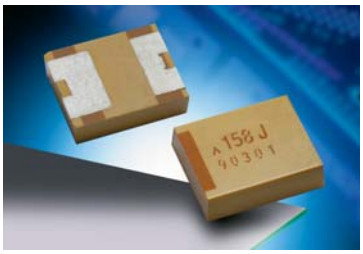
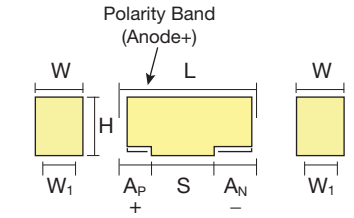
TCN PulseCap™ Series

Tantalum Solid Electrolytic Chip Capacitors Undertab Series With Conductive Polymer Electrode





FEATURES

- Large case size for maximum capacitance
- Conductive polymer electrode reduces ignition failure mode
- Low ESR
- Undertab terminations layout:
  - High Volumetric Efficiency
  - High PCB assembly density
  - High capacitance in smaller dimensions
- 3x reflow 260°C compatible
- 1case size available

APPLICATIONS

- Pulse energy battery support
- Power backup in SSDs

LEAD-FREE
LEAD-FREE COMPATIBLE COMPONENT

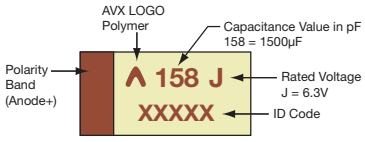
RoHS COMPLIANT

CASE DIMENSIONS: millimeters (inches)

Code	EIA Code	EIA Metric	L+0.30 (0.012) -0.30 (0.012)	W+0.30 (0.012) -0.30 (0.012)	H max.	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)
4	2924	7361-20	7.30 (0.287)	6.00 (0.240)	2.00 (0.079)	4.75 (0.187)	2.00 (0.079)	3.20 (0.126)
W1 dimension applies to the termination width for A dimensional area only.								

MARKING

4 CASE



HOW TO ORDER

TCN	4	158	M	006	R	0055
Type	**Case Size** See table above	**Capacitance Code** pF code: 1st two digits represent significant figures, 3rd digit represents multiplier	**Tolerance** M = ±20%	**Rated DC Voltage** 006 = 6.3Vdc 016 = 16Vdc	**Packaging** R = Pure Tin 7" Reel	**ESR in mΩ**

TECHNICAL SPECIFICATIONS

Technical Data:	All technical data relate to an ambient temperature of +25°C			
Capacitance Range:	220 µF to 1500 µF			
Capacitance Tolerance:	±20%			
Leakage Current DCL:	0.1CV			
Rated Voltage (V_R)	≤ +85°C:	6.3	16	
Surge Voltage (V_S)	≤ +85°C:	8	21	
Temperature Range:	-55°C to +85°C			
Reliability:	1% per 1000 hours at 85°C, V_R with 0.1Ω/V series impedance with 60% confidence level			

TCN PulseCap™ Series

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CAPACITANCE AND RATED VOLTAGE RANGE (FIGURE DENOTES CASE SIZE)

Capacitance		Voltage Rating DC (V_R) to 85°C		
µF	Code	4V (G)	6.3V (J)	16V (C)
220	227			4(70)
1000	108		4(55)	
1500	158		4(55)	
2200	228			
3300	338			

Available Codes (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 Ripple Current (mA)			Product Catagory
											25ºC	85ºC	105ºC	
6.3 Volt @ 85ºC														
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 @ 85ºC														
TCN4227M016#0070	4	220	16	85	16	85	352	20	70	4	1650	1155	-	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, 0.5 RMS 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 catalogue limit post mounting

For typical weight and composition see page 162.

NOTE: AVX reserves the right to supply a higher voltage rating in the same case size, to the same reliability standards.

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 ≤3Ω.	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, 2000_h	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: 1 — Temperature°C: +20±2 — Duration(min): 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+3/0°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

F38 Series

Conductive Polymer, Miniature, Undertab

LEAD-FREE

LEAD-FREE COMPATIBLE COMPONENT

RoHS COMPLIANT

FEATURES

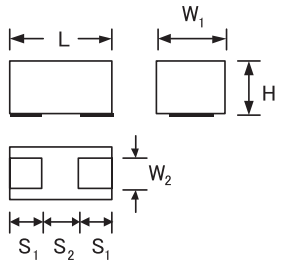
- Compliant to the RoHS2 directive 2011/65/EU
- SMD facedown
- Small and low profile

APPLICATIONS

- Smartphone
- Tablet PC
- Wireless module
- Portable game

CASE DIMENSIONS: millimeters (inches)

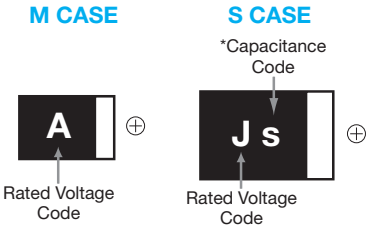
Code	L	W_1	W_2	H	S_1	S_2
M	1.60 $^{+0.20}_{-0.10}$ (0.063 $^{+0.008}_{-0.004}$)	0.85 $^{+0.20}_{-0.10}$ (0.033 $^{+0.008}_{-0.004}$)	0.65±0.10 (0.026±0.004)	0.80±0.10 (0.031±0.004)	0.50±0.10 (0.020±0.004)	0.60±0.10 (0.024±0.004)
S	2.00 $^{+0.20}_{-0.10}$ (0.079 $^{+0.008}_{-0.004}$)	1.25 $^{+0.20}_{-0.10}$ (0.049 $^{+0.008}_{-0.004}$)	0.90±0.10 (0.035±0.004)	0.80±0.10 (0.031±0.004)	0.50±0.10 (0.020±0.004)	1.00±0.10 (0.039±0.004)



TECHNICAL SPECIFICATIONS

Item	Performance Characteristics
Category Temperature Range	-55 to +105°C (Rated temperature: +85°C)
Capacitance Tolerance	±20% (at 120Hz)
Dissipation Factor	Refer to next page
ESR (100kHz)	Refer to next page
Leakage Current	Refer to the table below Povided that • After 5 minute's application of rated voltage, leakage current at 105°C, 10 times or less than 20ºC specified value
Capacitance Change by Temperature	+15% Max. (at +125°C) +10% Max. (at +85°C) -10% Max. (at -55°C)
Damp Heat (Steady State)	At 40°C, 90 to 95% R.H., 500 hours (No voltage applied) Capacitance Change ..... Refer to next page (*1) Dissipation Factor ..... 200% or less of initial specified value Leakage Current ..... 300% or less of initial specified value
Temperature Cycles	At -55°C / +105°C, For 30 minutes each, 5 cycles Capacitance Change ..... Refer to next page (*1) Dissipation Factor ..... 200% or less of initial specified value Leakage Current ..... 400% or less of initial specified value
Resistance to Soldering Heat	10 seconds reflow at 240°C Capacitance Change ..... Refer to next page (*1) Dissipation Factor ..... 200% or less of initial specified value Leakage Current ..... 300% or less of initial specified value
Surge	After application of surge voltage in series with a 1kΩ resistor at the rate of 30 seconds ON, 30 seconds OFF, for 1000 successive test cycles at 85ºC, capacitors meet the characteristic requirements table below. Capacitance Change ..... Refer to next page (*1) Dissipation Factor ..... 200% or less of initial specified value Leakage Current ..... 300% or less of initial specified value
Endurance	After 1000 hours' application of rated voltage in series with a 3Ω resistor at 85°C, capacitors meet the characteristic requirements table below. Capacitance Change ..... Refer to next page (*1) Dissipation Factor ..... 200% or less of initial specified value Leakage Current ..... 400% or less of initial specified value
Shear Test	After applying the pressure load of 5N for 10±1 seconds horizontally to the center of capacitor side body which has no electrode and has been soldered beforehand on a substrate, there shall be found neither exfoliation nor its sign at the terminal electrode. 5N (0.51kg · f) For 10±1 seconds
Terminal Strength	Keeping a capacitor surface-mounted on a substrate upside down and supporting the substrate at both of the opposite bottom points 45mm apart from the center of capacitor, the pressure strength is applied with a specified jig at the center of substrate so that the substrate may bend by 1mm as illustrated. Then, there shall be found no remarkable abnormality on the capacitor terminals. R230 20 1mm 45 45

MARKING



HOW TO ORDER

F38 — **Type**

1A — **Rated Voltage**

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

M — **Tolerance**
M = ±20%

M — **Case Size**
See table above

□ — **Packaging**

Reel Dia (ϕ180)	Tape Width (mm)
A	B

F38 Series

Conductive Polymer, Miniature, Undertab

CAPACITANCE AND RATED VOLTAGE RANGE (LETTER DENOTES CASE SIZE)

Capacitance		Rated Voltage			*Cap Code
µF	Code	4V (0G)	6.3V (0J)	10V (1A)	
2.2	225			M	–
4.7	475			M	–
10	106		M	M	a
22	226		M/S	S*	j
33	336		S		n
47	476		M*/S		s
100	107	S*			A

Available Ratings

*Codes under development – subject to change

Please contact to your local AVX sales office when these series are being designed in your application.

RATINGS & PART NUMBER REFERENCE

AVX Part Number	Case Size	Cap (µF)	Rated Voltage (V)	*2 Leakage Current (µA)	Disspation Factor (%@120Hz)	ESR (mΩ@100kHz)	Ripple Current (mArms@100kHz, 20°C)	*1 ΔC/C (%)
6.3 Volt								
F380J106MMA	M	10	6.3	10.0	8	500	224	*
F380J226MMA	M	22	6.3	13.9	10	500	224	*
F380J226MSA	S	22	6.3	13.9	10	200	474	*
F380J336MSA	S	33	6.3	20.8	10	200	474	*
F380J476MSA	S	47	6.3	29.6	10	200	474	*
10 Volt								
F381A225MMA	M	2.2	10	10.0	6	500	224	*
F381A475MMA	M	4.7	10	10.0	6	500	224	*
F381A106MMA	M	10	10	10.0	15	500	224	*

1: ΔC/C Marked ""

Item	All Case (%)
Damp Heat, steady state	-20 to +30
Radid change of temperature	±20
Resistance soldering heat	±20
Surge	±20
Endurance	±20

*2: Leakage Current
After 5 minute's application of rated voltage, leakage current at 20°C.

THE CORELATIONS AMONG RATED VOLTAGE, SURGE VOLTAGE AND DERATED VOLTAGE

Rated Voltage (V)	6.3	10
85°C Surge Voltage (V)	8	13
105°C Derated Voltage (V)	5	8

NOTICE: DESIGN, SPECIFICATIONS ARE SUBJECT TO CHANGE WITHOUT NOTICE.