

TOSHIBA BI-DIRECTIONAL TRIODE THYRISTOR SILICON PLANAR TYPE

SM8GZ47, SM8JZ47, SM8GZ47A, SM8JZ47A

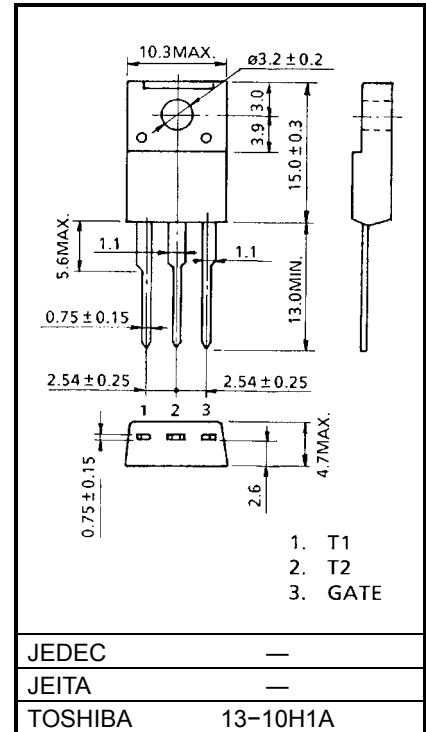
AC POWER CONTROL APPLICATIONS

- Repetitive Peak Off-State Voltage : $V_{DRM} = 400, 600V$
- R.M.S ON-State Current : $I_T (RMS) = 8A$
- High Commutating (dv / dt)
- Isolation Voltage : $V_{ISOL} = 1500V AC$

MAXIMUM RATINGS

| CHARACTERISTIC | SYMBOL | RATING | UNIT |
|--|---------------------|-----------|-------------|
| Repetitive Peak Off-State Voltage | SM8GZ47 SM8GZ47A | 400 | V |
| | SM8JZ47 SM8JZ47A | 600 | |
| R.M.S On-State Current (Full Sine Waveform $T_c = 83^\circ C$) | $I_T (RMS)$ | 8 | A |
| Peak One Cycle Surge On-State Current (Non-Repetitive) | I_{TSM} | 80 (50Hz) | A |
| | | 88 (60Hz) | |
| I^2t Limit Value | I^2t | 32 | A^2s |
| Critical Rate of Rise of On-State Current (Note 1) | di / dt | 50 | $A / \mu s$ |
| Peak Gate Power Dissipation | P_{GM} | 5 | W |
| Average Gate Power Dissipation | $P_G (AV)$ | 0.5 | W |
| Peak Gate Voltage | V_{GM} | 10 | V |
| Peak Gate Current | I_{GM} | 2 | A |
| Junction Temperature | T_j | -40~125 | $^\circ C$ |
| Storage Temperature Range | T_{stg} | -40~125 | $^\circ C$ |
| Isolation Voltage (AC, $t = 1min.$) | V_{ISOL} | 1500 | V |

Unit: mm



Weight: 1.7g

Note 1: di / dt Test Condition

$V_{DRM} = 0.5 \times \text{Rated}$

$I_{TM} \leq 12A$

$t_{gw} \geq 10\mu s$

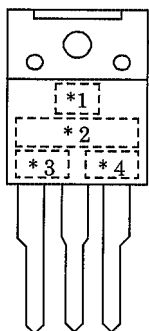
$t_{gr} \leq 250ns$

$i_{GP} = I_{GT} \times 2.0$

ELECTRICAL CHARACTERISTICS (Ta = 25°C)

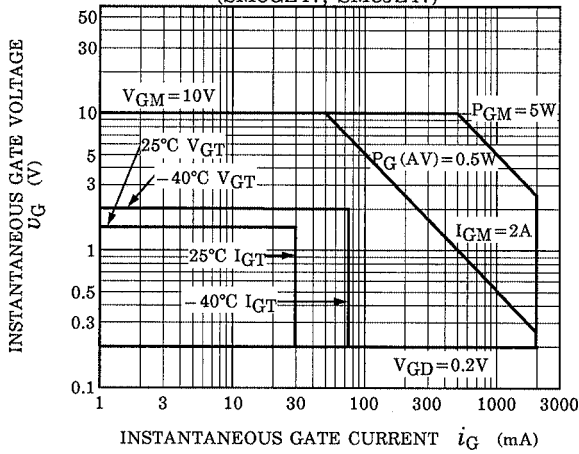
| CHARACTERISTIC | | SYMBOL | TEST CONDITION | MIN | TYP. | MAX | UNIT | |
|---|----------------------|---------------|--|------------------|------|-----|-----------------------------|----|
| Repetitive Peak Off-State Current | | I_{DRM} | $V_{DRM} = \text{Rated}$ | — | — | 20 | μA | |
| Gate Trigger Voltage | I | V_{GT} | $V_D = 12\text{V}$ $R_L = 20\Omega$ | T2 (+), Gate (+) | — | — | 1.5 | V |
| | II | | | T2 (+), Gate (-) | — | — | 1.5 | |
| | III | | | T2 (-), Gate (-) | — | — | 1.5 | |
| | IV | | | T2 (-), Gate (+) | — | — | — | |
| Gate Trigger Current | SM8GZ47 SM8JZ47 | I_{GT} | $V_D = 12\text{V}$ $R_L = 20\Omega$ | T2 (+), Gate (+) | — | — | 30 | mA |
| | | | | T2 (+), Gate (-) | — | — | 30 | |
| | | | | T2 (-), Gate (-) | — | — | 30 | |
| | | | | T2 (-), Gate (+) | — | — | — | |
| | SM8GZ47A SM8JZ47A | | | T2 (+), Gate (+) | — | — | 20 | |
| | | | | T2 (+), Gate (-) | — | — | 20 | |
| | | | | T2 (-), Gate (-) | — | — | 20 | |
| | | | | T2 (-), Gate (+) | — | — | — | |
| Peak On-State Voltage | | V_{TM} | $I_{TM} = 12\text{A}$ | — | — | 1.5 | V | |
| Gate Non-Trigger Voltage | | V_{GD} | $V_D = \text{Rated}, T_c = 125^\circ\text{C}$ | 0.2 | — | — | V | |
| Holding Current | | I_H | $V_D = 12\text{V}, I_{TM} = 1\text{A}$ | — | — | 50 | mA | |
| Thermal Resistance | | $R_{th(j-c)}$ | Junction to Case, AC | — | — | 3.6 | $^\circ\text{C} / \text{W}$ | |
| Critical Rate of Rise of Off-State Voltage | SM8GZ47 SM8JZ47 | dv / dt | $V_{DRM} = \text{Rated}, T_j = 125^\circ\text{C}$ Exponential Rise | — | 300 | — | V / μs | |
| | SM8GZ47A SM8JZ47A | | | — | 200 | — | | |
| Critical Rate of Rise of Off-State Voltage at Commutation | SM8GZ47 SM8JZ47 | $(dv / dt)_c$ | $V_{DRM} = 400\text{V}, T_j = 125^\circ\text{C}$ $(di / dt)_c = -4.5\text{A} / \text{ms}$ | 10 | — | — | V / μs | |
| | SM8GZ47A SM8JZ47A | | | 4 | — | — | | |

MARKING

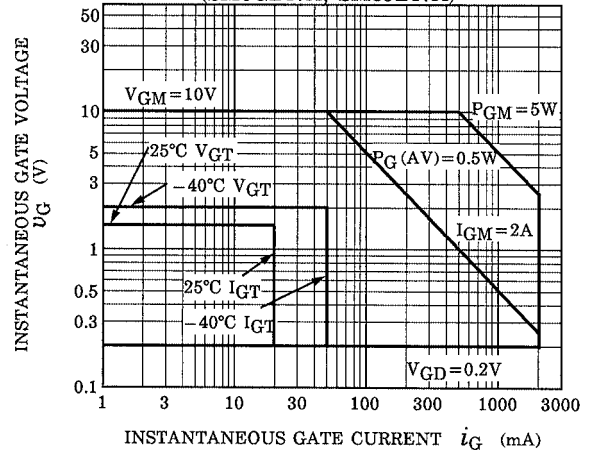


| * NUMBER | SYMBOL | MARK |
|----------|---|--|
| * 1 | TOSHIBA PRODUCT MARK | |
| * 2 | TYPE | SM8GZ47, SM8GZ47A |
| | | SM8JZ47, SM8JZ47A |
| | | SM8GZ47A, SM8JZ47A |
| * 3 | | A |
| * 4 | Lot Number Month (Starting from Alphabet A) Year (Last Decimal Digit of the Current Year) | Example 8A : January 1998 8B : February 1998 8L : December 1998 |

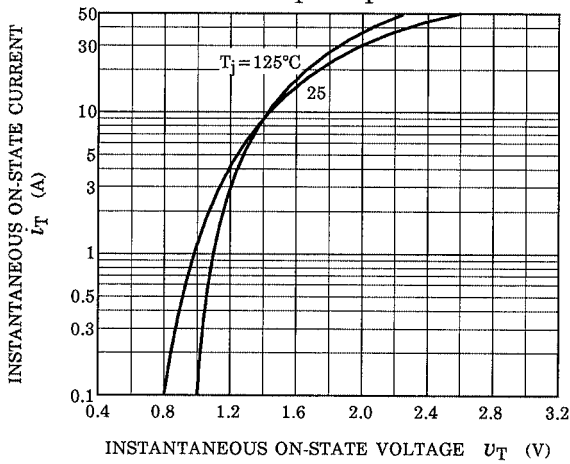
GATE TRIGGER CHARACTERISTIC
(SM8GZ47, SM8JZ47)



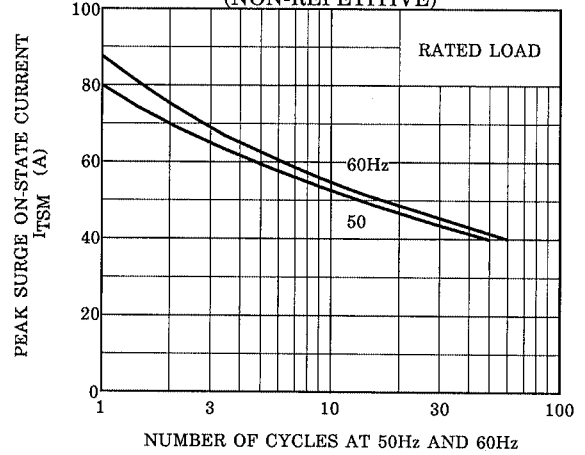
GATE TRIGGER CHARACTERISTIC
(SM8GZ47A, SM8JZ47A)



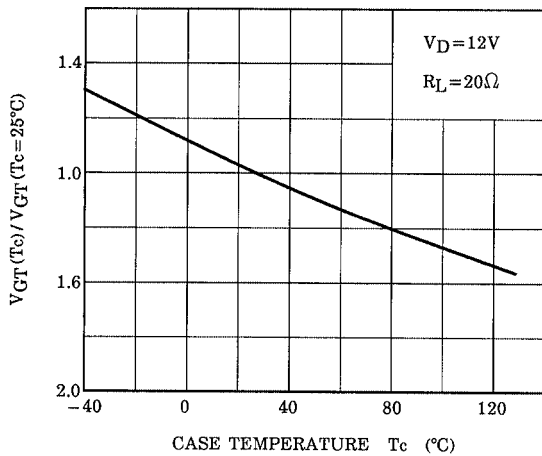
$i_T - v_T$



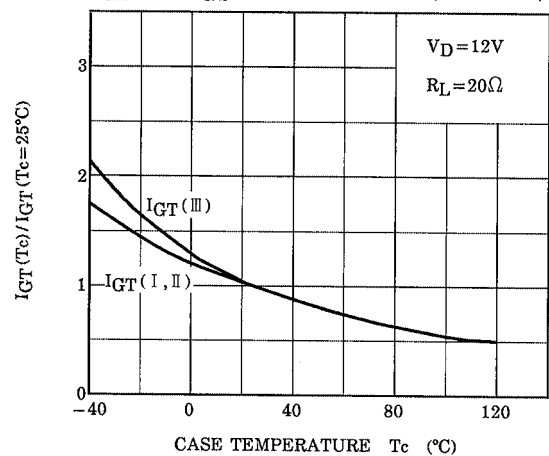
SURGE ON-STATE CURRENT
(NON-REPETITIVE)

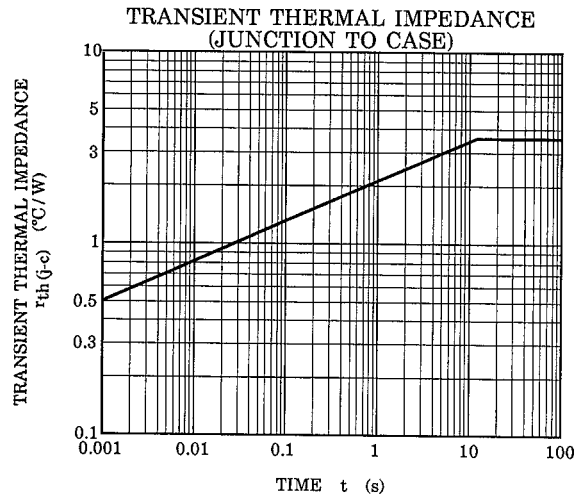
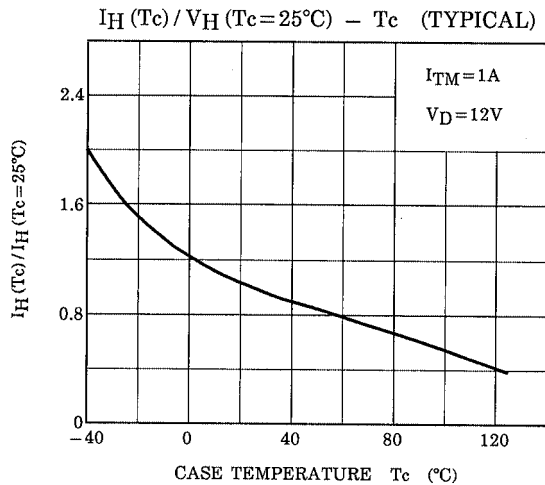
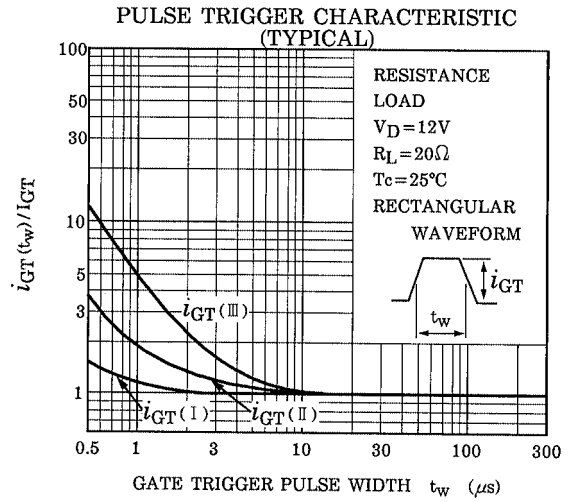
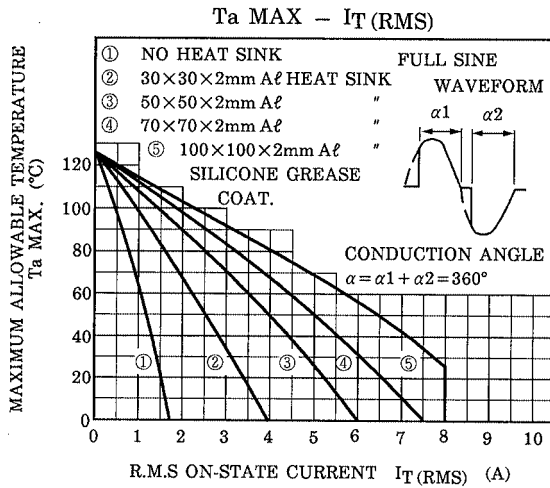
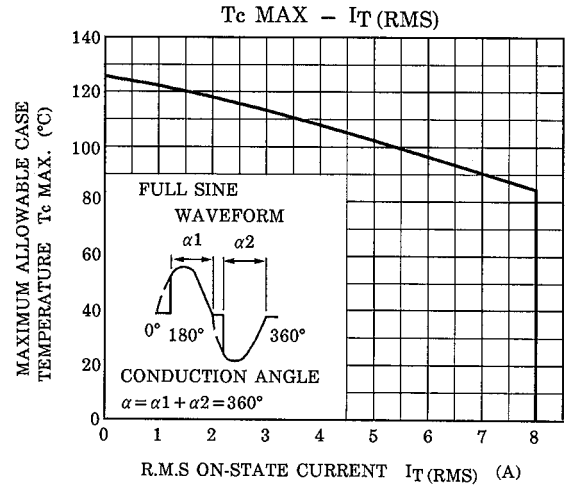
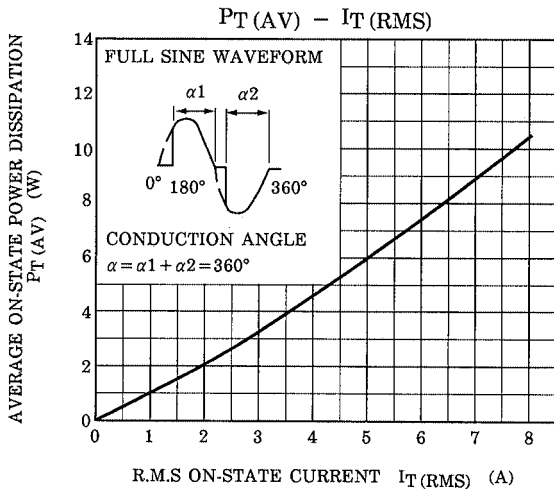


$V_{GT}(T_c) / V_{GT}(T_c=25^\circ\text{C}) - T_c$ (TYPICAL)



$I_{GT}(T_c) / I_{GT}(T_c=25^\circ\text{C}) - T_c$ (TYPICAL)





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