Four quadrant Triacs BT137 800D

1、Description

Designed primarily for industrial and consumer applications for full wave control of ac loads such as appliance controls, heater controls, motor controls, and other power switching applications.

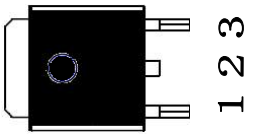
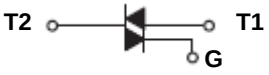
2、Applications

- Power gate Switching
- appliance control
- heater control
- motor control

3、Features

- Blocking voltage to 800V
- On-state RMS current to 8A
- Ultra low gate trigger current
- Low cost package.

4、Pinning information

PIN	Description	Simplified outline	Symbol
1	main terminal 1 (T1)	 TO-252	
2	main terminal 2 (T2)		
3	gate (G)		
tab	main terminal		

5、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	8	A
I_{TSM}	Non-repetitive peak on-state current	80	A

6、Thermal characteristics

SYMBOL	PARAMETER	CONDITIONS	MIN	TYP	MAX	UNIT
$R_{\theta JC}$	Thermal resistance junction to case		-	-	2.0	°C/W
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient		-	-	62.5	°C/W
T_L	Maximum Lead Temperature for Soldering Purposes 1/8" from case for 10 Seconds	in free air		-	260-	°C

7、Limiting value

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

SYMBOL	PARAMETER	CONDITIONS	MIN	TYP	MAX	UNIT
V_{DRM} V_{RRM}	Repetitive peak off-state voltages		-		800	V
$I_{T(RMS)}$	RMS on-state current	Full Cycle Sine Wave 50 to 60 Hz (T_C = 80 C)	-		8	A
I_{Tsm}	Non-repetitive peak Surge Current	One Full Cycle Sine Wave, 60 Hz, T_J = 110 C	-	-	80	A
I^2t	I^2t for fusing	t = 8.3 ms	-	-	26	A^2s
dI_T/dt	Repetitive rate of rise of on-state current after triggering	I_{TM} = 12 A; I_G = 0.2 A; dI_G/dt = 0.2 A/s				
		T2+ G+	-	-	50	A/µs
		T2+ G-	-	-	50	A/µs
		T2- G-	-	-	50	A/µs
		T2- G+	-	-	10	A/µs
I_{GM}	Peak gate current	t ≤ 2 s, TC = 80 C	-	-	±2.0	A
V_{GM}	Peak gate voltage	t ≤ 2 s, TC = 80 C	-	-	±10	V
P_{GM}	Peak gate power	t ≤ 2 s, TC = 80 C	-	-	20	W
$P_{G(AV)}$	Average gate power	t ≤ 8.3 ms, TC = 80 C	-	-	0.5	W
T_{stg}	Storage temperature		-40	-	150	°C
T_J	Operating junction temperature		-40	-	110	°C

8、Characteristics

T_J = 25℃ 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+	-	3	5	mA
		T2+ G-	-	3	5	mA
		T2- G-	-	3	5	mA
		T2- G+	-	5	10	mA
I_H	Holding current	V_D = 12 Vdc, Initiating Current = ±200 mA, Gate Open	-	-	15	mA
V_{TM}	On-state voltage	I_{TM} = ±11 A Peak, Pulse Width ≤2 ms, Duty Cycle ≤2%	-	1.3	1.8	V
V_{GT}	Gate trigger voltage	V_D = 12 V; I_T = 0.1A				
		MT2(+), G(+); MT2(+), G(–); MT2(–), G(–)	-	-	2.0	V
		MT2(–), G(+)	-	-	2.5	V
V_{GD}	Gate Non–Trigger Voltage (Continuous dc)	V_D = 12 V, T_C = 110 C, R_L = 100) All Four Quadrants	0.2	-	-	V
Dynamic Characteristics						
dv_D/dt	Critical rate of rise of off-state voltage	V_D = Rated V_{DRM}, Exponential Waveform, T_C = 110 C	-	25	-	V/µs
$dv_D/dt(c)$	Critical Rate of Rise of Commutation Voltage	V_D = Rated V_{DRM}, I_{TM} = 11.3 A, Commutating di/dt = 4.1 A/ms, Gate Unenergized, T_C = 80 C		5.0	-	V/µs
t_{gt}	Gate controlled turn-on time	V_D = Rated V_{DRM}, I_{TM} = 16 A Peak, I_G = 30 mA	-	1.5	-	µs

9、Electrical Characteristics Curve

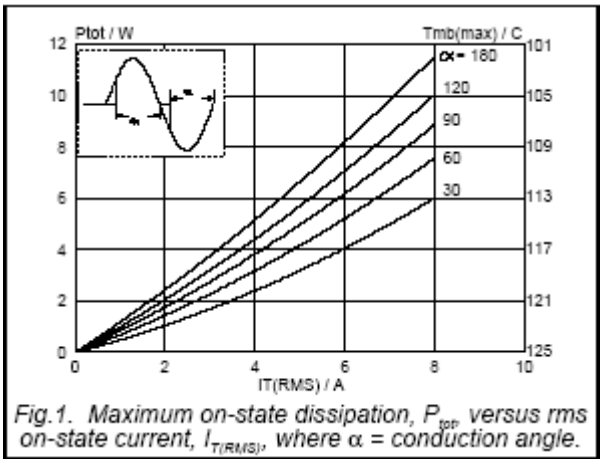


Fig.1. Maximum on-state dissipation, P_{tot}, versus rms on-state current, $I_{T(RMS)}$, where α = conduction angle.

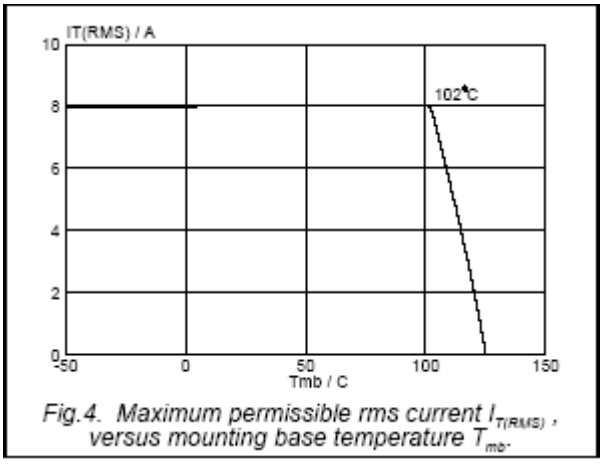


Fig.4. Maximum permissible rms current $I_{T(RMS)}$, versus mounting base temperature T_{mb}.

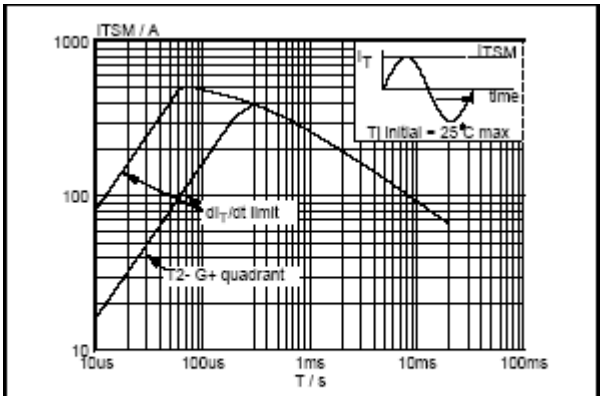


Fig.2. Maximum permissible non-repetitive peak on-state current I_{TSM}, versus pulse width t_p, for sinusoidal currents, $t_p \leq 20ms$.

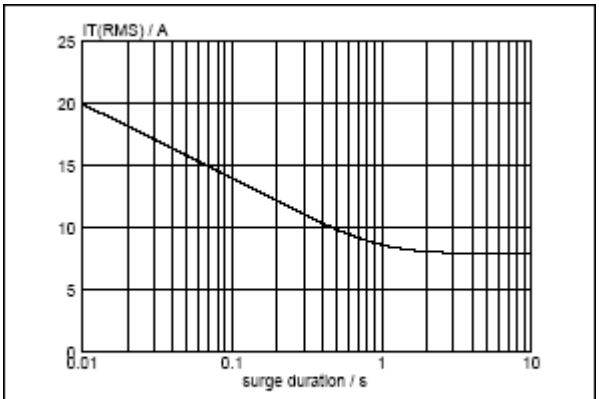


Fig.5. Maximum permissible repetitive rms on-state current $I_{T(RMS)}$, versus surge duration, for sinusoidal currents, f = 50 Hz; $T_{mb} \leq 102°C$.

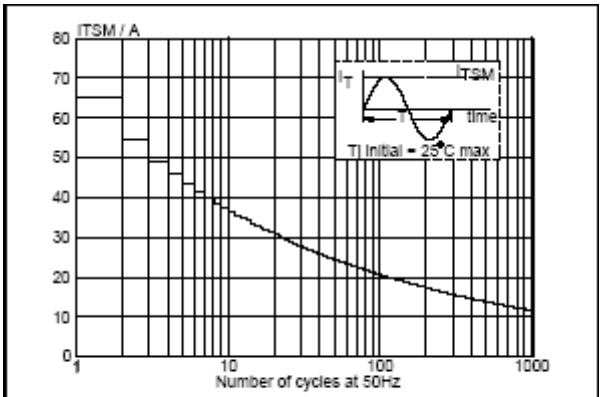


Fig.3. Maximum permissible non-repetitive peak on-state current I_{TSM}, versus number of cycles, for sinusoidal currents, f = 50 Hz.

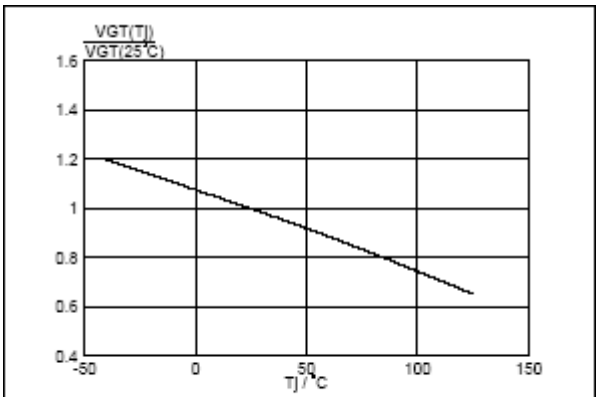


Fig.6. Normalised gate trigger voltage $V_{GT}(T_j)/ V_{GT}(25°C)$, versus junction temperature T_j.

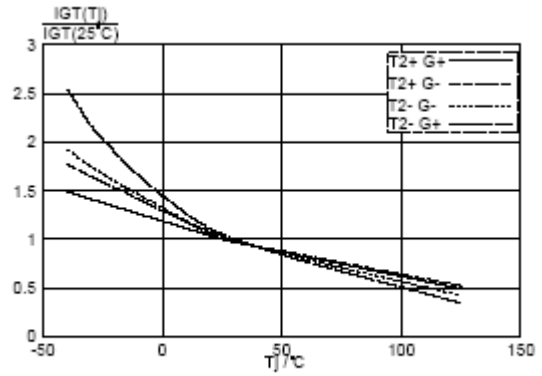


Fig.7. Normalised gate trigger current $I_{GT}(T_j)/ I_{GT}(25°C)$, versus junction temperature T_j.

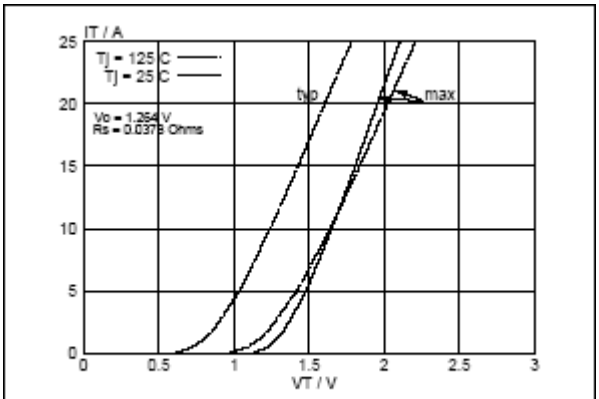


Fig.10. Typical and maximum on-state characteristic.

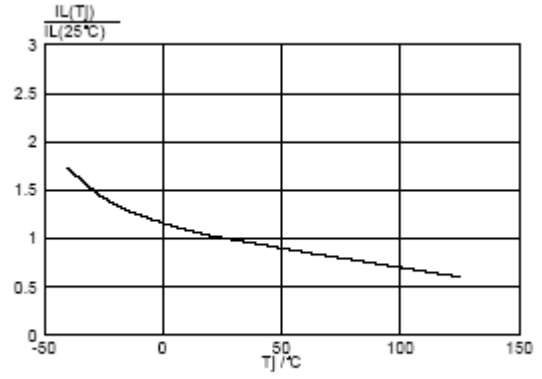


Fig.8. Normalised latching current $I_L(T_j)/ I_L(25°C)$, versus junction temperature T_j.

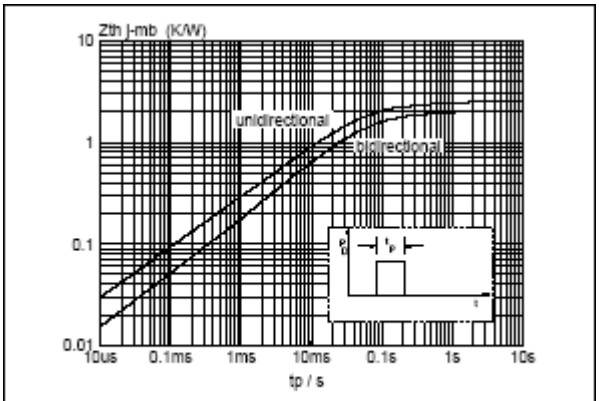


Fig.11. Transient thermal impedance $Z_{th\,j\text{-}mb}$, versus pulse width t_p.

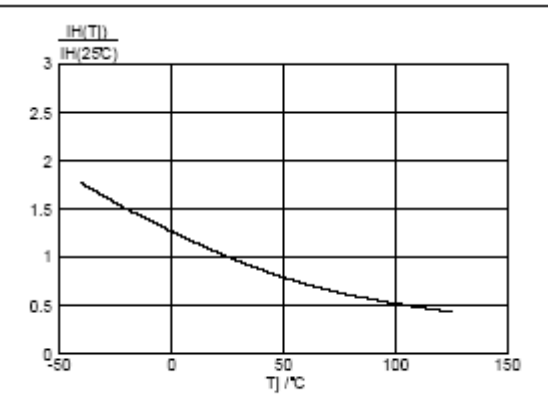


Fig.9. Normalised holding current $I_H(T_j)/ I_H(25°C)$, versus junction temperature T_j.

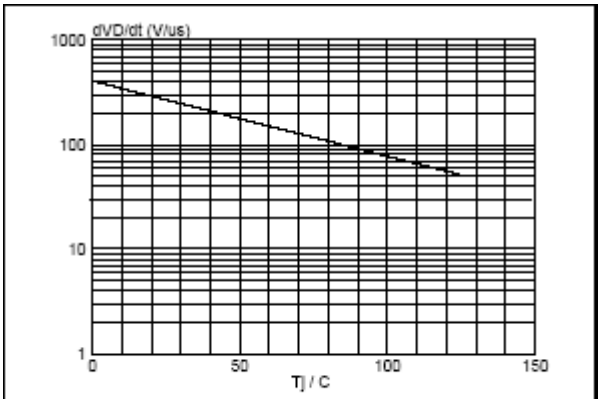
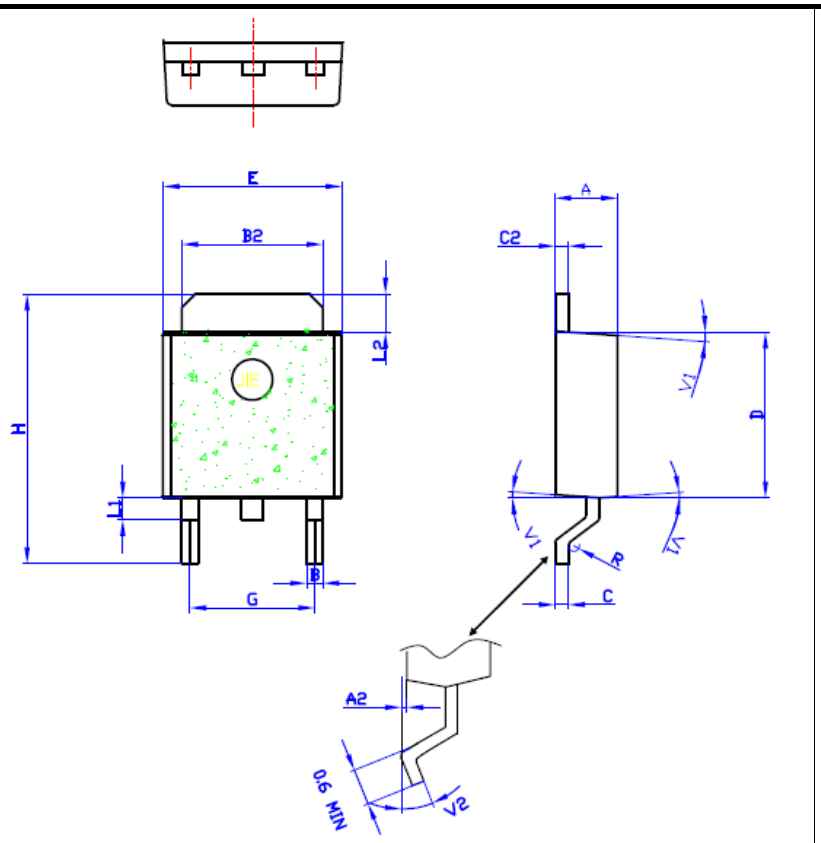
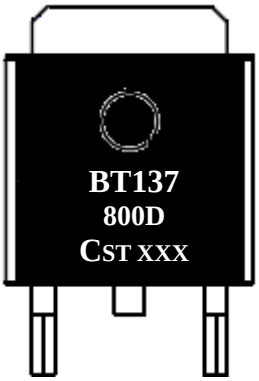


Fig.12. Typical, critical rate of rise of off-state voltage, dV_D/dt versus junction temperature T_j.

10、Package outline(TO-252)



Marking:



DIM	Inches			Milimeters		
	Min	Type	Max	Min	Type	Max
A	0.087	-	0.094	2.20	-	2.40
A2	0.001	-	0.009	0.03	-	0.23
B	0.022	-	0.026	0.55	-	0.65
B2	0.205	-	0.213	5.20	-	5.40
B3	0.030	-	0.033	0.76	-	0.85
B4	-	0.013	-	-	0.32	-
C	0.018	-	0.024	0.45	-	0.62
C2	0.016	-	0.021	0.40	-	0.54
D	0.236	-	0.244	6.00	-	6.20
E	0.252	-	0.260	6.40	-	6.60
G	0.173	-	0.181	4.40	-	4.60
H	0.384	-	0.419	9.75	-	10.65
L1	-	0.031	-	-	0.8	-
L2	0.071	-	0.075	1.80	-	1.90
V1	-	4^o	-	-	4^o	-
V2	0^o		8^o	0^o		8^o