

Tantalum Chip Capacitors

TCR series

Low ESR & High Ripple Current

Low ESR & High Ripple Current. High Resistance against Rush current.
Lower failure even at low impedance Circuits. Failure Rate: 0.5% or less/1000 hrs.
Capacitance up to 1000 μ F in E case.

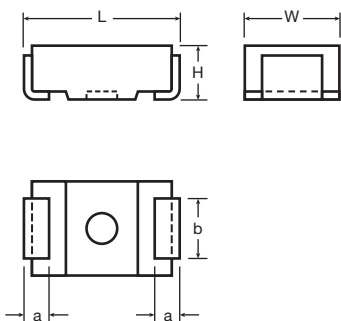
Specifications

Operating Temperature Range	-55°~+125°C
Maximum Operating Temperature at Rated Voltage	+85°C
Capacitance Tolerance	±20% (M), ±10% (K) at 120Hz
Dissipation Factor (Tan)	As per the following table
ESR & Maximum Ripple Current	As per the following table
DC Leakage Current	As per the following table
Resistance to Rush Current	Rated Voltage applied, 5A/ON • OFF 10,000 cycle
Solderability	260°C 10 Sec. (Dip or Reflow) Within 5% of recorded value before test.
Humidity Test	60°C, 90 – 95%RH 5000 hrs.
High Temp Load Test	85°C, Rated Voltage Applied for 2,000 hrs. or 125°C, Derated Voltage Applied for 2,000 hrs.
Failure Rate	0.5% or less/1,000 hrs after solder (60% CL)
Conformity	JIS-C-5143 Performance HB, EIA-535BAAC etc.

Standard Ratings and Case Codes

W.V.	4	6.3	10	16	20	25	35
Cap. (μ F)	0G	0J	1A	1C	1D	1E	1V
0.68							A
1.0						A	A
1.5					A	A	B
2.2				A	A	A	B
3.3			A	A	A	B	C
4.7		A	A	A	B	B	C
6.8	A	A	A	B	B	C	C
10	A	A	A,B	B	C	C	D
15	A	B	B	B	C	D	D
22	B	B	B	C	C	D	D,E
33	B	B	C	C	D	D,E	
47	B	B,C	B,C,D	C,D	E		
68	C	C	C,D	D	E		
100	C	C,D	D	D,E			
150	C	D	D,E	E			
220	D	D	D,E				
330	D	E	E				
470	E	E					
680	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 ± 0.2 (0.031 ± 0.008)	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 ± 0.2 (0.236 ± 0.008)	3.2 ± 0.2 (0.126 ± 0.008)	2.5 ± 0.2 (0.098 ± 0.008)	1.3 ± 0.3 (0.051 ± 0.012)	2.2 ± 0.2 (0.087 ± 0.008)
D	7.3 ± 0.2 (0.287 ± 0.008)	4.3 ± 0.2 (0.169 ± 0.008)	2.8 ± 0.2 (0.110 ± 0.008)	1.3 ± 0.3 (0.051 ± 0.012)	2.4 ± 0.2 (0.094 ± 0.008)
E	7.3 ± 0.2 (0.287 ± 0.008)	4.3 ± 0.2 (0.169 ± 0.008)	4.1 ± 0.2 (0.162 ± 0.008)	1.3 ± 0.3 (0.051 ± 0.012)	2.4 ± 0.2 (0.094 ± 0.008)

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TCR SERIES DATA TABLE (Low ESR) 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)	Max. Ripple Current (mA@ 25°C)
4.0V DC						
6.8	A	TA 4R0 TCR 685 K or M A R	0.5	8	2.50	220
10	A	TA 4R0 TCR 106 K or M A R	0.5	8	2.50	220
15	A	TA 4R0 TCR 156 K or M A R	0.6	8	2.50	220
33	B	TA 4R0 TCR 336 K or M B R	1.32	8	0.80	410
47	B	TA 4R0 TCR 476 K or M B R	1.88	8	0.80	410
68	C	TA 4R0 TCR 686 K or M C R	2.72	8	0.30	660
100	C	TA 4R0 TCR 107 K or M C R	4	8	0.27	690
150	C	TA 4R0 TCR 157 K or M C R	6	8	0.24	740
220	D	TA 4R0 TCR 227 K or M D R	8.8	8	0.22	830
330	D	TA 4R0 TCR 337 K or M D R	13.2	8	0.17	940
470	E	TA 4R0 TCR 477 K or M E R	18.8	8	0.15	1060
680	E	TA 4R0 TCR 687 K or M E R	27.4	15	0.10	1285
6.3V DC						
4.7	A	TA 6R3 TCR 475 K or M A R	0.5	8	2.50	220
6.8	A	TA 6R3 TCR 685 K or M A R	0.5	8	2.50	220
10	A	TA 6R3 TCR 106 K or M A R	0.63	8	2.50	220
15	B	TA 6R3 TCR 156 K or M B R	0.95	8	0.80	410
22	B	TA 6R3 TCR 226 K or M B R	1.39	8	0.80	410
33	B	TA 6R3 TCR 336 K or M B R	2.08	8	0.80	410
47	B	TA 6R3 TCR 476 K or M B R	3.0	8	0.40	410
47	C	TA 6R3 TCR 476 K or M C R	2.96	8	0.30	660
68	C	TA 6R3 TCR 686 K or M C R	4.28	8	0.27	690
100	C	TA 6R3 TCR 107 K or M C R	6.3	8	0.24	740
100	D	TA 6R3 TCR 107 K or M D R	6.3	8	0.20	870
150	D	TA 6R3 TCR 157 K or M D R	9.45	8	0.20	870
220	D	TA 6R3 TCR 227 K or M D R	13.86	8	0.16	970
330	E	TA 6R3 TCR 337 K or M E R	20.79	8	0.15	1060
470	E	TA 6R3 TCR 477 K or M E R	28.2	8	0.10	1280

TCR SERIES DATA TABLE (Low ESR) 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)	Max. Ripple Current (mA@ 25°C)
10V DC						
3.3	A	TA 010 TCR 335 K or M A R	0.5	8	2.50	220
4.7	A	TA 010 TCR 475 K or M A R	0.47	8	2.50	220
6.8	A	TA 010 TCR 685 K or M A R	0.68	8	2.50	220
10	A	TA 010 TCR 106 K or M A R	1.0	8	2.00	220
10	B	TA 010 TCR 106 K or M B R	1.0	8	1.00	320
15	B	TA 010 TCR 156 K or M B R	1.5	8	0.80	410
22	B	TA 010 TCR 226 K or M B R	2.2	8	0.80	410
33	C	TA 010 TCR 336 K or M C R	3.3	8	0.30	660
47	B	TA 010 TCR 476 K or M B R	4.7	8	0.50	450
47	C	TA 010 TCR 476 K or M C R	4.7	8	0.25	720
47	D	TA 010 TCR 476 K or M D R	4.7	8	0.25	720
68	C	TA 010 TCR 686 K or M C R	6.8	8	0.25	720
68	D	TA 010 TCR 686 K or M D R	6.8	8	0.22	780
100	D	TA 010 TCR 107 K or M D R	10	8	0.10	870
150	D	TA 010 TCR 157 K or M D R	15	8	0.10	970
150	E	TA 010 TCR 157 K or M E R	15	8	0.10	970
220	D	TA 010 TCR 227 K or M D R	22	8	0.15	970
220	E	TA 010 TCR 227 K or M E R	22	8	0.10	1060
330	E	TA 010 TCR 337 K or M E R	33	8	0.10	1280
16V DC						
2.2	A	TA 016 TCR 225 K or M A R	0.5	8	2.50	220
3.3	A	TA 016 TCR 335 K or M A R	0.53	8	2.50	220
4.7	A	TA 016 TCR 475 K or M A R	0.75	8	2.50	220
6.8	B	TA 016 TCR 685 K or M B R	1.09	8	0.80	410
10	B	TA 016 TCR 106 K or M B R	1.6	8	0.80	410
15	B	TA 016 TCR 156 K or M B R	2.4	8	0.80	410
22	C	TA 016 TCR 226 K or M C R	3.52	8	0.30	660
33	C	TA 016 TCR 336 K or M C R	5.28	8	0.25	720
47	C	TA 016 TCR 476 K or M C R	7.52	8	0.25	720
47	D	TA 016 TCR 476 K or M D R	7.85	8	0.22	780
68	D	TA 016 TCR 686 K or M D R	10.88	8	0.20	870
100	D	TA 016 TCR 107 K or M D R	16	8	0.16	970
100	E	TA 016 TCR 107 K or M E R	22	8	0.15	1020
150	E	TA 016 TCR 157 K or M E R	24	8	0.15	1060

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TCR SERIES DATA TABLE (Low ESR) 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)	Max. Ripple Current (mA@ 25°C)
20V DC						
1.5	A	TA 020 TCR 155 K or M A R	0.5	8	3.30	160
2.2	A	TA 020 TCR 225 K or M A R	0.5	8	3.30	160
3.3	A	TA 020 TCR 335 K or M A R	0.66	8	3.30	160
4.7	B	TA 020 TCR 475 K or M B R	0.94	8	1.60	250
6.8	B	TA 020 TCR 685 K or M B R	1.36	8	1.60	250
10	C	TA 020 TCR 106 K or M C R	2	8	0.50	510
15	C	TA 020 TCR 156 K or M C R	3	8	0.50	510
22	C	TA 020 TCR 226 K or M C R	4.4	8	0.50	510
33	D	TA 020 TCR 336 K or M D R	6.6	8	0.30	710
47	E	TA 020 TCR 476 K or M E R	9.4	8	0.30	750
68	E	TA 020 TCR 686 K or M E R	13.6	8	0.25	820
25V DC						
1.0	A	TA 025 TCR 105 K or M A R	0.5	8	3.30	160
1.5	A	TA 025 TCR 155 K or M A R	0.5	8	3.30	160
2.2	A	TA 025 TCR 225 K or M A R	0.63	8	3.30	160
3.3	B	TA 025 TCR 335 K or M B R	0.95	8	1.60	250
4.7	B	TA 025 TCR 475 K or M B R	1.39	8	1.60	250
6.8	C	TA 025 TCR 685 K or M C R	2.08	8	0.50	510
10	C	TA 025 TCR 106 K or M C R	2.96	8	0.50	510
15	D	TA 025 TCR 156 K or M D R	4.28	8	0.30	710
22	D	TA 025 TCR 226 K or M D R	6.3	8	0.30	710
33	D	TA 025 TCR 336 K or M D R	8.3	8	0.25	820
33	E	TA 025 TCR 336 K or M E R	9.45	8	0.25	820
35V DC						
0.68	A	TA 035 TCR 684 K or M A R	0.5	8	4.00	160
1.0	A	TA 035 TCR 105 K or M A R	0.47	8	3.30	160
1.5	B	TA 035 TCR 155 K or M B R	0.68	8	1.60	250
2.2	B	TA 035 TCR 225 K or M B R	1	8	1.60	250
3.3	C	TA 035 TCR 335 K or M C R	1.5	8	0.70	430
4.7	C	TA 035 TCR 475 K or M C R	2.2	8	0.60	470
6.8	C	TA 035 TCR 685 K or M C R	3.3	8	0.60	470
10	D	TA 035 TCR 106 K or M D R	4.7	8	0.30	710
15	D	TA 035 TCR 156 K or M D R	6.8	8	0.30	710
22	D	TA 035 TCR 226 K or M D R	7.7	8	0.30	710
22	E	TA 035 TCR 226 K or M E R	10	8	0.25	820

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

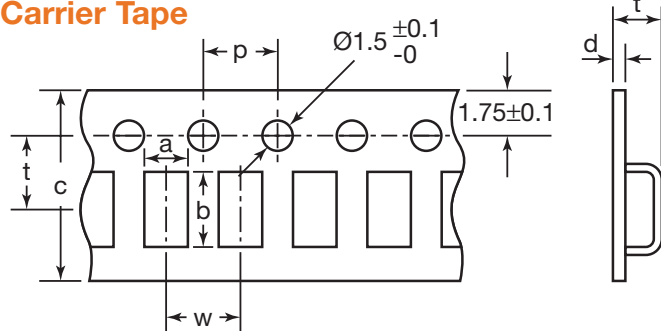
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VENKEL LTD.

Taping Specifications

Carrier Tape



Carrier Tape Dimensions

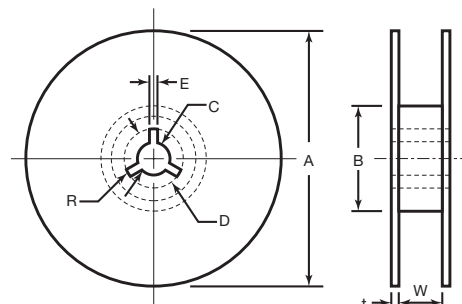
(Unit: mm)

CASE	a ± 0.1	b ± 0.1	c ± 0.2	t ± 0.1	p ± 0.1	w ± 0.1	d
A	1.9	3.9	8.0	2.0	4.0	4.0	0.2
B	3.1	3.9	8.0	2.3	4.0	4.0	0.2
C	3.9	6.3	12.0	2.7	4.0	8.0	0.3
D	4.6	7.7	12.0	3.3	4.0	8.0	0.3
E	4.6	7.7	12.0	4.2	4.0	8.0	0.3

Quantity per reel

Case Size	Reel Size	
	7"	13"
A	2,000 pcs	10,000 pcs
B	2,000 pcs	7,500 pcs
C, D, E	500 pcs	2,500 pcs
E	400 pcs	2,000 pcs

Reel



Reel Dimensions

Case Size	A +0 -3.0	B -0	C ± 0.2	D ± 0.8	E ± 0.5	W ± 0.3	t ± 0.5	R
A, B,	180	60	13.0	21.0	2.0	9.0	2.0	1.0
C, D, E	330	60	13.0	21.0	2.0	13.0	2.0	1.0

How To Order

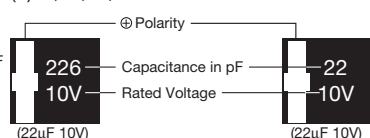
TA	035	TCM	105	M	B	R	-13
Tantalum	Rated Voltage 6.3V-006 (TCM series) 6.3V-6R3 (TCR series) 35V-035	Series TCM TCR	Capacitance in picofarads First two figures are significant. Third is the number of zeros to follow. 1.0 μ F - 105 22 μ F - 226 100 μ F - 107	Capacitance Tolerance $\pm$ 20%: M $\pm$ 10%: K	Case Code A, B, C, D, E	Packaging Tape R: See below.	For 13 inch reels add -13, leave blank for standard 7 inch reels

Marking*

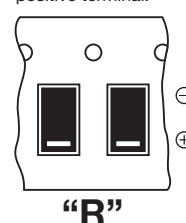
(1) A Case



(2) B, C, D, E Case



White bar indicates
positive terminal.



CODE	G	J	A	C	D	E	V	T
Rated Voltage	4V	6.3V	10V	16V	20V	25V	35V	50V

Standard termination finish for this product is 100% matte Tin (Sn)

* Marking codes can be either way depending on customer needs and what is available in stock. All 6.3V rated Tantalums will typically be marked as 6 or 6V.

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

Please Note: Venkel offers Engineering Kits for this product. See page 117 for details.

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