Solid Tantalum Surface Mount Chip Capacitors
TANTAMOUNT®, Molded Case, for Medical Instruments

FEATURES

- **For non-life support medical applications**
- High reliability
- Weibull grading options
- 100 % surge current tested (B, C, D, E cases)
- Terminations: 100 % matte tin and tin/lead
- Standard EIA 535BAAC case sizes (A through E)
- Manufacturing location is certified to medical standard ISO 13485
- Compliant terminations
- Mounting: Surface mount
- Dry pack as per IPC/JEDEC J-STD-033 standard
- Material categorization: For definitions of compliance please see www.vishay.com/doc?99912

Pb-free Available

RoHS* Available

HALOGEN FREE

PERFORMANCE/ELECTRICAL CHARACTERISTICS

Operating Temperature: - 55 °C to + 125 °C (above 85 °C, voltage derating is required)

Capacitance Range: 1 µF to 220 µF

Capacitance Tolerance: ± 10 %, ± 20 % standard

Voltage Rating: 4 V_{DC} to 20 V_{DC}

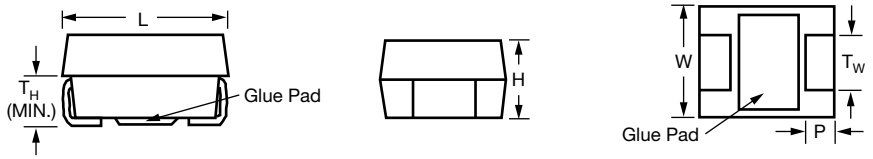
Note

* This datasheet provides information about parts that are RoHS-compliant and/or parts that are non-RoHS-compliant. For example, parts with lead (Pb) terminations are not RoHS-compliant. Please see the information/tables in this datasheet for details.

ORDERING INFORMATION

TM3	C	226	K	6R3	C	B	A
TYPE	CASE CODE	CAPACITANCE	CAPACITANCE TOLERANCE	DC VOLTAGE RATING AT + 85 °C	TERMINATION AND PACKAGING	RELIABILITY LEVEL	SURGE CURRENT
	See Ratings and Case Codes table.	This is expressed in picofarads. The first two digits are the significant figures. The third is the number of zeros to follow.	K = ± 10 % M = ± 20 %	This is expressed in volts. To complete the three-digit block, zeros precede the voltage rating. A decimal point is indicated by an "R" (6R3 = 6.3 V).	C: Matte tin/ 7" (178 mm) reel H: Matte tin/ 7" (178 mm) ½ reel E: Tin/lead/ 7" (178 mm) reel L: Tin/lead/ 7" (178 mm) ½ reel	B = 0.1 % Weibull FRL S = Hi-Rel std. (40 h burn-in) Z = Non-established reliability	A = 10 cycles at + 25 °C, 1.1 RV Z = No surge (for A case only)

DIMENSIONS in inches (millimeters)



CASE CODE	EIA SIZE	L	W	H	P	T_W	T_H (MIN.)
A	3216-18	0.126 ± 0.008 [3.2 ± 0.20]	0.063 ± 0.008 [1.6 ± 0.20]	0.063 ± 0.008 [1.6 ± 0.20]	0.031 ± 0.012 [0.80 ± 0.30]	0.047 ± 0.004 [1.2 ± 0.10]	0.028 [0.70]
B	3528-21	0.138 ± 0.008 [3.5 ± 0.20]	0.110 ± 0.008 [2.8 ± 0.20]	0.075 ± 0.008 [1.9 ± 0.20]	0.031 ± 0.012 [0.80 ± 0.30]	0.087 ± 0.004 [2.2 ± 0.10]	0.028 [0.70]
C	6032-28	0.236 ± 0.012 [6.0 ± 0.30]	0.126 ± 0.012 [3.2 ± 0.30]	0.098 ± 0.012 [2.5 ± 0.30]	0.051 ± 0.012 [1.3 ± 0.30]	0.087 ± 0.004 [2.2 ± 0.10]	0.039 [1.0]
D	7343-31	0.287 ± 0.012 [7.3 ± 0.30]	0.169 ± 0.012 [4.3 ± 0.30]	0.110 ± 0.012 [2.8 ± 0.30]	0.051 ± 0.012 [1.3 ± 0.30]	0.094 ± 0.004 [2.4 ± 0.10]	0.039 [1.0]
E	7343-43	0.287 ± 0.012 [7.3 ± 0.30]	0.169 ± 0.012 [4.3 ± 0.30	0.157 ± 0.012 [4.0 ± 0.30]	0.051 ± 0.012 [1.3 ± 0.30]	0.094 ± 0.004 [2.4 ± 0.10]	0.039 [1.0]

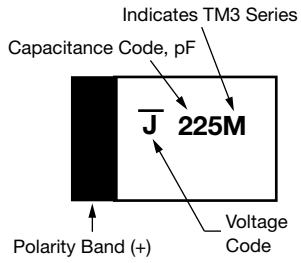
Note

- Glue pad (non-conductive, part of molded case) is dedicated for glue attachment (as user option).

RATINGS AND CASE CODES

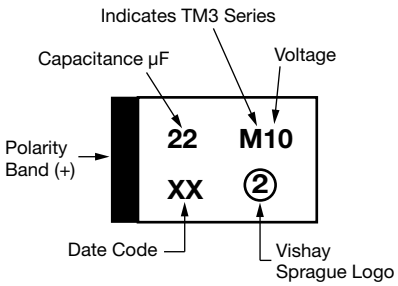
µF	4 V	6.3 V	10 V	16 V	20 V
1.0				A	
1.5			A	A	
2.2		A	A	A/B	B
3.3		A	A	A/B	B
4.7			A/B	A/B	C
6.8		B	B	B	B/C
10		A/B	A/B	B/C	C
15			B/C	B/C	
22		A/B/C	B/C	B/C/D	C/D
33		B	B/C/D	D	D
47		B/C/D	C/D	C/D	E
68	B	D	D	D	
100	D	D	D	D/E	
150	D	D			
220	D/E	D/E	E		

MARKING



A Case

"A" CASE VOLTAGE CODE	
VOLTS	**CODE**
4.0	G
6.3	J
10	A
16	C
20	D
25	E
35	V
50	T



B, C, D, E Cases

Marking

Capacitor marking includes an anode (+) polarity band, capacitance in microfarads and the voltage rating. "A" case capacitors use a letter code for the voltage and EIA capacitance code.

The Vishay Sprague® trademark is included if space permits. Capacitors rated at 6.3 V are marked 6 V.

A manufacturing date code is marked on all capacitors.

Call the factory for further explanation.

STANDARD RATINGS

CAPACITANCE (µF)	CASE CODE	PART NUMBER	MAX. DCL AT + 25 °C (µA)	MAX. DF AT + 25 °C 120 Hz (%)	MAX. ESR AT + 25 °C 100 kHz (Ω)	MAX. RIPPLE 100 kHz I_{RMS} (A)
4 V_{DC} AT + 85 °C; 2.7 V_{DC} AT + 125 °C						
68	B	TM3B686(1)004(2)(3)A	2.7	6	1.90	0.21
100	D	TM3D107(1)004(2)(3)A	4.0	6	0.70	0.46
150	D	TM3D157(1)004(2)(3)A	6.0	8	0.60	0.50
220	D	TM3D227(1)004(2)(3)A	8.8	8	0.60	0.50
220	E	TM3E227(1)004(2)(3)A	8.8	8	0.50	0.57
6.3 V_{DC} AT + 85 °C; 4 V_{DC} AT + 125 °C						
2.2	A	TM3A225(1)6R3(2)(3)Z	0.5	6	7.60	0.10
3.3	A	TM3A335(1)6R3(2)(3)Z	0.5	6	6.30	0.11
6.8	B	TM3B685(1)6R3(2)(3)A	0.5	6	3.40	0.16
10	A	TM3A106(1)6R3(2)(3)Z	0.6	6	3.40	0.15
10	B	TM3B106(1)6R3(2)(3)A	0.6	6	2.90	0.17
22	A	TM3A226(1)6R3(2)(3)Z	1.3	6	2.90	0.16
22	B	TM3B226(1)6R3(2)(3)A	1.3	6	2.00	0.21
22	C	TM3C226(1)6R3(2)(3)A	1.3	6	1.80	0.25
33	B	TM3B336(1)6R3(2)(3)A	2.0	6	1.90	0.21
47	B	TM3B476(1)6R3(2)(3)A	2.8	6	1.90	0.21
47	C	TM3C476(1)6R3(2)(3)A	2.8	6	1.40	0.28
47	D	TM3D476(1)6R3(2)(3)A	2.8	6	0.80	0.43
68	D	TM3D686(1)6R3(2)(3)A	4.1	6	0.70	0.46
100	D	TM3D107(1)6R3(2)(3)A	6.0	6	0.14	1.04
150	D	TM3D157(1)6R3(2)(3)A	9.0	8	0.60	0.50
220	D	TM3D227(1)6R3(2)(3)A	13.2	8	0.60	0.50
220	E	TM3E227(1)6R3(2)(3)A	13.2	8	0.50	0.57
10 V_{DC} AT + 85 °C; 7 V_{DC} AT + 125 °C						
1.5	A	TM3A155(1)010(2)(3)Z	0.5	6	8.00	0.10
2.2	A	TM3A225(1)010(2)(3)Z	0.5	6	6.30	0.11
3.3	A	TM3A335(1)010(2)(3)Z	0.5	6	5.50	0.12
4.7	A	TM3A475(1)010(2)(3)Z	0.5	6	5.00	0.12
4.7	B	TM3B475(1)010(2)(3)A	0.5	6	3.40	0.16
6.8	B	TM3B685(1)010(2)(3)A	0.7	6	2.90	0.17
10	A	TM3A106(1)010(2)(3)Z	1.0	6	3.40	0.15
10	B	TM3B106(1)010(2)(3)A	1.0	6	2.50	0.18
15	B	TM3B156(1)010(2)(3)A	1.5	6	2.00	0.21
15	C	TM3C156(1)010(2)(3)A	1.5	6	1.80	0.25
22	B	TM3B226(1)010(2)(3)A	2.2	6	1.90	0.21
22	C	TM3C226(1)010(2)(3)A	2.2	6	0.35	0.56
33	B	TM3B336(1)010(2)(3)A	3.3	6	1.90	0.21
33	C	TM3C336(1)010(2)(3)A	3.3	6	1.40	0.28
33	D	TM3D336(1)010(2)(3)A	3.3	6	0.80	0.43
47	C	TM3C476(1)010(2)(3)A	4.7	6	1.10	0.32
47	D	TM3D476(1)010(2)(3)A	4.7	6	0.70	0.46
68	D	TM3D686(1)010(2)(3)A	6.8	6	0.70	0.46
100	D	TM3D107(1)010(2)(3)A	10.0	6	0.60	0.50
220	E	TM3E227(1)010(2)(3)A	22.0	8	0.50	0.57

Note

- Part number definitions:
  (1) Capacitance tolerance: K, M
  (2) Termination and packaging: C, E, H, L
  (3) Reliability level: B, S, Z

STANDARD RATINGS

CAPACITANCE (µF)	CASE CODE	PART NUMBER	MAX. DCL AT + 25 °C (µA)	MAX. DF AT + 25 °C 120 Hz (%)	MAX. ESR AT + 25 °C 100 kHz (Ω)	MAX. RIPPLE 100 kHz I_{RMS} (A)
16 V_{DC} AT + 85 °C; 10 V_{DC} AT + 125 °C						
1.0	A	TM3A105(1)016(2)(3)Z	0.5	4	9.30	0.09
1.5	A	TM3A155(1)016(2)(3)Z	0.5	6	6.70	0.11
2.2	A	TM3A225(1)016(2)(3)Z	0.5	6	4.00	11.00
2.2	B	TM3B225(1)016(2)(3)A	0.5	6	4.60	0.14
3.3	A	TM3A335(1)016(2)(3)Z	0.5	6	3.50	0.15
3.3	B	TM3B335(1)016(2)(3)A	0.5	6	3.50	0.16
4.7	A	TM3A475(1)016(2)(3)Z	0.8	6	5.00	0.12
4.7	B	TM3B475(1)016(2)(3)A	0.8	6	2.90	0.17
6.8	B	TM3B685(1)016(2)(3)A	1.1	6	2.50	0.18
10	B	TM3B106(1)016(2)(3)A	1.6	6	2.00	0.21
10	C	TM3C106(1)016(2)(3)A	1.6	6	1.80	0.25
15	B	TM3B156(1)016(2)(3)A	2.4	6	2.00	0.21
15	C	TM3C156(1)016(2)(3)A	2.4	6	0.40	0.52
22	B	TM3B226(1)016(2)(3)A	3.5	6	1.90	0.21
22	C	TM3C226(1)016(2)(3)A	3.5	6	1.40	0.28
22	D	TM3D226(1)016(2)(3)A	3.5	6	0.80	0.43
33	D	TM3D336(1)016(2)(3)A	4.2	6	0.70	0.46
47	C	TM3C476(1)016(2)(3)A	7.5	6	1.00	0.33
47	D	TM3D476(1)016(2)(3)A	7.5	6	0.70	0.46
68	D	TM3D686(1)016(2)(3)A	10.9	6	0.60	0.50
100	D	TM3D107(1)016(2)(3)A	16.0	8	0.60	0.50
100	E	TM3E107(1)016(2)(3)A	16.0	8	0.60	0.52
20 V_{DC} AT + 85 °C; 13 V_{DC} AT + 125 °C						
2.2	B	TM3B225(1)020(2)(3)A	0.5	6	3.50	0.16
3.3	B	TM3B335(1)020(2)(3)A	0.7	6	3.00	0.17
4.7	C	TM3C475(1)020(2)(3)A	0.9	6	2.30	0.22
6.8	B	TM3B685(1)020(2)(3)A	1.4	6	2.50	0.18
6.8	C	TM3C685(1)020(2)(3)A	1.4	6	1.90	0.24
10	C	TM3C106(1)020(2)(3)A	2.0	6	1.70	0.25
22	C	TM3C226(1)020(2)(3)A	4.4	6	1.10	0.32
22	D	TM3D226(1)020(2)(3)A	3.5	6	0.70	0.46
33	D	TM3D336(1)020(2)(3)A	6.6	6	0.70	0.46
47	E	TM3E476(1)020(2)(3)A	7.5	6	0.60	0.52

Note

- Part number definitions:
  (1) Capacitance tolerance: K, M
  (2) Termination and packaging: C, E, H, L
  (3) Reliability level: B, S, Z

RECOMMENDED VOLTAGE DERATING GUIDELINES (for temperatures below + 85 °C)	
STANDARD CONDITIONS. FOR EXAMPLE: OUTPUT FILTERS	
Capacitor Voltage Rating	**Operating Voltage**
4.0	2.5
6.3	3.3
10	5.0
16	8.0
20	10
SEVERE CONDITIONS. FOR EXAMPLE: INPUT FILTERS	
Capacitor Voltage Rating	**Operating Voltage**
4.0	2.5
6.3	3.6
10	6.0
16	10
20	12

POWER DISSIPATION	
CASE CODE	**MAXIMUM PERMISSIBLE POWER DISSIPATION AT + 25 °C (W) IN FREE AIR**
A	0.075
B	0.085
C	0.110
D	0.150
E	0.165

STANDARD PACKAGING QUANTITY		
CASE CODE	**UNITS PER REEL**	
	7" FULL REEL	**7" HALF REEL**
A	2000	1000
B	2000	1000
C	500	250
D	500	250
E	400	200

PRODUCT INFORMATION	
Guide for Molded Tantalum Capacitors	www.vishay.com/doc?40074
Pad Dimensions	
Packaging Dimensions	
Moisture Sensitivity	www.vishay.com/doc?40135
SELECTOR GUIDES	
Solid Tantalum Selector Guide	www.vishay.com/doc?49053
Solid Tantalum Chip Capacitors	www.vishay.com/doc?40091
FAQ	
Frequently Asked Questions	www.vishay.com/doc?40110

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