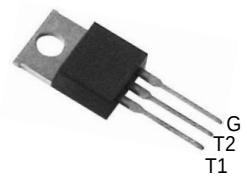
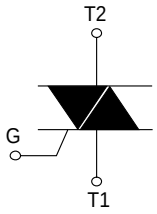
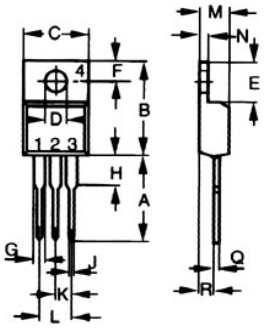
# BTB/BTA08

## Discrete Triacs(Non-Isolated/Isolated)




Dimensions TO-220AB




| Dim. | Inches | | Milimeter | |
|---|---|---|---|---|
| | Min. | Max. | Min. | Max. |
| A | 0.500 | 0.550 | 12.70 | 13.97 |
| B | 0.580 | 0.630 | 14.73 | 16.00 |
| C | 0.390 | 0.420 | 9.91 | 10.66 |
| D | 0.139 | 0.161 | 3.54 | 4.08 |
| E | 0.230 | 0.270 | 5.85 | 6.85 |
| F | 0.100 | 0.125 | 2.54 | 3.18 |
| G | 0.045 | 0.065 | 1.15 | 1.65 |
| H | 0.110 | 0.230 | 2.79 | 5.84 |
| J | 0.025 | 0.040 | 0.64 | 1.01 |
| K | 0.100 | BSC | 2.54 | BSC |
| M | 0.170 | 0.190 | 4.32 | 4.82 |
| N | 0.045 | 0.055 | 1.14 | 1.39 |
| Q | 0.014 | 0.022 | 0.35 | 0.56 |
| R | 0.090 | 0.110 | 2.29 | 2.79 |

### ABSOLUTE MAXIMUM RATINGS

| Symbol | Parameter | | | Value | Unit |
|---|---|---|---|---|---|
| $I_{T(RMS)}$ | RMS on-state current (full sine wave) | TO-220AB | Tc = 110°C | 8 | A |
| $I_{TSM}$ | Non repetitive surge peak on-state current (full cycle, Tj initial = 25°C) | F = 60 Hz | t = 16.7 ms | 84 | A |
| | | F = 50 Hz | t = 20 ms | 80 | |
| $I^2t$ | $I^2t$ Value for fusing | tp = 10 ms | | 36 | $A^2s$ |
| dI/dt | Critical rate of rise of on-state current $I_G$ = 2 x $I_{GT}$ , tr ≤ 100 ns | F = 120 Hz | Tj = 125°C | 50 | A/µs |
| $I_{GM}$ | Peak gate current | tp = 20 µs | Tj = 125°C | 4 | A |
| $P_{G(AV)}$ | Average gate power dissipation | | Tj = 125°C | 1 | W |
| $T_{stg}$<br>$T_j$ | Storage junction temperature range<br>Operating junction temperature range | | | - 40 to + 150<br>- 40 to + 125 | °C |

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

■ **SNUBBERLESS™ and LOGIC LEVEL(3 Quadrants)**

| Symbol | Test Conditions | Quadrant | | BTA/BTB | | Unit |
|---|---|---|---|---|---|---|
| | | | | CW | BW | |
| $I_{GT}$ (1) | $V_D$ = 12 V $R_L$ = 30 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 Tj = 125°C | I - II - III | MIN. | 0.2 | | V |
| $I_H$ (2) | $I_T$ = 100 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 Tj = 125°C | | MIN. | 400 | 1000 | V/µs |
| (dI/dt)c (2) | Without snubber Tj = 125°C | | MIN. | 4.5 | 7 | A/ms |

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## Discrete Triacs(Non-Isolated/Isolated)

### ■ STANDARD (4 Quadrants)

| Symbol | Test Conditions | Quadrant | | Value | Unit |
|---|---|---|---|---|---|
| $I_{GT}$ (1) | $V_D$ = 12 V $R_L$ = 30 Ω | I - II - III<br>IV | MAX. | 50<br>100 | mA |
| $V_{GT}$ | | ALL | MAX. | 1.3 | V |
| $V_{GD}$ | $V_D = V_{DRM}$ $R_L$ = 3.3 Ω Tj = 125°C | ALL | MIN. | 0.2 | V |
| $I_H$ (2) | $I_T$ = 500 mA | | MAX. | 50 | mA |
| $I_L$ | $I_G = 1.2\ I_{GT}$ | I - III - IV | MAX. | 50 | mA |
| | | II | | 100 | |
| dV/dt (2) | $V_D$ = 67 % $V_{DRM}$ gate open Tj = 125°C | | MIN. | 400 | V/µs |
| (dV/dt)c (2) | (dI/dt)c =3.5 A/ms Tj = 125°C | | MIN. | 10 | V/µs |

### STATIC CHARACTERISTICS

| Symbol | Test Conditions | | | Value | Unit |
|---|---|---|---|---|---|
| $V_{TM}$ (2) | $I_{TM}$ = 11 A tp = 380 µs | Tj = 25°C | MAX. | 1.55 | V |
| $V_{to}$ (2) | Threshold voltage | Tj = 125°C | MAX. | 0.85 | V |
| $R_d$ (2) | Dynamic resistance | Tj = 125°C | MAX. | 50 | mΩ |
| $I_{DRM}$ | $V_{DRM} = V_{RRM}$ | Tj = 25°C | MAX. | 5 | µA |
| $I_{RRM}$ | | Tj = 125°C | | 1 | mA |

**Note 1**: minimum IGT is guaranted at 5% of IGT 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) | 1.6 | °C/W |
| $R_{th(j-a)}$ | Junction to ambient | 60 | °C/W |

### PRODUCT SELECTOR

| Part Number | Voltage (xxx) | | Sensitivity | Type | Package |
|---|---|---|---|---|---|
| | 200 V ~~ 1000 V | | | | |
| BTB/BTA08 | X | X | 50 mA | Standard | TO-220AB |

### OTHER INFORMATION

| Part Number | Marking | Weight | Base quantity | Packing mode |
|---|---|---|---|---|
| BTB/BTA08 | BTB/BTA08 | 2.3 g | 250 | Bulk |

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## Discrete Triacs(Non-Isolated/Isolated)

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

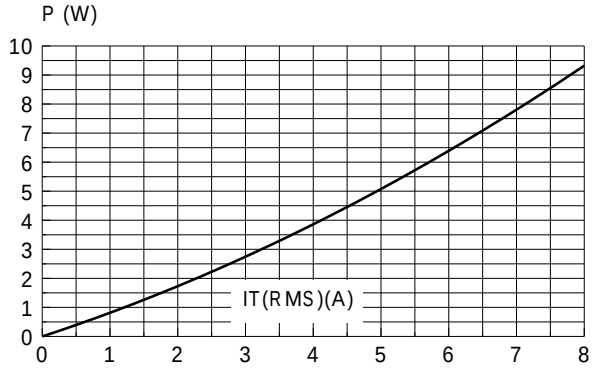



Fig. 2-1: RMS on-state current versus case temperature (full cycle).

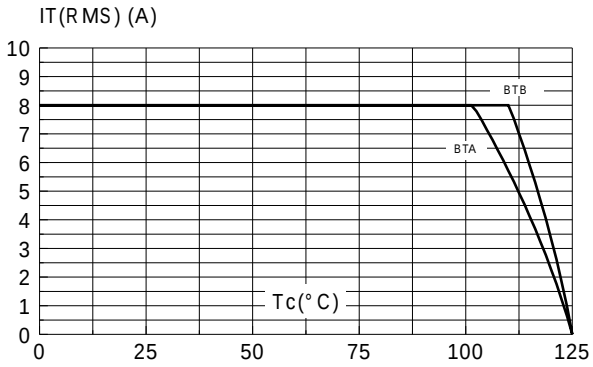



Fig. 2-2: RMS on-state current versus ambient temperature (printed circuit board FR4, copper thickness: 35µm ),full cycle.

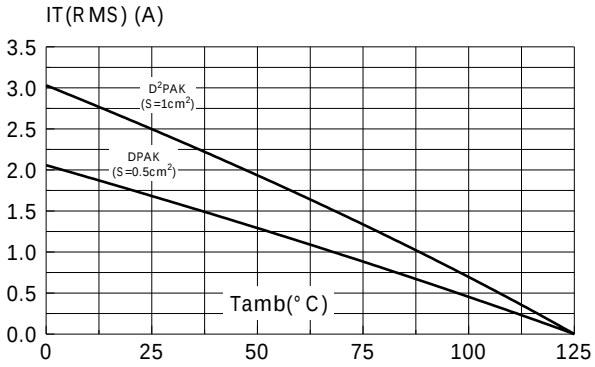



Fig. 3: Relative variation of thermal impedance versus pulse duration.

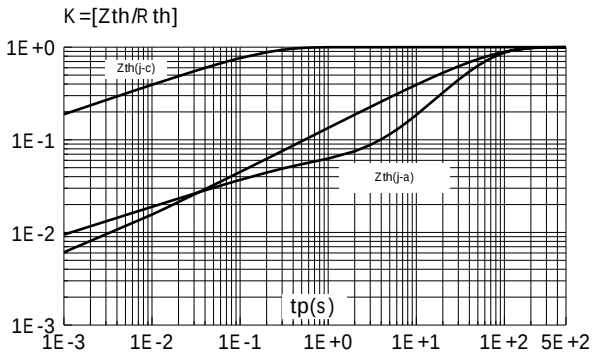



Fig. 4: On-state characteristics (maximum values).

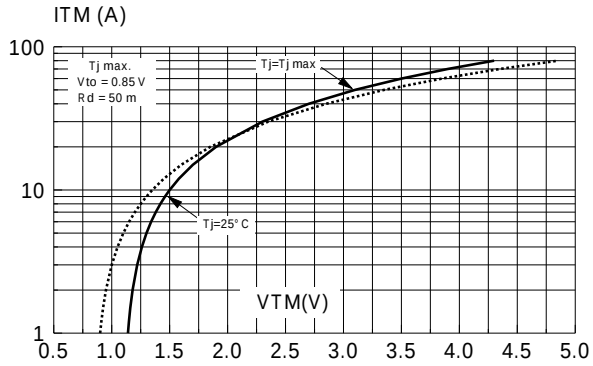



Fig. 5: Surge peak on-state current versus number of cycles.

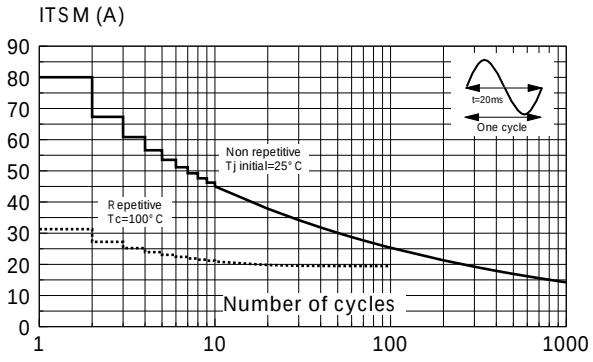


Fig. 6: Non-repetitive surge peak on-state current for a sinusoidal pulse with width tp < 10ms, and corresponding value of $I^2t$.

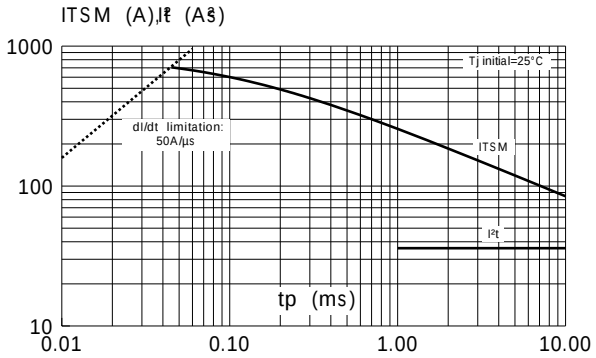



Fig. 7: Relative variation of gate trigger current, holding current and latching current versus junction temperature (typical values).

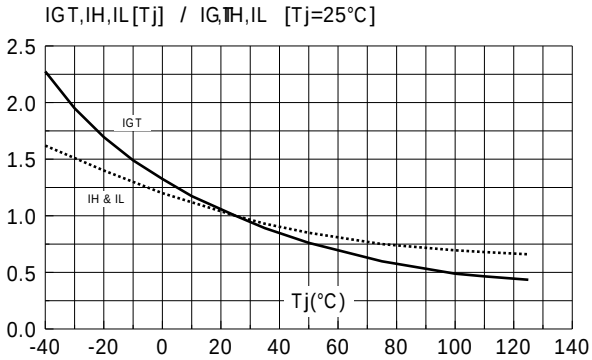



Fig. 8: Relative variation of critical rate of decrease of main current versus (dV/dt)c (typical values). Standard Types

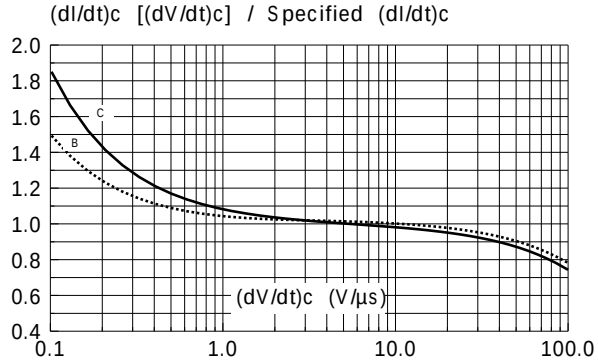



Fig. 9: Relative variation of critical rate of decrease of main current versus junction temperature.

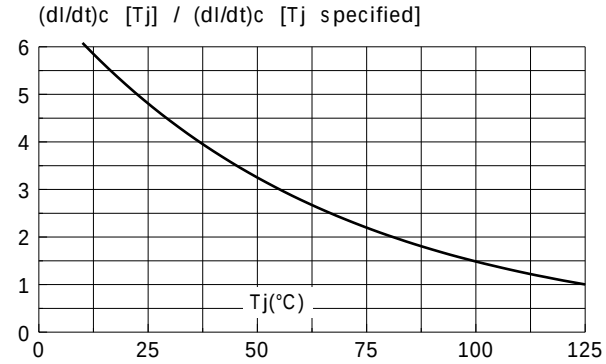



Fig. 10: DPAK and $D^2PAK$ Thermal resistance junction to ambient versus copper surface under tab (printed circuit board FR4, copper thickness: 35 ∝m).

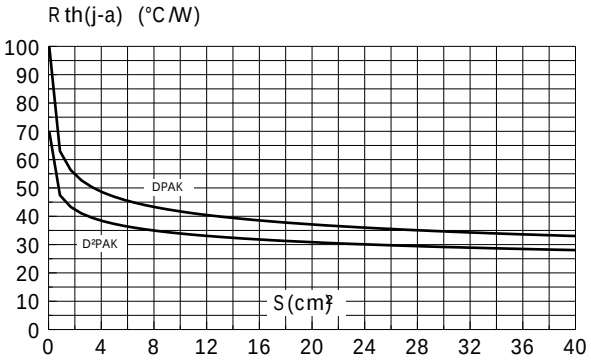


Fig. 6: Non-repetitive surge peak on-state current for a sinusoidal pulse with width tp < 10ms, and corresponding value of I²t.

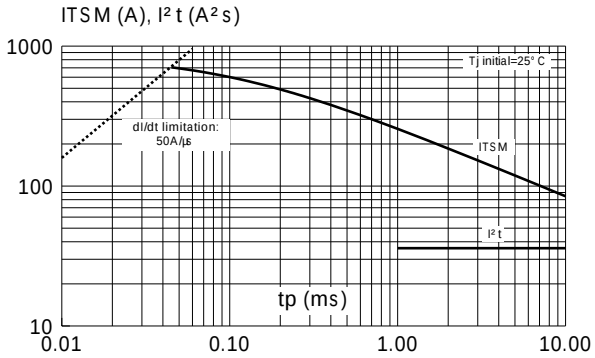



Fig. 7: Relative variation of gate trigger current, holding current and latching current versus junction temperature (typical values).

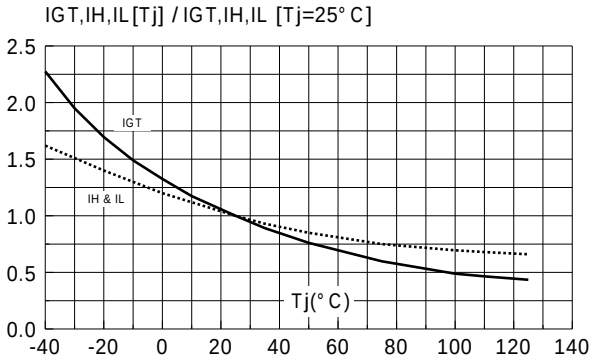



Fig. 8-1: Relative variation of critical rate of decrease of main current versus (dV/dt)c (typical values). Snubberless & Logic Level Types

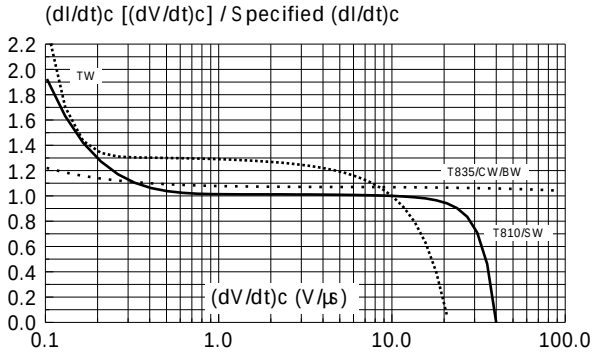



Fig. 8-2: Relative variation of critical rate of decrease of main current versus (dV/dt)c (typical values). Standard Types

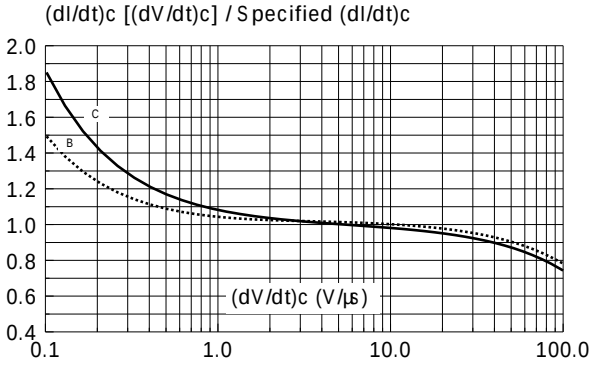
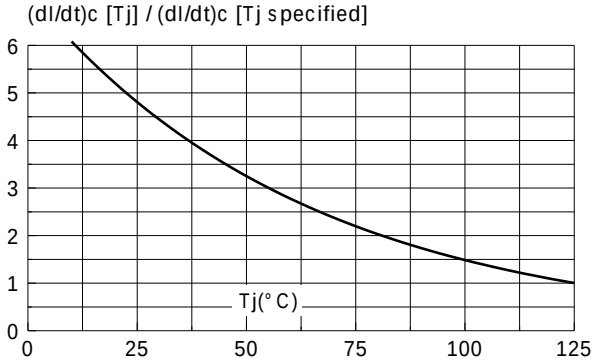



Fig. 9: Relative variation of critical rate of decrease of main current versus junction temperature.

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