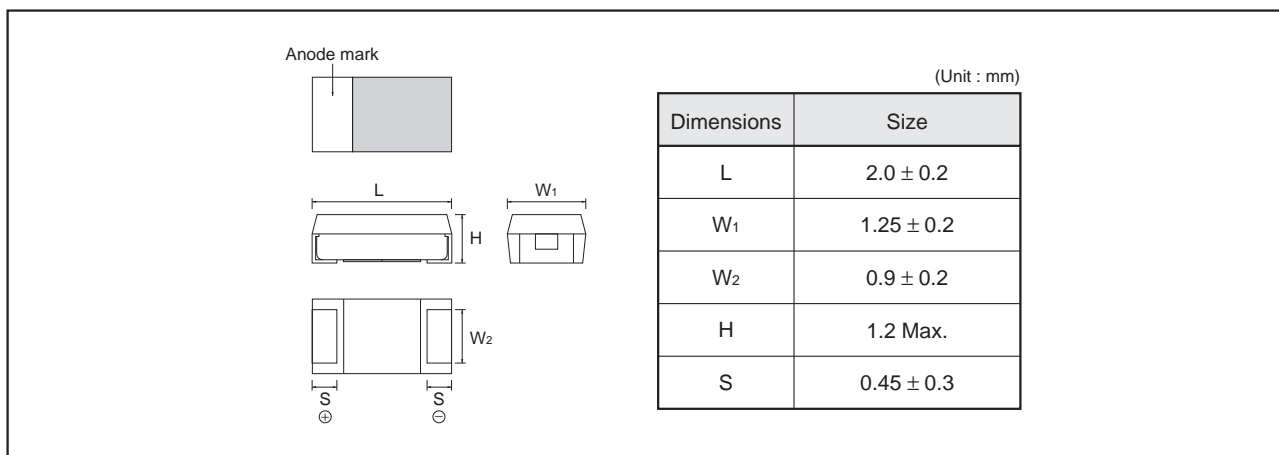


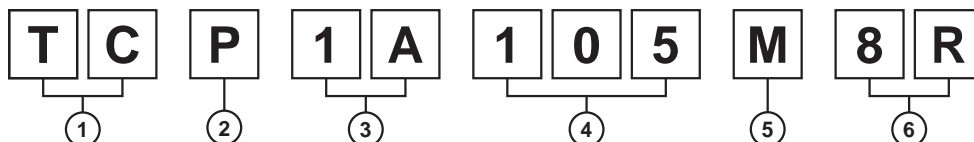
●Features

- 1) Small package, large capacitance chip tantalum capacitor.
- 2) Low impedance capacitors.
- 3) Screening by thermal shock.

●Dimensions



●Part No. Explanation



① Series name
TC

② Case style
P : 2012-12 (0805) size

③ Rated voltage

Rated voltage (V)	4	6.3	10	16	20	25
CODE	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
8 : Reel width : 8mm
R : Positive electrode on the side opposite to sprocket hole

●Rated table

Capacitance (μF)	Rated voltage (V.DC)				
	4	6.3	10	16	25
1.0 (105)			P	P	P
1.5 (155)			P		
2.2 (225)		P	P		
3.3 (335)			P		
4.7 (475)		P	P		
10 (106)	P	P	P		
15 (156)		P			
22 (226)	P	P			

Remark) Case size codes (P) in the above show products line-up.

●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 : A voltage code is shown as below table.
- (3) Capacitance : A capacitance code is shown as below table.

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

Capacitance Code	Nominal Capacitance (μF)
A	1.0
E	1.5
J	2.2
N	3.3
S	4.7
a	10
e	15
j	22

Visual typical example
voltage code and capacitance code are variable with parts number.

[P case]

EX.) $\frac{j}{(1)}$ $\frac{J}{(2)}$

(1) voltage code (2) capacitance code



●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 (V.DC)		4 6.3 10 16 20 25	at 85°C															
Category voltage (V.DC)		2.5 4 6.3 10 13 16	at 125°C															
Surge voltage (V.DC)		5.0 8 13 20 26 32	at 85°C															
DC Leakage current		Shall be satisfied the value on " 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 +1.5V.DC Measuring circuit : DC Equivalent series circuit															
Tangent of loss angle (Df, tan δ)		Shall be satisfied the value 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 +1.5V.DC Measuring circuit : DC Equivalent series circuit															
Impedance		Shall be satisfied the value 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	TCP0J226M8R : Within ±20% of initial value TCP1A106M8R : Within ±20% of initial value Others : Within ±10% of initial value																
	Df (tan δ)	Less than 150% 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. <table border="1" data-bbox="901 1317 1259 1478"> <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.	TCP0J226M8R : Less than 150% of initial limit Others : Less than initial limit																	
ΔC / C	1 to 10μF : Within ±10% of initial value 15 to 33μF : Within ±20% of initial value TCP1A106M8R : Within ±20% of initial value																	
Df (tan δ)	Less than 150% 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, respectively, for 500±12h leave it at room temperature for over 24h and then measure the sample.															
	L.C.	TCP0G336M8R : Less than 150% of initial limit Others : Less than initial limit																
	ΔC / C	Within ±20% of initial value																
	Df (tan δ)	Less than 150% of initial limit																

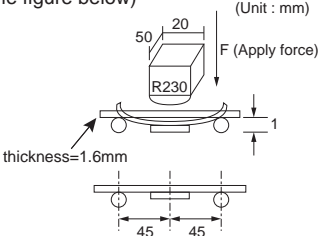
Item	Performance	Test conditions (based on JIS C 5101-1 and JIS C 5101-3)
Temperature Stability	Temp.	-55°C
	$\Delta C / C$	Within 0/-15% of initial value
	Df (tan δ)	Shall be satisfied the voltage on " Standard list "
	L.C.	-
	Temp.	+85°C
	$\Delta C / C$	Within +15/0% of initial value
	Df (tan δ)	Shall be satisfied the voltage on " Standard list "
	L.C.	Less than 1000% of initial limit
	Temp.	+125°C
	$\Delta C / C$	Within +20/0% of initial value
	Df (tan δ)	Shall be satisfied the voltage on " Standard list "
L.C.	Less than 1250% of initial limit	
Surge voltage	Appearance	There should be no significant abnormality.
	L.C.	Shall be satisfied the voltage on " Standard list "
	$\Delta C / C$	TCP0J226M8R : Within $\pm 20\%$ of initial value Others : Within $\pm 10\%$ of initial value
	Df (tan δ)	Less than 150% of initial limit
Loading at High temperature	Appearance	There should be no significant abnormality.
	L.C.	TCP0J226M8R : Less than 150% of initial limit Others : Less than initial limit
	$\Delta C / C$	TCP0J226M8R : Within $\pm 20\%$ of initial value Others : Within $\pm 10\%$ of initial value
	Df (tan δ)	Less than 150% of initial limit
Terminal strength	Capacitance	The measured value should be stable.
	Appearance	There should be no significant abnormality.
Adhesiveness	The terminal should not come off.	

As per 4.29 JIS C 5101-1
As per 4.13 JIS C 5101-3

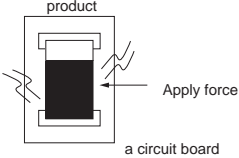
As per 4.26 JIS C 5101-1
As per 4.14 JIS C 5101-3
Apply the specified surge voltage via the serial resistance of 1k Ω every 5 \pm 0.5 min. for 30 \pm 5 s. each time in the atmospheric condition of 85 \pm 2°C. Repeat this procedure 1,000 times. After the specimens, leave it at room temperature for over 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 1000+36/0 h without discontinuation via the serial resistance of 3 Ω or less at a temperature of 85 \pm 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)



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 \pm 1s after mounting the terminal on a circuit board.

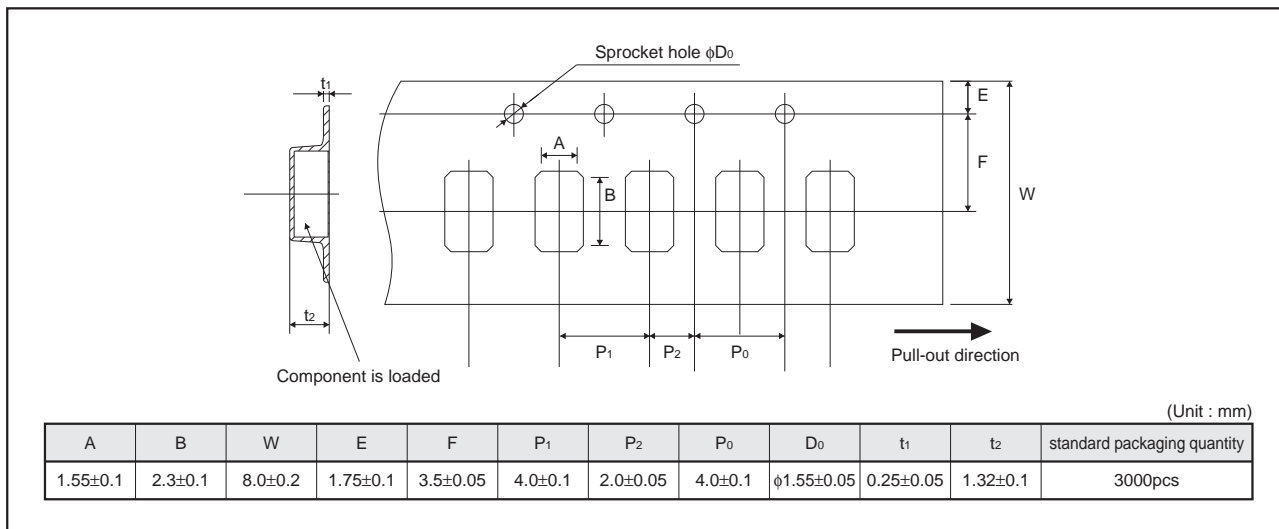


Item		Performance	Test conditions (JIS C 5101-1 and JIS C 5101-3)
Dimensions		Refer to "External dimensions"	Measure using a caliper of JIS B 7507 Class 2 or higher grade.
Resistance to solvents		The indication should be clear	As per 4.32 JIS C 5101-1 As per 4.18 JIS C 5101-3 Dip in the isopropyl alcohol 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.	

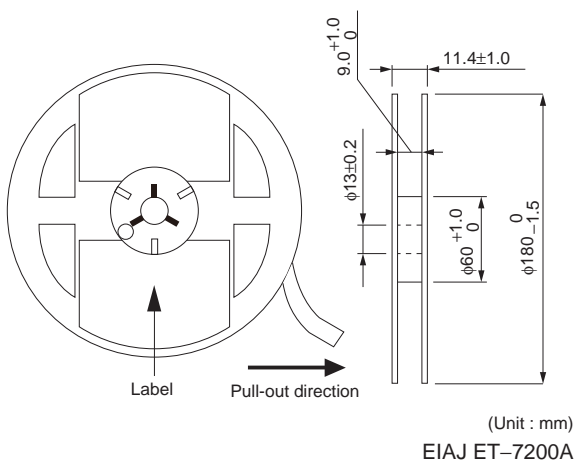
●Standard products list

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 P 0G 106 M8R	4	2.5	5	10	± 20	0.5	30	20	30	9.3
TC P 0G 226 M8R	4	2.5	5	22	± 20	0.9	30	20	30	7.7
TC P 0J 225 M8R	6.3	4	8	2.2	± 20	0.5	30	20	30	17.5
TC P 0J 475 M8R	6.3	4	8	4.7	± 20	0.5	30	20	30	11.8
TC P 0J 106 M8R	6.3	4	8	10	± 20	0.6	30	20	30	8.3
TC P 0J 156 M8R	6.3	4	8	15	± 20	0.9	30	20	30	7.7
TC P 0J 226 M8R	6.3	4	8	22	± 20	1.4	38	25	38	5.0
TC P 1A 105 M8R	10	6.3	13	1.0	± 20	0.5	15	10	15	17.5
TC P 1A 155 M8R	10	6.3	13	1.5	± 20	0.5	30	20	30	16.1
TC P 1A 225 M8R	10	6.3	13	2.2	± 20	0.5	30	20	30	14.4
TC P 1A 335 M8R	10	6.3	13	3.3	± 20	0.5	30	20	30	11.8
TC P 1A 475 M8R	10	6.3	13	4.7	± 20	0.5	30	20	30	9.3
TC P 1A 106 M8R	10	6.3	13	10	± 20	1.0	30	20	30	7.7
TC P 1C 105 M8R	16	10	20	1.0	± 20	0.5	15	10	15	16.1
TC P 1E 105 M8R	25	16	32	1.0	± 20	0.6	30	20	30	9.3

●Packaging specifications



●Reel dimensions



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