

### Surface Mount Type

Series: **FC** Type: **V**

FC High temperature Lead-Free reflow(suffix:A\*)

Low impedance



### ■ Features

- Endurance : 105 °C 1000 h
- Low impedance (1/2 for HA series)
- Vibration-proof product is available upon request. (φ8 mm and larger)
- AEC-Q200 qualified\*
- RoHS directive compliant

### ■ Specifications

Category Temp. Range	-40 °C to +105 °C						
Rated W.V. Range	6.3 V.DC to 35 V.DC						
Nominal Cap. Range	1 μF to 1500 μF						
Capacitance Tolerance	±20 % (120 Hz/+20 °C)						
DC Leakage Current	I ≤ 0.01 CV or 3 (μA) After 2 minutes (Whichever is greater)						
tan δ	Please see the attached High temperature lead-free reflow products list.						
Characteristics at Low Temperature	W.V. (V)	6.3	10	16	25	35	(Impedance ratio at 120 Hz)
	Z(-25 °C) / Z(+20 °C)	2	2	2	2	2	
	Z(-40 °C) / Z(+20 °C)	3	3	3	3	3	
Endurance	After applying rated working voltage for 1000 hours at +105 °C±2 °C and then being stabilized at +20 °C, Capacitors shall meet the following limits.						
	Capacitance change	±20 % of initial measured value					
	tan δ	≤ 200 % of initial specified value					
	DC leakage current	≤ initial specified value					
Shelf Life	After storage for 1000 hours at +105 °C±2 °C with no voltage applied and then being stabilized at +20 °C, capacitors shall meet the limits specified in Endurance.(With voltage treatment)						
	After reflow soldering and then being stabilized at +20 °C, capacitors shall meet the following limits.						
Resistance to Soldering Heat	After reflow soldering and then being stabilized at +20 °C, capacitors shall meet the following limits.						
	Capacitance change	±10 % of initial measured value					
	tan δ	≤ initial specified value					
	DC leakage current	≤ initial specified value					

### ■ Frequency correction factor for ripple current

Correction factor	Frequency (Hz)				
	50, 60	120	1 k	10 k	100 k to
	0.70	0.75	0.90	0.95	1.00

### ■ Marking

Example: 6.3 V 22 μF  
Marking color : BLACK

Negative polarity marking (-)  
Capacitance (μF)  
Series identification  
Mark for Lead-Free Products Black Dot (Square)  
Rated voltage Mark  
Lot number

Rated Voltage Mark			
j	6.3 V	E	25 V
A	10 V	V	35 V
C	16 V		

### ■ Dimensions in mm (not to scale)

(Unit : mm)

0.3 max.  
φD±0.5  
L  
A±0.2  
B±0.2  
W  
P  
K  
I  
H  
( ) Reference size

Size code	D	L	A, B	H	I	W	P	K
B	4.0	5.4 <sup>+0.1</sup> <sub>-0.2</sub>	4.3	5.5 max.	1.8	0.65±0.1	1.0	0.35 <sup>+0.15</sup> <sub>-0.20</sub>
C	5.0	5.4 <sup>+0.1</sup> <sub>-0.2</sub>	5.3	6.5 max.	2.2	0.65±0.1	1.5	0.35 <sup>+0.15</sup> <sub>-0.20</sub>
D	6.3	5.4 <sup>+0.1</sup> <sub>-0.2</sub>	6.6	7.8 max.	2.6	0.65±0.1	1.8	0.35 <sup>+0.15</sup> <sub>-0.20</sub>
E	8.0	6.2±0.3	8.3	9.5 max.	3.4	0.65±0.1	2.2	0.35 <sup>+0.15</sup> <sub>-0.20</sub>
F	8.0	10.2±0.3	8.3	10.0 max.	3.4	0.90±0.2	3.1	0.70±0.2
G	10.0	10.2±0.3	10.3	12.0 max.	3.5	0.90±0.2	4.6	0.70±0.2

\* This product qualify for AEC-Q200, but it has some deviations.

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### High temperature Lead-Free reflow Products

Endurance : 105 °C 1000 h

W.V.	Cap. (±20 %)	Case size			Specification			Part No. (RoHS:compliant)	Reflow	Min. Packaging Q'ty
		Dia.	Length	Size Code	Ripple Current (100 kHz) (+105°C) (mA r.m.s.)	tan δ (120 Hz) (+20 °C)	Impedance (100 kHz) (+20 °C) (Ω)			Taping  (pcs)
(V)	(μF)	(mm)	(mm)							
6.3	22	4	5.4	B	60	0.26	3.00	EEEFC0J220AR	(5)	2000
	47	5	5.4	C	95	0.26	1.80	EEEFC0J470AR	(5)	1000
	68	6.3	5.4	D	140	0.26	1.00	EEEFC0J680AP	(5)	1000
	100	6.3	5.4	D	140	0.26	1.00	EEEFC0J101AP	(5)	1000
	220	8	6.2	E	230	0.26	0.40	EEEFC0J221AP	(6)	1000
	330	8	10.2	F	450	0.26	0.30	EEEFC0J331AP	(6)	500
	1000	10	10.2	G	670	0.26	0.15	EEEFC0J102AP	(6)	500
	1500	10	10.2	G	670	0.26	0.15	EEEFC0J152AP	(6)	500
10	33	5	5.4	C	95	0.19	1.80	EEEFC1A330AR	(5)	1000
	100	8	6.2	E	230	0.19	0.40	EEEFC1A101AP	(6)	1000
	150	8	6.2	E	230	0.19	0.40	EEEFC1A151AP	(6)	1000
	220	8	10.2	F	450	0.19	0.30	EEEFC1A221AP	(6)	500
	470	10	10.2	G	670	0.19	0.15	EEEFC1A471AP	(6)	500
	1000	10	10.2	G	670	0.19	0.15	EEEFC1A102AP	(6)	500
16	10	4	5.4	B	60	0.16	3.00	EEEFC1C100AR	(5)	2000
	22	5	5.4	C	95	0.16	1.80	EEEFC1C220AR	(5)	1000
	47	6.3	5.4	D	140	0.16	1.00	EEEFC1C470AP	(5)	1000
	68	8	6.2	E	230	0.16	0.40	EEEFC1C680AP	(6)	1000
	100	8	6.2	E	230	0.16	0.40	EEEFC1C101AP	(6)	1000
	220	10	10.2	G	670	0.16	0.15	EEEFC1C221AP	(6)	500
	330	10	10.2	G	670	0.16	0.15	EEEFC1C331AP	(6)	500
	470	10	10.2	G	670	0.16	0.15	EEEFC1C471AP	(6)	500
	680	10	10.2	G	670	0.16	0.15	EEEFC1C681AP	(6)	500
25	6.8	4	5.4	B	60	0.14	3.00	EEEFC1E6R8AR	(5)	2000
	22	6.3	5.4	D	140	0.14	1.00	EEEFC1E220AP	(5)	1000
	33	6.3	5.4	D	140	0.14	1.00	EEEFC1E330AP	(5)	1000
	47	8	6.2	E	230	0.14	0.40	EEEFC1E470AP	(6)	1000
	68	8	10.2	F	450	0.14	0.30	EEEFC1E680AP	(6)	500
	100	8	10.2	F	450	0.14	0.30	EEEFC1E101AP	(6)	500
	220	10	10.2	G	670	0.14	0.15	EEEFC1E221AP	(6)	500
	330	10	10.2	G	670	0.14	0.15	EEEFC1E331AP	(6)	500
	470	10	10.2	G	670	0.14	0.15	EEEFC1E471AP	(6)	500
35	1	4	5.4	B	60	0.12	3.00	EEEFC1V1R0AR	(5)	2000
	2.2	4	5.4	B	60	0.12	3.00	EEEFC1V2R2AR	(5)	2000
	3.3	4	5.4	B	60	0.12	3.00	EEEFC1V3R3AR	(5)	2000
	4.7	4	5.4	B	60	0.12	3.00	EEEFC1V4R7AR	(5)	2000
	6.8	5	5.4	C	95	0.12	1.80	EEEFC1V6R8AR	(5)	1000
	10	5	5.4	C	95	0.12	1.80	EEEFC1V100AR	(5)	1000
	22	6.3	5.4	D	140	0.12	1.00	EEEFC1V220AP	(5)	1000
	33	8	6.2	E	230	0.12	0.40	EEEFC1V330AP	(6)	1000
	47	8	6.2	E	230	0.12	0.40	EEEFC1V470AP	(6)	1000
	100	10	10.2	G	670	0.12	0.15	EEEFC1V101AP	(6)	500
	220	10	10.2	G	670	0.12	0.15	EEEFC1V221AP	(6)	500
330	10	10.2	G	670	0.12	0.15	EEEFC1V331AP	(6)	500	

- Please refer to the page of "Reflow Profile" and "The Taping Dimensions".
- When requesting vibration-proof product, please put the last "V" instead to "P"

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