

**Triacs**

**BT137B series**

**GENERAL DESCRIPTION**

Glass passivated triacs in a plastic envelope suitable for surface mounting, intended for use in applications requiring high bidirectional transient and blocking voltage capability and high thermal cycling performance. Typical applications include motor control, industrial and domestic lighting, heating and static switching.

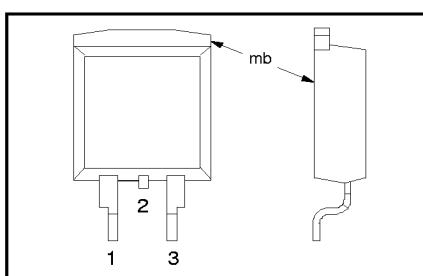
**QUICK REFERENCE DATA**

SYMBOL	PARAMETER	MAX.	MAX.	MAX.	UNIT
$V_{DRM}$	Repetitive peak off-state voltages	BT137B-500	600	800	V
		BT137B-500F	600F	800F	
		BT137B-500G	600G	800G	
$I_{T(RMS)}$	RMS on-state current	8	8	8	A
$I_{TSM}$	Non-repetitive peak on-state current	65	65	65	A

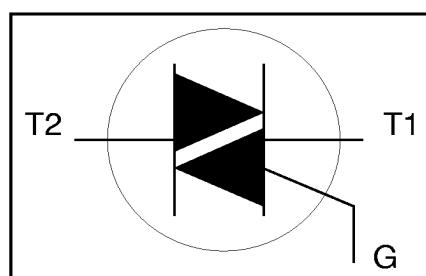
**PINNING - SOT404**

PIN	DESCRIPTION
1	main terminal 1
2	main terminal 2
3	gate
mb	main terminal 2

**PIN CONFIGURATION**



**SYMBOL**



**LIMITING VALUES**

Limiting values in accordance with the Absolute Maximum System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.			UNIT
				-500	-600	-800	
$V_{DRM}$	Repetitive peak off-state voltages		-	500 <sup>1</sup>	600 <sup>1</sup>	800	V
$I_{T(RMS)}$	RMS on-state current	full sine wave; $T_{mb} \leq 102\text{ }^\circ\text{C}$	-	8			A
$I_{TSM}$	Non-repetitive peak on-state current	full sine wave; $T_j = 25\text{ }^\circ\text{C}$ prior to surge	-	65			A
$I^2t$	$I^2t$ for fusing	$t = 20\text{ ms}$	-	71			A
$di_T/dt$	Repetitive rate of rise of on-state current after triggering	$t = 16.7\text{ ms}$	-	21			A <sup>2</sup> s
		$t = 10\text{ ms}$	-	50			A/μs
		$I_{TM} = 12\text{ A}; I_G = 0.2\text{ A}; di_G/dt = 0.2\text{ A}/\mu\text{s}$	-	50			A/μs
		T2+ G+	-	10			A/μs
		T2+ G-	-	2			A
		T2- G-	-	5			V
		T2- G+	-	5			W
$I_{GM}$	Peak gate current		-	0.5			W
$V_{GM}$	Peak gate voltage		-	150			°C
$P_{GM}$	Peak gate power		-	125			°C
$P_{G(AV)}$	Average gate power	over any 20 ms period	-				
$T_{stg}$	Storage temperature		-40				
$T_j$	Operating junction temperature		-				

<sup>1</sup> 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 6 A/μs.

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## THERMAL RESISTANCES

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$R_{th\text{-}j\text{-}mb}$	Thermal resistance junction to mounting base	full cycle	-	-	2.0	K/W
$R_{th\text{-}j\text{-}a}$	Thermal resistance junction to ambient	half cycle minimum footprint, FR4 board	-	55	2.4	K/W
			-		-	K/W

## STATIC CHARACTERISTICS

 $T_j = 25\text{ }^\circ\text{C}$  unless otherwise stated

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.			UNIT
$I_{GT}$	Gate trigger current	<b>BT137B-</b> $V_D = 12\text{ V}; I_T = 0.1\text{ A}$			...	...F	...G	
		T2+ G+	-	5	35	25	50	mA
		T2+ G-	-	8	35	25	50	mA
		T2- G-	-	11	35	25	50	mA
		T2- G+	-	30	70	70	100	mA
$I_L$	Latching current	$V_D = 12\text{ V}; I_{GT} = 0.1\text{ A}$						
		T2+ G+	-	7	30	30	45	mA
		T2+ G-	-	16	45	45	60	mA
		T2- G-	-	5	30	30	45	mA
		T2- G+	-	7	45	45	60	mA
$I_H$	Holding current	$V_D = 12\text{ V}; I_{GT} = 0.1\text{ A}$	-	5	20	20	40	mA
$V_T$	On-state voltage	$I_T = 10\text{ A}$	-	1.3	1.65			V
$V_{GT}$	Gate trigger voltage	$V_D = 12\text{ V}; I_T = 0.1\text{ A}$	-	0.7	1.5			V
		$V_D = 400\text{ V}; I_T = 0.1\text{ A};$ $T_j = 125\text{ }^\circ\text{C}$	0.25	0.4	-			V
$I_D$	Off-state leakage current	$V_D = V_{DRM(max)};$ $T_j = 125\text{ }^\circ\text{C}$	-	0.1	0.5			mA

## DYNAMIC CHARACTERISTICS

 $T_j = 25\text{ }^\circ\text{C}$  unless otherwise stated

SYMBOL	PARAMETER	CONDITIONS	MIN.			TYP.	MAX.	UNIT
$dV_D/dt$	Critical rate of rise of off-state voltage	<b>BT137B-</b> $V_{DM} = 67\% V_{DRM(max)};$ $T_j = 125\text{ }^\circ\text{C};$ exponential waveform; gate open circuit	...	...F	...G	250	-	V/ $\mu\text{s}$
$dV_{com}/dt$	Critical rate of change of commutating voltage	$V_{DM} = 400\text{ V}; T_j = 95\text{ }^\circ\text{C};$ $I_{T(RMS)} = 8\text{ A};$ $dl_{com}/dt = 3.6\text{ A/ms};$ gate open circuit	-	-	10	20	-	V/ $\mu\text{s}$
$t_{gt}$	Gate controlled turn-on time	$I_{TM} = 12\text{ A}; V_D = V_{DRM(max)};$ $I_G = 0.1\text{ A}; dl_G/dt = 5\text{ A}/\mu\text{s}$	-	-	-	2	-	$\mu\text{s}$

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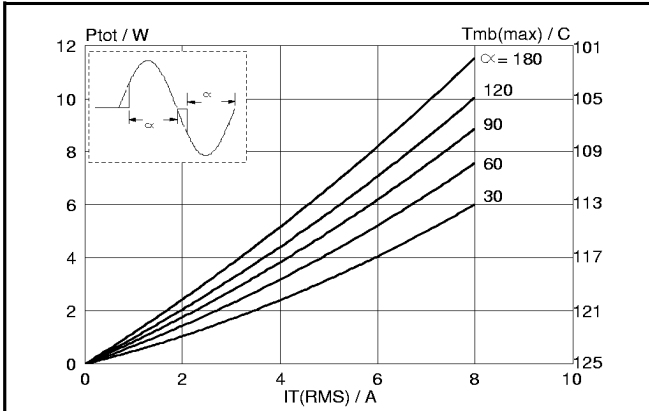


Fig.1. Maximum on-state dissipation,  $P_{tot}$  versus rms on-state current,  $I_{T(RMS)}$ , where  $\alpha =$  conduction angle.

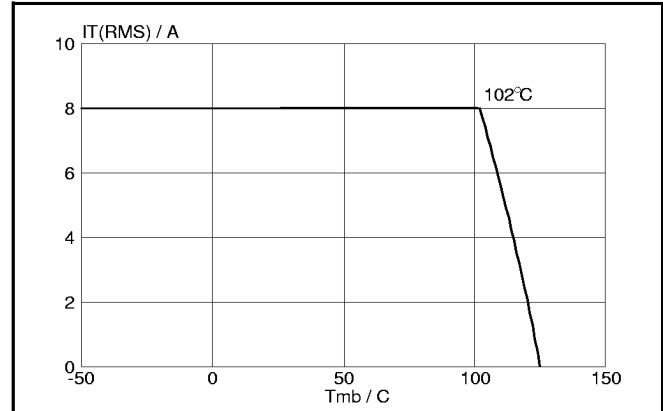


Fig.4. Maximum permissible rms current  $I_{T(RMS)}$ , versus mounting base temperature  $T_{mb}$ .

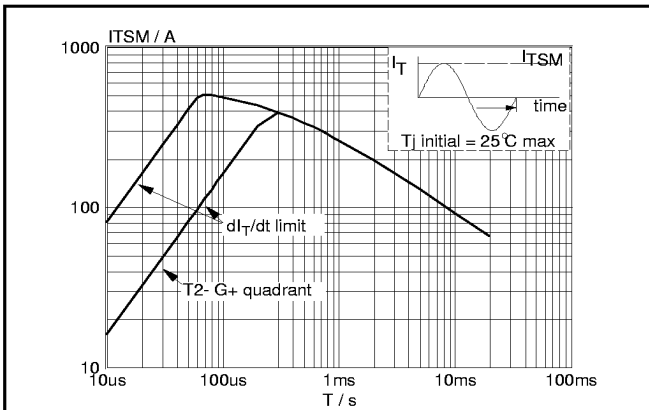


Fig.2. Maximum permissible non-repetitive peak on-state current  $I_{TSM}$ , versus pulse width  $t_p$ , for sinusoidal currents,  $t_p \leq 20ms$ .

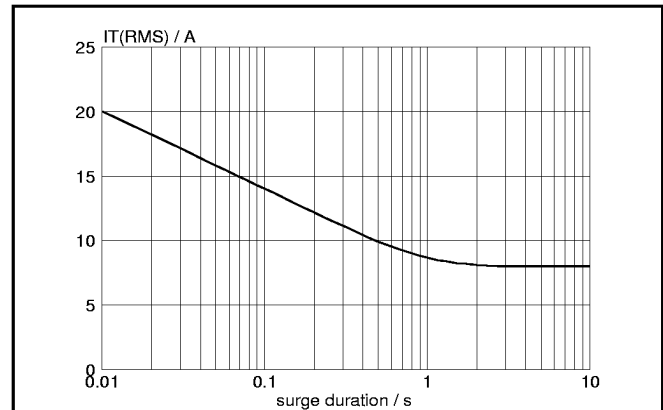


Fig.5. Maximum permissible repetitive rms on-state current  $I_{T(RMS)}$ , versus surge duration, for sinusoidal currents,  $f = 50 Hz$ ;  $T_{mb} \leq 102^\circ C$ .

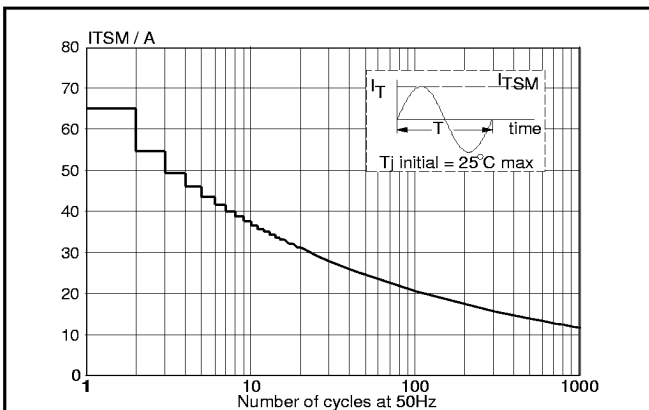


Fig.3. Maximum permissible non-repetitive peak on-state current  $I_{TSM}$ , versus number of cycles, for sinusoidal currents,  $f = 50 Hz$ .

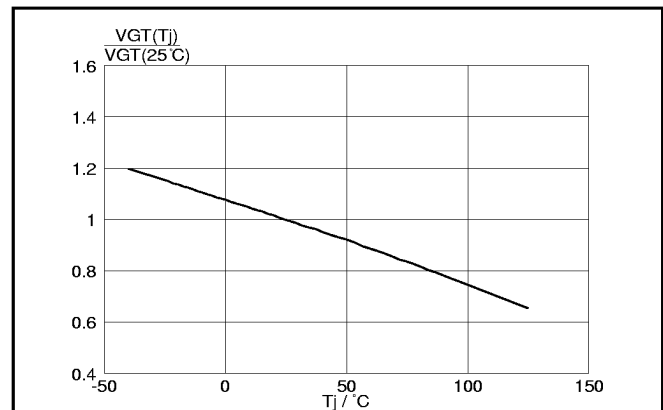
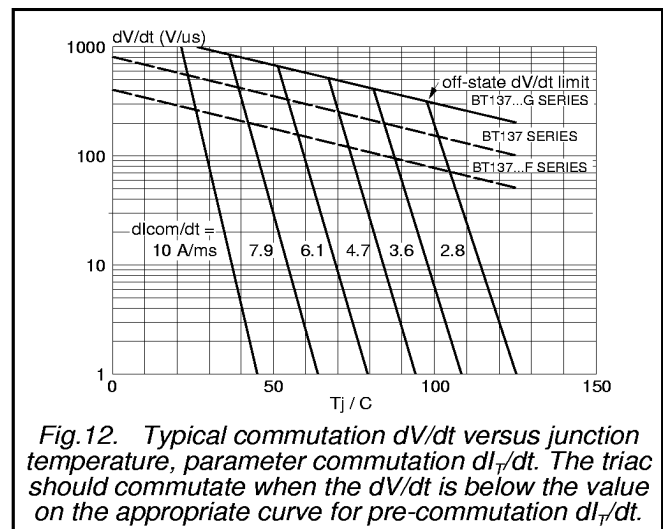
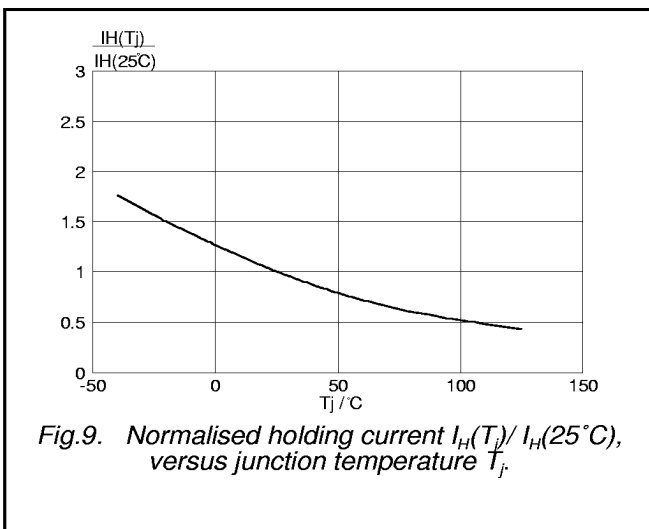
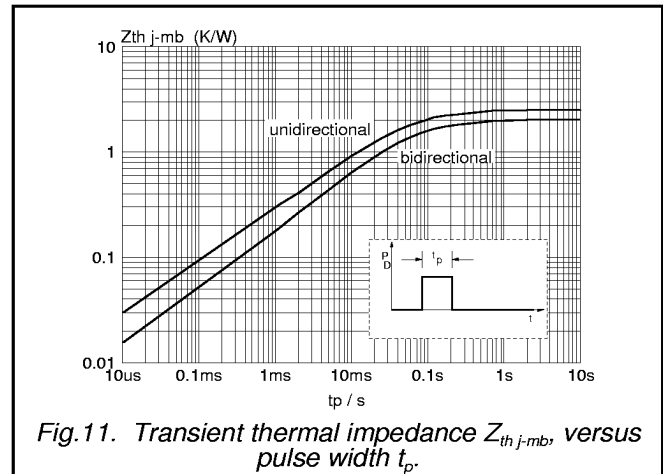
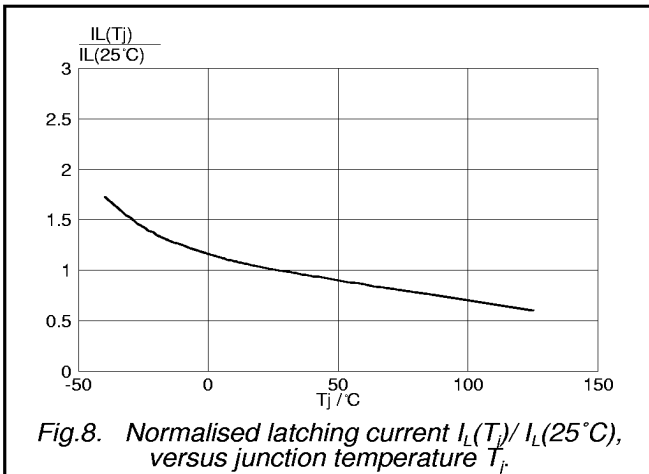
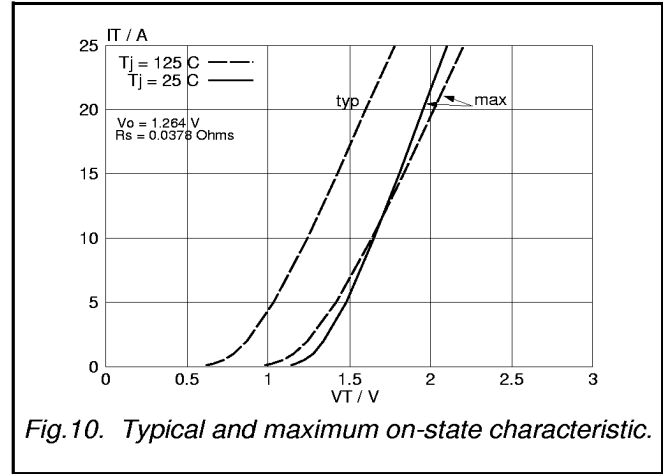
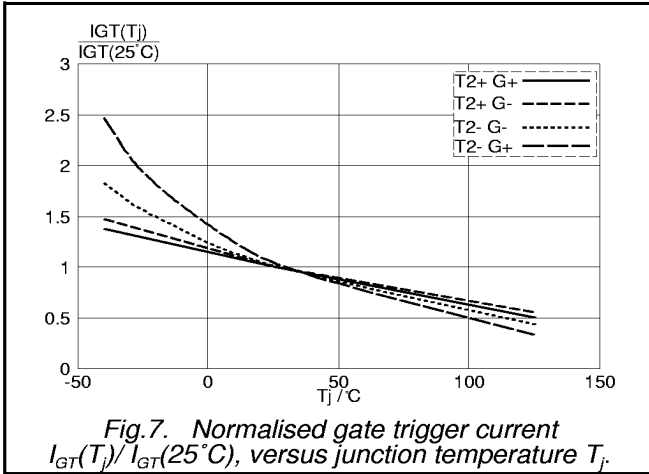


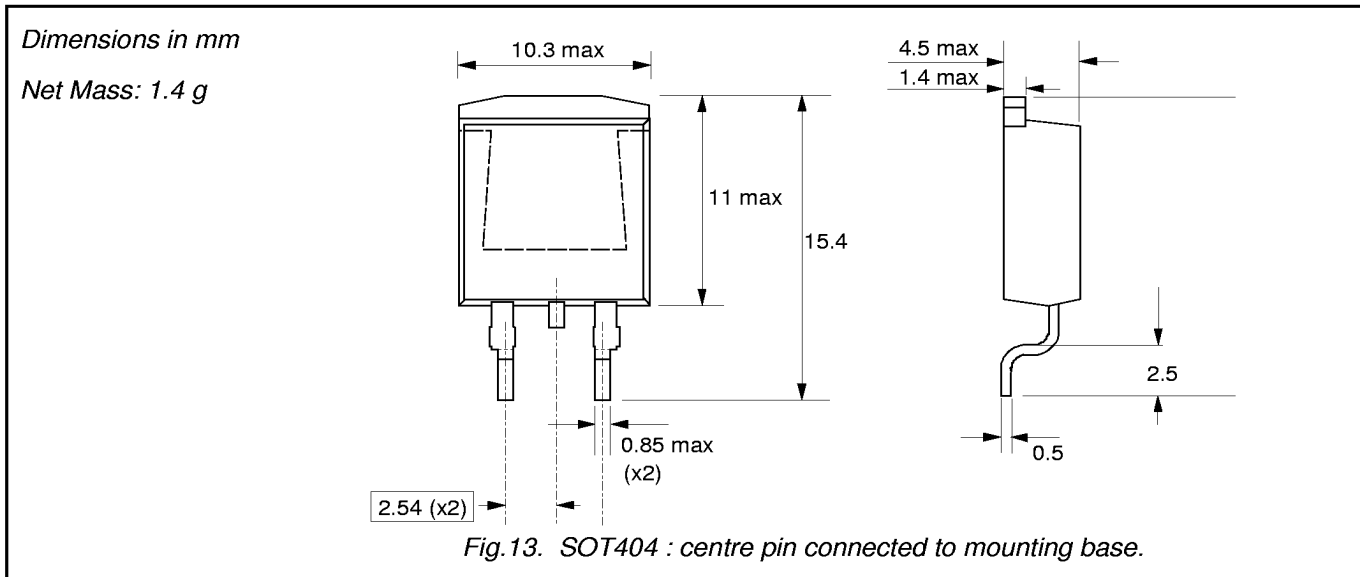
Fig.6. Normalised gate trigger voltage  $V_{GT}(T_j) / V_{GT}(25^\circ C)$ , versus junction temperature  $T_j$ .

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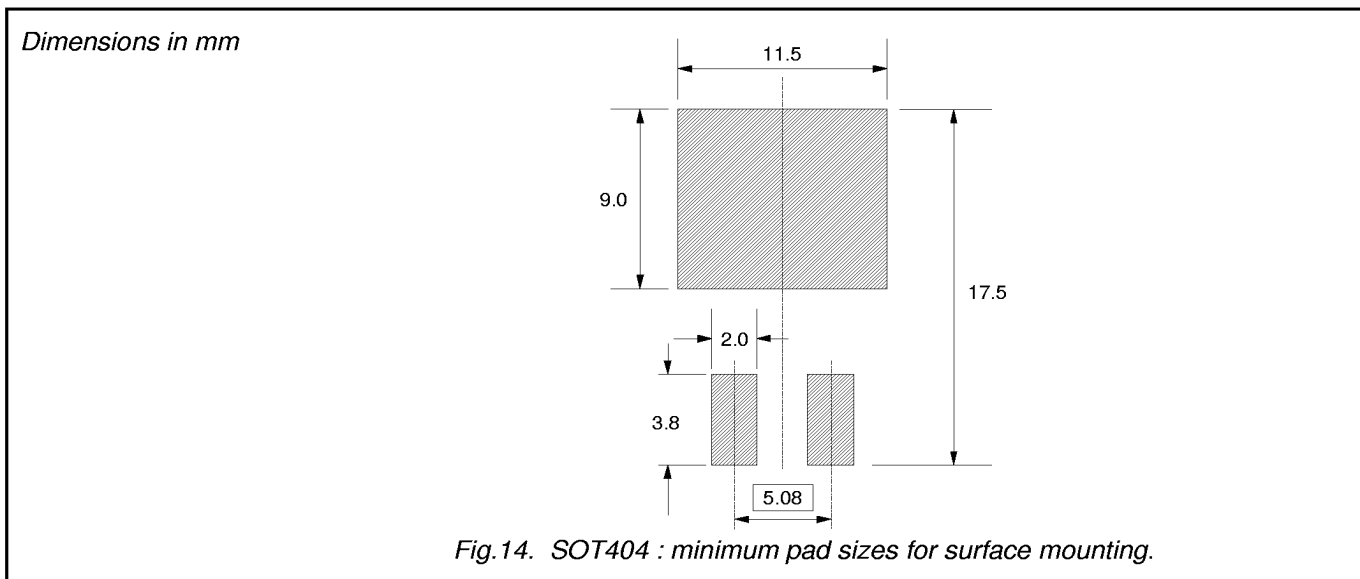
**MECHANICAL DATA**



**Notes**

- 1. Epoxy meets UL94 V0 at 1/8".

**MOUNTING INSTRUCTIONS**



**Notes**

- 1. Plastic meets UL94 V0 at 1/8".