

# TANTALUM ELECTROLYTIC CAPACITORS

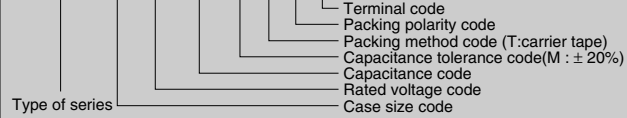
## TMCS Series (Standard Tantalum Chip Capacitors)

### Features

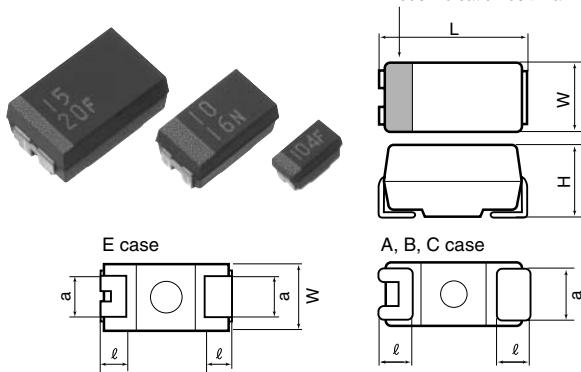
- The product is a standard type that has been most widely used among tantalum chip capacitors. The product has high solder heat resistance and is suitable for automatic mounting.
- The product is provided with both excellent frequency characteristic and excellent impedance characteristics.

Product symbol : (Example) TMCS Series A case 16V 1 $\mu$ F  $\pm$ 20%

**TMCS A 1C 105 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	l $\pm$ 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

Capitance		Rated voltage (V.DC)							
$\mu$ F	Code	4	7	10	16	20	25	35	
		0G	0J	1A	1C	1D	1E	1V	
0.10	104								A
0.15	154								A
0.22	224								A
0.33	334								A
0.47	474						A		B
0.68	684					A			B
1.0	105				A				B
1.5	155			A			B		C
2.2	225		A			B			C
3.3	335	A			B				C
4.7	475			B			C		E
6.8	685		B			C			E
10	106	B			C		E		
15	156			C		E			
22	226		C		E				
33	336	C		E					
47	476		E						
68	686	E							

Product specifications	TMCS	Test conditions JIS C5101-1:1998																			
Operating temperature range	-55°C ~ +125°C																				
Rated voltage	DC4 ~ 35V	85°C																			
Surge voltage	DC5 ~ 45V	85°C																			
Derated voltage	DC2.5 ~ 22V	125°C																			
Capacitance	0.1 ~ 68 $\mu$ F																				
Capacitance tolerance	$\pm$ 10% or 20%	Paragraph 4.7, 120 Hz																			
Leakage current	0.01 CV or 0.5 $\mu$ A, whichever is larger or less	Paragraph 4.9, in 5 minutes after the rated voltage is applied.																			
tan $\delta$	0.1 ~ 1.0    0.04 or less 1.5 ~ 68    0.06 or less	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>0.04</td> <td>0.05</td> <td>0.05</td> </tr> <tr> <td>Leakage current</td> <td>0.06</td> <td>0.06</td> <td>0.07</td> <td>0.07</td> </tr> </tbody> </table> or less 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	Specified initial value	-55	85	125	$\Delta$ C/C	-	-10 ~ 0%	0 ~ +10%	0 ~ +12%	tan $\delta$	0.04	0.04	0.05	0.05	Leakage current	0.06	0.06	0.07	0.07	Paragraph 4.24
Specified initial value	-55	85	125																		
$\Delta$ C/C	-	-10 ~ 0%	0 ~ +10%	0 ~ +12%																	
tan $\delta$	0.04	0.04	0.05	0.05																	
Leakage current	0.06	0.06	0.07	0.07																	
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 $\pm$ 5% 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 $\pm$ 5% 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 125% 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 - TMCS series

Standard product table - TMCS series

Rated voltage V.DC	Capacitance μF	tanδ	Leakage current μA	Case code	Product name
4	3.3	0.06	0.5	A	TMCSA0G335
	10	0.06	0.5	B	TMCSB0G106
	33	0.06	1.3	C	TMCSC0G336
	68	0.06	2.7	E	TMCSE0G686
7	2.2	0.06	0.5	A	TMCSA0J225
	6.8	0.06	0.5	B	TMCSB0J685
	22	0.06	1.5	C	TMCSC0J226
	47	0.06	3.3	E	TMCSE0J476
10	1.5	0.06	0.5	A	TMCSA1A155
	4.7	0.06	0.5	B	TMCSB1A475
	15	0.06	1.5	C	TMCSC1A156
	33	0.06	3.3	E	TMCSE1A336
16	1.0	0.04	0.5	A	TMCSA1C105
	3.3	0.06	0.5	B	TMCSB1C335
	10	0.06	1.6	C	TMCSC1C106
	22	0.06	3.5	E	TMCSE1C226
20	0.68	0.04	0.5	A	TMCSA1D684
	2.2	0.06	0.5	B	TMCSB1D225
	6.8	0.06	1.4	C	TMCSC1D685
	15	0.06	3.0	E	TMCSE1D156
25	0.47	0.04	0.5	A	TMCSA1E474
	1.5	0.06	0.5	B	TMCSB1E155
	4.7	0.06	1.2	C	TMCSC1E475
	10	0.06	2.5	E	TMCSE1E106
35	0.1	0.04	0.5	A	TMCSA1V104
	0.15	0.04	0.5	A	TMCSA1V154
	0.22	0.04	0.5	A	TMCSA1V224
	0.33	0.04	0.5	A	TMCSA1V334
	0.47	0.04	0.5	B	TMCSB1V474
	0.68	0.04	0.5	B	TMCSB1V684
	1.0	0.04	0.5	B	TMCSB1V105
	1.5	0.06	0.5	C	TMCSC1V155
	2.2	0.06	0.8	C	TMCSC1V225
	3.3	0.06	1.2	C	TMCSC1V335
	4.7	0.06	1.6	E	TMCSE1V475
	6.8	0.06	2.4	E	TMCSE1V685

Marking indication TMCS series

TMCS * △△□□○○○F	
A, B case	<p>① Anode indication belt mark ② Simplified code of nominal capacitance (A7 : 10μF) ③ Lot indication (A:for manufacturing in January, 2009)</p>
C, E case	<p>① Anode indication belt mark ② Nominal capacitance Value (10μF) ③ Rated voltage (16V) ④ Lot indication (A:for manufacturing in January, 2009)</p>

Lot indication

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