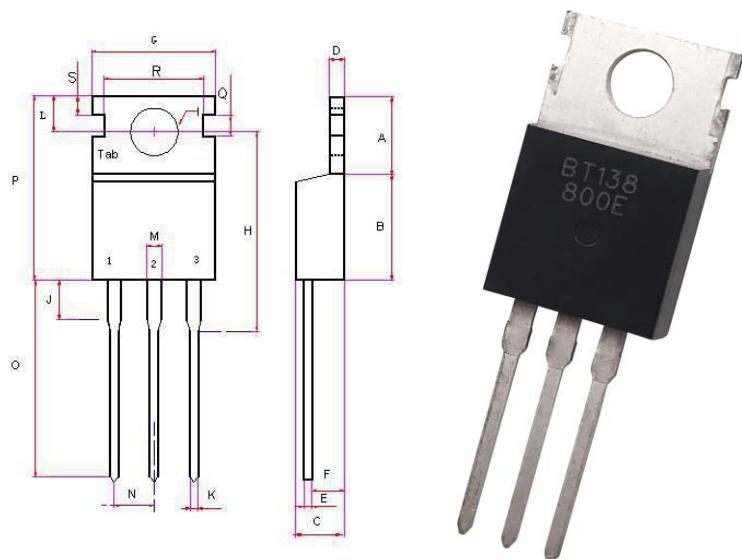


BT138 800E**TRIACS***Blocking voltage -800 Volts On-state RMS current -12 Ampere***FEATURES**

- Ultra low gate trigger current
- Low cost package.

(TO-220)

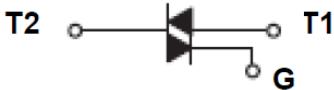
**APPLICATIONS**

Typical applications include motor control, industrial and domestic lighting, heating and static switching.

- Heating regulation
- Motor control
- Phase control

DIM	Inches			Milimeters		
	Min	Type	Max	Min	Type	Max
A	0.226	0.258	0.301	5.750	6.550	7.650
B	0.349	0.362	0.369	8.860	9.200	9.380
C	0.171	0.178	0.183	4.350	4.530	4.650
D	0.046	0.051	0.055	1.160	1.300	1.400
E	0.018	0.020	0.026	0.450	0.510	0.650
F	0.070	0.094	0.105	1.785	2.400	2.675
G	0.367	0.394	0.415	9.310	10.000	10.550
H	-	-	0.640	-	-	16.250
I	-	0.143	0.152	-	3.620	3.850
J	0.087	0.108	0.127	2.220	2.750	3.220
K	0.027	0.031	0.035	0.680	0.800	0.880
L	0.093	-	0.128	2.360	-	3.240
M	0.046	0.048	0.057	1.180	1.220	1.440
N	-	0.100	0.104	-	2.540	2.650
O	0.485	0.514	0.546	12.320	13.050	13.880
P	0.593	0.616	0.648	15.070	15.650	16.470
Q	0.057	0.067	0.073	1.460	1.700	1.860
R	0.320	0.344	0.360	8.140	8.750	9.140
S	0.046	0.051	0.058	1.170	1.300	1.470

BT138 800E**TRIACS***Blocking voltage -800 Volts On-state RMS current -12 Ampere***PINNING INFORMATION**

PIN	Description	Simplified outline	Symbol
1	main terminal 1 (T1)	 TO-220	
2	main terminal 2 (T2)		
3	gate (G)		
tab	main terminal		

QUICK REFERENCE DATA

SYMBOL	PARAMETER	MAX	UNIT
V_{DRM} V_{RRM}	Repetitive peak off-state voltages	800	V
$I_{T(RMS)}$	RMS on-state current	12	A
I_{TSM}	Non-repetitive peak on-state current	90	A

THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	MIN	TYP	MA	UNIT
$R_{th\ j\text{-}mb}$	Thermal resistance junction to mounting base	full cycle	-	-	1.50	K/W
		half cycle	-	-	2.00	K/W
$R_{th\ j\text{-}a}$	Thermal resistance junction to ambient	in free air		60	-	K/W

LIMITING VALUE

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

SYMBOL	PARAMETER	CONDITIONS	MI	MAX	UNIT
V_{DRM} V_{RRM}	Repetitive peak off-state voltages		-	800	V
$I_{T(RMS)}$	RMS on-state current	full sine wave; $T_{mb} \leq 102^\circ C$	-	12	A
	Non-repetitive peak on-state current	full sine wave;	-	90	A
		$T_j = 25^\circ C$ prior to surge	$t = 16.7\ ms$	105	A
I^2t	I^2t for fusing	$t = 10\ ms$	-	45	A2s
dI_T/dt	Repetitive rate of rise of on-state current after triggering	$I_{TM} = 12\ A$; $IG = 0.2\ A$; $DI_G/dt = 0.2\ A/s$			
		$T2+ G+$	-	100	$A/\mu s$
		$T2+ G-$	-	100	$A/\mu s$
		$T2- G-$	-	100	$A/\mu s$
I_{GM}	Peak gate current		-	2	A
V_{GM}	Peak gate voltage		-	8	V
PGM	Peak gate power		-	16	W
$PG(AV)$	Average gate power	over any 20 ms period	-	0.35	W
T_{stg}	Storage temperature		-40	150	°C
T_j	Junction temperature		-40	125	°C

BT138 800E**TRIACS***Blocking voltage -800 Volts On-state RMS current -12 Ampere***CHARACTERISTICS**T_J = 25°C unless otherwise stated

SYMBOL	PARAMETER	CONDITIONS	MIN	TYP	MAX	UNIT
Static characteristics						
I _{GT}	Gate trigger current	V _D = 12 V; I _T = 0.1A T2+ G+ T2+ G- T2- G- T2- G+	-	-	10	mA
I _L	Latching current	V _D = 12 V; I _{GT} = 0.1A T2+ G+ T2+ G- T2- G- T2- G+	-	-	20	mA
I _H	Holding current	V _D = 12 V; I _{GT} = 0.15A	-	20	50	mA
V _T	On-state voltage	I _T = 17A	-	-	1.85	V
V _{GT}	Gate trigger voltage	V _D = 12 V; I _T = 0.1A T2+ G+ T2+ G- T2- G- T2- G+	0.50 0.50 0.50 -	0.80 0.78 0.70 -	1.50 1.50 1.50 -	V
Dynamic Characteristics						
dV _D /dt	Critical rate of rise of off-state voltage	V _{DM} = 67% V _{DRM(max)} ; T _j = 125 °C; Exponential wave form; gate open circuit	250	500	-	V/μs
dI _{com} /dt	Critical rate of change of commutating current	V _D = 400 V; T _j = 125 °C I _{T(RMS)} =4.4A; Commutatingdv/dt = 18 V/ s, Without snubber; gate open circuit	6.5	-	-	A/ms
dI/dt	Repetitive Critical Rate of Rise of On-State Current	I _{PK} = 50 A; PW = 40 sec; di _G /dt = 200 mA/ sec; f = 60 Hz	-	-	10	A/μs

RATINGS AND CHARACTERISTIC CURVES BT138 800E

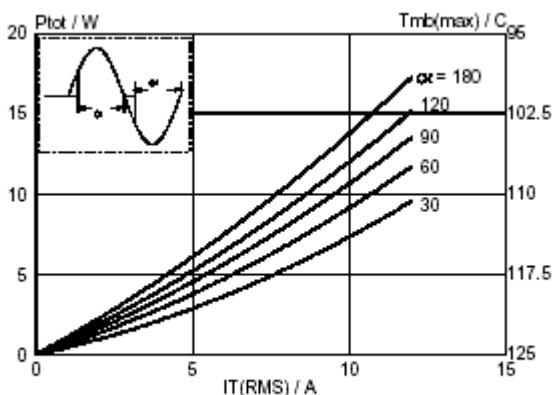


Fig. 1. Maximum on-state dissipation, P_{tpt} , versus rms on-state current, $I_{T(RMS)}$, where α = conduction angle.

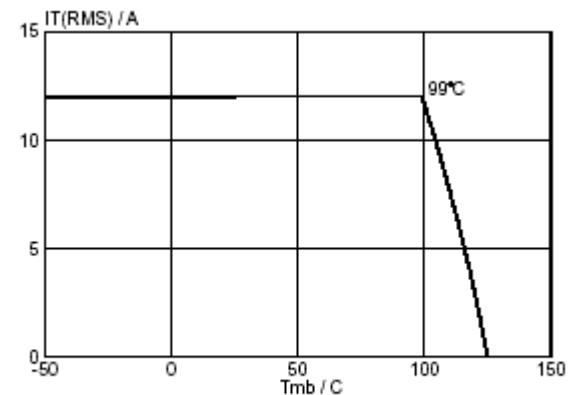


Fig. 4. Maximum permissible rms current $I_{T(RMS)}$, versus mounting base temperature T_{mb} .

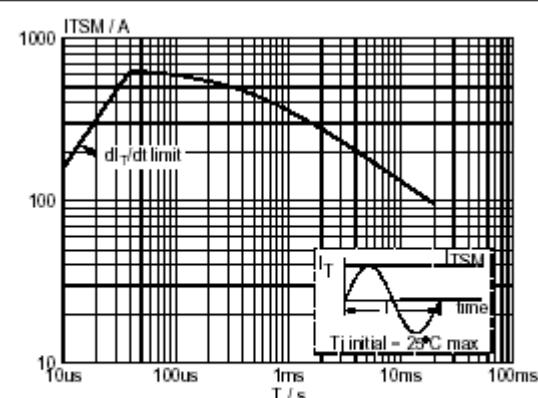


Fig. 2. Maximum permissible non-repetitive peak on-state current I_{TSM} , versus pulse width t_p for sinusoidal currents, $t_p \leq 20\text{ms}$.

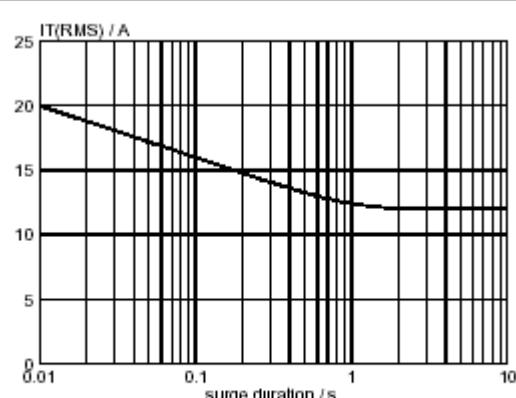


Fig. 5. Maximum permissible repetitive rms on-state current $I_{T(RMS)}$, versus surge duration, for sinusoidal currents, $f = 50\text{Hz}$; $T_{mb} \leq 99^\circ\text{C}$.

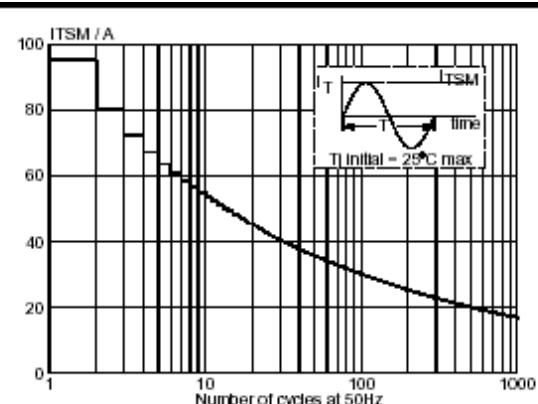


Fig. 3. Maximum permissible non-repetitive peak on-state current I_{TSM} , versus number of cycles, for sinusoidal currents, $f = 50\text{Hz}$.

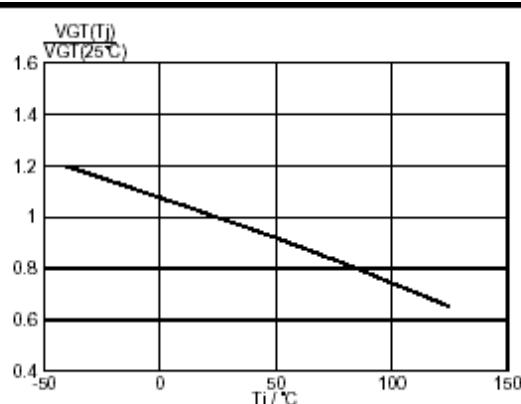


Fig. 6. Normalised gate trigger voltage $V_{Gt}(T_j)/V_{Gt}(25^\circ\text{C})$, versus junction temperature T_j .

Note: Specification are subject to change without notice. For more detail and update, please visit our website.

RATINGS AND CHARACTERISTIC CURVES BT138 800E

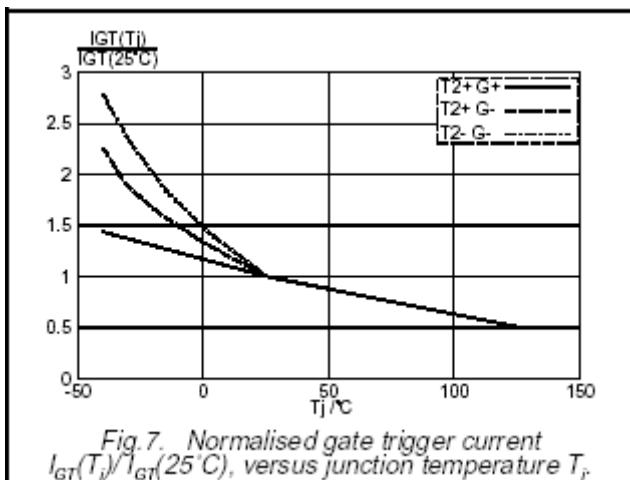


Fig. 7. Normalised gate trigger current
 $I_{GT}(T_j)/I_{GT}(25^\circ\text{C})$, versus junction temperature T_j

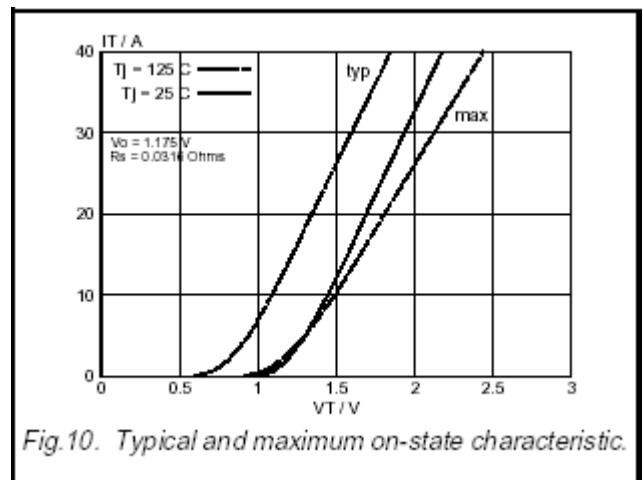


Fig. 10. Typical and maximum on-state characteristic.

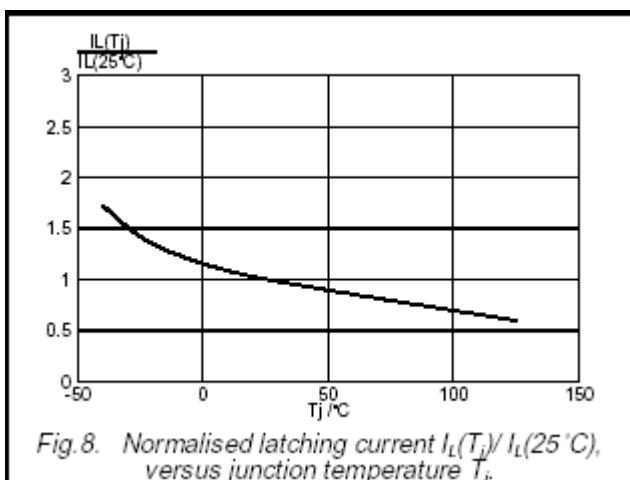


Fig. 8. Normalised latching current $I_L(T_j)/I_L(25^\circ\text{C})$, versus junction temperature T_j

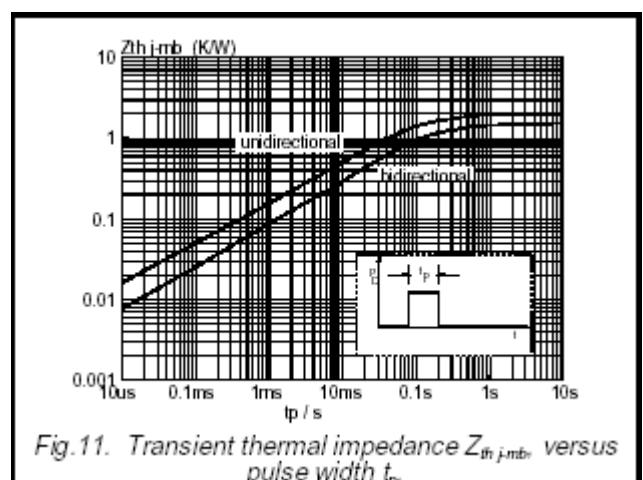


Fig. 11. Transient thermal impedance $Z_{th,j-imb}$ versus pulse width t_p

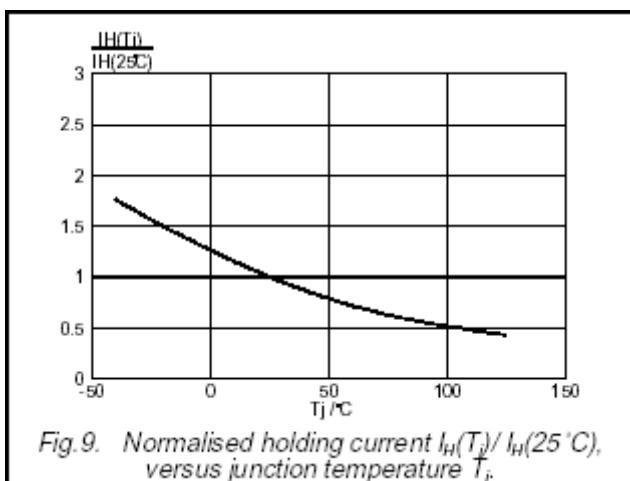


Fig. 9. Normalised holding current $I_H(T_j)/I_H(25^\circ\text{C})$, versus junction temperature T_j

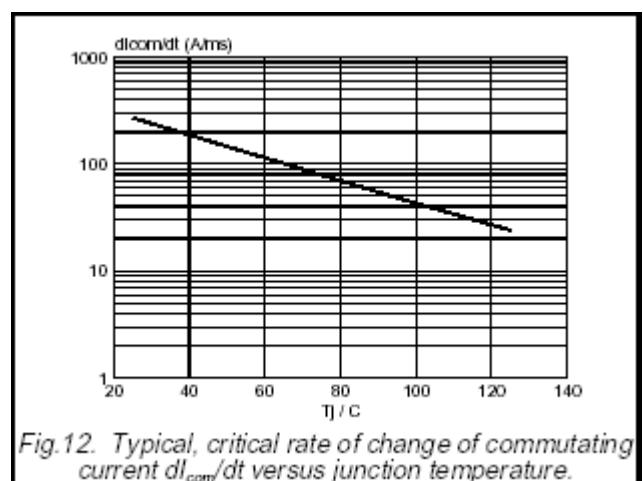


Fig. 12. Typical, critical rate of change of commutating current dl_{com}/dt versus junction temperature.

Note: Specification are subject to change without notice. For more detail and update, please visit our website.