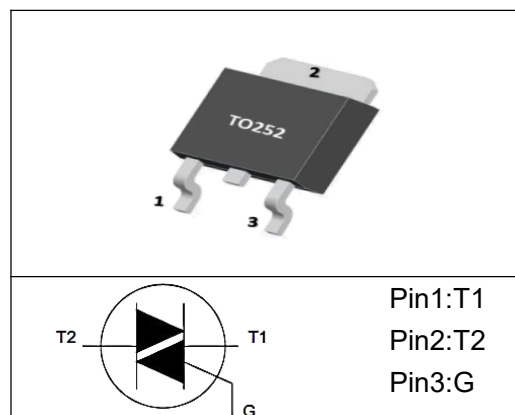


BT138S-800

TRIAC

■ GENERAL DESCRIPTION

Glass passivated , sensitive gate triac in a plastic envelope, intended for use in general purpose bidirectional switching and phase control applications, where high sensitivity is required in all four quadrants.



■ ABSOLUTE MAXIMUM RATINGS (TC=25°C, unless otherwise specified)

SYMBOL	PARAMETER		TEST CONDITION	RATINGS	UNIT
V_{DRM}	Repetitive Peak Off-State Voltage	BT138-800	$T_j = 25^{\circ}C$	800	V
$I_{T(RMS)}$	RMS On-State Current(Full sine wave, $T_{MB} \leq 99^{\circ}C$)			12	A
I_{TSM}	Non Repetitive Peak. On-State Current	$t=20ms$		95	A
		$t=16.7ms$		105	
$I^2 t$	$I^2 t$ For Fusing	$t=10ms$		45	$A^2 s$
di/dt	Repetitive Rate of Rise of On-state Current after Triggering ($I_{TM}=20A$, $I_G=0.2A$, $dI_G/dt=0.2A/\mu s$)	T2+ G-		50	A/ μs
		T2+ G-		50	
		T2- G-		50	
		T2- G+		10	
V_{GM}	Peak Gate Voltage			5	V
I_{GM}	Peak Gate Current			2	A
$P_{G(AV)}$	Average Gate Power			0.5	W
P_{GM}	Peak Gate Power			5	W
T_{stg}	Storage Temperature			-40 to +150	$^{\circ}C$
T_j	Operating junction temperature			150	$^{\circ}C$

Notes: Although not recommended, off-state voltages up to 800V may be applied without damage, but the triac may switch to the on-state. The rate of rise of current should not exceed 15A/ μs .

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■ THERMAL RESISTANCES

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	TO-252	$R\theta_{JA}$	62.5	$^{\circ}\text{C}/\text{W}$
Junction to Case	TO-252	$R\theta_{JC}$	2.6	$^{\circ}\text{C}/\text{W}$

■ STATIC CHARACTERISTICS (T_J=25°C, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Gate trigger current	I_{GT}	T2+ G+ $V_D=12\text{V}$, $I_T=0.1\text{A}$		2.5	10	mA
		T2+ G- $V_D=12\text{V}$, $I_T=0.1\text{A}$		4.0	10	mA
		T2- G- $V_D=12\text{V}$, $I_T=0.1\text{A}$		5.0	10	mA
		T2- G+ $V_D=12\text{V}$, $I_T=0.1\text{A}$		11	25	mA
Latching Current	I_L	T2+ G+ $V_D=12\text{V}$, $I_T=0.1\text{A}$		3.2	30	mA
		T2+ G- $V_D=12\text{V}$, $I_T=0.1\text{A}$		16	40	mA
		T2- G- $V_D=12\text{V}$, $I_T=0.1\text{A}$		4.0	30	mA
		T2- G+ $V_D=12\text{V}$, $I_T=0.1\text{A}$		5.5	40	mA
Holding current	I_H	$V_D=12\text{V}$, $I_{GT}=0.1\text{A}$		4.0	30	mA
On-State Voltage	V_T	$I_T=15\text{A}$		1.4	1.65	V
Gate Trigger Voltage	V_{GT}	$V_D=12\text{V}$, $I_T=0.1\text{A}$		0.7	1.5	V
		$V_D=400\text{V}$, $I_T=0.1\text{A}$, $T_J=125^{\circ}\text{C}$		0.4		
Off-state leakage current	I_D	$V_D=V_{DRM(max)}$, $T_J=125^{\circ}\text{C}$			0.5	mA

■ DYNAMIC CHARACTERISTICS(T_J=25°C, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Critical Rate Of Rise Of Off-State Voltage	dV_D/dt	$V_{DM}=67\%$, $V_{DRM(max)}$, $T_J=125^{\circ}\text{C}$ Exponential waveform, Gate open circuit		50		V/ μs
Gate Controlled Turn-on Time	t_{gt}	$I_{TM}=16\text{A}$; $V_D=V_{DRM(max)}$; $I_G=0.1\text{A}$ $dI_G/dt=5\text{A}/\mu\text{s}$		2.0		μs

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TYPICAL CHARACTERISTICS (1)

Figure 1. Maximum On-State Dissipation. P_{tot} vs RMS On-state Current, $I_{T(RMS)}$, Where α =Conduction Angle.

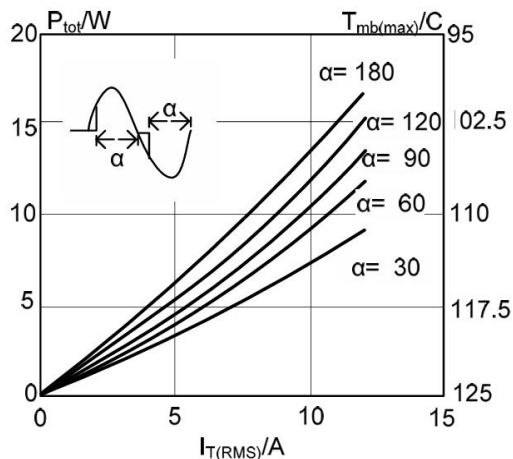


Figure 2. Maximum Permissible Non-Repetitive Peak On-State Current I_{TSM} , vs Pulse Width t_p , for Sinusoidal Currents, $t_p \leq 20ms$.

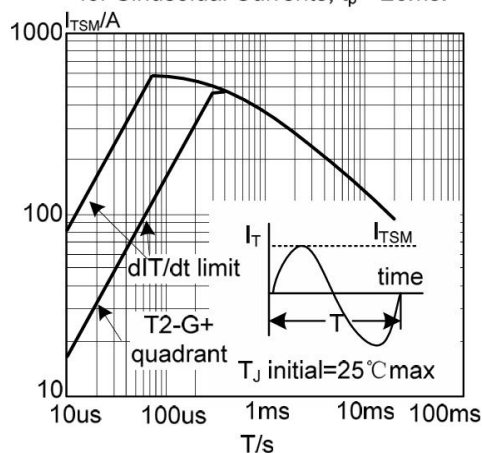


Figure 3. Maximum Permissible Non-Repetitive Peak On-State Current I_{TSM} , vs Number of Cycles, for Sinusoidal Currents, $f=50Hz$.

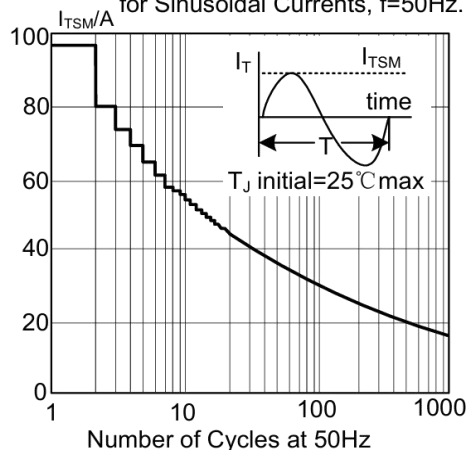


Figure 4. Maximum Permissible RMS Current $I_{T(RMS)}$ vs Mounting Base Temperature T_{mb}

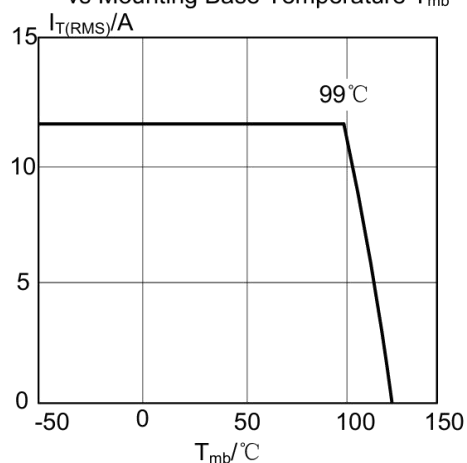


Figure 5. Maximum Permissible Repetitive RMS On-State Current $I_{T(RMS)}$, vs Surge Duration, for Sinusoidal Currents, $f=50Hz$, $T_{mb} \leq 99^\circ C$

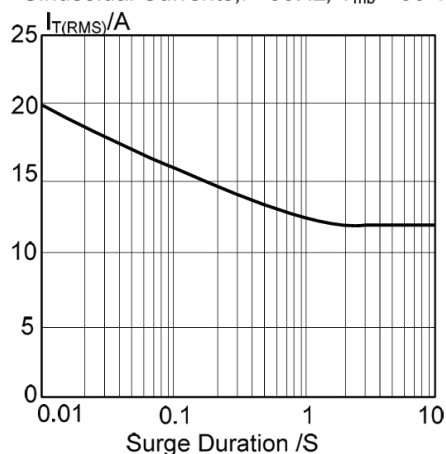
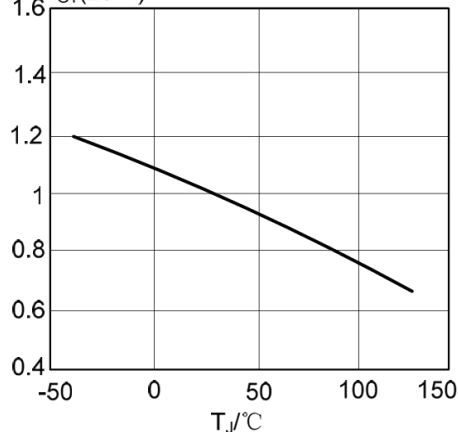


Figure 6. Normalised Gate Trigger Voltage $V_{GT}(T_J)/V_{GT}(25^\circ C)$, vs Junction Temperature T_J



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TRIAC

TYPICAL CHARACTERISTICS (2)

Figure 7. Normalised Gate Trigger Current $I_{GT}(T_J)/I_{GT}(25^\circ\text{C})$, vs Junction Temperature T_J .

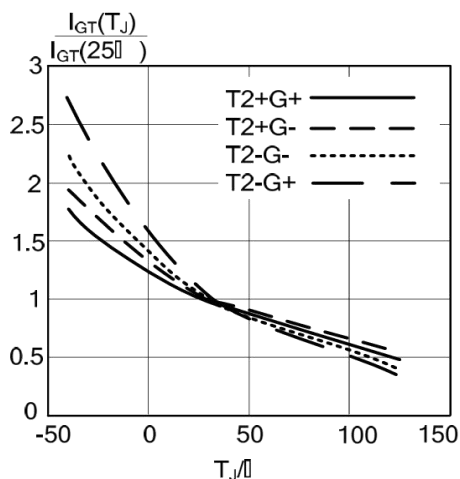


Figure 8. Normalised Latching Current $I_L(T_J)/I_L(25^\circ\text{C})$, vs Junction Temperature T_J .

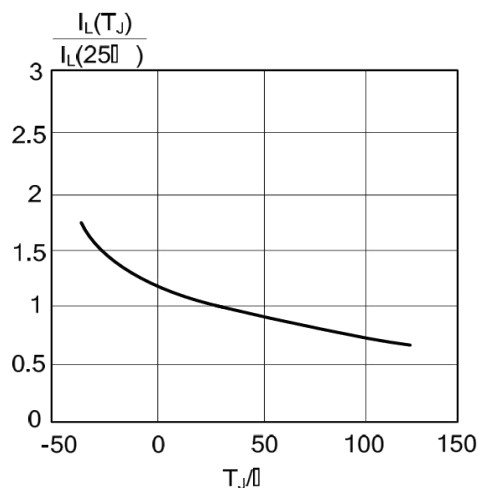


Figure 9. Normalised Holding Current $I_H(T_J)/I_H(25^\circ\text{C})$, vs Junction Temperature T_J .

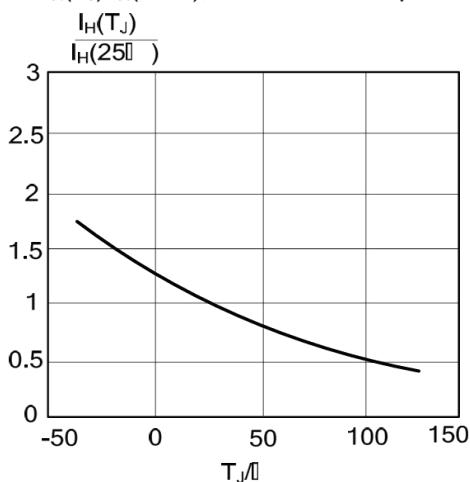


Figure 10. Typical and Maximum On-state Characteristic

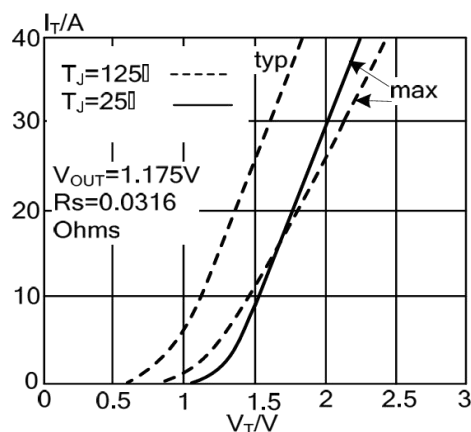


Figure 11. Transient Thermal Impedance $Z_{th j-mb}$, vs Pulse Width t_p

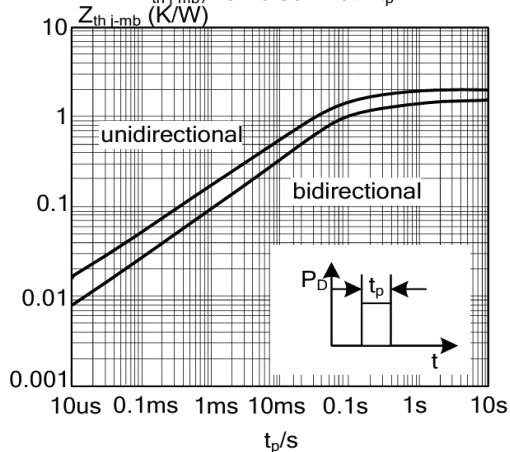
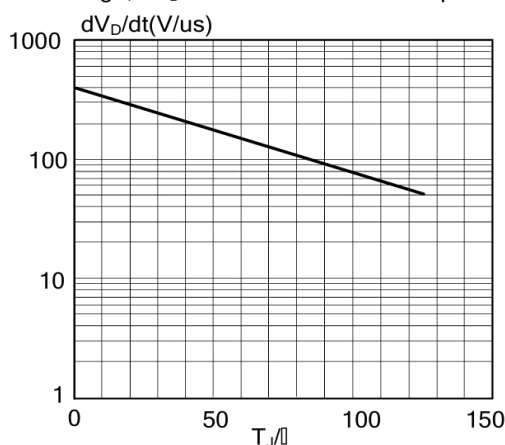
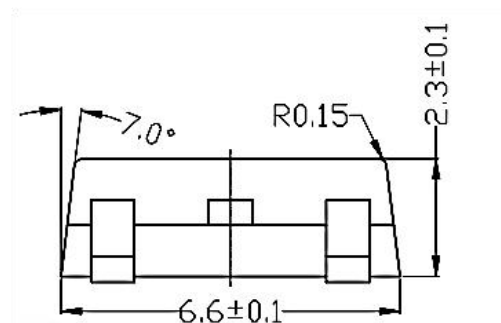
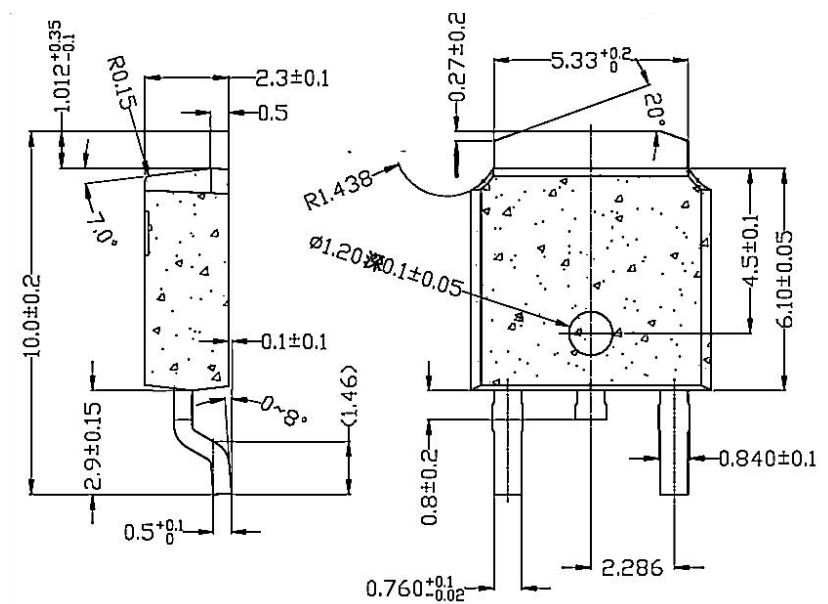


Figure 12. Typical Critical Rate of Rise of Off-State Voltage, dV_D/dt Versus Junction Temperature T_J



■ TO - 252 Package Outline Dimensions



■ TO - 252 Packing Information

Package version	Reel dimensions $\Phi \times H$ (mm)	Per Reel (pcs)	Reels per box	Inner box dimensions $L \times W \times H$ (mm)	Outer box (pcs)	Outer box dimensions $L \times W \times H$ (mm)
T0-252	$\Phi 330 \times 20$	2500	2	360*340*50	25000	375*375*280