

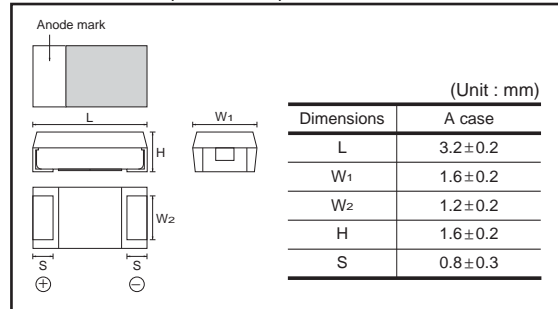
# Chip tantalum capacitors

## TC Series A Case

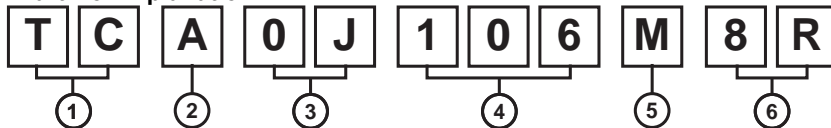
### ●Features (A)

- 1) Vital for all hybrid integrated circuits board application.
- 2) Wide capacitance range.
- 3) Screening by thermal shock.

### ●Dimensions (Unit : mm)



### ●Part No. Explanation



① Series name  
TC

② Case style  
TC..... A

③ Rated voltage

Rated voltage (V)	4	6.3	10	16	20	25	35
CODE	0G	0J	1A	1C	1D	1E	1V

④ Nominal capacitance  
Nominal capacitance in pF in 3 digits:  
2 significant figures followed by the figure  
representing the number of 0's.

⑤ Capacitance tolerance  
M : ±20%

⑥ Taping  
8 : Reel width : 8mm  
R : Positive electrode on the side opposite to sprocket hole

● **Rated table**

(μF)	Rated voltage (V)						
	4 0G	6.3 0J	10 1A	16 1C	20 1D	25 1E	35 1V
1 (105)				A	A	A	* A
1.5 (155)			A	A	A	A	
2.2 (225)			A	A	A	A	
3.3 (335)		A	A	A	A	A	
4.7 (475)	A	A	A	A	A	A	
6.8 (685)	A	A	A	A			
10 (106)	A	A	A	A			
15 (156)	A	A	A				
22 (226)	A	A	A				
33 (336)	A	A					
47 (476)	A	A					
68 (686)	A						
100 (107)	A						
150 (157)							

Remark) Case size codes (A) in the above show products line-up.  
 \* Under development

● **Marking**

The indications listed below should be given on the surface of a capacitor.

- (1) Polarity : The polarity should be shown by □ bar. (on the anode side)
- (2) Rated DC voltage : Due to the small size of A case, a voltage code is used as shown below.
- (3) Visual typical example (1) voltage code (2) capacitance code

Voltage Code	Rated DC Voltage (V)
g	4
j	6.3
A	10
C	16
D	20
E	25
V	35

Capacitance Code	Nominal Capacitance (μF)
A	1.0
E	1.5
J	2.2
N	3.3
S	4.7
W	6.8
a	10
e	15
j	22
n	33
s	47
w	68
ā	100

[A case] note 1)  $\frac{j}{(1)} \frac{a}{(2)}$

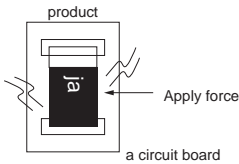


note 2) voltage code and capacitance code are variable with parts number

● Characteristics

Item		Performance	Test conditions (based on JIS C 5101-1 and JIS C 5101-3)															
Operating Temperature		-55°C~+125°C	Voltage reduction when temperature exceeds +85°C															
Maximum operating temperature with no voltage derating		+85°C																
Rated voltage (VDC)		4 6.3 10 16 20 25 35	at 85°C															
Category voltage (VDC)		2.5 4 6.3 10 13 16 22	at 125°C															
Surge voltage (VDC)		5 8 13 20 26 32 44	at 85°C															
DC Leakage current		0.5μA or 0.01CV whichever is greater Shown in " Standard list "	As per 4.9 JIS C 5101-1 As per 4.5.1 JIS C 5101-3 Voltage : Rated voltage for 1min															
Capacitance tolerance		Shall be satisfied allowance range. ±20%	As per 4.7 JIS C 5101-1 As per 4.5.2 JIS C 5101-3 Measuring frequency : 120±12Hz Measuring voltage : 0.5Vrms +1.5 to 2V.DC Measuring circuit : DC Equivalent series circuit															
Tangent of loss angle (Df, tan δ)		Shall be satisfied the voltage on " Standard list "	As per 4.8 JIS C 5101-1 As per 4.5.3 JIS C 5101-3 Measuring frequency : 120±12Hz Measuring voltage : 0.5Vrms +1.5 to 2V.DC Measuring circuit : DC Equivalent series circuit															
Impedance		Shall be satisfied the voltage on " Standard list "	As per 4.10 JIS C 5101-1 As per 4.5.4 JIS C 5101-3 Measuring frequency : 100±10kHz Measuring voltage : 0.5Vrms or less Measuring circuit : DC Equivalent series circuit															
Resistance to Soldering heat	Appearance	There should be no significant abnormality. The indications should be clear.	As per 4.14 JIS C 5101-1 As per 4.6 JIS C 5101-3 Dip in the solder bath Solder temp : 260±10°C Duration : 5±0.5s Repetition : 1 After the specimens, leave it at room temperature for over 24h and then measure the sample.															
	L.C.	Less than initial limit																
	ΔC / C	TCA0G686M8R : Within ±15% of initial value TCA0G107M8R : Within ±20% of initial value Others : Within ±5% of initial value																
	Df (tan δ)	Less than initial limit																
Temperature cycle	Appearance	There should be no significant abnormality. The indications should be clear.	As per 4.16 JIS C 5101-1 As per 4.10 JIS C 5101-3 Repetition : 5 cycles (1 cycle : steps 1 to 4) without discontinuation. <table border="1" data-bbox="863 1238 1171 1397"> <thead> <tr> <th></th> <th>Temp.</th> <th>Time</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>-55±3°C</td> <td>30±3min.</td> </tr> <tr> <td>2</td> <td>Room temp.</td> <td>3min.or less</td> </tr> <tr> <td>3</td> <td>125±2°C</td> <td>30±3min.</td> </tr> <tr> <td>4</td> <td>Room temp.</td> <td>3min.or less</td> </tr> </tbody> </table> After the specimens, leave it at room temperature for over 24h and then measure the sample.		Temp.	Time	1	-55±3°C	30±3min.	2	Room temp.	3min.or less	3	125±2°C	30±3min.	4	Room temp.	3min.or less
		Temp.		Time														
	1	-55±3°C		30±3min.														
	2	Room temp.		3min.or less														
3	125±2°C	30±3min.																
4	Room temp.	3min.or less																
L.C.	TCAP0J226 : Less than 150% of initial limit Others : Less than initial limit																	
ΔC / C	TCA0G686M8R : Within ±15% of initial value TCA0G107M8R : Within ±20% of initial value TCA0J476M8R : Within ±15% of initial value TCA1A226M8R : Within ±15% of initial value Others : Within ±10% of initial value																	
Df (tan δ)	Less than initial limit																	
Moisture resistance	Appearance	There should be no significant abnormality. The indications should be clear.	As per 4.22 JIS C 5101-1 As per 4.12 JIS C 5101-3 After leaving the sample under such atmospheric condition that the temperature and humidity are 60±2°C and 90 to 95% RH,respectively, for 500±12h leave it at room temperature for over 24h and then measure the sample.															
	L.C.	Less than initial limit																
	ΔC / C	TCA0G686M8R : Within ±15% of initial value TCA0G107M8R : Within ±20% of initial value Others : Within ±10% of initial value																
	Df (tan δ)	TCA0G686M8R : Less than 150% of initial limit TCA0G107M8R : Less than 150% of initial limit Others : Less than initial limit																

Item	Performance	Test conditions (based on JIS C 5101-1 and JIS C 5101-3)
Temperature Stability	Temp.	-55°C
	ΔC / C	Within 0/-12% of initial value
	Df (tan δ)	Shall be satisfied the voltage on " Standard list "
	L.C.	-
	Temp.	+85°C
	ΔC / C	TCA0G686M8R : Within +12/0% of initial value TCA0G107M8R : Within +12/0% of initial value Others : Within +10/0% of initial value
	Df (tan δ)	Shall be satisfied the voltage on " Standard list "
	L.C.	Less than 1000% of initial limit
	Temp.	+125°C
	ΔC / C	Within +15/0% of initial value
Surge voltage	Appearance	There should be no significant abnormality.
	L.C.	Shall be satisfied the voltage on " Standard list "
	ΔC / C	TCA0G686M8R : Within ±15% of initial value TCA0G107M8R : Within ±20% of initial value Others : ±10% of initial value
	Df (tan δ)	Less than initial limit
Loading at High temperature	Appearance	There should be no significant abnormality.
	L.C.	TCA0G686M8R : Less than 125% of initial limit TCA0G107M8R : Less than 125% of initial limit TCA1A226M8R : Less than 125% of initial limit TCA1E105M8R : Less than 125% of initial limit Others : Less than initial limit
	ΔC / C	TCA0G686M8R : Within ±15% of initial value TCA0G107M8R : Within ±20% of initial value TCA0J476M8R : Within ±15% of initial value TCA1A226M8R : Within ±15% of initial value Others : Within±10% of initial value
	Df (tan δ)	Less than initial limit
Terminal strength	Capacitance	The measured value should be stable.
	Appearance	There should be no significant abnormality.
		As per 4.29 JIS C 5101-1 As per 4.13 JIS C 5101-3 As per 4.26 JIS C 5101-1 As per 4.14 JIS C 5101-3 Apply the specified surge voltage via the serial resistance of 1kΩ every 5±0.5 min. for 30±5 s. each time in the atmospheric condition of 85±2°C. Repeat this procedure 1,000 times. After the specimens, leave it at room temperature for over 24h and then measure the sample. As per 4.23 JIS C 5101-1 As per 4.15 JIS C 5101-3 After applying the rated voltage for 2000+72/0 h without discontinuation via the serial resistance of 3Ω or less at a temperature of 85±2°C, leave the sample at room temperature / humidity for over 24h and measure the value. As per 4.35 JIS C 5101-1 As per 4.9 JIS C 5101-3 A force is applied to the terminal until it bends to 1mm and by a prescribed tool maintain the condition for 5s. (See the figure below)
		<p>(Unit : mm)</p> <p>thickness=1.6mm</p> <p>45 45</p> <p>50 20</p> <p>R230</p> <p>F (Apply force)</p> <p>1</p>

Item		Performance	Test conditions (JIS C 5101-1 and JIS C 5101-3)
Adhesiveness		The terminal should not come off.	As per 4.34 JIS C 5101-1 As per 4.8 JIS C 5101-3 Apply force of 5N in the two directions shown in the figure below for 10±1s after mounting the terminal on a circuit board.  
Dimensions		Refer to "External dimensions"	Measure using a caliper of JIS B 7507 Class 2 or higher grade.
Resistance to solvents		The indication should be clear	As per 4.32 JIS C 5101-1 As per 4.18 JIS C 5101-3 Dip in the isopropyl alcohol for 30±5s, at room temperature.
Solderability		3/4 or more surface area of the solder coated terminal dipped in the soldering bath should be covered with the new solder.	As per 4.15.2 JIS C 5101-1 As per 4.7 JIS C 5101-3 Dip speed=25±2.5mm / s Pre-treatment(accelerated aging): Leave the sample on the boiling distilled water for 1 h. Solder temp. : 245±5°C Duration : 3±0.5s Solder : M705 Flux : Rosin 25% IPA 75%
Vibration	Capacitance	Measure value should not fluctuate during the measurement.	As per 4.17 JIS C 5101-1 Frequency : 10 to 55 to 10Hz/min. Amplitude : 1.5mm
	Appearance	There should be no significant abnormality.	Time : 2h each in X and Y directions Mounting : The terminal is soldered on a print circuit board.

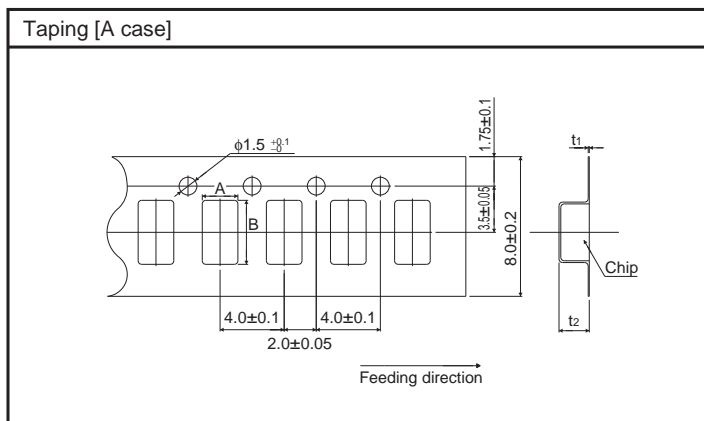
## ● Standard products list, TC series A case

Part No.	Rated voltage 85°C (V)	Category voltage 125°C (V)	Surge voltage 85°C (V)	Cap. 120Hz (μF)	Tolerance (%)	Leakage current 25°C 1WV.60s (μA)	Df 120Hz (%)			Impedance 100kHz (Ω)
							-55°C	25°C 85°C	125°C	
TC A 0G 475M8R	4	2.5	5	4.7	± 20	0.5	10	6	8	5.6
TC A 0G 685M8R	4	2.5	5	6.8	± 20	0.5	12	8	10	4.9
TC A 0G 106M8R	4	2.5	5	10	± 20	0.5	12	8	10	4.2
TC A 0G 156M8R	4	2.5	5	15	± 20	0.6	12	8	10	4
TC A 0G 226M8R	4	2.5	5	22	± 20	0.9	12	8	10	3
TC A 0G 336M8R	4	2.5	5	33	± 20	1.3	14	10	12	3.5
TC A 0G 476M8R	4	2.5	5	47	± 20	1.9	30	12	16	3.2
TC A 0G 686M8R	4	2.5	5	68	± 20	2.7	34	18	24	3
TC A 0G 107M8R	4	2.5	5	100	± 20	4	54	30	36	3
TC A 0J 335M8R	6.3	4	8	3.3	± 20	0.5	10	6	8	5.6
TC A 0J 475M8R	6.3	4	8	4.7	± 20	0.5	12	8	10	4.9
TC A 0J 685M8R	6.3	4	8	6.8	± 20	0.5	12	8	10	4.2
TC A 0J 106M8R	6.3	4	8	10	± 20	0.6	12	8	10	4
TC A 0J 156M8R	6.3	4	8	15	± 20	0.9	12	8	10	3
TC A 0J 226M8R	6.3	4	8	22	± 20	1.4	14	10	12	3.5
TC A 0J 336M8R	6.3	4	8	33	± 20	2.1	30	12	16	3.2
TC A 0J 476M8R	6.3	4	8	47	± 20	3.0	34	18	24	3.2
TC A 1A 155M8R	10	6.3	13	1.5	± 20	0.5	10	6	8	8.8
TC A 1A 225M8R	10	6.3	13	2.2	± 20	0.5	10	6	8	5.6
TC A 1A 335M8R	10	6.3	13	3.3	± 20	0.5	12	8	10	4.9
TC A 1A 475M8R	10	6.3	13	4.7	± 20	0.5	12	8	10	4.2
TC A 1A 685M8R	10	6.3	13	6.8	± 20	0.7	12	8	10	4
TC A 1A 106M8R	10	6.3	13	10	± 20	1.0	12	8	10	3
TC A 1A 156M8R	10	6.3	13	15	± 20	1.5	14	10	12	3.5
TC A 1A 226M8R	10	6.3	13	22	± 20	2.2	30	12	16	3.2
TC A 1C 105M8R	16	10	20	1	± 20	0.5	10	6	8	7
TC A 1C 155M8R	16	10	20	1.5	± 20	0.5	10	6	8	5.6
TC A 1C 225M8R	16	10	20	2.2	± 20	0.5	10	6	8	4.9
TC A 1C 335M8R	16	10	20	3.3	± 20	0.5	10	6	8	4.8
TC A 1C 475M8R	16	10	20	4.7	± 20	0.8	10	6	8	3.9
TC A 1C 685M8R	16	10	20	6.8	± 20	1.1	10	6	8	3.8
TC A 1C 106M8R	16	10	20	10	± 20	1.6	12	8	10	3.5
TC A 1D 105M8R	20	13	26	1	± 20	0.5	10	6	8	7
TC A 1D 155M8R	20	13	26	1.5	± 20	0.5	10	6	8	6
TC A 1D 225M8R	20	13	26	2.2	± 20	0.5	10	6	8	5.2
TC A 1D 335M8R	20	13	26	3.3	± 20	0.7	10	6	8	4.8
TC A 1D 475M8R	20	13	26	4.7	± 20	0.9	10	6	8	3.9
TC A 1E 105M8R	25	16	32	1	± 20	0.5	10	6	8	7
TC A 1E 155M8R	25	16	32	1.5	± 20	0.5	10	6	8	6
TC A 1E 225M8R	25	16	32	2.2	± 20	0.6	10	6	8	5.2
TC A 1E 335M8R	25	16	32	3.3	± 20	0.8	10	6	8	4.8
TC A 1E 475M8R	25	16	32	4.7	± 20	1.2	12	8	10	3.4
*TC A 1V 105M8R	35	22	44	1	± 20	0.5	10	6	8	7

\* = Under development

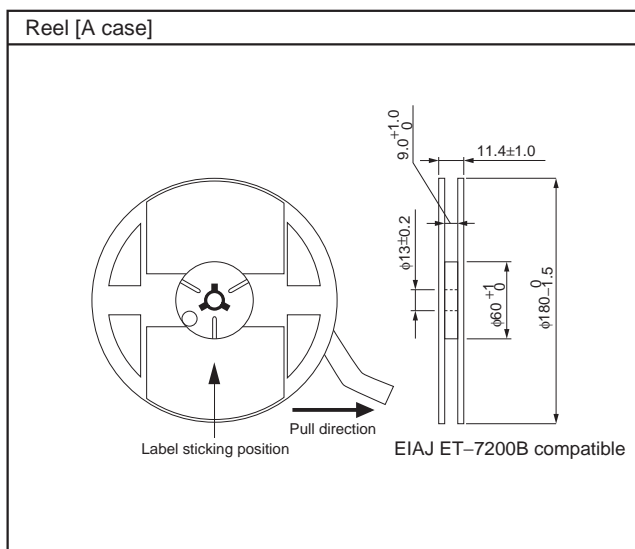
● Packaging specifications

Case code	A±0.1	B±0.1	t <sub>1</sub> ±0.05	t <sub>2</sub> ±0.1
A	1.9	3.5	0.25	1.9



● Packaging style

Case code	Packaging	Packaging style		Symbol	Basic ordering units
A case	Taping	plastic taping	φ180mm Reel	R	2,000pcs



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