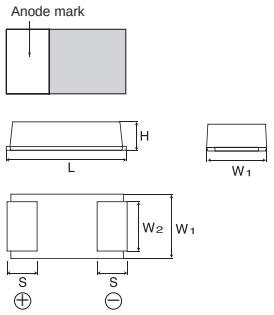
Chip tantalum capacitors

TCT Series CL Case

●Features (CL)

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

●Dimensions (Unit : mm)



(Unit : mm)

Dimensions	CL case
L	6.0±0.2
W1	3.2±0.2
W2	2.2±0.2
H	1.4±0.1
S	1.3±0.2

●Part No. Explanation

T	C	T	C	L	1	A	1	5	7	M	C	R
①			②		③		④			⑤	⑥	

① Series name
TCT

② Case style
TC····· CL

③ Rated voltage

Rated voltage (V)	2.5	4	6.3	10	16	20	25
CODE	0E	0G	0J	1A	1C	1D	1E

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
C : Tape width (12mm)
R : Positive electrode on the side opposite to sprocket hole

● Rated table

(µF)	Rated voltage (V)							
	2.5 0E	4 0G	6.3 0J	10 1A	16 1C	20 1D	25 1E	35 1V
10 (106)								* CL
100 (107)					* CL			
150 (157)				CL				
220(227)			CL					
330(337)		* CL						
470(477)	* CL							

Remark) Case size codes (CL) 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
(2) Rated DC voltage
(3) Visual typical example (1) capacitance code (2) voltage code

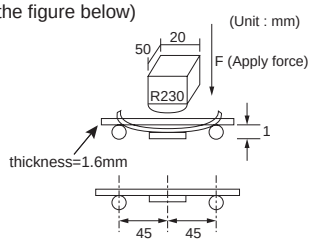
[CL case] note 1) $\frac{10V}{(1)}$ $\frac{150}{(2)}$

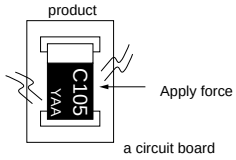
note 2) voltage code and capacitance code are variable with parts number

● Characteristics

Item		Performance	Test conditions (based on JIS C 5101–1 and JIS C 5101–3)
Operating Temperature		–55°C to +125°C	Voltage reduction when temperature exceeds +85°C
Maximum operating temperature with no voltage derating		+85°C	
Rated voltage (VDC)		2.5 4 6.3 10 16 20 25 35	at 85°C
Category voltage (VDC)		1.6 2.5 4 6.3 10 13 16 22	at 125°C
Surge voltage (VDC)		3.2 5.0 8 13 20 26 32 44	at 85°C
DC Leakage current		Shall be satisfied the voltage on " Standard list "	As per 4.9 JIS C 5101-1 As per 4.5.1 JIS C 5101-3 Voltage : Rated voltage for 5min
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±5°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 200% of initial limit	
	ΔC / C	Within ±20% of initial value	
	Df (tan δ)	Less than 200% of 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. After the specimens, leave it at room temperature for over 24h and then measure the sample.
	L.C.	Less than 200%of initial limit	
	ΔC / C	Within ±20% of initial value	
	Df (tan δ)	Less than 200%of 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, respectiveiy, for 500±12h leave it at room temperature for over 24h and then measure the sample.
	L.C.	Less than 200% of initial limit	
	ΔC / C	Within ±20% of initial value	
	Df (tan δ)	Less than 200% of initial limit	

	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

Item		Performance	Test conditions (based on JIS C 5101–1 and JIS C 5101– 3)
Temperature Stability	Temp.	–55°C	As per 4.29 JIS C 5101-1 As per 4.13 JIS C 5101-3
	ΔC / C	Within 0/–15% of initial value	
	Df (tan δ)	Shall be satisfied the voltage on " Standard list "	
	L.C.	–	
	Temp.	+85°C	
	ΔC / C	Within +15/–5% of initial value	
	Df (tan δ)	Shall be satisfied the voltage on " Standard list "	
	L.C.	5μA or 0.1CV whichever is greater	
	Temp.	+125°C	
	ΔC / C	Within +20/–5% of initial value	
	Df (tan δ)	Shall be satisfied the voltage on " Standard list "	
	L.C.	6.3μA or 0.2CV whichever is greater	
Surge voltage	Appearance	There should be no significant abnormality.	As per 4.26JIS C 5101-1 As per 4.14JIS C 5101-3 Apply the specified surge voltage 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.
	L.C.	Less than 200% of initial limit	
	ΔC / C	Within ±20% of initial value	
	Df (tan δ)	Less than 200% of initial limit	
Loading at High temperature	Appearance	There should be no significant abnormality.	As per 4.23 JIS C 5101-1 As per 4.15 JIS C 5101-3 After applying the rated voltage for 1000+36/0 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.
	L.C.	Less than 200% of initial limit	
	ΔC / C	Within ±20% of initial value	
	Df (tan δ)	Less than 200% of initial limit	
Terminal strength	Capacitance	The measured value should be stable.	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) 
	Appearance	There should be no significant abnormality.	

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 Time : 2h each in X and Y directions Mounting : The terminal is soldered on a print circuit board.
	Appearance	There should be no significant abnormality.	

● Standard products list, TCT series CL case

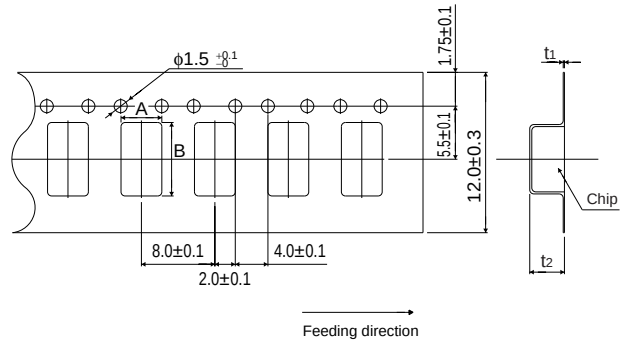
Part No.	Rated voltage 85°C (V)	Category voltage 125°C (V)	Surge voltage 85°C (V)	Cap. 120Hz (µF)	Tolerance (%)	Leakage current 25°C 1WV.60s (µA)	Df 120Hz (%)			Impedance 100kHz
							−55°C	25°C 85°C	125°C	(Ω)
TCT CL 0J 227M	6.3	4	8	220	±20	13.9	32	14	20	0.8
TCT CL 1A 157M	10	6.3	13	150	±20	15	30	12	16	1.3

□=Tolerance (M : ±20%)

● Packaging specifications

Case code	A±0.1	B±0.1	t_1±0.05	t_2±0.1
CL	3.5	6.6	0.3	1.7

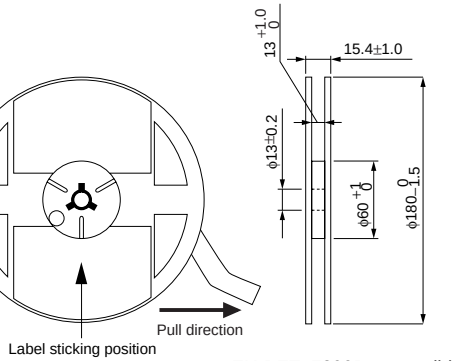
Taping [CL case]



● **Packaging style**

Case code	Packaging	Packaging style		Symbol	Basic ordering units
CL case	Taping	plastic taping	ϕ180mm Reel	R	1,000pcs

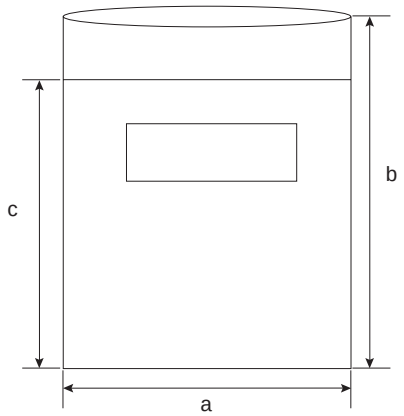
Reel [CL case]



EIAJ ET−7200B compatible

● **Damp proof package**

① One reel is packed in aluminum bag.
The size of aluminum bag is 240(a) x 250(b)mm.
The size up to 230(c)mm is to zipper.
② A desiccant is packed with a reel.
③ The aluminum bag is heat-sealed.
④ The label of the same as the label on the reel is placed on the aluminum bag.



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