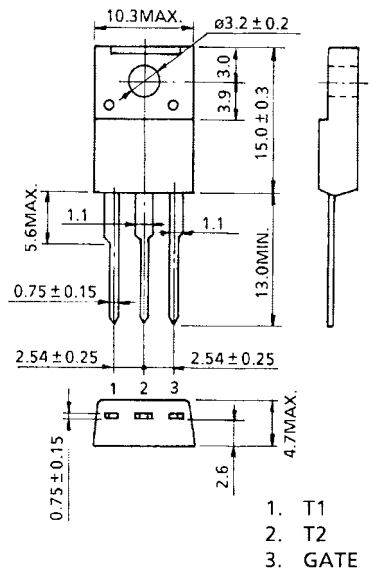
TOSHIBA BI−DIRECTIONAL TRIODE THYRISTOR SILICON PLANAR TYPE

# SM8LZ47

AC POWER CONTROL APPLICATIONS

- Repetitive Peak Off−State Voltage : $V_{DRM}$ = 800V
- R.M.S ON−State Current : $I_{T(RMS)}$ = 8A
- High Commutating (dv / dt) : (dv / dt) c = 10V / μs (Min.)
- Isolation Voltage : $V_{ISOL}$ = 1500V AC

Unit: mm




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

Weight: 1.7g

## MAXIMUM RATINGS

| CHARACTERISTIC | SYMBOL | RATING | UNIT |
|---|---|---|---|
| Repetitive PeakOff−State Voltage | $V_{DRM}$ | 800 | V |
| R.M.S On−State Current (Full Sine Waveform) | $I_{T\ (RMS)}$ | 8 | A |
| Peak One Cycle Surge On-State Current (Non−Repetitive) | $I_{TSM}$ | 70 (50Hz) | A |
| | | 80 (60Hz) | |
| $I^2t$ Limit Value | $I^2t$ | 24.5 | $A^2s$ |
| Critical Rate of Rise of On−State Current (Note 1) | di / dt | 50 | A / μs |
| Peak Gate Power Dissipation | $P_{GM}$ | 5 | W |
| Average Gate Power Dissipation | $P_{G\ (AV)}$ | 0.5 | W |
| Peak Gate Voltage | $V_{FGM}$ | 10 | V |
| Peak Gate Current | $I_{GM}$ | 2 | 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: di / dt test condition

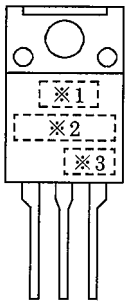
$V_{DRM}$ = 400V, $I_{TM}$≤12A, $t_{gw}$≥10μs, $t_{gr}$≤250ns,

$i_{gp}$ = $I_{GT}$×2.0

## ELECTRICAL CHARACTERISTICS (Ta = 25°C)

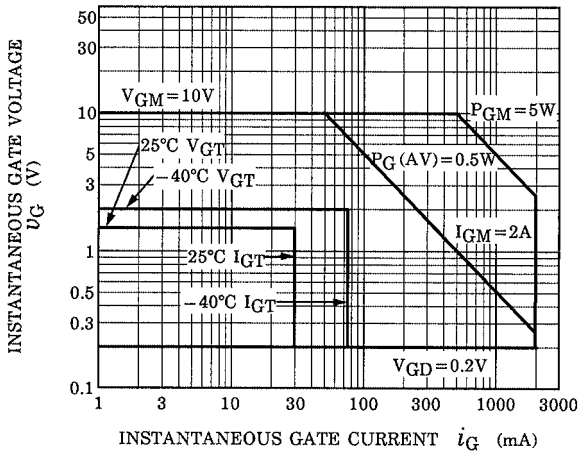
| CHARACTERISTIC | | SYMBOL | TEST CONDITION | | MIN | TYP. | MAX | UNIT |
|---|---|---|---|---|---|---|---|---|
| Repetitive Peak Off−State Current | | $I_{DRM}$ | $V_{DRM}$ = 800V | | — | — | 20 | μA |
| Gate Trigger Voltage | I | $V_{GT}$ | $V_D$ = 12V, $R_L$ = 20Ω | T2 (+), Gate (+) | — | — | 1.5 | V |
| | II | | | T2 (+), Gate (−) | — | — | 1.5 | |
| | III | | | T2 (−), Gate (−) | — | — | 1.5 | |
| Gate Trigger Current | I | $I_{GT}$ | $V_D$ = 12V, $R_L$ = 20Ω | T2 (+), Gate (+) | — | — | 30 | mA |
| | II | | | T2 (+), Gate (−) | — | — | 30 | |
| | III | | | T2 (−), Gate (−) | — | — | 30 | |
| Peak On−State Voltage | | $V_{TM}$ | $I_{TM}$ = 12A | | — | — | 1.5 | V |
| Gate Non−Trigger Voltage | | $V_{GD}$ | $V_D$ = 800V, Tc = 125°C | | 0.2 | — | — | V |
| Holding Current | | $I_H$ | $V_D$ = 12V, $I_{TM}$ = 1A | | — | — | 50 | mA |
| Thermal Resistance | | $R_{th\ (j-c)}$ | Junction to Case, AC | | — | — | 3.6 | °C / W |
| Critical Rate of Rise of Off-State Voltage | | dv / dt | $V_{DRM}$ = 800V, $T_j$ = 125°C Exponential Rise | | — | 300 | — | V / μs |
| Critical Rate of Rise of Off-State Voltage at Commutation | | (dv / dt) c | $V_{DRM}$ = 400V, $T_j$ = 125°C (di / dt) c = −4.5A / ms | | 10 | — | — | V / μs |

## MARKING

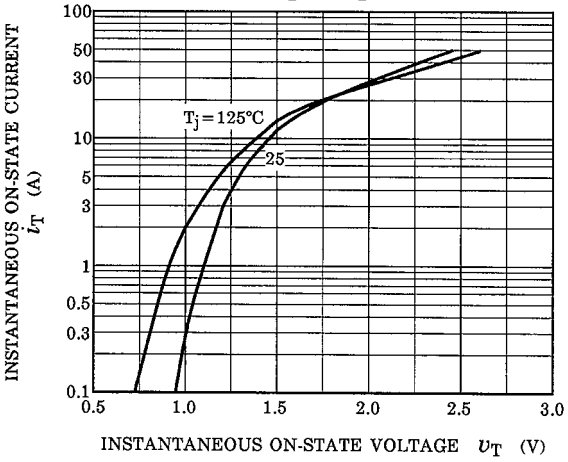



| NUMBER | SYMBOL | | MARK |
|---|---|---|---|
| * 1 | TOSHIBA PRODUCT MARK | | |
| * 2 | TYPE | SM8LZ47 | M8LZ47 |
| * 3 | Lot Number<br>Month (Starting from Alphabet A)<br>Year (Last Decimal Digit of the Current Year) | | Example<br>8A : January 1998<br>8B : Febrary 1998<br>8L : December 1998 |

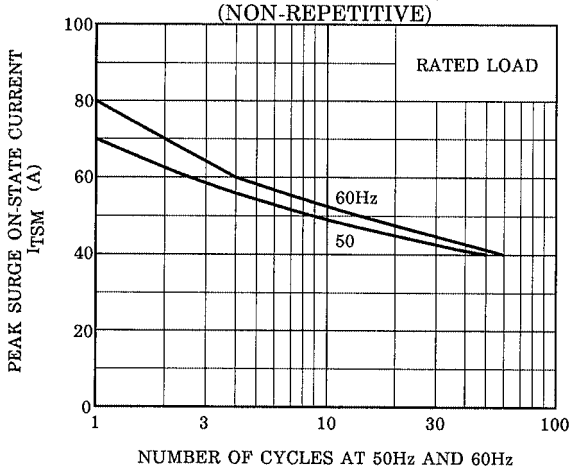
GATE TRIGGER CHARACTERISTIC



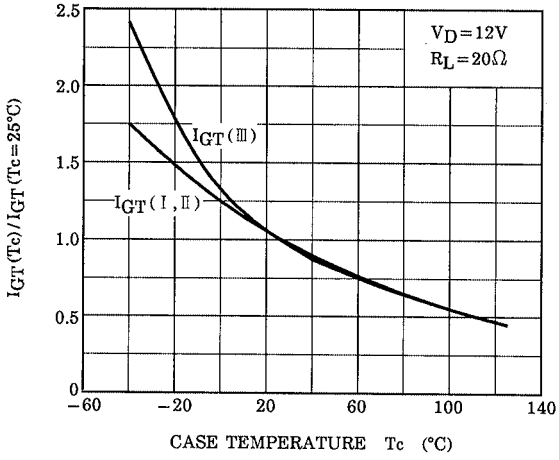

$i_T$ – $v_T$



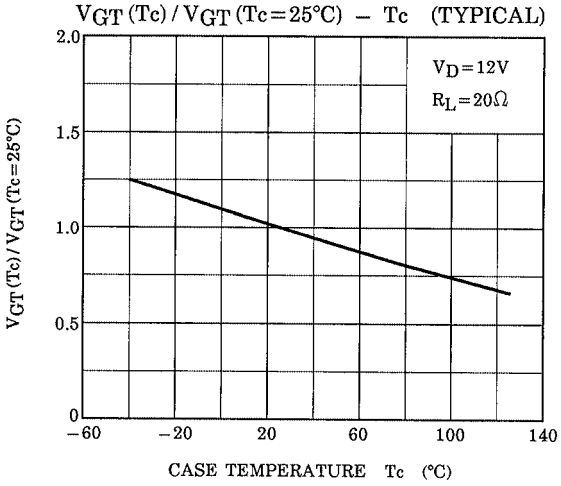

SURGE ON-STATE CURRENT
(NON-REPETITIVE)



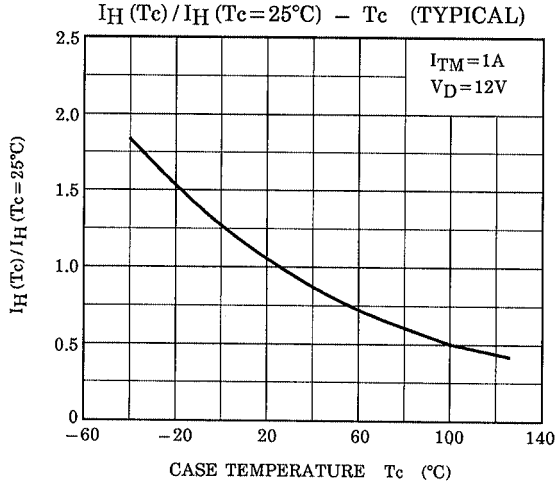

$I_{GT}$ (Tc) / $I_{GT}$ (Tc = 25°C) – Tc (TYPICAL)



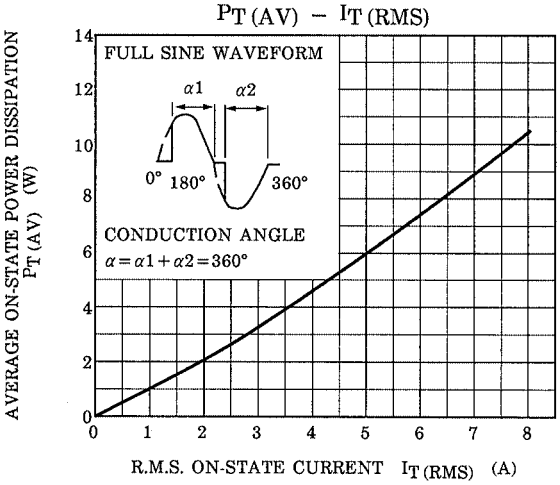

$V_{GT}$ (Tc) / $V_{GT}$ (Tc = 25°C) – Tc (TYPICAL)



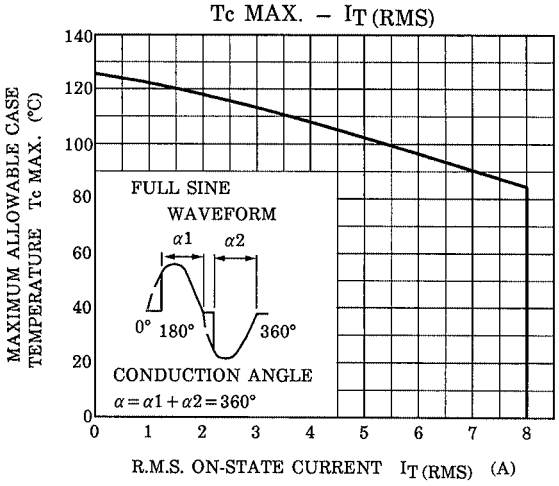

$I_H$ (Tc) / $I_H$ (Tc = 25°C) – Tc (TYPICAL)



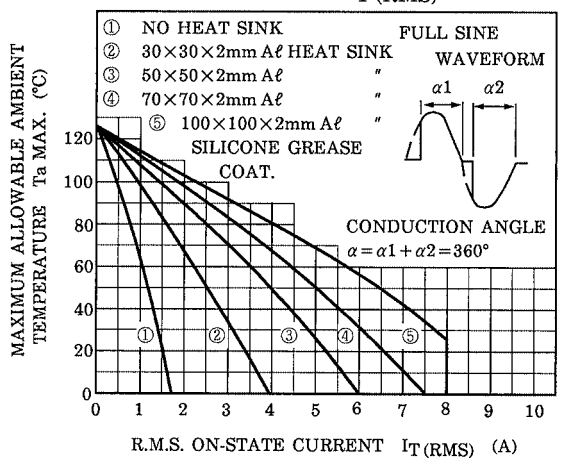
$P_{T(AV)}$ – $I_{T(RMS)}$



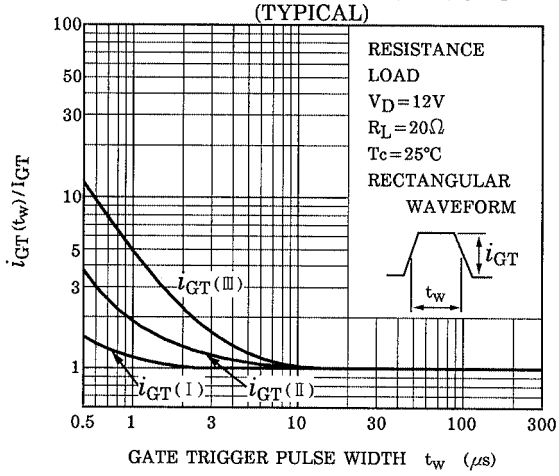

$T_c$ MAX. – $I_{T(RMS)}$



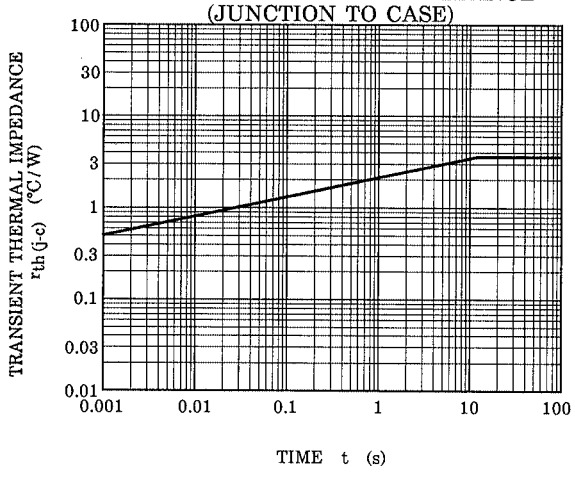

$T_a$ MAX. – $I_{T(RMS)}$




PULSE TRIGGER CHARACTERISTIC (TYPICAL)




TRANSIENT THERMAL IMPEDANCE (JUNCTION TO CASE)



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