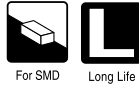
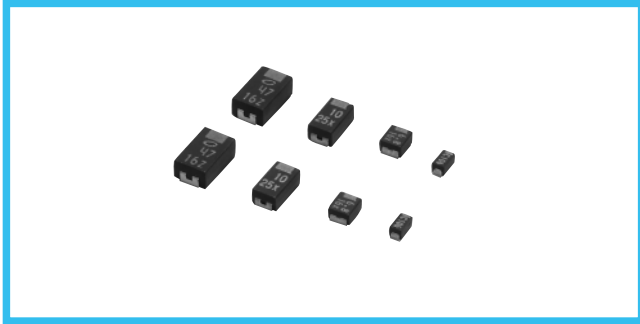


## F97

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



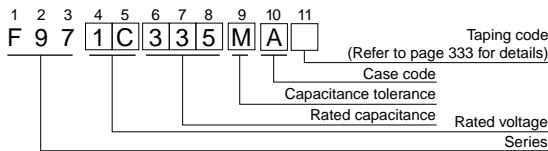
- Compliant to the RoHS directive (2002/95/EC).
- Compliant to AEC-Q200.



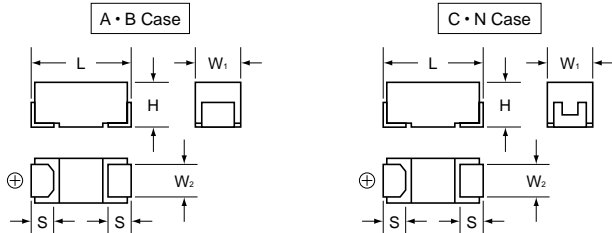
### Applications

- Automotive electronics(Engine ECU)
- Industrial equipment

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



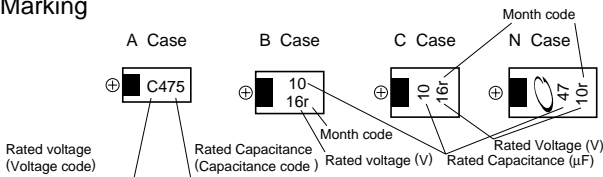
### Drawing



### Dimensions

Case code	L	W <sub>1</sub>	W <sub>2</sub>	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	6.3	10	16	20	25	35
0.47	Code	0J	1A	1C	1D	1E	1V
0.47	474						A
0.68	684				A	A	A
1	105				A	A	(A)
1.5	155			A	A		(A) · B
2.2	225		A	A	A	(A) · B	B
3.3	335	A	A	A	B	B	(B) · C
4.7	475	A	A · B	A · B	A · B	(B) · C	C
6.8	685	A · B	B	B	(B) · C	C	(C) · N
10	106		A · B	A · B · C	(B) · C	C · N	N
15	156	B	B	(B) · C	N	(C) · N	
22	226	A · B	A · B	B · C · N	C · N	(N)	
33	336	A · C	B · C · N	B · C · N		(N)	
47	476	B · C	(B) · C · N	(C) · N			
68	686	N	N				
100	107	N	(C) · (N)				

### Specifications

Item	Performance Characteristics
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*	<ul style="list-style-type: none"> <li>• 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.</li> <li>• After 1 minute's application of rated voltage,leakage current at 85°C is not more than 0.1CV or 5μA, whichever is greater.</li> <li>• 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.</li> </ul>
Capacitance Change by Temperature	+15% Max. (at +125°C) +10% Max. (at +85°C) -10% Max. (at -55°C)
Damp Heat (Steady State)	At 85°C, 85% R.H.,For 1000 hours (No voltage applied) Capacitance Change ..... Within ±10% of the initial value Dissipation Factor ..... Initial specified value or less Leakage Current ..... 125% or less than the initial specified value
Load Humidity	After 500 hour's application of rated voltage in series with a 33Ω resistor at 60°C, 90 to 95% R.H.,capacitors meet the characteristics requirements table below. Capacitance Change ..... Within ±10% of the initial value Dissipation Factor ..... Initial specified value or less Leakage Current ..... 125% or less than the initial specified value
Temperature Cycles	At -55°C / +125°C,For 30 minutes each,1000 cycles Capacitance Change ..... Within ±5% of the initial value 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 ..... Within ±5% of the 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 to 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 shall meet the characteristic requirements table below. Capacitance Change ..... Within ±5% of the 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 shall meet the characteristic requirements table below. Capacitance Change ..... Within ±10% of the 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 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 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.

( ) The series in parentheses are being developed.

Please contact to your local Nichicon sales office when these series are being designed in your application.

## F97

### Standard Ratings

Rated Volt	Rated Capacitance (μF)	Case code	Part Number	Leakage Current (μA)	Dissipation Factor (%@120Hz)	ESR (Ω@100kHz)
6.3V	3.3	A	F970J335MAA	0.5	4	4.5
	4.7	A	F970J475MAA	0.5	6	4.0
	6.8	A	F970J685MAA	0.5	6	3.5
	6.8	B	F970J685MBA	0.5	6	2.5
	15	B	F970J156MBA	0.9	6	2.0
	22	A	F970J226MAA	1.4	12	2.5
	22	B	F970J226MBA	1.4	8	1.9
	33	A	F970J336MAA	2.1	12	2.5
	33	C	F970J336MCC	2.1	6	1.1
	47	B	F970J476MBA	3.0	8	1.0
	47	C	F970J476MCC	3.0	6	0.9
	68	N	F970J686MNC	4.3	6	0.6
	100	N	F970J107MNC	6.3	8	0.6
	10V	2.2	A	F971A225MAA	0.5	4
3.3		A	F971A335MAA	0.5	4	4.5
4.7		A	F971A475MAA	0.5	6	4.0
4.7		B	F971A475MBA	0.5	6	2.8
6.8		B	F971A685MBA	0.7	6	2.5
10		A	F971A106MAA	1.0	6	3.0
10		B	F971A106MBA	1.0	6	2.0
15		B	F971A156MBA	1.5	6	2.0
22		A	F971A226MAA	2.2	15	3.0
22		B	F971A226MBA	2.2	8	1.9
33		B	F971A336MBA	3.3	8	1.9
33		C	F971A336MCC	3.3	6	1.1
33		N	F971A336MNC	3.3	6	0.7
47		C	F971A476MCC	4.7	8	0.9
47	N	F971A476MNC	4.7	6	0.7	
68	N	F971A686MNC	6.8	6	0.6	
16V	1.5	A	F971C155MAA	0.5	4	6.3
	2.2	A	F971C225MAA	0.5	4	5.0
	3.3	A	F971C335MAA	0.5	4	4.5
	4.7	A	F971C475MAA	0.8	8	4.0
	4.7	B	F971C475MBA	0.8	6	2.8
	6.8	B	F971C685MBA	1.1	6	2.5
	10	A	F971C106MAA	1.6	8	3.5
	10	B	F971C106MBA	1.6	6	2.1
	10	C	F971C106MCC	1.6	6	1.5
	15	C	F971C156MCC	2.4	6	1.2
	22	B	F971C226MBA	3.5	8	1.9
	22	C	F971C226MCC	3.5	8	1.1
	22	N	F971C226MNC	3.5	6	0.7
	33	B	F971C336MBA	5.3	10	2.1
33	C	F971C336MCC	5.3	8	1.1	
33	N	F971C336MNC	5.3	6	0.7	
47	N	F971C476MNC	7.5	8	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	4	6.7
	2.2	A	F971D225MAA	0.5	6	6.3
	3.3	B	F971D335MBA	0.7	4	3.1
	4.7	A	F971D475MAA	0.9	8	4.0
	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	C	F971D226MCC	4.4	8	1.1
	22	N	F971D226MNC	4.4	6	0.7

Rated Volt	Rated Capacitance (μF)	Case code	Part Number	Leakage Current (μA)	Dissipation Factor (%@120Hz)	ESR (Ω@100kHz)
25V	0.68	A	F971E684MAA	0.5	4	7.6
	1	A	F971E105MAA	0.5	4	7.5
	2.2	B	F971E225MBA	0.6	4	3.8
	3.3	B	F971E335MBA	0.8	4	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	0.47	A	F971V474MAA	0.5	4
0.68		A	F971V684MAA	0.5	4	7.6
1.5		B	F971V155MBA	0.5	4	4.0
2.2		B	F971V225MBA	0.8	4	3.8
3.3		C	F971V335MCC	1.2	4	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	

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