

F93 Series



Resin-Molded Chip, Standard Tantalum J-Lead



FEATURES

- Compliant to the RoHS2 directive 2011/65/EU
- SMD J-lead

APPLICATIONS

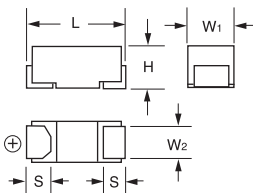
- Low power DC/DC



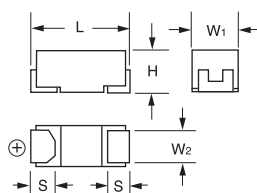
CASE DIMENSIONS: millimeters (inches)

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 (0.126 ± 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)

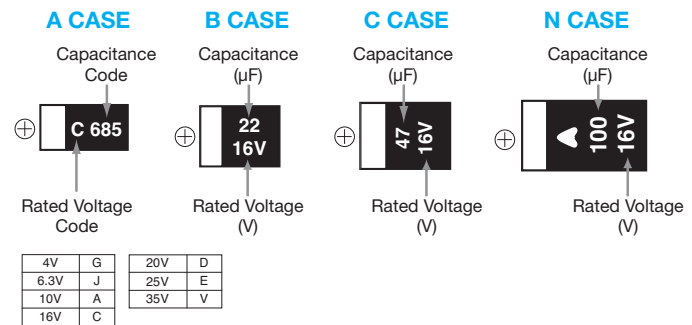
A, B CASE



C, N CASE



MARKING



HOW TO ORDER

F93	1A	106	M	A	
Type	Rated Voltage	Capacitance Code	Tolerance	Case Size	Packaging
		pF code: 1st two digits represent significant figures, 3rd digit represents multiplier (number of zeros to follow)	K = ±10% M = ±20%	See table above	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

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CAPACITANCE AND RATED VOLTAGE RANGE (LETTER DENOTES CASE SIZE)

Capacitance		Rated Voltage						
μF	Code	4V (0G)	6.3V (0J)	10V (1A)	16V (1C)	20V (1D)	25V (1E)	35V (1V)
0.68	684							A
1.0	105				A		A	A
1.5	155				A		A	A
2.2	225				A	A	A	A/B
3.3	335				A	A	A	B
4.7	475			A	A	A/B	A/B	B/C
6.8	685			A	A	A/B		C
10	106		A	A	A/B	A/B	B/C	C
15	156		A	A	A/B	C	C	N
22	226	A	A	A/B	A/B/C	B/C	C/N	N
33	336	A	A	A/B	B/C	C/N	N	N*
47	476	A	A/B	A/B/C	B/C/N	C/N	N	
68	686	A	A/B	B/C	C/N	N*		
100	107	A/B	A/B/C	B/C/N	C/N			
150	157	B	B/C	C/N	N			
220	227	A*/B/C	B/C/N	C/N	N			
330	337	C	C*/N	N				
470	447	N	N					
680	687	N	N*					

Released ratings

*Ratings 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 No.	Case Size	Capacitance (μF)	Rated Voltage (V)	DCL (μA)	DF @ 120Hz (%)	ESR @ 100kHz (Ω)	*1 ΔC/C (%)
4 Volt							
F930G226MAA	A	22	4	0.9	6	2.5	*
F930G336MAA	A	33	4	1.3	8	2.5	*
F930G476MAA	A	47	4	1.9	18	2.5	*
F930G686MAA	A	68	4	2.7	24	2.5	*
F930G107MAA	A	100	4	4.0	30	2.0	*
F930G107MBA	B	100	4	4.0	14	0.9	*
F930G157MBA	B	150	4	6.0	16	0.7	*
F930G227MBA	B	220	4	8.8	18	0.7	*
F930G227MCC	C	220	4	8.8	12	0.7	*
F930G337MCC	C	330	4	13.2	14	0.7	*
F930G477MNC	N	470	4	18.8	16	0.3	*
F930G687MNC	N	680	4	27.2	18	0.3	*
6.3 Volt							
F930J106MAA	A	10	6.3	0.6	6	3.0	*
F930J156MAA	A	15	6.3	0.9	6	2.9	*
F930J226MAA	A	22	6.3	1.4	8	2.5	*
F930J336MAA	A	33	6.3	2.1	8	2.5	*
F930J476MAA	A	47	6.3	3.0	18	2.5	*
F930J476MBA	B	47	6.3	3.0	6	1.0	*
F930J686MAA	A	68	6.3	4.3	20	2.0	*
F930J686MBA	B	68	6.3	4.3	8	1.0	*
F930J107MAA	A	100	6.3	6.3	35	2.0	±15
F930J107MBA	B	100	6.3	6.3	14	0.9	*
F930J107MCC	C	100	6.3	6.3	8	0.7	*
F930J157MBA	B	150	6.3	9.5	18	0.9	*
F930J157MCC	C	150	6.3	9.5	12	0.7	*
F930J227MBA	B	220	6.3	13.9	30	1.2	±15
F930J227MCC	C	220	6.3	13.9	14	0.7	*
F930J227MNC	N	220	6.3	13.9	10	0.5	*
F930J337MNC	N	330	6.3	20.8	14	0.5	*
F930J477MNC	N	470	6.3	29.6	16	0.3	*
10 Volt							
F931A475MAA	A	4.7	10	0.5	6	4.0	*
F931A685MAA	A	6.8	10	0.7	6	3.5	*
F931A106MAA	A	10	10	1.0	6	3.0	*
F931A156MAA	A	15	10	1.5	8	2.9	*
F931A226MAA	A	22	10	2.2	12	2.5	*
F931A226MBA	B	22	10	2.2	6	1.9	*
F931A336MAA	A	33	10	3.3	18	2.5	*
F931A336MBA	B	33	10	3.3	8	1.4	*
F931A476MAA	A	47	10	4.7	40	2.0	±15
F931A476MBA	B	47	10	4.7	8	1.0	*
F931A476MCC	C	47	10	4.7	6	0.9	*
F931A686MBA	B	68	10	6.8	12	0.9	±15
F931A686MCC	C	68	10	6.8	8	0.8	*
F931A107MBA	B	100	10	10.0	18	1.2	±15
F931A107MCC	C	100	10	10.0	10	0.7	*
F931A107MNC	N	100	10	10.0	8	0.6	*
F931A157MCC	C	150	10	15.0	14	0.7	*
F931A157MNC	N	150	10	15.0	10	0.6	*
F931A227MCC	C	220	10	22.0	40	0.9	±15
F931A227MNC	N	220	10	22.0	12	0.5	*
F931A337MNC	N	330	10	33.0	18	0.5	*
16 Volt							
F931C105MAA	A	1	16	0.5	4	7.5	*
F931C155MAA	A	1.5	16	0.5	4	6.0	*
F931C225MAA	A	2.2	16	0.5	4	5.0	*
F931C335MAA	A	3.3	16	0.5	4	4.5	*
F931C475MAA	A	4.7	16	0.8	6	4.0	*
F931C685MAA	A	6.8	16	1.1	6	3.5	*

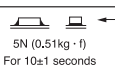
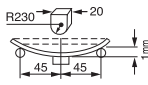
AVX Part No.	Case Size	Capacitance (μF)	Rated Voltage (V)	DCL (μA)	DF @ 120Hz (%)	ESR @ 100kHz (Ω)	*1 ΔC/C (%)
16 Volt							
F931C106MAA	A	10	16	1.6	6	3.0	*
F931C106MBA	B	10	16	1.6	6	2.0	*
F931C156MAA	A	15	16	2.4	10	3.0	*
F931C156MBA	B	15	16	2.4	6	2.0	*
F931C226MAA	A	22	16	3.5	15	3.0	±15
F931C226MBA	B	22	16	3.5	8	1.9	*
F931C226MCC	C	22	16	3.5	6	1.1	*
F931C336MBA	B	33	16	5.3	8	1.9	*
F931C336MCC	C	33	16	5.3	6	1.1	*
F931C476MBA	B	47	16	7.5	16	2.0	±15
F931C476MCC	C	47	16	7.5	8	0.9	*
F931C476MNC	N	47	16	7.5	6	0.7	*
F931C686MCC	C	68	16	10.9	10	0.8	±10
F931C686MNC	N	68	16	10.9	6	0.6	*
F931C107MCC	C	100	16	16.0	15	0.7	±10
F931C107MNC	N	100	16	16.0	10	0.6	*
F931C157MNC	N	150	16	24.0	15	0.6	*
F931C227MNC	N	220	16	35.2	25	0.7	±10
20 Volt							
F931D225MAA	A	2.2	20	0.5	4	5.0	*
F931D335MAA	A	3.3	20	0.7	4	4.5	*
F931D475MAA	A	4.7	20	0.9	6	3.0	*
F931D475MBA	B	4.7	20	0.9	6	2.8	*
F931D685MAA	A	6.8	20	1.4	6	3.5	*
F931D685MBA	B	6.8	20	1.4	6	2.5	*
F931D106MAA	A	10	20	2.0	8	3.5	*
F931D106MBA	B	10	20	2.0	6	2.1	*
F931D156MCC	C	15	20	3.0	6	1.2	*
F931D226MBA	B	22	20	4.4	8	1.9	*
F931D226MCC	C	22	20	4.4	8	1.1	*
F931D336MCC	C	33	20	6.6	8	1.1	*
F931D336MNC	N	33	20	6.6	6	0.7	*
F931D476MCC	C	47	20	9.4	10	1.1	*
F931D476MNC	N	47	20	9.4	8	0.7	*
25 Volt							
F931E105MAA	A	1	25	0.5	4	7.5	*
F931E155MAA	A	1.5	25	0.5	4	6.7	*
F931E225MAA	A	2.2	25	0.6	6	6.3	*
F931E335MAA	A	3.3	25	0.8	6	6.0	*
F931E475MAA	A	4.7	25	1.2	8	4.0	*
F931E475MBA	B	4.7	25	1.2	6	2.8	*
F931E106MBA	B	10	25	2.5	12	1.9	*
F931E106MCC	C	10	25	2.5	6	1.5	*
F931E156MCC	C	15	25	3.8	8	1.2	*
F931E226MCC	C	22	25	5.5	8	1.1	*
F931E226MNC	N	22	25	5.5	6	0.7	*
F931E336MNC	N	33	25	8.3	8	0.7	*
F931E476MNC	N	47	25	11.8	8	0.7	*
35 Volt							
F931V684MAA	A	0.68	35	0.5	4	7.6	*
F931V105MAA	A	1	35	0.5	4	7.5	*
F931V155MAA	A	1.5	35	0.5	6	7.5	*
F931V225MAA	A	2.2	35	0.8	6	7.0	*
F931V225MBA	B	2.2	35	0.8	4	3.8	*
F931V335MBA	B	3.3	35	1.2	4	3.5	*
F931V475MBA	B	4.7	35	1.6	8	3.1	*
F931V475MCC	C	4.7	35	1.6	6	1.8	*
F931V685MCC	C	6.8	35	2.4	6	1.8	*
F931V106MCC	C	10	35	3.5	6	1.6	*
F931V156MNC	N	15	35	5.3	6	0.7	*
F931V226MNC	N	22	35	7.7	8	0.7	*

1: ΔC/C Marked “”

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

* In case of capacitance tolerance ± 10% type, “K” will be put at 9th digit of type numbering system

QUALIFICATION TABLE

TEST	F93 series (Temperature range -55°C to +125°C)	
	Condition	
Damp Heat (Steady State)	At 40°C, 90 to 95% R.H., 500 hours (No voltage applied) Capacitance Change Refer to page 21 (*1) Dissipation Factor Initial specified value or less Leakage Current Initial specified value or less	
Temperature Cycles	-55°C / +125°C, 30 minutes each, 5 cycles Capacitance Change Refer to page 21 (*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 21 (*1) Dissipation Factor Initial specified value or less Leakage Current Initial specified value or less	
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 21 (*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 21 (*1) Dissipation Factor Initial specified value or less Leakage Current Initial specified value or less	
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.	
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.	
Failure Rate	1% per 1000 hours at 85°C, VR with 0.1Ω/V series impedance, 60% confidence level.	

We can supply the type of compliance to AEC-Q200. Please contact to your local AVX sales office when these series are being designed in your application.

Mouser Electronics

Authorized Distributor

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AVX:

F931A157MCC	F931C107MCC	F930G686KAA	F930J476KBA	F931A226KBA	F931A475MAA	F931D155MAA
F931C226MBA	F930E227MBA	F930J227MNC	F931E225KAA	F931A107KCC	F931V475MCC	F931E475KBA
F931D475MAA	F931E155MAA	F931A107KBA	F931V335KBA	F931V335MBA	F931A476MBA	F930E477MCC
F930J227KBA	F930J686MCC	F931A686MCC	F931D685MAA	F930G226MBA	F930J107MAA	F930J336MAA
F931E226MCC	F931A106KAA	F930J686KBA	F931C476KNC	F930G687KNC	F931D105MAA	F931V156KNC
F931A226KAA	F931C157KNC	F931D106MBA	F931C156KAA	F931V474KAA	F930G337MCC	F931V684KAA
F931E475MAA	F930G687MNC	F931C227KNC	F931D475KBA	F931A107KNC	F930J157KBA	F931D225MAA
F931C336KBA	F930J336MBA	F930G337KCC	F931C155MAA	F931D336MCC	F931C476MCC	F930G157MBA
F930E477MNC	F931C226MCC	F931A336MBA	F930J156MBA	F931V226MNC	F930J107KCC	F931D685MBA
F931V106KCC	F931A156MBA	F931E106KCC	F931A336MAA	F931E105MAA	F931A686MNC	F931A476MAA
F930G107KAA	F930G107MBA	F931C106KCC	F931C226KAA	F931V225MAA	F931E156KNC	F931A335MAA
F930J107MBA	F931A107MNC	F931C107KNC	F931A226MAA	F931D106KAA	F930J157MCC	F931D225KAA
F930G336KAA	F930J475KAA	F931V475MBA	F931C105KAA	F931D226KBA	F930J107MCC	F930G106MAA
F931V475KCC	F931C336MBA	F931E476KNC	F930J337MNC	F931C335MAA	F931E336KNC	F931E476MNC
F931C476MNC	F931E106KBA					