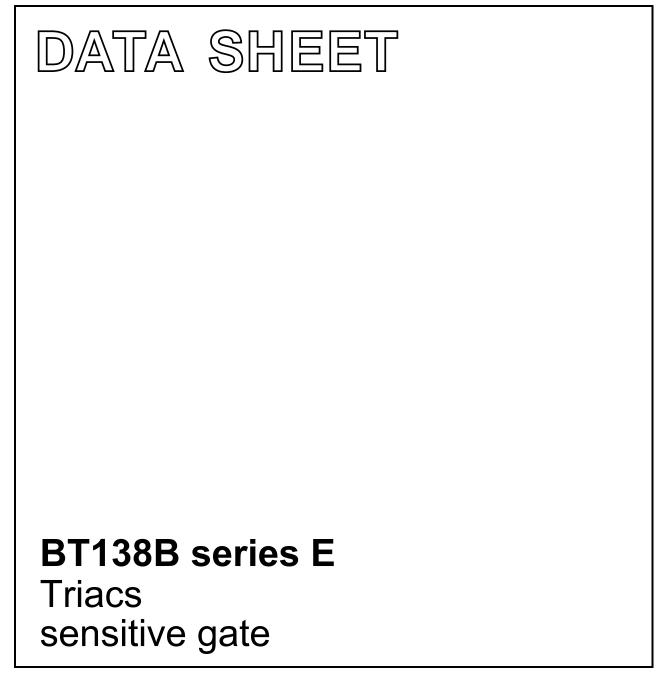
DISCRETE SEMICONDUCTORS



Product specification

July 2001



Triacs sensitive gate

BT138B series E

MAX.

800E

800

12

95

UNIT

٧

А

А

GENERAL DESCRIPTION

Passivated, sensitive gate triacs in a plastic envelope suitable for surface mounting, intended for use in general purpose bidirectional switching and phase control applications, where high sensitivity is required in all four quadrants.

PINNING - SOT404

PIN CONFIGURATION

SYMBOL

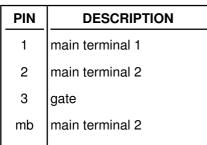
 V_{DRM}

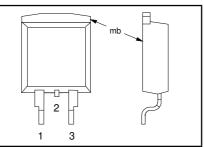
T(RMS)

I_{TSM}

SYMBOL

BT138B-





QUICK REFERENCE DATA

PARAMETER

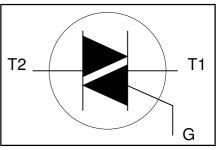
voltages

current

Repetitive peak off-state

Non-repetitive peak on-state

RMS on-state current



MAX.

600E

600

12

95

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		-	-600 600 ¹	-800 800	V
I _{T(RMS)} I _{TSM}	RMS on-state current Non-repetitive peak on-state current	full sine wave; $T_{mb} \le 99$ °C full sine wave; $T_j = 25$ °C prior to surge	-		2	A
		t = 20 ms	-		5	A
l²t dI _⊤ /dt	I ² t for fusing Repetitive rate of rise of on-state current after		-		05 5	A A ² s
	triggering	T2+ G+ T2+ G- T2- G- T2- G+		5	0 0 0 0	A/μs A/μs A/μs
I _{GM} V _{GM} P _{GM}	Peak gate current Peak gate voltage Peak gate power				2 5 5	A/μs A V W
$\begin{array}{c} P_{G(AV)}^{CIW} \\ T_{stg}^{stg} \\ T_{j} \end{array}$	Average gate power Storage temperature Operating junction temperature	over any 20 ms period	-40 -	15	.5 50 25	°℃ ℃

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 15 $A/\mu s$.

Triacs BT138B series E sensitive gate

THERMAL RESISTANCES

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
R _{th j-mb} R _{th j-a}		full cycle half cycle minimum footprint, FR4 board	- -	- - 55	1.5 2.0 -	K/W K/W K/W

STATIC CHARACTERISTICS

 $T_j = 25$ °C unless otherwise stated

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
I _{GT}	Gate trigger current	$V_{\rm D} = 12 \text{ V}; I_{\rm T} = 0.1 \text{ A}$				
a.		T2+ G-	. -	2.5	10	mA
		T2+ G-	-	4.0	10	mA
		T2- G-	-	5.0	10	mA
		T2- G+	-	11	25	mA
I _L	Latching current	$V_{\rm D} = 12 \text{ V}; I_{\rm GT} = 0.1 \text{ A}$				
	-	T2+ G-		3.2	30	mA
		T2+ G-	-	16	40	mA
		T2- G-	-	4.0	30	mA
		T2- G+	-	5.5	40	mA
I _H	Holding current	$V_{\rm D} = 12 \text{ V}; I_{\rm GT} = 0.1 \text{ A}$	-	4.0	30	mA
V _T	On-state voltage	$I_{T} = 15 A$	-	1.4	1.65	V
∣I _H V _T V _{GT}	Gate trigger voltage	$V_{\rm D} = 12 \text{ V}; I_{\rm T} = 0.1 \text{ A}$	-	0.7	1.5	V
		$V_{\rm D} = 400 \text{ V}; I_{\rm T} = 0.1 \text{ A}; T_{\rm L} = 125 \text{ °C}$	0.25	0.4	-	V
I _D	Off-state leakage current	$V_{D} = 12 \text{ V}; I_{T} = 0.1 \text{ A}$ $V_{D} = 400 \text{ V}; I_{T} = 0.1 \text{ A}; T_{j} = 125 ^{\circ}\text{C}$ $V_{D} = V_{DRM(max)}; T_{j} = 125 ^{\circ}\text{C}$	-	0.1	0.5	mA

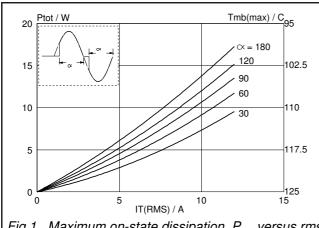
DYNAMIC CHARACTERISTICS

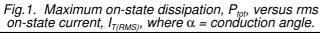
 $T_j = 25$ °C unless otherwise stated

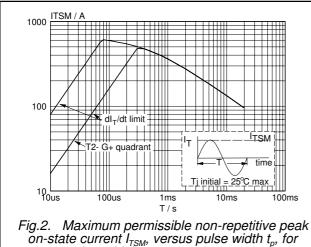
SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
dV _D /dt	Critical rate of rise of off-state voltage	$V_{DM} = 67\% V_{DRM(max)}; T_j = 125 °C;$ exponential waveform; gate open circuit	-	50	-	V/µs
t _{gt}		$I_{TM} = 16 \text{ A}; V_D = V_{DRM(max)}; I_G = 0.1 \text{ A}; dI_G/dt = 5 \text{ A/}\mu\text{s}$	-	2	-	μs

BT138B series E

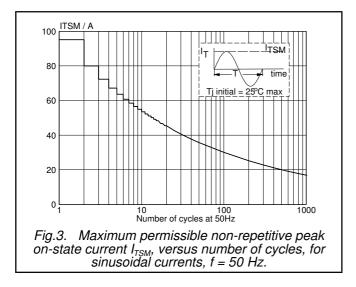
Triacs sensitive gate

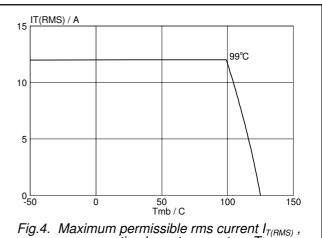


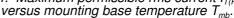


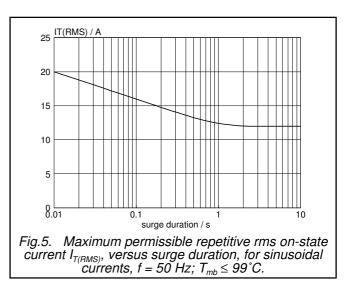


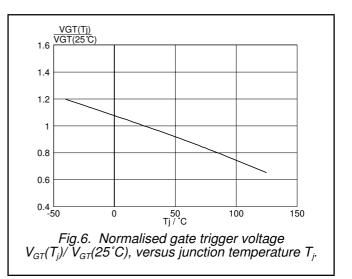
on-state current I_{TSM} , versus pulse width t_p , for sinusoidal currents, $t_p \le 20ms$.





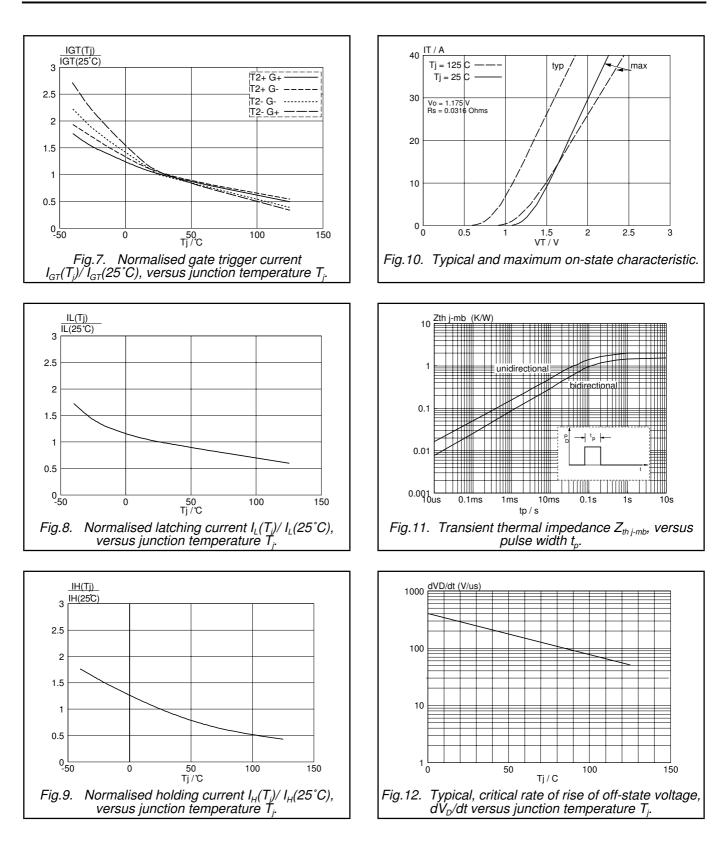






BT138B series E

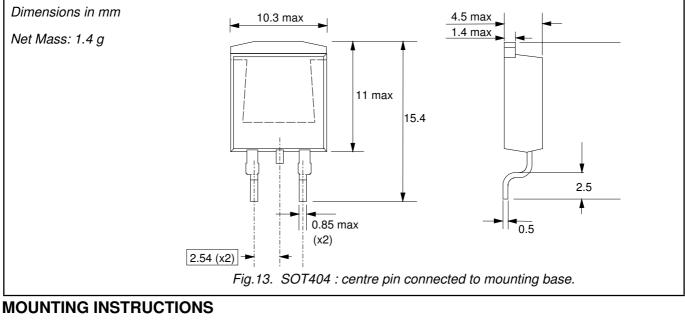
Triacs sensitive gate

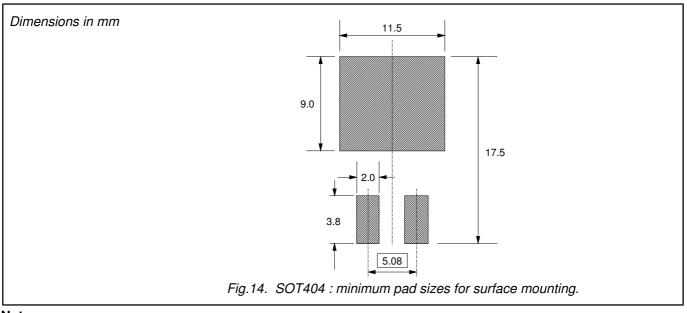


Triacs sensitive gate

BT138B series E

MECHANICAL DATA





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

Legal information

DATA SHEET STATUS

DOCUMENT STATUS ⁽¹⁾	PRODUCT STATUS ⁽²⁾	DEFINITION
Objective data sheet	Development	This document contains data from the objective specification for product development.
Preliminary data sheet	Qualification	This document contains data from the preliminary specification.
Product data sheet	Production	This document contains the product specification.

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Contact information

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