

## Surface Mount Type

Series: **FKS** Type: **V**

High temperature Lead-Free reflow



### ■ Features

- Endurance: 2000 h at 105 °C
- 1 size smaller than series FK
- Vibration-proof product is available upon request. ( $\phi$  8 mm and larger)
- AEC-Q200 qualified\*
- RoHS directive compliant

### ■ Specifications

|                                    |   |                                      |    |    |    |    |    |                            |
|------------------------------------|---|--------------------------------------|----|----|----|----|----|----------------------------|
| Category Temp. Range               | -55 °C to +105 °C   |                                      |    |    |    |    |    |                            |
| Rated W.V. Range                   | 6.3 V.DC to 50 V.DC   |                                      |    |    |    |    |    |                            |
| Nominal Cap. Range                 | 39 $\mu$ F to 1800 $\mu$ F  |                                      |    |    |    |    |    |                            |
| Capacitance Tolerance              | $\pm$ 20 % (120 Hz/+20 °C)  |                                      |    |    |    |    |    |                            |
| DC Leakage Current                 | $I \leq 0.01 CV$ or 3 ( $\mu$ A) After 2 minutes (Whichever is greater)   |                                      |    |    |    |    |    |                            |
| $\tan \delta$                      | Please see the attached Standard Products list  |                                      |    |    |    |    |    |                            |
| Characteristics at Low Temperature | W.V.(V)   | 6.3                                  | 10 | 16 | 25 | 35 | 50 | (Impedance ratio at 120Hz) |
|                                    | Z(-25 °C)/Z(+20 °C)   | 2                                    | 2  | 2  | 2  | 2  | 2  |                            |
|                                    | Z(-40 °C)/Z(+20 °C)   | 3                                    | 3  | 3  | 3  | 3  | 3  |                            |
|                                    | Z(-55 °C)/Z(+20 °C)   | 4                                    | 4  | 4  | 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.   |                                      |    |    |    |    |    |                            |
|                                    | Capacitance Change  | $\pm$ 30 % of initial measured value |    |    |    |    |    |                            |
|                                    | $\tan \delta$   | $\leq$ 200 % initial specified value |    |    |    |    |    |                            |
|                                    | DC Leakage Current  | $\leq$ initial specified value       |    |    |    |    |    |                            |
| 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) |                                      |    |    |    |    |    |                            |
| Resistance to Soldering Heat       | After reflow soldering and then being stabilized at +20 °C, capacitors shall meet the following limits.   |                                      |    |    |    |    |    |                            |
|                                    | Capacitance Change  | $\pm$ 10 % of initial measured value |    |    |    |    |    |                            |
|                                    | $\tan \delta$   | $\leq$ initial specified value       |    |    |    |    |    |                            |
|                                    | DC Leakage Current  | $\leq$ initial specified value       |    |    |    |    |    |                            |

### ■ Frequency correction factor for ripple current

| Capacitance ( $\mu$ F) | Frequency (Hz) |      |      |         |
|------------------------|----------------|------|------|---------|
|                        | 120            | 1k   | 10k  | 100k to |
| 39 to 1800             | 0.65           | 0.85 | 0.95 | 1.00    |

### ■ Marking

Example: 6.3 V.DC / 270  $\mu$ F Marking color: BLACK

Negative polarity marking (-)

Capacitance ( $\mu$ F)

Series identification

Rated voltage mark

Lot number

| Rated Voltage Mark |          |   |         |
|--------------------|----------|---|---------|
| j                  | 6.3 V.DC | E | 25 V.DC |
| A                  | 10 V.DC  | V | 35 V.DC |
| C                  | 16 V.DC  | H | 50 V.DC |

### ■ Dimensions in mm (not to scale)

Unit: mm

| Size code | D    | L              | A, B | H         | I   | W              | P   | K   |
|-----------|------|----------------|------|-----------|-----|----------------|-----|---|
| D         | 6.3  | 5.8 $\pm$ 0.3  | 6.6  | 7.8 max.  | 2.6 | 0.65 $\pm$ 0.1 | 1.8 | 0.35 $\begin{smallmatrix} +0.15 \\ -0.20 \end{smallmatrix}$ |
| D8        | 6.3  | 7.7 $\pm$ 0.3  | 6.6  | 7.8 max.  | 2.6 | 0.65 $\pm$ 0.1 | 1.8 | 0.35 $\begin{smallmatrix} +0.15 \\ -0.20 \end{smallmatrix}$ |
| 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  |

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

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.

## Standard Products

Endurance : 105 °C 2000 h

| Rated voltage<br>(V.DC) | Capacitance<br>(±20 %)<br>( $\mu$ F) | Case size   |                |              | Specification  |  |                                       | Part No.<br>(RoHS: compliant) | Reflow | Min. Packaging Q't |  |
|-------------------------|--------------------------------------|-------------|----------------|--------------|--|--|---------------------------------------|-------------------------------|--------|--------------------|--|
|                         |                                      | Dia<br>(mm) | Length<br>(mm) | Size<br>code | Ripple<br>current<br>(100 kHz)<br>(+105 °C)<br>(mA r.m.s.) | ESR<br>(100 kHz)<br>(+20 °C)<br>( $\Omega$ ) | $\tan \delta$<br>(120 Hz)<br>(+20 °C) |                               |        | Taping<br>(pcs)    |  |
| 6.3                     | 270                                  | 6.3         | 5.8            | D            | 240  | 0.36   | 0.26                                  | EEEFK0J271SP                  | (5)    | 1000               |  |
|                         | 470                                  | 6.3         | 7.7            | D8           | 280  | 0.34   | 0.26                                  | EEEFKJ471XSP                  | (5)    | 900                |  |
|                         | 1800                                 | 10          | 10.2           | G            | 850  | 0.08   | 0.26                                  | EEEFK0J182SP                  | (6)    | 500                |  |
| 10                      | 220                                  | 6.3         | 5.8            | D            | 240  | 0.36   | 0.19                                  | EEEFK1A221SP                  | (5)    | 1000               |  |
|                         | 330                                  | 6.3         | 7.7            | D8           | 280  | 0.34   | 0.19                                  | EEEFKA331XSP                  | (5)    | 900                |  |
|                         | 820                                  | 8           | 10.2           | F            | 600  | 0.16   | 0.19                                  | EEEFK1A821SP                  | (6)    | 500                |  |
|                         | 1200                                 | 10          | 10.2           | G            | 850  | 0.08   | 0.19                                  | EEEFK1A122SP                  | (6)    | 500                |  |
| 16                      | 150                                  | 6.3         | 5.8            | D            | 240  | 0.36   | 0.16                                  | EEEFK1C151SP                  | (5)    | 1000               |  |
|                         | 270                                  | 6.3         | 7.7            | D8           | 280  | 0.34   | 0.16                                  | EEEFKC271XSP                  | (5)    | 900                |  |
|                         | 560                                  | 8           | 10.2           | F            | 600  | 0.16   | 0.16                                  | EEEFK1C561SP                  | (6)    | 500                |  |
|                         | 1000                                 | 10          | 10.2           | G            | 850  | 0.08   | 0.16                                  | EEEFK1C102SP                  | (6)    | 500                |  |
| 25                      | 100                                  | 6.3         | 5.8            | D            | 240  | 0.36   | 0.14                                  | EEEFK1E101SP                  | (5)    | 1000               |  |
|                         | 150                                  | 6.3         | 7.7            | D8           | 280  | 0.34   | 0.14                                  | EEEFKE151XSP                  | (5)    | 900                |  |
|                         | 180                                  | 6.3         | 7.7            | D8           | 280  | 0.34   | 0.14                                  | EEEFKE181XSP                  | (5)    | 900                |  |
|                         | 390                                  | 8           | 10.2           | F            | 600  | 0.16   | 0.14                                  | EEEFK1E391SP                  | (6)    | 500                |  |
|                         | 680                                  | 10          | 10.2           | G            | 850  | 0.08   | 0.14                                  | EEEFK1E681SP                  | (6)    | 500                |  |
| 35                      | 68                                   | 6.3         | 5.8            | D            | 240  | 0.36   | 0.12                                  | EEEFK1V680SP                  | (5)    | 1000               |  |
|                         | 82                                   | 6.3         | 5.8            | D            | 240  | 0.36   | 0.12                                  | EEEFK1V820SP                  | (5)    | 1000               |  |
|                         | 120                                  | 6.3         | 7.7            | D8           | 280  | 0.34   | 0.12                                  | EEEFKV121XSP                  | (5)    | 900                |  |
|                         | 270                                  | 8           | 10.2           | F            | 600  | 0.16   | 0.12                                  | EEEFK1V271SP                  | (6)    | 500                |  |
|                         | 470                                  | 10          | 10.2           | G            | 850  | 0.08   | 0.12                                  | EEEFK1V471SP                  | (6)    | 500                |  |
| 50                      | 39                                   | 6.3         | 5.8            | D            | 165  | 0.88   | 0.10                                  | EEEFK1H390SP                  | (5)    | 1000               |  |
|                         | 82                                   | 6.3         | 7.7            | D8           | 195  | 0.68   | 0.10                                  | EEEFKH820XSP                  | (5)    | 900                |  |
|                         | 180                                  | 8           | 10.2           | F            | 350  | 0.34   | 0.10                                  | EEEFK1H181SP                  | (6)    | 500                |  |
|                         | 270                                  | 10          | 10.2           | G            | 670  | 0.18   | 0.10                                  | EEEFK1H271SP                  | (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"