

TANTALUM ELECTROLYTIC CAPACITORS

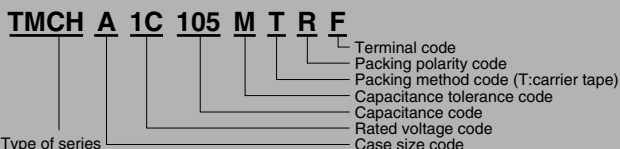
TANTALUM ELECTROLYTIC CAPACITORS

TMCH Series (High Reliability Tantalum Chip Capacitors)

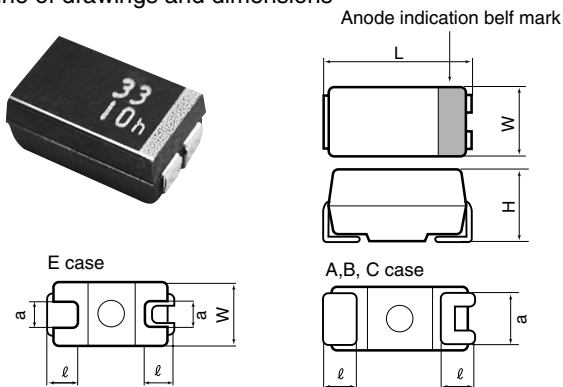
Features

- A moulded type chip capacitor developed on the basis of TMC production technology especially for car electronics applications. Also usable for use in office automation and other computer-based equipment which is required to offer high reliability.
- High heat resistance and high reliability: Improved over the predecessor in high-temperature (125°C) reliability, moisture resistance, and temperature cycling test resistance.

Product symbol : (Example) TMCH Series A case 16V 1μF ±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)						
		4	7	10	16	20	25	35
μF	Code	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	A,B
0.68	684					A	A	B
1.0	105				A	A		B
1.5	155			A	A	A	B	B,C
2.2	225		A	A	A	A,B	B	C
3.3	335	A	A	A	A,B	B		C
4.7	475	A	A	A,B	B	B	C	C,E
6.8	685		A,B	B	B	B,C	C	E
10	106	B	B	B	B,C	C	E	E
15	156	B	B	B,C	C	C,E	E	
22	226		B,C	C	C,E	E		
33	336	C	C	C,E	E			
47	476	C	C,E	E				
68	686	E	E					
100	107	E						

Product specifications	TMCH	Test conditions JIS C5101-3-1998																			
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 ~ 100μF																				
Capacitance tolerance	±10% or 20%	Paragraph 7.8, 120 Hz																			
Leakage current	0.005CV or 0.25μA, whichever is larger or less	Paragraph 7.7, in 5 minutes after the rated voltage is applied.																			
tanδ	0.1 ~ 1.0 0.04 or less 1.5 ~ 100 0.06 or less	Paragraph 7.9, 120Hz																			
Surge withstanding voltage	ΔC/C ±5% or less tanδ 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>ΔC/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>0.04</td> <td>0.05</td> <td>0.05</td> </tr> <tr> <td>Leakage current or less</td> <td>0.05</td> <td>0.06</td> <td>0.07</td> <td>0.07</td> </tr> </tbody> </table> LC 0.005CV or 0.25μA or less — 0.05CV or 2.5μA or less 0.062CV or 3.12μA or less	Specified initial value	-55	85	125	ΔC/C	-	-10 ~ 0%	0 ~ +10%	0 ~ +12%	tanδ	0.04	0.04	0.05	0.05	Leakage current or less	0.05	0.06	0.07	0.07	Paragraph 7.12
Specified initial value	-55	85	125																		
ΔC/C	-	-10 ~ 0%	0 ~ +10%	0 ~ +12%																	
tanδ	0.04	0.04	0.05	0.05																	
Leakage current or less	0.05	0.06	0.07	0.07																	
Solder heat resistance	ΔC/C ±5% or less tanδ Specified initial value or less LC Specified initial value or less	Dip 260±5°C A, B case C, E case 10±1 sec. 5±0.5 sec. Reflow-260°C 10±1 sec.																			
Moisture resistance leaving	ΔC/C ±5% or less tanδ 150% Specified initial value or less LC 200% Specified initial value or less	Paragraph 9.5, 85°C 85%RH,1000h																			
High-temperature load	ΔC/C ±10% or less tanδ 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. (TMCH : Derated voltage at 125°C)																			
Thermal shock	ΔC/C ±5% or less tanδ Specified initial value or less LC 200% 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 1000 times running.																			
Moisture resistance load	ΔC/C ±5% or less tanδ 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. H : 65°C																			
Failure rate	0.5% / 1000h	85°C. The rated voltage is applied (through a protective resistor of 1Ω/V).																			

Standard product tables - TMCH series

Standard product table - TMCH series

Rated voltage V. DC	Capacitance μF	tanδ	Leakage current μA	Case code	Product name
4	3.3	0.06	0.25	A	TMCHA0G335
	4.7	0.06	0.25	A	TMCHA0G475
	10	0.06	0.25	B	TMCHB0G106
	15	0.06	0.3	B	TMCHB0G156
	33	0.06	0.7	C	TMCHC0G336
	47	0.06	0.9	C	TMCHC0G476
	68	0.06	1.4	E	TMCHE0G686
	100	0.06	2.0	E	TMCHE0G107
7	2.2	0.06	0.25	A	TMCHA0J225
	3.3	0.06	0.25	A	TMCHA0J335
	4.7	0.06	0.25	A	TMCHA0J475
	6.8	0.06	0.25	A	TMCHA0J685
		0.06	0.25	B	TMCHB0J685
	10	0.06	0.4	B	TMCHB0J106
	15	0.06	0.53	B	TMCHB0J156
	22	0.06	0.77	B	TMCHB0J226
		0.06	0.8	C	TMCHC0J226
	33	0.06	1.2	C	TMCHC0J336
	47	0.06	1.65	C	TMCHC0J476
		0.06	1.6	E	TMCHE0J476
	68	0.06	2.4	E	TMCHE0J686
	10	1.5	0.06	0.25	A
2.2		0.06	0.25	A	TMCHA1A225
3.3		0.06	0.25	A	TMCHA1A335
4.7		0.06	0.25	A	TMCHB1A475
		0.06	0.25	B	TMCHB1B475
6.8		0.06	0.3	B	TMCHB1A685
10		0.06	0.5	B	TMCHB1A106
15		0.06	0.75	B	TMCHB1A156
		0.06	0.8	C	TMCHC1A156
22		0.06	1.1	C	TMCHC1A226
33		0.06	1.65	C	TMCHC1A336
		0.06	1.7	E	TMCHE1A336
47		0.06	2.4	E	TMCHE1A476
16		1.0	0.04	0.25	A
	1.5	0.06	0.25	A	TMCHA1C155
	2.2	0.06	0.25	A	TMCHA1C225
	3.3	0.06	0.27	A	TMCHA1C335
		0.06	0.3	B	TMCHB1C335
	4.7	0.06	0.4	B	TMCHB1C475
	6.8	0.06	0.55	B	TMCHB1C685
	10	0.06	0.8	B	TMCHC1B106
		0.06	0.8	C	TMCHC1C106
	15	0.06	1.2	C	TMCHC1C156
	22	0.06	1.76	C	TMCHE1C226
		0.06	1.8	E	TMCHE1E226
	33	0.06	2.6	E	TMCHE1C336

Rated voltage V. DC	Capacitance μF	tanδ	Leakage current μA	Case code	Product name	
20	0.68	0.04	0.25	A	TMCHA1D684	
	1.0	0.04	0.25	A	TMCHA1D105	
	1.5	0.06	0.25	A	TMCHA1D155	
	2.2	0.06	0.25	A	TMCHA1D225	
		0.06	0.25	B	TMCHB1D225	
	3.3	0.06	0.30	B	TMCHB1D335	
	4.7	0.06	0.47	B	TMCHB1D475	
	6.8	0.06	0.68	B	TMCHB1D685	
		0.06	0.70	C	TMCHC1D685	
	10	0.06	1.00	C	TMCHC1D106	
	15	0.06	1.5	C	TMCHC1D156	
		0.06	1.5	E	TMCHE1D156	
22	0.06	2.2	E	TMCHE1D226		
25	0.47	0.04	0.25	A	TMCHA1E474	
	0.68	0.04	0.25	A	TMCHA1E684	
	1.5	0.06	0.25	B	TMCHB1E155	
	2.2	0.06	0.3	B	TMCHB1E225	
	4.7	0.06	0.6	C	TMCHC1E475	
	6.8	0.06	0.9	C	TMCHC1E685	
	10	0.06	1.3	E	TMCHE1E106	
	15	0.06	1.9	E	TMCHE1E156	
	35	0.1	0.04	0.25	A	TMCHA1V104
		0.15	0.04	0.25	A	TMCHA1V154
		0.22	0.04	0.25	A	TMCHA1V224
0.33		0.04	0.25	A	TMCHA1V334	
0.47		0.04	0.25	A	TMCHA1V474	
		0.04	0.25	B	TMCHB1V474	
0.68		0.04	0.25	B	TMCHB1V684	
1.0		0.04	0.25	B	TMCHB1V105	
1.5		0.06	0.3	B	TMCHB1V155	
		0.06	0.3	C	TMCHC1V155	
2.2		0.06	0.4	C	TMCHC1V225	
3.3		0.06	0.6	C	TMCHC1V335	
4.7		0.06	0.8	C	TMCHC1V475	
		0.06	0.8	E	TMCHE1V475	
6.8	0.06	1.2	E	TMCHE1V685		
10	0.06	1.8	E	TMCHE1V106		

Marking indication

	TMCH * △ △ □ □ □ ○ ○ ○	TMCH * △ △ □ □ □ ○ ○ ○ F
A, B case	<p>① Simplified code of nominal capacitance (A6 : 1μF) ② Lot indication (for manufacturing in January, 2001) ③ Anode indication belt mark ④ Simplified code of rated voltage (D : 20V)</p>	<p>① Simplified code of nominal capacitance (A6 : 1μF) ② Lot indication (for manufacturing in January, 2001) ③ Anode indication belt mark ④ Simplified code of rated voltage (D : 20V)</p>
	<p>*When the capacitance code is the same in the same case, use the voltage code for the higher rated voltage. *The simplified code is subject to JIS C 5143, paragraph 10 and EIAJ RC-3813, paragraph 7.</p>	<p>*When the capacitance code is the same in the same case, use the voltage code for the higher rated voltage. *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 (10μF) Anode indication belt mark Lot indication (for manufacturing in January, 2001) Rated voltage (16V)</p>	<p>Nominal capacitance Value (10μF) Anode indication belt mark Lot indication (for manufacturing in January, 2001) Rated voltage (16V)</p>

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