

Tantalum Chip Capacitors

TCM series

Standard Tantalum Chip Capacitors.

TCM Series Molded Chip Tantalum Capacitors are designed for use in thick film hybrid circuits and for direct mounting on printed circuit boards.

Fully-molded construction has good resistance to mechanical stress and moisture.

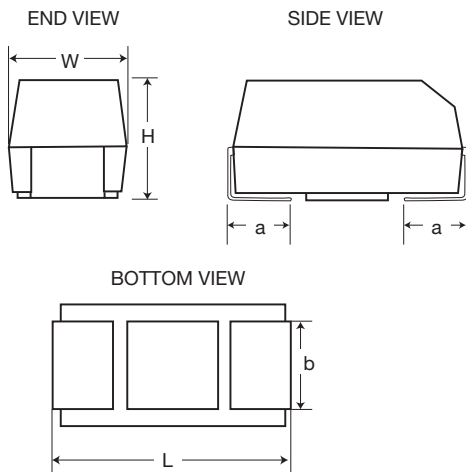
Specifications

Operating Temperature Range		-55°C – +125°C
Maximum Operating Temperature at Rated Voltage		+85°C
Leakage Current		0.01CV or 0.5µA max.
Dissipation Factor at 20°C and 120 Hz		Cap. ≤ 1.0µF less than 4% Cap. ≥ 1.5µF less than 6%
Humidity Test	Test Condition	Temp.: 60°C, humidity: 90 – 95% RH, duration: 500 hrs
	Capacitance Change	Within 5% of the value before test
	Leakage Current	Not to exceed the value specified above
	Dissipation Factor	Not to exceed 125 % of the value specified above
High Temp. Load Test	Test Condition	Temp.: 85°C at rated voltage duration: 1,000 hrs
	Capacitance Change	Within 10% of the value before test
	Leakage Current	Not to exceed 125 % of the value specified above
	Dissipation Factor	Not to exceed 125 % of the value specified above
	Solderability	260°C 10 sec. (Dip or Reflow) Within 5% of recorded value before test.
Reliability		Failure rate: Less than 1%/1,000 hours (60% CL)

Standard Ratings and Case Codes

W.V. ▶	4	6.3	10	16	20	25	35	50
Cap. (µF) ▼								
0.1							A	A
0.15							A	A,B
0.22							A	B
0.33						A	A	B
0.47						A	A,B	B,C
0.68					A	A	A,B	B,C
1				A	A	A,B	A,B	B,C
1.5			A	A	A	A,B	B,C	C,D
2.2		A	A,B	A	A,B	B,C	B,C	C,D
3.3	A	A	A	A,B	A,B	B,C	B,C	D
4.7	A	A	A,B	A,B,C	A,B,C	A,B,C	C,D	D
6.8	A	A,B	A,B	A,B,C	A,B,C	B,C	C,D	D,E
10	A,B	A,B	A,B,C	A,B,C	A,B,C	B,C,D	C,D	D,E
15	A,B	A,B,C	A,B,C	A,B,C	C,D	B,C,D	D,E	E
22	A,B,C	A,B,C	A,B,C	B,C,D	B,C,D	C,D	D,E	
33	A,B,C	A,B,C	A,B,C,D	C,D	C,D	C,D,E	E	
47	A,B,C	A,B,C,D	B,C,D	C,D	C,D	D,E	E	
68	A,B,C,D	A,B,C,D	B,C,D	C,D	D,E	D,E		
100	A,B,C,D	B,C,D	C,D	D,E	E	E		
150	B,C,D	C,D	C,D,E	D,E	E			
220	B	C,D,E	D,E	E				
330	C,D	D,E	D,E					
470	D,E	D,E	E					
680	D,E							
1000	E							

Dimensions



Unit: mm (inch)

Case Code	L	W	H	a	b
A	3.2 ± 0.2 (0.126 ± 0.008)	1.6 ± 0.2 (0.063 ± 0.008)	1.6 ± 0.2 (0.063 ± 0.008)	0.8 ± 0.3 (0.031 ± 0.012)	1.2 ± 0.2 (0.047 ± 0.008)
B	3.5 ± 0.2 (0.138 ± 0.008)	2.8 ± 0.2 (0.110 ± 0.008)	1.9 ± 0.2 (0.075 ± 0.008)	0.8 ± 0.3 (0.031 ± 0.012)	2.2 ± 0.2 (0.087 ± 0.008)
C	6.0 ± 0.3 (0.236 ± 0.012)	3.2 ± 0.3 (0.126 ± 0.012)	2.5 ± 0.3 (0.098 ± 0.012)	1.3 ± 0.3 (0.051 ± 0.012)	2.2 ± 0.2 (0.087 ± 0.008)
D	7.3 ± 0.3 (0.287 ± 0.012)	4.3 ± 0.3 (0.169 ± 0.012)	2.8 ± 0.3 (0.110 ± 0.012)	1.3 ± 0.3 (0.051 ± 0.012)	2.4 ± 0.2 (0.094 ± 0.008)
E	7.3 ± 0.3 (0.287 ± 0.012)	4.3 ± 0.3 (0.169 ± 0.012)	4.0 ± 0.3 (0.157 ± 0.012)	1.3 ± 0.3 (0.051 ± 0.012)	2.4 ± 0.2 (0.094 ± 0.008)

All components in this section are RoHS compliant per the EU directives and definitions.

TCM SERIES DATA TABLE

Standard Part Numbers & Data

Cap. µF	Case Code	Catalogue P/N	Max. DCL @ +25°C (µA)	Max. DF @ +25°C 120 Hz (%)	Max. ESR 100 kHz (Ω)
4.0V DC					
3.3	A	TA004TCM335 K or M AR	0.5	6	8
4.7	A	TA004TCM475 K or M AR	0.5	6	8
6.8	A	TA004TCM685 K or M AR	0.5	6	6
10	A	TA004TCM106 K or M AR	0.5	6	6
10	B	TA004TCM106 K or M BR	0.5	6	3.5
15	A	TA004TCM156 K or M AR	0.6	6	4
15	B	TA004TCM156 K or M BR	0.6	6	3.5
22	A	TA004TCM226 K or M AR	0.9	6	4
22	B	TA004TCM226 K or M BR	0.9	6	3.5
22	C	TA004TCM226 K or M CR	0.9	6	1.8
33	A	TA004TCM336 K or M AR	1.3	6	4
33	B	TA004TCM336 K or M BR	1.3	6	3.5
33	C	TA004TCM336 K or M CR	1.3	6	1.8
47	A	TA004TCM476 K or M AR	1.9	12	2.5
47	B	TA004TCM476 K or M BR	1.9	6	3
47	C	TA004TCM476 K or M CR	1.9	6	1.8
68	A	TA004TCM686 K or M AR	2.8	30	4
68	B	TA004TCM686 K or M BR	2.7	6	3.5
68	C	TA004TCM686 K or M CR	2.7	6	1.6
68	D	TA004TCM686 K or M DR	2.7	6	0.8
100	A	TA004TCM107 K or M AR	4	30	4
100	B	TA004TCM107 K or M BR	4	8	0.9
100	C	TA004TCM107 K or M CR	4	8	1.2
100	D	TA004TCM107 K or M DR	4	8	0.8
150	B	TA004TCM157 K or M BR	6	12	2
150	C	TA004TCM157 K or M CR	6	8	1.2
150	D	TA004TCM157 K or M DR	6	8	0.8
220	B	TA004TCM227 K or M BR	8.8	18	0.5
330	C	TA004TCM337 K or M CR	13.2	10	0.9
330	D	TA004TCM337 K or M DR	13.2	8	0.7
470	D	TA004TCM477 K or M DR	18.8	8	0.8
470	E	TA004TCM477 K or M ER	18.8	8	0.5
680	D	TA004TCM687 K or M DR	27.2	12	0.5
680	E	TA004TCM687 K or M ER	27.2	12	0.5
1000	E	TA004TCM108 K or M ER	40	12	0.5

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TCM SERIES DATA TABLE Standard Part Numbers & Data

Cap. μF	Case Code	Catalogue P/N	Max. DCL @ +25°C (μA)	Max. DF @ +25°C 120 Hz (%)	Max. ESR 100 kHz (Ω)
6.3V DC					
2.2	A	TA006TCM225 K or M AR	0.5	6	8
3.3	A	TA006TCM335 K or M AR	0.5	6	8
4.7	A	TA006TCM475 K or M AR	0.5	6	6
6.8	A	TA006TCM685 K or M AR	0.5	6	6
6.8	B	TA006TCM685 K or M BR	0.5	6	3.5
10	A	TA006TCM106 K or M AR	0.6	6	4
10	B	TA006TCM106 K or M BR	0.6	6	3.5
15	A	TA006TCM156 K or M AR	0.9	6	3.5
15	B	TA006TCM156 K or M BR	0.9	6	3.5
15	C	TA006TCM156 K or M CR	0.9	6	1.8
22	A	TA006TCM226 K or M AR	1.4	6	4
22	B	TA006TCM226 K or M BR	1.4	6	3.5
22	C	TA006TCM226 K or M CR	1.4	6	1.8
33	A	TA006TCM336 K or M AR	2	12	2.5
33	B	TA006TCM336 K or M BR	2	6	3
33	C	TA006TCM336 K or M CR	2	6	1.8
47	A	TA006TCM476 K or M AR	3	12	3.5
47	B	TA006TCM476 K or M BR	2.9	6	2
47	C	TA006TCM476 K or M CR	2.9	6	1.6
47	D	TA006TCM476 K or M DR	2.9	6	0.8
68	A	TA006TCM686 K or M AR	5	30	4
68	B	TA006TCM686 K or M BR	4.1	8	0.9
68	C	TA006TCM686 K or M CR	4.1	6	1.2
68	D	TA006TCM686 K or M DR	4.1	6	0.8
100	B	TA006TCM107 K or M BR	6.3	15	3
100	C	TA006TCM107 K or M CR	6	8	0.9
100	D	TA006TCM107 K or M DR	6	8	0.8
150	C	TA006TCM157 K or M CR	9	8	1.2
150	D	TA006TCM157 K or M DR	9	8	0.7
220	C	TA006TCM227 K or M CR	13.2	10	1.2
220	D	TA006TCM227 K or M DR	13.2	8	0.7
220	E	TA006TCM227 K or M ER	13.2	8	0.7
330	D	TA006TCM337 K or M DR	19.8	8	0.4
330	E	TA006TCM337 K or M ER	19.8	8	0.4
470	D	TA006TCM477 K or M DR	28.2	12	0.4
470	E	TA006TCM477 K or M ER	28.2	10	0.4

Note: All 6.3V Tantalums have P/N callouts as "006" but are rated at 6.3V.

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VENKEL LTD.

TCM SERIES DATA TABLE

Standard Part Numbers & Data

Cap. µF	Case Code	Catalogue P/N	Max. DCL @ +25°C (µA)	Max. DF @ +25°C 120 Hz (%)	Max. ESR 100 kHz (Ω)
10V DC					
1.5	A	TA010TCM155 K or M AR	0.5	6	8
2.2	A	TA010TCM225 K or M AR	0.5	6	8
2.2	B	TA010TCM225 K or M BR	0.5	5	3.5
3.3	A	TA010TCM335 K or M AR	0.5	6	6
4.7	A	TA010TCM475 K or M AR	0.5	6	5
4.7	B	TA010TCM475 K or M BR	0.5	6	3.5
6.8	A	TA010TCM685 K or M AR	0.7	6	4
6.8	B	TA010TCM685 K or M BR	0.7	6	3.5
10	A	TA010TCM106 K or M AR	1	6	4
10	B	TA010TCM106 K or M BR	1	6	3.5
10	C	TA010TCM106 K or M CR	1	6	1.8
15	A	TA010TCM156 K or M AR	1.5	8	6
15	B	TA010TCM156 K or M BR	1.5	6	2.8
15	C	TA010TCM156 K or M CR	1.5	6	1.8
22	A	TA010TCM226 K or M AR	2.2	10	6
22	B	TA010TCM226 K or M BR	2.2	6	2.4
22	C	TA010TCM226 K or M CR	2.2	6	1.8
33	A	TA010TCM336 K or M AR	3.3	15	6
33	B	TA010TCM336 K or M BR	3.3	6	1.8
33	C	TA010TCM336 K or M CR	3.3	6	1.6
33	D	TA010TCM336 K or M DR	3.3	6	0.8
47	B	TA010TCM476 K or M BR	4.7	8	1
47	C	TA010TCM476 K or M CR	4.7	6	1.2
47	D	TA010TCM476 K or M DR	4.7	6	0.8
68	B	TA010TCM686 K or M BR	6.8	10	3
68	C	TA010TCM686 K or M CR	6.8	6	1.2
68	D	TA010TCM686 K or M DR	6.8	6	0.8
100	C	TA010TCM107 K or M CR	10	8	1.2
100	D	TA010TCM107 K or M DR	10	8	0.7
150	C	TA010TCM157 K or M CR	15	10	0.9
150	D	TA010TCM157 K or M DR	15	8	0.7
150	E	TA010TCM157 K or M ER	15	8	0.7
220	D	TA010TCM227 K or M DR	22	8	0.5
220	E	TA010TCM227 K or M ER	22	8	0.5
330	D	TA010TCM337 K or M DR	33	10	0.5
330	E	TA010TCM337 K or M ER	33	10	0.5
470	E	TA010TCM477 K or M ER	47	10	0.2

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TCM SERIES DATA TABLE Standard Part Numbers & Data

Cap. μF	Case Code	Catalogue P/N	Max. DCL @ +25°C (μA)	Max. DF @ +25°C 120 Hz (%)	Max. ESR 100 kHz (Ω)
16V DC					
1	A	TA016TCM105 K or M AR	0.5	4	10
1.5	A	TA016TCM155 K or M AR	0.5	6	8
2.2	A	TA016TCM225 K or M AR	0.5	6	6
3.3	A	TA016TCM335 K or M AR	0.5	6	5
3.3	B	TA016TCM335 K or M BR	0.5	6	3.5
4.7	A	TA016TCM475 K or M AR	0.8	6	4
4.7	B	TA016TCM475 K or M BR	0.8	6	3.5
4.7	C	TA016TCM475 K or M CR	0.8	6	2.4
6.8	A	TA016TCM685 K or M AR	1.1	6	3.5
6.8	B	TA016TCM685 K or M BR	1.1	6	2.5
6.8	C	TA016TCM685 K or M CR	1.1	6	1.9
10	A	TA016TCM106 K or M AR	1.6	8	7
10	B	TA016TCM106 K or M BR	1.6	6	2.8
10	C	TA016TCM106 K or M CR	1.6	6	1.8
15	A	TA016TCM156 K or M AR	2.4	8	3.5
15	B	TA016TCM156 K or M BR	2.4	6	2.5
15	C	TA016TCM156 K or M CR	2.5	6	1.8
22	B	TA016TCM226 K or M BR	3.6	6	2.2
22	C	TA016TCM226 K or M CR	3.6	6	1.6
22	D	TA016TCM226 K or M DR	3.6	6	0.8
33	C	TA016TCM336 K or M CR	5.3	6	1.2
33	D	TA016TCM336 K or M DR	5.3	6	0.8
47	C	TA016TCM476 K or M CR	7.5	6	1.2
47	D	TA016TCM476 K or M DR	7.5	6	0.8
68	C	TA016TCM686 K or M CR	10.9	12	1.2
68	D	TA016TCM686 K or M DR	10.9	6	0.7
100	D	TA016TCM107 K or M DR	16	8	0.7
100	E	TA016TCM107 K or M ER	16	8	0.7
150	D	TA016TCM157 K or M DR	24	12	0.7
150	E	TA016TCM157 K or M ER	24	8	0.5
220	E	TA016TCM227 K or M ER	35.2	10	0.5

TCM SERIES DATA TABLE

Standard Part Numbers & Data

Cap. μF	Case Code	Catalogue P/N	Max. DCL @ +25°C (μA)	Max. DF @ +25°C 120 Hz (%)	Max. ESR 100 kHz (Ω)
20V DC					
0.68	A	TA020TCM684 K or M AR	0.5	4	12
1	A	TA020TCM105 K or M AR	0.5	4	9
1.5	A	TA020TCM155 K or M AR	0.5	6	6.5
2.2	A	TA020TCM225 K or M AR	0.5	6	7
2.2	B	TA020TCM225 K or M BR	0.5	6	3.5
3.3	A	TA020TCM335 K or M AR	0.7	6	4.5
3.3	B	TA020TCM335 K or M BR	0.7	6	3
4.7	A	TA020TCM475 K or M AR	1	6	4
4.7	B	TA020TCM475 K or M BR	1	6	3
4.7	C	TA020TCM475 K or M CR	1	6	2.4
6.8	A	TA020TCM685 K or M AR	1.4	8	6
6.8	B	TA020TCM685 K or M BR	1.4	6	2.5
6.8	C	TA020TCM685 K or M CR	1.4	6	1.9
10	A	TA020TCM106 K or M AR	2	10	5
10	B	TA020TCM106 K or M BR	2	6	2.1
10	C	TA020TCM106 K or M CR	2	6	1.8
15	C	TA020TCM156 K or M CR	3	6	1.7
15	D	TA020TCM156 K or M DR	3	6	1
22	B	TA020TCM226 K or M BR	4.4	8	4
22	C	TA020TCM226 K or M CR	4.4	6	1.2
22	D	TA020TCM226 K or M DR	4.4	6	0.8
33	C	TA020TCM336 K or M CR	6.6	6	1.2
33	D	TA020TCM336 K or M DR	6.6	6	0.8
47	C	TA020TCM476 K or M CR	9.4	10	0.9
47	D	TA020TCM476 K or M DR	9.4	6	0.7
68	D	TA020TCM686 K or M DR	13.6	8	0.7
68	E	TA020TCM686 K or M ER	13.6	6	0.7
100	E	TA020TCM107 K or M ER	20	8	0.5
150	E	TA020TCM157 K or M ER	30	10	0.5

Tantalum Chip Capacitors

TCM SERIES DATA TABLE Standard Part Numbers & Data

Cap. μ F	Case Code	Catalogue P/N	Max. DCL @ +25°C (μ A)	Max. DF @ +25°C 120 Hz (%)	Max. ESR 100 kHz (Ω)
25V DC					
0.33	A	TA025TCM334 K or M AR	0.5	4	15
0.47	A	TA025TCM474 K or M AR	0.5	4	14
0.68	A	TA025TCM684 K or M AR	0.5	4	10
1	A	TA025TCM105 K or M AR	0.5	4	8
1	B	TA025TCM105 K or M BR	0.5	4	5
1.5	A	TA025TCM155 K or M AR	0.5	6	7.5
1.5	B	TA025TCM155 K or M BR	0.5	6	5
2.2	B	TA025TCM225 K or M BR	0.6	6	4.5
2.2	C	TA025TCM225 K or M CR	0.6	6	3.5
3.3	B	TA025TCM335 K or M BR	0.9	6	3.5
3.3	C	TA025TCM335 K or M CR	0.9	6	2.5
4.7	A	TA025TCM475 K or M AR	1.2	8	6
4.7	B	TA025TCM475 K or M BR	1.2	6	1.5
4.7	C	TA025TCM475 K or M CR	1.2	6	2.4
6.8	B	TA025TCM685 K or M BR	1.7	8	2.8
6.8	C	TA025TCM685 K or M CR	1.7	6	1.9
10	B	TA025TCM106 K or M BR	2.5	8	3
10	C	TA025TCM106 K or M CR	2.5	6	1.5
10	D	TA025TCM106 K or M DR	2.5	6	1
15	B	TA025TCM156 K or M BR	3.8	8	4
15	C	TA025TCM156 K or M CR	3.8	6	1.5
15	D	TA025TCM156 K or M DR	3.8	6	1
22	C	TA025TCM226 K or M CR	5.5	6	1.4
22	D	TA025TCM226 K or M DR	5.5	6	0.8
33	C	TA025TCM336 K or M CR	8.3	10	1.2
33	D	TA025TCM336 K or M DR	8.3	6	0.7
33	E	TA025TCM336 K or M ER	8.3	6	0.7
47	D	TA025TCM476 K or M DR	11.8	10	0.7
47	E	TA025TCM476 K or M ER	11.8	6	0.7
68	D	TA025TCM686 K or M DR	17	10	0.7
68	E	TA025TCM686 K or M ER	17	8	0.7
100	E	TA025TCM107 K or M ER	25	8	0.3

TCM SERIES DATA TABLE

Standard Part Numbers & Data

Cap. μF	Case Code	Catalogue P/N	Max. DCL @ +25°C (μA)	Max. DF @ +25°C 120 Hz (%)	Max. ESR 100 kHz (Ω)
35V DC					
0.1	A	TA035TCM104 K or M AR	0.5	4	20
0.15	A	TA035TCM154 K or M AR	0.5	4	19
0.22	A	TA035TCM224 K or M AR	0.5	4	18
0.33	A	TA035TCM334 K or M AR	0.5	4	15
0.47	A	TA035TCM474 K or M AR	0.5	4	12
0.47	B	TA035TCM474 K or M BR	0.5	4	8
0.68	A	TA035TCM684 K or M AR	0.5	4	8
0.68	B	TA035TCM684 K or M BR	0.5	4	6.5
1	A	TA035TCM105 K or M AR	0.5	4	7.5
1	B	TA035TCM105 K or M BR	0.5	4	5
1.5	B	TA035TCM155 K or M BR	0.5	6	5
1.5	C	TA035TCM155 K or M CR	0.5	6	4.5
2.2	B	TA035TCM225 K or M BR	0.8	6	4
2.2	C	TA035TCM225 K or M CR	0.8	6	3.5
3.3	B	TA035TCM335 K or M BR	1.2	6	3.5
3.3	C	TA035TCM335 K or M CR	1.2	6	2.5
4.7	C	TA035TCM475 K or M CR	1.7	6	2.2
4.7	D	TA035TCM475 K or M DR	1.7	6	1.5
6.8	C	TA035TCM685 K or M CR	2.4	6	1.8
6.8	D	TA035TCM685 K or M DR	2.4	6	1.3
10	C	TA035TCM106 K or M CR	3.5	6	1.6
10	D	TA035TCM106 K or M DR	3.5	6	1
15	D	TA035TCM156 K or M DR	5.3	6	0.8
15	E	TA035TCM156 K or M ER	5.3	6	0.9
22	D	TA035TCM226 K or M DR	7.7	6	0.7
22	E	TA035TCM226 K or M ER	7.7	6	0.7
33	E	TA035TCM336 K or M ER	11.6	6	0.6
47	E	TA035TCM476 K or M ER	16.5	8	0.6

Tantalum Chip Capacitors

TCM SERIES DATA TABLE Standard Part Numbers & Data

Cap. μ F	Case Code	Catalogue P/N	Max. DCL @ +25°C (μ A)	Max. DF @ +25°C 120 Hz (%)	Max. ESR 100 kHz (Ω)
50V DC					
0.1	A	TA050TCM104 K or M AR	0.5	4	20
0.15	A	TA050TCM154 K or M AR	0.5	4	15
0.15	B	TA050TCM154 K or M BR	0.5	4	16
0.22	B	TA050TCM224 K or M BR	0.5	4	14
0.33	B	TA050TCM334 K or M BR	0.5	4	10
0.47	B	TA050TCM474 K or M BR	0.5	4	9
0.47	C	TA050TCM474 K or M CR	0.5	4	8
0.68	B	TA050TCM684 K or M BR	0.5	4	8
0.68	C	TA050TCM684 K or M CR	0.5	4	7
1	B	TA050TCM105 K or M BR	0.5	6	6
1	C	TA050TCM105 K or M CR	0.5	4	5.5
1.5	C	TA050TCM155 K or M CR	0.8	6	4.5
1.5	D	TA050TCM155 K or M DR	0.8	6	3.5
2.2	C	TA050TCM225 K or M CR	1.1	6	3
2.2	D	TA050TCM225 K or M DR	1.1	6	2.5
3.3	D	TA050TCM335 K or M DR	1.7	6	2
4.7	D	TA050TCM475 K or M DR	2.4	6	1.4
6.8	D	TA050TCM685 K or M DR	3.4	6	1
6.8	E	TA050TCM685 K or M ER	3.5	6	1
10	D	TA050TCM106 K or M DR	5	6	0.8
10	E	TA050TCM106 K or M ER	5	6	0.7
15	E	TA050TCM156 K or M ER	7.5	8	0.7
22	E	TA050TCM226 K or M ER	11	10	0.6