



## BTB320A

Preliminary

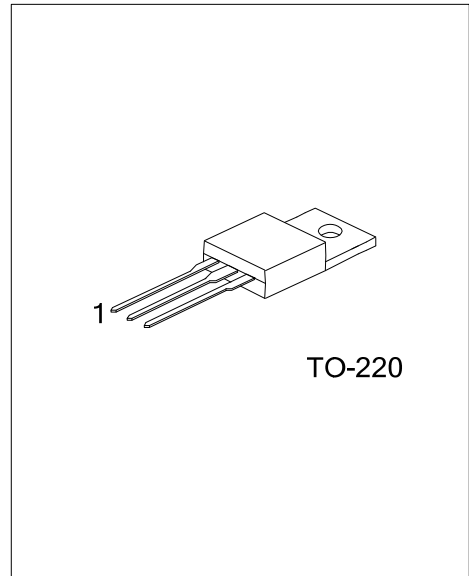
TRIAC

### 20A TRIACS

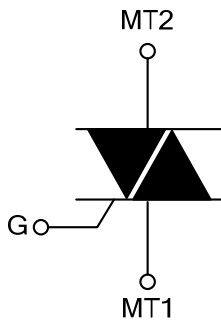
#### DESCRIPTION

The UTC **BTB320A** is a 20A triacs which can be operated in 3 quadrants, it uses UTC's advanced technology to provide customers with high commutation performances.

The UTC **BTB320A** 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	
BTB320AL-x-xx-TA3-T	BTB320AG-x-xx-TA3-T	TO-220	MT1	MT2	G	Tube

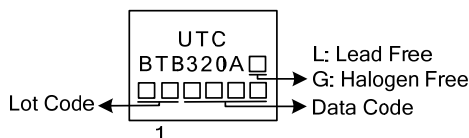
Note: Pin Assignment: MT1: MT1 MT2: MT2 G: Gate

BTB320AG-x-xx-TA3-T	(1)Packing Type (2)Package Type (3)Sensitivity and type (4) $V_{DRM}$ , $V_{RRM}$ (5)Green Package	(1) T: Tube (2) TA3: TO-220 (3) refer to SENSITIVITY AND TYPE (4) 6: 600V, 7: 700V (5) G: Halogen Free and Lead Free, L: Lead Free
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#### SENSITIVITY AND TYPE

PART NUMBER	Repetitive peak off-state voltage ( $V_{DRM}$ , $V_{RRM}$ )		SENSITIVITY	TYPE
	600V	700V		
BW		⊙	50mA	SNUBBERLESS
CW	⊙	⊙	35mA	SNUBBERLESS

#### MARKING



■ **ABSOLUTE MAXIMUM RATINGS**

PARAMETER		SYMBOL	RATINGS	UNIT	
RMS On-State Current (Full Sine Wave)	$T_C=70^\circ\text{C}$	$I_{T(RMS)}$	20	A	
Non Repetitive Surge Peak On-State Current (Full Cycle, $T_J$ initial= $25^\circ\text{C}$ )	F=50 Hz	$t=10\text{ms}$	210	A	
	F=60 Hz	$t=8.3\text{ms}$			
$I^2t$ Value for Fusing	$t_p=10\text{ms}$	$I^2t$	200	$\text{A}^2\text{s}$	
Critical Rate of Rise of On-State Current $I_G=500\text{mA}$ , $dI_G/dt = 1\text{A}/\mu\text{s}$	Repetitive, F=50 Hz	$T_J=125^\circ\text{C}$	$dI/dt$	50	$\text{A}/\mu\text{s}$
	Non Repetitive			100	$\text{A}/\mu\text{s}$
Non Repetitive Surge Peak Off-State Voltage	$t_p=10\text{ms}$	$T_J=25^\circ\text{C}$	$V_{DSM}/V_{RSM}$	$V_{DSM}/V_{RSM}+100$	V
Peak Gate Current	$t_p=20\mu\text{s}$	$T_J=125^\circ\text{C}$	$I_{GM}$	4	A
Peak Positive Gate Voltage	$t_p=20\mu\text{s}$		$V_{GM}$	16	V
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)	$\theta_{JC}$	1.3	$^\circ\text{C}/\text{W}$
Junction to Case (DC)		1.7	$^\circ\text{C}/\text{W}$

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

PARAMETER	SYMBOL	TEST CONDITIONS	BW			CW			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	2		50	1		35	mA
Gate Trigger Voltage	$V_{GT}$		I-II-III			1.5			1.5	V
Gate Non-Trigger Voltage	$V_{GD}$	$V_D=V_{DRM}$ , $R_L=3.3\text{k}\Omega$ , $T_J=125^\circ\text{C}$	I-II-III	0.2			0.2			V
Holding Current (Note 2)	$I_H$	$I_T=500\text{mA}$ , Gate Open			75				50	mA
Latching Current	$I_L$	$I_G=1.2I_{GT}$	I-III		50					mA
			II		90					mA
			I-II-III						80	mA
Critical Rate of Rise of Off-State Voltage (Note 2)	$dV/dt$	$V_D=67\%V_{DRM}$ , Gate Open, $T_J=125^\circ\text{C}$		500	750		250	500		$\text{V}/\mu\text{s}$
Critical Rate of Rise of Off-State Voltage at Commutation (Note 2)	$(dV/dt)_c$	$(dI/dt)_c=20\text{A}/\text{ms}$ , $T_J=125^\circ\text{C}$		18	36		11	22		$\text{V}/\mu\text{s}$

■ **STATIC CHARACTERISTICS**

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT		
Peak On-State Voltage (Note 2)	$V_{TM}$	$I_{TM}=28\text{A}$ , $t_p=380\mu\text{s}$				$T_J=25^\circ\text{C}$	1.70	V
Repetitive Peak Off-State Current	$I_{DRM}$	$V_{DRM}=V_{RRM}$				$T_J=25^\circ\text{C}$	10	$\mu\text{A}$
	$I_{RRM}$					$T_J=125^\circ\text{C}$	3	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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