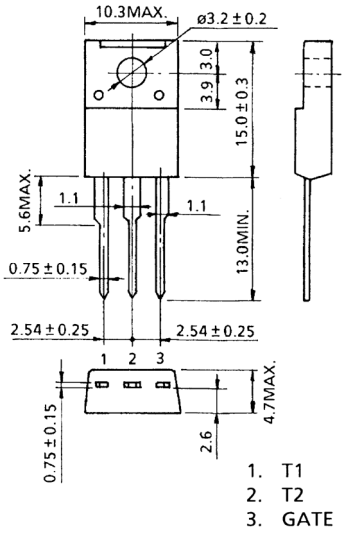
TOSHIBA BI−DIRECTIONAL TRIODE THYRISTOR SILICON PLANAR TYPE

# SM2GZ47, SM2GZ47A, SM2JZ47, SM2JZ47A

AC POWER CONTROL APPLICATIONS

- $I_{T\ (RMS)}$ = 1A (Ta = 65°C without radiator)
- Gate Trigger Current: $I_{GT}$ = 5mA Max. (TYPE "A")
- Repetitive Peak Off−State Voltage: $V_{DRM}$ = 400V, 600V
- R.M.S On−State Current: $I_{T\ (RMS)}$ = 2A (Tc = 110°C)
- Isolation Voltage: $V_{ISOL}$ = 1500V (AC, t = 60s)

Unit: mm




| | |
|---|---|
| JEDEC | — |
| JEITA | — |
| TOSHIBA | 13-10H1A |

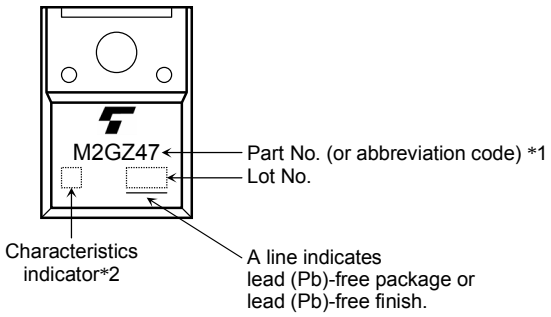
Weight: 1.7 g (typ.)

## ABSOLUTE MAXIMUM RATINGS

| CHARACTERISTIC | | SYMBOL | RATING | UNIT |
|---|---|---|---|---|
| Repetitive Peak Off−State Voltage and Repetitive Peak Reverse Voltage | SM2GZ47 SM2GZ47A | $V_{DRM}$ | 400 | V |
| | SM2JZ47 SM2JZ47A | | 600 | |
| R.M.S On−State Current (Full Sine Waveform) | Tc = 110°C | $I_{T\ (RMS)}$ | 2 | A |
| | Ta = 65°C | | 1 | |
| Peak One Cycle Surge On−State Current (Non−Repetitive) | | $I_{TSM}$ | 8 (50Hz) | A |
| | | | 8.8 (60Hz) | |
| I2t Limit Value | | I2t | 0.32 | A2s |
| Peak Gate Power Dissipation | | $P_{GM}$ | 3 | W |
| Average Gate Power Dissipation | | $P_{G\ (AV)}$ | 0.3 | W |
| Peak Gate Voltage | | $V_{FGM}$ | 10 | V |
| Peak Gate Current | | $I_{GM}$ | 1.6 | A |
| Junction Temperature | | $T_j$ | −40~125 | °C |
| Storage Temperature Range | | $T_{stg}$ | −40~125 | °C |
| Isolation Voltage (AC, t = 1min.) | | $V_{ISOL}$ | 1500 | V |

Note: Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.) are within the absolute maximum ratings.
Please design the appropriate reliability upon reviewing the Toshiba Semiconductor Reliability Handbook ("Handling Precautions"/Derating Concept and Methods) and individual reliability data (i.e. reliability test report and estimated failure rate, etc).

## MARKING

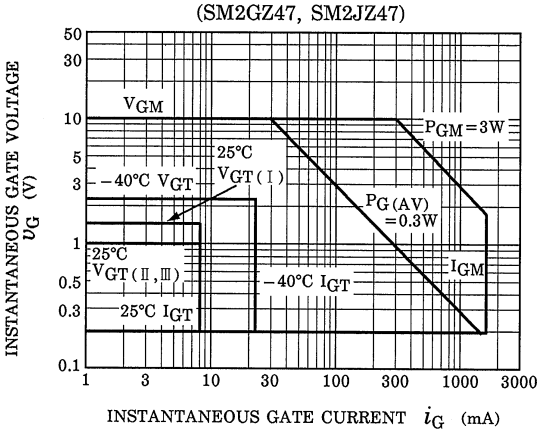



| | Part No. (or abbreviation code) | Part No. |
|---|---|---|
| *1 | M2GZ47 | SM2GZ47, SM2GZ47A |
| | M2JZ47 | SM2JZ47, SM2JZ47A |
| *2 | Nothing | SM2GZ47, SM2JZ47 |
| | A | SM2GZ47A, SM2JZ47A |

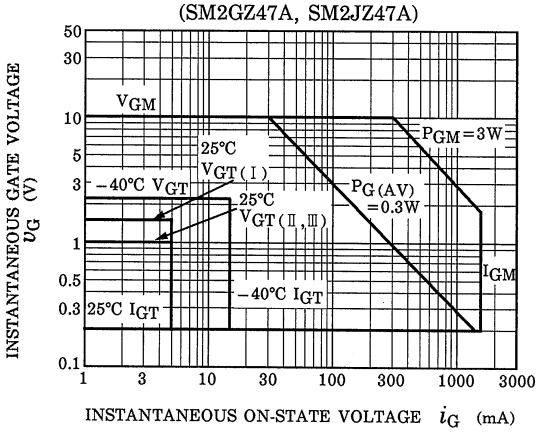
## ELECTRICAL CHARACTERISTICS (Ta = 25°C)

| CHARACTERISTIC | | | SYMBOL | TEST CONDITION | | MIN | TYP. | MAX | UNIT |
|---|---|---|---|---|---|---|---|---|---|
| Repetitive Peak Off−State Current | | | $I_{DRM}$ | $V_{DRM}$ = Rated | | — | — | 20 | μA |
| Gate Trigger Voltage | | I | $V_{GT}$ | $V_D$ = 12V<br>$R_L$ = 20Ω | T2 (+) , Gate (+) | — | — | 1.5 | V |
| | | II | | | T2 (+) , Gate (−) | — | — | 1 | |
| | | III | | | T2 (−) , Gate (−) | — | — | 1 | |
| | | IV | | | T2 (−) , Gate (+) | — | — | — | |
| Gate Trigger Current | SM2GZ47<br>SM2JZ47 | I | $I_{GT}$ | $V_D$ = 12V<br>$R_L$ = 20Ω | T2 (+) , Gate (+) | — | — | 8 | mA |
| | | II | | | T2 (+) , Gate (−) | — | — | 8 | |
| | | III | | | T2 (−) , Gate (−) | — | — | 8 | |
| | | IV | | | T2 (−) , Gate (+) | — | — | — | |
| | SM2GZ47A<br>SM2JZ47A | I | | | T2 (+) , Gate (+) | — | — | 5 | |
| | | II | | | T2 (+) , Gate (−) | — | — | 5 | |
| | | III | | | T2 (−) , Gate (−) | — | — | 5 | |
| | | IV | | | T2 (−) , Gate (+) | — | — | — | |
| Peak On−State Voltage | | | $V_{TM}$ | $I_{TM}$ = 3A | | — | — | 1.7 | V |
| Gate Non−Trigger Voltage | | | $V_{GD}$ | $V_D$ = Rated, Tc = 125°C | | 0.2 | — | — | V |
| Holding Current | | | $I_H$ | $R_L$ = 100Ω | | — | — | 10 | mA |
| Thermal Resistance | | | $R_{th\ (j-a)}$ | Junction to Ambient, AC | | — | — | 55 | °C / W |

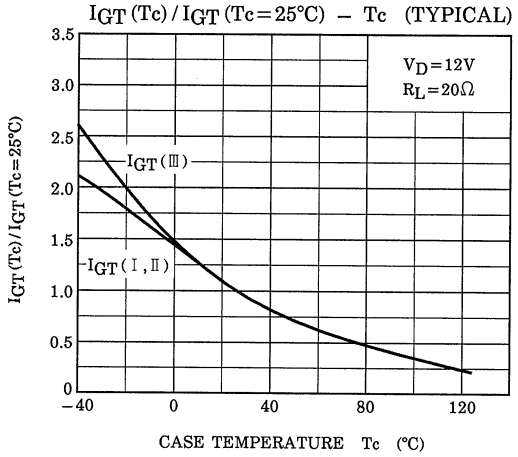
GATE TRIGGER CHARACTERISTIC
(SM2GZ47, SM2JZ47)



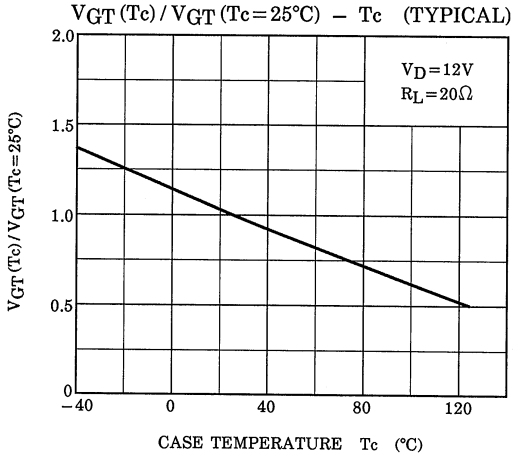

GATE TRIGGER CHARACTERISTIC
(SM2GZ47A, SM2JZ47A)



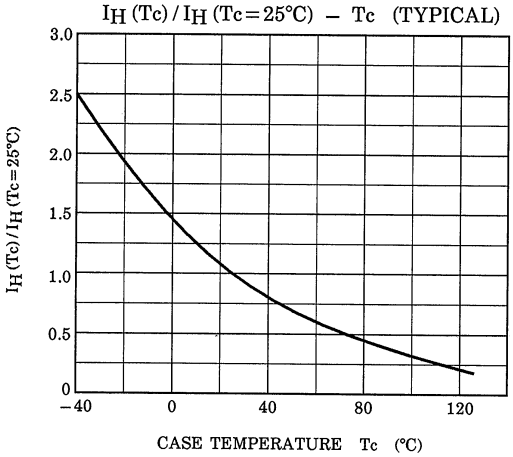

$I_{GT}$ (Tc) / $I_{GT}$ (Tc = 25°C) – Tc (TYPICAL)



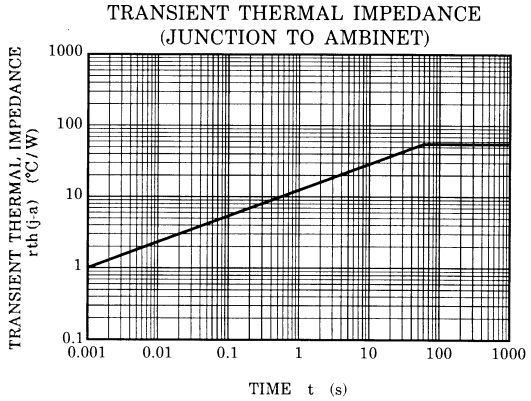

$V_{GT}$ (Tc) / $V_{GT}$ (Tc = 25°C) – Tc (TYPICAL)



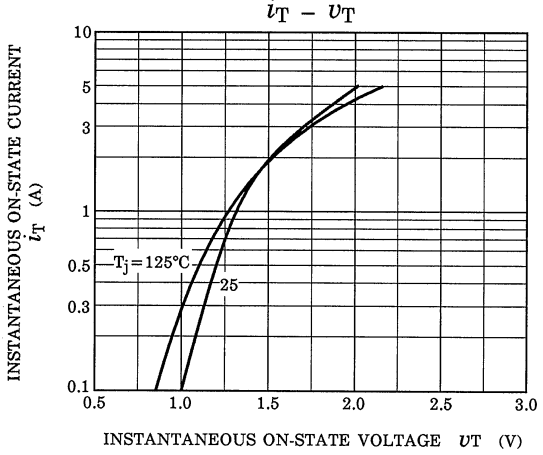

$I_H$ (Tc) / $I_H$ (Tc = 25°C) – Tc (TYPICAL)



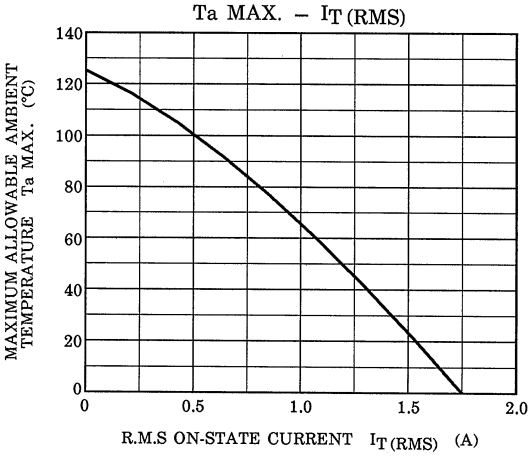

TRANSIENT THERMAL IMPEDANCE
(JUNCTION TO AMBINET)



$i_T - v_T$




Ta MAX. – $I_{T\,(RMS)}$




<CONDITION>

- NO HEAT SINK
- LEAD FORMING : LB182
- PRINT BOARD
  (t=1.6mm
  SOLDER LAND : 2mm$\phi$)

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