SGS-THOMSON MICROELECTRONICS

# BTA/BTB 06 SW

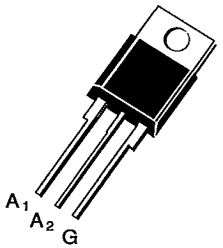
S G S-THOMSON

## LOGIC LEVEL TRIACS

- $I_{TRMS}$ = 6 A at $T_c$ = 80 °C.
- $V_{DRM}$ : 200 V to 800 V.
- $I_{GT}$ = 10 mA (QI-II-III).
- $(di/dt)_c$ = 3.5 A / ms @ $(dv/dt)_c$ = 50 V / µs.
- SUITED FOR LOW POWER TRIGGER CIRCUITS (INTEGRATED CIRCUITS AND MICROPROCESSORS).
- GLASS PASSIVATED CHIP.
- HIGH EFFICIENCY SWITCHING.
- AVAILABLE IN INSULATED VERSION → BTA SERIES (INSULATING VOLTAGE : 2500 $V_{RMS}$) OR IN UNINSULATED VERSION → BTB SERIES.
- UL RECOGNIZED FOR BTA SERIES (E81734).

### DESCRIPTION

New range suited for applications such as phase control and static switching on inductive or resistive load.




**TO 220 AB**
(CB-415 Plastic)

### ABSOLUTE RATINGS (limiting values)

| Symbol | Parameter | | Value | Unit |
|---|---|---|---|---|
| $I_{TRMS}$ | RMS on-state current (360 ° conduction angle) | $T_c$ = 80 °C | 6 | A |
| $I_{TSM}$ | Non repetitive surge peak on-state current ($T_j$ initial = 25 °C) | t = 8.3 ms | 95 | A |
| | | t = 10 ms | 85 | |
| $I^2t$ | $I^2t$ value | t = 10 ms | 36 | $A^2s$ |
| di/dt | Critical rate of rise of on-state current (1) | Repetitive F = 50 Hz | 20 | A /µs |
| | | Non Repetitive | 100 | |
| $T_{stg}$ $T_j$ | Storage and operating junction temperature range | | - 40, + 150<br>- 40, + 110 | °C<br>°C |

| Symbol | Parameter | BTA/BTB 06- | | | | | Unit |
|---|---|---|---|---|---|---|---|
| | | 200 SW | 400 SW | 600 SW | 700 SW | 800 SW | |
| $V_{DRM}$ | Repetitive peak off-state voltage (2) | ± 200 | ± 400 | ± 600 | ± 700 | ± 800 | V |

(1) Gate supply : $I_G$ = 100 mA – $di_G/dt$ = 1 A / µs.
(2) $T_j$ = 110 °C.



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## THERMAL RESISTANCES

| Symbol | Parameter | Value | Unit |
|---|---|---|---|
| $R_{th\ (j-a)}$ | Junction to ambient | 60 | °C/W |
| $R_{th\ (j-c)}$ DC | Junction to case for DC | 4.8 | °C/W |
| $R_{th\ (j-c)}$ AC | Junction to case for 360 ° conduction angle (F = 50 Hz) | 3.6 | °C/W |

## GATE CHARACTERISTICS (maximum values)

$P_{GM}$ = 40 W (t = 10 µs) $P_{G(AV)}$ = 1 W $I_{GM}$ = 4 A (t = 10 µs) $V_{GM}$ = 16 V (t = 10 µs).

## ELECTRICAL CHARACTERISTICS

| Symbol | Test Conditions | | | Quadrants | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|---|---|
| $I_{GT}$ | $T_j$ = 25 °C $V_D$ = 12 V<br>Pulse duration > 20 µs | | $R_L$ = 33 Ω | I-II-III | | | 10 | mA |
| $V_{GT}$ | $T_j$ = 25 °C $V_D$ = 12 V<br>Pulse duration > 20 µs | | $R_L$ = 33 Ω | I-II-III | | | 1.5 | V |
| $V_{GD}$ | $T_j$ = 110 °C $V_D$ = $V_{DRM}$<br>Pulse duration > 20 µs | | $R_L$ = 3.3 kΩ | I-II-III | 0.2 | | | V |
| $I_H$* | $T_j$ = 25 °C $I_T$ = 100 mA<br>Gate open $R_L$ = 140 Ω | | | | | | 25 | mA |
| $I_L$ | $T_j$ = 25 °C $V_D$ = 12 V<br>Pulse duration > 20 µs | | $R_L$ = 33 Ω<br>$I_G$ = 50 mA | I-III<br>II | | 25<br>50 | | mA |
| $V_{TM}$* | $T_j$ = 25 °C | $I_{TM}$ = 8.5 A | $t_p$ = 10 ms | | | | 1.75 | V |
| $I_{DRM}$* | $T_j$ = 25 °C<br>$T_j$ = 110 °C | $V_{DRM}$ rated | Gate open | | | | 10<br>500 | µA |
| dv/dt* | $T_j$ = 110 °C Gate open<br>Linear slope up to 0.67 $V_{DRM}$ | | | | 50 | | | V/µs |
| $(di/dt)_c$* | $T_j$ = 110 °C<br>$T_j$ = 110 °C | $(dv/dt)_c$ = 0.1 V/µs<br>$(dv/dt)_c$ = 50 V/µs | | | 3.5<br>2.7 | 5<br>3.5 | | A/ms |
| $t_{gt}$ | $T_j$ = 25 °C $di_G/dt$ = 1 A/µs<br>$I_T$ = 8.5 A $V_D$ = $V_{DRM}$ | | $I_G$ = 50 mA | I-II-III | | 2 | | µs |

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



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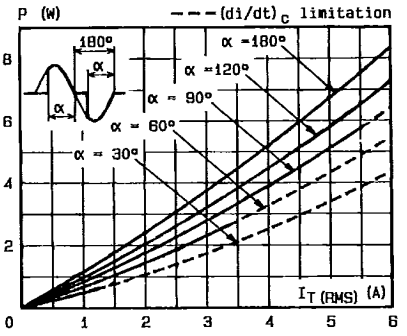


Fig.1 - Maximum mean power dissipation versus RMS on-state current (f = 50 Hz).

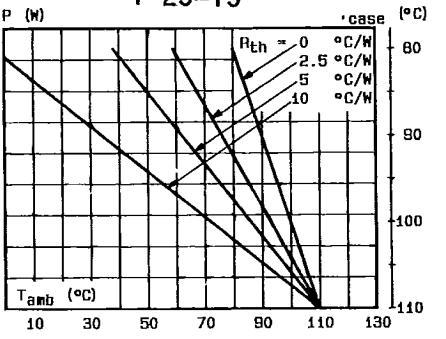


Fig.2 - Correlation between maximum mean power dissipation and maximum allowable temperatures ($T_{amb}$ and $T_{case}$) for different thermal resistances heatsink + contact.

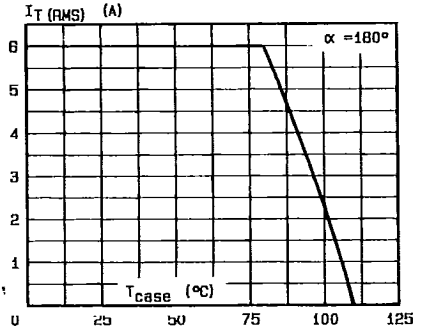


Fig.3 - RMS on-state current versus case temperature.

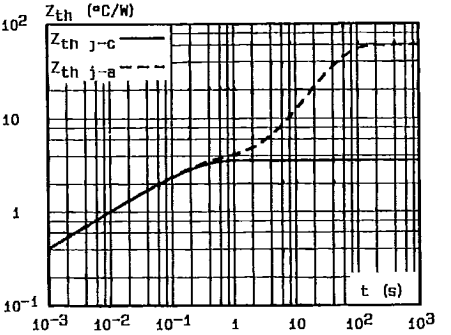


Fig.4 - Thermal transient impedance junction to case and junction to ambient versus pulse duration.

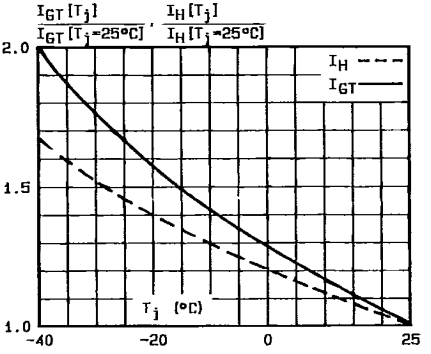


Fig.5 - Relative variation of gate trigger current and holding current versus junction temperature.

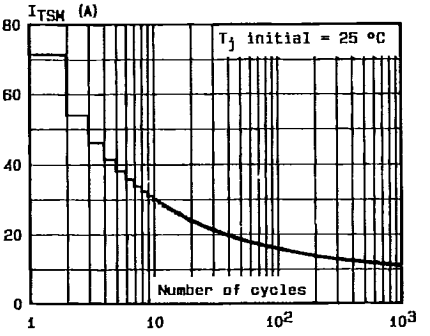


Fig.6 - Non repetitive surge peak on-state current versus number of cycles.



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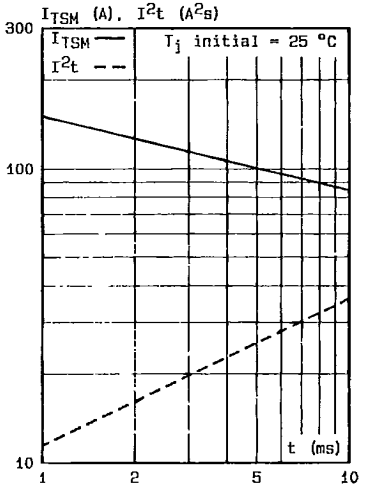


Fig.7 - Non repetitive surge peak on-state current for a sinusoidal pulse with width : t ≤ 10 ms, and corresponding value of $I^2t$.

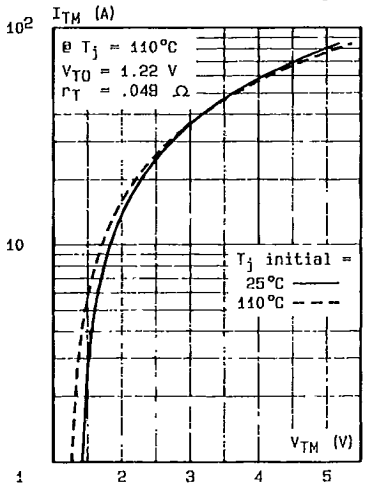


Fig.8 - On-state characteristics (maximum values).

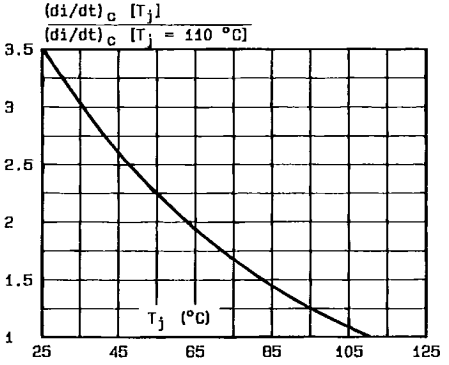


Fig.9 - Relative variation of $(di/dt)_c$ versus junction temperature.

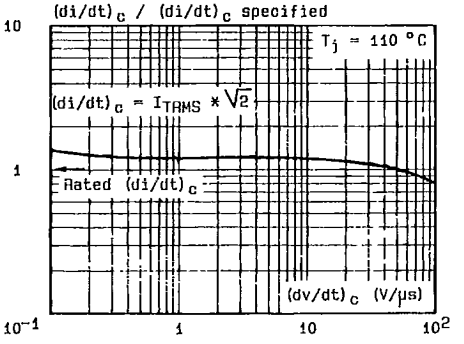


Fig.10 - Relative variation of $(di/dt)_c$ versus $(dv/dt)_c$ (inductive load) (typical values).



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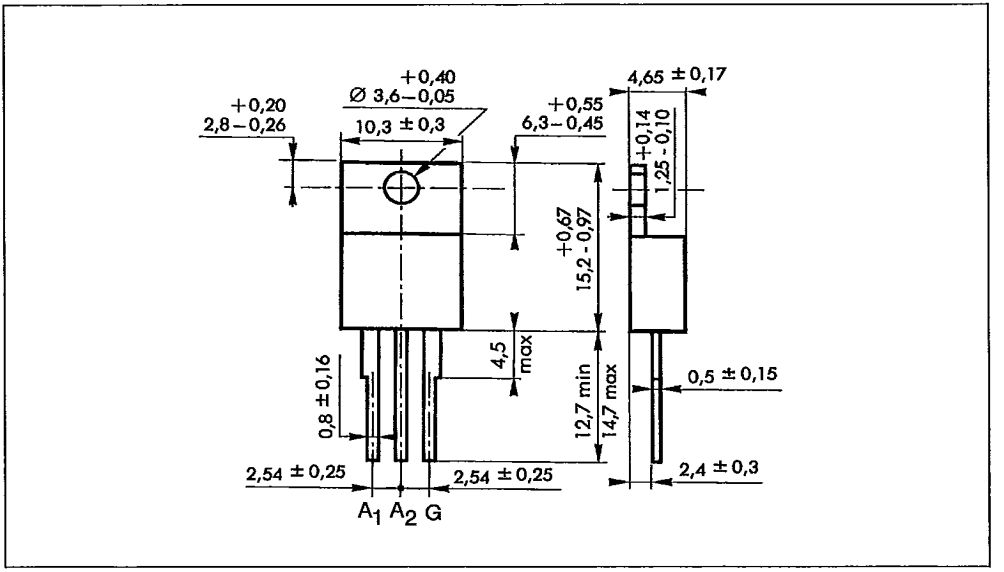
## PACKAGE MECHANICAL DATA

TO 220 AB (CB-415) Plastic




Cooling method : by conduction (method C)
Marking : type number
Weight : 2 g



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