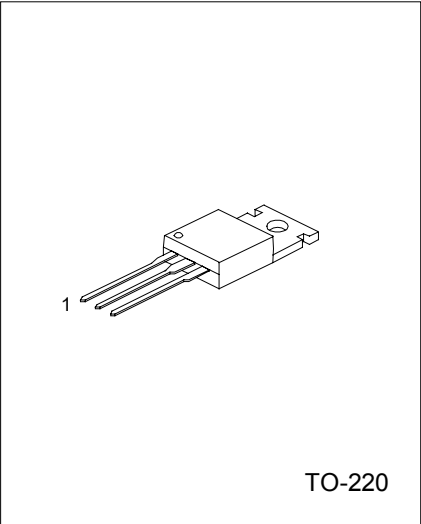
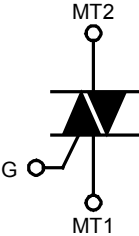


TRIACS

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.

SYMBOL



1:MT1 2:MT2 3:GATE

ABSOLUTE MAXIMUM RATINGS (T_j=25°C)

PARAMETER	SYMBOL	RATING	UNIT
Repetitive Peak Off State Voltage UT138F/G-4 UT138F/G-6 UT138F/G-8	V _{DRM}	400* 600* 800	V
RMS On-state Current (Full sine wave; T _{mb} ≤99°C)	I _{T(RMS)}	12	A
Non-repetitive Peak. On-State Current (Full sine wave; T _j =25°C prior to surge) t=20ms t=16.7ms	I _{TSM}	95 105	A
I ² t For Fusing (t=10ms)	I ² t	45	A ² s
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	P _{G(AV)}	0.5	W
Operating Junction Temperature	T _j	125	°C
Storage Temperature	T _{stg}	-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/ μ s.

THERMAL RESISTANCES

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

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

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX		UNIT
					UT138F	UT138G	
Gate trigger current	IGT	V _D =12V, I _T =0.1A T2+ G+ T2+ G- T2- G- T2- G+		5 8 10 22	25 25 25 70	50 50 50 100	mA
Latching current	IL	V _D =12V, I _{GT} =0.1A T2+ G+ T2+ G- T2- G- T2- G+		7 20 8 10	40 60 40 60	60 90 60 90	
Holding current	I _H	V _D = 12 V; I _{GT} = 0.1 A		6	30	60	
On-state voltage	V _T	I _T =15A		1.4	1.65		
Gate trigger voltage	V _{GT}	V _D =12V, I _T =0.1A		0.7	1.5		V
		V _D =400V, I _T =0.1A, T _J =125°C	0.25	0.4			V
Off-state leakage current	I _D	V _D =V _{DRM(max)} , T _J =125°C		0.1	0.5		mA

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

PARAMETER	SYMBOL	CONDITIONS	MIN		TYP	MAX	UNIT
			UT138F	UT138G			
Critical rate of rise of Off-state voltage	dV _D /dt	V _{DM} = 67% V _{DRM(max)} ; T _J =125°C; exponential waveform; gate open circuit	50	200	250		V/ μ s
Critical rate of change of Commutating voltage	dV _{com} /dt	V _{DM} =400V; T _J =95°C; I _{T(RMS)} =12A; dI _{com} /dt =5.4A/ms; gate open circuit		10	20		V/ μ s
Gate controlled turn-on time	t _{gt}	I _{TM} = 16 A; V _D = V _{DRM(max)} ; I _G =0.1A; dI _G /dt=5A/ μ s			2		μ s

TYPICAL CHARACTERISTICS

Figure 1. Maximum on-state Dissipation, P_{tot} vs RMS On-state Current, $I_T(RMS)$, Where α = conduction Angle.

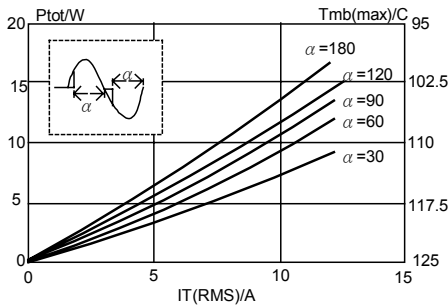


Figure 4. Maximum Permissible RMS Current $I_T(RMS)$ vs mounting base Temperature T_{mb}

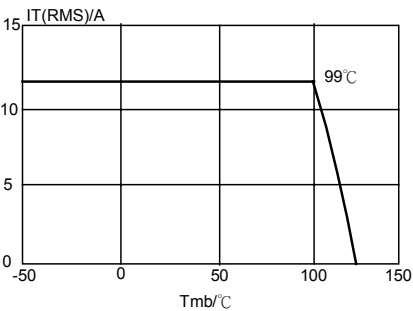


Figure 2. Maximum Permissible Non-repetitive Peak On-state Current I_{TSM} , vs Pulse Width t_p , for Sinusoidal Currents, $t_p \approx 20ms$

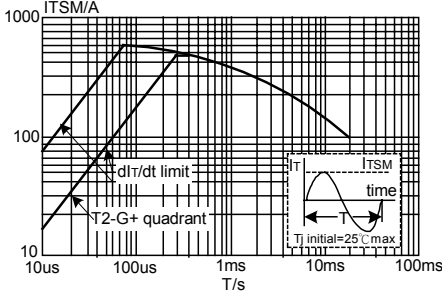


Figure 5. Maximum Permissible Repetitive RMS on-state Current $I_T(RMS)$, vs Surge Duration, for Sinusoidal Currents, $f=50Hz$; $T_{mb} \approx 99^\circ C$

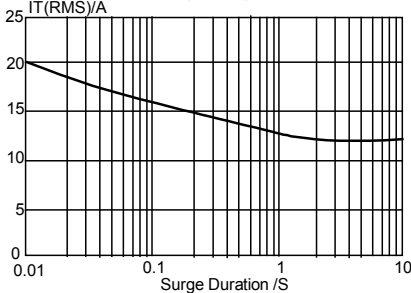


Figure 3. Maximum Permissible Non-Repetitive peak on-state Current I_{TSM} , vs Number of Cycles, for Sinusoidal Currents, $f=50Hz$

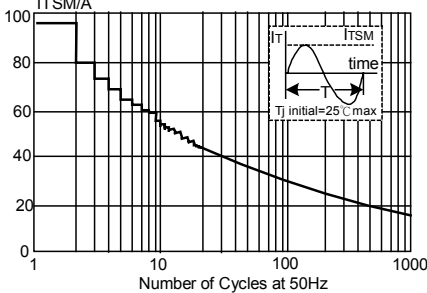


Figure 6. Normalised Gate Trigger Voltage $V_{GT}(T_j)/V_{GT}(25^\circ C)$, vs Junction Temperature T_j

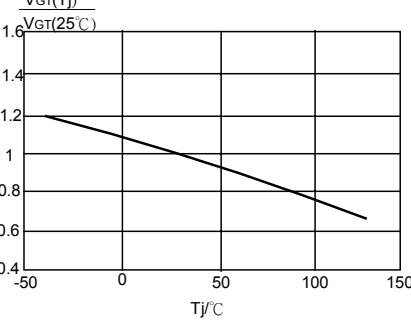


Figure 7. Normalised Gate Trigger Current
 $I_{GT}(T_j)/I_{GT}(25^\circ\text{C})$, vs Junction Temperature T_j

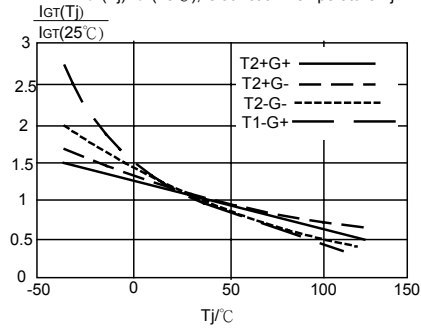


Figure 8. Normalised Latching Current
 $I_L(T_j)/I_L(25^\circ\text{C})$, vs Junction Temperature T_j

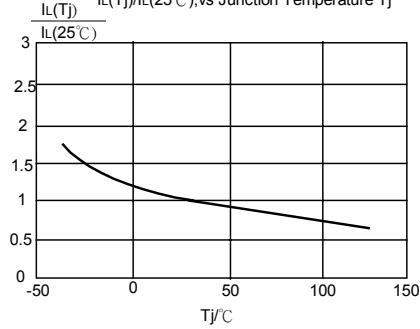


Figure 9. Normalised Holding Current
 $I_H(T_j)/I_H(25^\circ\text{C})$, vs Junction Temperature T_j

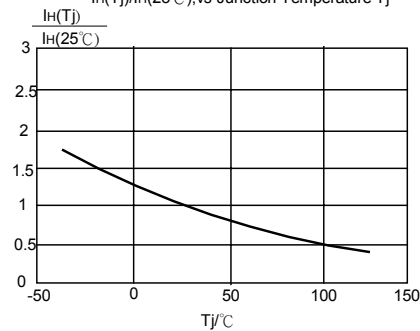


Figure 10. Typical and Maximum
 On-state Characteristic

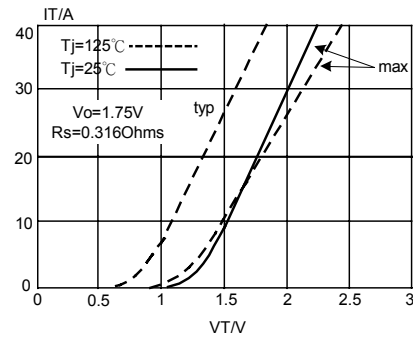


Figure 11. Transient Thermal Impedance
 $Z_{th j-mb}$, vs Pulse Width t_p

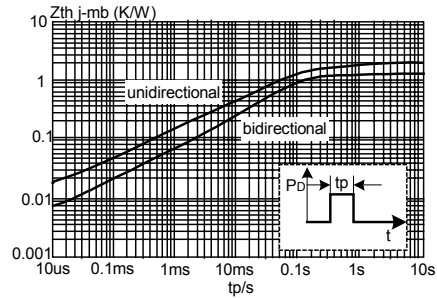


Figure 12. Typical commutation dV/dt vs junction temperature, parameter commutation dI/dt . The triac should commute when the dV/dt is below the value on the appropriate curve for pre-commutation dI/dt

