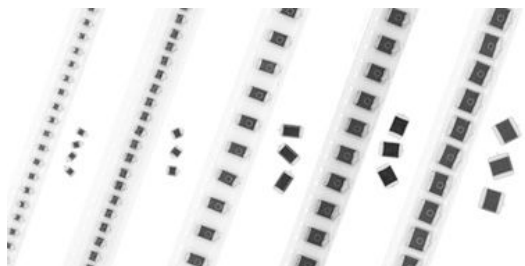


Solid Tantalum Chip Capacitors TANTAMOUNT[®], Low Profile, Low ESR, Conformal Coated, Maximum CV



FEATURES

- New robust ratings for pulsed applications
- 1.0 mm to 2.5 mm height
- Terminations: 100 % matte tin (2) standard, tin/lead available
- Mounting: Surface mount
- 8 mm, 12 mm tape and reel packaging available per EIA 481 and reeling per IEC 60286-3
7" [178 mm] standard
13" [330 mm] available
- Case code compatibility with EIA 535BAAC and CECC 30801
- See also 592W for additional ratings designs for pulsed applications
- Material categorization: For definitions of compliance please see www.vishay.com/doc?99912


RoHS*
COMPLIANT

Note

* Lead (Pb)-containing terminations are not RoHS-compliant. Exemptions may apply.

PERFORMANCE CHARACTERISTICS

www.vishay.com/doc?40088

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

Capacitance Range: 1 µF to 2200 µF

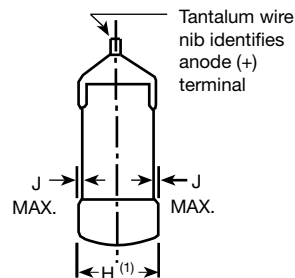
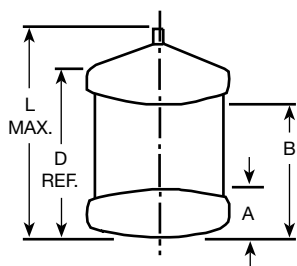
Capacitance Tolerance: ± 10 %, ± 20 % standard

Voltage Rating: 4 V_{DC} to 50 V_{DC}

ORDERING INFORMATION							
592D	106	X0	010	B	2	T	15H
TYPE	CAPACITANCE	CAPACITANCE TOLERANCE	DC VOLTAGE RATING AT + 85 °C	CASE CODE	TERMINATION	REEL SIZE AND PACKAGING	SUFFIX
	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 %	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).	See Ratings and Case Codes table	2 = 100 % tin 4 = Gold plated 8 = Solder plated 60/40 Special order	T = Tape and reel 7" [178 mm] reel W = 13" [330 mm] reel	Maximum height (mm) see Standard Ratings table

Note

- Preferred tolerance and reel sizes are in bold.
We reserve the right to substitute form-fit-function replacement products with higher voltage rating, tighter capacitance tolerance or lower ESR (e.g., 591D series).

DIMENSIONS in inches [millimeters]


CASE CODE	L MAX.	W	A	B	D REF.	J MAX.
A	0.146 [3.7]	0.071 ± 0.012 [1.8 ± 0.3]	0.031 ± 0.012 [0.8 ± 0.3]	0.087 ± 0.016 [2.2 ± 0.4]	0.114 [2.9]	0.004 [0.1]
B	0.157 [4.0]	0.110 + 0.012/- 0.016 [2.8 + 0.3/- 0.4]	0.031 ± 0.012 [0.8 ± 0.3]	0.098 ± 0.016 [2.5 ± 0.4]	0.138 [3.5]	0.004 [0.1]
C	0.28 [7.1]	0.126 ± 0.012 [3.2 ± 0.3]	0.051 ± 0.012 [1.3 ± 0.3]	0.173 ± 0.024 [4.4 ± 0.6]	0.236 [6.0]	0.004 [0.1]
D	0.295 [7.5]	0.169 ± 0.012 [4.3 ± 0.3]	0.051 ± 0.012 [1.3 ± 0.3]	0.181 ± 0.024 [4.6 ± 0.6]	0.252 [6.4]	0.004 [0.1]
M	0.295 [7.5]	0.248 ± 0.012 [6.3 ± 0.3]	0.051 ± 0.012 [1.3 ± 0.3]	0.200 ± 0.024 [5.1 ± 0.6]	0.264 [6.7]	0.004 [0.1]
R	0.283 [7.2]	0.236 + 0.012/- 0.024 [6.0 + 0.3/- 0.6]	0.051 ± 0.012 [1.3 ± 0.3]	0.181 ± 0.024 [4.6 ± 0.6]	0.244 [6.2]	0.004 [0.1]
S	0.138 [3.5]	0.063 ± 0.012 [1.6 ± 0.3]	0.031 ± 0.012 [0.8 ± 0.3]	0.079 ± 0.012 [2.0 ± 0.3]	0.087 [2.2]	0.004 [0.1]
X	0.571 [14.5]	0.290 + 0.010/- 0.020 [7.37 + 0.25/- 0.5]	0.051 ± 0.016 [1.3 ± 0.4]	0.469 ± 0.024 [11.9 ± 0.6]	0.52 [13.2]	0.004 [0.1]

Notes

- The anode termination (D less B) will be a minimum of 0.012" [0.3 mm]
- (1) For package height, please refer to specific rating in the "Standard Ratings" table

RATINGS AND CASE CODES

μF	4 V	6.3 V	10 V	16 V	20 V	25 V	35 V	50 V
1.0							A/B	B
1.5							B	
2.2					A	A/B	B/C	C
3.3						B/C	C/D	C
4.7			A	A	A/B	C	B/C/D/R	C/R
6.8			A	A/B	B/C	C/D	D/R	R
10		A	A/B	B/C	B/C/D	B/D/R	R	R
15		A/B	B	B/C/D	C/D/R	R		
22	A/B	A/B	A/B/C	B/C/D	B/D/R			
33	B	A/B/C/S	C/D	B/C/D/R	R			
47	C	A/B/C/D	B/D/R	B/C/R				
68	B/C/D	B/C/D/R	B/C/D/R	C/D		R		
100	A/B/C/D/R	B/C/D/R	B/C/D/R	C/D				
120		C						
150	B/C/D/R	C/D/R	C/D	D/R				
220	C/D/R	C/D/R	D/R	R				
330	C/D	C/D/R	D/R					
470	C/D/R	C/D/R						
680	D/R	R	X					
1000	R	R/X						
1500	X	M/R/X						
2200	X	X						



STANDARD RATINGS							
CAPACITANCE (μ F)	CASE CODE	PART NUMBER	HEIGHT MAX. (mm)	MAX. DCL AT + 25 °C (μ A)	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							
22	A	592D226(1)004A(2)(3)15H	1.5	0.9	6	2.400	0.16
22	B	592D226(1)004B(2)(3)15H	1.5	0.9	6	1.600	0.22
33	B	592D336(1)004B(2)(3)15H	1.5	1.3	6	1.600	0.22
47	C	592D476(1)004C(2)(3)15H	1.5	1.9	6	0.400	0.50
68	B	592D686(1)004B(2)(3)15H	1.5	2.7	6	1.400	0.24
68	C	592D686(1)004C(2)(3)15H	1.5	2.7	6	0.350	0.53
68	D	592D686(1)004D(2)(3)15H	1.5	2.7	6	0.270	0.68
100	A	592D107(1)004A(2)(3)12H	1.2	4.0	24	1.000	0.23
100	B	592D107(1)004B(2)(3)20H	2.0	4.0	8	0.450	0.42
100	C	592D107(1)004C(2)(3)15H	1.5	4.0	8	0.450	0.47
100	D	592D107(1)004D(2)(3)15H	1.5	4.0	8	0.350	0.60
100	R	592D107(1)004R(2)(3)15H	1.5	4.0	8	0.260	0.76
150	B	592D157(1)004B(2)(3)20H	2.0	6.0	8	0.450	0.42
150	C	592D157(1)004C(2)(3)15H	1.5	6.0	8	0.450	0.47
150	D	592D157(1)004D(2)(3)15H	1.5	6.0	8	0.360	0.59
150	R	592D157(1)004R(2)(3)15H	1.5	6.0	8	0.250	0.77
220	C	592D227(1)004C(2)(3)20H	2.0	8.8	8	0.200	0.74
220	D	592D227(1)004D(2)(3)15H	1.5	8.8	8	0.200	0.79
220	R	592D227(1)004R(2)(3)15H	1.5	8.8	8	0.190	0.89
330	C	592D337(1)004C(2)(3)20H	2.0	13.2	8	0.120	0.96
330	D	592D337(1)004D(2)(3)20H	2.0	13.2	8	0.120	1.02
470	C	592D477(1)004C(2)(3)20H	2.0	18.8	8	0.100	1.05
470	D	592D477(1)004D(2)(3)14H	1.4	18.8	8	0.140	0.93
470	D	592D477(1)004D(2)(3)15H	1.5	18.8	8	0.140	0.94
470	D	592D477(1)004D(2)(3)20H	2.0	18.8	8	0.100	1.18
470	R	592D477(1)004R(2)(3)20H	2.0	18.8	10	0.100	1.32
680	D	592D687(1)004D(2)(3)20H	2.0	27.2	12	0.100	1.18
680	R	592D687(1)004R(2)(3)20H	2.0	27.2	12	0.100	1.32
1000	R	592D108(1)004R(2)(3)20H	2.0	40.0	14	0.200	0.94
1500	X	592D158(1)004X(2)(3)20H	2.0	60.0	20	0.040	2.09
2200	X	592D228(1)004X(2)(3)20H	2.0	88.0	25	0.055	1.78
2200	X	592D228(1)004X(2)(3)25H	2.5	88.0	25	0.040	2.12
6.3 V _{DC} AT + 85 °C; 4 V _{DC} AT + 125 °C							
10	A	592D106(1)6R3A(2)(3)15H	1.5	0.6	6	2.700	0.15
15	A	592D156(1)6R3A(2)(3)15H	1.5	0.9	6	2.500	0.15
15	B	592D156(1)6R3B(2)(3)15H	1.5	0.9	6	1.700	0.22
22	A	592D226(1)6R3A(2)(3)10H	1.0	1.4	12	4.000	0.11
22	A	592D226(1)6R3A(2)(3)13H	1.3	1.4	6	1.500	0.19
22	A	592D226(1)6R3A(2)(3)15H	1.5	1.4	6	1.500	0.20
22	B	592D226(1)6R3B(2)(3)15H	1.5	1.4	6	1.500	0.23
33	A	592D336(1)6R3A(2)(3)15H	1.5	2.1	6	1.700	0.19
33	B	592D336(1)6R3B(2)(3)15H	1.5	2.1	6	1.400	0.24
33	C	592D336(1)6R3C(2)(3)15H	1.5	2.1	6	0.400	0.50
33	S	592D336(1)6R3S(2)(3)12H	1.2	2.1	10	2.000	0.17
47	A	592D476(1)6R3A(2)(3)13H	1.3	2.7	14	2.000	0.16
47	A	592D476(1)6R3A(2)(3)15H	1.5	2.7	14	2.000	0.17
47	B	592D476(1)6R3B(2)(3)12H	1.2	3.0	8	1.400	0.23
47	B	592D476(1)6R3B(2)(3)15H	1.5	3.0	8	1.400	0.24

Note

- Part number definitions:

(1) Tolerance: For 10 % tolerance, specify "X9"; for 20 % tolerance, change to "X0"

(2) Termination: For 100 % tin specify "2", for gold plated specify "4", for solder plated 60/40 specify "8"

(3) Packaging code: For 7" reels specify "T", for 13" reels specify "W"

**STANDARD RATINGS**

CAPACITANCE (μ F)	CASE CODE	PART NUMBER	HEIGHT MAX. (mm)	MAX. DCL AT + 25 °C (μ A)	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							
47	C	592D476(1)6R3C(2)(3)15H	1.5	3.0	6	0.400	0.50
47	D	592D476(1)6R3D(2)(3)15H	1.5	3.0	6	0.300	0.65
68	B	592D686(1)6R3B(2)(3)13H	1.3	4.3	8	0.600	0.35
68	B	592D686(1)6R3B(2)(3)15H	1.5	4.3	8	0.600	0.37
68	B	592D686(1)6R3B(2)(3)20H	2.0	4.3	6	0.500	0.40
68	C	592D686(1)6R3C(2)(3)14H	1.4	4.3	6	0.380	0.51
68	C	592D686(1)6R3C(2)(3)15H	1.5	4.3	6	0.380	0.51
68	D	592D686(1)6R3D(2)(3)15H	1.5	4.3	6	0.270	0.68
68	R	592D686(1)6R3R(2)(3)15H	1.5	4.3	6	0.200	0.87
100	B	592D107(1)6R3B(2)(3)15H	1.5	6.3	8	1.000	0.28
100	B	592D107(1)6R3B(2)(3)20H	2.0	6.3	8	0.450	0.42
100	C	592D107(1)6R3C(2)(3)15H	1.5	6.3	8	0.380	0.51
100	D	592D107(1)6R3D(2)(3)15H	1.5	6.3	8	0.260	0.69
100	R	592D107(1)6R3R(2)(3)15H	1.5	6.3	8	0.200	0.87
120	C	592D127(1)6R3C(2)(3)20H	2.0	7.2	8	0.200	0.74
150	C	592D157(1)6R3C(2)(3)20H	2.0	9.5	8	0.190	0.76
150	D	592D157(1)6R3D(2)(3)15H	1.5	9.5	8	0.250	0.71
150	R	592D157(1)6R3R(2)(3)15H	1.5	9.5	8	0.200	0.87
220	C	592D227(1)6R3C(2)(3)18H	1.8	13.9	8	0.150	0.86
220	C	592D227(1)6R3C(2)(3)20H	2.0	13.9	8	0.150	0.86
220	D	592D227(1)6R3D(2)(3)15H	1.5	13.9	8	0.220	0.75
220	D	592D227(1)6R3D(2)(3)20H	2.0	13.9	8	0.120	1.08
220	R	592D227(1)6R3R(2)(3)15H	1.5	13.9	8	0.180	0.91
330	C	592D337(1)6R3C(2)(3)16H	1.6	20.8	10	0.150	0.82
330	C	592D337(1)6R3C(2)(3)20H	2.0	20.8	12	0.200	0.74
330	D	592D337(1)6R3D(2)(3)15H	1.5	20.8	8	0.120	1.02
330	D	592D337(1)6R3D(2)(3)16H	1.6	20.8	12	0.150	0.93
330	D	592D337(1)6R3D(2)(3)19H	1.9	20.8	8	0.100	1.18
330	D	592D337(1)6R3D(2)(3)20H	2.0	20.8	8	0.100	1.18
330	R	592D337(1)6R3R(2)(3)12H	1.2	20.8	10	0.180	0.87
330	R	592D337(1)6R3R(2)(3)15H	1.5	20.8	8	0.180	0.91
330	R	592D337(1)6R3R(2)(3)20H	2.0	20.8	8	0.100	1.32
470	C	592D477(1)6R3C(2)(3)16H	1.6	29.6	14	0.200	0.71
470	C	592D477(1)6R3C(2)(3)20H	2.0	29.6	14	0.100	1.05
470	D	592D477(1)6R3D(2)(3)20H	2.0	29.6	10	0.100	1.18
470	R	592D477(1)6R3R(2)(3)16H	1.6	29.6	10	0.120	1.37
470	R	592D477(1)6R3R(2)(3)20H	2.0	29.6	10	0.100	1.32
680	R	592D687(1)6R3R(2)(3)16H	1.6	42.8	10	0.100	1.25
680	R	592D687(1)6R3R(2)(3)20H	2.0	42.8	10	0.100	1.32
1000	R	592D108(1)6R3R(2)(3)20H	2.0	63.0	29	0.200	0.94
1000	R	592D108(1)6R3R(2)(3)22H	2.2	63.0	29	0.200	0.96
1000	X	592D108(1)6R3X(2)(3)20H	2.0	63.0	16	0.040	2.09
1500	M	592D158X06R3M(2)(3)20H	2.0	95.0	50	0.090	1.39
1500	R	592D158X06R3R(2)(3)20H	2.0	95.0	50	0.120	1.21
1500	X	592D158(1)6R3X(2)(3)16H	1.6	95.0	25	0.045	1.94
1500	X	592D158(1)6R3X(2)(3)20H	2.0	95.0	25	0.045	1.97
1500	X	592D158(1)6R3X(2)(3)25H	2.5	95.0	20	0.035	2.27
2200	X	592D228(1)6R3X(2)(3)20H	2.0	139.0	35	0.055	1.78
2200	X	592D228(1)6R3X(2)(3)21H	2.1	139.0	35	0.055	1.79
2200	X	592D228(1)6R3X(2)(3)22H	2.2	139.0	35	0.055	1.79

Note

- Part number definitions:

(1) Tolerance: For 10 % tolerance, specify "X9"; for 20 % tolerance, change to "X0"

(2) Termination: For 100 % tin specify "2", for gold plated specify "4", for solder plated 60/40 specify "8"

(3) Packaging code: For 7" reels specify "T", for 13" reels specify "W"



STANDARD RATINGS							
CAPACITANCE (μ F)	CASE CODE	PART NUMBER	HEIGHT MAX. (mm)	MAX. DCL AT + 25 °C (μ A)	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							
4.7	A	592D475(1)010A(2)(3)15H	1.5	0.5	6	6.000	0.10
6.8	A	592D685(1)010A(2)(3)15H	1.5	0.7	6	6.000	0.10
10	A	592D106(1)010A(2)(3)15H	1.5	1.0	6	2.600	0.15
10	B	592D106(1)010B(2)(3)15H	1.5	1.0	6	1.700	0.22
15	B	592D156(1)010B(2)(3)15H	1.5	1.5	6	1.600	0.22
22	A	592D226(1)010A(2)(3)13H	1.3	2.2	6	1.500	0.19
22	B	592D226(1)010B(2)(3)13H	1.3	2.2	6	1.500	0.22
22	B	592D226(1)010B(2)(3)15H	1.5	2.2	6	1.500	0.23
22	C	592D226(1)010C(2)(3)15H	1.5	2.2	6	0.400	0.50
33	C	592D336(1)010C(2)(3)15H	1.5	3.3	6	0.400	0.50
33	D	592D336(1)010D(2)(3)15H	1.5	3.3	6	0.300	0.65
47	B	592D476(1)010B(2)(3)20H	2.0	4.7	6	0.500	0.40
47	D	592D476(1)010D(2)(3)15H	1.5	4.7	6	0.270	0.68
47	R	592D476(1)010R(2)(3)15H	1.5	4.7	6	0.200	0.87
68	B	592D686(1)010B(2)(3)20H	2.0	6.8	6	0.450	0.42
68	C	592D686(1)010C(2)(3)15H	1.5	6.8	6	0.240	0.65
68	D	592D686(1)010D(2)(3)15H	1.5	6.8	6	0.270	0.68
68	R	592D686(1)010R(2)(3)15H	1.5	6.8	6	0.200	0.87
100	B	592D107(1)010B(2)(3)20H	2.0	10.0	14	0.400	0.45
100	C	592D107(1)010C(2)(3)20H	2.0	10.0	8	0.190	0.76
100	D	592D107(1)010D(2)(3)13H	1.3	10.0	8	0.100	1.10
100	D	592D107(1)010D(2)(3)15H	1.5	10.0	8	0.100	1.12
100	R	592D107(1)010R(2)(3)15H	1.5	10.0	6	0.220	0.83
150	C	592D157(1)010C(2)(3)15H	1.5	15.0	8	0.170	0.77
150	C	592D157(1)010C(2)(3)20H	2.0	15.0	8	0.170	0.80
150	D	592D157(1)010D(2)(3)15H	1.5	15.0	8	0.250	0.71
150	D	592D157(1)010D(2)(3)20H	2.0	15.0	8	0.140	1.00
220	D	592D227(1)010D(2)(3)19H	1.9	22.0	8	0.120	1.08
220	D	592D227(1)010D(2)(3)20H	2.0	22.0	8	0.120	1.08
220	R	592D227(1)010R(2)(3)20H	2.0	22.0	8	0.100	1.32
330	D	592D337(1)010D(2)(3)20H	2.0	33.0	8	0.100	1.18
330	R	592D337(1)010R(2)(3)20H	2.0	33.0	8	0.100	1.32
680	X	592D687(1)010X(2)(3)20H	2.0	100.0	15	0.070	1.58
16 V _{DC} AT + 85 °C; 10 V _{DC} AT + 125 °C							
4.7	A	592D475(1)016A(2)(3)15H	1.5	0.8	6	3.500	0.13
6.8	A	592D685(1)016A(2)(3)15H	1.5	1.1	6	3.300	0.13
6.8	B	592D685(1)016B(2)(3)15H	1.5	1.1	6	1.800	0.21
10	B	592D106(1)016B(2)(3)15H	1.5	1.6	6	1.600	0.22
10	C	592D106(1)016C(2)(3)15H	1.5	1.6	6	1.000	0.32
15	B	592D156(1)016B(2)(3)15H	1.5	2.4	6	1.400	0.24
15	C	592D156(1)016C(2)(3)15H	1.5	2.4	6	1.300	0.28

Note

- Part number definitions:
 - Tolerance: For 10 % tolerance, specify "X9"; for 20 % tolerance, change to "X0"
 - Termination: For 100 % tin specify "2", for gold plated specify "4", for solder plated 60/40 specify "8"
 - Packaging code: For 7" reels specify "T", for 13" reels specify "W"



STANDARD RATINGS							
CAPACITANCE (μ F)	CASE CODE	PART NUMBER	HEIGHT MAX. (mm)	MAX. DCL AT + 25 °C (μ A)	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							
15	D	592D156(1)016D(2)(3)15H	1.5	2.4	6	0.500	0.50
22	B	592D226(1)016B(2)(3)20H	2.0	3.5	6	0.600	0.37
22	C	592D226(1)016C(2)(3)15H	1.5	3.5	6	0.300	0.58
22	D	592D226(1)016D(2)(3)15H	1.5	3.5	6	0.400	0.56
33	B	592D336(1)016B(2)(3)20H	2.0	5.3	6	0.600	0.37
33	C	592D336(1)016C(2)(3)15H	1.5	5.3	6	0.250	0.63
33	D	592D336(1)016D(2)(3)15H	1.5	5.3	6	0.300	0.65
33	R	592D336(1)016R(2)(3)15H	1.5	5.3	6	0.270	0.75
47	B	592D476(1)016B(2)(3)20H	2.0	7.5	6	0.720	0.33
47	C	592D476(1)016C(2)(3)16H	1.6	7.5	6	0.250	0.63
47	C	592D476(1)016C(2)(3)20H	2.0	7.5	6	0.250	0.66
47	R	592D476(1)016R(2)(3)15H	1.5	7.5	6	0.250	0.77
68	C	592D686(1)016C(2)(3)12H	1.2	10.9	6	0.500	0.43
68	C	592D686(1)016C(2)(3)15H	1.5	10.9	6	0.500	0.45
68	C	592D686(1)016C(2)(3)20H	2.0	10.9	6	0.250	0.66
68	D	592D686(1)016D(2)(3)20H	2.0	10.9	6	0.170	0.91
100	C	592D107(1)016C(2)(3)20H	2.0	16.0	8	0.150	0.86
100	C	592D107(1)016C(2)(3)20H	2.0	16.0	8	0.150	0.86
100	D	592D107(1)016D(2)(3)15H	1.5	16.0	8	0.150	0.91
100	D	592D107(1)016D(2)(3)20H	2.0	16.0	8	0.150	0.97
150	D	592D157(1)016D(2)(3)20H	2.0	24.0	8	0.100	1.18
150	R	592D157(1)016R(2)(3)20H	2.0	24.0	8	0.100	1.32
220	R	592D227(1)016R(2)(3)20H	2.0	35.2	10	0.120	1.21
20 V _{DC} AT + 85 °C; 13 V _{DC} AT + 125 °C							
2.2	A	592D225(1)020A(2)(3)15H	1.5	0.5	6	6.000	0.10
4.7	A	592D475(1)020A(2)(3)15H	1.5	0.9	6	3.800	0.13
4.7	B	592D475(1)020B(2)(3)15H	1.5	0.9	6	3.200	0.16
6.8	B	592D685(1)020B(2)(3)15H	1.5	1.4	6	3.100	0.16
6.8	C	592D685(1)020C(2)(3)15H	1.5	1.4	6	1.100	0.30
10	B	592D106(1)020B(2)(3)15H	1.5	2.0	6	3.000	0.16
10	C	592D106(1)020C(2)(3)15H	1.5	2.0	6	1.300	0.28
10	D	592D106(1)020D(2)(3)15H	1.5	2.0	6	0.500	0.50
15	C	592D156(1)020C(2)(3)15H	1.5	3.0	6	0.600	0.41
15	D	592D156(1)020D(2)(3)15H	1.5	3.0	6	1.260	0.31
15	R	592D156(1)020R(2)(3)15H	1.5	3.0	6	0.400	0.61
22	B	592D226(1)020B(2)(3)20H	2.0	4.4	6	0.600	0.37
22	D	592D226(1)020D(2)(3)15H	1.5	4.4	6	0.400	0.56
22	R	592D226(1)020R(2)(3)15H	1.5	4.4	6	0.280	0.73
33	R	592D336(1)020R(2)(3)15H	1.5	6.6	6	0.280	0.73

Note

- Part number definitions:
 - Tolerance: For 10 % tolerance, specify "X9"; for 20 % tolerance, change to "X0"
 - Termination: For 100 % tin specify "2", for gold plated specify "4", for solder plated 60/40 specify "8"
 - Packaging code: For 7" reels specify "T", for 13" reels specify "W"



STANDARD RATINGS							
CAPACITANCE (μ F)	CASE CODE	PART NUMBER	HEIGHT MAX. (mm)	MAX. DCL AT + 25 °C (μ A)	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	A	592D225(1)025A(2)(3)15H	1.5	0.6	6	8.000	0.09
2.2	B	592D225(1)025B(2)(3)15H	1.5	0.6	6	6.000	0.12
3.3	B	592D335(1)025B(2)(3)15H	1.5	0.8	6	5.600	0.12
3.3	C	592D335(1)025C(2)(3)15H	1.5	0.8	6	2.000	0.22
4.7	C	592D475(1)025C(2)(3)15H	1.5	1.2	6	1.600	0.25
6.8	C	592D685(1)025C(2)(3)15H	1.5	1.7	6	1.300	0.28
6.8	D	592D685(1)025D(2)(3)15H	1.5	1.7	6	1.300	0.31
10	B	592D106X0025B(2)(3)15H	1.5	2.5	6	2.000	0.20
10	D	592D106(1)025D(2)(3)15H	1.5	2.5	6	1.200	0.32
10	R	592D106(1)025R(2)(3)15H	1.5	2.5	6	0.480	0.56
15	R	592D156(1)025R(2)(3)15H	1.5	3.8	6	0.400	0.61
68	R	592D686(1)025R(2)(3)20H	2.0	17.0	8	0.230	0.87
35 V _{DC} AT + 85 °C; 23 V _{DC} AT + 125 °C							
1.0	A	592D105(1)035A(2)(3)15H	1.5	0.5	4	10.000	0.08
1.0	B	592D105(1)035B(2)(3)15H	1.5	0.5	4	6.500	0.11
1.5	B	592D155(1)035B(2)(3)15H	1.5	0.5	4	4.200	0.14
2.2	B	592D225(1)035B(2)(3)15H	1.5	0.8	6	6.000	0.12
2.2	C	592D225(1)035C(2)(3)15H	1.5	0.8	6	3.500	0.17
3.3	C	592D335(1)035C(2)(3)15H	1.5	1.2	6	3.200	0.18
3.3	D	592D335(1)035D(2)(3)15H	1.5	1.2	6	2.100	0.24
4.7	B	592D475(1)035B(2)(3)15H	1.5	1.6	6	1.600	0.22
4.7	C	592D475(1)035C(2)(3)15H	1.5	1.6	6	2.800	0.19
4.7	D	592D475(1)035D(2)(3)15H	1.5	1.6	6	1.800	0.26
4.7	R	592D475(1)035R(2)(3)15H	1.5	1.6	6	1.300	0.34
6.8	D	592D685(1)035D(2)(3)15H	1.5	2.4	6	1.300	0.31
6.8	R	592D685(1)035R(2)(3)15H	1.5	2.4	6	1.200	0.35
10	R	592D106(1)035R(2)(3)15H	1.5	3.5	6	1.200	0.35
50 V _{DC} AT + 85 °C; 33 V _{DC} AT + 125 °C							
1.0	B	592D105(1)050B(2)(3)15H	1.5	0.8	6	6.500	0.11
2.2	C	592D225(1)050C(2)(3)15H	1.5	1.1	6	0.800	0.35
3.3	C	592D335(1)050C(2)(3)15H	1.5	1.7	6	0.800	0.35
4.7	C	592D475(1)050C(2)(3)20H	2.0	2.4	6	0.800	0.37
4.7	R	592D475(1)050R(2)(3)15H	1.5	2.4	6	0.700	0.50
6.8	R	592D685(1)050R(2)(3)15H	1.5	3.4	6	0.700	0.50
10	R	592D106(1)050R(2)(3)20H	2.0	5.0	6	0.700	0.50

Note

- Part number definitions:
 - (1) Tolerance: For 10 % tolerance, specify "X9"; for 20 % tolerance, change to "X0"
 - (2) Termination: For 100 % tin specify "2", for gold plated specify "4", for solder plated 60/40 specify "8"
 - (3) Packaging code: For 7" reels specify "T", for 13" reels specify "W"

**RECOMMENDED VOLTAGE DERATING GUIDELINES** (for temperatures below + 85 °C)**STANDARD CONDITIONS. FOR EXAMPLE: OUTPUT FILTERS**

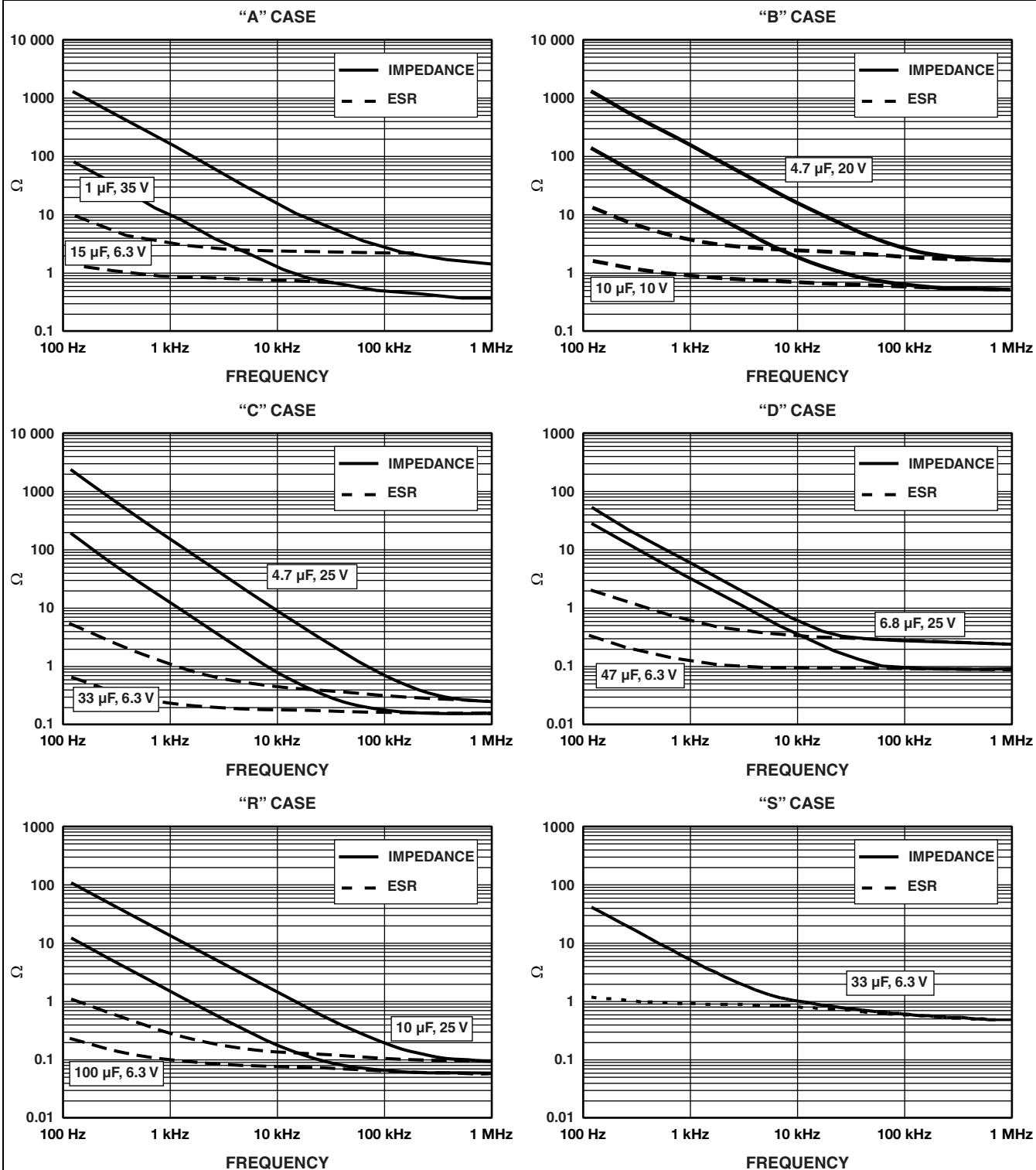
Capacitor Voltage Rating	Operating Voltage
4.0	2.5
6.3	3.6
10	6.0
16	10
20	12
25	15
35	24
50	28

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

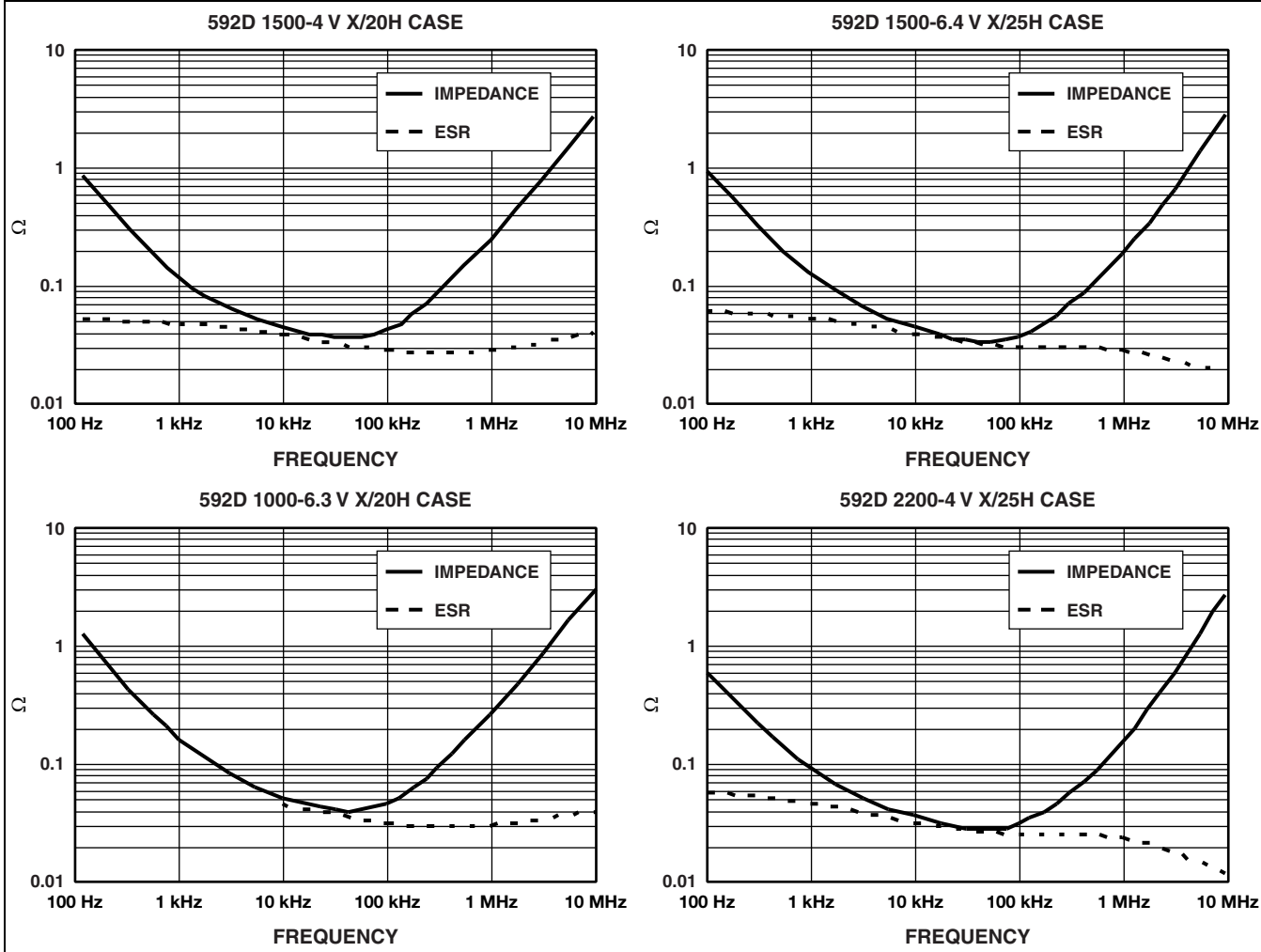
CASE CODE/PART NUMBER X-REF

OLD	NEW
A2_	A2_15H
B2_	B2_15H
C2_	C2_15H
D2_	D2_15H
R2_	R2_15H
S2_	S2_13H
T2_	B2_20H
U2_	C2_20H
V2_	D2_20H
W2_	R2_20H
X2_	X2_20H
Y2_	X2_25H

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




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



POWER DISSIPATION

CASE CODE	HEIGHT	MAXIMUM PERMISSIBLE POWER DISSIPATION AT + 25 °C (W) IN FREE AIR
A	10H	0.050
A	12H	0.055
A	13H	0.055
A	15H	0.060
B	12H	0.075
B	13H	0.075
B	15H	0.080
B	20H	0.085
C	12H	0.095
C	14H	0.100
C	15H	0.100
C	16H	0.100
C	18H	0.110
C	20H	0.110
D	13H	0.120

**POWER DISSIPATION**

CASE CODE	HEIGHT	MAXIMUM PERMISSIBLE POWER DISSIPATION AT + 25 °C (W) IN FREE AIR
D	14H	0.120
D	15H	0.125
D	16H	0.130
D	19H	0.140
D	20H	0.140
M	20H	0.175
R	12H	0.135
R	15H	0.150
R	16H	0.155
R	20H	0.175
R	22H	0.185
S	12H	0.060
X	16H	0.170
X	20H	0.175
X	21H	0.175
X	22H	0.175
X	25H	0.180

STANDARD PACKAGING QUANTITY

CASE CODE	HEIGHT	UNITS PER REEL	
		7" REEL	13" REEL
A	Any	2500	10 000
B	Any	2000	8000
C	Any	1000	4000
D	Any	1000	4000
M	20H	1000	2500
R	12H; 15H	1000	4000
R	16H; 18H; 20H	1000	2500
S	12H	2500	10 000
X	Any	500	n/a

PRODUCT INFORMATION

Conformal Coated Guide

- Recommended Pad Layouts
- Carrier Tape Information
- Reflow Profiles

www.vishay.com/doc?40150

Moisture Sensitivity

www.vishay.com/doc?40135

SELECTOR GUIDES

Solid Tantalum Selector Guide

Solid Tantalum Chip Capacitors

www.vishay.com/doc?49053

www.vishay.com/doc?40091

FAQ

Frequently Asked Questions

www.vishay.com/doc?40110



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