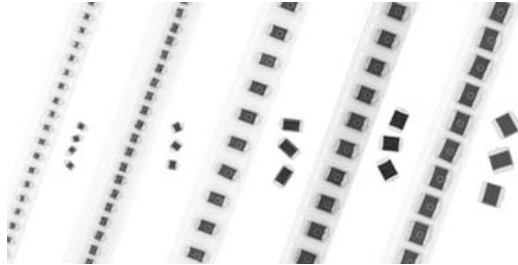


Solid Tantalum Chip Capacitors TANTAMOUNT[®], Low Profile, Low ESR, Conformal Coated, Maximum CV



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 CECC30801 molded chips
- See also 592W for additional ratings designs for pulsed applications
- Compliant to RoHS Directive 2002/95/EC


RoHS*
COMPLIANT

Note

* 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

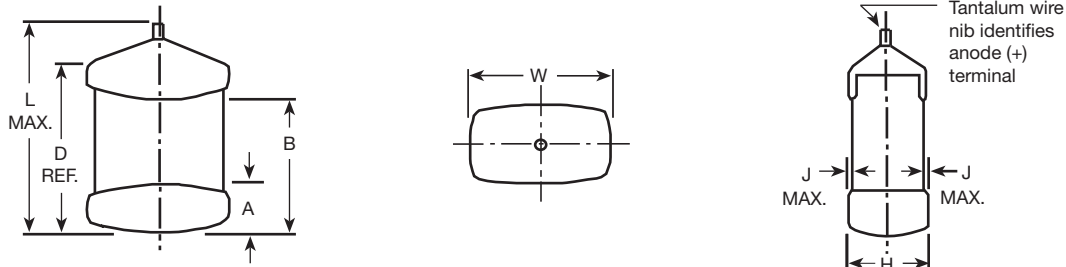
Capacitance Tolerance: ± 10 %, ± 20 % standard

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 supply higher voltage ratings and tighter capacitance tolerance capacitors in the same case size. Voltage substitutions will be marked with the higher voltage rating.

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 [2.8 ± 0.3]	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]	0.181 ± 0.024 [4.6 ± 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]
- 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	3.9	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	8	0.100	1.05
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	8	0.120	1.04
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	10	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:
 - 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)
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

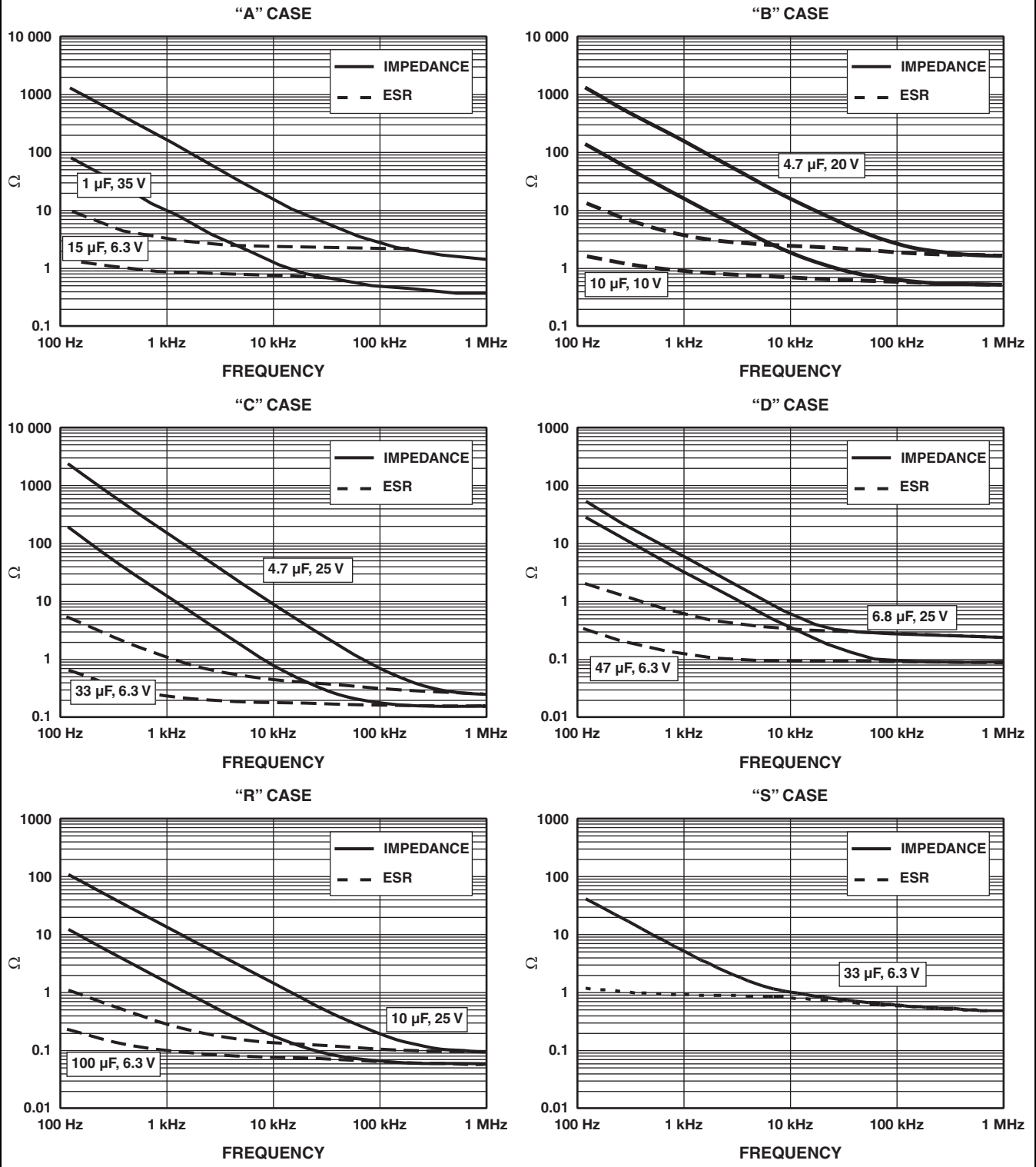
- Part number definitions:
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 - Termination: For 100 % tin specify "2", for gold plated specify "4", for solder plated 60/40 specify "8"
 - Packaging code: For 7" reels specify "T", for 13" reels specify "W"



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

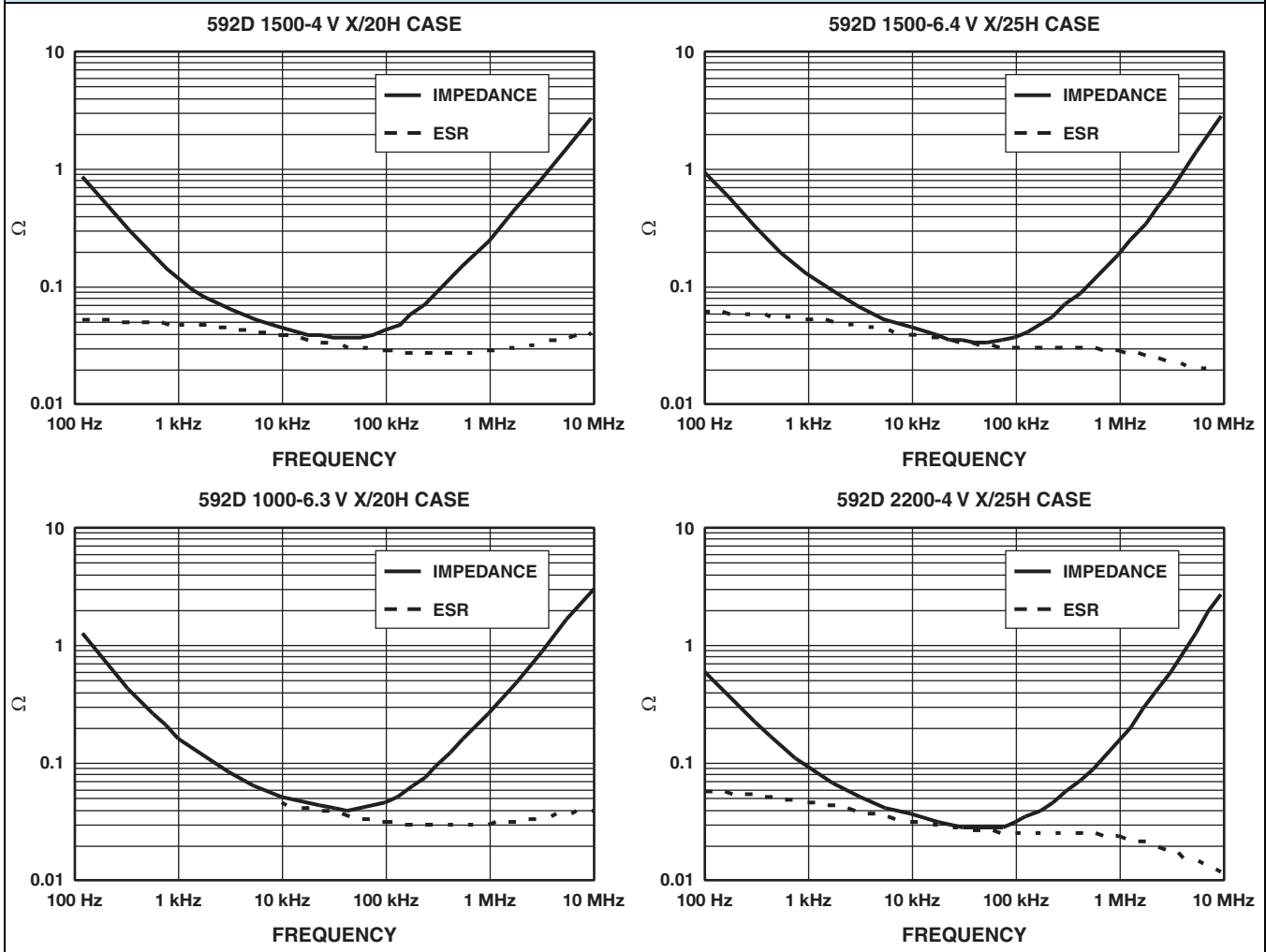
CASE CODE/PART NUMBER X-REF	
OLD	NEW
A2_	A2_15H
B2_	B2_15H
C2_	C2_15H
D2_	D2_15H
R2_	R2_15H
S2_	S2_13H
T2_	B2_20H
U2_	C2_20H
V2_	D2_20H
W2_	R2_20H
X2_	X2_20H
Y2_	X2_25H

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	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	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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