



## BTB304A

Preliminary

TRIAC

### SENSITIVE GATE TRIACS

#### DESCRIPTION

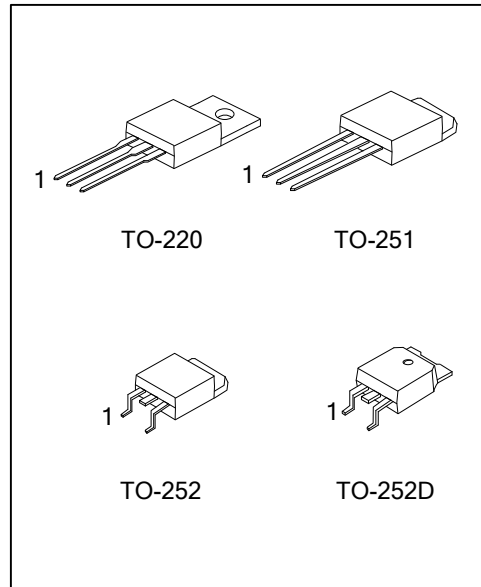
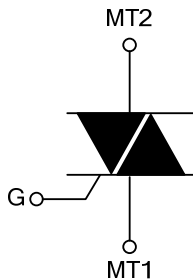
The UTC **BTB304A** is a 4A triacs which can be operated in 3 quadrants, it uses UTC's advanced technology to provide customers with high commutation performances.

The UTC **BTB304A** 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.

#### FEATURES

- \* Low gate trigger current
- \* Low holding current

#### SYMBOL



#### ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
BTB304AL-x-xx-TA3-T	BTB304AG-x-xx-TA3-T	TO-220	MT1	MT2	G	Tube
BTB304AL-x-xx-TM3-T	BTB304AG-x-xx-TM3-T	TO-251	MT1	MT2	G	Tube
BTB304AL-x-xx-TN3-R	BTB304AG-x-xx-TN3-R	TO-252	MT1	MT2	G	Tape Reel
BTB304AL-x-xx-TND-R	BTB304AG-x-xx-TND-R	TO-252D	MT1	MT2	G	Tape Reel

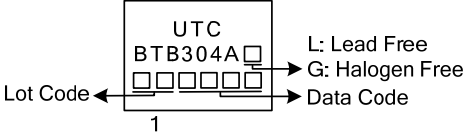
Note: Pin Assignment: MT1: MT1 MT2: MT2 G: Gate

<p>BTB304AL-x-xx-TM3-T</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) Green Package</li> </ul>	<ul style="list-style-type: none"> <li>(1) T: Tube, R: Tape Reel</li> <li>(2) TA3: TO-220, TM3: TO-251, TN3: TO-252 TND: TO-252D</li> <li>(3) refer to SENSITIVITY AND TYPE</li> <li>(4) 4: 400V, 6: 600V, 9: 900V</li> <li>(5) L: Lead Free, G: Halogen Free and Lead Free</li> </ul>
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#### SENSITIVITY AND TYPE

PART NUMBER	VOLTAGE			SENSITIVITY	TYPE
	400V	600V	900V		
SW	⊙	⊙	⊙	10mA	LOGIC LEVEL

MARKING



### ■ ABSOLUTE MAXIMUM RATINGS

PARAMETER		SYMBOL	RATINGS	UNIT
RMS On-State Current (360° Conduction Angle)	$T_C=90^\circ\text{C}$	$I_{T(RMS)}$	4	A
Non Repetitive Surge Peak On-State Current ( $T_J$ initial= $25^\circ\text{C}$ )	$t_p=8.3\text{ms}$	$I_{TSM}$	42	A
	$t_p=10\text{ms}$		40	A
$I^2t$ Value	$t_p=10\text{ms}$	$I^2t$	8	$\text{A}^2\text{s}$
Critical Rate of Rise of On-State Current: $I_G=50\text{mA}$ , $dI_G/dt=0.1\text{A}/\mu\text{s}$	Repetitive $F=50\text{Hz}$	$dI/dt$	10	$\text{A}/\mu\text{s}$
	Non Repetitive		50	$\text{A}/\mu\text{s}$
Peak Gate Current	$t_p=20\mu\text{s}$	$I_{GM}$	4	A
Peak Positive Gate Voltage	$t_p=20\mu\text{s}$	$V_{GM}$	16	V
Peak Positive Gate Power Dissipation	$t_p=20\mu\text{s}$	$P_{GM}$	40	W
Average Gate Power Dissipation		$P_{G(AV)}$	0.5	W
Operating Junction Temperature		$T_J$	-40 ~ +110	$^\circ\text{C}$
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	TO-220	$\theta_{JA}$	60	$^\circ\text{C}/\text{W}$
	TO-251/TO-252		70	$^\circ\text{C}/\text{W}$
	TO-252D			
Junction to Case for 360° Conduction Angle ( $F=50\text{Hz}$ ) (AC)	TO-220	$\theta_{JC}$	3	$^\circ\text{C}/\text{W}$
	TO-251/TO-252		3.6	$^\circ\text{C}/\text{W}$
	TO-252D			

### ■ ELECTRICAL CHARACTERISTICS

#### FOR LOGIC LEVEL (3 QUADRANTS)

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

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

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