

Data Sheet

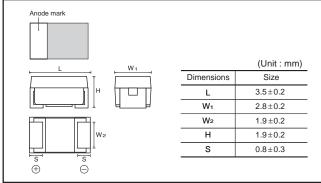
Chip tantalum capacitors (Fail-safe open structure type)

TCFG Series B Case

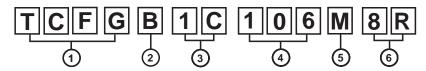
Features

- 1) Safety design by open function built in.
- 2) Wide capacitance range
- 3) Screening by thermal shock.

●Dimensions (Unit : mm)



● Product No. Explanation



- 1 Series name
- 2 Case code
- 3 Rated voltage

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

(4) Capacitance

Nominal capacitance in pF in 3 digits: 2 significant 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

●Capacitance range

(μF)	Rated voltage (V.DC)										
(μι)	2.5	4	6.3	10	16	20	25				
3.3 (335)					В	B *	В				
4.7 (475)				В	В	В	В				
6.8 (685)				В	В	B *					
10 (106)			В	В	В	B *					
15 (156)		В	В	В	В						
22 (226)		В	В	В	В						
33 (336)		В	В	В	В						
47 (476)		В	В	В							
68 (686)		В	В	В							
100 (107)		В	В	В							
150 (157)		В	В	В							
220 (227)	В	В	В								
330 (337)	B *	B *									

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

●Marking

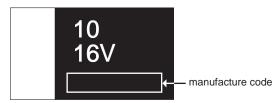
The indications listed below should be given on the surface of a capacitor.

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

[B Case]

note 1) Visual typical example (1) voltage code (2) capacitance code

10 16V (2) (1)



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

^{*:} Under development

Data Sheet

Characteristics

Item			Performance							Test conditions (based on JIS C5101-1 and JIS C5101-3)					1-3)								
Operating Tem	−55 °C to +125 °C						Voltage reduction when temperature exceeds +85°C																
Maximum operatir with no voltage de	+85 °C																						
Rated Voltage	(V.DC)	2.5	4	6.3	10	10	6 20	25	5		at	85°C											
Category Volta	ge (V.DC)	1.6	2.5	4	6.3	10	0 13	16	3		at	125°C)										
Surge Voltage		3.2	5.0	8	13	2	0 26	32	2		at	85°C											
DC leakage cu	rrent						hiche rd list'		is	greater	As	As per 4.9 JIS C 5101-1 As per 4.5.1 JIS C 5101-3 Voltage : Rated voltage for 1 min											
Capacitance to	lerance	Sha ±20		e sati	sfied	all	owand	ce ra	ang	ge.	As Me Me	per 4 per 4 asurinç asurinç asurinç	I.5. g fr g vo	.2 c equ	JIS uend age	C 5	101 : 12 : 0.	-3 20± .5V	±12 /rms	s, +'	1.5V. lent s		s circuit
Tangent of loss (Df, tanδ)	angle	Sha	all be	e sati	sfied	th	e volta	ige o	on	"Standard list"	As Me Me	per 4 per 4 asurino asurino asurino asurino	l.5. g fr g vo	.3 c equ	JIS uend age	C 5	101 : 12 : 0.	-3 20± .5∨	±12 /rms	s, +	1.5V. lent s		s circuit
Impedance		Sha	all be	e sati	sfied	th	e volta	ige (on	"Standard list"	As Me Me	per 4 per 4 asurin asurii	I.5. ng fi ng	4 creq	JIS Juen Itag	C 5 icy : ge :	101 100 0.5	-3 0±′ 5Vr	10k ms	or l		ries	circuit
Resistance to	Appearance									bnormality.		per 4											
soldering heat	L.C	TCI TCI TCI	The indications should be clear. TCFGB0G227M8R: Less than 150% of initial limit TCFGB0J227M8R: Less than 150% of initial limit TCFGB1A157M8R: Less than 150% of initial limit TCFGB1A107M8R: Less than 150% of initial limit TCFGB1E475M8R: Less than 150% of initial limit Others: Less than initial limit						Dip So Du Re Aft	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													
	TCI TCI TCI TCI	$ \begin{array}{llll} TCFGB0G227M8R : Within \pm 15\% \ of initial \ value \\ TCFGB0J227M8R : Within \pm 15\% \ of initial \ value \\ TCFGB1A157M8R : Within \pm 15\% \ of initial \ value \\ TCFGB1A107M8R : Within \pm 15\% \ of initial \ value \\ TCFGB1E475M8R : Within \pm 10\% \ of initial \ value \\ Others : Within \pm 5\% \ of initial \ value \\ \end{array} $						for	for over 24h and then measure the sample.														
	tanδ	3.3 to 33µF : Less than initial limit : Less than 150% of initial limit TCFGB0E227M8R : Less than 200% of initial limit TCFGB0J227M8R : Less than 150% of initial limit TCFGB1A157M8R : Less than 150% of initial limit TCFGB1A107M8R : Less than 150% of initial limit TCFGB1C336M8R : Less than 150% of initial limit TCFGB1C336M8R : Less than 150% of initial limit TCFGB1C336M8R : Less than 150% of initial limit																					
Fail-Safe open	unit actuation	Wit	thin (320°	C – 2	20:	S				Dip	in the						°C					
Temperature	Appearance	The	ere s	houl	d be	no	signifi	can	t al	bnormality.		per 4	1.16	6 J	IS (C 51	01-	-1					
cycle	L.C	TCI TCI TCI	FGB(FGB [*] FGB [*])J227 IA157 IA107	M8R 'M8R 'M8R	1: L 1: L 1: L	ess that ess that ess that ess that	an 20 an 20 an 20 an 19	009 009 009 509	% of initial limit % of initial limit % of initial limit % of initial limit % of initial limit	Re	per 4 petition hout of Step	on dis	: 5	cyc	cles	(1 (сус		: ste	_	to 4	4)
	ΔC / C	-	ers FGB()F227	M8R		ess the			of initial value	-	1	4			± 3°() <u>+</u> 3r			
	2070	TCI	FGB()G22	7M8R	۱: ۱	Nithin	±15	% (of initial value of initial value		3	+			ten ±2°(3		n. oi)±3r	r less min	+	
		TCI	FGB′	1A157	M8R	١: ١	Vithin	±20°	% (of initial value of initial value		4	\dagger			ten		3			r less	;	
	tanδ	3.3 47 t TCI TCI TCI TCI	to 33 to 15 FGB(FGB' FGB'	βμF 0μF 0G227 0J227 1A157	7M8R M8R ′M8R ′M8R	: \	Vithin Less th	±10° nan i nan i nan i nan i nan i	niti 150 150 200 200 200	of initial value al limit 0% of initial limit		er the over 2											erature
Moisture resistance	Appearance						signifi uld be			bnormality.	As	per 4 per 4	1.12	2 J	IS (C 51	01-	-3					_
L.C		TCFGB0G227M8R: Less than 150% of initial limit TCFGB0J227M8R: Less than 200% of initial limit TCFGB1A157M8R: Less than 200% of initial limit TCFGB1A107M8R: Less than 200% of initial limit TCFGB1E475M8R: Less than 150% of initial limit Others: Less than initial limit Others					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 level it at room temperature for over 24 and then measure the sample.																
	ΔC / C	TCI TCI TCI Oth	FGB(FGB' FGB' ners	0J227 1A157 1A107	M8R 'M8R	: \	Within Within Within Within	±20° ±20° ±20° ±10°	% (% (% (of initial value of initial value of initial value of initial value of initial value													
	tanδ	TCI TCI TCI TCI	FGB(FGB [*] FGB [*]	0μF 0G227 0J227 1A157	M8R 'M8R 'M8R	:	Less the Les	nan 7 nan 7 nan 2 nan 2	150 150 200 200 200	al limit 0% of initial limit													

Item		Performance	Test conditions (based on JIS C5101-1 and JIS C5101-3)					
Temperature Stability	Temp.	−55°C	As per 4.29 JIS C 5101-1					
Stability	ΔC / C	TCFGB0G227M8R: Within 0/-15% of initial value TCFGB0J227M8R: Within 0/-30% of initial value TCFGB1A157M8R: Within 0/-30% of initial value TCFGB1A107M8R: Within 0/-30% of initial value Others: Within 0/-12% of initial value	As per 4.13 JIS C 5101-3					
	tanδ	Shall be satisfied the value on Table5						
	L.C	_						
	Temp.	+85°C	-					
	ΔC / C	TCFGB0G227M8R: Within +12/0% of initial value TCFGB0J227M8R: Within +15/0% of initial value TCFGB1A157M8R: Within +15/0% of initial value TCFGB1A107M8R: Within +15/0% of initial value Others: Within +10/0% of initial value						
	tanδ	Shall be satisfied the value on Table5	-					
	L.C	Less than 1000% of intial limit	-					
	Temp.	+125°C						
	ΔC / C	TCFGB0J227M8R : Within +20/0% of initial value TCFGB1A157M8R : Within +20/0% of initial value TCFGB1A107M8R : Within +20/0% of initial value TCFGB1C336M8R : Within +20/0% of initial value Others : Within +15/0% of initial value						
	tanδ	Shall be satisfied the value on Table5						
	L.C	Less than 1250% of initial limit						
Surge Voltage	Appearance	There should be no significant abnormality. The indications should be clear.	As per 4.26 JIS C 5101-1 As per 4.14 JIS C 5101-3					
-	L.C	TCFGB0G227M8R: Less than 150% of initial limit TCFGB0J227M8R: Less than 200% of initial limit TCFGB1A157M8R: Less than 200% of initial limit TCFGB1A107M8R: Less than 200% of initial limit TCFGB1E475M8R: Less than 150% of initial limit TCFGB1E475M8R: Less than initial limit	Apply the specified surge voltage via the seria resistance of 1kΩ every 5±0.5min. for 30±5 s. each time in the atmospheric condit of 85±2°C. Repeat this procedure 1,000 times.					
	ΔC / C	TCFGB0E227M8R: Within ±12% of initial value TCFGB0G227M8R: Within ±15% of initial value TCFGB0J227M8R: Within ±20% of initial value TCFGB1A157M8R: Within ±20% of initial value TCFGB1A107M8R: Within ±20% of initial value Others: Within ±10% of initial value	After the specimens, leave it at room temperature for over 24h and then measure the sample.					
	tanδ	$\begin{array}{llllllllllllllllllllllllllllllllllll$						
Loading at High	Appearance	The indications should be clear.	As per 4.23 JIS C 5101-1 As per 4.15 JIS C 5101-3					
temperature	L.C	TCFGB0E227M8R : Less than 125% of initial limit TCFGB0G227M8R : Less than 150% of initial limit TCFGB0J227M8R : Less than 200% of initial limit TCFGB1A157M8R : Less than 200% of initial limit TCFGB1A107M8R : Less than 200% of initial limit TCFGB1E475M8R : Less than 150% of initial limit Others : Less than initial limit	After applying the rated voltage for 2000+72/0 without discontinuation via the serial resistanc of 3Ω or less at a temperature of $85\pm2^{\circ}\text{C}$, leav the sample at room temperature/humidity for 1 to 2h and measure the value. After the specimens, leave it at room temperature					
	ΔC / C	TCFGB0G227M8R: Within ±15% of initial value TCFGB0J227M8R: Within ±20% of initial value TCFGB1A157M8R: Within ±20% of initial value TCFGB1A107M8R: Within ±20% of initial value Others: Within ±10% of initial value	for over 24h and then measure the sample.					
	tanδ	$\begin{array}{llllllllllllllllllllllllllllllllllll$						

Item		Performance	Test conditions (based on JIS C5101-1 and JIS C5101-3)			
Terminal	Capacitance	The measured value should be stable.	As per 4.35 JIS C 5101-1			
Strength	Appearance	There should be no significant abnormality.	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.) (Unit: mm) F (Apply force) Thickness 1.6mm			
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. product Apply force a circuit board			
Dimension	ns	Be based on "External dimensions"	Measure using a caliper of JIS B 7505 Class 2 or higher grade.			
Resistanc	e 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 1h. 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.			
Appearance		There should be no significant abnormality.	Amplitude: 1.5mm Time: 2h each in X and Y directions Mounting: The terminal is soldered on a print circuit board.			

TCFG Series B Case Data Sheet

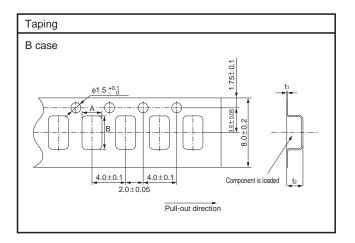
●Standard list, TCFG series B Cases

Part No.	Rated Voltage @85°C	Derated Voltage @125°C	Surge Voltage @85°C	Capacitance 120Hz	Tolerance	Leakage current 25°C	DF 120Hz (%)			Impedance 100kHz	Case
	(V)	(V)	(V)	(μF)	(%)	1WV.60s (μA)	–55°C	25°C 85°C	125°C	(Ω)	
TCFG B 0E 227 M8R	2.5	1.6	3.2	220	±20	5.5	34	18	22	1.5	В
TCFG B 0G 156 M8R	4	2.5	5	15	±20	0.6	12	8	10	3.0	В
TCFG B 0G 226 M8R	4	2.5	5	22	±20	0.9	12	8	10	3.0	В
TCFG B 0G 336 M8R	4	2.5	5	33	±20	1.3	12	8	10	2.5	В
TCFG B 0G 476 M8R	4	2.5	5	47	±20	1.9	14	10	12	2.0	В
TCFG B 0G 686 M8R	4	2.5	5	68	±20	2.7	14	10	12	1.9	В
TCFG B 0G 107 M8R	4	2.5	5	100	±20	4.0	30	12	16	1.6	В
TCFG B 0G 157 M8R	4	2.5	5	150	±20	6.3	34	18	22	1.3	В
TCFG B 0G 227 M8R	4	2.5	5	220	±20	8.8	40	20	30	1.3	В
TCFG B 0J 106 M8R	6.3	4	8	10	±20	0.6	12	8	10	3.0	В
TCFG B 0J 156 M8R	6.3	4	8	15	±20	0.9	12	8	10	3.0	В
TCFG B 0J 226 M8R	6.3	4	8	22	±20	1.4	12	8	10	2.5	В
TCFG B 0J 336 M8R	6.3	4	8	33	±20	2.1	12	8	10	2.0	В
TCFG B 0J 476 M8R	6.3	4	8	47	±20	3.0	14	10	12	1.9	В
TCFG B 0J 686 M8R	6.3	4	8	68	±20	4.3	30	12	16	1.6	В
TCFG B 0J 107 M8R	6.3	4	8	100	±20	6.3	30	12	16	1.5	В
TCFG B 0J 157 M8R	6.3	4	8	150	±20	9.5	34	18	22	1.5	В
TCFG B 0J 227 M8R	6.3	4	8	220	±20	70	60	30	45	1.3	В
TCFG B 1A 475 M8R	10	6.3	13	4.7	±20	0.5	10	6	8	3.0	В
TCFG B 1A 685 M8R	10	6.3	13	6.8	±20	0.7	12	8	10	3.0	В
TCFG B 1A 106 M8R	10	6.3	13	10	±20	1.0	12	8	10	3.0	В
TCFG B 1A 156 M8R	10	6.3	13	15	±20	1.5	12	8	10	2.5	В
TCFG B 1A 226 M8R	10	6.3	13	22	±20	2.2	12	8	10	2.0	В
TCFG B 1A 336 M8R	10	6.3	13	33	±20	3.3	14	10	12	1.9	В
TCFG B 1A 476 M8R	10	6.3	13	47	±20	4.7	14	10	12	1.6	В
TCFG B 1A 686 M8R	10	6.3	13	68	±20	6.8	22	12	14	1.5	В
TCFG B 1A 107 M8R	10	6.3	13	100	±20	20	40	20	30	1.5	В
TCFG B 1C 335 M8R	16	10	20	3.3	±20	0.5	10	6	8	4.2	В
TCFG B 1C 475 M8R	16	10	20	4.7	±20	0.8	10	6	8	3.0	В
TCFG B 1C 685 M8R	16	10	20	6.8	±20	1.1	10	6	8	3.0	В
TCFG B 1C 106 M8R	16	10	20	10	±20	1.6	10	6	8	2.5	В
TCFG B 1C 156 M8R	16	10	20	15	±20	2.4	10	6	8	2.0	В
TCFG B 1C 226 M8R	16	10	20	22	±20	3.5	10	6	8	1.9	В
TCFG B 1C 336 M8R	16	10	20	33	±20	5.3	16	14	16	1.9	В
TCFG B 1D 335 M8R	20	13	26	3.3	±20	0.66	10	6	8	4.2	В
* TCFG B 1D 475 M8R	20	13	26	4.7	±20	1.0	10	6	8	3.0	В
* TCFG B 1D 106 M8R	20	13	26	10	±20	2.0	12	8	10	15.0	B
TCFG B 1E 335 M8R	25	16	32	3.3	±20	0.83	10	6	8	4.2	B
TCFG B 1E 475 M8R	25	16	32	4.7	±20	1.2	10	6	8	3.0	В

^{*} = Under development

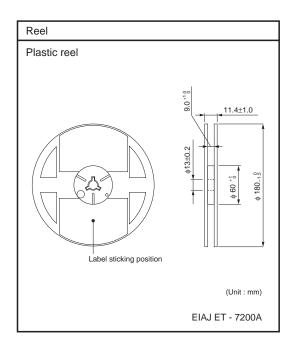
Packaging specifications

	.g -p			(Unit : mm)
Case code	A±0.1	B±0.1	t1±0.05	t2±0.1
B (3528)	3.3	3.8	0.25	2.2



●Packaging style

Case code	Packaging	Packag	ing style	Symbol	Basic ordering unit
B Case	Taping	Plastic taping	φ180mm reel	8R	2,000



Notes

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