



**BTA10**

Preliminary

**TRIAC**

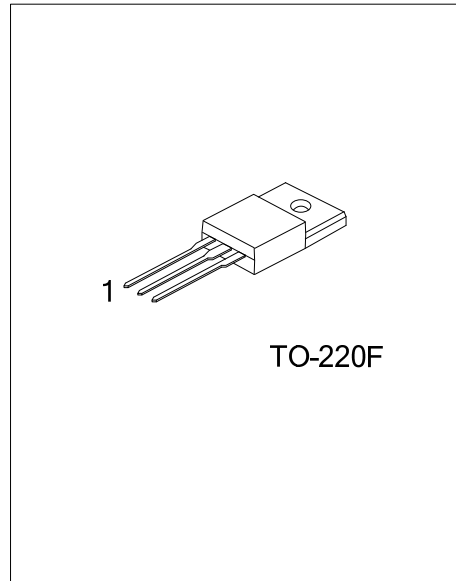
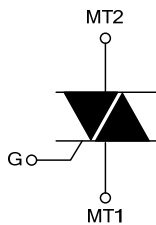
**10A TRIACS**

■ DESCRIPTION

The UTC **BTA10** is a 10A triacs which can be operated in 4 quadrants, it uses UTC's advanced technology to provide customers with high commutation performances, etc.

The UTC **BTA10** is suitable for AC switching application and phase control application such as fan speed and temperature modulation control, lighting control and static switching relay, either in through-hole or surface-mount packages.

■ SYMBOL



■ ORDERING INFORMATION

| Ordering Number  |                  | Package | Pin Assignment |     |   | Packing |
|------------------|------------------|---------|----------------|-----|---|---------|
| Lead Free        | Halogen Free     |         | 1              | 2   | 3 |         |
| BTA10L-x-x-TF3-T | BTA10G-x-x-TF3-T | TO-220F | MT1            | MT2 | G | Tube    |

|   |   |
|---|---|
| <p><b>BTA10L-x-x-TF3-T</b></p> <ul style="list-style-type: none"> <li>(1) Packing Type</li> <li>(2) Package Type</li> <li>(3) Sensitivity and type</li> <li>(4) Voltage</li> <li>(5) Lead Free</li> </ul> | <ul style="list-style-type: none"> <li>(1) T: Tube</li> <li>(2) TF3: TO-220F</li> <li>(3) refer to SENSITIVITY AND TYPE</li> <li>(4) 6: 600V, 8: 800V</li> <li>(5) L: Lead Free, G: Halogen Free</li> </ul> |
|---|---|

■ SENSITIVITY AND TYPE

| PART NUMBER | VOLTAGE |      | SENSITIVITY | TYPE     |
|-------------|---------|------|-------------|----------|
|             | 600V    | 800V |             |          |
| B           | ⊙       | ⊙    | 50mA        | STANDARD |
| C           | ⊙       | ⊙    | 25mA        | STANDARD |

⊙: Available

■ MARKING INFORMATION

| PACKAGE | MARKING  |
|---------|--|
| TO-220F | <p>UTC<br/>BTA 10 □<br/>□ □ □ □ □ □<br/>Lot Code ← → Data Code<br/>1</p> <p>L: Lead Free<br/>G: Halogen Free</p> |

### ■ ABSOLUTE MAXIMUM RATINGS

| PARAMETER  |                         |                         | SYMBOL            | RATINGS               | UNIT                 |
|--|-------------------------|-------------------------|-------------------|-----------------------|----------------------|
| RMS On-State Current (Full Sine Wave)  | $T_C=95^\circ\text{C}$  |                         | $I_{T(RMS)}$      | 10                    | A                    |
| Non Repetitive Surge Peak On-State Current (Full Cycle $T_J$ initial= $25^\circ\text{C}$ ) | F=50Hz                  | t=20ms                  | $I_{TSM}$         | 100                   | A                    |
|  | F=60Hz                  | t=16.7ms                |                   | 105                   | A                    |
| $I^2t$ Value for Fusing  | $t_P=10\text{ms}$       |                         | $I^2t$            | 55                    | $\text{A}^2\text{s}$ |
| Critical Rate of Rise of On-State Current:<br>$I_G=2I_{GT}$ , $t_r \leq 100\text{ns}$      | F=120Hz                 | $T_J=125^\circ\text{C}$ | dI/dt             | 50                    | A/ $\mu\text{s}$     |
| Non Repetitive Surge Peak Off-State Voltage  | $t_P=10\text{ms}$       | $T_J=25^\circ\text{C}$  | $V_{DSM}/V_{RSM}$ | $V_{DSM}/V_{RSM}+100$ | V                    |
| Peak Gate Current  | $t_P=20\mu\text{s}$     | $T_J=125^\circ\text{C}$ | $I_{GM}$          | 4                     | A                    |
| Average Gate Power Dissipation   | $T_J=125^\circ\text{C}$ |                         | $P_{G(AV)}$       | 1                     | W                    |
| Operating Junction Temperature   |                         |                         | $T_J$             | -40~+125              | $^\circ\text{C}$     |
| Storage Junction Temperature   |                         |                         | $T_{STG}$         | -40~+150              | $^\circ\text{C}$     |

Note: Absolute maximum ratings are those values beyond which the device could be permanently damaged. Absolute maximum ratings are stress ratings only and functional device operation is not implied.

### ■ THERMAL RESISTANCES

| PARAMETER             | SYMBOL        | RATINGS | UNIT               |
|-----------------------|---------------|---------|--------------------|
| Junction to Ambient   | $\theta_{JA}$ | 60      | $^\circ\text{C/W}$ |
| Junction to Case (AC) | $\theta_{JC}$ | 2.4     | $^\circ\text{C/W}$ |

### ■ ELECTRICAL CHARACTERISTICS ( $T_J=25^\circ\text{C}$ , unless otherwise specified)

#### FOR STANDARD (4 QUADRANTS)

| PARAMETER  | SYMBOL               | TEST CONDITIONS   | C        |     |     | B   |     |     | UNIT |                  |
|--|----------------------|---|----------|-----|-----|-----|-----|-----|------|------------------|
|  |                      |   | MIN      | TYP | MAX | MIN | TYP | MAX |      |                  |
| Gate Trigger Current (Note 1)                                      | $I_{GT}$             | $V_D=12\text{V}$ ,<br>$R_L=33\Omega$                                    | I-II-III |     |     | 25  |     |     | 50   | mA               |
|  |                      |   | IV       |     |     | 50  |     |     | 100  | mA               |
| Gate Trigger Voltage   | $V_{GT}$             |   | ALL      |     |     | 1.3 |     |     | 1.3  | V                |
| Gate Non-Trigger Voltage   | $V_{GD}$             | $V_D=V_{DRM}$ ,<br>$R_L=3.3\text{k}\Omega$ ,<br>$T_J=125^\circ\text{C}$ | ALL      | 0.2 |     |     | 0.2 |     |      | V                |
| Holding Current (Note 2)   | $I_H$                | $I_T=500\text{mA}$  |          |     |     | 25  |     |     | 50   | mA               |
| Latching Current   | $I_L$                | $I_G=1.2I_{GT}$   | I-III-IV |     |     | 40  |     |     | 50   | mA               |
|  |                      |   | II       |     |     | 80  |     |     | 100  | mA               |
| Critical Rate of Rise of Off-State Voltage (Note 2)                | dV/dt                | $V_D=67\%V_{DRM}$ , Gate Open,<br>$T_J=125^\circ\text{C}$               |          | 200 |     |     | 400 |     |      | V/ $\mu\text{s}$ |
| Critical Rate of Rise of Off-State Voltage at Commutation (Note 2) | (dV/dt) <sub>c</sub> | (dI/dt) <sub>c</sub> =4.4A/ms, $T_J=125^\circ\text{C}$                  |          | 5   |     |     | 10  |     |      | V/ $\mu\text{s}$ |

### ■ STATIC CHARACTERISTICS

| PARAMETER                         | SYMBOL    | TEST CONDITIONS                            | MIN | TYP | MAX  | UNIT          |
|-----------------------------------|-----------|--|-----|-----|------|---------------|
| Peak On-State Voltage (Note 2)    | $V_T$     | $I_{TM}=14\text{A}$ , $t_P=380\mu\text{s}$ |     |     | 1.55 | V             |
| Threshold Voltage (Note 2)        | $V_{TO}$  |  |     |     | 0.85 | V             |
| Dynamic Resistance (Note 2)       | $R_D$     |  |     |     | 40   | m $\Omega$    |
| Repetitive Peak Off-State Current | $I_{DRM}$ | $V_{DRM}=V_{RRM}$                          |     |     | 5    | $\mu\text{A}$ |
|                                   | $I_{RRM}$ |  |     |     | 1    | mA            |

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

2. For both polarities of MT2 referenced to MT1.

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