Features

- 1) Conductive polymer used at the cathode for ultra-low ESR.
- 2) Bottom electrode configuration results in the largest capacitance.
- 3) Compact, low profile, high capacitance contribute to smaller, thinner sets with greater functionality.
- 4) Conductive polymer has a self-healing function that prevents failure, resulting in safe, high reliability operation.

Dimensions



Part No. Explanation



① Series name TCTO

(4) Nominal capacitance

Nominal capacitance in pF in 3 digits:

2 significant figures followed by the figure representing the number of 0's.

2 Case styleM : 1608-1608(09)size

③ Rated voltage

CODE	Rated voltage(V)
0E	2.5
0G	4
0J	6.3
1A	10
1C	16
1D	20
1E	25
1V	35
1H	50

- (5) Capacitance tolerance M : $\pm 20\%$
- 6 Taping
 - 8: Tape width

R: Positive electrode on the side opposite to sprocket hole

⑦ Discrimination code

Rated table

ESR(mΩ)

Capac	itance			F	Rated volta	age (V.DC)		
(µF)		2.5	4	6.3	10	16	20	25	35
1	(105)							☆700	
1.5	(155)								
2.2	(225)				500	☆500			
3.3	(335)				500				
4.7	(475)				500				
6.8	(685)								
10	(106)			500					
15	(156)								
22	(226)								
33	(336)								
47	(476)								
68	(686)								
100	(107)								

☆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: A voltage code is shown as below table.

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

Voltage Code	Rated DC	Cap	acitance Code	Nominal Capacitance (uE)	Capacitance Code	Nominal Capacitance (uE)
	Voltage (V)		0000			
е	2.5		<u>E</u>	0.15	е	15
g	4		<u>N</u>	0.33	j	22
j	6.3		<u>S</u>	0.47	n	33
k	8		А	1.0	S	47
А	10		E	1.5	W	68
С	16		J	2.2	а	100
D	20		Ν	3.3	e	150
E	25		S	4.7	j	220
V	35		W	6.8	n	330
Н	50		а	10	S	470

Visual typical example

voltage code and capacitance code are variable with parts number.

[TCTO series M case]



а

(2)





Characteristics

ltem		Performance		Test conditions					
		i chemianeo		(based on JIS C 5101-1 and JIS C 5101-3)					
Operating Tempe	erature	-55℃~+105℃		Voltage reduction when temperature exceeds					
				35°C					
Maximum operating		+85℃							
temperature with	no								
voltage derating									
Rated voltage (V	.DC)	Refer to " Standard list ".	at	85℃					
Category voltage	(V.DC)	Refer to " Standard list ".	at	105℃					
Surge voltage (V	.DC)	Refer to " Standard list ".	at	at 85℃					
DC Lookana aver		Chall he estistical the velue on							
DC Leakage curr	ent	Shall be satisfied the value on		s per 4.	9 JIS C 5101-1				
		" Standard list ".	As	s per 4.	5.1 JIS C 5101-3				
			Vo	oltage :	Rated voltage for	omin			
Capacitance tole	rance	Shall be satisfied allowance range.	As	s per 4.	7 JIS C 5101-1				
		±20%	As	s per 4.	5.2 JIS C 5101-3				
			M	easurin	g frequency : 120 :	± 12Hz			
			M	easurin	g voltage : 0.5Vrm	s + 1.5V.DC			
			M	easurin	g circuit : DC Equi	valent series circuit			
Tangent of loss a	ingle	Shall be satisfied the value on	As	s per 4.	8 JIS C 5101-1				
(Df,tanδ)		" Standard list ".		As per 4.5.3 JIS C 5101-3					
			M	Measuring frequency : 120 ± 12Hz					
			M	Measuring voltage : 0.5Vrms + 1.5V.DC					
			M	Measuring circuit : DC Equivalent series circuit					
ESR		Shall be satisfied the value on	As	As per 4.10 JIS C 5101-1					
		" Standard list ".		As per 4.5.4 JIS C 5101-3					
			M	easurin	g frequency : 100 :	± 10kHz			
			M	easurin	g voltage : 0.5Vrm	s or less			
			Measuring circuit : DC Equivalent series circuit						
Resistance to	Appe-	There should be no significant	As	s per 4.	14 JIS C 5101-1				
Soldering	arance	abnormality.	As	s per 4.	6 JIS C 5101-3				
heat		The indications should be clear.	Di	p in the	solder bath				
	L.C.	Less than 300% of initial limit.	S	Solder temp : 240 ± 5°C					
			D	uration	: 10 ± 0.5s				
	⊿C/C	Within ±20% of initial value.	R	epetitio	on : 1				
			Af	After the specimens, leave it at room temperature					
	DF	Less than 300% of initial limit.	for over 24h and then measure the sample.						
	(tanð)								
Temperature	Appe-	There should be no significant	As	s per 4.	16 JIS C 5101-1				
cycle	arance	abnormality.	As per 4.10 JIS C 5101-3						
		The indications should be clear.		Repetition : 5 cycles					
L.C.		Less than 1000% of initial limit.		cycle :	steps 1 to 4) witho	ut discontinuation.			
					Temp.	Time			
	⊿C/C	Within $\pm 20\%$ of initial value.		1	-55±3℃	30±3min			
				2	Room Temp.	3min or less			
	DF	Less than 300% of initial limit.		3	105±2℃	30±3min			
	(tanδ)			4	Room Temp.	3min or less			
			After the specimens, leave it at room temperature						
			for over 24h and then measure the sample.						
			Ini	itial valu	ue for ⊿C/C shall I	be the value after			
			mounted.						

ltem		Performance	Test conditions (based on JIS C 5101-1 and JIS C 5101-3)			
Moisture	Appe-	There should be no significant	As per 4.22 JIS C 5101-1			
resistance	arance	abnormality.	As per 4.12 JIS C 5101-3			
		The indications should be clear.	After leaving the sample under such atmospheric			
	L.C.	Less than 300% of initial limit.	condition that the temperature and humidity are			
			40±2°C and 90 to 95% RH, respectively, for			
	⊿C/C	Within +30/-20% of initial value.	500+12/0h leave it at room temperature for			
			over 24h and then measure the sample.			
	DF	Less than 300% of initial limit.	Initial value for ⊿C/C shall be the value after			
	(tanδ)		mounted.			
Temperature	Temp.:-	55°C	As per 4.29 JIS C 5101-1			
Stability	⊿C/C	Within 0/-20% of initial value.	As per 4.13 JIS C 5101-3			
			Initial value for ∠C/C shall be the value after			
	DF	Shall be satisfied the value on	mounted.			
	(tanδ)	" Standard list "				
	L.C.	-				
	Temp.:-	-105°C				
	⊿C/C	Within +50/0% of initial value.				
	DF	Shall be satisfied the value on	-			
	(tanδ)	" Standard list "				
	L.C.	Less than 1000% of initial limit.				
Surae	Appe-	There should be no significant	As per 4.26JIS C 5101-1			
voltage	arance	abnormality.	As per 4.14JIS C 5101-3			
0		The indications should be clear.	Apply the specified surge voltage via the serial			
	L.C.	Less than 200% of initial limit.	resistance of $1k\Omega$ ever 5±0.5 min. for 30±5 s.			
			each time in the atmospheric condition of			
	⊿C/C	Within ±20% of initial value.	85±2°C. Repeat this procedure 1,000 times.			
			After the specimens, leave it at room temperature			
	DF	Less than 200% of initial limit.	for over 24h and then measure the sample.			
	(tanδ)		Initial value for ⊿C/C shall be the value after			
		1	mounted.			
Loading at	Appe-	There should be no significant	As per 4.23 JIS C 5101-1			
High	arance	abnormality.	As per 4.15 JIS C 5101-3			
temperature		The indications should be clear.	After applying the rated voltage for 1000+72/0 h			
	L.C.	Less than 400% of initial limit.	without discontinuation via the serial resistance			
			of 3Ω or less at a temperature of $85\pm2^{\circ}C$, leave			
	⊿C/C	Within ±20% of initial value.	the sample at room temperature / humidity for			
			over 24h and measure the value.			
	DF	Less than 300% of initial limit.	Initial value for ∠C/C shall be the value after			
	(tanδ)		mounted.			



ltem		Performance	Test conditions		
		T chomanee	(based on JIS C 5101-1 and JIS C 5101-3)		
Terminal	Capa-	The measured value should be	As per 4.35 JIS C 5101-1		
strength	citance	stable.	As per 4.9 JIS C 5101-3		
	Appe-	There should be no significant	A force is applied to the terminal until it bends to		
	arance	abnormality.	1mm and by a prescribed tool maintains the		
			condition for 5s.		
			$50 \xrightarrow{20}$ F(Apply force) 1.0mm thickness=1.6mm $45 \xrightarrow{45}$		
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 2N in the two directions shown in		
			the figure below for 10±1s after mounting the		
			terminal on a circuit board.		
			Products Apply force A circuit board		
Dimensions		Refer to "External dimensions".	Measure using a caliper of JIS B 7507 Class		
Desistence to		The indication of solutions are set	2 or higher grade.		
Resistance to		The indication should be clear.	As per 4.32 JIS C 5101-1		
solvents			As per 4.18 JIS C 5101-3		
			Dip in the isopropyl alconol for 30±5s, at room		
Soldorobility		2/4 or more surface area of the	temperature.		
Solderability		3/4 of more surface area of the	As per 4.15.2 JIS C 5101-1		
		the soldering bath should be	As per 4.7 513 C 5101-5		
		covered with the new solder	Pre-treatment (accelerated aging):		
		covered with the new solder.	Leave the sample on the boiling distilled water		
			for 1h		
			Solder temp : 245+5°C		
			Duration : $3+0.5s$		
			Solder : M705		
			Flux : Rosin 25% IPA 75%		
Vibration	Capa-	Measure value should not fluctuate	As per 4.17 JIS C 5101-1		
	citance	during the measurement.	Frequency : 10 to 55 to 10Hz/min.		
	Appe-	There should be no significant	Amplitude : 1.5mm		
	arance	abnormality.	Time : 2h each in X and Y directions		
			Mounting : The terminal is soldered on a print		
			circuit board.		

• Standard products list

	Rated	Category	Surge	Cap.	Tole-	Leakage		tanδ		ESR	Max
	voltage	voltage	voltage		rance	current		120Hz			allowable
	85°C	105°C	85°C	120Hz		25℃				100kHz	ripple
Part No.						1WV	-55℃	25°C	105℃		current
						5min					≦45°C
											100kHz
	(V)	(V)	(V)	(µF)	(%)	(µA)	(%)	(%)	(%)	(mΩ)	(mArms)
TCTOM0J106M8R-ZT1	6.3	5	8	10	±20	6.3	8	8	12	500	264
TCTOM1A225M8R	10	8	13	2.2	±20	2.2	6	6	9	500	264
TCTOM1A335M8R	10	8	13	3.3	±20	3.3	6	6	9	500	264
TCTOM1A475M8R	10	8	13	4.7	±20	4.7	6	6	9	500	264
* TCTOM1C225M8R-ZT1	16	12.8	20	2.2	±20	10.6	10	10	15	500	264
* TCTOM1E105M8R-7B1	25	20	29	1	±20	7.5	10	10	15	700	223

* This specification has possibility of charge, due to underdevelopment product.

Please ask for latest specification to our sales.



Packaging specifications



• Reel dimensions



Damp proof package

①One 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.
- ②A desiccant is packed with a reel.
- ③The 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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