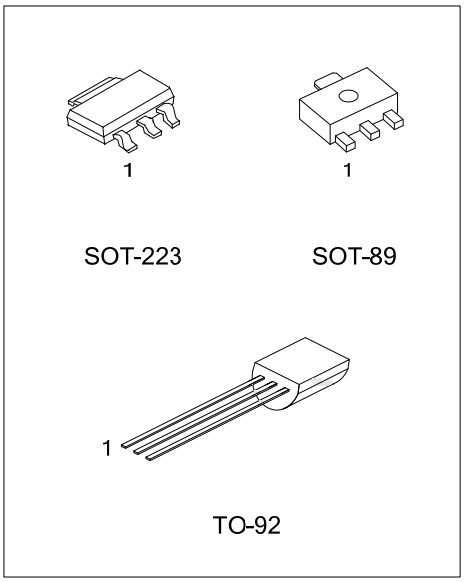
MAC97A6/8

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.

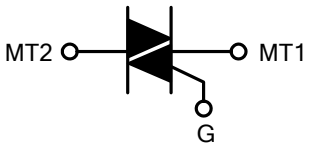
■ FEATURES

*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-AB3-R	MAC97A6G-AB3-R	SOT-89	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-AB3-R	MAC97A8G-AB3-R	SOT-89	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

MAC97A6L-AA3-R (1)Packing Type (2)Package Type (3)Lead Free	(1) B: Tape Box, K: Bulk, R: Tape Reel (2) AA3: SOT-223, AB3: SOT-89, T92: TO-92 (3) L: Lead Free, G: Halogen Free

■ ABSOLUTE MAXIMUM RATINGS

CHARACTERISTIC		SYMBOL	RATINGS	UNIT
Repetitive Peak off-State Voltage (T_J=25 ~125°C)	MAC97A6	V_{DRM}	400	V
	MAC97A8		600	V
RMS on-State Current (Full Sine Wave, T_{LEAD}≤50°C)		$I_{T(RMS)}$	0.6	A
Non-Repetitive Peak on-State Current (Full Sine Wave, T_J=25°C 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^2s
Repetitive Rate of Rise of on-State Current After Triggering (I_{TM}=1.0A, I_G=0.2A, dI_G/dt=0.2A/μs)	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=2μs (max)]		V_{GM}	5	V
Peak Gate Current [t=2μs (max)]		I_{GM}	1	A
Peak Gate Power [t=2μs (max)]		P_{GM}	5	W
Average Gate Power [T_C=80°C, t=2us (max)]		$P_{G(AV)}$	0.1	W
Operating Junction Temperature		T_J	-40~+125	°C
Storage Temperature		T_{STG}	-40~+150	°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	°C/W
	SOT-89		160	°C/W
	SOT-223		165	°C/W

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

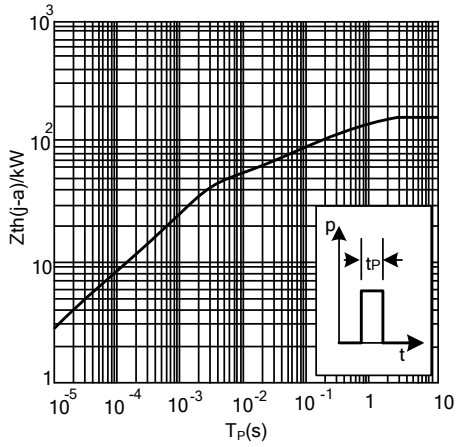
PARAMETER	SYMBOL	TEST CONDITIONS		MIN	TYP	MAX	UNITS
Gate Trigger Current	I_{GT}	V_D=12V, I_T=0.1A	T2+G+		1	5	mA
			T2+G-		2	5	mA
			T2-G-		2	5	mA
			T2-G+		4	7	mA
Latching Current	I_L	V_D=12V, I_{GT}=0.1A	T2+G+		1	10	mA
			T2+G-		5	10	mA
			T2-G-		1	10	mA
			T2-G+		2	10	mA
Holding Current	I_H	V_D=12V,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

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

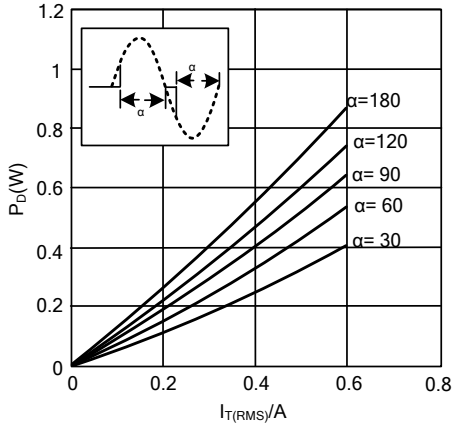
PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS
Critical Rate of Rise of Off-State Voltage	dV_D/dt	V_D=67% of $V_{DRM(MAX)}$, T_C=110°C, Exponential Waveform, Gate Open Circuit	30	45		V/μs
Critical Rate of Rise of Commutation Voltage	dV_{COM}/dt	V_D=Rated V_{DRM}, T_C=50°C, I_{TM}=0.84A, commutating dI/dt=0.3A/ms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

■ TYPICAL CHARACTERISTICS

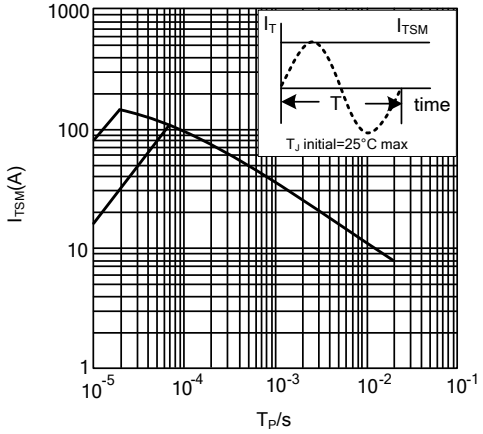
Transient Thermal Impedance From Junction to Ambient as a Function of Pulse Duration.



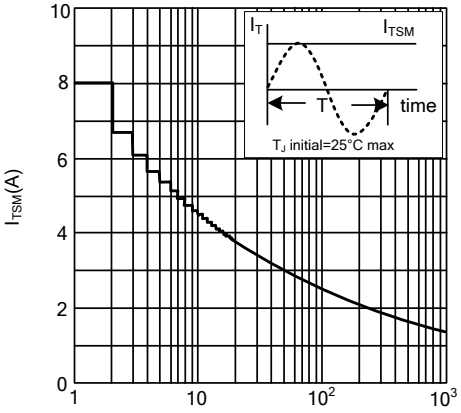
Maximum On-State Dissipation as a Function of RMS On-State Current; Typical Values. α=Conduction Angle.



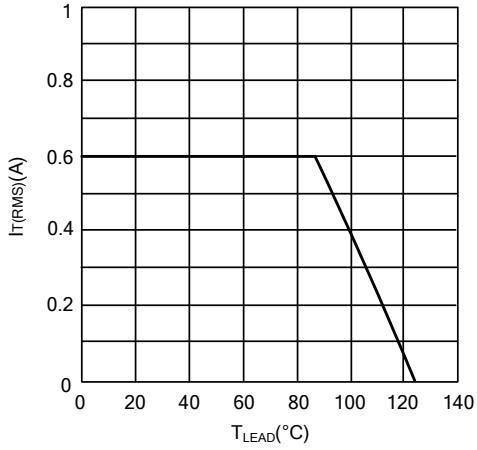
Maximum Permissible Non-Repetitive Peak on-State Current as a Function of Pulse Width for Sinusoidal Currents;Tyical Values. t_P 20ms.



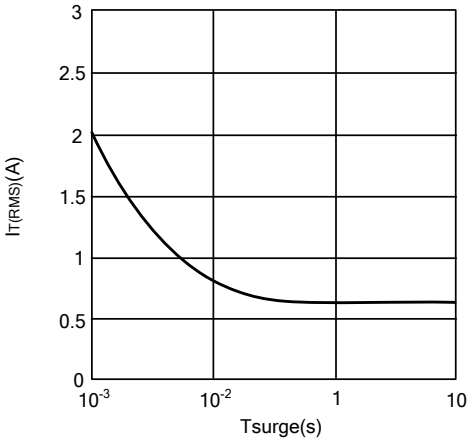
Maximum Permissible Non-Repetitive Peak On-State Current as a Function of Number of Cycles for Sinusoidal Currents; Typical Values . n=Number of Cycles at f=50Hz.



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

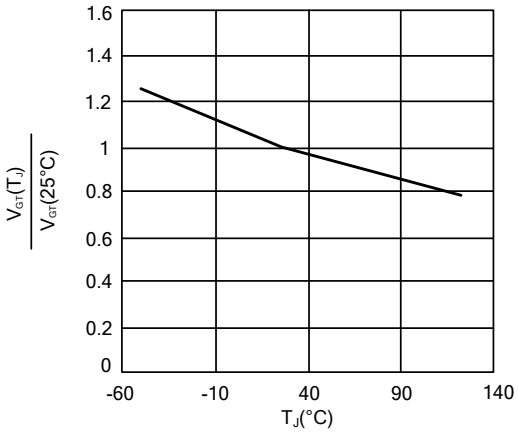


Maximum Permissible Repetitive RMS On-State Current as a Function of Surge Duration for Sinusoidal Currents; Typical Values. f=50Hz; T_{LEAD} 50°C

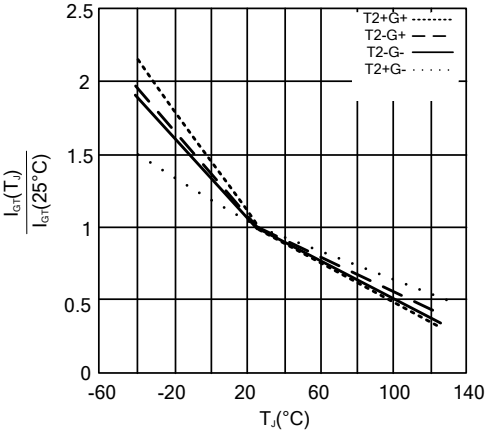


■ TYPICAL CHARACTERISTICS(Cont.)

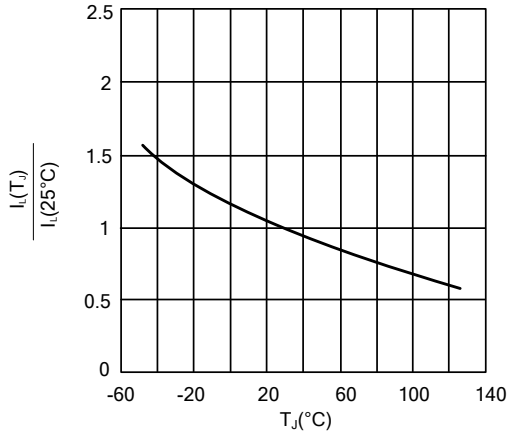
Normalized Gate Trigger Voltage as a of Function Junction Temperature; Typical Values.



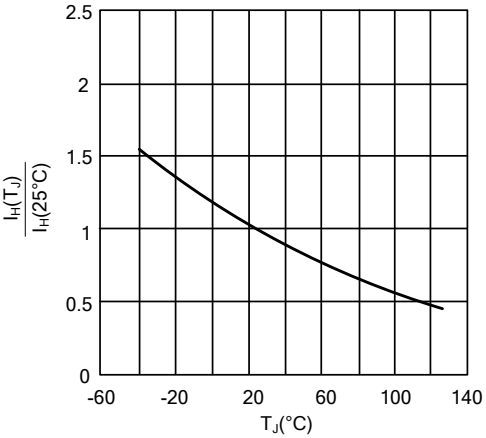
Normalized Gate Trigger Current as a Function of Junction Temperature; Typical Values.



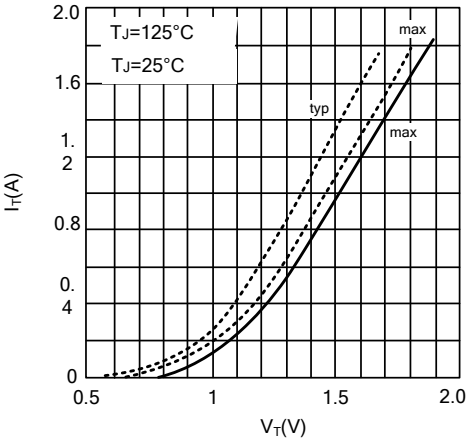
Normalized Latching Current as a Function of Junction Temperature; Typical Values.



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.