



**BTB12**

Preliminary

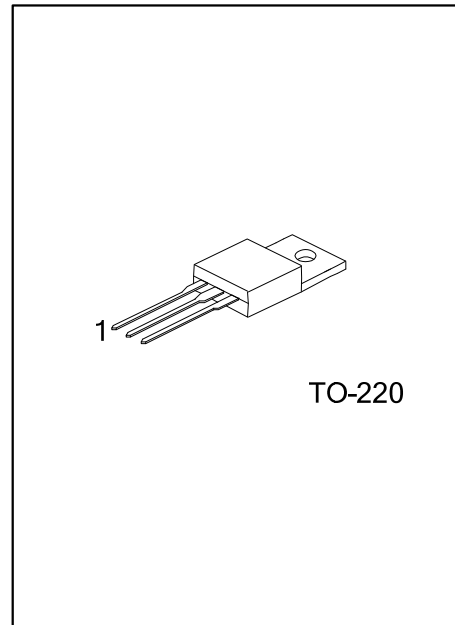
**TRIAC**

**12A TRIACS**

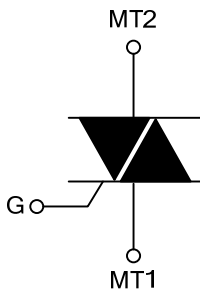
■ DESCRIPTION

The UTC **BTB12** is a 12A triacs which can be operated in 4 quadrants, it uses UTC's advanced technology to provide customers with high commutation performances.

The UTC **BTB12** 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	
BTB12L-x-x-TA3-T	BTB12G-x-x-TA3-T	TO-220	MT1	MT2	G	Tube

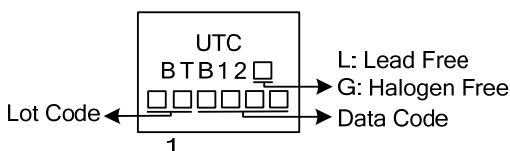
<p>BTB12L-x-x-TA3-T</p>	<p>(1) Packing Type                  (2) Package Type                  (3) Sensitivity and type                  (4) Voltage                  (5) Lead Free</p>	<p>(1) T: Tube                  (2) TA3: TO-220                  (3) refer to SENSITIVITY AND TYPE                  (4) 6: 600V, 8: 800V                  (5) L: Lead Free, G: Halogen Free</p>
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■ SENSITIVITY AND TYPE

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

⊙: Available

■ MARKING



### ■ ABSOLUTE MAXIMUM RATINGS

PARAMETER			SYMBOL	RATINGS	UNIT
RMS On-State Current (Full Sine Wave)		$T_C=90^\circ\text{C}$	$I_{T(RMS)}$	12	A
Non Repetitive Surge Peak On-State Current (Full Cycle, $T_J$ initial= $25^\circ\text{C}$ )	F=50 Hz	t=20ms	$I_{TSM}$	120	A
	F=60 Hz	t=16.7ms		126	A
$I^2t$ Value for Fusing		$t_p=10\text{ms}$	$I^2t$	78	$\text{A}^2\text{s}$
Critical Rate of Rise of On-State Current $I_G=2I_{GT}$ , $t_r \leq 100\text{ns}$		F=120 Hz $T_J=125^\circ\text{C}$	di/dt	50	$\text{A}/\mu\text{s}$
Non Repetitive Surge Peak Off-State Voltage		$t_p=10\text{ms}$ $T_J=25^\circ\text{C}$	$V_{DSM}/V_{RSM}$	$V_{DRM}/V_{RRM}+100$	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	$^\circ\text{C}/\text{W}$
Junction to Case (AC)	$\theta_{JC}$	1.4	$^\circ\text{C}/\text{W}$

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

#### FOR STANDARD TYPE (4 QUADRANTS)

PARAMETER	SYMBOL	TEST CONDITIONS	C			B			UNIT	
			MIN	TYP	MAX	MIN	TYP	MAX		
Gate Trigger Current (Note 1)	$I_{GT}$	$V_D=12\text{V}$ , $R_L=33\Omega$	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	$V_{GD}$	$V_D=V_{DRM}$ , $R_L=3.3\text{k}\Omega$ , $T_J=125^\circ\text{C}$	ALL	0.2			0.2			V
Holding Current (Note 2)	$I_H$	$I_T=500\text{mA}$				25			50	mA
Latching Current	$I_L$	$I_G=1.2 I_{GT}$	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, $T_J=125^\circ\text{C}$		200			400			$\text{V}/\mu\text{s}$
Critical Rate of Rise of Off-State Voltage at Commutation (Note 2)	(dV/dt) <sub>c</sub>	(di/dt) <sub>c</sub> =5.3A/ms, $T_J=125^\circ\text{C}$		5			10			$\text{V}/\mu\text{s}$

### ■ STATIC CHARACTERISTICS

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT	
Peak On-State Voltage (Note)	$V_T$	$I_{TM}=17\text{A}$ , $t_p=380\mu\text{s}$		$T_J=25^\circ\text{C}$		1.55	V
Threshold Voltage (Note)	$V_{TO}$			$T_J=125^\circ\text{C}$		0.85	V
Dynamic Resistance (Note)	$R_D$			$T_J=125^\circ\text{C}$		35	m $\Omega$
Repetitive Peak Off-State Current	$I_{DRM}$	$V_{DRM}=V_{RRM}$		$T_J=25^\circ\text{C}$		5	$\mu\text{A}$
	$I_{RRM}$			$T_J=125^\circ\text{C}$		1	mA

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

2. For both polarities of MT2 referenced to MT1.

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