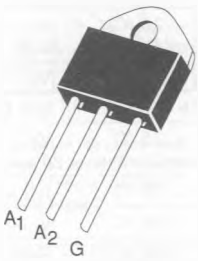
SGS-THOMSON MICROELECTRONICS

# BTB 41 A

## TRIACS

- GLASS PASSIVATED CHIP
- $I_{GT}$ SPECIFIED IN FOUR QUADRANTS




**TOP 3**
(Plastic)

### DESCRIPTION

This new design of plastic uninsulated power triacs offers maximum efficiency with maximum ease of mounting.

### ADVANTAGES

- NO TAPPING REQUIRED FOR FIXING
- EXCELLENT THERMAL IMPEDANCE AND HIGH RELIABILITY CONSTRUCTION

### ABSOLUTE RATINGS (limiting values)

| Symbol | Parameter | | Value | Unit |
|---|---|---|---|---|
| $I_{T(RMS)}$ | RMS on-state Current (360° conduction angle) | $T_C$ = 80 °C | 45 | A |
| $I_{TSM}$ | Non Repetitive Surge Peak on-state Current ($T_j$ initial = 25 °C - Half sine wave) | t = 8.3 ms | 315 | A |
| | | t = 10 ms | 300 | |
| $I^2t$ | $I^2t$ Value for Fusing | t = 10 ms | 450 | $A^2s$ |
| di/dt | Critical Rate of Rise of on-state Current (1) | Repetitive F = 50 Hz | 10 | A/µs |
| | | Non Repetitive | 50 | |
| $T_{stg}$<br>$T_j$ | Storage and Operating Junction Temperature Range | | – 40 to 125<br>– 40 to 125 | °C<br>°C |

| Symbol | Parameter | BTB 41– | | | | | Unit |
|---|---|---|---|---|---|---|---|
| | | 200A | 400A | 600A | 700A | 800A | |
| $V_{DRM}$ | Repetitive Peak off-state Voltage (2) | 200 | 400 | 600 | 700 | 800 | V |

(1) $I_G$ = 1.5 A $di_G/dt$ = 1 A/µs
(2) $T_j$ = 125 °C

### THERMAL RESISTANCES

| Symbol | Parameter | Value | Unit |
|---|---|---|---|
| $R_{th\ (j-a)}$ | Junction to Ambient | 50 | °C/W |
| $R_{th\ (c-h)}$ | Contact (case-heatsink) with Grease | 0.2 | °C/W |
| $R_{th\ (j-c)}$ DC | Junction to Case for DC | 0.95 | °C/W |
| $R_{th\ (j-c)}$ AC | Junction to Case for 360 ° Conduction Angle (F = 50 Hz) | 0.7 | °C/W |

## GATE CHARACTERISTICS (maximum values)

$P_{GM}$ = 40 W ($t_p$ = 10 µs) $I_{GM}$ = 10 A ($t_p$ = 10 µs)
$P_{G(AV)}$ = 1 W $V_{GM}$ = 16 V ($t_p$ = 10 µs)

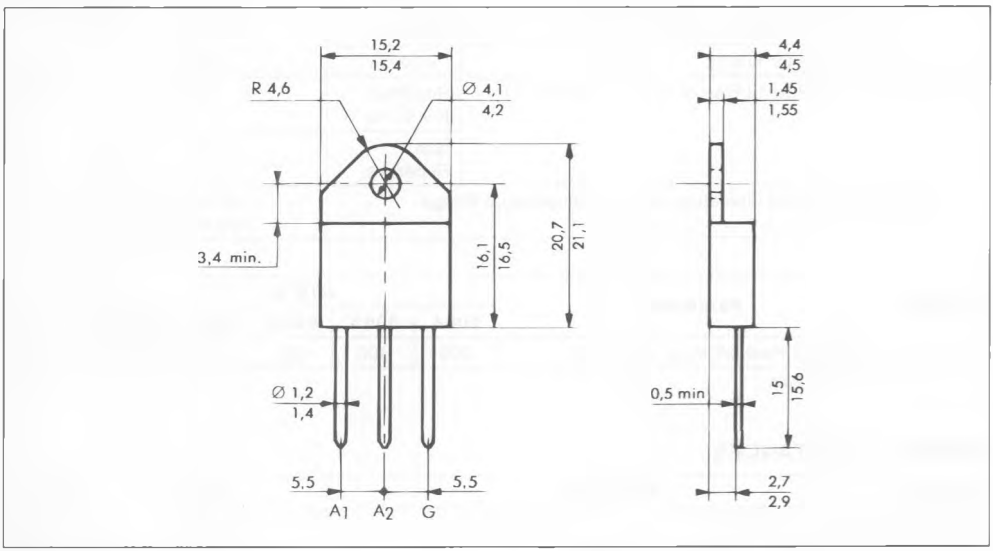
## ELECTRICAL CHARACTERISTICS

| Symbol | Test Conditions | | | Quadrants | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|---|---|
| $I_{GT}$ | $T_j$ = 25 °C<br>Pulse Duration > 20 µs | $V_D$ = 12 V | $R_L$ = 33 Ω | I-II-III | 1 | | 100 | mA |
| | | | | IV | 1 | | 150 | |
| $V_{GT}$ | $T_j$ = 25 °C<br>Pulse Duration > 20 µs | $V_D$ = 12 V | $R_L$ = 33 Ω | I-II-III-IV | | | 1.5 | V |
| $V_{GD}$ | $T_j$ = 125 °C | $V_D$ = $V_{DRM}$ | $R_L$ = 3.3 kΩ | I-II-III-IV | 0.2 | | | V |
| $I_H$* | $T_j$ = 25 °C | $I_T$ = 500 mA | Gate Open | | | 30 | 100 | mA |
| $I_L$ | $T_j$ = 25 °C<br>Pulse Duration > 20 µs | $V_D$ = 12 V | $I_G$ = 300 mA | I-II-III-IV | | | 150 | mA |
| $V_{TM}$* | $T_j$ = 25 °C | $I_{TM}$ = 60 A | $t_p$ = 10 ms | | | | 1.8 | V |
| $I_{DRM}$* | $T_j$ = 125 °C | $V_{DRM}$ Specified | | | | 1.5 | 6 | mA |
| dv/dt* | $T_j$ = 125 °C<br>Linear Slope up to $V_D$ = 67 % $V_{DRM}$ | Gate Open | | | 250 | | | V/µs |
| $(dv/dt)_c$* | $T_C$ = 75 °C<br>$(di/dt)_c$ = 20 A/ms | $V_D$ = $V_{DRM}$ | $I_T$ = 60 A | | 10 | | | V/µs |
| $t_{gt}$ | $T_j$ = 25 °C<br>$I_G$ = 1 A | $V_D$ = $V_{DRM}$<br>$di_G/dt$ = 10 A/µs | $I_T$ = 60 A | I-II-III-IV | | 2.5 | | µs |

* For either polarity of electrode $A_2$ voltage with reference to electrode $A_1$.

## PACKAGE MECHANICAL DATA

TOP 3 Plastic




Cooling method : by conduction (method C)
Marking : type number
Weight : 5 g

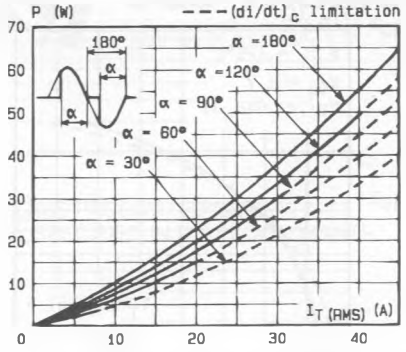



Fig.1 - Maximum mean power dissipation versus RMS on-state current (f = 60 Hz).

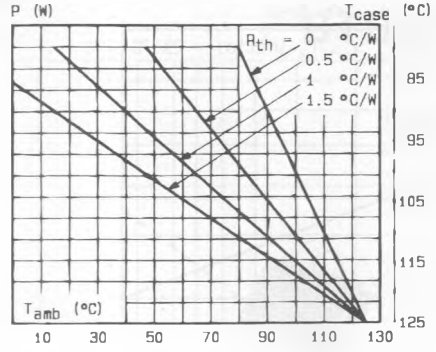



Fig.2 - Correlation between maximum mean power dissipation and maximum allowable temperatures ($T_{amb}$ and $T_{case}$) for different thermal resistances heatsink + contact.

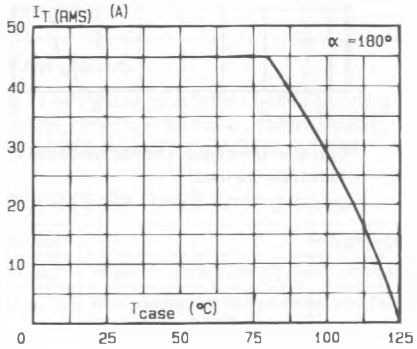



Fig.3 - RMS on-state current versus case temperature.

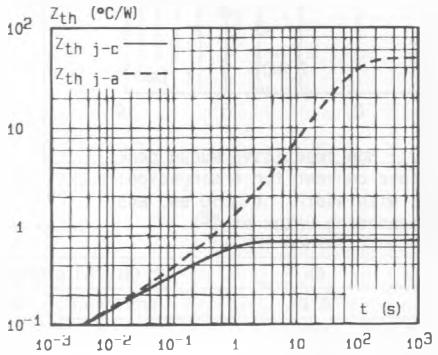



Fig.4 - Thermal transient impedance junction to case and junction to ambient versus pulse duration.

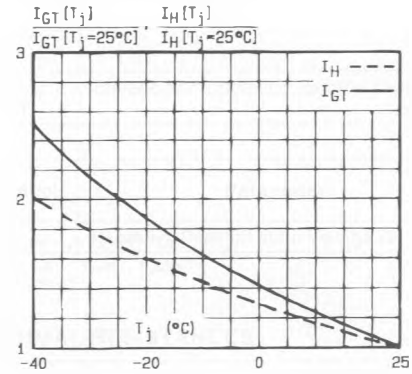



Fig.5 - Relative variation of gate trigger current and holding current versus junction temperature.

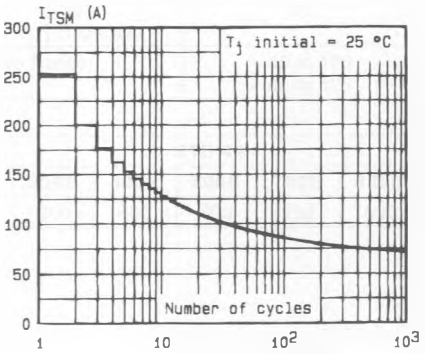



Fig.6 - Non repetitive surge peak on-state current versus number of cycles.

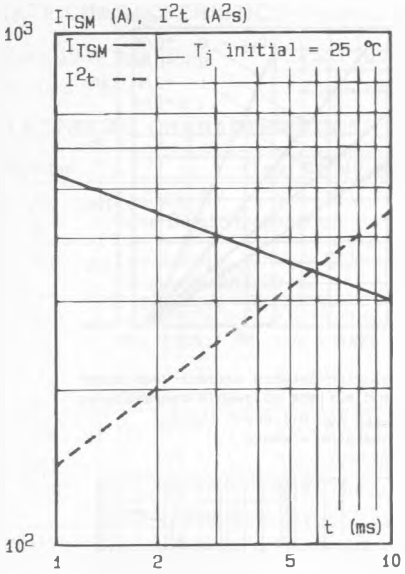



Fig.7 - Non repetitive surge peak on-state current for a sinusoidal pulse with width : t ≤ 10 ms, and corresponding value of $I^2t$.

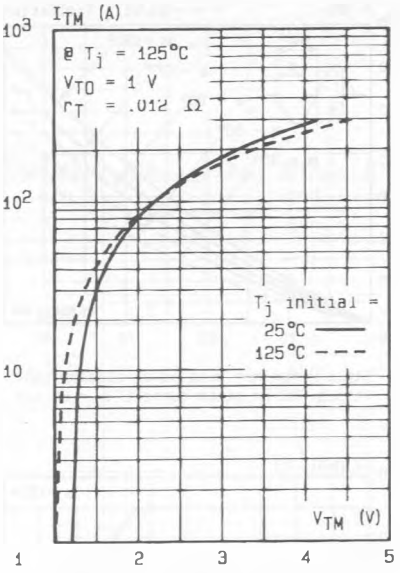



Fig.8 - On-state characteristics (maximum values).