

Kingtronics®

BT138 800E

TRIACS

Blocking Voltage - 800 Volts On-state RMS Current - 12 Ampere

FEATURES

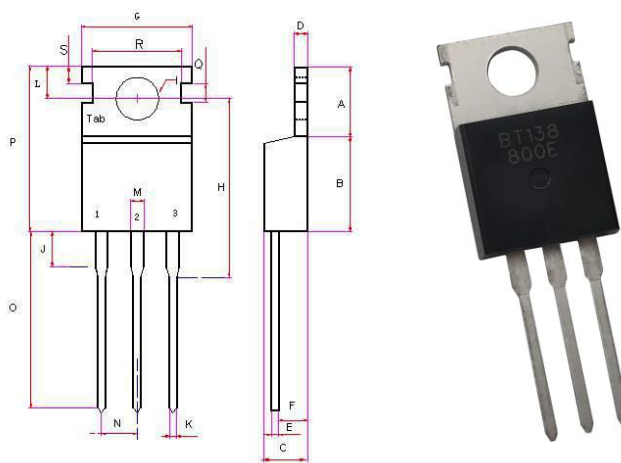
- ◆ Ultra low gate trigger current.
- ◆ Low cost package.

APPLICATIONS

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

- ◆ Heating regulation.
- ◆ Motor control.
- ◆ Phase control.

TO-220





DIM	Inches			Millimeters		
	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

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Kingtronics®**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	MAX	UNIT
R_{thj-mb}	Thermal resistance junction to mounting base	full cycle	-	-	1.50	K/W
		half cycle	-	-	2.00	K/W
R_{thj-a}	Thermal resistance junction to ambient	in free air		60	-	K/W

CHARACTERISTICS $T_J = 25^\circ\text{C}$ unless otherwise stated

SYMBOL	PARAMETER	CONDITIONS	MIN	TYP	MAX	UNIT	
Static characteristics							
I_{GT}	Gate trigger current	$V_D = 12\text{ V}; I_T = 0.1\text{ A}$	T2+ G+	-	-	10	mA
			T2+ G-	-	-	10	mA
			T2- G-	-	-	10	mA
			T2- G+	-	-	-	mA
I_L	Latching current	$V_D = 12\text{ V}; I_{GT} = 0.1\text{ A}$	T2+ G+	-	-	20	mA
			T2+ G-	-	-	50	mA
			T2- G-	-	-	20	mA
			T2- G+	-	-	-	mA
I_H	Holding current	$V_D = 12\text{ V}; I_{GT} = 0.15\text{ A}$	-	20	50	mA	
V_T	On-state voltage	$I_T = 17\text{ A}$	-	-	1.85	V	
V_{GT}	Gate trigger voltage	$V_D = 12\text{ V}; I_T = 0.1\text{ A}$	T2+ G+	0.50	0.80	1.50	V
			T2+ G-	0.50	0.78	1.50	V
			T2- G-	0.50	0.70	1.50	V
			T2- G+	-	-	-	V

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Kingtronics®**BT138 800E****TRIACS****Blocking Voltage - 800 Volts On-state RMS Current - 12 Ampere****CHARACTERISTICS**

SYMBOL	PARAMETER	CONDITIONS	MIN	TYP	MAX	UNIT
Dynamic Characteristics						
dV_D/dt	Critical rate of rise of off-state voltage	VDM = 67% VDRM(max); Tj = 125 °C; Exponential wave form; gate open circuit	250	500	-	V/μs
di_{com}/dt	Critical rate of change of commutating current	VD = 400 V; Tj = 125 °C IT(RMS)=4.4A; Commutating dv/dt = 18 V/ s, Without snubber; gate open circuit	6.50	-	-	A/ms
di/dt	Repetitive Critical Rate of Rise of On-State Current	IPK = 50 A; PW = 40 sec; diG/dt = 200 mA/ sec; f = 60 Hz	-	-	10	A/μs

LIMITING VALUE

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

SYMBOL	PARAMETER	CONDITIONS	MIN	MAX	UNIT	
VDRM VRRM	Repetitive peak off-state voltages		-	800	V	
IT(RMS)	RMS on-state current	full sine wave; Tmb ≤ 102 °C	-	12	A	
	Non-repetitive peak on-state current	full sine wave; Tj = 25 °C prior to surge t = 16.7 ms	-	105	A	
I2t	I2t for fusing	t = 10 ms	-	45	A2s	
dIT/dt	Repetitive rate of rise of on-state current after triggering	ITM = 12 A; IG = 0.2 A; DIG/dt = 0.2 A/s				
			T2+ G+	-	100	A/μs
			T2+ G-	-	100	A/μs
IGM	Peak gate current		-	2	A	
VGM	Peak gate voltage		-	8	V	
PGM	Peak gate power		-	16	W	
PG(AV)	Average gate power	over any 20 ms period	-	0.35	W	
Tstg	Storage temperature		-40	150	°C	
Tj	Junction temperature		-40	125	°C	

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ELECTRICAL CHARACTERISTICS CURVE

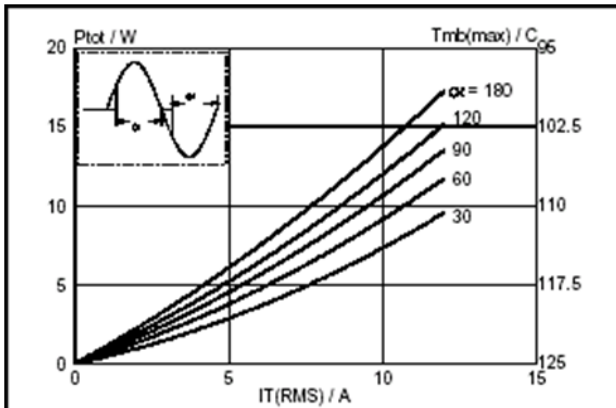


Fig. 1. Maximum on-state dissipation, P_{tot} , versus rms on-state current, $I_{T(RMS)}$, where α = conduction angle.

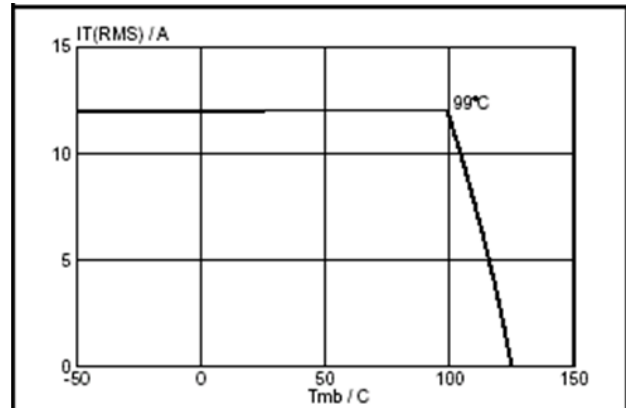


Fig. 4. Maximum permissible rms current $I_{T(RMS)}$, versus mounting base temperature T_{mb} .

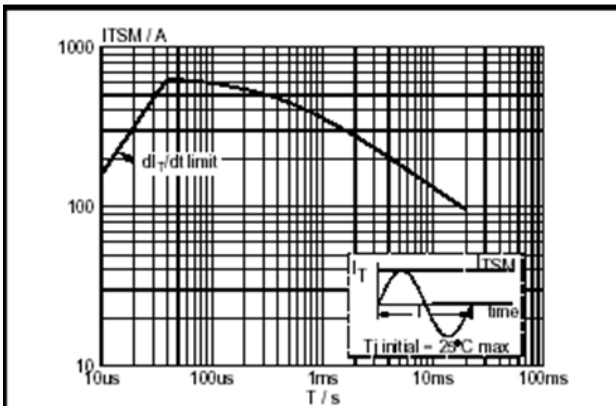


Fig. 2. Maximum permissible non-repetitive peak on-state current I_{TSM} versus pulse width t_p , for sinusoidal currents, $t_p \leq 20$ ms.

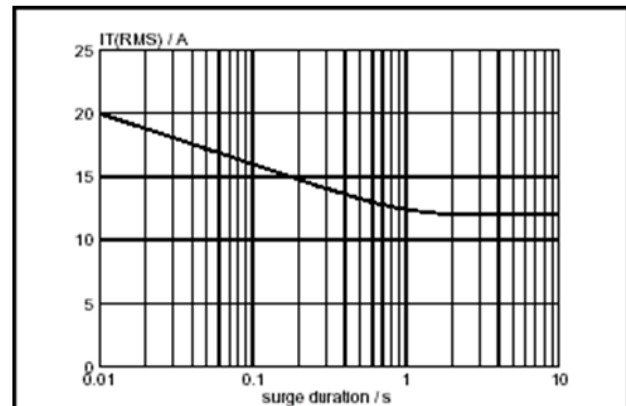


Fig. 5. Maximum permissible repetitive rms on-state current $I_{T(RMS)}$, versus surge duration, for sinusoidal currents, $f = 50$ Hz, $T_{mb} \leq 99$ °C.

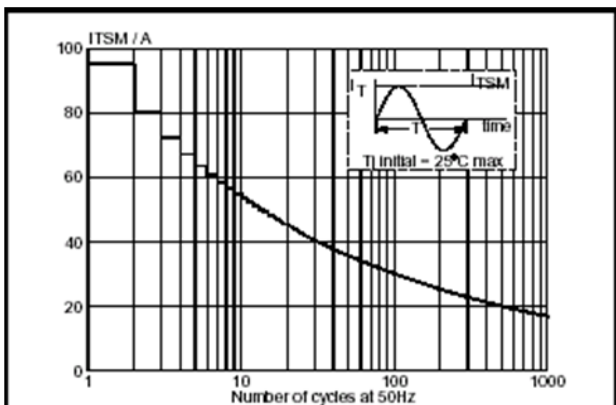


Fig. 3. Maximum permissible non-repetitive peak on-state current I_{TSM} , versus number of cycles, for sinusoidal currents, $f = 50$ Hz.

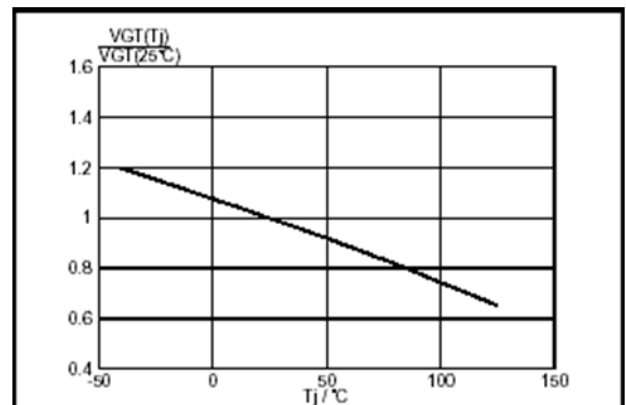
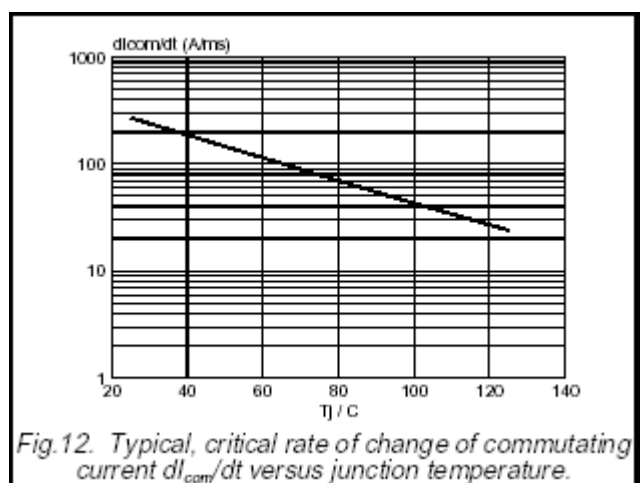
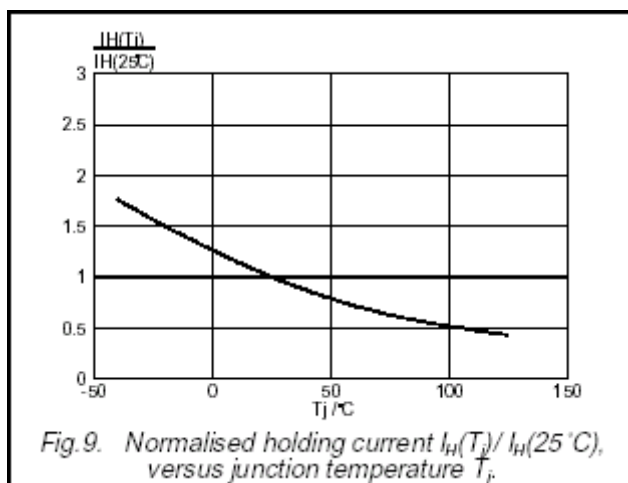
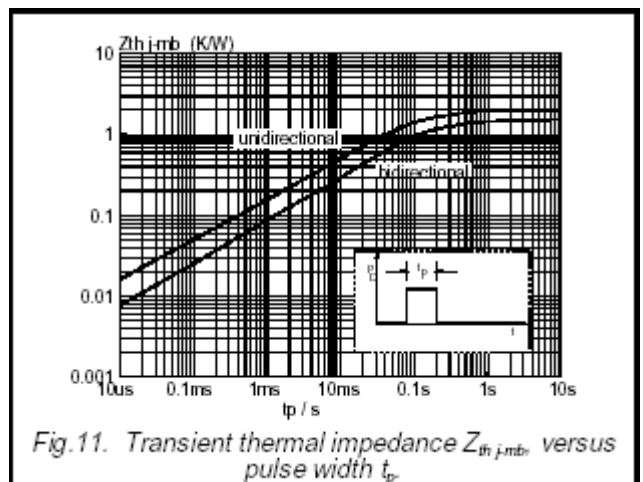
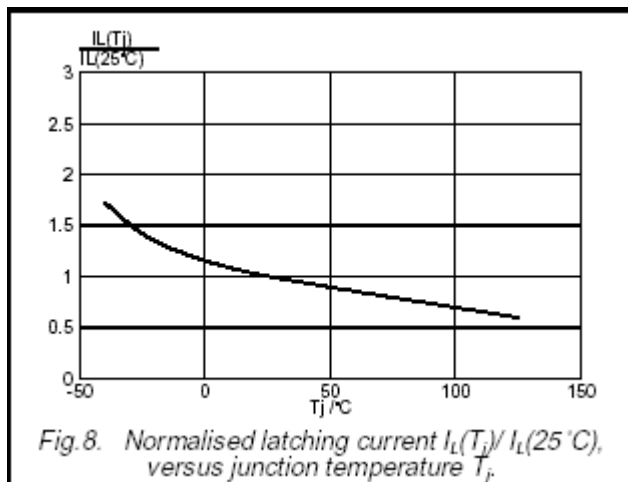
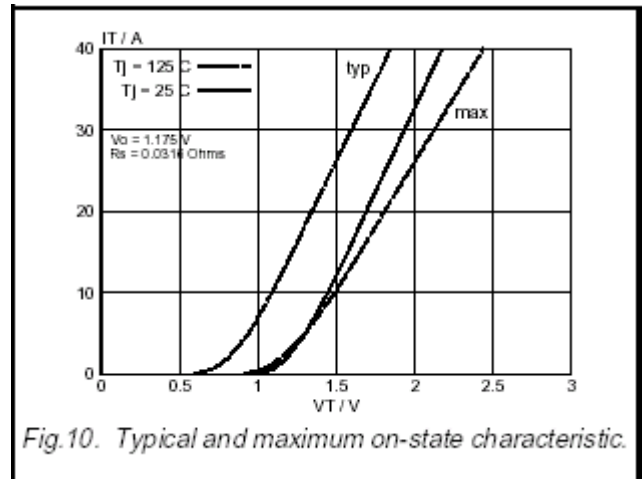
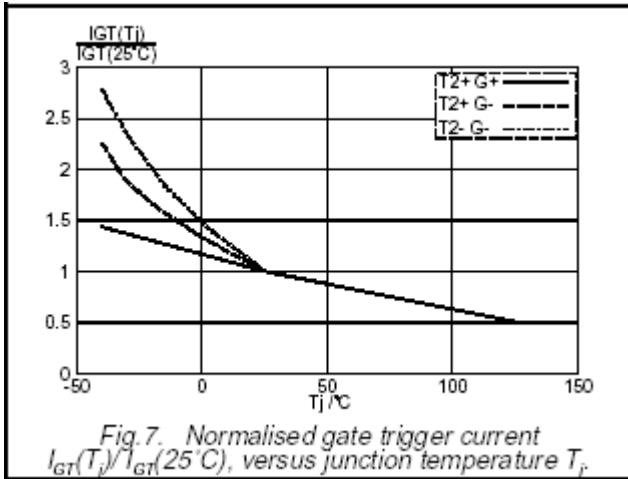


Fig. 6. Normalised gate trigger voltage $V_{GT}(T_j) / V_{GT}(25^\circ\text{C})$, versus junction temperature T_j .

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ELECTRICAL CHARACTERISTICS CURVE



Note: Specifications are subject to change without notice.

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