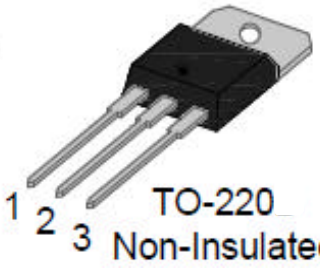
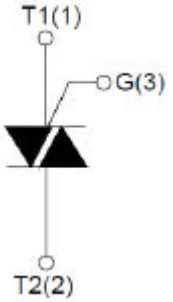
# 16A TRIACs

**BTB16 - 600/800/1200**




**TO-220**
**Non Insulated**
**Plastic Package**

BTB16 Series Triacs, with high ability to withstand the shock loading of large current, provide high dV/dt rate with strong resistance to electromagnetic interface. With high commutation performances, 3 Quadrants products especially recommended for use on Inductive Load.

## ABSOLUTE MAXIMUM RATINGS

| PARAMETER | SYMBOL | VALUE | UNIT |
|---|---|---|---|
| Repetitive Peak Off-State Voltage (Tj=25°C) | $V_{DRM}$ | 600 / 800 / 1200 | V |
| Repetitive Peak Reverse Voltage (Tj=25°C) | $V_{RRM}$ | 600 / 800 / 1200 | V |
| Non Repetitive Surge Peak Off-State Voltage | $V_{DSM}$ | $V_{DRM}$ + 100 | V |
| Non Repetitive Peak Reverse Voltage | $V_{RSM}$ | $V_{RRM}$ + 100 | V |
| RMS On-State Current ($T_C$ = 107°C) | $I_{T(RMS)}$ | 16 | A |
| Non Repetitive Surge Peak On-State Current (Full Cycle, f = 50MHz) | $I_{TSM}$ | 160 | A |
| $I^2t$ Value For Fusing (tp=10ms) | $I^2t$ | 128 | $A^2s$ |
| Critical Rate of Rise of On-State Current ($I_G$ = 2 X $I_{GT}$) | dI/dt | 50 | A/µs |
| Peak Gate Current | $I_{GM}$ | 4 | A |
| Average Gate Power Dissipation | $P_{G(AV)}$ | 1 | W |
| Peak Gate Power | $P_{GM}$ | 5 | W |
| Storage Junction Temperarure Range | $T_{STG}$ | -40 to +150 | °C |
| Operating Junction Temperarure Range | $T_J$ | -40 to +125 | °C |

## THERMAL RESISTANCE

| | | | |
|---|---|---|---|
| Maximum Thermal Resistance Junction to case | $R_{th(j-c)}$ | 1.2 | °C/W |

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

### Quadrants I - II - III ($V_{DRM}$ / $V_{RRM}$ : 600/800V)

| PARAMETER | TEST CONDITION | SYMBOL | QUADRANT | VALUES BTB16 - 600 /800 | | | | UNIT |
|---|---|---|---|---|---|---|---|---|
| | | | | BW | CW | SW | TW | |
| Gate Trigger Current | $V_D$=12V, $R_L$=33Ω | $I_{GT}$ | I - II - III | < 50 | < 35 | < 10 | < 5 | mA |
| Gate Trigger Voltage | | $V_{GT}$ | I - II - III | <1.3 | | | | V |
| Off-State Gate Voltage | $V_D$=$V_{DRM}$, Tj=125°C, $R_L$ = 3.3KΩ | $V_{GD}$ | I - II - III | >0.2 | | | | V |
| Latching Current | $I_G$=1.2 X $I_{GT}$ | $I_L$ | I - III | < 70 | < 50 | < 30 | < 15 | mA |
| | | | II | < 80 | < 60 | < 40 | < 20 | |
| Holding Current | $I_T$ = 100mA | $I_H$ | | < 60 | < 40 | < 25 | < 15 | mA |
| Critical Rate of Rise of Off-State Voltage | $V_D$ = 2/3 $V_{DRM}$, Gate Open, Tj=125°C | dV/dt | | > 1000 | > 500 | > 200 | > 100 | V/µs |

### Quadrant IV ($V_{DRM}$ / $V_{RRM}$ : 600/800V)

| PARAMETER | TEST CONDITION | SYMBOL | QUADRANT | VALUES BTB16 - 600 /800 | | UNIT |
|---|---|---|---|---|---|---|
| | | | | B | C | |
| Gate Trigger Current | $V_D$=12V, $R_L$=33Ω | $I_{GT}$ | I - II - III | < 50 | < 25 | mA |
| | | | IV | < 70 | < 50 | |
| Gate Trigger Voltage | | $V_{GT}$ | ALL | <1.5 | | V |
| Off-State Gate Voltage | $V_D$=$V_{DRM}$, Tj=125°C, $R_L$ = 3.3KΩ | $V_{GD}$ | ALL | >0.2 | | V |
| Latching Current | $I_G$=1.2 X $I_{GT}$ | $I_L$ | I - III - IV | < 70 | < 50 | mA |
| | | | II | < 100 | < 80 | |
| Holding Current | $I_T$ = 100mA | $I_H$ | | < 60 | < 40 | mA |
| Critical Rate of Rise of Off-State Voltage | $V_D$ = 2/3 $V_{DRM}$, Gate Open, Tj=125°C | dV/dt | dV/dt | > 500 | > 200 | V/µs |

## Quadrants I - II - III ($V_{DRM}$ / $V_{RRM}$ : 1200V)

| PARAMETER | TEST CONDITION | SYMBOL | QUADRANT | VALUES BTB16 - 1200 | UNIT |
|---|---|---|---|---|---|
| Gate Trigger Current | $V_D$=12V, $R_L$=33Ω | $I_{GT}$ | I - II - III | < 50 | mA |
| Gate Trigger Voltage | | $V_{GT}$ | I - II - III | <1.5 | V |
| Off-State Gate Voltage | $V_D$=$V_{DRM}$, Tj=125°C, $R_L$ = 3.3KΩ | $V_{GD}$ | I - II - III | >0.2 | V |
| Latching Current | $I_G$=1.2 X $I_{GT}$ | $I_L$ | I - III | < 70 | mA |
| | | | II | < 90 | |
| Holding Current | $I_T$ = 100mA | $I_H$ | | < 60 | mA |
| Critical Rate of Rise of Off-State Voltage | $V_D$ = 2/3 $V_{DRM}$, Gate Open, Tj=125°C | dV/dt | dV/dt | > 1500 | V/µs |

## STATIC CHARACTERISTICS

| PARAMETER | TEST CONDITION | SYMBOL | | VALUE BTB16 | | | UNIT |
|---|---|---|---|---|---|---|---|
| | | | | 600 | 800 | 1200 | |
| On-State Voltage | $I_{TM}$=22.5A, tp=380µs | $V_{TM}$ | $T_J$=25°C | <1.5 | | | V |
| Off-State Leakage Current | $V_D$ = $V_{DRM}$, $V_R$ = $V_{RRM}$ | $I_{DRM}$ | $T_J$ = 25°C | <5 | <5 | <10 | µA |
| | | $I_{DRM}$ | $T_J$ = 125°C | <2 | <2 | <1 | mA |

## CHARACTERISTICS CURVES

**FIG.1** Maximum power dissipation versus RMS on-state current

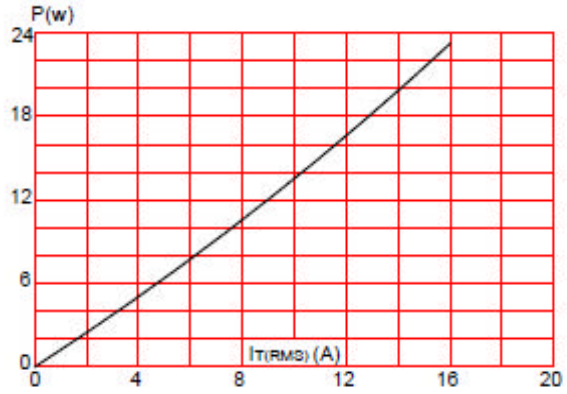



**FIG.2:** RMS on-state current versus case temperature

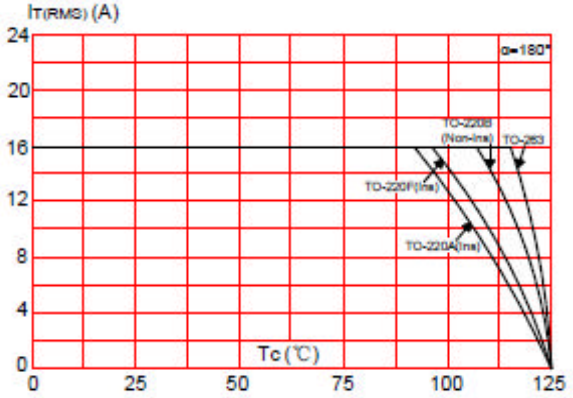



**FIG.3:** Surge peak on-state current versus number of cycles

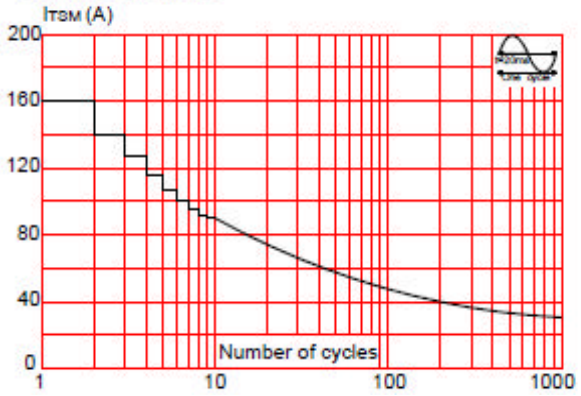



**FIG.4:** On-state characteristics (maximum values)

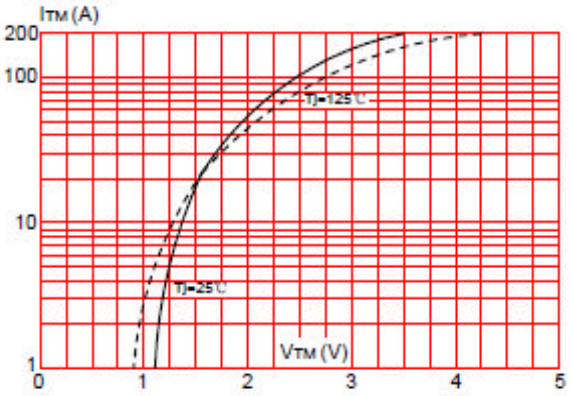



**FIG.5:** Non-repetitive surge peak on-state current for a sinusoidal pulse with width tp<20ms, and corresponging value of $I^2t$ (dI/dt < 50A/µs)

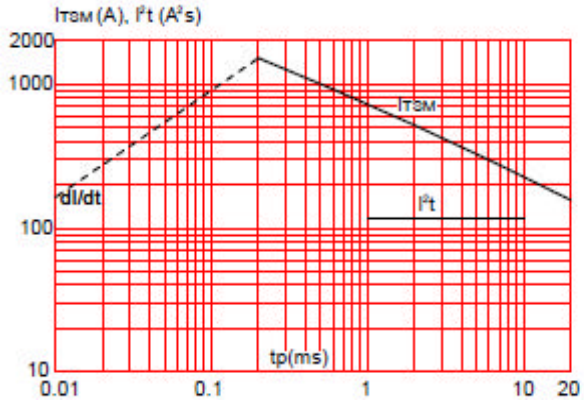
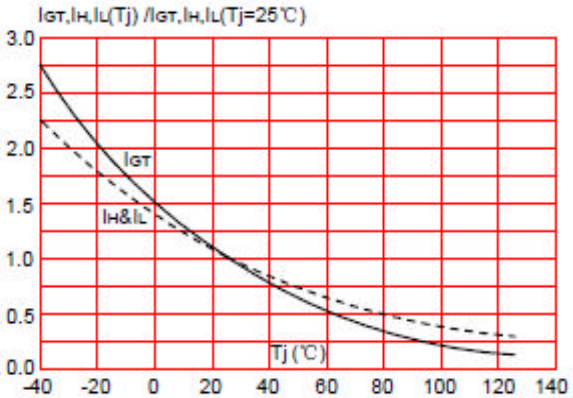
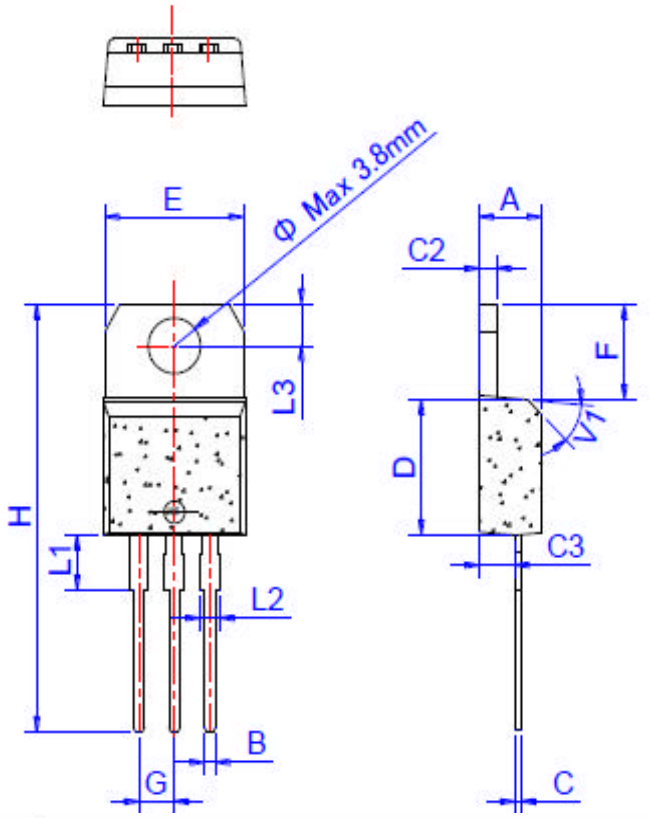



**FIG.6:** Relative variations of gate trigger current, holding current and latching current versus junction temperature



## TO-220 PACKAGE OUTLINE AND DIMENSION




| Ref. | Dimensions | | | | | |
|---|---|---|---|---|---|---|
| | Millimeters | | | Inches | | |
| | Min. | Typ. | Max. | Min. | Typ. | Max. |
| A | 4.40 | | 4.60 | 0.173 | | 0.181 |
| B | 0.61 | | 0.88 | 0.024 | | 0.035 |
| C | 0.46 | | 0.70 | 0.018 | | 0.028 |
| C2 | 1.21 | | 1.32 | 0.048 | | 0.052 |
| C3 | 2.40 | | 2.72 | 0.094 | | 0.107 |
| D | 8.60 | | 9.70 | 0.339 | | 0.382 |
| E | 9.60 | | 10.4 | 0.378 | | 0.409 |
| F | 6.20 | | 6.60 | 0.244 | | 0.260 |
| G | | 2.54 | | | 0.1 | |
| H | 28.0 | | 29.8 | 1.102 | | 1.173 |
| L1 | | 3.75 | | | 0.148 | |
| L2 | 1.14 | | 1.70 | 0.045 | | 0.067 |
| L3 | 2.65 | | 2.95 | 0.104 | | 0.116 |
| V1 | | 45° | | | 45° | |

## Customer Notes

**Component Disposal Instructions**

1. CDIL Semiconductor Devices are RoHS compliant, customers are requested to please dispose as per prevailing Environmental Legislation of their Country.

2. In Europe, please dispose as per EU Directive 2002/96/EC on Waste Electrical and Electronic Equipment (WEEE).

## Disclaimer

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