



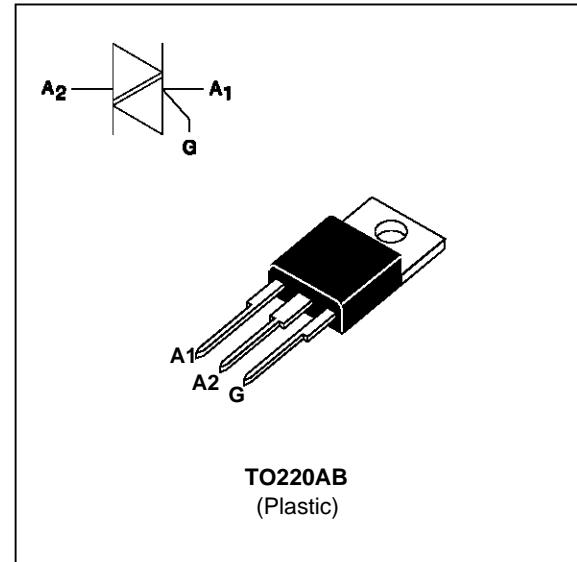
SNUBBERLESS TRIACS

FEATURES

- HIGH COMMUTATION : $(di/dt)c > 18A/ms$ without snubber
- HIGH SURGE CURRENT : $I_{TSM} = 200A$
- V_{DRM} UP TO 800V
- BTA Family :
 - INSULATING VOLTAGE = 2500V(RMS)
 - (UL RECOGNIZED : E81734)

DESCRIPTION

The BTA/BTB20 BW/CW triac family are high performance glass passivated chips technology. The SNUBBERLESS™ concept offer suppression of RC network and it is suitable for application such as phase control and static switching on inductive or resistive load.



ABSOLUTE RATINGS (limiting values)

| Symbol | Parameter | | | Value | Unit | |
|------------|--|--------------------------------|-------------------------|----------|------|--|
| IT(RMS) | RMS on-state current (360° conduction angle) | BTA | Tc = 70 °C | 20 | A | |
| | | BTB | Tc = 90 °C | | | |
| ITSM | Non repetitive surge peak on-state current (Tj initial = 25°C) | | tp = 8.3 ms | 210 | A | |
| | | | tp = 10 ms | 200 | | |
| I2t | I2t value | tp = 10 ms | | 200 | A2s | |
| dl/dt | Critical rate of rise of on-state current Gate supply : Ig = 500mA diG/dt = 1A/μs | | Repetitive F = 50 Hz | 20 | A/μs | |
| | | | Non Repetitive | 100 | | |
| Tstg Tj | Storage and operating junction temperature range | - 40 to + 150 - 40 to + 125 | | °C °C | | |
| Tl | Maximum lead temperature for soldering during 10 s at 4.5 mm from case | 260 | | °C | | |

| Symbol | Parameter | BTA / BTB20... BW/CW | | | | Unit |
|--------------------------------------|--|----------------------|-----|-----|-----|------|
| | | 400 | 600 | 700 | 800 | |
| V _{DRM} V _{RRM} | Repetitive peak off-state voltage Tj = 125 °C | 400 | 600 | 700 | 800 | V |

BTA20 BW/CW / BTB20 BW/CW

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 | | BTA | 2.8 | °C/W |
| | BTB | 1.7 | | | |
| R _{th} (j-c) AC | Junction to case for 360° conduction angle (F = 50 Hz) | | BTA | 2.1 | °C/W |
| | BTB | 1.3 | | | |

GATE CHARACTERISTICS (maximum values)

P_G (AV) = 1W P_{GM} = 10W (tp = 20 μs) I_{GM} = 4A (tp = 20 μs) V_{GM} = 16V (tp = 20 μs).

ELECTRICAL CHARACTERISTICS

| Symbol | Test Conditions | Quadrant | | Suffix | | Unit |
|--------------------------------------|---|-----------------------|----------|--------|------|------|
| | | | | BW | CW | |
| I _{GT} | V _D =12V (DC) R _L =33Ω | T _j =25°C | I-II-III | MIN | 2 | 1 |
| | | | | MAX | 50 | 35 |
| V _{GT} | V _D =12V (DC) R _L =33Ω | T _j =25°C | I-II-III | MAX | 1.5 | V |
| V _{GD} | V _D =V _{DRM} R _L =3.3kΩ | T _j =125°C | I-II-III | MIN | 0.2 | V |
| t _{GT} | V _D =V _{DRM} I _G = 500mA dI _G /dt = 3A/μs | T _j =25°C | I-II-III | TYP | 2 | μs |
| I _L | I _G =1.2 I _{GT} | T _j =25°C | I-III | TYP | 50 | - |
| | | | II | TYP | 90 | - |
| | | | I-II-III | MAX | - | 80 |
| I _H * | I _T = 500mA gate open | T _j =25°C | | MAX | 75 | 50 |
| V _{TM} * | I _{TM} = 28A tp= 380μs | T _j =25°C | | MAX | 1.70 | V |
| I _{DRM} I _{RRM} | V _{DRM} Rated V _{RRM} Rated | T _j =25°C | | MAX | 0.01 | mA |
| | | T _j =125°C | | MAX | 3 | |
| dV/dt * | Linear slope up to V _D =67%V _{DRM} gate open | T _j =125°C | | MIN | 500 | 250 |
| | | | | TYP | 750 | 500 |
| (dI/dt) _c * | Without snubber | T _j =125°C | | MIN | 18 | 11 |
| | | | | TYP | 36 | 22 |

* For either polarity of electrode A2 voltage with reference to electrode A1.

ORDERING INFORMATION

| Package | $I_T(\text{RMS})$ | $V_{\text{DRM}} / V_{\text{RRM}}$ | Sensitivity Specification | | | |
|----------------------|-------------------|-----------------------------------|---------------------------|---|----|----|
| | | | A | V | BW | CW |
| BTA (Insulated) | 20 | 400 | X | | X | |
| | | 600 | X | | X | |
| | | 700 | X | | X | |
| | | 800 | X | | X | |
| BTB (Uninsulated) | | 400 | X | | X | |
| | | 600 | X | | X | |
| | | 700 | X | | X | |
| | | 800 | X | | X | |

Fig.1 : Maximum RMS power dissipation versus RMS on-state current ($F=50\text{Hz}$).
(Curves are cut off by $(dI/dt)_c$ limitation)

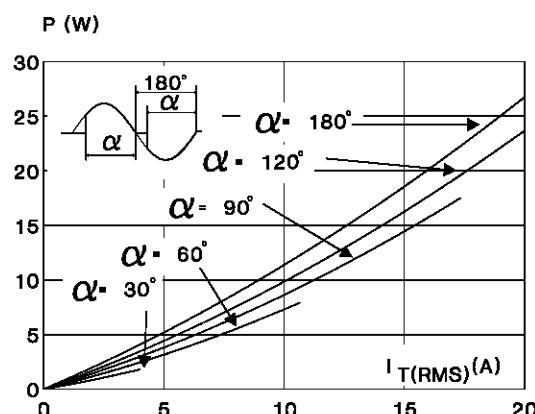


Fig.2 : Correlation between maximum RMS power dissipation and maximum allowable temperatures (T_{amb} and T_{case}) for different thermal resistances heatsink + contact (BTA).

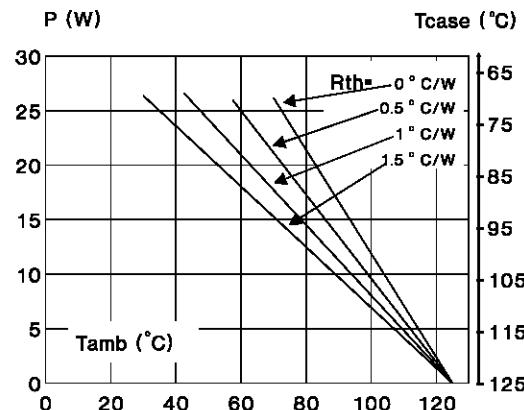


Fig.3 : Correlation between maximum RMS power dissipation and maximum allowable temperatures (T_{amb} and T_{case}) for different thermal resistances heatsink + contact (BTB).

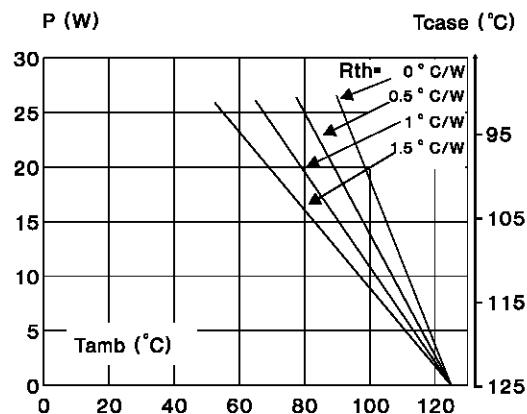
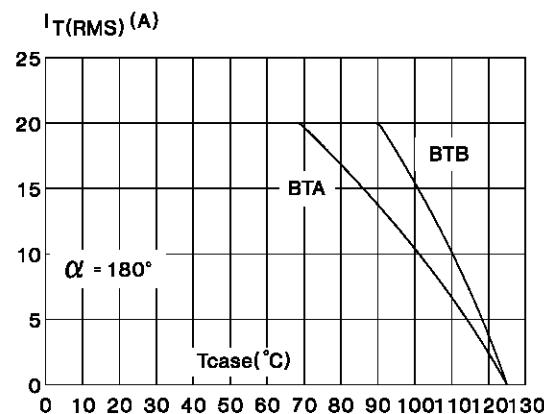


Fig.4 : RMS on-state current versus case temperature.



BTA20 BW/CW / BTB20 BW/CW

Fig.5 : Relative variation of thermal impedance versus pulse duration.

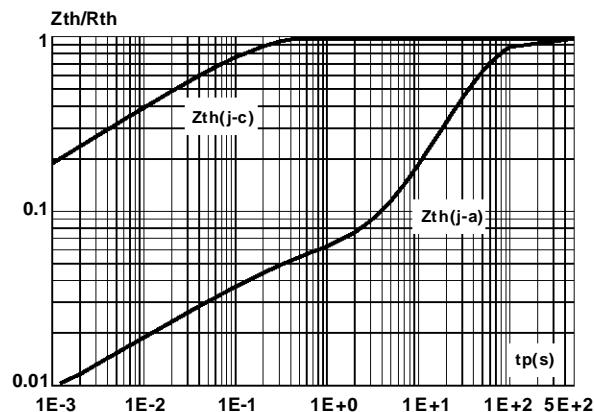


Fig.7 : Non Repetitive surge peak on-state current versus number of cycles.

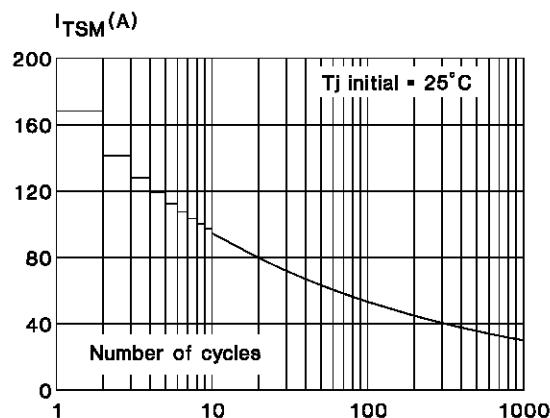


Fig.9 : On-state characteristics (maximum values).

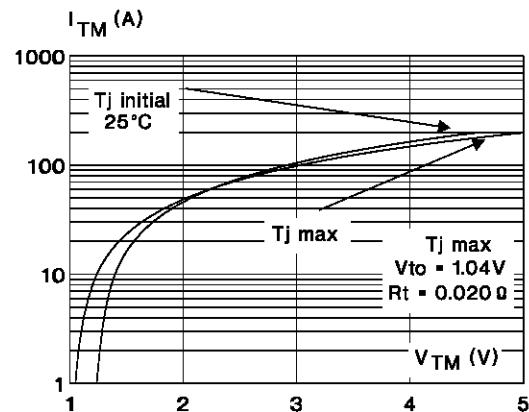


Fig.6 : Relative variation of gate trigger current and holding current versus junction temperature.

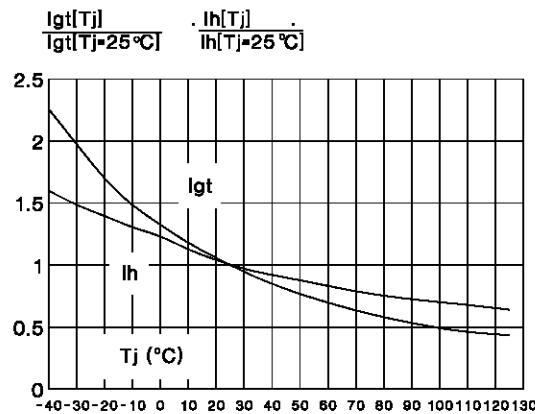
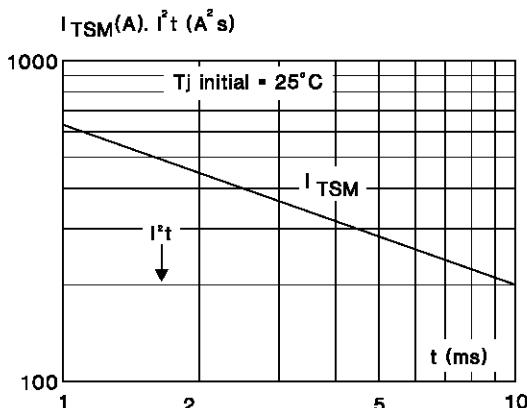
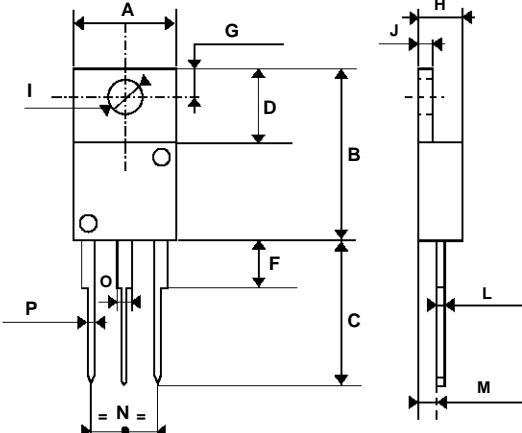


Fig.8 : Non repetitive surge peak on-state current for a sinusoidal pulse with width : $t \leq 10\text{ms}$, and corresponding value of I^2t .



PACKAGE MECHANICAL DATA

TO220AB Plastic



| REF. | DIMENSIONS | | | |
|------|-------------|-------|--------|-------|
| | Millimeters | | Inches | |
| | Min. | Max. | Min. | Max. |
| A | 10.20 | 10.50 | 0.401 | 0.413 |
| B | 14.23 | 15.87 | 0.560 | 0.625 |
| C | 12.70 | 14.70 | 0.500 | 0.579 |
| D | 5.85 | 6.85 | 0.230 | 0.270 |
| F | | | 4.50 | 0.178 |
| G | 2.54 | 3.00 | 0.100 | 0.119 |
| H | 4.48 | 4.82 | 0.176 | 0.190 |
| I | 3.55 | 4.00 | 0.140 | 0.158 |
| J | 1.15 | 1.39 | 0.045 | 0.055 |
| L | 0.35 | 0.65 | 0.013 | 0.026 |
| M | 2.10 | 2.70 | 0.082 | 0.107 |
| N | 4.58 | 5.58 | 0.18 | 0.22 |
| O | 0.80 | 1.20 | 0.031 | 0.048 |
| P | 0.64 | 0.96 | 0.025 | 0.038 |

Cooling method : C

Marking : type number

Weight : 2.3 g

Recommended torque value : 0.8 m.N.

Maximum torque value : 1 m.N.

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