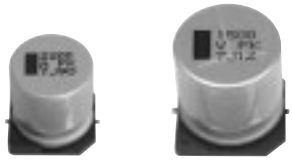
Surface Mount Type

Series: Medium-size **FK** Type: **V**

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



■ Features

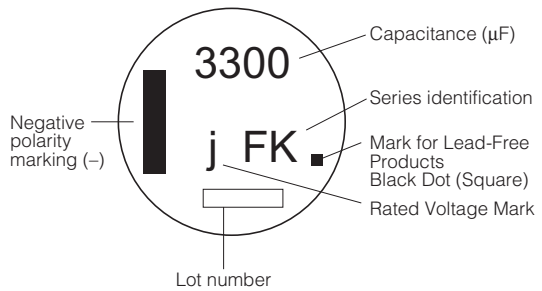
- Endurance: 5000 h at 105 °C
- Vibration-proof product is available upon request.
- RoHS directive compliant

■ Specifications

Category Temp. Range	–55 °C to +105 °C									
Rated W.V.Range	6.3 V.DC to 100 V.DC									
Nominal Cap.Range	47 µF to 6800 µF									
Capacitance Tolerance	±20 % (120 Hz/+20 °C)									
DC Leakage Current	I ≦ 0.01 CV (µA) After 2 minutes									
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	50	63	80	100
	Z(–25 °C)/Z(+20 °C)	2	2	2	2	2	2	2	2	2
	Z(–40 °C)/Z(+20 °C)	3	3	3	3	3	3	3	3	3
	Z(–55 °C)/Z(+20 °C)	4	4	4	3	3	3	3	3	3
	(Impedance ratio at 120 Hz)									
Endurance	After applying rated working voltage for 5000 hours at +105 °C±2 °C and then being stabilized at +20 °C, Capacitors shall meet the following limits.									
	Capacitance change	±30 % 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)									
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								

■ Marking

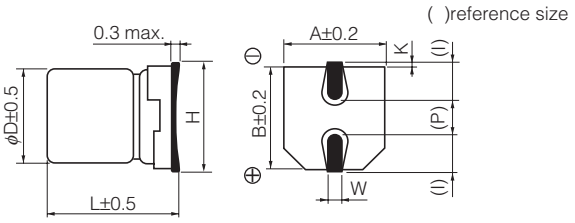
Example:6.3 V 3300 µF Marking color : BLACK



Rated Voltage Mark

j	6.3 V
A	10 V
C	16 V
E	25 V
V	35 V
H	50 V
J	63 V
K	80 V
2A	100 V

■ Dimensions in mm (not to scale)



(mm)

Size code	D	L	A,B	H max.	I	W	P	K
H13	12.5	13.5	13.5	15.0	4.7	0.90±0.3	4.4	0.70±0.3
J16	16.0	16.5	17.0	19.0	5.5	1.20±0.3	6.7	0.70±0.3
K16	18.0	16.5	19.0	21.0	6.7	1.20±0.3	6.7	0.70±0.3

Design and specifications are each subject to change without notice. Ask factory for the current technical specifications before purchase and/or use.
Should a safety concern arise regarding this product, please be sure to contact us immediately.

■ High temperature Lead-Free reflow

Endurance : 105 °C 5000 h

W.V. (V)	Cap. (±20 %) (μF)	Case size Dia. (mm)	Length (mm)	Size Code	Specification Ripple Current (100 kHz) (+105 °C) (mA r.m.s.)	Impedance (100 kHz) (+20 °C)	tan δ (120 Hz) (+20 °C)	Part No. (RoHS:compliant)	Reflow	Min. Packaging Q'ty Taping (pcs)
6.3	3300	12.5	13.5	H13	1100	0.06	0.30	EEEFK0J332AQ	(9)	200
	6800	16	16.5	J16	1800	0.035	0.36	EEEFK0J682AM	(9)	125
10	2200	12.5	13.5	H13	1100	0.06	0.21	EEEFK1A222AQ	(9)	200
	4700	16	16.5	J16	1800	0.035	0.25	EEEFK1A472AM	(9)	125
	6800	18	16.5	K16	2060	0.033	0.29	EEEFK1A682AM	(9)	125
16	1500	12.5	13.5	H13	1100	0.06	0.16	EEEFK1C152AQ	(9)	200
	3300	16	16.5	J16	1800	0.035	0.20	EEEFK1C332AM	(9)	125
	4700	18	16.5	K16	2060	0.033	0.22	EEEFK1C472AM	(9)	125
25	1000	12.5	13.5	H13	1100	0.06	0.14	EEEFK1E102AQ	(9)	200
	1500	16	16.5	J16	1800	0.035	0.16	EEEFK1E152AM	(9)	125
	2200	16	16.5	J16	1800	0.035	0.16	EEEFK1E222AM	(9)	125
	3300	18	16.5	K16	2060	0.033	0.18	EEEFK1E332AM	(9)	125
35	470	12.5	13.5	H13	1100	0.06	0.12	EEEFK1V471AQ	(9)	200
	680	12.5	13.5	H13	1100	0.06	0.12	EEEFK1V681AQ	(9)	200
	1000	16	16.5	J16	1800	0.035	0.12	EEEFK1V102AM	(9)	125
	1500	16	16.5	J16	1800	0.035	0.12	EEEFK1V152AM	(9)	125
50	330	12.5	13.5	H13	900	0.12	0.12	EEEFK1H331AQ	(10)	200
	390	12.5	13.5	H13	900	0.12	0.12	EEEFK1H391AQ	(10)	200
	470	16	16.5	J16	1610	0.073	0.12	EEEFK1H471AM	(10)	125
	560	16	16.5	J16	1610	0.073	0.12	EEEFK1H561AM	(10)	125
	680	16	16.5	J16	1610	0.073	0.12	EEEFK1H681AM	(10)	125
	1000	16	16.5	J16	1610	0.073	0.12	EEEFK1H102AM	(10)	125
63	150	12.5	13.5	H13	800	0.16	0.10	EEEFK1J151AQ	(10)	200
	220	12.5	13.5	H13	800	0.16	0.10	EEEFK1J221AQ	(10)	200
	470	16	16.5	J16	1410	0.082	0.10	EEEFK1J471AM	(10)	125
	680	18	16.5	K16	1690	0.08	0.10	EEEFK1J681AM	(10)	125
80	68	12.5	13.5	H13	500	0.32	0.08	EEEFK1K680AQ	(11)	200
	100	12.5	13.5	H13	500	0.32	0.08	EEEFK1K101AQ	(11)	200
	150	12.5	13.5	H13	500	0.32	0.08	EEEFK1K151AQ	(11)	200
	330	16	16.5	J16	793	0.17	0.08	EEEFK1K331AM	(11)	125
	470	18	16.5	K16	917	0.153	0.08	EEEFK1K471AM	(11)	125
100	47	12.5	13.5	H13	500	0.32	0.07	EEEFK2A470AQ	(11)	200
	68	12.5	13.5	H13	500	0.32	0.07	EEEFK2A680AQ	(11)	200
	100	16	16.5	J16	793	0.17	0.07	EEEFK2A101AM	(11)	125
	150	16	16.5	J16	793	0.17	0.07	EEEFK2A151AM	(11)	125
	220	18	16.5	K16	917	0.153	0.07	EEEFK2A221AM	(11)	125
	330	18	16.5	K16	917	0.153	0.07	EEEFK2A331AM	(11)	125

The taping dimensions are explained on p.177 of our Catalog. Please use it as a reference guide.
Reflow Profile(Fig-1 to Fig-11) listed on p.175 of our Catalog.

Design and specifications are each subject to change without notice. Ask factory for the current technical specifications before purchase and/or use.
Should a safety concern arise regarding this product, please be sure to contact us immediately.

NEW

Surface Mount Type

Series: **FK** Type: **V**

FK High temperature Lead-Free reflow(suffix:A✻)



■ Features

- Endurance: 2000 h at 105 °C
- Low impedance (40 % to 60 % less than FC series)
  Miniaturized (30 % to 50 % less than FC series)
- Vibration-proof product is available upon request. (ϕ8 ≦)
- RoHS directive compliant

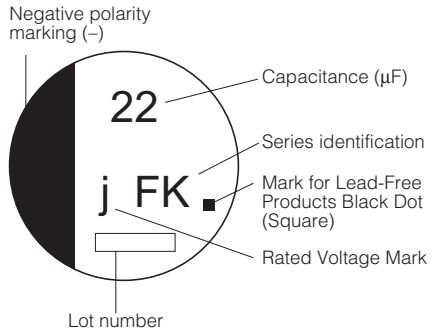
■ Specifications

Category Temp. Range	–55 °C to +105 °C						
Rated W.V.Range	6.3 V.DC to 35 V.DC						
Nominal Cap.Range	4.7 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	
	Z(–55 °C)/Z(+20 °C)	4	4	4	3	3	
Endurance	After applying rated working voltage for 2000 hours at +105 °C±2 °C and then being stabilized at +20 °C, Capacitors shall meet the following limits.						
	Capacitance change	±30 % 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)						
Resistance to Soldering Heat	After reflow soldering and then being stabilized at +20 °C, capacitor shall meet the following limits.						
	Capacitance change	±10 % of initial measured value					
	tan δ	≦ initial specified value					
	DC leakage current	≦ initial specified value					

■ Marking

Example:6.3 V 22 µF

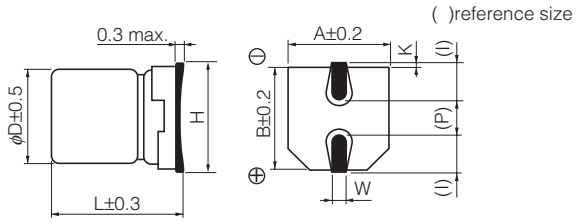
Marking color : BLACK



Rated Voltage Mark

j	6.3 V
A	10 V
C	16 V
E	25 V
V	35 V

■ Dimensions in mm (not to scale)



(mm)

Size code	D	L	A,B	H max.	I	W	P	K
B	4.0	5.8	4.3	5.5	1.8	0.65±0.1	1.0	0.35–0.20 to +0.15
C	5.0	5.8	5.3	6.5	2.2	0.65±0.1	1.5	0.35–0.20 to +0.15
D	6.3	5.8	6.6	7.8	2.6	0.65±0.1	1.8	0.35–0.20 to +0.15
D8	6.3	7.7	6.6	7.8	2.6	0.65±0.1	1.8	0.35–0.20 to +0.15
E	8.0	6.2	8.3	9.5	3.4	0.65±0.1	2.2	0.35–0.20 to +0.15
F	8.0	10.2	8.3	10.0	3.4	0.90±0.2	3.1	0.70±0.2
G	10.0	10.2	10.3	12.0	3.5	0.90±0.2	4.6	0.70±0.2

Design and specifications are each subject to change without notice. Ask factory for the current technical specifications before purchase and/or use.
Should a safety concern arise regarding this product, please be sure to contact us immediately.

■ High temperature Lead-Free reflow

Endurance : 105 °C 2000 h

W.V. (V)	Cap. (±20 %) (μF)	Case size Dia. (mm)	Length (mm)	✻Size Code	Specification Ripple Current (100 kHz) (+105 °C) (mA r.m.s.)	Impedance (100 kHz) (+20 °C)	tan δ (120 Hz) (+20 °C)	Part No. (RoHS:compliant)	Reflow	Min. Packaging Q'ty Taping (pcs)
6.3	22	4	5.8	B	90	1.35	0.26	EEEFK0J220AR	(5)	2000
	47	4	5.8	(B)	90	1.35	0.26	EEEFKJ470UAR	(5)	2000
		5	5.8	C	160	0.70	0.26	EEEFK0J470AR	(5)	1000
	100	5	5.8	(C)	160	0.70	0.26	EEEFKJ101UAR	(5)	1000
		6.3	5.8	D	240	0.36	0.26	EEEFK0J101AP	(5)	1000
	220	6.3	5.8	D	240	0.36	0.26	EEEFK0J221AP	(5)	1000
	330	6.3	7.7	D8	280	0.34	0.26	EEEFKJ331XAP	(5)	900
		8	6.2	E	300	0.26	0.26	EEEFK0J331AP	(6)	1000
	470	8	10.2	F	600	0.16	0.26	EEEFK0J471AP	(6)	500
	1000	8	10.2	F	600	0.16	0.26	EEEFK0J102AP	(6)	500
	1500	10	10.2	G	850	0.08	0.26	EEEFK0J152AP	(6)	500
10	22	4	5.8	B	90	1.35	0.19	EEEFK1A220AR	(5)	2000
	33	4	5.8	(B)	90	1.35	0.19	EEEFKA330UAR	(5)	2000
		5	5.8	C	160	0.70	0.19	EEEFK1A330AR	(5)	1000
	150	6.3	5.8	D	240	0.36	0.19	EEEFK1A151AP	(5)	1000
	220	6.3	7.7	D8	280	0.34	0.19	EEEFKA221XAP	(5)	900
		8	6.2	E	300	0.26	0.19	EEEFK1A221AP	(6)	1000
	330	8	10.2	F	600	0.16	0.19	EEEFK1A331AP	(6)	500
	470	8	10.2	F	600	0.16	0.19	EEEFK1A471AP	(6)	500
	680	8	10.2	F	600	0.16	0.19	EEEFK1A681AP	(6)	500
	1000	10	10.2	G	850	0.08	0.19	EEEFK1A102AP	(6)	500
16	10	4	5.8	B	90	1.35	0.16	EEEFK1C100AR	(5)	2000
	22	4	5.8	(B)	90	1.35	0.16	EEEFKC220UAR	(5)	2000
		5	5.8	C	160	0.70	0.16	EEEFK1C220AR	(5)	1000
	47	5	5.8	(C)	160	0.70	0.16	EEEFKC470UAR	(5)	1000
		6.3	5.8	D	240	0.36	0.16	EEEFK1C470AP	(5)	1000
	68	6.3	5.8	D	240	0.36	0.16	EEEFK1C680AP	(5)	1000
	100	6.3	5.8	D	240	0.36	0.16	EEEFK1C101AP	(5)	1000
	150	6.3	7.7	D8	280	0.34	0.16	EEEFKC151XAP	(5)	900
	220	6.3	7.7	D8	280	0.34	0.16	EEEFKC221XAP	(5)	900
		8	6.2	E	300	0.26	0.16	EEEFK1C221AP	(6)	1000
	330	8	10.2	F	600	0.16	0.16	EEEFK1C331AP	(6)	500
	470	8	10.2	F	600	0.16	0.16	EEEFK1C471AP	(6)	500
	680	10	10.2	G	850	0.08	0.16	EEEFK1C681AP	(6)	500
25	10	4	5.8	B	90	1.35	0.14	EEEFK1E100AR	(5)	2000
	22	5	5.8	C	160	0.70	0.14	EEEFK1E220AR	(5)	1000
	33	5	5.8	(C)	160	0.70	0.14	EEEFKE330UAR	(5)	1000
		6.3	5.8	D	240	0.36	0.14	EEEFK1E330AP	(5)	1000
	47	6.3	5.8	D	240	0.36	0.14	EEEFK1E470AP	(5)	1000
	68	6.3	5.8	D	240	0.36	0.14	EEEFK1E680AP	(5)	1000
	100	6.3	7.7	D8	280	0.34	0.14	EEEFKE101XAP	(5)	900
		8	6.2	E	300	0.26	0.14	EEEFK1E101AP	(6)	1000
	150	8	10.2	F	600	0.16	0.14	EEEFK1E151AP	(6)	500
	220	8	10.2	F	600	0.16	0.14	EEEFK1E221AP	(6)	500
	330	8	10.2	F	600	0.16	0.14	EEEFK1E331AP	(6)	500
	470	10	10.2	G	850	0.08	0.14	EEEFK1E471AP	(6)	500
35	4.7	4	5.8	B	90	1.35	0.12	EEEFK1V4R7AR	(5)	2000
	10	4	5.8	(B)	90	1.35	0.12	EEEFKV100UAR	(5)	2000
		5	5.8	C	160	0.70	0.12	EEEFK1V100AR	(5)	1000
	22	5	5.8	C	160	0.70	0.12	EEEFK1V220AR	(5)	1000
	33	6.3	5.8	D	240	0.36	0.12	EEEFK1V330AP	(5)	1000
	47	6.3	5.8	D	240	0.36	0.12	EEEFK1V470AP	(5)	1000
	68	6.3	7.7	D8	280	0.34	0.12	EEEFKV680XAP	(5)	900
	100	8	10.2	F	600	0.16	0.12	EEEFK1V101AP	(6)	500
	150	8	10.2	F	600	0.16	0.12	EEEFK1V151AP	(6)	500
	220	8	10.2	F	600	0.16	0.12	EEEFK1V221AP	(6)	500
	330	10	10.2	G	850	0.08	0.12	EEEFK1V331AP	(6)	500

✻Size code( ):Miniaturization product
If Part number exceeds 12 digits, voltage code is abbreviated as follows; 0J→J, 1A→A, 1C→C, 1E→E, 1V→V
The taping dimensions are explained on p.177 of our Catalog. Please use it as a reference guide.
Reflow Profile(Fig-1 to Fig-11) listed on p.175 of our Catalog.

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Should a safety concern arise regarding this product, please be sure to contact us immediately.