3 General item of safety

3.1 Real equipment, and welding conditions

3.1.1 design of P.C.B.

Between the hold of PCB with lead of capacitor must have some apare .

3.1.2 Adjustion of assembly machine

If it have excessive pound phenomenon when auto assembly, please adjust the assembly machine.

Capacitor location and the surrounding space adjustment

Voltage	Distance and space between the PCB safety
& 250VDC	' 0.5mm
500VDC(2KVDC 250VAC(1KVAC	' 1.0mm
3KVDC(6.3KVDC 2KVAC(4KVAC	' 2.0mm
' 8KVDC	' 2.5mm

Voltage	At least to maintain the space in other parts of the capacitance between a safe distance to avoid arcing between
& 250VDC	' 0.5mm
500VDC(2KVDC 250VAC(	' 1.5mm
3KVDC(6.3KVDC 2KVAC(4KVAC	' 3.0mm
' 8KVDC	' 4.5mm
* 20KVDC	' 6.5mm

3.1.3 Soldering

Soldering fluidness: In this flow of the halogen need : - 0.1WT%(0.1WT% are rated of transform C1)

Solder: It can't immerge capacitor body in the solder process at approve.

Washing:It must use lotion wash. If the capacitor wash with P.C.B. must comfirn the solvent cam't influence the capacitor body.

3.2 Storage

The capacitor must storage in door ,That can't storage in high humidity and high temperature environment.The temperature must at 5~40) and the humidity under75%.They are wallamted for a period of one year .From the date of mannfacture,But the storage perior must confirm lead will not oxidize.

It must avoid direct by sun shine and soaked by dew

Standard title : Ceramic disc capacitor approve	Record NO.
Name: Guidelines for using ceramic disc capacitor	Page : 3-14

1．Applicable range :

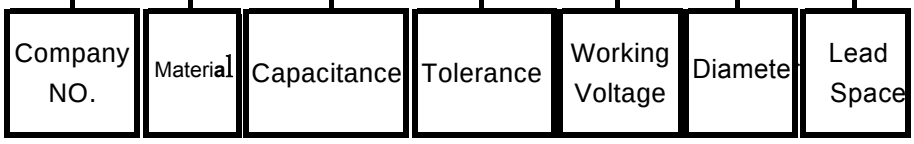
The specification applicable at ceramic disc capacitor (500VDC-4KVDC)

2．Recommend standard：

GB9597-88

3．The principle of part number：

RC2 Y 104 Z 102 D17 P10



Prodoct Series

3-CLASS1	4-CLASS2	5-CLASS3

Capacitance

223～22000PF～22nF～0.022μF	103~10000PF~10nF~0.01μF
331～330PF～0.33nF～0.00033μF	104~100000PF~100nF~0.1μF
222～2200PF～2.2nF～0.0022uF	
472～4700PF～4.7nF～0.0047uF	

Tolerance

Tolerance	±5%	±10%	±20%	+80%-20%
Symbol	J	K	M	Z

Voltage

Voltage	500V	1KV	4KV
Symbol	2H	3A	3G

Material

NPO	N75	SLO	2SL	X7R	Y5E	Y5P	Y5R	Y5U	Y5V	Z5V
NPO	N750	SL	2SL	X7R	Y5E	Y5P	Y5R	Y5U	Y5V	Z5V
CH	UJ	SL	2SL	B	B	B	B	E	F	F

Lead type

Lead type	Straight lead	Inside kink	Outside kink	up/down kink
Symbol	S	I	O	F

Pitch

Pitch	2.5mm	6.35mm	10mm
Symbol	3	6	9

Lead length

Lead length	3±0.5mm	18±2mm	25±3mm	Taping
Symbol	3	M	L	T

Coating

Painting method	Expore
Symbol	E

Rve	Edit	Date	Content	Responsible
1	1			
	2			
	3			

Issue		Approve	Manager	Prepare
12-Jun-17	ZONKAS ELECTRONIC CO., LTD	Max Weng	Sun YongQing	ZhongMinEr
Implement				
12-Jun-17				

4．Operating temperature range：

-25℃～125℃ Include capacitor-self heat maximum 20℃, it can't application temperature characteristic.

5．Performance： Performance and test method refer to table1.

6．Experiment condition：

The standard experiment condition as (temperature15~35℃,humidity45`75%,atmospheric pressure 86~106kpa).If it can't limited any condition But doubt place or special place,Must using standard condition, as (temperature20±5℃, humidity 60～70%, atmospheric pressure 86～106kPa)

NO	Item		Characteristics	Test Method
1	Appearance,size and mark		Normal	Size measured by vernier. Appearance and
2	Mark and resistance to solvent		The mark reference appendix specification, resistance to solvent test, mark must clear	Appearance part number test by visual. Resistance to solvent test: Put the capacitor in the 20-25℃ cleanser immerge 5+/-0.5mins
3	Voltage proo	Between terminals	Normal	Test Voltage: W.V.=500V-2KV T.V=200%×W.V. W.V.=3KV-6KV T.V=150%×W.V. W.V.=8KV-15KV T.V=125%×W.V. Time of Voltage: 1～5seconds Charge and dischange current 50mA max
		Between terminal and case	Normal	Test Voltage: 1300V.DC Time of Voltage: between1～5seconds Charge and discharge current 50mA max Voltage is applied: small metal ball method
4	Insulation resistance		T.C. 10000MΩ MIN HIK 5000MΩ MIN semiconductor(S.C.)100MΩ MIN	Test voltage: Rated voltage Test time: 1min±5s
5	Capacitance		Within the standard tolerance	Measure voltage T.C. HIK：1.0Vrms semiconductor(S.C.)：0.1Vrms Measure frequency: T.C.：≦1000PF 1MHz >1000PF 1KHz HIK、semiconductor（S.C.）：1KHz Measure temperature：25℃±2℃
6	Q and Dissipation factor （tan£）		T.C.： 1.C<30PF：Q≧400+20×C 2.C≧30PF：Q≧1000 HIK：1.Y5E、Y5P、Z5U、Y5U、X7R：DF≦2.5% 2. Z5V、Y5V：DF≦5% 3. BN、Y5T：DF≦0.5% 4.Y5R：DF≦0.2% semiconductor(S.C.): 1.Y5P、Y5U：DF≦5% 2.Y5V：DF≦7%	same condition as the capacitance

Rve	Edit	Date	Content	Responsible
1	1			
	2			
	3			

NO	Item		Characteristics	Test Method
7	Temperature characteristic		T.C.：C≦4PF TC ±250PPM/℃ C≦9.9PF TC ±120PPM/℃ C≧10PF TC ±60PPM/℃ SL TC P350-N1000 HIK、S.C.： Y5E：±4.7% Y5P、BN：±10% X7R、Y5R：±15% Y5T：±22% Y5U、Z5U：+22%-56% Y5V、Z5V：+22%-82%	measure temperature: NPO、SL、X7R：-55℃～125℃ Y5P、Y5R、BN、Y5E、Y5U：-25℃～125℃ Z5U、Y5V、Z5V：-25℃～85℃ Measure frequency: 1KHz1.0V measure temperature: 25℃±2℃
8	Strength of lead	Pull	Normal	Direction ：Direction of ternainal Time：10±1s Pull：1.0KG
		Bending	Normal	Direction： Bend to 90°than bend 90° reversely Pull：0.5KG Times：5times
9	Resistance to vibration	Appearance	No marked defect	Frequency：10～55～10Hz(1min) Amplitude： 1.5mm Direction to vibration：X、Y、Z 3 direction Time：2hours
		Capacitance	Refer to item 5	
		DF	Refer to item 6	
10	Weldability		Lead wire shall be soldered with uniformly coated on the axial . Direction over 75% of the circumferential direction, and no defect.	Solder temperature:260±5℃ Test time: 3.5±0.5s Soak position：between bottom 4mm Stored in room temperature 24hours then test
11	Solder ability of leads	Appearance	No marked defect	Solder temperature:260±5℃ Soak position：between bottom 4mm Stored in room temperature 24hours then test it
		Capacitance Changes	T.C.：±5% or ±0.5PF HIK、S.C.：Y5E、Y5P、BN：±10% X7R、Y5R：±15% Y5T、Y5U、Z5U：±20% Z5V、Y5V：±30%	
		Q or DF	T.C.： 1.C<30PF：Q≧400+20×C 2.C≧30PF：Q≧1000 HIK： 1.Y5E、Y5P、Z5U、Y5U、X7R：DF≦2.5% 2. Z5V、Y5V：DF≦5% 3. BN、Y5T：DF≦0.5% 4.Y5R：DF≦0.2% (S.C.): 1.Y5P、Y5U：DF≦5% 2.Y5V：DF≦7%	
		IR	To satisfy the specified initial value	

Rve	Edit	Date	Content	Responsible
1	1			
	2			
	3			

<table>
<tr><th>NO</th><th colspan="2">Item</th><th>Characteristics</th><th>Test Method</th></tr>
<tr><td rowspan="4">12</td><td rowspan="4">Temperature and soak cycle</td><td>Appearance</td><td>Normal</td><td rowspan="4">Temperature cycle as one cycle to follow below list，After 10 cycles sink in water of 65+5/-0℃ for 15 minutes then sink in the salt water of 0+/-3℃ for 15minutes which as 1 cycle and perform 2 cycles ,To test after stored in room temperature for 24hours
Temp. cycle condition: (X7R、Y5P、Y5U)
<table><tr><th>Seq.</th><th>Temp (℃)</th><th>Time (min)</th></tr><tr><td>1</td><td>-25 0/-3</td><td>30</td></tr><tr><td>2</td><td>room temp.</td><td>10~15</td></tr><tr><td>3</td><td>+125 +3/0</td><td>30</td></tr><tr><td>4</td><td>room temp.</td><td>10~15</td></tr></table>
Temp. cycle condition: (Y5V)
<table><tr><th>Seq.</th><th>Temp (℃)</th><th>Time (min)</th></tr><tr><td>1</td><td>-25 0/-3</td><td>30</td></tr><tr><td>2</td><td>room temp.</td><td>10~15</td></tr><tr><td>3</td><td>+85 +3/0</td><td>30</td></tr><tr><td>4</td><td>room temp.</td><td>10~15</td></tr></table></td></tr>
<tr><td>Capacitance Change</td><td>T.C. : ±5% or ±0.5PF max
HIK、S.C. : Y5E、Y5P、BN : ±10%
X7R、Y5R : ±15%
Y5T、Y5U、Z5U : ±20%
Z5V、Y5V : ±30%</td></tr>
<tr><td>Q or DF</td><td>T.C. :
1.C<30PF : Q≧400+20×C
2.C≧30PF : Q≧1000
HIK :
1.Y5E、Y5P、Z5U、Y5U、X7R : DF≦5%
2. Z5V、Y5V : DF≦7.5%
3. BN、Y5T : DF≦1%
4.Y5R : DF≦0.5%
(S.C.): 1.Y5P、Y5U : DF≦7.5%
2.Y5V : DF≦10%</td></tr>
<tr><td>IR</td><td>To Satisfy the special initial value</td></tr>
<tr><td rowspan="4">13</td><td rowspan="4">Humidity loading</td><td>Appearance</td><td>Normal</td><td rowspan="4">Apply rated voltage for 500(+20-0) hours at (40+2℃) in 95% RH, Charge and dischange current 50mAmax.
Leave the capacitance in ambient condition for over the following time.
Measurement : T.C.:24 H rs HIK .S.C:48 Hrs Tempereture: 40±2℃</td></tr>
<tr><td>Capacitance</td><td>T.C. : ±7.5% or ±0.75PF max
HIK、S.C. : Y5E、Y5P、BN : ±15%
X7R、Y5R : ±20%
Y5T、Y5U、Z5U : ±25%
Z5V、Y5V : ±35%</td></tr>
<tr><td>Q or DF</td><td>T.C. :
1.C<10PF : Q≧200+10×C
2.10PF≦C<30PF :
Q≧275+2.5×C 3.C≧30PF:Q≧350
HIK :
1.Y5E、Y5P、Z5U、Y5U、X7R : DF≦5%
2. Z5V、Y5V : DF≦7.5%
3. BN、Y5T : DF≦1%
4.Y5R : DF≦0.5%
(S.C.):1.Y5P、Y5U : DF≦7.5%
2.Y5V : DF≦10%</td></tr>
<tr><td>IR</td><td>500MΩ min or 25MΩ X UF min</td></tr>
</table>

Rve	Edit	Date	Content	Responsible
	1			
	2			
	3			

Issue		Approve	Manager	Prepare
12-Jun-17	ZONKAS ELECTRONIC CO., LTD	Max Weng	Sun YongQing	ZhongMinE
Implement 12-Jun-17				

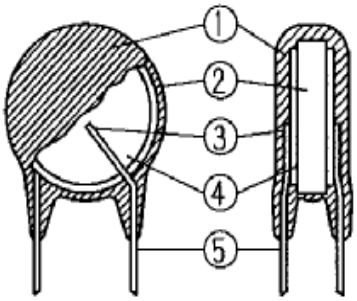
NO	Item		Characteristics	Test Method
14	High Temperature loading	Appearance	Normal	Test temp.: Y5E、Y5P、BN、Y5R、Y5T、Y5U、Z5U、Y5V、Z5V：85±5℃ NPO、N750、X7R：125+5℃ Test time: 1000+48/-0 Hrs Apply voltage：Rated voltage x1.5 Charge-diacharge current <50mA. Capacitor shall be measured after leaving at room temperature T.C.:24Hr,HIK,S.C.:48Hr
		Capacitance Change	T.C.：±7.5% or ±0.75PF HIK、S.C.：Y5E、Y5P、BN：±10% X7R、Y5R：±15% Y5T、Y5U、Z5U：±20% Z5V、Y5V：±30%	
		Q or DF	T.C.： 1.C<30PF：Q≧200+10×C 2.C≧30PF：Q≧500 HIK： 1.Y5E、Y5P、Z5U、Y5U、X7R：DF≦5% 2. Z5V、Y5V：DF≦7.5% 3. BN、Y5T：DF≦1% 4.Y5R：DF≦0.5% (S.C.): 1.Y5P、Y5U：DF≦7.5%	
		Insulation Resistance	T.C.：1000MΩ above HIK：500MΩ above S.C.：25MΩ × UF	
15	Stored in high temperature	Appearance	Normal	Temperature: 60±2℃ Humidity：90%RH Test time: 1000+48/-0H Capacitor shall be measured after leaving at room temperature T.C.:24Hr,HIK,S.C.:48Hr
		Capacitance Change	T.C.：±7.5% or ±0.75PF HIK、S.C.：Y5E、Y5P、BN：±10% X7R、Y5R：±15% Y5T、Y5U、Z5U：±20% Z5V、Y5V：±30%	
		Q or DF	T.C.： 1.C<30PF：Q≧200+10×C 2.C≧30PF：Q≧500 HIK： 1.Y5E、Y5P、Z5U、Y5U、X7R：DF≦5% 2. Z5V、Y5V：DF≦7.5% 3. BN、Y5T：DF≦1%， 4.Y5R：DF≦0.5% (S.C.): 1.Y5P、Y5U：DF≦7.5%	
		Insulation Resistance	T.C.：1000MΩ above HIK：500MΩ above S.C.：25MΩ × UF	
16	confirm the coating of thn		tin must add 50% on the capacitor	room temperature to 60℃ Test time: 1000+48/-0 Hrs

Rve	Edit	Date	Content	Responsible
1	1			
	2			
	3			

7．Construction . Shape . Dimension

Does not specifically limit conditions, according to state (temperature 15 ~ 35 ℃, relative humidity of 45 ~ 75%, atmospheric pressure 86 ~ 106kPa).

Doubt occasions or special requirements of the occasion, according to state (temperature 20 ± 5 ° C, relative temperature 60 ~ 70%, atmospheric pressure 86 ~ 06kPa).

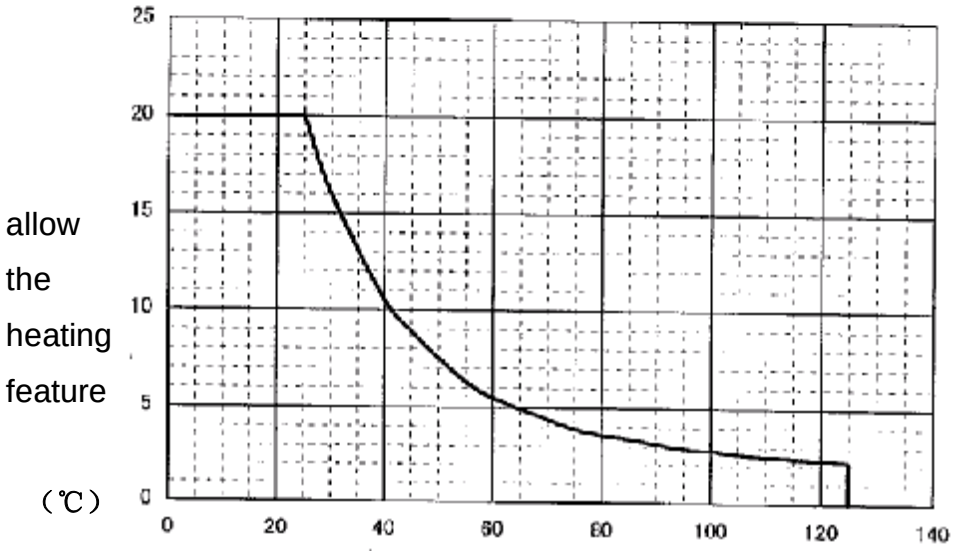


Shape and outline dimension refer to attachmen

Material

NO.	Name	Material
1	Coating	Blue expoxy UL94.V-0
2	disc	Ceramic
3	Sloder	Tin of ROHS
4	Electrode	Silver
5	Loading	CP Lead

8.Ambient temperature - allow the heating features

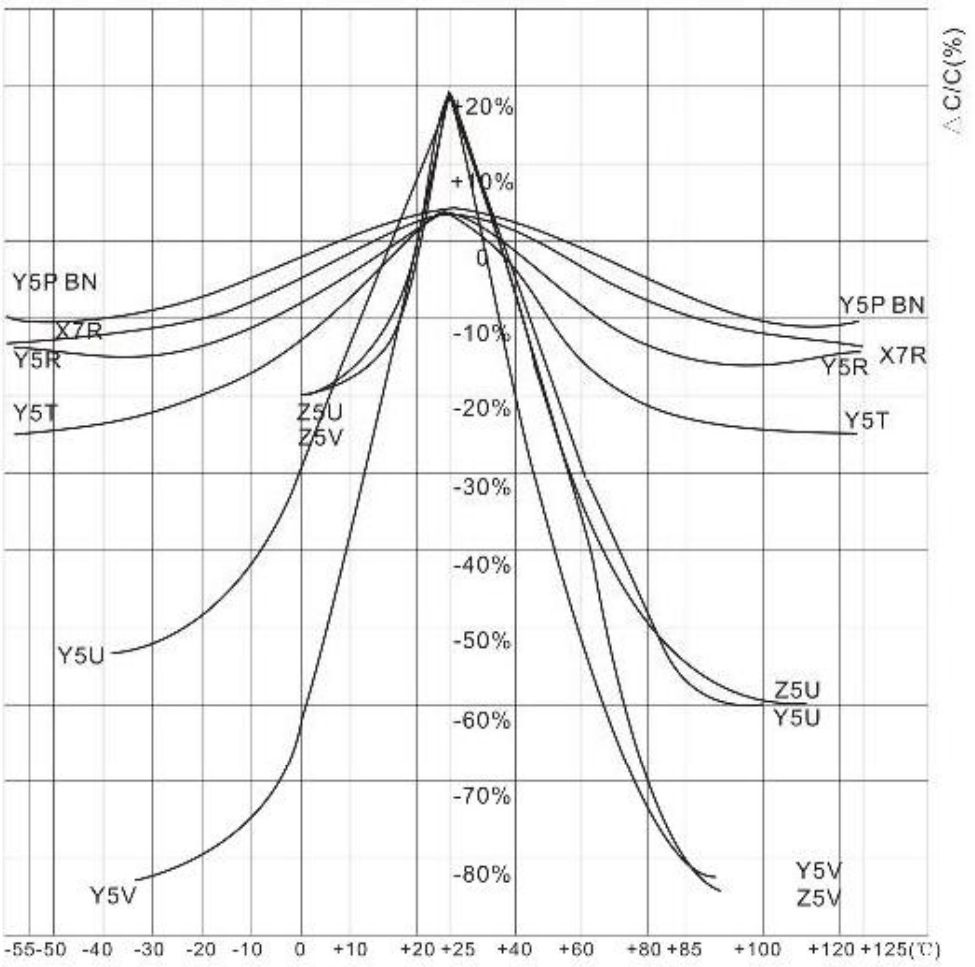


【Explain】：

The capacitor operating at AC voltage self-heat temperature in room temperature(25℃)max are 20℃. Self-heat tempetature (to different capacitor surface and environment temperature). It have varied according variety of surface temprature. Environment temperature over 25℃, It'll referent up figure.

Rve	Edit	Date	Content	Responsible
1	1			
	2			
	3			

9.Capacitance and Temperature Curve



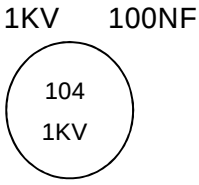
Code	T.R.	PPM/℃	EIA Code	Code	T.R.	Cap change	EIA Code	Code	T.R.	Cap Change	EIA code
CH	-55℃ ~ 125℃	0±60~500	COH(NPO)	B	-25℃ - +85℃	±15%	Y5R	B	-55℃ ~ +125℃	±15%	X7R
UJ	-55℃ ~ 125℃	-750±120	U2J(N750)	B	-25℃ - +85℃	±10%	Y5P BN	B	-25℃ - +85℃	±22%	Y5T
SL	-55℃ ~ 125℃	+350~ -1000	S2L	E	-25℃ - +85℃	+22% ~ -56%	Z5U	E	-25℃ - +85℃	+22%~-56%	Y5U
2SL	-55℃ ~ 125℃	+2000~ -5000	2SL	F	-25℃ - +85℃	+22% ~ -82%	Z5V	F	-25℃ - +85℃	+22%~-82%	Y5V

10．REPRESATATION：

1.Capacitance： under100pF, marking 2 number,over 100pF , marking 3 number

2.Voltage： 1kV/2kV/3kV real marking

For example：



11．Packing Method：

(1) Bulk ☑ 1000PCS per bag

(2) Taped ☐ 2000PCS per bag

12．Manufacturer：

Name： Zonkas Electronic co., Ltd.

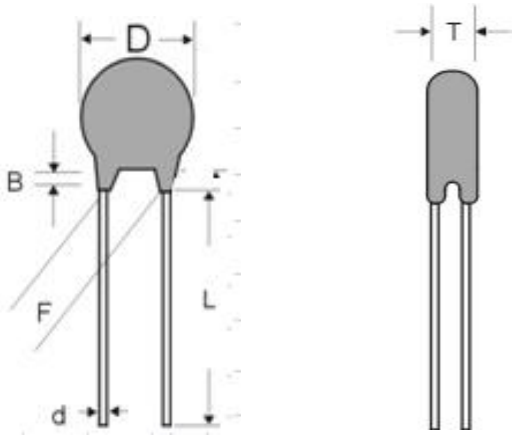
Address： Ling Xia Industrial Area, Liaobu Town, Dong Guan City, Guang Dong Province,China

TEL： 0769-83222669 83237061

FAX： 0769-83237062

Rve	Edit	Date	Content	Responsibl
1	1			
	2			
	3			

13.Shape and Dimension



Outline dimension

Symbo	dimension(mm)	Remark
D	-	Refer to be below list
T	-	Refer to be below list
L	-	Refer to be below list
F	10.0±1.0	
B	3.0max	
d	0.5±0.1	

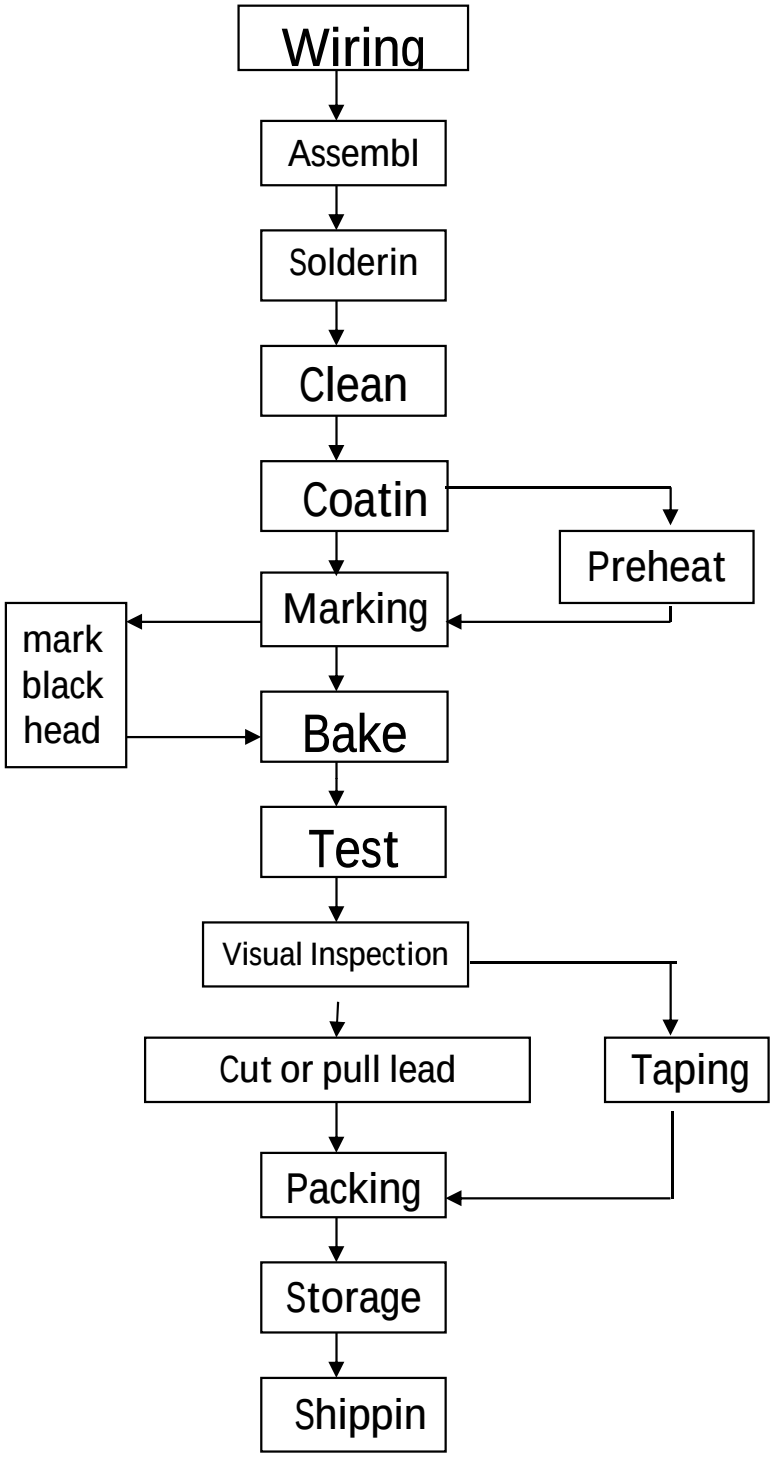
Code

Customer NO.	Type NO.	Capacitance		voltage (KV)	Dimension (mm)			
		Cap.(nF)	tolerance		D max	T max	F	L
	J4104Z3AY5VS9LEN	100	+80%-20%	1.0	18.0	3	10±1.0	25±3.0

Rve	Edit	Date	Content	Responsible
1	1			
	2			
	3			

Issue		Approve	Manager	Prepare
12-Jun-17	ZONKAS ELECTRONIC CO., LTD	Max Weng	Sun YongQing	ZhongMinE
Implement 12-Jun-17				

14. Manufacture Process:

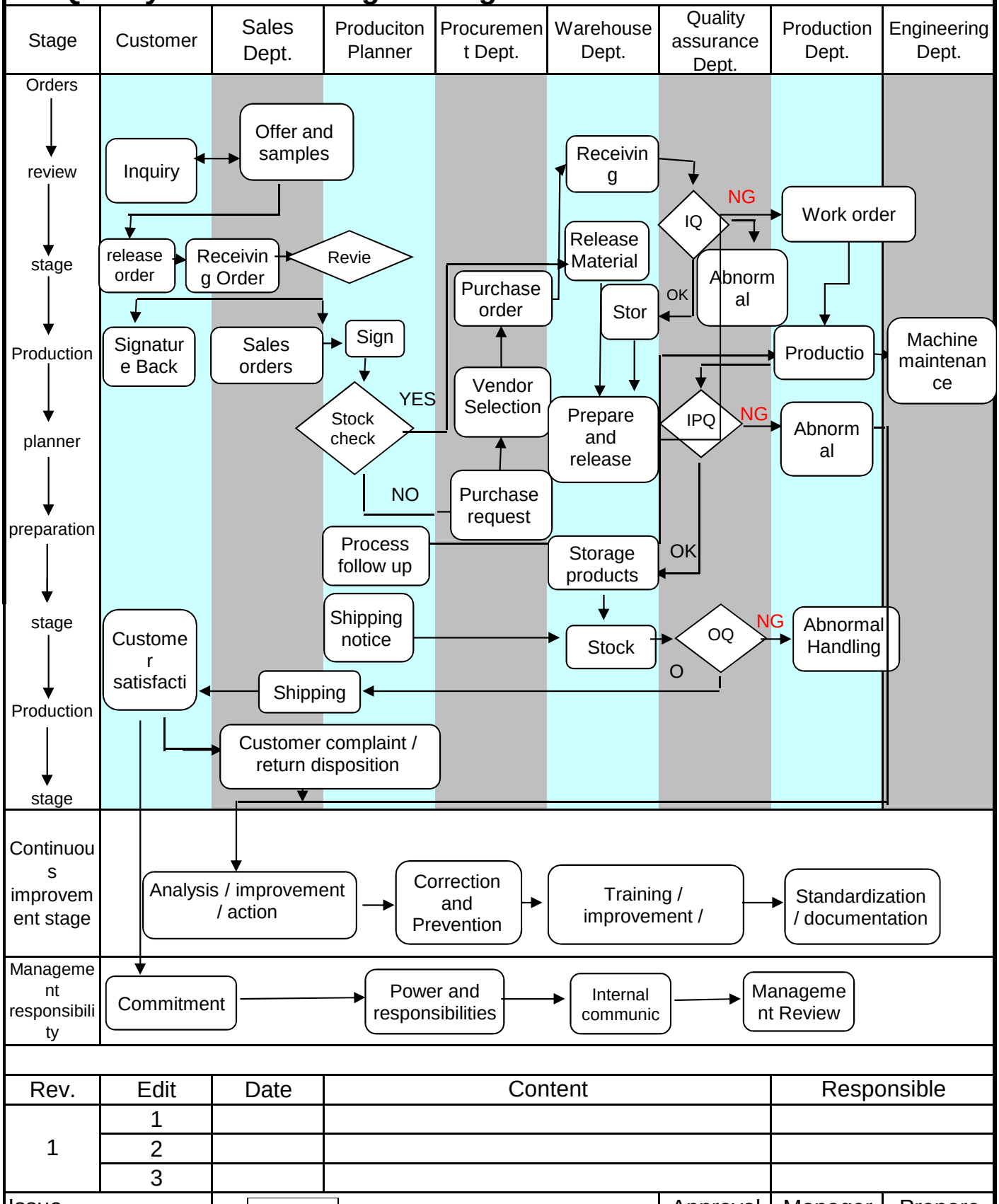


Rve	Edit	Date	Content	Responsible
1	1			
	2			
	3			

Issue		Approve	Manager	Prepare
12-Jun-17	ZONKAS ELECTRONIC CO., LTD	Max Weng	Sun YongQing	ZhongMinEr
Implement 12-Jun-17				

Spec. Name	Record number
Ceramic disc capacitor approve	
Description	Page：13-14
Guidelines for using ceramic disc capacitor	

15 .Quality assurance engineering chart



Rev.	Edit	Date	Content	Responsible
1	1			
	2			
	3			

Issue		Approval	Manager	Prepare
12/Jun/17	ZONKAS ELECTRONIC CO., LTD	Max Weng	Sun YongQing	ZhongMin Er
Implement				
12/Jun/17				

16. Quality Change History

Responsible Dept.

Date:
Dept.:
Company Name
Signature:
e-mail:

[Change] means referring to mass production at the time of the activities related to production changes。 Select one of two

	Change	Unchanged
1.Quality responsible Top Quality responsible change: Title: Name: *Whatever change or not, please fill in the above information.	☐	☐
2.Production location change or increase Production line change (process change) Production factory (address) or origin (country) change Processing supplier (sub-contract supplier) change	☐	☐
3. Material and parts Upstream supplier (sub-contract supplier) change Specification change Material change Re-cycle material change Supplement material（plastic, solvent, coating, ink, soldering etc） Packing material	☐	☐

Above record are correct。

Change content:

Note: As supplier issue to change (the above item 2, 3), approved by Zonkas IQC or SQA in advance is required.

Rev	Edit	Date	Content	Responsible
1	1			
	2			
	3			

松 家 電 子 有 限 公 司
ZONKAS ELECTRONIC CO.,LTD.
(單層)陶瓷系列承認書

170612001

(Disc) Ceramic Capacitors series

編號：SJ/RD—8224 **2017年6月12日**

Customer	金沛	**Customer NO** 顧客料號						**Q'TY** 數量		**PCS**
		Part No 零件代號	**J4104Z3AY5VS9LEN**							
顧 客		**Operating Temperature (使用溫度範圍)**		**-25℃～ +85℃**			**Cap change (容量變化率)**	+22%~-82%		
Name Code	**C/C**	**CAP.**	**100nF (104)**	**TOL**	**+80%**	**Material**	**Y5V**	**W.V. 電壓 （DC）**		**1KV**
規 格		容量		誤差	**-20%**	材質				

1. Test condition 測 試 條 件

Instrument（儀器）	Freq.頻率	Temp.溫度	R.H.濕度	非ROHS ☐
HP4278A	1KHz 1.0V	31℃+/-2℃	65%	ROHS ☑

Appearance 外 觀	Capacitance 靜電容量（nF）	Insulation Resistance 絕緣電阻（MΩ）	Body size 外徑（mm）D	Coating on Lead 塗料長度（mm） B	Lead Spacing 導線間格（mm） F
104 1KV	80~180	≥5000	≤18	≤3.0	10±1.0
DF值	Lead Length 導線長度（mm）L	Thickness 厚度（mm）T	Wire diameter 線徑（mm） d	Dielectric Strength 誘電體強度V.DC	
≤5%	25±3.0	≤3	0.5±0.1	2KV.DC1-5S 充放電電流爲50mA以下	

2.Actual record 實 測 記 錄

NO	1	2	3	4	5	6	7	8	9	10
Capacitance 靜電容量(nF)	95.16	96.35	93.94	95.20	96.40	95.91	96.09	97.77	100.44	85.85
DF值(%)	0.47	0.43	0.41	0.39	0.45	0.44	0.45	0.41	0.38	0.43
Judgment 判定	AC ☑ RE ☐									

3.Reference drawing 圖 形 參 考