Kingtronics®

BT139 800T

THREE QUADRANT TRIACS

Blocking voltage - 800 Volts **On-state RMS current -** 16.0 Ampere

FEATURES

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

APPLICATIONS

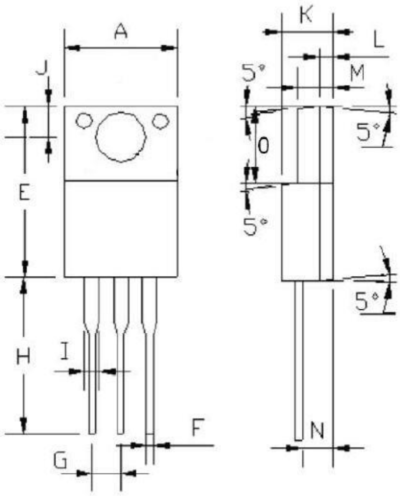
◆Typical applications include motor control, industrial and domestic lighting, heating and static switching

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

DESCRIPTION

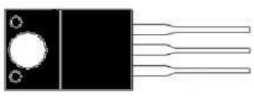
Glass passivated high commutation triacs in a full pack, plastic envelope intended for use in circuits where high static and dynamic dV/dt and high dI/dt can occur. These devices will commutate the full rated rms current at the maximum rated junction temperature, without the aid of a snubber.

TO-220F



	Inches		Milimeters			Inches		Milimeters	
DIM	Min	Max	Min	Max	DIM	Min	Max	Min	Max
A	0.396	0.404	10.050	10.250	J	0.123	0.131	3.130	3.330
E	0.618	0.630	15.700	16.000	K	0.182	0.186	4.630	4.730
F	0.028	0.035	0.700	0.900	L	0.030(TYP.)		0.77(TYP.)	
G	0.093	0.108	2.350	2.750	M	0.097	0.101	2.470	2.570
H	0.500	0.512	12.700	13.000	N	0.104	0.112	2.650	2.850
I	0.049	0.057	1.240	1.440	O	0.258	0.262	6.550	6.650

PINNING INFORMATION

PIN	Description	Simplified outline	Symbol
1	main terminal 1(T1)	 TO-220F	
-	-		
3	Gate(G)		

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	16	A
I_{TSM}	Non-repetitive peak on-state current	120	A

THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	MIN	TYP	MAX	UNIT
$R_{th\ j\text{-}mb}$	Thermal resistance junction to mounting base	full cycle	-	-	1.5	K /W
		half cycle	-	-	2.0	K /W
$R_{th\ j\text{-}a}$	Thermal resistance junction to ambient	in free air	-	60	-	K /W

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LIMITING VALUE

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

SYMBOL	PARAMETER	CONDITIONS		MIN	MAX	UNIT
$I_{T(RMS)}$	RMS on-state current	full sine wave; T_{mb} <= 102 °C		-	16	A
	Non-repetitive peak on-state current	full sine wave; Tj =25 °C prior to surge	t = 20 ms	-	120	A
			t = 16.7 ms	-	140	A
I^2t	I^2t for fusing	t = 10 ms		-	45	A^2s
dI_T/dt	Repetitive rate of rise of on-state current after triggering	I_{TM} = 16 A; IG = 0.2 A; DI_G/dt = 0.2 A/s				
			T2+ G+	-	100	A/µs
			T2- G-	-	100	A/µs
I_{GM}	Peak gate current			-	2	A
V_{GM}	Peak gate voltage			-	8	V
P_{GM}	Peak gate power			-	16	W
$P_{G(AV)}$	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

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 = 0.1 A	T2+ G+	-	10	35	mA
			T2+ G-	-	15	35	mA
			T2- G-	-	15	35	mA
I_L	Latching current	V_D = 12 V; I_{GT} = 0.1A					
			T2+ G+	-	20	50	mA
			T2+ G-	-	30	80	mA
			T2- G-	-	20	50	mA
I_H	Holding current	V_D =12 V; I_{GT} = 0.15A		-	20	40	mA
V_T	On-state voltage	I_T = 20A		-	-	1.85	V
V_{GT}	Gate trigger voltage	V_D = 12 V; I_T = 0.1A	T2+ G+	0.5	0.78	1.5	V
			T2+ G-	0.5	0.70	1.5	V
			T2- G-	0.5	0.71	1.5	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; Commutating d_V/dt = 18V/s, Without snubber; gate open circuit		6.5	-	-	A/ms
dI/dt	Repetitive Critical Rate of Rise of On-State Current	I_{PK} = 50A; PW = 40sec; di_G/dt = 200mA/set; f = 60Hz		-	-	10	A/µs

RATINGS AND CHARACTERISTIC CURVES BT139 800T

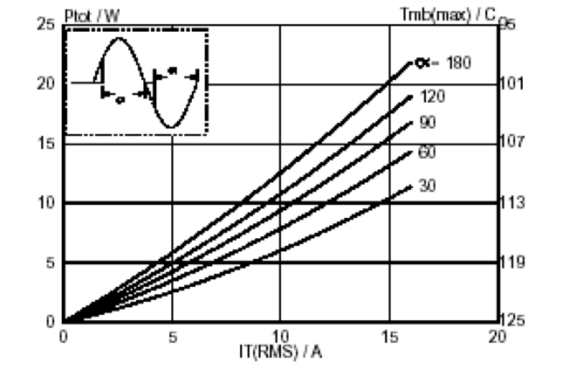

Fig.1. Maximum on-state dissipation, P_{tot}, versus rms on-state current, $I_{T(RMS)}$, where α = conduction angle.

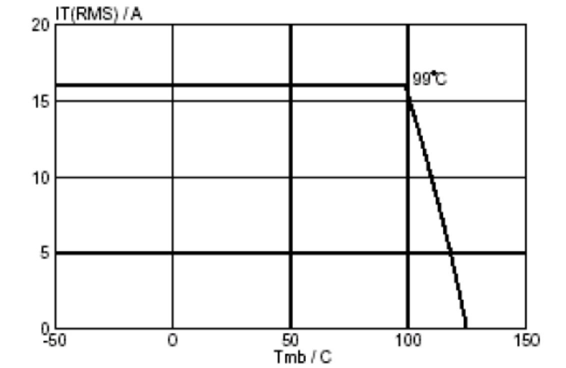

Fig.4. Maximum permissible rms current $I_{T(RMS)}$, versus mounting base temperature T_{mb}.

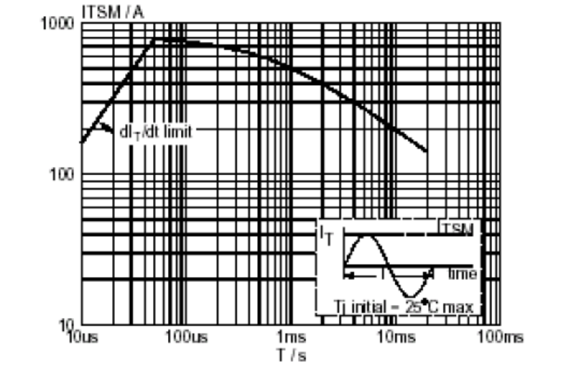

Fig.2. Maximum permissible non-repetitive peak on-state current I_{TSM}, versus pulse width t_p, for sinusoidal currents, $t_p \le 20ms$.

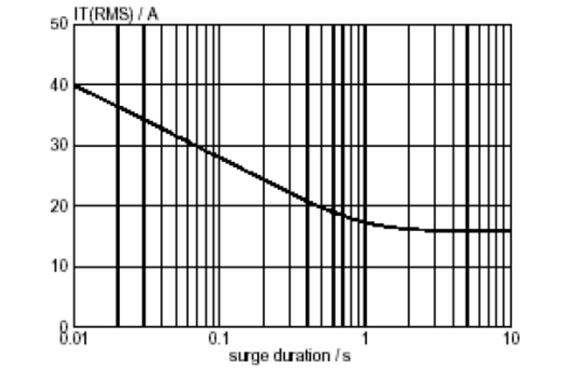

Fig.5. Maximum permissible repetitive rms on-state current $I_{T(RMS)}$, versus surge duration, for sinusoidal currents, f = 50 Hz; $T_{mb} \le 99^{\circ}C$.

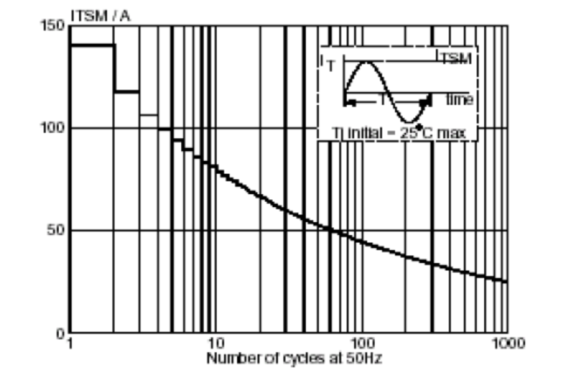

Fig.3. Maximum permissible non-repetitive peak on-state current I_{TSM}, versus number of cycles, for sinusoidal currents, f = 50 Hz.

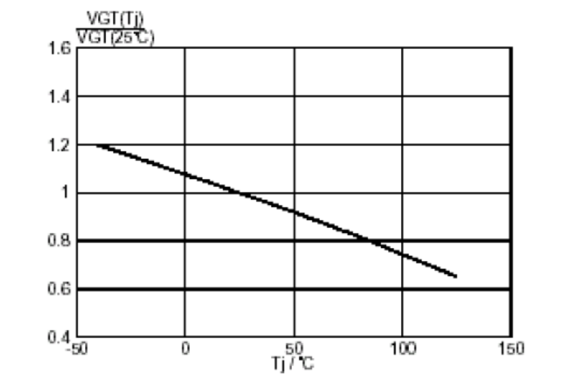

Fig.6. Normalised gate trigger voltage $V_{GT}(T_j)/V_{GT}(25^{\circ}C)$, versus junction temperature T_j.

Note: Specifications are subject to change without notice.

RATINGS AND CHARACTERISTIC CURVES BT139 800T

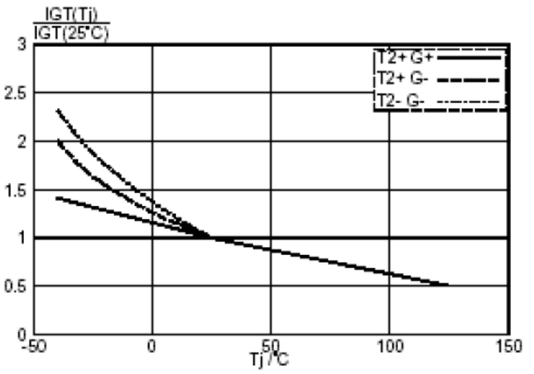

Fig.7. Normalised gate trigger current $I_{GT}(T_j)/I_{GT}(25^\circ C)$, versus junction temperature T_j.

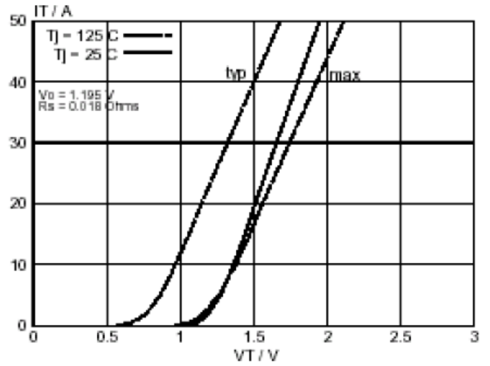

Fig.10. Typical and maximum on-state characteristic.

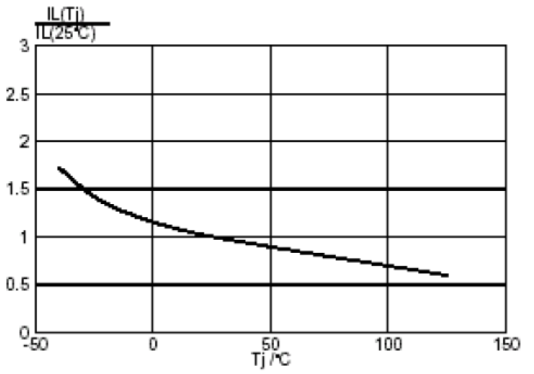

Fig.8. Normalised latching current $I_L(T_j)/I_L(25^\circ C)$, versus junction temperature T_j.

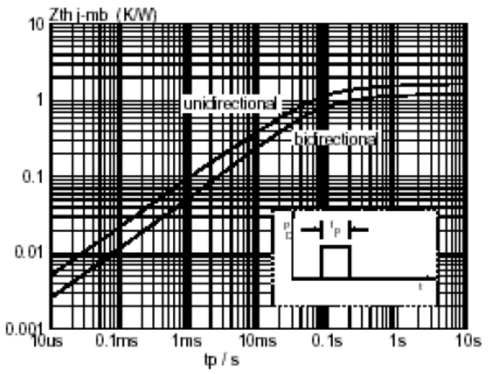

Fig.11. Transient thermal impedance $Z_{th\ j\text{-}mb}$, versus pulse width t_p.

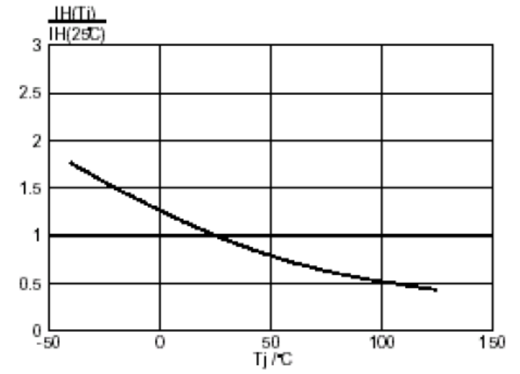

Fig.9. Normalised holding current $I_H(T_j)/I_H(25^\circ C)$, versus junction temperature T_j.

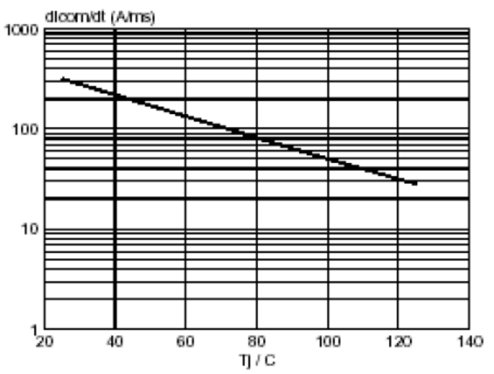

Fig.12. Typical, critical rate of change of commutating current dI_{com}/dt versus junction temperature.

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