



BTA/BTB10 Series

SNUBBERLESS™ & STANDARD

10A TRIACs

MAIN FEATURES:

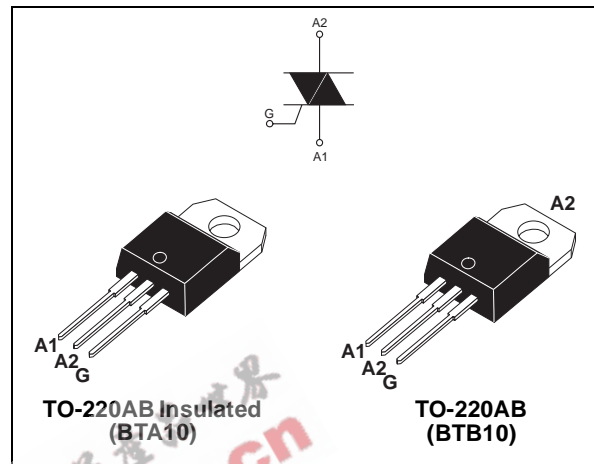
| Symbol | Value | Unit |
|-------------------|-------------|------|
| $I_{T(RMS)}$ | 10 | A |
| V_{DRM}/V_{RRM} | 600 and 800 | V |
| $I_{GT}(Q_1)$ | 25 to 50 | mA |

DESCRIPTION

Available either in standard or snubberless version, the BTA/BTB10 triac series is suitable for general purpose AC switching. They can be used as an ON/OFF function in applications such as static relays, heating regulation, induction motor starting circuits... or for phase control operation in light dimmers, motor speed controllers, ...

The snubberless version (W suffix) is specially recommended for use on inductive loads, thanks to their high commutation performances.

By using an internal ceramic pad, the BTA series provides voltage insulated tab (rated at 2500 V RMS) complying with UL standards (File ref.: E81734).



ABSOLUTE MAXIMUM RATINGS

| Symbol | Parameter | Value | Unit | | |
|--------------------|--|---------------|-------------|--------------------------------|------------------|
| $I_{T(RMS)}$ | RMS on-state current (full sine wave) | TO-220AB | 10 | A | |
| | | TO-220AB Ins. | | | |
| I_{TSM} | Non repetitive surge peak on-state current (full cycle, T_j initial = 25°C) | F = 60 Hz | t = 16.7 ms | 105 | A |
| | | F = 50 Hz | t = 20 ms | | |
| I^2t | I^2t Value for fusing | tp = 10 ms | | 55 | A ² s |
| di/dt | Critical rate of rise of on-state current $I_G = 2 \times I_{GT}$, tr ≤ 100 ns | F = 120 Hz | Tj = 125°C | 50 | A/μs |
| V_{DSM}/V_{RSM} | Non repetitive surge peak off-state voltage | tp = 10 ms | Tj = 25°C | $V_{DRM}/V_{RRM} + 100$ | V |
| I_{GM} | Peak gate current | tp = 20 μs | Tj = 125°C | 4 | A |
| $P_{G(AV)}$ | Average gate power dissipation | Tj = 125°C | | 1 | W |
| T_{stg} T_j | Storage junction temperature range Operating junction temperature range | | | - 40 to + 150 - 40 to + 125 | °C |

BTA/BTB10 Series

ELECTRICAL CHARACTERISTICS (T_j = 25°C, unless otherwise specified)

■ SNUBBERLESS™ (3 Quadrants)

| Symbol | Test Conditions | Quadrant | | BTA/BTB10 | | Unit |
|--------------------------|--|--------------|------|-----------|------|------|
| | | | | CW | BW | |
| I _{GT} (1) | V _D = 12 V R _L = 33 Ω | I - II - III | MAX. | 35 | 50 | mA |
| V _{GT} | | I - II - III | MAX. | 1.3 | | V |
| V _{GD} | V _D = V _{DRM} R _L = 3.3 kΩ T _j = 125°C | I - II - III | MIN. | 0.2 | | V |
| I _H (2) | I _T = 500 mA | | MAX. | 35 | 50 | mA |
| I _L | I _G = 1.2 I _{GT} | I - III | MAX. | 50 | 70 | mA |
| | | II | | 60 | 80 | |
| dV/dt (2) | V _D = 67 % V _{DRM} gate open T _j = 125°C | | MIN. | 500 | 1000 | V/μs |
| (dI/dt) _c (2) | Without snubber T _j = 125°C | | MIN. | 5.5 | 9.0 | A/ms |

■ STANDARD (4 Quadrants)

| Symbol | Test Conditions | Quadrant | | BTA/BTB10 | | Unit |
|--------------------------|--|--------------------|------|-----------|-----------|------|
| | | | | C | B | |
| I _{GT} (1) | V _D = 12 V R _L = 33 Ω | I - II - III IV | MAX. | 25 50 | 50 100 | mA |
| V _{GT} | | ALL | MAX. | 1.3 | | V |
| V _{GD} | V _D = V _{DRM} R _L = 3.3 kΩ T _j = 125°C | ALL | MIN. | 0.2 | | V |
| I _H (2) | I _T = 500 mA | | MAX. | 25 | 50 | mA |
| I _L | I _G = 1.2 I _{GT} | I - III - IV | MAX. | 40 | 50 | mA |
| | | II | | 80 | 100 | |
| dV/dt (2) | V _D = 67 % V _{DRM} gate open T _j = 125°C | | MIN. | 200 | 400 | V/μs |
| (dI/dt) _c (2) | (dI/dt) _c = 4.4 A/ms T _j = 125°C | | MIN. | 5 | 10 | V/μs |

STATIC CHARACTERISTICS

| Symbol | Test Conditions | | | Value | Unit | |
|--------------------------------------|-------------------------------------|-------------------------|------------------------|-------|------|----|
| V _{TM} (2) | I _{TM} = 14 A | t _p = 380 μs | T _j = 25°C | MAX. | 1.55 | V |
| V _{to} (2) | Threshold voltage | | T _j = 125°C | MAX. | 0.85 | V |
| R _d (2) | Dynamic resistance | | T _j = 125°C | MAX. | 40 | mΩ |
| I _{DRM} I _{RRM} | V _{DRM} = V _{RRM} | | T _j = 25°C | MAX. | 5 | μA |
| | | | T _j = 125°C | | 1 | mA |

Note 1: minimum I_{GT} is guaranteed at 5% of I_{GT} max.

Note 2: for both polarities of A2 referenced to A1

THERMAL RESISTANCES

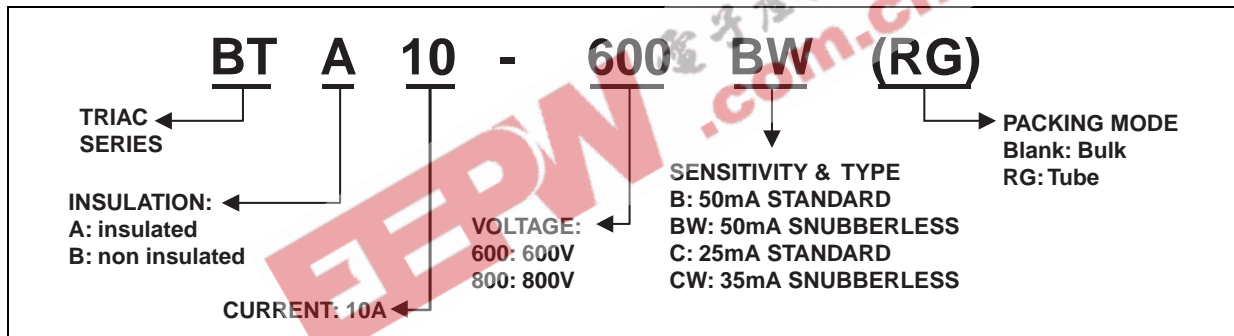
| Symbol | Parameter | | Value | Unit |
|----------------------|-----------------------|--------------------|-------|------|
| R _{th(j-c)} | Junction to case (AC) | TO-220AB | 1.5 | °C/W |
| | | TO-220AB Insulated | 2.4 | |
| R _{th(j-a)} | Junction to ambient | TO-220AB | 60 | °C/W |
| | | TO-220AB Insulated | | |

PRODUCT SELECTOR

| Part Number | Voltage (xxx) | | Sensitivity | Type | Package |
|-----------------|---------------|-------|-------------|-------------|----------|
| | 600 V | 800 V | | | |
| BTA/BTB10-xxxB | X | X | 50 mA | Standard | TO-220AB |
| BTA/BTB10-xxxBW | X | X | 50 mA | Snubberless | TO-220AB |
| BTA/BTB10-xxxC | X | X | 25 mA | Standard | TO-220AB |
| BTA/BTB10-xxxCW | X | X | 35 mA | Snubberless | TO-220AB |

BTB: Non insulated TO-220AB package

ORDERING INFORMATION



OTHER INFORMATION

| Part Number | Marking | Weight | Base quantity | Packing mode |
|-------------------|-----------------|--------|---------------|--------------|
| BTA/BTB10-xxxzy | BTA/BTB10xxxzy | 2.3 g | 250 | Bulk |
| BTA/BTB10-xxxzyRG | BTA/BTB10-xxxzy | 2.3 g | 50 | Tube |

Note: xxx = voltage, y = sensitivity, z = type

Fig. 1: Maximum power dissipation versus RMS on-state current (full cycle).

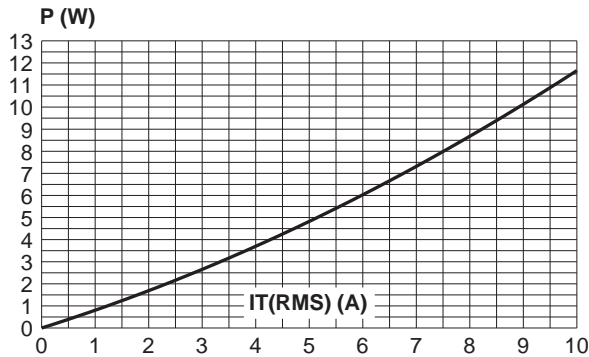


Fig. 3: Relative variation of thermal impedance versus pulse duration.

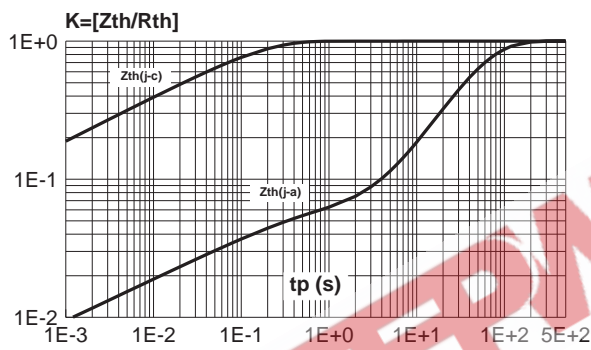


Fig. 5: Surge peak on-state current versus number of cycles.

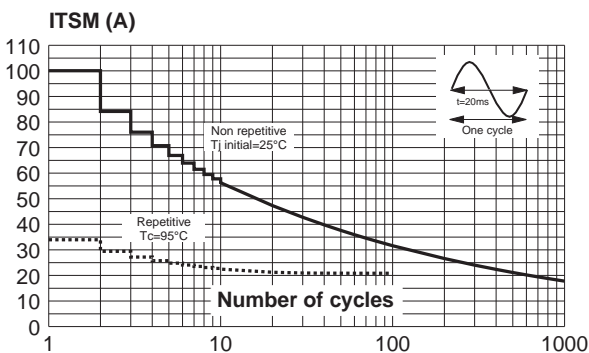


Fig. 2: RMS on-state current versus case temperature (full cycle).

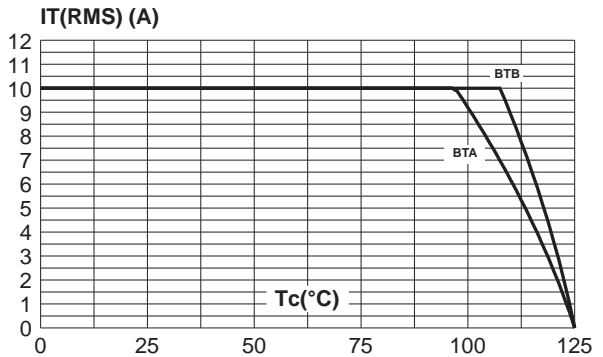


Fig. 4: On-state characteristics (maximum values).

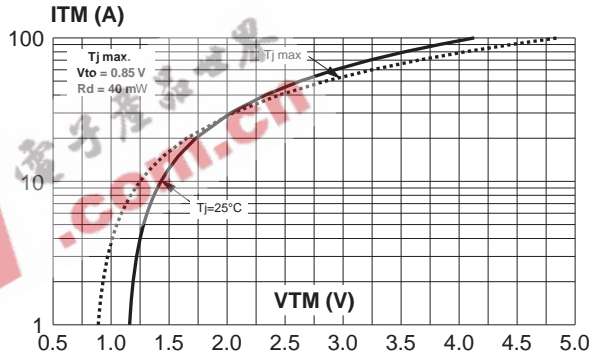


Fig. 6: Non-repetitive surge peak on-state current for a sinusoidal pulse with width $t_p < 10\text{ms}$, and corresponding value of I^2t .

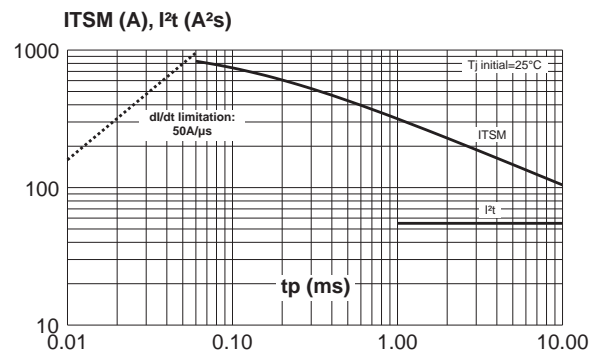


Fig. 7: Relative variation of gate trigger current, holding current and latching current versus junction temperature (typical values).

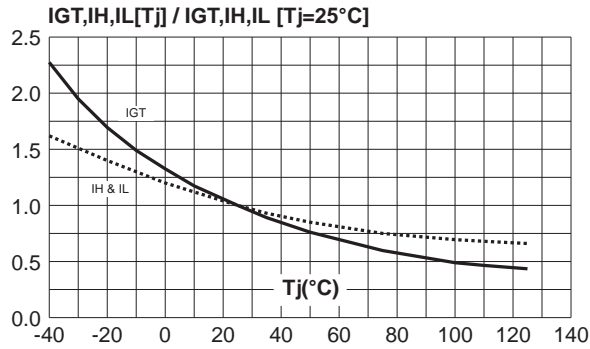


Fig. 8: Relative variation of critical rate of decrease of main current versus (dV/dt)c (typical values).

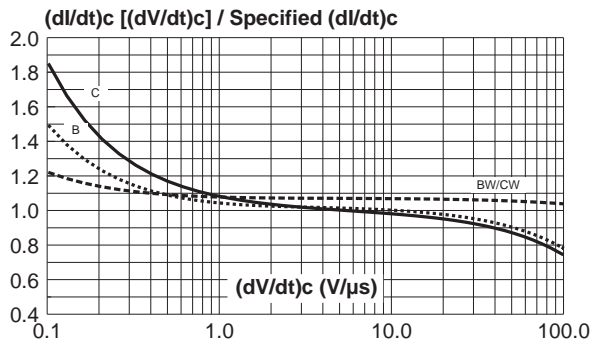
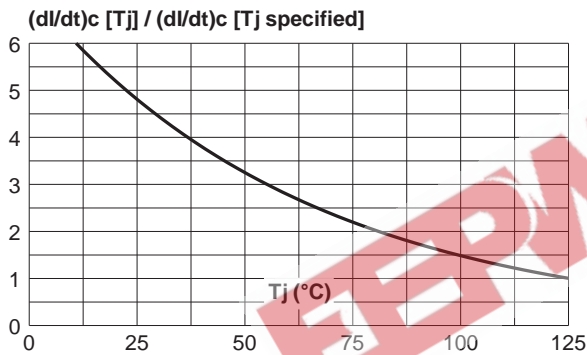


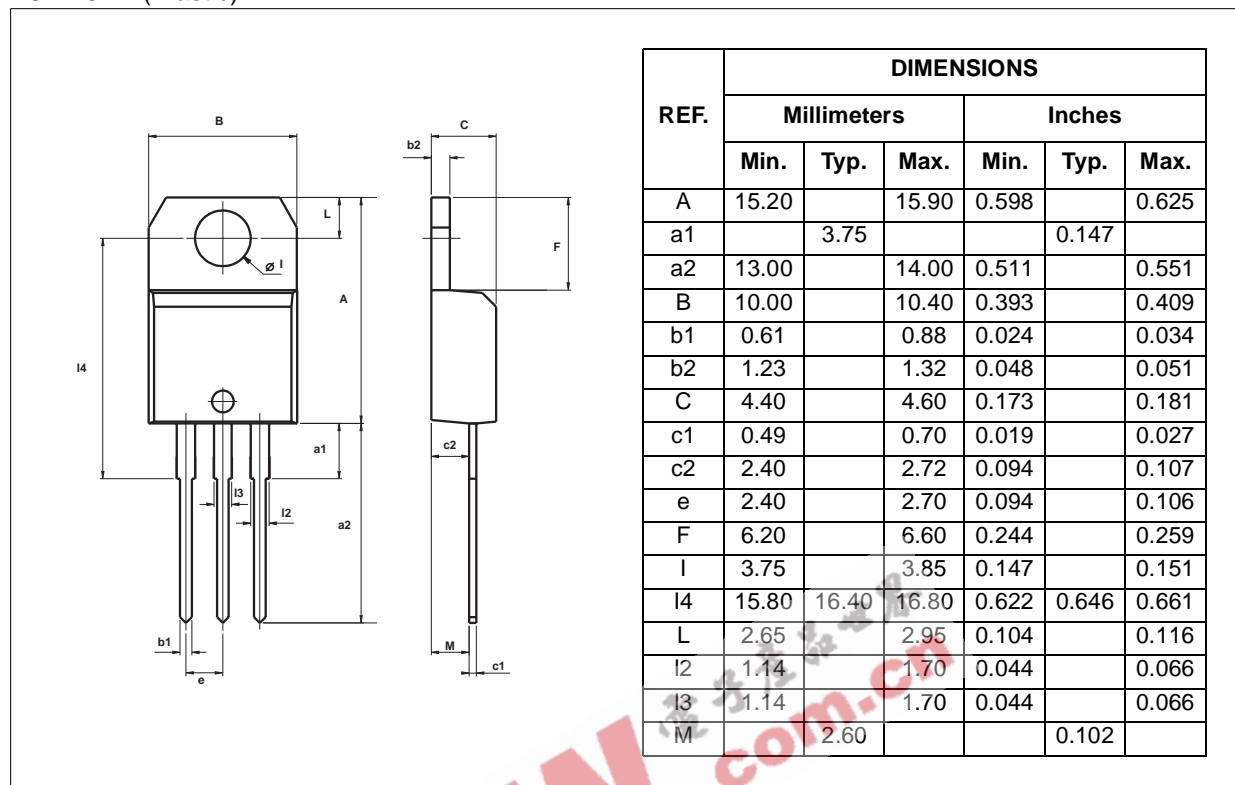
Fig. 9: Relative variation of critical rate of decrease of main current versus junction temperature.



BTA/BTB10 Series

PACKAGE MECHANICAL DATA

TO-220AB (Plastic)



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