

# TLN Series



## Tantalum Solid Electrolytic Chip Capacitors Undertab Series



### FEATURES

- Undertab terminations layout:
  - High Volumetric Efficiency
  - High PCB assembly density
  - High capacitance in smaller dimensions
- 3x reflow 260°C compatible
- Consumer applications (e.g. PCMCIA/USB wireless express cards, mobiles, MP3 etc.)
- 6 case sizes available
- CV range: 47-220µF / 4-10V



### APPLICATIONS

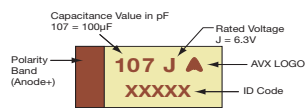
- Mobile phones
- Tablets
- MP3/4players

### CASE DIMENSIONS: millimeters (inches)

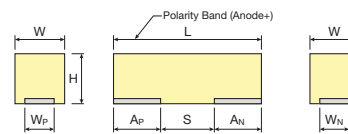
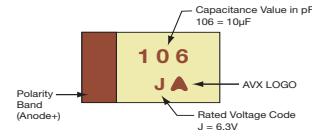
Code	EIA Code	EIA Metric	L±0.20 (0.008)	W+0.20 (0.008) -0.10 (0.004)	H max.	W <sub>P</sub> ±0.10 (0.004)	W <sub>N</sub> ±0.10 (0.004)	A <sub>P</sub> ±0.10 (0.004)	A <sub>N</sub> ±0.10 (0.004)	S Min.
M	0805	2012-09	2.05 (0.081)	1.30 (0.051)	0.90 (0.035)	1.00 (0.039)	1.00 (0.039)	0.85 (0.033)	0.85 (0.033)	0.40 (0.016)
N	0805	2012-10	2.05 (0.081)	1.30 (0.051)	1.00 (0.039)	1.00 (0.039)	1.00 (0.039)	0.85 (0.033)	0.85 (0.033)	0.40 (0.016)
K	1206	3216-10	3.20 (0.126)	1.60 (0.063)	1.00 (0.039)	1.30 (0.051)	1.30 (0.051)	1.15 (0.045)	1.15 (0.045)	0.90 (0.035)
S	1206	3216-12	3.20 (0.126)	1.60 (0.063)	1.20 (0.047)	1.30 (0.051)	1.30 (0.051)	1.15 (0.045)	1.15 (0.045)	0.90 (0.035)
L	1210	3528-10	3.50 (0.138)	2.80 (0.110)	1.00 (0.039)	2.50 (0.098)	2.10 (0.083)	1.15 (0.045)	1.35 (0.053)	1.00 (0.039)
T	1210	3528-12	3.50 (0.138)	2.80 (0.110)	1.20 (0.047)	2.50 (0.098)	2.10 (0.083)	1.15 (0.045)	1.35 (0.053)	1.00 (0.039)

### MARKING

#### K, L, S, T, CASE



#### M, N CASE



### HOW TO ORDER

**TLN**

Type

**S**

Case Size  
See table above

**227**

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

**M**

Tolerance  
M = ±20%

**004**

Rated DC Voltage  
004 = 4Vdc  
006 = 6.3Vdc  
010 = 10Vdc

**R**

Packaging  
R = Pure Tin 7" Reel  
S = Pure Tin 13" Reel

**3000**

ESR in mΩ

### TECHNICAL SPECIFICATIONS

Technical Data:

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

Capacitance Range:

47 µF to 220 µF

Capacitance Tolerance:

±20%

Rated Voltage (V<sub>R</sub>)

-55°C ≤ +40°C:

4

6.3

10

Category Voltage (V<sub>C</sub>)

at 85°C:

2

3.2

5

Category Voltage (V<sub>C</sub>)

at 125°C:

0.8

1.3

2

Temperature Range:

-55°C to +125°C with category voltage

Reliability:

0.2% per 1000 hours at 85°C, 0.5xV<sub>R</sub> with 0.1Ω/V series impedance with 60% confidence level

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## Tantalum Solid Electrolytic Chip Capacitors Undertab Series

### CAPACITANCE AND RATED VOLTAGE RANGE (LETTER DENOTES CASE SIZE)

Capacitance		Rated Voltage DC to 40°C / 0.5DC to 85°C/ 0.2DC to 125°C		
µF	Code	4V (G)	6.3V (J)	10V (A)
33	336			
47	476			K(1500)/M(6000)/N(6000)
68	686		K(5400)	K(5400)/S(6000)
100	107	N(5200)	K(2000,5400)/S(5400)	K(2500) S(2500)
150	157	K(2500)/S(2500)	K(2500) S(2500)	H(6000)/L(1300) T(1500)
220	227	K(2500)/L(1300) S(3000)/T(1500)	L(1000) T(1500)	T(1300)

Released ratings, (ESR ratings in mOhms in parentheses)

Engineering samples - please contact AVX

Note: Voltage ratings are minimum values. AVX reserves the right to supply higher voltage ratings in the same case size, to the same reliability standards.

### RATINGS & PART NUMBER REFERENCE

AVX Part No.	Case Size	Capacitance (µF)	Rated Voltage (V)	Rated Temperature (°C)	Category Voltage (V)	Category Temperature (°C)	Maximum Surge Current (A)	DCL Max. (µA)	ESR Max. @ 100kHz (mΩ)	100kHz RMS Current (mA)			MSL
										25°C	85°C	125°C	
<b>4 Volt @ 40°C</b>													
TLNN107M004#5200	N	100	4	40	0.8	125	0.4	20	5200	88	79	35	3
TLNK157M004#2500	K	150	4	40	0.8	125	0.7	12	2500	148	133	59	3
TLNS157M004#2500	S	150	4	40	0.8	125	0.7	12	2500	148	133	59	3
TLNK227M004#2500	K	220	4	40	0.8	125	0.7	44	2500	148	133	59	3
TLNL227M004#1300	L	220	4	40	0.8	125	1.1	17.6	1300	215	193	86	3
TLNS227M004#3000	S	220	4	40	0.8	125	0.6	17.6	3000	135	122	54	3
TLNT227M004#1500	T	220	4	40	0.8	125	1.0	17.6	1500	216	194	86	3
<b>6.3 Volt @ 40°C</b>													
TLNK686M006#5400	K	68	6.3	40	1.3	125	0.5	4.1	5400	101	91	40	3
TLNK107M006#2000	K	100	6.3	40	1.3	125	1.3	12	2000	166	149	66	3
TLNK107M006#5400	K	100	6.3	40	1.3	125	0.5	6	5400	101	91	40	3
TLNS107M006#5400	S	100	6.3	40	1.3	125	0.5	6	5400	101	91	40	3
TLNK157M006#2500	K	150	6.3	40	1.3	125	1.1	18	2500	148	133	59	3
TLNS157M006#2500	S	150	6.3	40	1.3	125	1.1	18	2500	148	133	59	3
TLNL227M006#1000	L	220	6.3	40	1.3	125	2.2	26.4	1000	245	220	98	3
TLNT227M006#1500	T	220	6.3	40	1.3	125	1.6	26.4	1500	216	194	86	3
<b>10 Volt @ 40°C</b>													
TLNK476M010#1500	K	47	10	40	2	125	2.6	4.7	1500	191	172	77	3
TLNM476M010#6000	M	47	10	40	2	125	0.8	9.4	6000	82	73	33	3
TLNN476M010#6000	N	47	10	40	2	125	0.8	9.4	6000	82	73	33	3
TLNK686M010#5400	K	68	10	40	2	125	0.9	6.8	5400	101	91	40	3
TLNS686M010#6000	S	68	10	40	2	125	0.8	6.8	6000	96	86	38	3
TLNK107M010#2500	K	100	10	40	2	125	1.7	20	2500	148	133	59	3
TLNS107M010#2500	S	100	10	40	2	125	1.7	10	2500	148	133	59	3
TLNH157M010#6000	H	150	10	40	2	125	0.8	30	6000	108	97	43	3
TLNL157M010#1300	L	150	10	40	2	125	2.9	30	1300	215	193	86	3
TLNT157M010#1500	T	150	10	40	2	125	2.6	30	1500	216	194	86	3
TLNT227M010#1300	T	220	10	40	2	125	2.9	44	1300	232	209	93	3

Moisture Sensitivity Level (MSL) is defined according to J-STD-020.

All technical data relates to an ambient temperature of +25°C. Capacitance is measured at 120Hz, 0.5V RMS with a maximum DC bias of 2.2 volts.

DCL is measured at rated voltage after 5 minutes.

ESR allowed to move up to 1.25 times catalogue limit post mounting

DCL allowed to move up to 2.00 times catalogue limit post mounting

For typical weight and composition see page 269.

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

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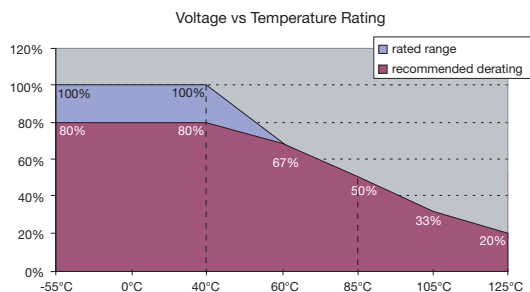


## Tantalum Solid Electrolytic Chip Capacitors Undertab Series

### QUALIFICATION TABLE

TEST	TLN series (Temperature range -55°C to +125°C)										
	Condition			Characteristics							
Endurance	Apply rated voltage (Ur) at 40°C and / or category voltage (Uc) at 85°C for 2000 hours through a circuit impedance of $\leq 0.1\Omega/V$ . Stabilize at room temperature for 1-2 hours before measuring.			Visual examination	no visible damage						
				DCL	2 x initial limit						
				$\Delta C/C$	within +5/-30% of initial value						
				ESR	1.25 x initial limit						
Humidity	Store at 65°C and 90-95% relative humidity for 500 hours, with no applied voltage. Stabilize at room temperature and humidity for 1-2 hours before measuring.			Visual examination	no visible damage						
				DCL	2 x initial limit						
				$\Delta C/C$	within $\pm 10\%$ of initial value						
				ESR	1.25 x initial limit						
Temperature Stability	Step	Temperature°C	Duration(min)		+20°C	-55°C	+20°C	+85°C	+125°C	+20°C	
	1	+20	15	DCL	2 x IL*	n/a	2 x IL*	20 x IL*	25 x IL*	2 x IL*	
	2	-55	15		$\Delta C/C$	n/a	+5/-20%	$\pm 10\%$	+20/-0%	+25/-0%	$\pm 10\%$
	3	+20	15	ESR		1.25 x IL*	2.5 x IL*	1.25 x IL*	1.25 x IL*	1.25 x IL*	1.25 x IL*
	4	+85	15								
	5	+125	15								
6	+20	15									
Surge Voltage	Apply 1.3x rated voltage (Ur) at 40°C for 1000 cycles of duration 6 min (30 sec charge, 5 min 30 sec discharge) through a charge / discharge resistance of 1000 $\Omega$ .			Visual examination	no visible damage						
				DCL	2 x initial limit						
				$\Delta C/C$	within $\pm 5\%$ of initial value						
				ESR	1.25 x initial limit						

\*Initial Limit

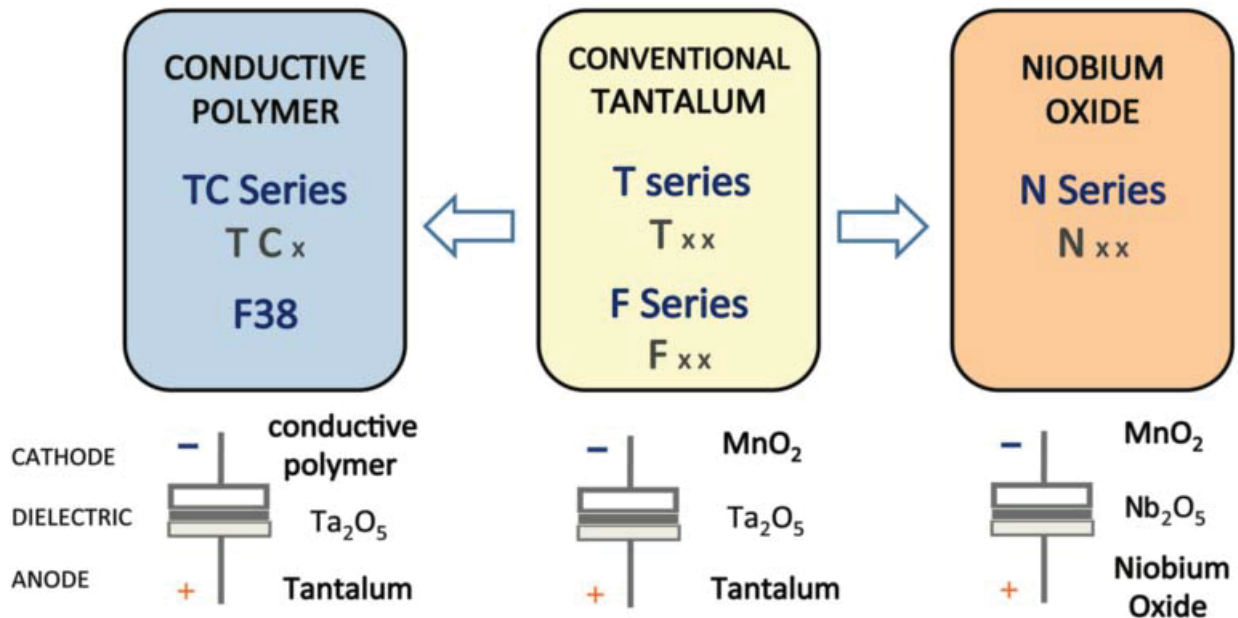


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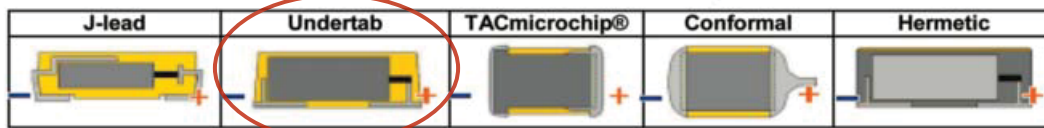


## Tantalum Solid Electrolytic Chip Capacitors Undertab Series

### AVX SOLID ELECTROLYTIC CAPACITOR ROADMAP



### Five Capacitor Construction Styles



### SERIES LINE UP: CONVENTIONAL SMD MnO<sub>2</sub>

