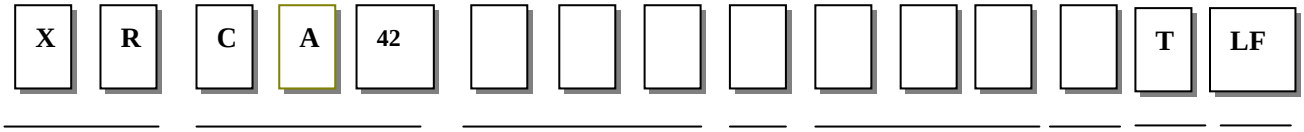
1. Scope

This specification applies to Epoxy-coated Solid Electrolytic Tantalum Capacitors(LEAD FREE).

2.Product identification



Explain:

(1)company logo

(2)series: CA42 represent series number of epoxy-coated solid electrolytic tantalum capacitors

(3)capacitance code:Capacitance code:expressed in Pico farad ,1st two digits represent significant figures and 3rd digit represents multiplier(number of zeros to follow)

(4)capacitance tolerance: Capacitance tolerance code is listed as follows:

Allowable Tolerance Code of the Capacitance

Allowable Tolerance%	Tolerance Code
±5	J
±10	K
±20	M

(5)rated DC voltage: Rated DC voltage Code is expressed in three digits.

(6)case size: Case Code is specified in specification sheets of the individual product series

(7)packing style(B:Bulk;T:tape & reel): Packaging Code :B:Bulk.T:Tape and Reel.A:Ammo

EX:Series CA42Δc/c±20%,35V10μF, Taped and Reeled, XRCA42106M350DT

For special order,other part number can be specified by users.

(8) lead free

3.The range of the specification

table I

Nominal cap. Range	0.047~680μF								
capacitance tolerance	±20% ±10% ±5%(special order)								
Rated voltage(VR)	3V	4V	6.3V	10V	16V	20V	25V	35V	50V
Surge voltage(VS)	4V	5.2V	8V	13V	20V	26V	33V	46V	65V
Temperature range	-55’C ~ +125’C								
The life test	1000Hr								

4.Temperature characteristic

1	leakage current	0.01CRVR or0.5μA (whichever is greater)	Series protective resistor:1000Ω Measuring voltage: rated voltage Measuring time:1minutes
2	Capacitance Tolerance	±20%,±10%	Measurement circuit: Equivalent series circuit Measuring frequency:120Hz±10% Measuring voltage max.:0.5Vrms,+1.5Vdc.
3	Tangent of loss angle (tanδ)	≤1.0uF:≤0.04 1.5~6.8uF:≤0.06 10~68uF: ≤0.08 100~680uF:≤0.1	

Table II

Cap. (μF)	Change in cap. (%)			DF max. (%)				DCL max. (μA)		
	-55'C	+85'C	+125'C	-55'C	+20'C	+85'C	+125'C	+20'C	+85'C	+125'C
≤1.0	±10	±15	±25	6	4	6	6	Io=0.01CRV or 0.5μA(whichever is greater)	10Io	12.5Io
1.5~6.8				8	6	8	8			
10~68				10	8	10	10			
100~680				12	10	12	12			

5.Appearance & Dimensions

5.1 Appearance & Dimensions

(Fig. 5.1) Table III(unit:mm)

case size	D(±0.5mm)	H(±0.5mm)	h(±0.5mm)	d
A	4.5	7.0	2.5	0.5
B	5.0	8.0	2.5	0.5
C	5.5	9.5	2.5	0.5
D	6.5	11.0	2.5	0.5
E	8.5	13.0	5.0	0.5
F	9.5	16.5	5.0	0.5

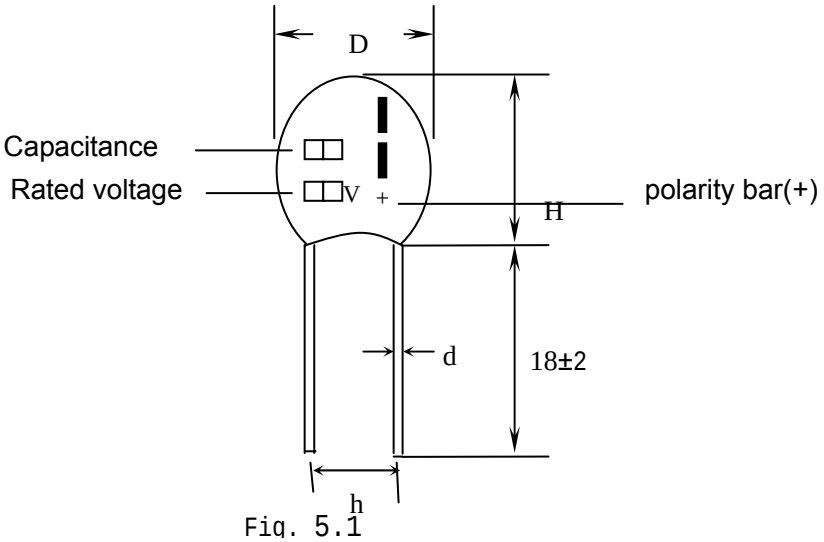


Fig. 5.1

(other lead styles are available)

6.Marking

Fig. 5.1,capacitance, DC voltage and polarity(+) are laser marked on the capacitor body

7.The range of the capacitance and case

(letter expresses case) table IV

Capacitance (μF)	Rated voltage								
	3 V	4V	6.3 V	10 V	16V	20V	25V	35V	50V
0.047								A	A
0.068								A	A
0.1								A	A
0.15								A	A
0.22								A	A
0.33								A	A
0.47								A	A
0.68								A	A
1.0					A	A	A	A	B
1.5					A	A	A	A	C
2.2				A	A	A	A	B	C
3.3			A	A	A	B	B	B	D
4.7	A	A	A	A	B	B	B	C	D
6.8	A	A	A	B	B	C	C	D	E
10	A	A	B	B	B	C	C	D	E
15	A	A	B	C	C	D	D	E	F
22	B	B	C	C	C	D	D	E	F
33	B	B	C	D	D	E	E	F	
47	C	C	D	D	D	E	E	F	
68	D	D	D	D	E	F	F		
100	D	D	E	E	E	F	F		
150	D	E	E	E	F				
220	E	E	E	F					
330	E	F	F						
470	F								
680	F								

8.Reliable performance

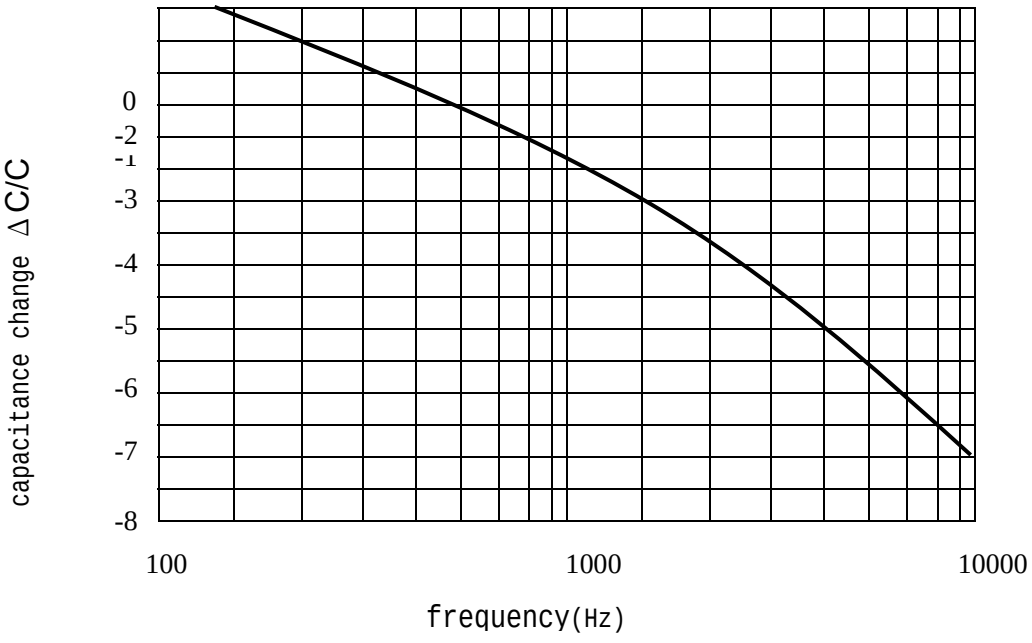
<table>
<tr><th>Items</th><th colspan="4">Performance characteristics</th><th colspan="3">Conditions of test</th></tr>
<tr><td rowspan="10">(1)Characteristics at high and low temperature</td><td>Step</td><td colspan="2">Performance characteristics</td><td rowspan="10">See table II</td><td rowspan="10">Step
1:
2:
3:</td><td rowspan="10">Temperature
+20’C±2
-55’C±3
+85’C±2</td><td rowspan="10">Duration
-
30min
30min</td></tr>
<tr><td rowspan="2">1</td><td colspan="2">Change in cap.</td></tr>
<tr><td colspan="2">Tangent of loss angle(tanδ)</td></tr>
<tr><td rowspan="3">2</td><td colspan="2">Change in cap.</td></tr>
<tr><td colspan="2">Tangent of loss angle(tanδ)</td></tr>
<tr><td colspan="2">Leakage current</td></tr>
<tr><td rowspan="3">3</td><td colspan="2">Change in cap.</td></tr>
<tr><td colspan="2">Tangent of loss angle(tanδ)</td></tr>
<tr><td colspan="2">Leakage current</td></tr>
<tr><td>(2)Surge test</td><td colspan="2">Change in cap.</td><td>Relative to the Value before test ±10%</td><td colspan="3" rowspan="4">Temperature:85±2’C
protective series resistor:1000Ω
1000cycles.
charge time :30±5s
discharge time: 5min 30s
[Measuring voltage(R.V):
surge voltage(S.V)]
<table><tr><td>R.V.</td><td>4</td><td>6.3</td><td>10</td><td>16</td></tr><tr><td>S.V.</td><td>4.6</td><td>7.25</td><td>11.5</td><td>18.4</td></tr><tr><td>R.V.</td><td>20</td><td>25</td><td>35</td><td>50</td></tr><tr><td>S.V.</td><td>23</td><td>28.2</td><td>40.2</td><td>57.5</td></tr></table></td></tr>
<tr><td></td><td colspan="2">Tangent of lossangle (tanδ)</td><td>See table II DF max</td></tr>
<tr><td></td><td colspan="2">Leakage current</td><td>See table II DCL max</td></tr>
<tr><td></td><td colspan="2">Appearance</td><td>There shall be no such mechanical damage</td></tr>
<tr><td>(3) Resistance to soldering heat</td><td colspan="2">Appearance</td><td>No visible damage
The marking shall be legible.</td><td colspan="3">Test method
Solder temperature:260±5’C
Dip duration:5±0.5s</td></tr>
<tr><td>(4) Solderability</td><td colspan="3">A new uniform coating of solder shall cover the surface being immersed</td><td colspan="3">Test method
Solder temperature:235±5’C
Dip duration: 2±0.5s</td></tr>
<tr><td>(5)Vibration</td><td colspan="2">Appearance</td><td>No visible damage</td><td colspan="3">The entire frequency range:
10 to 55Hz
Amplitude: 0.35mm
Duration: 3×0.5h</td></tr>
<tr><td rowspan="4">(6)Damp heat</td><td colspan="2">Change in cap.</td><td>Relative to value before test ±12%</td><td colspan="3" rowspan="4">Test temp:40±2’C
Humidity:90-95%R.H
Test time: 10 days
No voltage applied
Recovery:1-2hours</td></tr>
<tr><td colspan="2">Tangent of lossangle(δ)</td><td>See table II DF max</td></tr>
<tr><td colspan="2">Leakage current</td><td>See table II DCL max</td></tr>
<tr><td colspan="2">Appearance</td><td>No visible damage
The marking shall be legible</td></tr>
</table>

<table>
<tr><td rowspan="4">(7)Electrical endurance</td><td>Change in cap.</td><td>Relative to valuebefore test ±10%</td><td rowspan="4">1.Test temp:85'C±2'C
Test time:1000 hours
Voltage: Rated voltage
2.Test temp:125'C±2'C
Test time:1000 hours
Voltage: Derated voltage
Recovery:16 hours
[(R.V)Measuring voltage:
(D.V)Derated voltage]
<table><tr><td>R.V.</td><td>4</td><td>6.3</td><td>10</td><td>16</td></tr><tr><td>S.V.</td><td>2.5</td><td>4.7</td><td>6.3</td><td>10</td></tr><tr><td>R.V.</td><td>20</td><td>25</td><td>35</td><td>50</td></tr><tr><td>S.V.</td><td>13</td><td>16</td><td>20</td><td>32</td></tr></table></td></tr>
<tr><td>Tangent of loss angle(δ)</td><td>See table II DF max</td></tr>
<tr><td>Leakage current</td><td>See table II DCL max×1.25</td></tr>
<tr><td>Appearance</td><td>No visible damage
The marking shall be legible</td></tr>
</table>

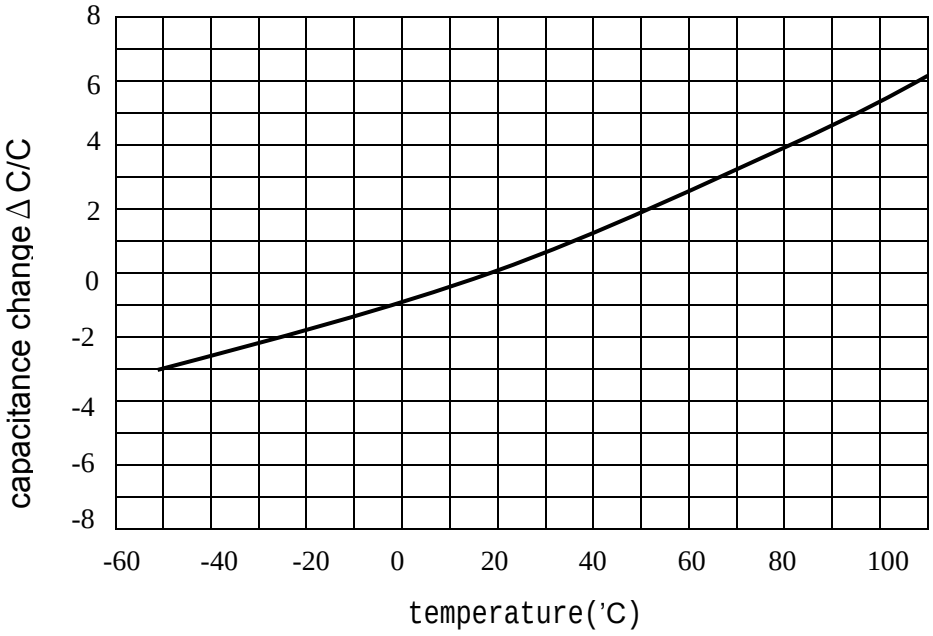
9.The Lead-free product identifying label

For identify lead-free product, our company will attach the lead-free label " Pb "on the packaging.

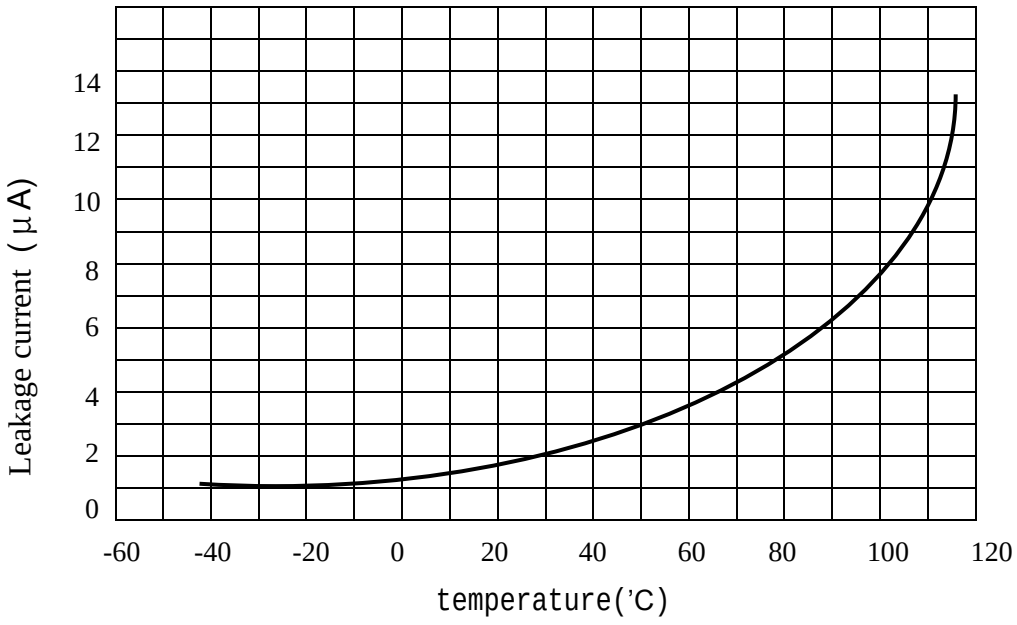
10.Typical Characteristic curve



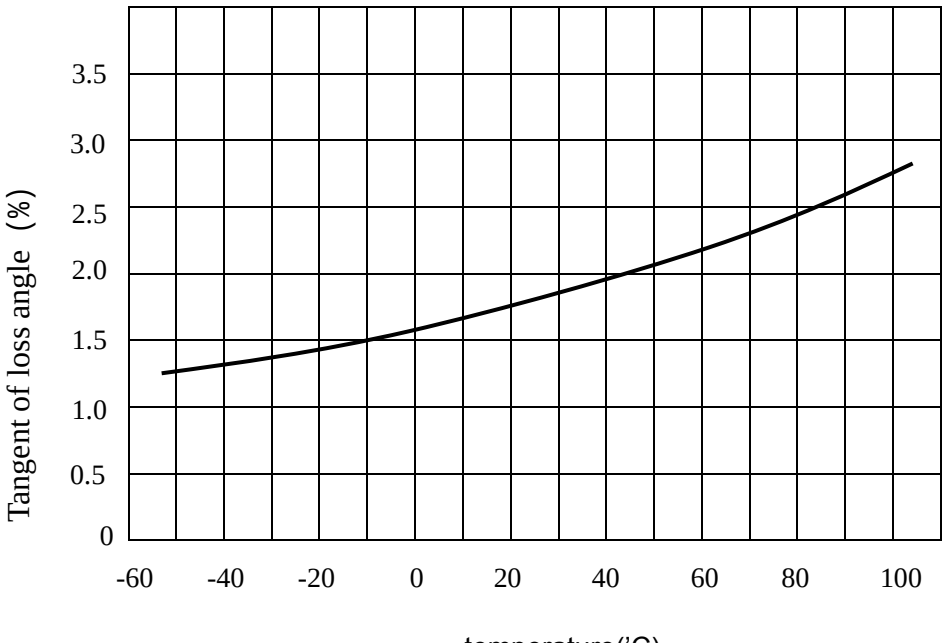
9.1 Capacitance change vs frequency



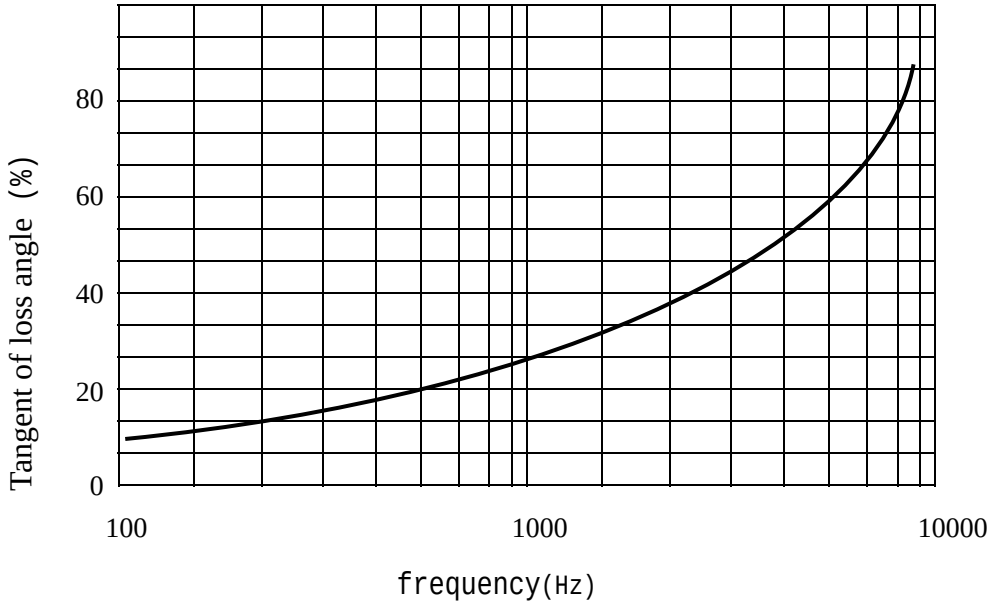
9.2 capacitance change vs temperature



9.3Leakage current vs temperature



9.4 Tangent of loss angle vs temperature

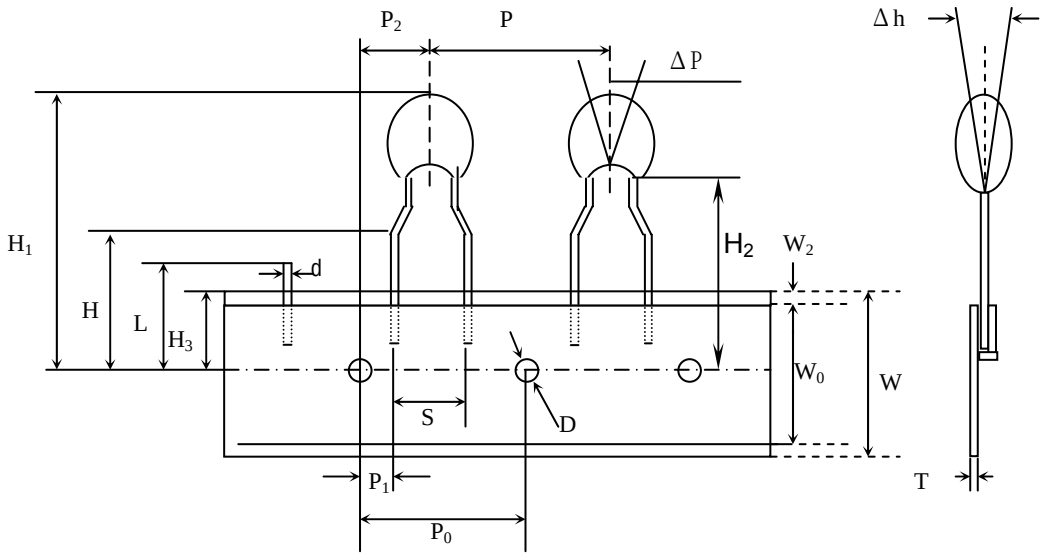


9.5 Tangent of loss angle vs frequency

11.Packing

11.1 Taping

11.1.1 Taping dimension



Symbol	Dimension (mm)	
P	12.7±1.0	
P_0	12.7±0.3	
W	$18^{+1}_{-0.5}$	
W_0	12±0.5	
H_3	$9^{+0.75}_{-0.5}$	
W_2	3max.	
H_1	32.5max	
ΔP	±1.3max	
D	4.0±0.3	
T	0.5±0.2	
Δh	±2max	
L	11max	
H	16±0.5	
S	2.5±0.5	5±0.5
P_1	5.10±0.5	3.85±0.7
P_2	6.35±0.4	
H_2	18-22	
d	0.5±0.05	

11.1.2 TAPPING PACKAGING

1) SCOPE

This specification covers the requirements for CA42 series type resin-coated tantalum capacitor(lead free).

2) PACKING MATERIAL

ITEM	SUBSTANCE
CARTON BOX	CORRUGATED PAPER
PACKING CTN	CORRUGATED PAPER
PASTEBOARD	THICK CRAFT PAPER
PLASTIC BAG	COMMON WHITE PIASTIC BAG
HOT MELTING TAPE	CREPE PAPER AND RUBBER ADHESIVE

3) PACKING UNIT

a) The capacity of packing ctn.

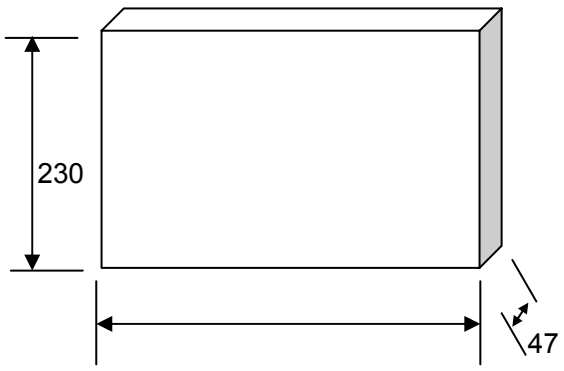
Every carton contains 10 packing box.

b) Every packing box contain quantity as follow:

CASE	QUANTITY(PCS)
A	2500
B/ C	2000
D /E /F	1000

4) THE SHAPE AND DIMENSION OF PACKING BOX

Unit : mm



5) THE PACKING METHOD

a) At the beginning and the end of TAPING there is 3 more pitches of vacuum goods.

b) When the TAPING packs, every 25pcs has a fold line, besides the fold line there is half of pitch of vacuum goods.

6) STORAGE

Have the products keeping in constant temperature and constant humidity. Storage time is two years after manufacturing.

7) LABEL OF PACKING CTN

Every packing ctn has a piece of label.

11.2 Bulk

Packing product in plastic bag

A/B/C case: 1000pcs per bag

D/E case: 500pcs per bag

F case: 250pcs per bag

12.The method of mounting

Recommend the method of mounting: the capacitor directly insets PCB when it is used. The body and the lead are steadied in the application of the vibration and shock tests, the distance between the body and the mounting point shall be 6±1mm.

Recommended Soldering condition: The CA42 lead-free product generally uses wave soldering.

Pre-heating: 150'C±15'C /60-90s

Max. peak gradient: 2.5'C /s

The peak temperature is 250'C -260'C for 3-5s

Time at>230'C:40s Max.

13.Note in use

13.1 For circuits with low resistance circuit, make the use voltage be 1/3 or under of the rated voltage; in general circuit, make the use voltage be 1/2 or under of the rated voltage.

13.2 In case of circuits with large instantaneous rush current or rapid charging/discharging circuits, connect the protection resistor of 3Ω/v or more in series to the capacitor to limit the current to 300mA or less. when the protection resistor can not be inserted, lower the use voltage to 1/3 or under of the rated voltage .

13.3 Use the capacitors within the permissible ripple voltage specified independently. Use in the range that the sum of the DC voltage value and the peak value of ripple voltage does not exceed the rated voltage. Design not to apply over voltage made by fluctuation of superimposed DC voltage or reverse voltage to the capacitors.

13.4 Use the capacitors within the specified use temperature range. In case use temperature exceeds +85'C,apply the reduced voltage shown in the below figure as the rated voltage.

13.5 environmental conditions

do not use the equipment fit with the capacitor in the below environment.

- Environment where capacitors are directly splashed with water, salt water and oil.
- Environment where capacitors are directly exposed to sunlight.
- Environment in high temperature and humidity causing dewing on capacitor surface.
- Environment where capacitors touch various active gases.
- Acid and alkaline atmosphere.

  Environment with high frequency induction.
- Environment with excessive vibration and shock..

14.Storage

14.1 storage condition

environmental temperature:-10’C- +40’C

relative humidity: no more than 70%

14.2 storing period

No more than one and half year since date of stocking.

15.Ordering information

Orders for capacitors covered by this specification shall contain, in clear or in coded form, the following minimum information :

A Rated capacitance.

B Tolerance on rated capacitance.

C Rated d.c. voltage.