F97 Series

Resin-Molded Chip, Improved Reliability J-Lead

FEATURES

- Compliant to the RoHS3 directive 2015/863/EU
- Compliant to AEC-Q200
- Improved Reliability - FR=0.5%/1000hrs
- 100% Surge Current Tested
- SMD J-lead

LEAD-FREE
LEAD-FREE COMPATIBLE COMPONENT

RoHS COMPLIANT

APPLICATIONS

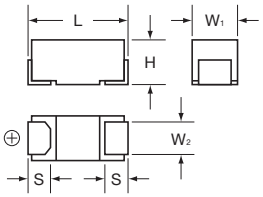
- Automotive Electronics(Engine ECU)
- Industrial Equipment

CASE DIMENSIONS:

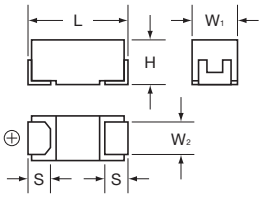
millimeters (inches)

Code	EIA Code	EIA Metric	L	W_1	W_2	H	S
A	1206	3216-18	3.20 ± 0.20 (0.126 ± 0.008)	1.60 ± 0.20 (0.063 ± 0.008)	1.20 ± 0.10 (0.047 ± 0.004)	1.60 ± 0.20 (0.063 ± 0.008)	0.80 ± 0.20 (0.031 ± 0.008)
B	1210	3528-21	3.50 ± 0.20 (0.138 ± 0.008)	2.80 ± 0.20 (0.110 ± 0.008)	2.20 ± 0.10 (0.087 ± 0.004)	1.90 ± 0.20 (0.075 ± 0.008)	0.80 ± 0.20 (0.031 ± 0.008)
C	2312	6032-27	6.00 ± 0.20 (0.236 ± 0.008)	3.20 ± 0.20 (0.126 ± 0.008)	2.20 ± 0.10 (0.087 ± 0.004)	2.50 ± 0.20 (0.098 ± 0.008)	1.30 ± 0.20 (0.051 ± 0.008)
N	2917	7343-30	7.30 ± 0.20 (0.287 ± 0.008)	4.30 ± 0.20 (0.169 ± 0.008)	2.40 ± 0.10 (0.094 ± 0.004)	2.80 ± 0.20 (0.110 ±0.008)	1.30 ± 0.20 (0.051 ± 0.008)

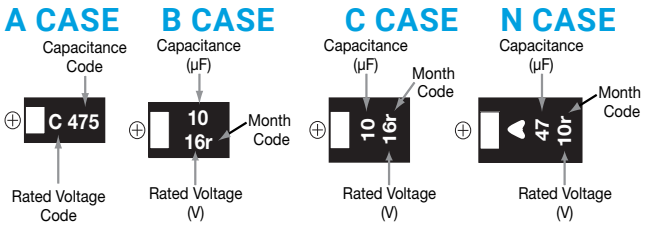
A, B CASE



C, N CASE



MARKING



HOW TO ORDER

F97	1C	335	M	A	□
Type	**Rated Voltage**	**Capacitance Code** pF code: 1st two digits represent significant figures, 3rd digit represents multiplier (number of zeros to follow)	**Tolerance** K = ±10% M = ±20%	**Case Size** See table above	**Packaging** See Tape & Reel Packaging Section

TECHNICAL SPECIFICATIONS

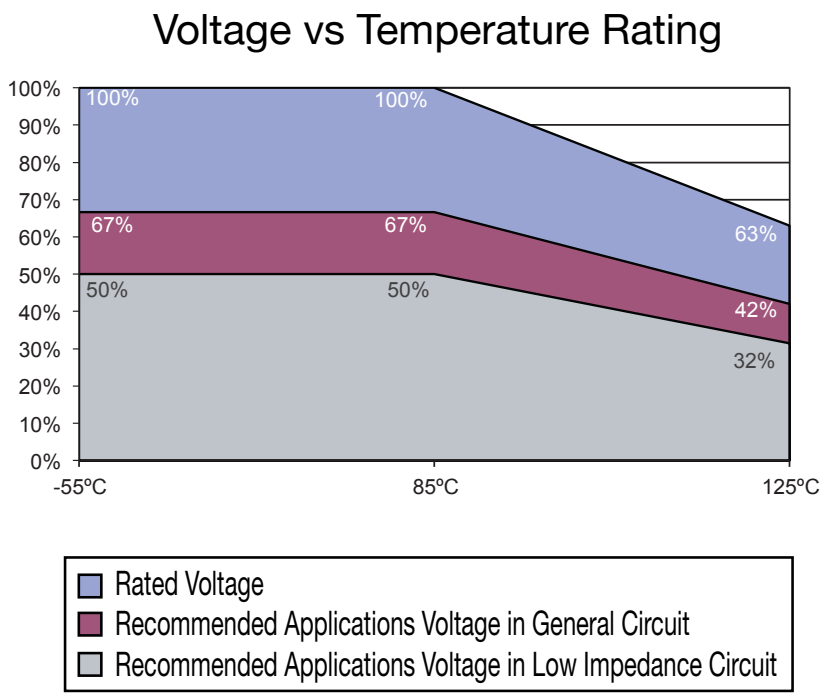
Category Temperature Range:	-55 to +125°C
Rated Temperature:	+85°C
Capacitance Tolerance:	±20%, ±10% at 120Hz
Dissipation Factor:	Refer to next page
ESR 100kHz:	Refer to next page
Leakage Current:	After 1 minute's application of rated voltage, leakage current at 20°C is not more than 0.01CV or 0.5µA, whichever is greater.
	After 1 minute's application of rated voltage, leakage current at 85°C is not more than 0.1CV or 5µA, whichever is greater.
	After 1 minute's application of derated voltage, leakage current at 125°C is not more than 0.125CV or 6.3µA, whichever is greater.
Capacitance Change By Temperature	+15% Max. at +125°C
	+10% Max. at +85°C
	-10% Max. at -55°C

CAPACITANCE AND RATED VOLTAGE RANGE (LETTER DENOTES CASE SIZE)

Capacitance		Rated Voltage					
µF	Code	6.3V (0J)	10V (1A)	16V (1C)	20V (1D)	25V (1E)	35V (1V)
0.33	334						A
0.47	474						A
0.68	684					A	A
1.0	105			A	A	A	B
1.5	155				A		B
2.2	225		A	A	A	B	B
3.3	335	A	A	A	B	B	C
4.7	475		A/B	A/B	A/B		C
6.8	685		B	B	C	C	N
10	106		A/B	A/B/C	C	C/N	N
15	156	B	B		N	N	
22	226	A/B	A/B	B/C/N	C/N	N	
33	336	A/C	B/C/N	B/C/N			
47	476	B/C	B/C/N	C/N			
68	686		N				
100	107		C				
150	157	C					

Released ratings

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



RATINGS & PART NUMBER REFERENCE

AVX Part No.	Case Size	Capacitance (µF)	Rated Voltage (V)	DCL (µA)	DF @ 120Hz (%)	ESR @ 100kHz (Ω)	100kHz RMS Current (mA)			*1 ΔC/C (%)	MSL
							25°C	85°C	125°C		
6.3 Volt											
F970J335#AA	A	3.3	6.3	0.5	4	4.5	129	116	52	*	3
F970J156#BA	B	15	6.3	0.9	6	2.0	206	186	82	*	3
F970J226#AA	A	22	6.3	1.4	12	2.5	173	156	69	*	3
F970J226#BA	B	22	6.3	1.4	8	1.9	212	190	85	*	3
F970J336#AA	A	33	6.3	2.1	12	2.5	173	156	69	*	3
F970J336#CC	C	33	6.3	2.1	6	1.1	316	285	126	*	3
F970J476#BA	B	47	6.3	3.0	8	1.0	292	262	117	*	3
F970J476#CC	C	47	6.3	3.0	6	0.9	350	315	140	*	3
F970J157#CC	C	150	6.3	9.5	12	0.7	396	357	159	*	3
10 Volt											
F971A225#AA	A	2.2	10	0.5	4	5.0	122	110	49	*	3
F971A335#AA	A	3.3	10	0.5	4	4.5	129	116	52	*	3
F971A475#AA	A	4.7	10	0.5	6	4.0	137	123	55	*	3
F971A475#BA	B	4.7	10	0.5	6	2.8	174	157	70	*	3
F971A685#BA	B	6.8	10	0.7	6	2.5	184	166	74	*	3
F971A106#AA	A	10	10	1.0	6	3.0	158	142	63	*	3
F971A106#BA	B	10	10	1.0	6	2.0	206	186	82	*	3
F971A156#BA	B	15	10	1.5	6	2.0	206	186	82	*	3
F971A226#AA	A	22	10	2.2	15	3.0	158	142	63	*	3
F971A226#BA	B	22	10	2.2	8	1.9	212	190	85	*	3
F971A336#BA	B	33	10	3.3	8	1.9	212	190	85	*	3
F971A336#CC	C	33	10	3.3	6	1.1	316	285	126	*	3
F971A336#NC	N	33	10	3.3	6	0.7	463	417	185	*	3
F971A476#BA	B	47	10	4.7	10	1.0	292	262	117	*	3
F971A476#CC	C	47	10	4.7	8	0.9	350	315	140	*	3
F971A476#NC	N	47	10	4.7	6	0.7	463	417	185	*	3
F971A686#NC	N	68	10	6.8	6	0.6	500	450	200	*	3
F971A107#CC	C	100	10	10.0	10	0.7	396	357	159	*	3
16 Volt											
F971C105#AA	A	1	16	0.5	4	7.5	100	90	40	*	3
F971C225#AA	A	2.2	16	0.5	4	5.0	122	110	49	*	3
F971C335#AA	A	3.3	16	0.5	4	4.5	129	116	52	*	3
F971C475#AA	A	4.7	16	0.8	8	4.0	137	123	55	*	3
F971C475#BA	B	4.7	16	0.8	6	2.8	174	157	70	*	3
F971C685#BA	B	6.8	16	1.1	6	2.5	184	166	74	*	3
F971C106#AA	A	10	16	1.6	8	3.5	146	132	59	*	3
F971C106#BA	B	10	16	1.6	6	2.1	201	181	80	*	3
F971C106#CC	C	10	16	1.6	6	1.5	271	244	108	*	3
F971C226#BA	B	22	16	3.5	8	1.9	212	190	85	*	3
F971C226#CC	C	22	16	3.5	8	1.1	316	285	126	*	3
F971C226#NC	N	22	16	3.5	6	0.7	463	417	185	*	3
F971C336#BA	B	33	16	5.3	10	2.1	201	181	80	*	3
F971C336#CC	C	33	16	5.3	8	1.1	316	285	126	*	3
F971C336#NC	N	33	16	5.3	6	0.7	463	417	185	*	3
F971C476#CC	C	47	16	7.5	10	1.1	316	285	126	*	3
F971C476#NC	N	47	16	7.5	8	0.7	463	417	185	*	3
20 Volt											
F971D105#AA	A	1	20	0.5	4	7.5	100	90	40	*	3
F971D155#AA	A	1.5	20	0.5	4	6.7	106	95	42	*	3
F971D225#AA	A	2.2	20	0.5	6	6.3	109	98	44	*	3
F971D335#BA	B	3.3	20	0.7	4	3.1	166	146	66	*	3
F971D475#AA	A	4.7	20	0.9	8	4.0	137	123	55	*	3
F971D475#BA	B	4.7	20	0.9	6	2.8	174	157	70	*	3
F971D685#CC	C	6.8	20	1.4	6	1.8	247	222	99	*	3
F971D106#CC	C	10	20	2.0	6	1.5	271	244	108	*	3
F971D156#NC	N	15	20	3.0	6	0.7	463	417	185	*	3
F971D226#CC	C	22	20	4.4	8	1.1	316	285	126	*	3
F971D226#NC	N	22	20	4.4	6	0.7	463	417	185	*	3
25 Volt											
F971E684#AA	A	0.68	25	0.5	4	7.6	99	89	40	*	3
F971E105#AA	A	1	25	0.5	4	7.5	100	90	40	*	3
F971E225#BA	B	2.2	25	0.6	4	3.8	150	135	60	*	3
F971E335#BA	B	3.3	25	0.8	4	3.5	156	140	62	*	3
F971E685#CC	C	6.8	25	1.7	6	1.8	247	222	99	*	3
F971E106#NC	N	10	25	2.5	6	1.0	387	349	155	*	3
F971E156#NC	N	15	25	3.8	6	0.7	463	417	185	*	3
F971E226#NC	N	22	25	5.5	6	0.7	463	417	185	*	3

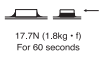
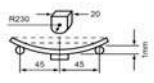
RATINGS & PART NUMBER REFERENCE

AVX Part No.	Case Size	Capacitance (µF)	Rated Voltage (V)	DCL (µA)	DF @ 120Hz (%)	ESR @ 100kHz (Ω)	100kHz RMS Current (mA)			*1 ΔC/C (%)	MSL
							25°C	85°C	125°C		
35 Volt											
F971V334#AA	A	0.33	35	0.5	4	12.0	79	71	32	*	3
F971V474#AA	A	0.47	35	0.5	4	10.0	87	78	35	*	3
F971V684#AA	A	0.68	35	0.5	4	7.6	99	89	40	*	3
F971V105#BA	B	1	35	0.5	4	4.0	146	131	58	*	3
F971V155#BA	B	1.5	35	0.5	4	4.0	146	131	58	*	3
F971V225#BA	B	2.2	35	0.8	4	3.8	150	135	60	*	3
F971V335#CC	C	3.3	35	1.2	4	2.0	235	211	94	*	3
F971V475#CC	C	4.7	35	1.6	6	1.8	247	222	99	*	3
F971V685#NC	N	6.8	35	2.4	6	1.0	387	349	155	*	3
F971V106#NC	N	10	35	3.5	6	1.0	387	349	155	*	3

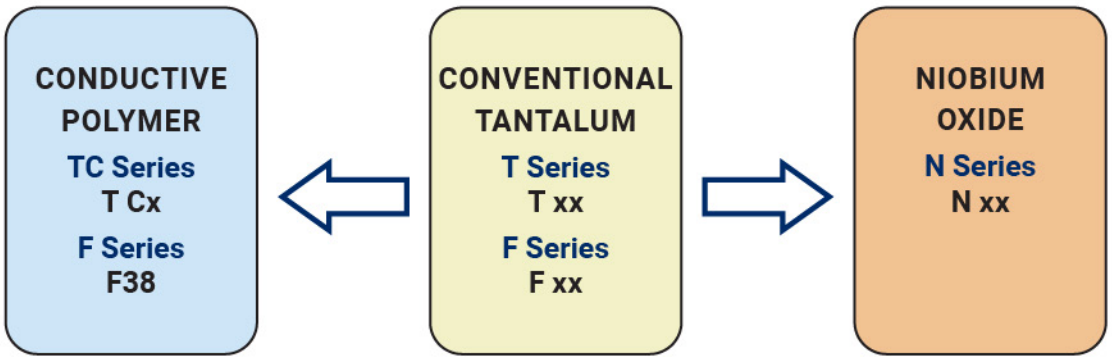
1: ΔC/C Marked ""
#: "M" for ±20% tolerance, "K" for ± 10% tolerance.
Moisture Sensitivity Level (MSL) is defined according to J-STD-020.

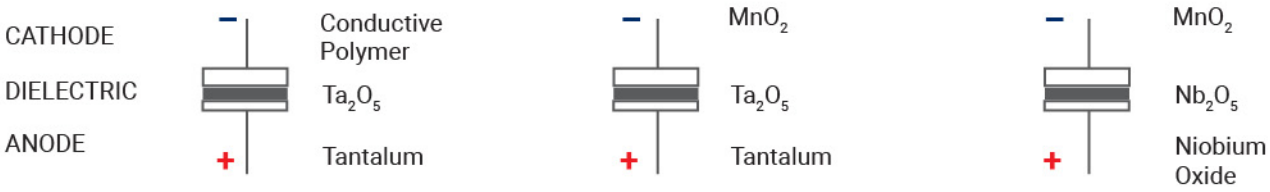
Item	All Case (%)
Damp Heat	±10
Temperature cycles	±5
Resistance soldering heat	±5
Surge	±5
Endurance	±10
Load Humidity	±10

QUALIFICATION TABLE

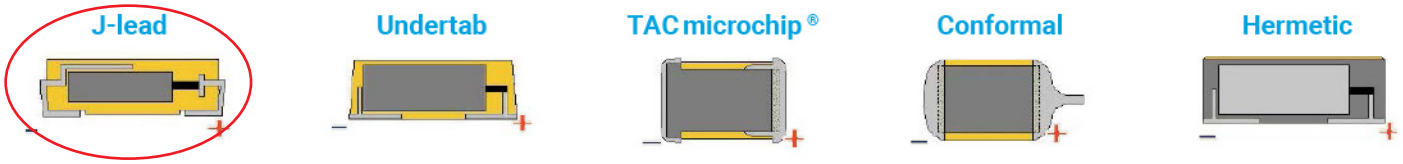
TEST	F97 series (Temperature range -55°C to +125°C) Condition
Damp Heat (Steady State)	At 85°C, 85% R.H., 1000 hours (No voltage applied) Capacitance Change ..... Refer to page 110 (*1) Dissipation Factor ..... Initial specified value or less Leakage Current ..... 125% or less than the initial specified value
Load Humidity	After 1000 hour's application of rated voltage in series with a 33Ω resistor at 85°C, 85% R.H., capacitors meet the characteristics requirements table below. Capacitance Change ..... Refer to page 110 (*1) Dissipation Factor ..... 120% or less than the initial specified value Leakage Current ..... 200% of less than the initial specified value
Temperature Cycles	At -55°C / +125°C, 30 minutes each, 1000 cycles Capacitance Change ..... Refer to page 109 (*1) Dissipation Factor ..... Initial specified value or less Leakage Current ..... Initial specified value or less
Resistance to Soldering Heat	10 seconds reflow at 260°C, 5 seconds immersion at 260°C. Capacitance Change ..... Refer to page 110 (*1) Dissipation Factor ..... Initial specified value or less Leakage Current ..... Initial specified value or less
Solderability	After immersing capacitors completely into a solder pot at 245°C for 2 to 3 seconds, more than 3/4 of their electrode area shall remain covered with new solder.
Surge	After application of surge voltage in series with a 33Ω resistor at the rate of 30 seconds ON, 30 seconds OFF, for 1000 successive test cycles at 85°C, capacitors shall meet the characteristic requirements in the table above. Capacitance Change .....Refer to page 110 (*1) Dissipation Factor .....Initial specified value or less Leakage Current .....Initial specified value or less
Endurance	After 2000 hours' application of rated voltage in series with a 3Ω resistor at 85°C, or derated voltage in series with a 3Ω resistor at 125°C, capacitors shall meet the characteristic requirements in the table above. Capacitance Change ..... Refer to page 110 (*1) Dissipation Factor ..... Initial specified value or less Leakage Current ..... Initial specified value or less
Shear Test	After applying the pressure load of 17.7N for 60 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 
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 the substrate so that substrate may bend by1mm as illustrated. Then, there shall be found no remarkable abnormality on the capacitor terminals. 
Failure Rate	0.5% per 1000 hours at 85°C, V_R with 0.1Ω/V series impedance, 60% confidence level.

AVX SOLID ELECTROLYTIC CAPACITOR ROADMAP





FIVE CAPACITOR CONSTRUCTION STYLES



SERIES LINE UP : CONVENTIONAL SMD MnO_2