DISCRETE SEMICONDUCTORS

DATA SHEET

BT134 series Triacs

Product specification

August 1997



Triacs BT134 series

GENERAL DESCRIPTION

Glass passivated triacs in a plastic envelope, 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.

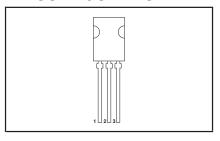
QUICK REFERENCE DATA

SYMBOL	PARAMETER	MAX.	MAX.	MAX.	UNIT
	BT134- BT134- BT134-	500 500F 500G	600 600F 600G	800 800F 800G	
V_{DRM}	Repetitive peak off-state	500	600	800	V
I _{T(RMS)} I _{TSM}	voltages RMS on-state current Non-repetitive peak on-state current	4 25	4 25	4 25	A A

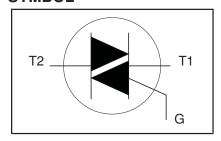
PINNING - SOT82

PIN	PIN DESCRIPTION			
1	main terminal 1			
2	main terminal 2			
3	gate			
tab	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	-800 800	\ \
I _{T(RMS)}	RMS on-state current Non-repetitive peak on-state current	full sine wave; $T_{mb} \le 107 ^{\circ}\text{C}$ full sine wave; $T_{j} = 25 ^{\circ}\text{C}$ prior to surge	-		4		А
l ² t	I ² t for fusing	t = 20 ms t = 16.7 ms t = 10 ms	- - -		25 27 3.1		A A A ² s
dl _T /dt	Repetitive rate of rise of on-state current after triggering	$\begin{array}{c} I_{TM} = 6 \text{ A}; \ I_G = 0.2 \text{ A}; \\ dI_G/dt = 0.2 \text{ A}/\mu s \\ & T2 + G + \\ & T2 + G - \\ & T2 - G - \\ & T2 - G + \end{array}$	- - -		50 50 50 10		Α/μs Α/μs Α/μs Α/μs
I _{GM} V _{GM} P _{GM} P _{G(AV)} T _{stg} T _j	Peak gate current Peak gate voltage Peak gate power Average gate power Storage temperature Operating junction temperature	over any 20 ms period	- - - -40		2 5 5 0.5 150 125		Ç

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 3 $A/\mu s$.

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THERMAL RESISTANCES

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$R_{\text{th j-mb}}$ $R_{\text{th j-a}}$	Thermal resistance junction to mounting base Thermal resistance junction to ambient	full cycle half cycle in free air	1 1 1	- - 100	3.0 3.7 -	K/W K/W K/W

STATIC CHARACTERISTICS

 $T_i = 25$ °C unless otherwise stated

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	. MAX.			UNIT
		BT134-				F	G	
I _{GT}	Gate trigger current	$V_D = 12 \text{ V}; I_T = 0.1 \text{ A}$ T2+ G+	_	5	35	25	50	l _{mA}
		T2+ G-	-	8	35	25	50	mA
		T2- G- T2- G+	-	11 30	35 70	25 70	50 100	mA mA
I _L	Latching current	$V_D = 12 \text{ V}; I_{GT} = 0.1 \text{ A}$		_				
		T2+ G+ T2+ G-	-	7 16	20 30	20 30	30 45	mA mA
		T2- G-	-	5	20	20	30	mA
 ₁	Holding current	$V_D = 12 \text{ V}; I_{GT} = 0.1 \text{ A}$	-	7 5	30 15	30 15	45 30	mA mA
I _H		1 2					00	1
V _T V _{GT}	On-state voltage Gate trigger voltage	$I_T = 5 \text{ A}$ $V_D = 12 \text{ V}; I_T = 0.1 \text{ A}$ $V_D = 400 \text{ V}; I_T = 0.1 \text{ A};$	- - 0.25	1.4 0.7 0.4		1.70 1.5 -		V V
I _D	Off-state leakage current	$T_{j} = 125 ^{\circ}C$ $V_{D} = V_{DRM(max)};$ $T_{j} = 125 ^{\circ}C$	-	0.1		0.5		mA

DYNAMIC CHARACTERISTICS

 $T_i = 25$ °C unless otherwise stated

SYMBOL	PARAMETER	CONDITIONS		MIN.		TYP.	MAX.	UNIT
dV _D /dt	Critical rate of rise of off-state voltage	$V_{DM} = 67\% V_{DRM(max)};$ $T_{j} = 125 \text{ °C}; exponential}$	100	F 50	G 200	250	-	V/µs
dV _{com} /dt	Critical rate of change of commutating voltage	waveform; gate open circuit $V_{DM} = 400 \text{ V}; T_j = 95 ^{\circ}\text{C};$ $I_{T(RMS)} = 4 \text{ A};$ $dI_{com}/dt = 1.8 \text{ A/ms};$ gate	-	-	10	50	-	V/μs
t_{gt}	Gate controlled turn-on time	open circuit $I_{TM} = 6 \text{ A}; V_D = V_{DRM(max)};$ $I_G = 0.1 \text{ A};$ $dI_G/dt = 5 \text{ A}/\mu s;$	-	-	-	2	-	μs

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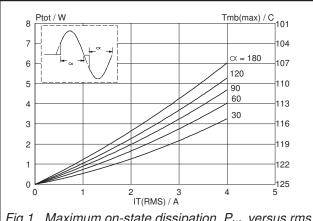


Fig.1. Maximum on-state dissipation, P_{tot} , versus rms on-state current, $I_{T(RMS)}$, where α = conduction angle.

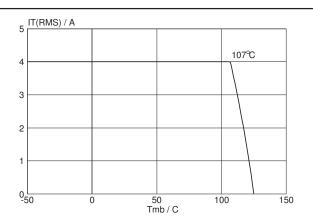


Fig.4. Maximum permissible rms current $I_{T(RMS)}$, versus mounting base temperature T_{mb} .

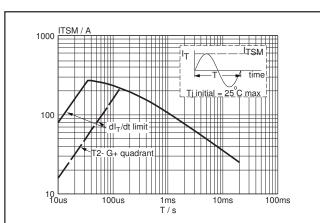


Fig.2. Maximum permissible non-repetitive peak on-state current I_{TSM} , versus pulse width t_p , for sinusoidal currents, $t_p \le 20$ ms.

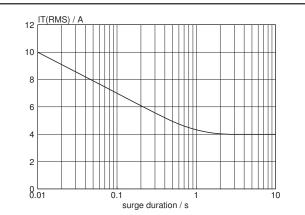


Fig.5. Maximum permissible repetitive rms on-state current $I_{T(RMS)}$, versus surge duration, for sinusoidal currents, f = 50 Hz; $T_{mb} \le 107 ^{\circ}\text{C}$.

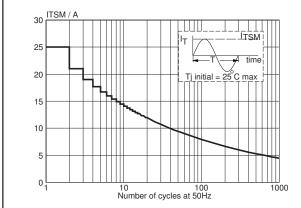


Fig.3. Maximum permissible non-repetitive peak on-state current I_{TSM} , versus number of cycles, for sinusoidal currents, f = 50 Hz.

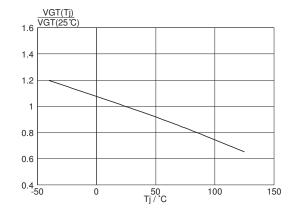
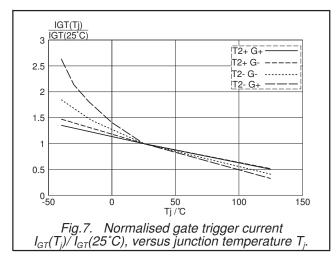
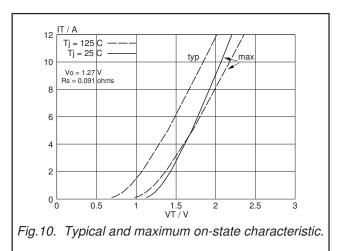
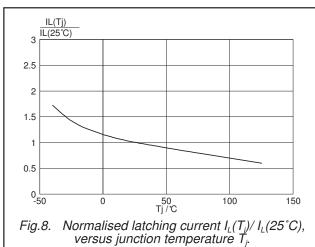


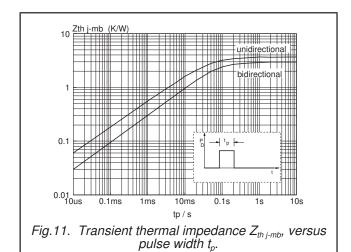
Fig.6. Normalised gate trigger voltage $V_{GT}(T_i)/V_{GT}(25^{\circ}C)$, versus junction temperature T_i .

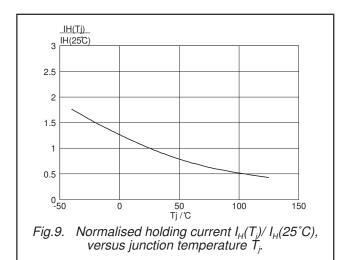
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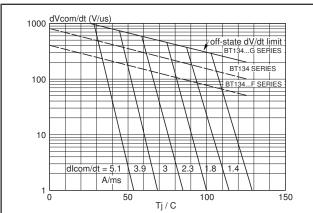
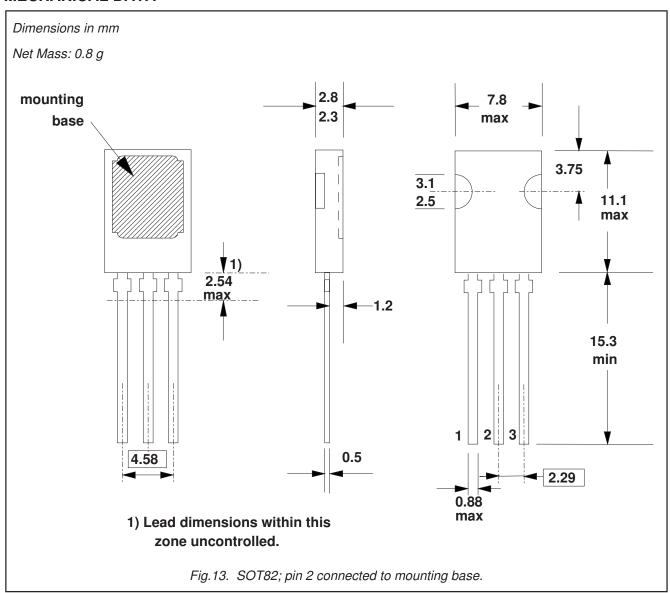


Fig. 12. Typical commutation dV/dt versus junction temperature, parameter commutation dI_T/dt . The triac should commutate when the dV/dt is below the value on the appropriate curve for pre-commutation dI_T/dt .

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MECHANICAL DATA



- Refer to mounting instructions for SOT82 envelopes.
 Epoxy 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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