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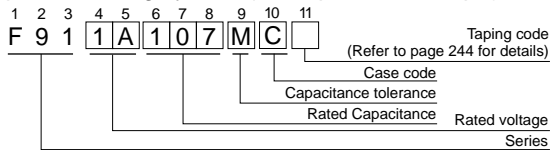
LOW ESR
Resin-molded Chip,



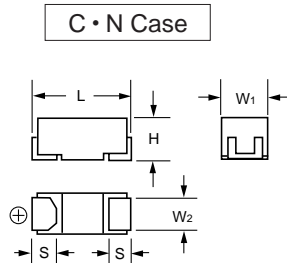
● Adapted to the RoHS directive (2002/95/EC).



■ Type numbering system (Example : 10V 100μF)



■ Drawing

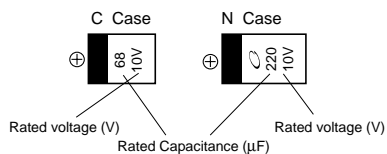


■ Dimensions

Case Code	L	W ₁	W ₂	H	S
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

(mm)

■ Marking



■ Standard ratings

Cap. (μF)	Code	V			
		2.5	4	6.3	10
68	686	0E	0G	0J	1A
100	107			C	C
150	157		C	C	N
220	227	C	C	C · N	N
330	337		N	N	N
470	477	N	N	N	
680	687		N		

■ Specifications

Item	Performance Characteristics
Category	
Temperature Range	-55 ~ +125°C (Rated temperature : 85°C)
Capacitance Tolerance	±20%, ±10% (at 120Hz)
Dissipation Factor (120Hz)	Refer to the list below.
E.S.R. (100kHz)	Refer to the list below.
Leakage Current	<ul style="list-style-type: none"> 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 (No voltage applied)	At 40°C 90 ~ 95% R.H. 500 hours Capacitance Change Within ±10% of initial value 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 Within ±5% of initial value Dissipation Factor.....Initial specified value or less Leakage Current.....Initial specified value or less
Resistance to Soldering Heat	Test condition: 10 seconds reflow at 260°C Capacitance Change Within ±3% of initial value Dissipation Factor.....Initial specified value or less Leakage Current.....Initial specified value or less
Surge*	After application of surge in series with a 33Ω resistor at the rate of 30 seconds ON, seconds OFF, for 1000 successive test cycles at 85°C, capacitors meet the characteristic requirements listed below. Capacitance Change.....Within ±5% of initial value 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 meet the characteristics requirements listed below. Capacitance Change.....Within ±10% of initial value 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 an aluminum substrate, neither exfoliation nor its sign shall be found at the terminal electrode. <p>5N (0.51kg · f) For 10±1seconds</p>
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 the capacitor, the pressure load is applied with a specified jig at the center of the substrate so that the substrate may bend by 1mm as illustrated. <p>R230 20 45 45 1mm</p> <p>Then, there shall be found no remarkable abnormality on the capacitor terminals.</p>

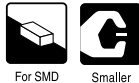
* As for the surge and derated voltage at 125°C, refer to page 243 for details.

Rated Volt	Rated Capacitance (μF)	Case code	Part Number	Leakage Current (μA)	Dissipation Factor (%@120Hz)	E.S.R. (mΩ@100kHz)
2.5V	220	C	F910E227MCC	5.5	12	250
	470	N	F910E477MNC	11.8	12	100
4V	150	C	F910G157MCC	6.0	12	250
	220	C	F910G227MCC	8.8	12	250
	330	N	F910G337MNC	13.2	10	100
	470	N	F910G477MNC	18.8	16	100
	680	N	F910G687MNC	27.2	18	100
6.3V	100	C	F910J107MCC	6.3	10	250
	150	C	F910J157MCC	9.5	12	250
	220	C	F910J227MCC	13.9	14	250
	220	N	F910J227MNC	13.9	10	100
	330	N	F910J337MNC	20.8	14	100
10V	470	N	F910J477MNC	29.6	16	100
	68	C	F911A686MCC	6.8	8	300
	100	C	F911A107MCC	10.0	10	250
	150	N	F911A157MNC	15.0	10	100
	220	N	F911A227MNC	22.0	12	100
	330	N	F911A337MNC	33.0	18	100

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

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Resin-molded Chip,
Compact Series

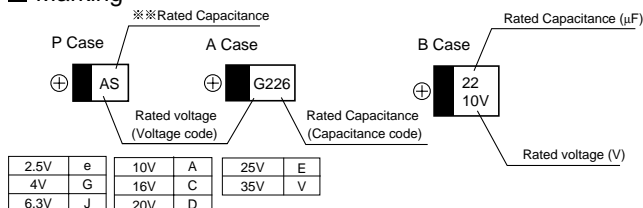


Upgrade

● Adapted to the RoHS directive (2002/95/EC).



Marking



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

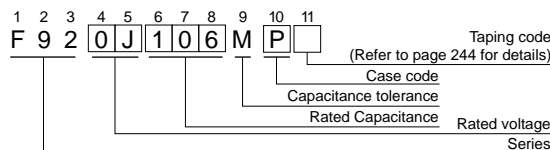
Specifications

Item	Performance Characteristics	
	P Case	A · B Case
Category	Performance Characteristics	
Temperature Range	-55 ~ +125°C (Rated temperature : 85°C)	
Capacitance Tolerance	±20% (at 120Hz)	
Dissipation Factor (120Hz)	refer to Next Page	
E.S.R. (100kHz)	refer to Next Page	
Leakage Current	<ul style="list-style-type: none"> 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	+20% Max. (at +125°C) +15% Max. (at +85°C) -15% Max. (at -55°C)	+15% Max. (at +125°C) +10% Max. (at +85°C) -10% Max. (at -55°C)
Damp Heat (No voltage applied)	At 40°C 90 ~ 95% R.H. 240 hours Capacitance Change... Refer to next page (* 1) Dissipation Factor...150% or less of initial specified value Leakage Current... Initial specified value or less	At 40°C 90 ~ 95% R.H. 500 hours Refer to next page (* 1) 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...150% of less of initial specified value Leakage Current... Initial specified value or less	Refer to next page (* 1) Initial specified value or less

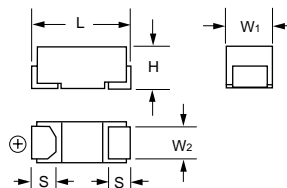
Standard ratings

V	2.5	4	6.3	10	16	20	25	35	※ ※ Capacitance code
Code	0E	0G	0J	1A	1C	1D	1E	1V	
0.22	224					P		A	J
0.33	334					P		A	N
0.47	474				P	P · A	A	A	S
0.68	684				P	A	B	B	W
1	105		P	P	P · A	P · A	P · A · B	A	A
1.5	155		P	P	P · A	A			E
2.2	225		P	P	P · A	(P) · A · B	B	(B)	J
3.3	335		P	P	P · A	A	B		N
4.7	475		P · A	P · A	P · A	A · B	(A) · B	(A) · B	S
6.8	685		P	P	P · A	B			w
10	106		P · A	P · A	P · A · B	A · B			a
15	156		P	P · A	A				e
22	226	P · A	P · A	P · A · B	A · B				j
33	336	P · A	P · A	A · B	B				n
47	476	(P) · B	(P) · A · B	A · B	(B)				
68	686	B	A · B						
100	107	B	B	B					
150	157	B	B						

Type numbering system (Example: 6.3V 10µF)



Drawing



Dimensions

Case code	L	W ₁	W ₂	H	S
P	2.0 ± 0.2	1.25 ± 0.1	0.9 ± 0.1	1.1 ± 0.1	0.5 ± 0.2
A	3.2 ± 0.2	1.6 ± 0.2	1.2 ± 0.1	1.1 ± 0.1	0.8 ± 0.2
B	3.4 ± 0.2	2.8 ± 0.2	2.3 ± 0.1	1.1 ± 0.1	0.8 ± 0.2

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...150% of less of initial specified value Leakage Current... Initial specified value or less	Refer to next page (* 1) 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 meet the characteristics requirements listed below. Capacitance Change... Refer to next page (* 1) Dissipation Factor...150% or less of initial specified value Leakage Current... Initial specified value or less	Refer to next page (* 1) Initial specified value or less
Endurance*	After 1000hours' 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 meet the characteristic requirements listed below. Capacitance Change... Refer to next page (* 1) Dissipation Factor...150% or less of initial specified value Leakage Current... Initial specified value or less	After 2000hours' 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 meet the characteristic requirements listed 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 an aluminum substrate, there shall be found neither exfoliation nor its sign at the terminal electrode.	 5N (0.51kg · f) For 10 ± 1seconds
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 the capacitor, the pressure strength is applied with a specified jig at the center of the substrate so that the substrate may bend by 1mm as illustrated. Then, there shall be found no remarkable abnormality on the capacitor terminals.	 R230 20 45 45 1mm

* As for the surge and derated voltage at 125°C, refer to page 243 for details.

() The series in parentheses are being developed. Please contact to your local Nichicon sales office when these series are being designed in your application.

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■ Standard ratings

Rated Volt	Rated Capacitance (μF)	Case code	Part Number	Leakage Current (μA)	Dissipation Factor (%@120Hz)	E.S.R. (Ω@100kHz)	*1 ΔC/C (%)
2.5V	22	P	F920E226MPA	0.6	20	4.0	*
	22	A	F920E226MAA	0.6	12	2.8	*
	33	P	F920E336MPA	0.8	20	4.0	*
	33	A	F920E336MAA	0.8	12	2.8	*
	47	B	F920E476MBA	1.2	12	1.7	*
	68	B	F920E686MBA	1.7	12	1.5	*
	100	B	F920E107MBA	2.5	18	1.3	*
150	B	F920E157MBA	3.8	20	1.0	±15	
4V	2.2	P	F920G225MPA	0.5	8	12.0	*
	3.3	P	F920G335MPA	0.5	8	12.0	*
	4.7	P	F920G475MPA	0.5	8	6.0	*
	4.7	A	F920G475MAA	0.5	6	4.0	*
	6.8	P	F920G685MPA	0.5	10	6.0	*
	10	P	F920G106MPA	0.5	10	6.0	*
	10	A	F920G106MAA	0.5	8	4.0	*
	15	P	F920G156MPA	0.6	10	5.0	*
	22	P	F920G226MPA	0.9	20	5.0	*
	22	A	F920G226MAA	0.9	12	2.8	*
	33	P	F920G336MPA	1.3	20	4.0	*
	33	A	F920G336MAA	1.3	12	2.8	*
	47	A	F920G476MAA	1.9	18	2.8	*
	47	B	F920G476MBA	1.9	12	1.7	*
	68	A	F920G686MAA	2.7	25	2.8	±15
68	B	F920G686MBA	2.7	18	1.5	*	
100	B	F920G107MBA	4.0	18	1.3	*	
150	B	F920G157MBA	6.0	25	1.3	±15	
6.3V	1	P	F920J105MPA	0.5	8	12.0	*
	1.5	P	F920J155MPA	0.5	8	12.0	*
	2.2	P	F920J225MPA	0.5	8	12.0	*
	3.3	P	F920J335MPA	0.5	8	12.0	*
	4.7	P	F920J475MPA	0.5	8	6.0	*
	4.7	A	F920J475MAA	0.5	6	4.0	*
	6.8	P	F920J685MPA	0.5	10	6.0	*
	10	P	F920J106MPA	0.6	10	6.0	*
	10	A	F920J106MAA	0.6	8	4.0	*
	15	P	F920J156MPA	0.9	10	6.0	*
	15	A	F920J156MAA	0.9	8	4.0	*
	22	P	F920J226MPA	1.4	20	5.0	*
	22	A	F920J226MAA	1.4	12	2.8	*
	22	B	F920J226MBA	1.4	8	1.9	*
	33	A	F920J336MAA	2.1	12	2.8	*
33	B	F920J336MBA	2.1	12	1.7	*	
47	A	F920J476MAA	3.0	18	2.8	±15	
47	B	F920J476MBA	3.0	12	1.7	*	
100	B	F920J107MBA	6.3	20	1.3	±15	

Rated Volt	Rated Capacitance (μF)	Case code	Part Number	Leakage Current (μA)	Dissipation Factor (%@120Hz)	E.S.R. (Ω@100kHz)	*1 ΔC/C (%)	
10V	1	P	F921A105MPA	0.5	8	12.0	*	
	1.5	P	F921A155MPA	0.5	8	12.0	*	
	1.5	A	F921A155MAA	0.5	6	7.4	*	
	2.2	P	F921A225MPA	0.5	8	12.0	*	
	2.2	A	F921A225MAA	0.5	6	7.0	*	
	3.3	P	F921A335MPA	0.5	8	12.0	*	
	3.3	A	F921A335MAA	0.5	6	7.0	*	
	4.7	P	F921A475MPA	0.5	8	6.0	*	
	4.7	A	F921A475MAA	0.5	6	4.0	*	
	6.8	P	F921A685MPA	0.7	8	6.0	*	
	6.8	A	F921A685MAA	0.7	6	4.0	*	
	10	P	F921A106MPA	1.0	14	6.0	*	
	10	A	F921A106MAA	1.0	8	4.0	*	
	10	B	F921A106MBA	1.0	6	2.0	*	
	15	A	F921A156MAA	1.5	8	4.0	*	
22	A	F921A226MAA	2.2	14	4.0	±15		
22	B	F921A226MBA	2.2	8	1.9	*		
33	B	F921A336MBA	3.3	12	1.9	*		
16V	0.47	P	F921C474MPA	0.5	8	20.0	*	
	0.68	P	F921C684MPA	0.5	8	12.0	*	
	1	P	F921C105MPA	0.5	8	12.0	*	
	1	A	F921C105MAA	0.5	4	10.0	*	
	1.5	P	F921C155MPA	0.5	8	12.0	*	
	1.5	A	F921C155MAA	0.5	6	7.4	*	
	2.2	P	F921C225MPA	0.5	8	12.0	*	
	2.2	A	F921C225MAA	0.5	6	7.0	*	
	3.3	A	F921C335MAA	0.5	6	7.0	*	
	4.7	A	F921C475MAA	0.8	6	7.0	*	
	4.7	B	F921C475MBA	0.8	6	3.0	*	
	6.8	B	F921C685MBA	1.1	6	3.0	*	
	10	A	F921C106MAA	1.6	8	7.0	±15	
	10	B	F921C106MBA	1.6	6	2.0	*	
	22	B	F921C226MBA	3.5	12	2.0	±15	
20V	0.22	P	F921D224MPA	0.5	8	20.0	*	
	0.33	P	F921D334MPA	0.5	8	20.0	*	
	0.47	P	F921D474MPA	0.5	8	20.0	*	
	0.47	A	F921D474MAA	0.5	4	10.0	*	
	0.68	A	F921D684MAA	0.5	4	10.0	*	
	1	P	F921D105MPA	0.5	8	20.0	*	
	1	A	F921D105MAA	0.5	4	10.0	*	
	1.5	A	F921D155MAA	0.5	6	7.4	*	
	2.2	A	F921D225MAA	0.5	6	7.0	*	
	2.2	B	F921D225MBA	0.5	6	3.0	*	
	3.3	B	F921D335MBA	0.7	6	3.0	*	
	4.7	B	F921D475MBA	0.9	6	3.0	*	
	25V	0.47	A	F921E474MAA	0.5	4	10.0	*
		0.68	B	F921E684MBA	0.5	4	4.0	*
		1	P	F921E105MPA	0.5	8	20.0	*
1		A	F921E105MAA	0.5	6	10.0	*	
1		B	F921E105MBA	0.5	4	4.0	*	
4.7	B	F921E475MBA	1.2	6	3.0	*		
35V	0.22	A	F921V224MAA	0.5	4	10.0	*	
	0.33	A	F921V334MAA	0.5	4	10.0	*	
	0.47	A	F921V474MAA	0.5	4	10.0	*	
	0.68	B	F921V684MBA	0.5	4	4.0	*	
1	A	F921V105MAA	0.5	6	10.0	*		

*1 : ΔC/C

	P Case (%)	A , B Case(%)
Damp Heat	±20	±10
Temperature cycles	±10	±5
Resistance soldering heat	±10	±5
Surge	±10	±5
Endurance	±10	±10

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■ Standard ratings

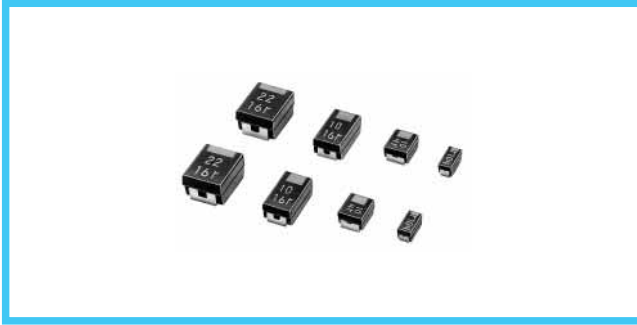
Rated Volt	Rated Capacitance (μF)	Case code	Part Number	Leakage Current (μA)	Dissipation Factor (%@120Hz)	E.S.R. (Ω@100kHz)
2.5V	47	A	F930E476MAA	1.2	12	2.5
	68	A	F930E686MAA	1.7	18	2.5
	100	B	F930E107MBA	2.5	14	0.9
	150	B	F930E157MBA	3.8	14	0.7
	220	B	F930E227MBA	5.5	18	0.7
	330	C	F930E337MCC	8.3	16	0.7
	470	C	F930E477MCC	11.8	18	0.5
	470	N	F930E477MNC	11.8	12	0.3
4V	4.7	A	F930G475MAA	0.5	6	4.0
	6.8	A	F930G685MAA	0.5	6	3.5
	10	A	F930G106MAA	0.5	6	3.0
	15	A	F930G156MAA	0.6	6	2.9
	22	A	F930G226MAA	0.9	8	2.5
	22	B	F930G226MBA	0.9	6	1.9
	33	A	F930G336MAA	1.3	8	2.5
	33	B	F930G336MBA	1.3	6	1.4
	47	A	F930G476MAA	1.9	18	2.5
	47	B	F930G476MBA	1.9	8	1.0
	68	A	F930G686MAA	2.7	24	2.5
	68	B	F930G686MBA	2.7	8	0.8
	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
	330	N	F930G337MNC	13.2	10	0.5
	470	N	F930G477MNC	18.8	16	0.3
680	N	F930G687MNC	27.2	18	0.3	
6.3V	2.2	A	F930J225MAA	0.5	6	5.0
	3.3	A	F930J335MAA	0.5	6	4.5
	4.7	A	F930J475MAA	0.5	6	4.0
	6.8	A	F930J685MAA	0.5	6	3.5
	10	A	F930J106MAA	0.6	6	3.0
	15	A	F930J156MAA	0.9	8	2.9
	15	B	F930J156MBA	0.9	6	2.0
	22	A	F930J226MAA	1.4	8	2.5
	22	B	F930J226MBA	1.4	6	1.9
	33	A	F930J336MAA	2.1	8	2.5
	33	B	F930J336MBA	2.1	8	1.4
	47	A	F930J476MAA	3.0	18	2.5
	47	B	F930J476MBA	3.0	8	1.0
	68	A	F930J686MAA	4.3	20	2.0
	68	B	F930J686MBA	4.3	8	1.0
	68	C	F930J686MCC	4.3	8	0.8
	100	B	F930J107MBA	6.3	14	0.9
	100	C	F930J107MCC	6.3	10	0.7
	150	B	F930J157MBA	9.5	18	0.9
	150	C	F930J157MCC	9.5	12	0.7
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	2.2	A	F931A225MAA	0.5	6	5.0
	3.3	A	F931A335MAA	0.5	6	4.5
	4.7	A	F931A475MAA	0.5	6	4.0
	6.8	A	F931A685MAA	0.7	6	3.5
	10	A	F931A106MAA	1.0	6	3.0
	10	B	F931A106MBA	1.0	6	2.1
	15	A	F931A156MAA	1.5	8	2.9
	15	B	F931A156MBA	1.5	6	2.0
	22	A	F931A226MAA	2.2	12	2.5
	22	B	F931A226MBA	2.2	8	1.9
	33	A	F931A336MAA	3.3	18	2.5
	33	B	F931A336MBA	3.3	8	1.4
	33	C	F931A336MCC	3.3	6	1.1
	47	B	F931A476MBA	4.7	8	1.0
	47	C	F931A476MCC	4.7	8	0.9
	68	C	F931A686MCC	6.8	8	0.8
	68	N	F931A686MNC	6.8	6	0.6
	100	C	F931A107MCC	10.0	10	0.7
	100	N	F931A107MNC	10.0	10	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	
16V	1	A	F931C105MAA	0.5	4	7.5
	1.5	A	F931C155MAA	0.5	6	6.0
	2.2	A	F931C225MAA	0.5	6	5.0
	3.3	A	F931C335MAA	0.5	6	4.5
	4.7	A	F931C475MAA	0.8	6	4.0
	6.8	A	F931C685MAA	1.1	6	3.5
	6.8	B	F931C685MBA	1.1	6	2.5
	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	8	2.0
	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	8	1.1
	47	C	F931C476MCC	7.5	8	0.9
	47	N	F931C476MNC	7.5	6	0.7
	68	N	F931C686MNC	10.9	8	0.6
	100	N	F931C107MNC	16.0	10	0.6
	20V	1	A	F931D105MAA	0.5	4
1.5		A	F931D155MAA	0.5	6	6.3
2.2		A	F931D225MAA	0.5	6	5.0
3.3		A	F931D335MAA	0.7	6	4.5
4.7		A	F931D475MAA	0.9	6	4.0
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	
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	N	F931D476MNC	9.4	8	0.7	
25V	0.68	A	F931E684MAA	0.5	4	7.6
	1	A	F931E105MAA	0.5	4	7.5
	1.5	A	F931E155MAA	0.5	6	6.7
	2.2	A	F931E225MAA	0.6	6	6.3
	3.3	A	F931E335MAA	0.8	6	6.0
	3.3	B	F931E335MBA	0.8	6	3.1
	4.7	A	F931E475MAA	1.2	8	4.0
	4.7	B	F931E475MBA	1.2	6	2.8
	6.8	C	F931E685MCC	1.7	6	1.8
	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	0.47	A	F931V474MAA	0.5	4	10.0
	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	6	3.8
	3.3	B	F931V335MBA	1.2	6	3.5
	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
15	N	F931V156MNC	5.3	6	0.7	
22	N	F931V226MNC	7.7	8	0.7	

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

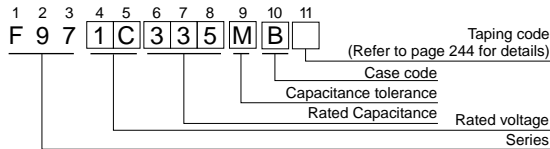
F97 Resin-molded Chip,
High Reliability
(High temperature /
moisture resistance) Series



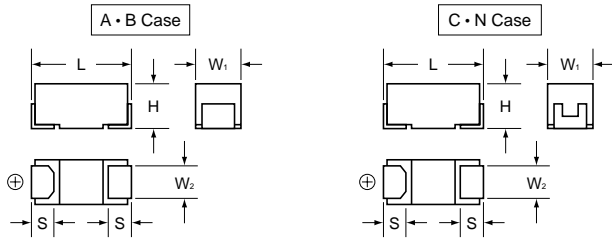
● Adapted to the RoHS directive (2002/95/EC).



■ Type numbering system (Example : 16V 3.3 μF)



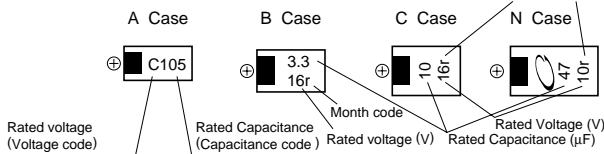
■ Drawing



■ 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

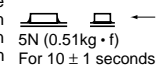
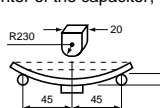
■ Marking



■ Standard ratings

Cap. (μF)	V Code	4	6.3	10	16	20	25	35
		0G	0J	1A	1C	1D	1E	1V
0.33	334							A
0.47	474						A	A
0.68	684					A	A	A
1	105				A	A	A	B
1.5	155			A	A	A	B	B
2.2	225		A	A	A	B	B	B
3.3	335	A	A	A	B	B	B	C
4.7	475	A	A	B	B	B	C	C
6.8	685	A	B	B	B	C	C	N
10	106	B	B	B	C	C	C·N	N
15	156	B	B	C	C	N	N	
22	226	B	C	C	C·N	N		
33	336	C	C	C·N	N			
47	476	C	C·N	N				
68	686	C·N	N					
100	107	N	N					
150	157	N						

■ Specifications

Item	Performance Characteristics
Category Temperature Range	-55 ~ +125°C (Rated temperature : 85°C.)
Capacitance Tolerance	±20%, ±10% (at 120Hz)
Dissipation Factor	Refer to next page
E.S.R. (100kHz)	Refer to next page
Leakage Current*	<ul style="list-style-type: none"> 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	At 85°C, 85% R.H.,For 1000 hours (No voltage applied) Capacitance Change Within ±10% of initial value Dissipation Factor Initial specified value or less Leakage Current 125% or less of initial specified value
Load Humidity	After 500 hour' s application of rated voltage in series with a 33Ω resistor at 60°C,90-95% R.H.,capacitors meet the characteristics requirements listed below. Capacitance Change Within ±10% of initial value Dissipation Factor Initial specified value or less Leakage Current 125% or less of initial specified value
Temperature Cycles	At -55°C / +125°C,For 30 minutes each,1000 cycles Capacitance Change Within ±5% of initial value Dissipation Factor Initial specified value or less Leakage Current Initial specified value or less
Resistance to Soldering Heat	At 260°C,reflowing capacitors for 10 seconds Max. Capacitance Change Within ±5% of initial value 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 2-3 seconds,more than 3/4 of their electrode area shall remain covered with new solder.
Surge*	After application of surge 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 meet the characteristics requirements listed below. Capacitance Change Within ±5% of initial value 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 meet the characteristic requirements listed below. Capacitance Change Within ±10% of initial value 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 an aluminum 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 the capacitor, the pressure strength is applied with a specified jig at the center of the 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 243 for details.

F97

■ Standard ratings

Rated Volt	Rated Capacitance (μF)	Case code	Part Number	Leakage Current (μA)	Dissipation Factor (%@120Hz)	E.S.R. (Ω@100kHz)
4V	3.3	A	F970G335MAA	0.5	6	4.5
	4.7	A	F970G475MAA	0.5	6	4.0
	6.8	A	F970G685MAA	0.5	6	3.5
	10	B	F970G106MBA	0.5	6	2.1
	15	B	F970G156MBA	0.6	6	2.0
	22	B	F970G226MBA	0.9	6	1.9
	33	C	F970G336MCC	1.3	6	1.1
	47	C	F970G476MCC	1.9	6	0.9
	68	C	F970G686MCC	2.7	6	0.8
	68	N	F970G686MNC	2.7	6	0.6
	100	N	F970G107MNC	4.0	8	0.6
150	N	F970G157MNC	6.0	8	0.6	
6.3V	2.2	A	F970J225MAA	0.5	6	5.0
	3.3	A	F970J335MAA	0.5	6	4.5
	4.7	A	F970J475MAA	0.5	6	4.0
	6.8	B	F970J685MBA	0.5	6	2.5
	10	B	F970J106MBA	0.6	6	2.1
	15	B	F970J156MBA	0.9	6	2.0
	22	C	F970J226MCC	1.4	6	1.1
	33	C	F970J336MCC	2.1	6	1.1
	47	C	F970J476MCC	3.0	6	0.9
	47	N	F970J476MNC	3.0	6	0.7
	68	N	F970J686MNC	4.3	6	0.6
100	N	F970J107MNC	6.3	8	0.6	
10V	1.5	A	F971A155MAA	0.5	4	6.0
	2.2	A	F971A225MAA	0.5	6	5.0
	3.3	A	F971A335MAA	0.5	6	4.5
	4.7	B	F971A475MBA	0.5	6	2.8
	6.8	B	F971A685MBA	0.7	6	2.5
	10	B	F971A106MBA	1.0	6	2.0
	15	C	F971A156MCC	1.5	6	1.2
	22	C	F971A226MCC	2.2	6	1.1
	33	C	F971A336MCC	3.3	6	1.1
	33	N	F971A336MNC	3.3	6	0.7
47	N	F971A476MNC	4.7	6	0.7	
16V	1	A	F971C105MAA	0.5	4	7.5
	1.5	A	F971C155MAA	0.5	4	6.3
	2.2	A	F971C225MAA	0.5	6	5.0
	3.3	B	F971C335MBA	0.5	6	3.1
	4.7	B	F971C475MBA	0.8	6	2.8
	6.8	B	F971C685MBA	1.1	6	2.5
	10	C	F971C106MCC	1.6	6	1.5
	15	C	F971C156MCC	2.4	6	1.2
	22	C	F971C226MCC	3.5	8	1.1
	22	N	F971C226MNC	3.5	6	0.7
33	N	F971C336MNC	5.3	6	0.7	
20V	0.68	A	F971D684MAA	0.5	4	7.6
	1	A	F971D105MAA	0.5	4	7.5
	1.5	A	F971D155MAA	0.5	6	6.7
	2.2	B	F971D225MBA	0.5	6	3.8
	3.3	B	F971D335MBA	0.7	6	3.1
	4.7	B	F971D475MBA	0.9	6	2.8
	6.8	C	F971D685MCC	1.4	6	1.8
	10	C	F971D106MCC	2.0	6	1.5
	15	N	F971D156MNC	3.0	6	0.7
22	N	F971D226MNC	4.4	6	0.7	

Rated Volt	Rated Capacitance (μF)	Case code	Part Number	Leakage Current (μA)	Dissipation Factor (%@120Hz)	E.S.R. (Ω@100kHz)
25V	0.47	A	F971E474MAA	0.5	4	10.0
	0.68	A	F971E684MAA	0.5	4	7.6
	1	A	F971E105MAA	0.5	4	7.5
	1.5	B	F971E155MBA	0.5	4	4.0
	2.2	B	F971E225MBA	0.6	6	3.8
	3.3	B	F971E335MBA	0.8	6	3.5
	4.7	C	F971E475MCC	1.2	6	1.8
	6.8	C	F971E685MCC	1.7	6	1.8
	10	C	F971E106MCC	2.5	6	1.6
	10	N	F971E106MNC	2.5	6	1.0
	15	N	F971E156MNC	3.8	6	0.7
35V	0.33	A	F971V334MAA	0.5	4	12.0
	0.47	A	F971V474MAA	0.5	4	10.0
	0.68	A	F971V684MAA	0.5	4	7.6
	1	B	F971V105MBA	0.5	4	4.0
	1.5	B	F971V155MBA	0.5	6	4.0
	2.2	B	F971V225MBA	0.8	6	3.8
	3.3	C	F971V335MCC	1.2	6	2.0
	4.7	C	F971V475MCC	1.6	6	1.8
	6.8	N	F971V685MNC	2.4	6	1.0
	10	N	F971V106MNC	3.5	6	1.0

SOLID TANTALUM ELECTROLYTIC CAPACITORS



F98 Resin-molded Chip,
High Capacitance Series

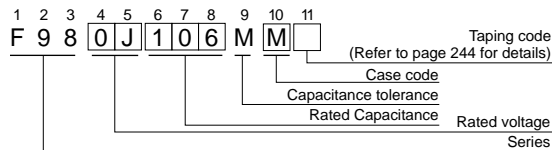
FRAMELESS™



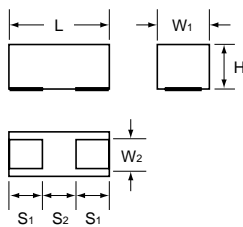
● Adapted to the RoHS directive (2002/95/EC).



■ Type numbering system (Example : 6.3V 10 μF)

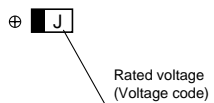


■ Drawing



Case Code	L	W ₁	W ₂	H	S ₁	S ₂
M	1.6 ± 0.1	0.85 ± 0.1	0.65 ± 0.1	0.8 ± 0.1	0.5 ± 0.1	0.6 ± 0.1
S	2.0 ± 0.1	1.25 ± 0.1	0.9 ± 0.1	0.8 ± 0.1	0.5 ± 0.1	1.0 ± 0.1

■ Marking

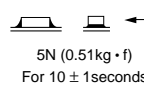
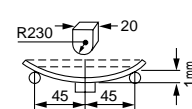


■ Standard ratings

Cap.(μF)	Code	V					
		2.5	4	6.3	10	16	
1	105	0E	0G	0J	1A	1C	
2.2	225				M	M	
4.7	475			M	M	M	
10	106			M	M	S	
22	226		M	M	S		
33	336		M		S		
47	476	M		S			
68	686		S				
100	107	(S)	(S)				

() The series in parentheses are being developed.
Please contact to your local Nichicon sales office when
these series are being designed in your application.

■ Specifications

Item	Performance Characteristics
Category	
Temperature Range	-55 ~ +125°C (Rated temperature : 85°C)
Capacitance Tolerance	±20% (at 120Hz)
Dissipation Factor(120Hz)	Refer to the list below (* 1)
E.S.R.(100kHz)	Refer to the list below (* 1)
Leakage Current	After 5 minute's application of rated voltage, leakage current at 20°C is not more than 0.1CV or 0.5μA, whichever is greater.
Damp Heat	At 40°C, 90 ~ 95% R.H., For 500hours (No voltage applied) Capacitance Change ... Refer to the list below (* 1) Dissipation Factor ... 150% or less of initial specified value Leakage Current ... 200% or less of initial specified value
Temperature Cycles	At -55°C / +125°C, For 30 minutes each, 5 cycles Capacitance Change ... Refer to the list below (* 1) Dissipation Factor ... 150% or less of initial specified value Leakage Current ... Initial specified value or less
Resistance to Soldering Heat	At 260°C, For 10 seconds, Reflow, Capacitance Change ... Refer to the list below (* 1) Leakage Current ... Initial specified value or less Leakage Current ... Initial specified value or less
Surge*	After application of surge in series with a 1kΩ resistor at the rate of 30 seconds ON, 30 seconds OFF, for 1000 successive test cycles at 85°C, capacitors meet the characteristics requirements listed below. Capacitance Change ... Refer to the list below (* 1) Dissipation Factor ... 150% or less of initial specified value Leakage Current ... 200% or less of initial specified value
Endurance*	After 1000 hours' application of rated voltage in series with a 3Ω resistor at 85°C, capacitors meet the characteristic requirements listed below Capacitance Change ... Refer to the list below (* 1) Dissipation Factor ... 150% or less of initial specified value Leakage Current ... 200% or less of initial specified value
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 an aluminum 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 the capacitor, the pressure strength is applied with a specified jig at the center of the 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 243 for details.

Rated Volt (V)	Rated Capacitance (μF)	Case code	Part Number	Leakage Current (μA)	Dissipation Factor (% @120Hz)	E.S.R (Ω @100kHz)	*1ΔC/C (%)	
2.5	47	M	F980E476MMA	1.2	30	4	±30	
	4	22	M	F980G226MMA	0.9	15	8	±30
		33	M	F980G336MMA	1.3	30	4	±30
6.3	68	S	F980G686MSA	2.7	30	6	±30	
	4.7	M	F980J475MMA	0.5	20	8	±30	
	10	M	F980J106MMA	0.6	8	8	±30	
	22	M	F980J226MMA	1.4	20	8	±30	
	47	S	F980J476MSA	3.0	25	6	±30	
	10	2.2	M	F981A225MMA	0.5	20	16	±30
4.7		M	F981A475MMA	0.5	6	10	±30	
10		M	F981A106MMA	1.0	20	8	±30	
22		S	F981A226MSA	2.2	20	4	±20	
33		S	F981A336MSA	3.3	30	6	±30	
16	1	M	F981C105MMA	0.5	6	20	±30	
	2.2	M	F981C225MMA	0.5	6	20	±30	
	4.7	M	F981C475MMA	0.8	12	12	±20	
	10	S	F981C106MSA	1.6	18	4	±20	

SOLID TANTALUM ELECTROLYTIC CAPACITORS

F95

Conformal coated
Chip

FRAMELESS™

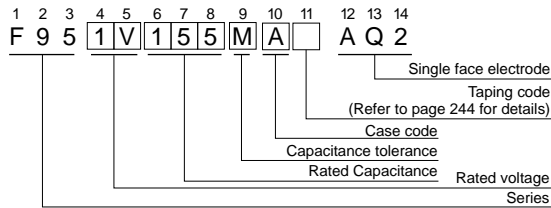


Upgrade

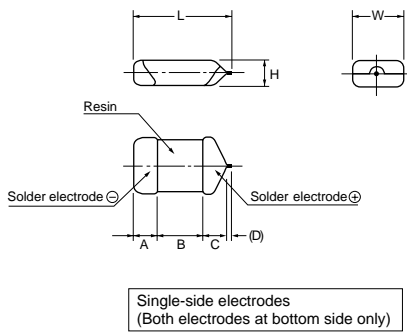
- Adapted to the RoHS directive (2002/95/EC).



Type numbering system (Example : 35V 1.5 μF)



Drawing



Dimensions

case code	L	W	H	A	B	C	(D)
P	2.2 ± 0.3	1.25 ± 0.3	1.0 ± 0.2	0.6 ± 0.3	0.8 ± 0.3	0.8 ± 0.3	(0.2)
Q	3.2 ± 0.2	1.6 ± 0.2	0.8 ± 0.2	0.8 ± 0.2	1.2 ± 0.2	0.8 ± 0.2	(0.2)
S	3.2 ± 0.3	1.6 ± 0.3	1.0 ± 0.2	0.8 ± 0.3	1.2 ± 0.3	0.8 ± 0.3	(0.2)
A	3.2 ± 0.3	1.7 ± 0.3	1.4 ± 0.2	0.8 ± 0.3	1.2 ± 0.3	0.8 ± 0.3	(0.2)
T	3.5 ± 0.2	2.7 ± 0.2	1.0 ± 0.2	0.8 ± 0.2	1.2 ± 0.2	1.1 ± 0.2	(0.2)
B	3.3 ± 0.3	2.7 ± 0.3	1.8 ± 0.2	0.8 ± 0.3	1.2 ± 0.3	1.1 ± 0.3	(0.2)

D dimension only for reference

Standard ratings

Cap. (μF)	V	Code							
		4	6.3	10	16	20	25	35	
	Code	0G	OJ	1A	1C	1D	1E	1V	
1	105				P		P · S	S · A	
1.5	155				P		S	A	
2.2	225				P	P · S	(P) · S · A	A	
3.3	335			P	P	A	A	(A) · B	
4.7	475			P	P	S · A	S · A	B	
6.8	685			P		A			
10	106		P	P	P · Q · S · A	A · B	(A) · B		
15	156	P	P	P	S · A				
22	226	P	P	P · Q · S · A	Q · S · A · T · B	B			
33	336	P	P · Q · S · A	Q · S · A	B				
47	476	P · Q · S · A	P · Q · S · A	S · A · T · B	B				
68	686	S · A	S · A	B					
100	107	P · Q · S · A	S · A · T · B	B					
150	157	B	B						
220	227	S · A · T · B	B						

() The series in parentheses are being developed.
Please contact to your local Nichicon sales office when these series are being designed in your application.

Specifications

Item	Performance Characteristics
Category	
Temperature Range	-55 ~ +125°C (Rated temperature : 85°C)
Capacitance Tolerance	±20%, ±10% (at 120Hz) (However P.Q.T Case ±20%)
Dissipation Factor (at 120Hz)	Refer to P.235
E.S.R.(100kHz)	Refer to P.235
Leakage Current	<ul style="list-style-type: none"> After 1 minute's application of rated voltage, leakage current at 20°C is not more than 0.01CV or 0.5 μA, whichever is greater. After 1 minute's application of rated voltage, leakage current at 85°C is not more than 0.1CV or 5 μA, whichever is greater. After 1 minute's application of derated voltage, leakage current at 125°C is not more than 0.125CV or 6.3 μA, whichever is greater.
Capacitance Change by Temperature	+15% Max. (at +125°C) +10% Max. (at +85°C) -10% Max. (at -55°C)
Damp Heat	At 40°C, 90 ~ 95% R.H., For 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	At -55°C / +125°C, 30 minutes each, For 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	Dipping Flow at 260°C for 10 seconds, reflow at 260°C for 10 seconds 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 meet the characteristics requirements listed 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 at 85°C, or derated voltage at 125°C, capacitors meet the characteristic requirements listed 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 an aluminum substrate, there shall be found neither exfoliation nor its sign at the terminal electrode. 5N (0.51kg · f) For 10 ± 1 seconds
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 the capacitor, the pressure strength is applied with a specified jig at the center of the substrate so that the substrate may bend by 1mm as illustrated. Then, there shall be found no remarkable abnormality on the capacitor terminals. R230 20 45 45 1mm

* As for the surge and derated voltage at 125°C, refer to page 243 for details.

F95

■ Standard ratings

Rated Volt	Rated Capacitance (μF)	Case code	Part Number	Leakage Current (μA)	Dissipation Factor (%@120Hz)	E.S.R (Ω@100kHz)	*1 ΔC/C (%)	
4V	15	P	F950G156MPAAQ2	0.6	10	1.8	*	
	22	P	F950G226MPAAQ2	0.9	14	1.1	*	
	33	P	F950G336MPAAQ2	1.3	14	1.1	*	
	47	P	F950G476MPAAQ2	1.9	14	1.1	*	
	47	Q	F950G476MQAAQ2	1.9	10	1.1	*	
	47	S	F950G476MSAAQ2	1.9	10	0.8	*	
	47	A	F950G476MAAAQ2	1.9	8	0.6	*	
	68	S	F950G686MSAAQ2	2.7	10	0.8	*	
	68	A	F950G686MAAAQ2	2.7	10	0.5	*	
	100	P	F950G107MPAAQ2	4.0	30	1.2	±15	
	100	Q	F950G107MQAAQ2	4.0	25	1.0	±15	
	100	S	F950G107MSAAQ2	4.0	14	0.8	*	
	100	A	F950G107MAAAQ2	4.0	12	0.5	*	
	150	B	F950G157MBAAQ2	6.0	14	0.4	*	
	220	S	F950G227MSAAQ2	8.8	25	0.8	±15	
	220	A	F950G227MAAAQ2	8.8	25	0.8	±15	
	220	T	F950G227MTAAQ2	8.8	25	0.6	*	
	220	B	F950G227MBAAQ2	8.8	16	0.4	*	
	6.3V	10	P	F950J106MPAAQ2	0.6	8	2.0	*
		15	P	F950J156MPAAQ2	0.9	10	1.8	*
22		P	F950J226MPAAQ2	1.4	14	1.1	*	
33		P	F950J336MPAAQ2	2.1	14	1.1	*	
33		Q	F950J336MQAAQ2	2.1	10	2.0	*	
33		S	F950J336MSAAQ2	2.1	10	1.0	*	
33		A	F950J336MAAAQ2	2.1	8	0.8	*	
47		P	F950J476MPAAQ2	3.0	20	1.1	±15	
47		Q	F950J476MQAAQ2	3.0	10	1.1	*	
47		S	F950J476MSAAQ2	3.0	10	0.9	*	
47		A	F950J476MAAAQ2	3.0	10	0.6	*	
68		S	F950J686MSAAQ2	4.3	14	0.9	*	
68		A	F950J686MAAAQ2	4.3	12	0.5	*	
100		S	F950J107MSAAQ2	6.3	20	0.9	±15	
100		A	F950J107MAAAQ2	6.3	14	0.5	*	
100		T	F950J107MTAAQ2	6.3	14	0.6	*	
100		B	F950J107MBAAQ2	6.3	14	0.4	*	
150		B	F950J157MBAAQ2	9.5	18	0.4	*	
220		B	F950J227MBAAQ2	13.9	30	0.4	*	
10V		3.3	P	F951A335MPAAQ2	0.5	8	5.0	*
	4.7	P	F951A475MPAAQ2	0.5	8	4.0	*	
	6.8	P	F951A685MPAAQ2	0.7	8	4.0	*	
	10	P	F951A106MPAAQ2	1.0	8	3.0	*	
	15	P	F951A156MPAAQ2	1.5	10	3.0	*	
	22	P	F951A226MPAAQ2	2.2	14	3.0	*	
	22	Q	F951A226MQAAQ2	2.2	10	2.0	*	
	22	S	F951A226MSAAQ2	2.2	10	1.1	*	
	22	A	F951A226MAAAQ2	2.2	6	0.9	*	
	33	S	F951A336MSAAQ2	3.3	10	1.1	*	
	33	A	F951A336MAAAQ2	3.3	10	0.8	*	
	47	S	F951A476MSAAQ2	4.7	14	1.1	±15	
	47	A	F951A476MAAAQ2	4.7	10	0.8	*	
	47	T	F951A476MTAAQ2	4.7	12	0.8	*	
	47	B	F951A476MBAAQ2	4.7	8	0.4	*	
	68	B	F951A686MBAAQ2	6.8	12	0.4	*	
	100	B	F951A107MBAAQ2	10.0	14	0.4	*	

Rated Volt	Rated Capacitance (μF)	Case code	Part Number	Leakage Current (μA)	Dissipation Factor (%@120Hz)	E.S.R (Ω@100kHz)	*1 ΔC/C (%)	
16V	1	P	F951C105MPAAQ2	0.5	8	8.0	*	
	1.5	P	F951C155MPAAQ2	0.5	8	8.0	*	
	2.2	P	F951C225MPAAQ2	0.5	8	6.0	*	
	3.3	P	F951C335MPAAQ2	0.5	8	6.0	*	
	4.7	P	F951C475MPAAQ2	0.8	10	4.0	*	
	10	P	F951C106MPAAQ2	1.6	10	4.0	*	
	10	Q	F951C106MQAAQ2	1.6	8	3.0	*	
	10	S	F951C106MSAAQ2	1.6	8	2.0	*	
	10	A	F951C106MAAAQ2	1.6	6	1.4	*	
	15	S	F951C156MSAAQ2	2.4	8	2.0	*	
	15	A	F951C156MAAAQ2	2.4	8	1.4	*	
	22	Q	F951C226MQAAQ2	3.5	12	3.0	*	
	22	S	F951C226MSAAQ2	3.5	10	2.0	±15	
	22	A	F951C226MAAAQ2	3.5	8	1.4	*	
	22	T	F951C226MTAAQ2	3.5	8	1.4	*	
	22	B	F951C226MBAAQ2	3.5	6	0.5	*	
	33	B	F951C336MBAAQ2	5.3	8	0.5	*	
	47	B	F951C476MBAAQ2	7.5	10	0.6	*	
	20V	2.2	P	F951D225MPAAQ2	0.5	6	6.0	*
		2.2	S	F951D225MSAAQ2	0.5	6	5.0	*
3.3		A	F951D335MAAAQ2	0.7	6	2.0	*	
4.7		S	F951D475MSAAQ2	0.9	8	4.0	*	
4.7		A	F951D475MAAAQ2	0.9	6	1.5	*	
6.8		A	F951D685MAAAQ2	1.4	8	1.5	*	
10		A	F951D106MAAAQ2	2.0	8	1.5	*	
10		B	F951D106MBAAQ2	2.0	6	0.8	*	
22	B	F951D226MBAAQ2	4.4	8	0.8	*		
25V	1	P	F951E105MPAAQ2	0.5	6	8.0	*	
	1	S	F951E105MSAAQ2	0.5	6	8.0	*	
	1.5	S	F951E155MSAAQ2	0.5	6	7.0	*	
	2.2	S	F951E225MSAAQ2	0.6	6	7.0	*	
	2.2	A	F951E225MAAAQ2	0.6	6	3.2	*	
	3.3	A	F951E335MAAAQ2	0.8	6	2.8	*	
	4.7	S	F951E475MSAAQ2	1.2	8	4.0	*	
	4.7	A	F951E475MAAAQ2	1.2	8	2.0	*	
10	B	F951E106MBAAQ2	2.5	6	0.9	*		
35V	1	S	F951V105MSAAQ2	0.5	6	8.0	*	
	1	A	F951V105MAAAQ2	0.5	4	4.4	*	
	1.5	A	F951V155MAAAQ2	0.5	6	4.4	*	
	2.2	A	F951V225MAAAQ2	0.8	6	4.4	*	
	3.3	B	F951V335MBAAQ2	1.2	6	1.6	*	
4.7	B	F951V475MBAAQ2	1.7	6	1.6	*		

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

*1 : ΔC/C

Item	P · Q · S · A · T · B Case (%)
Damp Heat	±10
Temperature cycles	±5
Resistance soldering heat	±5
Surge	±5
Endurance	±10

Conformal coated Chip, For Mobile Audio

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



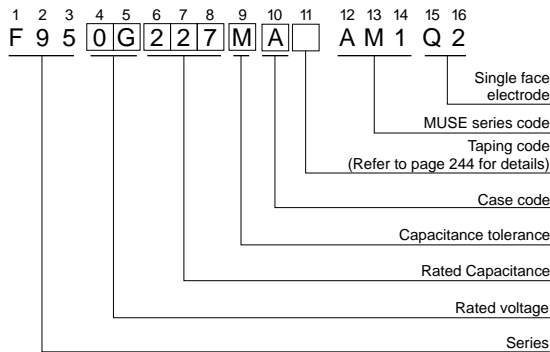
Applications

- Mobile Audio Player
- Digital still camera
- Digital video camcorder
- Mobile phone

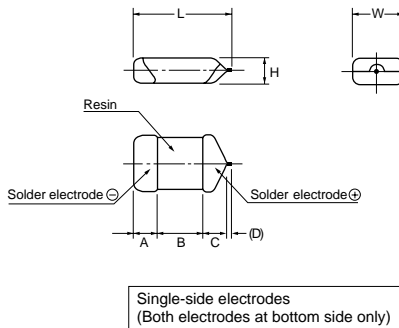
Feature

- Rich sound in the bass register and clear sound, Materials are strictly selected to achieve high level sound. F95 series has no lead-frame, and no vibration factor.
- Low ESR, Low ESL
- Line up miniature size and high capacitance, necessary to mobile design.

Type numbering system (Example : 4V 220 μF)



Drawing



Specifications

Item	Performance Characteristics
Category	
Temperature Range	-55 ~ +125°C (Rated temperature : +85°C)
Capacitance Tolerance	±20% (at 120Hz)
Dissipation Factor (at 120Hz)	Refer to next page
E.S.R.(100kHz)	Refer to next page
Leakage Current	• After 1 minute's application of rated voltage, leakage current at 25°C is not more than 0.01CV or 0.5 μA, whichever is greater.
Capacitance Change by Temperature	+15% Max. (at +125°C) +10% Max. (at +85°C) -10% Max. (at -55°C)
Damp Heat	At 40°C, 90 ~ 95% R.H., For 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	At -55°C / +125°C, 30 minutes each, For 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	Reflow at 260°C for 10 seconds 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 meet the characteristics requirements listed 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 at 85°C, or derated voltage at 125°C, capacitors meet the characteristic requirements listed 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 an aluminum substrate, there shall be found neither exfoliation nor its sign at the terminal electrode. 5N (0.51kg·f) For 10 ± 1 seconds
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 the capacitor, the pressure strength is applied with a specified jig at the center of the substrate so that the substrate may bend by 1mm as illustrated. Then, there shall be found no remarkable abnormality on the capacitor terminals. R230 20 45 45 1mm

* As for the surge and derated voltage at 125°C, refer to page 243 for details.

Dimensions

case code	L	W	H	A	B	C	(D)
S	3.2 ± 0.3	1.6 ± 0.3	1.0 ± 0.2	0.8 ± 0.3	1.2 ± 0.3	0.8 ± 0.3	(0.2)
A	3.2 ± 0.3	1.7 ± 0.3	1.4 ± 0.2	0.8 ± 0.3	1.2 ± 0.3	0.8 ± 0.3	(0.2)
T	3.5 ± 0.2	2.7 ± 0.2	1.0 ± 0.2	0.8 ± 0.2	1.2 ± 0.2	1.1 ± 0.2	(0.2)
B	3.5 ± 0.2	2.8 ± 0.2	1.8 ± 0.2	0.8 ± 0.3	1.2 ± 0.3	1.1 ± 0.3	(0.2)

D dimension only for reference

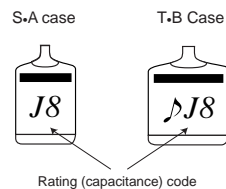
nichicon MUSE F95

Standard ratings

Cap. (μF)	V			
	Code	4	6.3	10
68	686	S	S · A	B
100	107	S	S · A · T	B
150	157	S	(A)	
220	227	S · A · T	B	
330	337	(T) · B	(B)	
470	477	(B)		
680	687	(B)		

() The series in parentheses are being developed.
Please contact to your local Nichicon sales office when these series are being designed in your application.

Marking



Rating (capacitance) code

μF	68	100	150	220	330	470	680
code	W7	A8	E8	J8	N8	S8	W8

Standard ratings

Rated Volt	Rated Capacitance (μF)	Case code	Part Number	Leakage Current (μA)	Dissipation Factor (%@120Hz)	E.S.R (Ω@100kHz)	*1 ΔC/C (%)
4V	68	S	F950G686MSAAM1Q2	2.7	10	0.8	*
	100	S	F950G107MSAAM1Q2	4.0	14	0.8	*
	150	S	F950G157MSAAM1Q2	6.0	22	0.8	±15
	220	S	F950G227MSAAM1Q2	8.8	25	0.8	±15
	220	A	F950G227MAAAM1Q2	8.8	25	0.8	±15
	220	T	F950G227MTAAM1Q2	8.8	25	0.6	*
	330	B	F950G337MBAAM1Q2	13.2	30	0.5	±15
6.3V	68	S	F950J686MSAAM1Q2	4.3	14	0.9	*
	68	A	F950J686MAAAM1Q2	4.3	12	0.5	*
	100	A	F950J107MAAAM1Q2	6.3	14	0.5	*
	100	T	F950J107MTAAM1Q2	6.3	14	0.6	*
	220	B	F950J227MBAAM1Q2	13.9	30	0.4	*
10V	68	B	F951A686MBAAM1Q2	6.8	12	0.4	*
	100	B	F951A107MBAAM1Q2	10.0	14	0.4	*

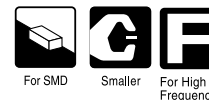
*1 : ΔC/C

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

F72 Low Profile
Conformal coated Chip

F75 Maximum CV
Conformal coated Chip

FRAMELESS™



● Adapted to the RoHS directive (2002/95/EC).



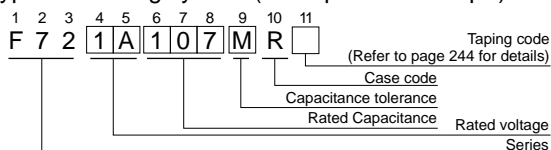
Specifications

Item	Performance Characteristics			
Category	-55 ~ +125°C (Rated temperature : +85°C)			
Temperature Range	-55 ~ +125°C (Rated temperature : +85°C)			
Capacitance Tolerance	±20%, ±10% (at 120Hz)			
Dissipation Factor (120Hz)	F72		F75	
	33~68µF	6%Max.	68~330µF	10%Max.
	100µF~	8%Max.	470µF	14%Max.
	150µF	10%Max.	680µF	18%Max.
E.S.R (100kHz)	F72		F75	
	33µF	0.90Ω	~150µF	0.22Ω
	47µF	0.80Ω	220µF	0.20Ω
	68µF	0.75Ω	330µF	0.15Ω
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.			
Capacitance Change by Temperature	+15% Max. (at +125°C)			
	+10% Max. (at +85°C) -10% Max. (at -55°C)			
Damp Heat	At 40°C, 90~95% R.H., For 500 hours (No voltage applied)			
	Capacitance Change Within ±10% of initial value Dissipation Factor Initial specified value or less Leakage Current Initial specified value or less			
Temperature Cycles	At -55°C / +125°C, 30 minutes each, For 5 cycles.			
	Capacitance Change Within ±5% of initial value Dissipation Factor Initial specified value or less Leakage Current Initial specified value or less			
Resistance to Soldering Heat	Reflow at 260°C for 10 seconds, Dipping Flow at 260°C for 10 seconds			
	Capacitance Change Within ±5% of initial value Dissipation Factor Initial specified value or less Leakage Current Initial specified value or less			
Surge*	After application of surge 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 meet the characteristics requirements listed below.			
	Capacitance Change Within ±5% of initial value Dissipation Factor Initial specified value or less Leakage Current Initial specified value or less			
Endurance*	After 2000 hours' application of rated voltage at 85°C, or derated voltage at 125°C, capacitors meet the characteristic requirements listed below.			
	Capacitance Change Within ±10% of initial value 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 an aluminum substrate, there shall be found neither exfoliation nor its sign at the terminal electrode.			
	5N (0.51kg · f) For 10 ± 1 seconds			
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 the capacitor, the pressure strength is applied with a specified jig at the center of the substrate so that the substrate may bend by 1mm as illustrated. Then, there shall be found no remarkable abnormality on the capacitor terminals.			

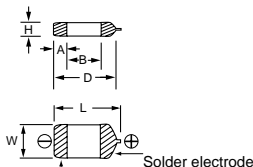
* As for the surge and derated voltage at 125°C, refer to page 243 for details.

F72

Type numbering system (Example : 10V 100µF)



Drawing



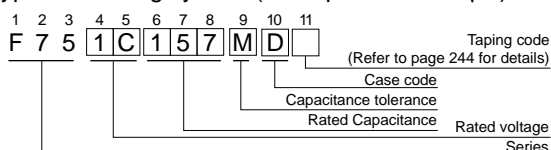
Dimensions

Case code	L	W	H	A	B	(D)
R	7.2 ± 0.3	6.0 ± 0.3	1.2 ± 0.3	1.3 ± 0.4	3.8 ± 0.6	(6.2)

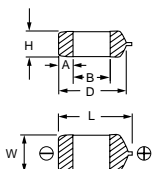
D dimension only for reference

F75

Type numbering system (Example : 16V 150µF)



Drawing



Dimensions

Case code	L	W	H	A	B	(D)
C	7.1 ± 0.3	3.2 ± 0.3	2.5 ± 0.3	1.3 ± 0.3	3.6 ± 0.6	(6.0)
D	7.3 ± 0.3	4.3 ± 0.3	2.8 ± 0.3	1.3 ± 0.4	3.9 ± 0.6	(6.4)
R	7.2 ± 0.3	6.0 ± 0.3	3.5 ± 0.3	1.3 ± 0.4	3.8 ± 0.6	(6.2)

D dimension only for reference

Standard ratings

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Cap. (µF)	Code	V			
		4	6.3	10	16
33	336				R
47	476			R	R
68	686		R	R	R
100	107	R	R	R	
150	157	R	R	R	
220	227	R	R		
330	337	R			

F75

Cap. (µF)	Code	V			
		4	6.3	10	16
68	686				C
100	107				C
150	157			C	D
220	227		C	C · D	R
330	337	C	C · D	D	
470	477	C · D	D	R	
680	687	D	D · R		
1000	108	D · R	R		
1500	158	R			
2200	228	R			