

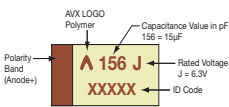
FEATURES

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

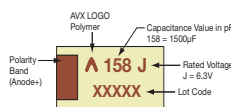


MARKING

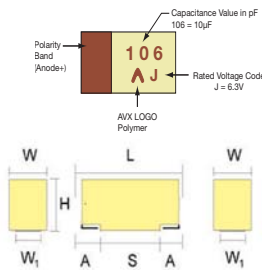
K, L, S, T, X CASE



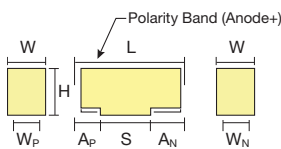
3, 4 CASE



N CASE



L, T, X, 3, 4 CASE



APPLICATIONS

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

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)
K	1206	3216-10	3.20 (0.126)	1.60 (0.063)	1.00 (0.039)	1.20 (0.047)	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)

W₁ dimension applies to the termination width for A dimensional area only.

Code	EIA Code	EIA Metric	L±0.20 (0.008)	W+0.20 (0.008) -0.10 (0.004)	H max.	W ₁ +0.50 (0.020) -0.10 (0.004)	W ₁ ±0.20 (0.008)	A _p +0.30 (0.012) -0.20 (0.008)	A _n +0.30 (0.012) -0.20 (0.008)
L	1210	3528-10	3.50 (0.138)	2.80 (0.110)	1.00 (0.039)	2.10 (0.083)	2.10 (0.083)	1.15 (0.045)	1.35 (0.053)
T	1210	3528-12	3.50 (0.138)	2.80 (0.110)	1.20 (0.047)	2.10 (0.083)	2.10 (0.083)	1.15 (0.045)	1.35 (0.053)
X	2917	7343-15	7.30 (0.287)	4.30 (0.169)	1.50 (0.059)	3.25 ± 0.20 (0.128±0.008)	3.25 (0.128)	2.00 (0.079)	3.20 (0.126)

W₁ dimension applies to the termination width for A dimensional area only.

Code	EIA Code	EIA Metric	L±0.30 (0.012)	W+0.30 (0.012)	H max.	W ₁ ±0.20 (0.008)	W ₁ ±0.20 (0.008)	A _p +0.30 (0.012) -0.20 (0.008)	A _n +0.30 (0.012) -0.20 (0.008)
3	2924	7360-15	7.30 (0.287)	6.00 (0.240)	1.50 (0.059)	4.75 (0.187)	4.75 (0.187)	2.00 (0.079)	3.20 (0.126)
4	2924	7360-20	7.30 (0.287)	6.00 (0.240)	2.00 (0.079)	4.75 (0.187)	4.75 (0.187)	2.00 (0.079)	3.20 (0.126)

W₁ dimension applies to the termination width for A dimensional area only.

Engineering samples

HOW TO ORDER

TCN

Type

L

Case Size
See table above

157

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

M

Tolerance
M = ±20%

006

Rated DC Voltage
006 = 6.3Vdc
016 = 16Vdc
025 = 25Vdc
035 = 35Vdc

R

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

0200

ESR in mΩ

TECHNICAL SPECIFICATIONS

Technical Data:	All technical data relate to an ambient temperature of +25°C							
Capacitance Range:	1.0 µF to 1500 µF							
Capacitance Tolerance:	±20%							
Leakage Current DCL:	0.1CV							
Rated Voltage (V _R)	≤ +85°C:	4	6.3	10	16	25	35	
Category Voltage (V _C)	≤ +105°C:	3.2	5	8	13	20	28	
Surge Voltage (V _S)	≤ +85°C:	5.2	8	13	21	33	46	
Surge Voltage (V _S)	≤ +105°C:	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							

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(250)* N(500)*	K(500)*S(500)*	L(250)/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(200,250) L(200)/S(250)	G(150)*L(150)* S(150)*T(150)*		3(70)	
150	157	G(200)*L(200)* S(500)*	K(200)*L(200) S(250)/T(200)	G(150)*H(150)* T(150)*	X(70)	4(70)	
220	227	G(200)*L(150)* S(200)*T(150)*	H(100,200)* T(200)	H(150)*	4(70)		
330	337	H(150)*T(150)*	H(200)*		4(70)		
470	477	H(150)*	X(50)		4(100)		
1000	108		X(200)/4(55)				
1500	158		4(55)				

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														
TCNK107M006#0200	K	100	6.3	85	6.3	85	60	10	200	3	700	500	–	85°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#0250	S	150	6.3	85	6.3	85	90	10	250	3	600	400	–	85°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	6.3	85	132	10	200	3	700	500	–	85°C
TCNX477M006#0050	X	470	6.3	85	6.3	85	282	10	50	3	1900	1300	–	85°C
TCNX108M006#0200	X	1000	6.3	85	6.3	85	600	30	200	3	900	600	–	85°C
TCN4108M006#0055	4	1000	6.3	85	6.3	85	600	20	55	4	1860	1302	–	85°C
TCN4158M006#0055	4	1500	6.3	85	6.3	85	900	20	55	4	1860	1302	–	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
TCNL476M016#0250	L	47	16	85	16	85	75.2	6	250	3	600	400	–	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
TCN4227M016#0070	4	220	16	105	16	105	352	20	70	4	1650	1155	660	105°C
TCN4337M016#0070	4	330	16	85	16	85	528	20	70	4	1650	1155	–	85°C
TCN4477M016#0100	4	470	16	85	16	85	752	20	100	4	1380	966	–	85°C
25 Volt @ 85°C														
TCNT226M025#0200	T	22	25	85	20	105	55	6	200	3	700	500	300	105°C
TCNX476M025#0100	X	47	25	105	25	105	117.5	6	100	3	1300	900	600	105°C
TCN3107M025#0070	3	100	25	105	25	105	250	6	70	4	1440	1008	576	105°C
TCN4157M025#0070	4	150	25	85	20	105	375	6	70	4	1650	1155	660	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
TCNX476M035#0100	X	47	35	85	28	105	164.5	10	100	3	1300	900	600	105°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 218.

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.

PRODUCT CATEGORY 105°C

TEST	105°C series (Temperature range -55°C to +105°C)										
	Condition			Characteristics							
Endurance	Determine after application of rated voltage for 2000 +48/-0 hours at 85±2°C and then leaving 1-2 hours at room temperature. Also determine after application of 105°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	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	105°C, 0V, 2000h			Visual examination	no visible damage						
				DCL (V _R ≤ 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±2°C 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	+20°C	-55°C	+20°C	+85°C	+105°C	+20°C		
	2	-55+0/-3	15	DCL	IL*	n/a	IL*	10 x IL*	12.5 x IL*	IL*	
	3	+20±2	15	ΔC/C	n/a	+0/-20%	±5%	+20/-0%	+30/-0%	±5%	
	4	+85+3/-0	15	DF	IL*	1.5 x IL*	IL*	1.5 x IL*	2 x IL*	IL*	
	5	+105+3/-0	15								
	6	+20±2	15								
Surge Voltage	Test temperature: 105°C+3/0°C Test voltage: Category voltage at 105°C Surge voltage: 1.3 x category voltage at 105°C 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 -55°C to +85°C)										
	Condition			Characteristics							
Endurance	Determine after application of rated voltage for 2000 +48/-0 hours at 85±2°C 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	85°C, 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±2°C 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	+20°C	-55°C	+20°C	+85°C	+20°C			
	2	-55+0/-3	15	DCL	IL*	n/a	IL*	10 x IL*	IL*		
	3	+20±2	15	ΔC/C	n/a	+0/-20%	±5%	+20/-0%	±5%		
	4	+85+3/-0	15	DF	IL*	1.5 x IL*	IL*	1.5 x IL*	IL*		
	5	+20±2	15								
Surge Voltage	Test temperature: 85+3/0°C 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