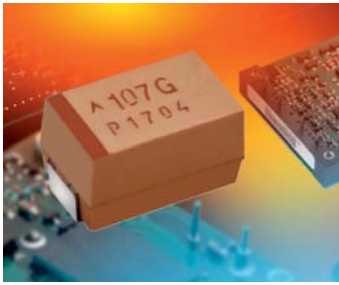


Conductive Polymer Solid Electrolytic Chip Capacitors



FEATURES

- Conductive polymer electrode
- Benign failure mode under recommended use conditions
- Lower ESR
- 3x reflow 260°C compatible
- CV range: 0.47-470µF / 2.5-125V
- 17 case sizes available

APPLICATIONS

- Smart phone, Tablets, Notebook, LCD TV, Power supplies



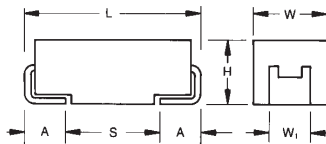
Elektra Award 2010



LEAD-FREE
LEAD-FREE COMPATIBLE
COMPONENT

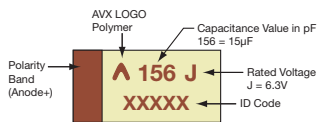


RoHS
COMPLIANT

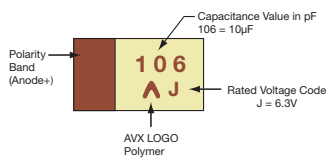


MARKING

A, B, C, D, E, G, H, K,
S, T, V, W, X, Y CASE



N, P, R 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+0.20 (0.008) -0.10 (0.004)	W ₁ ±0.20 (0.008)	A+0.30 (0.012) -0.20 (0.008)	S Min.
A	1206	3216-18	3.20 (0.126)	1.60 (0.063)	1.60 (0.063)	1.20 (0.047)	0.80 (0.031)	1.10 (0.043)
B	1210	3528-21	3.50 (0.138)	2.80 (0.110)	1.90 (0.075)	2.20 (0.087)	0.80 (0.031)	1.40 (0.055)
C	2312	6032-28	6.00 (0.236)	3.20 (0.126)	2.60 (0.102)	2.20 (0.087)	1.30 (0.051)	2.90 (0.114)
D	2917	7343-31	7.30 (0.287)	4.30 (0.169)	2.90 (0.114)	2.40 (0.094)	1.30 (0.051)	4.40 (0.173)
E	2917	7343-43	7.30 (0.287)	4.30 (0.169)	4.10 (0.162)	2.40 (0.094)	1.30 (0.051)	4.40 (0.173)
G	1206	3216-15	3.20 (0.126)	1.60 (0.063)	1.50 (0.059) max	1.20 (0.047)	0.80 (0.031)	1.10 (0.043)
H	1210	3528-15	3.50 (0.138)	2.80 (0.110)	1.50 (0.059) max	2.20 (0.087)	0.80 (0.031)	1.40 (0.055)
K	1206	3216-10	3.20 (0.126)	1.60 (0.063)	1.00 (0.039) max	1.20 (0.047)	0.80 (0.031)	1.10 (0.043)
N	0805	2012-10	2.05 (0.081)	1.30 (0.051)	1.00 (0.039) max	1.00 (0.039)	0.50 (0.020)	0.85 (0.033)
P	0805	2012-15	2.05 (0.081)	1.35 (0.050)	1.50 (0.059) max	1.00±0.10 (0.039±0.004)	0.50 (0.020)	0.85 (0.033)
R	0805	2012-12	2.05 (0.081)	1.30 (0.051)	1.20 (0.047) max	1.00±0.10 (0.039±0.004)	0.50 (0.020)	0.85 (0.033)
S	1206	3216-12	3.20 (0.126)	1.60 (0.063)	1.20 (0.047) max	1.20 (0.047)	0.80 (0.031)	1.10 (0.043)
T	1210	3528-12	3.50 (0.138)	2.80 (0.110)	1.20 (0.047) max	2.20 (0.087)	0.80 (0.031)	1.40 (0.055)
V	2924	7361-38	7.30 (0.287)	6.10 (0.240)	3.55 (0.140)	3.10 (0.120)	1.30 (0.051)	4.40 (0.173)
W	2312	6032-15	6.00 (0.236)	3.20 (0.126)	1.50 (0.059) max	2.20 (0.087)	1.30 (0.051)	2.90 (0.114)
X	2917	7343-15	7.30 (0.287)	4.30 (0.169)	1.50 (0.059) max	2.40 (0.094)	1.30 (0.051)	4.40 (0.173)
Y	2917	7343-20	7.30 (0.287)	4.30 (0.169)	2.00 (0.079) max	2.40 (0.094)	1.30 (0.051)	4.40 (0.173)

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

HOW TO ORDER

TCJ	A	226	M	004	R	0300
Type	Case Size	Capacitance Code	Tolerance	Rated DC Voltage	Packaging	ESR in mΩ
	See table above	pF code: 1st two digits represent significant figures, 3rd digit represents multiplier (number of zeros to follow)	M = ±20%	002 = 2.5Vdc 004 = 4Vdc 006 = 6.3Vdc 010 = 10Vdc 016 = 16Vdc 020 = 20Vdc 025 = 25Vdc	035 = 35Vdc 050 = 50Vdc 063 = 63Vdc 075 = 75Vdc 100 = 100Vdc 125 = 125Vdc	R = Pure Tin 7" Reel S = Pure Tin 13" Reel

TECHNICAL SPECIFICATIONS (Common for all TCJ series)

Technical Data:	All technical data relate to an ambient temperature of +25°C
Capacitance Tolerance:	±20%
Leakage Current DCL:	0.1CV
Reliability:	1% per 1000 hours at 85°C, V _R with 0.1Ω/V series impedance, 60% confidence level
Resistance to soldering heat:	3x260°C peak for max. 10s reflow

Conductive Polymer Solid Electrolytic Chip Capacitors

CAPACITANCE AND RATED VOLTAGE RANGE (LETTER DENOTES CASE SIZE)

Cap		Rated Voltage DC (V _R) to 85°C												
µF	Code	2.5V (e)	4V (G)	6.3V (J)	10V (A)	16V (C)	20V (D)	25V (E)	35V (V)	50V (T)	63V (J)	75V (P)	100V (A)	125V (B)
0.47	474										B(400)			
0.68	684									B(400)	B(300)			
1.0	105							P(500)		B(300)	B(300) C(300)			
1.5	155								B(200)	B(300) C(300)	C(300)			
2.2	225								B(200)	C(300)	C(200)			
3.3	335								B(200)	C(200)	C(200)			D(250)
4.7	475				K(300,500) R(500)			B(100,150)	B(200) C(200)	C(200)	C(200) D(120)	D(150)	D(250)	
6.8	685					A(200)		B(90,150) T(100,150)	C(200)	C(200) D(120)	D(120) E(100,150)	D(120)		
10	106			A(300) N(200,250,500) R(500)	A(200,300)	A(200) B(100,200) T(100,150,200)		B(90,100,150)	B(200) C(200) Y(70)	D(120) E(70,100)	E(100,150)	U*	U*	
15	156		A(300)	A(300)	A(200)	B(150)		B(100,150) Y(90)	B(200), C(200) D(70,100) Y(70,100)	E(70,100)				
22	226		A(300)	A(300), K(400) N(500), R(500) S(400), T(150)	B(300) T(70,150)	B(150)	B(90,150) Y(70)	B(100,150), C(100) D(60,100) Y(70)	D(70,100) Y*					
33	336		A(300)	A(200) B(70,200) T(150)	B(70,200) C(100) T(70,150)	Y(45,60,70)	Y(70)	D(60,100) X(70,100) Y(60,70,100)	D(70,100) E(55,70)					
47	476		A(200) T(80)	A(70,100,200), B(70) K(150,200,400) P(500), R(500) T(55,69,70,80,120)	B(70) C(100)	X(45,70) Y(45,70)	D(55) X(55,70) Y(70)	D(60,100) E(50)	E(55)					
68	686	A(250)	A(250) B(70) T(80)	B(55,70) C(100) T(200), W(70)	D(45,55) Y(45,55)	D(50) Y(50)	D(55) E(45)	D(70) E(50)						
100	107	A(200), B(70)	A(200) B(40,70) G(300) T(70,150)	A(100,150) B(45,55,69,70) T(70,200)	D(45,55,80) Y(25,45,55)	D(50), E(40) Y(50)	D(55) E(45)	D(55,70) E(80)						
150	157	B(70)	B(70), Y(25,45)	B(25,35,45,55,69,70) D(12,15,25,40) H(70,200), W(40,70) Y(15,25,40)	D(25,40,45,55) Y(25,40,45,55)	D(40,50) E(40) Y(40,50)								
220	227	B(35,45,70)	B(35,45,55,60,70) D(12,15,25,40) Y(15,25,40)	B(70,200) D(12,15,25,35,40,50) Y(15,25,35,40,50)	D(12,15,25,40,50) Y(15,25,40,50)									
330	337	B(35,45,70) Y(25,40)	D(25,40,50) Y(25,40,50)	D(15,25,40,50) Y(15,25,40,50)		E(50,70)								
470	477	D(12,15,25,40,50) Y(15,25,40,50)	D(12,15,25,40,50) Y(15,25,40,50)	X(55,100)										
3300	338			U*										

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	125°C	
TCJE106M050#0100	E	10	50	85	40	105	50	6	100	3	1600	1100	700	-	105°C
TCJE156M050#0070	E	15	50	85	40	105	75	6	70	3	1900	1300	900	-	105°C
TCJE156M050#0100	E	15	50	85	40	105	75	6	100	3	1600	1100	700	-	105°C
63 Volt @ 85°C															
TCJB474M063#0400	B	0.47	63	85	50	105	3	8	400	3	600	400	300	-	105°C
TCJB684M063#0300	B	0.68	63	85	50	105	4.3	8	300	3	600	400	300	-	105°C
TCJB105M063#0300	B	1.0	63	85	50	105	6.3	8	300	3	600	400	300	-	105°C
TCJC105M063#0300	C	1.0	63	85	50	105	6.3	6	300	3	800	600	400	-	105°C
TCJC155M063#0300	C	1.5	63	85	50	105	9.5	6	300	3	800	600	400	-	105°C
TCJC225M063#0200	C	2.2	63	85	50	105	13.9	6	200	3	900	600	400	-	105°C
TCJC335M063#0200	C	3.3	63	85	50	105	20.8	6	200	3	900	600	400	-	105°C
TCJC475M063#0200	C	4.7	63	85	50	105	29.6	6	200	3	900	600	400	-	105°C
TCJD475M063#0120	D	4.7	63	85	50	105	29.6	6	120	3	1400	1000	600	-	105°C
TCJD685M063#0120	D	6.8	63	85	50	105	42.8	6	120	3	1400	1000	600	-	105°C
TCJE685M063#0100	E	6.8	63	85	50	105	42.8	6	100	3	1600	1100	700	-	105°C
TCJE685M063#0150	E	6.8	63	85	50	105	42.8	6	150	3	1300	900	600	-	105°C
TCJE106M063#0100	E	10	63	85	50	105	63	6	100	3	1600	1100	700	-	105°C
TCJE106M063#0150	E	10	63	85	50	105	63	6	150	3	1300	900	600	-	105°C
75 Volt @ 85°C															
TCJD475M075#0150	D	4.7	75	85	60	105	35.3	6	150	3	1200	800	500	-	105°C
TCJD685M075#0120	D	6.8	75	85	60	105	51	6	120	3	1400	1000	600	-	105°C
100 Volt @ 85°C															
TCJD475M100#0250	D	4.7	100	85	80	105	47	8	250	3	900	600	400	-	105°C
125 Volt @ 85°C															
TCJD335M125#0250	D	3.3	125	85	100	105	41.2	8	250	3	900	600	400	-	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 221.

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 125°C

TEST	125°C series (Temperature range -55°C to +125°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 of 125°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	125°C, 0V, 2000h			Visual examination			no visible damage									
				DCL			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)	DCL	+20°C	-55°C	+20°C	+85°C	+125°C	+20°C						
	1	+20±2	15								IL*	n/a	IL*	10 x IL*	12.5 x IL*	IL*
	2	-55+0/-3	15													
	3	+20±2	15													
	4	+85+3/-0	15													
	5	+125+3/-0	15													
6	+20±2	15														
Surge Voltage	Test temperature: 125°C±3/0°C Test voltage: Category voltage at 125°C Surge voltage: 1.3 x category voltage at 125°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 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