



UNISONIC TECHNOLOGIES CO., LTD

MAC97A6/8

TRIACS

LOGIC LEVEL TRIAC

DESCRIPTION

Logic level sensitive gate triac intended to be interfaced directly to microcontrollers, logic integrated circuits and other low power gate trigger circuits.

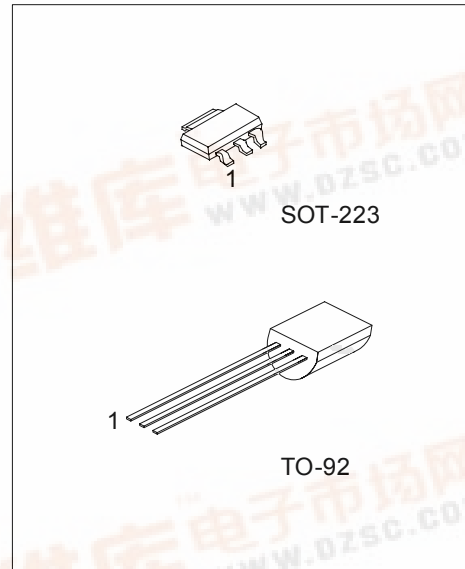
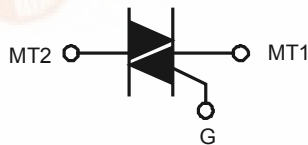
FEATURES

- *Blocking voltage to 600 V (MAC97A8)
- *RMS on-state current to 0.6 A
- *Sensitive gate in all four quadrants

APPLICATIONS

- *General purpose bidirectional switching
- *Phase control applications
- *Solid state relays.

SYMBOL



*Pb-free plating product number:
MAC97A6L/MAC97A8L

ORDERING INFORMATION

Order Number		Package	Pin Assignment			Packing
Normal	Lead Free Plating		1	2	3	
MAC97A6-AA3-R	MAC97A6L-AA3-R	SOT-223	MT1	MT2	Gate	Tape Box
MAC97A6-T92-B	MAC97A6L-T92-B	TO-92	MT1	Gate	MT2	Tape Box
MAC97A6-T92-K	MAC97A6L-T92-K	TO-92	MT1	Gate	MT2	Bulk
MAC97A6-T92-R	MAC97A6L-T92-R	TO-92	MT1	Gate	MT2	Tape Reel
MAC97A8-AA3-R	MAC97A8L-AA3-R	SOT-223	MT1	MT2	Gate	Tape Box
MAC97A8-T92-B	MAC97A8L-T92-B	TO-92	MT1	Gate	MT2	Tape Box
MAC97A8-T92-K	MAC97A8L-T92-K	TO-92	MT1	Gate	MT2	Bulk
MAC97A8-T92-R	MAC97A8L-T92-R	TO-92	MT1	Gate	MT2	Tape Reel

<p>MAC97A6L-AA3-R</p> <ul style="list-style-type: none"> (1)Packing Type (2)Package Type (3)Lead Plating 	<ul style="list-style-type: none"> (1) B: Tape Box, K: Bulk, R: Tape Reel (2) AA3: SOT-223, T92: TO-92 (3) L: Lead Free Plating, Blank: Pb/Sn
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MAC97A6/8

TRIACS

■ ABSOLUTE MAXIMUM RATINGS

CHARACTERISTIC		SYMBOL	RATINGS	UNIT
Repetitive Peak off-State Voltage ($T_J=25 \sim 125$)	MAC97A6	V_{DRM}	400	V
	MAC97A8		600	V
RMS on-State Current (Full Sine Wave, $T_{LEAD} \leq 50$)		$I_{T(RMS)}$	0.6	A
Non-Repetitive Peak on-State Current (Full Sine Wave, $T_J=25$ Prior to Surge)	t=20ms	I_{TSM}	8.0	A
	t=16.7ms		8.8	A
I^2t for Fusing (t=10ms)		I^2t	0.32	A ² s
Repetitive Rate of Rise of on-State Current After Triggering ($I_{TM}=1.0A$, $I_G=0.2A$, $dI_G/dt=0.2A/\mu s$)	T2+G+	dI_T/dt	50	A/ μs
	T2+G-		50	A/ μs
	T2-G-		50	A/ μs
	T2-G+		10	A/ μs
Peak Gate Voltage [t=2 μs (max)]		V_{GM}	5	V
Peak Gate Current [t=2 μs (max)]		I_{GM}	1	A
Peak Gate Power [t=2 μs (max)]		P_{GM}	5	W
Average Gate Power [$T_{case}=80$, t=2 μs (max)]		$P_{G(AV)}$	0.1	W
Operating Junction Temperature		T_J	-40~+125	
Storage Temperature		T_{STG}	-40~+150	

Note: 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.

■ THERMAL DATA

PARAMETER		SYMBOL	RATINGS	UNIT
Thermal Resistance Junction to Ambient	TO-92	θ_{JA}	150	/W
	SOT-223		165	/W

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

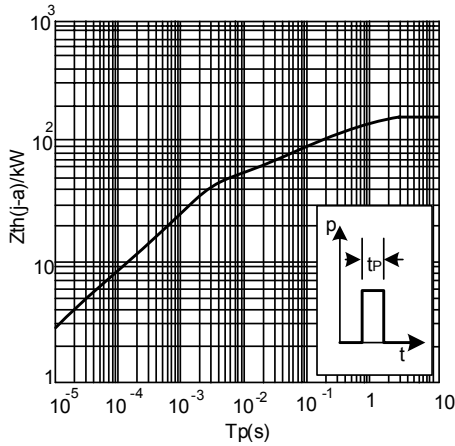
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNITS
Gate Trigger Current	I_{GT}	$V_D=12V$, $I_T=0.1A$	T2+G+	1	5	mA
			T2+G-	2	5	mA
			T2-G-	2	5	mA
			T2-G+	4	7	mA
Latching Current	I_L	$V_D=12V$, $I_{GT}=0.1A$	T2+G+	1	10	mA
			T2+G-	5	10	mA
			T2-G-	1	10	mA
			T2-G+	2	10	mA
Holding Current	I_H	$V_D=12V$, $I_{GT}=0.1A$		1	10	mA
On-State Voltage	V_T	$I_T=0.85A$		1.4	1.9	V
Gate Trigger Voltage	V_{GT}	$V_D=12V$, $I_T=0.1A$		0.9	2	V
		$V_D=V_{DRM}$, $I_T=0.1A$, $T_J=110$	0.1	0.7		V
Off-State Leakage Current	I_D	$V_D=V_{DRM(MAX)}$, $T_J=110$		3	100	μA

■ DYNAMIC CHARACTERISTICS ($T_J=25$, unless otherwise specified)

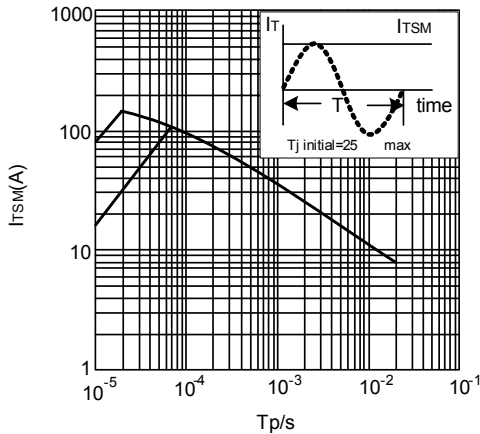
PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS
Critical Rate of Rise of Off-State Voltage	dV_D/dt	$V_D=67\%$ of $V_{DRM(max)}$, $T_{case}=110$, Exponential Waveform, Gate Open Circuit	30	45		V/ μs
Critical Rate of Rise of Commutation Voltage	dV_{com}/dt	$V_D=Rated V_{DRM}$, $T_{case}=50$, $I_{TM}=0.84A$, commutating $dI/dt=0.3A/ms$		5		V/ μs
Gate Controlled Turn-On Time	tgt	$I_{TM}=1.0A$, $V_D=V_{DRM(max)}$, $I_G=25mA$, $dI_G/dt=5A/\mu s$		2		μs

TYPICAL CHARACTERISTICS

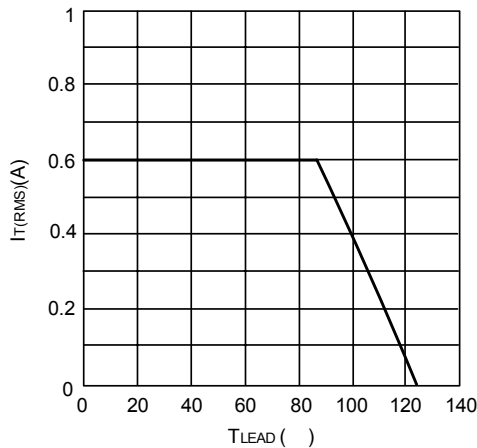
Transient Thermal Impedance From Junction to Ambient as a Function of Pulse Duration.



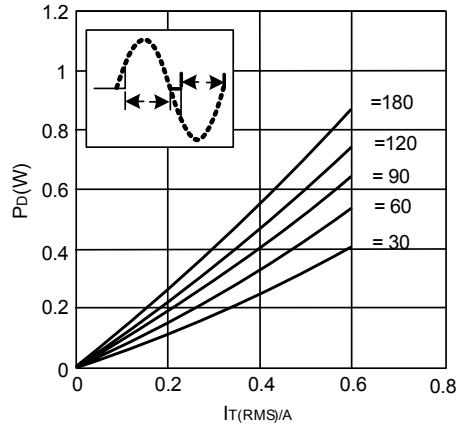
Maximum Permissible Non-Repetitive Peak on-State Current as a Function of Pulse Width for Sinusoidal Currents; Typical Values. $t_p \leq 20\text{ms}$.



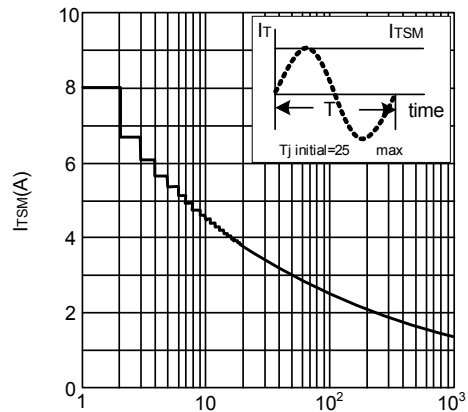
Maximum Permissible RMS Current as a Function of Lead Temperature; Typical Values.



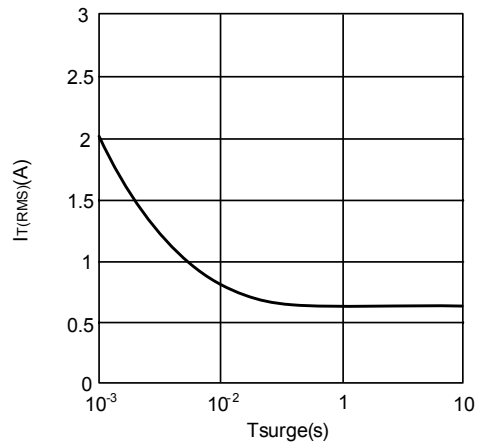
Maximum On-State Dissipation as a Function of RMS On-State Current; Typical Values. $\theta = \text{Conduction Angle}$.



Maximum Permissible Non-Repetitive Peak On-State Current as a Function of Number of Cycles for Sinusoidal Currents; Typical Values. $n = \text{Number of Cycles at } f=50\text{Hz}$.

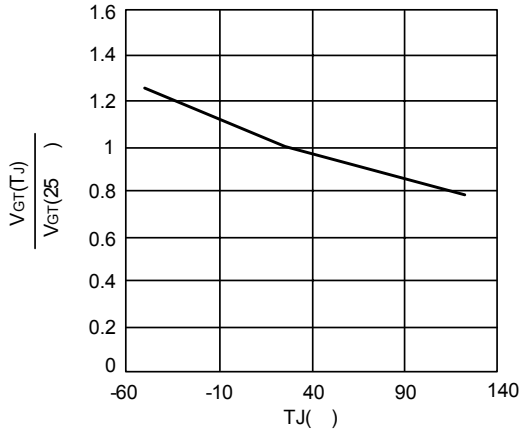


Maximum Permissible Repetitive RMS On-State Current as a Function of Surge Duration for Sinusoidal Currents; Typical Values. $f=50\text{Hz}$; $T_{\text{LEAD}} = 50^\circ\text{C}$.

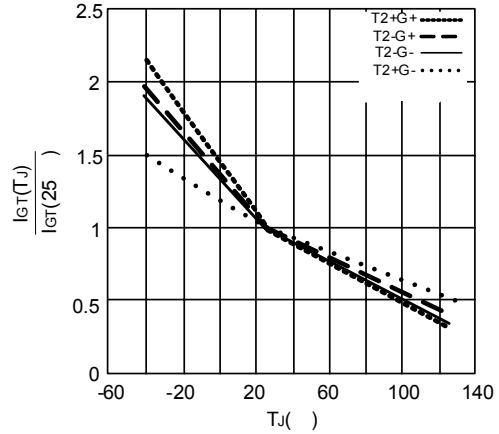


TYPICAL CHARACTERISTICS(Cont.)

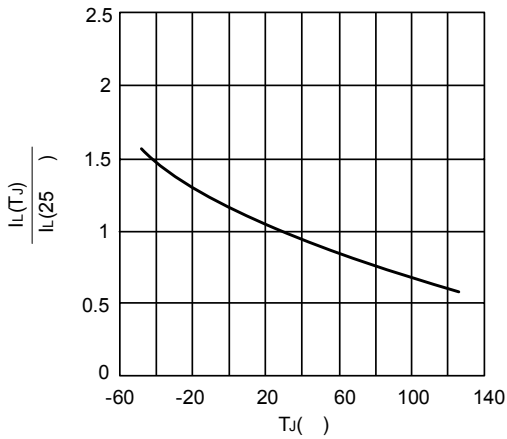
Normalized Gate Trigger Voltage as a Function of Junction Temperature; Typical Values.



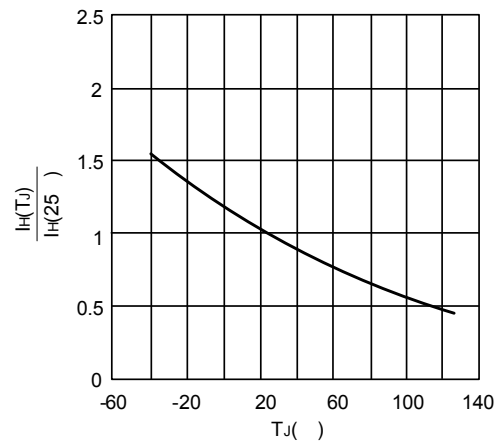
Normalized Gate Trigger Current as a Function of Junction Temperature; Typical Values.



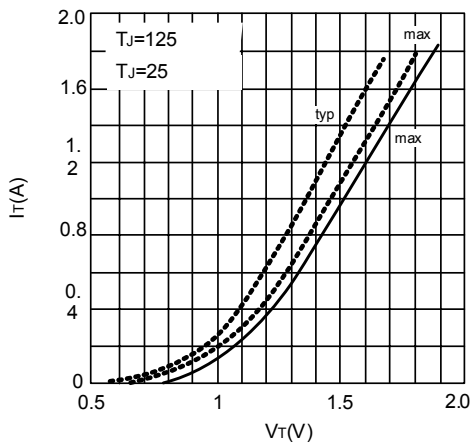
Normalized Latching Current as a Function of Junction Temperature; Typical Values.



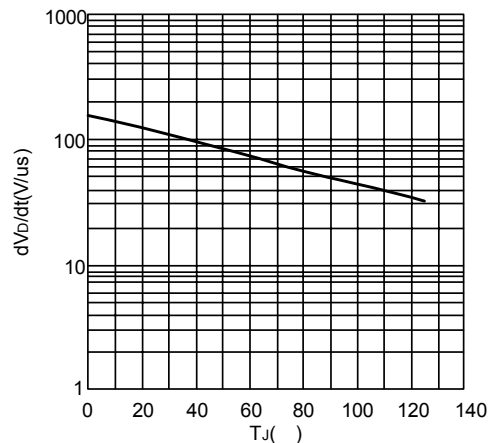
Normalized Holding Current as a Function of Junction Temperature; Typical Values.



On-State Current as a Function of On-State Voltage; Typical and Maximum Values.



Critical Rate of Rise of Off-State Voltage as a Function of Junction Temperature; Typical Values.



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