

# TANTALUM ELECTROLYTIC CAPACITORS

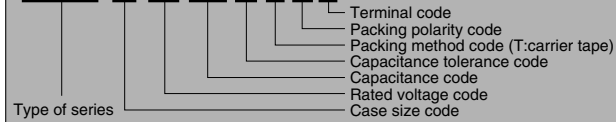
## TMCM Series (Miniaturized Tantalum Chip Capacitors with Extended Capacitance Range)

### Features

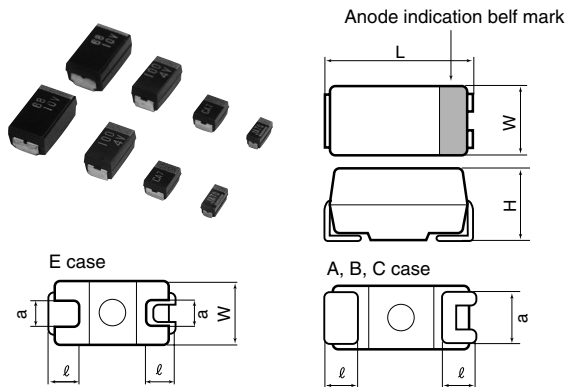
- A model type miniaturized chip capacitor developed on the basis of TMCS production technology ideal for high density component mounting applied in AV equipment.
- Super compact : Reduced size 1/2 to 1/3 in comparison with TMCS.

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

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



### 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 $\pm$ 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
$\mu$ F		0E	0G	0J	1A	1C	1D	1E	1V
0.47	474								A
0.68	684							A	A
1.0	105							A	A
1.5	155							A	B
2.2	225						A	A,B	B
3.3	335					A	A	B	B
4.7	475				A	A	A,B	B	C
6.8	685				A	A	B	C	C
10	106				A	A,B	B,C	C	C,E
15	156		A		A	A,B	C	C,E	E
22	226		A	A	A,B	B,C	C,E	E	E
33	336	A	A	A	B	B,C	(C)E	E	
47	476	A	A	A,B	B,C	C,E	E		
68	686	A,B	A,B	B,C	B,C	E	(E)		
100	107	(A)B,C	(A)B,C	B,C	C	E			
150	157	B,C	B,C	C	E				
220	227	B,C	B,C	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 $\mu$ 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 $\delta$	Refer to table standard product table				Paragraph 7.9, 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 7.14	
Temperature characteristics		Specified initial value	-55	85	125	Paragraph 7.12
$\Delta$ C/C	-	-10 - 0%	0 ~ +10%	0 ~ +12%		
tan $\delta$	0.04	0.09	0.07	0.09		
Leakage current 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 $\mu$ A or less	-	0.1CV or 5 $\mu$ A or less	0.125CV or 6.25 $\mu$ A or less		
Solder heat resistance	$\Delta$ C/C $\pm$ 5% or less tan $\delta$ 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	$\Delta$ C/C $\pm$ 10% or less tan $\delta$ Specified initial value or less LC Specified initial value or less				Paragraph 9.5, 40°C 90 ~ 95%RH, 500h	
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 9.10, 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 20 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% / 1000h				85°C. The rated voltage is applied (through a protective resistor of 1 $\Omega$ /V).	

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## 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	33	0.08	0.8	A	TMCMA0E336
		0.12	1.2	A	TMCMA0E476
	68	0.18	1.7	A	TMCMA0E686
			1.7	B	TMCMB0E686
	100	(0.18)	(5.0)	(A)	TMCMA0E107
			2.5	B	TMCMB0E107
			2.5	C	TMCMB0E107
	150	0.08	3.8	B	TMCMB0E157
			3.8	C	TMCMB0E157
			3.8	E	TMCME0E157
	220	0.18	5.5	B	TMCMB0E227
			5.5	C	TMCMB0E227
			5.5	E	TMCME0E227
	330	0.18	8.3	C	TMCME0E337
			8.3	E	TMCME0E337
	470	0.10	11.8	E	TMCME0E477
4	15	0.08	0.6	A	TMCMA0G156
				A	TMCMA0G226
	33	0.08	1.3	A	TMCMA0G336
				A	TMCMA0G476
	68	0.12	5.4	A	TMCMA0G686
				B	TMCMB0G686
	100	0.12	4.0	B	TMCMB0G107
				C	TMCMB0G107
	150	0.18	6.0	B	TMCMB0G157
				C	TMCMB0G157
	220	0.18	17.6	B	TMCMB0G227
				C	TMCMB0G227
	330	0.18	13.2	C	TMCMB0G337
				E	TMCME0G337
	470	0.10	18.8	E	TMCME0G477
	6.3 (7)	22	0.08	1.5	A
A					TMCMA0J336
47		0.12	5.9	A	TMCMA0J476
				B	TMCMB0J476
68		0.10	4.8	B	TMCMB0J686
				C	TMCMB0J686
100		0.12	7.0	B	TMCMB0J107
				C	TMCMB0J107
150		0.18	10.5	C	TMCMB0J157
				C	TMCMB0J227
220		0.18	15.4	C	TMCMB0J227
				E	TMCME0J227
330	0.10	23.1	E	TMCME0J337	
			E	TMCME0J477	
470	0.20	32.9	E	TMCME0J477	
10	4.7	0.06	0.5	A	TMCMA1A475
				A	TMCMA1A685
	10	0.08	1.0	A	TMCMA1A106
				A	TMCMA1A156
	22	0.12	4.4	A	TMCMA1A226
				B	TMCMB1A226
	33	0.08	3.3	B	TMCMB1A336
				B	TMCMB1A476
	47	0.10	4.7	B	TMCMB1A476
				C	TMCMB1A476
	68	0.08	6.8	C	TMCMB1A686
				C	TMCMB1A107
100	0.10	10.0	C	TMCMB1A107	
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
				A	TMCMA1C475
	6.8	0.06	1.1	A	TMCMA1C685
				A	TMCMA1C106
	10	0.08	1.6	A	TMCMA1C106
				B	TMCMB1C106
	15	0.08	2.4	B	TMCMB1C156
				B	TMCMB1C226
	22	0.08	3.5	B	TMCMB1C226
				C	TMCMB1C226
	33	0.08	5.3	C	TMCMB1C336
				C	TMCMB1C476
	47	0.08	7.5	C	TMCMB1C476
				E	TMCME1C476
	68	0.08	10.9	E	TMCME1C686
				E	TMCME1C107
100	0.08	16.0	E	TMCME1C107	
20	2.2	0.06	0.5	A	TMCMA1D225
				A	TMCMA1D335
	4.7	0.06	0.9	A	TMCMA1D475
				B	TMCMB1D475
	6.8	0.06	1.4	B	TMCMB1D685
				B	TMCMB1D106
	10	0.08	2.0	B	TMCMB1D106
				C	TMCMB1D106
22	0.08	4.4	C	TMCMB1D226	
			E	TMCME1D226	
47	0.08	9.4	E	TMCME1D476	
25	0.68	0.04	0.5	A	TMCMA1E684
				A	TMCMA1E105
	1.0	0.04	0.5	A	TMCMA1E155
				A	TMCMA1E155
	2.2	0.06	0.6	B	TMCMB1E225
				B	TMCMB1E335
	3.3	0.06	0.8	B	TMCMB1E475
				B	TMCMB1E475
	4.7	0.06	1.2	B	TMCMB1E475
				C	TMCMB1E685
	6.8	0.06	1.7	C	TMCMB1E685
				C	TMCMB1E106
10	0.08	3.8	C	TMCMB1E156	
			E	TMCME1E156	
22	0.08	3.8	E	TMCME1E226	
			E	TMCME1E336	
33	0.08	8.3	E	TMCME1E336	
35	0.47	0.04	0.5	A	TMCMA1V474
				A	TMCMA1V684
	1.0	0.04	0.5	A	TMCMA1V105
				A	TMCMA1V155
	1.5	0.06	0.5	B	TMCMB1V155
				B	TMCMB1V225
	2.2	0.06	0.8	B	TMCMB1V225
				B	TMCMB1V335
	3.3	0.06	1.2	B	TMCMB1V335
				C	TMCMB1V475
	4.7	0.06	1.6	C	TMCMB1V475
				C	TMCMB1V685
6.8	0.06	2.4	C	TMCMB1V685	
			C	TMCMB1V106	
10	0.08	3.5	C	TMCMB1V106	
			E	TMCME1V106	
15	0.08	5.3	E	TMCME1V156	
			E	TMCME1V226	
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	i	j	k	l
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>*The simplified code is subject to JIS C 5143, paragraph 10 and EIAJ RC-3813, paragraph 7.</p>	<p>*The simplified code is subject to JIS C 5143, paragraph 10 and EIAJ RC-3813, paragraph 7.</p>
C, E case		