

F93Resin-molded Chip,
Standard Series

- Compliant to the RoHS directive (2002/95/EC).



■ Type numbering system (Example: 10V 10μF)



■ Drawing



■ Dimensions

Case code	L	W ₁	W ₂	H	S
A	3.2 ± 0.2	1.6 ± 0.2	1.2 ± 0.1	1.6 ± 0.2	0.8 ± 0.2
B	3.5 ± 0.2	2.8 ± 0.2	2.2 ± 0.1	1.9 ± 0.2	0.8 ± 0.2
C	6.0 ± 0.2	3.2 ± 0.2	2.2 ± 0.1	2.5 ± 0.2	1.3 ± 0.2
N	7.3 ± 0.2	4.3 ± 0.2	2.4 ± 0.1	2.8 ± 0.2	1.3 ± 0.2

■ Marking



■ Standard Ratings

Cap. (μF)	V	4	6.3	10	16	20	25	35
Code		0G	0J	1A	1C	1D	1E	1V
0.68	684							A
1	105				A		A	A
1.5	155						A	A
2.2	225				A	A	A	A · B
3.3	335				A	A	A	B
4.7	475				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	
47	476	A	A · B	A · B · C	(B) · C · N	C · N	N	
68	686	A	A · B	B · 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	N	N			
330	337	C	N	N				
470	477	N	N					
680	687	N						

■ Specifications

Item	Performance Characteristics
Category	–55 to +125°C (Rated temperature : +85°C)
Temperature Range	
Capacitance Tolerance	±20%, ±10% (at 120Hz)
Dissipation Factor (120Hz)	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)
Damp Heat (Steady State)	At 40°C 90 to 95% R.H. 500 hours (No voltage applied) Capacitance Change...Refer to next page (* 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 next page (* 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 next page (* 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 table below. Capacitance Change...Refer to next page (* 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 table below. Capacitance Change...Refer to next page (* 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.

* As for the surge and derated voltage at 125°C, refer to page 332 for details.

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

() The series in parentheses are being developed.
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CAT.8100B

F93

■ Standard Ratings

Rated Volt	Rated Capacitance (μF)	Case code	Part Number	Leakage Current (μA)	Dissipation Factor (%@120Hz)	ESR (Ω@100kHz)	*1 ΔC/C (%)
4V	22	A	F930G226MAA	0.9	6	2.5	*
	33	A	F930G336MAA	1.3	8	2.5	*
	47	A	F930G476MAA	1.9	18	2.5	*
	68	A	F930G686MAA	2.7	24	2.5	*
	100	A	F930G107MAA	4.0	30	2.0	*
	100	B	F930G107MBA	4.0	14	0.9	*
	150	B	F930G157MBA	6.0	16	0.7	*
	220	B	F930G227MBA	8.8	18	0.7	*
	220	C	F930G227MCC	8.8	12	0.7	*
	330	C	F930G337MCC	13.2	14	0.7	*
6.3V	470	N	F930G477MNC	18.8	16	0.3	*
	680	N	F930G687MNC	27.2	18	0.3	*
	10	A	F930J106MAA	0.6	6	3.0	*
	15	A	F930J156MAA	0.9	6	2.9	*
	22	A	F930J226MAA	1.4	8	2.5	*
	33	A	F930J336MAA	2.1	8	2.5	*
	47	A	F930J476MAA	3.0	18	2.5	*
	47	B	F930J476MBA	3.0	6	1.0	*
	68	A	F930J686MAA	4.3	20	2.0	*
	68	B	F930J686MBA	4.3	8	1.0	*
10V	100	A	F930J107MAA	6.3	35	2.0	±15
	100	B	F930J107MBA	6.3	14	0.9	*
	100	C	F930J107MCC	6.3	8	0.7	*
	150	B	F930J157MBA	9.5	18	0.9	*
	150	C	F930J157MCC	9.5	12	0.7	*
	220	B	F930J227MBA	13.9	30	1.2	±15
	220	C	F930J227MCC	13.9	14	0.7	*
	220	N	F930J227MNC	13.9	10	0.5	*
	330	N	F930J337MNC	20.8	14	0.5	*
	470	N	F930J477MNC	29.6	16	0.3	*
10V	6.8	A	F931A685MAA	0.7	6	3.5	*
	10	A	F931A106MAA	1.0	6	3.0	*
	15	A	F931A156MAA	1.5	8	2.9	*
	22	A	F931A226MAA	2.2	12	2.5	*
	22	B	F931A226MBA	2.2	6	1.9	*
	33	A	F931A336MAA	3.3	18	2.5	*
	33	B	F931A336MBA	3.3	8	1.4	*
	47	A	F931A476MAA	4.7	40	2.0	±15
	47	B	F931A476MBA	4.7	8	1.0	*
	47	C	F931A476MCC	4.7	6	0.9	*
10V	68	B	F931A686MBA	6.8	12	0.9	±15
	68	C	F931A686MCC	6.8	8	0.8	*
	100	B	F931A107MBA	10.0	18	1.2	±15
	100	C	F931A107MCC	10.0	10	0.7	*
	100	N	F931A107MNC	10.0	8	0.6	*
	150	C	F931A157MCC	15.0	14	0.7	*
	150	N	F931A157MNC	15.0	10	0.6	*
	220	N	F931A227MNC	22.0	12	0.5	*
	330	N	F931A337MNC	33.0	18	0.5	*

1 : ΔC/C Marked ""

Item	A · B · C · N Case (%)
Damp Heat	±10
Temperature cycles	±5
Resistance soldering heat	±5
Surge	±5
Endurance	±10

Rated Volt	Rated Capacitance (μF)	Case code	Part Number	Leakage Current (μA)	Dissipation Factor (%@120Hz)	ESR (Ω@100kHz)	*1 ΔC/C (%)
16V	1	A	F931C105MAA	0.5	4	7.5	*
	2.2	A	F931C225MAA	0.5	4	5.0	*
	3.3	A	F931C335MAA	0.5	4	4.5	*
	4.7	A	F931C475MAA	0.8	6	4.0	*
	6.8	A	F931C685MAA	1.1	6	3.5	*
	10	A	F931C106MAA	1.6	6	3.0	*
	10	B	F931C106MBA	1.6	6	2.0	*
	15	A	F931C156MAA	2.4	10	3.0	*
	15	B	F931C156MBA	2.4	6	2.0	*
	22	A	F931C226MAA	3.5	15	3.0	±15
16V	22	B	F931C226MBA	3.5	8	1.9	*
	22	C	F931C226MCC	3.5	6	1.1	*
	33	B	F931C336MBA	5.3	8	1.9	*
	33	C	F931C336MCC	5.3	6	1.1	*
	47	C	F931C476MCC	7.5	8	0.9	*
	47	N	F931C476MNC	7.5	6	0.7	*
	68	N	F931C686MNC	10.9	6	0.6	*
	100	C	F931C107MCC	16.0	15	0.7	±10
	100	N	F931C107MNC	16.0	10	0.6	*
	150	N	F931C157MNC	24.0	15	0.6	*
20V	220	N	F931C227MNC	35.2	25	0.7	±10
	2.2	A	F931D225MAA	0.5	4	5.0	*
	3.3	A	F931D335MAA	0.7	4	4.5	*
	4.7	A	F931D475MAA	0.9	6	3.0	*
	4.7	B	F931D475MBA	0.9	6	2.8	*
	6.8	A	F931D685MAA	1.4	6	3.5	*
	6.8	B	F931D685MBA	1.4	6	2.5	*
	10	A	F931D106MAA	2.0	8	3.5	*
	10	B	F931D106MBA	2.0	6	2.1	*
	15	C	F931D156MCC	3.0	6	1.2	*
25V	22	B	F931D226MBA	4.4	8	1.9	*
	22	C	F931D226MCC	4.4	8	1.1	*
	33	C	F931D336MCC	6.6	8	1.1	*
	33	N	F931D336MNC	6.6	6	0.7	*
	47	C	F931D476MCC	9.4	10	1.1	*
	47	N	F931D476MNC	9.4	8	0.7	*
	1	A	F931E105MAA	0.5	4	7.5	*
	1.5	A	F931E155MAA	0.5	4	6.7	*
	2.2	A	F931E225MAA	0.6	6	6.3	*
	3.3	A	F931E335MAA	0.8	6	6.0	*
25V	4.7	A	F931E475MAA	1.2	8	4.0	*
	4.7	B	F931E475MBA	1.2	6	2.8	*
	10	B	F931E106MBA	2.5	12	1.9	*
	10	C	F931E106MCC	2.5	6	1.5	*
	15	C	F931E156MCC	3.8	8	1.2	*
	22	C	F931E226MCC	5.5	8	1.1	*
	22	N	F931E226MNC	5.5	6	0.7	*
	33	N	F931E336MNC	8.3	8	0.7	*
	47	N	F931E476MNC	11.8	8	0.7	*
35V	0.68	A	F931V684MAA	0.5	4	7.6	*
	1	A	F931V105MAA	0.5	4	7.5	*
	1.5	A	F931V155MAA	0.5	6	7.5	*
	2.2	A	F931V225MAA	0.8	6	7.0	*
	2.2	B	F931V225MBA	0.8	4	3.8	*
	3.3	B	F931V335MBA	1.2	4	3.5	*
	4.7	B	F931V475MBA	1.6	8	3.1	*
	4.7	C	F931V475MCC	1.6	6	1.8	*
	6.8	C	F931V685MCC	2.4	6	1.8	*
	10	C	F931V106MCC	3.5	6	1.6	*
35V	15	N	F931V156MNC	5.3	6	0.7	*
	22	N	F931V226MNC	7.7	8	0.7	*

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



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