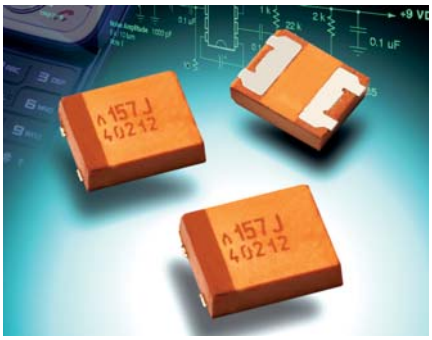
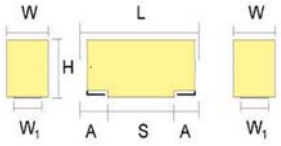
TCN Series

Tantalum Solid Electrolytic Chip Capacitors Undertab Series with Conductive Polymer Electrode





FEATURES

- Conductive polymer electrode reduces ignition failure mode
- Lower ESR
- Undertab terminations layout:
  - High Volumetric Efficiency
  - High PCB assembly density
  - High capacitance in smaller dimensions
- 3x reflow 260°C compatible
- 3 case sizes available

LEAD-FREE
LEAD-FREE COMPATIBLE COMPONENT

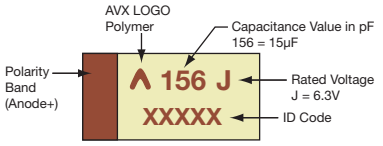
RoHS COMPLIANT

APPLICATIONS

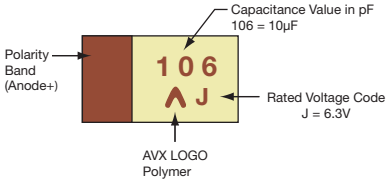
- Consumer applications (e.g. mobiles, MP3 etc.)

MARKING

L, S, T CASE



N CASE



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_1±0.20 (0.008)	A+0.30 (0.012) -0.20 (0.008)
L	1210	3528-10	3.50 (0.138)	2.80 (0.110)	1.00 (0.039)	2.20 (0.087)	0.80 (0.031)
S	1206	3216-12	3.20 (0.126)	1.60 (0.063)	1.20 (0.047)	1.20 (0.047)	0.80 (0.031)
T	1210	3528-12	3.50 (0.138)	2.80 (0.110)	1.20 (0.047)	2.20 (0.087)	0.80 (0.031)
W1 dimension applies to the termination width for A dimensional area only.							

HOW TO ORDER

TCN	L	157	M	006	R	0200
Type	**Case Size** See table above	**Capacitance Code** pF code: 1st two digits represent significant figures, 3rd digit represents multiplier (number of zeros to follow)	**Tolerance** M = ±20%	**Rated DC Voltage** 006 = 6.3Vdc 016 = 16Vdc 025 = 25Vdc 035 = 35Vdc	**Packaging** R = Pure Tin 7" Reel S = Pure Tin 13" Reel	**ESR in mΩ**

TECHNICAL SPECIFICATIONS

Technical Data:	All technical data relate to an ambient temperature of +25°C							
Capacitance Range:	1.0 µF to 1000 µF							
Capacitance Tolerance:	±20%							
Leakage Current DCL:	0.1CV							
Rated Voltage (V_R)	≤ +85ºC:	4	6.3	10	16	25	35	
Category Voltage (V_C)	≤ +105ºC:	3.2	5	8	13	20	28	
Surge Voltage (V_S)	≤ +85ºC:	5.2	8	13	21	33	46	
Surge Voltage (V_S)	≤ +105ºC:	4	6	10	16	25	35	
Temperature Range:	-55°C to +105°C							
Reliability:	1% per 1000 hours at 85°C, V_R with 0.1Ω/V series impedance 60% confidence level							

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CAPACITANCE AND RATED VOLTAGE RANGE (LETTER DENOTES CASE SIZE)

Capacitance		Rated Voltage DC to 85°C / 0.66DC to 105°C					
µF	Code	4V (G)	6.3V (J)	10V (A)	16V (C)	25V (E)	35V (V)
1.0	105						O*
4.7	475						T(200)
10	106						T(200)
15	156			N(500)*			
22	226			N(500)*		T(200)*/X*	X(100)*
33	336	N(500)*	K(500)*/N(500)*	K(500)*/N(500)*	L(200)/T(200)		
47	476	N(500)*	K(500)*/M(200)* N(500)*	K(500)*/S(500)*	T(200)	X(100)	X(100)*
68	686	K(500)*/N(500)*	K(500)*/S(500)*	G(150)*/L(150)* S(500)*			
100	107	K(500)*/S(500)*	G(200)*/K(250) L(200)/S(250)	G(150)*/L(150)* S(150)*/T(150)*			
150	157	G(200)*/L(200)* S(500)*	K(200)*/L(200) S(200)*/T(200)	G(150)*/H(150)* T(150)*	X(70)		
220	227	G(200)*/L(150)* S(200)*/T(150)*	H(100,200)* T(200)*	H(150)*			
330	337	H(150)*/T(150)*	H(200)*				
470	477	H(150)*	X(50)				
1000	108		X(200)				

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	Cap (µF)	Rated Voltage (V)	Rated Temp. (°C)	Category Voltage (V)	Category Temp. (°C)	DCL (µA) Max.	DF % Max.	ESR Max. (mΩ) @ 100kHz	MSL	100kHz RMS Current (mA)			Product Category
											25°C	85°C	105°C	
6.3 Volt @ 85°C														
TCNN476M006#0500	N	47	6.3	85	5	105	28.2	10	500	3	400	300	200	105°C
TCNK107M006#0250	K	100	6.3	85	6.3	85	60	10	250	3	600	400	–	85°C
TCNL107M006#0200	L	100	6.3	85	5	105	60	10	200	3	700	500	300	105°C
TCNS107M006#0250	S	100	6.3	85	6.3	85	60	10	250	3	600	400	–	85°C
TCNL157M006#0200	L	150	6.3	85	5	105	90	10	200	3	700	500	300	105°C
TCNS157M006#0200	S	150	6.3	85	5	105	90	10	200	3	700	500	300	105°C
TCNT157M006#0200	T	150	6.3	85	5	105	90	10	200	3	700	500	300	105°C
TCNT227M006#0200	T	220	6.3	85	5	105	132	10	200	3	700	500	300	105°C
TCNX477M006#0050	X	470	6.3	85	6.3	85	282	6	50	3	1900	1300	–	85°C
TCNX108M006#0200	X	1000	6.3	85	6.3	85	600	30	200	3	900	600	–	85°C
16 Volt @ 85°C														
TCNL336M016#0200	L	33	16	85	16	85	52.8	6	200	3	700	500	–	85°C
TCNT336M016#0200	T	33	16	85	16	85	52.8	6	200	3	700	500	–	85°C
TCNT476M016#0200	T	47	16	85	16	85	75.2	6	200	3	700	500	–	85°C
TCNX157M016#0070	X	150	16	85	16	85	240	6	70	3	1600	1100	–	85°C
25 Volt @ 85°C														
TCNX476M025#0100	X	47	25	105	25	105	117.5	6	100	3	1300	900	600	105°C
35 Volt @ 85°C														
TCNT475M035#0200	T	4.7	35	85	35	85	16.5	10	200	3	700	500	–	85°C
TCNT106M035#0200	T	10	35	85	35	85	35	10	200	3	700	500	–	85°C

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

All technical data relates to an ambient temperature of +25°C. Capacitance and DF are measured at 120Hz, 0.5RMS with DC bias of 2.2 volts. DCL is measured at rated voltage after 5 minutes.

ESR allowed to move up to 1.25 times catalog limit post mounting.

For typical weight and composition see page 214.

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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PRODUCT CATEGORY 105°C

TEST	105°C series (Temperature range -55ºC to +105ºC)		
	Condition	Characteristics	
Endurance	Determine after application of rated voltage for 2000 +48/-0 hours at 85±2ºC and then leaving 1-2 hours at room temperature. Also determine after application of 105ºC 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	1.25 x initial limit
		ΔC/C	within +20/-30% of initial value
		DF	1.5 x initial limit
		ESR	2 x initial limit
Storage Life	105ºC, 0V, 2000h	Visual examination	no visible damage
		DCL ($V_R \leq 75V$)	1.25 x initial limit
		DCL ($V_R > 75V$)	2 x initial limit
		ΔC/C	within ±20% of initial value
		DF	1.5 x initial limit
		ESR	2 x initial limit
Humidity	Determine after storage without applied voltage at 65±2ºC and 95±2% relative humidity for 500 hours and then recovery 1-2 hours at room temperature.	Visual examination	no visible damage
		DCL	3 x initial limit
		ΔC/C	within +30/-20% of initial value
		DF	1.5 x initial limit
		ESR	2 x initial limit

Temperature Stability

Step	Temperature°C	Duration(min)
1	+20±2	15
2	-55+0/-3	15
3	+20±2	15
4	+85+3/-0	15
5	+105+3/-0	15
6	+20±2	15

	+20ºC	-55ºC	+20ºC	+85ºC	+105ºC	+20ºC
DCL	IL*	n/a	IL*	10 x IL*	12.5 x IL*	IL*
ΔC/C	n/a	+0/-20%	±5%	+20/-0%	+30/-0%	±5%
DF	IL*	1.5 x IL*	IL*	1.5 x IL*	2 x IL*	IL*

Surge Voltage	Test temperature: 105ºC+3/0ºC Test voltage: Category voltage at 105ºC Surge voltage: 1.3 x category voltage at 105ºC 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	initial limit
		ΔC/C	within +20/-30% of initial value
		DF	1.25 x initial limit

*Initial Limit

PRODUCT CATEGORY 85°C

TEST	85°C series (Temperature range -55ºC to +85ºC)		
	Condition	Characteristics	
Endurance	Determine after application of rated voltage for 2000 +48/-0 hours at 85±2ºC and then leaving 1-2 hours at room temperature. Power supply impedance to be ≤0.1Ω/V.	Visual examination	no visible damage
		DCL	1.25 x initial limit
		ΔC/C	within +20/-30% of initial value
		DF	1.5 x initial limit
		ESR	2 x initial limit
Storage Life	85ºC, 0V, 2000h	Visual examination	no visible damage
		DCL	1.25 x initial limit
		ΔC/C	within ±20% of initial value
		DF	1.5 x initial limit
		ESR	2 x initial limit
Humidity	Determine after storage without applied voltage at 65±2ºC and 95±2% relative humidity for 500 hours and then recovery 1-2 hours at room temperature.	Visual examination	no visible damage
		DCL	5 x initial limit
		ΔC/C	within +40/-20% of initial value
		DF	1.5 x initial limit
		ESR	2 x initial limit

Temperature Stability

Step	Temperature°C	Duration(min)
1	+20±2	15
2	-55+0/-3	15
3	+20±2	15
4	+85+3/-0	15
5	+20±2	15

	+20ºC	-55ºC	+20ºC	+85ºC	+20ºC
DCL	IL*	n/a	IL*	10 x IL*	IL*
ΔC/C	n/a	+0/-20%	±5%	+20/-0%	±5%
DF	IL*	1.5 x IL*	IL*	1.5 x IL*	IL*

Surge Voltage	Test temperature: 85+3/0ºC Test voltage: Rated voltage Surge 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	initial limit
		ΔC/C	within +20/-30% of initial value
		DF	1.25 x initial limit

*Initial Limit

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