

### Surface Mount Type

Series: **Medium-size FKS** Type: **V**  
**High temperature Lead-Free reflow**



#### Features

- Endurance : 105 °C 5000 h
- High capacitance : 20 to 80 % higher than FK series, large capacitance up to 13000 µF
- Vibration-proof product (30G guaranteed) is available upon request
- RoHS compliant

#### Specifications

Category temp. range	-55 °C to +105 °C						
Rated voltage range	6.3 V.DC to 35 V.DC						
Capacitance range	750 µF to 13000 µF						
Capacitance tolerance	±20 % (120 Hz / +20 °C)						
Leakage current	I ≤ 0.01 CV (µA) After 2 minutes						
Dissipation factor (tan δ)	Please see the attached characteristics list						
Characteristics at low temperature	Rated voltage (V.DC)	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 5000 hours at +105 °C ± 2 °C and then being stabilized at +20 °C, capacitors shall meet the following limits.						
	Capacitance change	Within ±30 % of the initial value					
	Dissipation factor (tan δ)	≤ 300 % of the initial limit					
	Leakage current	Within the initial limit					
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)						
	Capacitance change	Within ±30 % of the initial value					
	Dissipation factor (tan δ)	≤ 200 % of the initial limit					
	Leakage current	Within the initial limit					
Resistance to soldering heat	After reflow soldering and then being stabilized at +20 °C, capacitors shall meet the following limits.						
	Capacitance change	Within ±10 % of the initial value					
	Dissipation factor (tan δ)	Within the initial limit					
	Leakage current	Within the initial limit					
AEC-Q200	AEC-Q200 compliant						

#### Frequency correction factor for ripple current

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

#### Marking

Example : 6.3 V.DC 3500 µF  
 Marking color : BLACK

3500  
j FK

R.voltage code		Unit : V.DC	
j	6.3	E	25
A	10	V	35
C	16		

#### Dimensions

( ) Reference size

Size code	φD	L	A, B	H	I	W	P	K
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
K21	18.0	21.5±0.5	19.0	21.0 max.	6.7	1.20±0.3	6.7	0.70±0.3

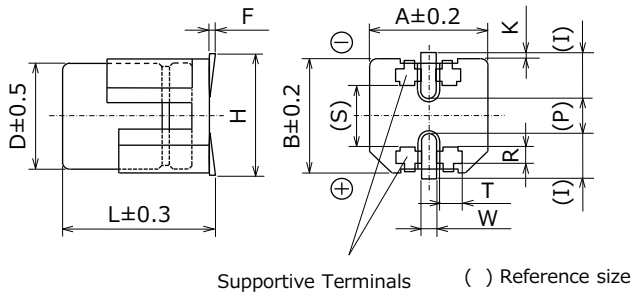
Unit : mm

\*The dimensions of the vibration-proof products, please refer to the page of the mounting specification.

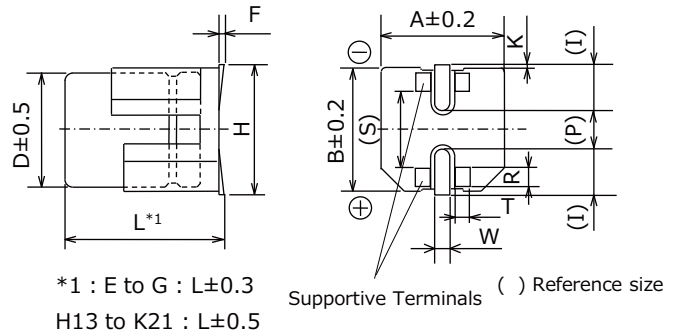
### Dimensions (Vibration-proof products)

\* The size and shape are different from standard products. Please inquire details of our company.

< Size code : D, D8 >



< Size code : E, F, G, H13, J16, K16, K21 >



\*1 : E to G : L±0.3  
H13 to K21 : L±0.5

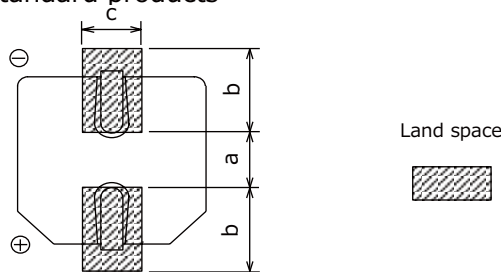
Unit : mm

Size code	φD	L	A, B	H max.	F	I	W	P	K	R	S	T
D	6.3	6.1	6.6	7.8	0 to +0.15	2.4	0.65±0.1	2.2	0.35 <sup>+0.15</sup> <sub>-0.20</sub>	1.1±0.2	3.3±0.2	1.05±0.2
D8	6.3	8.0	6.6	7.8	0 to +0.15	2.4	0.65±0.1	2.2	0.35 <sup>+0.15</sup> <sub>-0.20</sub>	1.1±0.2	3.3±0.2	1.05±0.2
E	8.0	6.5	8.3	9.5	0 to +0.15	3.4	0.7±0.1	2.2	0.35 <sup>+0.15</sup> <sub>-0.20</sub>	0.70±0.2	5.3±0.2	1.7±0.2
F	8.0	10.5	8.3	10.0	0 to +0.15	3.4	1.2±0.2	3.1	0.70±0.2	0.70±0.2	5.3±0.2	1.3±0.2
G	10.0	10.5	10.3	12.0	0 to +0.15	3.5	1.2±0.2	4.6	0.70±0.2	0.70±0.2	6.9±0.2	1.3±0.2
H13	12.5	13.8	13.5	15.0	-0.1 to +0.15	4.7	1.2±0.2	4.4	0.70±0.3	2.2±0.2	7.1±0.2	2.4±0.2
J16	16.0	16.8	17.0	19.0	-0.1 to +0.15	5.5	1.4±0.2	6.7	0.70±0.3	3.0±0.2	9.0±0.2	1.9±0.2
K16	18.0	16.8	19.0	21.0	-0.1 to +0.15	6.7	1.4±0.2	6.7	0.70±0.3	3.0±0.2	11.0±0.2	1.9±0.2
K21	18.0	21.8	19.0	21.0	-0.1 to +0.15	6.7	1.4±0.2	6.7	0.70±0.3	3.0±0.2	11.0±0.2	1.9±0.2

### Land / Pad pattern

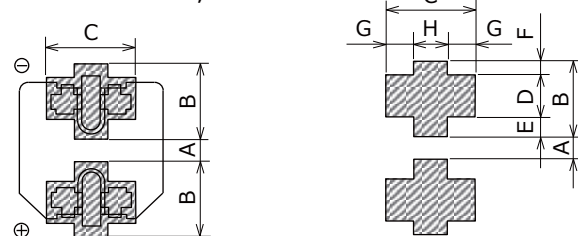
The circuit board land/pad pattern size for chip capacitors is specified in the following table. The land pitch influences installation strength and consider it.

#### ● Standard products

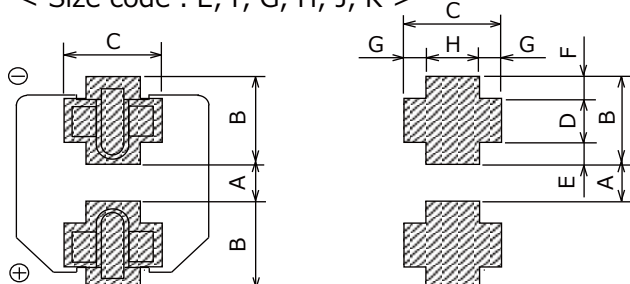


#### ● Vibration-proof products

< Size code : D, D8 >



< Size code : E, F, G, H, J, K >



(Table of board land size vs. capacitor size)

Size code	a	b	c
B (φ4)	1.0	2.5	1.6
C (φ5)	1.5	2.8	1.6
D (φ6.3)	1.8	3.2	1.6
D8 (φ6.3x7.7L)	1.8	3.2	1.6
E (φ8x6.2L)	2.2	4.0	1.6
F (φ8x10.2L)	3.1	4.0	2.0
G (φ10x10.2L)	4.6	4.1	2.0
H (φ12.5)	4.0	5.7	2.0
J (φ16)	6.0	6.5	2.5
K (φ18)	6.0	7.5	2.5

When size "a" is wide, back fillet can be made, decreasing fitting strength.

(Table of board land size vs. capacitor size)

Size code	A	B	C	D	E	F	G	H
D (φ6.3xL6.1)	1.2	3.6	3.2	2.0	0.95	0.65	1.0	1.2
D8 (φ6.3xL8.0)	1.2	3.6	3.2	2.0	0.95	0.65	1.0	1.2
E (φ8x6.5L)	1.8	4.2	5.0	1.3	1.5	1.4	1.5	2.0
F (φ8x10.5L)	2.7	4.0	4.7	1.3	1.0	1.7	1.1	2.5
G (φ10)	3.9	4.4	4.7	1.3	1.2	1.9	1.1	2.5
H (φ12.5)	3.9	6.0	6.9	2.8	1.3	1.9	2.2	2.5
J (φ16)	5.8	6.8	6.2	3.6	1.3	1.9	1.7	2.8
K (φ18)	5.8	7.3	6.2	3.6	1.8	1.9	1.7	2.8

When size "A" is wide, back fillet can be made, decreasing fitting strength.

\* Take mounting conditions, solderability and fitting strength into consideration when selecting parts for your company's design.

\* The vibration-proof capacitors of size φ6.3 has support terminals extending from the bottom side to the lead edge. Then, make sure to find appropriate soldering conditions to form fillet on the support terminals if required for appearance inspection.

### Characteristics list

Endurance : 105 °C 5000 h

Rated volt. (V.DC)	Cap. (±20 %) (μF)	Case size (mm)			Size code	Specification			Part No.		Reflow	Min. Packaging Q'ty
		φD	L			Ripple current *1 (mA r.m.s.)	ESR *2 (Ω)	tan δ *3	Standard	Vibration-proof		Taping (pcs)
			Standard	Vibration-proof								
6.3	3500	12.5	13.5	13.8	H13	1100	0.06	0.30	EEEFK0J352SQ	EEEFK0J352SV	(9)	200
	7500	16	16.5	16.8	J16	1800	0.035	0.38	EEEFK0J752SM	EEEFK0J752SV	(9)	125
	10000	18	16.5	16.8	K16	2060	0.033	0.42	EEEFK0J103SM	EEEFK0J103SV	(9)	125
	13000	18	21.5	21.8	K21	2640	0.025	0.50	EEEFK0J133SM	EEEFK0J133SV	(9)	75
10	2400	12.5	13.5	13.8	H13	1100	0.06	0.21	EEEFK1A242SQ	EEEFK1A242SV	(9)	200
	5600	16	16.5	16.8	J16	1800	0.035	0.27	EEEFK1A562SM	EEEFK1A562SV	(9)	125
	7500	18	16.5	16.8	K16	2060	0.033	0.31	EEEFK1A752SM	EEEFK1A752SV	(9)	125
	9100	18	21.5	21.8	K21	2640	0.025	0.35	EEEFK1A912SM	EEEFK1A912SV	(9)	75
16	1800	12.5	13.5	13.8	H13	1100	0.06	0.16	EEEFK1C182SQ	EEEFK1C182SV	(9)	200
	4300	16	16.5	16.8	J16	1800	0.035	0.22	EEEFK1C432SM	EEEFK1C432SV	(9)	125
	5600	18	16.5	16.8	K16	2060	0.033	0.24	EEEFK1C562SM	EEEFK1C562SV	(9)	125
	7500	18	21.5	21.8	K21	2640	0.025	0.28	EEEFK1C752SM	EEEFK1C752SV	(9)	75
25	1200	12.5	13.5	13.8	H13	1100	0.06	0.14	EEEFK1E122SQ	EEEFK1E122SV	(9)	200
	2700	16	16.5	16.8	J16	1800	0.035	0.16	EEEFK1E272SM	EEEFK1E272SV	(9)	125
	3600	18	16.5	16.8	K16	2060	0.033	0.18	EEEFK1E362SM	EEEFK1E362SV	(9)	125
	4700	18	21.5	21.8	K21	2640	0.025	0.20	EEEFK1E472SM	EEEFK1E472SV	(9)	75
35	750	12.5	13.5	13.8	H13	1100	0.06	0.12	EEEFK1V751SQ	EEEFK1V751SV	(9)	200
	1600	16	16.5	16.8	J16	1800	0.035	0.14	EEEFK1V162SM	EEEFK1V162SV	(9)	125
	2200	18	16.5	16.8	K16	2060	0.033	0.14	EEEFK1V222SM	EEEFK1V222SV	(9)	125
	3000	18	21.5	21.8	K21	2640	0.025	0.16	EEEFK1V302SM	EEEFK1V302SV	(9)	75

\*1: Ripple current (100 kHz / +105 °C)

\*2: ESR (100 kHz / +20 °C)

\*3: tan δ (120 Hz / +20 °C)

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

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**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.**

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