



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.

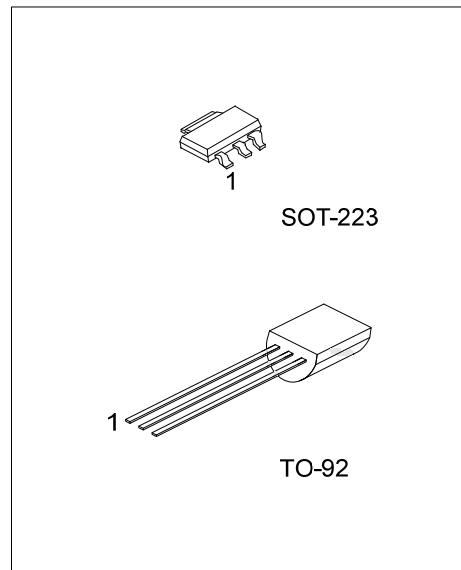
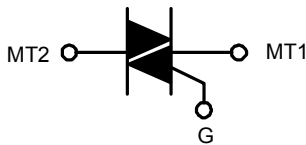
■ **FEATURES**

- *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**



■ **ORDERING INFORMATION**

Order Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
MAC97A6L-AA3-R	MAC97A6G-AA3-R	SOT-223	MT1	MT2	Gate	Tape Reel
MAC97A6L-T92-B	MAC97A6G-T92-B	TO-92	MT1	Gate	MT2	Tape Box
MAC97A6L-T92-K	MAC97A6G-T92-K	TO-92	MT1	Gate	MT2	Bulk
MAC97A6L-T92-R	MAC97A6G-T92-R	TO-92	MT1	Gate	MT2	Tape Reel
MAC97A8L-AA3-R	MAC97A8G-AA3-R	SOT-223	MT1	MT2	Gate	Tape Reel
MAC97A8L-T92-B	MAC97A8G-T92-B	TO-92	MT1	Gate	MT2	Tape Box
MAC97A8L-T92-K	MAC97A8G-T92-K	TO-92	MT1	Gate	MT2	Bulk
MAC97A8L-T92-R	MAC97A8G-T92-R	TO-92	MT1	Gate	MT2	Tape Reel

<p>MAC97A6L-AA3-R</p> <p>(1)Packing Type</p> <p>(2)Package Type</p> <p>(3)Lead Free</p>	<p>(1) B: Tape Box, K: Bulk, R: Tape Reel</p> <p>(2) AA3: SOT-223, T92: TO-92</p> <p>(3) G: Halogen Free, L: Lead Free</p>
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■ ABSOLUTE MAXIMUM RATINGS

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

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
Junction to Ambient	TO-92	θ_{JA}	150	$^\circ\text{C}/\text{W}$
	SOT-223		165	$^\circ\text{C}/\text{W}$

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

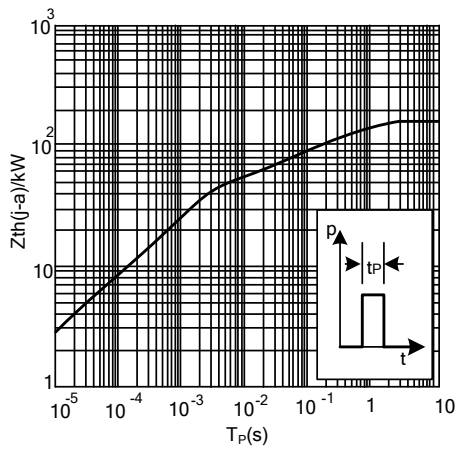
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNITS
Gate Trigger Current	I_{GT}	$V_D=12\text{V}$, $I_T=0.1\text{A}$	T2+G+	1	5	mA
			T2+G-	2	5	mA
			T2-G-	2	5	mA
			T2-G+	4	7	mA
Latching Current	I_L	$V_D=12\text{V}$, $I_{\text{GT}}=0.1\text{A}$	T2+G+	1	10	mA
			T2+G-	5	10	mA
			T2-G-	1	10	mA
			T2-G+	2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

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

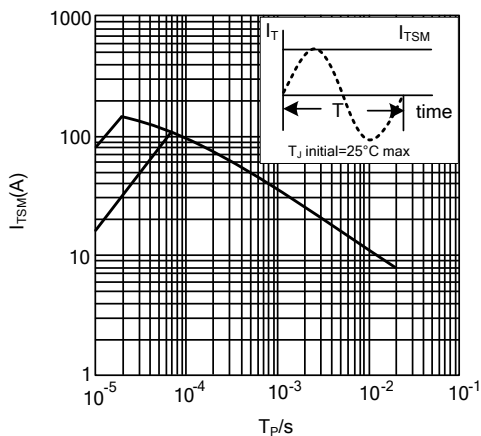
PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS
Critical Rate of Rise of Off-State Voltage	dV_D/dt	$V_D=67\%$ of $V_{\text{DRM(MAX)}}$, $T_C=110^\circ\text{C}$, Exponential Waveform, Gate Open Circuit	30	45		$\text{V}/\mu\text{s}$
Critical Rate of Rise of Commutation Voltage	dV_{COM}/dt	$V_D=\text{Rated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

TYPICAL CHARACTERISTICS

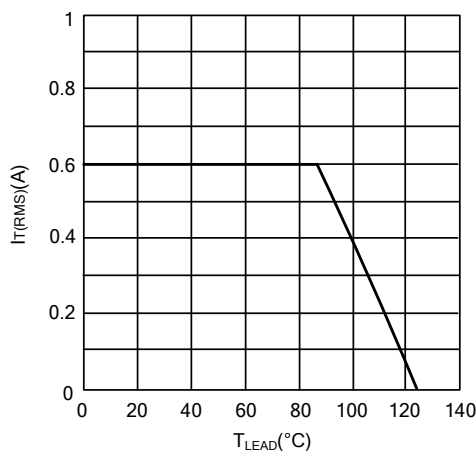
Transient Thermal Impedance From Junction to Ambient as a Function of Pulse Duration.



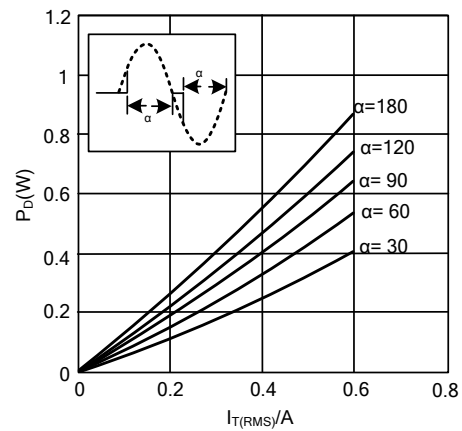
Maximum Permissible Non-Repetitive Peak on-State Current as a Function of Pulse Width for Sinusoidal Currents; Typical Values. $t_p \leq 20\text{ms}$.



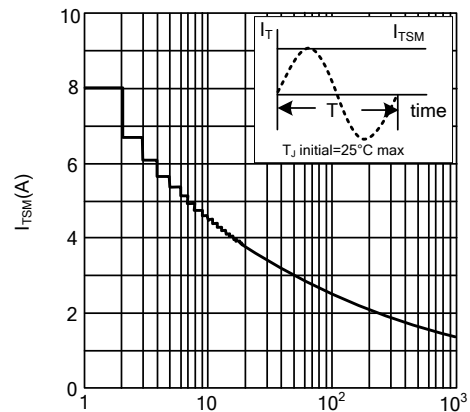
Maximum Permissible RMS Current as a Function of Lead Temperature; Typical Values.



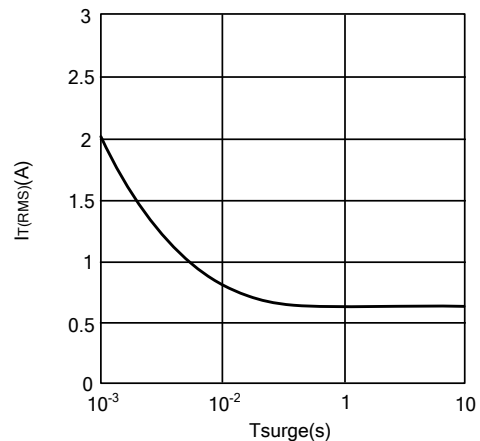
Maximum On-State Dissipation as a Function of RMS On-State Current; Typical Values. $\alpha = \text{Conduction Angle}$.



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

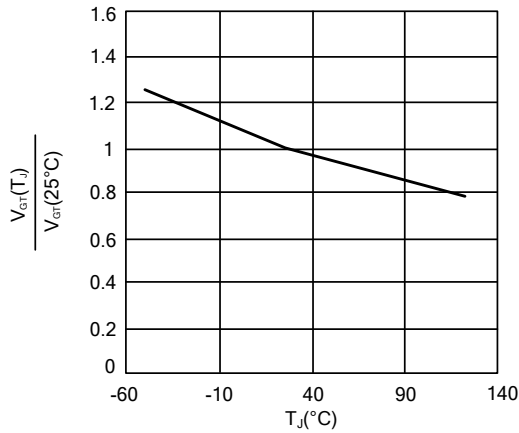


Maximum Permissible Repetitive RMS On-State Current as a Function of Surge Duration for Sinusoidal Currents; Typical Values. $f = 50\text{Hz}$; $T_{\text{LEAD}} \leq 50^\circ\text{C}$.

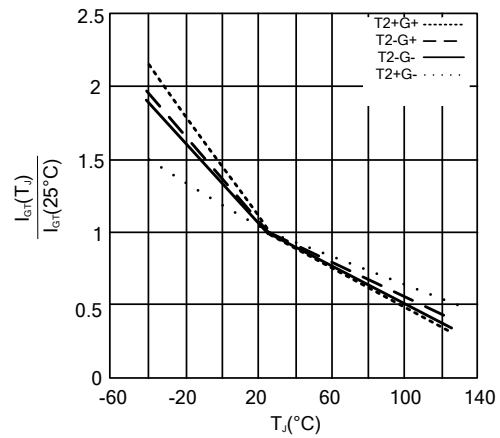


■ TYPICAL CHARACTERISTICS(Cont.)

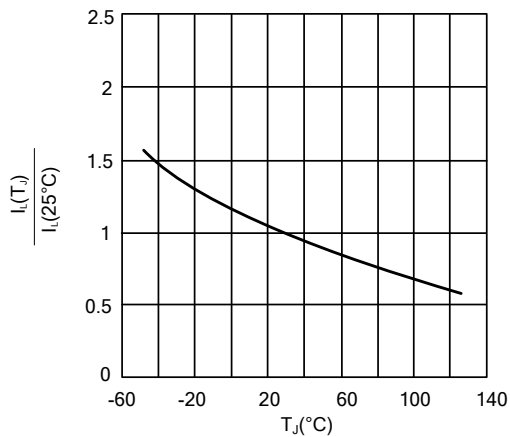
Normalized Gate Trigger Voltage as a Function of Junction Temperature; Typical Values.



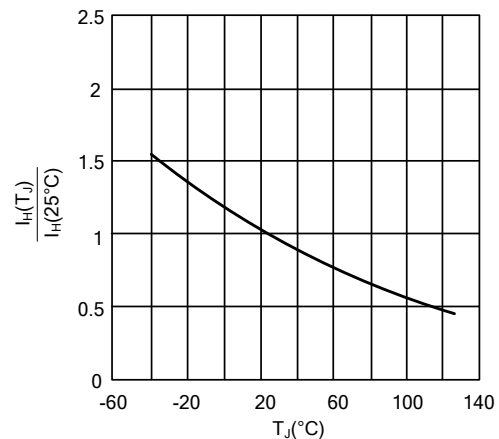
Normalized Gate Trigger Current as a Function of Junction Temperature; Typical Values.



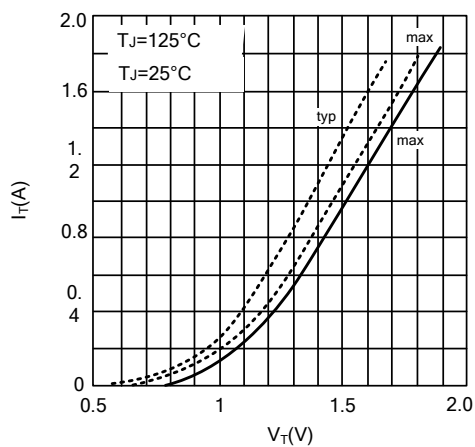
Normalized Latching Current as a Function of Junction Temperature; Typical Values.



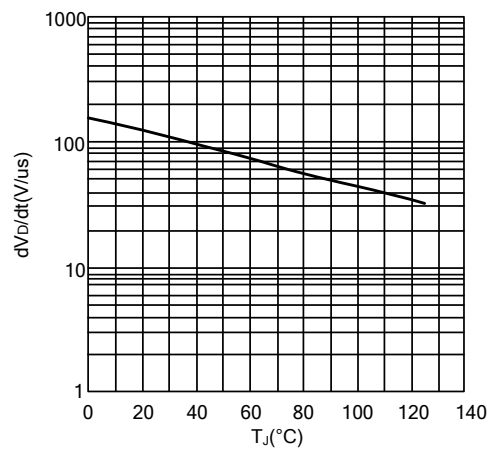
Normalized Holding Current as a Function of Junction Temperature; Typical Values.



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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