

Surface Mount Type

Series : **S** Type : **V**

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



Features

- Endurance : 85 °C 2000 h
- Vibration-proof product is available upon request. ($\phi 8$ mm and larger)
- RoHS compliant

Specifications

| | | | | | | | | |
|--------------------------------------|---|--|----|-----------------------|----|----|----|-----------------------------|
| Category temperature range | -40 °C to +85 °C | | | | | | | |
| Rated voltage range | 6.3 V.DC to 50 V.DC | | | | | | | |
| Capacitance range | 1 μ F to 1500 μ F | | | | | | | |
| Capacitance tolerance | ± 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 | (Impedance ratio at 120 Hz) |
| | Z(-25 °C)/Z(+20 °C) | 4 | 3 | 2 | 2 | 2 | 2 | |
| | Z(-40 °C)/Z(+20 °C) | 8 | 6 | 4 | 4 | 3 | 3 | |
| Endurance | After applying rated working voltage for 2000 hours (Miniaturization product type 1000 hours) at +85 °C ± 2 °C and then being stabilized at +20 °C, Capacitors shall meet the following limits. | | | | | | | |
| | Capacitance change | Within ± 20 % of the initial value | | | | | | |
| | | Size code | | Cap. change | | | | |
| | | D8 ($\phi 6.3 \times 7.7$) | | 2000 hours ± 25 % | | | | |
| \leq D ($\phi 6.3$) Miniature | | 1000 hours ± 30 % | | | | | | |
| $\tan \delta$ | ≤ 200 % of the initial limit | | | | | | | |
| DC leakage current | Within the initial limit | | | | | | | |
| Shelf life | After storage for 1000 hours at +85 °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 | Within ± 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

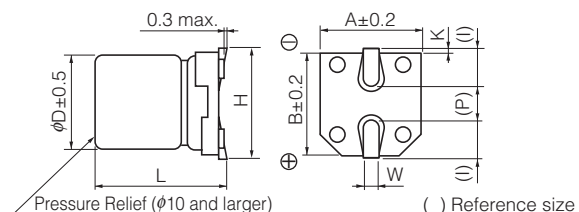
| | | | | |
|-------------------|--------|------|------|---------|
| Frequency (Hz) | 50, 60 | 120 | 1 k | 10 k to |
| Correction factor | 0.70 | 1.00 | 1.30 | 1.70 |

Marking

Example : 6.3 V.DC 22 μ F
Marking color : BLACK



Dimensions



| Size code | ϕD | L | A, B | H. | I | W | P | K |
|-----------|----------|----------------------|------|----------|-----|----------------|-----|-------------------------|
| B | 4.0 | 5.4 $^{+0.1}_{-0.2}$ | 4.3 | 5.5 max | 1.8 | 0.65 ± 0.1 | 1.0 | 0.35 $^{+0.15}_{-0.20}$ |
| C | 5.0 | 5.4 $^{+0.1}_{-0.2}$ | 5.3 | 6.5 max | 2.2 | 0.65 ± 0.1 | 1.5 | 0.35 $^{+0.15}_{-0.20}$ |
| D | 6.3 | 5.4 $^{+0.1}_{-0.2}$ | 6.6 | 7.8 max | 2.6 | 0.65 ± 0.1 | 1.8 | 0.35 $^{+0.15}_{-0.20}$ |
| D8 | 6.3 | 7.7 ± 0.3 | 6.6 | 7.8 max | 2.6 | 0.65 ± 0.1 | 1.8 | 0.35 $^{+0.15}_{-0.20}$ |
| E | 8.0 | 6.2 ± 0.3 | 8.3 | 9.5 max | 3.4 | 0.65 ± 0.1 | 2.2 | 0.35 $^{+0.15}_{-0.20}$ |
| F | 8.0 | 10.2 ± 0.3 | 8.3 | 10.0 max | 3.4 | 0.90 ± 0.2 | 3.1 | 0.70 ± 0.20 |
| G | 10.0 | 10.2 ± 0.3 | 10.3 | 12.0 max | 3.5 | 0.90 ± 0.2 | 4.6 | 0.70 ± 0.20 |

Characteristics list

| Rated voltage (V.DC) | Cap. (±20 %) (μF) | Case size (mm) | | Size* code | Specification | | | Part No. | Reflow | Min. Packaging Qty |
|----------------------|-------------------|----------------|------|------------|--|-------------------------|-------------------|--------------|--------|--------------------|
| | | φD | L | | Ripple current (120 Hz) (+85 °C) (mA r.m.s.) | tan δ (120 Hz) (+20 °C) | Endurance (hours) | | | Taping (pcs) |
| 6.3 | 22 | 4 | 5.4 | B | 29 | 0.30 | 2000 | EEE0JA220AR | (5) | 2000 |
| | 33 | 4 | 5.4 | (B) | 22 | 0.35 | 1000 | EEE0JA330WAR | (5) | 2000 |
| | 47 | 5 | 5.4 | C | 46 | 0.30 | 2000 | EEE0JA470AR | (5) | 1000 |
| | 100 | 5 | 5.4 | (C) | 47 | 0.40 | 1000 | EEE0JA101WAR | (5) | 1000 |
| | | 6.3 | 5.4 | D | 71 | 0.30 | 2000 | EEE0JA101AP | (5) | 1000 |
| | 330 | 6.3 | 7.7 | D8 | 188 | 0.30 | 2000 | EEE0JA331XAP | (5) | 900 |
| | | 8 | 6.2 | E | 300 | 0.35 | 2000 | EEE0JA331AP | (7) | 1000 |
| | 470 | 8 | 10.2 | (F) | 380 | 0.35 | 1000 | EEE0JA471UAP | (7) | 500 |
| 1000 | 10 | 10.2 | G | 700 | 0.35 | 2000 | EEE0JA102AP | (7) | 500 | |
| 1500 | 10 | 10.2 | (G) | 750 | 0.50 | 1000 | EEE0JA152UAP | (7) | 500 | |
| 10 | 22 | 4 | 5.4 | (B) | 28 | 0.30 | 1000 | EEE1AA220WAR | (5) | 2000 |
| | 33 | 4 | 5.4 | (B) | 29 | 0.30 | 1000 | EEE1AA330WAR | (5) | 2000 |
| | | 5 | 5.4 | C | 43 | 0.22 | 2000 | EEE1AA330AR | (5) | 1000 |
| | 47 | 5 | 5.4 | (C) | 47 | 0.30 | 1000 | EEE1AA470WAR | (5) | 1000 |
| | 100 | 5 | 5.4 | (C) | 50 | 0.30 | 1000 | EEE1AA101WAR | (5) | 1000 |
| | | 6.3 | 5.4 | D | 70 | 0.26 | 2000 | EEE1AA101AP | (5) | 1000 |
| | 220 | 6.3 | 7.7 | D8 | 173 | 0.22 | 2000 | EEE1AA221XAP | (5) | 900 |
| | | 8 | 6.2 | E | 250 | 0.26 | 2000 | EEE1AA221AP | (7) | 1000 |
| | 330 | 8 | 10.2 | F | 390 | 0.26 | 2000 | EEE1AA331AP | (7) | 500 |
| | 470 | 8 | 10.2 | (F) | 390 | 0.26 | 1000 | EEE1AA471UAP | (7) | 500 |
| 10 | | 10.2 | G | 400 | 0.26 | 2000 | EEE1AA471AP | (7) | 500 | |
| 1000 | 10 | 10.2 | (G) | 580 | 0.35 | 1000 | EEE1AA102UAP | (7) | 500 | |
| 16 | 10 | 4 | 5.4 | B | 28 | 0.16 | 2000 | EEE1CA100AR | (5) | 2000 |
| | 22 | 4 | 5.4 | (B) | 28 | 0.26 | 1000 | EEE1CA220WAR | (5) | 2000 |
| | | 5 | 5.4 | C | 39 | 0.16 | 2000 | EEE1CA220AR | (5) | 1000 |
| | 33 | 5 | 5.4 | (C) | 35 | 0.26 | 1000 | EEE1CA330WAR | (5) | 1000 |
| | 47 | 5 | 5.4 | (C) | 39 | 0.26 | 1000 | EEE1CA470WAR | (5) | 1000 |
| | | 6.3 | 5.4 | D | 70 | 0.16 | 2000 | EEE1CA470AP | (5) | 1000 |
| | 100 | 6.3 | 5.4 | (D) | 70 | 0.26 | 1000 | EEE1CA101WAP | (5) | 1000 |
| | | 8 | 6.2 | E | 200 | 0.20 | 2000 | EEE1CA101AP | (7) | 1000 |
| | 220 | 6.3 | 7.7 | D8 | 162 | 0.20 | 2000 | EEE1CA221XAP | (5) | 900 |
| | | 8 | 10.2 | (F) | 280 | 0.20 | 1000 | EEE1CA221UAP | (7) | 500 |
| | 330 | 8 | 10.2 | (F) | 320 | 0.20 | 1000 | EEE1CA331UAP | (7) | 500 |
| | | 10 | 10.2 | G | 380 | 0.20 | 2000 | EEE1CA331AP | (7) | 500 |
| | 470 | 8 | 10.2 | (F) | 350 | 0.26 | 1000 | EEE1CA471UAP | (7) | 500 |
| | | 10 | 10.2 | G | 420 | 0.20 | 2000 | EEE1CA471AP | (7) | 500 |
| 25 | 4.7 | 4 | 5.4 | B | 22 | 0.14 | 2000 | EEE1EA4R7AR | (5) | 2000 |
| | 10 | 4 | 5.4 | (B) | 22 | 0.20 | 1000 | EEE1EA100WAR | (5) | 2000 |
| | | 5 | 5.4 | C | 28 | 0.14 | 2000 | EEE1EA100AR | (5) | 1000 |
| | 22 | 5 | 5.4 | (C) | 35 | 0.20 | 1000 | EEE1EA220WAR | (5) | 1000 |
| | | 6.3 | 5.4 | D | 55 | 0.14 | 2000 | EEE1EA220AP | (5) | 1000 |
| | 33 | 5 | 5.4 | (C) | 42 | 0.20 | 1000 | EEE1EA330WAR | (5) | 1000 |
| | | 6.3 | 5.4 | D | 65 | 0.14 | 2000 | EEE1EA330AP | (5) | 1000 |
| | 47 | 6.3 | 5.4 | (D) | 70 | 0.20 | 1000 | EEE1EA470WAP | (5) | 1000 |
| | | 8 | 6.2 | (E) | 91 | 0.16 | 1000 | EEE1EA101UAP | (7) | 1000 |
| | 100 | 6.3 | 7.7 | D8 | 143 | 0.16 | 2000 | EEE1EA101XAP | (5) | 900 |
| | | 8 | 10.2 | F | 180 | 0.16 | 2000 | EEE1EA101AP | (7) | 500 |
| | 220 | 8 | 10.2 | (F) | 230 | 0.20 | 1000 | EEE1EA221UAP | (7) | 500 |
| | | 10 | 10.2 | G | 310 | 0.16 | 2000 | EEE1EA221AP | (7) | 500 |
| | 330 | 8 | 10.2 | (F) | 270 | 0.20 | 1000 | EEE1EA331UAP | (7) | 500 |
| 10 | | 10.2 | G | 340 | 0.16 | 2000 | EEE1EA331AP | (7) | 500 | |
| 470 | 10 | 10.2 | (G) | 380 | 0.25 | 1000 | EEE1EA471UAP | (7) | 500 | |

* 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

| Rated voltage (V.DC) | Cap. (±20 %) (μF) | Case size (mm) | | Size* code | Specification | | | Part No. | Reflow | Min. Packaging Qty |
|----------------------|-------------------|----------------|------|------------|--|-------------------------|-------------------|--------------|--------|--------------------|
| | | φD | L | | Ripple current (120 Hz) (+85 °C) (mA r.m.s.) | tan δ (120 Hz) (+20 °C) | Endurance (hours) | | | Taping (pcs) |
| 35 | 4.7 | 4 | 5.4 | B | 22 | 0.12 | 2000 | EEE1VA4R7AR | (5) | 2000 |
| | 10 | 4 | 5.4 | (B) | 22 | 0.16 | 1000 | EEE1VA100WAR | (5) | 2000 |
| | | 5 | 5.4 | C | 30 | 0.12 | 2000 | EEE1VA100AR | (5) | 1000 |
| | 22 | 5 | 5.4 | (C) | 36 | 0.16 | 1000 | EEE1VA220WAR | (5) | 1000 |
| | | 6.3 | 5.4 | D | 60 | 0.12 | 2000 | EEE1VA220AP | (5) | 1000 |
| | 33 | 6.3 | 5.4 | (D) | 60 | 0.16 | 1000 | EEE1VA330WAP | (5) | 1000 |
| | | 8 | 6.2 | E | 130 | 0.14 | 2000 | EEE1VA330AP | (7) | 1000 |
| | 47 | 6.3 | 5.4 | (D) | 70 | 0.16 | 1000 | EEE1VA470WAP | (5) | 1000 |
| | | 8 | 6.2 | E | 165 | 0.14 | 2000 | EEE1VA470AP | (7) | 1000 |
| | 100 | 6.3 | 7.7 | D8 | 132 | 0.14 | 2000 | EEE1VA101XAP | (5) | 900 |
| | | 8 | 10.2 | (F) | 140 | 0.14 | 1000 | EEE1VA101UAP | (7) | 500 |
| | | 10 | 10.2 | G | 210 | 0.14 | 2000 | EEE1VA101AP | (7) | 500 |
| | 220 | 8 | 10.2 | (F) | 200 | 0.14 | 1000 | EEE1VA221UAP | (7) | 500 |
| | | 10 | 10.2 | G | 310 | 0.14 | 2000 | EEE1VA221AP | (7) | 500 |
| 330 | 10 | 10.2 | (G) | 350 | 0.30 | 1000 | EEE1VA331UAP | (7) | 500 | |
| 50 | 1 | 4 | 5.4 | B | 10 | 0.12 | 2000 | EEE1HA1R0AR | (5) | 2000 |
| | 2.2 | 4 | 5.4 | B | 16 | 0.12 | 2000 | EEE1HA2R2AR | (5) | 2000 |
| | 3.3 | 4 | 5.4 | B | 16 | 0.12 | 2000 | EEE1HA3R3AR | (5) | 2000 |
| | 4.7 | 4 | 5.4 | (B) | 18 | 0.14 | 1000 | EEE1HA4R7WAR | (5) | 2000 |
| | | 5 | 5.4 | C | 23 | 0.12 | 2000 | EEE1HA4R7AR | (5) | 1000 |
| | 10 | 5 | 5.4 | (C) | 27 | 0.14 | 1000 | EEE1HA100WAR | (5) | 1000 |
| | | 6.3 | 5.4 | D | 35 | 0.12 | 2000 | EEE1HA100AP | (5) | 1000 |
| | 22 | 6.3 | 5.4 | (D) | 40 | 0.14 | 1000 | EEE1HA220WAP | (5) | 1000 |
| | | 8 | 6.2 | E | 120 | 0.12 | 2000 | EEE1HA220AP | (7) | 1000 |
| | 33 | 8 | 6.2 | (E) | 65 | 0.12 | 1000 | EEE1HA330UAP | (7) | 1000 |
| | | 6.3 | 7.7 | D8 | 65 | 0.14 | 2000 | EEE1HA330XAP | (5) | 900 |
| | | 8 | 10.2 | F | 110 | 0.12 | 2000 | EEE1HA330AP | (7) | 500 |
| | 47 | 6.3 | 7.7 | D8 | 105 | 0.14 | 2000 | EEE1HA470XAP | (5) | 900 |
| | | 8 | 10.2 | (F) | 110 | 0.12 | 1000 | EEE1HA470UAP | (7) | 500 |
| | | 10 | 10.2 | G | 130 | 0.12 | 2000 | EEE1HA470AP | (7) | 500 |
| | 100 | 8 | 10.2 | (F) | 200 | 0.18 | 1000 | EEE1HA101UAP | (7) | 500 |
| | | 10 | 10.2 | G | 250 | 0.12 | 2000 | EEE1HA101AP | (7) | 500 |
| 220 | 10 | 10.2 | (G) | 300 | 0.18 | 1000 | EEE1HA221UAP | (7) | 500 | |

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

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