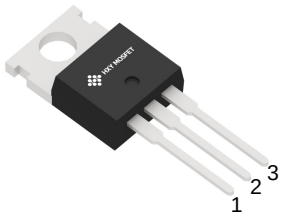
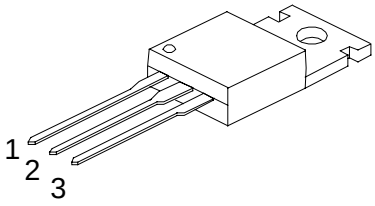
BT137-800E

Plastic-Encapsulate Thyristors

DESCRIPTION

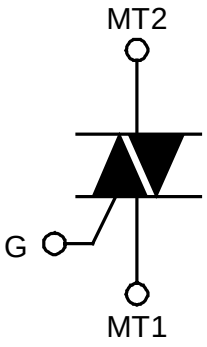
Passivated triacs in a plastic envelope, intended for use in applications requiring high bidirectional transient and blocking voltage capability and high thermal cycling performance. Typical applications include motor control, industrial and domestic lighting, heating voltages and static switching.





1:MT1 2:MT2 3:GATE

TO-220



ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	RATINGS		UNIT
Repetitive Peak Off State Voltage	V_{DRM}	800*	-800	V
RMS On-state Current (Full sine wave; Tmb≤102°C)	$I_{T(RMS)}$	8		A
Non-Repetitive Peak. On-State Current (Full sine wave; Tj=25°C prior to surge) t=20ms t=16.7ms	I_{TSM}	 65 71		A
I^2t For Fusing t=10ms	I^2t	 21		A^2s
Repetitive Rate of Rise of On-state Current after Triggering I_{TM}=12A;I_G=0.2A,dI_G/dt=0.2A/μs T2+G+ T2+G- T2-G- T2-G+	dI_T/dt	 50 50 50 10		A/μs
Peak Gate Voltage	V_{GM}	5		V
Peak Gate Current	I_{GM}	2		A
Peak Gate Power	P_{GM}	5		W
Average Gate Power (Over any 20ms period)	$P_{G(AV)}$	0.5		W
Operating Junction Temperature	Tj	125		°C
Storage Temperature	Tstg	-40~150		°C

*Although not recommended, off-state voltages up to 800V may be applied without damage, but the triac may switch to the on-state. The rate of rise of current should not exceed 6A/μs.

THERMAL RESISTANCES

PARAMETER	SYMBOL	MIN	TYP	MAX	UNIT
Thermal Resistance Junction to Mounting Base Full cycle Half cycle	Rth j-mb			 2.0 2.4	K/W
Thermal Resistance Junction to Ambient In free air	Rth j-a		60		K/W

ELECTRICAL CHARACTERISTICS (Tj=25°C,unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
STATIC CHARACTERISTICS						
Gate Trigger Current	I_{GT}	V_D=12V, I_T=0.1A				
		T2+G+		5	35	
		T2+G-		8	35	mA
		T2-G-		11	35	
		T2-G+		30	70	
Latching Current	I_L	V_D=12V, I_{GT}=0.1A				
		T2+G+		7	30	
		T2+G-		16	45	mA
		T2-G-		5	30	
		T2-G+		7	45	
On-State Voltage	V_T	I_T=10A		1.3	1.65	V
Gate Trigger Voltage	V_{GT}	V_D=12V, I_T=0.1A		0.7	1.5	V
		V_D=400V, I_T=0.1A Tj=125°C	0.25	0.4		V
Holding Current	I_H	V_D=12V, I_{GT}=0.1A		5	20	mA
Off-state Leakage Current	I_D	V_D=$V_{DRM(max)}$, Tj=125°C		0.1	0.5	mA
DYNAMIC CHARACTERISTICS						
Critical Rate of Rise of off-state Voltage	dV_D/dt	V_{DM}=67% $V_{DRM(max)}$, Tj=125°C Exponential waveform,Gate open circuit	100	250		V/μs
Critical Rate of Change of commutating Voltage	dV_{com}/dt	V_{DM}=400V , Tj=95°C, $I_{T(RMS)}$=8A dI_{com}/dt =3.6A/ms Gate open circuit		20		V/μs
Gate Controlled Turn-on Time	tgt	I_{TM}=12A,V_D=$V_{DRM(max)}$,I_G=0.1A dI_G/dt=5A/μs		2		μs

TYPICAL CHARACTERISTICS

Figure 1.Maximum on -state Dissipation.Ptot vs RMS On-state Current,$I_{T(RMS)}$,Where α =conduction Angle.

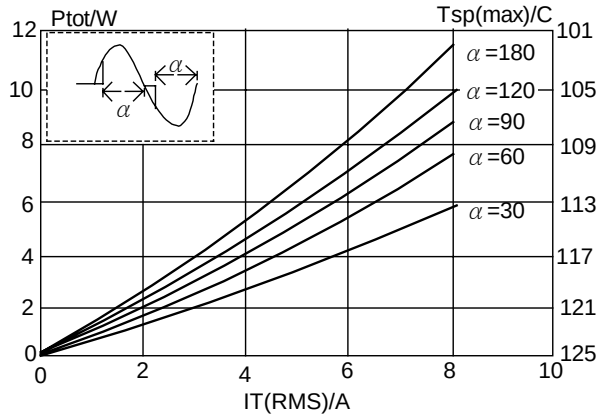


Figure 4.Maximum Permissible RMS Current $I_{T(RMS)}$ vs mounting baseTemperature T_{mb}

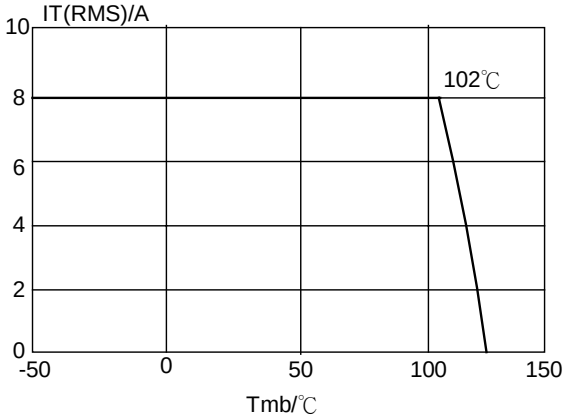


Figure 2. Maximum Permissible Non-repetitive Peak On-state Current I_{TSM},vs Pulse Width t_p,for Sinusoidal Currents,t_p≒20ms

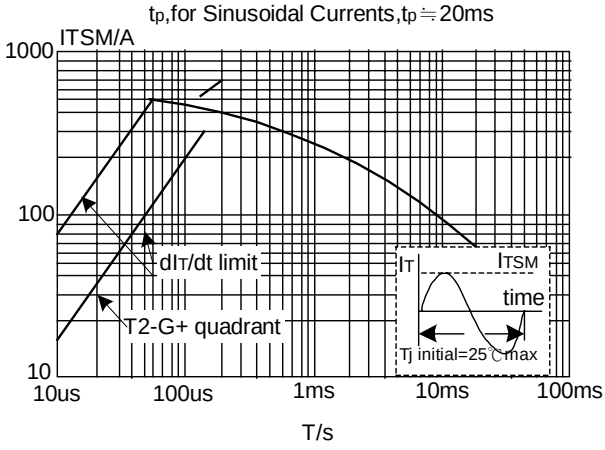


Figure 5.Maximum Permissible Repetitive RMS on-state Current $I_{T(RMS)}$,vs Surge Duration,for Sinusoidal Currents,f=50Hz;Tmb≒102℃

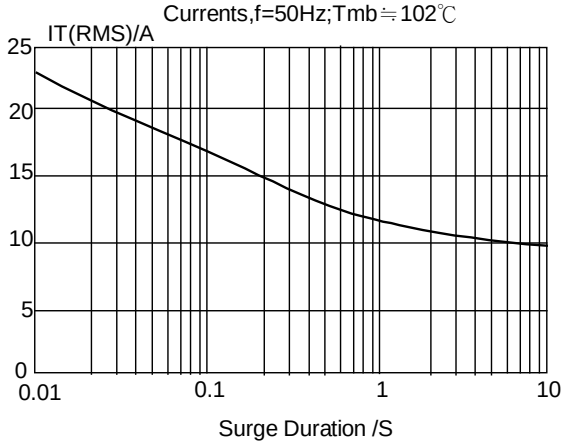


Figure 3 .Maximum Permissible Non-Repetitive peak on-state Current I_{TSM},vs Number of Cycles, for Sinusoidal Currents,f=50Hz

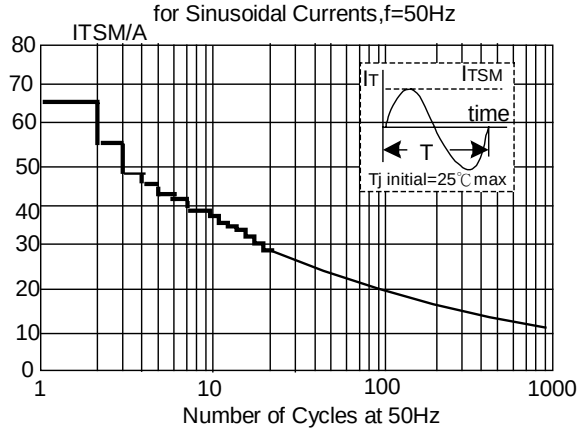


Figure 6.Normalised Gate Trigger Voltage V_{GT}(Tj)/ V_{GT}(25℃),vs Junction Temperature Tj

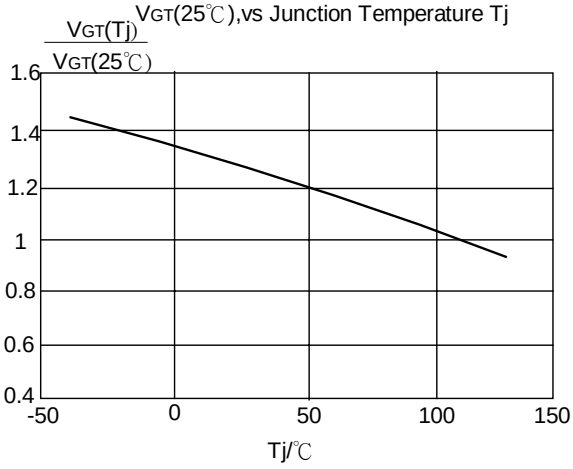


Figure 7.Normalised Gate Trigger Current
IGT(Tj)/IGT(25℃),vs Junction Temperature Tj

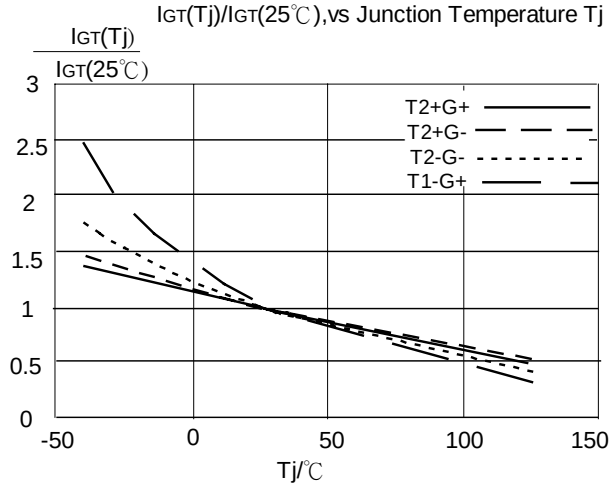


Figure 8.Normalised Latching Current
IL(Tj)/IL(25℃),vs Junction Temperature Tj

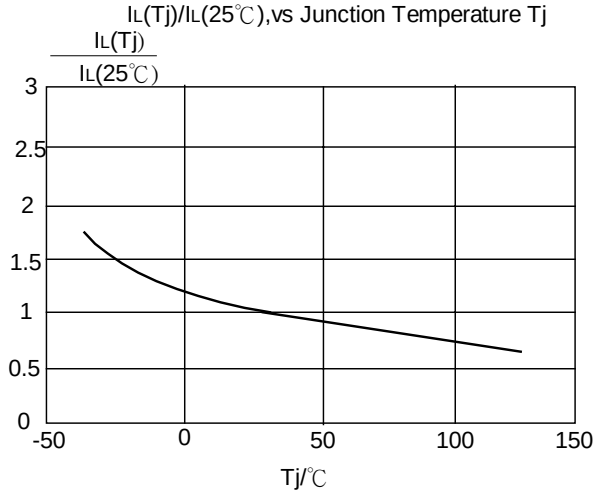


Figure 9.Normalised Holding Current
IH(Tj)/IH(25℃),vs Junction Temperature Tj

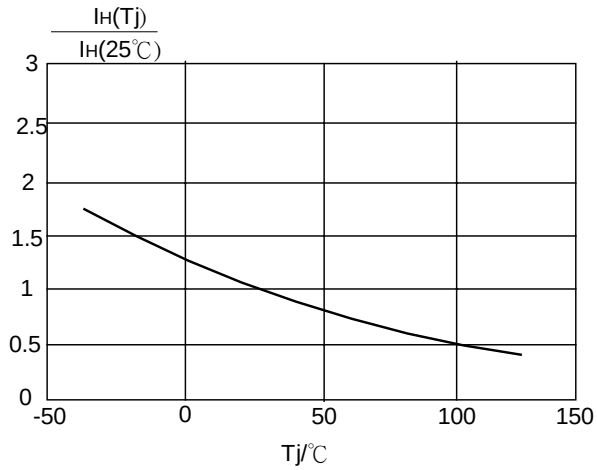


Figure 10.Typical and Maximum
On-state Characteristic

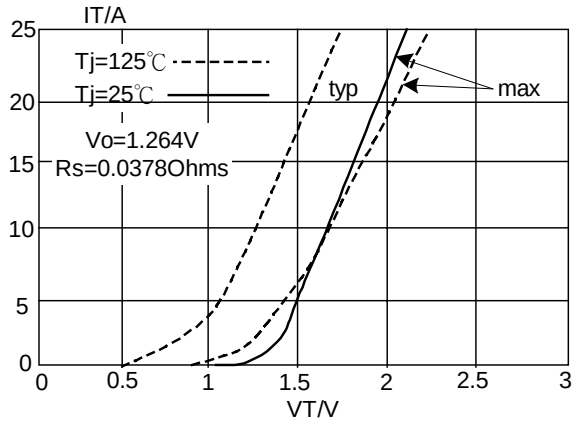


Figure 11.Transient Thermal Impedance
Zth j-mb,vs Pulse Width tp

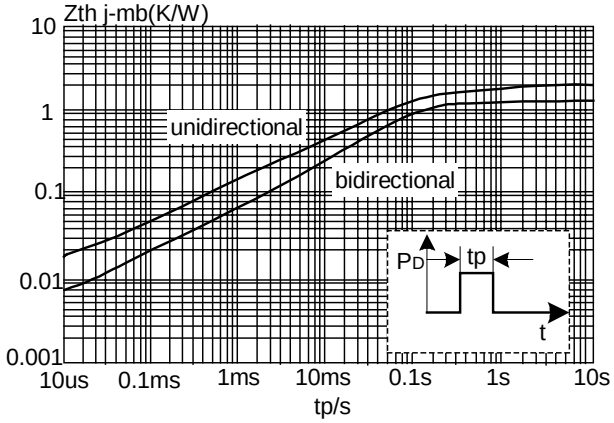
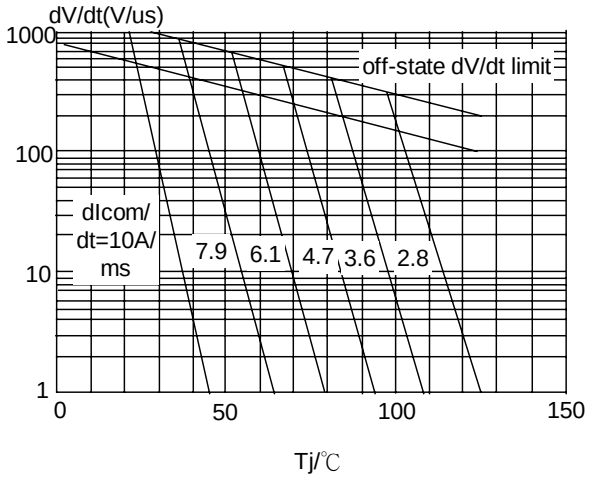
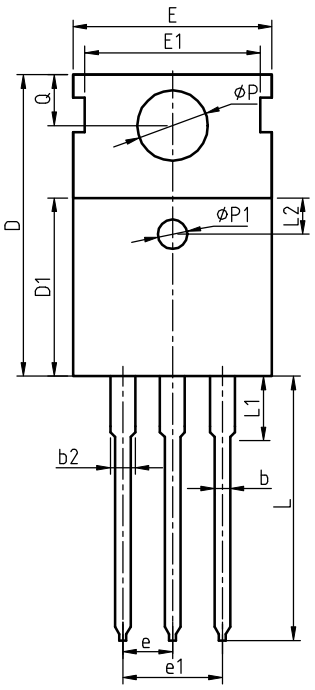


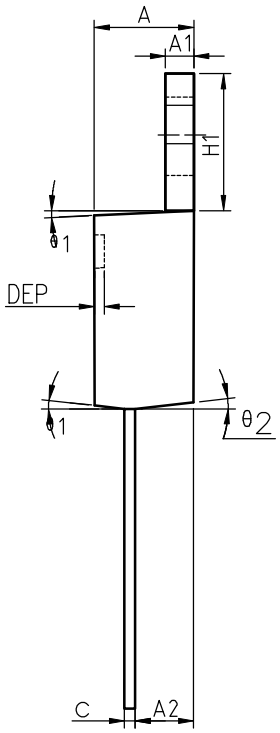
Figure 12.Typical commutation dV/dt vs junction temperature,parameter commutation dIT/dt.The triac should commutate when the dV/dt is below the value on the appropriate curve for pre-commutation dIT/dt

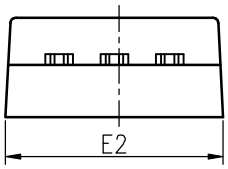


Package Information

TO-220







COMMON DIMENSIONS

SYMBOL	MIN	NOM	MAX	MIN	NOM	MAX
A	4.40	4.57	4.70	0.173	0.180	0.185
A1	1.27	1.30	1.33	0.050	0.051	0.052
A2	2.35	2.40	2.50	0.093	0.094	0.098
b	0.77	0.80	0.90	0.030	0.031	0.035
b2	1.17	1.27	1.36	0.046	0.050	0.054
c	0.48	0.50	0.56	0.019	0.020	0.022
D	15.40	15.60	15.80	0.606	0.614	0.622
D1	9.00	9.10	9.20	0.354	0.358	0.362
DEP	0.05	0.10	0.20	0.002	0.004	0.008
E	9.80	10.00	10.20	0.386	0.394	0.402
E1	-	8.70	-	-	0.343	-
E2	9.80	10.00	10.20	0.386	0.394	0.402
e		2.54	BSC		0.100	BSC
e1		5.08	BSC		0.200	BSC
H1	6.40	6.50	6.60	0.252	0.256	0.260
L	12.75	13.50	13.65	0.502	0.531	0.537
L1	-	3.10	3.30	-	0.122	0.130
L2		2.50	REF		0.098	REF
P	3.50	3.60	3.63	0.138	0.142	0.143
P1	3.50	3.60	3.63	0.138	0.142	0.143
Q	2.73	2.80	2.87	0.107	0.110	0.113
θ1	5°	7°	9°	5°	7°	9°
θ2	1°	3°	5°	1°	3°	5°
θ3	1°	3°	5°	1°	3°	5°

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