F93-AJ6 Series

Resin-Molded Chip - Automotive Product Range



FEATURES

- Compliant to the RoHS3 directive 2015/863/EU
- Compliant to AEC-Q200
- 100% Surge Current Tested

APPLICATIONS

- Cabin Electronics
- Infotainment

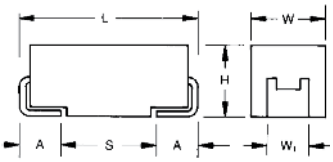
LEAD-FREE
LEAD-FREE COMPATIBLE COMPONENT

RoHS COMPLIANT

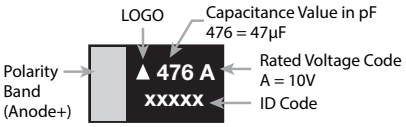
CASE DIMENSIONS: millimeters (inches)

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)
N	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)

W_1 dimension applies to the termination width for a dimensional area only



A, B, C, N CASE



4V	G	16V	C	35V	V
6.3V	J	20V	D		
10V	A	25V	E		

*Capacitance code of "P" case products are as shown below.

HOW TO ORDER

F93	1A	106	M	A	□	AJ6
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	**AEC-Q200 Compliant**

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 0µA, 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 6µA, 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	4V (0G)	6.3V (0J)	10V (1A)	16V (1C)	20V (1D)	25V (1E)	35 V (1V)
1.0	105				A		A	A
1.5	155						A	A
2.2	225				A	A	A	B
3.3	335				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	B	C	C
15	156		A	A	B	C	C	N
22	226	A	A	A/B	B/C	B/C	N	N
33	336	A	A	B	B/C	C/N	N	N
47	476	A	A/B	B/C	C/N	C/N	N	
68	686	A	B	B/C	C/N			
100	107	A/B	B/C	C/N	C/N			
150	157	B	C	N				
220	227	B/C	C/N	N				
330	337	C	N					
470	477	N	N					
680	687	N	N					

Released ratings

RATINGS & PART NUMBER REFERENCE

Part Number	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		
4 Volt											
F930G226#AAAJ6	A	22	4	0.9	6	2.5	173	156	69	*	3
F930G336#AAAJ6	A	33	4	1.3	8	2.5	173	156	69	*	3
F930G476#AAAJ6	A	47	4	1.9	18	2.5	173	156	69	*	3
F930G686#AAAJ6	A	68	4	2.7	24	2.5	173	156	69	*	3
F930G107#AAAJ6	A	100	4	4	30	2.0	194	174	77	*	3
F930G107#BAAJ6	B	100	4	4	14	0.9	307	277	123	*	3
F930G157#BAAJ6	B	150	4	6	16	0.7	348	314	139	*	3
F930G227#BAAJ6	B	220	4	8.8	18	0.7	348	314	139	*	3
F930G227#CCAJ6	C	220	4	8.8	12	0.7	396	357	159	*	3
F930G337#CCAJ6	C	330	4	13.2	14	0.7	396	357	159	*	3
F930G477#NCAJ6	N	470	4	18.8	16	0.3	707	636	283	*	3
F930G687#NCAJ6	N	680	4	27.2	18	0.3	707	636	283	*	3
6.3 Volt											
F930J106#AAAJ6	A	10	6.3	0.6	6	3.0	158	142	63	*	3
F930J156#AAAJ6	A	15	6.3	0.9	6	2.9	161	145	64	*	3
F930J226#AAAJ6	A	22	6.3	1.4	8	2.5	173	156	69	*	3
F930J336#AAAJ6	A	33	6.3	2.1	8	2.5	173	156	69	*	3
F930J476#AAAJ6	A	47	6.3	3	18	2.5	173	156	69	*	3
F930J476#BAAJ6	B	47	6.3	3	6	1.0	292	262	117	*	3
F930J686#BAAJ6	B	68	6.3	4.3	8	1.0	292	262	117	*	3
F930J107#BAAJ6	B	100	6.3	6.3	14	0.9	307	277	123	*	3
F930J107#CCAJ6	C	100	6.3	6.3	8	0.7	396	357	159	*	3
F930J157#CCAJ6	C	150	6.3	9.5	12	0.7	396	357	159	*	3
F930J227#CCAJ6	C	220	6.3	13.9	14	0.7	396	357	159	*	3
F930J227#NCAJ6	N	220	6.3	13.9	10	0.5	548	493	219	*	3
F930J337#NCAJ6	N	330	6.3	20.8	14	0.5	548	493	219	*	3
F930J477#NCAJ6	N	470	6.3	29.6	16	0.3	707	636	283	*	3
F930J687#NCAJ6	N	680	6.3	42.8	40	0.3	707	636	283	±15	3
10 Volt											
F931A475#AAAJ6	A	4.7	10	0.5	6	4.0	137	123	55	*	3
F931A685#AAAJ6	A	6.8	10	0.7	6	3.5	146	132	59	*	3
F931A106#AAAJ6	A	10	10	1	6	3.0	158	142	63	*	3
F931A156#AAAJ6	A	15	10	1.5	8	2.9	161	145	64	*	3
F931A226#AAAJ6	A	22	10	2.2	12	2.5	173	156	69	*	3
F931A226#BAAJ6	B	22	10	2.2	6	1.9	212	190	85	*	3
F931A336#BAAJ6	B	33	10	3.3	8	1.4	246	222	99	*	3
F931A476#BAAJ6	B	47	10	4.7	8	1.0	292	262	117	*	3
F931A476#CCAJ6	C	47	10	4.7	6	0.9	350	315	140	*	3
F931A686#BAAJ6	B	68	10	6.8	12	0.9	307	277	123	±15	3
F931A686#CCAJ6	C	68	10	6.8	8	0.8	371	334	148	*	3
F931A107#CCAJ6	C	100	10	10	10	0.7	396	357	159	*	3
F931A107#NCAJ6	N	100	10	10	8	0.6	500	450	200	*	3
F931A157#NCAJ6	N	150	10	15	10	0.6	500	450	200	*	3
F931A227#NCAJ6	N	220	10	22	12	0.5	548	493	219	*	3

1: ΔC/C Marked ""
*#: "M" for ±20% tolerance, "K" for ± 10% tolerance. When you need K tolerance for the part numbers which have M tolerance only, please contact to your local KYOCERA AVX sales office.
Moisture Sensitivity Level (MSL) is defined according to J-STD-020.

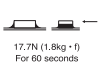
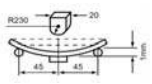
RATINGS & PART NUMBER REFERENCE

Part Number	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		
16 Volt											
F931C105#AAAJ6	A	1	16	0.5	4	7.5	100	90	40	*	3
F931C225#AAAJ6	A	2.2	16	0.5	4	5.0	122	110	49	*	3
F931C335#AAAJ6	A	3.3	16	0.5	4	4.5	129	116	52	*	3
F931C475#AAAJ6	A	4.7	16	0.8	6	4.0	137	123	55	*	3
F931C685#AAAJ6	A	6.8	16	1.1	6	3.5	146	132	59	*	3
F931C106#AAAJ6	A	10	16	1.6	6	3.0	158	142	63	*	3
F931C106#BAAJ6	B	10	16	1.6	6	2.0	206	186	82	*	3
F931C156#BAAJ6	B	15	16	2.4	6	2.0	206	186	82	*	3
F931C226#BAAJ6	B	22	16	3.5	8	1.9	212	190	85	*	3
F931C226#CCAJ6	C	22	16	3.5	6	1.1	316	285	126	*	3
F931C336#BAAJ6	B	33	16	5.3	8	1.9	212	190	85	*	3
F931C336#CCAJ6	C	33	16	5.3	6	1.1	316	285	126	*	3
F931C476#CCAJ6	C	47	16	7.5	8	0.9	350	315	140	*	3
F931C476#NCAJ6	N	47	16	7.5	6	0.7	463	417	185	*	3
F931C686#CCAJ6	C	68	16	10.9	10	0.8	371	334	148	*	3
F931C686#NCAJ6	N	68	16	10.9	6	0.6	500	450	200	*	3
F931C107#CCAJ6	C	100	16	16	15	0.7	396	357	159	*	3
F931C107#NCAJ6	N	100	16	16	10	0.6	500	450	200	*	3
20 Volt											
F931D225#AAAJ6	A	2.2	20	0.5	4	5.0	122	110	49	*	3
F931D335#AAAJ6	A	3.3	20	0.7	4	4.5	129	116	52	*	3
F931D475#AAAJ6	A	4.7	20	0.9	6	3.0	158	142	63	*	3
F931D475#BAAJ6	B	4.7	20	0.9	6	2.8	174	157	70	*	3
F931D685#AAAJ6	A	6.8	20	1.4	6	3.5	146	132	59	*	3
F931D685#BAAJ6	B	6.8	20	1.4	6	2.5	184	166	74	*	3
F931D106#BAAJ6	B	10	20	2	6	2.1	201	181	80	*	3
F931D156#CCAJ6	C	15	20	3	6	1.2	303	272	121	*	3
F931D226#BAAJ6	B	22	20	4.4	8	1.9	212	190	85	*	3
F931D226#CCAJ6	C	22	20	4.4	8	1.1	316	285	126	*	3
F931D336#CCAJ6	C	33	20	6.6	8	1.1	316	285	126	*	3
F931D336#NCAJ6	N	33	20	6.6	6	0.7	463	417	185	*	3
F931D476#CCAJ6	C	47	20	9.4	10	1.1	316	285	126	*	3
F931D476#NCAJ6	N	47	20	9.4	8	0.7	463	417	185	*	3
25 Volt											
F931E105#AAAJ6	A	1	25	0.5	4	7.5	100	90	40	*	3
F931E155#AAAJ6	A	1.5	25	0.5	4	6.7	106	95	42	*	3
F931E225#AAAJ6	A	2.2	25	0.6	6	6.3	109	98	44	*	3
F931E475#AAAJ6	A	4.7	25	1.2	8	4.0	137	123	55	*	3
F931E475#BAAJ6	B	4.7	25	1.2	6	2.8	174	157	70	*	3
F931E106#CCAJ6	C	10	25	2.5	6	1.5	271	244	108	*	3
F931E156#CCAJ6	C	15	25	3.8	8	1.2	303	272	121	*	3
F931E226#NCAJ6	N	22	25	5.5	6	0.7	463	417	185	*	3
F931E336#NCAJ6	N	33	25	8.3	8	0.7	463	417	185	*	3
F931E476#NCAJ6	N	47	25	11.8	8	0.7	463	417	185	*	3
35 Volt											
F931V105#AAAJ6	A	1	35	0.5	4	7.5	100	90	40	*	3
F931V155#AAAJ6	A	1.5	35	0.5	6	7.5	100	90	40	*	3
F931V225#BAAJ6	B	2.2	35	0.8	4	3.8	150	135	60	*	3
F931V335#BAAJ6	B	3.3	35	1.2	4	3.5	156	140	62	*	3
F931V475#BAAJ6	B	4.7	35	1.6	8	3.1	166	149	66	*	3
F931V475#CCAJ6	C	4.7	35	1.6	6	1.8	247	222	99	*	3
F931V685#CCAJ6	C	6.8	35	2.4	6	1.8	247	222	99	*	3
F931V106#CCAJ6	C	10	35	3.5	6	1.6	262	236	105	*	3
F931V156#NCAJ6	N	15	35	5.3	6	0.7	463	417	185	*	3
F931V226#NCAJ6	N	22	35	7.7	8	0.7	463	417	185	*	3
F931V336#NCAJ6	N	33	35	11.6	8	0.7	463	417	185	*	3

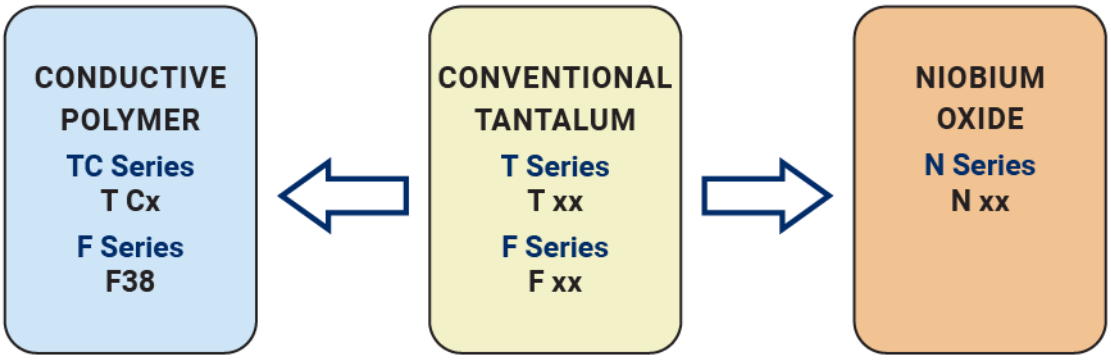
1: ΔC/C Marked ""
*#: "M" for ±20% tolerance, "K" for ± 10% tolerance. When you need K tolerance for the part numbers which have M tolerance only, please contact to your local KYOCERA AVX sales office.
Moisture Sensitivity Level (MSL) is defined according to J-STD-020.

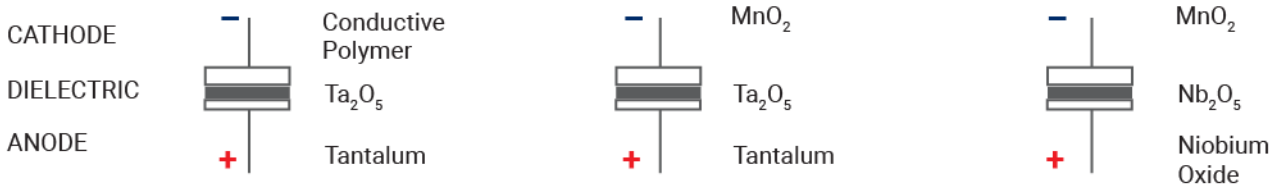
Item	All Case (%)
Damp Heat	±10
Temperature cycles	±10
Resistance soldering heat	±10
Surge	±10
Endurance	±10
Load Humidity	±10

QUALIFICATION TABLE

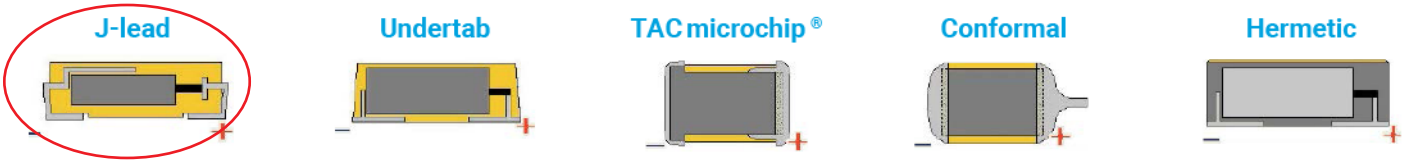
TEST	F92 series (Temperature range -55°C to +125°C)
	Condition
Damp Heat (Steady State)	At 40°C, 90 to 95% R.H., 500 hours (No voltage applied) Capacitance Change ..... Refer to the table above (*1) Dissipation Factor ..... Initial specified value or less Leakage Current ..... Initial specified value or less
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 the table above (*1) Dissipation Factor ..... Initial specified value or less Leakage Current ..... 125% or less than the initial specified value
Temperature Cycles	At -55°C / +125°C, 30 minutes each, 1000 cycles Capacitance Change ..... Refer to the table above (*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, 10 seconds immersion at 260°C. Capacitance Change ..... Refer to the table above (*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 85ºC, capacitors shall meet the characteristic requirements in the table above. Capacitance Change .....Refer to the table above (*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 the table above (*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	1% per 1000 hours at 85°C, V_R with 0.1Ω/V series impedance, 60% confidence level.

SOLID ELECTROLYTIC CAPACITOR ROADMAP

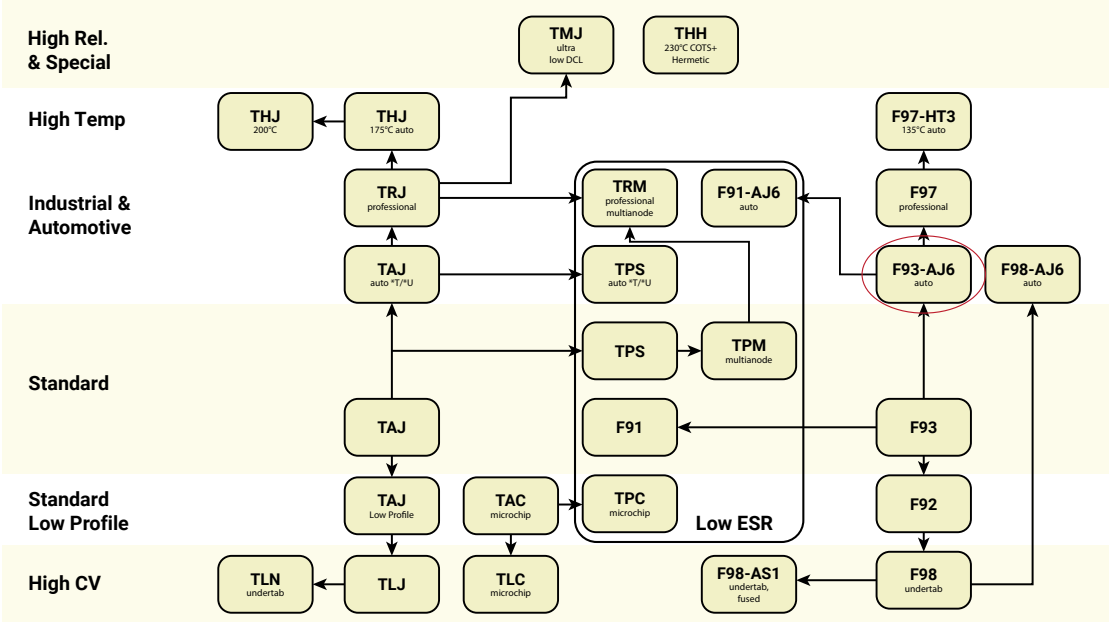




FIVE CAPACITOR CONSTRUCTION STYLES



SERIES LINE UP: CONVENTIONAL SMD MnO2



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