

## 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

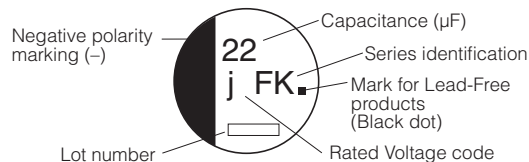
Category temperature range	-55 °C to +105 °C										
Rated voltage range	6.3 V.DC to 100 V.DC										
Capacitance range	3.3 $\mu$ F to 6800 $\mu$ F										
Capacitance tolerance	$\pm 20\%$ (120 Hz/+20 °C)										
Leakage current	$I \leq 0.01$ CV or 3 ( $\mu$ A) After 2 minutes (Whichever is greater)										
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 $\pm 2$ °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 $\pm 2$ °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  $\mu$ F, 6.3 V.DC 3300  $\mu$ F  
Marking color : BLACK  
 $\leq \phi 10$

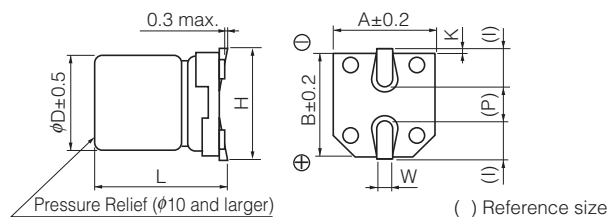


$\geq \phi 12.5$



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	$\phi D$	L	A, B	H	I	W	P	K
B	4.0	5.8 $\pm 0.3$	4.3	5.5 max.	1.8	0.65 $\pm 0.1$	1.0	0.35 $^{+0.05}_{-0.2}$
C	5.0	5.8 $\pm 0.3$	5.3	6.5 max.	2.2	0.65 $\pm 0.1$	1.5	0.35 $^{+0.05}_{-0.2}$
D	6.3	5.8 $\pm 0.3$	6.6	7.8 max.	2.6	0.65 $\pm 0.1$	1.8	0.35 $^{+0.05}_{-0.2}$
D8	6.3	7.7 $\pm 0.3$	6.6	7.8 max.	2.6	0.65 $\pm 0.1$	1.8	0.35 $^{+0.05}_{-0.2}$
E	8.0	6.2 $\pm 0.3$	8.3	9.5 max.	3.4	0.65 $\pm 0.1$	2.2	0.35 $^{+0.05}_{-0.2}$
F	8.0	10.2 $\pm 0.3$	8.3	10.0 max.	3.4	0.90 $\pm 0.2$	3.1	0.70 $\pm 0.2$
G	10.0	10.2 $\pm 0.3$	10.3	12.0 max.	3.5	0.90 $\pm 0.2$	4.6	0.70 $\pm 0.2$
H13	12.5	13.5 $\pm 0.5$	13.5	15.0 max.	4.7	0.90 $\pm 0.3$	4.4	0.70 $\pm 0.3$
J16	16.0	16.5 $\pm 0.5$	17.0	19.0 max.	5.5	1.20 $\pm 0.3$	6.7	0.70 $\pm 0.3$
K16	18.0	16.5 $\pm 0.5$	19.0	21.0 max.	6.7	1.20 $\pm 0.3$	6.7	0.70 $\pm 0.3$

## 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)
	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)
	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
	100	6.3	7.7	D8	280	0.34	0.12	EEEFK1V101XP	(1)	900
		8	10.2	F	600	0.16	0.12	EEEFK1V101P	(2)	500
	150	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
	22	6.3	7.7	D8	120	1.20	0.08	EEEFK1J220XP	(1)	900
		8	6.2	E	120	1.20	0.08	EEEFK1J220P	(2)	1000
	33	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"