# UNISONIC TECHNOLOGIES CO., LTD

## BTA310A                    Preliminary                    *TRIAC*

# 10A TRIACS

TO-220F

## ■ DESCRIPTION

The UTC **BTA310A** is a 10A triacs which can be operated in 3 quadrants only, it uses UTC's advanced technology to provide customers with high commutation performances, etc.

The UTC **BTA310A** is suitable for inductive load switching operations, also can be used in ON/OFF function applications such as induction motor starting circuits, heating regulation, static relays etc.

## ■ SYMBOL
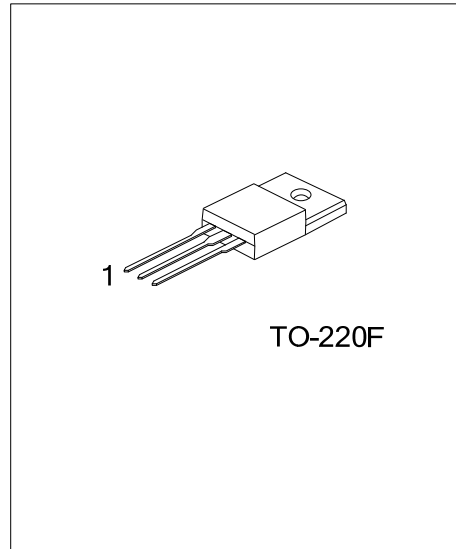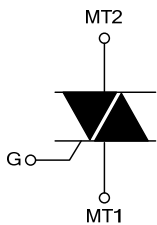
## ■ ORDERING INFORMATION

| Ordering Number | | Package | Pin Assignment | | | Packing |
| --- | --- | --- | --- | --- | --- | --- |
| Lead Free | Halogen Free | | 1 | 2 | 3 | |
| BTA310AL-x-xx-TF3-T | BTA310AG-x-xx-TF3-T | TO-220F | MT1 | MT2 | G | Tube |

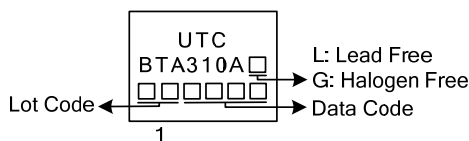Note: Pin Assignment: MT1: MT1     MT2: MT2     G: Gate

BTA310AL-x-xx-TF3-T
- (1) Packing Type
- (2) Package Type
- (3) Sensitivity and type
- (4) Voltage
- (5) Green Package

(1) T: Tube
(2) TF3: TO-220F
(3) refer to SENSITIVITY AND TYPE
(4) 6: 600V, 8: 800V
(5) L: Lead Free, G: Halogen Free and Lead Free

## ■ SENSITIVITY AND TYPE

| PART NUMBER | VOLTAGE | | SENSITIVITY | TYPE |
| --- | --- | --- | --- | --- |
| | 600V | 800V | | |
| BW | ◎ | ◎ | 50mA | SNUBBERLESS |
| CW | ◎ | ◎ | 35mA | SNUBBERLESS |

◎: Available

## ■ MARKING

UTC
BTA310A□
Lot Code
1

L: Lead Free
G: Halogen Free
Data Code

QW-R401-052.b

# BTA310A

■ **ABSOLUTE MAXIMUM RATINGS**

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

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

■ **ELECTRICAL CHARACTERISTICS** ($T_J$= 25°C, unless otherwise specified)

**FOR SNUBBERLESS (3 QUADRANTS)**

| PARAMETER | SYMBOL | TEST CONDITIONS | | CW | | | BW | | | UNIT |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | MIN | TYP | MAX | MIN | TYP | MAX | |
| Gate Trigger Current (Note 1) | $I_{GT}$ | $V_D$=12V, $R_L$=33Ω | I-II-III | | | 35 | | | 50 | mA |
| Gate Trigger Voltage | $V_{GT}$ | | I-II-III | | | 1.3 | | | 1.3 | V |
| Gate Non-Trigger Voltage | $V_{GD}$ | $V_D$=$V_{DRM}$, $R_L$=3.3kΩ, $T_J$=125°C | I-II-III | 0.2 | | | 0.2 | | | V |
| Holding Current (Note 2) | $I_H$ | $I_T$=500mA | | | | 35 | | | 50 | mA |
| Latching Current | $I_L$ | $I_G$=1.2$I_{GT}$ | I-III | | | 50 | | | 70 | mA |
| | | | II | | | 60 | | | 80 | mA |
| Critical Rate of Rise of Off-State Voltage (Note 2) | dV/dt | $V_D$=67%$V_{DRM}$, Gate Open, $T_J$=125°C | | 500 | | | 1000 | | | V/μs |
| Critical Rate of Rise of Off-State Voltage at Commutation (Note 2) | (dI/dt)c | Without Snubber, $T_J$=125°C | | 5.5 | | | 9.0 | | | A/ms |

Notes: 1. Minimum $I_{GT}$ is guaranteed at 5% of $I_{GT}$ max.
     2. For both polarities of MT2 referenced to MT1.

■ **STATIC CHARACTERISTICS**

| PARAMETER | SYMBOL | TEST CONDITIONS | | MIN | TYP | MAX | UNIT |
|---|---|---|---|---|---|---|---|
| Peak On-State Voltage (Note 2) | $V_T$ | $I_{TM}$=14A, $t_P$=380μs | $T_J$=25°C | | | 1.55 | V |
| Threshold Voltage (Note 2) | $V_{TO}$ | | $T_J$=125°C | | | 0.85 | V |
| Dynamic Resistance (Note 2) | $R_D$ | | $T_J$=125°C | | | 40 | mΩ |
| Repetitive Peak Off-State Current | $I_{DRM}$ | $V_{DRM}$=$V_{RRM}$ | $T_J$=25°C | | | 5 | μA |
| | $I_{RRM}$ | | $T_J$=125°C | | | 1 | mA |

Notes: 1. Minimum $I_{GT}$ is guaranteed at 5% of $I_{GT}$ max.
     2. For both polarities of MT2 referenced to MT1.