



## CA42 SERIES

### DIPPED TANTALUM CAPACITOR

**DIPPED TANTALUM CAPACITOR ▲ THT type**

Standard industrial grade MnO<sub>2</sub>

Meets or exceeds Standard IEX384-15-3 and GB7215-87

Laser marked resin case

Available on tape (ammopack or reel) or in bulk

**Low leakage current version on request**

### SPECIFICATION

Item		Characteristics <sup>Note 1</sup>			
Related Documents		IEX384-15-3 ▲ GB7215-87			
Rated Temperature Range <sup>Note 2</sup>		-55°C to +125°C			
Capacitance Range	C <sub>R</sub>	1μF to 1000μF			
Capacitance Tolerance	ΔC	±10% ▲ ±20%			
Rated Voltage Range	V <sub>R</sub>	4V <sub>DC</sub> to 50V <sub>DC</sub>			
Dissipation Factor	tan δ	-55°C	6 to 12%		
		+25°C	4 to 10%		
		+85°C	6 to 12%		
		+125°C	6 to 12%		
Leakage Current <sup>Note 3</sup>	I <sub>LEAK</sub>	Less than 0.02 x C <sub>R</sub> x V <sub>R</sub> or 1μA (whichever is greater)			
		<b><u>On request</u></b> Less than 0.01 x C <sub>R</sub> x V <sub>R</sub> or 0.5μA (whichever is greater)			
Case Sizes	Size/Code	Diameter	Height	Lead Length	Lead Diameter
	A	4.5mm	7.0mm	14±1mm	0.5±0.05mm
	B	5.0mm	8.0mm	14±1mm	0.5±0.05mm
	C	5.5mm	9.5mm	14±1mm	0.5±0.05mm
	D	6.5mm	11.0mm	14±1mm	0.5±0.05mm
	E	8.5mm	12.5mm	14±1mm	0.5±0.05mm
	F	9.5mm	16.0mm	14±1mm	0.5±0.05mm

#### Notes:

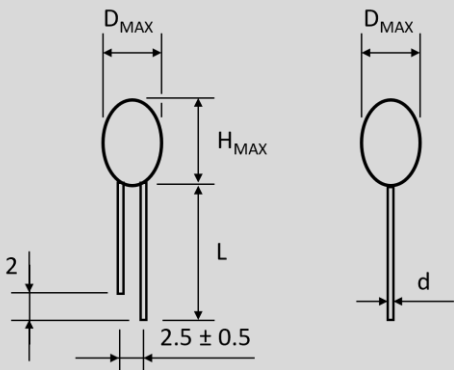
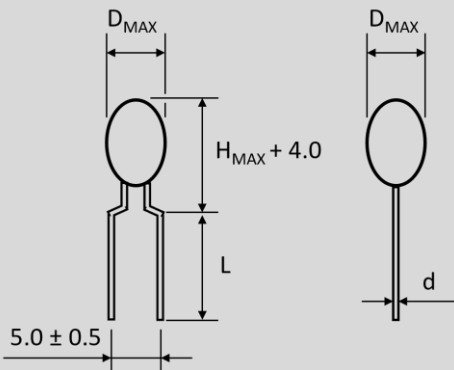
- 1: All technical data measured at 25°C
- 2: Above 85°C voltage derating is required
- 3: The leakage current should be measured after 5 minutes application of rated voltage at 85°C. 125°C with voltage derating.

### APPLICATIONS

Consumer Electronics	DC/DC Converter	Filter Circuits	Telecom Infrastructure

## PACKAGE OUTLINE AND CASE DIMENSIONS

Case Code	D <sub>MAX</sub> (mm)	H <sub>MAX</sub> (mm)	L (mm)	d (mm)
A	4.5	7.0	14.0 ± 1.0	0.50 ± 0.05
B	5.0	8.0	14.0 ± 1.0	0.50 ± 0.05
C	5.5	9.5	14.0 ± 1.0	0.50 ± 0.05
D	6.5	11.0	14.0 ± 1.0	0.50 ± 0.05
E	8.5	12.5	14.0 ± 1.0	0.50 ± 0.05
F	9.5	16.0	14.0 ± 1.0	0.50 ± 0.05

	
Straight Leads with Pitch 2.5mm, see product code for details	Bended Leads with Pitch 5.0mm, see product code for details

## CAPACITOR RATINGS AND CASE CODES

C <sub>R</sub> (μF)	Capacitance Code	Rated Voltage V <sub>R</sub> at 85°C (V)						
		4	6.3	10	16	25	35	50
0.10	104						A	A
0.15	154						A	A
0.22	224						A	A
0.33	334						A	A
0.47	474						A	A
0.68	684						A	A
1.0	105				A	A	A	B
1.5	155				A	A	A	C
2.2	225			A	A	A	B	C
3.3	335		A	A	A	B	B	D
4.7	475	A	A	A	B	B	C	D
6.8	685	A	A	B	B	C	D	E
10	106	A	B	B	B	C	D	E
15	156	A	B	C	C	D	E	F
22	226	B	C	C	C	D	E	F
33	336	B	C	D	D	E	F	
47	476	C	D	D	D	E	F	
68	686	D	D	D	E	F		
100	107	D	E	E	E	F		
150	157	E	E	E	F			
220	227	E	E	F				
330	337	F	F					

## ELECTRICAL CHARACTERISTICS

$V_R$	$C_R$ ( $\mu F$ )	Case Code	Max. $I_{LEAK}$ ( $\mu A$ ) Note 1	Max. $\tan\delta$ (%) Note 1	Part Number Note 2
<b>4V<sub>DC</sub></b> (at 85°C) ▲ <b>2.5V<sub>DC</sub></b> (at 125°C)	4.7	A	1	6	CA42-475□004□□
	6.8	A	1	6	CA42-685□004□□
	10	A	1	8	CA42-106□004□□
	15	A	1.2	8	CA42-156□004□□
	22	B	1.8	8	CA42-226□004□□
	33	B	2.6	8	CA42-336□004□□
	47	C	3.8	8	CA42-476□004□□
	68	D	5.4	8	CA42-686□004□□
	100	D	8	10	CA42-107□004□□
	150	E	12	10	CA42-157□004□□
	220	E	17.6	10	CA42-227□004□□
	330	F	26.4	10	CA42-337□004□□
<b>6.3V<sub>DC</sub></b> (at 85°C) ▲ <b>4V<sub>DC</sub></b> (at 125°C)	3.3	A	1	6	CA42-335□006□□
	4.7	A	1	6	CA42-475□006□□
	6.8	A	1	6	CA42-685□006□□
	10	B	1.3	8	CA42-106□006□□
	15	B	1.9	8	CA42-156□006□□
	22	C	2.8	8	CA42-226□006□□
	33	C	4.2	8	CA42-336□006□□
	47	D	5.9	8	CA42-476□006□□
	68	D	8.6	8	CA42-686□006□□
	100	E	12.6	10	CA42-107□006□□
	150	E	18.9	10	CA42-157□006□□
	220	E	27.7	10	CA42-227□006□□
	330	F	41.6	10	CA42-337□006□□
<b>10V<sub>DC</sub></b> (at 85°C) ▲ <b>6.3V<sub>DC</sub></b> (at 125°C)	2.2	A	1	6	CA42-225□010□□
	3.3	A	1	6	CA42-335□010□□
	4.7	A	1	6	CA42-475□010□□
	6.8	B	1.4	6	CA42-685□010□□
	10	B	2	8	CA42-106□010□□
	15	C	3	8	CA42-156□010□□
	22	C	4.4	8	CA42-226□010□□
	33	D	6.6	8	CA42-336□010□□
	47	D	9.4	8	CA42-476□010□□
	68	D	13.6	8	CA42-686□010□□
	100	E	20	10	CA42-107□010□□
	150	E	30	10	CA42-157□010□□
	220	F	44	10	CA42-227□010□□

- Note: 1 All technical data measured at 25°C. Capacitance and loss test conditions:  $V = 1.7$  to  $2.2V$ ,  $V_{partial} = 0$  to  $1V$  (RMS), Measurement frequency: 100 (120)Hz. The leakage current should be measured after 5 minutes application of rated voltage at 85°C. 125°C with voltage derating.
- 2 □ : Enter the appropriate capacitance tolerance code. K for  $\pm 10\%$  or M for  $\pm 20\%$ .
- 3 □□ : Enter the appropriate leads pitch and packaging code. See product code description for details.

## ELECTRICAL CHARACTERISTICS

$V_R$	$C_R$ ( $\mu F$ )	Case Code	Max. $I_{LEAK}$ ( $\mu A$ ) Note 1	Max. $\tan \delta$ (%) Note 1	Part Number Note 2
<b>16V<sub>DC</sub></b> (at 85°C) ▲ <b>10V<sub>DC</sub></b> (at 125°C)	1.0	A	1	4	CA42-105□016□□
	1.5	A	1	6	CA42-155□016□□
	2.2	A	1	6	CA42-225□016□□
	3.3	A	1.1	6	CA42-335□016□□
	4.7	B	1.5	6	CA42-475□016□□
	6.8	B	2.2	6	CA42-685□016□□
	10	B	3.2	8	CA42-106□016□□
	15	C	4.8	8	CA42-156□016□□
	22	C	7	8	CA42-226□016□□
	33	D	10.6	8	CA42-336□016□□
	47	D	15	8	CA42-476□016□□
	68	E	21.8	8	CA42-686□016□□
	100	E	32	10	CA42-107□016□□
	150	F	48	10	CA42-157□016□□
<b>25V<sub>DC</sub></b> (at 85°C) ▲ <b>16V<sub>DC</sub></b> (at 125°C)	1.0	A	1	4	CA42-105□025□□
	1.5	A	1	6	CA42-155□025□□
	2.2	A	1.1	6	CA42-225□025□□
	3.3	B	1.7	6	CA42-335□025□□
	4.7	B	2.4	6	CA42-475□025□□
	6.8	C	3.4	6	CA42-685□025□□
	10	C	5	8	CA42-106□025□□
	15	D	7.5	8	CA42-156□025□□
	22	D	11	8	CA42-226□025□□
	33	E	16.5	8	CA42-336□025□□
	47	E	23.5	8	CA42-476□025□□
	68	F	34	8	CA42-686□025□□
	100	F	50	10	CA42-107□025□□
<b>35V<sub>DC</sub></b> (at 85°C) ▲ <b>23V<sub>DC</sub></b> (at 125°C)	0.10	A	1	4	CA42-104□035□□
	0.15	A	1	4	CA42-154□035□□
	0.22	A	1	4	CA42-224□035□□
	0.33	A	1	4	CA42-334□035□□
	0.47	A	1	4	CA42-474□035□□
	0.68	A	1	4	CA42-684□035□□
	1.0	A	1	4	CA42-105□035□□
	1.5	A	1.1	6	CA42-155□035□□
	2.2	B	1.5	6	CA42-225□035□□
	3.3	B	2.3	6	CA42-335□035□□
	4.7	C	3.3	6	CA42-475□035□□
	6.8	D	4.8	6	CA42-685□035□□
	10	D	7	8	CA42-106□035□□
	15	E	10.5	8	CA42-156□035□□
	22	E	15.4	8	CA42-226□035□□
	33	F	23.1	8	CA42-336□035□□
	47	F	32.9	8	CA42-476□035□□

Note: 1 All technical data measured at 25°C. Capacitance and loss test conditions:  $V = 1.7$  to  $2.2V$ ,  $V_{partial} = 0$  to  $1V$  (RMS), Measurement frequency: 100 (120)Hz. The leakage current should be measured after 5 minutes application of rated voltage at 85°C.

125°C with voltage derating.

2 □ : Enter the appropriate capacitance tolerance code. K for  $\pm 10\%$  or M for  $\pm 20\%$ .

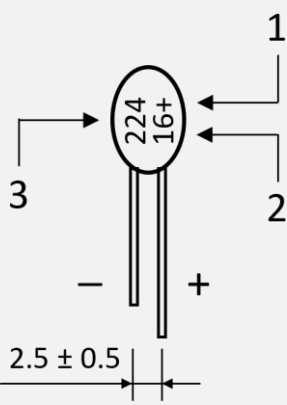
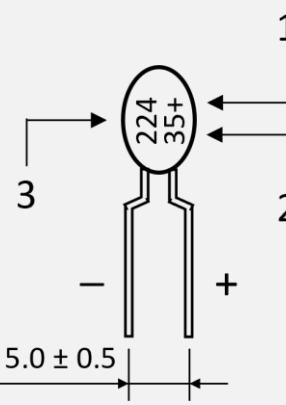
3 □□ : Enter the appropriate leads pitch and packaging code. See product code description for details.

## ELECTRICAL CHARACTERISTICS

$V_R$	$C_R$ ( $\mu F$ )	Case Code	Max. $I_{LEAK}$ ( $\mu A$ ) Note 1	Max. $\tan \delta$ (%) Note 1	Part Number Note 2
<b>50V<sub>DC</sub></b> (at 85°C) ▲ <b>35V<sub>DC</sub></b> (at 125°C)	0.10	A	1	4	CA42-104□050□□
	0.15	A	1	4	CA42-154□050□□
	0.22	A	1	4	CA42-224□050□□
	0.33	A	1	4	CA42-334□050□□
	0.47	A	1	4	CA42-474□050□□
	0.68	A	1	4	CA42-684□050□□
	1.0	B	1	4	CA42-105□050□□
	1.5	C	1.5	6	CA42-155□050□□
	2.2	C	2.2	6	CA42-225□050□□
	3.3	D	3.3	6	CA42-335□050□□
	4.7	D	4.7	6	CA42-475□050□□
	6.8	E	6.8	6	CA42-685□050□□
	10	E	10	8	CA42-106□050□□
	15	F	15	8	CA42-156□050□□
	22	F	22	8	CA42-226□050□□

- Note: 1 All technical data measured at 25°C. Capacitance and loss test conditions:  $V = 1.7$  to  $2.2V$ ,  $V_{partial} = 0$  to  $1V$  (RMS), Measurement frequency: 100 (120)Hz. The leakage current should be measured after 5 minutes application of rated voltage at 85°C. 125°C with voltage derating.
- 2 □ : Enter the appropriate capacitance tolerance code. K for  $\pm 10\%$  or M for  $\pm 20\%$ .
- 3 □□ : Enter the appropriate leads pitch and packaging code. See product code description for details.

## PRODUCT MARKING

Marking		Details	
Straight Leads with Pitch 2.5mm	Bended Leads with Pitch 5.0mm	No.	Description
		1	Polarity (+) Anode side
		2	Rated voltage
		3	Capacitance (Code)
16V ▲ 0.22μF	35V ▲ 0.22μF	Example	

## PRODUCT CODE

Example: CA42 series ▲ 10μF ▲ 16V<sub>DC</sub> ▲ ±10% ▲ Straight leads with pitch 2.5mm ▲ Bulk

CA42-		106		K		016		A		B	
Series		Capacitance Code <sup>Note1</sup> (pF)		Capacitance Tolerance (%)		Rated Voltage (V <sub>DC</sub> )		Leads Pitch (mm)		Packaging Type	
Code	Series	Code	μF	Code	Tol.	Code	VDC	Code	Pitch	Code	Type
CA42-	CA42	104	0.1	K	±10	004	4	A	2.5	A	Ammo Tape
		564	0.56	M	±20	006	6.3	B	5.0	B	Bulk
		225	2.2			010	10			T	Tape & Reel
		686	68			016	16				
		337	330			025	25				
						035	35				
						050	50				

**Note:** 1 Capacitance code expressed in pF. The first two digits represent significant figures.  
The last digit specifies the total number of zeros to be added.

## PACKAGING INFORMATION

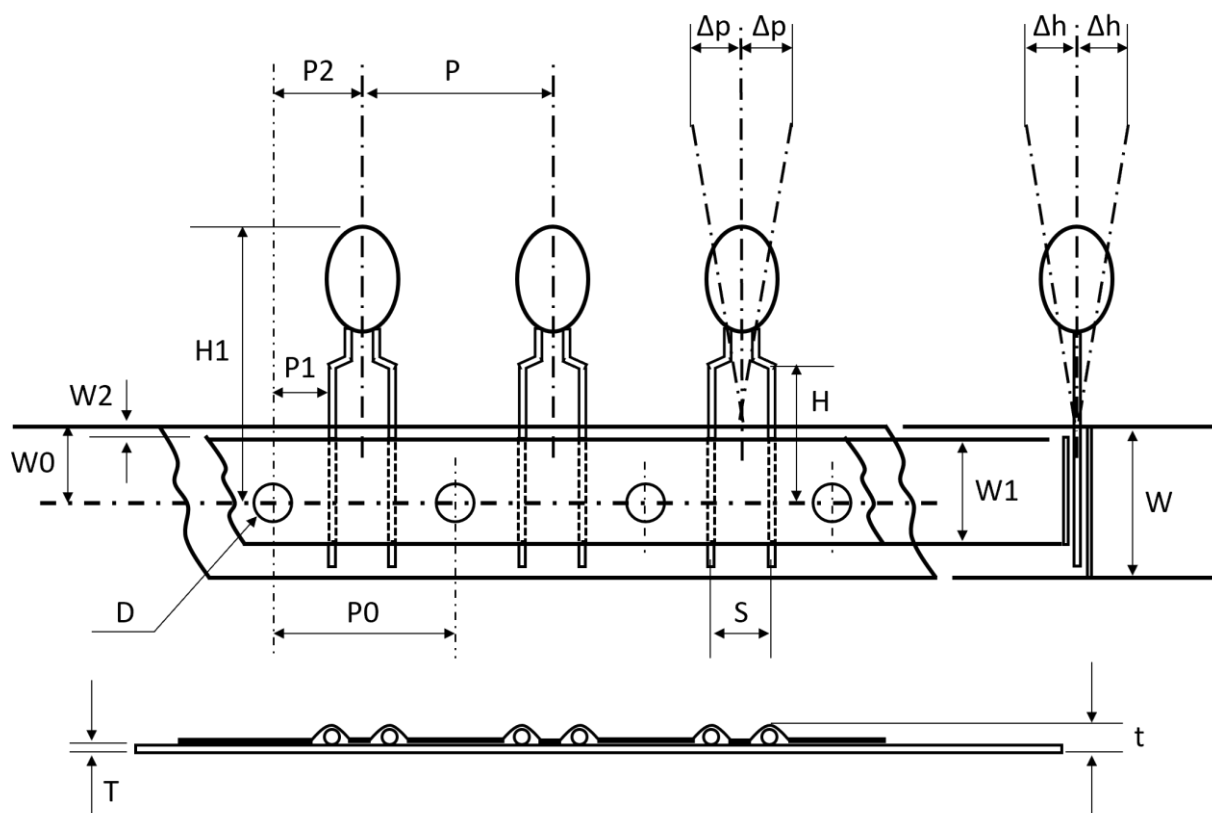
Bulk Package Pitch 2.5mm											
$C_R (\mu F)$ $V_R (V)$	≤ 3.3	4.7	6.8	10	15	22	33	47	68	100	≥ 150
4	1000 pcs	1000 pcs	1000 pcs	1000 pcs	1000 pcs	1000 pcs	1000 pcs	1000 pcs	1000 pcs	1000 pcs	500 pcs
6.3	1000 pcs	1000 pcs	1000 pcs	1000 pcs	1000 pcs	1000 pcs	1000 pcs	500 pcs	500 pcs	500 pcs	500 pcs
10	1000 pcs	1000 pcs	1000 pcs	1000 pcs	1000 pcs	1000 pcs	1000 pcs	500 pcs	500 pcs	500 pcs	500 pcs
16	1000 pcs	1000 pcs	1000 pcs	1000 pcs	1000 pcs	500 pcs	500 pcs	500 pcs	500 pcs	200 pcs	200 pcs
20	1000 pcs	1000 pcs	1000 pcs	1000 pcs	500 pcs	500 pcs	500 pcs	500 pcs	200 pcs	200 pcs	
25	1000 pcs	1000 pcs	1000 pcs	1000 pcs	500 pcs	500 pcs	500 pcs	500 pcs	200 pcs	200 pcs	
35	1000 pcs	1000 pcs	1000 pcs	500 pcs	500 pcs	500 pcs	500 pcs	200 pcs			
50	1000 pcs	500 pcs	500 pcs	500 pcs	500 pcs	500 pcs	500 pcs				

Bulk Package Pitch 5mm											
$C_R (\mu F)$ $V_R (V)$	≤ 10	15	22	33	47	68	100	150	220	330	
4	500 pcs	500 pcs	500 pcs	500 pcs	500 pcs	500 pcs	500 pcs	200 pcs	200 pcs	200 pcs	
6.3	500 pcs	500 pcs	500 pcs	500 pcs	500 pcs	500 pcs	500 pcs	200 pcs	200 pcs	200 pcs	
10	500 pcs	500 pcs	500 pcs	500 pcs	500 pcs	500 pcs	500 pcs	200 pcs	200 pcs	200 pcs	
16	500 pcs	500 pcs	500 pcs	500 pcs	500 pcs	500 pcs	200 pcs	200 pcs	200 pcs		
20	500 pcs	500 pcs	500 pcs	500 pcs	500 pcs	200 pcs	200 pcs				
25	500 pcs	500 pcs	500 pcs	200 pcs	200 pcs	200 pcs	200 pcs				
35	500 pcs	500 pcs	200 pcs	200 pcs	200 pcs						
50	500 pcs	200 pcs	200 pcs								

Ammo Tape Package											
$C_R (\mu F)$ $V_R (V)$	≤ 3.3	4.7	6.8	10	15	22	33	47	68	100	≥ 150
4	2000 pcs	2000 pcs	2000 pcs	2000 pcs	2000 pcs	2000 pcs	2000 pcs	1500 pcs	1500 pcs	1500 pcs	1000 pcs
6.3	2000 pcs	2000 pcs	2000 pcs	2000 pcs	2000 pcs	2000 pcs	1500 pcs	1500 pcs	1000 pcs	1000 pcs	1000 pcs
10	2000 pcs	2000 pcs	2000 pcs	2000 pcs	2000 pcs	2000 pcs	1500 pcs	1500 pcs	1000 pcs	1000 pcs	1000 pcs
16	2000 pcs	2000 pcs	2000 pcs	1500 pcs	1500 pcs	1000 pcs	1000 pcs	1000 pcs	1000 pcs	1000 pcs	500 pcs
20	2000 pcs	1500 pcs	1500 pcs	1000 pcs	1000 pcs	1000 pcs	1000 pcs	1000 pcs	1000 pcs	500 pcs	
25	2000 pcs	1500 pcs	1500 pcs	1000 pcs	1000 pcs	1000 pcs	1000 pcs	1000 pcs	1000 pcs	500 pcs	
35	1500 pcs	1500 pcs	1500 pcs	1000 pcs	1000 pcs	1000 pcs	1000 pcs				
50	1500 pcs	1500 pcs	1000 pcs	1000 pcs	1000 pcs	1000 pcs					

Tape & Reel Package											
$C_R (\mu F)$ $V_R (V)$	≤ 3.3	4.7	6.8	10	15	22	33	47	68	100	≥ 150
4	2000 pcs	2000 pcs	2000 pcs	2000 pcs	2000 pcs	2000 pcs	2000 pcs	2000 pcs	2000 pcs	2000 pcs	1500 pcs
6.3	2000 pcs	2000 pcs	2000 pcs	2000 pcs	2000 pcs	2000 pcs	2000 pcs	2000 pcs	2000 pcs	1500 pcs	1500 pcs
10	2000 pcs	2000 pcs	2000 pcs	2000 pcs	2000 pcs	2000 pcs	2000 pcs	2000 pcs	2000 pcs	1500 pcs	1500 pcs
16	2000 pcs	2000 pcs	2000 pcs	2000 pcs	2000 pcs	1500 pcs	1500 pcs	1500 pcs	1500 pcs	1500 pcs	1000 pcs
20	2000 pcs	2000 pcs	2000 pcs	2000 pcs	2000 pcs	1500 pcs	1500 pcs	1500 pcs	1000 pcs	1000 pcs	
25	2000 pcs	2000 pcs	2000 pcs	2000 pcs	2000 pcs	1500 pcs	1500 pcs	1500 pcs	1000 pcs	1000 pcs	
35	2000 pcs	2000 pcs	2000 pcs	2000 pcs	1500 pcs	1500 pcs	1500 pcs	1000 pcs			
50	2000 pcs	2000 pcs	1500 pcs	1500 pcs	1500 pcs	1500 pcs					

## TAPE DIMENSIONS ▲ All dimensions in mm



Symbol	P ± 1.0	P0 ± 0.3	W +1/-0.5	W0	H2 +0.75/-0.5	W2 ± 1.0	H1	D ± 0.2
Dimension	12.7	12.7	18.0	5 min.	9.0	0	32.5 max.	4.0

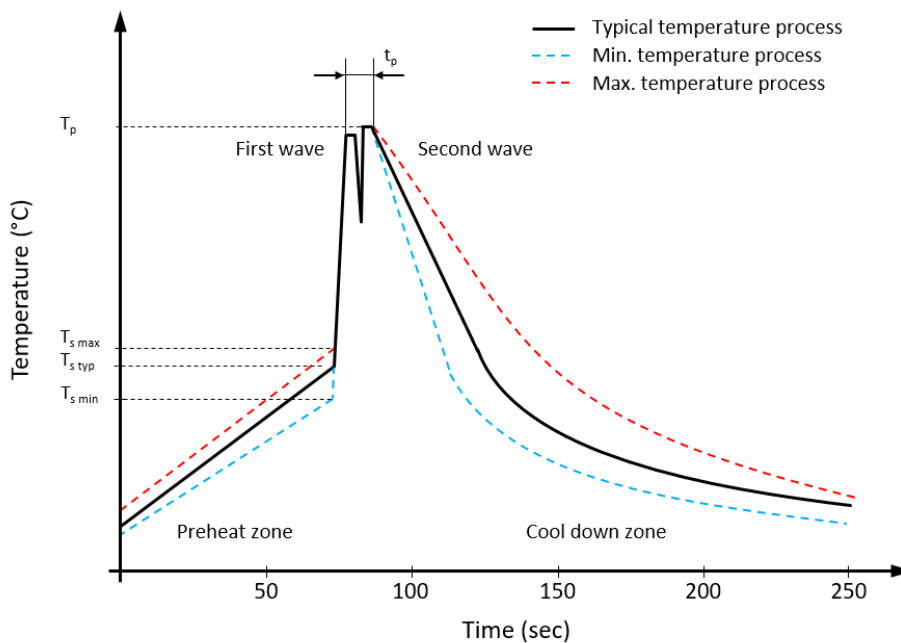
Symbol	T ± 0.2	t ± 0.2	Δh ± 2.0	H ± 0.5	S = 2.5	S = 5.0	P2 ± 0.4	Δp
					P1 ± 0.5	P1 ± 0.5		
Dimension	1.5	0.5	0	16.0	5.10 ± 0.5	3.85 ± 0.7	6.35	± 1.3 max.



## TECHNICAL SPECIFICATION

No.	Category	Specification												
1	Scope	This specification applies to DIPPED TANTALUM CAPACITORS for electronics applications. Reference standards: IEX384-15-3 ▲ GB7215-87												
2	Product Name	Dipped tantalum capacitors, Type CA42												
3	Testing Conditions	Room temperature			15 to 35°C									
		Relative humidity			45% to 75%									
		Air pressure			800mbar to 1060mbar									
4	Handling	It is mandatory to fully discharge capacitor to avoid failure test results. The product is a polarized component. It is prohibited to connect positive poles and negative poles re- versely to avoid product performance failure.												
5	Checking List	Item			Characteristics				Testing Method					
		Drawing and dimension			See package outline and case di- mensions				Measured with Vernier Caliper 150 x 0.01mm					
		Appearance			Correct marking, clear, no pin- hole, no burr, no damage				Visual examination					
		Leakage current ( $I_{LEAK}$ )			Less than 0.02·C·V or 1μA (which- ever is greater)  <b>On request</b> Less than 0.01·C·V or 0.5μA (whichever is greater)				DC leakage current is the current that, after 5 minutes charging period, flows through a capacitor when voltage measures at 25°C with rated DC voltage applied to the capacitor in series connec- tion with 1kΩ resistor. Read value.					
		Capacitance tolerance (ΔC)			± 10% (K); ± 20% (M)				Measurement frequency: 100Hz Voltage: 0.3 ± 0.02V					
		Dissipation factor (tan δ)			C <sub>R</sub> : ≤ 1μF		tanδ ≤ 4%		Measurement frequency: 100Hz Voltage: 0.3 ± 0.02V					
					C <sub>R</sub> : 1.5 to 6.8μF		tanδ ≤ 6%							
					C <sub>R</sub> : 10 to 68μF		tanδ ≤ 8%							
					C <sub>R</sub> : ≥ 100μF		tanδ ≤ 10%							
		Solderability			Soldering coverage rate ≥ 95%				Solder temperature: 235 ± 5°C Immersion time: 2 ± 0.5s					
		Temperature performance			Capaci- tance (μF)	Change of Capacitance (ΔC) (%)			Max. tan δ (%)				Max. $I_{LEAK}$ (μA)	
						-55°C	+85°C	+125°C	-55°C	+25°C	+85°C	+125°C	+85°C	+125°C
					≤ 1.0	±10	±15	±25	6	4	6	6	10 · $I_{LEAK\_25^\circ C}$	12.5 · $I_{LEAK\_25^\circ C}$
					1.5 to 6.8				8	6	8	8		
					10 to 68				10	8	10	10		
					≥ 100				12	10	12	12		

## RECOMMENDED WAVE SOLDERING PROFILE ▲ THT PACKAGE



Profile Features		Value - Sn-Pb Assembly	Value - Pb-free Assembly
Preheat temperature min.	$T_{s \text{ min}}$	100 °C	100 °C
Preheat temperature typical	$T_{s \text{ typ}}$	120 °C	120 °C
Preheat temperature max.	$T_{s \text{ max}}$	130 °C	130 °C
Preheat time $t_s$ from $T_{s \text{ min}}$ to $T_{s \text{ max}}$	$t_s$	70 seconds	70 seconds
Peak temperature	$T_p$	235 °C to 260 °C	245 °C to 260 °C
Time of actual peak temperature	$t_p$	Max. 10 seconds Max. 5 second each wave	Max. 10 seconds Max. 5 second each wave
Ramp-down rate min.		~ 2 °C/second	~ 2 °C/second
Ramp-down rate typical		~ 3.5 °C/second	~ 3.5 °C/second
Ramp-down rate max.		~ 5 °C/second	~ 5 °C/second
Time 25°C to 25°C		4 minutes	4 minutes

## SOLDERING SUGGESTIONS

When solder a capacitor, heat in soldering is conducted to the element of the capacitor from wire lead and an enclosure, and hence it should be noted that soldering under high temperature and a long period may cause deterioration of breakdown of capacitors. Be sure to solder within the recommended temperature condition range.

### HAND SOLDERING

- Soldering iron top temperature:  $\leq 350^\circ\text{C}$
- Soldering time:  $\leq 3\text{sec}$

If re-work or dipping twice is necessary, it should be done after the capacitor returned to the normal temperature.

Suggestion time is 24 hours.

THT capacitors are not suitable for reflow soldering.

## CORRECT USE OF DIPPED TANTALUM CAPACITORS

No.	Category	Specification
1	Ripple voltage	The ripple voltage that may be applied is limited by two criteria:
		[a] The sum of DC voltage and peak value of the ripple voltage must not exceed the rated voltage.
		[b] The negative peak value of the ripple voltage must not exceed the permissible reverse voltage value specified in the following section, Reverse Voltage.
2	Reverse Voltage	Because the solid tantalum capacitor is a polarized type, do not apply a reverse voltage to it. If reverse voltage cannot be avoided, it must be applied for a short time and must not exceed the following values:
		25°C 10% max. of rated voltage or 1V <sub>DC</sub> , whichever is smaller
		85°C 5% max. of rated voltage or 0.5V <sub>DC</sub> , whichever is smaller
		125°C 1% max. of rated voltage or 0.1V <sub>DC</sub> , whichever is smaller
		The capacitors should not be operated continuously in reverse mode, even within these limits.
3	Applied Voltage	(1) For general application, apply 70% or less of the rated voltage to the capacitor.
		(2) When the capacitor is used in a power line or a low impedance circuit, keep the applied voltage within 30% of the rated voltage to avoid the adverse influence of inrush current.
		(3) Derated voltage at 85°C or more.
		When using a Chip type capacitor at a temperature of 85°C or higher, calculate reduced voltage V <sub>T</sub> from the following expression. Note, however, that the ambient temperature must not exceed 125°C
		(4) $V_T = (V_R - V_C) \cdot \frac{(T - 85^\circ C)}{40^\circ C}$ <p>Where:  V<sub>R</sub>: Rated voltage (V) at ≤ 85°C  V<sub>C</sub>: Derated voltage at 125°C (V)  V<sub>T</sub>: Derated voltage between 85°C to 125°C  T: Ambient temperature (°C)</p>
4	Current (Series Resistance)	Reliability of tantalum capacitor is increased by inserting a series resistance of at least 3Ω/V into circuits where current flow is momentary (switching circuit, charge/discharge circuits, etc) .If the capacitor is in a low impedance circuit, the voltage applied to the capacitor should be less than 1/2 to 1/3 of DC rated voltage.
5	Risk of Short Circuit	Manganese oxide tantalum capacitor (conventional tantalum capacitor) is heated and may generate fire and be burned depending upon its excess current, time and other factors. <b>When design the circuit, provide as much margin as possible to maintain capacitor reliability.</b>
6	Product Soldering	See details in our recommended wave soldering profile.

## REVISION TABLE

Revision	Date	Status	Notes
001	26/06/2022	Initial release	Initial publication

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