

FEATURES	
<ul style="list-style-type: none"> - Lower Equivalent Series Resistance (ESR) - Conductive polymer electrode reduces ignition failure mode - 3x reflow 260°C compatible - Wider rated voltage range: 2.5 to 125V - Meets or Exceeds EIA 535 BAAC and IECQ standards (QC300801/US001, IS-28) - Pre-conditioned, surge current tested for maximum robustness - Capacitance range: 0.47µF to 470µF 	<ul style="list-style-type: none"> - Operating Temperature range -55°C to +125°C - Precision molded case with flat surfaces for vacuum pick-up - Laser marking and bold videcon – readable polarity - Compliant terminations - Glue pad on underside for bonding to circuit board prior to soldering - Encapsulant material satisfies the UL 94 V0 flammability classification - MSL (moisture sensitivity level) per IPC/Jedec J-STD-020B is level 3

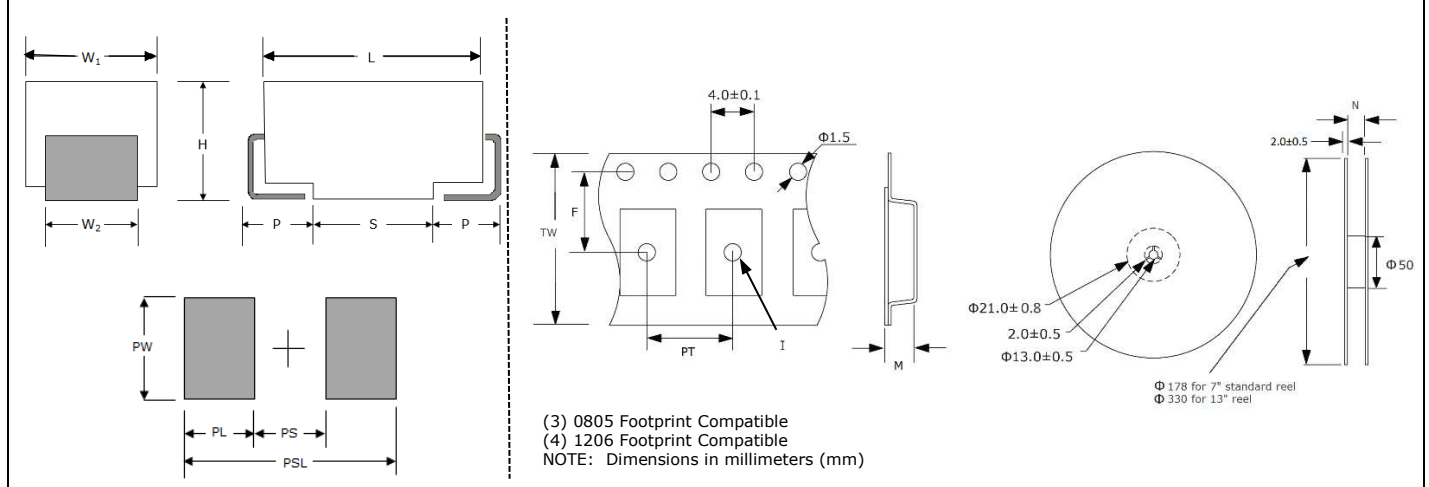


PART NUMBERING GUIDE	
<p>SERIES TYPE → SPT 10 / 35 D M 300 (optional) ← OPTIONAL</p> <p>CAPACITANCE in microfarads (µF) Ex. 0.68µF would be .68</p> <p>VOLTAGE</p> <p>2(2.5) 4 6(6.3) 10 16 20 25 35 50 63 100 125</p> <p>OPTIONAL -13 = 13 inch diameter Tape & Reel <blank> = 7 inch standard Tape & Reel</p> <p>MAXIMUM ESR in milliohms</p> <p>TOLERANCE M = (±20%)</p> <p>CASE SIZE A (3216-18) B (3528-21) C (6032-28) D (7343-31) H (7343-43)</p>	

ELECTRICAL SPECIFICATION													
Technical Data:	All technical data relate to an ambient temperature of +25°C. Capacitance and DF are measured at 120Hz, 0.5 RMS												
Capacitance Range	0.47µF to 470µF												
Capacitance Tolerance	±20% (M)												
Testing Data	<table border="1"> <thead> <tr> <th></th> <th>Surge Voltage</th> <th>Storage Life</th> </tr> </thead> <tbody> <tr> <td>125°C Series (-55°C to 125°C)</td> <td>1.3 x Category Voltage</td> <td>125°C, 0V, 2000h</td> </tr> <tr> <td>105°C Series (-55°C to 105°C)</td> <td>1.3 x Category Voltage</td> <td>105°C, 0V, 2000h</td> </tr> <tr> <td>85°C Series (-55°C to 85°C)</td> <td>1.3 x Rated Voltage</td> <td>85°C, 0V, 2000h</td> </tr> </tbody> </table>		Surge Voltage	Storage Life	125°C Series (-55°C to 125°C)	1.3 x Category Voltage	125°C, 0V, 2000h	105°C Series (-55°C to 105°C)	1.3 x Category Voltage	105°C, 0V, 2000h	85°C Series (-55°C to 85°C)	1.3 x Rated Voltage	85°C, 0V, 2000h
	Surge Voltage	Storage Life											
125°C Series (-55°C to 125°C)	1.3 x Category Voltage	125°C, 0V, 2000h											
105°C Series (-55°C to 105°C)	1.3 x Category Voltage	105°C, 0V, 2000h											
85°C Series (-55°C to 85°C)	1.3 x Rated Voltage	85°C, 0V, 2000h											
ESR Variation	ESR allowed to move up to 1.25 times limit post mounting												
Reliability	1% per 1000 hours at rated voltage (V _R), rated temperature (85°C) and 0.1Ω/volt circuit impedance, 60% confidence level												
Qualifications	Fixed Tantalum Specifications: EIA 525BAAC and IECQ standards (QC300801/US001, IS-28) Solder-ability: Sn Plated Terminations – meets requirements of IEC 68 2.20 test Ta and MIL-STD=202, Method 208 MSL (moisture sensitivity level): Level 3 of IPC/Jedec J-STD-020B												

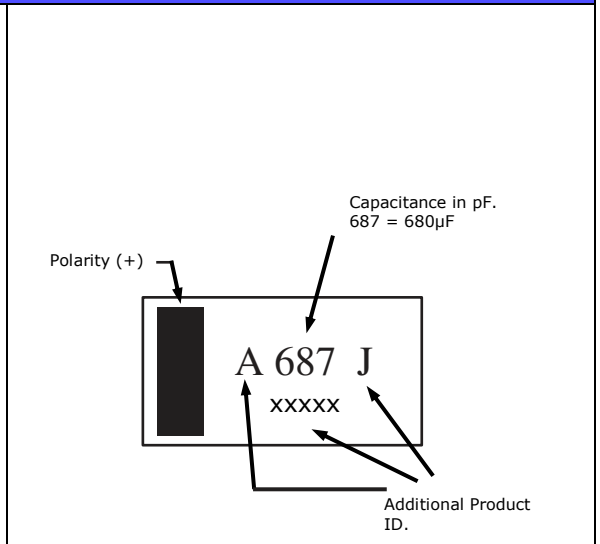
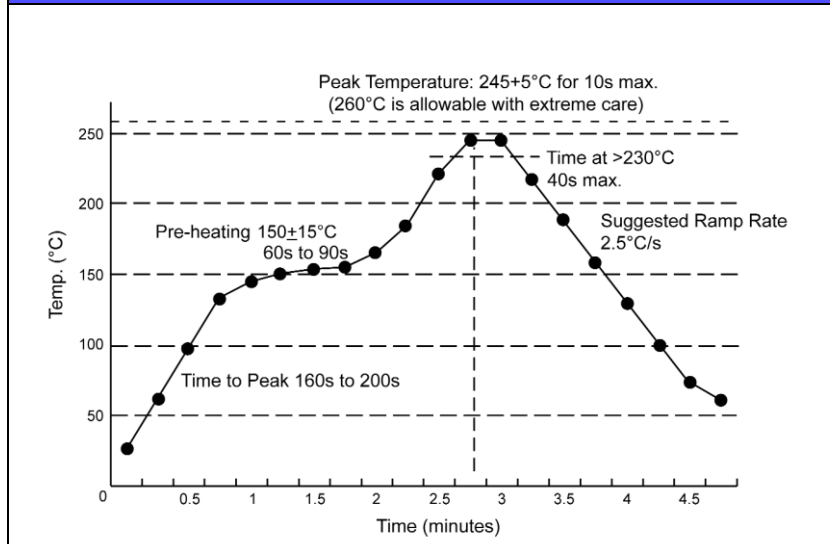
CASE SIZE CROSS REFERENCE: CAPACITANCE AND VOLTAGE RATING (Rated Voltage DC@ 85°C)													
Cap (µF)	2.5V	4V	6.3V	10V	16V	20V	25V	35V	50V	63V	75V	100V	125V
0.47										B			
0.68									B	B			
1.0									B	B,C			
1.5								B	B,C	C			
2.2								B	C	C			
3.3								B	C	C			
4.7							B	B,C	C	C,D	D	D	
6.8					A		B	C	C,D,HD	D,H	D		
10.0			A	A	A,B		B	B,C	H	H			
15.0		A	A	A	B		B	C,D					
22.0		A	A	B	B		C,D	D					
33.0		A	A,B	B,C			D	D,H					
47.0		A	A,B	B,C		D	D	H					
68.0	A	A,B	B,C	D	D	D	D,H						
100.0	A, B	A,B	A,B	D	H	D,H	D,H						
150.0	B	B	B,D	D	H								
220.0	B	B,D	B,D	D									
330.0	B	D	D										
470.0	D	D											

OUTLINE DRAWING AND PAD PRINT **TAPE AND REEL DIMENSION**



NEMCO Size	EIA Size	L ±0.2	W ₁ ± 0.2	H (MAX)	W ₂ ± 0.1	P ±0.3	S Min.	PSL	PL	PS	PW	TW ±0.3	PT (Pitch)	M (MAX)	I	N ±1	F ±0.05
A(4)	3216-18	3.2	1.6	1.6	1.2	0.8	1.10	3.8	1.4	1.0	1.8	8	4	2.3	1.0	9.5	3.5
B	3528-21	3.5	2.8	1.9	2.2	0.8	1.40	4.0	1.4	1.2	2.8	8	4	2.6	1.0	9.5	3.5
C	6032-28	6.0	3.2	2.6	2.2	1.3	2.90	6.5	2.0	2.5	2.8	12	8	3.3	1.5	13	5.5
D	7343-31	7.3	4.3	2.9	2.4	1.3	4.40	8.0	2.0	4.0	3.0	12	8	3.6	1.5	13	5.5
H	7343-43	7.3	4.3	4.1	2.4	1.3	4.40	8.0	2.0	4.0	3.0	12	8	4.8	1.5	13	5.5

REFLOW PROFILE **MARKING**



Tantalum capacitors are lead-free system compatible system components, meeting the requirements of J-STD-020 standard. Maximum peak temperature 260°C for 10 seconds maximum, 3 reflow cycles.

- There are several important general soldering considerations for tantalum capacitors.
- Soldering temperature and time should be the minimum for a good connection.
 - Recommended soldering profiles are designed to insure that the temperature of the internal construction of the capacitors does not exceed +220°C.
 - Positioning capacitors near components radiating heat such as power transistors should be avoided.
 - Allow for an increase to ESR ratings of 1.25 x catalog limit post PCB assembly.

NEMCO reserves the right to supply a higher voltage rating, tighter tolerance and/or lower ESR in the same case size, to the same reliability standards.

RATINGS AND PART NUMBER REFERENCE

2.5 V DC @ 85°C										
Capacitance (µF)	Case Size	ESR @ 100kHz max. (mΩ)	Nemco Part No.	Category Voltage	DCL (µA) max	tan δ max. (%)	Max. Ripple Current @100kHz mA (milliamps)			
							25°C	85°C	105°C	125°C
68.0	A	250	SPT68 / 2A_250	2	17.0	6	600	400	300	-
100.0	A	200	SPT100 / 2A_200	2	25.0	6	700	500	300	-
100.0	B	70	SPT100 / 2B_70	1.7	25.0	6	1300	900	600	300
150.0	B	70	SPT150 / 2B_70	2	37.5	6	1300	900	600	-
220.0	B	35	SPT220 / 2B_35	2	55.0	8	1900	1300	900	-
220.0	B	45	SPT220 / 2B_45	2	55.0	8	1700	1200	800	-
220.0	B	70	SPT220 / 2B_70	2	55.0	8	1300	900	600	-
330.0	B	35	SPT330 / 2B_35	2	82.5	8	1900	1300	900	-
330.0	B	45	SPT330 / 2B_45	2	82.5	8	1700	1200	800	-
330.0	B	70	SPT330 / 2B_70	2	82.5	8	1300	900	600	-
470.0	D	15	SPT470 / 2D_15	2.5	117.5	6	3900	2700	1800	-
470.0	D	25	SPT470 / 2D_25	2	117.5	6	3000	2100	1400	-
470.0	D	40	SPT470 / 2D_40	2	117.5	6	2400	1700	1100	-
470.0	D	50	SPT470 / 2D_50	2	117.5	6	2100	1500	900	-

4 V DC @ 85°C										
15.0	A	300	SPT15 / 4A_300	2.7	6.0	6	600	400	300	200
22.0	A	300	SPT22 / 4A_300	2.7	8.8	6	600	400	300	200
33.0	A	300	SPT33 / 4A_300	2.7	13.2	6	600	400	300	200
47.0	A	200	SPT47 / 4A_200	3.2	18.8	6	700	500	300	-
68.0	A	250	SPT68 / 4A_250	3.2	27.2	6	600	400	300	-
68.0	B	70	SPT68 / 4B_70	2.7	27.2	6	1300	900	600	300
100.0	A	200	SPT100 / 4A_200	3.2	40.0	6	700	500	300	-
100.0	B	40	SPT100 / 4B_40	2.7	40.0	8	1300	1300	600	300
150.0	B	70	SPT150 / 4B_70	3.2	60.0	6	1300	900	600	-
220.0	B	35	SPT220 / 4B_35	3.2	88.0	10	1900	1300	900	-
220.0	B	45	SPT220 / 4B_45	3.2	88.0	10	1700	1200	800	-
220.0	B	60	SPT220 / 4B_60	3.2	88.0	10	1400	1000	600	-
220.0	B	70	SPT220 / 4B_70	3.2	88.0	10	1300	900	600	-
220.0	D	15	SPT220 / 4D_15	4	88.0	6	3900	2700	1800	-
220.0	D	25	SPT220 / 4D_25	4	88.0	6	3000	2100	1400	-
220.0	D	40	SPT220 / 4D_40	4	88.0	6	2400	1700	1100	-
330.0	D	25	SPT330 / 4D_25	3.2	132.0	6	3000	2100	1400	-
330.0	D	40	SPT330 / 4D_40	3.2	132.0	6	2400	1700	1100	-
330.0	D	50	SPT330 / 4D_50	3.2	132.0	6	2100	1500	900	-
470.0	D	15	SPT470 / 4D_15	4	188.0	6	3900	2700	1800	-
470.0	D	25	SPT470 / 4D_25	3.2	188.0	6	3000	2100	1400	-
470.0	D	40	SPT470 / 4D_40	4	188.0	6	2400	1700	1100	-
470.0	D	50	SPT470 / 4D_50	4	188.0	6	2100	1500	900	-

6.3 V DC @ 85°C										
10.0	A	300	SPT10 / 6A_300	4	6.0	6	600	400	300	200
15.0	A	300	SPT15 / 6A_300	4	9.0	6	600	400	300	200
22.0	A	300	SPT22 / 6A_300	4	13.2	6	600	400	300	200
33.0	A	200	SPT33 / 6A_200	5	19.8	6	700	500	300	-
33.0	B	70	SPT33 / 6B_70	4	19.8	6	1300	900	600	300
33.0	B	200	SPT33 / 6B_200	4	19.8	6	800	600	400	200
47.0	A	200	SPT47 / 6A_300	5	28.2	6	700	500	300	-
47.0	B	70	SPT47 / 6B_70	4	28.2	6	1300	900	600	300
68.0	B	55	SPT68 / 6B_55	4	40.8	8	1500	1100	700	400
68.0	B	70	SPT68 / 6B_70	4	40.8	8	1300	900	600	300
68.0	C	100	SPT68 / 6C_100	4	40.8	6	1300	900	600	300
100.0	A	100	SPT100 / 6A_100	6.3	60.0	10	1000	700	-	-
100.0	B	45	SPT100 / 6B_45	5	60.0	10	1700	1200	800	-
100.0	B	69	SPT100 / 6B_69	5	60.0	10	1300	900	600	-
100.0	B	70	SPT100 / 6B_70	5	60.0	10	1300	900	600	-
150.0	B	35	SPT150 / 6B_35	5	90.0	10	1900	1300	900	-
150.0	B	45	SPT150 / 6B_45	5	90.0	10	1700	1200	800	-
150.0	B	69	SPT150 / 6B_69	5	90.0	10	1300	900	600	-
150.0	B	70	SPT150 / 6B_70	5	90.0	10	1300	900	600	-
150.0	D	15	SPT150 / 6D_15	6.3	90.0	6	3900	2700	1800	-
150.0	D	25	SPT150 / 6D_25	6.3	90.0	6	3000	2100	1400	-
150.0	D	40	SPT150 / 6D_40	6.3	90.0	6	2400	1700	1100	-
220.0	B	70	SPT220 / 6B_70	6.3	132.0	10	1300	900	600	-
220.0	B	200	SPT220 / 6B_200	6.3	132.0	10	800	600	400	-
220.0	D	25	SPT220 / 6D_25	6.3	132.0	6	3000	2100	1400	-
220.0	D	35	SPT220 / 6D_35	6.3	132.0	6	2500	1800	1100	-
220.0	D	40	SPT220 / 6D_40	6.3	132.0	6	2400	1700	1100	-
220.0	D	50	SPT220 / 6D_50	6.3	132.0	6	2100	1500	900	-
330.0	D	25	SPT330 / 6D_25	6.3	198.0	6	3000	2100	1400	-
330.0	D	40	SPT330 / 6D_40	6.3	198.0	6	2400	1700	1100	-
330.0	D	50	SPT330 / 6D_50	6.3	198.0	6	2100	1500	900	-

_ Insert tolerance M(±20%) to complete the Nemco part number
 NEMCO reserves the right to supply a higher voltage rating, tighter tolerance and/or lower ESR in the same case size, to the same reliability standards.

RATINGS AND PART NUMBER REFERENCE

10 V DC @ 85°C											
Capacitance (µF)	Case Size	ESR @ 100kHz max. (mΩ)	Nemco Part No.	Category Voltage	DCL (µA) max	tan δ max. (%)	Max. Ripple Current @100kHz mA (milliamps)				
							25°C	85°C	105°C	125°C	
10.0	A	300	SPT10 / 10A_300	7	10.0	6	600	400	300	-	
15.0	A	200	SPT15 / 10A_200	7	15.0	6	700	500	300	200	
22.0	B	300	SPT22 / 10B_300	7	22.0	6	600	400	300	200	
33.0	B	70	SPT33 / 10B_70	7	33.0	6	1300	900	600	300	
33.0	B	200	SPT33 / 10B_200	7	33.0	6	800	600	400	200	
33.0	C	100	SPT33 / 10C_100	7	33.0	6	1300	900	600	300	
47.0	B	70	SPT47 / 10B_70	8	47.0	6	1300	900	600	-	
47.0	C	100	SPT47 / 10C_100	7	47.0	6	1300	900	600	300	
68.0	D	45	SPT68 / 10D_45	8	68.0	6	2200	1500	1000	-	
68.0	D	55	SPT68 / 10D_55	8	68.0	6	2000	1400	900	-	
100.0	D	45	SPT100 / 10D_45	8	100.0	6	2200	1500	1000	-	
100.0	D	55	SPT100 / 10D_55	8	100.0	6	2000	1400	900	-	
150.0	D	25	SPT150 / 10D_25	8	150.0	6	3000	2100	1400	-	
150.0	D	40	SPT150 / 10D_40	8	150.0	6	2400	1700	1100	-	
150.0	D	45	SPT150 / 10D_45	8	150.0	6	2200	1500	1000	-	
150.0	D	55	SPT150 / 10D_55	8	150.0	6	2000	1400	900	-	
220.0	D	25	SPT220 / 10D_25	8	220.0	6	3000	2100	1400	-	
220.0	D	40	SPT220 / 10D_40	8	220.0	6	2400	1700	1100	-	
220.0	D	50	SPT220 / 10D_50	8	220.0	6	2100	1500	900	-	

16 V DC @ 85°C											
6.8	A	200	SPT6.8 / 16A_200	10	10.9	6	700	500	300	200	
10.0	A	200	SPT10 / 16A_200	10	16.0	6	700	500	300	200	
10.0	B	200	SPT10 / 16B_200	10	16.0	6	800	600	400	200	
15.0	B	150	SPT15 / 16B_150	10	24.0	6	900	600	400	200	
22.0	B	150	SPT22 / 16B_150	10	35.2	6	900	600	400	200	
68.0	D	50	SPT68 / 16D_50	16	108.8	6	2100	1500	900	-	
100.0	D	50	SPT100 / 16D_50	16	160.0	6	2100	1500	900	-	
100.0	H	40	SPT100 / 16H_40	16	160.0	6	2500	1800	1100	-	
150.0	H	40	SPT150 / 16H_40	16	240	6	2500	1800	1100	-	

20 V DC @ 85°C											
47.0	D	55	SPT47 / 20D_55	20	94.0	6	2000	1400	900	-	
68.0	D	55	SPT68 / 20D_55	20	136.0	6	2000	1400	900	-	
68.0	H	45	SPT68 / 20H_45	20	136.0	6	2400	1700	1100	-	
100.0	D	55	SPT100 / 20D_55	20	200.0	6	2000	1400	900	-	
100.0	H	45	SPT100 / 20H_45	20	200.0	6	2400	1700	1100	-	

25 V DC @ 85°C											
4.7	B	150	SPT4.7 / 25B_150	20	11.8	6	900	600	400	-	
6.8	B	90	SPT6.8 / 25B_90	25	17.0	6	1200	800	500	-	
6.8	B	150	SPT6.8 / 25B_150	20	17	6	900	600	400	-	
10.0	B	100	SPT10 / 25B_100	20	25.0	6	1100	800	500	-	
10.0	B	150	SPT10 / 25B_150	25	25.0	6	900	600	400	-	
15.0	B	150	SPT15 / 25B_150	25	37.5	6	900	600	400	-	
22.0	C	100	SPT22 / 25C_100	20	55.0	6	1300	900	600	-	
22.0	D	60	SPT22 / 25D_60	20	55.0	6	1900	1300	900	-	
22.0	D	100	SPT22 / 25D_100	25	55.0	6	1500	1100	700	-	
33.0	D	60	SPT33 / 25D_60	25	82.5	6	1900	1300	900	-	
33.0	D	100	SPT33 / 25D_100	25	82.5	6	1500	1100	700	-	
47.0	D	100	SPT47 / 25D_100	20	117.5	6	1500	1100	700	-	
68.0	D	70	SPT68 / 25D_70	25	170.0	6	1800	1300	800	-	
68.0	H	50	SPT68 / 25H_50	20	170.0	6	2200	1500	1000	-	
100.0	D	55	SPT100 / 25D_55	25	250.0	6	2000	1400	900	-	
100.0	D	70	SPT100 / 25D_70	25	250.0	6	1800	1300	800	-	
100.0	H	80	SPT100 / 25H_80	25	250.0	6	1800	1300	800	-	

Insert tolerance M(±20%) to complete the Nemco part number
NEMCO reserves the right to supply a higher voltage rating, tighter tolerance and/or lower ESR in the same case size, to the same reliability standards.

RATINGS AND PART NUMBER REFERENCE

35 V DC @ 85°C										
Capacitance (µF)	Case Size	ESR @ 100kHz max. (mΩ)	Nemco Part No.	Category Voltage	DCL (µA) max	tan δ max. (%)	Max. Ripple Current @100kHz mA (milliamps)			
							25°C	85°C	105°C	125°C
1.5	B	200	SPT1.5 / 35B_200	35	5.3	6	800	600	400	-
2.2	B	200	SPT2.2 / 35B_200	28	7.7	6	800	600	400	-
3.3	B	200	SPT3.3 / 35B_200	28	11.6	6	800	600	400	-
4.7	B	200	SPT4.7 / 35B_200	28	16.5	6	800	600	400	-
4.7	C	200	SPT4.7 / 35C_200	28	16.5	6	900	600	400	-
6.8	C	200	SPT6.8 / 35C_200	28	23.8	6	900	600	400	-
10.0	B	200	SPT10 / 35B_200	28	35.0	6	800	600	400	-
10.0	C	200	SPT10 / 35C_200	28	35.0	6	900	600	400	-
15.0	C	200	SPT15 / 35C_200	28	52.5	6	900	600	400	-
15.0	D	70	SPT15 / 35D_70	28	52.5	6	1800	1300	800	-
15.0	D	100	SPT15 / 35D_100	28	52.5	6	1500	1100	700	-
22.0	D	70	SPT22 / 35D_70	35	77.0	6	1800	1300	800	-
22.0	D	100	SPT22 / 35D_100	35	77.0	6	1500	1100	700	-
33.0	D	70	SPT33 / 35D_70	28	115.5	6	1800	1300	800	-
33.0	D	100	SPT33 / 35D_100	28	115.5	6	1500	1100	700	-
33.0	H	55	SPT33 / 35H_55	28	115.5	6	2100	1500	900	-
33.0	H	70	SPT33 / 35H_70	28	115.5	6	1900	1300	900	-
47.0	H	55	SPT47 / 35H_55	28	164.5	6	2100	1500	900	-

50 V DC @ 85°C										
0.68	B	400	SPT.68 / 50B_400	40	3.4	6	600.0	400.0	300.0	-
1.0	B	300	SPT1.0 / 50B_300	40	5.0	6	600.0	400.0	300.0	-
1.5	B	300	SPT1.5 / 50B_300	40	7.5	6	600.0	400.0	300.0	-
1.5	C	300	SPT1.5 / 50C_300	40	7.5	6	800	600	400	-
2.2	C	300	SPT2.2 / 50C_300	40	11.0	6	800	600	400	-
3.3	C	200	SPT3.3 / 50C_200	40	16.5	8	900	600	400	-
4.7	C	200	SPT4.7 / 50C_200	40	23.5	8	900	600	400	-
6.8	C	200	SPT6.8 / 50C_200	40	34.0	8	900.0	600.0	400.0	-
6.8	D	120	SPT6.8 / 50D_120	40	34.0	10	1400.0	1000.0	600.0	-
10.0	D	120	SPT10 / 50D_120	40	50.0	10	1400.0	1000.0	600.0	-
10.0	H	70	SPT10 / 50H_70	40	50	6	1900	1300	900	-
10.0	H	100	SPT10 / 50H_100	40	50.0	6	1600	1100	700	-
15.0	H	70	SPT15 / 50H_70	40	75.0	6	1900	1300	900	-
15.0	H	100	SPT15 / 50H_100	40	75.0	6	1600	1100	700	-

63 V DC @ 85°C										
0.47	B	400	SPT.47 / 63B_400	50	3.0	8	600.0	400.0	300.0	-
0.68	B	300	SPT.68 / 63B_400	50	4.3	8	600.0	400.0	300.0	-
1.0	B	300	SPT1 / 63B_300	50	6.3	8	600.0	400.0	300.0	-
1.0	C	300	SPT1 / 63C_300	50	6.3	6	800	600	400	-
1.5	C	300	SPT1.5 / 63C_300	50	9.5	6	800	600	400	-
2.2	C	200	SPT2.2 / 63C_200	50	13.9	6	900	600	400	-
3.3	C	200	SPT3.3 / 63C_200	50	20.8	6	900	600	400	-
4.7	C	200	SPT4.7 / 63C_200	50	29.61	6	900	600	400	-
4.7	D	120	SPT4.7 / 63D_120	50	29.61	6	1400	1000	600	-
6.8	D	120	SPT6.8 / 63D_120	50	42.84	6	1400	1000	600	-
6.8	H	100	SPT6.8 / 63H_100	50	42.84	6	1600	1100	700	-
10	H	100	SPT10 / 63H_100	50	63	6	1600	1100	700	-
10	H	150	SPT10 / 63H_150	50	63	6	1300	900	600	-

75 V DC @ 85°C										
4.7	D	150	SPT4.7 / 75D_150	60	35.25	6	1200	800	500	-
6.8	D	120	SPT6.8 / 75D_120	60	51	6	1400	1000	600	-

100 V DC @ 85°C										
4.7	D	250	SPT4.7 / 100D_250	80	47	8	900	600	400	-

125 V DC @ 85°C										
3.3	D	250	SPT3.3 / 125D_250	100	41.25	8	900	600	400	-

PACKAGING REFERENCE

CASE SIZE	CASE SIZE	STANDARD PACKAGING	AVAILABLE
NEMCO	EIA IECQ	7" Reel Quantity	13" Reel Quantity
A	3216-18	2000	8000
B	3528-21	2000	8000
C	6032-28	500	3000
D	7343-31	500	2500
H	7343-43	400	1500

Insert tolerance M(±20%) to complete the Nemco part number
 NEMCO reserves the right to supply a higher voltage rating, tighter tolerance and/or lower ESR in the same case size, to the same reliability standards.