

LOW ESR Resin-molded Chip



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



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





C · N Case W1 н ΓL 4 \oplus W2 4 → s -

Dimensions

Dimen	1510115				(mm)
Case Code	L	W1	W2	Н	S	
С	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

Car	V	4	6.3	10
(µF)	Code	0G	OJ	1A
68	686			С
100	107		С	С
150	157	С	С	N
220	227	С	C•N	N
330	337	Ν	N	N
470	477	N	N	
680	687	Ν		-

Item	Performance Characteristics
Category Temperature Range	-55 to +125°C (Rated temperature : +85°C)
Capacitance Tolerance	±20%, ±10% (at 120Hz)
Dissipation Factor (120Hz)	Refer to the table below.
ESR (100kHz)	Refer to the table below.
Leakage Current	 After 1 minute's application of rated voltage, leakage current at 20°C is not more than 0.01CV or 0.5µÅ, whichever is greater. After 1 minute's application of rated voltage, leakage current at 85°C is not more than 0.1CV or 5µÅ, whichever is greater. After 1 minute's application of derated voltage, leakage current at 125°C is not more than 0.125CV or 6.3µÅ, whichever is greater.
Capacitance Change by Temperature	+15% Max. (at +125°C) +10% Max. (at +85°C) –10% Max. (at –55°C)
	At 40°C 90 to 95% R.H. 500 hours (No voltage applied)
Damp Heat	Capacitance Change Within ±10% of the initial value
(Sieady Sidle)	Leakage CurrentInitial specified value or less
	-55°C / +125°C 30 minutes each 5 cycles
Temperature Cycles	Capacitance Change Within ±5% of the initial value Dissipation FactorInitial specified value or less Leakage CurrentInitial 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 FactorInitial specified value or less Leakage CurrentInitial 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 shall meet the characteristic requirements table below. Capacitance ChangeWithin ±5% of the initial value Dissipation FactorInitial specified value or less Leakage CurrentInitial 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 characteristics requirements table below. Capacitance ChangeWithin ±10% of the initial value Dissipation FactorInitial specified value or less Leakage CurrentInitial 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. $\square \square \square \square \square \square \square \square \square \square $
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.

	Rated Volt	Rated Capacitance (µF)	Case code	Part Number	Leakage Current (µA)	Disspation Factor (%@120Hz)	ESR (mΩ@100kHz)
		150	С	F910G157MCC	6.0	12	250
		220	С	F910G227MCC	8.8	12	250
	4V	330	N	F910G337MNC	13.2	10	100
		470	Ν	F910G477MNC	18.8	16	100
		680	N	F910G687MNC	27.2	18	100
		100	С	F910J107MCC	6.3	8	250
		150	С	F910J157MCC	9.5	12	250
	6 21/	220	С	F910J227MCC	13.9	14	250
	0.3V	220	N	F910J227MNC	13.9	10	100
		330	N	F910J337MNC	20.8	14	100
		470	N	F910J477MNC	29.6	16	100
		68	С	F911A686MCC	6.8	8	300
		100	С	F911A107MCC	10.0	10	250
	10V	150	N	F911A157MNC	15.0	10	100
		220	N	F911A227MNC	22.0	12	100
		330	Ν	F911A337MNC	33.0	18	100

% In case of capacitance tolerance \pm 10% type, \overleftarrow{K} will be put at 9th digit of type numbering system.

CAT.8100B







For SMD Smaller

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





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

Specifications

Itom	Performance Characteristics				
nem	P Case	A · B Case			
Category Temperature Range	-55 to +125°C (Rated temperature : +85°C)				
Capacitance Tolerance	±20% (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 0.12CV 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)			
	At 40°C 90 to 95% R.H. 500 hours (No voltage applied)				
Damp Heat (Steady State)	Capacitance Change Refer to next page (*1) Dissipation Factor150% or less than the initial specified value Leakage Current Initial specified value or less	Refer to next page (*1) Initial specified value or less Initial specified value or less			
	_55°C / +125°C 30 minutes eac	h 5 cycles			
Temperature Cycles	Capacitance Change Refer to next page (*1) Dissipation Factor150% or less than the initial specified value Leakage Current Initial specified value or less	Refer to next page (*1) Initial specified value or less Initial specified value or less			

∎ Тур	be numbe	ering sys	tem (E:	xample:	6.3V 10	ĴμF)		
1	2 3 4	5 6 7	8 9 1 C M [0 11		Taning and		
F -	920	<u>J 1 0 0</u>			Refer to page	e 333 for details)		
				Capacitan	Case code			
				Rated	capacitance	Pated voltage		
						Series		
Dra	wina							
	Π.	ήн						
			н	H				
		┍┑╧╶╹	-					
	⊕IJ		2					
	► S ◄ -	►s 🖛 📍						
Din	nensions					(mm)		
	Case code		W.	W.	н	(mm)		
	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		
	В	3.4 ± 0.2	2.8 ± 0.2	2.3 ± 0.1	1.1 ± 0.1	0.8 ± 0.2		
		10 second	s reflow a	t 260°C, 5 s	econds imn	nersion at 260°C		
Resistan	e.	Refer to	next page	(*1)	Refer to next page (*1)			
to Solderi	ing Heat	Dissipation	Dissipation Factor150% of					
	0	Leakage C	less than the initial specified value			Initial specified value of less		
		Initial spe	ecified value	ue or less	Initial specified value or less			
		After application of the After application of	ation of sur	ge voltage in 0 seconds Of	series with a	33Ω (For "P"case : 1kΩ) S OFF for 1000		
		successive	test cycles	at 85°C, capa	acitors shall n	neet the characteristic		
		requirement	ts table bel	OW.				
Surge*		Capacitan Refer to	ce Chang next page	e… (*1)	Refer to ne	ext page (*1)		
		Dissipation	n Factor…	150% or				
		Leakage C	ne initial spe Current…	cified value	Initial spec	cified value or less		
		Initial spe	cified value	ue or less	Initial spec	ified value or less		
		After 2000	hours' ap	plication of	After 2000	hours' application of		
		3Ω resisto	r at 85°C,	or derated	3Ω resisto	r at 85°C, or derated		
		voltage in	series with	h a 3Ω	voltage in	series with a 3Ω		
		shall meet	the chara	acteristic	shall meet	the characteristic		
Enduranc	ce*	requireme	nts table t	below.	requireme	nts table below.		

nichicon

Endurance*	requirements table below. Capacitance Change… Refer to next page (*1) Dissipation Factor…150% or less than the initial specified value Leakage Current…	requirements table below. Capacitance Change··· Refer to next page (*1) Dissipation Factor··· Initial specified value or less Leakage Current···
Shear Test	Initial specified value or less After applying the pressure load 10±1 seconds horizontally to the of capacitor side body which has electrode and has been soldered beforehand on a substrate, there found neither exfoliation nor its s	Initial specified value or less of 5N for center s no $5N (0.51 \text{kg} \cdot \text{f})$ e shall be sign at For 10 ± 1 seconds
Terminal Strength	Keeping a capacitor surface-mo down and supporting the substra bottom points 45mm apart from pressure strength is applied with jig at the center of substrate so t the substrate may bend by 1mm illustrated. Then, there shall be found no remarkable abnormality on the capacitor terminals	unted on a substrate upside ate at both of the opposite the center of capacitor, the a specified hat R230 - 20 45 45 45

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

Standard Ratings

220

227

(B)

	0								
\square	V	4	6.3	10	16	20	25	35	**
Сар. (µF)	Code	0G	0J	1A	1C	1D	1E	1V	Capacitance code
0.22	224							A	J
0.33	334							A	N
0.47	474				Р	P·A		A	S
0.68	684				Р	A			W
1	105			Р	Р	P·A	Р·А	A	A
1.5	155			Р	P	A			E
2.2	225		Р	Р	P·A	(P) • A	А·В	В	J
3.3	335	Р	Р	P·A	A			В	N
4.7	475	Р	Р	Р·А	(P) • A • B	A·B	А·В		S
6.8	685	Р	Р	Р·А	В				w
10	106	Р·А	Р·А	Р·А	A·B	B			а
15	156	Р	Р·А	A					е
22	226	Р·А	Р·А	A·B	В				J
33	336	Р·А	А·В	В					n
47	476	(P) • A • B	А·В	В					S
68	686	A·B							
100	107	A·B	(A) • B		() The s	series in parenthese	s are being develop	ed. Please contact t	o your local Nichicor
150	157	в		-	sales off	fice when these serie	es are being designe	ed in vour application	٦.

Standard Ratings

F92

3.3 P F920G335MPA 0.5 8 12.0 * 4.7 P F920G475MPA 0.5 10 6.0 * 10 A F920G165MPA 0.5 10 6.0 * 10 A F920G165MPA 0.5 8 4.0 * 15 P F920G265MPA 0.9 20 5.0 * 22 A F920G263MPA 1.3 12 2.8 * 33 A F920G376MAA 1.9 18 2.8 * 47 A F920G476MAA 1.9 18 2.8 * 47 B F920G107MBA 4.0 18 1.3 * 100 A F920G107MBA 4.0 18 1.3 * 150 B F920J16MAA 0.5 8 1.0 * 100 A F920J16MAA 0.5 8 1.0 * 100 <th>Rated Volt</th> <th>Rated Capacitance (µF)</th> <th>Case code</th> <th>Part Number</th> <th>Leakage Current (µA)</th> <th>Disspation Factor (%@120Hz)</th> <th>ESR (@@100kHz)</th> <th>*1 ∆C/C (%)</th>	Rated Volt	Rated Capacitance (µF)	Case code	Part Number	Leakage Current (µA)	Disspation Factor (%@120Hz)	ESR (@@100kHz)	*1 ∆C/C (%)
4.7 P F920G475MPA 0.5 8 6.0 * 6.8 P F920G106MPA 0.5 10 6.0 * 10 A F920G106MPA 0.5 8 4.0 * 15 P F920G226MPA 0.9 12 2.8 * 22 A F920G326MPA 1.3 20 4.0 * 33 A F920G326MPA 1.9 12 2.8 * 47 B F920G476MBA 1.9 12 1.7 * 68 A F920G686MBA 2.7 18 1.5 * 100 A F920G177MBA 4.0 30 2.8 115 100 B F920G157MBA 0.5 8 12.0 * 100 A F920J35MPA 0.5 8 12.0 * 101 A F920J15MPA 0.5 8 1.0 * 101<		3.3	Р	F920G335MPA	0.5	8	12.0	*
6.8 P F920C106MPA 0.5 10 6.0 * 10 A F920C106MAA 0.5 8 4.0 * 15 P F920C326MPA 0.9 20 5.0 * 22 A F920C326MPA 0.9 12 2.8 * 4V 33 A F920C336MAA 1.3 12 2.8 * 47 A F920C476MBA 1.9 12 2.8 * 47 B F920C476MBA 1.9 12 2.8 * 68 A F920C668MAA 2.7 25 2.8 * 100 A F920C177MBA 4.0 30 2.8 * 100 A F920L355MPA 0.5 8 12.0 * 10 P F920L315MPA 0.5 8 12.0 * 10 A F920L315MPA 0.5 8 12.0 * <t< td=""><td></td><td>4.7</td><td>Р</td><td>F920G475MPA</td><td>0.5</td><td>8</td><td>6.0</td><td>*</td></t<>		4.7	Р	F920G475MPA	0.5	8	6.0	*
10 P F920G106MPA 0.5 10 6.0 * 10 A F920G166MPA 0.6 10 5.0 * 22 P F920G265MPA 0.9 20 5.0 * 22 A F920G326MPA 1.3 20 4.0 * 33 A F920G376MAA 1.3 12 2.8 * 47 A F920G476MAA 1.9 18 2.8 * 47 B F920G476MAA 1.9 18 1.3 * * 68 A F920G677MBA 4.0 30 2.8 ±15 100 A F920G157MBA 0.5 8 12.0 * 4.7 P F920J355MPA 0.5 8 12.0 * 10 A F920J166MPA 0.6 8 4.0 * 10 A F920J156MPA 0.5 8 12.0 * <t< td=""><td></td><td>6.8</td><td>P</td><td>F920G685MPA</td><td>0.5</td><td>10</td><td>6.0</td><td>*</td></t<>		6.8	P	F920G685MPA	0.5	10	6.0	*
10 A F920G106MAA 0.5 8 4.0 * 15 P F920G126MPA 0.9 10 5.0 * 22 P F920G226MPA 0.9 12 2.8 * 4V 33 A F920G336MPA 1.3 20 4.0 * 47 A F920G476MAA 1.9 18 2.8 * 47 B F920G476MBA 1.9 12 1.7 * 68 A F920G476MBA 1.9 18 1.5 * 100 A F920G476MBA 4.0 30 2.8 15 100 B F920G475MBA 6.0 18 1.3 15 110 A F920J35MPA 0.5 8 6.0 * 15 P F920J36MAA 0.5 8 4.0 * 15 P F920J35MAA 0.5 8 4.0 *		10	P	F920G106MPA	0.5	10	6.0	*
15 P F920G226MPA 0.6 10 5.0 * 22 A F920G226MAA 0.9 20 5.0 * 4V 33 P F920G236MAA 1.3 20 4.0 * 33 A F920G376MAA 1.3 12 2.8 * 47 A F920G476MBA 1.9 12 1.7 * 68 A F920G686MAA 2.7 25 2.8 ±15 100 A F920G107MAA 4.0 30 2.8 ±15 100 B F920G137MBA 6.0 25 1.3 ±15 100 B F920G137MBA 0.5 8 12.0 * 3.3 P F920J335MPA 0.5 8 12.0 * 4.7 P F920J475MPA 0.5 8 12.0 * 5.33 P F920J326MPA 1.4 20 5.0 * <		10	A	F920G106MAA	0.5	8	4.0	*
22 P F920G226MPA 0.9 12 2.8 * 4V 33 P F920G336MPA 1.3 2.0 4.0 * 33 A F920G336MPA 1.3 2.0 4.0 * 47 A F920G476MPA 1.9 12 1.7 * 47 B F920G676MPA 1.9 12 1.7 * 68 A F920G6107MPA 4.0 30 2.8 ±15 100 B F920G107MPA 4.0 18 1.3 * 100 B F920J25MPA 0.5 8 12.0 * 3.3 P F920J35MPA 0.5 8 12.0 * 100 P F920J106MPA 0.5 8 12.0 * 10 P F920J106MPA 0.5 8 4.0 * 10 P F920J105MPA 0.5 8 4.0 *		15	P	F920G156MPA	0.6	10	5.0	*
22 A F920G226MAA 0.9 12 2.8 * 4V 33 A F920G336MPA 1.3 20 4.0 * 47 A F920G336MAA 1.3 12 2.8 * 47 B F920G476MBA 1.9 12 1.7 * 68 A F920G686MAA 2.7 18 1.5 * 100 A F920G107MBA 4.0 18 1.3 * 100 B F920G107MBA 4.0 18 1.3 * 150 B F920J25MPA 0.5 8 12.0 * 3.3 P F920J35MPA 0.5 18 6.0 * 150 B F920J106MPA 0.6 10 6.0 * 15 P F920J106MPA 0.6 18 4.0 * 15 P F920J105MPA 0.5 8 1.0 * <t< td=""><td></td><td>22</td><td>P</td><td>F920G226MPA</td><td>0.9</td><td>20</td><td>5.0</td><td>*</td></t<>		22	P	F920G226MPA	0.9	20	5.0	*
4V 33 P F920G336MPA 1.3 12 2.8 * 47 A F920G376MBA 1.9 18 2.8 * 47 B F920G476MBA 1.9 12 1.7 * 68 A F920G686MBA 2.7 18 1.5 * 100 A F920G107MBA 4.0 30 2.8 ±15 100 B F920G107MBA 4.0 18 1.3 * 150 B F920G107MBA 6.0 25 1.3 ±15 3.3 P F920J333MPA 0.5 8 12.0 * 4.7 P F920J406MPA 0.5 8 6.0 * 4.7 P F920J36MPA 0.5 8 4.0 * 10 A F920J36MPA 0.9 10 6.0 * 6.3V 15 F F920J36MPA 0.5 8 12.0 <t< td=""><td></td><td>22</td><td>A</td><td>F920G226MAA</td><td>0.9</td><td>12</td><td>2.8</td><td>*</td></t<>		22	A	F920G226MAA	0.9	12	2.8	*
33 A F920G336MAA 1.3 12 2.8 * 47 B F920G476MBA 1.9 12 1.7 * 68 A F920G686MAA 2.7 25 2.8 ±15 68 B F920G107MBA 4.0 18 1.3 * 100 A F920G157MBA 6.0 25 1.3 ±15 100 B F920J107MBA 4.0 18 1.3 * 100 B F920J35MPA 0.5 8 10.0 * 4.7 P F920J35MPA 0.5 8 10.0 * 10 P F920J106MAA 0.6 10 6.0 * 15 P F920J156MPA 0.9 10 6.0 * 22 P F920J226MPA 1.4 20 5.0 * 10 A F920J226MPA 1.4 20 5.0 * 2	4V	33	P	F920G336MPA	1.3	20	4.0	*
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 F920G107MBA 4.0 30 2.8 ±15 100 A F920G107MBA 4.0 18 1.3 * 150 B F920J255MPA 0.5 8 12.0 * 6.8 P F920J356MPA 0.5 10 6.0 * 10 P F920J106MPA 0.6 10 6.0 * 11 A F920J156MPA 0.6 8 4.0 * 10 A F920J226MPA 1.4 20 5.0 * 122 A F920J26MPA 0.9 10 6.0 * 122 A F920J36MPA 1.4 12 2.8 * 1		33	A	F920G336MAA	1.3	12	2.8	*
47 B F920G476MBA 1.9 1.2 1.7 * 68 A F920G686MAA 2.7 25 2.8 ±15 100 A F920G107MAA 4.0 30 2.8 ±15 100 B F920G107MBA 4.0 18 1.3 * 150 B F920G107MBA 4.0 18 1.3 * 3.3 P F920J25MPA 0.5 8 12.0 * 4.7 P F920J35MPA 0.5 8 16.0 * 6.8 P F920J16MPA 0.5 8 6.0 * 10 A F920J16MAA 0.6 10 6.0 * 115 P F920J16MAA 0.9 18 4.0 * 122 A F920J36MAA 1.4 12 2.8 * 133 B F920J36MAA 3.0 12 1.7 * 1		47	A	F920G476MAA	1.9	18	2.8	*
68 A F920G686MAA 2.7 25 2.8 F15 68 B F920G107MAA 4.0 30 2.8 F15 100 A F920G107MBA 4.0 18 1.3 * 150 B F920135MPA 0.5 8 12.0 * 3.3 P F920135MPA 0.5 8 12.0 * 4.7 P F920106MPA 0.5 8 6.0 * 6.8 P F920106MPA 0.6 10 6.0 * 10 P F9201366MPA 0.9 10 6.0 * 15 P F9201226MAA 1.4 12 2.8 * 22 P F9201226MAA 1.4 12 2.8 * 33 B F920336MAA 2.1 12 1.7 * 47 A F920476MAA 3.0 12 1.7 * 15 <td></td> <td>47</td> <td>В</td> <td>F920G476MBA</td> <td>1.9</td> <td>12</td> <td>1.7</td> <td>*</td>		47	В	F920G476MBA	1.9	12	1.7	*
68 B F920G686MBA 2.7 18 1.5 * 100 A F920G107MAA 4.0 30 2.8 ±15 150 B F920G157MBA 6.0 25 1.3 ±15 3.3 P F920J35MPA 0.5 8 12.0 * 4.7 P F920J35MPA 0.5 8 6.0 * 6.8 P F920J06SMPA 0.5 10 6.0 * 10 A F920J156MPA 0.6 10 6.0 * 15 P F920J156MPA 0.9 8 4.0 * 22 P F920J26MPA 1.4 20 5.0 * 33 B F920J36MAA 2.1 12 1.7 * 47 A F920J36MAA 2.1 12 1.7 * 33 B F920J36MAA 3.0 12 1.7 * 10 <td></td> <td>68</td> <td>A</td> <td>F920G686MAA</td> <td>2.7</td> <td>25</td> <td>2.8</td> <td>±15</td>		68	A	F920G686MAA	2.7	25	2.8	±15
100 A F920G107MBA 4.0 30 2.8 F15 150 B F920G107MBA 4.0 18 1.3 *15 150 B F920J25MPA 0.5 8 12.0 * 3.3 P F920J35MPA 0.5 8 12.0 * 4.7 P F920J475MPA 0.5 8 6.0 * 6.8 P F920J106MPA 0.6 10 6.0 * 10 A F920J106MAA 0.6 8 4.0 * 15 P F920J126MPA 0.9 10 6.0 * 22 P F920J226MPA 1.4 12 2.8 * 33 A F920J36MAA 2.1 12 2.8 * 33 B F920J36MAA 3.0 12 1.7 * 47 A F920J476MAA 3.0 12 * * 33 <td></td> <td>68</td> <td>В</td> <td>F920G686MBA</td> <td>2.7</td> <td>18</td> <td>1.5</td> <td>*</td>		68	В	F920G686MBA	2.7	18	1.5	*
100 B F920G107/MBA 4.0 18 1.3 * 150 B F920G157/MBA 6.0 25 1.3 ±15 2.2 P F920J255MPA 0.5 8 12.0 * 3.3 P F920J305MPA 0.5 8 6.0 * 4.7 P F920J106MPA 0.6 10 6.0 * 10 P F920J106MPA 0.6 10 6.0 * 15 P F920J206MPA 0.9 10 6.0 * 15 A F920J208MAA 0.9 8 4.0 * 22 P F920J20306MAA 2.1 12 2.8 * 33 A F920J366MBA 2.1 12 2.8 * 33 B F920J366MBA 2.1 12 1.7 * 47 A F920J476MAA 3.0 12 1.7 * <t< td=""><td></td><td>100</td><td>A</td><td>F920G107MAA</td><td>4.0</td><td>30</td><td>2.8</td><td>±15</td></t<>		100	A	F920G107MAA	4.0	30	2.8	±15
150 B F9202157/MA 6.0 25 1.3 E15 2.2 P F920J225MPA 0.5 8 12.0 * 3.3 P F920J355MPA 0.5 8 6.0 * 6.8 P F920J065MPA 0.5 10 6.0 * 10 P F920J106MAA 0.6 10 6.0 * 10 A F920J156MAA 0.9 8 4.0 * 15 P F920J226MPA 1.4 20 5.0 * 22 P F920J26MPA 1.4 20 5.0 * 33 A F920J36MAA 2.1 12 2.8 * 33 B F920J36MBA 3.0 18 2.8 *15 47 A F920J36MBA 3.0 12 1.7 * 33 B F920J35MPA 0.5 8 12.0 * 100 <td></td> <td>100</td> <td>В</td> <td>F920G107MBA</td> <td>4.0</td> <td>18</td> <td>1.3</td> <td>*</td>		100	В	F920G107MBA	4.0	18	1.3	*
2.2 P F920J225MPA 0.5 8 12.0 * 3.3 P F920J335MPA 0.5 8 6.0 * 4.7 P F920J475MPA 0.5 8 6.0 * 6.8 P F920J06MPA 0.6 10 6.0 * 10 A F920J156MPA 0.9 10 6.0 * 10.3 A F920J26MPA 0.9 10 6.0 * 6.3V 15 A F920J226MPA 1.4 20 5.0 * 22 P F920J226MPA 1.4 12 2.8 * 33 A F920J336MAA 2.1 12 1.7 * 47 A F920J476MBA 3.0 18 2.8 15 47 B F920J476MBA 3.0 12 1.7 * 100 B F920J476MBA 3.0 12 1.7 *		150	В	F920G157MBA	6.0	25	1.3	±15
3.3 P F920J335MPA 0.5 8 12.0 * 4.77 P F920J475MPA 0.5 8 6.0 * 6.8 P F920J106MPA 0.5 10 6.0 * 10 P F920J106MAA 0.6 8 4.0 * 15 P F920J26MPA 1.4 20 5.0 * 22 P F920J226MAA 1.4 20 5.0 * 33 A F920J26MAA 1.4 20 5.0 * 33 A F920J26MAA 1.4 20 5.0 * 33 B F920J336MAA 2.1 12 1.7 * 33 B F920J107MBA 3.0 18 2.8 ±15 47 A F920J107MBA 0.5 8 12.0 * 100 B F920J107MBA 0.5 8 12.0 * 15 <td></td> <td>2.2</td> <td>P</td> <td>F920J225MPA</td> <td>0.5</td> <td>8</td> <td>12.0</td> <td>*</td>		2.2	P	F920J225MPA	0.5	8	12.0	*
4.7 P F920J475MPA 0.5 8 6.0 * 6.8 P F920J106MPA 0.5 10 6.0 * 10 P F920J106MPA 0.6 10 6.0 * 15 P F920J106MAA 0.9 10 6.0 * 22 P F920J26MPA 1.4 20 5.0 * 22 A F920J36MAA 2.1 12 2.8 * 33 B F920J336MAA 2.1 12 2.8 * 33 B F920J336MBA 2.1 12 1.7 * 47 A F920J36MPA 0.5 8 12.0 * 100 B F920J335MPA 0.5 8 12.0 * 15 P F921A105MPA 0.5 8 12.0 * 100 B F921A335MPA 0.5 8 12.0 * 115 <td></td> <td>3.3</td> <td>Р</td> <td>F920J335MPA</td> <td>0.5</td> <td>8</td> <td>12.0</td> <td>*</td>		3.3	Р	F920J335MPA	0.5	8	12.0	*
6.8 P F920J685MPA 0.5 10 6.0 * 10 P F920J106MPA 0.6 10 6.0 * 15 P F920J156MPA 0.9 10 6.0 * 6.3V 15 A F920J156MAA 0.9 18 4.0 * 22 P F920J26MPA 1.4 20 5.0 * 22 A F920J36MAA 2.1 12 2.8 * 33 B F920J376MAA 3.0 18 2.8 ±15 47 A F920J476MBA 3.0 12 1.7 * 100 B F920J476MBA 3.0 12 1.7 * 100 B F920J476MBA 3.0 12 1.7 * 110 P F921A105MPA 0.5 8 12.0 * 3.3 P F921A355MPA 0.5 8 12.0 *		4.7	Р	F920J475MPA	0.5	8	6.0	*
10 P F920J106MPA 0.6 10 6.0 * 10 A F920J156MPA 0.9 10 6.0 * 6.3V 15 A F920J156MPA 0.9 8 4.0 * 22 P F920J226MPA 1.4 20 5.0 * 33 A F920J36MAA 2.1 12 2.8 * 33 B F920J376MAA 3.0 18 2.8 * 47 A F920J476MAA 3.0 18 2.8 ±15 47 B F920J476MBA 0.5 8 12.0 * 100 B F920J107MBA 0.5 8 12.0 * 3.3 P F921A105MPA 0.5 8 12.0 * 3.3 P F921A25MPA 0.5 8 12.0 * 3.3 A F921A335MPA 0.5 8 12.0 *		6.8	Р	F920J685MPA	0.5	10	6.0	*
10 A F920J106MAA 0.6 8 4.0 * 6.3V 15 A F920J156MPA 0.9 10 6.0 * 22 P F920J226MPA 1.4 20 5.0 * 33 A F920J226MPA 1.4 12 2.8 * 33 A F920J36MBA 2.1 12 1.7 * 47 A F920J376MAA 3.0 18 2.8 ±15 47 B F920J476MAA 3.0 12 1.7 * 100 B F920J107MBA 6.3 20 1.3 ±15 1 P F921A105MPA 0.5 8 12.0 * 3.3 P F921A255MPA 0.5 8 12.0 * 3.3 A F921A355MPA 0.5 8 12.0 * 1.5 P F921A355MPA 0.5 8 12.0 *		10	Р	F920J106MPA	0.6	10	6.0	*
15 P F920J156MPA 0.9 10 6.0 * 6.3V 15 A F920J156MAA 0.9 8 4.0 * 22 P F920J226MPA 1.4 20 5.0 * 33 A F920J336MAA 2.1 12 2.8 * 33 B F920J336MBA 2.1 12 2.8 * 47 A F920J376MAA 3.0 18 2.8 ±15 47 B F920J476MBA 3.0 12 1.7 * 100 B F920J476MBA 3.0 12 1.7 * 110 P F921A155MPA 0.5 8 12.0 * 3.3 A F921A335MPA 0.5 8 12.0 * 3.3 A F921A355MPA 0.5 8 6.0 * 3.3 A F921A355MPA 0.5 8 6.0 *		10	A	F920J106MAA	0.6	8	4.0	*
6.3V 15 A F920J156MAA 0.9 8 4.0 * 22 P F920J226MPA 1.4 20 5.0 * 22 A F920J336MAA 2.1 12 2.8 * 33 A F920J336MBA 2.1 12 1.7 * 47 A F920J476MBA 3.0 12 1.7 * 100 B F920J476MBA 3.0 12 1.7 * 100 B F920J476MBA 0.5 8 12.0 * 1.5 P F921A155MPA 0.5 8 12.0 * 3.3 P F921A255MPA 0.5 8 12.0 * 3.3 P F921A335MAA 0.5 6 7.0 * 3.3 A F921A355MAA 0.5 8 12.0 * 10V 6.8 A F921A475MPA 0.5 8 6.0 * 10V A F921A475MPA 0.5 8 4.0 *		15	P	F920J156MPA	0.9	10	6.0	*
22 P F920J226MPA 1.4 20 5.0 * 22 A F920J226MAA 1.4 12 2.8 * 33 A F920J336MAA 2.1 12 1.7 * 47 A F920J376MBA 3.0 18 2.8 ±15 47 B F920J476MBA 3.0 12 1.7 * 100 B F920J107MBA 6.3 20 1.3 ±15 1 P F921A105MPA 0.5 8 12.0 * 3.3 P F921A25MPA 0.5 8 12.0 * 3.3 P F921A335MPA 0.5 8 12.0 * 3.3 A F921A335MPA 0.5 8 12.0 * 4.7 P F921A475MPA 0.5 8 6.0 * 10v A F921A4685MPA 0.7 8 6.0 *	6.3V	15	A	F920J156MAA	0.9	8	4.0	*
22 A F920J226MAA 1.4 12 2.8 * 33 A F920J336MAA 2.1 12 1.7 * 47 A F920J36MBA 2.1 12 1.7 * 47 B F920J476MAA 3.0 18 2.8 ±15 47 B F920J476MBA 3.0 12 1.7 * 100 B F920J107MBA 6.3 20 1.3 ±15 1 P F921A155MPA 0.5 8 12.0 * 3.3 P F921A25MPA 0.5 8 12.0 * 3.3 A F921A335MAA 0.5 8 12.0 * 3.3 A F921A335MAA 0.5 8 12.0 * 3.3 A F921A335MAA 0.5 6 4.0 * 10v A F921A436SMAA 0.7 8 6.0 * 1		22	Р	F920J226MPA	1.4	20	5.0	*
33 A F920J336MAA 2.1 12 2.8 * 33 B F920J36MBA 2.1 12 1.7 * 47 A F920J476MAA 3.0 18 2.8 ±15 47 B F920J476MBA 3.0 12 1.7 * 100 B F920J476MBA 0.5 8 12.0 * 100 B F921A155MPA 0.5 8 12.0 * 2.2 P F921A25MPA 0.5 8 12.0 * 3.3 P F921A25MPA 0.5 8 12.0 * 3.3 A F921A25MPA 0.5 8 12.0 * 3.3 A F921A235MPA 0.5 8 12.0 * 4.7 P F921A35MAA 0.5 6 4.0 * 10v A F921A2685MAA 0.7 8 6.0 * 10<		22	A	F920J226MAA	1.4	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 1 P F921A105MPA 0.5 8 12.0 * 1.5 P F921A225MPA 0.5 8 12.0 * 3.3 P F921A335MPA 0.5 8 12.0 * 3.3 P F921A335MPA 0.5 8 12.0 * 3.3 A F921A355MAA 0.5 6 7.0 * 4.7 P F921A475MAA 0.5 6 4.0 * 10v A F921A685MPA 0.7 8 6.0 * 10v A F921A166MAA 1.0 14 6.0 * <td< td=""><td></td><td>33</td><td>A</td><td>F920J336MAA</td><td>2.1</td><td>12</td><td>2.8</td><td>*</td></td<>		33	A	F920J336MAA	2.1	12	2.8	*
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 1 P F921A155MPA 0.5 8 12.0 * 2.2 P F921A225MPA 0.5 8 12.0 * 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 P F921A655MPA 0.7 8 6.0 * 10V 6.8 P F921A655MAA 0.7 6 4.0 * 10 P F921A106MPA 1.0 14 6.0 * 122 A F921A226MBA 2.2 14 4.0 *15 <td></td> <td>33</td> <td>В</td> <td>F920J336MBA</td> <td>2.1</td> <td>12</td> <td>1.7</td> <td>*</td>		33	В	F920J336MBA	2.1	12	1.7	*
47 B F920J476MBA 3.0 12 1.7 * 100 B F920J107MBA 6.3 20 1.3 ±15 1 P F921A105MPA 0.5 8 12.0 * 1.5 P F921A155MPA 0.5 8 12.0 * 3.3 P F921A225MPA 0.5 8 12.0 * 3.3 P F921A335MPA 0.5 8 12.0 * 3.3 A F921A335MPA 0.5 8 12.0 * 3.3 A F921A335MPA 0.5 6 7.0 * 4.7 P F921A475MPA 0.5 8 6.0 * 4.7 A F921A475MAA 0.5 6 4.0 * 10V P F921A1665MAA 0.7 8 6.0 * 10 A F921A685MAA 0.7 6 4.0 * 1		47	A	F920J476MAA	3.0	18	2.8	±15
100 B F920J107MBA 6.3 20 1.3 ±15 1 P F921A105MPA 0.5 8 12.0 * 1.5 P F921A155MPA 0.5 8 12.0 * 2.2 P F921A255MPA 0.5 8 12.0 * 3.3 P F921A335MPA 0.5 8 12.0 * 3.3 A F921A335MPA 0.5 8 12.0 * 3.3 A F921A355MAA 0.5 6 7.0 * 4.7 P F921A475MPA 0.5 8 6.0 * 4.7 A F921A4685MPA 0.7 8 6.0 * 10V P F921A106MPA 1.0 14 6.0 * 10 A F921A106MPA 1.0 14 6.0 * 10 A F921A26MBA 2.2 14 4.0 *		47	В	F920J476MBA	3.0	12	1.7	*
1 P F921A105MPA 0.5 8 12.0 * 1.5 P F921A155MPA 0.5 8 12.0 * 2.2 P F921A225MPA 0.5 8 12.0 * 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 * 10v F921A475MAA 0.5 6 4.0 * 10 P F921A685MAA 0.7 8 6.0 * 10 A F921A106MPA 1.0 14 6.0 * 10 A F921A106MAA 1.0 8 4.0 * 22 A F921A226MBA 2.2 14 4.0 ±15 22 B <td></td> <td>100</td> <td>В</td> <td>F920J107MBA</td> <td>6.3</td> <td>20</td> <td>1.3</td> <td>±15</td>		100	В	F920J107MBA	6.3	20	1.3	±15
1.5 P F921A155MPA 0.5 8 12.0 * 2.2 P F921A225MPA 0.5 8 12.0 * 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 * 10 P F921A1665MAA 0.7 6 4.0 * 10 P F921A106MPA 1.0 14 6.0 * 10 A F921A106MAA 1.0 8 4.0 * 122 A F921A226MAA 2.2 14 4.0 ±15 22 B F921A36MBA 3.3 12 19 * 33 </td <td></td> <td>1</td> <td>Р</td> <td>F921A105MPA</td> <td>0.5</td> <td>8</td> <td>12.0</td> <td>*</td>		1	Р	F921A105MPA	0.5	8	12.0	*
2.2 P F921A225MPA 0.5 8 12.0 * 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 * 10 P F921A106MPA 1.0 14 6.0 * 10 A F921A106MPA 1.0 14 6.0 * 10 A F921A106MAA 1.0 8 4.0 * 122 A F921A226MAA 2.2 14 4.0 ±15 22 B F921A226MBA 2.2 8 1.9 * 33 B F921A336MBA 3.3 12 1.9 * 33 </td <td></td> <td>1.5</td> <td>Р</td> <td>F921A155MPA</td> <td>0.5</td> <td>8</td> <td>12.0</td> <td>*</td>		1.5	Р	F921A155MPA	0.5	8	12.0	*
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 * 10 P F921A106MPA 1.0 14 6.0 * 10 P F921A106MPA 1.0 14 6.0 * 10 A F921A106MAA 1.0 8 4.0 * 12 A F921A106MAA 1.0 8 4.0 * 12 A F921A226MAA 2.2 14 4.0 ±15 22 B F921A226MBA 2.2 8 1.9 * 33 B F921A336MBA 3.3 12 1.9 * 47		2.2	Р	F921A225MPA	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 * 10 P F921A685MAA 0.7 6 4.0 * 10 P F921A106MPA 1.0 14 6.0 * 10 A F921A106MPA 1.0 14 6.0 * 10 A F921A106MAA 1.0 8 4.0 * 12 A F921A106MAA 1.0 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 * 47		3.3	Р	F921A335MPA	0.5	8	12.0	*
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 * 10 P F921A685MAA 0.7 6 4.0 * 10 P F921A106MPA 1.0 14 6.0 * 10 A F921A106MAA 1.0 8 4.0 * 10 A F921A126MAA 1.0 8 4.0 * 12 A F921A226MAA 2.2 14 4.0 ±15 22 B F921A226MBA 2.2 8 1.9 * 33 B F921A336MBA 3.3 12 1.9 * 47 B F921C474MPA 0.5 8 20.0 * 0.68 P F921C684MPA 0.5 8 12.0 * 1.5		3.3	A	F921A335MAA	0.5	6	7.0	*
4.7 A F921A475MAA 0.5 6 4.0 * 10V 6.8 P F921A685MPA 0.7 8 6.0 * 10 P F921A685MAA 0.7 6 4.0 * 10 P F921A106MPA 1.0 14 6.0 * 10 A F921A106MPA 1.0 8 4.0 * 10 A F921A156MAA 1.0 8 4.0 * 15 A F921A226MAA 2.2 14 4.0 ±15 22 A F921A226MBA 2.2 8 1.9 * 33 B F921A226MBA 2.2 8 1.9 * 33 B F921A336MBA 3.3 12 1.9 * 47 B F921C474MPA 0.5 8 20.0 * 0.68 P F921C255MPA 0.5 8 12.0 *		4.7	P	F921A475MPA	0.5	8	6.0	*
10V 6.8 P F921A685MPA 0.7 8 6.0 * 10 P F921A685MAA 0.7 6 4.0 * 10 P F921A106MPA 1.0 14 6.0 * 10 A F921A106MPA 1.0 14 6.0 * 10 A F921A106MAA 1.0 8 4.0 * 15 A F921A156MAA 1.5 8 4.0 * 22 A F921A226MBA 2.2 14 4.0 ±15 22 B F921A226MBA 2.2 8 1.9 * 33 B F921A226MBA 2.2 8 1.9 * 33 B F921A36MBA 3.3 12 1.9 * 47 B F921C474MPA 0.5 8 20.0 * 0.68 P F921C105MPA 0.5 8 12.0 *		4.7	A	F921A475MAA	0.5	6	4.0	*
6.8 A F921A685MAA 0.7 6 4.0 * 10 P F921A106MPA 1.0 14 6.0 * 10 A F921A106MPA 1.0 14 6.0 * 10 A F921A106MAA 1.0 8 4.0 * 15 A F921A26MAA 2.2 14 4.0 ±15 22 A F921A226MBA 2.2 8 1.9 * 33 B F921A226MBA 2.2 8 1.9 * 33 B F921A336MBA 3.3 12 1.9 * 47 B F921C474MPA 0.5 8 20.0 * 0.68 P F921C684MPA 0.5 8 12.0 * 1.5 P F921C105MPA 0.5 8 12.0 * 1.5 P F921C255MPA 0.5 8 12.0 * 2.2 </td <td>101/</td> <td>6.8</td> <td>Р</td> <td>F921A685MPA</td> <td>0.7</td> <td>8</td> <td>6.0</td> <td>*</td>	101/	6.8	Р	F921A685MPA	0.7	8	6.0	*
10 P F921A106MPA 1.0 14 6.0 * 10 A F921A106MAA 1.0 8 4.0 * 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 * 47 B F921C474MPA 0.5 8 20.0 * 0.47 P F921C474MPA 0.5 8 12.0 * 1 P F921C684MPA 0.5 8 12.0 * 1.5 P F921C255MPA 0.5 8 12.0 * 1.5 P F921C255MPA 0.5 8 12.0 * 2.2 P F921C235MAA 0.5 6 7.0 * 1.6V<	101	6.8	A	F921A685MAA	0.7	6	4.0	*
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$		10	P	F921A106MPA	1.0	14	6.0	*
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$		10	A	F921A106MAA	1.0	8	4.0	*
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$		15	A	F921A156MAA	1.5	8	4.0	*
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$		22	A	F921A226MAA	2.2	14	4.0	±15
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$		22	В	F921A226MBA	2.2	8	1.9	*
47 B F921A476MBA 4.7 18 1.9 ±15 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 * 1.5 P F921C155MPA 0.5 8 12.0 * 2.2 P F921C255MPA 0.5 8 12.0 * 2.2 A F921C225MPA 0.5 8 12.0 * 2.2 A F921C225MPA 0.5 8 12.0 * 2.2 A F921C255MAA 0.5 6 7.0 * 16V 3.3 A F921C235MAA 0.5 6 7.0 * 4.7 A F921C475MAA 0.8 6 3.0 * 4.7 B F921C475MBA 0.8 6 3.0 * <td></td> <td>33</td> <td>В</td> <td>F921A336MBA</td> <td>3.3</td> <td>12</td> <td>1.9</td> <td>*</td>		33	В	F921A336MBA	3.3	12	1.9	*
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 * 1.5 P F921C155MPA 0.5 8 12.0 * 2.2 P F921C255MPA 0.5 8 12.0 * 2.2 A F921C225MPA 0.5 8 12.0 * 2.2 A F921C225MAA 0.5 6 7.0 * 16V 3.3 A F921C235MAA 0.5 6 7.0 * 4.7 A F921C475MAA 0.8 6 3.0 * 4.7 B F921C475MBA 0.8 6 3.0 * 6.8 B F921C1065MBA 1.1 6 3.0 * 10 A F921C106MAA 1.6 8 7.0 ±15		47	В	F921A476MBA	4.7	18	1.9	±15
0.68 P F921C684MPA 0.5 8 12.0 * 1 P F921C105MPA 0.5 8 12.0 * 1.5 P F921C155MPA 0.5 8 12.0 * 2.2 P F921C255MPA 0.5 8 12.0 * 2.2 A F921C225MPA 0.5 8 12.0 * 16V 3.3 A F921C255MAA 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 F921C1068MBA 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		0.47	Р	F921C474MPA	0.5	8	20.0	*
1 P F921C105MPA 0.5 8 12.0 * 1.5 P F921C155MPA 0.5 8 12.0 * 2.2 P F921C255MPA 0.5 8 12.0 * 2.2 A F921C255MPA 0.5 8 12.0 * 16V 3.3 A F921C255MAA 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 F921C10685MBA 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		0.68	P	F921C684MPA	0.5	8	12.0	*
1.5 P F921C155MPA 0.5 8 12.0 * 2.2 P F921C225MPA 0.5 8 12.0 * 2.2 A F921C225MAA 0.5 6 7.0 * 16V 3.3 A F921C25MAA 0.5 6 7.0 * 4.7 A F921C475MAA 0.8 6 7.0 * 4.7 B F921C475MAA 0.8 6 3.0 * 6.8 B F921C1068MBA 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		1	P	F921C105MPA	0.5	8	12.0	*
2.2 P F921C225MPA 0.5 8 12.0 * 2.2 A F921C225MAA 0.5 6 7.0 * 16V 3.3 A F921C235MAA 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		1.5	P	F921C155MPA	0.5	8	12.0	*
2.2 A F921C225MAA 0.5 6 7.0 * 16V 3.3 A F921C335MAA 0.5 6 7.0 * 4.7 A F921C475MAA 0.8 6 7.0 * 4.7 B F921C475MAA 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		2.2	P	F921C225MPA	0.5	8	12.0	*
16V 3.3 A F921C335MAA 0.5 6 7.0 * 4.7 A F921C475MAA 0.8 6 7.0 * 4.7 B F921C475MAA 0.8 6 3.0 * 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		2.2	A	F921C225MAA	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	16V	3.3	A	F921C335MAA	0.5	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		4.7	A	F921C475MAA	0.8	6	7.0	*
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		4.7	В	F921C475MBA	0.8	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		6.8	В	F921C685MBA	1.1	6	3.0	*
10 B F921C106MBA 1.6 6 2.0 * 22 B F921C226MBA 3.5 12 2.0 ±15		10	A	F921C106MAA	1.6	8	7.0	±15
22 B F921C226MBA 3.5 12 2.0 ±15		10	В	F921C106MBA	1.6	6	2.0	*
		22	В	F921C226MBA	3.5	12	2.0	±15

Rated Volt	Rated Capacitance (µF)	Case code	Part Number	Leakage Current (µA)	Disspation Factor (%@120Hz)	ESR (Ω@100kHz)	*1 ∆C/C (%)
	0.47	Р	F921D474MPA	0.5	8	20.0	*
	0.47	А	F921D474MAA	0.5	4	10.0	*
	0.68	А	F921D684MAA	0.5	4	10.0	*
	1	Р	F921D105MPA	0.5	8	20.0	*
2014	1	А	F921D105MAA	0.5	4	10.0	*
200	1.5	А	F921D155MAA	0.5	6	7.4	*
	2.2	А	F921D225MAA	0.5	6	7.0	*
	4.7	А	F921D475MAA	0.9	10	7.0	±10
	4.7	В	F921D475MBA	0.9	6	3.0	*
	10	В	F921D106MBA	2.0	8	3.0	±10
	1	Р	F921E105MPA	0.5	8	20.0	*
	1	А	F921E105MAA	0.5	6	10.0	*
251	2.2	А	F921E225MAA	0.6	8	10.0	±15
250	2.2	В	F921E225MBA	0.6	6	4.0	*
	4.7	А	F921E475MAA	1.2	10	7.0	±10
	4.7	В	F921E475MBA	1.2	6	3.0	*
	0.22	А	F921V224MAA	0.5	4	10.0	*
	0.33	А	F921V334MAA	0.5	4	10.0	*
351/	0.47	А	F921V474MAA	0.5	4	10.0	*
550	1	А	F921V105MAA	0.5	6	10.0	*
	2.2	В	F921V225MBA	0.8	6	4.0	±10
	3.3	В	F921V335MBA	1.2	10	4.0	±10

1 : ΔC/C Marked ""

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

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





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



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



C685 22 16V 47 16V 800 \oplus (Rated voltage code) (Capa ice code) Rated voltage (V) Capacitance (µF) Rated voltage (V) 20V D

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

Specifications

Item	Performance Characteristics			
Category Temperature Range	-55 to +125°C (Rated temperature : +85°C)			
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)			
	At 40°C 90 to 95% R.H. 500 hours (No voltage applied)			
Damp Heat (Steady State)	Capacitance Change…Refer to next page (* 1) Dissipation FactorInitial specified value or less Leakage CurrentInitial specified value or less			
	_55°C / +125°C 30 minutes each 5 cycles			
Temperature Cycles	Capacitance ChangeRefer to next page (* 1) Dissipation FactorInitial specified value or less Leakage CurrentInitial specified value or less			
	10 seconds reflow at 260°C , 5 seconds immersion at 260°C			
Resistance	Capacitance ChangeRefer to next page (* 1)			
to Soldering Heat	Dissipation FactorInitial specified value or less Leakage CurrentInitial 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 ChangeRefer to next page (* 1) Dissipation FactorInitial specified value or less Leakage CurrentInitial 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 ChangeRefer to next page (* 1) Dissipation FactorInitial specified value or less Leakage CurrentInitial 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.

Standard Ratings

	V	4	6.3	10	16	20	25	35
Cap. (µF)	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	В
4.7	475				A	A · B	A · B	B · C
6.8	685			A	A	A·B		С
10	106		A	A	A · B	A · B	B·C	C
15	156		A	A	A · B	С	С	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·Β	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	В	B · C	C·N	N			
220	227	(A) · B · C	B·C·N	N	N			
330	337	С	N	N		() The serie	s in parentheses are b	eina developed.
470	477	N	N			Diagon conto	et to your logal Nichiga	n color office when the
680	687	N		• -		riease conta	ict to your local Nichico	n sales unice when the

se series are being designed in your application



F93

Standard Ratings

Rated Volt	Rated Capacitance	Case code	Part Number	Leakage Current	Disspation Factor	ESR (Ω@100kHz	*1 ∆C/C	Rated Volt	Rated Capacitance	Case code	Part Number	Leakage Current	Disspation Factor	ESR (Ω@100kHz	*1 <u>AC/C</u>
	(µr) 22	۸	E020C226MAA	(μΛ)	(//JUE 120112)	25	(70)		(µi)	•	E0210105MAA	(μΑ)	(70@120112)	7.5	(70)
	22	A	F930G220WAA	0.9	0	2.5	*			A	F931C105MAA	0.5	4	7.5	*
	33	A	F930G330WAA	1.3	10	2.5	*		2.2	A	F931C225MAA	0.5	4	5.0	*
	47	A	F930G476MAA	1.9	18	2.5	*		3.3	A	F931C335MAA	0.5	4	4.5	*
	00	A	F930G000WIAA	2.7	24	2.5	*		4.7	A	F931C475IVIAA	0.8	0	4.0	*
	100	A	F930G107MAA	4.0	30	2.0	*		0.8	A	F931C685IVIAA	1.1	6	3.5	*
4V	100	В	F930G107MBA	4.0	14	0.9	*		10	A	F931C106MAA	1.6	6	3.0	*
	150	В	F930G157MBA	6.0	16	0.7	*		10	в	F931C106MBA	1.6	6	2.0	*
	220	В	F930G227MBA	8.8	18	0.7	*		15	A	F931C156MAA	2.4	10	3.0	*
	220	С	F930G227MCC	8.8	12	0.7	*		15	В	F931C156MBA	2.4	6	2.0	*
	330	С	F930G337MCC	13.2	14	0.7	*		22	A	F931C226MAA	3.5	15	3.0	± 15
	470	N	F930G477MNC	18.8	16	0.3	*	16V	22	В	F931C226MBA	3.5	8	1.9	*
	680	N	F930G687MNC	27.2	18	0.3	*		22	С	F931C226MCC	3.5	6	1.1	*
	10	A	F930J106MAA	0.6	6	3.0	*		33	В	F931C336MBA	5.3	8	1.9	*
	15	A	F930J156MAA	0.9	6	2.9	*		33	С	F931C336MCC	5.3	6	1.1	*
	22	A	F930J226MAA	1.4	8	2.5	*		47	С	F931C476MCC	7.5	8	0.9	*
	33	Α	F930J336MAA	2.1	8	2.5	*		47	N	F931C476MNC	7.5	6	0.7	*
	47	А	F930J476MAA	3.0	18	2.5	*		68	Ν	F931C686MNC	10.9	6	0.6	*
	47	В	F930J476MBA	3.0	6	1.0	*		100	С	F931C107MCC	16.0	15	0.7	± 10
	68	А	F930J686MAA	4.3	20	2.0	*		100	Ν	F931C107MNC	16.0	10	0.6	*
	68	В	F930J686MBA	4.3	8	1.0	*		150	Ν	F931C157MNC	24.0	15	0.6	*
6 21/	100	А	F930J107MAA	6.3	35	2.0	±15		220	Ν	F931C227MNC	35.2	25	0.7	± 10
0.30	100	В	F930J107MBA	6.3	14	0.9	*		2.2	Α	F931D225MAA	0.5	4	5.0	*
	100	С	F930J107MCC	6.3	8	0.7	*		3.3	А	F931D335MAA	0.7	4	4.5	*
	150	В	F930J157MBA	9.5	18	0.9	*		4.7	А	F931D475MAA	0.9	6	3.0	*
	150	С	F930J157MCC	9.5	12	0.7	*		4.7	В	F931D475MBA	0.9	6	2.8	*
	220	В	F930J227MBA	13.9	30	1.2	±15		6.8	А	F931D685MAA	1.4	6	3.5	*
	220	С	F930J227MCC	13.9	14	0.7	*		6.8	в	F931D685MBA	1.4	6	2.5	*
	220	Ν	F930J227MNC	13.9	10	0.5	*		10	А	F931D106MAA	2.0	8	3.5	*
	330	N	F930J337MNC	20.8	14	0.5	*	20V	10	В	F931D106MBA	2.0	6	2.1	*
	470	Ν	F930J477MNC	29.6	16	0.3	*		15	С	F931D156MCC	3.0	6	1.2	*
	6.8	А	F931A685MAA	0.7	6	3.5	*		22	В	F931D226MBA	4.4	8	1.9	*
	10	А	F931A106MAA	1.0	6	3.0	*		22	С	F931D226MCC	4.4	8	1.1	*
	15	А	F931A156MAA	1.5	8	2.9	*		33	С	F931D336MCC	6.6	8	1.1	*
	22	А	F931A226MAA	2.2	12	2.5	*		33	N	F931D336MNC	6.6	6	0.7	*
	22	в	F931A226MBA	2.2	6	1.9	*		47	C	F931D476MCC	9.4	10	11	*
	33	А	F931A336MAA	3.3	18	2.5	*		47	N	F931D476MNC	94	8	0.7	*
	33	В	F931A336MBA	3.3	8	14	*		1	Δ	F931E105MAA	0.1	4	7.5	*
	47	A	F931A476MAA	47	40	20	± 15		1.5	A	F931E155MAA	0.5	4	67	*
	47	B	F931A476MBA	47	8	1.0	*		22	Δ	F931E225MAA	0.6	6	63	*
101/	47	C	F931A476MCC	47	6	0.9	*		33	Δ	F031E335MAA	0.0	6	6.0	*
100	68	B	F931A686MBA	6.8	12	0.0	+ 15		4.7	Δ	F031E475MAA	1.2	8	4.0	*
	68	C	F031A686MCC	6.8	8	0.0	* 10		4.7		E031E475MBA	1.2	6	2.0	*
	100	В	F031A107MBA	10.0	18	1.2	+ 15	251/	10	D		1.2	12	2.0	
	100	C	E031A107MCC	10.0	10	0.7	± 15	250	10	C	F93TE100MBA	2.5	6	1.9	<u> </u>
	100		F931A107MCC	10.0		0.7	*		10		F93TETUONICC	2.5	0	1.5	
	100		F931A1071010C	10.0	11	0.0	* 		15		F93TET56MCC	3.0 5.5	0	1.2	
	150		F931A157MCC	15.0	14	0.7	*		22		F931E226MCC	5.5	8	1.1	*
	100	IN N	F931A15/WINC	10.0	10	0.0	*		22	N N	F93TE226MINC	5.5	6	0.7	
	220	IN N	F93TA22/WINC	22.0	12	0.5	*		33	N	F931E336WINC	8.3	8 C	0.7	*
	<u> </u>	IN	F95TA537MINC	33.0	٥١	0.5	*		4/	Ň	F931E4/6MINC	11.8	8	0.7	*
									0.68	A	F931V684MAA	0.5	4	7.6	*
										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	В	F931V225MBA	0.8	4	3.8	*
								35V	3.3	B	F931V335MBA	1.2	4	3.5	*

1 : ∆C/C Marked ""

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

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

F931V475MBA

F931V475MCC

F931V685MCC

F931V106MCC

F931V156MNC

F931V226MNC

1.6

1.6

2.4

3.5

5.3

7.7

8

6

6

6

6

8

4.7

4.7

6.8

10

15

22

В

С

С

С

Ν

Ν

3.1

1.8

1.8

1.6

0.7

0.7

*

*

*

*

* *

nichicon



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





C • N Case

Dimensions

Dimensions (m								
Case code	L	W1	W2	н	S			
A	3.2 ± 0.2	1.6 ± 0.2	1.2 ± 0.1	1.6 ± 0.2	0.8 ± 0.2			
В	3.5 ± 0.2	2.8 ± 0.2	2.2 ± 0.1	1.9 ± 0.2	0.8 ± 0.2			
С	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

		•					
\searrow	V	6.3	10	16	20	25	35
Cap.(µF)	Code	OJ	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	В
3.3	335	A	A	A	В	В	(B) • C
4.7	475	A	A · B	A · B	A·Β	(B) · C	С
6.8	685	A·Β	В	В	(B) • C	С	(C) • N
10	106		A · B	A · B · C	(B) • C	C·N	N
15	156	В	В	(B) · C	N	(C) • N	
22	226	A۰B	A · B	B·C·N	C·N	(N)	() The serie
33	336	A·C	B·C·N	B·C·N		(N)	Please conta
47	476	B·C	(B) • C • N	(C) • N			series are be
68	686	N	N		-		
100	107	N	$(C) \cdot (N)$	1			

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° is not more than 0.01CV or 0.5µA, whichever is greater. After 1 minute's application of rated voltage,leakage current at 85° 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 characteristic requirements table below. Capacitance Change Within ±10% of the initial value Dissipation Factor Initial specified value or less Leakage Current
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

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

capacitor terminals.

ries in parentheses are being developed.

ntact to your local Nichicon sales office when these being designed in your application.



Standard Ratings

F97

Rated Volt	Rated Capacitance (µF)	Case code	Part Number	Leakage Current (µA)	Disspation Factor (%@120Hz)	ESR (Ω@100kHz)
	3.3	Α	F970J335MAA	0.5	4	4.5
	4.7	Α	F970J475MAA	0.5	6	4.0
	6.8	Α	F970J685MAA	0.5	6	3.5
	6.8	В	F970J685MBA	0.5	6	2.5
	15	В	F970J156MBA	0.9	6	2.0
	22	А	F970J226MAA	1.4	12	2.5
6.3V	22	в	F970J226MBA	1.4	8	1.9
	33	А	F970J336MAA	2.1	12	2.5
	33	с	F970J336MCC	2.1	6	1.1
	47	В	F970J476MBA	3.0	8	1.0
	47	c	F970J476MCC	3.0	6	0.9
	68	N	F970.J686MNC	4.3	6	0.6
	100	N	F970.1107MNC	6.3	8	0.6
				0.5	4	5.0
	2.2	A	F97 TAZZOWAA	0.5	4	5.0
	3.3	A	F9/1A335WAA	0.5	4	4.5
	4.7	A	F971A475MAA	0.5	0	4.0
	4.7	В	F9/1A4/5MBA	0.5	6	2.8
	6.8	в	F971A685MBA	0.7	6	2.5
	10	A	F971A106MAA	1.0	6	3.0
	10	В	F971A106MBA	1.0	6	2.0
10V	15	В	F971A156MBA	1.5	6	2.0
	22	A	F971A226MAA	2.2	15	3.0
	22	В	F971A226MBA	2.2	8	1.9
	33	В	F971A336MBA	3.3	8	1.9
	33	С	F971A336MCC	3.3	6	1.1
	33	N	F971A336MNC	3.3	6	0.7
	47	С	F971A476MCC	4.7	8	0.9
	47	N	F971A476MNC	4.7	6	0.7
	68	N	F971A686MNC	6.8	6	0.6
	1.5	Α	F971C155MAA	0.5	4	6.3
	2.2	Α	F971C225MAA	0.5	4	5.0
	3.3	Α	F971C335MAA	0.5	4	4.5
	4.7	Α	F971C475MAA	0.8	8	4.0
	4.7	В	F971C475MBA	0.8	6	2.8
	6.8	В	F971C685MBA	1.1	6	2.5
	10	Α	F971C106MAA	1.6	8	3.5
	10	В	F971C106MBA	1.6	6	2.1
16V	10	С	F971C106MCC	1.6	6	1.5
	15	С	F971C156MCC	2.4	6	1.2
	22	В	F971C226MBA	3.5	8	1.9
	22	С	F971C226MCC	3.5	8	1.1
	22	N	F971C226MNC	3.5	6	0.7
	33	В	F971C336MBA	5.3	10	2.1
	33	с	F971C336MCC	5.3	8	1.1
	33	N	F971C336MNC	5.3	6	0.7
	47	N	F971C476MNC	7.5	8	0.7
	0.68	^		0.5	1	7.6
	0.00	Å	F971D004WAA	0.5	4	7.0
	15	Å	E071D105WAA	0.5	4	7.5 6.7
	1.0			0.5	4	0.7
	2.2			0.5	0	0.0
	3.3		E071D475MAA	0.7	4	3.1
20V	4./	A		0.9	ð	4.0
	4./	в	F9/104/5MBA	0.9	o C	2.8
	0.8			1.4	6	1.8
	10			2.0	o C	1.5
	15			3.0	6	0.7
	22		F9/1D226MCC	4.4	8 C	1.1
	22	N	F9/10226MNC	4.4	6	0.7

Rated Volt	Rated Capacitance (µF)	Case code	Part Number	Leakage Current (µA)	Disspation Factor (%@120Hz)	ESR (Ω@100kHz)
	0.68	А	F971E684MAA	0.5	4	7.6
	1	А	F971E105MAA	0.5	4	7.5
	2.2	В	F971E225MBA	0.6	4	3.8
	3.3	В	F971E335MBA	0.8	4	3.5
25V	4.7	С	F971E475MCC	1.2	6	1.8
	6.8	С	F971E685MCC	1.7	6	1.8
	10	С	F971E106MCC	2.5	6	1.6
	10	Ν	F971E106MNC	2.5	6	1.0
	15	Ν	F971E156MNC	3.8	6	0.7
	0.47	А	F971V474MAA	0.5	4	10.0
	0.68	А	F971V684MAA	0.5	4	7.6
	1.5	В	F971V155MBA	0.5	4	4.0
351/	2.2	В	F971V225MBA	0.8	4	3.8
337	3.3	С	F971V335MCC	1.2	4	2.0
	4.7	С	F971V475MCC	1.6	6	1.8
	6.8	Ν	F971V685MNC	2.4	6	1.0
	10	Ν	F971V106MNC	3.5	6	1.0

 \ast In case of capacitance tolerance ±10% type, $\ensuremath{\overleftarrow{\text{K}}}$ will be put at 9th digit of type numbering system.

FRAMELESS tm



Specifications

•	
Item	Performance Characteristics
Category Temperature Range	-55 to +125°C (Rated temperature : +85°C)
Capacitance Tolerance	±20%, ±10% (at 120Hz)
Dissipation Factor (at 120Hz)	Refer to next page
ESR(100kHz)	Refer to next page
Leakage Current	Refer to next page Provided that • After 1 minute's application of rated voltage, leakage current at 85°C, 10 times or less than 20°C specified value. • After 1 minute's application of rated voltage, leakage current at 125°C, 12.5 times or less than 20°C specified value.
Capacitance Change	+15% Max. (at +125°C)
by Temperature	+10% Max. (at +85°C) -10% Max. (at -55°C)
Damp Heat (Steady State)	At 40°C, 90 to 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
Posistance to	10 seconds reflow at 260°C, 10 seconds immersion at 260°C
Soldering Heat	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 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
Shear Test	After applying the pressure load of 5N for 10 \pm 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. $\qquad \qquad $
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 voltage, refer to page 332 for details.

Dimensions							
Case code	L	W	Н	A	В	С	(D)
Р	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)
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)
Т	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)
В	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

Applications

- Mobile Audio Player
- Mobile phone
 Wireless Microphone System
- Smartphone
- 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 220µF)



Drawing



(Both electrodes at bottom side only)





Conformal coated Chip, For Mobile Audio

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

MUSE F95

Standard Ratings

	v	4	6.3	10
(µF)	Code	0G	0J	1A
68	686	S	S	В
100	107	S	S•T	В
150	157	S	(A)	
220	227	(P) • S • T	(A) • (T) • B	
330	337	Т	В	
470	477	(T) • B	(B)	
680	687	(T) • (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.



P case - No marking on part.

Standard Ratings

			-					
	Rated Volt	Rated Capacitance (µF)	Case code	Part Number	*2 Leakage Current (µA)	Disspation Factor (%@120Hz)	ESR (Ω@100kHz)	*1 ∆C/C (%)
		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
	4V	220	S	F950G227MSAAM1Q2	8.8	30	0.8	± 15
		220	Т	F950G227MTAAM1Q2	8.8	25	0.6	*
		330	Т	F950G337MTAAM1Q2	13.2	40	0.8	±20
		470	В	F950G477MBAAM1Q2	18.8	40	0.4	±20
		68	S	F950J686MSAAM1Q2	4.3	14	0.9	*
		100	S	F950J107MSAAM1Q2	6.3	20	0.9	± 15
	6.3V	100	Т	F950J107MTAAM1Q2	6.3	14	0.6	*
		220	В	F950J227MBAAM1Q2	13.9	30	0.4	*
		330	В	F950J337MBAAM1Q2	20.8	35	0.6	±20
	101/	68	В	F951A686MBAAM1Q2	6.8	12	0.4	*
	TUV	100	В	F951A107MBAAM1Q2	10.0	14	0.4	*

1 : \(\Delta C/C) Marked ""

S·A·T·B Case (%)
±10
±5
±5
±5
±10

*2 : Leakage Current

After 1 minute's application of rated voltage, leakage current at 20°C.





Conformal coated FRAMELESS TM Chip

	G	F
For SMD	Smaller	For High Frequenc

Specifications



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



Applications

 Smartphone • Wireless module

• Tablet PC e-book

■Type numbering system (Example : 4V 330µF)





Dimensions

Case code	L	W	н	A	В	С	(D)
R	2.2 ± 0.3	1.25 ± 0.3	0.65MAX.	0.6 ± 0.3	0.8 ± 0.3	0.5MIN	(0.2)
Р	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)
А	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)
Т	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)
В	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)

Item Performance Characteristics Category -55 to +125°C (Rated temperature : +85°C) Temperature Range ±20%, ±10% (at 120Hz) (However R • P Case ±20%) Capacitance Tolerance Dissipation Factor Refer to next page (at 120Hz) ESR(100kHz) Refer to next page Refer to next page Provided that After 1 minute's application of rated voltage, leakage current at 85°C. Leakage Current 10 times or less than 20°C specified value.
After 1 minute's application of rated voltage, leakage current at 125°C, 12.5 times or less than 20°C specified value. +15% Max. (at +125°C) Capacitance Change +10% Max. (at +85°C) -10% Max. (at -55°C) by Temperature At 40°C, 90 to 95% R.H., For 500 hours (No voltage applied) Capacitance Change Refer to next page (*1) Dissipation Factor Initial specified value or less Damp Heat (Steady State) Leakage Current Initial specified value or less 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 Temperature Cycles Leakage Current Initial specified value or less 10 seconds reflow at 260°C, 10 seconds immersion at 260°C Resistance to Capacitance Change Refer to next page (*1) Dissipation Factor Initial specified value or less Leakage Current Initial specified value or less Soldering Heat 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. Surge* Capacitance Change Refer to next page (*1) Dissipation Factor Initial specified value or less Leakage Current Initial specified value or less After 2000 hours' application of rated voltage at 85°C, capacitors shall meet the characteristic requirements table below. Capacitance Change Refer to next page (*1) Endurance³ Dissipation Factor Initial specified value or less Leakage Current Initial specified value or less After applying the pressure load of 5N for 10±1 seconds horizontally to the center of capacitor side body which has Shear Test no electrode and has been soldered 5N (0.51kg · f) beforehand on a substrate, there shall be For 10 + 1 seconds found neither exfoliation nor its sign at the terminal electrode. 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 Terminal Strength R230 ш

* As for the surge voltage, refer to page 332 for details.

bend by 1mm as illustrated. Then there shall be found no remarkable

abnormality on the capacitor terminals.

45

45

D dimension only for reference

Standard Ratings

Cap	V	4	6.3	10	16	20	25	35			
(µF)	Code	0G	0J	1A	1C	1D	1E	1V			
1	105						R	P·S			
1.5	155										
2.2	225					Р	R·P	A			
3.3	335										
4.7	475				R·P	S·A	P·Q·S·A	В			
6.8	685						(Q) · (S)				
10	106			R·P	P·Q·S·A	S·A·B	A · (T) · B				
15	156			Р	S·A						
22	226		R	P·Q·S·A	Q·S·A·T·B	В					
33	336		(R) · P	P·Q·S·A	(A) · T · B		-				
47	476	(R)	Р	P · (Q) · S·A·T·B	В						
68	686		Р	В							
100	107	P·S·A	P·Q·S·A·T·B	(S) · A · T · B							
150	157	Р∙В	В			ntheses are being devel	anad				
220	227	(P) · Q · S · A · T · B	$(S) \cdot (A) \cdot (T) \cdot B$		() The series in pare	ur less Nichison sales off	iee when				
330	337	(P) · (S) · A · T· B	В]	Please contact to your local Nichicon sales office when these series are being designed in your application.						
470	477	$(P) \cdot (A) \cdot (T) \cdot B$	(B)					CAT 8100B			
680	687	(T)		-							

(mm)

F95

Standard Ratings

Rated Volt	Rated Capacitance (µF)	Case code	Part Number	*2 Leakage Current (µA)	Disspation Factor (%@120Hz)	ESR (Ω@100kHz)	*1 ∆C/C (%)
100 F		Р	F950G107MPAAQ2	4.0	30	1.2	±15
	100	S	F950G107MSAAQ2	4.0	14	0.8	*
	100	A	F950G107MAAAQ2	4.0	12	0.5	*
	150	Р	F950G157MPAAQ2	12.0	31	1.1	±20
	150	В	F950G157MBAAQ2	6.0	14	0.4	*
	220	Q	F950G227MQAAQ2	8.8	30	1.5	±20
	220	s	F950G227MSAAQ2	8.8	30	0.8	±15
40	220	A	F950G227MAAAQ2	8.8	25	0.8	±15
	220	Т	F950G227MTAAQ2	8.8	25	0.6	*
	220	В	F950G227MBAAQ2	8.8	16	0.4	*
	330	A	F950G337MAAAQ2	13.2	40	0.8	±20
	330	Т	F950G337MTAAQ2	13.2	40	0.8	±20
	330	в	F950G337MBAAQ2	13.2	30	0.6	±15
	470	в	F950G477MBAAQ2	18.8	40	0.4	±20
	22	P	E050 1226MRAAO2	14	20	2.0	+20
	33	P	F950 1336MPAAO2	21	14	1 1	*
	47	P	F950 1476MPAAO2	3.0	20	1.1	+15
	68	P	F950 1686MPAAO2	43	25	1.1	+15
	100	P	F050 1107MPAAO2	12.6	35	1.2	+20
	100		F050 1107MOAAO2	63	30	1.2	+20
6.3V	100	s s	F050 1107 MQAAQ2	63	20	0.0	+15
	100	۵ ۱	E050 1107 MOAAQ2	6.2	14	0.5	тı3
	100		E050 1107 MAAAQ2	6.2	14	0.5	*
	100		F9505107101AAQ2	0.3	14	0.0	*
	100		F9505107MBAAQ2	0.5	14	0.4	r v
	220		E050 1227MBAAQ2	9.5	30	0.4	*
	220		E050 1227 MDAAQ2	20.0	25	0.4	+20
	10	ь Б	E051A106MBAAQ2	1.0	10	2.0	+20
	10			1.0	0	3.0	12U
	10			1.0	10	3.0	*
	10			1.5	10	3.0	*
	22			2.2	14	3.0	*
	22			2.2	10	2.0	*
	22	5	F951A220WSAAQ2	2.2		1.1	*
	22			2.2	0	0.9	*
	33		F95TA330WPAAQ2	3.3	20	3.0	±15
	33	Q	F951A336MQAAQ2	3.3	18	3.0	±15
10V	33	5	F951A336MSAAQ2	3.3	10	1.1	*
	33	A	F951A336MAAAQ2	3.3	10	0.8	*
	47		F951A476MPAAQ2	4.7	30	3.0	±20
	47	S	F951A476MSAAQ2	4.7	14	1.1	±15
	47	A	F951A4/6MAAAQ2	4.7	10	0.8	*
	47		F951A476MTAAQ2	4.7	12	0.8	*
	47	В	F951A476MBAAQ2	4.7	8	0.4	*
	68	В	F951A686MBAAQ2	6.8	12	0.4	*
	100	A	F951A107MAAAQ2	10.0	35	1.0	±15
	100	T	F951A107MTAAQ2	10.0	20	0.6	±15
	100	В	F951A107MBAAQ2	10.0	14	0.4	*

Rated Volt	Rated Capacitance (µF)	Case code	Part Number	*2 Leakage Current (µA)	Disspation Factor (%@120Hz)	ESR (Ω@100kHz)	*1 ∆C/C (%)
	4.7	R	F951C475MRAAQ2	0.8	12	6.0	±20
	4.7	Р	F951C475MPAAQ2	0.8	10	4.0	*
	10	Р	F951C106MPAAQ2	1.6	10	4.0	*
	10	Q	F951C106MQAAQ2	1.6	8	3.0	*
	10	S	F951C106MSAAQ2	1.6	8	2.0	*
	10	А	F951C106MAAAQ2	1.6	6	1.4	*
	15	S	F951C156MSAAQ2	2.4	8	2.0	*
16∨	15	А	F951C156MAAAQ2	2.4	8	1.4	*
	22	Q	F951C226MQAAQ2	3.5	12	3.0	*
	22	S	F951C226MSAAQ2	3.5	10	2.0	±15
	22	Α	F951C226MAAAQ2	3.5	8	1.4	*
	22	Т	F951C226MTAAQ2	3.5	8	1.4	*
	22	В	F951C226MBAAQ2	3.5	6	0.5	*
	33	Т	F951C336MTAAQ2	5.3	11	1.5	±10
	33	В	F951C336MBAAQ2	5.3	8	0.5	*
	47	В	F951C476MBAAQ2	7.5	10	0.6	*
	2.2	Р	F951D225MPAAQ2	0.5	6	6.0	*
	4.7	S	F951D475MSAAQ2	0.9	8	4.0	*
	4.7	А	F951D475MAAAQ2	0.9	6	1.5	*
20V	10	S	F951D106MSAAQ2	2.0	10	4.0	±10
	10	А	F951D106MAAAQ2	2.0	8	1.5	*
	10	В	F951D106MBAAQ2	2.0	6	0.8	*
	22	В	F951D226MBAAQ2	4.4	8	0.8	*
	1	R	F951E105MRAAQ2	0.5	10	10.0	±10
	2.2	R	F951E225MRAAQ2	0.6	15	15.0	±20
	2.2	Р	F951E225MPAAQ2	0.6	8	6.0	±15
	4.7	Р	F951E475MPAAQ2	1.2	10	8.0	±15
250	4.7	Q	F951E475MQAAQ2	1.2	10	4.0	±15
	4.7	S	F951E475MSAAQ2	1.2	8	4.0	*
	4.7	А	F951E475MAAAQ2	1.2	8	2.0	*
	10	Α	F951E106MAAAQ2	2.5	12	2.0	±15
	10	В	F951E106MBAAQ2	2.5	6	0.9	*
	1	Ρ	F951V105MPAAQ2	0.5	8	10.0	±10
35V	1	S	F951V105MSAAQ2	0.5	6	8.0	*
	2.2	А	F951V225MAAAQ2	0.8	6	4.4	*
	4.7	В	F951V475MBAAQ2	1.7	6	1.6	*

% In case of capacitance tolerance ±10% type, \overleftarrow{K} will be put at 9th digit of type numbering system.

1 : ∆C/C Marked ""

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

*2 : Leakage Current After 1 minute's application of rated voltage, leakage current at 20°C.



For High Frequency

Smaller

For SMD

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

Low Profile

Conformal

coated Chip



Standard Ratings

F72		V	4	6.3	10	16	F7
	Cap.(µF)	Code	0G	0J	1A	1C	
	33	336				R	
	47	476			R	R	
	68	686		R	R	R	
	100	107	R	R	R		
	150	157	R	R	R	1	
	220	227	R	R	R	1	
	330	337	R	R	(R)	 () The se are being of 	ries in parenthese developed. Please
	470 477				М	contact to	your local Nichicor
680 1000		687			М	series are	being designed in
		108		М	М	your applic	ation.
	1500	158		М			

Item	Performance Characteristics
Category Temperature Range	-55 to +125°C (Rated temperature : +85°C)
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., For 500 hours (No voltage applied) Capacitance Change Refer to * 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 * 1 Dissipation Factor Initial specified value or less Leakage Currentv 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 * 1 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 shall meet the characteristic requirements table below. Capacitance Change Refer to * 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, capacitors shall meet the characteristic requirements table below. Capacitance Change Refer to * 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 appormality on the capacitor terminals

FRAMELESS TM

Upgrade

Maximum CV

Conformal

coated Chip

* As for the surge voltage, refer to page 332 for details.

Dimensions

Case code	L	W	н	A	В	(D)			
U	7.1 ± 0.3	3.2 ± 0.3	2.0MAX.	1.3 ± 0.3	3.6 ± 0.6	(6.0)			
С	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									

F75		V	4	6.3	10	16
	Cap. (µF)	Code	0G	0J	1A	1C
	68	68 686				С
	100	107				С
	150	157			С	D
	220	227		С	C·D	R
	330	337	С	C·D	D	
	470	477	C·D	U·D	U·R	
	680	687	D	(U) · D · R		
neses	1000	108	D·R	(U) • R		
ease	1500	158	R			
hicon	2200	228	R]		

CAT.8100B

(mm)

F72

Standard Ratings

Rated Volt	Rated Capacitance (µF)	Case code	Part Number	Leakage Current (µA)	Disspation Factor (%@120Hz)	ESR (Ω@100kHz)	*1 ∆C/C (%)
	100	R	F720G107MRC	4.0	8	0.70	*
	150	R	F720G157MRC	6.0	10	0.70	*
v	220	R	F720G227MRC	8.8	12	0.70	*
	330	R	F720G337MRC	13.2	12	0.70	*
	68	R	F720J686MRC	4.3	6	0.75	*
	100	R	F720J107MRC	6.3	8	0.70	*
	150	R	F720J157MRC	9.5	10	0.70	*
6.3V	220	R	F720J227MRC	13.9	12	0.70	*
	330	R	F720J337MRC	20.8	12	0.70	*
	1000	М	F720J108MMC	63.0	30	0.14	±15
	1500	М	F720J158MMC	95.0	45	0.14	±20
	47	R	F721A476MRC	4.7	6	0.80	*
	68	R	F721A686MRC	6.8	6	0.75	*
	100	R	F721A107MRC	10.0	8	0.70	*
101/	150	R	F721A157MRC	15.0	10	0.70	*
100	220	R	F721A227MRC	22.0	12	0.70	*
	470	М	F721A477MMC	47.0	30	0.14	±15
	680	М	F721A687MMC	68.0	35	0.14	±20
	1000	М	F721A108MMC	200	45	0.14	±20
	33	R	F721C336MRC	5.3	6	0.90	*
16V	47	R	F721C476MRC	7.5	6	0.80	*
	68	R	F721C686MRC	10.9	6	0.75	*

1 : ∆C/C Mar	ked ""
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1 : $\Delta C/C$ Marked ""

Tempereature cycles Resistance soldering heat

Damp Heat

Surge

Endurance

F75 ALL Case (%)

±10

±5 ±5 ±5

±10

	F72 ALL Case (%)
Damp Heat	±10
Tempereature cycles	±5
Resistance soldering heat	±5
Surge	±5
Endurance	±10

F75

Standard Ratings

Rated Volt	Rated Capacitance (µF)	Case code	Part Number	Leakage Current (µA)	Disspation Factor (%@120Hz)	ESR (Ω@100kHz)	*1 ∆C/C (%)
	330	С	F750G337MCC	13.2	10	0.15	*
	470	С	F750G477MCC	18.8	14	0.12	*
	470	D	F750G477MDC	18.8	14	0.12	*
	680	D	F750G687MDC	27.2	18	0.12	*
+v	1000	D	F750G108MDC	40.0	24	0.12	*
	1000	R	F750G108MRC	40.0	24	0.12	*
	1500	R	F750G158MRC	60.0	30	0.12	*
	2200	R	F750G228MRC	88.0	45	0.07	*
	220	С	F750J227MCC	13.9	10	0.20	*
	330	С	F750J337MCC	20.8	10	0.15	*
	330	D	F750J337MDC	20.8	10	0.15	*
6.21/	470	U	F750J477MUC	29.6	15	0.10	*
0.30	470	D	F750J477MDC	29.6	14	0.12	*
	680	D	F750J687MDC	42.8	18	0.12	*
	680	R	F750J687MRC	42.8	18	0.12	*
	1000	R	F750J108MRC	63.0	24	0.12	*
	150 C F751A157MCC		15.0	10	0.22	*	
	220	С	F751A227MCC	22.0	10	0.20	*
101/	220	D	F751A227MDC	22.0	10	0.20	*
100	330	D	F751A337MDC	33.0	10	0.15	*
	470	U	F751A477MUC	94.0	30	0.15	±20
	470	R	F751A477MRC	47.0	14	0.12	*
	68	С	F751C686MCC	10.9	10	0.22	*
161/	100	С	F751C107MCC	16.0	10	0.22	*
	150	D	F751C157MDC	24.0	10	0.22	*
	220	R	F751C227MRC	35.2	10	0.20	*





Resin-molded Chip, High Capacitance Series FRAMELESS TM





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



			1
			1
 		~	
S1	S2	S1	

					(
L	W1	W2	Н	S1	S2
1.10 ± 0.05	0.60 ± 0.05	0.35 ± 0.05	0.55 ± 0.05	0.3 ± 0.05	0.5 ± 0.05
1.6 ^{+0.2} -0.1	0.85 ^{+0.2} 0.1	0.65 ± 0.1	0.8 ± 0.1	0.5 ± 0.1	0.6 ± 0.1
2.0+0.2	1.25 ^{+0.2} 0.1	0.9 ± 0.1	0.8 ± 0.1	0.5 ± 0.1	1.0 ± 0.1
	$\begin{array}{c} L \\ 1.10 \pm 0.05 \\ 1.6 \substack{+0.2 \\ -0.1} \\ 2.0 \substack{+0.2 \\ -0.1} \end{array}$	$\begin{array}{c c} L & W_1 \\ \hline 1.10 \pm 0.05 & 0.60 \pm 0.05 \\ \hline 1.6 \stackrel{+0.2}{_{-0.1}} & 0.85 \stackrel{+0.2}{_{-0.1}} \\ 2.0 \stackrel{+0.2}{_{-0.1}} & 1.25 \stackrel{+0.2}{_{-0.1}} \end{array}$	$\begin{array}{ c c c c c c c } L & W_1 & W_2 \\ \hline 1.10 \pm 0.05 & 0.60 \pm 0.05 & 0.35 \pm 0.05 \\ \hline 1.6^{+}0.2 & 0.85^{+}0.2 & 0.65 \pm 0.1 \\ \hline 2.0^{+}0.2 & 1.25^{+}0.2 & 0.9 \pm 0.1 \\ \hline \end{array}$	$\begin{array}{ c c c c c c } L & W_1 & W_2 & H \\ \hline 1.10 \pm 0.05 & 0.60 \pm 0.05 & 0.35 \pm 0.05 & 0.55 \pm 0.05 \\ \hline 1.6^{+}0.2 & 0.85^{+}0.2 & 0.65 \pm 0.1 & 0.8 \pm 0.1 \\ \hline 2.0^{+}0.2 & 1.25^{+}0.2 & 0.9 \pm 0.1 & 0.8 \pm 0.1 \\ \hline \end{array}$	$\begin{array}{ c c c c c c c } L & W_1 & W_2 & H & S_1 \\ \hline 1.10 \pm 0.05 & 0.60 \pm 0.05 & 0.35 \pm 0.05 & 0.55 \pm 0.05 & 0.3 \pm 0.05 \\ \hline 1.6^{+}_{0.2.1} & 0.85^{+}_{0.2.1} & 0.65 \pm 0.1 & 0.8 \pm 0.1 & 0.5 \pm 0.1 \\ \hline 2.0^{+}_{-0.2.1} & 1.25^{+}_{-0.2.1} & 0.9 \pm 0.1 & 0.8 \pm 0.1 & 0.5 \pm 0.1 \\ \hline \end{array}$

Marking



S Case ^{★★}Capacitance code ⊕ Js



M Case

Rated voltage (Voltage code)

Standard Ratings

\sim	V	4	6.3	10	16	20	25	* *
Cap.(µF)	Code	0G	0J	1A	1C	1D	1E	code
1	105				м	М	М	-
2.2	225			U•М	М			-
4.7	475	U	U•М	(U) • M	М			-
10	106	U	(U) ∙ M	М	S			а
22	226	М	М	(M) • S				J
33	336	М	М	(M) • S				n
47	476	М	M·S	S				s
68	686	м·s						w
100	107	M·S	S					A
220	227	S						J

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

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

Item	Performance Characteristics
Category Temperature Range	-55 to +125°C (Rated temperature : +85°C)
Capacitance Tolerance	±20% (at 120Hz)
Dissipation Factor	Refer to the table below
ESR	Refer to the table below
Leakage Current	Refer to the table below Provided that • After 5 minute's application of rated voltage, leakage current at 85°C, 10 times or less than 20°C specified value. • After 5 minute's application of rated voltage, leakage current at 125°C, 12.5 times or less than 20°C specified value.
Damp Heat (Steady State)	At 40°C, 90 to 95% R.H., For 500hours (No voltage applied) Capacitance Change ··· Refer to the table 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 table below (* 1) Dissipation Factor · · · · · 150% or less than the initial specified value 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 the table 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 $1k\Omega$ 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 listed below. Capacitance Change \cdots Refer to the table below (* 1) Dissipation Factor $\cdots 150\%$ or less than the initial specified value Leakage Current $\cdots 200\%$ or less than the initial specified value
Endurance*	After 1000 hours' application of rated voltage in series with a 3Ω resistor at 85°C, capacitors shall meet the characteristic requirements table below Capacitance Change \cdots . Refer to the table below (* 1) Dissipation Factor $\cdots \cdots 150\%$ or less than the initial specified value Leakage Current $\cdots \cdots 200\%$ or less than the 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 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 ijg 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 voltage, refer to page 332 for details.

Rated Volt	Rated Capacitance (µF)	Case code	Part Number	*2 Leakage Current (μA)	Disspation Factor (%@120Hz)	ESR (Ω@100kHz)	*1 ∆C/C (%)
	4.7	U	F980G475MUA	0.5	20	20	±30
	10	U	F980G106MUA	0.8	25	20	±30
	22	M	F980G226MMA	0.9	15	7.5	±30
	33	M	F980G336MMA	1.3	30	4	±30
41/	47	M	F980G476MMA	1.9	40	8	±30
4 V	68	M	F980G686MMA	27.2	50	10	±30
	68	S	F980G686MSA	2.7	30	4	±30
	100	M	F980G107MMA	80.0	60	10	±30
	100	S	F980G107MSA	4.0	35	4	±30
	220	S	F980G227MSA	132	80	5	±30
	4.7	U	F980J475MUA	0.6	20	20	±30
	4.7	М	F980J475MMA	0.5	20	7.5	±30
	10	M	F980J106MMA	0.6	8	6	±30
6.31/	22	M	F980J226MMA	1.4	20	6	±30
0.5 V	33	M	F980J336MMA	4.2	35	8	±30
	47	M	F980J476MMA	29.6	45	10	±30
	47	S	F980J476MSA	3.0	25	6	±30
	100	S	F980J107MSA	63.0	50	8	±30
	2.2	U	F981A225MUA	0.5	15	15	±30
	2.2	M	F981A225MMA	0.5	6	7.5	±30
	4.7	M	F981A475MMA	0.5	6	6	±30
10V	10	M	F981A106MMA	1.0	20	7.5	±30
	22	S	F981A226MSA	2.2	20	4	±20
	33	S	F981A336MSA	3.3	30	6	±30
	47	S	F981A476MSA	9.4	35	5	±30
	1	M	F981C105MMA	0.5	6	10	±30
161/	2.2	M	F981C225MMA	0.5	6	10	±30
100	4.7	M	F981C475MMA	0.8	12	12	±30
	10	S	F981C106MSA	1.6	18	4	±20
20V	1	M	F981D105MMA	0.5	6	10	±30
25V	1	M	F981E105MMA	0.5	8	10	±30

*2 : Leakage Current

After 5 minute's application of rated voltage, leakage current at 20°C.

