

Spec. No:

Date:

Product Specification

Customer Name : _____

Part Description : _____

Customer Part No. : _____

Xiangyee Part No. : _____

【For Customer approval Only】

Date: _____

Qualification Status: Full Restricted Rejected

Approved By	Verified By	Check By

Comments:

Approved By	Checked By	Issued By
Xiaohong Qu	Hu Liu	Yuchun Lai

[Version change history]

01	2016-4-7	New release		Yuchun Lai
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1、 Scope

This specification applies to CA42 series of Chip Tantalum Capacitors.

2、 Reference

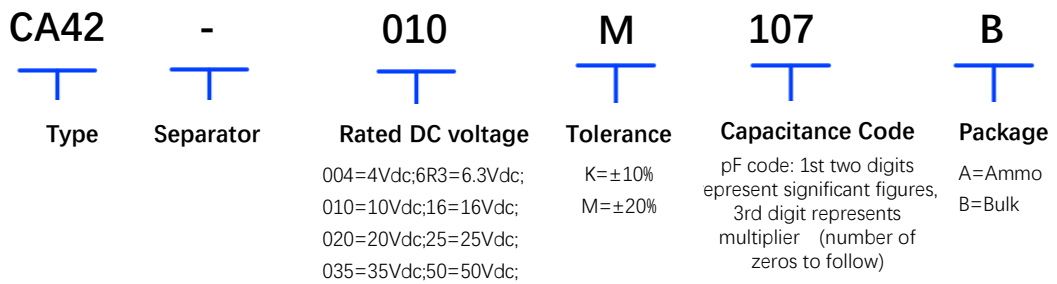
GJB 360A-96 Test methods for electronic and electrical component parts
 IEC384-3-1 Test Methods for Environmental Testing
 QJ/PWV61-2002 CA42 Series Operating Standard

3、 Product Description and Identification (Part Number)

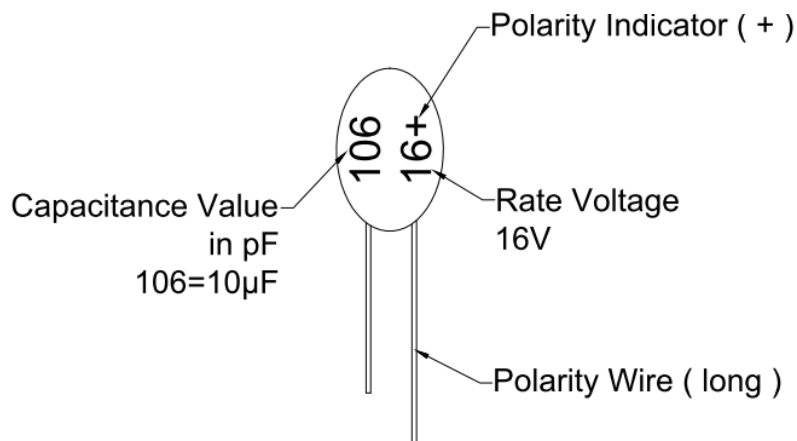
3.1 Description

CA42 Series of resin dipped solid tantalum capacitors.

3.2 Product Identification (Part Number)



3.3 Markings



Capacitance Code

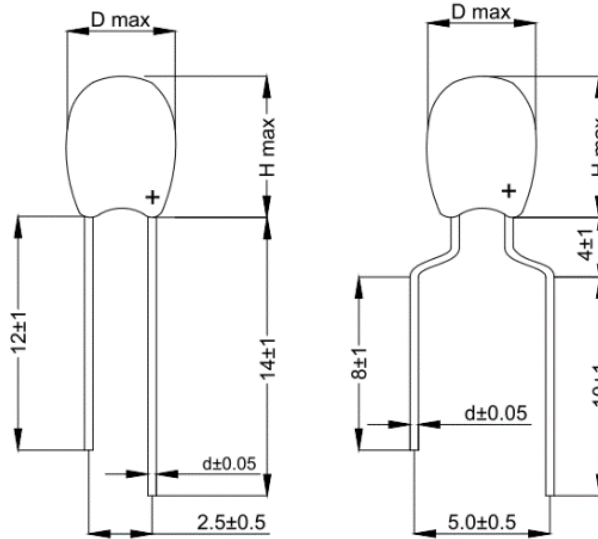
Capacitance (µF)	0.1	0.15	0.22	0.33	0.47	0.68	1.0	1.5	2.2	3.3	4.7	6.8	10
Code	104	154	224	334	474	684	105	155	225	335	475	685	106
Capacitance (µF)	15	22	33	47	68	100	220	330	470	680			
Code	156	226	336	476	686	107	227	337	477	687			

4、 Electrical Characteristics

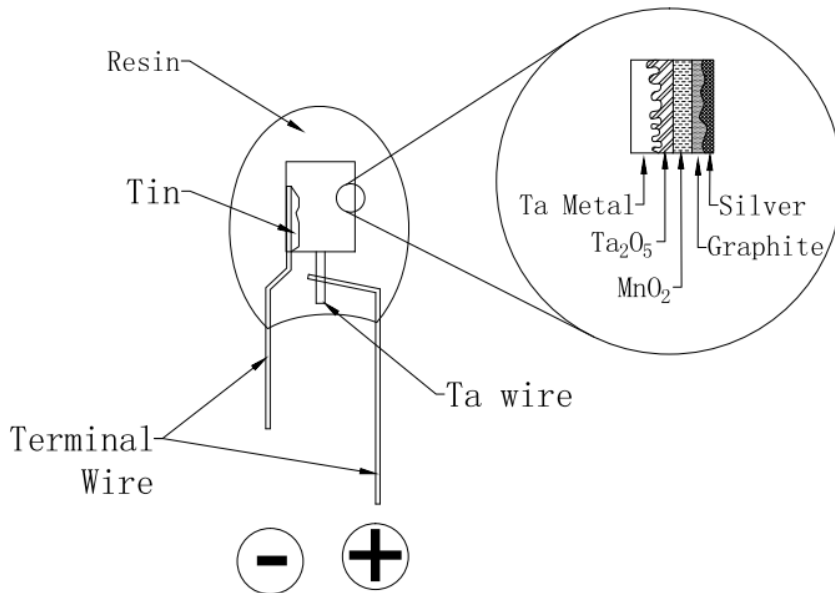
Please refer to Appendix A

- 1) Operating and storage temperature range (individual chip without packing): $-55^{\circ}\text{C}\sim+105^{\circ}\text{C}$
- 2) Storage temperature range (packaging conditions): $-10^{\circ}\text{C}\sim+40^{\circ}\text{C}$, RH70% (MAX).

5、 Shape and Dimensions



6、 Construction


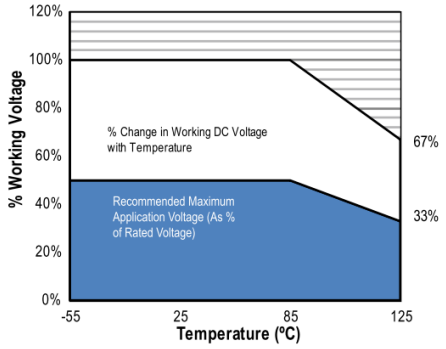
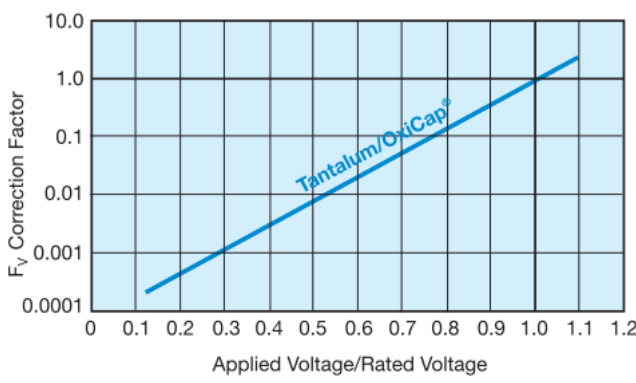


7、 Performance


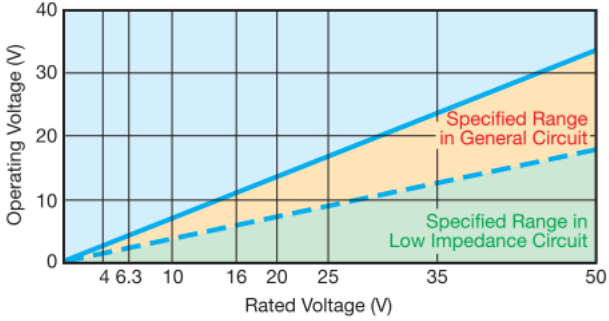
Unless other specified, the standard atmospheric conditions for measurement/test as: a, Ambient Temperature: $25\pm 10^{\circ}\text{C}$; b, Relative Humidity: $50\pm 30\%$; c, Air Pressure: $86\text{KPa} \sim 106\text{KPa}$.

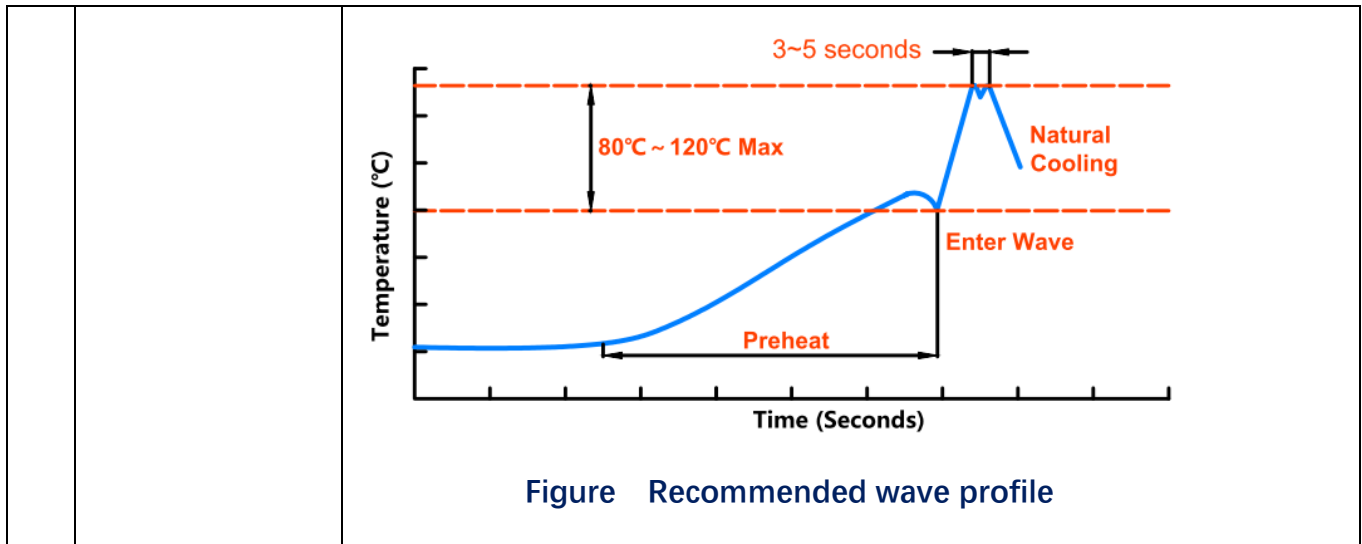
No.	Item	Performance	Test or Inspection method
1	Visual Examinations	No defects which may affect performance.	Inspection Equipment: 20X magnifier
2	Capacitance (C_R)	Within the specified tolerance.	<ul style="list-style-type: none"> a. Test frequency : $100\pm 5\text{Hz}$. b. Test equipment: HP4263B or equal capacitance tester . c. Test signal: 1000mV.
3	Dissipation Factor (DF or $\text{tg}\delta$)	Meet the spec (Refer to Appendix A)	<ul style="list-style-type: none"> a. Test frequency: $100\pm 5\text{Hz}$. b. Test equipment: HP4263B or equal capacitance tester. c. Test signal: 1000mV.
4	Equivalent Series Resistance (ESR)	Meet the spec (Refer to Appendix A)	<ul style="list-style-type: none"> a. Test frequency: $100\pm 5\text{KHz}$. b. Test equipment (Analyzer): HP4263B or equal ESR Tester.
5	Leakage Current (DCL)	Measured after 5 minutes application of rated voltage reading, $I_0 \leq 0.01 \times C_R \cdot U_R$ or $0.5\mu\text{A}$ whichever is greater (20°C) (Refer to Appendix A)	<ul style="list-style-type: none"> a. Test equipment: TH2686 or equivalent I_0 test equipment. b. Measurement method: <ul style="list-style-type: none"> 1) The chip shall be charged for 5min at most at rated voltage at 25°C. 2) Current decreases as time passes, but gets into a stable situation at a certain value which shall be recorded as I_0.
6	Solderability	<ul style="list-style-type: none"> a. No visible mechanical damage. b. Wetting shall exceed 95% coverage. c. The less 5% of area is permitted to contain a few defect, such as pinholes, holes, un-soaking or poor soaking area which do not gather together. 	<ul style="list-style-type: none"> a. Solder temperature: $235\pm 2^{\circ}\text{C}$ b. Duration: 3 sec. c. Solder: Sn/3.0Ag/0.5Cu d. Flux: 25% Resin and 75% ethanol in weight.

8、 Cautions for Using Tantalum Capacitor

No.	Process	Condition									
1	Operating condition (Storage ,Transportation)	<p>1-1 Storage</p> <ul style="list-style-type: none"> a. The solderability of the external electrode may be deteriorated if packages are stored where they are exposed to high humidity. Package must be stored at 40℃ or less and 70% RH or less. b. The solderability of the external electrode may be deteriorated if packages are stored where they are exposed to dust of harmful gas (e.g. HCl, sulfurous gas of H2S). c. Packaging material may be deformed if package are stored where they are exposed to heat of direct sunlight. d. The minimum package and polyethylene package should not be opened until the capacitors are used; once they were opened, use the capacitors as soon as possible. e. Solderability specified shall be guaranteed for 3 months from the date of delivery on condition that they are stored at the environment specified in Clause 4. For those parts, which passed more than 3 months shall be checked solder-ability before use. <p>1-2 Transportation</p> <p>Package should not be destroyed or get wet.</p>									
2	Precautionary measures	<ul style="list-style-type: none"> a. Put on electrostatic prevention to avoid ESD. b. Equipments involved in capacitor application (such as soldering tip and tester) should be well grounded. c. Avoid touching electrode directly by hand or metal (such as metal table). 									
3	Circuit design  caution	<p>3-1 Operating temperature</p> <p>-55 degrees C to +125 degrees C.</p> <p>3-2 Operating Voltage</p> <table border="1" style="margin-left: 20px;"> <thead> <tr> <th></th> <th>-55C° to 85C°</th> <th>85C° to 125C°</th> </tr> </thead> <tbody> <tr> <td>% Change in Working DC Voltage with Temperature</td> <td>V_R</td> <td>67% of V_R</td> </tr> <tr> <td>Recommended Max Application Voltage</td> <td>50% of V_R</td> <td>33% of V_R</td> </tr> </tbody> </table> <div style="margin-left: 20px;">  </div> <p>3-3</p> <div style="margin-left: 20px;">  </div>		-55C° to 85C°	85C° to 125C°	% Change in Working DC Voltage with Temperature	V_R	67% of V_R	Recommended Max Application Voltage	50% of V_R	33% of V_R
	-55C° to 85C°	85C° to 125C°									
% Change in Working DC Voltage with Temperature	V_R	67% of V_R									
Recommended Max Application Voltage	50% of V_R	33% of V_R									

continue

No.	Process	Condition																
3	Circuit design  caution	<div style="text-align: center;">  </div> <p>3-3 Reverse Voltage</p> <p>Since tantalum capacitor has polarity, do not apply a reverse voltage to it. Do not apply capacitor to a circuit which only has alternating current.</p> <ol style="list-style-type: none"> If there is no alternation, applying a low reverse voltage which is listed below to capacitor in a short time is approved: In principle, testing a circuit with tantalum capacitor or capacitor itself by using a resistor gear of millimeters in ignorance of polarity is forbidden. During measurement and application, if the tantalum capacitor is subjected to an undesirable reverse voltage due to carelessness, please dispose it, even if its electrical characteristics are still qualified. <table border="1" data-bbox="464 974 1417 1151"> <thead> <tr> <th>Temp.</th> <th>Max. Reverse voltage in a short time</th> </tr> </thead> <tbody> <tr> <td>25°C</td> <td>10%U_R (rated voltage),working voltage to maximum of 1.0v.</td> </tr> <tr> <td>85°C</td> <td>3% U_R (rated voltage) ,working voltage to maximum of 0.5v.</td> </tr> <tr> <td>125°C</td> <td>1% U_R (rated voltage) ,working voltage to maximum of 0.1v.</td> </tr> </tbody> </table> <p>3-4 Ripple Voltage</p> <p>Please use the capacitor within permissible ripple voltage.</p> <ol style="list-style-type: none"> The sum of DC bias voltage and the maximum AC branch voltage should not exceed rated voltage during operation. The sum of negative peak AC value and DC bias voltage should not exceed the specified reverse voltage. Ripple current applied to capacitor will generate active power loss, which will raise the rate of the failure caused by heat due to self-heat generation of capacitor. Therefore, ripple current and permissible power loss must be in control. 	Temp.	Max. Reverse voltage in a short time	25°C	10%U _R (rated voltage),working voltage to maximum of 1.0v.	85°C	3% U _R (rated voltage) ,working voltage to maximum of 0.5v.	125°C	1% U _R (rated voltage) ,working voltage to maximum of 0.1v.								
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125°C	1% U _R (rated voltage) ,working voltage to maximum of 0.1v.																	
4	Mounting	In mounting, if the capacitor has underwent excessive mechanical and thermal shock which may cause deterioration of electrical characteristics, open circuits and short circuits, please confirm the practical mounting conditions before usage.																
5	Soldering	<table border="1" data-bbox="507 1662 1264 1982"> <thead> <tr> <th>Profile Feature</th> <th>Pb-free Assembly</th> <th>SnPb Assembly</th> </tr> </thead> <tbody> <tr> <td rowspan="2">Pre-heating</td> <td>50~165C°</td> <td>50~165C°</td> </tr> <tr> <td>90~120sec.</td> <td>90~120sec.</td> </tr> <tr> <td>Max. Peak Temperature</td> <td>250~260C°</td> <td>240~250C°</td> </tr> <tr> <td rowspan="2">Time of wave</td> <td>3~5sec.</td> <td>3~5sec.</td> </tr> <tr> <td>(max. 10sec.)</td> <td>(max. 10sec.)</td> </tr> </tbody> </table> <p>The upper side temperature of the board should not exceed +150C°.</p>	Profile Feature	Pb-free Assembly	SnPb Assembly	Pre-heating	50~165C°	50~165C°	90~120sec.	90~120sec.	Max. Peak Temperature	250~260C°	240~250C°	Time of wave	3~5sec.	3~5sec.	(max. 10sec.)	(max. 10sec.)
Profile Feature	Pb-free Assembly	SnPb Assembly																
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Time of wave	3~5sec.	3~5sec.																
	(max. 10sec.)	(max. 10sec.)																



9、Packaging

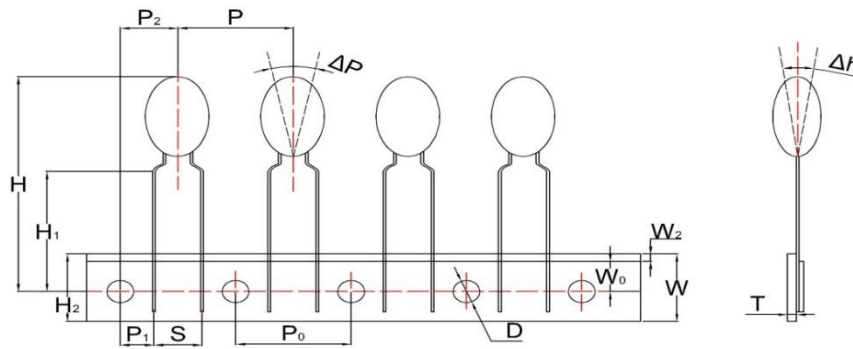


Figure Dimension of tape and reel

Symbol	Dimensions (mm)		Symbol	Dimensions (mm)
P	12.7±1.0		D	4.0±0.2
P ₀	12.7±0.3		T	0.5±0.2
W	18	+1.0	Δh	0±0.2
		-0.5	H ₁	16±0.5
W ₀	5 Minimum		S	2.50±0.5 , 5.00±0.7
H ₂	9	+0.75	P ₁	5.10±0.5 , 3.85±0.7
		-0.50		
W ₂	0	+1	P ₂	6.35±0.4
		-0		
H	32.5 Maximum		ΔP	±1.3 Maximum

Appendix A

Rated Voltage U_R (V)			4	6.3	10	16	25	35	40	50
Category Voltage U_C (V)			2.5	4	6.3	10	16	20	25	32
Dimensions (mm)			Capacitance (μF)							
D*H	d	S								
4.4 x 6.5	0.5	2	3.3	1.5	1	0.68	0.33	0.1	0.1	0.1
			4.7	2.2	1.5	1	0.47	0.15	0.15	0.15
			6.8	3.3	2.2	1.5	0.68	0.22	0.22	0.22
			10	4.7	3.3	2.2	1	0.33	0.33	0.33
			15	6.8	6.8	3.3	1.5	0.47	0.47	0.47
			22	10	10	4.7	2.2	0.68	0.68	
			33	15	15	6.8	3.3	1		
5.0 x 7.5	0.5	2	47	33	22	15	4.7	2.2	1	0.68
			68	47	33	22	6.8	3.3	1.5	1
							10	4.7	2.2	1.5
5.5 x 9.0	0.5	2.5	100	68	47	33	15	6.8	3.3	2.2
			150	100	68	47	22	10	4.7	3.3
					100					
6.3 x 10.5	0.5	2.5	220	150	150	68	33	15	6.8	4.7
			330	220		100	47	22	10	6.8
7.2x 12	0.5	5	470	330	220	150	68	33	15	10
			680	470	330	220	100	47	22	15
8.5 x 13	0.5	5		680	470	330	150	68	33	22

Appendix B

Capacitance Range (μF)	Capacitance change $\Delta C/C$ (%)			DF (%)				DC leakage	
	-55°C	+85°C	+125°C	-55°C	+25°C	+85°C	+125°C	+85°C	+125°C
0.47 ~ 1.0	±10	±10	±15	6	4	6		8 ₀ ⁽¹⁾	10 ₀
1.5 ~ 6.8				8	6	8			
10 ~ 68				10	8	10			
100 ~ 330				12	10	12			
470 ~ 680				14	12	14			
> 680				16	14	16			

(1) I_0 refer to initial value of DC leakage current