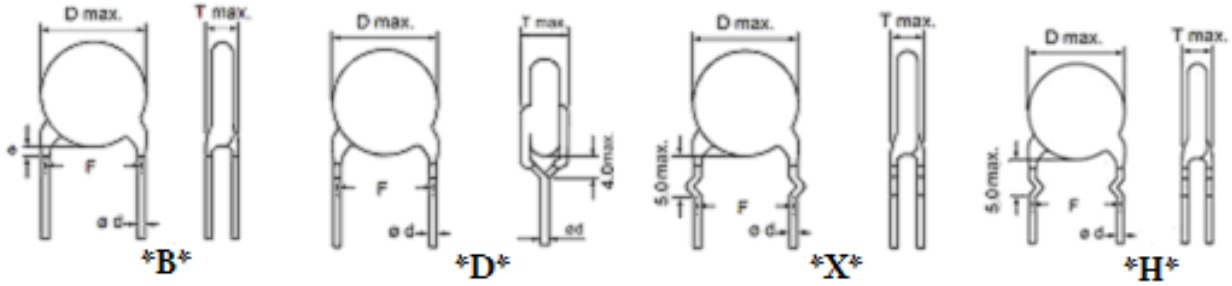
Item		Symbol	Specification		Remarks
			Value	Tolerance	
Body diameter		D	*	max.	See Section "3. Capacitance value vs. rated voltage, product diameter".
Body thickness		T	*	max.	
Lead-wire diameter		d	0.55	±0.05	
Pitch of component		P	12.7	±1.0	
Feed hole pitch		P0	12.7	±0.3	Cumulative pitch erroe:1.0mm/20 pitch
Feed hole center to lead		P1	3.85	±0.7	To be measured at bottom of clinch
Hole center to component center		P2	6.35	±1.3	
Lead-to-lead distance		F	5.0	+0.8,-0.2	
Component alignment, F-R		△h	0	±2.0	
Tape width		W	18.0	+1.0,-0.5	
Hole-down tape width		W0	8.0	min.	
Hole position		W1	9.0	+0.75,-0.5	
Hole-down tape position		W2	3.0	max.	
Height of component form tape center	For straight lead type	H	20.0	+1.0 -0.5	
	For kinked lead type	H0	16.0	±0.5	
Component height		H1	32.25	max.	
Lead-wire protrusion		ℓ	2.0	max.	Or the end of lead wire may be inside the tape.
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)".		

• 15 mm pitch/lead spacing 7.5mm taping

Lead Code: *BAFD7 & *DAFD7 & *XAFD7



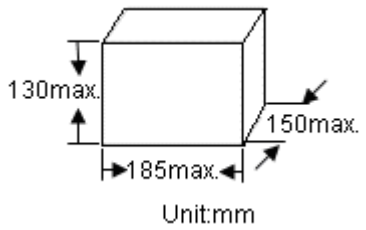
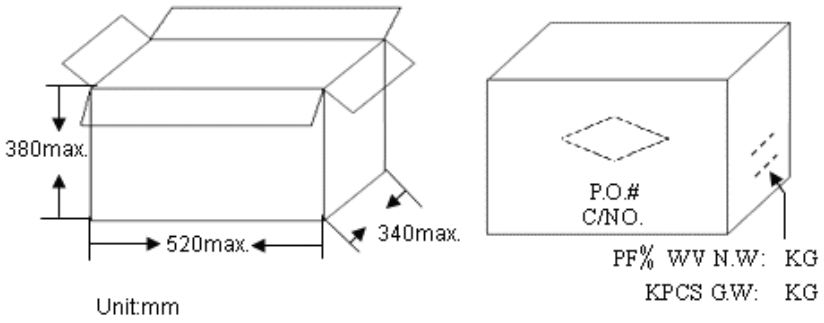
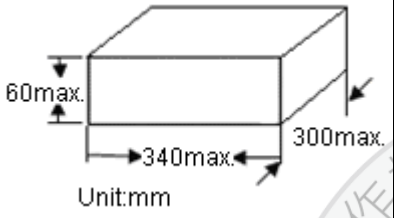
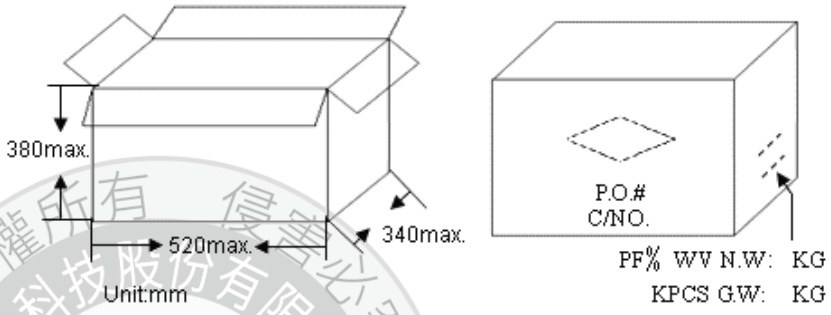




POE Part Number		*BAFD7 / *DAFD7 *HAFD7 / *XAFD7
Item	Symbol	Dimensions (mm)
Pitch of component	P	15.0±1.0
Pitch of sprocket	P0	15.0±0.3
Lead spacing	F	7.5±1.0
Length from hole center to component center	P2	7.5±1.5
Length from hole center to lead	P1	3.75±1.0
Body diameter	D	See the "3. Capacitance value vs. Rate voltage, product diameter"
Deviation along tape, left or right	Δ S	0±2.0
Carrier tape width	W	18.0 +1/-0.5
Position of sprocket hole	W1	9.0±0.5
Lead distance between the kink and center of sprocket hole	H0	18.0+2/-0 (For: *D* & *X* & *Y* lead type)
Lead distance between the bottom of body and the center of sprocket hole	H	20.0+1.5/-1.0 (For: *B* lead type)
Component Height	H1	32.25Max
Lead-Wire 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	Δ h	2.0 max.
Portion to cut in case of defect	L	11.0 max.
Hole-down tape width	W0	8.0min
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"

6. Packing Baggage：

6.1 Packing size:

Type	Box	Carton
Bulk		
Ammo taping		

6.2 Packing quantity:

Packing type	The code of 14th to15th in SAP P/N	MPQ (Kpcs/Box)	Remark
Taping	AN	2	Phenolic resin
	AN	1.5	Epoxy resin
	AF	1	Epoxy resin

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

7. Specification and test method:

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

7.2 TEST CONDITIONS :

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

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

7.4 TEST ITEMS :

ITEM	POST-TEST REQUIREMENTS	TESTING PROCEDURE
APPEARANCE STRUCTURE SIZE	NO ABNORMALITIES	AS STATED IN SECTION 3.
MARKING		AS STATED IN SECTION 4
WITHSTAND VOLTAGE	BETWEEN TERMINALS: NO ABNORMALITIES	A. BELOW 1KV: 250% RATED VOLTAGE WITH 50mA MAX. CHARGING CURRENT FOR 1～5 SEC. B. 1KV & ABOVE: 200% RATED VOLTAGE WITH 50mA MAX. CHARGING CURRENT FOR 1～5 SEC.
	BETWEEN TERMINAL AND ENCLOSURE : NO ABNORMALITIES	SMALL METALLIC BALLS WITH 1mm DIAMETERS SHALL BE PUT ON A VESSEL AND THE TEST CAPACITOR SHALL BE SUBMERGED EXCEPT 2mm FROM THE TOP OF ITS COMPONENT BODY. THE TEST VOLTAGE SHALL BE APPLIED BETWEEN THE SHORT-CIRCUITED TERMINALS AND THE METALLIC BALLS. (APPLY 1.3KV DC VOLTAGE BETWEEN TERMINALS AND ENCLOSURE FOR 1～5 SEC)
INSULATION RESISTANCE	10000 MΩ MIN	INSULATION RESISTANCE SHALL BE MEASURED AT 60±5 SECONDS AFTER RATED VOLTAGE APPLIED. RATED VOLTAGE :100V =100V 500V & ABOVE = 500V
CAPACITANCE	TOLERANCE : K : ±10%　M : ±20% Z : +80-20%	TESTING FREQUENCY: 1 KHZ ± 20% TESTING TEMPERATURE: 25 ± 2℃ TESTING VOLTAGE: 1.0Vrms
OPERATING TEMPERATURE RANGE	Y5P : -25℃ ～ +125℃ Y5U: -25℃ ～ +85℃ Z5U & Z5V: +10℃ ～ +85℃	
TEMPERATURE RANGE	Y5P : -25℃ ～ +125℃(INCLUDING CAPACITOR'S SELF-HEATING MAX.+20℃) Y5U: -25℃ ～ +85℃ Z5U & Z5V: +10℃ ～ +85℃	
DISSIPATION FACTOR (D.F)	Y5P : BELOW 2.5% Z5U & Y5U : BELOW 2.5% Z5V : BELOW 5.0%	AS ABOVE STIPULATION OF CAPACITANCE

ITEM	POST-TEST REQUIREMENTS	TESTING PROCEDURE
TEMPERATURE CHARACTERISTIC	CAP. CHANGE : Y5P : WITHIN ± 10%(-25℃to +85℃) & WITHIN ± 55%(85℃to +125℃) Z5U & Y5U : WITHIN -56,+22% Z5V : WITHIN -82,+22%	CAPACITANCE SHALL BE MEASURED AT 25℃. AND CLASSIFIED AS CAP. CHANGE : CLASS Y5P : -25℃ ～ +125℃ CLASS Y5U : -25℃ ～ +85℃ CLASS Z5U&Z5V : +10℃ ～ +85℃ Pre-treatment: Capacitor shall be stored at125±3℃ for 1hour.then placed at※1room condition for 24±2hours
TERMINAL STRENGTH	TENSILE STRENGTH : NO BREAKDOWN	WIRE DIA.0.5 M/M, LOADING WEIGHT 0.5KG FOR 10±1 SECONDS WIRE DIA.0.6 M/M, LOADING WEIGHT 1.0KG FOR 10±1 SECONDS
	BENDING STRENGTH : NO BREAKDOWN	WIRE DIA.0.5 M/M, LOADING WEIGHT 0.25 KG WIRE DIA.0.6 M/M, LOADING WEIGHT 0.5 KG (BENDING BACK AND FORTH 90 DEGREE TWICE)
SOLDERABILITY	LEAD WIRE SHALL BE SOLDERED OVER 3/4 OF THE CIRCUMFERENTIAL DIRECTION.	TO COMPLY WITH JIS-C-5102 8.4 SOLDER TEMPERATURE 245±5℃ AND DIPPING TIME 5±0.5 SECONDS. FLUX : WEIGHT RATIO OF POSIN 25%
SOLDERING HEAT RESISTANCE	APPEARANCE : NO ABNORMALITIES	LEAD WIRE OR TERMINALS SHALL IMMERSE UP TO 2.0 M/M FORM BODY. (A) BODY DIA.≦5.0mm: INTO THE MOLTEN SOLDER OF WHICH TEMPERATURE: 260(+5/-0)℃ FOR 3.0±0.5 SECONDS. (B) BODY DIA.＞5.0mm: INTO THE MOLTEN SOLDER OF WHICH TEMPERATURE 260(+5/-0)℃ FOR 5~10 SECONDS. THEN LEAVE AT STANDARD TEST CONDITIONS FOR 24±2 HOURS, THEN MEASURED. ※WHEN SOLDERING CAPACITOR WITH A SOLDERING IRON, IT SHOULD BE PERFORMED IN FOLLOWING CONDITIONS. TEMPERATURE OF IRON-TIP: 350~400 ℃ SOLDERING IRON WATTAGE : 50W MAX. SOLDERING TIME : 3.5 SEC. MAX.
	CAP. CHANGE : Y5P : ±5% MAX Z5U & Y5U : ±15% MAX Z5V : ±20% MAX	
	WITHSTAND VOLTAGE: (BETWEEN TERMINALS) NO ABNORMALITIES	
HUMIDITY CHARACTERISTIC (STABLE SITUATION)	APPEARANCE: NO ABNORMALITIES	CAPACITORS SHALL BE SUBJECTED TO A RELATIVE HUMIDITY OF 90 ～ 95% AT 40±2℃ FOR 500(+24/-0) HOURS. THEN DRIED FOR 1～2 HOURS AND MEASURED.
	CAP. CHANGE : Y5P : ± 15% MAX Z5U & Y5U : ± 20% MAX Z5V : ± 30% MAX	
	D.F. Y5P : 5% MAX Z5U & Y5U: 5% MAX Z5V : 7.5% MAX	
	INSULATION RESISTANCE : 1000MΩ MIN.	

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

ITEM	POST-TEST REQUIREMENTS	TESTING PROCEDURE
HUMIDITY LOADING	APPEARANCE: NO ABNORAMLITIES	CAPACITORS SHALL BE SUBJECTED TO A RELATIVE HUMIDITY OF 90 ～ 95% AT 40 ± 2℃ FOR 500(+24/-0) HOURS WITH RATED VOLTAGE APPLIED WITH 50mA MAX., THEN DRIED FOR 1～2 HOURS AND MEASURED. Pre-treatment: Capacitor shall be stored at125±3℃ for 1hour.then placed at※ 1room condition for 24±2hours
	CAP. CHANGE : Y5P : ±15% MAX Z5U & Y5U: ±20% MAX Z5V : ±30% MAX	
	D.F. Y5P : 5% MAX Z5U & Y5U : 5% MAX Z5V : 7.5% MAX	
	INSULATION RESISTANCE 500 MΩ MIN.	
HIGH TEMPERATURE LOADING	APPEARANCE : NO ABNORMALITIES	CAPACITORS SHALL BE SUBJECTED TO A TEST OF (A) BELOW 1KV: 200% RATED VOLTAGE WITH 50mA MAX. (B) 1KV & ABOVE: 150% RATED VOLTAGE WITH 50mA MAX. FOR 1000(+48/-0) HOURS AT 85 ± 2℃ (FOR Y5U, Z5U, Z5V) / AT 125 ± 3℃(ONLY FOR Y5P) AND THEN DRIED FOR 12～24 HOURS AND MEASURED. Pre-treatment: Capacitor shall be stored at125±3℃ for 1hour.then placed at※ 1room condition for 24±2hours
	CAP. CHANGE : Y5P : ±15% MAX Z5U & Y5U: ±20% MAX Z5V : ±30% MAX	
	D.F. Y5P : 4% MAX Z5U & Y5U: 4% MAX Z5V : 7.5% MAX	
	INSULATION RESISTANCE : 1000 MΩ MIN.	
TEMPERATURE CYCLING	APPEARANCE : NO ABNORMALITIES	CAPACITORS SHALL BE SUBJECTED TO: -25±3℃(30±3min) → 25℃(3min) → 85±3℃(30±3min) → 25℃(3min) FOR 5 CYCLE. Pre-treatment: Capacitor shall be stored at125±3℃ for 1hour.then placed at※ 1room condition for 24±2hours
	CAP. CHANGE : Y5P : ±15% MAX Z5U & Y5U: ±20% MAX Z5V : ±30% MAX	
	D.F. Y5P : 5% MAX Z5U & Y5U: 5% MAX Z5V : 7.5% MAX	
	INSULATION RESISTANCE : 1000 MΩ MIN.	

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

8. Cautions & notices:

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

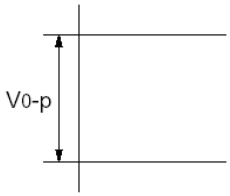
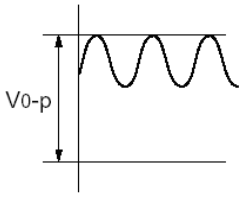
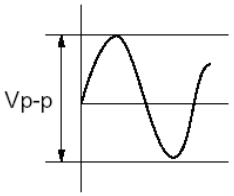
As coupling and decoupling capacitors for such application where higher losses and a reduced capacitance stability are required.

8.1. Caution (Rating)

I. Operating Voltage

When DC-rated capacitors are to be used in AC or ripple current circuits, be sure to maintain the 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
Positional measurement			

II. Operating Temperature and Self-generated Heat

Keep the surface temperature of a capacitor below the upper limit of its rated operating temperature range. Be sure to take into account the heat generated by the capacitor itself. When the capacitor is used in a high frequency current, pulse current or similar current, it may self-generate heat due to dielectric loss. The frequency of the applied sine wave voltage should be less than 150Hz. The applied voltage load (*) should be such that the capacitor's self-generated heat is within 20℃ at an atmosphere temperature of 25℃. When measuring, use a thermocouple of small thermal capacity-K of ø0.1mm in conditions where the capacitor is not affected by radiant heat from other components or surrounding ambient fluctuations.

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

III. Fail-Safe

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

8.2. Caution (Storage and operating condition)

I. Operating and storage environment

The insulating coating of capacitors does not form a perfect seal; therefore, do not use or store capacitors in a corrosive atmosphere, especially where chloride gas, sulfide gas, acid, alkali, salt or the like are present. And avoid exposure to moisture. Before cleaning, bonding or molding this product, verify that these processes do not affect product quality by testing the performance of a cleaned, bonded or molded product in the intended equipment. Store the capacitors where the temperature and relative humidity do not exceed –10 to 40 degrees centigrade and 15 to 85 % for 6 months maximum and use within the period after receiving the capacitors.

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

8.3.Caution (Soldering and Mounting)

I. Vibration and impact

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

II. Soldering

When soldering this product to a PCB/PWB, do not exceed the solder heat resistance specification of the capacitor. Subjecting this product to excessive heating could melt the internal junction solder and may result in thermal shocks that can crack the ceramic element. When soldering capacitor with a soldering iron, it should be performed in following conditions.

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

Soldering iron wattage : 50W max.

Soldering time : 3.5 sec. max.

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

8.4. Caution (Handling)

Vibration and impact

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

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

8.5. Notice

8.5.1. Notice (Soldering and Mounting)

Cleaning (ultrasonic cleaning)

To perform ultrasonic cleaning, observe the following conditions.

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

Rinsing time : 5 min. maximum.

Do not vibrate the PCB/PWB directly.

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

8.5.2. Notice (Rating)

Capacitance change of capacitor

Class 2 series:

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

Please contact us if you need detailed information.

8.5.3 List of substances that affect the insulation strength of coating：

Resin solvent

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

Resin thinner

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

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

9. Soldering Recommendation:

9.1 Wave Soldering Profile:

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

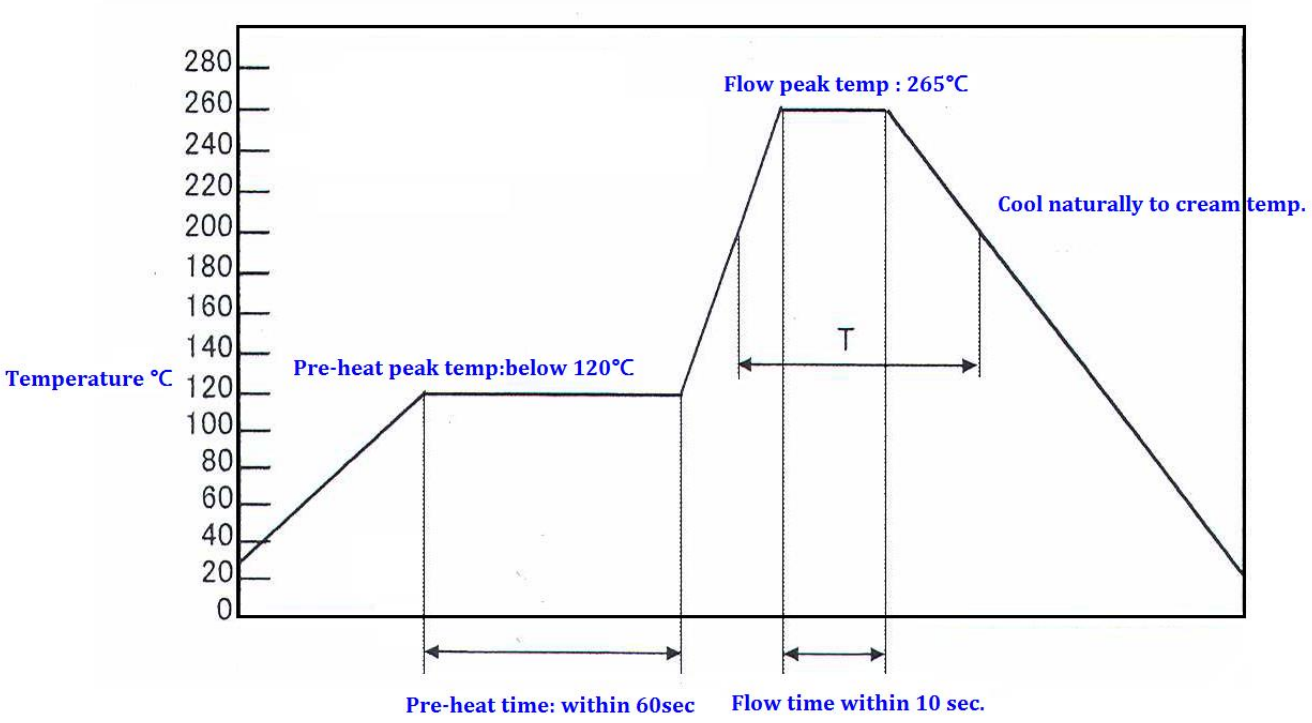


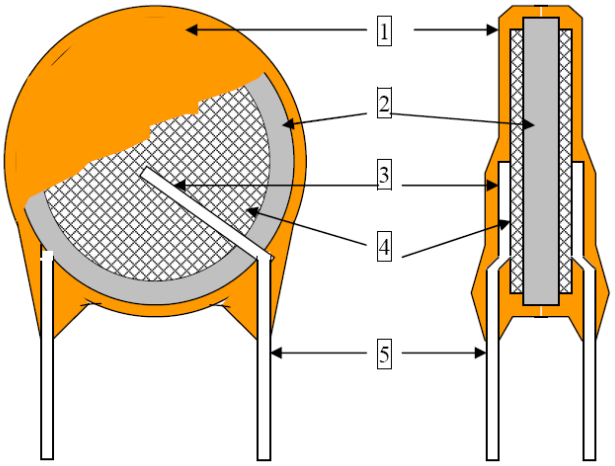
Chart to show flow recommended temp

9.2 Recommended Reworking Conditions with Soldering Iron：

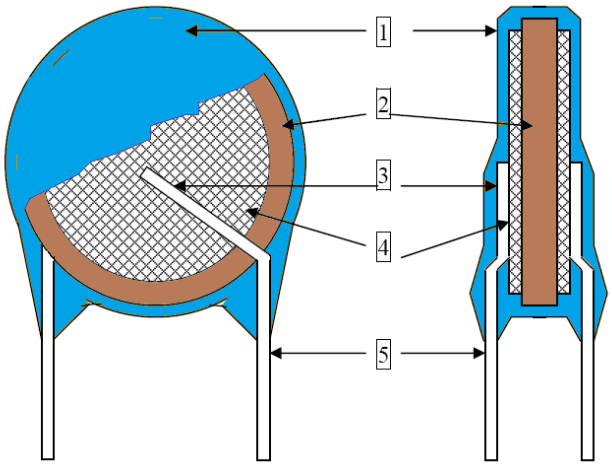
- Temperature of iron-tip: 400 degrees C. max.
- Soldering iron wattage: 50W max.
- Soldering time: 3.5 sec. max.
- Distance from coating body: 2 mm (min.)

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

10. Drawing of internal structure and material list:



(phenolic resin)



(epoxy resin)

NO.	部位 Part name	材質 Material	構成部份 Component	供應商 Vendor
1	Insulation Coating	Phenolic resin Epoxy resin	Phenolic resin, Filler, Pigment Epoxy resin, SiO2, TiO2	Namics Kai Hua
2	Dielectric Element	Ceramic	BaTiO3	Hua Xing Wang Feng Fenghua
3	Solder	Tin-silver	Sn97.5-Ag2.5	Huajun Haili
4	Electrodes	Ag	Silver,Glass frit	Daejoo Xinguang
5	Leads wire	Tinned copper clad steel wire	Substrate metal:Fe&Cu Surface plating:Sn 100%	Hengtai Wuhu Taililai

单击下面可查看定价，库存，交付和生命周期等信息

>>Walsin Technology(华新科技)