

Surface Mount Type

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

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



■ Features

- Endurance: 85 °C 2000 h
- Vibration-proof product is available upon request.(φ8 ≤)
- RoHS directive compliant

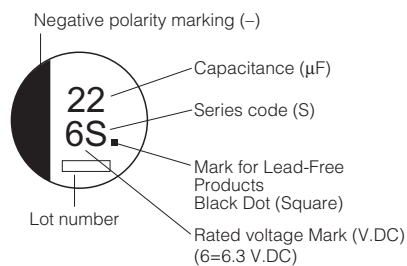
■ Specifications

| | | | | | | | | |
|------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|------------------|----|----|----|----|-----------------------------|
| Category Temp. Range | -40 °C to +85 °C | | | | | | | |
| Rated W.V. Range | 6.3 V.DC to 50 V.DC | | | | | | | |
| Nominal Cap. Range | 0.1 μF to 1500 μF | | | | | | | |
| Capacitance Tolerance | ±20 % (120 Hz/+20 °C) | | | | | | | |
| DC Leakage Current | I ≤ 0.01 CV or 3 (μA) After 2 minutes (Whichever is greater) | | | | | | | |
| tan δ | Please see the attached High temperature lead-free reflow products list. | | | | | | | |
| Characteristics at Low Temperature | W.V. (V) | 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 | ±20 % of initial measured value | | | | | | |
| | | Size code | Cap. change | | | | | |
| | | D8(φ6.3×7.7) | 2000 hours ±25 % | | | | | |
| | ≤D(φ6.3) Miniature | 1000 hours ±30 % | | | | | | |
| tan δ | ≤ 200 % of initial specified value | | | | | | | |
| DC leakage current | ≤ initial specified value | | | | | | | |
| 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 | ±10 % of initial measured value | | | | | | |
| | tan δ | ≤ initial specified value | | | | | | |
| | DC leakage current | ≤ initial specified value | | | | | | |

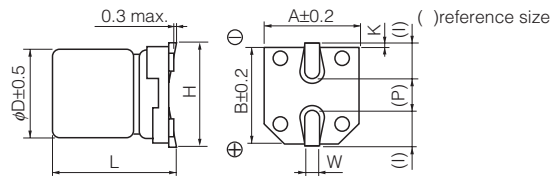
■ Marking

Example: 6.3 V 22 μF (Polarized)

Marking color: BLACK



■ Dimensions in mm (not to scale)



| Size code | D | 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 |

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.

00 Sep. 2010

■ High temperature Lead-Free reflow Products

| W.V. | Cap. (±20 %) | Case size | | | Specification | | | Part No. (RoHS:compliant) | Reflow | Min. Packaging Q'ty |
|------|-----------------|-----------|--------|---------------|----------------------------------------------------------|-------------------------------|--------------|------------------------------|--------|------------------------|
| | | Dia. | Length | *Size Code | Ripple Current (120 Hz) (+85 °C) (mA r.m.s.) | tan δ (120 Hz) (+20 °C) | Endurance | | | Taping |
| (V) | (μF) | (mm) | (mm) | | | (hours) | | | (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 |
| | 100 | 8 | 6.2 | (E) | 91 | 0.16 | 1000 | EEE1EA101UAP | (7) | 1000 |
| | | 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
 The taping dimensions are explained on EE188 of our Catalog. Please use it as a reference guide.
 Reflow Profile(Fig-1 to Fig-11) listed on EE186 of our Catalog.

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.

■ High temperature Lead-Free reflow Products

| W.V. | Cap. (±20 %) | Case size | | | Specification | | | Part No. (RoHS:compliant) | Reflow | Min. Packaging Q'ty |
|------|-----------------|-----------|--------|---------------|----------------------------------------------------------|-------------------------------|--------------|------------------------------|--------|------------------------|
| | | Dia. | Length | *Size Code | Ripple Current (120 Hz) (+85 °C) (mA r.m.s.) | tan δ (120 Hz) (+20 °C) | Endurance | | | Taping |
| (V) | (μF) | (mm) | (mm) | | | | | | (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 | 0.1 | 4 | 5.4 | B | 1 | 0.12 | 2000 | EEE1HAR10AR | (5) | 2000 |
| | 0.22 | 4 | 5.4 | B | 2 | 0.12 | 2000 | EEE1HAR22AR | (5) | 2000 |
| | 0.33 | 4 | 5.4 | B | 3 | 0.12 | 2000 | EEE1HAR33AR | (5) | 2000 |
| | 0.47 | 4 | 5.4 | B | 5 | 0.12 | 2000 | EEE1HAR47AR | (5) | 2000 |
| | 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 |
| | | 8 | 6.2 | (E) | 65 | 0.12 | 1000 | EEE1HA330UAP | (7) | 1000 |
| | 33 | 6.3 | 7.7 | D8 | 65 | 0.14 | 2000 | EEE1HA330XAP | (5) | 900 |
| | | 8 | 10.2 | F | 110 | 0.12 | 2000 | EEE1HA330AP | (7) | 500 |
| | | 6.3 | 7.7 | D8 | 105 | 0.14 | 2000 | EEE1HA470XAP | (5) | 900 |
| | 47 | 8 | 10.2 | (F) | 110 | 0.12 | 1000 | EEE1HA470UAP | (7) | 500 |
| | | 10 | 10.2 | G | 130 | 0.12 | 2000 | EEE1HA470AP | (7) | 500 |
| | | 8 | 10.2 | (F) | 200 | 0.18 | 1000 | EEE1HA101UAP | (7) | 500 |
| 100 | 10 | 10.2 | G | 250 | 0.12 | 2000 | EEE1HA101AP | (7) | 500 | |
| | 10 | 10.2 | (G) | 300 | 0.18 | 1000 | EEE1HA221UAP | (7) | 500 | |

* Size code():Miniaturization product

The taping dimensions are explained on EE188 of our Catalog. Please use it as a reference guide.

Reflow Profile(Fig-1 to Fig-11) listed on EE186 of our Catalog.