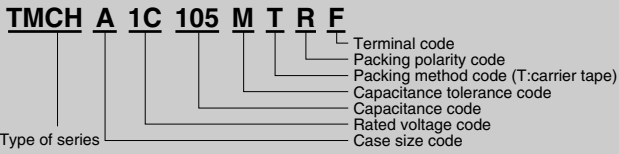


TMCH Series (High Reliability Tantalum Chip Capacitors)

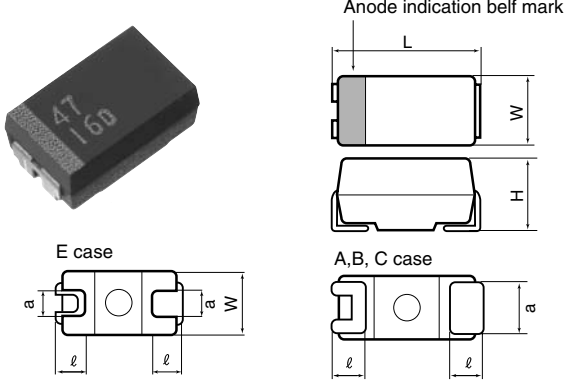
Features

- 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}
P	2.0	1.25	1.2	0.5	0.9
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

※Please see the page of TMCP Series, about details information of P case.

Standard value and case size

Capacitance	Code	Rated voltage (V.DC)						
		4	7	10	16	20	25	35
μF		0G	0J	1A	1C	1D	1E	1V
0.10	104							A
0.15	154							A
0.22	224							A
0.33	334					P		A
0.47	474				P		A	A,B
0.68	684				P	A	A	A,B
1.0	105				P,A	A		A,B
1.5	155			P,A	A	A	B	B,C
2.2	225		A	P,A	A	A,B	B	B,C
3.3	335	A	A	P,A	A,B	B	B	B,C
4.7	475	A	A	P,A,B	A,B	B	B,C	C,E
6.8	685		P,A,B	B	B	B,C	C	C,E
10	106	B	P,(A),B	(A),B	B,C	C	(C),E	(C),E
15	156	B	B	B,C	C	C,E	E	E
22	226		B,C	C	C,E	E	E	(E)
33	336	C	C	C	C,E	E	E	E
47	476	C	C,E	C,E	C,E	E	E	E
68	686	E	E	(C),E				
100	107	E	E					

() brackets ; in development.

Product specifications	TMCH	P case and the other (Bold - type indication)	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 ~ 100μF																																					
Capacitance tolerance	±10% or 20%		Paragraph 4.7, 120 Hz																																			
Leakage current	Refer to Standard product table		Paragraph 4.9, in 5 minutes after the rated voltage is applied.																																			
tanδ	Refer to Standard product table		Paragraph 4.8, 120Hz																																			
Surge withstanding voltage	ΔC/C ±5% or less tan δ Specified initial value or less LC Specified initial value or less	ΔC/C ±10% or less tan δ Specified initial value or less LC Specified initial value or less	Paragraph 4.26																																			
Temperature characteristics	<table border="1"> <tr> <td>ΔC/C</td> <td>—</td> <td>-10%</td> <td>±1%</td> <td>±1%</td> </tr> <tr> <td>tan δ</td> <td>0.04</td> <td>0.04</td> <td>0.05</td> <td>0.05</td> </tr> <tr> <td>Value shown table or less</td> <td>0.06</td> <td>0.06</td> <td>0.07</td> <td>0.07</td> </tr> <tr> <td></td> <td>0.08</td> <td>0.08</td> <td>0.10</td> <td>0.12</td> </tr> </table>	ΔC/C	—	-10%	±1%	±1%	tan δ	0.04	0.04	0.05	0.05	Value shown table or less	0.06	0.06	0.07	0.07		0.08	0.08	0.10	0.12	<table border="1"> <tr> <td>ΔC/C</td> <td>—</td> <td>-20%</td> <td>±10%</td> <td>±1%</td> </tr> <tr> <td>tan δ</td> <td>0.06</td> <td>0.10</td> <td>0.08</td> <td>0.10</td> </tr> <tr> <td>Value shown table or less</td> <td></td> <td></td> <td></td> <td></td> </tr> </table>	ΔC/C	—	-20%	±10%	±1%	tan δ	0.06	0.10	0.08	0.10	Value shown table or less					Paragraph 4.24
ΔC/C	—	-10%	±1%	±1%																																		
tan δ	0.04	0.04	0.05	0.05																																		
Value shown table or less	0.06	0.06	0.07	0.07																																		
	0.08	0.08	0.10	0.12																																		
ΔC/C	—	-20%	±10%	±1%																																		
tan δ	0.06	0.10	0.08	0.10																																		
Value shown table or less																																						
Solder heat resistance	ΔC/C ±5% or less tan δ Specified initial value or less LC Specified initial value or less	ΔC/C ±5% or less tan δ Specified initial value or less LC Specified initial value or less	Solder 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 no load	ΔC/C ±5% or less tan δ 150% Specified initial value or less LC 200% Specified initial value or less	ΔC/C ±10% or less tan δ Specified initial value or less LC 500% Specified initial value or less	Paragraph 4.22, 85°C 85%RH, 1000hrs																																			
High-temperature load	ΔC/C ±10% or less tan δ Specified initial value or less LC 125% Specified initial value or less	ΔC/C ±20% or less tan δ 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	ΔC/C ±5% or less tan δ Specified initial value or less LC 200% Specified initial value or less	ΔC/C ±20% or less tan δ 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 tan δ 150% Specified initial value or less LC 200% Specified initial value or less	ΔC/C ±12% or less tan δ 200% Specified initial value or less LC 500% Specified initial value or less	65°C, humidity 90 to 95%RH The rated voltage is applied for 500 hrs.																																			
High temperature load	ΔC/C ±10% or less tan δ 150% Specified initial value or less LC 200% Specified initial value or less	ΔC/C ±10% or less tan δ 200% Specified initial value or less LC 500% Specified initial value or less	(At 150°C with no load)																																			
Failure rate	0.5% / 1000hrs	0.5% / 1000hrs	85°C. The rated voltage is applied (through a protective resistor of 1 Ω/V).																																			

※This catalog is designed for providing general information. Please inquire of our Sales Department to confirm specifications prior to use.

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	P	TMCHP0J685	
		0.06	0.25	A	TMCHA0J685	
		0.06	0.25	B	TMCHB0J685	
		0.06	0.25	P	TMCHP0J106	
	10	(0.08)	(0.4)	(A)	(TMCHA0J106)	
	10	0.06	0.4	B	TMCHB0J106	
	15	0.06	0.5	B	TMCHB0J156	
	22	0.06	0.8	B	TMCHB0J226	
		0.06	0.8	C	TMCHC0J226	
		0.06	1.2	C	TMCHC0J336	
		0.06	1.7	C	TMCHC0J476	
	47	0.06	1.7	E	TMCHE0J476	
		0.04	2.4	E	TMCHE0J686	
		0.06	3.5	E	TMCHE0J107	
	10	1.5	0.08	0.25	P	TMCHP1A155
0.06			0.25	A	TMCHA1A155	
2.2		0.08	0.25	P	TMCHP1A225	
		0.06	0.25	A	TMCHA1A225	
3.3		0.08	0.25	P	TMCHP1A335	
		0.06	0.25	A	TMCHA1A335	
4.7		0.08	0.25	P	TMCHP1A475	
		0.06	0.25	A	TMCHA1A475	
		0.06	0.25	B	TMCHB1A475	
		0.06	0.3	B	TMCHB1A685	
(10)		(0.08)	(0.5)	(A)	(TMCHA1A106)	
10		0.06	0.5	B	TMCHB1A106	
15		0.06	0.8	B	TMCHB1A156	
22		0.06	0.8	C	TMCHC1A156	
		0.06	1.1	C	TMCHC1A226	
33		0.06	1.7	C	TMCHC1A336	
		0.06	1.7	E	TMCHE1A336	
47		0.08	2.4	C	TMCHC1A476	
		0.06	2.4	E	TMCHE1A476	
(68)		(0.08)	(3.4)	(C)	(TMCHC1A686)	
68		0.08	3.4	E	TMCHE1A686	
16		0.47	0.06	0.25	P	TMCHP1C474
		0.68	0.06	0.25	P	TMCHP1C684
		1.0	0.06	0.25	P	TMCHP1C105
			0.04	0.25	A	TMCHA1C105
		1.5	0.06	0.25	A	TMCHA1C155
		2.2	0.06	0.25	A	TMCHA1C225
			0.08	0.3	P	TMCHP1C335
	0.06		0.3	A	TMCHA1C335	
	3.3	0.06	0.3	B	TMCHB1C335	
		0.06	0.4	A	TMCHA1C475	
	4.7	0.06	0.4	B	TMCHB1C475	
		0.06	0.6	B	TMCHB1C685	
	10	0.06	0.8	B	TMCHB1C106	
		0.06	0.8	C	TMCHC1C106	
	15	0.06	1.2	C	TMCHC1C156	
		0.06	1.8	C	TMCHC1C226	
	22	0.06	1.8	E	TMCHE1C226	
		0.08	2.6	C	TMCHC1C336	
	33	0.06	2.6	E	TMCHE1C336	
		0.08	3.8	C	TMCHC1C476	
47	0.08	3.8	E	TMCHE1C476		
20	0.33	0.06	0.25	P	TMCHP1D334	
	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		

Rated voltage V. DC	Capacitance μF	tanδ	Leakage current μA	Case code	Product name	
20	4.7	0.06	0.5	B	TMCHB1D475	
		0.06	0.7	B	TMCHB1D685	
	6.8	0.06	0.70	C	TMCHC1D685	
		0.06	1.00	C	TMCHC1D106	
	15	0.06	1.5	C	TMCHC1D156	
		0.06	1.5	E	TMCHE1D156	
		0.06	2.2	E	TMCHE1D226	
	33	0.06	3.3	E	TMCHE1D336	
	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	
3.3		0.06	0.4	B	TMCHB1E335	
4.7		0.06	0.6	B	TMCHB1E475	
		0.06	0.6	C	TMCHC1E475	
6.8		0.06	0.9	C	TMCHC1E685	
(10)		(0.06)	(1.3)	(C)	(TMCHC1E106)	
10		0.06	1.3	E	TMCHE1E106	
15		0.06	1.9	E	TMCHE1E156	
22		0.06	2.8	E	TMCHE1E226	
35	0.1	0.04	0.25	A	TMCHA1V104	
		0.04	0.25	A	TMCHA1V154	
	0.22	0.04	0.25	A	TMCHA1V224	
		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	A	TMCHA1V684	
		0.04	0.25	B	TMCHB1V684	
	1.0	0.04	0.25	A	TMCHA1V105	
		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	B	TMCHB1V225	
		0.06	0.4	C	TMCHC1V225	
	3.3	0.06	0.6	B	TMCHB1V335	
		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	C	TMCHC1V685	
		0.06	1.2	E	TMCHE1V685	
	(10)	(0.08)	(1.8)	(C)	(TMCHC1V106)	
	10	0.06	1.8	E	TMCHE1V106	
15	0.06	2.6	E	TMCHE1V156		
(22)	(0.08)	(3.9)	(E)	(TMCHE1V226)		

Marking indication

TMCH * △△□□□○○○F	
A, B case	<p>① Simplified code of nominal capacitance (A6 : 1μF) ② Lot indication (for manufacturing in January, 2007) 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.</p>
C, E case	<p>Nominal capacitance Value (10μF) Lot indication (for manufacturing in January, 2007) Rated voltage (16V)</p>
P case	<p>Anode indication belt mark Simplified code of nominal capacitance(S: 4.7μ) Simplified code of rated voltage (A: 10V)</p>

Lot indication

Year	Month											
	1	2	3	4	5	6	7	8	9	10	11	12
2007	a	b	c	d	e	f	g	h	j	k	l	m
2008	n	p	q	r	s	t	u	v	w	x	y	z
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