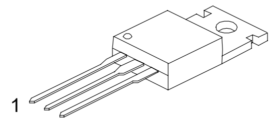
TRIACS LOGIC LEVEL

DESCRIPTION

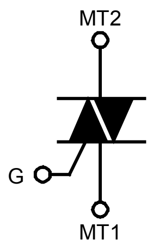
Passivated triacs in a plastic envelope, intended for use in applications requiring high bidirectional transient and blocking voltage capability and high thermal cycling performance. Typical applications include motor control, industrial and domestic lighting, heating voltages and static switching.



TO-220

1:MT1 2:MT2 3:GATE

SYMBOL



ABSOLUTE MAXIMUM RATINGS (Tj=25°C)

PARAMETER	SYMBOL	RATING	UNIT
Repetitive Peak Off State Voltage	V_{DRM}		V
BT138-600		600	
BT138-800		800	
RMS On-state Current (Full sine wave; Tmb≤99°C)	$I_{T(RMS)}$	12	A
Non-repetitive Peak. On-State Current (Full sine wave; Tj=25°C prior to surge)	I_{TSM}		A
t=20ms		95	
t=16.7ms		105	
I^2t For Fusing (t=10ms)	I^2t	45	A^2s
Repetitive Rate of Rise of On-state Current after Triggering (I_{TM}=20A;I_G=0.2A; dI_G/dt=0.2A/μs)	dI_T/dt		A/μs
T2+G+		50	
T2+G-		50	
T2-G-		50	
T2-G+		10	
Peak Gate Voltage	V_{GM}	5	V
Peak Gate Current	I_{GM}	2	A
Peak Gate Power	P_{GM}	5	W
Average Gate Power	$P_{G(AV)}$	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 15A/μs.

THERMAL RESISTANCES

PARAMETER	SYMBOL	MIN	TYP	MAX	UNIT
Thermal Resistance, Junction to Mounting Base Full cycle Half cycle	R θ j-mb			 1.5 2.0	°C /W
Thermal Resistance, Junciton to Ambient In free air	R θ j-a		60	-	°C /W

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

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Gate Trigger Current T2+G+ T2+G- T2-G- T2-G+	I_{GT}	V_D=12V, I_T=0.1A		 5 8 10 12	 35 35 35 70	mA
Latching Current T2+G+ T2+G- T2-G- T2-G+	I_L	V_D=12V, I_{GT} =0.1A		 7 20 8 10	 40 60 40 60	mA
Holding Current	I_H	V_D=12V, I_{GT}=0.1A		6	30	mA
On-State Voltage	V_T	I_T=15A		1.4	1.65	V
Gate Trigger Voltage	V_{GT}	V_D=12V, I_T=0.1A V_D=400V, I_T=0.1A, Tj=125°C	 0.25	0.7 0.4	1.5	V
Off-state Leakage Current	I_D	V_D=$V_{DRM(max)}$, Tj=125°C		0.1	0.5	mA

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

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
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, $I_{T(RMS)}$=12A dI_{com}/dt =5.4A/ms, Gate open circuit		20		V/μs
Gate Controlled Turn-on Time	tgt	I_{TM}=16A, 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.

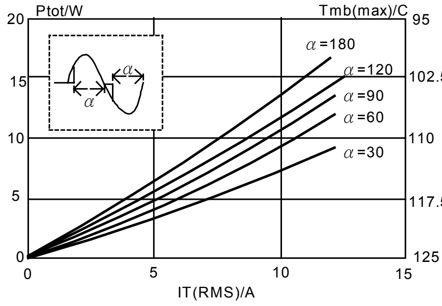


Figure 4.Maximum Permissible RMS Current $I_{T(RMS)}$ vs mounting baseTemperature T_{mb}

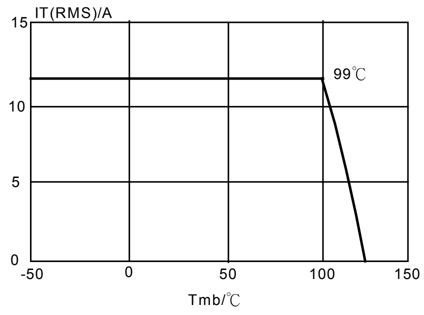


Figure 2. Maximum Permissible Non-repetitive Peak On-state Current I_{TSM},vs Pulse Width t_p,for Sinusoidal Currents,t_p≒20ms

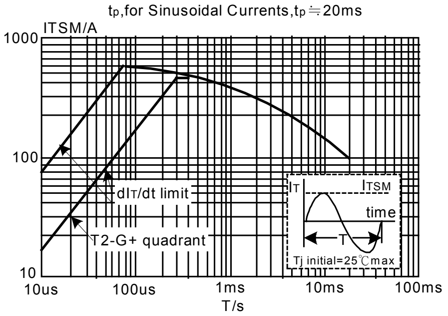


Figure 5.Maximum Permissible Repetitive RMS on-state Current IT(RMS),vs Surge Duration,for Sinusoidal Currents,f=50Hz;Tmb≒99℃

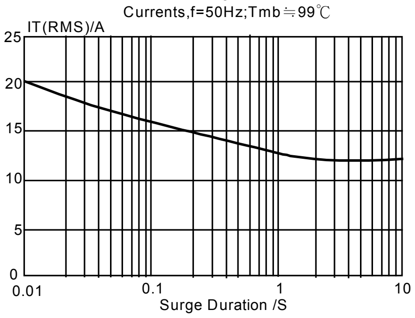


Figure 3 .Maximum Permissible Non-Repetitive peak on-state Current I_{TSM},vs Number of Cycles, for Sinusoidal Currents,f=50Hz

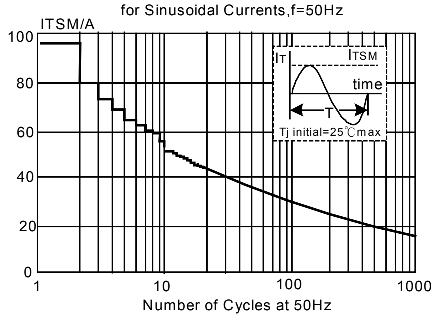


Figure 6.Normalised Gate Trigger Voltage $V_{GT}(Tj)$/ $V_{GT}(25℃)$,vs Junction Temperature Tj

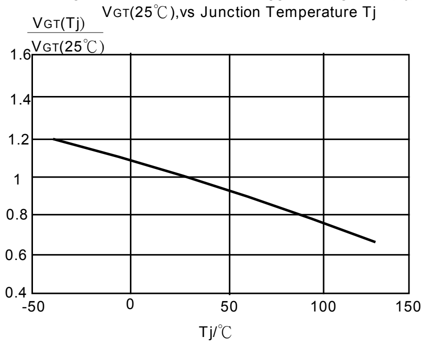


Figure 7.Normalised Gate Trigger Current IGT(Tj)/IGT(25℃),vs Junction Temperature Tj

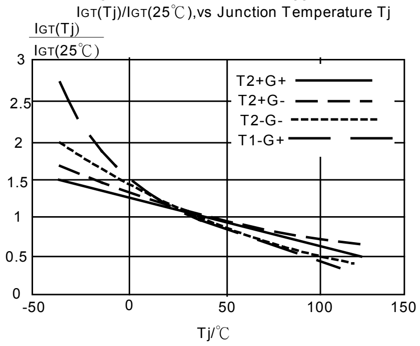


Figure 10.Typical and Maximum On-state Characteristic

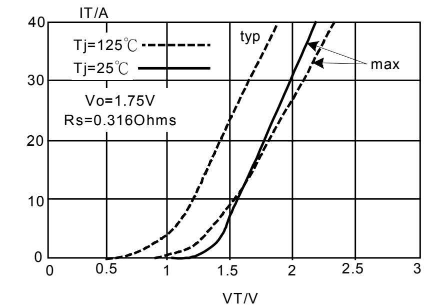


Figure 8.Normalised Latching Current IL(Tj)/IL(25℃),vs Junction Temperature Tj

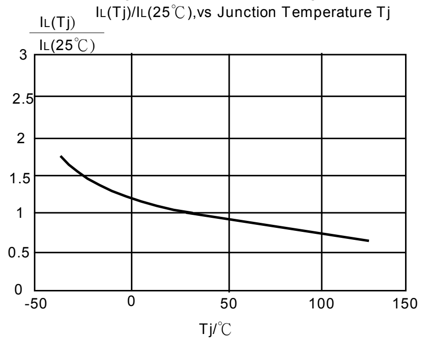


Figure 11.Transient Thermal Impedance Zth j-mb,vs Pulse Width tp

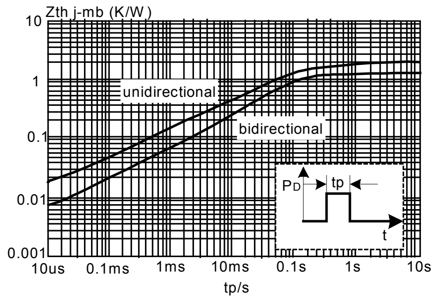


Figure 9.Normalised Holding Current IH(Tj)/IH(25℃),vs Junction Temperature Tj

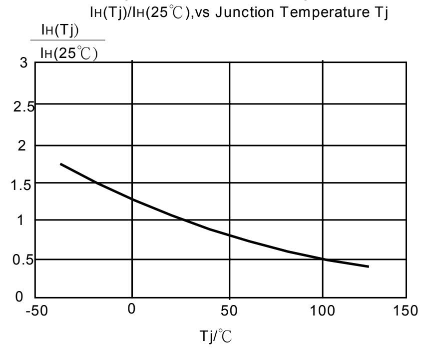


Figure 12.Typical commutation dV/dt vs junction temperature,parameter commutation dIT/dt.The triac should commutate when the dV/dt is below the value on the appropriate curve for pre-commutation dIT/dt