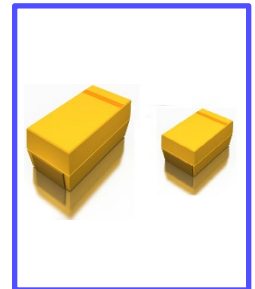




**THE DATASHEET OF  
PCT33/10BK**



FEATURES	
<ul style="list-style-type: none"> <li>- Surface Mount (SMT) Tantalum Capacitors</li> <li>- Meets or Exceeds EIA 535 BAAC and IECQ standards (QC300801/US001, IS-28)</li> <li>- Capacitance range: 0.1µF to 1500µF</li> <li>- Voltage range: 4 to 50 WVDC</li> <li>- Down sized, extended range values</li> <li>- Low profile sizes: XL, AL, BL, CL, DL</li> <li>- Surge tested for maximum robustness</li> <li>- Operating Temperature range -55°C to +125°C</li> </ul>	<ul style="list-style-type: none"> <li>- Precision molded case with flat surfaces for vacuum pick-up</li> <li>- Laser marking and bold videcon – readable polarity</li> <li>- Compliant terminations</li> <li>- Glue pad on underside for bonding to circuit board prior to soldering</li> <li>- Encapsulant material satisfies the UL 94 V0 flammability classification</li> <li>- MSL (moisture sensitivity level) per IPC/Jedec J-STD-020B is level 1</li> </ul>



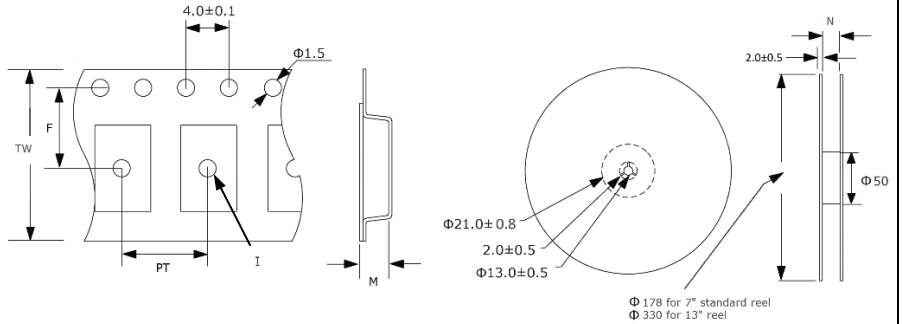
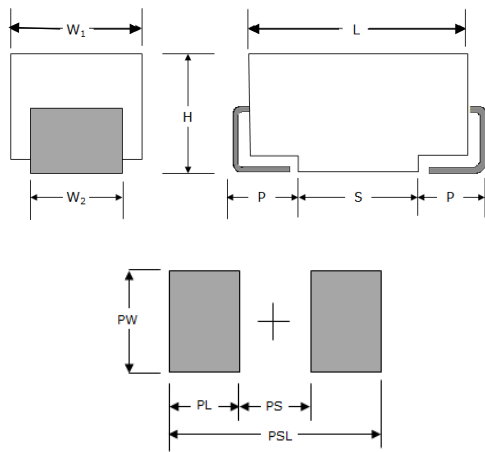
PART NUMBERING GUIDE	
<p><b>SERIES TYPE</b> → PCT 10 / 35 D K (optional) ←</p> <p><b>CAPACITANCE</b> in microfarads (µF) Ex. 0.68µF would be .68</p> <p><b>VOLTAGE</b> 4 6(6.3) 10 16 20 25 35 50</p>	<p><b>OPTIONAL</b> -13 = 13 inch diameter Tape &amp; Reel &lt;blank&gt; = 7 inch standard Tape &amp; Reel TL = Tin/Lead</p> <p><b>TOLERANCE</b> M = (±20%) K = (±10%)</p> <p><b>CASE SIZE</b> A (3216-18) B (3528-21) C (6032-28) D (7343-31) H (7343-43) Z (7361-38) XL (2012-12) Low Profile AL (3216-12) Low Profile BL (3528-12) Low Profile CL (6032-15) Low Profile DL (7343-20) Low Profile</p>

ELECTRICAL SPECIFICATION	
Technical Data:	All technical data relate to an ambient temperature of +25°C
Capacitance Range	0.10µF to 1500µF
Capacitance Tolerance	±10% (K); ±20% (M)
Rated Voltage DC (V <sub>R</sub> )	≤+85°C
Category Voltage DC (V <sub>C</sub> )	≤+125°C
Surge Voltage (V <sub>S</sub> )	≤+85°C
Surge Voltage (V <sub>S</sub> )	≤+125°C
Temperature Range	-55°C to +125°C with 2/3 V <sub>r</sub> (linear derating) required for operation above +85°C
Reliability	Level M (1% per 1000 hours at rated voltage (V <sub>R</sub> ), rated temperature (85°C) and 0.1Ω/volt circuit impedance.
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 1 of IPC/Jedec J-STD-020B

CASE SIZE CROSS REFERENCE: CAPACITANCE AND VOLTAGE RATING (Rated Voltage DC@ 85°C)								
Cap (µF)	4V	6.3V	10V	16V	20V	25V	35V	50V
0.10	A, AL, XL	A, AL, XL	A, AL, XL	A, AL, XL	A, AL, XL	A, AL, XL	A, AL, XL	A, AL
0.15	A, AL, B, XL	A, AL, B, XL	A, AL, B, XL	A, AL, B, XL	A, AL, B, XL	A, AL, B, XL	A, AL, B, XL	A, AL, B
0.22	A, AL, B, XL	A, AL, B, XL	A, AL, B, XL	A, AL, B, XL	A, AL, B, XL	A, AL, B, XL	A, AL, B, XL	A, AL, B
0.33	A, AL, BL, XL	A, AL, BL, XL	A, AL, BL, XL	A, AL, BL, XL	A, AL, BL, XL	A, AL, BL, XL	A, AL, BL, XL	AL, BL
0.47	A, AL, B, BL, C XL	A, AL, B, BL, C XL	A, AL, B, BL, C XL	A, AL, B, BL, C XL	A, AL, B, BL, C XL	A, AL, B, BL, C XL	A, AL, B, BL, C XL	A, AL, B, BL, C
0.68	A, AL, B, BL, C	A, AL, B, BL, C	A, AL, B, BL, C	A, AL, B, BL, C	A, AL, B, BL, C	A, AL, B, BL, C	A, AL, B, BL, C	A, B, C
1.0	A, AL, B, BL, C, CL, XL	A, AL, B, BL, C, CL, XL	A, AL, B, BL, C, CL, XL	A, AL, B, BL, C, CL, XL	A, AL, B, BL, C, CL, XL	A, AL, B, BL, C, CL, XL	A, AL, B, BL, C, CL	A, B, C, CL
1.5	A, AL, B, BL, C, D, XL	A, AL, B, BL, C, D, XL	A, AL, B, BL, C, D, XL	A, AL, B, BL, C, D, XL	A, AL, B, BL, C, D, XL	A, AL, B, BL, C, D	A, B, BL, C, D	B, C, D
2.2	A, AL, B, BL, C, D, XL	A, AL, B, BL, C, D, XL	A, AL, B, BL, C, D, XL	A, AL, B, BL, C, D, XL	A, AL, B, BL, C, D, XL	A, B, BL, C, D	A, B, BL, C, D	B, C, D
3.3	A, AL, B, BL, C, CL, D, DL, XL	A, AL, B, BL, C, CL, D, DL, XL	A, AL, B, BL, C, CL, D, DL, XL	A, AL, B, BL, C, CL, D, DL, XL	A, B, BL, C, CL, D, DL	A, B, BL, C, CL, D, DL	B, C, D, DL	C, D, DL
4.7	A, AL, B, BL, C, CL, D, DL, H, XL	A, AL, B, BL, C, CL, D, DL, H, XL	A, AL, B, BL, C, CL, D, DL, H, XL	A, AL, B, BL, C, CL, D, DL, H, XL	A, B, BL, C, CL, D, DL, H	A, B, BL, C, CL, D, DL, H	C, D, DL, H	C, D, DL
6.8	A, AL, B, BL, C, D, DL, XL	A, AL, B, BL, C, D, DL, XL	A, AL, B, BL, C, D, DL, XL	A, AL, B, BL, C, D, DL, XL	A, B, BL, C, D, DL	A, B, BL, C, D, DL	B, C, D, DL	C, D, DL
10.0	A, AL, B, BL, C, CL, D, DL, H, XL	A, AL, B, BL, C, CL, D, DL, H, XL	A, AL, B, BL, C, CL, D, DL, H, XL	A, B, BL, C, CL, D, DL, H	B, C, CL, D, DL, H	B, C, CL, D, DL, H	C, D, DL, H	D, H
15.0	A, AL, B, BL, C, CL, D, DL, H, XL	A, AL, B, BL, C, CL, D, DL, H, XL	A, AL, B, BL, C, CL, D, DL, H, XL	A, B, BL, C, CL, D, DL, H	B, C, CL, D, DL, H	C, D, DL, H	C, D, DL, H	D, H
22.0	A, AL, B, BL, C, CL, D, DL, H, Z, XL	A, AL, B, BL, C, CL, D, DL, H, Z, XL	A, B, BL, C, CL, D, DL, H, Z	B, C, CL, D, DL, H, Z	B, C, CL, D, DL, H, Z	C, D, DL, H, Z	D, DL, H, Z	Z
33.0	A, AL, BL, C, CL, D, DL, H, Z	A, B, BL, C, CL, D, DL, H, Z	A, B, C, CL, D, DL, H, Z	B, C, CL, D, DL, H, Z	C, D, DL, H, Z	D, H, Z	D, H, Z	
47.0	A, B, BL, C, CL, D, DL, H, Z	A, B, BL, C, CL, D, DL, H, Z	B, C, CL, D, DL, H, Z	C, CL, D, DL, H, Z	C, D, DL, H, Z	D, DL, H, Z	H, Z	
68.0	A, B, BL, C, CL, D, DL, H, Z	B, C, CL, D, DL, H, Z	B, C, D, DL, H, Z	C, D, DL, H, Z	C, D, DL, H, Z	H, Z	Z	
100.0	A, B, BL, C, CL, D, DL, H, Z	B, C, CL, D, DL, H, Z	B, C, CL, D, DL, H, Z	C, D, DL, H, Z	D, H, Z	H, Z		
150.0	B, C, CL, D, DL, H, Z	B, C, CL, D, DL, H, Z	C, D, DL, H, Z	D, DL, H, Z	H, Z	Z		
220.0	B, C, CL, D, DL, H	C, D, DL, H	C, D, DL, H	H				
330.0	C, D, DL, H, J	C, D, DL, H, J	D, H, J	J				
470.0	C, D, DL, H	D, DL, H	H					
680.0	D, DL, H	H						
1000.0	D, H, Z	H, Z						
1500.0	H							

**OUTLINE DRAWING AND PAD PRINT**

**TAPE AND REEL DIMENSION**

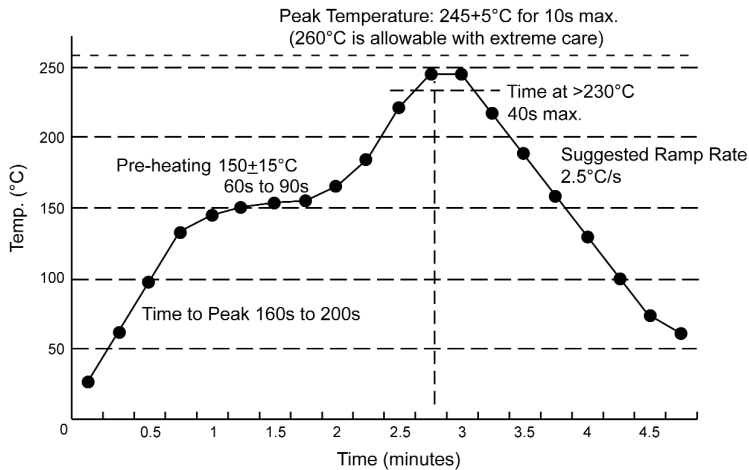


(3) 0805 Footprint Compatible  
(4) 1206 Footprint Compatible  
NOTE: Dimensions in millimeters

NEMCO Size	EIA Size	L ±0.2	W1 ±0.2	H ±0.3	W2 ±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	2.5	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	2.8	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
Z	7361-38	7.3	6.1	3.45	3.1	1.4	4.40	8.0	2.0	4.0	3.7	12	8	4.8	1.5	13	5.5
XL(3)	2012-12	2.05	1.3	1.2	1.2	0.5	0.85	2.7	1.0	0.8	1.6	8	4	1.9	1.0	9.5	3.5
AL(4)	3216-12	3.2	1.6	1.2	1.2	0.8	1.10	3.8	1.4	1.0	1.8	8	4	1.9	1.0	9.5	3.5
BL	3528-12	3.5	2.8	1.2	2.2	0.8	1.40	4.0	1.4	1.2	2.8	8	4	1.9	1.0	9.5	3.5
CL	6032-15	6.0	3.2	1.5	2.2	1.3	2.90	6.5	2.0	2.5	2.8	8	4	1.9	1.0	9.5	3.5
DL	7343-20	7.3	4.3	2.0	2.4	1.3	4.40	8.0	2.0	4.0	3.0	8	4	1.7	1.0	9.5	3.5

**REFLOW PROFILE**

**MARKING**

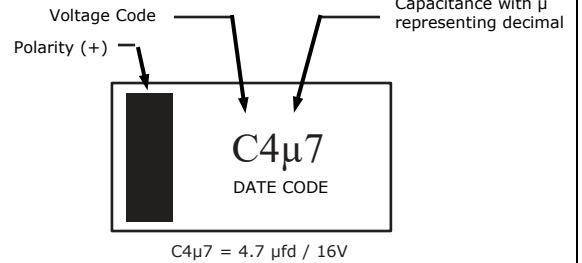


Tantalum capacitors are lead-free system compatible system components, meeting the requirements of J-STD-020 standard. Maximum peak temperature 260°C for 10 seconds maximum, 3 reflow cycles.

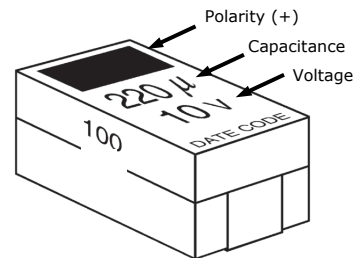
There are several important general soldering considerations for tantalum capacitors.

- 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.

**Case Sizes: XL, A, AL, B, BL**



**Case Sizes: C, CL, D, DL, H, Z**



NEMCO reserves the right to supply a higher voltage rating,

Voltage VDC	4V	6.3V	10V	16V	20V	25V	35V	50V
Voltage Code	G	J	A	C	D	E	V	T

tighter tolerance and/or lower ESR in the same case size, to the same reliability standards.

**RATINGS AND PART NUMBER REFERENCE**

4 V DC @ 85°C (2.7 V DC @ 125°C)						
Capacitance (µF)	Case Size	Nemco Part No.	DCL (µA) max	tan δ max. (%)	ESR @ 100kHz max. (Ω)	
2.2	AL	PCT2.2 / 4AL	0.5	6	25.0	
2.2	XL	PCT2.2 / 4XL	0.5	6	25.0	
3.3	AL	PCT3.3 / 4AL	0.5	6	18.0	
3.3	XL	PCT3.3 / 4XL	0.5	6	20.0	
4.7	AL	PCT4.7 / 4AL	0.5	6	10.0	
4.7	XL	PCT4.7 / 4XL	0.5	6	12.0	
6.8	AL	PCT6.8 / 4AL	0.5	6	8.0	
6.8	BL	PCT6.8 / 4BL	0.5	6	6.0	
6.8	XL	PCT6.8 / 4XL	0.5	6	5.2	
10.0	AL	PCT10 / 4AL	0.5	6	6.0	
10.0	BL	PCT10 / 4BL	0.6	6	5.0	
10.0	XL	PCT10 / 4XL	0.5	6	7.0	
15.0	AL	PCT15 / 4AL	0.6	8	4.0	
15.0	BL	PCT15 / 4BL	0.6	6	2.0	
15.0	XL	PCT15 / 4XL	0.6	8	4.0	
22.0	AL	PCT22 / 4AL	0.9	8	3.5	
22.0	BL	PCT22 / 4BL	0.9	6	1.9	
22.0	XL	PCT22 / 4XL	0.9	8	3.8	
33.0	A	PCT33 / 4A	1.3	6	3.0	
33.0	AL	PCT33 / 4AL	1.3	8	1.7	
33.0	BL	PCT33 / 4BL	1.3	6	1.7	
33.0	CL	PCT33 / 4CL	1.3	6	0.6	
47.0	A	PCT47 / 4A	1.9	8	2.6	
47.0	BL	PCT47 / 4BL	1.9	10	2.0	
47.0	CL	PCT47 / 4CL	1.9	6	0.5	
68.0	A	PCT68 / 4A	2.7	10	1.5	
68.0	B	PCT68 / 4B	2.7	6	1.8	
68.0	BL	PCT68 / 4BL	2.7	15	1.5	
68.0	CL	PCT68 / 4CL	2.7	6	0.4	
100.0	A	PCT100 / 4A	4.0	30	1.4	
100.0	B	PCT100 / 4B	4.0	8	0.9	
100.0	BL	PCT100 / 4BL	4.0	14	1.4	
100.0	CL	PCT100 / 4CL	4.0	6	1.3	
150.0	B	PCT150 / 4B	6.0	10	1.5	
150.0	C	PCT150 / 4C	6.0	6	0.3	
150.0	CL	PCT150 / 4CL	6.0	6	1.3	
150.0	DL	PCT150 / 4DL	6.0	6	0.4	
220.0	B	PCT220 / 4B	8.8	12	1.1	
220.0	C	PCT220 / 4C	8.8	8	1.2	
220.0	CL	PCT220 / 4CL	8.8	8	1.2	
220.0	D	PCT220 / 4D	8.8	8	0.9	
220.0	DL	PCT220 / 4DL	8.8	8	0.3	
330.0	C	PCT330 / 4C	13.2	8	0.3	
330.0	D	PCT330 / 4D	13.2	8	0.9	
330.0	DL	PCT330 / 4DL	13.2	12	0.4	
470.0	C	PCT470 / 4C	18.8	14	0.3	
470.0	D	PCT470 / 4D	18.8	12	0.9	
470.0	DL	PCT470 / 4DL	18.8	14	0.9	
470.0	H	PCT470 / 4H	18.8	10	0.5	
680.0	D	PCT680 / 4D	27.2	14	0.5	
680.0	DL	PCT680 / 4DL	27.2	25	0.2	
680.0	H	PCT680 / 4H	27.2	14	0.9	
1000.0	D	PCT1000 / 4D	40.0	60	0.2	
1000.0	H	PCT1000 / 4H	40.0	14	0.4	
1500.0	H	PCT1500 / 4H	60.0	30	0.2	

6.3 V DC @ 85°C (4 V DC @ 125°C)						
Capacitance (µF)	Case Size	Nemco Part No.	DCL (µA) max	tan δ max. (%)	ESR @ 100kHz max. (Ω)	
1.5	AL	PCT1.5 / 6AL	0.5	6	25.0	
1.5	XL	PCT1.5 / 6XL	0.5	6	25.0	
2.2	AL	PCT2.2 / 6AL	0.5	6	18.0	
2.2	XL	PCT2.2 / 6XL	0.5	6	20.0	
3.3	AL	PCT3.3 / 6AL	0.5	6	9.0	
3.3	XL	PCT3.3 / 6XL	0.5	6	12.0	
4.7	AL	PCT4.7 / 6AL	0.5	6	7.5	
4.7	BL	PCT4.7 / 6BL	0.5	6	6.0	
4.7	XL	PCT4.7 / 6XL	0.5	6	7.0	
6.8	AL	PCT6.8 / 6AL	0.5	6	2.6	
6.8	BL	PCT6.8 / 6BL	0.5	6	5.0	
6.8	XL	PCT6.8 / 6XL	0.5	8	7.0	
10.0	A	PCT10 / 6A	0.6	6	4.0	
10.0	AL	PCT10 / 6AL	0.6	8	4.0	
10.0	BL	PCT10 / 6BL	0.6	6	4.0	
10.0	XL	PCT10 / 6XL	0.6	8	6.0	
15.0	A	PCT15 / 6A	0.9	6	3.5	
15.0	AL	PCT15 / 6AL	0.9	8	4.0	
15.0	B	PCT15 / 6B	1.0	6	2.5	
15.0	BL	PCT15 / 6BL	1.0	6	3.5	
15.0	XL	PCT15 / 6XL	0.9	8	4.1	
22.0	A	PCT22 / 6A	1.4	6	3.0	
22.0	AL	PCT22 / 6AL	1.3	10	1.8	
22.0	B	PCT22 / 6B	1.4	6	2.5	
22.0	BL	PCT22 / 6BL	1.4	8	2.5	
22.0	CL	PCT22 / 6CL	1.3	6	0.6	
33.0	A	PCT33 / 6A	2.1	8	3.2	
33.0	B	PCT33 / 6B	2.1	6	2.2	
33.0	BL	PCT33 / 6BL	2.1	10	2.5	
33.0	C	PCT33 / 6C	2.1	6	1.8	
33.0	CL	PCT33 / 6CL	2.1	6	1.8	
47.0	A	PCT47 / 6A	2.8	10	1.6	
47.0	B	PCT47 / 6B	3.0	6	2.0	
47.0	BL	PCT47 / 6BL	2.8	10	1.6	
47.0	C	PCT47 / 6C	3.0	6	1.6	
47.0	CL	PCT47 / 6CL	3.0	6	1.5	
68.0	B	PCT68 / 6B	4.0	8	0.9	
68.0	C	PCT68 / 6C	4.3	6	1.5	
68.0	CL	PCT68 / 6CL	4.3	6	1.5	
68.0	D	PCT68 / 6D	4.3	6	0.9	
100.0	B	PCT100 / 6B	6.3	10	1.7	
100.0	C	PCT100 / 6C	6.3	6	0.9	
100.0	CL	PCT100 / 6CL	6.3	6	0.9	
100.0	D	PCT100 / 6D	6.3	6	0.9	
100.0	DL	PCT100 / 6DL	6.3	6	0.9	
150.0	B	PCT150 / 6B	9.5	10	1.2	
150.0	C	PCT150 / 6C	9.5	6	1.3	
150.0	CL	PCT150 / 6CL	9.0	8	0.3	
150.0	D	PCT150 / 6D	9.5	6	0.9	
150.0	DL	PCT150 / 6DL	9.0	6	0.4	
220.0	C	PCT220 / 6C	13.9	8	1.2	
220.0	D	PCT220 / 6D	13.9	8	0.4	
220.0	DL	PCT220 / 6DL	13.9	10	0.9	
220.0	H	PCT220 / 6H	13.9	8	0.4	
330.0	C	PCT330 / 6C	19.8	12	0.5	
330.0	D	PCT330 / 6D	20.8	8	0.4	
330.0	DL	PCT330 / 6DL	20.8	8	0.4	
330.0	H	PCT330 / 6H	20.8	8	0.4	
470.0	D	PCT470 / 6D	28.0	12	0.4	
470.0	DL	PCT470 / 6DL	28.2	20	0.2	
470.0	H	PCT470 / 6H	28.0	10	0.4	
680.0	H	PCT680 / 6H	42.8	10	0.5	
1000.0	H	PCT1000 / 6H	60.0	20	0.2	
1000.0	Z	PCT1000 / 6Z	60.0	16	0.4	

\_ Insert tolerance M(±20%) or K(±10%) 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 (7 V DC @ 125°C)					
Capacitance (µF)	Case Size	Nemco Part No.	DCL (µA) max	tan δ max. (%)	ESR @ 100kHz max. (Ω)
1.0	AL	PCT1 / 10AL	0.5	4	25.0
1.0	XL	PCT1 / 10XL	0.5	4	25.0
1.5	AL	PCT1.5 / 10AL	0.5	6	20.0
1.5	XL	PCT1.5 / 10XL	0.5	6	20.0
2.2	A	PCT2.2 / 10A	0.5	6	7.0
2.2	AL	PCT2.2 / 10AL	0.5	6	12.0
2.2	XL	PCT2.2 / 10XL	0.5	6	15.0
3.3	AL	PCT3.3 / 10AL	0.5	6	8.0
3.3	BL	PCT3.3 / 10BL	0.5	6	6.0
3.3	XL	PCT3.3 / 10XL	0.5	6	8.0
4.7	A	PCT4.7 / 10A	0.5	6	5.0
4.7	AL	PCT4.7 / 10AL	0.5	6	5.0
4.7	BL	PCT4.7 / 10BL	0.5	6	5.0
4.7	XL	PCT4.7 / 10XL	0.5	6	9.0
6.8	A	PCT6.8 / 10A	0.7	6	4.0
6.8	AL	PCT6.8 / 10AL	0.7	6	4.0
6.8	B	PCT6.8 / 10B	0.7	6	3.0
6.8	BL	PCT6.8 / 10BL	0.7	6	4.0
6.8	XL	PCT6.8 / 10XL	0.7	6	5.2
10.0	A	PCT10 / 10A	1.0	6	3.0
10.0	AL	PCT10 / 10AL	1.0	8	4.0
10.0	B	PCT10 / 10B	1.0	6	2.5
10.0	BL	PCT10 / 10BL	1.0	6	3.0
10.0	XL	PCT10 / 10XL	1.0	20	6.0
15.0	A	PCT15 / 10A	1.5	6	3.2
15.0	AL	PCT15 / 10AL	1.5	6	2.0
15.0	B	PCT15 / 10B	1.5	6	2.8
15.0	BL	PCT15 / 10BL	1.5	8	2.8
15.0	CL	PCT15 / 10CL	1.5	6	0.7
22.0	A	PCT22 / 10A	2.2	8	3.0
22.0	B	PCT22 / 10B	2.2	6	2.4
22.0	BL	PCT22 / 10BL	2.2	8	2.2
22.0	C	PCT22 / 10C	2.2	6	1.8
22.0	CL	PCT22 / 10CL	2.2	6	0.6
33.0	A	PCT33 / 10A	3.3	8	1.7
33.0	B	PCT33 / 10B	3.3	6	1.8
33.0	C	PCT33 / 10C	3.3	6	1.6
33.0	CL	PCT33 / 10CL	3.3	6	1.6
47.0	B	PCT47 / 10B	4.7	8	1.0
47.0	C	PCT47 / 10C	4.7	6	1.2
47.0	CL	PCT47 / 10CL	4.7	6	1.4
47.0	D	PCT47 / 10D	4.7	6	0.9
47.0	DL	PCT47 / 10DL	4.7	6	0.5
68.0	B	PCT68 / 10B	6.8	6	1.4
68.0	C	PCT68 / 10C	6.8	6	1.3
68.0	D	PCT68 / 10D	6.8	6	0.9
100.0	B	PCT100 / 10B	10.0	8	1.4
100.0	C	PCT100 / 10C	10.0	8	1.2
100.0	CL	PCT100 / 10CL	10.0	6	0.4
100.0	D	PCT100 / 10D	10.0	6	0.9
100.0	DL	PCT100 / 10DL	10.0	6	0.9
150.0	C	PCT150 / 10C	15.0	8	0.9
150.0	D	PCT150 / 10D	15.0	8	0.9
150.0	DL	PCT150 / 10DL	15.0	6	1.2
150.0	H	PCT150 / 10H	15.0	8	0.9
220.0	C	PCT220 / 10C	22.0	8	0.5
220.0	D	PCT220 / 10D	22.0	8	0.5
220.0	DL	PCT220 / 10DL	22.0	10	0.5
220.0	H	PCT220 / 10H	22.0	8	0.5
330.0	D	PCT330 / 10D	33.0	8	0.9
330.0	H	PCT330 / 10H	33.0	8	0.9
470.0	H	PCT470 / 10H	47.0	10	0.5

16 V DC @ 85°C (10 V DC @ 125°C)					
Capacitance (µF)	Case Size	Nemco Part No.	DCL (µA) max	tan δ max. (%)	ESR @ 100kHz max. (Ω)
0.68	AL	PCT.68 / 16AL	0.5	4	25.0
0.68	XL	PCT.68 / 16XL	0.5	4	25.0
1.0	A	PCT1 / 16A	0.5	4	11.0
1.0	AL	PCT1 / 16AL	0.5	4	15.0
1.0	BL	PCT1 / 16BL	0.5	4	5.0
1.0	XL	PCT1 / 16XL	0.5	4	20.0
1.5	A	PCT1.5 / 16A	0.5	6	8.0
1.5	AL	PCT1.5 / 16AL	0.5	6	12.0
1.5	XL	PCT1.5 / 16XL	0.5	6	10.0
2.2	A	PCT2.2 / 16A	0.5	6	6.5
2.2	AL	PCT2.2 / 16AL	0.5	6	6.0
2.2	BL	PCT2.2 / 16BL	0.5	6	6.5
2.2	XL	PCT2.2 / 16XL	0.5	6	6.5
3.3	A	PCT3.3 / 16A	0.5	6	5.0
3.3	AL	PCT3.3 / 16AL	0.5	6	5.0
3.3	B	PCT3.3 / 16B	0.5	6	4.5
3.3	BL	PCT3.3 / 16BL	0.5	6	5.0
3.3	XL	PCT3.3 / 16XL	0.5	8	5.0
4.7	A	PCT4.7 / 16A	0.8	6	4.0
4.7	AL	PCT4.7 / 16AL	0.8	8	4.5
4.7	B	PCT4.7 / 16B	0.8	6	3.5
4.7	BL	PCT4.7 / 16BL	0.8	6	4.5
6.8	A	PCT6.8 / 16A	1.1	6	3.5
6.8	AL	PCT6.8 / 16AL	1.1	8	2.4
6.8	B	PCT6.8 / 16B	1.1	6	2.5
6.8	BL	PCT6.8 / 16BL	1.1	6	3.5
6.8	C	PCT6.8 / 16C	1.1	6	2.5
10.0	A	PCT10 / 16A	1.6	8	3.0
10.0	B	PCT10 / 16B	1.6	6	2.8
10.0	BL	PCT10 / 16BL	1.6	8	2.2
10.0	C	PCT10 / 16C	1.6	6	2.0
10.0	CL	PCT10 / 16CL	1.6	6	2.0
15.0	A	PCT15 / 16A	2.4	6	2.0
15.0	B	PCT15 / 16B	2.4	6	2.5
15.0	BL	PCT15 / 16BL	2.4	6	2.0
15.0	C	PCT15 / 16C	2.4	6	1.8
15.0	CL	PCT15 / 16CL	2.4	6	0.7
22.0	B	PCT22 / 16B	3.5	6	2.3
22.0	C	PCT22 / 16C	3.5	6	1.0
22.0	CL	PCT22 / 16CL	3.5	6	1.6
22.0	D	PCT22 / 16D	3.5	6	1.1
33.0	B	PCT33 / 16B	5.3	8	2.1
33.0	C	PCT33 / 16C	5.3	6	1.5
33.0	CL	PCT33 / 16CL	5.3	6	1.5
33.0	D	PCT33 / 16D	5.3	6	0.9
33.0	DL	PCT33 / 16DL	5.3	6	0.9
47.0	C	PCT47 / 16C	7.5	6	0.5
47.0	CL	PCT47 / 16CL	7.5	6	0.4
47.0	D	PCT47 / 16D	7.5	6	0.9
47.0	DL	PCT47 / 16DL	7.5	6	0.7
68.0	C	PCT68 / 16C	10.9	6	1.3
68.0	D	PCT68 / 16D	10.9	6	0.9
68.0	DL	PCT68 / 16DL	10.9	6	0.9
100.0	C	PCT100 / 16C	16.0	8	1.0
100.0	D	PCT100 / 16D	16.0	6	0.6
100.0	DL	PCT100 / 16DL	16.0	8	0.9
100.0	H	PCT100 / 16H	16.0	6	0.9
150.0	D	PCT150 / 16D	24.0	6	0.9
150.0	DL	PCT150 / 16DL	24.0	15	0.3
150.0	H	PCT150 / 16H	24.0	8	0.3
220.0	H	PCT220 / 16H	35.2	10	0.5
330.0	H	PCT330 / 16H	52.8	30	0.4

\_ Insert tolerance M(±20%) or K(±10%) 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**

20 V DC @ 85°C (13V DC @ 125°C)					
Capacitance (µF)	Case Size	Nemco Part No.	DCL (µA) max	tan δ max. (%)	ESR @ 100kHz max. (Ω)
0.10	AL	PCT.1 / 20AL _	0.5	4	25.0
0.10	XL	PCT.1 / 20XL _	0.5	4	25.0
0.15	AL	PCT.15 / 20AL _	0.5	4	25.0
0.15	XL	PCT.15 / 20XL _	0.5	4	25.0
0.22	AL	PCT.22 / 20AL _	0.5	4	25.0
0.22	XL	PCT.22 / 20XL _	0.5	4	25.0
0.33	AL	PCT.33 / 20AL _	0.5	4	25.0
0.33	XL	PCT.33 / 20XL _	0.5	4	25.0
0.47	AL	PCT.47 / 20AL _	0.5	4	25.0
0.47	XL	PCT.47 / 20XL _	0.5	4	25.0
0.68	AL	PCT.68 / 20AL _	0.5	4	25.0
0.68	BL	PCT.68 / 20BL _	0.5	4	15.0
0.68	XL	PCT.68 / 20XL _	0.5	4	20.0
1.0	A	PCT1 / 20A _	0.5	4	9.0
1.0	AL	PCT1 / 20AL _	0.5	4	12.0
1.0	BL	PCT1 / 20BL _	0.5	4	9.0
1.0	XL	PCT1 / 20XL _	0.5	4	20.0
1.5	A	PCT1.5 / 20A _	0.5	6	6.5
1.5	AL	PCT1.5 / 20AL _	0.5	6	5.4
1.5	BL	PCT1.5 / 20BL _	0.5	6	6.5
1.5	XL	PCT1.5 / 20XL _	0.5	6	9.6
2.2	A	PCT2.2 / 20A _	0.5	6	5.3
2.2	AL	PCT2.2 / 20AL _	0.5	6	4.5
2.2	B	PCT2.2 / 20B _	0.5	6	3.5
2.2	BL	PCT2.2 / 20BL _	0.5	6	6.0
2.2	XL	PCT2.2 / 20XL _	0.5	6	6.0
3.3	A	PCT3.3 / 20A _	0.7	6	4.5
3.3	B	PCT3.3 / 20B _	0.7	6	3.0
3.3	BL	PCT3.3 / 20BL _	0.7	6	3.0
4.7	A	PCT4.7 / 20A _	0.9	6	4.0
4.7	B	PCT4.7 / 20B _	0.9	6	3.0
4.7	BL	PCT4.7 / 20BL _	0.9	6	3.0
6.8	A	PCT6.8 / 20A _	1.4	6	2.4
6.8	B	PCT6.8 / 20B _	1.4	6	2.5
6.8	BL	PCT6.8 / 20BL _	1.4	6	2.6
6.8	C	PCT6.8 / 20C _	1.4	6	2.0
10.0	B	PCT10 / 20B _	2.0	6	2.1
10.0	C	PCT10 / 20C _	2.0	6	2.2
10.0	CL	PCT10 / 20CL _	2.0	6	1.9
15.0	B	PCT15 / 20B _	3.0	6	2.0
15.0	C	PCT15 / 20C _	3.0	6	1.7
15.0	CL	PCT15 / 20CL _	3.0	6	1.7
22.0	B	PCT22 / 20B _	4.4	6	1.8
22.0	C	PCT22 / 20C _	4.4	6	1.6
22.0	CL	PCT22 / 20CL _	4.4	6	1.6
22.0	D	PCT22 / 20D _	4.4	6	0.9
22.0	DL	PCT22 / 20DL _	4.4	6	0.9
33.0	C	PCT33 / 20C _	6.6	6	1.5
33.0	D	PCT33 / 20D _	6.6	6	0.9
33.0	DL	PCT33 / 20DL _	6.6	6	0.6
47.0	C	PCT47 / 20C _	9.4	6	0.5
47.0	D	PCT47 / 20D _	9.4	6	0.9
47.0	DL	PCT47 / 20DL _	9.4	6	0.9
47.0	H	PCT47 / 20H _	9.4	6	0.9
68.0	C	PCT68 / 20C _	13.6	8	0.5
68.0	D	PCT68 / 20D _	13.6	6	0.4
68.0	DL	PCT68 / 20DL _	13.6	6	0.9
68.0	H	PCT68 / 20H _	13.6	6	0.9
100.0	D	PCT100 / 20D _	20.0	6	0.5
100.0	H	PCT100 / 20H _	20.0	6	0.4
150.0	H	PCT150 / 20H _	30.0	8	0.3

25 V DC @ 85°C (17 V DC @ 125°C)					
Capacitance (µF)	Case Size	Nemco Part No.	DCL (µA) max	tan δ max. (%)	ESR @ 100kHz max. (Ω)
0.15	XL	PCT.15 / 25XL _	0.5	4	24.0
0.22	XL	PCT.22 / 25XL _	0.5	4	21.0
0.33	XL	PCT.33 / 25XL _	0.5	4	17.0
0.47	AL	PCT.47 / 25AL _	0.5	4	14.0
0.47	XL	PCT.47 / 25XL _	0.5	4	15.0
0.68	AL	PCT.68 / 25AL _	0.5	4	10.0
0.68	XL	PCT.68 / 25XL _	0.5	4	13.0
1.0	A	PCT1 / 25A _	0.5	4	8.0
1.0	AL	PCT1 / 25AL _	0.5	4	8.0
1.0	XL	PCT1 / 25XL _	0.5	4	8.0
1.5	A	PCT1.5 / 25A _	0.5	6	7.5
1.5	AL	PCT1.5 / 25AL _	0.5	6	5.4
1.5	B	PCT1.5 / 25B _	0.5	6	5.0
1.5	BL	PCT1.5 / 25BL _	0.5	6	5.0
2.2	A	PCT2.2 / 25A _	0.6	6	7.0
2.2	B	PCT2.2 / 25B _	0.6	6	4.5
2.2	BL	PCT2.2 / 25BL _	0.6	6	4.5
2.2	CL	PCT2.2 / 25CL _	0.6	6	4.5
3.3	A	PCT3.3 / 25A _	0.8	6	3.7
3.3	B	PCT3.3 / 25B _	0.8	6	3.5
3.3	BL	PCT3.3 / 25BL _	0.8	6	3.5
3.3	C	PCT3.3 / 25C _	0.8	6	2.8
3.3	CL	PCT3.3 / 25CL _	0.8	6	1.6
4.7	A	PCT4.7 / 25A _	1.2	6	3.1
4.7	B	PCT4.7 / 25B _	1.2	6	1.5
4.7	BL	PCT4.7 / 25BL _	1.2	6	3.1
4.7	C	PCT4.7 / 25C _	1.2	6	2.4
4.7	CL	PCT4.7 / 25CL _	1.2	6	1.2
6.8	B	PCT6.8 / 25B _	1.7	6	2.8
6.8	C	PCT6.8 / 25C _	1.7	6	2.0
6.8	CL	PCT6.8 / 25CL _	1.7	6	2.0
10.0	B	PCT10 / 25B _	2.5	6	2.5
10.0	C	PCT10 / 25C _	2.5	6	1.8
10.0	CL	PCT10 / 25CL _	2.5	6	1.8
10.0	D	PCT10 / 25D _	2.5	6	1.2
15.0	C	PCT15 / 25C _	3.8	6	1.6
15.0	D	PCT15 / 25D _	3.8	6	1.0
15.0	DL	PCT15 / 25DL _	3.8	6	1.0
22.0	C	PCT22 / 25C _	5.5	6	1.4
22.0	D	PCT22 / 25D _	5.5	6	0.9
22.0	DL	PCT22 / 25DL _	5.5	6	0.9
33.0	D	PCT33 / 25D _	8.3	6	0.9
33.0	H	PCT33 / 25H _	8.3	6	0.9
47.0	D	PCT47 / 25D _	11.8	6	0.9
47.0	DL	PCT47 / 25DL _	11.8	6	0.9
47.0	H	PCT47 / 25H _	11.8	6	0.9
68.0	H	PCT68 / 25H _	17.0	6	0.9
100.0	H	PCT100 / 25H _	25.0	10	0.3
150.0	Z	PCT100 / 25Z _	25.0	8	0.4
150.0	Z	PCT150 / 25Z _	37.5	10	0.4

\_ Insert tolerance M(±20%) or K(±10%) 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 (23 V DC @ 125°C)					
Capacitance (µF)	Case Size	Nemco Part No.	DCL (µA) max	tan δ max. (%)	ESR @ 100kHz max. (Ω)
0.10	A	PCT.1 / 35A _	0.5	4	24.0
0.10	AL	PCT.1 / 35AL _	0.5	4	24.0
0.10	XL	PCT.1 / 35XL _	0.5	4	29.0
0.15	A	PCT.15 / 35A _	0.5	4	21.0
0.15	AL	PCT.15 / 35AL _	0.5	4	21.0
0.15	XL	PCT.15 / 35XL _	0.5	4	24.0
0.22	A	PCT.22 / 35A _	0.5	4	18.0
0.22	AL	PCT.22 / 35AL _	0.5	4	18.0
0.22	XL	PCT.22 / 35XL _	0.5	4	21.0
0.33	A	PCT.33 / 35A _	0.5	4	15.0
0.33	AL	PCT.33 / 35AL _	0.5	4	15.0
0.33	XL	PCT.33 / 35XL _	0.5	4	17.0
0.47	A	PCT.47 / 35A _	0.5	4	12.0
0.47	AL	PCT.47 / 35AL _	0.5	4	12.0
0.47	B	PCT.47 / 35B _	0.5	4	10.0
0.47	BL	PCT.47 / 35BL _	0.5	4	10.0
0.47	XL	PCT.47 / 35XL _	0.5	4	15.0
0.68	A	PCT.68 / 35A _	0.5	4	8.0
0.68	AL	PCT.68 / 35AL _	0.5	4	8.0
0.68	B	PCT.68 / 35B _	0.5	4	8.0
0.68	BL	PCT.68 / 35BL _	0.5	4	8.0
1.0	A	PCT1 / 35A _	0.5	4	7.5
1.0	AL	PCT1 / 35AL _	0.5	4	7.5
1.0	B	PCT1 / 35B _	0.5	4	6.5
1.0	BL	PCT1 / 35BL _	0.5	4	6.5
1.5	A	PCT1.5 / 35A _	0.5	6	7.5
1.5	B	PCT1.5 / 35B _	0.5	6	5.2
1.5	BL	PCT1.5 / 35BL _	0.5	6	5.2
1.5	C	PCT1.5 / 35C _	0.5	6	4.5
2.2	A	PCT2.2 / 35A _	0.8	6	4.5
2.2	B	PCT2.2 / 35B _	0.8	6	4.2
2.2	BL	PCT2.2 / 35BL _	0.8	6	4.2
2.2	C	PCT2.2 / 35C _	0.8	6	3.5
3.3	B	PCT3.3 / 35B _	1.2	6	3.5
3.3	C	PCT3.3 / 35C _	1.2	6	2.5
3.3	CL	PCT3.3 / 35CL _	1.2	6	1.6
3.3	D	PCT3.3 / 35D _	1.2	6	2.5
4.7	B	PCT4.7 / 35B _	1.2	6	3.1
4.7	C	PCT4.7 / 35C _	1.6	6	2.2
4.7	D	PCT4.7 / 35D _	1.6	6	1.5
6.8	C	PCT6.8 / 35C _	2.4	6	1.8
6.8	D	PCT6.8 / 35D _	2.4	6	1.3
6.8	DL	PCT6.8 / 35DL _	2.3	6	0.9
10.0	C	PCT10 / 35C _	3.5	6	1.6
10.0	D	PCT10 / 35D _	3.5	6	1.0
10.0	DL	PCT10 / 35DL _	3.5	6	1.0
10.0	H	PCT10 / 35H _	3.5	6	0.9
15.0	C	PCT15 / 35C _	5.3	6	1.4
15.0	D	PCT15 / 35D _	5.3	6	0.9
15.0	DL	PCT15 / 35DL _	5.3	6	0.6
22.0	D	PCT22 / 35D _	7.7	6	0.9
22.0	DL	PCT22 / 35DL _	7.7	6	0.5
22.0	H	PCT22 / 35H _	7.7	6	0.5
33.0	D	PCT33 / 35D _	11.6	6	0.9
33.0	H	PCT33 / 35H _	11.6	6	0.9
33.0	Z	PCT33 / 35Z _	11.6	6	0.5
47.0	H	PCT47 / 35H _	16.5	6	0.9
47.0	Z	PCT47 / 35Z _	16.5	6	0.4
68.0	Z	PCT68 / 35Z _	23.8	6	0.5

50 V DC @ 85°C (33 V DC @ 125°C)					
Capacitance (µF)	Case Size	Nemco Part No.	DCL (µA) max	tan δ max. (%)	ESR @ 100kHz max. (Ω)
0.10	A	PCT.1 / 50A _	0.5	4	22.0
0.10	AL	PCT.1 / 50AL _	0.5	4	19.0
0.15	A	PCT.15 / 50A _	0.5	4	15.0
0.15	AL	PCT.15 / 50AL _	0.5	4	16.0
0.15	B	PCT.15 / 50B _	0.5	4	17.0
0.22	A	PCT.22 / 50A _	0.5	4	18.0
0.22	AL	PCT.22 / 50AL _	0.5	4	13.0
0.22	B	PCT.22 / 50B _	0.5	4	14.0
0.33	B	PCT.33 / 50B _	0.5	4	12.0
0.33	AL	PCT.33 / 50AL _	0.5	4	11.0
0.33	BL	PCT.33 / 50BL _	0.5	4	11.0
0.47	A	PCT.47 / 50A _	0.5	4	9.5
0.47	AL	PCT.47 / 50AL _	0.5	4	9.5
0.47	B	PCT.47 / 50B _	0.7	4	9.5
0.47	BL	PCT.47 / 50BL _	0.5	4	9.5
0.47	C	PCT.47 / 50C _	0.5	4	8.0
0.68	A	PCT.68 / 50A _	0.5	4	7.9
0.68	B	PCT.68 / 50B _	0.5	4	8.0
0.68	C	PCT.68 / 50C _	0.5	4	7.0
1.0	A	PCT1 / 50A _	0.5	4	6.6
1.0	B	PCT1 / 50B _	0.5	4	7.0
1.0	C	PCT1 / 50C _	0.5	4	5.5
1.0	CL	PCT1 / 50CL _	0.5	6	4.4
1.5	B	PCT1.5 / 50B _	0.8	8	5.4
1.5	C	PCT1.5 / 50C _	0.8	6	4.5
1.5	D	PCT1.5 / 50D _	0.8	6	4.0
2.2	B	PCT2.2 / 50B _	1.1	8	4.5
2.2	C	PCT2.2 / 50C _	1.1	8	2.5
2.2	D	PCT2.2 / 50D _	1.1	6	2.5
3.3	C	PCT3.3 / 50C _	1.6	6	2.5
3.3	D	PCT3.3 / 50D _	1.7	6	2.0
3.3	DL	PCT3.3 / 50DL _	1.7	4	1.7
4.7	C	PCT4.7 / 50C _	0.5	4	1.4
4.7	D	PCT4.7 / 50D _	2.4	6	1.4
4.7	DL	PCT4.7 / 50DL _	2.4	6	1.2
6.8	C	PCT6.8 / 50C _	3.4	6	1.0
6.8	D	PCT6.8 / 50D _	3.4	6	1.0
6.8	DL	PCT6.8 / 50DL _	3.4	6	0.9
10.0	D	PCT10 / 50D _	5.0	6	0.8
10.0	H	PCT10 / 50H _	5.0	6	1.0
15.0	D	PCT15 / 50D _	7.5	4	0.6
15.0	H	PCT15 / 50H _	7.5	6	0.6
22.0	Z	PCT22 / 50Z _	11.0	8	0.6

\_ Insert tolerance M(±20%) or K(±10%) 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.

**PACKAGING REFERENCE**

CASE SIZE	CASE SIZE	STANDARD PACKAGING	AVAILABLE
NEMCO	EIA IECQ	7" Reel Quantity	13" Reel Quantity
A	3216-18	<b>2000</b>	8000
B	3528-21	<b>2000</b>	8000
C	6032-28	<b>500</b>	3000
D	7343-31	<b>500</b>	2500
H	7343-43	<b>400</b>	1500
Z	7361-37	<b>400</b>	1500
<u>Low Profile Sizes</u>			
XL	2012-12	<b>2500</b>	10000
AL	3216-12	<b>2500</b>	10000
BL	3528-12	<b>2500</b>	10000
CL	6032-15	<b>1000</b>	5000
DL	7343-20	<b>1000</b>	5000

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