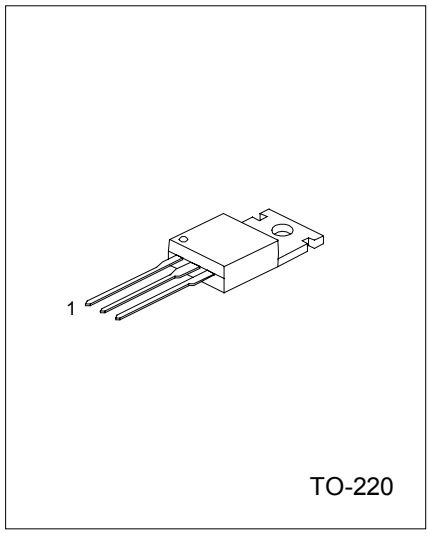
TRIACS

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 and static switching.



1:MT1 2:MT2 3:GATE

SYMBOL

ABSOLUTE MAXIMUM RATINGS (Tj=25°C)

PARAMETER	SYMBOL	RATING	UNIT
Repetitive Peak Off State Voltage UT138F/G-5 UT138F/G-6 UT138F/G-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	CONDITIONS	MIN	TYP	MAX		UNIT
					UT138F	UT138G	
Gate trigger current	I_{GT}	V_D=12V, I_T=0.1A					
		T2+ G+		5	25	50	mA
		T2+ G-		8	25	50	
		T2- G-		10	25	50	
		T2- G+		22	70	100	
Latching current	I_L	V_D=12V, I_{GT}=0.1A					
		T2+ G+		7	40	60	mA
		T2+ G-		20	60	90	
		T2- G-		8	40	60	
		T2- G+		10	60	90	
Holding current	I_H	V_D = 12 V,I_{GT} = 0.1 A		6	30	60	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	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/μs
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/μs
Gate controlled turn-on time	t_{gt}	I_{TM} = 16 A, 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.

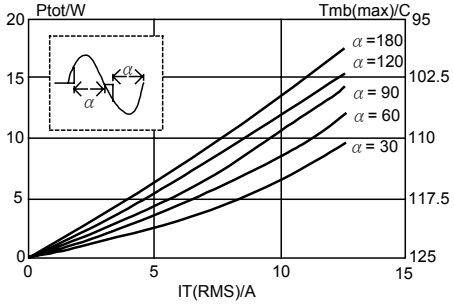


Figure 4. Maximum Permissible RMS Current $I_{T(RMS)}$ vs mounting base Temperature Tmb.

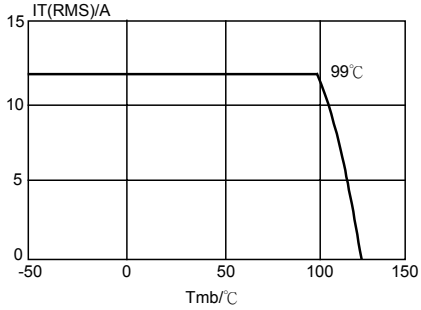


Figure 2. Maximum Permissible Non-repetitive Peak On-state Current I_{TSM},vs Pulse Width t_p,for Sinusoidal Currents ,$t_p \leqq 20$ms.

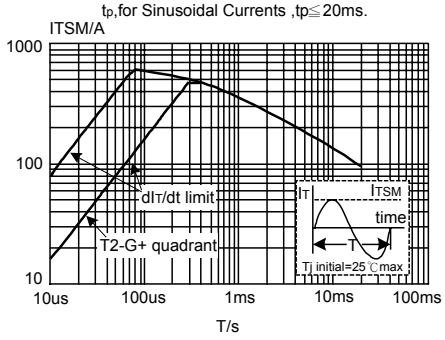


Figure 5.Maximum Permissible Repetitive RMS on-state Current $I_{T(RMS)}$,vs Surge Duration,for Sinusoidal Currents,f=50Hz;Tmb$\leqq$99℃.

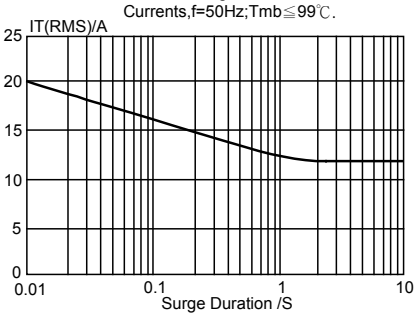


Figure 3 .Maximum Permissible Non-Repetitive peak on-state Current I_{TSM},vs Number of Cycles, for Sinusoidal Currents,f=50Hz.

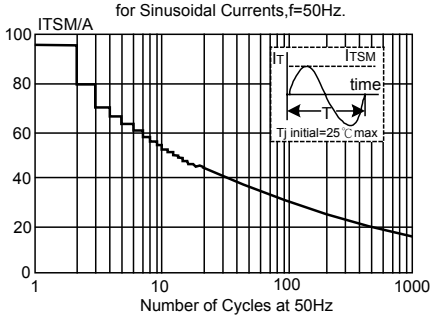


Figure 6.Normalised Gate Trigger Voltage $V_{GT(Tj)}/V_{GT(25℃)}$, $\frac{V_{GT(Tj)}}{V_{GT(25℃)}}$ vs Junction Temperature Tj.

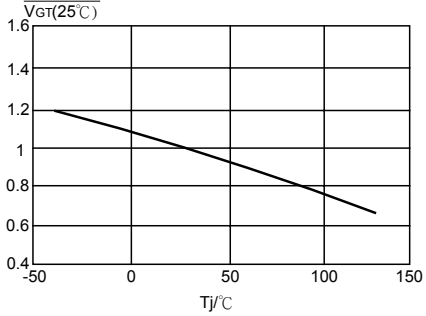


Figure 7.Normalised Gate Trigger Current
IGT(Tj)/IGT(25℃),vs Junction Temperature Tj.

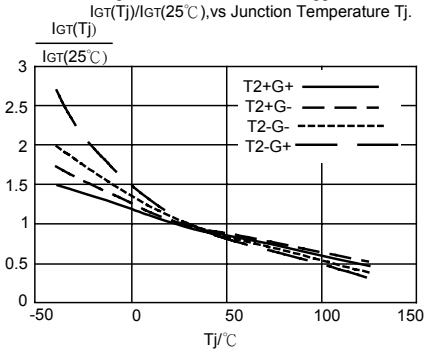


Figure 8.Normalised Latching Current
IL(Tj)/IL(25℃),vs Junction Temperature Tj.

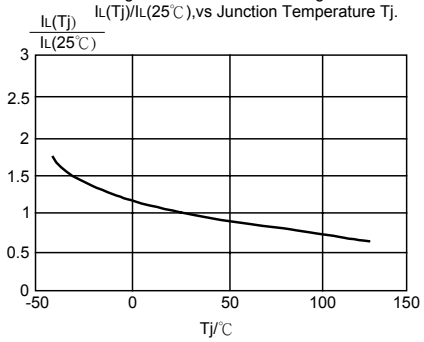


Figure 9.Normalised Holding Current
IH(Tj)/IH(25℃),vs Junction Temperature Tj.

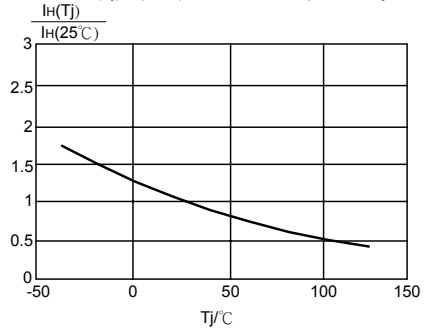


Figure 10.Typical and Maximum
On-state Characteristic.

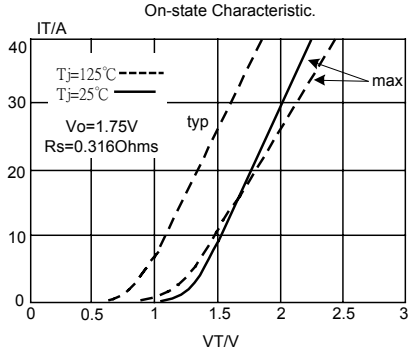


Figure 11.Transient Thermal Impedance
Zth j-mb,vs Pulse Width tp.

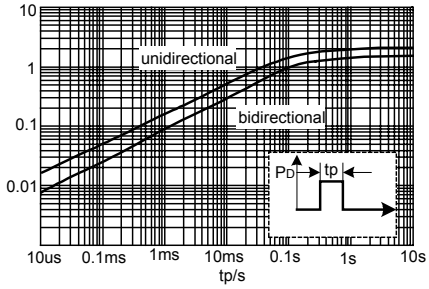


Figure 12. Typical commutation dV/dt vs junction temperature , parameter commutation dIT/dt . The triac should commutate when the dV/dt is below the value on the appropriate curve for pre-commutation dIV/dt.