

Triacs

logic level

BT137B series D

GENERAL DESCRIPTION

Glass passivated, sensitive gate triacs in a plastic envelope suitable for surface mounting, intended for use in general purpose bidirectional switching and phase control applications. These devices are intended to be interfaced directly to microcontrollers, logic integrated circuits and other low power gate trigger circuits.

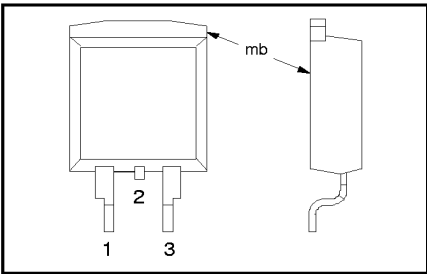
QUICK REFERENCE DATA

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

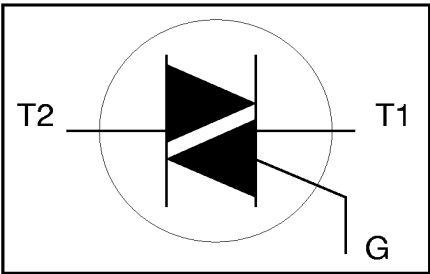
PINNING - SOT404

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

1 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 .

Triacs

logic level

BT137B series D

THERMAL RESISTANCES

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$R_{th\ j-mb}$	Thermal resistance junction to mounting base	full cycle	-	-	2.0	K/W
$R_{th\ j-a}$	Thermal resistance junction to ambient	half cycle minimum footprint, FR4 board	-	-	2.4	K/W
			-	55	-	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	$V_D = 12\text{ V}$; $I_T = 0.1\text{ A}$	-	-	-	-
		T2+ G+	-	2.5	5	mA
		T2+ G-	-	3.5	5	mA
		T2- G-	-	3.5	5	mA
		T2- G+	-	6.5	10	mA
I_L	Latching current	$V_D = 12\text{ V}$; $I_{GT} = 0.1\text{ A}$	-	-	-	-
		T2+ G+	-	1.6	15	mA
		T2+ G-	-	8.5	20	mA
		T2- G-	-	1.2	15	mA
		T2- G+	-	2.5	20	mA
I_H	Holding current	$V_D = 12\text{ V}$; $I_{GT} = 0.1\text{ A}$	-	1.5	10	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	$V_{DM} = 67\% V_{DRM(max)}$; $T_j = 125\text{ }^{\circ}\text{C}$; exponential waveform; $R_{GK} = 1\text{ k}\Omega$	-	5	-	V/ μs
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	-	μs

Triacs

logic level

BT137B series D

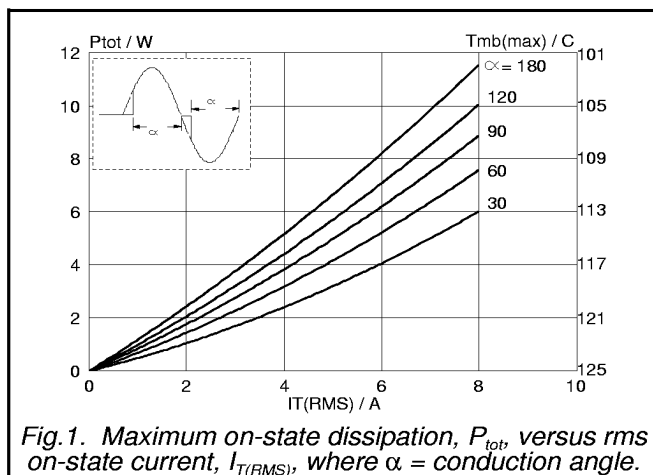


Fig.1. Maximum on-state dissipation, P_{tot} , versus rms on-state current, $I_{T(RMS)}$, where α = conduction angle.

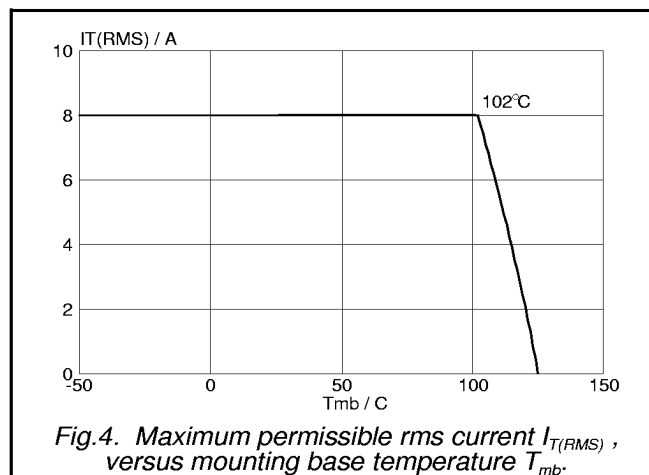


Fig.4. Maximum permissible rms current $I_{T(RMS)}$, versus mounting base temperature T_{mb} .

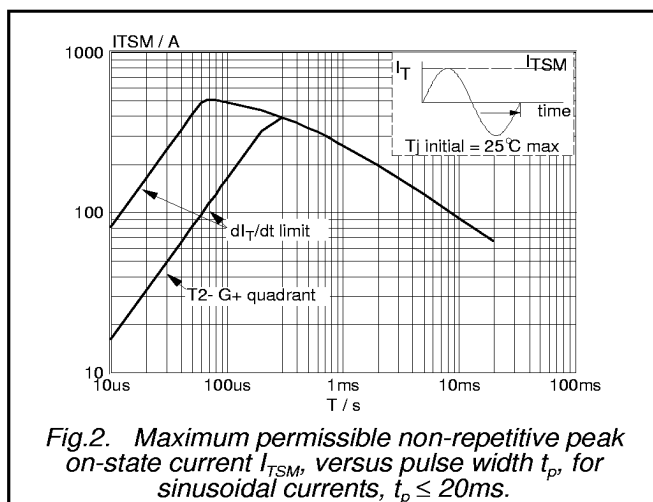


Fig.2. Maximum permissible non-repetitive peak on-state current I_{TSM} , versus pulse width t_p , for sinusoidal currents, $t_p \leq 20$ ms.

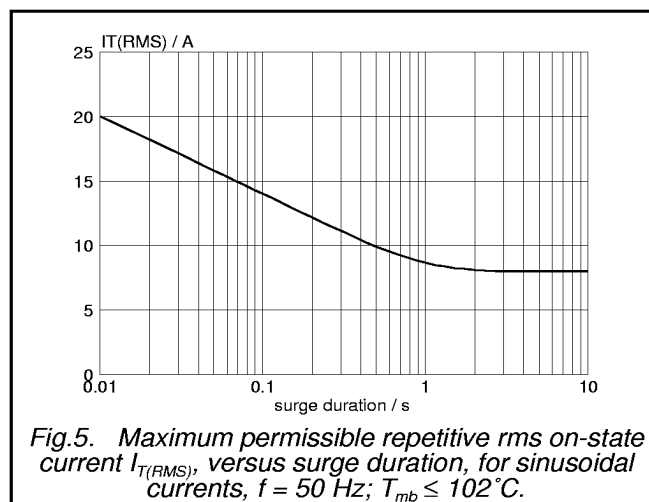


Fig.5. Maximum permissible repetitive rms on-state current $I_{T(RMS)}$, versus surge duration, for sinusoidal currents, $f = 50$ Hz; $T_{mb} \leq 102$ °C.

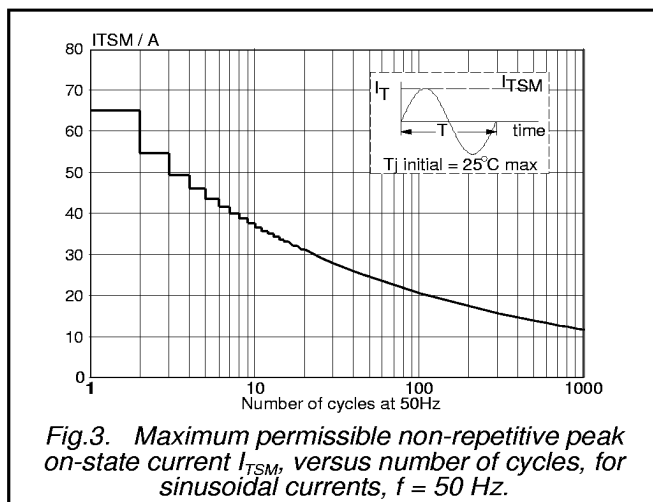


Fig.3. Maximum permissible non-repetitive peak on-state current I_{TSM} , versus number of cycles, for sinusoidal currents, $f = 50$ Hz.

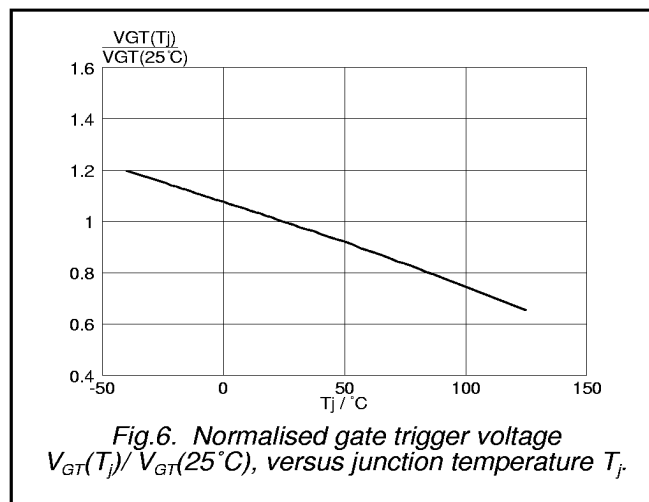
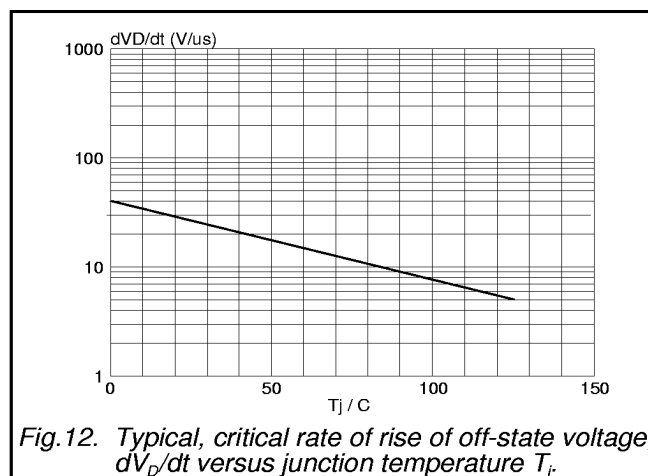
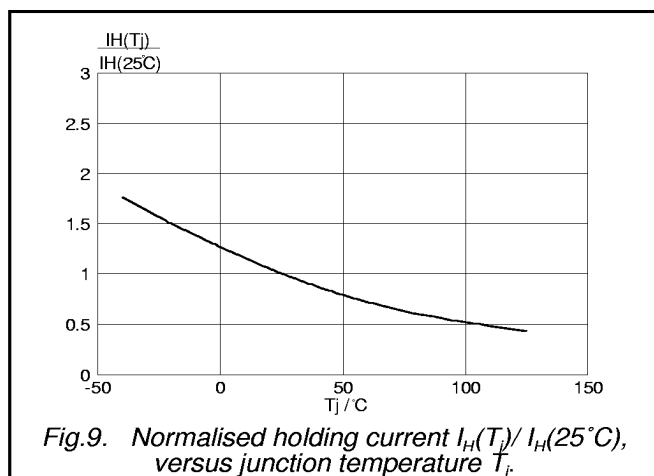
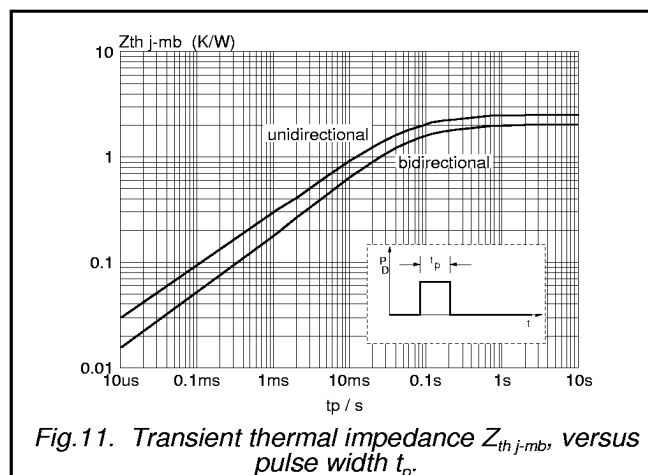
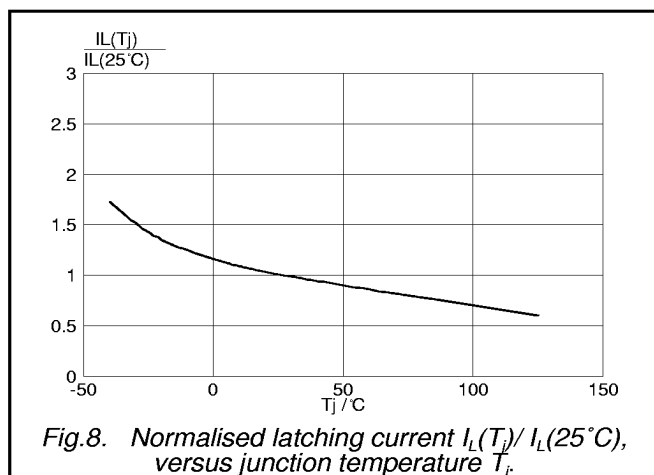
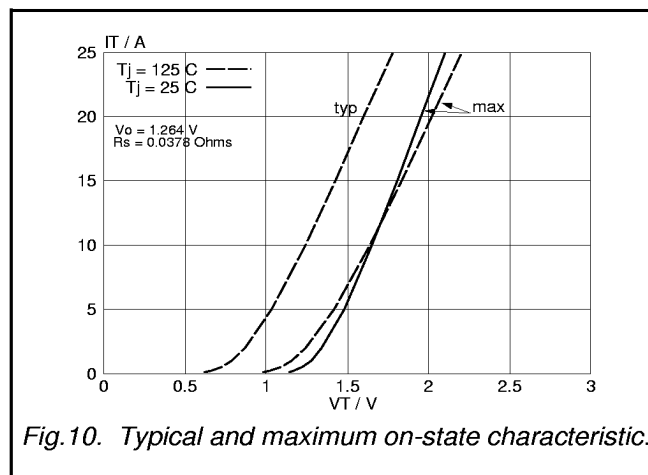
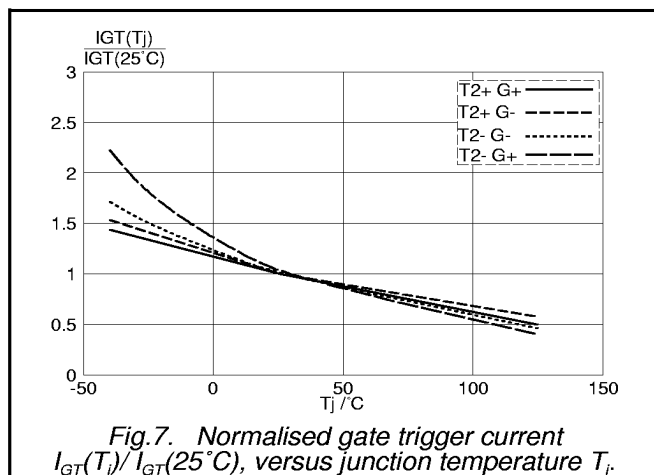


Fig.6. Normalised gate trigger voltage $V_{GT}(T_j) / V_{GT}(25\text{ °C})$, versus junction temperature T_j .

Triacs

logic level

BT137B series D



Triacs
logic level

BT137B series D

MECHANICAL DATA

Dimensions in mm

Net Mass: 1.4 g

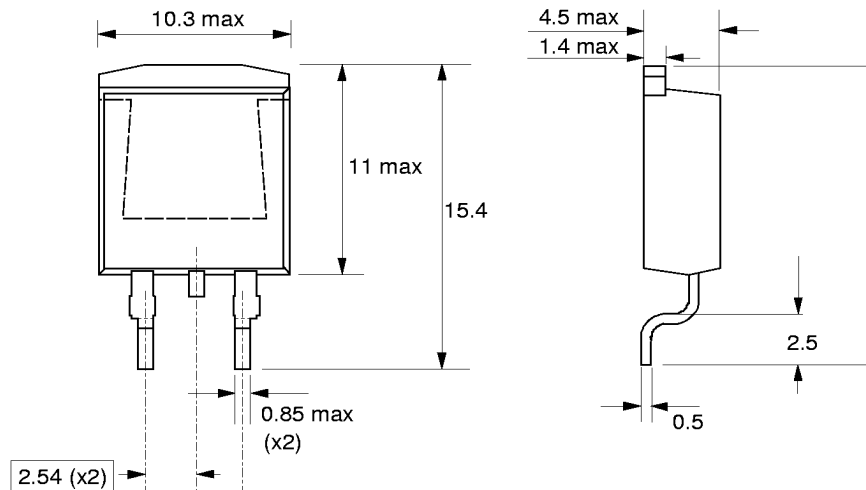


Fig.13. SOT404 : centre pin connected to mounting base.

Notes

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

MOUNTING INSTRUCTIONS

Dimensions in mm

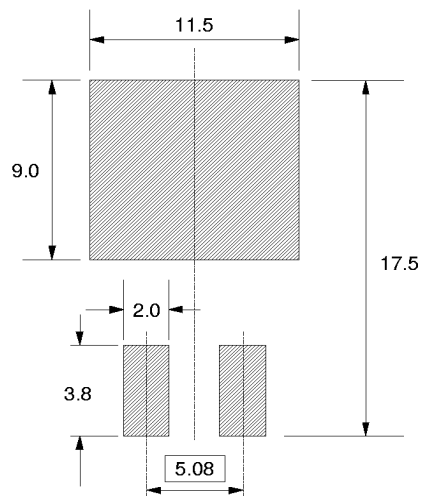


Fig.14. SOT404 : minimum pad sizes for surface mounting.

Notes

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