

# DATA SHEET

## **BT132 series D**

Triacs

logic level

Product specification

January 1998



# Triacs logic level

## BT132 series D

### GENERAL DESCRIPTION

Glass passivated, sensitive gate triacs in a plastic envelope, 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.

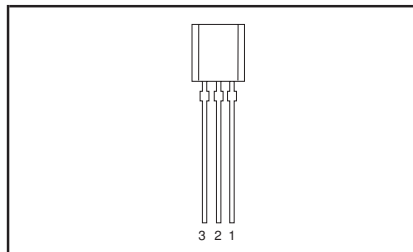
### QUICK REFERENCE DATA

SYMBOL	PARAMETER	MAX.	MAX.	UNIT
$V_{DRM}$	Repetitive peak off-state voltages	<b>500D</b> 500	<b>600D</b> 600	V
$I_{T(RMS)}$	RMS on-state current	1	1	A
$I_{TSM}$	Non-repetitive peak on-state current	16	16	A

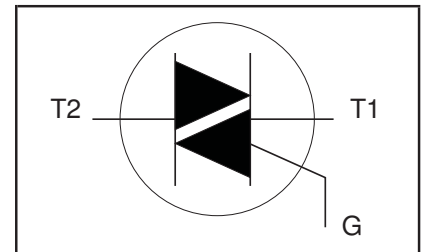
### PINNING - TO92

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

### PIN CONFIGURATION



### SYMBOL



### LIMITING VALUES

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.		UNIT
				-500 500 <sup>1</sup>	-600 600 <sup>1</sup>	
$V_{DRM}$	Repetitive peak off-state voltages		-	-500 500 <sup>1</sup>	-600 600 <sup>1</sup>	V
$I_{T(RMS)}$	RMS on-state current	full sine wave; $T_{lead} \leq 51^\circ C$	-	1		A
$I_{TSM}$	Non-repetitive peak on-state current	full sine wave; $T_j = 25^\circ C$ prior to surge	-	16		A
$I^2t$	$I^2t$ for fusing	$t = 20\ ms$	-	17.6		A
$dl_T/dt$	Repetitive rate of rise of on-state current after triggering	$t = 16.7\ ms$	-	1.28		A <sup>2</sup> s
		$t = 10\ ms$	-			
		$I_{TM} = 1.5\ A; I_G = 0.2\ A;$ $dl_G/dt = 0.2\ A/\mu s$				
		T2+ G+	-	50		A/ $\mu s$
		T2+ G-	-	50		A/ $\mu s$
		T2- G-	-	50		A/ $\mu s$
		T2- G+	-	10		A/ $\mu s$
$I_{GM}$	Peak gate current		-	2		A
$V_{GM}$	Peak gate voltage		-	5		V
$P_{GM}$	Peak gate power		-	5		W
$P_{G(AV)}$	Average gate power	over any 20 ms period	-	0.5		W
$T_{stg}$	Storage temperature		-40	150		$^\circ C$
$T_j$	Operating junction temperature		-	125		$^\circ C$

<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 3 A/ $\mu s$ .

Triacs  
logic level

BT132 series D

**THERMAL RESISTANCES**

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$R_{th\ j-lead}$	Thermal resistance junction to lead	full cycle	-	-	60	K/W
$R_{th\ j-a}$	Thermal resistance junction to ambient	half cycle pcb mounted; lead length = 4mm	-	-	80	K/W
			-	150	-	K/W

**STATIC CHARACTERISTICS**

$T_j = 25\text{ °C}$  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+	-	2.0	5	mA
		T2+ G-	-	2.5	5	mA
		T2- G-	-	2.5	5	mA
		T2- G+	-	5.0	10	mA
$I_L$	Latching current	$V_D = 12\text{ V}; I_{GT} = 0.1\text{ A}$				
		T2+ G+	-	1.6	10	mA
		T2+ G-	-	4.5	15	mA
		T2- G-	-	1.2	10	mA
		T2- G+	-	2.2	15	mA
$I_H$	Holding current	$V_D = 12\text{ V}; I_{GT} = 0.1\text{ A}$	-	1.2	10	mA
$V_T$	On-state voltage	$I_T = 5\text{ A}$	-	1.4	1.70	V
$V_{GT}$	Gate trigger voltage	$V_D = 12\text{ V}; I_T = 0.1\text{ A}$	-	0.7	1.5	V
		$V_D = 400\text{ V}; I_T = 0.1\text{ A}; T_j = 125\text{ °C}$	0.25	0.4	-	V
$I_D$	Off-state leakage current	$V_D = V_{DRM(max)}; T_j = 125\text{ °C}$	-	0.1	0.5	mA

**DYNAMIC CHARACTERISTICS**

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$dV_D/dt$	Critical rate of rise of off-state voltage	$V_{DM} = 67\% V_{DRM(max)}; T_j = 125\text{ °C};$ exponential waveform; $R_{GK} = 1\text{ k}\Omega$	-	5	-	V/ $\mu$ s
$t_{gt}$	Gate controlled turn-on time	$I_{TM} = 6\text{ A}; V_D = V_{DRM(max)}; I_G = 0.1\text{ A};$ $dI_G/dt = 5\text{ A}/\mu$ s	-	2	-	$\mu$ s

Triacs  
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BT132 series D

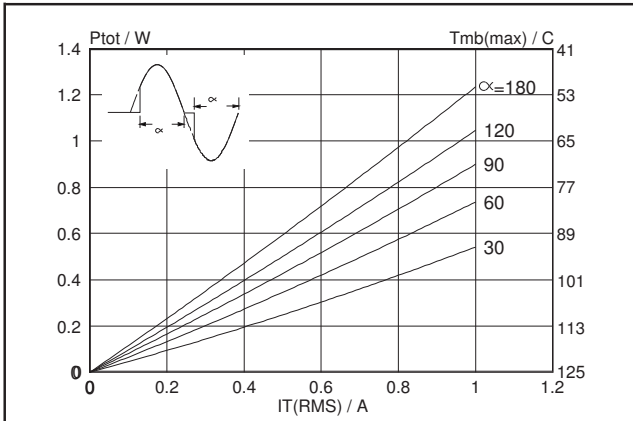


Fig.1. Maximum on-state dissipation,  $P_{tot}$ , versus rms on-state current,  $I_{T(RMS)}$ , where  $\alpha$  = conduction angle.

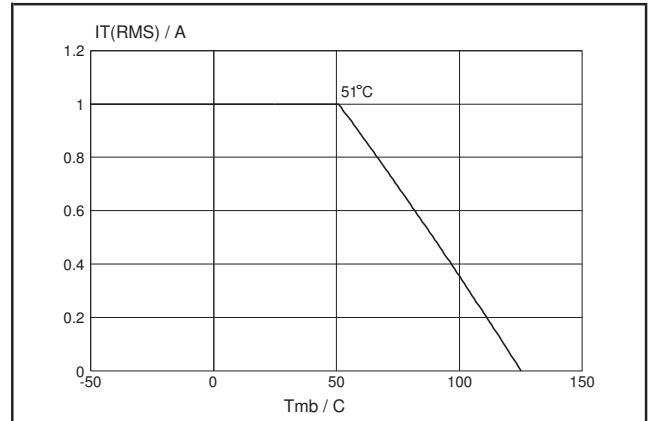


Fig.4. Maximum permissible rms current  $I_{T(RMS)}$ , versus lead temperature  $T_{lead}$ .

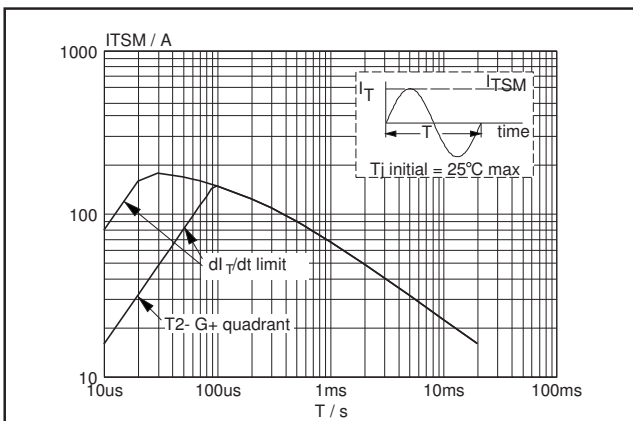


Fig.2. Maximum permissible non-repetitive peak on-state current  $I_{TSM}$ , versus pulse width  $t_p$ , for sinusoidal currents,  $t_p \leq 20ms$ .

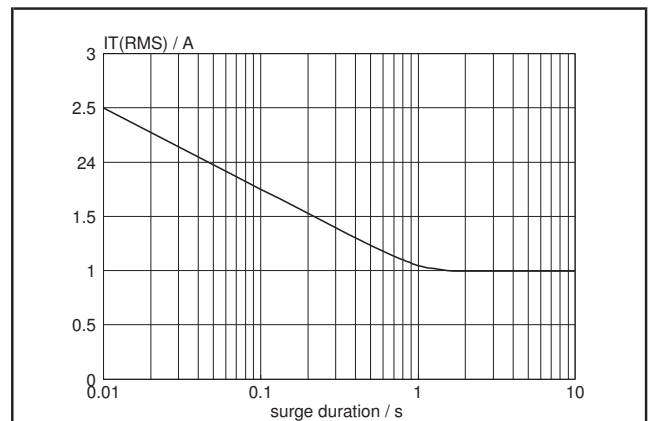


Fig.5. Maximum permissible repetitive rms on-state current  $I_{T(RMS)}$ , versus surge duration, for sinusoidal currents,  $f = 50 Hz$ ;  $T_{lead} \leq 51^\circ C$ .

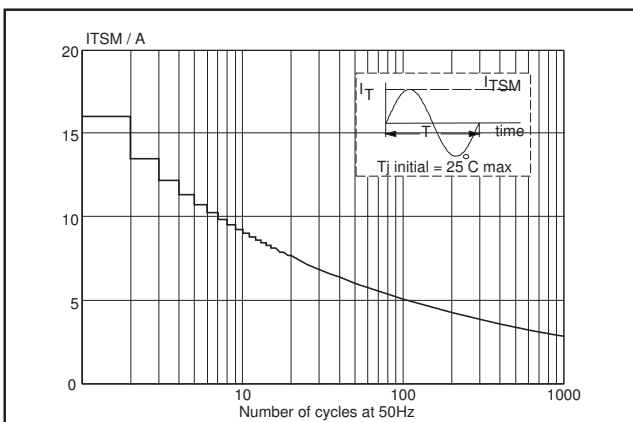


Fig.3. Maximum permissible non-repetitive peak on-state current  $I_{TSM}$ , versus number of cycles, for sinusoidal currents,  $f = 50 Hz$ .

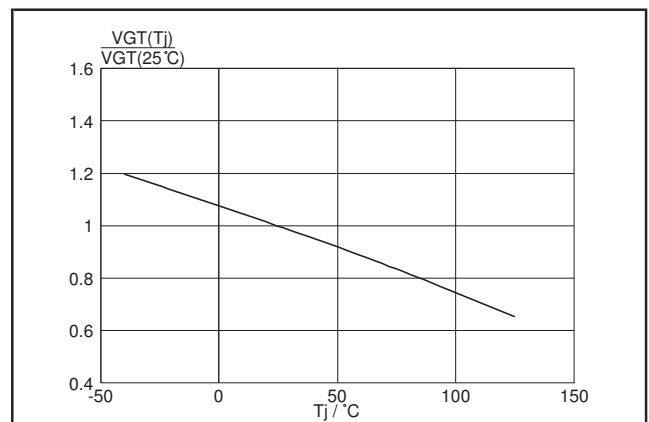
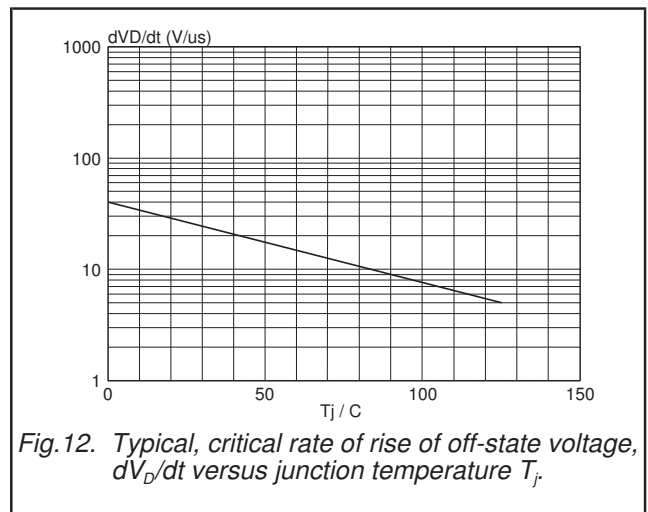
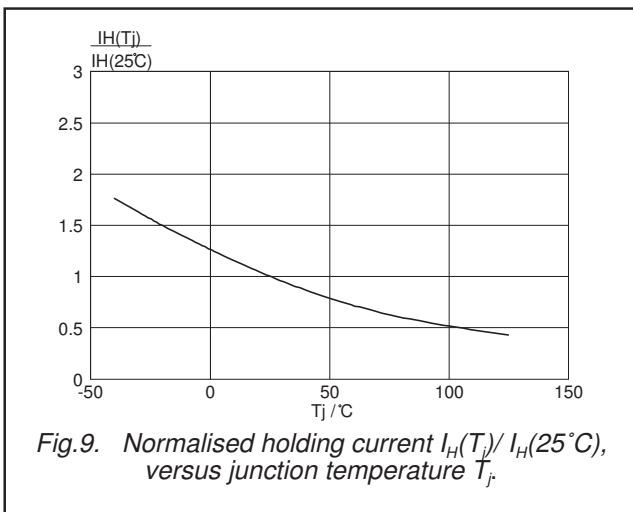
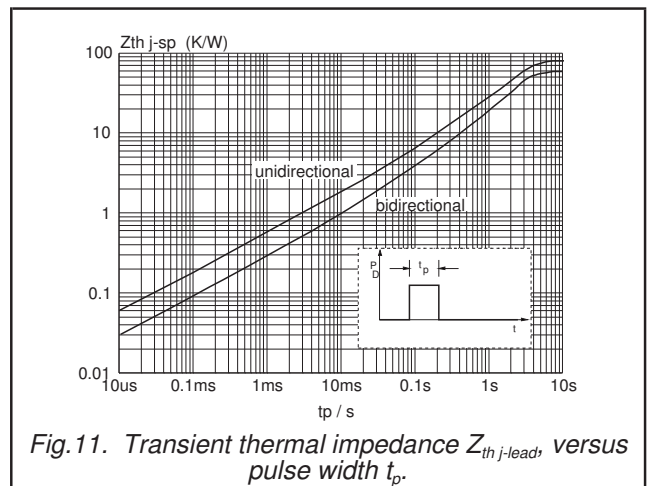
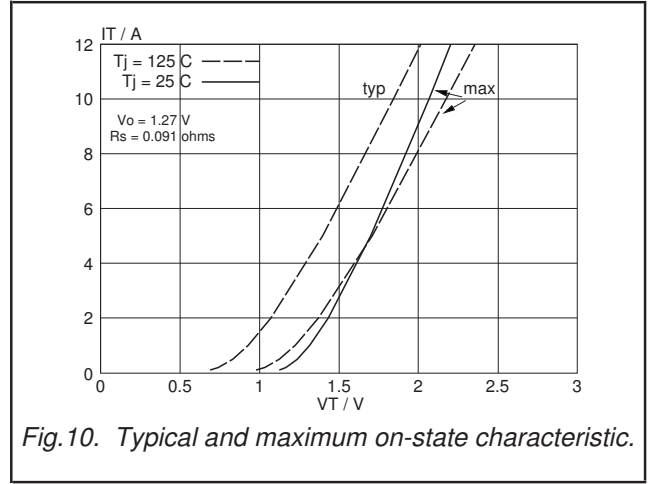
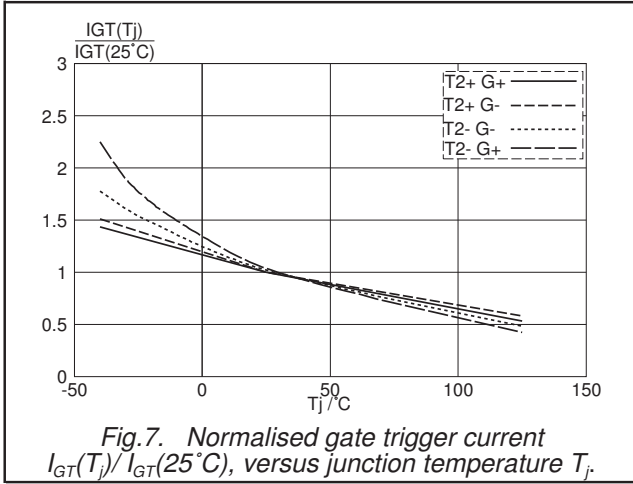


Fig.6. Normalised gate trigger voltage  $V_{GT}(T_j) / V_{GT}(25^\circ C)$ , versus junction temperature  $T_j$ .

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**MECHANICAL DATA**

Dimensions in mm

Net Mass: 0.2 g

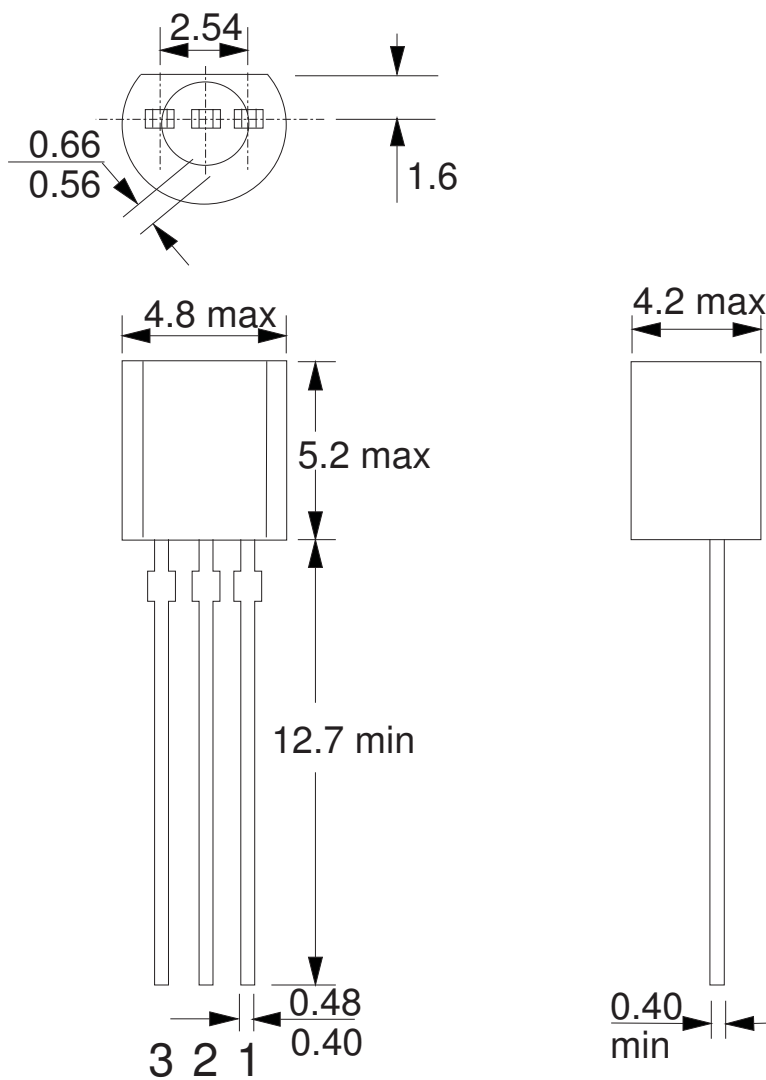


Fig.13. TO92 Variant; plastic envelope.

**Notes**

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

## Legal information

### DATA SHEET STATUS

DOCUMENT STATUS <sup>(1)</sup>	PRODUCT STATUS <sup>(2)</sup>	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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