

## Solid Tantalum Surface Mount Chip Capacitors, Molded Case, Extended Range



### PERFORMANCE / ELECTRICAL CHARACTERISTICS

**Operating Temperature:** -55 °C to +125 °C  
(above 85 °C, voltage derating is required)

**Capacitance Range:** 0.47 μF to 470 μF

**Capacitance Tolerance:** ± 10 %, ± 20 %

**Voltage Rating:** 2.5 V<sub>DC</sub> to 35 V<sub>DC</sub>

### FEATURES

- Small size, suitable for high density packaging
- Terminations: 100 % matte tin
- MSL level: 1
- Compatible with “high volume” automatic pick and place equipment
- Material categorization:  
for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)



**RoHS COMPLIANT**

**HALOGEN FREE**  
Available

**GREEN**  
(5-2008)  
Available

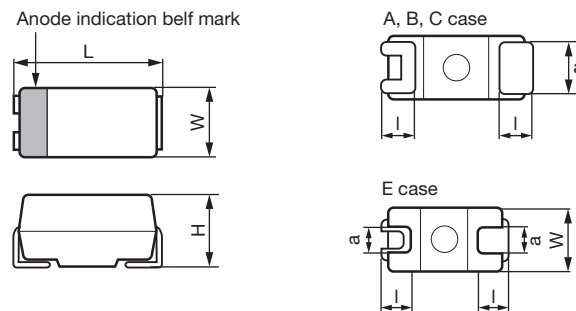
### APPLICATIONS

- Industrial
- AV equipment
- General purpose

### ORDERING INFORMATION

TMCM TYPE	A CASE CODE	OJ DC VOLTAGE RATING AT +85 °C	106 CAPACITANCE (μF)	M CAPACITANCE TOLERANCE	TR PACKAGING POLARITY	(2) (OPTIONAL)	F TERMINAL CODE
	See Ratings and Case Codes table	0E = 2.5 V 0G = 4.0 V 0J = 6.3 V (7 V) 1A = 10 V 1C = 16 V 1D = 20 V 1E = 25 V 1V = 35 V	This is expressed in picofarads. The first two digits are the significant figures. The third is the number of zeros to follow.	K = ± 10 % M = ± 20 %	TR = 7" reel, cathodes close to perforation side	Halogen-free (special order), not applicable for E case	F = lead (Pb)-free terminations

### DIMENSIONS in inches [millimeters]



CASE CODE	EIA SIZE	L	W	H	l	a
A	3216-18	0.126 ± 0.008 [3.2 ± 0.2]	0.063 ± 0.008 [1.6 ± 0.2]	0.063 ± 0.008 [1.6 ± 0.2]	0.028 ± 0.012 [0.7 ± 0.3]	0.047 ± 0.008 [1.2 ± 0.2]
B	3528-21	0.138 ± 0.008 [3.5 ± 0.2]	0.110 ± 0.008 [2.8 ± 0.2]	0.075 ± 0.008 [1.9 ± 0.2]	0.030 ± 0.012 [0.8 ± 0.3]	0.087 ± 0.008 [2.2 ± 0.2]
C	5832-27	0.228 ± 0.008 [5.8 ± 0.2]	0.126 ± 0.008 [3.2 ± 0.2]	0.100 ± 0.008 [2.5 ± 0.2]	0.051 ± 0.012 [1.3 ± 0.3]	0.087 ± 0.008 [2.2 ± 0.2]
E	7343-30	0.287 ± 0.008 [7.3 ± 0.2]	0.169 ± 0.012 [4.3 ± 0.3]	0.112 ± 0.008 [2.8 ± 0.2]	0.051 ± 0.012 [1.3 ± 0.3]	0.094 ± 0.008 [2.4 ± 0.2]

RATINGS AND CASE CODES								
μF	2.5 V	4.0 V	6.3 V (7 V)	10 V	16 V	20 V	25 V	35 V
0.47								A
0.68							A	A
1.0						A	A	A
1.5					A	A	A	A/B
2.2				A	A	A	A/B	A/B
3.3			A	A	A	A/B	A/B	B
4.7		A	A	A	A/B	A/B	A/B	C
6.8	A	A	A	A/B	A/B	A/B	B/C	C
10	A	A	A/B	A/B	A/B	B/C	C	C/E
15	A	A/B	A/B	A/B	A/B/C	B/C	C/E	E
22	A/B	A/B	A/B	A/B/C	A/B/C	B/C/E	C/E	E
33	A/B	A/B	A/B/C	A/B/C	B/C/E	C/E	E	
47	A/B	A/B/C	A/B/C	A/B/C/E	B/C/E	E	E	
68	A/B/C	A/B/C	A/B/C/E	B/C/E	C/E	E		
100	A/B/C	A/B/C/E	A/B/C/E	B/C/E	C/E			
150	A/B/C/E	A/B/C/E	B/C/E	C/E				
220	A/B/C/E	A/B/C/E	B/C/E	E				
330	B/C/E	B/C/E	C/E	E				
470	B/C/E	E	E					

### MARKING



SIMPLIFIED VOLTAGE CODES, CASES A, B			
VOLTAGE CODE V	CODE	VOLTAGE CODE V	CODE
2.5	e	16	C
4.0	G	20	D
6.3 (7)	J	25	E
10	A	35	V

SIMPLIFIED CAP CODES, CASES A, B			
CAPACITANCE CODE μF	CODE	CAPACITANCE CODE μF	CODE
0.47	S5	22	J7
0.68	W5	33	N7
1.0	A6	47	S7
1.5	E6	68	W7
2.2	J6	100	A8
3.3	N6	150	E8
4.7	S6	220	J8
6.8	W6	330	N8
10	A7	470	S8
15	E7		

### DATE CODE

YEAR	MONTH											
	1	2	3	4	5	6	7	8	9	10	11	12
2013	A	B	C	D	E	F	G	H	J	K	L	M
2014	N	P	Q	R	S	T	U	V	W	X	Y	Z
2015	a	b	c	d	e	f	g	h	j	k	l	m
2016	n	p	q	r	s	t	u	v	w	x	y	z



STANDARD RATINGS						
CAPACITANCE ( $\mu$ F)	CASE CODE	PART NUMBER	MAX. DCL AT +25 °C ( $\mu$ A)	MAX. DF AT +25 °C, 120 Hz (%)	MAX. ESR AT +25 °C, 100 kHz ( $\Omega$ )	MAX. RIPPLE, 100 kHz I <sub>RMS</sub> (A)
<b>2.5 V<sub>DC</sub> AT +85 °C, 1.6 V<sub>DC</sub> AT +125 °C</b>						
6.8	A	TMCMA0E685(1)TRF	0.5	6	4.0	0.140
10	A	TMCMA0E106(1)TRF	0.5	8	2.0	0.197
15	A	TMCMA0E156(1)TRF	0.5	8	2.9	0.164
22	A	TMCMA0E226(1)TRF	0.6	8	2.0	0.197
22	B	TMCMB0E226(1)TRF	0.6	8	1.1	0.295
33	A	TMCMA0E336(1)TRF	0.8	8	2.0	0.197
33	B	TMCMB0E336(1)TRF	0.8	8	1.1	0.295
47	A	TMCMA0E476(1)TRF	1.2	12	2.0	0.197
47	B	TMCMB0E476(1)TRF	1.2	8	1.1	0.295
68	A	TMCMA0E686(1)TRF	1.7	18	2.0	0.197
68	B	TMCMB0E686(1)TRF	1.7	8	1.1	0.295
68	C	TMCMC0E686(1)TRF	1.7	8	1.1	0.302
100	A	TMCMA0E107(1)TRF	5.0	18	1.1	0.266
100	B	TMCMB0E107(1)TRF	2.5	12	1.1	0.295
100	C	TMCMC0E107(1)TRF	2.5	8	1.1	0.302
150	A	TMCMA0E157(1)TRF	7.5	30	1.8	0.208
150	B	TMCMB0E157(1)TRF	3.8	18	1.1	0.295
150	C	TMCMC0E157(1)TRF	3.8	8	1.1	0.302
150	E	TMCME0E157(1)TRF	3.8	8	0.3	0.632
220	A	TMCMA0E227(1)TRF	27.5	30	1.8	0.208
220	B	TMCMB0E227(1)TRF	5.5	18	1.1	0.295
220	C	TMCMC0E227(1)TRF	5.5	8	1.1	0.302
220	E	TMCME0E227(1)TRF	5.5	8	0.3	0.632
330	B	TMCMB0E337(1)TRF	16.5	30	1.1	0.295
330	C	TMCMC0E337(1)TRF	8.3	18	1.1	0.302
330	E	TMCME0E337(1)TRF	8.3	10	0.3	0.632
470	B	TMCMB0E477MTRF	58.8	30	1.1	0.295
470	C	TMCMC0E477(1)TRF	11.8	18	1.1	0.302
470	E	TMCME0E477(1)TRF	11.8	10	0.2	0.775
<b>4 V<sub>DC</sub> AT + 85 °C, 2.5 V<sub>DC</sub> AT +125 °C</b>						
4.7	A	TMCMA0G475(1)TRF	0.5	6	4.0	0.140
6.8	A	TMCMA0G685(1)TRF	0.5	6	4.0	0.140
10	A	TMCMA0G106(1)TRF	0.5	8	2.0	0.197
15	A	TMCMA0G156(1)TRF	0.6	8	2.9	0.164
15	B	TMCMB0G156(1)TRF	0.6	8	1.7	0.238
22	A	TMCMA0G226(1)TRF	0.9	8	1.8	0.208
22	B	TMCMB0G226(1)TRF	0.9	8	1.1	0.295
33	A	TMCMA0G336(1)TRF	1.3	8	2.0	0.197
33	B	TMCMB0G336(1)TRF	1.3	8	1.1	0.295
47	A	TMCMA0G476(1)TRF	1.9	12	2.0	0.197
47	B	TMCMB0G476(1)TRF	1.9	8	1.1	0.295
47	C	TMCMC0G476(1)TRF	1.9	8	1.1	0.302
68	A	TMCMA0G686(1)TRF	5.4	12	2.0	0.197
68	B	TMCMB0G686(1)TRF	2.7	8	1.1	0.295
68	C	TMCMC0G686(1)TRF	2.7	8	1.1	0.302
100	A	TMCMA0G107(1)TRF	8.0	30	1.1	0.266
100	B	TMCMB0G107(1)TRF	4.0	12	1.1	0.295
100	C	TMCMC0G107(1)TRF	4.0	8	1.1	0.302
100	E	TMCME0G107(1)TRF	4.0	8	0.6	0.447
150	A	TMCMA0G157(1)TRF	60.0	30	1.8	0.208
150	B	TMCMB0G157(1)TRF	6.0	18	1.1	0.295
150	C	TMCMC0G157(1)TRF	6.0	8	1.1	0.302
150	E	TMCME0G157(1)TRF	6.0	8	0.3	0.632

Note

- Part number definition:
  - (1) Tolerance: For 10 % tolerance, specify "K"; for 20 % tolerance, change to "M"



STANDARD RATINGS						
CAPACITANCE ( $\mu$ F)	CASE CODE	PART NUMBER	MAX. DCL AT +25 °C ( $\mu$ A)	MAX. DF AT +25 °C, 120 Hz (%)	MAX. ESR AT +25 °C, 100 kHz ( $\Omega$ )	MAX. RIPPLE, 100 kHz I <sub>RMS</sub> (A)
<b>4 V<sub>DC</sub> AT + 85 °C, 2.5 V<sub>DC</sub> AT +125 °C</b>						
220	A	TMCMA0G227MTRF	88.0	30	1.8	0.208
220	B	TMCMB0G227(1)TRF	17.6	18	1.1	0.295
220	C	TMCMC0G227(1)TRF	8.8	12	1.1	0.302
220	E	TMCME0G227(1)TRF	8.8	8	0.3	0.632
330	B	TMCMB0G337MTRF	26.4	30	1.1	0.295
330	C	TMCMC0G337(1)TRF	13.2	18	1.1	0.302
330	E	TMCME0G337(1)TRF	13.2	10	0.3	0.632
470	E	TMCME0G477(1)TRF	18.8	16	0.2	0.775
<b>6.3 V<sub>DC</sub> (7 V<sub>DC</sub>) AT + 85 °C, 4 V<sub>DC</sub> AT +125 °C</b>						
3.3	A	TMCMA0J335(1)TRF	0.5	6	4.0	0.140
4.7	A	TMCMA0J475(1)TRF	0.5	6	4.0	0.140
6.8	A	TMCMA0J685(1)TRF	0.5	6	4.0	0.140
10	A	TMCMA0J106(1)TRF	0.7	8	2.9	0.164
10	B	TMCMB0J106(1)TRF	0.7	8	1.7	0.238
15	A	TMCMA0J156(1)TRF	1.1	8	4.0	0.140
15	B	TMCMB0J156(1)TRF	1.1	8	1.7	0.238
22	A	TMCMA0J226(1)TRF	1.5	8	1.8	0.208
22	B	TMCMB0J226(1)TRF	1.5	8	1.1	0.295
33	A	TMCMA0J336(1)TRF	2.3	10	2.0	0.197
33	B	TMCMB0J336(1)TRF	2.3	8	1.1	0.295
33	C	TMCMC0J336(1)TRF	2.3	8	1.1	0.302
47	A	TMCMA0J476(1)TRF	5.9	12	1.8	0.208
47	B	TMCMB0J476(1)TRF	3.3	8	1.1	0.295
47	C	TMCMC0J476(1)TRF	3.3	8	1.1	0.302
68	A	TMCMA0J686(1)TRF	8.6	20	2.0	0.197
68	B	TMCMB0J686(1)TRF	4.8	10	1.1	0.295
68	C	TMCMC0J686(1)TRF	4.8	8	1.1	0.302
68	E	TMCME0J686(1)TRF	4.8	8	0.6	0.447
100	A	TMCMA0J107MTRF	31.5	30	1.8	0.208
100	B	TMCMB0J107(1)TRF	7.0	12	1.1	0.295
100	C	TMCMC0J107(1)TRF	7.0	8	1.1	0.302
100	E	TMCME0J107(1)TRF	7.0	8	0.6	0.447
150	B	TMCMB0J157(1)TRF	18.9	20	1.1	0.295
150	C	TMCMC0J157(1)TRF	10.5	10	1.1	0.302
150	E	TMCME0J157(1)TRF	10.5	8	0.3	0.632
220	B	TMCMB0J227MTRF	27.7	30	1.1	0.295
220	C	TMCMC0J227(1)TRF	15.4	18	1.1	0.302
220	E	TMCME0J227(1)TRF	15.4	10	0.3	0.632
330	C	TMCMC0J337MTRF	23.1	30	1.1	0.302
330	E	TMCME0J337(1)TRF	23.1	16	0.2	0.775
470	E	TMCME0J477(1)TRF	32.9	20	0.3	0.632
<b>10 V<sub>DC</sub> AT + 85 °C, 6.3 V<sub>DC</sub> AT +125 °C</b>						
2.2	A	TMCMA1A225(1)TRF	0.5	6	4.4	0.133
3.3	A	TMCMA1A335(1)TRF	0.5	6	4.0	0.140
4.7	A	TMCMA1A475(1)TRF	0.5	6	4.0	0.140
6.8	A	TMCMA1A685(1)TRF	0.7	6	4.0	0.140
6.8	B	TMCMB1A685(1)TRF	0.7	6	2.8	0.185
6.8	A	TMCMA1A106(1)TRF	1.0	8	2.9	0.164
6.8	B	TMCMB1A106(1)TRF	1.0	8	1.7	0.238
15	A	TMCMA1A156(1)TRF	1.5	8	2.9	0.164
15	B	TMCMB1A156(1)TRF	1.5	8	1.7	0.238
22	A	TMCMA1A226(1)TRF	4.4	12	2.4	0.180
22	B	TMCMB1A226(1)TRF	2.2	8	1.1	0.295
22	C	TMCMC1A226(1)TRF	2.2	8	1.7	0.243

**Note**

- Part number definition:
  - (1) Tolerance: For 10 % tolerance, specify "K"; for 20 % tolerance, change to "M"



STANDARD RATINGS						
CAPACITANCE (μF)	CASE CODE	PART NUMBER	MAX. DCL AT +25 °C (μA)	MAX. DF AT +25 °C, 120 Hz (%)	MAX. ESR AT +25 °C, 100 kHz (Ω)	MAX. RIPPLE, 100 kHz I <sub>RMS</sub> (A)
<b>10 V<sub>DC</sub> AT + 85 °C, 6.3 V<sub>DC</sub> AT +125 °C</b>						
33	A	TMCMA1A336(1)TRF	6.6	18	2.0	0.197
33	B	TMCMB1A336(1)TRF	3.3	8	1.1	0.295
33	C	TMCMC1A336(1)TRF	3.3	8	1.1	0.302
47	A	TMCMA1A476MTRF	9.4	20	2.6	0.173
47	B	TMCMB1A476(1)TRF	4.7	10	1.1	0.295
47	C	TMCMC1A476(1)TRF	4.7	8	1.1	0.302
47	E	TMCME1A476(1)TRF	4.7	8	0.9	0.365
68	B	TMCMB1A686(1)TRF	6.8	18	1.1	0.295
68	C	TMCMC1A686(1)TRF	6.8	8	1.1	0.302
68	E	TMCME1A686(1)TRF	6.8	8	0.6	0.447
100	B	TMCMB1A107MTRF	20.0	30	1.7	0.238
100	C	TMCMC1A107(1)TRF	10.0	10	1.1	0.302
100	E	TMCME1A107(1)TRF	10.0	8	0.6	0.447
150	C	TMCMC1A157MTRF	15.0	18	1.1	0.302
150	E	TMCME1A157(1)TRF	15.0	8	0.3	0.632
220	E	TMCME1A227(1)TRF	22.0	12	0.2	0.775
330	E	TMCME1A337(1)TRF	33.0	30	0.3	0.632
<b>16 V<sub>DC</sub> AT + 85 °C, 10 V<sub>DC</sub> AT +125 °C</b>						
1.5	A	TMCMA1C155(1)TRF	0.5	6	6.6	0.109
2.2	A	TMCMA1C225(1)TRF	0.5	6	6.6	0.109
3.3	A	TMCMA1C335(1)TRF	0.5	6	4.0	0.140
4.7	A	TMCMA1C475(1)TRF	0.8	6	4.0	0.140
4.7	B	TMCMB1C475(1)TRF	0.8	6	2.8	0.185
6.8	A	TMCMA1C685(1)TRF	1.1	6	4.0	0.140
6.8	B	TMCMB1C685(1)TRF	1.1	6	2.8	0.185
10	A	TMCMA1C106(1)TRF	1.6	8	2.9	0.164
10	B	TMCMB1C106(1)TRF	1.6	8	1.7	0.238
15	A	TMCMA1C156(1)TRF	2.4	12	2.9	0.164
15	B	TMCMB1C156(1)TRF	2.4	8	1.7	0.238
15	C	TMCMC1C156(1)TRF	2.4	8	1.7	0.243
22	A	TMCMA1C226MTRF	7.0	16	2.9	0.164
22	B	TMCMB1C226(1)TRF	3.5	8	1.7	0.238
22	C	TMCMC1C226(1)TRF	3.5	8	1.1	0.302
33	B	TMCMB1C336(1)TRF	5.3	12	1.1	0.295
33	C	TMCMC1C336(1)TRF	5.3	8	1.1	0.302
33	E	TMCME1C336(1)TRF	5.3	8	0.9	0.365
47	B	TMCMB1C476MTRF	7.5	20	1.7	0.238
47	C	TMCMC1C476(1)TRF	7.5	8	2.2	0.213
47	E	TMCME1C476(1)TRF	7.5	8	0.9	0.365
68	C	TMCMC1C686(1)TRF	10.9	20	1.1	0.302
68	E	TMCME1C686(1)TRF	10.9	8	0.6	0.447
100	C	TMCMC1C107MTRF	16.0	20	1.7	0.243
100	E	TMCME1C107(1)TRF	16.0	8	0.6	0.447
<b>20 V<sub>DC</sub> AT + 85 °C, 13 V<sub>DC</sub> AT +125 °C</b>						
1.0	A	TMCMA1D105(1)TRF	0.5	4	6.6	0.109
1.5	A	TMCMA1D155(1)TRF	0.5	6	4.4	0.133
2.2	A	TMCMA1D225(1)TRF	0.5	6	4.4	0.133
3.3	A	TMCMA1D335(1)TRF	0.7	6	4.0	0.140
3.3	B	TMCMB1D335(1)TRF	0.7	6	3.9	0.157
4.7	A	TMCMA1D475(1)TRF	0.9	6	4.0	0.140
4.7	B	TMCMB1D475(1)TRF	0.9	6	2.8	0.185
6.8	A	TMCMA1D685MTRF	1.4	6	4.0	0.140
6.8	B	TMCMB1D685(1)TRF	1.4	6	2.2	0.209
10	B	TMCMB1D106(1)TRF	2.0	8	2.2	0.209
10	C	TMCMC1D106(1)TRF	2.0	8	1.7	0.243

Note

- Part number definition:
  - (1) Tolerance: For 10 % tolerance, specify "K"; for 20 % tolerance, change to "M"



STANDARD RATINGS						
CAPACITANCE (μF)	CASE CODE	PART NUMBER	MAX. DCL AT +25 °C (μA)	MAX. DF AT +25 °C, 120 Hz (%)	MAX. ESR AT +25 °C, 100 kHz (Ω)	MAX. RIPPLE, 100 kHz I <sub>RMS</sub> (A)
<b>20 V<sub>DC</sub> AT + 85 °C, 13 V<sub>DC</sub> AT +125 °C</b>						
15	B	TMCMB1D156(1)TRF	3.0	8	1.1	0.295
15	C	TMCMC1D156(1)TRF	3.0	8	1.7	0.243
22	B	TMCMB1D226(1)TRF	4.4	8	1.7	0.238
22	C	TMCMC1D226(1)TRF	4.4	8	1.7	0.243
22	E	TMCME1D226(1)TRF	4.4	8	0.9	0.365
33	C	TMCMC1D336(1)TRF	6.6	8	1.0	0.316
33	E	TMCME1D336(1)TRF	6.6	8	0.9	0.365
47	E	TMCME1D476(1)TRF	9.4	8	0.9	0.365
68	E	TMCME1D686(1)TRF	13.6	8	0.5	0.490
<b>25 V<sub>DC</sub> AT + 85 °C, 16 V<sub>DC</sub> AT +125 °C</b>						
0.68	A	TMCMA1E684(1)TRF	0.5	4	9.7	0.090
1.0	A	TMCMA1E105(1)TRF	0.5	4	6.6	0.109
1.5	A	TMCMA1E155(1)TRF	0.5	6	4.4	0.133
2.2	A	TMCMA1E225(1)TRF	0.6	6	4.4	0.133
2.2	B	TMCMB1E225(1)TRF	0.6	6	3.9	0.157
3.3	A	TMCMA1E335(1)TRF	0.8	6	2.8	0.167
3.3	B	TMCMB1E335(1)TRF	0.8	6	3.9	0.157
4.7	A	TMCMA1E475MTRF	1.2	6	6.6	0.109
4.7	B	TMCMB1E475(1)TRF	1.2	6	2.8	0.185
6.8	B	TMCMB1E685(1)TRF	1.7	8	2.8	0.185
6.8	C	TMCMC1E685(1)TRF	1.7	8	1.7	0.243
10	C	TMCMC1E106(1)TRF	2.5	8	1.7	0.243
15	C	TMCMC1E156(1)TRF	3.8	8	1.7	0.243
15	E	TMCME1E156(1)TRF	3.8	8	0.9	0.365
22	C	TMCMC1E226(1)TRF	5.5	8	1.1	0.302
22	E	TMCME1E226(1)TRF	5.5	8	0.9	0.365
33	E	TMCME1E336(1)TRF	8.3	8	0.9	0.365
47	E	TMCME1E476(1)TRF	11.8	8	0.9	0.365
<b>35 V<sub>DC</sub> AT + 85 °C, 22 V<sub>DC</sub> AT +125 °C</b>						
0.47	A	TMCMA1V474(1)TRF	0.5	4	16.5	0.069
0.68	A	TMCMA1V684(1)TRF	0.5	4	9.7	0.090
1.0	A	TMCMA1V105(1)TRF	0.5	4	6.6	0.109
1.5	A	TMCMA1V155(1)TRF	0.5	6	4.4	0.133
1.5	B	TMCMB1V155(1)TRF	0.5	6	3.9	0.157
2.2	A	TMCMA1V225MTRF	0.8	8	4.4	0.133
2.2	B	TMCMB1V225(1)TRF	0.8	6	5.5	0.132
3.3	B	TMCMB1V335(1)TRF	1.2	6	3.9	0.157
4.7	C	TMCMC1V475(1)TRF	1.6	6	2.8	0.189
6.8	C	TMCMC1V685(1)TRF	2.4	6	1.7	0.243
10	C	TMCMC1V106(1)TRF	3.5	8	1.7	0.243
10	E	TMCME1V106(1)TRF	3.5	8	1.1	0.330
15	E	TMCME1V156(1)TRF	5.3	8	0.9	0.365
22	E	TMCME1V226(1)TRF	7.7	8	0.9	0.365

**Note**

- Part number definition:
  - (1) Tolerance: For 10 % tolerance, specify "K"; for 20 % tolerance, change to "M"

RECOMMENDED VOLTAGE DERATING GUIDELINES (for temperature below +85 °C)	
CAPACITOR VOLTAGE RATING	OPERATING VOLTAGE
2.5	1.2
4.0	2.0
6.3 (7.0)	3.1 (3.5)
10	5.0
16	8.0
20	10.0
25	12.5
35	17.5



POWER DISSIPATION	
CASE CODE	MAXIMUM PERMISSIBLE POWER DISSIPATION AT +25 °C (W) IN FREE AIR
A	0.078
B	0.096
C	0.100
E	0.120

STANDARD PACKAGING QUANTITY	
CASE CODE	UNITS PER 7" REEL
A	2000
B	2000
C	500
E	500

PERFORMANCE CHARACTERISTICS						
ITEM	CONDITION	POST TEST PERFORMANCE				
		Specified initial value	-55 °C	+85 °C	+125 °C	
Temperature characteristics	Measure the specified characteristics in each stage	Capacitance change	-	-10 % to 0 %	0 % to +10 %	0 % to +12 %
		Dissipation factor (%)	4	9	7	9
			6	10	8	10
			8	12	10	12
			10	14	12	14
			12	16	14	16
			16	20	18	20
			18	34	20	22
			20	36	22	24
		30	60	30	40	
Leakage current	Refer to Standard Ratings table	-	1000 % specified initial value or less	1250 % specified initial value or less		
Solder heat resistance	Solder dip: 260 °C ± 5 °C A, B case: 10 s ± 1 s C, E case: 5 s ± 0.5 s Reflow 260 °C, 10 s ± 1 s	Capacitance change	Within ± 5 % of initial value			
		Dissipation factor	Shall not exceed initial specified value			
		Leakage current	Shall not exceed initial specified value			
Moisture resistance no load	Leave at 40 °C and 90 % to 95 % RH for 500 h	Capacitance change	Within ± 10 % of initial value			
		Dissipation factor	Shall not exceed initial specified value			
		Leakage current	Shall not exceed initial specified value			
High temperature load	85 °C. The rated voltage is applied for 2000 h	Capacitance change	Within ± 10 % of initial value			
		Dissipation factor	Shall not exceed initial specified value			
		Leakage current	Shall not exceed 125 % of initial specified value			
Thermal shock	Leave at -55 °C, normal temperature, 125 °C, and normal temperature for 30 min, 3 min, 30 min, and 3 min. Repeat this operation 5 times running	Capacitance change	Within ± 10 % of initial value			
		Dissipation factor	Shall not exceed initial specified value			
		Leakage current	Shall not exceed initial specified value			
Moisture resistance load	Leave at 40 °C and 90 % to 95 % RH. The rated voltage applied for 500 h	Capacitance change	Within ± 10 % of initial value			
		Dissipation factor	Shall not exceed 150 % of initial specified value			
		Leakage current	Shall not exceed 200 % of initial specified value			
Failure rate	85 °C. The rated voltage is applied through a protective resistor of 1 Ω/V	1 %/1000 h				

**Note**

- Test conditions per JIS C5101-1



## Disclaimer

ALL PRODUCT, PRODUCT SPECIFICATIONS AND DATA ARE SUBJECT TO CHANGE WITHOUT NOTICE TO IMPROVE RELIABILITY, FUNCTION OR DESIGN OR OTHERWISE.

Vishay Intertechnology, Inc., its affiliates, agents, and employees, and all persons acting on its or their behalf (collectively, "Vishay"), disclaim any and all liability for any errors, inaccuracies or incompleteness contained in any datasheet or in any other disclosure relating to any product.

Vishay makes no warranty, representation or guarantee regarding the suitability of the products for any particular purpose or the continuing production of any product. To the maximum extent permitted by applicable law, Vishay disclaims (i) any and all liability arising out of the application or use of any product, (ii) any and all liability, including without limitation special, consequential or incidental damages, and (iii) any and all implied warranties, including warranties of fitness for particular purpose, non-infringement and merchantability.

Statements regarding the suitability of products for certain types of applications are based on Vishay's knowledge of typical requirements that are often placed on Vishay products in generic applications. Such statements are not binding statements about the suitability of products for a particular application. It is the customer's responsibility to validate that a particular product with the properties described in the product specification is suitable for use in a particular application. Parameters provided in datasheets and/or specifications may vary in different applications and performance may vary over time. All operating parameters, including typical parameters, must be validated for each customer application by the customer's technical experts. Product specifications do not expand or otherwise modify Vishay's terms and conditions of purchase, including but not limited to the warranty expressed therein.

Except as expressly indicated in writing, Vishay products are not designed for use in medical, life-saving, or life-sustaining applications or for any other application in which the failure of the Vishay product could result in personal injury or death. Customers using or selling Vishay products not expressly indicated for use in such applications do so at their own risk. Please contact authorized Vishay personnel to obtain written terms and conditions regarding products designed for such applications.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document or by any conduct of Vishay. Product names and markings noted herein may be trademarks of their respective owners.

## Material Category Policy

**Vishay Intertechnology, Inc. hereby certifies that all its products that are identified as RoHS-Compliant fulfill the definitions and restrictions defined under Directive 2011/65/EU of The European Parliament and of the Council of June 8, 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment (EEE) - recast, unless otherwise specified as non-compliant.**

**Please note that some Vishay documentation may still make reference to RoHS Directive 2002/95/EC. We confirm that all the products identified as being compliant to Directive 2002/95/EC conform to Directive 2011/65/EU.**

**Vishay Intertechnology, Inc. hereby certifies that all its products that are identified as Halogen-Free follow Halogen-Free requirements as per JEDEC JS709A standards. Please note that some Vishay documentation may still make reference to the IEC 61249-2-21 definition. We confirm that all the products identified as being compliant to IEC 61249-2-21 conform to JEDEC JS709A standards.**





Компания «ЭлектроПласт» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

Наши преимущества:

- Оперативные поставки широкого спектра электронных компонентов отечественного и импортного производства напрямую от производителей и с крупнейших мировых складов;
- Поставка более 17-ти миллионов наименований электронных компонентов;
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- Лицензия ФСБ на осуществление работ с использованием сведений, составляющих государственную тайну;
- Поставка специализированных компонентов (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Aeroflex, Peregrine, Syfer, Eurofarad, Texas Instrument, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

Помимо этого, одним из направлений компании «ЭлектроПласт» является направление «Источники питания». Мы предлагаем Вам помощь Конструкторского отдела:

- Подбор оптимального решения, техническое обоснование при выборе компонента;
- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



#### Как с нами связаться

**Телефон:** 8 (812) 309 58 32 (многоканальный)

**Факс:** 8 (812) 320-02-42

**Электронная почта:** [org@eplast1.ru](mailto:org@eplast1.ru)

**Адрес:** 198099, г. Санкт-Петербург, ул. Калинина, дом 2, корпус 4, литера А.