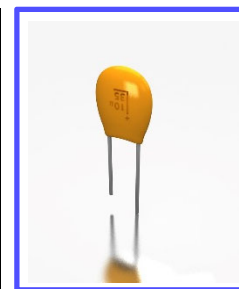


FEATURES	
<ul style="list-style-type: none"> <li>- Reliable, solid tantalum construction</li> <li>- Small size per C/V combination</li> <li>- Capacitance range: 0.1µF to 330µF</li> <li>- Voltage range: 6.3 to 50 WVDC</li> <li>- Surge tested for maximum robustness</li> <li>- Meniscus control eliminates thru-hole plugging for excellent top side solder joints</li> <li>- Operating Temperature range -55°C to +125°C</li> </ul>	<ul style="list-style-type: none"> <li>- Laser marking and bold polarity stripe</li> <li>- Supplied bulk or available packaged for auto insertion</li> <li>- Flame retardant, self extinguishing epoxy coating meets UL 94 V0 flammability classification</li> <li>- Lead cutting and forming is available</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> → TB 22 / 35 K 1 (optional)</p> <p><b>CAPACITANCE</b> in microfarads (µF) Ex. 0.68µF would be .68</p> <p><b>VOLTAGE</b> 6(6.3) 10 16 20 25 35 50</p>	<p><b>OPTIONAL</b> TR = Tape &amp; Reel TA = Ammo Packaging Bulk = &lt;default / blank&gt;</p> <p><b>LEAD SPACING CODE</b> 1 = (0.1 inches) 2 = (0.2 inches) Optional Lead Styles (see Page 3) 250 (0.25 inches) E1 (0.1 snap in) E2 (0.2 snap in) F (0.1 inches)</p> <p><b>TOLERANCE</b> M = (±20%) K = (±10%)</p>

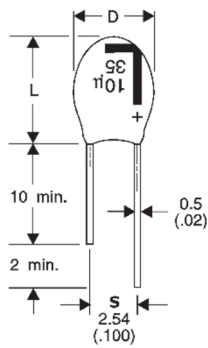
ELECTRICAL SPECIFICATION	
Technical Data:	All technical data relate to an ambient temperature of +25°C
Capacitance Range	0.10µF to 330µF
Capacitance Tolerance	±10% (K); ±20% (M)
Rated Voltage DC (V <sub>R</sub> ) ≤+85°C	6.3      10      16      20      25      35      50
Category Voltage DC (V <sub>C</sub> ) ≤+125°C	4      7      10      13      16      23      33
Surge Voltage (V <sub>S</sub> ) ≤+85°C	8      13      20      26      33      46      65
Surge Voltage (V <sub>S</sub> ) ≤+125°C	5      8      12      16      21      28      40
Temperature Range	-55°C to +125°C with 2/3 V <sub>r</sub> (linear derating) required for operation above +85°C
Reliability	1% per 1000 hours at rated voltage (V <sub>R</sub> ), rated temperature (85°C) and 0.1Ω/volt circuit impedance. 60% confidence level
Qualifications	Fixed Tantalum Specifications: CECC 30201-032 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)	6.3V	10V	16V	20V	25V	35V	50V
0.10						A	A
0.15						A	A
0.22						A	A
0.33						B	A
0.47						A	A
0.68						A	B
1.0				A	A	A	C
1.5			A	A	A	A	D
2.2		A	A	A	A	B	E
3.3	A	A	A	B	B	C	F
4.7	A	A	B	C	C	E	G
6.8	A	B	C	D	D	F	H
10.0	B	C	D	E	E	F	J
15.0	C	D	E	F	F	H	K
22.0	D	E	F	H	H	K	
33.0	E	F	F	J	J	M	
47.0	F	G	H	K	M	N	
68.0	G	H	L	N	N		
100.0	H	K	M	N			
150.0	K	N	N				
220.0	M	O	O				
330.0	N	O					

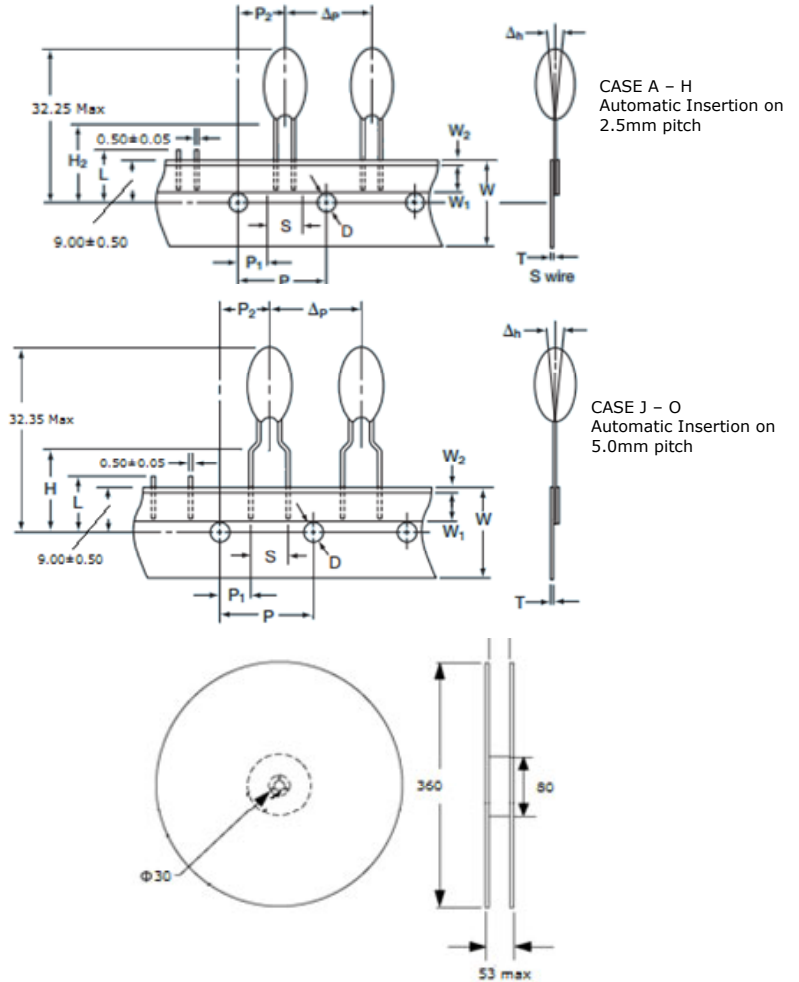
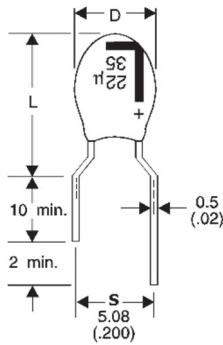
**DIMENSIONS AND LEAD SPACING**

**TAPE AND REEL DIMENSION**

**CASE: A,B,C,D,E,F,G,H**



**CASE: J,K,L,M,N,O**



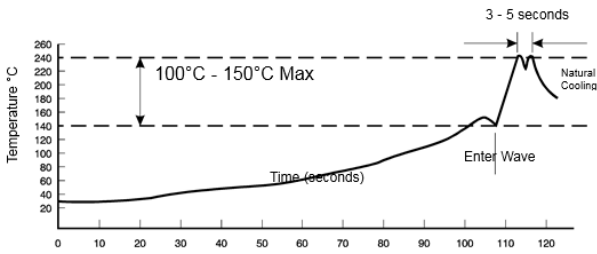
NOTE: Dimensions in millimeters (mm)

NEMCO Size	D MAX	L MAX	S ± 0.5	P ±0.3	P1	P2 ±0.4	Δp	H2 (MIN)	Δh	L (MAX)	W1 (MIN)	W2 (MAX)	W +1.00 -0.50	T ±0.2
A	4.5	7.0	2.5	12.7	5.05±1.00	6.35	±1.00	18	0±2.00	11.0	6.00	1.00	18	0.70
B	4.5	7.5	2.5	12.7	5.05±1.00	6.35	±1.00	18	0±2.00	11.0	6.00	1.00	18	0.70
C	5.0	8.5	2.5	12.7	5.05±1.00	6.35	±1.00	18	0±2.00	11.0	6.00	1.00	18	0.70
D	5.0	9.0	2.5	12.7	5.05±1.00	6.35	±1.00	18	0±2.00	11.0	6.00	1.00	18	0.70
E	5.5	9.0	2.5	12.7	5.05±1.00	6.35	±1.00	18	0±2.00	11.0	6.00	1.00	18	0.70
F	6.0	10.0	2.5	12.7	5.05±1.00	6.35	±1.00	18	0±2.00	11.0	6.00	1.00	18	0.70
G	6.5	10.0	2.5	12.7	5.05±1.00	6.35	±1.00	18	0±2.00	11.0	6.00	1.00	18	0.70
H	7.0	10.0	2.5	12.7	5.05±1.00	6.35	±1.00	18	0±2.00	11.0	6.00	1.00	18	0.70
J	8.0	10.5	5.0	12.7	3.85±0.70	6.35	±1.00	N/A	0±2.00	11.0	6.00	1.00	18	0.70
K	8.5	13.0	5.0	12.7	3.85±0.70	6.35	±1.00	N/A	0±2.00	11.0	6.00	1.00	18	0.70
L	9.0	14.0	5.0	12.7	3.85±0.70	6.35	±1.00	N/A	0±2.00	11.0	6.00	1.00	18	0.70
M	9.0	14.5	5.0	12.7	3.85±0.70	6.35	±1.00	N/A	0±2.00	11.0	6.00	1.00	18	0.70
N	9.0	16.0	5.0	12.7	3.85±0.70	6.35	±1.00	N/A	0±2.00	11.0	6.00	1.00	18	0.70
O	10.0	17.0	5.0	12.7	3.85±0.70	6.35	±1.00	N/A	0±2.00	11.0	6.00	1.00	18	0.70

**MARKING**

**REFLOW PROFILE**

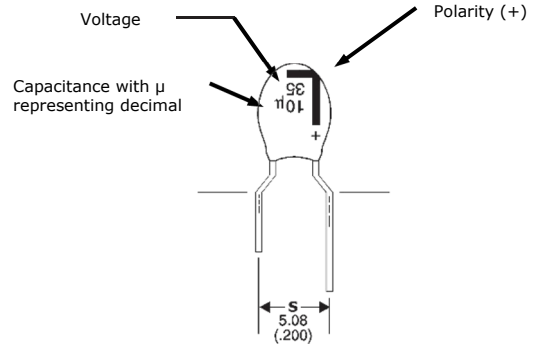
**ALL CASE SIZES**



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.

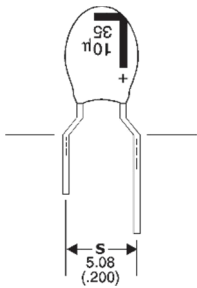


10μ = 10 μfd  
35V = 35V Rated Voltage at 85°C\*\*

\*\* 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.

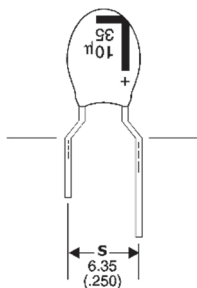
**OPTIONAL LEAD STYLES**

.200 inch Lead Spacing



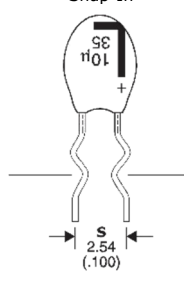
Available in Case Sizes A - H  
**P/N Suffix Code 2**

.250 inch Lead Spacing



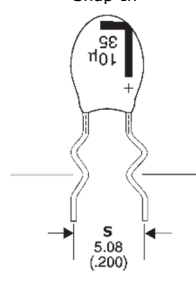
Available in Case Sizes A - O  
**P/N Suffix Code 250**

.100 inch Lead Spacing Snap-In



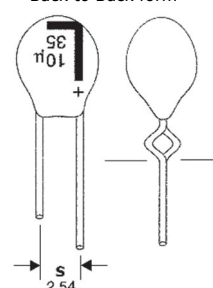
Available in Case Sizes A - H  
**P/N Suffix Code E1**  
Available in Bulk Only

.200 inch Lead Spacing Snap-In



Available in Case Sizes A - H  
**P/N Suffix Code E2**  
Available in Bulk Only

.100 inch Lead Spacing Back to Back form



Available in Case Sizes A - H  
**P/N Suffix Code F**

NOTE: Seated component heights for optional lead styles will vary based on case size. Contact your Nemco sales representative for samples of optional lead styles.

**RATINGS AND PART NUMBER REFERENCE**

6.3 V DC @ 85°C						
Capacitance (µF)	Case Size	Nemco Part No.	DCL (µA) max	tan δ max. (%)	ESR @ 100kHz max. (Ω)	
3.3	A	TB3.3 / 6_1	0.5	6	13.0	
4.7	A	TB4.7 / 6_1	0.5	6	10.0	
6.8	A	TB6.8 / 6_1	0.5	6	8.0	
10.0	B	TB10 / 6_1	0.5	8	6.0	
15.0	C	TB15 / 6_1	0.8	8	5.0	
22.0	D	TB22 / 6_1	1.1	8	3.7	
33.0	E	TB33 / 6_1	1.7	8	3.0	
47.0	F	TB47 / 6_1	2.4	8	2.0	
68.0	G	TB68 / 6_1	3.4	8	1.8	
100.0	H	TB100 / 6_1	5.0	10	1.6	
150.0	K	TB150 / 6_2	7.6	10	0.9	
220.0	M	TB220 / 6_2	11.0	10	0.9	
330.0	N	TB330 / 6_2	16.6	10	0.7	

25 V DC @ 85°C						
Capacitance (µF)	Case Size	Nemco Part No.	DCL (µA) max	tan δ max. (%)	ESR @ 100kHz max. (Ω)	
1.5	A	TB1.5 / 25_1	0.5	4	8.0	
2.2	A	TB2.2 / 25_1	0.5	6	6.0	
3.3	B	TB3.3 / 25_1	0.6	6	5.0	
4.7	C	TB4.7 / 25_1	0.9	6	4.0	
6.8	D	TB6.8 / 25_1	1.3	6	3.1	
10.0	E	TB10 / 25_1	2.0	8	2.5	
15.0	F	TB15 / 25_1	3.0	8	2.0	
22.0	H	TB22 / 25_1	4.4	8	1.5	
33.0	J	TB33 / 25_2	6.6	8	1.2	
47.0	M	TB47 / 25_2	9.4	8	1.0	
68.0	N	TB68 / 25_2	13.6	8	0.8	

10 V DC @ 85°C						
Capacitance (µF)	Case Size	Nemco Part No.	DCL (µA) max	tan δ max. (%)	ESR @ 100kHz max. (Ω)	
2.2	A	TB2.2 / 10_1	0.5	6	13.0	
3.3	A	TB3.3 / 10_1	0.5	6	10.0	
4.7	A	TB4.7 / 10_1	0.5	6	8.0	
6.8	B	TB6.8 / 10_1	0.5	6	6.0	
10.0	C	TB10 / 10_1	0.8	8	5.0	
15.0	D	TB15 / 10_1	1.2	8	3.7	
22.0	E	TB22 / 10_1	1.7	8	2.7	
33.0	F	TB33 / 10_1	2.6	8	2.1	
47.0	G	TB47 / 10_1	3.7	8	1.7	
68.0	H	TB68 / 10_1	5.4	8	1.3	
100.0	K	TB100 / 10_2	8.0	10	1.0	
150.0	N	TB150 / 10_2	12.0	10	0.8	
220.0	O	TB220 / 10_2	17.6	10	0.6	
330.0	O	TB330 / 10_2	20.0	10	0.5	

35V DC @ 85°C						
Capacitance (µF)	Case Size	Nemco Part No.	DCL (µA) max	tan δ max. (%)	ESR @ 100kHz max. (Ω)	
0.10	A	TB.1 / 35_1	0.5	4	26.0	
0.15	A	TB.15 / 35_1	0.5	4	21.0	
0.22	A	TB.22 / 35_1	0.5	4	17.0	
0.33	B	TB.33 / 35_1	0.5	4	15.0	
0.47	A	TB.47 / 35_1	0.5	4	13.0	
0.68	A	TB.68 / 35_1	0.5	4	10.0	
1.0	A	TB1 / 35_1	0.5	4	8.0	
1.5	A	TB1.5 / 35_1	0.5	4	6.0	
2.2	B	TB2.2 / 35_1	0.6	6	5.0	
3.3	C	TB3.3 / 35_1	0.9	6	4.0	
4.7	E	TB4.7 / 35_1	1.3	6	3.0	
6.8	F	TB6.8 / 35_1	1.9	6	2.5	
10.0	F	TB10 / 35_1	2.8	8	2.0	
15.0	H	TB15 / 35_1	4.2	8	1.6	
22.0	K	TB22 / 35_2	6.1	8	1.3	
33.0	M	TB33 / 35_2	9.2	8	1.0	
47.0	N	TB47 / 35_2	10.0	8	0.8	

16 V DC @ 85°C						
Capacitance (µF)	Case Size	Nemco Part No.	DCL (µA) max	tan δ max. (%)	ESR @ 100kHz max. (Ω)	
1.5	A	TB1.5 / 16_1	0.5	4	10.0	
2.2	A	TB2.2 / 16_1	0.5	6	8.0	
3.3	A	TB3.3 / 16_1	0.5	6	6.0	
4.7	B	TB4.7 / 16_1	0.6	6	5.0	
6.8	C	TB6.8 / 16_1	0.8	6	4.0	
10.0	D	TB10 / 16_1	1.2	8	3.2	
15.0	E	TB15 / 16_1	1.9	8	2.5	
22.0	F	TB22 / 16_1	2.8	8	2.0	
33.0	F	TB33 / 16_1	4.2	8	1.6	
47.0	H	TB47 / 16_1	6.0	8	1.3	
68.0	L	TB68 / 16_2	8.7	8	1.0	
100.0	M	TB100 / 16_2	12.8	10	0.8	
150.0	N	TB150 / 16_2	19.2	10	0.6	
220.0	O	TB220 / 16_2	20.0	10	0.5	

50V DC @ 85°C						
Capacitance (µF)	Case Size	Nemco Part No.	DCL (µA) max	tan δ max. (%)	ESR @ 100kHz max. (Ω)	
0.10	A	TB.1 / 50_1	0.5	4	26.0	
0.15	A	TB.15 / 50_1	0.5	4	21.0	
0.22	A	TB.22 / 50_1	0.5	4	17.0	
0.33	A	TB.33 / 50_1	0.5	4	15.0	
0.47	A	TB.47 / 50_1	0.5	4	13.0	
0.68	B	TB.68 / 50_1	0.5	4	10.0	
1.0	C	TB1 / 50_1	0.5	4	8.0	
1.5	D	TB1.5 / 50_1	0.6	4	5.0	
2.2	E	TB2.2 / 50_1	0.8	6	3.5	
3.3	F	TB3.3 / 50_1	1.3	6	3.0	
4.7	G	TB4.7 / 50_1	1.8	6	2.5	
6.8	H	TB6.8 / 50_1	2.7	6	2.0	
10.0	J	TB10 / 50_2	4.0	8	1.6	
15.0	K	TB15 / 50_2	6.0	8	1.2	

20 V DC @ 85°C						
Capacitance (µF)	Case Size	Nemco Part No.	DCL (µA) max	tan δ max. (%)	ESR @ 100kHz max. (Ω)	
1.5	A	TB1.5 / 20_1	0.5	4	9.0	
2.2	A	TB2.2 / 20_1	0.5	6	7.0	
3.3	B	TB3.3 / 20_1	0.5	6	5.5	
4.7	C	TB4.7 / 20_1	0.7	6	4.5	
6.8	D	TB6.8 / 20_1	1.0	6	3.6	
10.0	E	TB10 / 20_1	1.6	8	2.9	
15.0	F	TB15 / 20_1	2.4	8	2.3	
22.0	H	TB22 / 20_1	3.5	8	1.8	
33.0	J	TB33 / 20_2	5.2	8	1.4	
47.0	K	TB47 / 20_2	7.5	8	1.2	
68.0	N	TB68 / 20_2	10.8	8	0.9	
100.0	N	TB100 / 20_2	16.0	10	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	STANDARD PACKAGING IS BULK	TAPE AND REEL	AMMO
A	1000	1500	3000
B	1000	1250	3000
C	1000	1250	3000
D	1000	1250	3000
E	1000	1000	2500
F	1000	1000	2500
G	1000	750	2500
H	1000	750	2000
J	500	750	1000
K	500	500	1000
L	500	500	1000
M	500	500	1000
N	500	N/A	N/A
O	500	N/A	N/A