F93-AJ6 Series

Resin-Molded Chip - Automotive Product Range

FEATURES

- Compliant to the RoHS2 directive 2011/65/EU
- Compliant to AEC-Q200

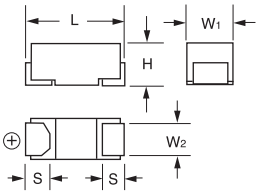
APPLICATIONS

- Cabin electronics
- Infotainment

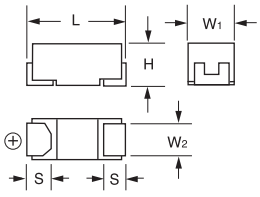
LEAD-FREE
LEAD-FREE COMPATIBLE COMPONENT

RoHS COMPLIANT

A, B CASE



C, N CASE

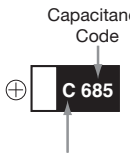


CASE DIMENSIONS: millimeters (inches)

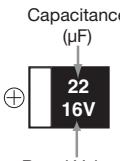
Code	L	W_1	W_2	H	S
A	3.20 ± 0.20 (0.126 ± 0.008)	1.60 ± 0.20 (0.063 ± 0.008)	1.20 ± 0.10 (0.047 ± 0.004)	1.60 ± 0.20 (0.063 ± 0.008)	0.80 ± 0.20 (0.031 ± 0.008)
B	3.50 ± 0.20 (0.126 ± 0.008)	2.80 ± 0.20 (0.110 ± 0.008)	2.20 ± 0.10 (0.087 ± 0.004)	1.90 ± 0.20 (0.075 ± 0.008)	0.80 ± 0.20 (0.031 ± 0.008)
C	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	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)

MARKING

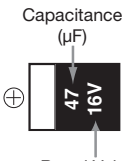
A CASE



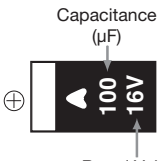
B CASE



C CASE



N CASE



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

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 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)
1	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	B/C	B/C	C/N	N
33	336	A	A	A/B	B/C	C/N	N	
47	476	A	A/B	B/C	C/N	C/N	N	
68	686	A	A/B	B/C	C/N			
100	107	A/B	B/C	C/N	N			
150	157	B	B/C	N	N			
220	227	B/C	C/N	N				
330	337	C	N	N				
470	477	N	N					
680	687	N						

Available Ratings

F93-AJ6 Series

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RATINGS & PART NUMBER REFERENCE

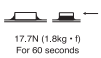
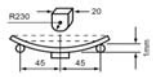
AVX Part No.	Case Size	Capacitance (µF)	Rated Voltage (V)	DCL (µA)	DF (%) @ 120Hz	ESR (Ω) @ 100kHz	*1 ΔC/C (%)
4 Volt							
F930G226MAAAJ6	A	22	4	0.9	6	2.5	*
F930G336MAAAJ6	A	33	4	1.3	8	2.5	*
F930G476MAAAJ6	A	47	4	1.9	18	2.5	*
F930G686MAAAJ6	A	68	4	2.7	24	2.5	*
F930G107MAAAJ6	A	100	4	4	30	2.0	*
F930G107MBAAJ6	B	100	4	4	14	0.9	*
F930G157MBAAJ6	B	150	4	6	16	0.7	*
F930G227MBAAJ6	B	220	4	8.8	18	0.7	*
F930G227MCCAJ6	C	220	4	8.8	12	0.7	*
F930G337MCCAJ6	C	330	4	13.2	14	0.7	*
F930G477MNCAJ6	N	470	4	18.8	16	0.3	*
F930G687MNCAJ6	N	680	4	27.2	18	0.3	*
6.3 Volt							
F930J106MAAAJ6	A	10	6.3	0.6	6	3.0	*
F930J156MAAAJ6	A	15	6.3	0.9	6	2.9	*
F930J226MAAAJ6	A	22	6.3	1.4	8	2.5	*
F930J336MAAAJ6	A	33	6.3	2.1	8	2.5	*
F930J476MAAAJ6	A	47	6.3	3	18	2.5	*
F930J476MBAAJ6	B	47	6.3	3	6	1.0	*
F930J686MAAAJ6	A	68	6.3	4.3	20	2.0	*
F930J686MBAAJ6	B	68	6.3	4.3	8	1.0	*
F930J107MBAAJ6	B	100	6.3	6.3	14	0.9	*
F930J107MCCAJ6	C	100	6.3	6.3	8	0.7	*
F930J157MBAAJ6	B	150	6.3	9.5	18	0.9	*
F930J157MCCAJ6	C	150	6.3	9.5	12	0.7	*
F930J227MCCAJ6	C	220	6.3	13.9	14	0.7	*
F930J227MNCAJ6	N	220	6.3	13.9	10	0.5	*
F930J337MNCAJ6	N	330	6.3	20.8	14	0.5	*
F930J477MNCAJ6	N	470	6.3	29.6	16	0.3	*
10 Volt							
F931A475MAAAJ6	A	4.7	10	0.5	6	4.0	*
F931A685MAAAJ6	A	6.8	10	0.7	6	3.5	*
F931A106MAAAJ6	A	10	10	1	6	3.0	*
F931A156MAAAJ6	A	15	10	1.5	8	2.9	*
F931A226MAAAJ6	A	22	10	2.2	12	2.5	*
F931A226MBAAJ6	B	22	10	2.2	6	1.9	*
F931A336MAAAJ6	A	33	10	3.3	18	2.5	*
F931A336MBAAJ6	B	33	10	3.3	8	1.4	*
F931A476MBAAJ6	B	47	10	4.7	8	1.0	*
F931A476MCCAJ6	C	47	10	4.7	6	0.9	*
F931A686MBAAJ6	B	68	10	6.8	12	0.9	±15
F931A686MCCAJ6	C	68	10	6.8	8	0.8	*
F931A107MCCAJ6	C	100	10	10	10	0.7	*
F931A107MNCAJ6	N	100	10	10	8	0.6	*
F931A157MNCAJ6	N	150	10	15	10	0.6	*
F931A227MNCAJ6	N	220	10	22	12	0.5	*
F931A337MNCAJ6	N	330	10	33	18	0.5	*
16 Volt							
F931C105MAAAJ6	A	1	16	0.5	4	7.5	*
F931C155MAAAJ6	A	1.5	16	0.5	4	6.0	*
F931C225MAAAJ6	A	2.2	16	0.5	4	5.0	*
F931C335MAAAJ6	A	3.3	16	0.5	4	4.5	*
F931C475MAAAJ6	A	4.7	16	0.8	6	4.0	*
F931C685MAAAJ6	A	6.8	16	1.1	6	3.5	*
F931C106MAAAJ6	A	10	16	1.6	6	3.0	*
F931C106MBAAJ6	B	10	16	1.6	6	2.0	*
F931C156MAAAJ6	A	15	16	2.4	10	3.0	*
F931C156MBAAJ6	B	15	16	2.4	6	2.0	*
F931C226MBAAJ6	B	22	16	3.5	8	1.9	*
F931C226MCCAJ6	C	22	16	3.5	6	1.1	*
F931C336MBAAJ6	B	33	16	5.3	8	1.9	*
F931C336MCCAJ6	C	33	16	5.3	6	1.1	*
F931C476MCCAJ6	C	47	16	7.5	8	0.9	*
F931C476MNCAJ6	N	47	16	7.5	6	0.7	*
F931C686MCCAJ6	C	68	16	10.9	10	0.8	*
F931C686MNCAJ6	N	68	16	10.9	6	0.6	*
F931C107MNCAJ6	N	100	16	16	10	0.6	*
F931C157MNCAJ6	N	150	16	24	15	0.6	*
20 Volt							
F931D225MAAAJ6	A	2.2	20	0.5	4	5.0	*
F931D335MAAAJ6	A	3.3	20	0.7	4	4.5	*
F931D475MAAAJ6	A	4.7	20	0.9	6	3.0	*
F931D475MBAAJ6	B	4.7	20	0.9	6	2.8	*
F931D685MAAAJ6	A	6.8	20	1.4	6	3.5	*
F931D685MBAAJ6	B	6.8	20	1.4	6	2.5	*
F931D106MAAAJ6	A	10	20	2	8	3.5	*
F931D106MBAAJ6	B	10	20	2	6	2.1	*
F931D156MCCAJ6	C	15	20	3	6	1.2	*
F931D226MBAAJ6	B	22	20	4.4	8	1.9	*
F931D226MCCAJ6	C	22	20	4.4	8	1.1	*
F931D336MCCAJ6	C	33	20	6.6	8	1.1	*
F931D336MNCAJ6	N	33	20	6.6	6	0.7	*
F931D476MCCAJ6	C	47	20	9.4	10	1.1	*
F931D476MNCAJ6	N	47	20	9.4	8	0.7	*
25 Volt							
F931E105MAAAJ6	A	1	25	0.5	4	7.5	*
F931E155MAAAJ6	A	1.5	25	0.5	4	6.7	*
F931E225MAAAJ6	A	2.2	25	0.6	6	6.3	*
F931E335MAAAJ6	A	3.3	25	0.8	6	6.0	*
F931E475MAAAJ6	A	4.7	25	1.2	8	4.0	*
F931E475MBAAJ6	B	4.7	25	1.2	6	2.8	*
F931E106MBAAJ6	B	10	25	2.5	12	1.9	*
F931E106MCCAJ6	C	10	25	2.5	6	1.5	*
F931E156MCCAJ6	C	15	25	3.8	8	1.2	*
F931E226MCCAJ6	C	22	25	5.5	8	1.1	*
F931E226MNCAJ6	N	22	25	5.5	6	0.7	*
F931E336MNCAJ6	N	33	25	8.3	8	0.7	*
F931E476MNCAJ6	N	47	25	11.8	8	0.7	*
35 Volt							
F931V105MAAAJ6	A	1	35	0.5	4	7.5	*
F931V155MAAAJ6	A	1.5	35	0.5	6	7.5	*
F931V225MAAAJ6	A	2.2	35	0.8	6	7.0	*
F931V225MBAAJ6	B	2.2	35	0.8	4	3.8	*
F931V335MBAAJ6	B	3.3	35	1.2	4	3.5	*
F931V475MBAAJ6	B	4.7	35	1.6	8	3.1	*
F931V475MCCAJ6	C	4.7	35	1.6	6	1.8	*
F931V685MCCAJ6	C	6.8	35	2.4	6	1.8	*
F931V106MCCAJ6	C	10	35	3.5	6	1.6	*
F931V156MNCAJ6	N	15	35	5.3	6	0.7	*
F931V226MNCAJ6	N	22	35	7.7	8	0.7	*

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

1: ΔC/C Marked ""

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

QUALIFICATION TABLE

TEST	F93-AJ6 series (Temperature range -55ºC to +125ºC) Condition
Damp Heat (Steady State)	At 40°C, 90 to 95% R.H., 500 hours (No voltage applied) Capacitance Change ..... Refer to page 24 (*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 page 24 (*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 page 24 (*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 page 24 (*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 page 24 (*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 24 (*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.