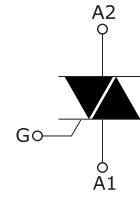


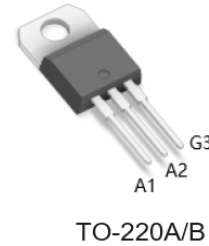
Product features and main applications:

NPNP five-layer structure of silicon bidirectional devices; with independent intellectual property rights of single-sided digging technology, table glass passivation process; multi-layer metallized electrodes on the back; with high blocking voltage and high temperature stability.



Mainly used in:

vacuum cleaners, power tools and other motor speed controllers; solid state relays; heating controllers (temperature regulation); other phase control circuits.



Characteristics

Table 1. Absolute maximum ratings (Tj = 25 °C unless otherwise stated)

| Symbol | Parameter name | | value | Unit |
|--------------|---|----------------------------------|-------|------------------|
| $I_{T(RMS)}$ | RMS on-state current (full sine wave) | BTA BTB Tc=80°C Tc=90°C | 24 | A |
| I_{TSM} | Non repetitive surge peak on-state current (full cycle, Tj initial = 25 °C) | F=50HZ tp=20ms | 240 | A |
| I^2t | I ² t value for fusing | tp=10ms | 288 | A ² S |
| di/dt | Critical rate of rise of on-state current IG = 2 x IGT, tr ≤ 100 ns | Tj=125°C | 50 | A/us |

| | | | | | |
|--------------------|--|--------------------------|---------------------------|----------------------------|--------------------|
| V_{DRM}/V_{RRM} | Off state repetitive peak voltage Reverse repetitive peak voltage | $T_j=25^{\circ}\text{C}$ | | 600/800 | V |
| I_{GM} | Peak gate current | $t_p=20\mu\text{s}$ | $T_j=150^{\circ}\text{C}$ | 4 | A |
| $P_{G(AV)}$ | Average gate power dissipation | | $T_j=150^{\circ}\text{C}$ | 1 | W |
| T_{stg} T_j | Storage junction temperature range Operating junction temperature range | | | -40 to +150 -40 to +125 | $^{\circ}\text{C}$ |

**Table 2. Electrical characteristics ($T_j = 25^{\circ}\text{C}$, unless otherwise specified)
--3quadrants**

| Symbol | Name and test conditions | Quadrant | Range | value | Unit | |
|-------------|--|----------------|-------|-----------|------|----|
| I_{GT} | $V_D=12\text{V}$ $R_L=100\Omega$ | I II III | MAX | ≤ 50 | mA | |
| V_{GT} | | | MAX | 1.5 | V | |
| V_{GD} | $V_D = V_{DRM}$, $R_L = 3.3\text{ k}\Omega$, $T_j = 125^{\circ}\text{C}$ | | MIN | 0.2 | V | |
| I_H | $I_T = 100\text{ mA}$ | | MAX | 80 | mA | |
| I_L | $I_G = 1.2 \times I_{GT}$ | | MAX | I -III | 80 | mA |
| | | | | II | 100 | |
| dv/dt | $V_D = 67\% V_{DRM}$, gate open, $T_j = 125^{\circ}\text{C}$ | | MIN | 500 | V/us | |
| $(dv/dt)_c$ | Critical rise rate of commutation voltage $T_J = 150^{\circ}\text{C}$ | | MIN | 10 | V/us | |

Table 3. Electrical characteristics (T_j = 25 °C, unless otherwise specified) -Standard Triac (4 quadrants)

| Symbol | Name and test conditions | Quadrant | Range | value | Unit |
|----------------------|---|----------------------|-------|----------|------|
| I _{GT} | V _D =12V R _L =100Ω | I II III IV | MAX | I II III | mA |
| | | | | IV | |
| V _{GT} | MAX | | 1.5 | V | |
| V _{GD} | MIN | | 0.2 | V | |
| | V _D = V _{DRM} , R _L = 3.3 kΩ, T _j = 125 ° C | | | | |
| I _H | I _T =500mA | | MAX | 80 | mA |
| I _L | I _G = 1.2 x I _{GT} | | MAX | 80 | mA |
| | | | | 100 | |
| dv/dt | V _D = 67% V _{DRM} , gate open, T _j = 125 ° C | | MIN | 500 | V/us |
| (dv/dt) _c | Critical rise rate of commutation voltage T _J = 150 ° C | | MIN | 10 | V/us |

Static parameters

| Symbol | Parameter name | value | Unit |
|--------------------------------------|-------------------------------------|--|----------------------|
| V _{TM} | I _{TM} = 50A | T _j =25°C MAX | 1.55 V |
| V _{T0} | threshold on-state voltage | T _j =150°C MAX | 0.87 V |
| R _d | Dynamic resistance | T _j =150°C MAX | 14.6 mΩ |
| I _{DRM} I _{RRM} | V _{DRM} = V _{RRM} | T _j =25°C T _j =150°C MAX | 5 uA |
| | | | 1 mA |
| R _{th(j-c)} | Junction to ambient | BTA BTB MAX | 2.05 1.25 °C/W |

BTA24 characteristic curve

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

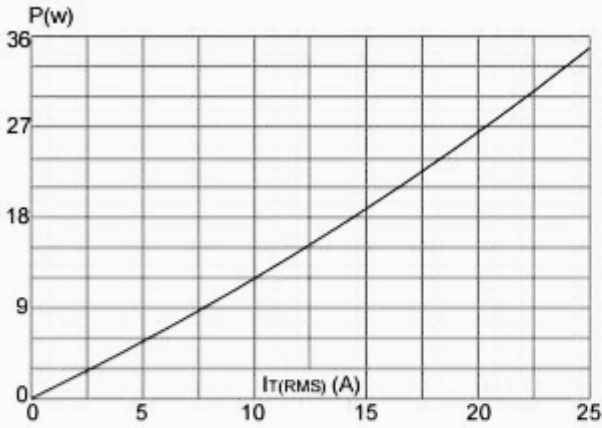


FIG.2: RMS on-state current versus case temperature

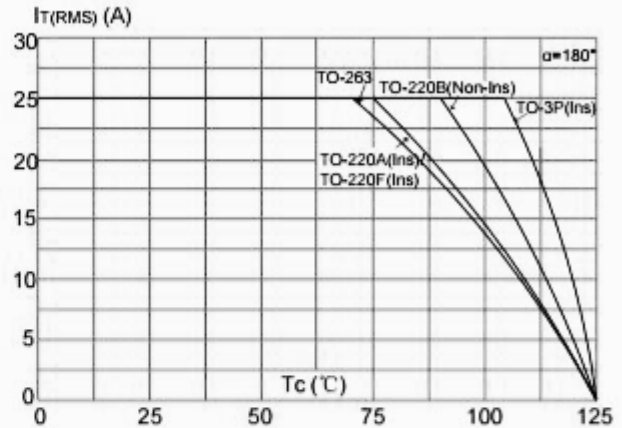


FIG.3: Surge peak on-state current versus number of cycles

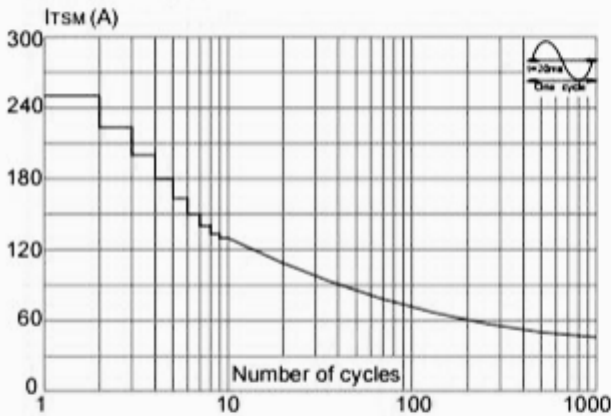


FIG.4: On-state characteristics (maximum values)

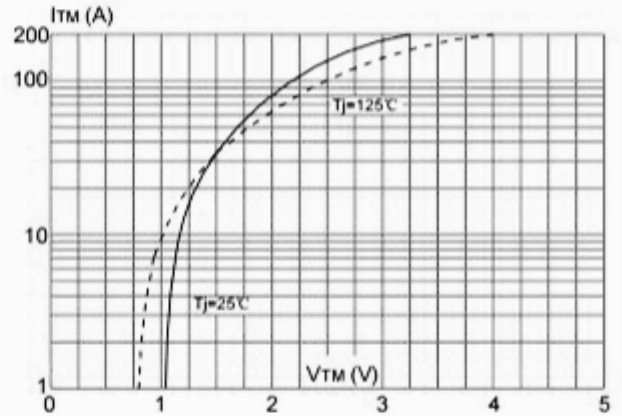


FIG.5: Non-repetitive surge peak on-state current for a sinusoidal pulse with width $t_p < 20\text{ms}$, and corresponding value of I^2t ($di/dt < 50\text{A}/\mu\text{s}$)

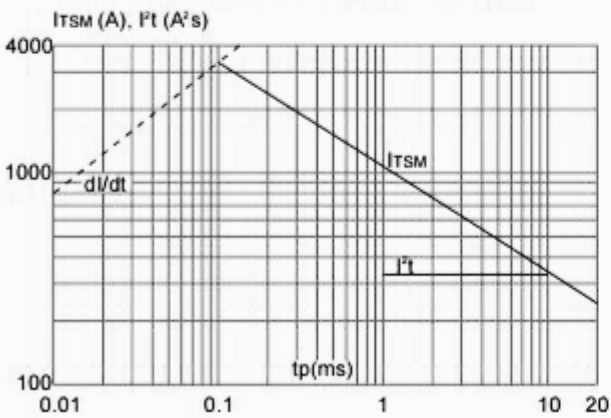
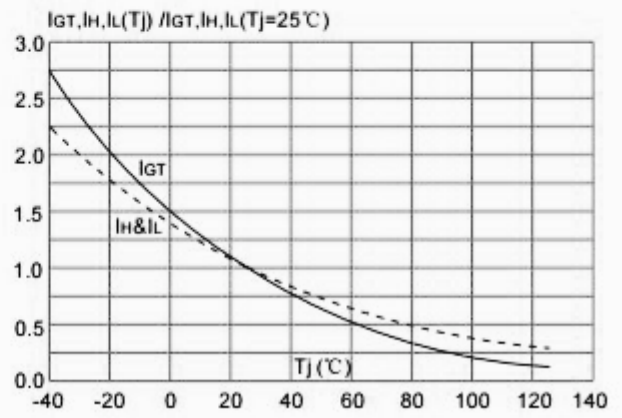
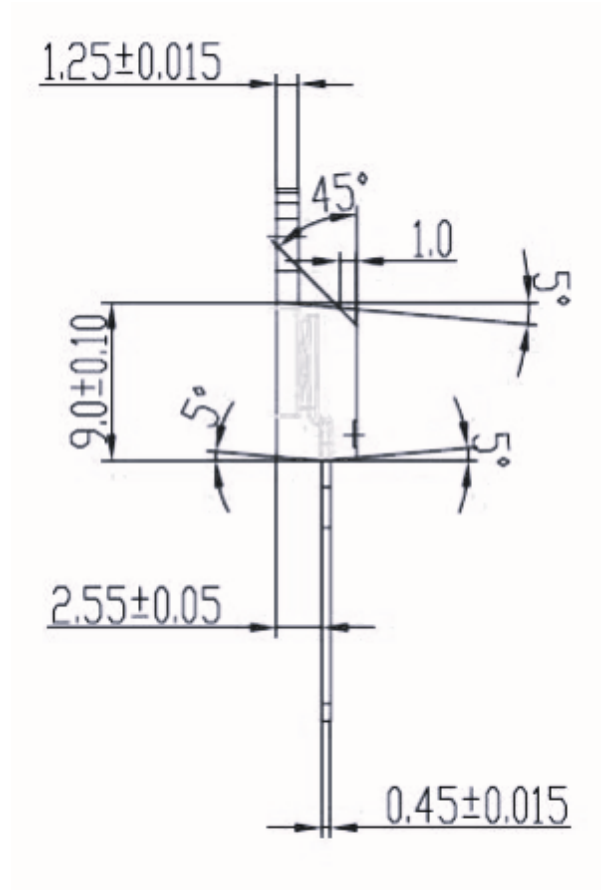
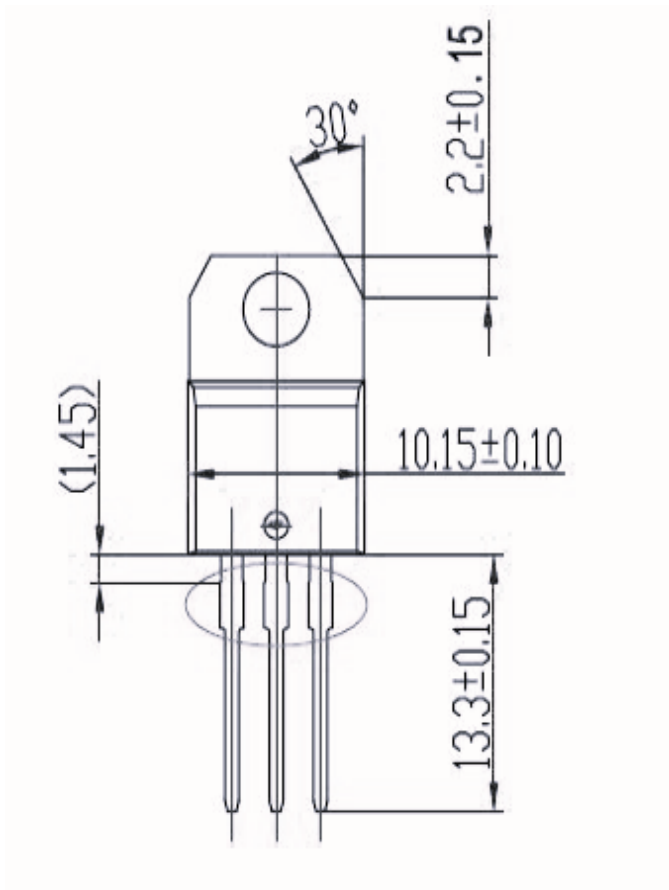


FIG.6: Relative variations of gate trigger current, holding current and latching current versus junction temperature

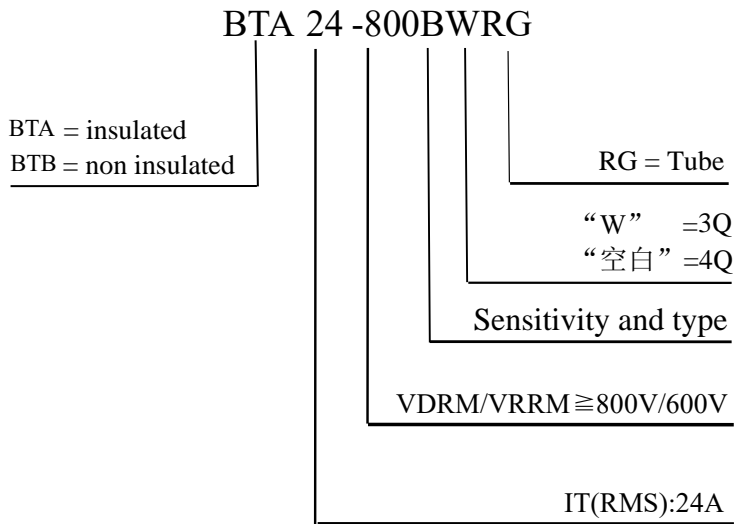


TO-220A/TO-220B Dimensional

drawing: Unit: mm (± 0.1)



Product Naming System



Ordering information

| Order code | Package | Baseqty | Deliverymode |
|-------------------|---------|---------|--------------|
| UMW BTA24-600CRG | TO-220A | 1000 | Tube and box |
| UMW BTA24-600BWRG | TO-220A | 1000 | Tube and box |
| UMW BTA24-600CWRG | TO-220A | 1000 | Tube and box |
| UMW BTA24-800CRG | TO-220A | 1000 | Tube and box |
| UMW BTA24-800BRG | TO-220A | 1000 | Tube and box |
| UMW BTA24-800BWRG | TO-220A | 1000 | Tube and box |
| UMW BTA24-800CWRG | TO-220A | 1000 | Tube and box |
| UMW BTB24-800BRG | TO-220B | 1000 | Tube and box |
| UMW BTB24-600BRG | TO-220B | 1000 | Tube and box |
| UMW BTB24-600BWRG | TO-220B | 1000 | Tube and box |
| UMW BTB24-600CWRG | TO-220B | 1000 | Tube and box |
| UMW BTB24-800BWRG | TO-220B | 1000 | Tube and box |
| UMW BTB24-800CWRG | TO-220B | 1000 | Tube and box |