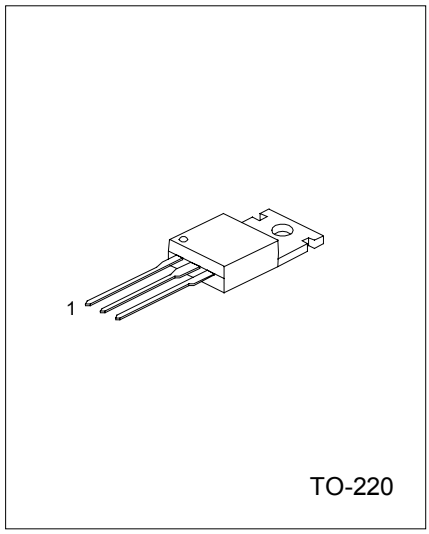
TRIACS

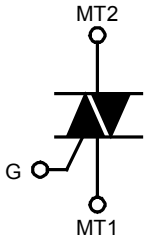
DESCRIPTION

Glass passivated , sensitive gate triacs in a plastic envelope, intended for use in general purpose bidirectional switching and phase control applications, where high sensitivity is required in all four quadrants.



1:MT1 2:MT2 3:GATE

SYMBOL



ABSOLUTE MAXIMUM RATINGS (Tj=25°C)

PARAMETER	SYMBOL	RATING	UNIT
Repetitive Peak Off State Voltage UT138E-5 UT138E-6 UT138E-8	V_{DRM}	 500* 600* 800	V
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) t=20ms t=16.7ms	I_{TSM}	 95 105	A
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) 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 15A/μs.

THERMAL RESISTANCES

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

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

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Gate Trigger Current	I_{GT}	V_D=12V, I_T=0.1A				
		T2+ G+		2.5	10	mA
		T2+ G-		4.0	10	
		T2- G-		5.0	10	
		T2- G+		11	25	
Latching Current	I_L	V_D=12V, I_{GT} =0.1A				
		T2+ G+		3.2	30	mA
		T2+ G-		16	40	
		T2- G-		4.0	30	
		T2- G+		5.5	40	
Holding Current	I_H	V_D=12V, I_{GT}=0.1A		4.0	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		0.7	1.5	V
		V_D=400V, I_T=0.1A, Tj=125°C	0.25	0.4		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		50		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.

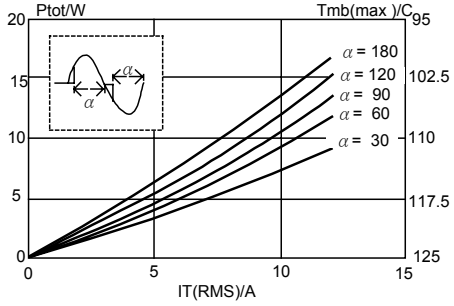


Figure 4.Maximum Permissible RMS Current $I_{T(RMS)}$ vs mounting baseTemperature T_{mb}.

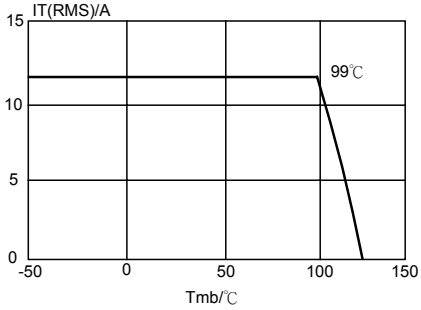


Figure 2. Maximum Permissible Non-repetitive Peak On-state Current I_{TSM},vs Pulse Width t_p,for Sinusoidal Currents,$t_p \leqq 20$ms.

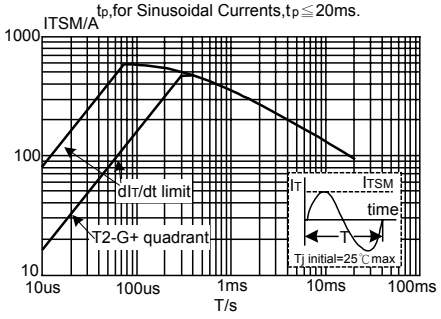


Figure 5.Maximum Permissible Repetitive RMS on-state Current IT(RMS),vs Surge Duration,for Sinusoidal Currents,f=50Hz;Tmb≦99℃.

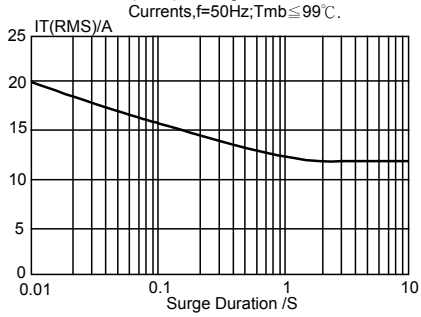


Figure 3 .Maximum Permissible Non-Repetitive peak on-state Current I_{TSM},vs Number of Cycles, for Sinusoidal Currents,f=50Hz.

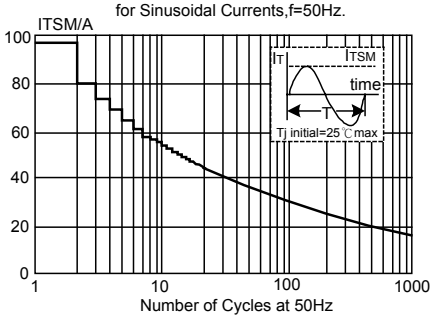


Figure 6.Normalised Gate Trigger Voltage $V_{GT}(Tj)$/ $V_{GT}(25℃)$,vs Junction Temperature Tj.

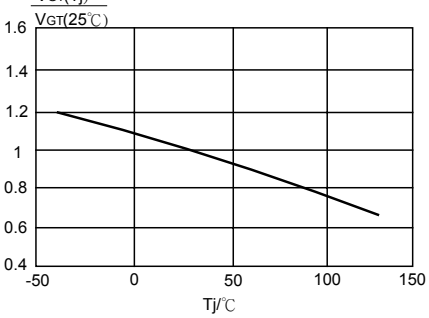


Figure 7.Normalised Gate Trigger Current
$I_{GT}(Tj)/I_{GT}(25℃)$,vs Junction Temperature Tj.

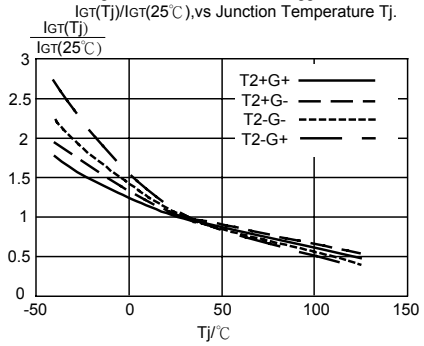


Figure 8.Normalised Latching Current
$I_L(Tj)/I_L(25℃)$,vs Junction Temperature Tj.

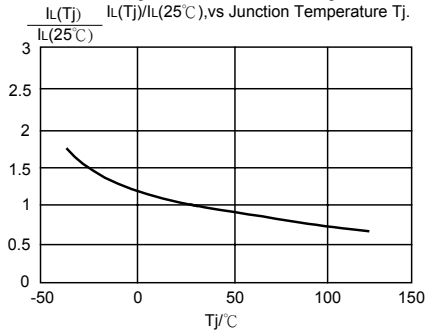


Figure 9.Normalised Holding Current
$I_H(Tj)/I_H(25℃)$,vs Junction Temperature Tj.

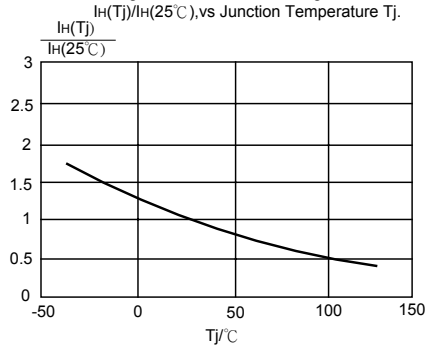


Figure 10.Typical and Maximum
On-state Characteristic.

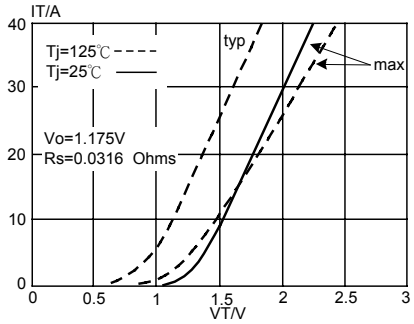


Figure 11.Transient Thermal Impedance
Zth j-mb,vs Pulse Width tp.

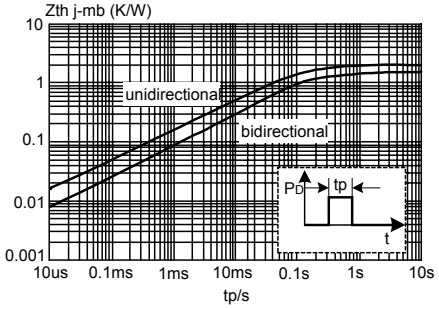


Figure 12.Typical,critical rate of rise of off-state voltage,
dV_D/dt versus junction temperature Tj.