

Surface Mount Type

Series: **TG** Type: **V**



■ Features

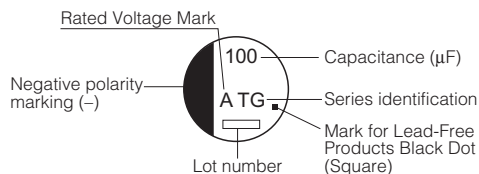
- Endurance: 125 °C 1000 h to 2000 h
- Miniaturization (40 % less than TA Series)
- Low ESR (Low temp)
- Vibration-proof product is available upon request. ($\phi 8 \leq$)
- RoHS directive compliant (Parts No $\phi 8$ to $\phi 10$: **EEE***, $\phi 12.5$ to $\phi 18$: **EEV***)

■ Specifications

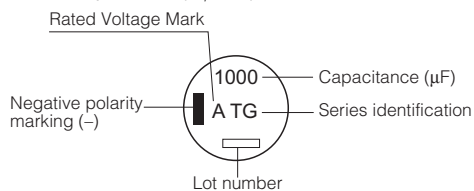
| | | | | | | | | | | |
|------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------|----|----|----|----|----|----|-----|-----------------------------|
| Category Temp. Range | -40 °C to +125 °C | | | | | | | | | |
| Rated W.V. Range | 10 V.DC to 100 V.DC | | | | | | | | | |
| Nominal Cap. Range | 10 μ F to 4700 μ F | | | | | | | | | |
| Capacitance Tolerance | ± 20 % (120 Hz/+20 °C) | | | | | | | | | |
| DC Leakage Current | $I \leq 0.01$ CV After 2 minutes | | | | | | | | | |
| tan δ | Please see the attached standard 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 1000 hours ($\phi 8 \times 6.2$), 2000 hours ($\phi 8 \times 10.2 \leq$) 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 (code U : ± 35 %) | | | | | | | | |
| | tan δ | ≤ 300 % of initial specified value (code U : ± 350 %) | | | | | | | | |
| | DC leakage current | \leq 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) | | | | | | | | | |
| | After reflow soldering and then being stabilized at +20 °C, capacitors shall meet the following limits. | | | | | | | | | |
| Resistance to Soldering Heat | Capacitance change | ± 10 % of initial measured value | | | | | | | | |
| | tan δ | \leq initial specified value | | | | | | | | |
| | DC leakage current | \leq initial specified value | | | | | | | | |
| | | | | | | | | | | |

■ Marking

Example : 10 V 100 μ F, 10 V 1000 μ F
 Marking color: **BLACK**
 Lead-Free products ($\leq \phi 10$)



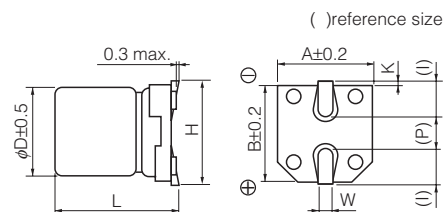
Lead-Free products ($\ge \phi 12.5$)



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 |
|-----------|------|----------------|------|-----------|-----|----------------|-----|-------------------------|
| E | 8.0 | 6.2 \pm 0.3 | 8.3 | 9.5 max. | 3.4 | 0.65 \pm 0.1 | 2.2 | 0.35 $^{+0.15}_{-0.20}$ |
| 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 0.20 |
| 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 0.20 |
| H13 | 12.5 | 13.5 \pm 0.5 | 13.5 | 15.0 max. | 4.7 | 0.90 \pm 0.3 | 4.4 | 0.70 \pm 0.30 |
| J16 | 16.0 | 16.5 \pm 0.5 | 17.0 | 19.0 max. | 5.5 | 1.20 \pm 0.3 | 6.7 | 0.70 \pm 0.30 |
| K16 | 18.0 | 16.5 \pm 0.5 | 19.0 | 21.0 max. | 6.7 | 1.20 \pm 0.3 | 6.7 | 0.70 \pm 0.30 |

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

Endurance : 125 °C 1000 h ($\phi 8 \times 10.2 \leq$: 2000 h)

| W.V. | Cap. ($\pm 20\%$) | Case size | | | Specification | | | Part No. (RoHS:compliant) | Reflow | Min. Packaging Q'ty |
|------|------------------------|-----------|--------|---------------|------------------------------------------------------------|----------------------------------------------|---------------------------------------|------------------------------|--------|------------------------|
| | | Dia. | Length | *Size Code | Ripple Current (100 kHz) (+125 °C) (mA r.m.s.) | ESR (100 kHz) (+20 °C) (Ω) | $\tan \delta$ (120 Hz) (+20 °C) | | | Taping (pcs) |
| (V) | (μ F) | (mm) | (mm) | | | | | | | |
| 10 | 100 | 8 | 6.2 | E | 100 | 1.00 | 0.30 | EEETG1A101P | (2) | 1000 |
| | 220 | 8 | 6.2 | (E) | 100 | 1.00 | 0.30 | EEETG1A221UP | (2) | 1000 |
| | | 8 | 10.2 | F | 197 | 0.50 | 0.30 | EEETG1A221P | (2) | 500 |
| | 330 | 8 | 10.2 | (F) | 197 | 0.50 | 0.30 | EEETG1A331UP | (2) | 500 |
| | | 10 | 10.2 | G | 270 | 0.30 | 0.30 | EEETG1A331P | (2) | 500 |
| | 470 | 10 | 10.2 | (G) | 270 | 0.30 | 0.30 | EEETG1A471UP | (2) | 500 |
| | 1000 | 12.5 | 13.5 | H13 | 800 | 0.12 | 0.30 | EEVTG1A102Q | (3) | 200 |
| | 1500 | 12.5 | 13.5 | (H13) | 800 | 0.12 | 0.30 | EEVTG1A152UQ | (3) | 200 |
| | 2200 | 16 | 16.5 | J16 | 1100 | 0.08 | 0.32 | EEVTG1A222M | (3) | 125 |
| | 3300 | 16 | 16.5 | (J16) | 1100 | 0.08 | 0.34 | EEVTG1A332UM | (3) | 125 |
| 18 | | 16.5 | K16 | 1300 | 0.075 | 0.34 | EEVTG1A332M | (3) | 125 | |
| 4700 | 18 | 16.5 | K16 | 1300 | 0.075 | 0.36 | EEVTG1A472M | (3) | 125 | |
| 16 | 100 | 8 | 10.2 | F | 197 | 0.50 | 0.23 | EEETG1C101P | (2) | 500 |
| | 220 | 8 | 10.2 | (F) | 197 | 0.50 | 0.23 | EEETG1C221UP | (2) | 500 |
| | | 10 | 10.2 | G | 270 | 0.30 | 0.23 | EEETG1C221P | (2) | 500 |
| | 330 | 10 | 10.2 | (G) | 270 | 0.30 | 0.23 | EEETG1C331UP | (2) | 500 |
| | | 12.5 | 13.5 | H13 | 800 | 0.12 | 0.23 | EEVTG1C331Q | (3) | 200 |
| | 470 | 12.5 | 13.5 | H13 | 800 | 0.12 | 0.23 | EEVTG1C471Q | (3) | 200 |
| | 680 | 12.5 | 13.5 | H13 | 800 | 0.12 | 0.23 | EEVTG1C681Q | (3) | 200 |
| | 1000 | 12.5 | 13.5 | (H13) | 800 | 0.12 | 0.23 | EEVTG1C102UQ | (3) | 200 |
| | | 16 | 16.5 | J16 | 1100 | 0.08 | 0.23 | EEVTG1C102M | (3) | 125 |
| | 2200 | 16 | 16.5 | (J16) | 1100 | 0.08 | 0.25 | EEVTG1C222UM | (3) | 125 |
| 18 | | 16.5 | K16 | 1300 | 0.075 | 0.25 | EEVTG1C222M | (3) | 125 | |
| 3300 | 18 | 16.5 | K16 | 1300 | 0.075 | 0.27 | EEVTG1C332M | (3) | 125 | |
| 25 | 47 | 8 | 6.2 | E | 100 | 1.00 | 0.18 | EEETG1E470P | (2) | 1000 |
| | 100 | 8 | 6.2 | (E) | 100 | 1.00 | 0.18 | EEETG1E101UP | (2) | 1000 |
| | | 8 | 10.2 | F | 197 | 0.50 | 0.18 | EEETG1E101P | (2) | 500 |
| | 220 | 8 | 10.2 | (F) | 197 | 0.50 | 0.18 | EEETG1E221UP | (2) | 500 |
| | | 10 | 10.2 | G | 270 | 0.30 | 0.18 | EEETG1E221P | (2) | 500 |
| | 330 | 10 | 10.2 | (G) | 270 | 0.30 | 0.18 | EEETG1E331UP | (2) | 500 |
| | | 12.5 | 13.5 | H13 | 800 | 0.12 | 0.18 | EEVTG1E331Q | (3) | 200 |
| | 470 | 12.5 | 13.5 | H13 | 800 | 0.12 | 0.18 | EEVTG1E471Q | (3) | 200 |
| | 680 | 12.5 | 13.5 | (H13) | 800 | 0.12 | 0.18 | EEVTG1E681UQ | (3) | 200 |
| | | 16 | 16.5 | J16 | 1100 | 0.08 | 0.18 | EEVTG1E681M | (3) | 125 |
| 1000 | 16 | 16.5 | (J16) | 1100 | 0.08 | 0.18 | EEVTG1E102UM | (3) | 125 | |
| | 18 | 16.5 | K16 | 1300 | 0.075 | 0.18 | EEVTG1E102M | (3) | 125 | |
| 2200 | 18 | 16.5 | K16 | 1300 | 0.075 | 0.20 | EEVTG1E222M | (3) | 125 | |
| 35 | 33 | 8 | 6.2 | E | 100 | 1.00 | 0.16 | EEETG1V330P | (2) | 1000 |
| | 47 | 8 | 6.2 | (E) | 100 | 1.00 | 0.16 | EEETG1V470UP | (2) | 1000 |
| | | 8 | 10.2 | F | 197 | 0.50 | 0.16 | EEETG1V470P | (2) | 500 |
| | 100 | 8 | 10.2 | (F) | 197 | 0.50 | 0.16 | EEETG1V101UP | (2) | 500 |
| | | 10 | 10.2 | G | 270 | 0.30 | 0.16 | EEETG1V101P | (2) | 500 |
| | 220 | 10 | 10.2 | (G) | 270 | 0.30 | 0.16 | EEETG1V221UP | (2) | 500 |
| 330 | 12.5 | 13.5 | H13 | 800 | 0.12 | 0.16 | EEVTG1V331Q | (3) | 200 | |
| 35 | 470 | 12.5 | 13.5 | (H13) | 800 | 0.12 | 0.16 | EEVTG1V471UQ | (3) | 200 |
| | | 16 | 16.5 | J16 | 1100 | 0.08 | 0.16 | EEVTG1V471M | (3) | 125 |
| | 680 | 16 | 16.5 | (J16) | 1100 | 0.08 | 0.16 | EEVTG1V681UM | (3) | 125 |
| | | 18 | 16.5 | K16 | 1300 | 0.075 | 0.16 | EEVTG1V681M | (3) | 125 |
| 1000 | 18 | 16.5 | K16 | 1300 | 0.075 | 0.16 | EEVTG1V102M | (3) | 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.

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

Endurance : 125 °C 1000 h ($\phi 8 \times 10.2 \leq$: 2000 h)

| W.V. | Cap. ($\pm 20\%$) | Case size | | | Specification | | | Part No. (RoHS:compliant) | Reflow | Min. Packaging Q'ty |
|------|------------------------|-----------|--------|---------------|------------------------------------------------------------|----------------------------------------------|---------------------------------------|------------------------------|--------|------------------------|
| | | Dia. | Length | *Size Code | Ripple Current (100 kHz) (+125 °C) (mA r.m.s.) | ESR (100 kHz) (+20 °C) (Ω) | $\tan \delta$ (120 Hz) (+20 °C) | | | Taping (pcs) |
| (V) | (μ F) | (mm) | (mm) | | | | | | | |
| 50 | 10 | 8 | 6.2 | E | 80 | 1.60 | 0.14 | EEETG1H100P | (2) | 1000 |
| | 22 | 8 | 6.2 | E | 80 | 1.60 | 0.14 | EEETG1H220P | (2) | 1000 |
| | 33 | 8 | 6.2 | (E) | 80 | 1.60 | 0.14 | EEETG1H330UP | (2) | 1000 |
| | | 8 | 10.2 | F | 133 | 0.75 | 0.14 | EEETG1H330P | (2) | 500 |
| | 47 | 8 | 10.2 | (F) | 133 | 0.75 | 0.14 | EEETG1H470UP | (2) | 500 |
| | | 10 | 10.2 | G | 221 | 0.50 | 0.14 | EEETG1H470P | (2) | 500 |
| | 100 | 10 | 10.2 | (G) | 221 | 0.50 | 0.14 | EEETG1H101UP | (2) | 500 |
| | 220 | 12.5 | 13.5 | H13 | 600 | 0.23 | 0.14 | EEVTG1H221Q | (3) | 200 |
| | 330 | 12.5 | 13.5 | H13 | 600 | 0.23 | 0.14 | EEVTG1H331Q | (3) | 200 |
| | 470 | 16 | 16.5 | J16 | 900 | 0.15 | 0.14 | EEVTG1H471M | (3) | 125 |
| 680 | 16 | 16.5 | (J16) | 900 | 0.15 | 0.14 | EEVTG1H681UM | (3) | 125 | |
| | 18 | 16.5 | K16 | 950 | 0.14 | 0.14 | EEVTG1H681M | (3) | 125 | |
| 1000 | 18 | 16.5 | K16 | 950 | 0.14 | 0.14 | EEVTG1H102M | (3) | 125 | |
| 63 | 10 | 8 | 6.2 | E | 55 | 2.20 | 0.12 | EEETG1J100P | (2) | 1000 |
| | 22 | 8 | 10.2 | F | 100 | 1.00 | 0.12 | EEETG1J220P | (2) | 500 |
| | 33 | 8 | 10.2 | (F) | 100 | 1.00 | 0.12 | EEETG1J330UP | (2) | 500 |
| | | 10 | 10.2 | G | 150 | 0.80 | 0.12 | EEETG1J330P | (2) | 500 |
| | 47 | 8 | 10.2 | (F) | 100 | 1.00 | 0.12 | EEETG1J470UP | (2) | 500 |
| | | 10 | 10.2 | G | 150 | 0.80 | 0.12 | EEETG1J470P | (2) | 500 |
| | 100 | 10 | 10.2 | (G) | 150 | 0.80 | 0.12 | EEETG1J101UP | (2) | 500 |
| | | 12.5 | 13.5 | H13 | 350 | 0.26 | 0.12 | EEVTG1J101Q | (3) | 200 |
| | 220 | 12.5 | 13.5 | H13 | 350 | 0.26 | 0.12 | EEVTG1J221Q | (3) | 200 |
| | 330 | 16 | 16.5 | J16 | 500 | 0.18 | 0.12 | EEVTG1J331M | (3) | 125 |
| 470 | 16 | 16.5 | J16 | 500 | 0.18 | 0.12 | EEVTG1J471M | (3) | 125 | |
| 80 | 10 | 8 | 10.2 | F | 70 | 1.30 | 0.12 | EEETG1K100P | (2) | 500 |
| | 22 | 8 | 10.2 | (F) | 70 | 1.30 | 0.12 | EEETG1K220UP | (2) | 500 |
| | | 10 | 10.2 | G | 90 | 1.00 | 0.12 | EEETG1K220P | (2) | 500 |
| | 33 | 8 | 10.2 | (F) | 70 | 1.30 | 0.12 | EEETG1K330UP | (2) | 500 |
| | | 10 | 10.2 | G | 90 | 1.00 | 0.12 | EEETG1K330P | (2) | 500 |
| | 47 | 10 | 10.2 | (G) | 90 | 1.00 | 0.12 | EEETG1K470UP | (2) | 500 |
| | | 12.5 | 13.5 | H13 | 250 | 0.42 | 0.12 | EEVTG1K470Q | (3) | 200 |
| | 100 | 12.5 | 13.5 | (H13) | 250 | 0.42 | 0.12 | EEVTG1K101UQ | (3) | 200 |
| | | 16 | 16.5 | J16 | 350 | 0.30 | 0.12 | EEVTG1K101M | (3) | 125 |
| | 220 | 16 | 16.5 | (J16) | 350 | 0.30 | 0.12 | EEVTG1K221UM | (3) | 125 |
| 18 | | 16.5 | K16 | 400 | 0.28 | 0.12 | EEVTG1K221M | (3) | 125 | |
| 330 | 16 | 16.5 | (J16) | 350 | 0.30 | 0.12 | EEVTG1K331UM | (3) | 125 | |
| | 18 | 16.5 | K16 | 400 | 0.28 | 0.12 | EEVTG1K331M | (3) | 125 | |
| 470 | 18 | 16.5 | K16 | 400 | 0.28 | 0.12 | EEVTG1K471M | (3) | 125 | |
| 100 | 10 | 8 | 10.2 | F | 70 | 1.30 | 0.10 | EEETG2A100P | (2) | 500 |
| | 22 | 8 | 10.2 | (F) | 70 | 1.30 | 0.10 | EEETG2A220UP | (2) | 500 |
| | | 10 | 10.2 | G | 90 | 1.00 | 0.10 | EEETG2A220P | (2) | 500 |
| | 33 | 10 | 10.2 | G | 90 | 1.00 | 0.10 | EEETG2A330P | (2) | 500 |
| | 47 | 12.5 | 13.5 | H13 | 250 | 0.42 | 0.10 | EEVTG2A470Q | (3) | 200 |
| | 100 | 16 | 16.5 | J16 | 350 | 0.30 | 0.10 | EEVTG2A101M | (3) | 125 |
| | 220 | 18 | 16.5 | K16 | 400 | 0.28 | 0.10 | EEVTG2A221M | (3) | 125 |
| 330 | 18 | 16.5 | K16 | 400 | 0.28 | 0.10 | EEVTG2A331M | (3) | 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.