

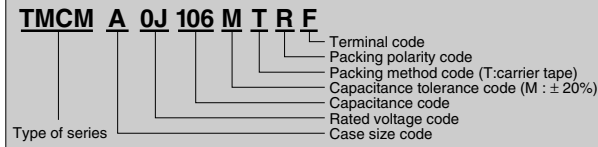
# TANTALUM ELECTROLYTIC CAPACITORS

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

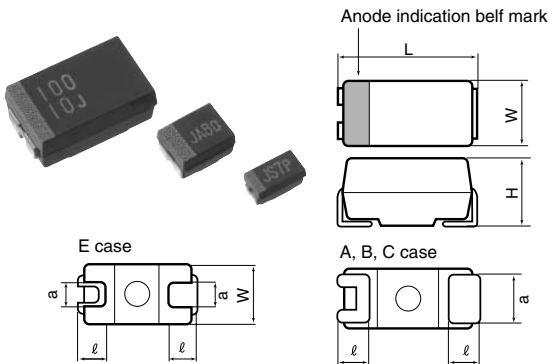
### Features

- 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%



### Outline of drawings and dimensions



### Dimensions (Unit : mm)

Case code	Case size				
	L $\pm$ 0.2	W $\pm$ 0.2	H $\pm$ 0.2	$\ell$ $\pm$ 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 $\pm$ 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	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	A,B
2.2	225				A	A	A	A,B	A,B	A,B
3.3	335			A	A	A	A,B	A,B	A,B	B
4.7	475		A	A	A	A,B	A,B	A,B	A,B	C
6.8	685	A	A	A	A,B	A,B	A,B	A,B	C,B	C
10	106	A	A	A,B	A,B	A,B	B	C	C	C,E
15	156	A	A,B	A,B	A,B	A,B,C	B,C	C,E	C,E	E
22	226	A,B	A,B	A,B	A,B,C	A,B,C	B,C,E	C,E	C,E	E
33	336	A,B	A,B	A,B,C	A,B,C	A,B,C	B,C,E	C,E	C,E	E
47	476	A,B	A,B,C	A,B,C	A,B,C	A,B,C,E	B,C,E	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></th> <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>LC</td> <td>0.06</td> <td>0.10</td> <td>0.08</td> <td>0.10</td> </tr> <tr> <td>or less</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	LC	0.06	0.10	0.08	0.10	or less	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
	22	0.08	0.6	A	TMCMA0E226	
		0.08	0.6	B	TMCMB0E226	
	33	0.08	0.8	A	TMCMA0E336	
		0.08	0.8	B	TMCMB0E336	
	47	0.12	1.2	A	TMCMA0E476	
		0.08	1.2	B	TMCMB0E476	
	68	0.18	1.7	A	TMCMA0E686	
		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	
	150	0.30	7.5	A	TMCMA0E157	
		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
			0.12	5.4	A	TMCMA0G686
		68	0.08	2.7	B	TMCMB0G686
			0.08	2.7	C	TMCMC0G686
			0.30	8.0	A	TMCMA0G107
100		0.12	4.0	B	TMCMB0G107	
		0.08	4.0	C	TMCMC0G107	
		0.08	4.0	E	TMCME0G107	
		0.30	60.0	A	TMCMA0G157	
150		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	
470		0.18	13.2	C	TMCMC0G337	
		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
		47	0.12	5.9	A	TMCMA0J476
			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	
		0.10	4.8	B	TMCMB0J686	
	68	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	
	150	0.18	18.9	B	TMCMB0J157	
		0.10	10.5	C	TMCMC0J157	
		0.08	10.5	E	TMCME0J157	
	220	0.30	27.7	B	TMCMB0J227	
		0.18	15.4	C	TMCMC0J227	
		0.10	15.4	E	TMCME0J227	
	330	0.30	23.1	C	TMCMC0J337	
		0.10	23.1	E	TMCME0J337	
		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	
68		0.08	4.7	E	TMCME1A476	
		0.18	6.8	B	TMCMB1A686	
		0.08	6.8	C	TMCMC1A686	
100	0.08	6.8	E	TMCME1A686		
	0.30	20.0	B	TMCMB1A107		
	0.10	10.0	C	TMCMC1A107		
150	0.08	10.0	E	TMCME1A107		
	0.18	15.0	C	TMCMC1A157		
	0.08	15.0	E	TMCME1A157		
220	0.12	22.0	E	TMCME1A227		
	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	
		0.12	2.4	A	TMCMA1C156	
	15	0.08	2.4	B	TMCMB1C156	
		0.08	2.4	C	TMCMC1C156	
		0.16	7.0	A	TMCMA1C226	
	22	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	

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