

TANTALUM ELECTROLYTIC CAPACITORS

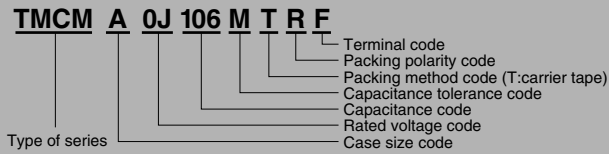
TANTALUM ELECTROLYTIC CAPACITORS

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

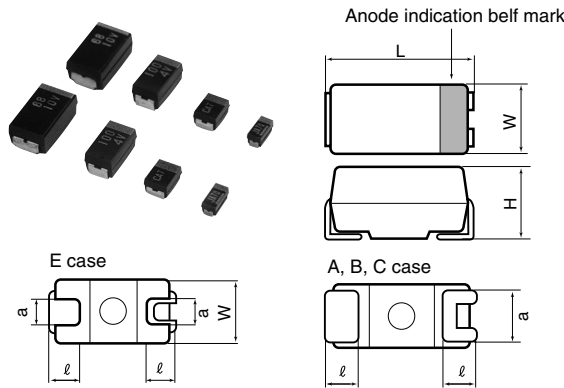
Features

- 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 μ F \pm 20%



Outline of drawings and dimensions



Dimensions (Unit : mm)

Case code	Case size				
	L ^{+0.2}	W ^{+0.2}	H ^{+0.2}	l ^{+0.3}	a ^{+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		Rated voltage (V.DC)							
		2.5	4	6.3 (7)	10	16	20	25	35
μ F	Code	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	B
2.2	225				A	A	A	A,B	B
3.3	335			A	A	A	A,B	B	B
4.7	475		A	A	A	A,B	A,B	B	C
6.8	685		A	A	A,B	A,B	B	C	C
10	106		A	A,B	A,B	A,B	B,C	C	C,E
15	156		A,B	A,B	A,B	A,B,C	C	C,E	E
22	226		A,B	A,B	A,B,C	B,C	C,E	E	E
33	336	A	A,B	A,B,C	B,C	B,C,E	(C)E	E	
47	476	A	A,B,C	A,B,C	B,C,E	C,E	E		
68	686	A,B	A,B,C	B,C,E	B,C,E	E	(E)		
100	107	(A)B,C	(A)B,C,E	B,C,E	C,E	E			
150	157	B,C	B,C,E	C,E	E				
220	227	B,C	B,C,E	C,E	E				
330	337	C,E	C,E	E	(E)				
470	477	E	E	E					

() : Under Developing

For ratings not covered the table, consult Hitachi AIC.

Product specifications	TMCM	Test conditions JIS C5101-3-1998																																																	
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 μ F																																																		
Capacitance tolerance	\pm 10% or 20%	Paragraph 7.8, 120 Hz																																																	
Leakage current	Refer to table standard product table	Paragraph 7.7, in 5 minutes after the rated voltage is applied.																																																	
tan δ	Refer to table standard product table	Paragraph 7.9, 120Hz																																																	
Surge withstanding voltage	Δ C/C \pm 5% or less tan δ Specified initial value or less LC Specified initial value or less	Paragraph 7.14																																																	
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>Δ C/C</td> <td>-</td> <td>-10 ~ 0%</td> <td>0 ~ +10%</td> <td>0 ~ +12%</td> </tr> <tr> <td>tanδ</td> <td>0.04</td> <td>0.09</td> <td>0.07</td> <td>0.09</td> </tr> <tr> <td>See show 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>LC</td> <td>0.01CV or 0.5μA or less</td> <td>-</td> <td>0.1CV or 5μA or less</td> <td>0.125CV or 6.25μA or less</td> </tr> </tbody> </table>	Specified initial value	-55	85	125	Δ C/C	-	-10 ~ 0%	0 ~ +10%	0 ~ +12%	tan δ	0.04	0.09	0.07	0.09	See show 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	LC	0.01CV or 0.5 μ A or less	-	0.1CV or 5 μ A or less	0.125CV or 6.25 μ A or less	Paragraph 7.12
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LC	0.01CV or 0.5 μ A or less	-	0.1CV or 5 μ A or less	0.125CV or 6.25 μ A or less																																															
Solder heat resistance	Δ C/C \pm 5% or less tan δ Specified initial value or less LC Specified initial value or less	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 leaving	Δ C/C \pm 10% or less tan δ Specified initial value or less LC Specified initial value or less	Paragraph 9.5, 40°C 90 ~ 95%RH,500h																																																	
High-temperature load	Δ C/C \pm 10% or less tan δ Specified initial value or less LC 125% Specified initial value or less	Paragraph 9.10, 85°C The rated voltage is applied for 2000 hours.																																																	
Thermal shock	Δ C/C \pm 10% or less tan δ 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 20 times running.																																																	
Moisture resistance load	Δ C/C \pm 10% or less tan δ 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% / 1000h	85°C. The rated voltage is applied (through a protective resistor of 1 Ω /V).																																																	

Standard product tables - TCMC series

Standard product table - TCMC series (For ratings not covered the table, consult Hitachi AIC.)

Rated voltage V. DC	Capacitance μF	tanδ	Leakage current μA	Case code	Product name	
2.5	33	0.08	0.8	A	TMCMA0E336	
	47	0.12	1.2	A	TMCMA0E476	
		0.18	1.7	A	TMCMA0E686	
	68	0.08	1.7	B	TMCMB0E686	
		(0.18)	(5.0)	(A)	TMCMA0E107	
	100	0.12	2.5	B	TMCMB0E107	
		0.08	2.5	C	TMCMB0E107	
		0.08	3.8	B	TMCMB0E157	
	150	0.08	3.8	C	TMCMC0E157	
		0.08	3.8	E	TMCME0E157	
	220	0.18	5.5	B	TMCMB0E227	
		0.08	5.5	C	TMCMC0E227	
		0.08	5.5	E	TMCME0E227	
	330	0.18	8.3	C	TMCME0E337	
		0.10	8.3	E	TMCME0E337	
	470	0.10	11.8	E	TMCME0E477	
4	15	0.08	0.6	A	TMCMA0G156	
	22	0.08	0.9	A	TMCMA0G226	
	33	0.08	1.3	A	TMCMA0G336	
	47	0.12	1.9	A	TMCMA0G476	
		0.12	5.4	A	TMCMA0G686	
	68	0.08	2.7	B	TMCMB0G686	
		0.12	4.0	B	TMCMB0G107	
	100	0.08	4.0	C	TMCMC0G107	
		0.18	6.0	B	TMCMB0G157	
	150	0.08	6.0	C	TMCMC0G157	
		0.18	17.6	B	TMCMB0G227	
	220	0.12	8.8	C	TMCMC0G227	
		0.18	13.2	C	TMCMC0G337	
	330	0.10	13.2	E	TMCME0G337	
		0.10	18.8	E	TMCME0G477	
	6.3 (7)	22	0.08	1.5	A	TMCMA0J226
33		0.10	2.3	A	TMCMA0J336	
		0.12	5.9	A	TMCMA0J476	
47		0.08	3.3	B	TMCMB0J476	
		0.10	4.8	B	TMCMB0J686	
68		0.08	4.8	C	TMCMC0J686	
		0.12	7.0	B	TMCMB0J107	
100		0.08	7.0	C	TMCMC0J107	
		0.10	10.5	C	TMCMC0J157	
150		0.18	15.4	C	TMCMC0J227	
		0.08	15.4	E	TMCME0J227	
220		0.10	23.1	E	TMCME0J337	
		0.20	32.9	E	TMCME0J477	
10		4.7	0.06	0.5	A	TMCMA1A475
		6.8	0.06	0.7	A	TMCMA1A685
		10	0.08	1.0	A	TMCMA1A106
	15	0.08	1.5	A	TMCMA1A156	
		0.12	4.4	A	TMCMA1A226	
	22	0.08	2.2	B	TMCMB1A226	
		0.08	3.3	B	TMCMB1A336	
	33	0.10	4.7	B	TMCMB1A476	
		0.08	4.7	C	TMCMC1A476	
	47	0.08	6.8	C	TMCMC1A686	
		0.10	10.0	C	TMCMC1A107	
	220	0.08	22.0	E	TMCME1A227	

Rated voltage V. DC	Capacitance μF	tanδ	Leakage current μA	Case code	Product name	
16	3.3	0.06	0.5	A	TMCMA1C335	
	4.7	0.06	0.8	A	TMCMA1C475	
		0.06	1.1	A	TMCMA1C685	
	6.8	0.08	1.6	A	TMCMA1C106	
		0.08	1.6	B	TMCMB1C106	
	10	0.08	2.4	B	TMCMB1C156	
		0.08	3.5	B	TMCMB1C226	
	15	0.08	3.5	C	TMCMC1C226	
		0.08	5.3	C	TMCMC1C336	
	22	0.08	7.5	C	TMCMC1C476	
		0.08	7.5	E	TMCME1C476	
	33	0.08	10.9	E	TMCME1C686	
		0.08	16.0	E	TMCME1C107	
	20	2.2	0.06	0.5	A	TMCMA1D225
		3.3	0.06	0.7	A	TMCMA1D335
			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	4.4	C	TMCMC1D226	
		0.08	4.4	E	TMCME1D226	
22		0.08	9.4	E	TMCME1D476	
		0.08	9.4	E	TMCME1D476	
25		0.68	0.04	0.5	A	TMCMA1E684
		1.0	0.04	0.5	A	TMCMA1E105
			0.06	0.5	A	TMCMA1E155
		2.2	0.06	0.6	B	TMCMB1E225
			0.06	0.8	B	TMCMB1E335
	3.3	0.06	1.2	B	TMCMB1E475	
		0.06	1.7	C	TMCMC1E685	
	6.8	0.08	2.5	C	TMCMC1E106	
		0.08	3.8	C	TMCMC1E156	
	10	0.08	3.8	E	TMCME1E156	
		0.08	5.5	E	TMCME1E226	
	22	0.08	8.3	E	TMCME1E336	
		0.08	8.3	E	TMCME1E336	
	35	0.47	0.04	0.5	A	TMCMA1V474
		0.68	0.04	0.5	A	TMCMA1V684
			0.04	0.5	A	TMCMA1V105
1.5		0.06	0.5	B	TMCMB1V155	
		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	
10		0.08	3.5	E	TMCME1V106	
		0.08	5.3	E	TMCME1V156	
22		0.08	7.7	E	TMCME1V226	

Lot indication

Year	Month											
	1	2	3	4	5	6	7	8	9	10	11	12
2002	N	P	Q	R	S	T	U	V	W	X	Y	Z
2003	a	b	c	d	e	f	g	h	j	k	l	m
2004	n	p	q	r	s	t	u	v	w	x	y	z
2005	A	B	C	D	E	F	G	H	J	K	L	M

Marking indication TCMC series

	TCMC * △△□□□○○○	TCMC * △△□□□○○○F
A, B case	<p>Simplified code of rated voltage (G : 4V) Anode indication belt mark Lot indication (for manufacturing in January, 2001) Simplified code of nominal capacitance (A7 : 10μF) *The simplified code is subject to JIS C 5143, paragraph 10 and EIAJ RC-3813, paragraph 7.</p>	<p>Anode indication belt mark Simplified code of rated voltage (G : 4V) Lot indication (for manufacturing in January, 2001) Simplified code of nominal capacitance (A7 : 10μF) *The simplified code is subject to JIS C 5143, paragraph 10 and EIAJ RC-3813, paragraph 7.</p>
C, E case	<p>Nominal capacitance Value (15μF) Anode indication belt mark Lot indication (for manufacturing in January, 2001) Rated voltage (16V)</p>	<p>Anode indication belt mark Nominal capacitance Value (15μF) Lot indication (for manufacturing in January, 2001) Rated voltage (16V)</p>