

Surface Mount Type

Series: **TP** Type: **V**

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



■ Features

- Lower ESR at Low temperature after endurance
- Endurance: 3000 h at 125 °C(D8 size : 2000 h)
- Automotive
- Vibration-proof product is available upon request. ($\phi 8 \leq$)
- RoHS directive compliant

■ Specifications

| | | | | |
|------------------------------|--|---|-----------|------|
| Category Temp. Range | -40 °C to +125 °C | | | |
| Rated W.V.Range | 10 V.DC to 35 V.DC | | | |
| Nominal Cap.Range | 47 μ F to 470 μ F | | | |
| Capacitance Tolerance | $\pm 20\%$ (120 Hz/+20 °C) | | | |
| DC Leakage Current | $I \leq 0.01 CV$ (μ A) After 2 minutes | | | |
| tan δ | Please see the attached standard products list | | | |
| Endurance | After the life test with DC rated working voltage at +125 °C ± 2 °C for 3000 hours(D8 size : 2000 h). the capacitors shall meet the limits specified below. | | | |
| | Capacitance change | $\pm 30\%$ of initial measured value | | |
| | tan δ | $\leq 300\%$ of initial specified value | | |
| | DC leakage current | \leq initial specified value | | |
| | ESR after Endurance ($\Omega/100kHz$) | | Size Code | |
| | | D8 | F | G |
| | Initial(+20 °C) | 0.45 | 0.2 | 0.15 |
| | After 2000 h(-40 °C) | 40 | 4.5 | 3.5 |
| Shelf Life | After storage for 1000 hours at +125 °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 | $\pm 10\%$ of initial measured value | | |
| | tan δ | \leq initial specified value | | |
| | DC leakage current | \leq initial specified value | | |

■ Marking

Example:10 V 220 μ F Marking color : BLACK

Capacitance (μ F)
Series identification
Mark for Lead-Free Products Black Dot (Square)
Rated Voltage Mark
Lot number
Negative polarity marking (-)

| | |
|---|------|
| A | 10 V |
| C | 16 V |
| E | 25 V |
| V | 35 V |

■ Dimensions in mm (not to scale)

() reference size

| Size code | D | L | A, B | H | I | W | P | K |
|-----------|------|----------------|------|----------|-----|----------------|-----|-------------------------|
| D8 | 6.3 | 7.7 ± 0.3 | 6.6 | 7.8 max. | 2.6 | 0.65 ± 0.1 | 1.8 | 0.35 $^{+0.15}_{-0.20}$ |
| F | 8.0 | 10.2 ± 0.3 | 8.3 | 10.0max. | 3.4 | 0.90 ± 0.2 | 3.1 | 0.70 ± 0.20 |
| G | 10.0 | 10.2 ± 0.3 | 10.3 | 12.0max. | 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

■ Standard Products

| W.V. (V) | Cap. (±20 %) (μF) | Case size | | | Specification | | | | Part No. (RoHS:compliant) | Reflow | Min. Packaging Q'ty |
|-------------|-------------------------|--------------|----------------|---------------|--|-------------------------|--------|-------------------------------|------------------------------|--------|------------------------|
| | | Dia. (mm) | Length (mm) | *Size Code | Ripple Current (100 kHz) (+125 °C) (mA r.m.s.) | ESR (100 kHz) (Ω) | | tan δ (120 Hz) (+20 °C) | | | Taping (pcs) |
| | | | | | | +20 °C | -40 °C | | | | |
| 10 | 220 | 8 | 10.2 | F | 270 | 0.20 | 3 | 0.30 | EEETP1A221AP | (8) | 500 |
| | 330 | 8 | 10.2 | (F) | 270 | 0.20 | 3 | 0.30 | EEETPA331UAP | (8) | 500 |
| | | 10 | 10.2 | G | 500 | 0.15 | 2 | 0.30 | EEETP1A331AP | (8) | 500 |
| | 470 | 10 | 10.2 | G | 500 | 0.15 | 2 | 0.30 | EEETP1A471AP | (8) | 500 |
| 16 | 100 | 6.3 | 7.7 | D8 | 197 | 0.45 | 5 | 0.23 | EEETPC101XAP | (8) | 900 |
| | | 8 | 10.2 | F | 270 | 0.20 | 3 | 0.23 | EEETP1C101AP | (8) | 500 |
| | 220 | 8 | 10.2 | F | 270 | 0.20 | 3 | 0.23 | EEETP1C221AP | (8) | 500 |
| | 330 | 10 | 10.2 | G | 500 | 0.15 | 2 | 0.23 | EEETP1C331AP | (8) | 500 |
| | 470 | 10 | 10.2 | G | 500 | 0.15 | 2 | 0.23 | EEETP1C471AP | (8) | 500 |
| 25 | 100 | 8 | 10.2 | F | 270 | 0.20 | 3 | 0.18 | EEETP1E101AP | (8) | 500 |
| | 220 | 10 | 10.2 | G | 500 | 0.15 | 2 | 0.18 | EEETP1E221AP | (8) | 500 |
| | 330 | 10 | 10.2 | G | 500 | 0.15 | 2 | 0.18 | EEETP1E331AP | (8) | 500 |
| 35 | 47 | 6.3 | 7.7 | D8 | 197 | 0.45 | 5 | 0.16 | EEETPV470XAP | (8) | 900 |
| | | 8 | 10.2 | F | 270 | 0.20 | 3 | 0.16 | EEETP1V470AP | (8) | 500 |
| | 100 | 8 | 10.2 | F | 270 | 0.20 | 3 | 0.16 | EEETP1V101AP | (8) | 500 |
| | 220 | 10 | 10.2 | G | 500 | 0.15 | 2 | 0.16 | EEETP1V221AP | (8) | 500 |

* Size code():Miniaturization product

If Part number exceeds 12 digits, voltage code is abbreviated as follows; 1A→A, 1C→C, 1E→E, 1V→V

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.