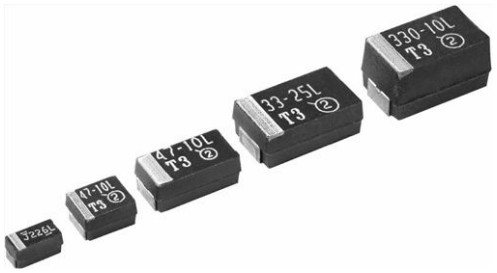
Solid Tantalum Surface Mount Capacitors
TANTAMOUNT®, Molded Case, Standard Industrial Grade



FEATURES

- Terminations: 100 % matte tin, standard, tin/lead available
- Compliant terminations
- Molded case available in six case codes
- Compatible with “High Volume” automatic pick and place equipment
- Optical character recognition qualified
- Meets IEC specification QC300801/US0001 and EIA535BAAC mechanical and performance requirements
- Compliant to RoHS Directive 2002/95/EC
- Moisture sensitivity level 1

Pb-free Available

RoHS* COMPLIANT

Note

* Pb containing terminations are not RoHS compliant, exemptions may apply

PERFORMANCE/ELECTRICAL CHARACTERISTICS

www.vishay.com/doc?40088

Operating Temperature: - 55 °C to + 85 °C
(to + 125 °C with voltage derating)

Capacitance Range: 0.10 µF to 1000 µF
Capacitance Tolerance: ± 5 %, ± 10 % , ± 20 %
100 % Surge Current Tested (D and E Case Codes)
Voltage Rating: 4 V_{DC} to 63 V_{DC}

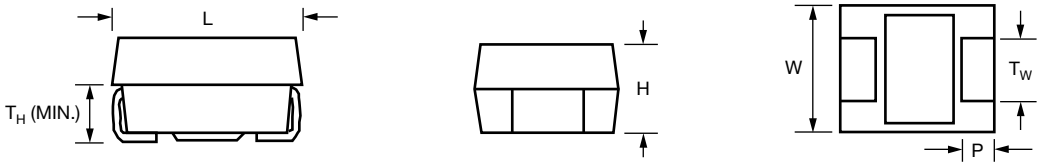
ORDERING INFORMATION

293D	107	X9	010	D	2WE3
TYPE	CAPACITANCE	CAPACITANCE TOLERANCE	DC VOLTAGE RATING AT + 85 °C	CASE CODE	TERMINATION AND PACKAGING
	This is expressed in picofarads. The first two digits are the significant figures. The third is the number of zeros to follow.	X0 = ± 20 % X9 = ± 10 % X5 = ± 5 % (special order)	This is expressed in V. To complete the three-digit block, zeros precede the voltage rating. A decimal point is indicated by an “R” (6R3 = 6.3 V).	See Ratings and Case Codes table	2TE3: Matte tin, 7" (178 mm) reel 2WE3: Matte tin, 13" (330 mm) reel 8T: Tin/lead, 7" (178 mm) reel 8W: Tin/lead, 13" (330 mm) reel

Notes

- We reserve the right to supply higher voltage ratings and tighter capacitance tolerance capacitors in the same case size. Voltage substitutions will be marked with the higher voltage rating.
- We reserve the right to supply better series with more extensive screening.
- Dry pack is available per request, contact regional marketing.

DIMENSIONS in inches [millimeters]

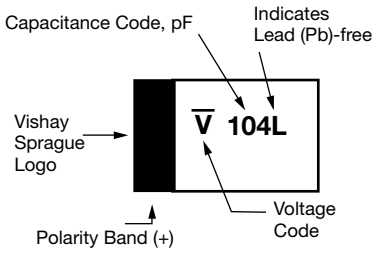


CASE CODE	EIA SIZE	L	W	H	P	T_W	T_H (MIN.)
A	3216-18	0.126 ± 0.008 [3.2 ± 0.20]	0.063 ± 0.008 [1.6 ± 0.20]	0.063 ± 0.008 [1.6 ± 0.20]	0.031 ± 0.012 [0.80 ± 0.30]	0.047 ± 0.004 [1.2 ± 0.10]	0.028 [0.70]
B	3528-21	0.138 ± 0.008 [3.5 ± 0.20]	0.110 ± 0.008 [2.8 ± 0.20]	0.075 ± 0.008 [1.9 ± 0.20]	0.031 ± 0.012 [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]
V	7343-20	0.287 ± 0.012 [7.3 ± 0.30]	0.169 ± 0.012 [4.3 ± 0.30]	0.079 max [2.0 max]	0.051 ± 0.012 [1.3 ± 0.30]	0.094 ± 0.004 [2.4 ± 0.10]	0.039 [1.0]

RATINGS AND CASE CODES

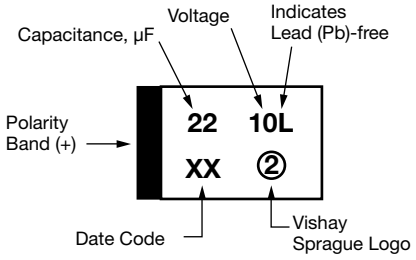
µF	4 V	6.3 V	10 V	16 V	20 V	25 V	35 V	50 V	63 V
0.10						A	A	A	
0.15							A	A/B	
0.22							A	A/B	
0.33						A	A	A/B	
0.47			A		A	A	A/B	A/B/C	
0.68				A	A	A	A/B	B/C	
1.0			A	A	A/B	A/B	A/B	B/C	
1.5		A	A	A/B	A/B	A/B	B/C	B/C/D	
2.2	A	A	A/B	A/B	A/B	A/B/C	B/C	B/C/D	
3.3	A	A/B	A/B	A/B	A/B/C	A/B/C	B/C/D	C/D	
4.7	A/B	A/B	A/B/C	A/B/C	A/B/C	A/B/C/D	B/C/D	C/D/E	D
6.8	A/B	A/B	A/B/C	A/B/C	A/B/C	B/C/D	C/D	D/E	
10	A/B	A/B/C	A/B/C	A/B/C/D	B/C/D	B/C/D	C/D	D/E	E
15	A/B/C	A/B/C	A/B/C	B/C	B/C/D	B/C/D	D/E	E	
22	A/B/C	A/B/C	A/B/C/D	B/C/D	B/C/D	C/D/E/V	D/E		
33	A/B/C	A/B/C	B/C/D	B/C/D	C/D	D/E			
47	A/B/C	A/B/C/D	B/C/D	C/D/E	D/E	D/E			
68	B/C/D	B/C/D	B/C/D/E/V	D/E	D/E				
100	A/B/C/D	B/C/D/E	B/C/D/E/V	D/E	D/E				
120	D	D	E						
150	B/C/D	C/D/E	C/D/E	D/E					
220	B/C/D/E	C/D/E	D/E/V	E					
330	D/E	D/E	D/E						
470	D/E	D/E	E						
680	D/E	E							
1000	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, V 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.

Capacitors may bear a different marking scheme if a part with more extensive screening is substituted. These would include "R" for low ESR series (TR3) or "P" for professional series (TP3).

Call the factory for further explanation.

STANDARD RATINGS

CAPACITANCE (µF)	CASE CODE	PART NUMBER	MAX. DC LEAKAGE 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						
2.2	A	293D225(1)004A(2)	0.5	6	7.60	0.10
3.3	A	293D335(1)004A(2)	0.5	6	7.60	0.10
4.7	A	293D475(1)004A(2)	0.5	6	6.30	0.11
4.7	B	293D475(1)004B(2)	0.5	6	7.00	0.11
6.8	A	293D685(1)004A(2)	0.5	6	5.50	0.12
6.8	B	293D685(1)004B(2)	0.5	6	3.40	0.16
10	A	293D106(1)004A(2)	0.5	6	5.10	0.12
10	B	293D106(1)004B(2)	0.5	6	3.50	0.16
15	A	293D156(1)004A(2)	0.6	6	3.40	0.15
15	B	293D156(1)004B(2)	0.6	6	2.90	0.17
15	C	293D156(1)004C(2)	0.6	6	2.80	0.20
22	A	293D226(1)004A(2)	0.9	6	2.90	0.16
22	B	293D226(1)004B(2)	0.9	6	2.50	0.18
22	C	293D226(1)004C(2)	0.9	6	1.80	0.25
33	A	293D336(1)004A(2)	1.3	6	2.90	0.16
33	B	293D336(1)004B(2)	1.3	6	2.00	0.21
33	C	293D336(1)004C(2)	1.3	6	1.80	0.25
47	A	293D476(1)004A(2)	1.9	14	2.50	0.17
47	B	293D476(1)004B(2)	1.9	6	1.90	0.21
47	C	293D476(1)004C(2)	1.9	6	1.80	0.25
68	B	293D686(1)004B(2)	2.7	6	1.90	0.21
68	C	293D686(1)004C(2)	2.7	6	1.40	0.28
68	D	293D686(1)004D(2)	2.7	6	0.80	0.43
100	A	293D107X0004A(2)	10.0	30	2.50	0.22
100	B	293D107(1)004B(2)	4.0	8	1.80	0.22
100	C	293D107(1)004C(2)	4.0	6	0.80	0.37
100	D	293D107(1)004D(2)	4.0	6	0.70	0.46
120	D	293D127(1)004D(2)	4.8	6	0.60	0.51
150	B	293D157(1)004B(2)	6.0	14	1.60	0.23
150	C	293D157(1)004C(2)	6.0	12	0.70	0.40
150	D	293D157(1)004D(2)	6.0	8	0.60	0.50
220	B	293D227X0004B(2)	8.8	18	1.50	0.24
220	C	293D227(1)004C(2)	8.8	8	0.70	0.40
220	D	293D227(1)004D(2)	8.8	8	0.60	0.50
220	E	293D227(1)004E(2)	8.8	8	0.50	0.57
330	D	293D337(1)004D(2)	13.2	8	0.60	0.50
330	E	293D337(1)004E(2)	13.2	8	0.50	0.57
470	D	293D477(1)004D(2)	18.8	10	0.60	0.50
470	E	293D477(1)004E(2)	18.8	10	0.50	0.57
680	D	293D687X0004D(2)	27.2	25	0.20	0.87
680	E	293D687(1)004E(2)	27.2	12	0.50	0.57
1000	E	293D108X0004E(2)	40.0	20	0.50	0.57

Note

- Part number definitions:
  (1) Tolerance: X0, X9
  (2) Terminations and packaging: 2TE3, 2WE3, 8T, 8W
  (3) Lead (Pb)-free terminations and packaging codes: 2TE3, 2WE3

STANDARD RATINGS

CAPACITANCE (µF)	CASE CODE	PART NUMBER	MAX. DC LEAKAGE 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)
6.3 V_{DC} AT + 85 °C; 4 V_{DC} AT 125 °C						
1.5	A	293D155(1)6R3A(2)	0.5	6	2.90	0.16
2.2	A	293D225(1)6R3A(2)	0.5	6	7.60	0.10
3.3	A	293D335(1)6R3A(2)	0.5	6	6.30	0.11
3.3	B	293D335(1)6R3B(2)	0.5	6	5.50	0.12
4.7	A	293D475(1)6R3A(2)	0.5	6	5.50	0.12
4.7	B	293D475(1)6R3B(2)	0.5	6	4.40	0.14
6.8	A	293D685(1)6R3A(2)	0.5	6	5.00	0.12
6.8	B	293D685(1)6R3B(2)	0.5	6	3.40	0.16
10	A	293D106(1)6R3A(2)	0.6	6	3.40	0.15
10	B	293D106(1)6R3B(2)	0.6	6	2.90	0.17
10	C	293D106(1)6R3C(2)	0.6	6	3.00	0.19
15	A	293D156(1)6R3A(2)	0.9	6	2.90	0.16
15	B	293D156(1)6R3B(2)	0.9	6	2.50	0.18
15	C	293D156(1)6R3C(2)	0.9	6	1.80	0.25
22	A	293D226(1)6R3A(2)	1.3	6	2.90	0.16
22	B	293D226(1)6R3B(2)	1.3	6	2.00	0.21
22	C	293D226(1)6R3C(2)	1.3	6	1.80	0.25
33	A	293D336(1)6R3A(2)	2.0	14	2.50	0.17
33	B	293D336(1)6R3B(2)	2.0	6	1.90	0.21
33	C	293D336(1)6R3C(2)	2.0	6	1.50	0.27
47	A	293D476(1)6R3A(2)	2.8	12	1.60	0.22
47	B	293D476(1)6R3B(2)	2.8	6	1.90	0.21
47	C	293D476(1)6R3C(2)	2.8	6	1.40	0.28
47	D	293D476(1)6R3D(2)	2.8	6	0.80	0.43
68	B	293D686(1)6R3B(2)	4.1	6	1.80	0.22
68	C	293D686(1)6R3C(2)	4.1	6	0.80	0.37
68	D	293D686(1)6R3D(2)	4.1	6	0.70	0.46
100	B	293D107(1)6R3B(2)	6.0	15	1.70	0.22
100	C	293D107(1)6R3C(2)	6.0	6	0.80	0.37
100	D	293D107(1)6R3D(2)	6.0	6	0.70	0.46
100	E	293D107(1)6R3E(2)	6.0	8	0.70	0.49
120	D	293D127(1)6R3D(2)	6.3	8	0.70	0.46
150	C	293D157(1)6R3C(2)	9.0	8	0.70	0.40
150	D	293D157(1)6R3D(2)	9.0	8	0.60	0.50
150	E	293D157(1)6R3E(2)	9.0	8	0.50	0.57
220	C	293D227(1)6R3C(2)	13.9	14	0.70	0.39
220	D	293D227(1)6R3D(2)	13.2	8	0.60	0.50
220	E	293D227(1)6R3E(2)	13.2	8	0.50	0.57
330	D	293D337(1)6R3D(2)	19.8	8	0.60	0.50
330	E	293D337(1)6R3E(2)	19.8	8	0.50	0.57
470	D	293D477(1)6R3D(2)	28.2	14	0.50	0.55
470	E	293E477(1)6R3E(2)	28.2	10	1.50	0.57
680	E	293D687(1)6R3E(2)	42.8	20	0.50	0.57
1000	E	293D108X06R3E(2)	63.0	30	0.40	0.64

Note

- Part number definitions:
  (1) Tolerance: X0, X9
  (2) Terminations and packaging: 2TE3, 2WE3, 8T, 8W
  (3) Lead (Pb)-free terminations and packaging codes: 2TE3, 2WE3

STANDARD RATINGS

CAPACITANCE (µF)	CASE CODE	PART NUMBER	MAX. DC LEAKAGE 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)
10 V_{DC} AT + 85 °C; 7 V_{DC} AT 125 °C						
0.47	A	293D474(1)010A(2)	0.5	4	14.00	0.07
1.0	A	293D105(1)010A(2)	0.5	4	9.60	0.09
1.5	A	293D155(1)010A(2)	0.5	6	8.00	0.10
2.2	A	293D225(1)010A(2)	0.5	6	6.30	0.11
2.2	B	293D225(1)010B(2)	0.5	6	4.60	0.14
3.3	A	293D335(1)010A(2)	0.5	6	5.50	0.12
3.3	B	293D335(1)010B(2)	0.5	6	5.50	0.12
4.7	A	293D475(1)010A(2)	0.5	6	5.00	0.12
4.7	B	293D475(1)010B(2)	0.5	6	3.40	0.16
4.7	C	293D475(1)010C(2)	0.5	6	2.30	0.22
6.8	A	293D685(1)010A(2)	0.7	6	4.20	0.13
6.8	B	293D685(1)010B(2)	0.7	6	2.90	0.17
6.8	C	293D685(1)010C(2)	0.7	6	1.90	0.24
10	A	293D106(1)010A(2)	1.0	6	3.40	0.15
10	B	293D106(1)010B(2)	1.0	6	2.50	0.18
10	C	293D106(1)010C(2)	1.0	6	1.80	0.25
15	A	293D156(1)010A(2)	1.5	6	2.90	0.16
15	B	293D156(1)010B(2)	1.5	6	2.00	0.21
15	C	293D156(1)010C(2)	1.5	6	1.80	0.25
22	A	293D226(1)010A(2)	2.2	8	2.50	0.17
22	B	293D226(1)010B(2)	2.2	6	1.90	0.21
22	C	293D226(1)010C(2)	2.2	6	1.50	0.27
22	D	293D226(1)010D(2)	2.2	6	1.50	0.32
33	B	293D336(1)010B(2)	3.3	6	1.90	0.21
33	C	293D336(1)010C(2)	3.3	6	1.40	0.28
33	D	293D336(1)010D(2)	3.3	6	0.80	0.43
47	B	293D476(1)010B(2)	4.7	6	1.80	0.22
47	C	293D476(1)010C(2)	4.7	6	1.10	0.32
47	D	293D476(1)010D(2)	4.7	6	0.70	0.46
68	B	293D686(1)010B(2)	6.8	14	1.80	0.22
68	C	293D686(1)010C(2)	6.8	6	1.00	0.33
68	D	293D686(1)010D(2)	6.8	6	0.70	0.46
68	E	293D686(1)010E(2)	6.8	6	0.80	0.45
68	V	293D686(1)010V(3)	6.8	6	0.70	0.42
100	B	293D107X0010B(2)	10.0	25	2.50	0.18
100	C	293D107(1)010C(2)	10.0	8	0.90	0.35
100	D	293D107(1)010D(2)	10.0	8	0.60	0.50
100	E	293D107(1)010E(2)	10.0	8	0.70	0.49
100	V	293D107(1)010V(3)	10.0	8	0.70	0.42
120	E	293D127(1)010E(2)	12.0	6	1.00	0.41
150	C	293D157X0010C(2)	15.0	20	0.90	0.35
150	D	293D157(1)010D(2)	15.0	8	0.60	0.50
150	E	293D157(1)010E(2)	15.0	8	0.50	0.57
220	D	293D227(1)010D(2)	22.0	8	0.60	0.50

Note

- Part number definitions:
  (1) Tolerance: X0, X9
  (2) Terminations and packaging: 2TE3, 2WE3, 8T, 8W
  (3) Lead (Pb)-free terminations and packaging codes: 2TE3, 2WE3

STANDARD RATINGS

CAPACITANCE (µF)	CASE CODE	PART NUMBER	MAX. DC LEAKAGE 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)
10 V_{DC} AT + 85 °C; 7 V_{DC} AT 125 °C						
220	E	293D227(1)010E(2)	22.0	8	0.50	0.57
220	V	293D227(1)010V(3)	30.0	12	0.50	0.50
330	D	293D337(1)010D(2)	33.0	15	0.50	0.57
330	E	293D337(1)010E(2)	33.0	10	0.50	0.57
470	E	293D477(1)010E(2)	47.0	15	0.50	0.57
16 V_{DC} AT + 85 °C; 10 V_{DC} AT + 125 °C						
0.68	A	293D684(1)016A(2)	0.5	4	10.40	0.08
1.0	A	293D105(1)016A(2)	0.5	4	9.30	0.09
1.5	A	293D155(1)016A(2)	0.5	6	6.70	0.11
1.5	B	293D155(1)016B(2)	0.5	6	6.40	0.12
2.2	A	293D225(1)016A(2)	0.5	6	5.90	0.11
2.2	B	293D225(1)016B(2)	0.5	6	4.60	0.14
3.3	A	293D335(1)016A(2)	0.5	6	5.00	0.12
3.3	B	293D335(1)016B(2)	0.5	6	3.50	0.16
4.7	A	293D475(1)016A(2)	0.8	6	5.00	0.12
4.7	B	293D475(1)016B(2)	0.8	6	2.90	0.17
4.7	C	293D475(1)016C(2)	0.8	6	2.90	0.19
6.8	A	293D685(1)016A(2)	1.1	6	4.20	0.13
6.8	B	293D685(1)016B(2)	1.1	6	2.50	0.18
6.8	C	293D685(1)016C(2)	1.1	6	1.90	0.24
10	A	293D106(1)016A(2)	1.6	6	3.00	0.16
10	B	293D106(1)016B(2)	1.6	6	2.00	0.21
10	C	293D106(1)016C(2)	1.6	6	1.80	0.25
10	D	293D106(1)016D(2)	2.5	6	1.20	0.35
15	B	293D156(1)016B(2)	2.4	6	2.00	0.21
15	C	293D156(1)016C(2)	2.4	6	1.50	0.27
22	B	293D226(1)016B(2)	3.5	6	1.90	0.21
22	C	293D226(1)016C(2)	3.5	6	1.40	0.28
22	D	293D226(1)016D(2)	3.5	6	0.80	0.43
33	B	293D336(1)016B(2)	5.3	6	1.80	0.22
33	C	293D336(1)016C(2)	5.3	6	1.10	0.32
33	D	293D336(1)016D(2)	5.3	6	0.70	0.46
47	C	293D476(1)016C(2)	7.5	6	1.00	0.33
47	D	293D476(1)016D(2)	7.5	6	0.70	0.46
47	E	293D476(1)016E(2)	7.5	6	0.80	0.45
68	D	293D686(1)016D(2)	10.9	6	0.60	0.50
68	E	293D686(1)016E(2)	10.9	6	0.80	0.45
100	D	293D107(1)016D(2)	16.0	8	0.60	0.50
100	E	293D107(1)016E(2)	16.0	8	0.60	0.52
150	D	293D157(1)016D(2)	24.0	8	0.60	0.50
150	E	293D157(1)016E(2)	24.0	8	0.50	0.57
220	E	293D227(1)016E(2)	35.2	14	0.50	0.57

Note

- Part number definitions:
  (1) Tolerance: X0, X9
  (2) Terminations and packaging: 2TE3, 2WE3, 8T, 8W
  (3) Lead (Pb)-free terminations and packaging codes: 2TE3, 2WE3

STANDARD RATINGS

CAPACITANCE (µF)	CASE CODE	PART NUMBER	MAX. DC LEAKAGE 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)
20 V_{DC} AT + 85 °C; 13 V_{DC} AT + 125 °C						
0.47	A	293D474(1)020A(2)	0.5	4	14.00	0.07
0.68	A	293D684(1)020A(2)	0.5	4	10.00	0.09
1.0	A	293D105(1)020A(2)	0.5	4	8.40	0.09
1.0	B	293D105(1)020B(2)	0.5	4	9.00	0.10
1.5	A	293D155(1)020A(2)	0.5	6	6.30	0.11
1.5	B	293D155(1)020B(2)	0.5	4.8	5.60	0.12
2.2	A	293D225(1)020A(2)	0.5	6	5.90	0.11
2.2	B	293D225(1)020B(2)	0.5	6	3.50	0.16
3.3	A	293D335(1)020A(2)	0.7	6	5.90	0.11
3.3	B	293D335(1)020B(2)	0.7	6	3.00	0.17
3.3	C	293D335(1)020C(2)	0.8	6	2.30	0.22
4.7	A	293D475(1)020A(2)	0.9	6	5.00	0.12
4.7	B	293D475(1)020B(2)	0.9	6	2.90	0.17
4.7	C	293D475(1)020C(2)	0.9	6	2.30	0.22
6.8	A	293D685(1)020A(2)	1.4	6	4.50	0.13
6.8	B	293D685(1)020B(2)	1.4	6	2.50	0.18
6.8	C	293D685(1)020C(2)	1.4	6	1.90	0.24
10	B	293D106(1)020B(2)	2.0	6	2.10	0.20
10	C	293D106(1)020C(2)	2.0	6	1.70	0.25
10	D	293D106(1)020D(2)	2.0	6	1.00	0.38
15	B	293D156(1)020B(2)	3.0	6	2.30	0.19
15	C	293D156(1)020C(2)	3.0	6	1.50	0.27
15	D	293D156(1)020D(2)	3.0	6	0.90	0.41
22	B	293D226(1)020B(2)	4.4	6	2.10	0.20
22	C	293D226(1)020C(2)	4.4	6	1.10	0.32
22	D	293D226(1)020D(2)	4.4	6	0.70	0.46
33	C	293D336(1)020C(2)	6.6	6	1.00	0.33
33	D	293D336(1)020D(2)	6.6	6	0.70	0.46
47	D	293D476(1)020D(2)	9.4	6	0.70	0.46
47	E	293D476(1)020E(2)	9.4	6	0.60	0.52
68	D	293D686(1)020D(2)	13.6	6	0.70	0.46
68	E	293D686(1)020E(2)	13.6	6	0.60	0.52
100	D	293D107(1)020D(2)	20.0	8	0.60	0.50
100	E	293D107(1)020E(2)	20.0	8	0.50	0.57
25 V_{DC} AT + 85 °C; 17 V_{DC} AT + 125 °C						
0.10	A	293D104(1)025A(2)	0.5	4	20.00	0.06
0.33	A	293D334(1)025A(2)	0.5	4	13.00	0.08
0.47	A	293D474(1)025A(2)	0.5	4	12.00	0.08
0.68	A	293D684(1)025A(2)	0.5	4	8.40	0.09
1.0	A	293D105(1)025A(2)	0.5	4	7.60	0.10
1.0	B	293D105(1)025B(2)	0.5	4	5.00	0.13
1.5	A	293D155(1)025A(2)	0.5	6	6.70	0.11
1.5	B	293D155(1)025B(2)	0.5	6	4.60	0.14
2.2	A	293D225(1)025A(2)	0.6	6	6.30	0.11

Note

- Part number definitions:
  (1) Tolerance: X0, X9
  (2) Terminations and packaging: 2TE3, 2WE3, 8T, 8W
  (3) Lead (Pb)-free terminations and packaging codes: 2TE3, 2WE3

STANDARD RATINGS

CAPACITANCE (µF)	CASE CODE	PART NUMBER	MAX. DC LEAKAGE 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)
25 V_{DC} AT + 85 °C; 17 V_{DC} AT + 125 °C						
2.2	B	293D225(1)025B(2)	0.6	6	3.80	0.15
2.2	C	293D225(1)025C(2)	0.6	6	3.20	0.19
3.3	A	293D335(1)025A(2)	0.8	6	6.00	0.14
3.3	B	293D335(1)025B(2)	0.8	6	3.10	0.17
3.3	C	293D335(1)025C(2)	0.8	6	2.30	0.22
4.7	A	293D475(1)025A(2)	1.2	6	5.50	0.12
4.7	B	293D475(1)025B(2)	1.2	6	2.80	0.17
4.7	C	293D475(1)025C(2)	1.2	6	2.00	0.24
4.7	D	293D475(1)025D(2)	1.2	6	1.30	0.34
6.8	B	293D685(1)025B(2)	1.7	6	2.40	0.19
6.8	C	293D685(1)025C(2)	1.7	6	1.70	0.25
6.8	D	293D685(1)025D(2)	1.7	6	1.10	0.37
10	B	293D106(1)025B(2)	2.5	6	2.30	0.19
10	C	293D106(1)025C(2)	2.5	6	1.50	0.27
10	D	293D106(1)025D(2)	2.5	6	1.00	0.39
15	B	293D156(1)025B(2)	3.8	6	2.20	0.20
15	C	293D156(1)025C(2)	3.8	6	1.20	0.30
15	D	293D156(1)025D(2)	3.8	6	0.80	0.43
22	C	293D226(1)025C(2)	5.5	6	1.20	0.30
22	D	293D226(1)025D(2)	5.5	6	0.70	0.46
22	E	293D226(1)025E(2)	5.5	6	0.80	0.45
22	V	293D226(1)025V(3)	5.5	6	0.70	0.42
33	D	293D336(1)025D(2)	8.3	6	0.70	0.46
33	E	293D336(1)025E(2)	8.3	6	0.60	0.52
47	D	293D476(1)025D(2)	11.8	8	0.70	0.46
47	E	293D476(1)025E(2)	11.8	6	0.60	0.52
35 V_{DC} AT + 85 °C; 23 V_{DC} AT + 125 °C						
0.10	A	293D104(1)035A(2)	0.5	4	20.00	0.06
0.15	A	293D154(1)035A(2)	0.5	4	18.00	0.07
0.22	A	293D224(1)035A(2)	0.5	4	15.00	0.07
0.33	A	293D334(1)035A(2)	0.5	4	13.00	0.08
0.47	A	293D474(1)035A(2)	0.5	4	10.00	0.09
0.47	B	293D474(1)035B(2)	0.5	4	8.00	0.10
0.68	A	293D684(1)035A(2)	0.5	4	7.60	0.10
0.68	B	293D684(1)035B(2)	0.5	4	6.50	0.11
1.0	A	293D105(1)035A(2)	0.5	4	7.50	0.10
1.0	B	293D105(1)035B(2)	0.5	4	5.00	0.13
1.5	B	293D155(1)035B(2)	0.5	6	4.20	0.14
1.5	C	293D155(1)035C(2)	0.5	6	3.80	0.17
2.2	B	293D225(1)035B(2)	0.8	6	3.80	0.15
2.2	C	293D225(1)035C(2)	0.8	6	2.90	0.20
3.3	B	293D335(1)035B(2)	1.2	6	3.50	0.16
3.3	C	293D335(1)035C(2)	1.2	6	2.10	0.23
3.3	D	293D335(1)035D(2)	1.2	6	1.70	0.30

Note

- Part number definitions:
  (1) Tolerance: X0, X9
  (2) Terminations and packaging: 2TE3, 2WE3, 8T, 8W
  (3) Lead (Pb)-free terminations and packaging codes: 2TE3, 2WE3

STANDARD RATINGS

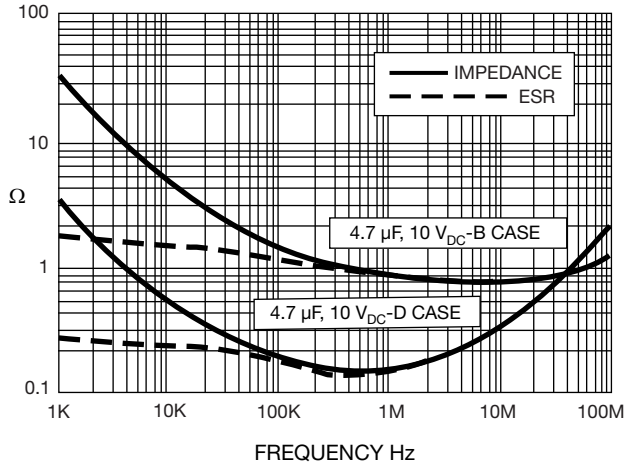
CAPACITANCE (µF)	CASE CODE	PART NUMBER	MAX. DC LEAKAGE AT + 25 °C (µA)	MAX. DF AT + 25 °C 120 Hz (%)	MAX. ESR AT + 25 °C 100 kHz (Ω)	MAX. RIPPLE 100 kHz I_{RMS} (A)
35 V_{DC} AT + 85 °C; 23 V_{DC} AT + 125 °C						
4.7	B	293D475(1)035B(2)	1.7	6	3.10	0.17
4.7	C	293D475(1)035C(2)	1.6	6	1.90	0.24
4.7	D	293D475(1)035D(2)	1.6	6	1.30	0.34
6.8	C	293D685(1)035C(2)	2.4	6	1.80	0.25
6.8	D	293D685(1)035D(2)	2.4	6	1.10	0.37
10	C	293D106(1)035C(2)	3.5	6	1.60	0.26
10	D	293D106(1)035D(2)	3.5	6	0.80	0.43
15	D	293D156(1)035D(2)	5.3	6	0.70	0.46
15	E	293D156(1)035E(2)	5.3	6	0.70	0.49
22	D	293D226(1)035D(2)	7.7	6	0.60	0.52
22	E	293D226(1)035E(2)	7.7	6	0.60	0.52
50 V_{DC} AT + 85 °C; 33 V_{DC} AT + 125 °C						
0.10	A	293D104(1)050A(2)	0.5	4	19.00	0.06
0.15	A	293D154(1)050A(2)	0.5	4	17.00	0.07
0.15	B	293D154(1)050B(2)	0.5	4	14.00	0.08
0.22	A	293D224(1)050A(2)	0.5	4	15.00	0.07
0.22	B	293D224(1)050B(2)	0.5	4	12.00	0.08
0.33	A	293D334(1)050A(2)	0.5	4	14.00	0.07
0.33	B	293D334(1)050B(2)	0.5	4	10.00	0.09
0.47	A	293D474(1)050A(2)	0.5	4	12.00	0.08
0.47	B	293D474(1)050B(2)	0.5	4	8.40	0.10
0.47	C	293D474(1)050C(2)	0.5	4	6.70	0.13
0.68	B	293D684(1)050B(2)	0.5	4	7.60	0.11
0.68	C	293D684(1)050C(2)	0.5	4	5.90	0.14
1.0	B	293D105(1)050B(2)	0.5	4	6.70	0.11
1.0	C	293D105(1)050C(2)	0.5	4	4.60	0.16
1.5	B	293D155(1)050B(2)	0.8	6	6.00	0.12
1.5	C	293D155(1)050C(2)	0.8	6	3.40	0.18
1.5	D	293D155(1)050D(2)	0.8	6	2.90	0.23
2.2	B	293D225(1)050B(2)	1.1	6	3.50	0.16
2.2	C	293D225(1)050C(2)	1.1	6	2.90	0.20
2.2	D	293D225(1)050D(2)	1.1	6	2.10	0.27
3.3	C	293D335(1)050C(2)	1.7	6	2.50	0.21
3.3	D	293D335(1)050D(2)	1.7	6	1.70	0.30
4.7	C	293D475(1)050C(2)	2.4	6	1.50	0.27
4.7	D	293D475(1)050D(2)	2.4	6	1.20	0.37
4.7	E	293D475(1)050E(2)	2.4	6	1.10	0.34
6.8	D	293D685(1)050D(2)	3.4	6	0.90	0.41
6.8	E	293D685(1)050E(2)	3.4	6	0.90	0.43
10	D	293D106(1)050D(2)	5.0	6	0.80	0.43
10	E	293D106(1)050E(2)	5.0	6	0.80	0.45
15	E	293D156(1)050E(2)	7.5	6	0.80	0.45
63 V_{DC} AT + 85 °C; 40 V_{DC} AT + 125 °C						
4.7	D	293D475(1)063D(2)	3.0	6	1.10	0.37
10	E	293D106(1)063E(2)	6.3	6	1.00	0.41

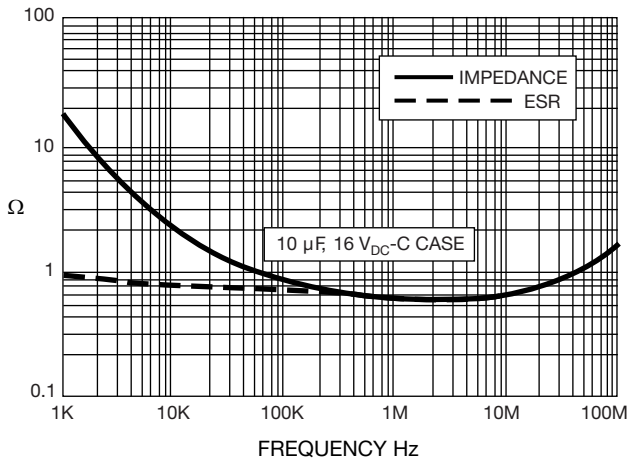
Note

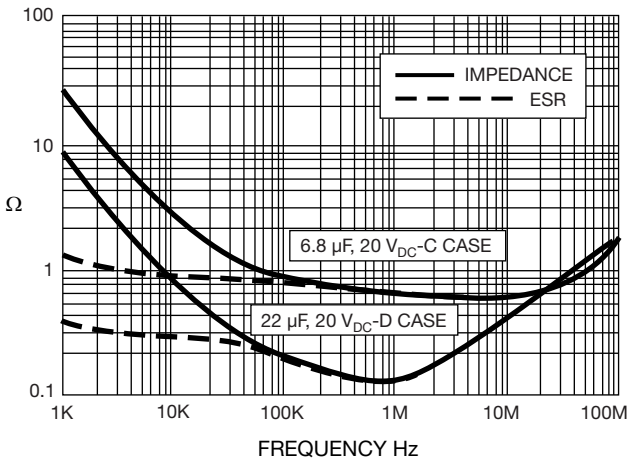
- Part number definitions:
  (1) Tolerance: X0, X9
  (2) Terminations and packaging: 2TE3, 2WE3, 8T, 8W
  (3) Lead (Pb)-free terminations and packaging codes: 2TE3, 2WE3

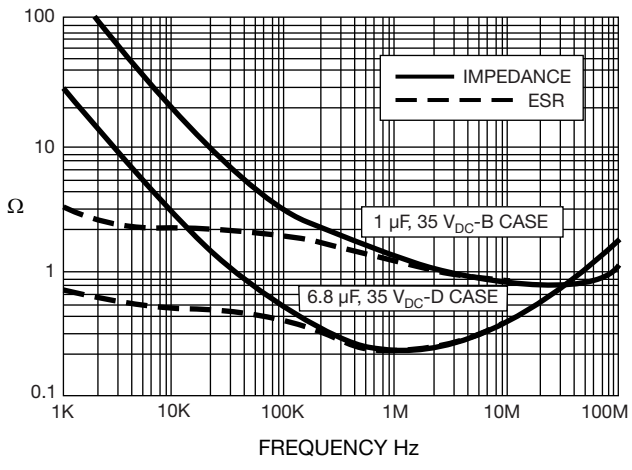
RECOMMENDED VOLTAGE DERATING GUIDELINES (for temperatures below + 85 °C)	
STANDARD CONDITIONS. FOR EXAMPLE: OUTPUT FILTERS	
Capacitor Voltage Rating	**Operating Voltage**
4.0	2.5
6.3	3.6
10	6.0
16	10
20	12
25	15
35	24
50	28
63	36
SEVERE CONDITIONS. FOR EXAMPLE: INPUT FILTERS	
Capacitor Voltage Rating	**Operating Voltage**
4.0	2.5
6.3	3.3
10	5.0
16	8.0
20	10
25	12
35	15
50	24
63	31

TYPICAL CURVES AT + 25 °C, IMPEDANCE AND ESR VS. FREQUENCY









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
V	0.125

STANDARD PACKAGING QUANTITY		
CASE CODE	**UNITS PER REEL**	
	7" REEL	**13" REEL**
A	2000	9000
B	2000	8000
C	500	3000
D	500	2500
E	400	1500
V	1000	5000

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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