SOLID TANTALUM ELECTROLYTIC CAPACITORS

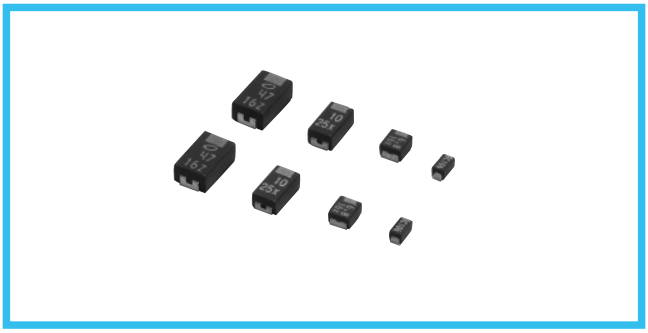
nichicon

F97

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

For SMD　Long Life

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



Applications

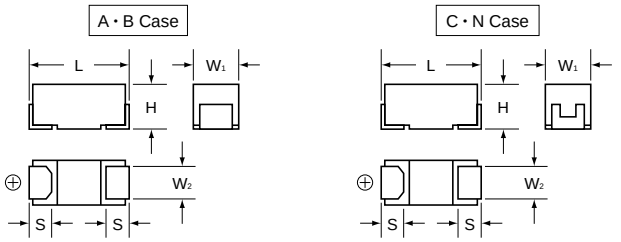
- Automotive electronics(Engine ECU)
- Industrial equipment

Type numbering system (Example : 16V 3.3µF)

1	2	3	4	5	6	7	8	9	10	11
F	9	7	1	C	3	3	5	M	A	

- 11: Taping code (Refer to page 333 for details)
- 10: Case code
- 9: Capacitance tolerance
- 8 7 6: Rated capacitance
- 5 4: Rated voltage
- 3 2 1: Series

Drawing

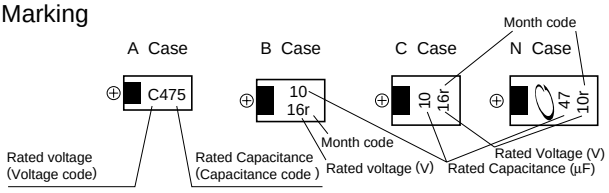


Dimensions

(mm)

Case code	L	W1	W2	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



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*	• 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 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. 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 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. R230　20　1mm　45　45

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

Standard ratings

Cap.(µF) \ V	6.3	10	16	20	25	35
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)				

( ) 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)	Disspation 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	5.0
	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)	Disspation 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	10.0
	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.

Стандарт Электрон Связь

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