

TPS Series III

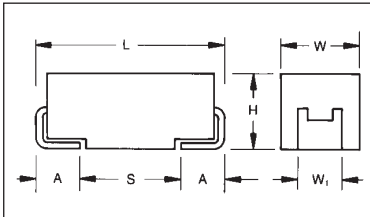
New Generation Low ESR



Current application trends in circuit designs for switch-mode power supplies, micro-processors, and digital circuits call for higher operating frequencies and smoother filtering. In order to function properly, components with low ESR, high capacitance and high reliability are required. The New Third generation TPS Low ESR series is based on the traditional MnO₂ process

that offers very low ESR levels previously only seen by other technologies. Further, continuous improvements in MnO₂ technology has allowed reductions in the resistance of the capacitor electrodes in order to further reduce ESR levels. Traditional MnO₂ technology guarantees excellent line and field performance, humidity stability and high electrical and thermal stress resistance.

CASE DIMENSIONS: millimeters (inches)



For part marking see page 164

Code	EIA Code	L±0.20 (0.008)	W+0.20 (0.008) -0.10 (0.004)	H+0.20 (0.008) -0.10 (0.004)	W ₁ ±0.20 (0.008)	A+0.30 (0.012) -0.20 (0.008)	S Min.
B	3528-21	3.50 (0.138)	2.80 (0.110)	1.90 (0.075)	2.20 (0.087)	0.80 (0.031)	1.40 (0.055)
C	6032-28	6.00 (0.236)	3.20 (0.126)	2.60 (0.102)	2.20 (0.087)	1.30 (0.051)	2.90 (0.114)
D	7343-31	7.30 (0.287)	4.30 (0.169)	2.90 (0.114)	2.40 (0.094)	1.30 (0.051)	4.40 (0.173)
E	7343-43	7.30 (0.287)	4.30 (0.169)	4.10 (0.162)	2.40 (0.094)	1.30 (0.051)	4.40 (0.173)
V	7361-38	7.30 (0.287)	6.10 (0.240)	3.45±0.30 (0.136±0.012)	3.10 (0.120)	1.40 (0.055)	1.80 (0.071)
W*	6032-15	6.00 (0.236)	3.20 (0.126)	1.50 (0.059) max.	2.20 (0.087)	1.30 (0.051)	2.90 (0.114)
Y**	7343-20	7.30 (0.287)	4.30 (0.169)	2.00 (0.079) max.	2.40 (0.094)	1.30 (0.051)	4.40 (0.173)

W₁ dimension applies to the termination width for A dimensional area only.

* Low Profile Version of C Case (max. height 1.5 [0.059])

** Low Profile Version of D Case (max. height 2.0 [0.079])

HOW TO ORDER

TPS

Type

D

Case Size
See table above

227

Capacitor Code
pF code: 1st two digits represent significant figures, 3rd digit represents multiplier (number of zeros to follow)

K

Capacitance Tolerance
K=±10%
M=±20%

010

Rated DC Voltage
002=2.5Vdc
004=4Vdc
006=6.3Vdc
010=10Vdc
016=16Vdc
020=20Vdc
025=25Vdc
035=35Vdc
050=50Vdc

R

Packaging
R = 7" T/R
(Lead Free since production date 1/1/04)
S = 13" T/R
(Lead Free since production date 1/1/04)
A = Gold Plating
7" Reel
B = Gold Plating
13" Reel

0050

Maximum ESR in Milliohms
See note below

NOTE: The EIA & CECC standards for low ESR Solid Tantalum Capacitors allow an ESR movement to 1.25 times catalog limit post mounting.

TECHNICAL SPECIFICATIONS

Technical Data:

All technical data relate to an ambient temperature of +25°C

Capacitance Range: 4.7 µF to 1500 µF

Capacitance Tolerance: ±10%; ±20%

Rated Voltage (V _R)	≤ +85°C:	2.5	4	6.3	10	16	20	25	35	50
Category Voltage (V _C)	≤ +125°C:	1.7	2.7	4	7	10	13	17	23	33
Surge Voltage (V _S)	≤ +85°C:	3.3	5.2	8	13	20	26	32	46	65
Surge Voltage (V _S)	≤ +125°C:	2.2	3.4	5	8	13	16	20	28	40

Temperature Range: -55°C to +125°C

Environmental Classification: 55/125/56 (IEC 68-2)

Reliability: 1% per 1000 hours at 85°C, V_R with 0.1/V series impedance, 60% confidence level

Meets requirements of AEC-Q200



TPS Series III



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CAPACITANCE AND RATED VOLTAGE, V_R (VOLTAGE CODE) RANGE LETTER DENOTES CASE SIZE (ESR in $m\Omega$)

SERIES III MATRIX

Capacitance		Rated Voltage DC (V_R) to 85°C								
μF	Code	2.5V (e)	4V (G)	6.3V (J)	10V (A)	16V (C)	20V (D)	25V (E)	35V (V)	50V (T)
4.7	475									D(300)
6.8	685									
10	106								D(125)	
15	156							D(100)	D(100)	
22	226					C(150)	C(100)	D(100)	D(125) E(125)	
33	336				C(150)	W(140)	D(100)	D(100) E(100)	D(200) E(100) V(80)	
47	476			B(250)	W(125)	D(80)	D(75) E(70)	E(80)	V(100)	
68	686			W(110)	Y(70,100)	D(70)	D(70)	E(125) V(80)		
100	107			C(75) Y(65,100)	C(75) D(50) Y(65,100)	D(60) E(55) Y(65,100)	V(60)			
150	157			D(50)	D(50) Y(65,100)	E(50) V(45)				
220	227	D(45)	D(40)	D(50) Y(65,100)	D(50) E(50)	V(45,50)				
330	337		D(35)	D(45)	E(40) V(40)					
470	477		D(45) E(35)	E(45)	E(45) V(40)					
680	687		E(40)	E(45) V(35)						
1000	108	E(30)	V(25) E(40)							
1500	158	V(30)								

Red - Developmental Ratings - subject to change

For TPS series and the case sizes C, D and E the ESR limits are printed on capacitor side in the following format:

T x x x - where x x x is ESR limit in milliohms i.e. T100 represents max. ESR of 100 milliohms.

ESR limits quoted in brackets (milliohms)

NOTE: The EIA & CECC standards for low ESR Solid Tantalum Capacitors allow an ESR movement to 1.25 times catalog limit post mounting.

TPS Series III



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RATINGS & PART NUMBER REFERENCE

AVX Part No.	Case Size	Capacitance (μF)	Rated Voltage (V)	DCL (μA) Max.	DF % Max.	ESR Max. (mΩ) @100kHz	100kHz Ripple Current Ratings (A)			100kHz Ripple Voltage Ratings (V)		
							25°C	85°C	125°C	25°C	85°C	125°C
TPSD227*002#0045	D	220	2.5	4.4	8	45	1.826	1.643	0.730	0.082	0.074	0.033
TPSE108*002#0030	E	1000	2.5	20	14	30	2.345	2.111	0.938	0.070	0.063	0.028
TPSV158*002#0030	V	1500	2.5	30	20	30	2.887	2.598	1.155	0.087	0.078	0.035
TPSD227*004#0040	D	220	4	8.8	8	40	1.936	1.743	0.775	0.077	0.070	0.031
TPSD337*004#0035	D	330	4	13.2	8	35	2.070	1.863	0.828	0.072	0.065	0.029
TPSD477*004#0045	D	470	4	18.8	12	45	1.826	1.643	0.730	0.082	0.074	0.033
TPSE477*004#0035	E	470	4	18.8	10	35	2.171	1.954	0.868	0.076	0.068	0.030
TPSE687*004#0040	E	680	4	27.2	10	40	2.031	1.828	0.812	0.081	0.073	0.032
TPSV108*004#0025	V	1000	4	40	16	25	3.162	2.846	1.265	0.079	0.071	0.032
TPSB476*006#0250	B	47	6.3	3	6	250	0.583	0.525	0.233	0.146	0.131	0.058
TPSW686*006#0110	W	68	6.3	4.3	6	110	0.905	0.814	0.362	0.099	0.090	0.040
TPSC107*006#0075	C	100	6.3	6.3	6	75	1.211	1.090	0.484	0.091	0.082	0.036
TPSY107*006#0100	Y	100	6.3	6.3	6	100	1.118	1.006	0.447	0.112	0.101	0.045
TPSD157*006#0050	D	150	6.3	9.5	6	50	1.732	1.559	0.693	0.087	0.078	0.035
TPSD227*006#0050	D	220	6.3	13.9	8	50	1.732	1.559	0.693	0.087	0.078	0.035
TPSY108*006#0100	Y	220	6.3	13.9	10	100	1.118	1.006	0.447	0.112	0.101	0.045
TPSD337*006#0045	D	330	6.3	20.8	8	45	1.826	1.643	0.730	0.082	0.074	0.033
TPSE477*006#0045	E	470	6.3	29.6	10	45	1.915	1.723	0.766	0.086	0.078	0.034
TPSE687*006#0045	E	680	6.3	42.8	10	45	1.915	1.723	0.766	0.086	0.078	0.034
TPSV687*006#0035	V	680	6.3	42.8	14	35	2.673	2.405	1.069	0.094	0.084	0.037
TPSC336*010#0150	C	33	10	3.3	6	150	0.856	0.771	0.343	0.128	0.116	0.051
TPSW476*010#0125	W	47	10	4.7	6	125	0.849	0.764	0.339	0.106	0.095	0.042
TPSY686*010#0100	Y	68	10	6.8	6	100	1.118	1.006	0.447	0.112	0.101	0.045
TPSC107*010#0075	C	100	10	10	8	75	1.211	1.090	0.484	0.091	0.082	0.036
TPSD107*010#0050	D	100	10	10	6	50	1.732	1.559	0.693	0.087	0.078	0.035
TPSY107*010#0100	Y	100	10	10	6	100	1.118	1.006	0.447	0.112	0.101	0.045
TPSD157*010#0050	D	150	10	15	6	50	1.732	1.559	0.693	0.087	0.078	0.035
TPSY157*010#0100	Y	150	10	15	6	100	1.118	1.006	0.447	0.112	0.101	0.045
TPSD227*010#0050	D	220	10	22	8	50	1.732	1.559	0.693	0.087	0.078	0.035
TPSE227*010#0050	E	220	10	22	8	50	1.817	1.635	0.727	0.091	0.082	0.036
TPSE337*010#0040	E	330	10	33	8	40	2.031	1.828	0.812	0.081	0.073	0.032
TPSV337*010#0040	V	330	10	33	10	40	2.500	1.250	1.000	0.100	0.090	0.040
TPSE477*010#0045	E	470	10	47	10	45	1.915	1.723	0.766	0.086	0.078	0.034
TPSV477*010#0040	V	470	10	47	10	40	2.500	2.250	1.000	0.100	0.090	0.040
TPSC226*016#0150	C	22	16	3.5	6	150	0.856	0.771	0.343	0.128	0.116	0.051
TPSW336*016#0140	W	33	16	5.3	6	140	0.802	0.722	0.321	0.112	0.101	0.045
TPSD476*016#0080	D	47	16	7.5	6	80	1.369	1.232	0.548	0.110	0.099	0.044
TPSD686*016#0070	D	68	16	10.8	6	70	1.464	1.317	0.586	0.102	0.092	0.041
TPSD107*016#0060	D	100	16	16	6	60	1.581	1.423	0.632	0.095	0.085	0.038
TPSE107*016#0055	E	100	16	16	6	55	1.732	1.559	0.693	0.095	0.086	0.038
TPSY107*016#0100	Y	100	16	16	8	100	1.118	1.006	0.447	0.112	0.101	0.045
TPSV157*016#0045	V	150	16	24	6	45	2.357	2.121	0.943	0.106	0.095	0.042
TPSV227*016#0050	V	220	16	35.2	8	50	2.236	2.012	0.894	0.112	0.101	0.045

All technical data relates to an ambient temperature of +25°C.
 Capacitance and DF are measured at 120Hz, 0.5V RMS with a maximum DC bias of 2.2 volts. DCL is measured at rated voltage after 5 minutes.
 * Insert K for ±10% and M for ±20% Capacitance Tolerance

Standard Plating – Insert R for 7" reel and S for 13" reel
 # Gold Plating – Insert A for 7" reel and B for 13" reel

NOTE: AVX reserves the right to supply a higher voltage rating or tighter tolerance part in the same case size, to the same reliability standards.

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RATINGS & PART NUMBER REFERENCE

AVX Part No.	Case Size	Capacitance (μF)	Rated Voltage (V)	DCL (μA) Max.	DF % Max.	ESR Max. (mΩ) @100kHz	100kHz Ripple Current Ratings (A)			100kHz Ripple Voltage Ratings (V)		
							25°C	85°C	125°C	25°C	85°C	125°C
TPSC226*020#0100	C	22	20	4.4	6	100	1.049	0.944	0.420	0.105	0.094	0.042
TPSD336*020#0100	D	33	20	6.6	6	100	1.225	1.102	0.490	0.122	0.110	0.049
TPSD476*020#0075	D	47	20	9.4	6	75	1.414	1.273	0.566	0.106	0.095	0.042
TPSE476*020#0070	E	47	20	9.4	6	70	1.535	1.382	0.614	0.107	0.097	0.043
TPSD686*020#0070	D	68	20	13.6	6	70	1.464	1.317	0.586	0.102	0.092	0.041
TPSV107*020#0060	V	100	20	20	8	60	2.041	1.837	0.816	0.122	0.110	0.049
TPSD156*025#0100	D	15	25	3.8	6	100	1.225	1.102	0.490	0.122	0.110	0.049
TPSD226*025#0100	D	22	25	5.5	6	100	1.225	1.102	0.490	0.122	0.110	0.049
TPSD336*025#0100	D	33	25	8.3	6	100	1.225	1.102	0.490	0.122	0.110	0.049
TPSE336*025#0100	E	33	25	8.3	6	100	1.285	1.156	0.514	0.128	0.116	0.051
TPSE476*025#0080	E	47	25	8.3	6	80	1.436	1.293	0.574	0.115	0.103	0.046
TPSE686*025#0125	E	68	25	17	6	125	1.149	1.034	0.460	0.144	0.129	0.057
TPSV686*025#0080	V	68	25	17	6	80	1.768	1.591	0.707	0.141	0.127	0.057
TPSD106*035#0125	D	10	35	3.5	6	125	1.095	0.986	0.438	0.137	0.123	0.055
TPSD156*035#0100	D	15	35	5.3	6	100	1.225	1.102	0.490	0.122	0.110	0.049
TPSD226*035#0125	D	22	35	7.7	6	125	1.095	0.986	0.438	0.137	0.123	0.055
TPSE226*035#0125	E	22	35	7.7	6	125	1.149	1.034	0.460	0.144	0.129	0.057
TPSD336*035#0200	D	33	35	11.6	6	200	0.866	0.779	0.346	0.173	0.156	0.069
TPSE336*035#0100	E	33	35	11.6	6	100	1.285	1.156	0.514	0.128	0.116	0.051
TPSD475*050#0300	D	4.7	50	2.4	6	300	0.707	0.636	0.283	0.212	0.191	0.085

All technical data relates to an ambient temperature of +25°C.
 Capacitance and DF are measured at 120Hz, 0.5V RMS with a maximum DC bias of 2.2 volts. DCL is measured at rated voltage after 5 minutes.
 * Insert K for ±10% and M for ±20% Capacitance Tolerance

Standard Plating – Insert R for 7" reel and S for 13" reel
 # **Gold Plating** – Insert A for 7" reel and B for 13" reel

NOTE: AVX reserves the right to supply a higher voltage rating or tighter tolerance part in the same case size, to the same reliability standards.

