

Features and Applications:

1. Molded case available in five case codes. Chip. Small size. Lead free terminations. Polar Capacitors. Taped and Reeled per EIA 481-1
2. Economy and high electricity performance. Low dissipation factor and DC leakage current. Equal to Kemet type T491.
3. Suitable for high volume automatic pick and place equipment as PC, mobile telephone sets, pickup camera, etc.

Performance and Characteristics

Operating Temperature: -55°C to $+85^{\circ}\text{C}$. (To $+125^{\circ}\text{C}$ with voltage derating.)

Rated Voltage, Derating Voltage, Nominal Capacitance: See table 3.

Capacitance Tolerance: At 100Hz, $+25^{\circ}\text{C}$, $\pm 10\%$; $\pm 20\%$ standard. $\pm 5\%$, special order.

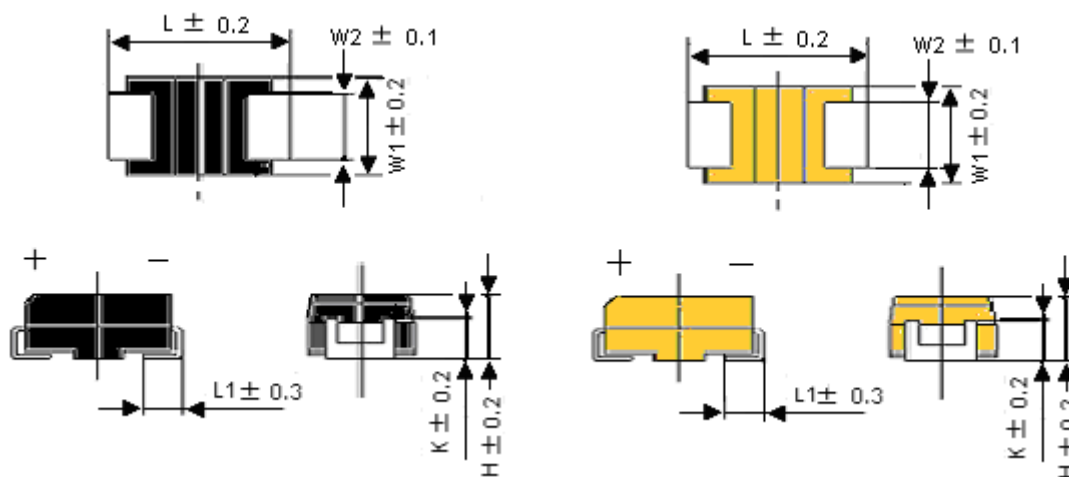
DC Leakage Current at 25°C : $\text{DCL}_{\text{Max}} \leq 0.01 C_R U_R$ (μA) or $0.5 \mu\text{A}$ (Whichever is greater) .

Dissipation Factor (D.F): At 100Hz, $+25^{\circ}\text{C}$. D.F won't exceed the values in table 2.

Temperature Performance: No more than maximum limits in table 2.

ESR at 100Khz, $+25^{\circ}\text{C}$: No more than maximum limits in table 4.

Dimensions: See Outline drawings and table 1.



(The marks ( OR ) on products is anode)

Table 1 Dimensions

mm

Case Code	EIA Size	L	W ₁	H	L ₁	W ₂	K
P	2012	2.0	1.25	1.2	0.55	1.1	0.3
A	3216	3.2	1.6	1.6	0.7	1.2	0.9
B	3528	3.4	2.6	1.9	0.8	2.0	1.1
C	6032	5.8	3.2	2.5	1.3	2.2	1.4 ± 0.3
D	7343	7.3	4.3	2.8	1.3	2.4	1.5 ± 0.3



Table 2 Temperature Performance

Capacitance (C _R) μ F	Capacitance Change %			Maximum					
	-55℃	85℃	125℃	D.F(%)				DCL(μ A)	
				-55℃	25℃	85℃	125℃	85℃	125℃
≤1.0	±10	±10	±12	6	4	6		10Io	12.5Io
1.5~68				8	6	8			
100~220				10	8	10			

Remarks: 1) Test Voltage: U=-2.2_{-1.0}⁰V; U~=-1.0_{-0.5}⁰V (RMS). Test frequency: 100Hz.

2) To 125℃ with voltage derating.

Table 3 Rating Voltage, Derating Voltage, Nominal Capacitance

Rating Voltage(U _R)	V	4	6.3	10	16	20	25	35	50
	Code	G	J	A	C	D	E	V	T
Derated Voltage(U _C)	V	2.5	4	6.3	10	13	16	20	32
Surge Voltage(SV)	V	5	7	11.5	18	23	29	40	57
Nominal Capacitance(CR)		Case Size							
uF	Code								
0.1	104(Z*)					A/P	A	A	A
0.15	154(X*)					A/P	A	A	B/A
0.22	224(R*)					A/P	A	A	B/A
0.33	334(Q*)					A/P	A	A	B/A
0.47	474(S*)				A/P	A/P	A	B/A	B/C
0.68	684(W*)				A/P	A/P	A	B/A	C
1	105(A*)			A/P	A/P	A	A	B/A	C
1.5	155(E*)		A/P	A/P	A	A	B/A	C/B	D/C
2.2	225(J*)	A/P	A/P	A/P	B/A	B/A	B	C/B	D/C
3.3	335(N*)	A/P	A/P	A	B/A	B/A	C/B	C	D
4.7	475(F*)	A/P	A	B/A	B/A	C/B	C/B	D/C	D
6.8	685	A	B/A	B/A	C/B	C/B	D/C	D	D
10	106	B/A	B/A	C/B/A	C/B	C/B	D/C	D	D
15	156	B/A	C/B	C/B	C/B	D/C	D/C	D	
22	226	C/B/A	C/B	C/B	D/C	D/C	D	D	
33	336	C/B	C/B	D/C/B	D/C	D	D		
47	476	D/C/B	D/C/B	D/C	D/C	D	D		
68	686	D/C	D/C	D/C	D	D			
100	107	D/C	D/C	D/C	D				
150	157	D	D	D					
220	227	D	D	D					

Remarks: “*” marking code for case size P



Type CA45 Chip Solid Electrolyte Tantalum Capacitors

Table 4 Max. ESR @ +25 °C, 100KHz(Ohms)

Rating Voltage (U _R) V		4	6.3	10	16	20	25	35	50
Capacitance uF	Case Size	ESR(100KHz) Ω							
		0.1	A						
0.15	B								16
	A							19	19
0.22	B								14
	A							18	
0.33	B								10
	A						15	15	
0.47	C								8
	B							8	8
	A					11	11	11	
0.68	C								7
	B						7.5	7.5	7.5
	A				12	12	10	10	
1	C								5.5
	B						5	5	
	A			10	10	10	10	10	
1.5	D								3.5
	C							4.5	4.5
	B					5	5	5	
	A		8	8	8	8	8		
2.2	D								2.5
	C						3.5	3.5	3.5
	B				4	4	4	4	
	A	8	8	8	7	7			
3.3	D								2
	C						2.5	2.5	
	B			3.5	3.5	3.5	3.5		
	A	8	8	7	7	7			
4.7	D							1.5	1.5
	C					2.4	2.4	2.4	
	B		3.5	3.5	3.5	3.5	3.5		
	A	6	6	6	6				

Remarks: ESR of Case P is N/A



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Table 4 Max. ESR @ +25 °C, 100KHz(Ohms)

Rating Voltage (U _R) V		4	6.3	10	16	20	25	35	50
Capacitance uF	Case Size	ESR(100KHz)							
		Ω							
6.8	D						1.2	1.2	1.2
	C				1.9	1.9	1.9	1.9	
	B	3.5	3.5	3.5	3.5	3.5			
	A	6	6	6					
10	D					1	1	1	1
	C			1.8	1.8	1.8	1.5		
	B	3.5	3.5	3.5	3.5	3			
	A	6	4	4					
15	D					1	1	1	
	C		1.8	1.8	1.8	1.7			
	B	3.5	3.5	3.5	3				
	A	4	4						
22	D				0.8	0.8	0.8	0.8	
	C	1.8	1.8	1.8	1.6	1.6			
	B	3.5	3.5	3					
	A	4							
33	D		0.8	0.8	0.8	0.8	0.8		
	C	1.8	1.8	1.6	1.2				
	B	2.5	2.5						
47	D	0.8	0.8	0.8	0.8	0.8	0.8		
	C	1	1	1	1				
	B	3	3						
68	D	0.8	0.8	0.8	0.8				
	C	1.2	1.2	1.2					
100	D	0.7	0.7	0.7	0.7				
	C	1	1	1.2					
150	D	0.5	0.5	0.5					
220	D	0.5	0.5	0.5					

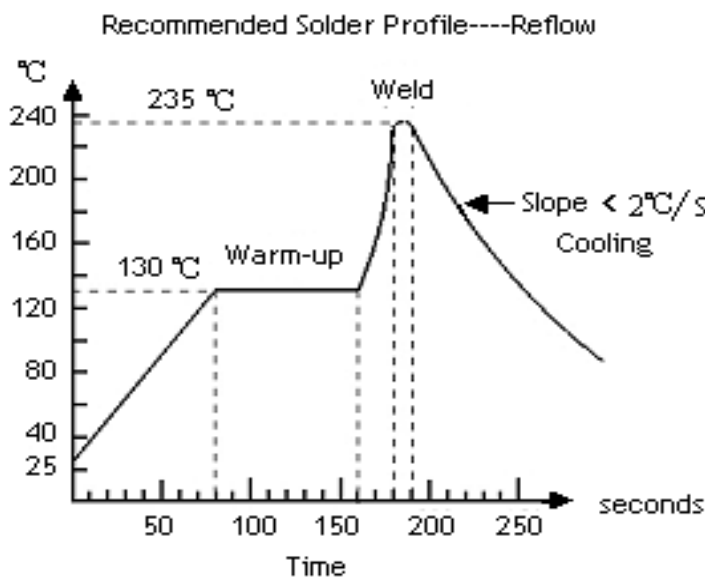
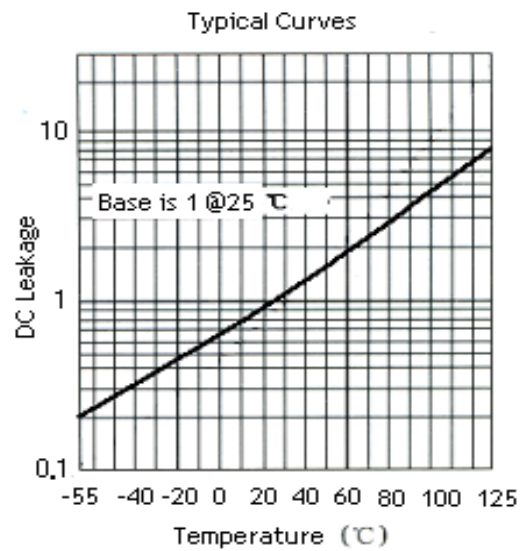
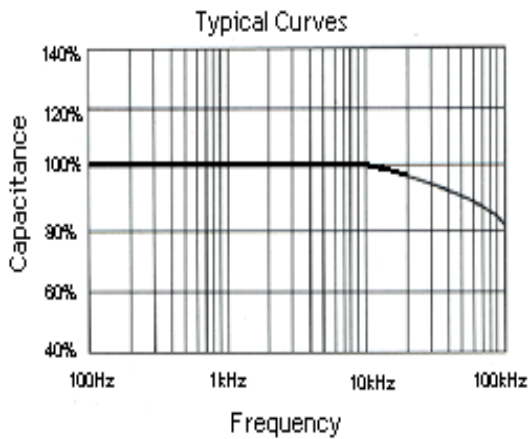
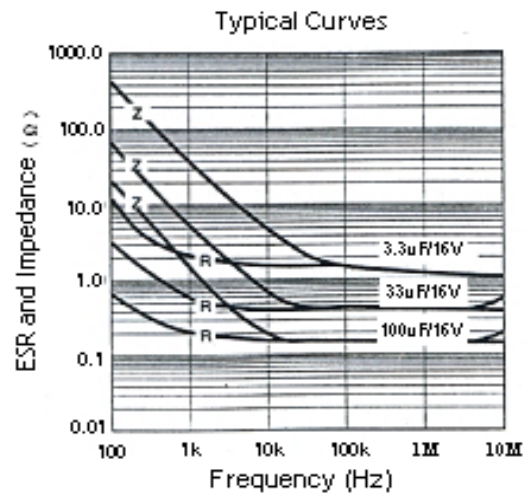
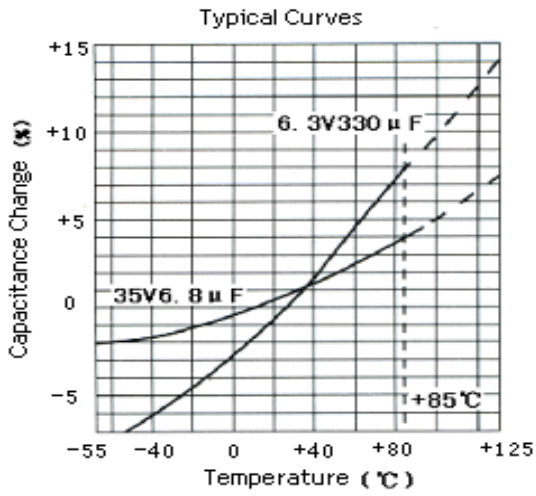
Remarks: ESR of Case P is N/A

How to order:

CZCA4510V10UFAMTR or CA45-10V-10UF A CASE M

Here: CA45: Type. A: Case. M: ±20%, K: ±10%. T: Tape. R: Right rotation

Typical Curves



Type CA45 Chip Solid Electrolyte Tantalum Capacitors

Tape and Reel Dimensions(mm)

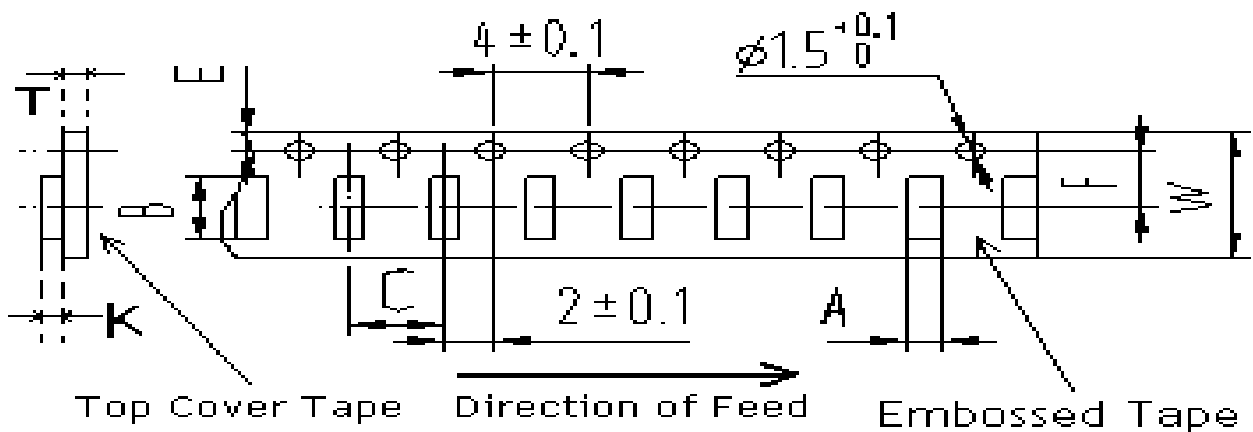
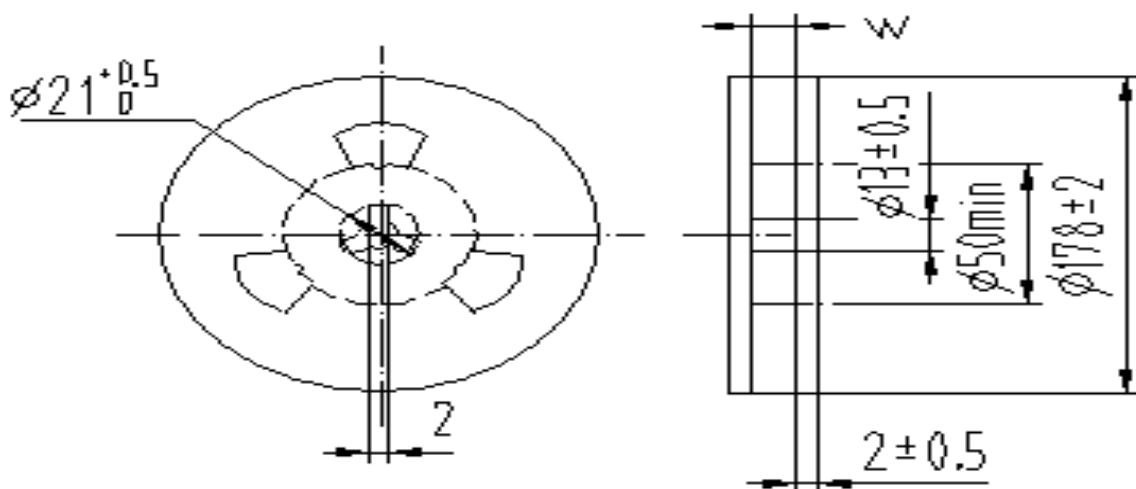


Diagram of Dimensions(mm)

Case Size	A±0.1	B±0.1	C±0.1	E±0.1	F±0.1	W±0.3	K±0.2	T±0.05
P	1.35	2.20	4.00	1.75	3.50	8.00	1.60	0.25
A	1.90	3.50	4.00	1.75	3.50	8.00	1.90	0.25
B	3.20	3.90	4.00	1.75	3.50	8.00	2.10	0.25
C	3.70	6.30	8.00	1.75	5.50	12.00	3.00	0.30
D	4.80	7.70	8.80	1.75	5.50	12.00	3.30	0.30



Packing Units

Case Size	Taped; Pieces/reel for 178mm diameter
P	3000
A	2000
B	2000
C	750/500
D	750/500



Components Characteristics

Capacitance

Capacitance is measured at 100Hz, less than 1.0volts rms, at 25°C.

Capacitance increases with increasing temperature.

DC leakage current(DCL)

DC leakage current is the current that, after a five minute charging period, flows through a capacitor when voltage is measured at 25°C with full rated DC voltage applied to the capacitor through a 1000 ohm resistor in series with the capacitor. DC current increases with increasing temperature.

Dissipation Factor (D.F)

Dissipation factor is measured at 100Hz up to 1.0 volt rms maximum.

DF increases with increasing frequency.

Temperature stability

Step No	TEMP.	CAPACITANCE	DCL	D.F
1	+25°C	Within specified tolerance	Within original limit	Within original limit
2	-55°C	Within ± 10% initial value	N/A	See table 2
3	+85°C	Within ± 10% initial value	Within 10× original limit	See table 2
4	+125°C	Within ± 12% initial value	Within 12.5× original limit	See table 2

Temperature cycle

-55°C, room temperature, 125°C, 5 cycles 30min, post test performance:

* Capacitance---within ±5% initial value

* DC Leakage---within initial limit

* D.F---within initial limit

Life test

2000 hours, +85°C, rated voltage or 2000 hours, +125°C, 2/3 rated voltage, post test performance:

* Capacitance---within ±10% initial value

* DC Leakage---within 200% initial limit

* D.F---within 150% initial limit

Surge voltage 85°C

1.15 rated voltage measurement is done after 1000 cycles of 0.5 minutes on, 5.5 minutes off with 1000Ω of series resistance, post test performance:

* Capacitance---within ±10% initial value

* DC Leakage---within initial limit

* D.F---within initial limit

Solvent resistance

Solution: isopropyl alcohol, solution temp:20-25°C. The specimen shall be completely immersed in the solution for min. and the marking shall be rubbed with a brush 10 times. The above cycle will be applied 3 times and then the marking shall be examined visually, post test performance:

* Capacitance---within initial value

* DC Leakage---within initial limit

* D.F---within initial limit

* Physical---Marking must be legible

Solderability

Solder temperature:230±5°C, immersion times(solder):3±0.5sec, Immersion in flux 5-10sec, The specimen shall be immersed completely, post test performance: The dipped portion of the termination is at least 95% covered by a new solder coating.