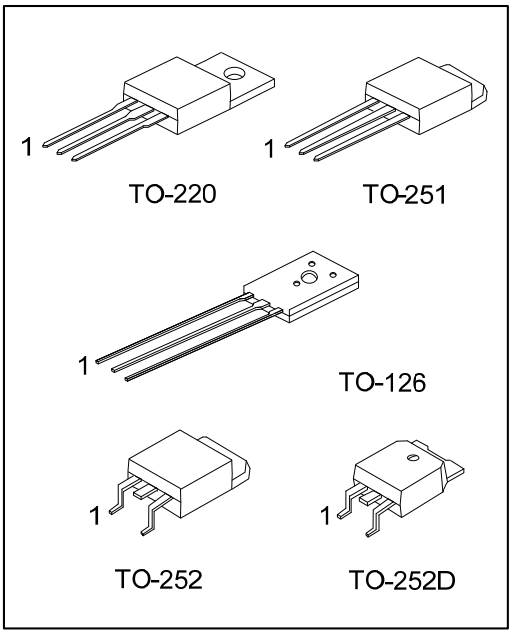
# BTB04

**TRIAC**

## SENSITIVE GATE TRIACS




### ■ DESCRIPTION

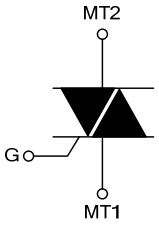
The UTC **BTB04** is a 4A triacs, it uses UTC's advanced technology to provide customers with high commutation performances.

The UTC **BTB04** is suitable for inductive loads, general purpose AC switching and an ON/OFF function in applications such as induction motor starting circuits, for phase control operation in light dimmers and static relays, etc.

### ■ FEATURES

* Low gate trigger current
* Low holding current

### ■ SYMBOL




### ■ ORDERING INFORMATION

| Ordering Number | | Package | Pin Assignment | | | Packing |
|---|---|---|---|---|---|---|
| Lead Free | Halogen Free | | 1 | 2 | 3 | |
| BTB04L-x-x-T60-K | BTB04G-x-x-T60-K | TO-126 | MT1 | MT2 | G | Bulk |
| BTB04L-x-x-TA3-T | BTB04G-x-x-TA3-T | TO-220 | MT1 | MT2 | G | Tube |
| BTB04L-x-x-TM3-T | BTB04G-x-x-TM3-T | TO-251 | MT1 | MT2 | G | Tube |
| BTB04L-x-x-TN3-R | BTB04G-x-x-TN3-R | TO-252 | MT1 | MT2 | G | Tape Reel |
| BTB04L-x-x-TND-T | BTB04G-x-x-TND-T | TO-252D | MT1 | MT2 | G | Tube |

Note: Pin Assignment: MT1: MT1 MT2: MT2 G: Gate

BTB04G-x-x-T60-K
(1)Packing Type
(2)Package Type
(3)Sensitivity
(4)Voltage
(5)Green Package

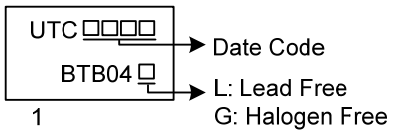
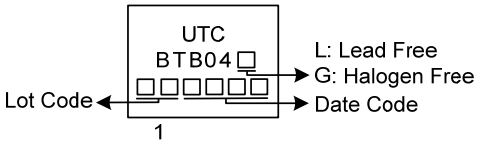
(1) K: Bulk, T: Tube, R: Tape Reel
(2) T60: TO-126, TA3: TO-220, TM3: TO-251
TN3: TO-252, TND: TO-252D
(3) refer to SENSITIVITY AND TYPE
(4) 4: 400V, 6: 600V, 8: 800V
(5) G: Halogen Free and Lead Free, L: Lead Free

### ■ SENSITIVITY AND TYPE

| PART NUMBER | VOLTAGE | | | SENSITIVITY | TYPE |
|---|---|---|---|---|---|
| | 400V | 600V | 800 | | |
| A | ◎ | ◎ | | 10mA | STANDARD |
| S | | ◎ | | 10mA | STANDARD |
| D | ◎ | | | 5mA | STANDARD |
| T | ◎ | ◎ | ◎ | 5mA | STANDARD |

◎: Available

## ■ MARKING

| TO-126 | TO-220 / TO-251 / TO-252 / TO-252D |
|---|---|
|  |  |

## ■ ABSOLUTE MAXIMUM RATINGS

| PARAMETER | | SYMBOL | RATINGS | UNIT |
|---|---|---|---|---|
| RMS On-State Current (360° Conduction Angle) | $T_C$=90°C | $I_{T(RMS)}$ | 4 | A |
| Non Repetitive Surge Peak On-State Current ($T_J$ initial=25°C) | $t_p$=8.3ms | $I_{TSM}$ | 42 | A |
| | $t_p$=10ms | | 40 | A |
| $I^2t$ Value | $t_p$=10ms | $I^2t$ | 8 | $A^2s$ |
| Critical Rate of Rise of On-State Current: $I_G$=50mA, $dI_G/dt$=0.1A/μs | Repetitive F=50Hz | dI/dt | 10 | A/μs |
| | Non Repetitive | | 50 | A/μs |
| Repetitive Peak Off-State Voltage ($T_J$=110°C) | 400 T/D | $V_{DRM}/V_{RRM}$ | 400 | V |
| | 600 T/S | | 600 | V |
| | 800 T | | 800 | V |
| Peak Gate Current | $t_p$=20μs | $I_{GM}$ | 4 | A |
| Peak Positive Gate Voltage | $t_p$=20μs | $V_{GM}$ | 16 | V |
| Peak Positive Gate Power Dissipation | $t_p$=20μs | $P_{GM)}$ | 40 | W |
| Average Gate Power Dissipation | | $P_{G(AV)}$ | 1 | W |
| Operating Junction Temperature | | $T_J$ | -40 ~ +110 | °C |
| Storage Junction Temperature | | $T_{STG}$ | -40 ~ +150 | °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 DATA

| PARAMETER | | SYMBOL | RATINGS | UNIT |
|---|---|---|---|---|
| Junction to Ambient | TO-126 | $\theta_{JA}$ | 100 | °C/W |
| | TO-220 | | 60 | °C/W |
| | TO-251/TO-252 TO-252D | | 100 | °C/W |
| Junction to Case (AC) | TO-126 | $\theta_{JC}$ | 3.7 | °C/W |
| | TO-220 | | 2.4 | °C/W |
| | TO-251/TO-252 TO-252D | | 2.6 | °C/W |

## ■ ELECTRICAL CHARACTERISTICS

| PARAMETER | SYMBOL | TEST CONDITIONS | | T | | | D | | | S | | | A | | | UNIT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | MIN | TYP | MAX | MIN | TYP | MAX | MIN | TYP | MAX | MIN | TYP | MAX | |
| Gate Trigger Current | $I_{GT}$ | $V_D$=12V (DC) $R_L$=33Ω $T_J$=25°C | I-II-III | | | 5 | | | 5 | | | 10 | | | 10 | mA |
| | | | IV | | | 5 | | | 10 | | | 10 | | | 25 | mA |
| Gate Trigger Voltage | $V_{GT}$ | | ALL | | | 1.5 | | | 1.5 | | | 1.5 | | | 1.5 | V |
| Gate Non-Trigger Voltage | $V_{GD}$ | $V_D$=$V_{DRM}$, $R_L$=3.3kΩ, $T_J$=110°C | ALL | 0.2 | | | 0.2 | | | 0.2 | | | 0.2 | | | V |
| Time Gate Trigger | $t_{GT}$ | $V_D$=$V_{DRM}$, $I_G$=40mA, $dI_G/dt$=0.5A/μs, $T_J$=25°C | ALL | | 2 | | | 2 | | | 2 | | | 2 | | μs |
| Holding Current (Note 1) | $I_H$ | $I_T$=100mA, Gate Open, $T_J$=25°C | | | | 15 | | | 15 | | | 25 | | | 25 | mA |
| Latching Current | $I_L$ | $I_G$=1.2$I_{GT}$, $T_J$=25°C | I-III-IV | | 10 | | | 10 | | | 20 | | | 20 | | mA |
| | | | II | | 20 | | | 20 | | | 40 | | | 40 | | mA |
| Peak On-State Voltage (Note 1) | $V_{TM}$ | $I_{TM}$=5.5A, $t_p$=380μs, $T_J$=25°C | | | | 1.65 | | | 1.65 | | | 1.65 | | | 1.65 | V |
| Repetitive Peak Off-State Current | $I_{DRM}$ | $V_{DRM}$ Rated, $T_J$=25°C | | | | 0.01 | | | 0.01 | | | 0.01 | | | 0.01 | mA |
| | $I_{RRM}$ | $V_{RRM}$ Rated, $T_J$=110°C | | | | 0.75 | | | 0.75 | | | 0.75 | | | 0.75 | mA |
| Critical Rate of Rise of Off-State Voltage (Note 1) | dV/dt | Linear Slope up to $V_D$=67%$V_{DRM}$, Gate Open, $T_J$=110°C | | | 10 | | | 10 | | 10 | | | 10 | | | V/μs |
| Critical Rate of Rise of Off-State Voltage at Commutation (Note 1) | (dV/dt)c | (dI/dt)c=1.8A/ms, $T_J$=110°C | | | 1 | | | 1 | | | 5 | | | 5 | | V/μs |

Note: For either polarity of electrode MT2 voltage with reference to electrode MT1.