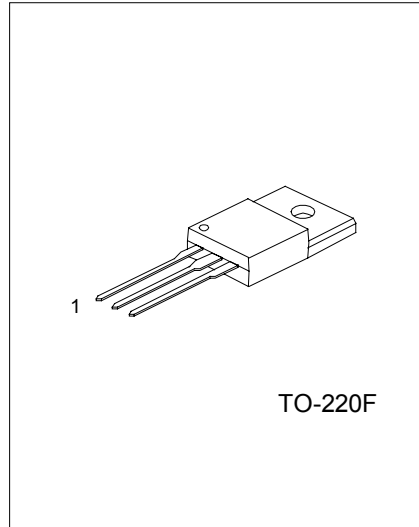
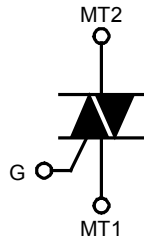


TRIACS

DESCRIPTION

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

SYMBOL



1:MT1 2:MT2 3:GATE

ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	RATINGS	UNIT
Repetitive Peak Off-State Voltage UT137FE-5 UT137FE-6 UT137FE-8	$V_{DRM}$	500* 600* 800	V
RMS On-state Current Full sine wave; $T_{hs} \leq 73^{\circ}C$	$I_T(RMS)$	8	A
Non-Repetitive Peak. On-State Current Full sine wave, $T_J = 125^{\circ}C$ prior to surge, with reapplied, $V_{DRM(max)}$ $t = 20ms$ $t = 16.7ms$	$I_{TSM}$	55 60	A
$I^2t$ For Fusing ( $t = 10ms$ )	$I^2t$	15	$A^2s$
Repetitive Rate of Rise of On-state Current after Triggering $I_{TM} = 12A; I_G = 0.2A; dI_G/dt = 0.2A/\mu s$ T2+ G+ T2+ G- T2- G- T2- G+	$dI_T/dt$	50 50 50 10	$A/\mu s$
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	$T_J$	125	$^{\circ}C$
Storage Temperature	$T_{stg}$	-40~150	$^{\circ}C$

\*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  $6A/\mu s$ .

ISOLATION LIMITING VALUE & CHARACTERISTIC ( $T_{HS}=25^{\circ}\text{C}$ , unless otherwise specified)

PARAMETER	SYMBOL	MIN	TYP	MAX	UNIT
Repetitive peak voltage from all three terminals to external heatsink (R.H. $\leq 65\%$ , clean and dustfree)	Visol			1500	V
Capacitance from MT2 to external heatsink (f=1MHz)	Cisol		12		pF

## THERMAL RESISTANCES

PARAMETER	SYMBOL	MIN	TYP	MAX	UNIT
Thermal Resistance Junction to heatsink (full or half cycle) with heatsink compound without heatsink compound	Rth j-hs			4.5 6.5	K/W
Thermal Resistance Junction to Ambient (In free air)	Rth j-a		55		K/W

STATIC CHARACTERISTICS ( $T_J=25^{\circ}\text{C}$ , unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Gate Trigger Current	IGT	$V_D=12\text{V}$ , $I_T=0.1\text{A}$ T2+ G+ T2+ G- T2- G- T2- G+		2.5 4.0 5.0 11	10 10 10 25	mA
Latching Current	IL	$V_D=12\text{V}$ , $I_{GT}=0.1\text{A}$ T2+ G+ T2+ G- T2- G- T2- G+		3.0 14 3.0 4.0	25 35 25 35	mA
Holding Current	IH	$V_D=12\text{V}$ , $I_{GT}=0.1\text{A}$		2.5	20	mA
On-State Voltage	V <sub>T</sub>	$I_T=10\text{A}$		1.3	1.65	V
Gate Trigger Voltage	V <sub>GT</sub>	$V_D=12\text{V}$ , $I_T=0.1\text{A}$ $V_D=400\text{V}$ , $I_T=0.1\text{A}$ , $T_J=125^{\circ}\text{C}$		0.7 0.25	1.5	V
Off-state Leakage Current	I <sub>D</sub>	$V_D=V_{DRM(max)}$ , $T_J=125^{\circ}\text{C}$		0.1	0.5	mA

DYNAMIC CHARACTERISTICS ( $T_J=25^{\circ}\text{C}$ , unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Critical Rate of Rise of off-state Voltage	dV <sub>D</sub> /dt	$V_{DM}=67\% V_{DRM(max)}$ , $T_J=125^{\circ}\text{C}$ Exponential waveform, Gate open circuit		50		V/ $\mu\text{s}$
Gate Controlled Turn-on Time	t <sub>gt</sub>	$I_{TM}=12\text{A}$ , $V_D=V_{DRM(max)}$ , $I_G=0.1\text{A}$ , $dI_G/dt=5\text{A}/\mu\text{s}$		2		$\mu\text{s}$

TYPICAL CHARACTERISTICS

Figure 1. Maximum on-state Dissipation. Plot vs RMS On-state Current,  $I_T(RMS)$ , Where  $\alpha$  = Conduction Angle.

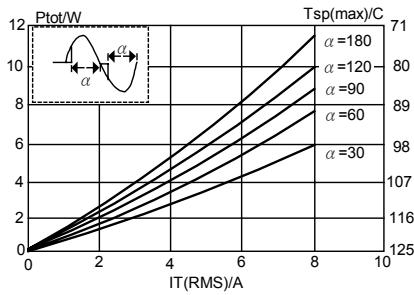


Figure 4. Maximum Permissible RMS Current  $I_T(RMS)$  vs Heatsink Temperature  $T_{hs}$

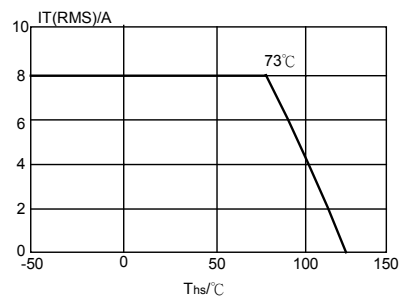


Figure 2. Maximum Permissible Non-repetitive Peak On-state Current  $I_{TSM}$ , vs Pulse Width  $t_p$ , for Sinusoidal Currents,  $t_p \leq 20ms$

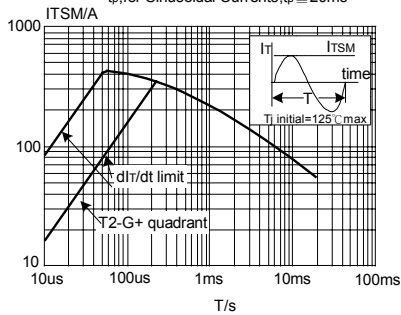


Figure 5. Maximum Permissible Repetitive RMS on-state Current  $I_T(RMS)$ , vs Surge Duration, for Sinusoidal Currents,  $f=50Hz, T_{hs} \leq 73^\circ C$

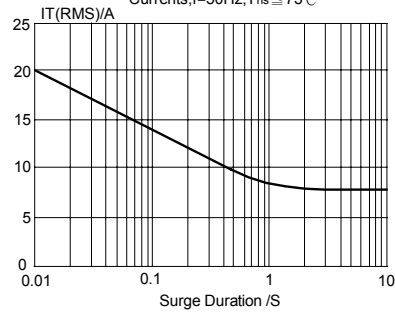


Figure 3. Maximum Permissible Non-Repetitive peak on-state Current  $I_{TSM}$ , vs Number of Cycles, for Sinusoidal Currents,  $f=50Hz$

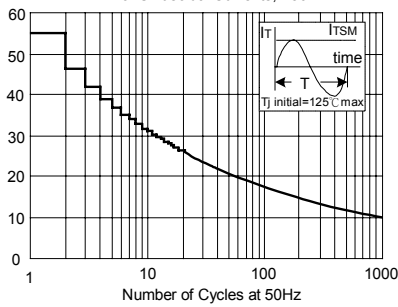


Figure 6. Normalised Gate Trigger Voltage  $V_{GT}(T_j) / V_{GT}(25^\circ C)$ , vs Junction Temperature  $T_j$

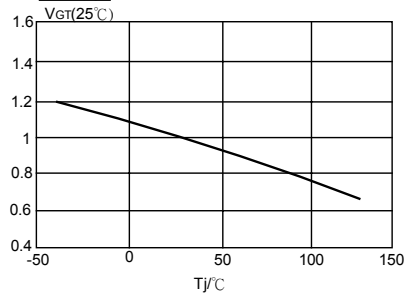


Figure 7. Normalised Gate Trigger Current  $I_{GT}(T_j)/I_{GT}(25^\circ\text{C})$ , vs Junction Temperature  $T_j$

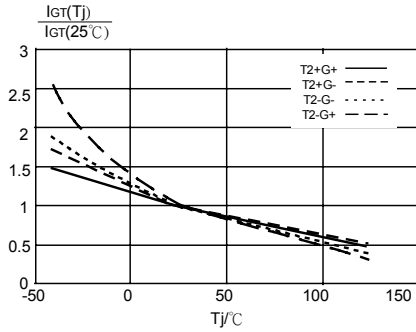


Figure 8. Normalised Latching Current  $I_L(T_j)/I_L(25^\circ\text{C})$ , vs Junction Temperature  $T_j$

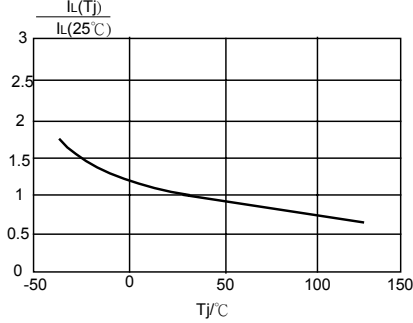


Figure 9. Normalised Holding Current  $I_H(T_j)/I_H(25^\circ\text{C})$ , vs Junction Temperature  $T_j$

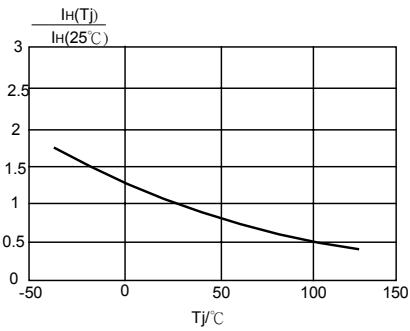


Figure 10. Typical and Maximum On-state Characteristic

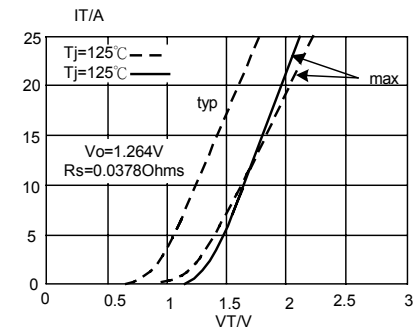


Figure 11. Transient Thermal Impedance  $Z_{th\ j-hs}$ , vs Pulse Width  $t_p$

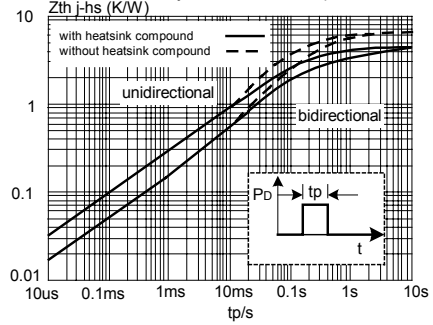
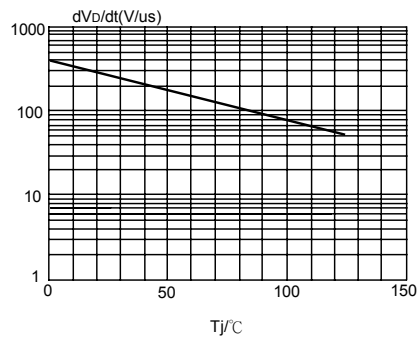


Figure 12. Typical, critical rate of rise of off-state voltage,  $dV_D/dt$  versus junction temperature  $T_j$



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