

# 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

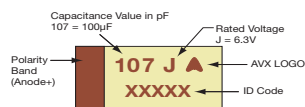
- Mobile phones
- Tablets
- MP3/4players

### CASE DIMENSIONS: millimeters (inches)

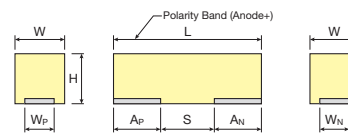
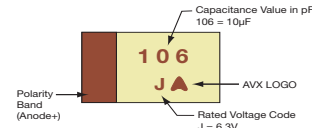
Code	EIA Code	EIA Metric	L±0.20 (0.008)	W+0.20 (0.008) -0.10 (0.004)	H max.	W <sub>P</sub> ±0.10 (0.004)	W <sub>N</sub> ±0.10 (0.004)	A <sub>P</sub> ±0.10 (0.004)	A <sub>N</sub> ±0.10 (0.004)	S Min.
M	0805	2012-09	2.05 (0.081)	1.30 (0.051)	0.90 (0.035)	1.00 (0.039)	1.00 (0.039)	0.85 (0.033)	0.85 (0.033)	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 1000 µF

Capacitance Tolerance: ±20%

Rated Voltage (V <sub>R</sub> )	-55°C ≤ +40°C:	4	6.3	10
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Category Voltage (V <sub>C</sub> )	at 85°C:	2	3.2	5
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Category Voltage (V <sub>C</sub> )	at 125°C:	0.8	1.3	2
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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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### 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	N(3000)*	K(5400)	K(5400)/S(6000)
100	107	N(5200)	K(2000,5400)/S(5400)	K(2500)/L(7200)* S(2500)
150	157	K(2500)/S(2500)	K(2500)/L(5400)* S(2500)	H(6000)/(1300) S(7200)*T(1500)
220	227	K(2500)/L(1300) S(3000)/T(1500)	K*/L(1000) S(8300)*T(1500)	G(7200)*H(6000)* T(1300)
330	337	G(4000)*K* L(4000)*S(5200)*	G(5400)*H(3000)*	H(7200)*T(9600)*
470	477	G(5200)*H(3000)* T(4000)*	H(5400)*T(8300)*	H(9600)*
680	687	H(4000)*T(5200)*	H(8300)*	
1000	108	H(5200)*	Y(150)*	

Available Ratings, (ESR ratings in mOhms in brackets)

Engineering samples - please contact manufacturer

\*Codes under development - subject to change

Note: Voltage ratings are minimum values. AVX reserves the right to supply higher 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)	MSL	100kHz RMS Current (mA)		
											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	3	88	79	35
TLNK157M004#2500	K	150	4	40	0.8	125	0.7	12	2500	3	148	133	59
TLNS157M004#2500	S	150	4	40	0.8	125	0.7	12	2500	3	148	133	59
TLNK227M004#2500	K	220	4	40	0.8	125	0.7	44	2500	3	148	133	59
TLNL227M004#1300	L	220	4	40	0.8	125	1.1	17.6	1300	3	215	193	86
TLNS227M004#3000	S	220	4	40	0.8	125	0.6	17.6	3000	3	135	122	54
TLNT227M004#1500	T	220	4	40	0.8	125	1.0	17.6	1500	3	216	194	86
<b>6.3 Volt @ 40°C</b>													
TLNK686M006#5400	K	68	6.3	40	1.3	125	0.5	4.1	5400	3	101	91	40
TLNK107M006#2000	K	100	6.3	40	1.3	125	1.3	12	2000	3	166	149	66
TLNK107M006#5400	K	100	6.3	40	1.3	125	0.5	6	5400	3	101	91	40
TLNS107M006#5400	S	100	6.3	40	1.3	125	0.5	6	5400	3	101	91	40
TLNK157M006#2500	K	150	6.3	40	1.3	125	1.1	18	2500	3	148	133	59
TLNS157M006#2500	S	150	6.3	40	1.3	125	1.1	18	2500	3	148	133	59
TLNL227M006#1000	L	220	6.3	40	1.3	125	2.2	26.4	1000	3	245	220	98
TLNT227M006#1500	T	220	6.3	40	1.3	125	1.6	26.4	1500	3	216	194	86
TLNY108M006#0150	Y	1000	6.3	40	1.3	125	5.3	63	150	3	876	788	350
<b>10 Volt @ 40°C</b>													
TLNK476M010#1500	K	47	10	40	2	125	2.6	4.7	1500	3	191	172	77
TLNM476M010#6000	M	47	10	40	2	125	0.8	9.4	6000	3	82	73	33
TLNN476M010#6000	N	47	10	40	2	125	0.8	9.4	6000	3	82	73	33
TLNK686M010#5400	K	68	10	40	2	125	0.9	6.8	5400	3	101	91	40
TLNS686M010#6000	S	68	10	40	2	125	0.8	6.8	6000	3	96	86	38
TLNK107M010#2500	K	100	10	40	2	125	1.7	20	2500	3	148	133	59
TLNS107M010#2500	S	100	10	40	2	125	1.7	10	2500	3	148	133	59
TLNH157M010#6000	H	150	10	40	2	125	0.8	30	6000	3	108	97	43
TLNL157M010#1300	L	150	10	40	2	125	2.9	30	1300	3	215	193	86
TLNT157M010#1500	T	150	10	40	2	125	2.6	30	1500	3	216	194	86
TLNT227M010#1300	T	220	10	40	2	125	2.9	44	1300	3	232	209	93

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 226.

**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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### QUALIFICATION TABLE

TEST	TLN series (Temperature range -55°C to +125°C)										
	Condition			Characteristics							
<b>Endurance</b>	Determine after application of rated voltage for 2000 +48/-0 hours at 40±2°C and then leaving 1-2 hours at room temperature. Also determine of 85°C temperature, category voltage for 2000 +48/-0 hours and then leaving 1-2 hours at room temperature. Power supply impedance to be ≤0.1Ω/V.			Visual examination	no visible damage						
				DCL	2 x initial limit						
				ΔC/C	within +5/-30% of initial value						
				ESR	1.25 x initial limit						
<b>Humidity</b>	Determine after storage without applied voltage at 65±2°C and 90-95% relative humidity for 500 hours and then recovery 1-2 hours at room temperature.			Visual examination	no visible damage						
				DCL	2 x initial limit						
				ΔC/C	within ±10% of initial value						
				ESR	1.25 x initial limit						
<b>Temperature Stability</b>	Step	Temperature°C	Duration(min)		+20°C	-55°C	+20°C	+85°C	+125°C	+20°C	
	1	+20±2	15	DCL	2 x IL*	n/a	2 x IL*	20 x IL*	25 x IL*	2 x IL*	
	2	-55+0/-3	15		ΔC/C	n/a	+5/-20%	±10%	+20/-0%	+25/-0%	±10%
	3	+20±2	15			ESR	1.25 x IL*	2.5 x IL*	1.25 x IL*	1.25 x IL*	1.25 x IL*
	4	+85+3/-0	15								
	5	+125+3/-0	15								
6	+20±2	15									
<b>Surge Voltage</b>	Test temperature: 40°C+3/0°C Test voltage: 1.3 x rated voltage Series protection resistance 1000±100Ω Discharge resistance: 1000Ω Number of cycles: 1000x Cycle duration: 6 min; 30 sec charge, 5 min 30 sec discharge			Visual examination	no visible damage						
				DCL	2 x initial limit						
				ΔC/C	within ±5% of initial value						
				ESR	1.25 x initial limit						

\*Initial Limit

