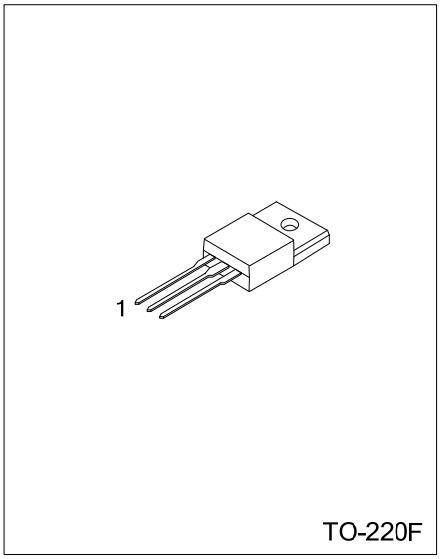
UT136FF/FG

TRIAC

TRIACS

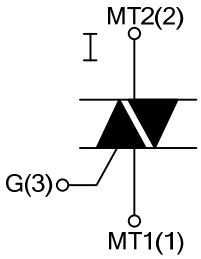


Lead-free: UTC136FFL/UTC136FGL
Halogen-free: UTC136FFP/UTC136FGP

■ DESCRIPTION

Glass passivated triacs in a full pack 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.

■ SYMBOL



■ ORDERING INFORMATION

Ordering Number			Package	Pin Description			Packing
Normal	Lead Free Plating	Halogen Free		1	2	3	
UT136FF-5-TF3-R	UT136FFL-5-TF3-R	UT136FFP-5-TF3-R	TO-220F	MT1	MT2	G	Tube
UT136FF-6-TF3-R	UT136FFL-6-TF3-R	UT136FFP-6-TF3-R	TO-220F	MT1	MT2	G	Tube
UT136FF-8-TF3-R	UT136FFL-8-TF3-R	UT136FFP-8-TF3-R	TO-220F	MT1	MT2	G	Tube
UT136FG-5-TF3-R	UT136FGL-5-TF3-R	UT136FGP-5-TF3-R	TO-220F	MT1	MT2	G	Tube
UT136FG-6-TF3-R	UT136FGL-6-TF3-R	UT136FGP-6-TF3-R	TO-220F	MT1	MT2	G	Tube
UT136FG-8-TF3-R	UT136FGL-8-TF3-R	UT136FGP-8-TF3-R	TO-220F	MT1	MT2	G	Tube

UT136FFL-5-TF3-T (1)Packing Type (2)Package Type (3)Lead Plating	(1) T: Tube (2) TF3: TO-220F (3) P: Halogen Free, L: Lead Free, Blank: Pb/Sn

■ ABSOLUTE MAXIMUM RATING

PARAMETER		SYMBOL	RATINGS	UNIT
Repetitive Peak Off-State Voltages	UT136FF/FG-5	V_{DRM}	500(Note2)	V
	UT136FF/FG-6		600(Note2)	
	UT136FF/FG-8		800	
RMS On-state Current Full sine wave, T_{HS} ≤92°C		$I_{T(RMS)}$	4	A
Non-Repetitive Peak. On-State Current Full sine wave, T_J =125°C prior to surge, with reapplied $V_{DRM(MAX)}$ t =20 ms t =16.7 ms		I_{TSM}	 25 27	A
I^2t For Fusing (t =10 ms)		I^2t	3.1	A^2s
Repetitive Rate of Rise of On-state Current after Triggering I_{TM}=6 A, I_G=0.2 A, 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		T_J	125	°C
Storage Temperature		T_{STG}	-40 ~ +150	°C

Note 1. Absolute maximum ratings are those values beyond which the device could be permanently damaged. Absolute maximum ratings are stress ratings only and functional device operation is not implied.

2. 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 3A/μs.

■ THERMAL DATA

PARAMETER	SYMBOL	MIN	TYP	MAX	UNIT
Thermal Resistance, Junction to Ambient (In free air)	θ_{JA}		55		K/W

■ ISOLATION LIMITING VALUE & CHARACTERISTIC (T_{HS} =25°C, unless otherwise specified)

PARAMETER	SYMBOL	MIN	TYP	MAX	UNIT
Repetitive peak voltage form all three terminals to external heatsink (R.H.≤ 65%,clean and dustfree)	V_{ISOL}			1500	V
Capacitance from MT2 to external heatsink (f =1MHz)	C_{ISOL}		12		pF

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

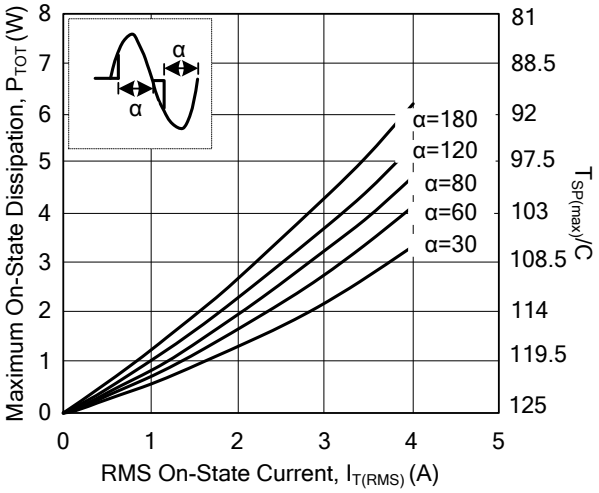
PARAMETER	SYMBOL	TEST CONDITIONS		MIN	TYP	MAX		UNIT
						UT136FF	UT136FG	
Gate Trigger Current	I_{GT}	V_D =12 V,I_T =0.1A	T2 + G+		5	25	50	mA
			T2 + G-		8	25	50	mA
			T2 - G-		11	25	50	mA
			T2 - G+		30	70	100	mA
Latching Current	I_L	V_D =12 V,I_{GT} =0.1A	T2 + G+		7	20	30	mA
			T2 + G-		16	30	45	mA
			T2 - G-		5	20	30	mA
			T2 - G+		7	30	45	mA
Holding Current	I_H	V_D =12 V,I_{GT} =0.1A			5	15	30	mA
On-State Voltage	V_T	I_T =5 A			1.4	1.70		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, 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℃, unless otherwise specified)

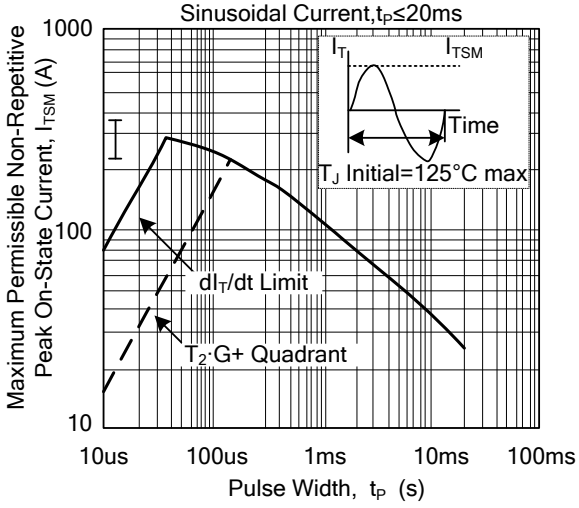
PARAMETER	SYMBOL	TEST CONDITIONS	MIN		TYP	MAX	UNIT
			UT136FF	UT136FG			
Critical Rate of Rise of Off-State Voltage	dV_D/dt	V_{DM} = 67% $V_{DRM(MAX)}$,T_J=125°C, exponential waveform, gate open circuit	50	200	250		V/μs
Critical Rate of Change of Commutating Voltage	dV_{COM}/dt	V_{DM}=400V, T_J=95°C,$I_{T(RMS)}$=4A, dI_{COM} /dt=1.8A/ms ,gate open circuit		10	50		V/μs
Gate Controlled Turn-On Time	t_{GT}	I_{TM} =6A,V_D= $V_{DRM(MAX)}$, I_G=0.1A,dI_G/dt=5A/μs			2		μs

■ TYPICAL CHARACTERISTICS

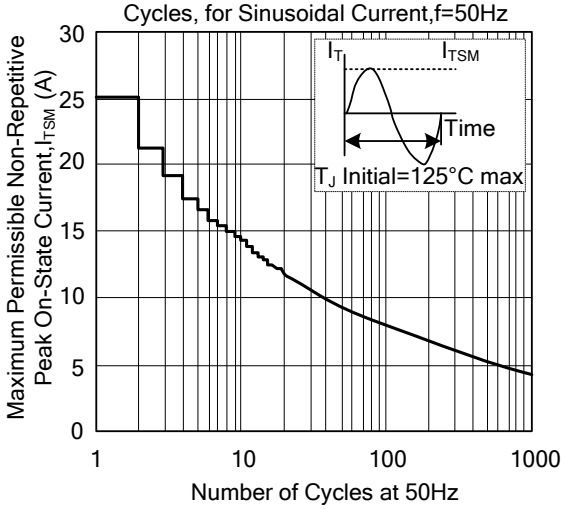
Maximum On-State Dissipation, P_{TOT} vs RMS On-State Current, $I_{T(RMS)}$, Where α=Conduction Angle



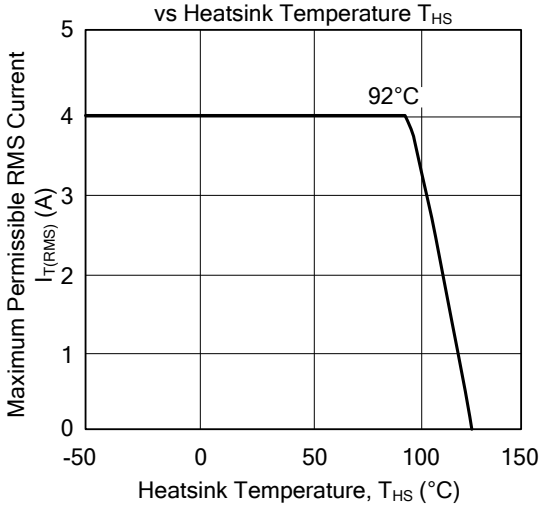
Maximum Permissible Non-Repetitive Peak On-State Current, I_{TSM}, vs Pulse Width t_P, for Sinusoidal Current, $t_P \le 20ms$



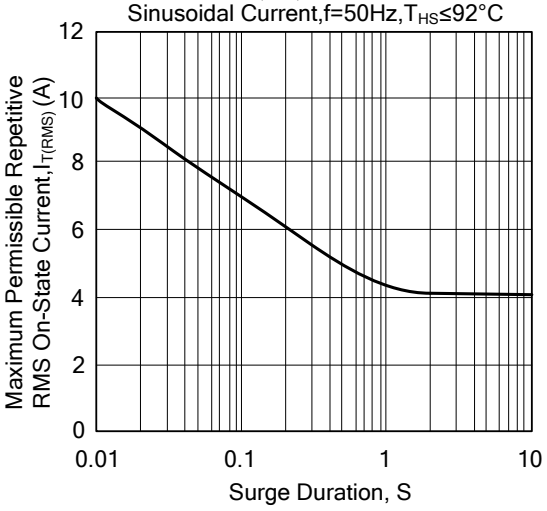
Maximum Permissible Non-Repetitive Peak On-State Current, I_{TSM}, vs Number of Cycles, for Sinusoidal Current, f=50Hz



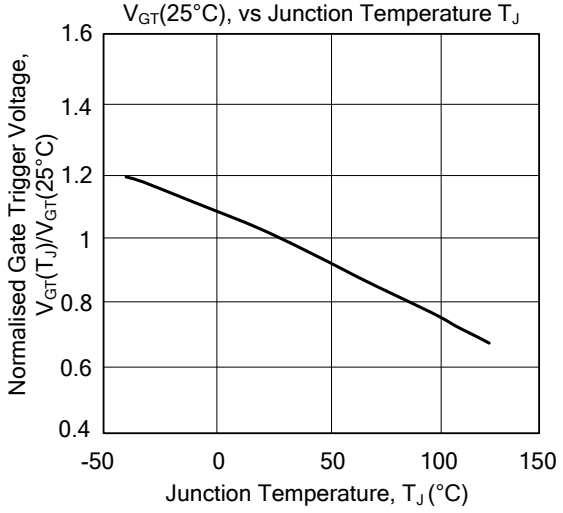
Maximum Permissible RMS Current $I_{T(RMS)}$ vs Heatsink Temperature T_{HS}



Maximum Permissible Repetitive RMS On-State Current, $I_{T(RMS)}$, vs Surge Duration, for Sinusoidal Current, f=50Hz, $T_{HS} \le 92°C$

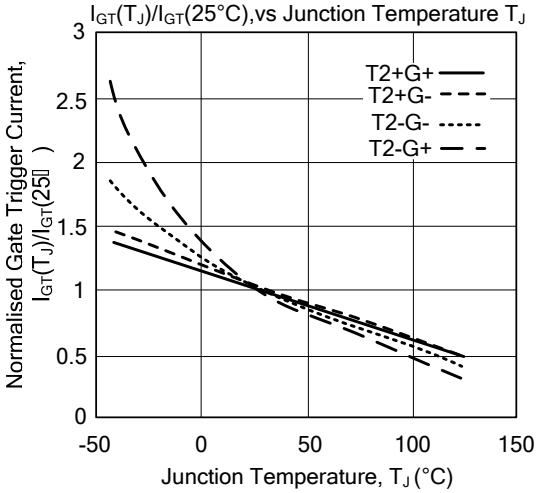


Normalised Gate Trigger Voltage $V_{GT}(T_J)/V_{GT}(25°C)$, vs Junction Temperature T_J

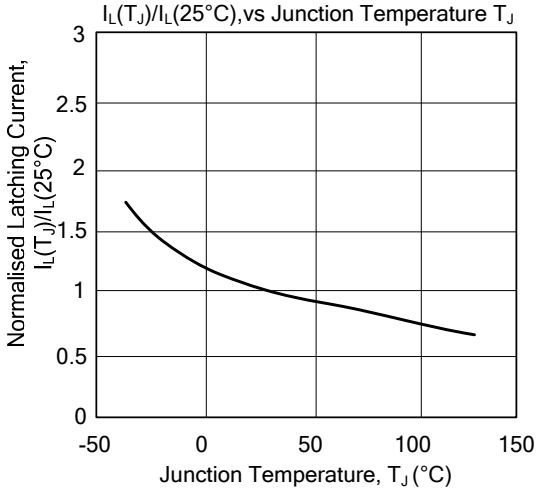


■ TYPICAL CHARACTERISTICS(Cont.)

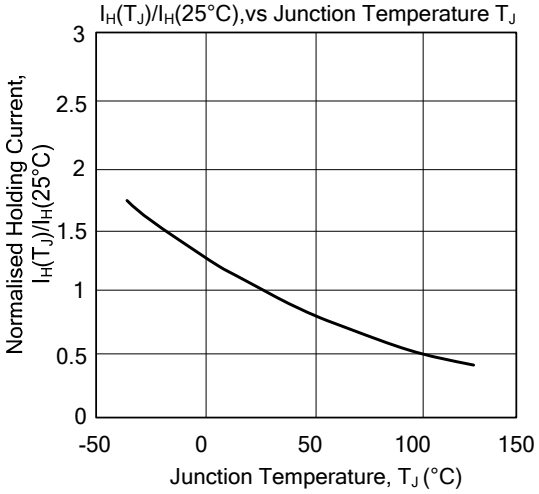
Normalised Gate Trigger Current
$I_{GT}(T_J)/I_{GT}(25°C)$,vs Junction Temperature T_J



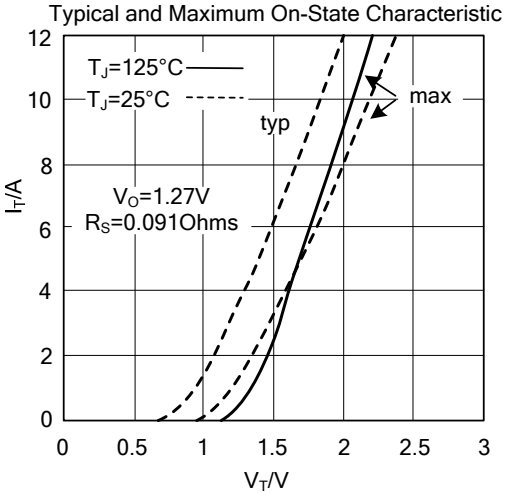
Normalised Latching Current
$I_L(T_J)/I_L(25°C)$,vs Junction Temperature T_J



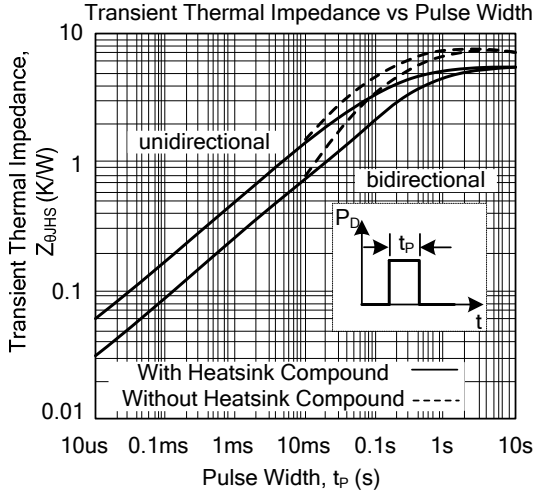
Normalised Holding Current
$I_H(T_J)/I_H(25°C)$,vs Junction Temperature T_J



Typical and Maximum On-State Characteristic



Transient Thermal Impedance vs Pulse Width



Typical Commutation d_V/dt vs Junction Temperature,parameter Commutation dI_T/dt. The Triac Should Commutate When the d_V/dt is belowthe value on the appropriate curve for pre-commutation dI_T/dt