

## TMCM Series (Miniaturized Tantalum Chip Capacitors with Extended Capacitance Range)

### Features

- A model type miniaturized chip capacitor developed on the basis of TMCS production technology ideal for high density component mounting applied in AV equipment.
- Super compact : Reduced size 1/2 to 1/3 in comparison with TMCS.

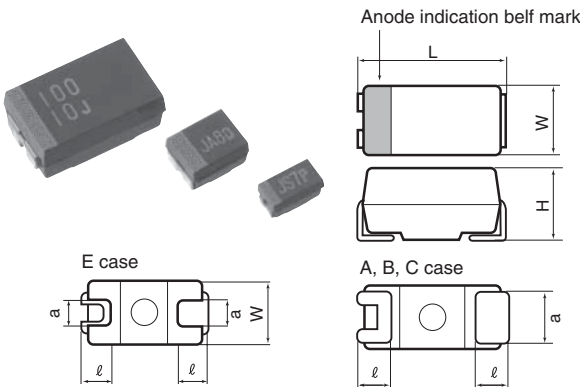
Product symbol : (Example) TMCM Series A case 7V 10 $\mu$ F  $\pm$ 20%

**TMCM A 0J 106 M T R F**

- Terminal code
- Packing polarity code
- Packing method code (T:carrier tape)
- Capacitance tolerance code (M :  $\pm$  20%)
- Capacitance code
- Rated voltage code
- Case size code

Type of series

### Outline of drawings and dimensions



### Dimensions (Unit : mm)

Case code	Case size				
	L $\pm$ 0.2	W $\pm$ 0.2	H $\pm$ 0.2	$\phi$ $\pm$ 0.3	a $\pm$ 0.2
A	3.2	1.6	1.6	0.7	1.2
B	3.5	2.8	1.9	0.8	2.2
C	5.8	3.2	2.5	1.3	2.2
E	7.3	4.3 $^{+0.3}$	2.8	1.3	2.4

### Standard value and case size

Capacitance	Code	Rated voltage (V.DC)							
		2.5	4	6.3 (7)	10	16	20	25	35
$\mu$ F		0E	0G	0J	1A	1C	1D	1E	1V
0.47	474								A
0.68	684							A	A
1.0	105						A	A	A
1.5	155					A	A	A	A,B
2.2	225				A	A	A	A,B	A,B
3.3	335			A	A	A	A,B	A,B	B
4.7	475		A	A	A	A,B	A,B	A,B	C
6.8	685	A	A	A	A,B	A,B	A,B	C,B	C
10	106	A	A	A,B	A,B	A,B	B	C	C,E
15	156	A	A,B	A,B	A,B	A,B,C	B,C	C,E	E
22	226	A,B	A,B	A,B	A,B,C	A,B,C	B,C,E	C,E	E
33	336	A,B	A,B	A,B,C	A,B,C	B,C,E	C,E	E	
47	476	A,B	A,B,C	A,B,C	A,B,C,E	B,C,E	E	E	
68	686	A,B,C	A,B,C	A,B,C,E	B,C,E	C,E	E		
100	107	A,B,C	A,B,C,E	A,B,C,E	B,C,E	C,E			
150	157	A,B,C,E	A,B,C,E	B,C,E	C,E				
220	227	A,B,C,E	A,B,C,E	B,C,E	E				
330	337	B,C,E	B,C,E	C,E	E				
470	477	B,C,E	E	E					

For ratings not covered the table, consult Hitachi AIC.

Product specifications	TMCM	Test conditions JIS C5101-1:1998																																																						
Operating temperature range	-55°C ~ +125°C																																																							
Rated voltage	DC2.5 ~ 35V	85°C																																																						
Surge voltage	DC3.2 ~ 45V	85°C																																																						
Derated voltage	DC1.6 ~ 22V	125°C																																																						
Capacitance	0.47 ~ 470 $\mu$ F																																																							
Capacitance tolerance	$\pm$ 10% or 20%	Paragraph 4.7, 120 Hz																																																						
Leakage current	Refer to table standard product table	Paragraph 4.9, in 5 minutes after the rated voltage is applied.																																																						
tan $\delta$	Refer to table standard product table	Paragraph 4.8, 120Hz																																																						
Surge withstanding voltage	$\Delta$ C/C $\pm$ 5% 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>-10 - 0%</td> <td>0 - +10%</td> <td>0 - +12%</td> </tr> <tr> <td>tan<math>\delta</math></td> <td>0.04</td> <td>0.09</td> <td>0.07</td> <td>0.09</td> </tr> <tr> <td>Refer to table or less</td> <td>0.06</td> <td>0.10</td> <td>0.08</td> <td>0.10</td> </tr> <tr> <td></td> <td>0.08</td> <td>0.12</td> <td>0.10</td> <td>0.12</td> </tr> <tr> <td></td> <td>0.10</td> <td>0.14</td> <td>0.12</td> <td>0.14</td> </tr> <tr> <td></td> <td>0.12</td> <td>0.16</td> <td>0.14</td> <td>0.16</td> </tr> <tr> <td></td> <td>0.16</td> <td>0.20</td> <td>0.18</td> <td>0.20</td> </tr> <tr> <td></td> <td>0.18</td> <td>0.34</td> <td>0.20</td> <td>0.22</td> </tr> <tr> <td></td> <td>0.20</td> <td>0.36</td> <td>0.22</td> <td>0.24</td> </tr> <tr> <td></td> <td>0.30</td> <td>0.60</td> <td>0.30</td> <td>0.40</td> </tr> </tbody> </table>	Specified initial value	-55	85	125	$\Delta$ C/C	-	-10 - 0%	0 - +10%	0 - +12%	tan $\delta$	0.04	0.09	0.07	0.09	Refer to table or less	0.06	0.10	0.08	0.10		0.08	0.12	0.10	0.12		0.10	0.14	0.12	0.14		0.12	0.16	0.14	0.16		0.16	0.20	0.18	0.20		0.18	0.34	0.20	0.22		0.20	0.36	0.22	0.24		0.30	0.60	0.30	0.40	Paragraph 4.24
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Solder heat resistance	$\Delta$ C/C $\pm$ 5% or less tan $\delta$ Specified initial value or less LC Specified initial value or less	Solder Dip 260 $\pm$ 5°C A, B case C, E case 10 $\pm$ 1 sec. 5 $\pm$ 0.5 sec. Reflow-260°C 10 $\pm$ 1 sec.																																																						
Moisture resistance no load	$\Delta$ C/C $\pm$ 10% or less tan $\delta$ Specified initial value or less LC Specified initial value or less	Paragraph 4.22, 40°C 90 ~ 95%RH,500hours																																																						
High-temperature load	$\Delta$ C/C $\pm$ 10% or less tan $\delta$ Specified initial value or less LC 125% Specified initial value or less	Paragraph 4.23, 85°C The rated voltage is applied for 2000 hours.																																																						
Thermal shock	$\Delta$ C/C $\pm$ 10% or less tan $\delta$ Specified initial value or less LC Specified initial value or less	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.																																																						
Moisture resistance load	$\Delta$ C/C $\pm$ 10% or less tan $\delta$ 150% Specified initial value or less LC 200% Specified initial value or less	40°C, humidity 90 to 95%RH The rated voltage is applied for 500 hours.																																																						
Failure rate	1% / 1000hours	85°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 - TCMC series

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Rated voltage V. DC	Capacitance μF	tanδ	Leakage current μA	Case code	Product name	
2.5	6.8	0.06	0.5	A	TMCMA0E685	
		10	0.08	0.5	A	TMCMA0E106
	15	0.08	0.5	A	TMCMA0E156	
		0.08	0.6	A	TMCMA0E226	
	22	0.08	0.6	B	TMCMB0E226	
		0.08	0.8	A	TMCMA0E336	
	33	0.08	0.8	B	TMCMB0E336	
		0.12	1.2	A	TMCMA0E476	
	47	0.08	1.2	B	TMCMB0E476	
		0.18	1.7	A	TMCMA0E686	
	68	0.08	1.7	B	TMCMB0E686	
		0.08	1.7	C	TMCMC0E686	
	100	0.18	5.0	A	TMCMA0E107	
		0.12	2.5	B	TMCMB0E107	
		0.08	2.5	C	TMCMC0E107	
		0.30	7.5	A	TMCMA0E157	
	150	0.18	3.8	B	TMCMB0E157	
		0.08	3.8	C	TMCMC0E157	
		0.08	3.8	E	TMCME0E157	
	220	0.30	27.5	A	TMCMA0E227	
		0.18	5.5	B	TMCMB0E227	
		0.08	5.5	C	TMCMC0E227	
		0.08	5.5	E	TMCME0E227	
	330	0.30	16.5	B	TMCMB0E337	
		0.18	8.3	C	TMCMC0E337	
		0.10	8.3	E	TMCME0E337	
	470	0.30	58.8	B	TMCMB0E477	
		0.18	11.8	C	TMCMC0E477	
		0.10	11.8	E	TMCME0E477	
	4	4.7	0.06	0.5	A	TMCMA0G475
		6.8	0.06	0.5	A	TMCMA0G685
		10	0.08	0.5	A	TMCMA0G106
			0.08	0.6	A	TMCMA0G156
		15	0.08	0.6	B	TMCMB0G156
			0.08	0.9	A	TMCMA0G226
		22	0.08	0.9	B	TMCMB0G226
			0.08	1.3	A	TMCMA0G336
		33	0.08	1.3	B	TMCMB0G336
			0.12	1.9	A	TMCMA0G476
		47	0.08	1.9	B	TMCMB0G476
			0.08	1.9	C	TMCMC0G476
		68	0.12	5.4	A	TMCMA0G686
0.08			2.7	B	TMCMB0G686	
0.08			2.7	C	TMCMC0G686	
100		0.30	8.0	A	TMCMA0G107	
		0.12	4.0	B	TMCMB0G107	
		0.08	4.0	C	TMCMC0G107	
		0.08	4.0	E	TMCME0G107	
150		0.30	60.0	A	TMCMA0G157	
		0.18	6.0	B	TMCMB0G157	
		0.08	6.0	C	TMCMC0G157	
		0.08	6.0	E	TMCME0G157	
220		0.30	88.0	A	TMCMA0G227	
		0.18	17.6	B	TMCMB0G227	
		0.12	8.8	C	TMCMC0G227	
330		0.08	8.8	E	TMCME0G227	
		0.30	26.4	B	TMCMB0G337	
		0.18	13.2	C	TMCMC0G337	
470		0.10	13.2	E	TMCME0G337	
		0.10	18.8	E	TMCME0G477	
6.3 (7)		3.3	0.06	0.5	A	TMCMA0J335
		4.7	0.06	0.5	A	TMCMA0J475
		6.8	0.06	0.5	A	TMCMA0J685
			0.08	0.7	A	TMCMA0J106
		10	0.08	0.7	B	TMCMB0J106
			0.08	1.1	A	TMCMA0J156
		15	0.08	1.1	B	TMCMB0J156
			0.08	1.5	A	TMCMA0J226
		22	0.08	1.5	B	TMCMB0J226
			0.10	2.3	A	TMCMA0J336
		33	0.08	2.3	B	TMCMB0J336
	0.08		2.3	C	TMCMC0J336	
	0.12		5.9	A	TMCMA0J476	
	47	0.08	3.3	B	TMCMB0J476	

Rated voltage V. DC	Capacitance μF	tanδ	Leakage current μA	Case code	Product name	
6.3 (7)	47	0.08	3.3	C	TMCMC0J476	
		0.18	8.6	A	TMCMA0J686	
	68	0.10	4.8	B	TMCMB0J686	
		0.08	4.8	C	TMCMC0J686	
		0.08	4.8	E	TMCME0J686	
		0.30	31.5	A	TMCMA0J107	
	100	0.12	7.0	B	TMCMB0J107	
		0.08	7.0	C	TMCMC0J107	
		0.08	7.0	E	TMCME0J107	
		0.18	18.9	B	TMCMB0J157	
	150	0.10	10.5	C	TMCMC0J157	
		0.08	10.5	E	TMCME0J157	
		0.30	27.7	B	TMCMB0J227	
	220	0.18	15.4	C	TMCMC0J227	
		0.10	15.4	E	TMCME0J227	
		0.30	23.1	C	TMCMC0J337	
	330	0.10	23.1	E	TMCME0J337	
		470	0.20	32.9	E	TMCME0J477
	10	2.2	0.06	0.5	A	TMCMA1A225
		3.3	0.06	0.5	A	TMCMA1A335
		4.7	0.06	0.5	A	TMCMA1A475
6.8		0.06	0.7	A	TMCMA1A685	
		0.06	0.7	B	TMCMB1A685	
10		0.08	1.0	A	TMCMA1A106	
		0.08	1.0	B	TMCMB1A106	
15		0.08	1.5	A	TMCMA1A156	
		0.08	1.5	B	TMCMB1A156	
22		0.12	4.4	A	TMCMA1A226	
		0.08	2.2	B	TMCMB1A226	
		0.08	2.2	C	TMCMC1A226	
33		0.18	6.6	A	TMCMA1A336	
		0.08	3.3	B	TMCMB1A336	
		0.08	3.3	C	TMCMC1A336	
47		0.20	9.4	A	TMCMA1A476	
		0.10	4.7	B	TMCMB1A476	
		0.08	4.7	C	TMCMC1A476	
		0.08	4.7	E	TMCME1A476	
68		0.18	6.8	B	TMCMB1A686	
		0.08	6.8	C	TMCMC1A686	
	0.08	6.8	E	TMCME1A686		
100	0.30	20.0	B	TMCMB1A107		
	0.10	10.0	C	TMCMC1A107		
	0.08	10.0	E	TMCME1A107		
150	0.18	15.0	C	TMCMC1A157		
	0.08	15.0	E	TMCME1A157		
	220	0.12	22.0	E	TMCME1A227	
330	0.30	33.0	E	TMCME1A337		
16	1.5	0.06	0.5	A	TMCMA1C155	
	2.2	0.06	0.5	A	TMCMA1C225	
	3.3	0.06	0.5	A	TMCMA1C335	
	4.7	0.06	0.8	A	TMCMA1C475	
		0.06	0.8	B	TMCMB1C475	
	6.8	0.06	1.1	A	TMCMA1C685	
		0.06	1.1	B	TMCMB1C685	
	10	0.08	1.6	A	TMCMA1C106	
		0.08	1.6	B	TMCMB1C106	
	15	0.12	2.4	A	TMCMA1C156	
		0.08	2.4	B	TMCMB1C156	
		0.08	2.4	C	TMCMC1C156	
	22	0.16	7.0	A	TMCMA1C226	
		0.08	3.5	B	TMCMB1C226	
		0.08	3.5	C	TMCMC1C226	
		0.12	5.3	B	TMCMB1C336	
	33	0.08	5.3	C	TMCMC1C336	
		0.08	5.3	E	TMCME1C336	
		0.20	7.5	B	TMCMB1C476	
	47	0.08	7.5	C	TMCMC1C476	
		0.08	7.5	E	TMCME1C476	
0.20		10.9	C	TMCMC1C686		
68	0.08	10.9	E	TMCME1C686		
	0.20	16.0	C	TMCMC1C107		
	0.08	16.0	E	TMCME1C107		
20	1	0.04	0.5	A	TMCMA1D105	
	1.5	0.06	0.5	A	TMCMA1D155	

## Standard product table - TCMC series

Rated voltage V. DC	Capacitance μF	tanδ	Leakage current μA	Case code	Product name
20	2.2	0.06	0.5	A	TMCMA1D225
		0.06	0.7	A	TMCMA1D335
	3.3	0.06	0.7	B	TMCMB1D335
		0.06	0.9	A	TMCMA1D475
	4.7	0.06	0.9	B	TMCMB1D475
		0.06	1.4	B	TMCMB1D685
	6.8	0.08	2.0	B	TMCMB1D106
		0.08	2.0	C	TMCMC1D106
	10	0.08	3.0	B	TMCMB1D156
		0.08	3.0	C	TMCMC1D156
	15	0.08	4.4	B	TMCMB1D226
		0.08	4.4	C	TMCMC1D226
		0.08	4.4	E	TMCME1D226
	22	0.08	6.6	C	TMCMC1D336
		0.08	6.6	E	TMCME1D336
	33	0.08	9.4	E	TMCME1D476
47	0.08	13.6	E	TMCME1D686	
25	0.68	0.04	0.5	A	TMCMA1E684
	1	0.04	0.5	A	TMCMA1E105
	1.5	0.06	0.5	A	TMCMA1E155
		0.06	0.6	A	TMCMA1E225
	2.2	0.06	0.6	B	TMCMB1E225
		0.06	0.8	A	TMCMA1E335
	3.3	0.06	0.8	B	TMCMB1E335
		0.08	1.2	A	TMCMA1E475
	4.7	0.06	1.2	B	TMCMB1E475
		0.08	1.7	B	TMCMB1E685
	6.8	0.06	1.7	C	TMCMC1E685
		0.08	2.5	C	TMCMC1E106
	10	0.08	3.8	C	TMCMC1E156
		0.08	3.8	E	TMCME1E156
	15	0.08	5.5	C	TMCMC1E226
		0.08	5.5	E	TMCME1E226
22	0.08	8.3	E	TMCME1E336	
	0.08	11.8	E	TMCME1E476	
35	0.47	0.04	0.5	A	TMCMA1V474
	0.68	0.04	0.5	A	TMCMA1V684
	1	0.04	0.5	A	TMCMA1V105
	1.5	0.06	0.5	A	TMCMA1V155
		0.06	0.5	B	TMCMB1V155
	2.2	0.08	0.8	A	TMCMA1V225
		0.06	0.8	B	TMCMB1V225
	3.3	0.06	1.2	B	TMCMB1V335
		0.06	1.6	C	TMCMC1V475
	4.7	0.06	2.4	C	TMCMC1V685
		0.08	3.5	C	TMCMC1V106
	6.8	0.08	3.5	E	TMCME1V106
		0.08	5.3	E	TMCME1V156
	15	0.08	7.7	E	TMCME1V226

## Marking code

Month Year	1	2	3	4	5	6	7	8	9	10	11	12
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
2011	a	b	c	d	e	f	g	h	j	k	l	m
2012	n	p	q	r	s	t	u	v	w	x	y	z

## Marking indication TCMC series

TCMC * △ □ □ □ ○ ○ ○ F	
A, B case	<p>① Anode indication belt mark ② Simplified code of rated voltage (G : 4V) ③ Simplified code of nominal capacitance (A7 : 10μF) ④ Marking code</p>
C, E case	<p>① Anode indication belt mark ② Nominal capacitance Value (15μF) ③ Rated voltage (16V) ④ Marking code</p>