



UT131

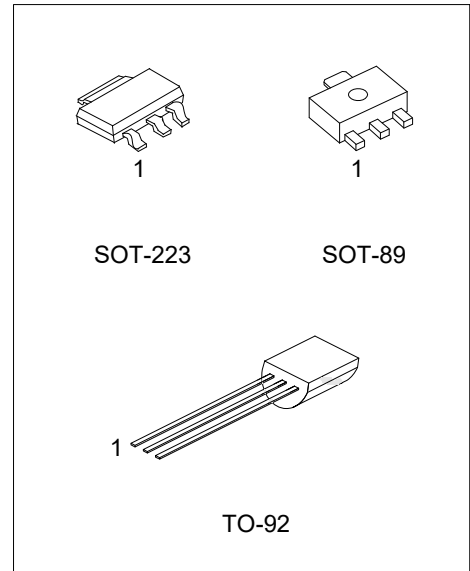
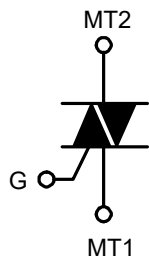
TRIAC

TRIAC LOGIC LEVEL

DESCRIPTION

Passivated, sensitive gate triac in a plastic envelope, intended for use in general purpose bidirectional switching and phase control applications. These devices are intended to be interfaced directly to microcontrollers. Logic integrated circuits and other low power gate trigger circuits.

SYMBOL



ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
UT131L-x-AA3-R	UT131G-x-AA3-R	SOT-223	MT1	MT2	GATE	Tape Reel
UT131L-x-AB3-R	UT131G-x-AB3-R	SOT-89	MT1	MT2	GATE	Tape Reel
UT131L-x-T92-B	UT131G -x-T92-B	TO-92	MT1	GATE	MT2	Tape Box
UT131L-x-T92-K	UT131G -x-T92-K	TO-92	MT1	GATE	MT2	Bulk

UT131G-x-AA3-R	(1)Packing Type (2)Package Type (3)Peak Voltage (4)Green Package	(1) R: Tape Reel, B: Tape Reel, K: Bulk (2) AA3: SOT-223, AB3: SOT-89, T92: TO-92 (3) 5: 500V, 6: 600V, 8: 800V (4) G: Halogen Free and Lead Free, L: Lead Free
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MARKING

PACKAGE	MARKING
SOT-223	UT131 1 L: Lead Free G: Halogen Free Date Code
SOT-89	UT131 1 Date Code L: Lead Free G: Halogen Free
TO-92	UTC UT131 1 Repetitive Peak Off-State Voltage L: Lead Free G: Halogen Free Date Code

■ ABSOLUTE MAXIMUM RATINGS

PARAMETER		SYMBOL	RATINGS	UNIT
Repetitive Peak Off-State Voltage (Note 2)	UT131-5	V_{DRM}	500	V
	UT131-6		600	V
	UT131-8		800	V
RMS On-State Current, Full Sine Wave; $T_{lead} \leq 51^{\circ}C$		$I_{T(RMS)}$	1	A
Non-Repetitive Peak On-State Current (Full Sine Wave; $T_J = 25^{\circ}C$ Prior to Surge)	$t = 20ms$	I_{TSM}	16	A
	$t = 16.7ms$		17.6	A
Circuit Fusing	$t = 10ms$	I_t^2	1.28	A^2s
Repetitive Rate of Rise of On-State Current after Triggering $I_{TM} = 1.5A$, $I_G = 0.2A$, $dI_G/dt = 0.2A/\mu s$	T2 + G +	dI_T/dt	50	$A/\mu s$
	T2 + G -		50	$A/\mu s$
	T2 - G -		50	$A/\mu s$
	T2 - G +		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
Junction Temperature		T_J	+125	$^{\circ}C$
Storage Temperature		T_{STG}	-40 ~ +150	$^{\circ}C$

Notes: 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 3 A/ μs .

■ THERMAL DATA

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Lead	Full Cycle	θ_{JLEAD}	60	K/W
	Half Cycle		80	K/W
Junction to Ambient (Note)	SOT-223	θ_{JA}	150	K/W
	SOT-89		200	K/W
	TO-92		140	K/W

Note: PCB mounted; lead length=4mm

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

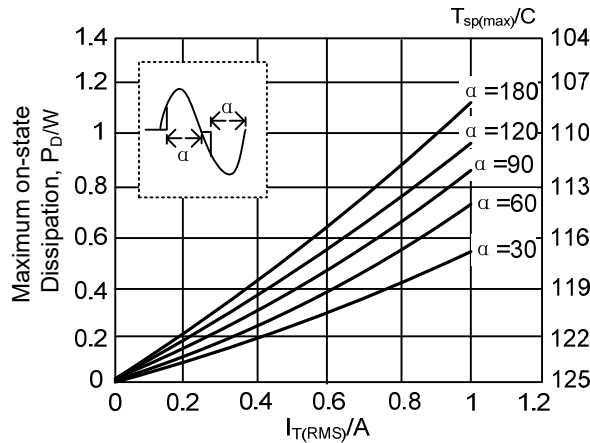
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Gate Trigger Current	I_{GT}	$V_D = 12V$, $I_T = 0.1A$		0.4	3	mA
				1.3	3	mA
				1.4	5	mA
				3.8	7	mA
Latching Current	I_L	$V_D = 12V$, $I_{GT} = 0.1A$		1.2	5	mA
				4.0	8	mA
				1.0	5	mA
				2.5	8	mA
Holding Current	I_H	$V_D = 12V$, $I_{GT} = 0.1A$		1.3	5	mA
On -State Voltage	V_T	$I_T = 2.0A$		1.2	1.5	V
Gate Trigger Voltage	V_{GT}	$V_D = 12V$, $I_T = 0.1A$		0.7	1.5	V
		$V_D = 400V$, $I_T = 0.1A$, $T_J = 125^{\circ}C$	0.2	0.3		V
Off-State Leakage Current	I_D	$V_D = V_{DRM(MAX)}$, $T_J = 125^{\circ}C$		0.1	0.5	mA

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

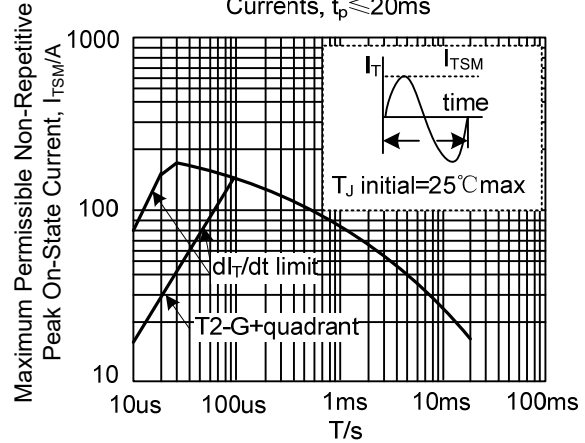
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Critical Rate of Rise of off-state Voltage	dV_D/dt	$V_{DM}=67\% V_{DRM(MAX)}$, $T_J=125^{\circ}\text{C}$ Exponential waveform, $R_{GK}=1\text{k}\Omega$	5	15		$\text{V}/\mu\text{s}$
Gate Controlled Turn-on Time	t_{GT}	$I_{TM}=1.5\text{A}$, $V_D=V_{DRM(MAX)}$, $I_G=0.1\text{A}$ $dI_G/dt=5\text{A}/\mu\text{s}$		2		μs

TYPICAL CHARACTERISTICS

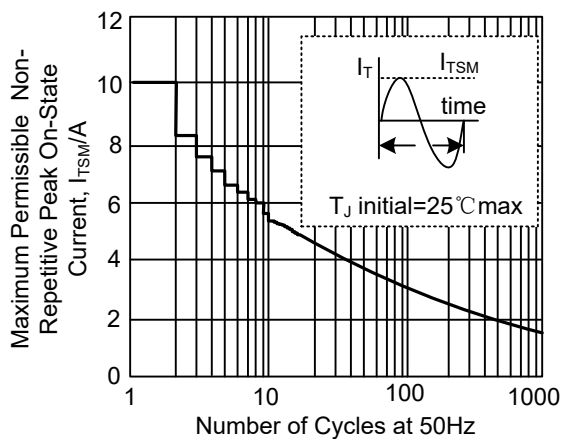
Maximum on-state Dissipation vs. RMS On-state Current, $I_{T(RMS)}$, Where α = conduction Angle



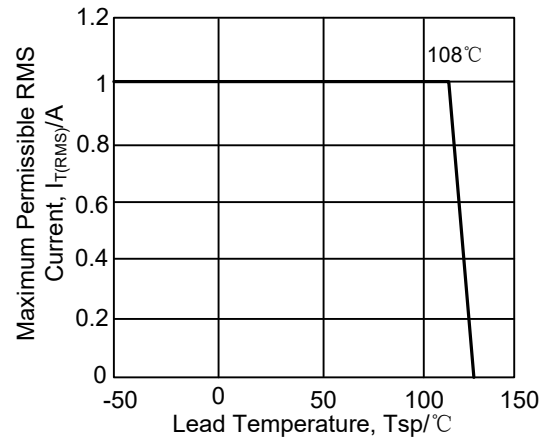
Maximum Permissible Non-repetitive Peak On-state Current vs. Pulse Width t_p , for Sinusoidal Currents, $t_p \leq 20ms$



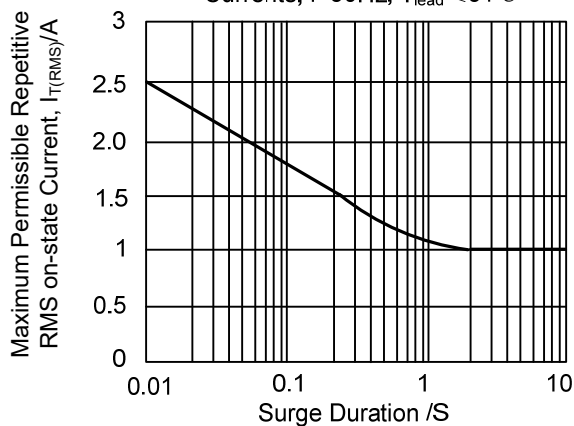
Maximum Permissible Non-Repetitive Peak On-state Current vs. Number of Cycles, for Sinusoidal Currents



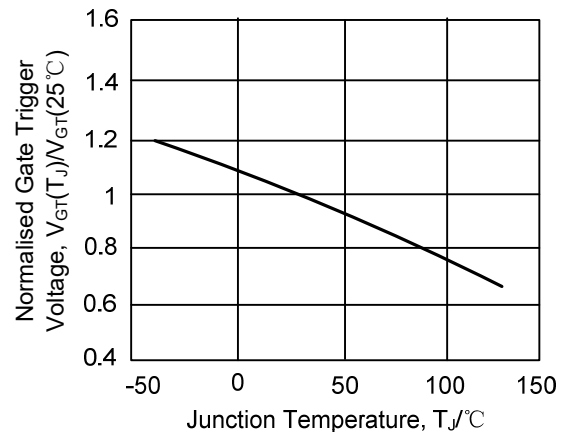
Maximum Permissible RMS Current $I_{T(RMS)}$ vs. Lead Temperature



Maximum Permissible Repetitive RMS on-state Current vs. Surge Duration, for Sinusoidal Currents, $f=50Hz$; $T_{lead} \leq 51^\circ C$

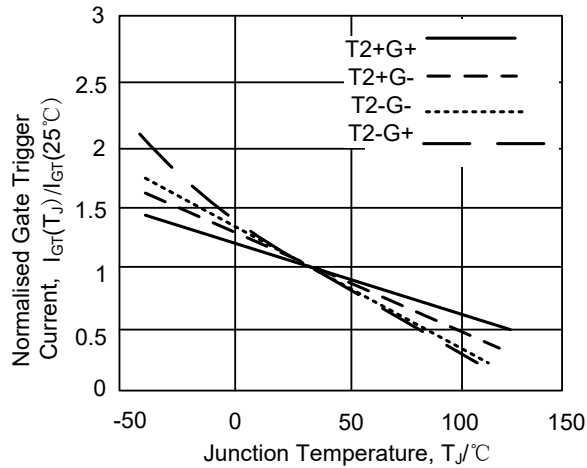


Normalised Gate Trigger Voltage vs. Junction Temperature

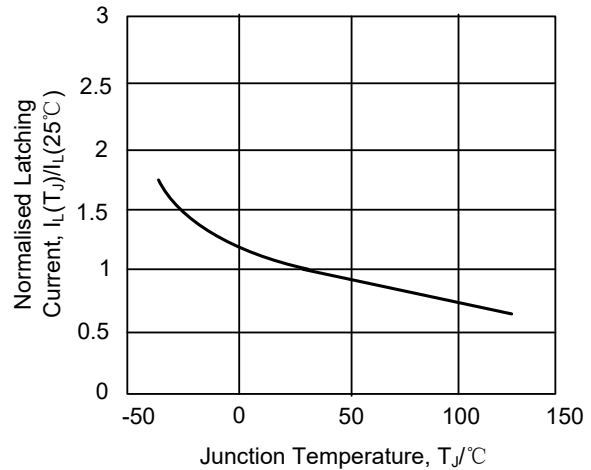


TYPICAL CHARACTERISTICS(Cont.)

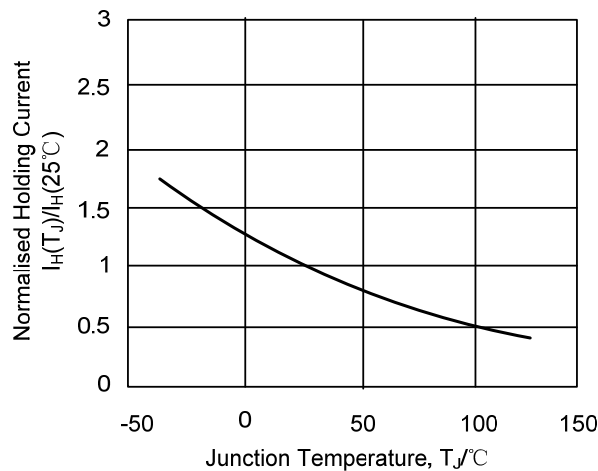
Normalised Gate Trigger Current
vs. Junction Temperature



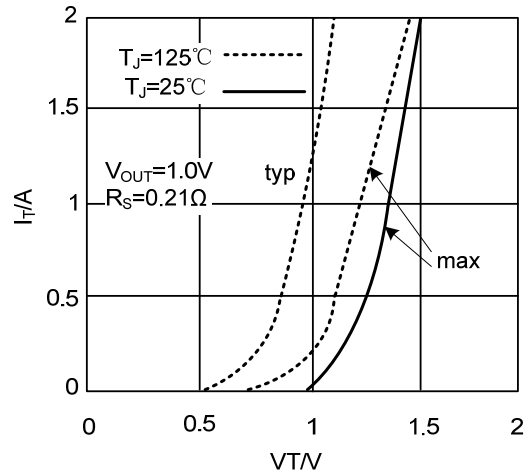
Normalised Latching Current
vs. Junction Temperature



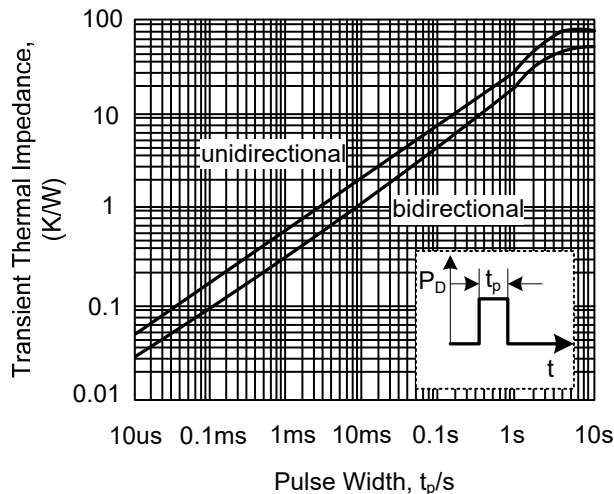
Normalised Holding Current
vs. Junction Temperature



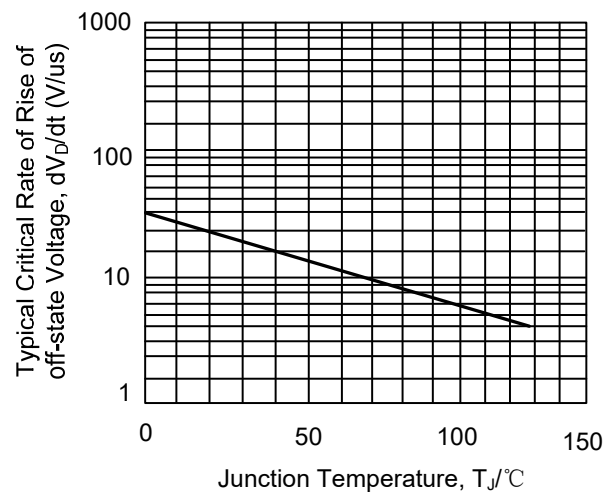
Typical and Maximum
On-State Characteristic



Transient Thermal Impedance
vs. Pulse Width



Typical Critical Rate of Rise of off-state
Voltage vs. Junction Temperature



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