

Surface Mount Type

Series: **Medium-size TK** Type: **V**
 TK High temperature Lead-Free reflow(suffix:A*)



■ Features

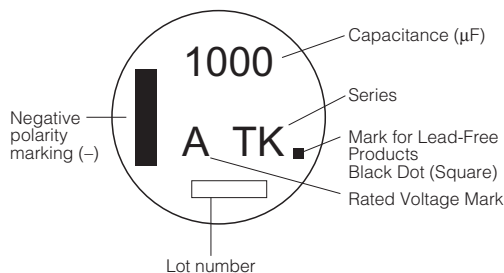
- Endurance: 2000 h at 125 °C
- Vibration-proof product is available upon request.
- RoHS directive compliant

■ Specifications

| | | | | | | | | | | |
|------------------------------------|--|---|----|----|----|----|----|----|-----|-----------------------------|
| Category Temp. Range | -40 °C to +125 °C | | | | | | | | | |
| Rated W.V. Range | 10 V.DC to 100 V.DC | | | | | | | | | |
| Nominal Cap. Range | 47 μF to 4700 μF | | | | | | | | | |
| Capacitance Tolerance | ±20 % (120 Hz/+20 °C) | | | | | | | | | |
| DC Leakage Current | I ≤ 0.01 CV After 2 minutes | | | | | | | | | |
| tan δ | Please see the attached High temperature lead-free reflow products list. | | | | | | | | | |
| Characteristics at Low Temperature | W.V. (V) | 10 | 16 | 25 | 35 | 50 | 63 | 80 | 100 | (Impedance ratio at 120 Hz) |
| | Z(-25 °C)/Z(+20 °C) | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | |
| | Z(-40 °C)/Z(+20 °C) | 6 | 4 | 4 | 3 | 3 | 3 | 3 | 3 | |
| Endurance | After applying rated working voltage for 2000 hours at +125 °C±2 °C and then being stabilized at +20 °C, Capacitors shall meet the following limits. | | | | | | | | | |
| | Capacitance change | ±30 % of initial measured value (Miniaturization product : Within ±35 %) | | | | | | | | |
| | tan δ | ≤ 300 % of initial specified value (Miniaturization product : Within 350 %) | | | | | | | | |
| | DC leakage current | ≤ initial specified value | | | | | | | | |
| 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 | ±10 % of initial measured value | | | | | | | | |
| | tan δ | ≤ initial specified value | | | | | | | | |
| | DC leakage current | ≤ initial specified value | | | | | | | | |

■ Marking

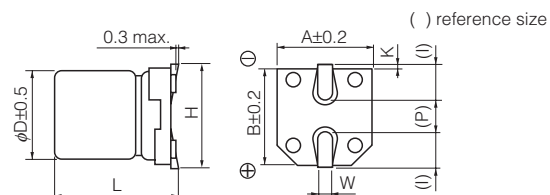
Example: 10 V 1000 μF
 Marking color: BLACK



Rated Voltage Mark

| | |
|----|-------|
| A | 10 V |
| C | 16 V |
| E | 25 V |
| V | 35 V |
| H | 50 V |
| J | 63 V |
| K | 80 V |
| 2A | 100 V |

■ Dimensions in mm (not to scale)



| Size code | D | 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 |

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

Endurance : 125 °C 2000 h

| 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 (Ω) | | tan δ (120 Hz) (+20 °C) | | | Taping (pcs) | |
| | | | | | | +20 °C | -40 °C | | | | | |
| 10 | 1000 | 12.5 | 13.5 | H13 | 800 | 0.120 | 1.80 | 0.30 | EEETK1A102AQ | (9) | 200 | |
| | 1500 | 12.5 | 13.5 | (H13) | 800 | 0.120 | 1.80 | 0.30 | EEETKA152UAQ | (9) | 200 | |
| | 2200 | 16 | 16.5 | J16 | 1100 | 0.080 | 1.20 | 0.32 | EEETK1A222AM | (9) | 125 | |
| | | 16 | 16.5 | (J16) | 1100 | 0.080 | 1.20 | 0.34 | EEETKA332UAM | (9) | 125 | |
| | 3300 | 18 | 16.5 | K16 | 1300 | 0.075 | 1.10 | 0.36 | EEETK1A332AM | (9) | 125 | |
| | | 18 | 16.5 | (K16) | 1300 | 0.075 | 1.10 | 0.38 | EEETK1A472AM | (9) | 125 | |
| 16 | 330 | 12.5 | 13.5 | H13 | 800 | 0.120 | 1.80 | 0.23 | EEETK1C331AQ | (9) | 200 | |
| | 470 | 12.5 | 13.5 | H13 | 800 | 0.120 | 1.80 | 0.23 | EEETK1C471AQ | (9) | 200 | |
| | 680 | 12.5 | 13.5 | H13 | 800 | 0.120 | 1.80 | 0.23 | EEETK1C681AQ | (9) | 200 | |
| | 1000 | 12.5 | 13.5 | (H13) | 800 | 0.120 | 1.80 | 0.23 | EEETKC102UAQ | (9) | 200 | |
| | | 16 | 16.5 | J16 | 1100 | 0.080 | 1.20 | 0.25 | EEETK1C102AM | (9) | 125 | |
| | 2200 | 16 | 16.5 | (J16) | 1100 | 0.080 | 1.20 | 0.27 | EEETKC222UAM | (9) | 125 | |
| | | 18 | 16.5 | K16 | 1300 | 0.075 | 1.10 | 0.27 | EEETK1C222AM | (9) | 125 | |
| | 3300 | 18 | 16.5 | K16 | 1300 | 0.075 | 1.10 | 0.29 | EEETK1C332AM | (9) | 125 | |
| | 25 | 330 | 12.5 | 13.5 | H13 | 800 | 0.120 | 1.80 | 0.18 | EEETK1E331AQ | (9) | 200 |
| | | 470 | 12.5 | 13.5 | H13 | 800 | 0.120 | 1.80 | 0.18 | EEETK1E471AQ | (9) | 200 |
| 680 | | 12.5 | 13.5 | (H13) | 800 | 0.120 | 1.80 | 0.18 | EEETKE681UAQ | (9) | 200 | |
| | | 16 | 16.5 | J16 | 1100 | 0.080 | 1.20 | 0.18 | EEETK1E681AM | (9) | 125 | |
| 1000 | | 16 | 16.5 | (J16) | 1100 | 0.080 | 1.20 | 0.18 | EEETKE102UAM | (9) | 125 | |
| | | 18 | 16.5 | K16 | 1300 | 0.075 | 1.10 | 0.18 | EEETK1E102AM | (9) | 125 | |
| 2200 | | 18 | 16.5 | K16 | 1300 | 0.075 | 1.10 | 0.20 | EEETK1E222AM | (9) | 125 | |
| 35 | 330 | 12.5 | 13.5 | H13 | 800 | 0.120 | 1.80 | 0.16 | EEETK1V331AQ | (9) | 200 | |
| | 470 | 12.5 | 13.5 | (H13) | 800 | 0.120 | 1.80 | 0.16 | EEETKV471UAQ | (9) | 200 | |
| | | 16 | 16.5 | J16 | 1100 | 0.080 | 1.20 | 0.16 | EEETK1V471AM | (9) | 125 | |
| | 680 | 16 | 16.5 | (J16) | 1100 | 0.080 | 1.20 | 0.16 | EEETKV681UAM | (9) | 125 | |
| | | 18 | 16.5 | K16 | 1300 | 0.075 | 1.10 | 0.16 | EEETK1V681AM | (9) | 125 | |
| | 1000 | 18 | 16.5 | K16 | 1300 | 0.075 | 1.10 | 0.16 | EEETK1V102AM | (9) | 125 | |
| 50 | 220 | 12.5 | 13.5 | H13 | 600 | 0.230 | 3.40 | 0.14 | EEETK1H221AQ | (10) | 200 | |
| | 330 | 12.5 | 13.5 | H13 | 600 | 0.230 | 3.40 | 0.14 | EEETK1H331AQ | (10) | 200 | |
| | 470 | 16 | 16.5 | J16 | 900 | 0.150 | 2.20 | 0.14 | EEETK1H471AM | (10) | 125 | |
| | | 16 | 16.5 | (J16) | 900 | 0.150 | 2.20 | 0.14 | EEETKH681UAM | (10) | 125 | |
| | 680 | 18 | 16.5 | K16 | 950 | 0.140 | 2.10 | 0.14 | EEETK1H681AM | (10) | 125 | |
| | | 18 | 16.5 | (K16) | 950 | 0.140 | 2.10 | 0.14 | EEETK1H102AM | (10) | 125 | |
| 63 | 100 | 12.5 | 13.5 | H13 | 350 | 0.260 | 5.20 | 0.12 | EEETK1J101AQ | (11) | 200 | |
| | 220 | 12.5 | 13.5 | H13 | 350 | 0.260 | 5.20 | 0.12 | EEETK1J221AQ | (11) | 200 | |
| | 330 | 16 | 16.5 | J16 | 500 | 0.180 | 3.60 | 0.12 | EEETK1J331AM | (11) | 125 | |
| | 470 | 16 | 16.5 | J16 | 500 | 0.180 | 3.60 | 0.12 | EEETK1J471AM | (11) | 125 | |
| | | 16 | 16.5 | (J16) | 500 | 0.180 | 3.60 | 0.12 | EEETK1K470AQ | (11) | 200 | |
| 80 | 47 | 12.5 | 13.5 | H13 | 250 | 0.420 | 8.40 | 0.12 | EEETK1K470AQ | (11) | 200 | |
| | 100 | 12.5 | 13.5 | (H13) | 250 | 0.420 | 8.40 | 0.12 | EEETKK101UAQ | (11) | 200 | |
| | | 16 | 16.5 | J16 | 350 | 0.300 | 6.00 | 0.12 | EEETK1K101AM | (11) | 125 | |
| | 220 | 16 | 16.5 | (J16) | 350 | 0.300 | 6.00 | 0.12 | EEETKK221UAM | (11) | 125 | |
| | | 18 | 16.5 | K16 | 400 | 0.280 | 5.60 | 0.12 | EEETK1K221AM | (11) | 125 | |
| | 330 | 16 | 16.5 | (J16) | 350 | 0.300 | 6.00 | 0.12 | EEETKK331UAM | (11) | 125 | |
| | | 18 | 16.5 | K16 | 400 | 0.280 | 5.60 | 0.12 | EEETK1K331AM | (11) | 125 | |
| | 470 | 18 | 16.5 | K16 | 400 | 0.280 | 5.60 | 0.12 | EEETK1K471AM | (11) | 125 | |
| 100 | 47 | 12.5 | 13.5 | H13 | 250 | 0.420 | 8.40 | 0.10 | EEETK2A470AQ | (11) | 200 | |
| | 100 | 16 | 16.5 | J16 | 350 | 0.300 | 6.00 | 0.10 | EEETK2A101AM | (11) | 125 | |
| | 220 | 18 | 16.5 | K16 | 400 | 0.280 | 5.60 | 0.10 | EEETK2A221AM | (11) | 125 | |
| | 330 | 18 | 16.5 | K16 | 400 | 0.280 | 5.60 | 0.10 | EEETK2A331AM | (11) | 125 | |

* 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.

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