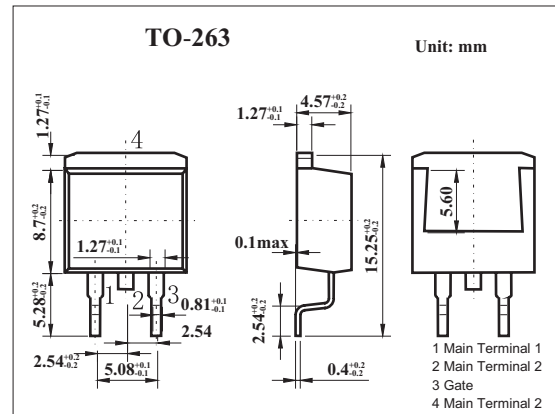
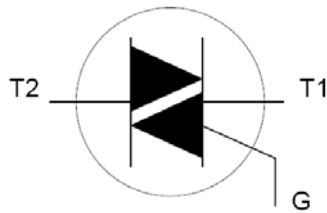


## Triacs

### BT139B series

#### ■ Features

- RMS on-state current :  $I_{T(RMS)}=16A$
- Non-repetitive peak on-state current:  $I_{TSM}=140A$



#### ■ Absolute Maximum Ratings $T_a = 25^\circ C$

Parameter	Symbol	BT139B series			Unit
		-500	-600	-800	
Peak Repetitive Off-State Voltage	$V_{DRM}, V_{RRM}$	500	600	800	V
On-State RMS Current	$I_{T(RMS)}$	16			A
Peak Non-Repetitive Surge Current	$I_{TSM}$	140			A
$t = 20 \text{ ms}$					
	$t = 16.7 \text{ ms}$	150			A
Circuit Fusing Consideration	$I^2t$	98			$A^2s$
Repetitive rate of rise of on-state current after triggering *1	$di_T/dt$	50			$A/\mu s$
T2+ G+					
T2+ G-					
T2- G-					
	T2- G+	10			$A/\mu s$
Peak Gate Current	$I_{GM}$	2			A
Peak Gate Voltage	$V_{GM}$	5			V
Peak Gate Power	$P_{GM}$	5			W
Average Gate Power	$P_{G(AV)}$	0.5			W
Operating Junction Temperature Range	$T_J$	125			$^\circ C$
Storage Temperature Range	$T_{stg}$	-40 to 150			$^\circ C$

\*1  $I_{TM} = 20 \text{ A}; I_G = 0.2 \text{ A}; di_G/dt = 0.2 \text{ A}/\mu s$

## BT139B series

■ Static Characteristics  $T_a = 25^\circ\text{C}$ 

Parameter	Symbol	Testconditions BT139B...	Min	Typ	Max			Unit
					...	...F	...G	
Gate Trigger Current (Continuous dc) MT2+, G+ MT2+, G- MT2-, G- MT2-, G+	$I_{GT}$	$V_D = 12\text{ V}, I_T = 0.1\text{ A}$		5 8 10 22	35 35 35 70	25 25 25 70	50 50 50 100	mA
Latching Current MT2+, G+ MT2+, G- MT2-, G- MT2-, G+	$I_L$	$V_D = 12\text{ V}, I_G = 0.1\text{ A}$		7 20 8 10	40 60 40 60	40 60 40 60	60 90 60 90	mA
Holding Current	$I_H$	$V_D = 12\text{ V}, I_{GT} = 0.1\text{ A}$		6	30	30	60	
On-state voltage	$V_T$	$I_T = 20\text{ A}$		1.2	1.6			V
Gate Trigger Voltage	$V_{GT}$	$V_D = 12\text{ V}; I_T = 0.1\text{ A}$ $V_D = 400\text{ V}; I_T = 0.1\text{ A}, T_j = 125^\circ\text{C}$	0.25	0.7 0.4	1.5			V V
Off-state leakage current	$I_D$	$V_D = V_{DRM(max)}; T_j = 125^\circ\text{C}$		0.1	0.5			mA

■ Dynamic Characteristics  $T_a = 25^\circ\text{C}$ 

Parameter	Symbol	Testconditions	Min			Typ	Max	Unit
			...	...F	...G			
Critical rate of rise of off-state voltage	$dv_D/dt$	$V_{DM} = 67\% V_{DRM(max)};$ $T_j = 125^\circ\text{C};$ exponential waveform; gate open circuit	100	50	200	250		V/ $\mu\text{s}$
Critical rate of change of commutating voltage	$dv_{com}/dt$	$V_{DM} = 400\text{ V}; T_j = 95^\circ\text{C};$ $I_{T(RMS)} = 16\text{ A};$ $di_{com}/dt = 7.2\text{ A/ms};$ gate open circuit			10	20		V/ $\mu\text{s}$
Gate controlled turn-on time	$t_{gt}$	$I_{TM} = 20\text{ A}; V_D = V_{DRM(max)};$ $I_G = 0.1\text{ A}; di_G/dt = 5\text{ A}/\mu\text{s}$						$\mu\text{s}$

BT139B series

■ Typical Characteristics

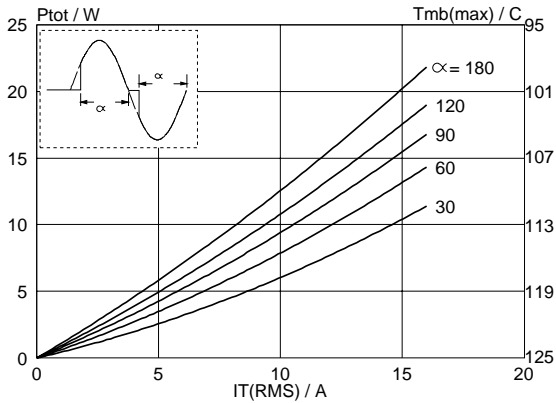


Fig.1. Maximum on-state dissipation,  $P_{tot}$ , versus rms on-state current,  $I_{T(RMS)}$ , where  $\alpha$  = conduction angle.

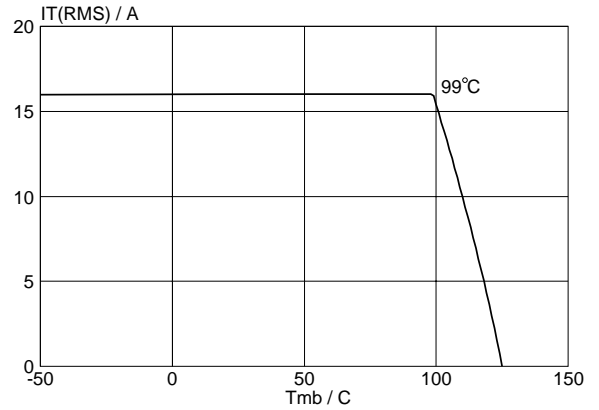


Fig.4. Maximum permissible rms current  $I_{T(RMS)}$ , versus mounting base temperature  $T_{mb}$ .

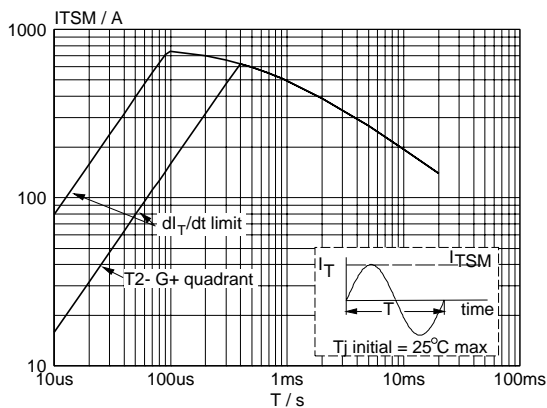


Fig.2. Maximum permissible non-repetitive peak on-state current  $I_{TSM}$ , versus pulse width  $t_p$ , for sinusoidal currents,  $t_p \leq 20\text{ms}$ .

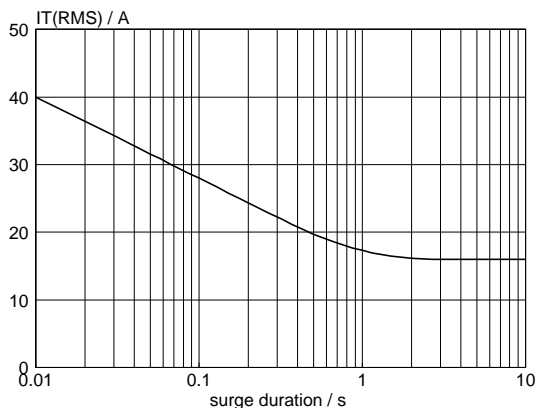


Fig.5. Maximum permissible repetitive rms on-state current  $I_{T(RMS)}$ , versus surge duration, for sinusoidal currents,  $f = 50\text{ Hz}$ ;  $T_{mb} \leq 99^\circ\text{C}$ .

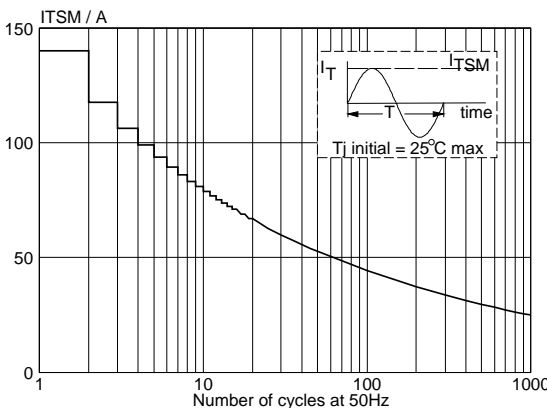


Fig.3. Maximum permissible non-repetitive peak on-state current  $I_{TSM}$ , versus number of cycles, for sinusoidal currents,  $f = 50\text{ Hz}$ .

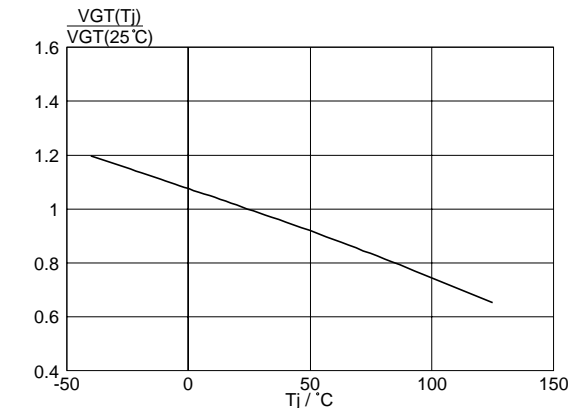


Fig.6. Normalised gate trigger voltage  $V_{GT}(T_j) / V_{GT}(25^\circ\text{C})$ , versus junction temperature  $T_j$ .

BT139B series

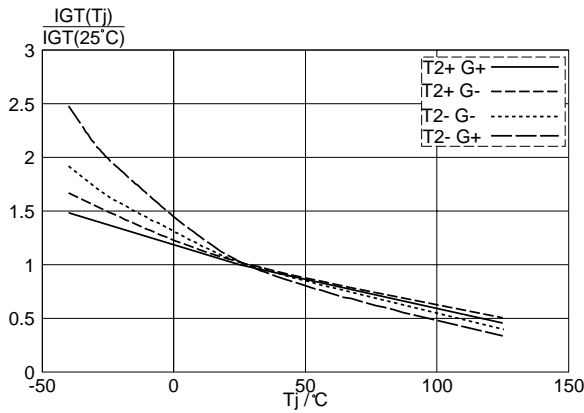


Fig.7. Normalised gate trigger current  $I_{GT}(T_j)/I_{GT}(25^\circ\text{C})$ , versus junction temperature  $T_j$ .

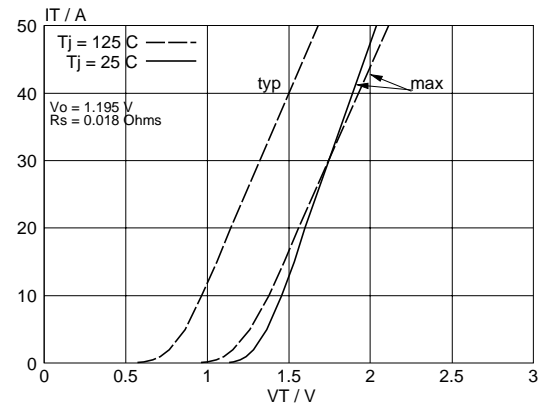


Fig.10. Typical and maximum on-state characteristic.

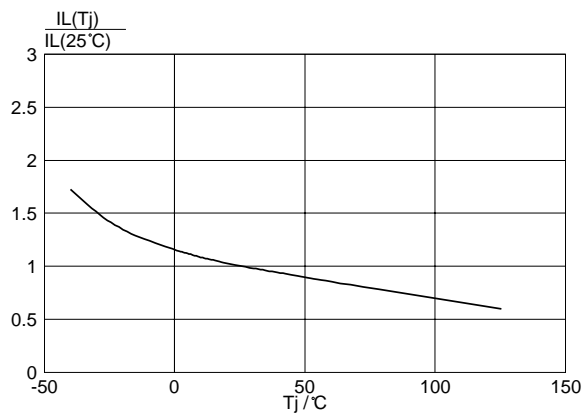


Fig.8. Normalised latching current  $I_L(T_j)/I_L(25^\circ\text{C})$ , versus junction temperature  $T_j$ .

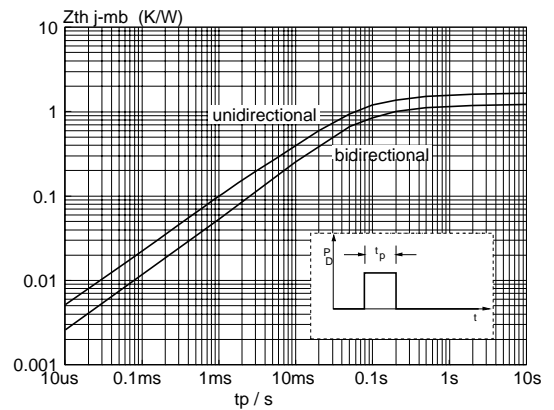


Fig.11. Transient thermal impedance  $Z_{th\ j-mb}$ , versus pulse width  $t_p$ .

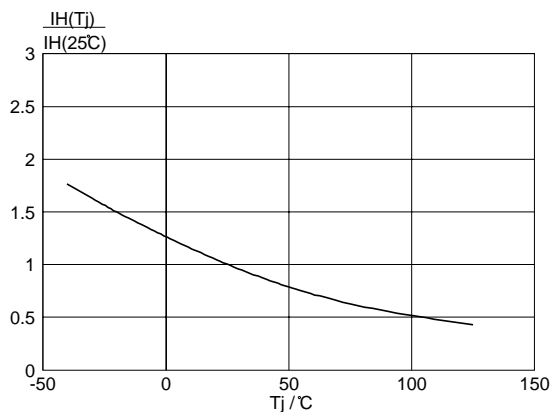


Fig.9. Normalised holding current  $I_H(T_j)/I_H(25^\circ\text{C})$ , versus junction temperature  $T_j$ .

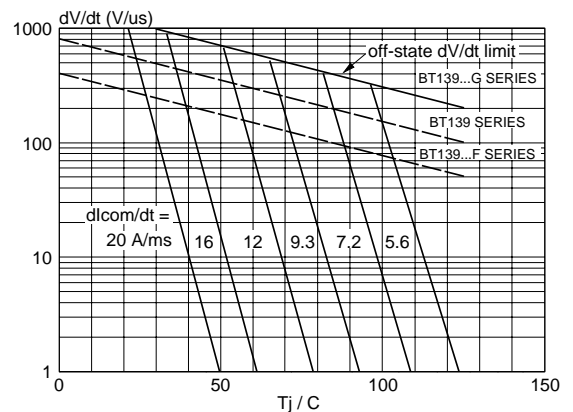


Fig.12. Typical commutation  $dV/dt$  versus junction temperature, parameter commutation  $di_T/dt$ . The triac should commute when the  $dV/dt$  is below the value on the appropriate curve for pre-commutation  $di_T/dt$ .