

Surface Mount Type

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



Features

- Endurance : 105 °C 2000 h to 5000 h
- Low impedance (40 % to 60 % less than FC series)
Miniaturized (30 % to 50 % less than FC series)
- Vibration-proof product is available upon request. ($\phi 8$ mm and larger)
- RoHS compliant

Specifications

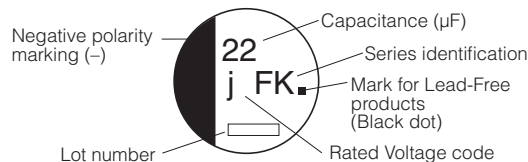
Category temperature range	-55 °C to +105 °C										
Rated voltage range	6.3 V.DC to 100 V.DC										
Capacitance range	3.3 μ F to 6800 μ F										
Capacitance tolerance	$\pm 20\%$ (120 Hz/+20 °C)										
Leakage current	$I \leq 0.01$ CV or 3 (μ A) After 2 minutes (Whichever is greater)										
Dissipation factor ($\tan \delta$)	Please see the attached characteristics list										
Characteristics at low temperature	V.DC	6.3	10	16	25	35	50	63	80	100	(Impedance ratio at 120 Hz)
	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	
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. ($\geq \phi 12.5$ and suffix "G" in $\phi 8 \times 10.2$, $\phi 10 \times 10.2$ are 5000 hours)										
	Capacitance change	Within $\pm 30\%$ of the initial value (Suffix "G" is 35 %)									
	$\tan \delta$	$\leq 200\%$ of the initial limit (Suffix "G" is 300 %)									
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	Capacitance change	Within $\pm 10\%$ of the initial value									
	$\tan \delta$	Within the initial limit									
	DC leakage current	Within the initial limit									
AEC-Q200	AEC-Q200 compliant										

Frequency correction factor for ripple current

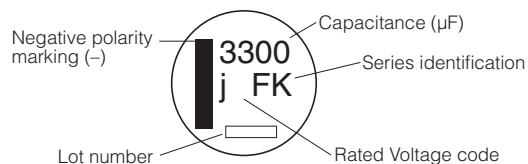
Frequency (Hz)	50, 60	120	1 k	10 k	100 k to
Correction factor	0.70	0.75	0.90	0.95	1.00

Marking

Example : 6.3 V.DC 22 μ F, 6.3 V.DC 3300 μ F
Marking color : BLACK
 $\leq \phi 10$

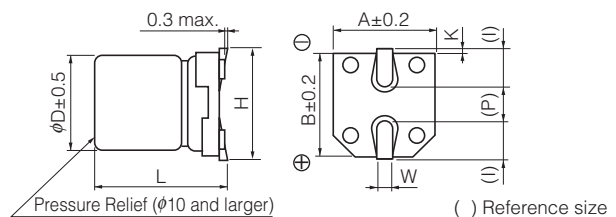


$\geq \phi 12.5$



R. Voltage (V.DC)	6.3	10	16	25	35	50	63	80	100
Code	j	A	C	E	V	H	J	K	2A

Dimensions



(Unit : mm)

Size code	ϕD	L	A, B	H	I	W	P	K
B	4.0	5.8 ± 0.3	4.3	5.5 max.	1.8	0.65 ± 0.1	1.0	0.35 $^{+0.05}_{-0.2}$
C	5.0	5.8 ± 0.3	5.3	6.5 max.	2.2	0.65 ± 0.1	1.5	0.35 $^{+0.05}_{-0.2}$
D	6.3	5.8 ± 0.3	6.6	7.8 max.	2.6	0.65 ± 0.1	1.8	0.35 $^{+0.05}_{-0.2}$
D8	6.3	7.7 ± 0.3	6.6	7.8 max.	2.6	0.65 ± 0.1	1.8	0.35 $^{+0.05}_{-0.2}$
E	8.0	6.2 ± 0.3	8.3	9.5 max.	3.4	0.65 ± 0.1	2.2	0.35 $^{+0.05}_{-0.2}$
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
H13	12.5	13.5 ± 0.5	13.5	15.0 max.	4.7	0.90 ± 0.3	4.4	0.70 ± 0.3
J16	16.0	16.5 ± 0.5	17.0	19.0 max.	5.5	1.20 ± 0.3	6.7	0.70 ± 0.3
K16	18.0	16.5 ± 0.5	19.0	21.0 max.	6.7	1.20 ± 0.3	6.7	0.70 ± 0.3

Characteristics list

Endurance : 105 °C 2000 h (≥ φ12.5 : 5000 h)

Rated voltage (V.DC)	Cap. (±20 %) (μF)	Case size (mm)		Size* code	Specification			Part No.	Reflow	Min. Packaging Qty	
		φD	L		Ripple current (100 kHz) (+105 °C) (mA r.m.s.)	Impedance (100 kHz) (+20 °C) (Ω)	tan δ (120 Hz) (+20 °C)			Taping (pcs)	
6.3	22	4	5.8	B	90	1.35	0.26	EEEFK0J220R	(1)	2000	
	47	4	5.8	(B)	90	1.35	0.26	EEEFK0J470UR	(1)	2000	
		5	5.8	C	160	0.70	0.26	EEEFK0J470R	(1)	1000	
	100	5	5.8	(C)	160	0.70	0.26	EEEFK0J101UR	(1)	1000	
		6.3	5.8	D	240	0.36	0.26	EEEFK0J101P	(1)	1000	
	220	6.3	5.8	D	240	0.36	0.26	EEEFK0J221P	(1)	1000	
	330	6.3	7.7	D8	280	0.34	0.26	EEEFK0J331XP	(1)	900	
		8	6.2	E	300	0.26	0.26	EEEFK0J331P	(2)	1000	
	470	8	10.2	F	600	0.16	0.26	EEEFK0J471P	(2)	500	
	1000	8	10.2	F	600	0.16	0.26	EEEFK0J102P	(2)	500	
	1500	10	10.2	G	850	0.08	0.26	EEEFK0J152P	(2)	500	
3300	12.5	13.5	H13	1100	0.06	0.30	EEVFK0J332Q	(3)	200		
6800	16	16.5	J16	1800	0.035	0.36	EEVFK0J682M	(3)	125		
10	22	4	5.8	B	90	1.35	0.19	EEEFK1A220R	(1)	2000	
	33	4	5.8	(B)	90	1.35	0.19	EEEFK1A330UR	(1)	2000	
		5	5.8	C	160	0.70	0.19	EEEFK1A330R	(1)	1000	
	150	6.3	5.8	D	240	0.36	0.19	EEEFK1A151P	(1)	1000	
	220	6.3	7.7	D8	280	0.34	0.19	EEEFK1A221XP	(1)	900	
		8	6.2	E	300	0.26	0.19	EEEFK1A221P	(2)	1000	
	330	8	10.2	F	600	0.16	0.19	EEEFK1A331P	(2)	500	
	470	8	10.2	F	600	0.16	0.19	EEEFK1A471P	(2)	500	
	680	8	10.2	F	600	0.16	0.19	EEEFK1A681P	(2)	500	
	1000	10	10.2	G	850	0.08	0.19	EEEFK1A102P	(2)	500	
	2200	12.5	13.5	H13	1100	0.06	0.21	EEVFK1A222Q	(3)	200	
4700	16	16.5	J16	1800	0.035	0.25	EEVFK1A472M	(3)	125		
6800	18	16.5	K16	2060	0.033	0.29	EEVFK1A682M	(3)	125		
16	10	4	5.8	B	90	1.35	0.16	EEEFK1C100R	(1)	2000	
	22	4	5.8	(B)	90	1.35	0.16	EEEFK1C220UR	(1)	2000	
		5	5.8	C	160	0.70	0.16	EEEFK1C220R	(1)	1000	
	47	5	5.8	(C)	160	0.70	0.16	EEEFK1C470UR	(1)	1000	
		6.3	5.8	D	240	0.36	0.16	EEEFK1C470P	(1)	1000	
	68	6.3	5.8	D	240	0.36	0.16	EEEFK1C680P	(1)	1000	
	100	6.3	5.8	D	240	0.36	0.16	EEEFK1C101P	(1)	1000	
	150	6.3	7.7	D8	280	0.34	0.16	EEEFK1C151XP	(1)	900	
		6.3	7.7	D8	280	0.34	0.16	EEEFK1C221XP	(1)	900	
	220	8	6.2	E	300	0.26	0.16	EEEFK1C221P	(2)	1000	
		330	8	10.2	F	600	0.16	0.16	EEEFK1C331P	(2)	500
	470	8	10.2	F	600	0.16	0.16	EEEFK1C471P	(2)	500	
	680	10	10.2	G	850	0.08	0.16	EEEFK1C681P	(2)	500	
	1500	12.5	13.5	H13	1100	0.06	0.16	EEVFK1C152Q	(3)	200	
3300	16	16.5	J16	1800	0.035	0.20	EEVFK1C332M	(3)	125		
4700	18	16.5	K16	2060	0.033	0.22	EEVFK1C472M	(3)	125		
25	10	4	5.8	B	90	1.35	0.14	EEEFK1E100R	(1)	2000	
	22	5	5.8	C	160	0.70	0.14	EEEFK1E220R	(1)	1000	
		5	5.8	(C)	160	0.70	0.14	EEEFK1E330UR	(1)	1000	
	33	6.3	5.8	D	240	0.36	0.14	EEEFK1E330P	(1)	1000	
		47	6.3	5.8	D	240	0.36	0.14	EEEFK1E470P	(1)	1000
	68	6.3	5.8	D	240	0.36	0.14	EEEFK1E680P	(1)	1000	
	100	6.3	7.7	D8	280	0.34	0.14	EEEFK1E101XP	(1)	900	
		8	6.2	E	300	0.26	0.14	EEEFK1E101P	(2)	1000	
	150	8	10.2	F	600	0.16	0.14	EEEFK1E151P	(2)	500	
	220	8	10.2	F	600	0.16	0.14	EEEFK1E221P	(2)	500	
	330	8	10.2	F	600	0.16	0.14	EEEFK1E331P	(2)	500	
	470	10	10.2	G	850	0.08	0.14	EEEFK1E471P	(2)	500	
	1000	12.5	13.5	H13	1100	0.06	0.14	EEVFK1E102Q	(3)	200	
	1500	16	16.5	J16	1800	0.035	0.14	EEVFK1E152M	(3)	125	
	2200	16	16.5	J16	1800	0.035	0.16	EEVFK1E222M	(3)	125	
	3300	18	16.5	K16	2060	0.033	0.18	EEVFK1E332M	(3)	125	

* Size code() : Miniaturization product

· 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"

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.

Characteristics list

Endurance : 105 °C 2000 h (≥ φ12.5 : 5000 h)

Rated voltage (V.DC)	Cap. (±20 %) (μF)	Case size (mm)		Size* code	Specification			Part No.	Reflow	Min. Packaging Qty
		φD	L		Ripple current (100 kHz) (+105 °C) (mA r.m.s.)	Impedance (100 kHz) (+20 °C) (Ω)	tan δ (120 Hz) (+20 °C)			Taping (pcs)
35	4.7	4	5.8	B	90	1.35	0.12	EEEFK1V4R7R	(1)	2000
	10	4	5.8	(B)	90	1.35	0.12	EEEFK1V100UR	(1)	2000
		5	5.8	C	160	0.70	0.12	EEEFK1V100R	(1)	1000
	22	5	5.8	C	160	0.70	0.12	EEEFK1V220R	(1)	1000
	33	6.3	5.8	D	240	0.36	0.12	EEEFK1V330P	(1)	1000
	47	6.3	5.8	D	240	0.36	0.12	EEEFK1V470P	(1)	1000
	68	6.3	7.7	D8	280	0.34	0.12	EEEFK1V680XP	(1)	900
		6.3	7.7	D8	280	0.34	0.12	EEEFK1V101XP	(1)	900
	100	8	10.2	F	600	0.16	0.12	EEEFK1V101P	(2)	500
		8	10.2	F	600	0.16	0.12	EEEFK1V151P	(2)	500
	220	8	10.2	F	600	0.16	0.12	EEEFK1V221P	(2)	500
	330	10	10.2	G	850	0.08	0.12	EEEFK1V331P	(2)	500
	470	12.5	13.5	H13	1100	0.06	0.12	EEVFK1V471Q	(3)	200
	680	12.5	13.5	H13	1100	0.06	0.12	EEVFK1V681Q	(3)	200
1000	16	16.5	J16	1800	0.035	0.12	EEVFK1V102M	(3)	125	
1500	16	16.5	J16	1800	0.035	0.12	EEVFK1V152M	(3)	125	
50	4.7	4	5.8	B	60	2.90	0.10	EEEFK1H4R7R	(1)	2000
	10	5	5.8	(C)	85	1.52	0.10	EEEFK1H100UR	(1)	1000
		6.3	5.8	D	165	0.88	0.10	EEEFK1H100P	(1)	1000
	22	6.3	5.8	D	165	0.88	0.10	EEEFK1H220P	(1)	1000
	33	6.3	7.7	D8	195	0.68	0.10	EEEFK1H330XP	(1)	900
		8	6.2	E	195	0.68	0.10	EEEFK1H330P	(2)	1000
	47	6.3	7.7	D8	195	0.68	0.10	EEEFK1H470XP	(1)	900
		8	6.2	E	195	0.68	0.10	EEEFK1H470P	(2)	1000
	100	8	10.2	F	350	0.34	0.10	EEEFK1H101P	(2)	500
	150	10	10.2	G	670	0.18	0.10	EEEFK1H151P	(2)	500
	220	10	10.2	G	670	0.18	0.10	EEEFK1H221P	(2)	500
	330	12.5	13.5	H13	900	0.12	0.10	EEVFK1H331Q	(3)	200
	390	12.5	13.5	H13	900	0.12	0.10	EEVFK1H391Q	(3)	200
	470	16	16.5	J16	1610	0.073	0.10	EEVFK1H471M	(3)	125
560	16	16.5	J16	1610	0.073	0.10	EEVFK1H561M	(3)	125	
680	16	16.5	J16	1610	0.073	0.10	EEVFK1H681M	(3)	125	
1000	16	16.5	J16	1610	0.073	0.10	EEVFK1H102M	(3)	125	
63	4.7	5	5.8	C	50	3.00	0.08	EEEFK1J4R7R	(1)	1000
	10	6.3	5.8	D	80	1.50	0.08	EEEFK1J100P	(1)	1000
		6.3	7.7	D8	120	1.20	0.08	EEEFK1J220XP	(1)	900
	22	8	6.2	E	120	1.20	0.08	EEEFK1J220P	(2)	1000
		8	10.2	F	250	0.65	0.08	EEEFK1J330P	(2)	500
	47	8	10.2	F	250	0.65	0.08	EEEFK1J470P	(2)	500
	68	8	10.2	(F)	250	0.65	0.08	EEEFK1J680UP	(2)	500
	100	10	10.2	G	400	0.35	0.08	EEEFK1J101P	(2)	500
	150	12.5	13.5	H13	800	0.16	0.08	EEVFK1J151Q	(3)	200
	220	12.5	13.5	H13	800	0.16	0.08	EEVFK1J221Q	(3)	200
	470	16	16.5	J16	1410	0.082	0.08	EEVFK1J471M	(3)	125
	680	18	16.5	K16	1690	0.08	0.08	EEVFK1J681M	(3)	125
	3.3	5	5.8	C	25	5.00	0.08	EEEFK1K3R3R	(1)	1000
	4.7	6.3	5.8	D	40	3.00	0.08	EEEFK1K4R7P	(1)	1000
6.3		7.7	D8	60	2.40	0.08	EEEFK1K100XP	(1)	900	
10	8	6.2	E	60	2.40	0.08	EEEFK1K100P	(2)	1000	
	8	10.2	F	130	1.30	0.08	EEEFK1K220P	(2)	500	
33	8	10.2	F	130	1.30	0.08	EEEFK1K330P	(2)	500	
47	10	10.2	G	200	0.70	0.08	EEEFK1K470P	(2)	500	
68	12.5	13.5	H13	500	0.32	0.08	EEVFK1K680Q	(3)	200	
100	12.5	13.5	H13	500	0.32	0.08	EEVFK1K101Q	(3)	200	
150	12.5	13.5	H13	500	0.32	0.08	EEVFK1K151Q	(3)	200	
330	16	16.5	J16	793	0.17	0.08	EEVFK1K331M	(3)	125	
470	18	16.5	K16	917	0.153	0.08	EEVFK1K471M	(3)	125	

* Size code() : Miniaturization product
 · 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"

Characteristics list

Endurance : 105 °C 2000 h (≥ φ12.5 : 5000 h)

Rated voltage (V.DC)	Cap. (±20 %) (μF)	Case size (mm)		Size* code	Specification			Part No.	Reflow	Min. Packaging Qty	
		φD	L		Ripple current (100 kHz) (+105 °C) (mA r.m.s.)	Impedance (100 kHz) (+20 °C) (Ω)	tan δ (120 Hz) (+20 °C)			Taping (pcs)	
100	22	8	10.2	F	130	1.30	0.07	EEEFK2A220P	(2)	500	
	33	10	10.2	G	200	0.70	0.07	EEEFK2A330P	(2)	500	
	47	12.5	13.5	H13	500	0.32	0.07	EEVFK2A470Q	(3)	200	
	68	12.5	13.5	H13	500	0.32	0.07	EEVFK2A680Q	(3)	200	
	100	16	16.5	J16	793	0.17	0.07	EEVFK2A101M	(3)	125	
	150	16	16.5	J16	793	0.17	0.07	EEVFK2A151M	(3)	125	
	220	18	16.5	K16	917	0.153	0.07	EEVFK2A221M	(3)	125	
	330	18	16.5	K16	917	0.153	0.07	EEVFK2A331M	(3)	125	

* Size code() : Miniaturization product

· Please refer to the page of "Reflow Profile" and "The Taping Dimensions".

Characteristics list

Endurance : 105 °C 5000 h

Rated voltage (V.DC)	Cap. (±20 %) (μF)	Case size (mm)		Size* code	Specification			Part No.	Reflow	Min. Packaging Qty	
		φD	L		Ripple current (100 kHz) (+105 °C) (mA r.m.s.)	Impedance (100 kHz) (+20 °C) (Ω)	tan δ (120 Hz) (+20 °C)			Taping (pcs)	
6.3	470	8	10.2	F	600	0.16	0.26	EEEFK0J471GP	(2)	500	
	1000	8	10.2	F	600	0.16	0.26	EEEFK0J102GP	(2)	500	
	1500	10	10.2	G	850	0.08	0.26	EEEFK0J152GP	(2)	500	
10	330	8	10.2	F	600	0.16	0.19	EEEFK1A331GP	(2)	500	
	470	8	10.2	F	600	0.16	0.19	EEEFK1A471GP	(2)	500	
	680	8	10.2	F	600	0.16	0.19	EEEFK1A681GP	(2)	500	
	1000	10	10.2	G	850	0.08	0.19	EEEFK1A102GP	(2)	500	
16	330	8	10.2	F	600	0.16	0.16	EEEFK1C331GP	(2)	500	
	470	8	10.2	F	600	0.16	0.16	EEEFK1C471GP	(2)	500	
	680	10	10.2	G	850	0.08	0.16	EEEFK1C681GP	(2)	500	
25	150	8	10.2	F	600	0.16	0.14	EEEFK1E151GP	(2)	500	
	220	8	10.2	F	600	0.16	0.14	EEEFK1E221GP	(2)	500	
	330	8	10.2	F	600	0.16	0.14	EEEFK1E331GP	(2)	500	
	470	10	10.2	G	850	0.08	0.14	EEEFK1E471GP	(2)	500	
35	100	8	10.2	F	600	0.16	0.12	EEEFK1V101GP	(2)	500	
	150	8	10.2	F	600	0.16	0.12	EEEFK1V151GP	(2)	500	
	220	8	10.2	F	600	0.16	0.12	EEEFK1V221GP	(2)	500	
	330	10	10.2	G	850	0.08	0.12	EEEFK1V331GP	(2)	500	
50	100	8	10.2	F	350	0.34	0.10	EEEFK1H101GP	(2)	500	
	150	10	10.2	G	670	0.18	0.10	EEEFK1H151GP	(2)	500	
	220	10	10.2	G	670	0.18	0.10	EEEFK1H221GP	(2)	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"

Guidelines and precautions regarding the technical information and use of our products described in this online catalog.

- If you want to use our products described in this online catalog for applications requiring special qualities or reliability, or for applications where the failure or malfunction of the products may directly jeopardize human life or potentially cause personal injury (e.g. aircraft and aerospace equipment, traffic and transportation equipment, combustion equipment, medical equipment, accident prevention, anti-crime equipment, and/or safety equipment), it is necessary to verify whether the specifications of our products fit to such applications. Please ensure that you will ask and check with our inquiry desk as to whether the specifications of our products fit to such applications use before you use our products.
- The quality and performance of our products as described in this online catalog only apply to our products when used in isolation. Therefore, please ensure you evaluate and verify our products under the specific circumstances in which our products are assembled in your own products and in which our products will actually be used.
- If you use our products in equipment that requires a high degree of reliability, regardless of the application, it is recommended that you set up protection circuits and redundancy circuits in order to ensure safety of your equipment.
- The products and product specifications described in this online catalog are subject to change for improvement without prior notice. Therefore, please be sure to request and confirm the latest product specifications which explain the specifications of our products in detail, before you finalize the design of your applications, purchase, or use our products.
- The technical information in this online catalog provides examples of our products' typical operations and application circuits. We do not guarantee the non-infringement of third party's intellectual property rights and we do not grant any license, right, or interest in our intellectual property.
- If any of our products, product specifications and/or technical information in this online catalog is to be exported or provided to non-residents, the laws and regulations of the exporting country, especially with regard to security and export control, shall be observed.

<Regarding the Certificate of Compliance with the EU RoHS Directive/REACH Regulations>

- The switchover date for compliance with the RoHS Directive/REACH Regulations varies depending on the part number or series of our products.
- When you use the inventory of our products for which it is unclear whether those products are compliant with the RoHS Directive/REACH Regulation, please select "Sales Inquiry" in the website inquiry form and contact us.

We do not take any responsibility for the use of our products outside the scope of the specifications, descriptions, guidelines and precautions described in this online catalog.
