

## TMF Series Chip Tantalum Capacitor With face down Terminals

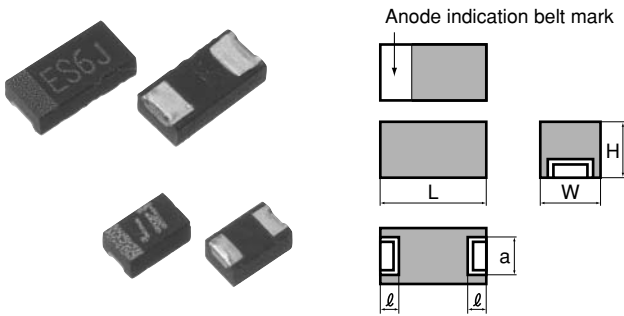
### Features

- A new, originally designed structure with reduced space requirement, resulting in the small size and large capacitance of units.
- Best suited for multi-media applications, such as cell phones, digital video cameras, etc.
- Environmentally friendly terminal plating -- lead-free (100% Sn) solder plating.

Product code : (Example) TMF Series LM case 6.3V 22 $\mu$ F $\pm$ 20%

<b>TMF</b>	<b>LM</b>	<b>OJ</b>	<b>226</b>	<b>M</b>	<b>T</b>	<b>R</b>	<b>F</b>
Type of series	Case size code		Capacitance code	Capacitance tolerance code	Packing polarity code	Packing method code (T: carrier tape)	Tinned plated terminals (Sn 100)

### Outline of drawings and dimensions



### Dimensions

(Unit : mm)

Case code	Case size				
	L $\pm$ 0.1	W $\pm$ 0.1	H $\pm$ 0.1	$\ell$ $\pm$ 0.1	a $\pm$ 0.1
LM	1.6	0.85	0.8	0.5	0.65
LP	2.0	1.25	0.9	0.5	0.9
LA	3.2	1.6	0.9	0.8	1.2

### Standard value and case size

Capacitance $\mu$ F	Code	Rated voltage (V.DC)					
		2.5	4	6.3	10	16	
		0E	0G	0J	1A	1C	
1.0	105						
1.5	155						
2.2	225						LM
3.3	335						LM
4.7	475						LM
6.8	685						LM LP
10	106						LM LA
15	156						LM LP LA
22	226			LM	LM		LP
33	336	LM	LM	LP	LP		LA
47	476	LM	LP	LP	LP		LA
68	686	LP	LP	LA			
100	107	LP	LA	LA			
150	157	LA	LA				
220	227	LA					

Product specifications	TMF	Test conditions JIS C5101-1:1998																
Operating temperature range	-55 $^{\circ}$ C ~ +125 $^{\circ}$ C																	
Rated voltage	DC2.5~16V	85 $^{\circ}$ C																
Surge voltage	DC3.2~20V	85 $^{\circ}$ C																
Derated voltage	DC1.6~10V	125 $^{\circ}$ C																
Capacitance	2.2~220 $\mu$ F																	
Capacitance tolerance	$\pm$ 20%	Paragraph 4.7, 120 Hz																
Leakage current	Refer to standard product table	Paragraph 4.9, in 5 minutes after the rated voltage is applied.																
tan $\delta$	0.3 or less	Paragraph 4.8, 120Hz																
Surge withstanding voltage	$\Delta$ C/C $\pm$ 20% or less tan $\delta$ Specified initial value or less LC Specified initial value or less	Paragraph 4.26																
Temperature characteristics	<table border="1"> <thead> <tr> <th>Specified initial value</th> <th>-55</th> <th>85</th> <th>125</th> </tr> </thead> <tbody> <tr> <td><math>\Delta</math>C/C</td> <td>-</td> <td>-20~+20%</td> <td>0~+20%</td> </tr> <tr> <td>tan <math>\delta</math></td> <td>0.3</td> <td>0.6</td> <td>0.3</td> </tr> <tr> <td>LC</td> <td>Refer to standard product table</td> <td>1000% or less specified initial value or less</td> <td>1250% or less specified initial value or less</td> </tr> </tbody> </table>	Specified initial value	-55	85	125	$\Delta$ C/C	-	-20~+20%	0~+20%	tan $\delta$	0.3	0.6	0.3	LC	Refer to standard product table	1000% or less specified initial value or less	1250% or less specified initial value or less	Paragraph 4.24
Specified initial value	-55	85	125															
$\Delta$ C/C	-	-20~+20%	0~+20%															
tan $\delta$	0.3	0.6	0.3															
LC	Refer to standard product table	1000% or less specified initial value or less	1250% or less specified initial value or less															
Solder heat resistance	$\Delta$ C/C $\pm$ 20% or less tan $\delta$ Specified initial value or less LC Specified initial value or less	Solder Dip 260 $\pm$ 5 $^{\circ}$ C 10 $\pm$ 1 sec. Reflow 260 $^{\circ}$ C 10 $\pm$ 1 sec.																
Moisture resistance no load	$\Delta$ C/C $\pm$ 20% or less tan $\delta$ 150% Specified initial value or less LC Specified initial value or less	Paragraph 4.22, 40 $^{\circ}$ C 90 ~ 95%RH,500hrs																
High-temperature load	$\Delta$ C/C $\pm$ 20% or less tan $\delta$ Specified initial value or less LC 200% Specified initial value or less	Paragraph 4.23, 85 $^{\circ}$ C The rated voltage is applied for 2000 hours.																
Thermal shock	$\Delta$ C/C $\pm$ 20% or less tan $\delta$ Specified initial value or less LC Specified initial value or less	Leave at -55 $^{\circ}$ C, normal temperature, 125 $^{\circ}$ C, and normal temperature for 30 min., 3 min., 30 min., and 3 min. Repeat this operation 5 times running.																
Failure rate	1%/1000hrs	85 $^{\circ}$ C. The rated voltage is applied (through a protective resistor of 1 $\Omega$ /V).																

※ This catalog is designed for providing general information. Please inquire of our Sales Department to confirm specifications prior to use.

## Standard product tables - TMF series

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Rated voltage V.DC	capacitance μF	tanδ	Leakage current μA	case code	Product name
2.5	33	0.30	8.2	LM	TMFLM0E336MTRF
	47	0.30	11.7	LM	TMFLM0E476MTRF
	68	0.30	17.0	LP	TMFLP0E686MTRF
	100	0.30	25.0	LP	TMFLP0E107MTRF
	150	0.30	37.5	LA	TMFLA0E157MTRF
	220	0.30	55.0	LA	TMFLA0E227MTRF
4	22	0.30	8.8	LM	TMFLM0G226MTRF
	33	0.30	13.2	LM	TMFLM0G336MTRF
	47	0.30	18.8	LP	TMFLP0G476MTRF
	68	0.30	27.2	LP	TMFLP0G686MTRF
	100	0.30	40.0	LA	TMFLA0G107MTRF
	150	0.30	60.0	LA	TMFLA0G157MTRF
6.3	15	0.30	9.4	LM	TMFLM0J156MTRF
	22	0.30	13.8	LM	TMFLM0J226MTRF
	33	0.30	20.7	LP	TMFLP0J336MTRF
	47	0.30	29.6	LP	TMFLP0J476MTRF
	68	0.30	42.8	LA	TMFLA0J686MTRF
	100	0.30	63	LA	TMFLA0J107MTRF
10	6.8	0.30	6.8	LM	TMFLM1A685MTRF
	10	0.30	10	LM	TMFLM1A106MTRF
	15	0.30	15	LP	TMFLP1A156MTRF
	22	0.30	22	LP	TMFLP1A226MTRF
	33	0.30	33	LA	TMFLA1A336MTRF
	47	0.30	47	LA	TMFLA1A476MTRF
16	2.2	0.30	3.5	LM	TMFLM1C225MTRF
	3.3	0.30	5.2	LM	TMFLM1C335MTRF
	4.7	0.30	7.5	LM	TMFLM1C475MTRF
	6.8	0.30	10.8	LP	TMFLP1C685MTRF
	10	0.30	16	LA	TMFLA1C106MTRF
	15	0.30	24	LA	TMFLA1C156MTRF

Marking indication TMF series

LM · LP case		① Anode indication belt mark ② Simplified code of rated voltage (J:6.3V) ③ Simplified code of nominal capacitance (A:10μF)
LA case		① Anode indication belt mark ② Simplified code of rated voltage (G:4V) ③ Simplified code of nominal capacitance (A8:100μF) ④ Lot indication (n:for manufacturing in January, 2008)

Lot indication

Month Year	1	2	3	4	5	6	7	8	9	10	11	12
2007	a	b	c	d	e	f	g	h	j	k	l	m
2008	n	p	q	r	s	t	u	v	w	x	y	z
2009	A	B	C	D	E	F	G	H	J	K	L	M
2010	N	P	Q	R	S	T	U	V	W	X	Y	Z