

MAC97A6&MAC97A8

TRIAC

GENERAL DESCRIPTION

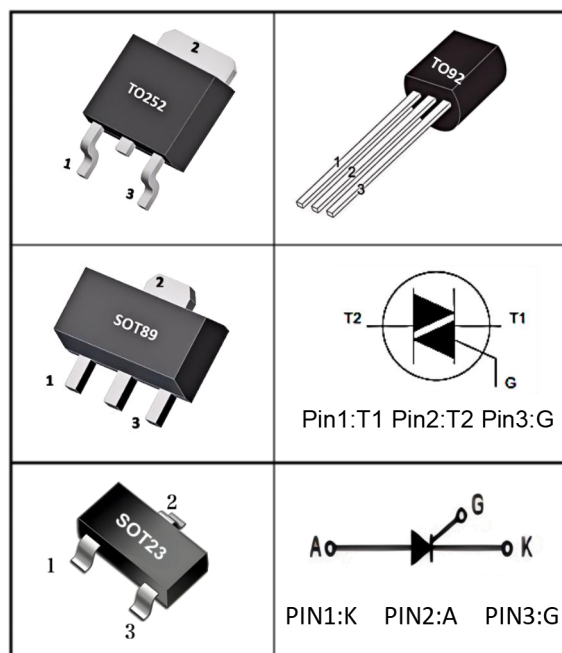
*The MAC97A6 triac is suitable for general purpose AC switching. It can be used as an ON/OFF function in applications such as heating regulation, induction motor starting circuits, for phase control operation in light dimmers, motor speed controllers.

FEATURES

- *Blocking voltage to 600V
- *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.



MARKING



97A6=DeVice Code
XXXX=Date Code



97A8=DeVice Code
XXXX=Date Code

ABSOLUTE MAXIMUM RATINGS (TC=25°C, unless otherwise specified)

SYMBOL	PARAMETER	TEST CONDITION	VALUE	UNIT
VDRM/VRRM	Repetitive Peak off-state/reverse voltage	97A6	400	V
		97A8	600	
IT(RMS)	RMS On-State Current(Full Sine Wave)	Tc=105°C	0.6	A
ITSM	Non Repetitive Surge Peak On-State Current (Tj=25°C)	t=20ms	8.0	A
		t=16.7ms	8.8	
IGM	Peak Gate Current	t=2μs	1	A
VGM	Peak Gate voltage	t=2μs	5	V
I ² t	I ² t Value for Fusing	t=10ms	0.32	A ² S
di/dt	Repetitive Rate of Rise of on-State Current After Triggering (IG=2×IGT , f=100Hz , Tj=125°C)	T2+ G+	50	A/μs
		T2+ G-	50	
		T2- G-	50	
		T2- G+	10	
PG(AV)	Average Gate Power Dissipation	TJ=125°C	0.1	W
PGM	Peak gate Power		5	W
Tstg	Storage Temperature		-40 to +150	°C
Tj	Operating junction temperature		125	°C

MAC97A6&MAC97A8

TRIAC

■ THERMAL RESISTANCES

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	SOT-89	R θ JA	165	$^{\circ}$ C/W
	TO-252		62.5	$^{\circ}$ C/W
	TO-92		150	$^{\circ}$ C/W
Junction to Case	SOT-89	R θ JC	60	$^{\circ}$ C/W
	TO-252		2.6	$^{\circ}$ C/W
	TO-92		75	$^{\circ}$ C/W

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

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT	
Repetitive Peak off-state current	I _{DRM}	V _D =V _{DRM}		0.4	5	μ A	
Gate Trigger current	I _{GT}	V _D =12V R _L =33 Ω			5	mA	
					T2+, G -		5
					T2-, G -		5
					T2-, G+		10
Gate Trigger voltage	V _{GT}	V _D =12V R _L =33 Ω			1.3	V	
					T2+, G -		1.3
					T2-, G -		1.3
					T2-, G+		1.3
Latching Current	I _L	I _G =1.2I _{GT}			10	mA	
					T2+, G -		10
					T2-, G -		10
					T2-, G+		20
Holding Current	I _H	I _G =20mA, I _T =600mA			10	mA	
On-state voltage	V _T	I _T =2A		1.3	1.7	V	
Off-state leakage current	I _D	V _D =V _{DRM(max)} ; T _j =125 $^{\circ}$ C			0.5	mA	
Critical Rate of Rise of Off-state Voltage	dV/dt	V _D =2/3V _{DRM} ; Gate Open T _j =125 $^{\circ}$ C		60		V/us	
DYNAMIC CHARACTERISTICS							
Critical Rate of Rise of off-state Voltage	dV _D /dt	V _{DM} =67%V _{DRM(max)} circuit	30	45		V/ μ s	
Gate Controlled Turn-on Time	t _{gt}	I _{TM} =1.5A, V _D =V _{DRM(max)} , I _G =0.1A dI _G /dt=5A/ μ s		2		μ s	

MAC97A6&MAC97A8

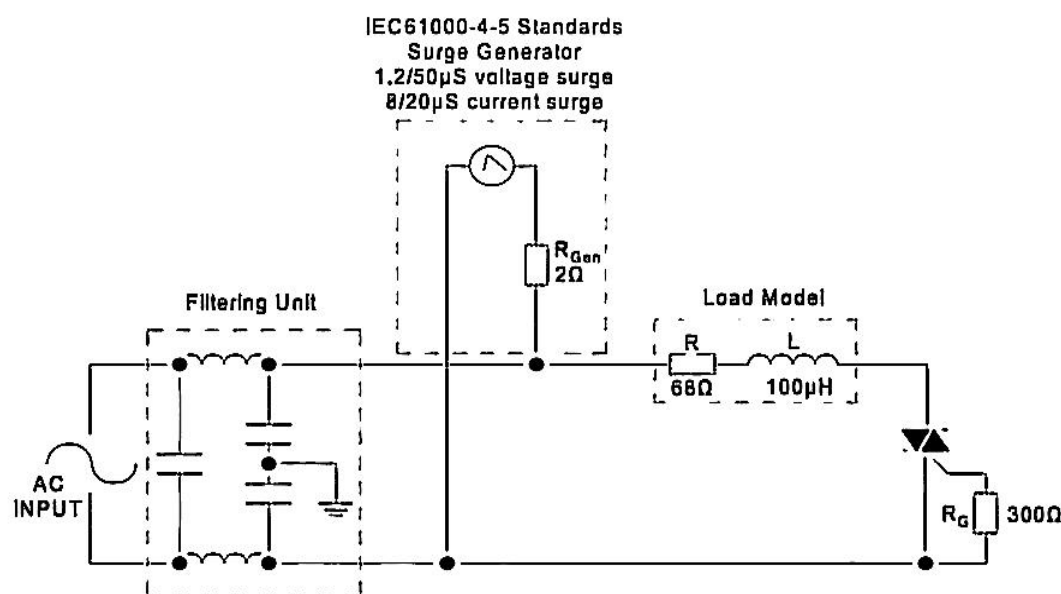
TRIAC

■ STATIC CHARACTERISTICS

PARAMETER	SYMBOL	TEST CONDITIONS		MIN	TYP	MAX	UNIT
Peak On-State Voltage	V_{TM}	$I_{TM}=0.85A$, $t_P=380\mu s$	$T_J=25^\circ C$			1.5	V
Threshold Voltage	V_{TO}		$T_J=125^\circ C$			0.98	V
Dynamic Resistance	R_D		$T_J=125^\circ C$			362	m Ω
Repetitive Peak Off-State Current	I_{DRM}	$V_D=V_{DRM}$ $V_R=V_{RRM}$	$T_J=25^\circ C$			5	μA
	I_{RRM}		$T_J=125^\circ C$			0.15	mA

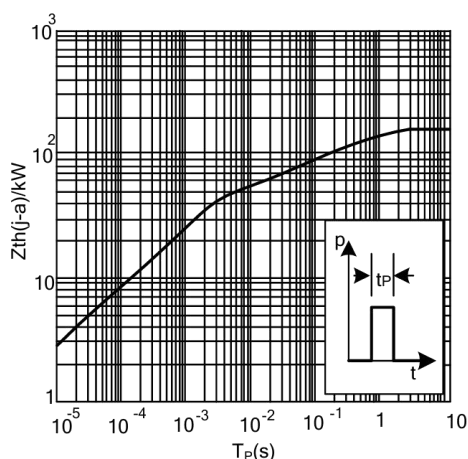
■ TEST CIRCUITS AND WAVEFORMS

Test circuit for inductive and resistive loads to IEC-61000-4-5 standards

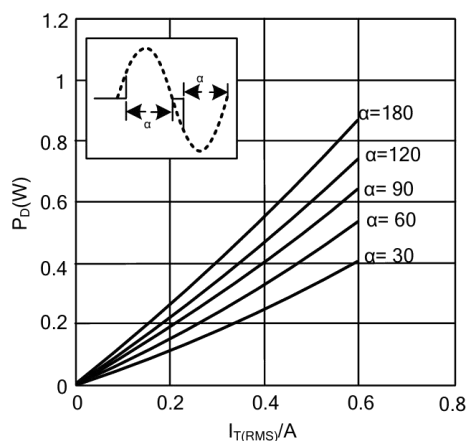


■ TYPICAL CHARACTERISTICS (1)

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.

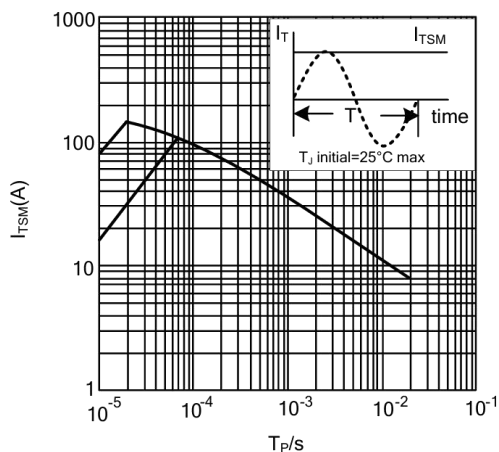


MAC97A6&MAC97A8

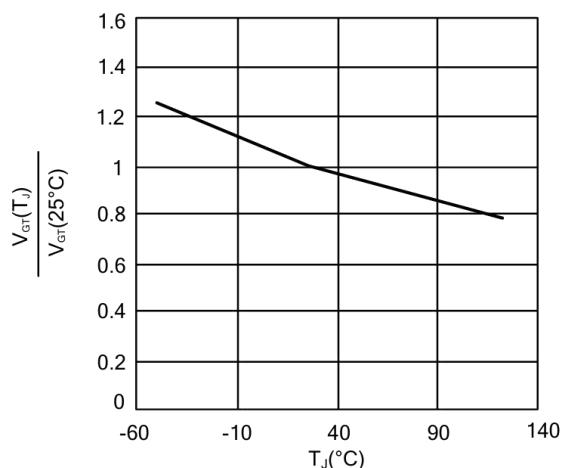
TRIAC

TYPICAL CHARACTERISTICS (2)

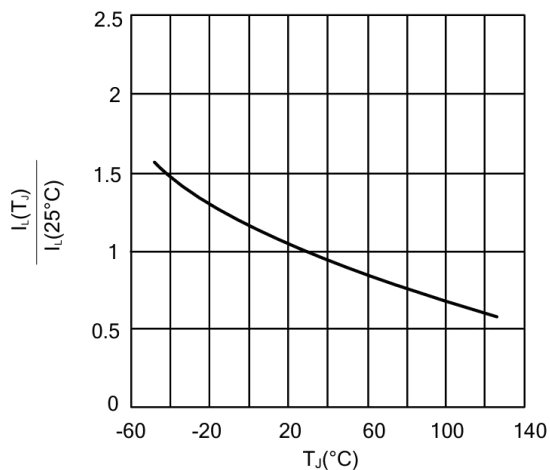
Maximum Permissible Non-Repetitive Peak On-State Current as a Function of Pulse Width for Sinusoidal Currents; Typical Values. $t_p \leq 20\text{ms}$.



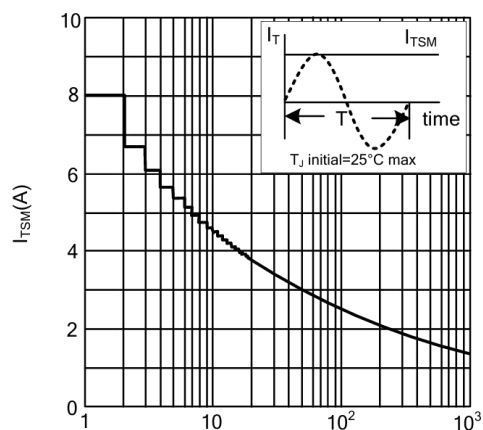
Normalized Gate Trigger Voltage as a Function of Junction Temperature; Typical Values.



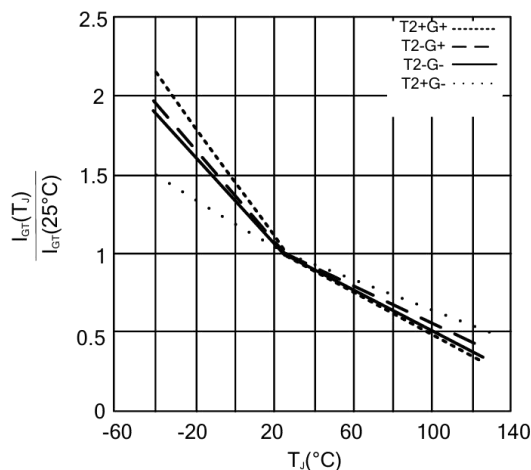
Normalized Latching Current as a Function of Junction Temperature; Typical Values.



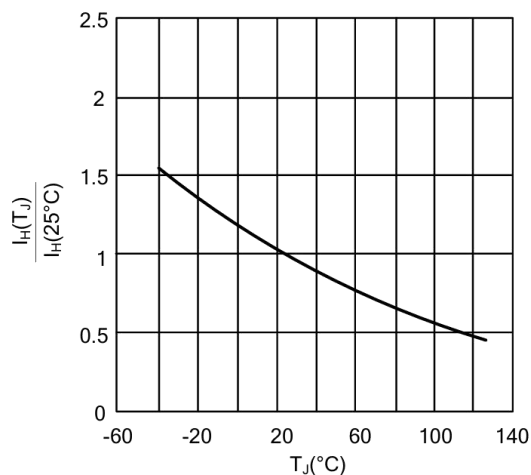
Maximum Permissible Non-Repetitive Peak On-State Current as a Function of Number of Cycles for Sinusoidal Currents; Typical Values. n =Number of Cycles at $f=50\text{Hz}$.



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



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

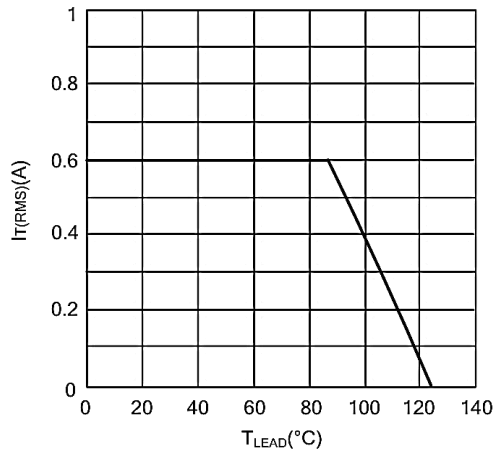


MAC97A6&MAC97A8

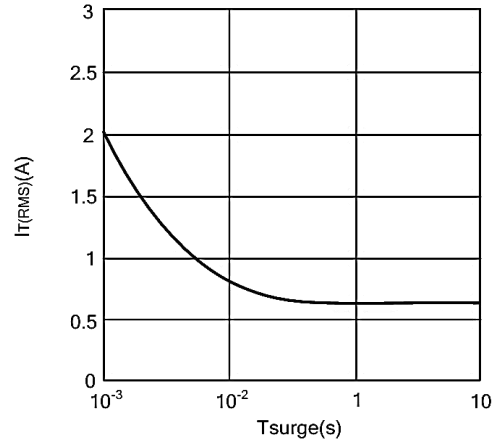
TRIAC

■ TYPICAL CHARACTERISTICS (3)

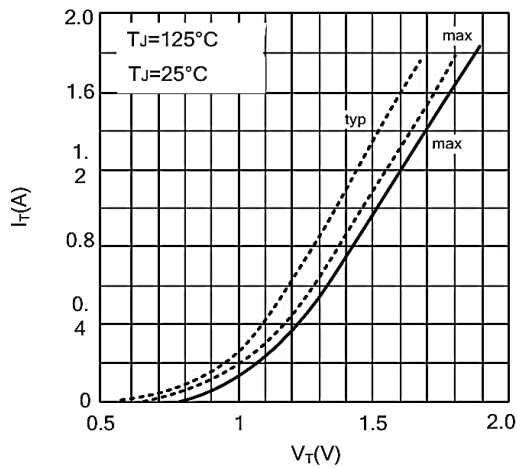
Maximum Permissible RMS Current as a Function of Lead Temperature; Typical Values.



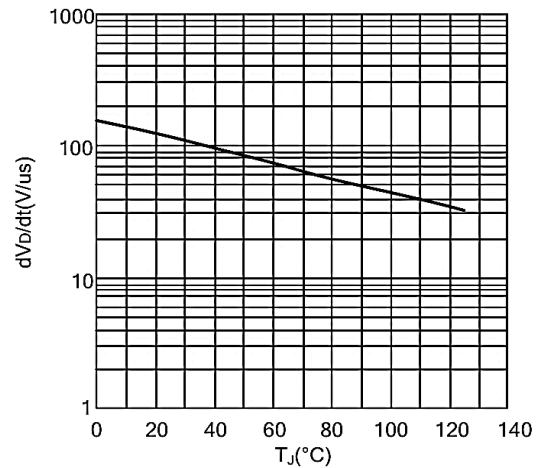
Maximum Permissible Repetitive RMS On-State Current as a Function of Surge Duration for Sinusoidal Currents; Typical Values. $f=50Hz$; $T_{LEAD} \downarrow 50^{\circ}C$



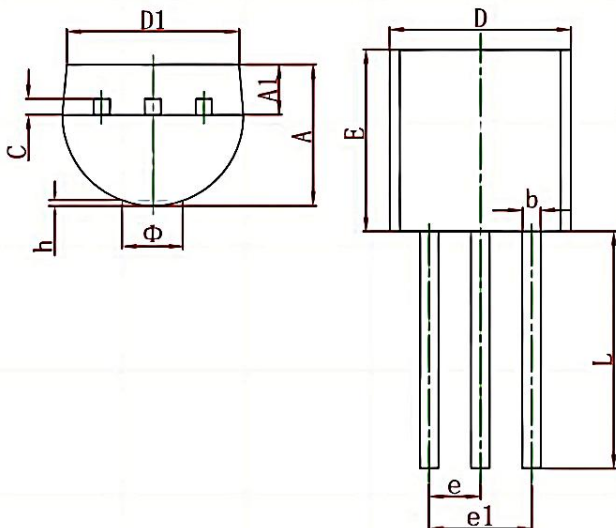
On-State Current as a Function of On-State Voltage; Typical and Maximum Values.



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



■ TO - 92 Package Outline Dimensions

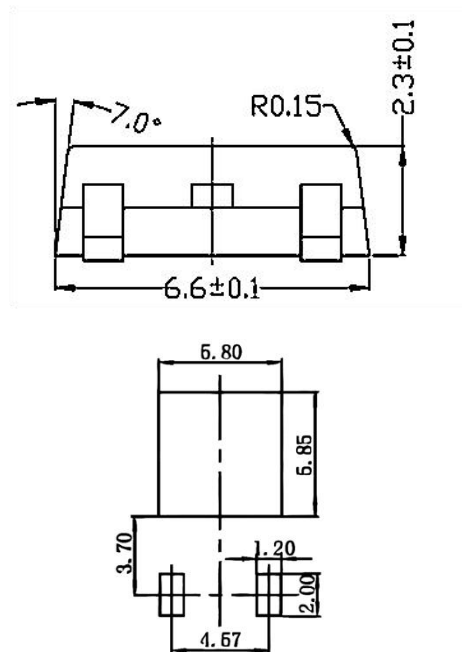
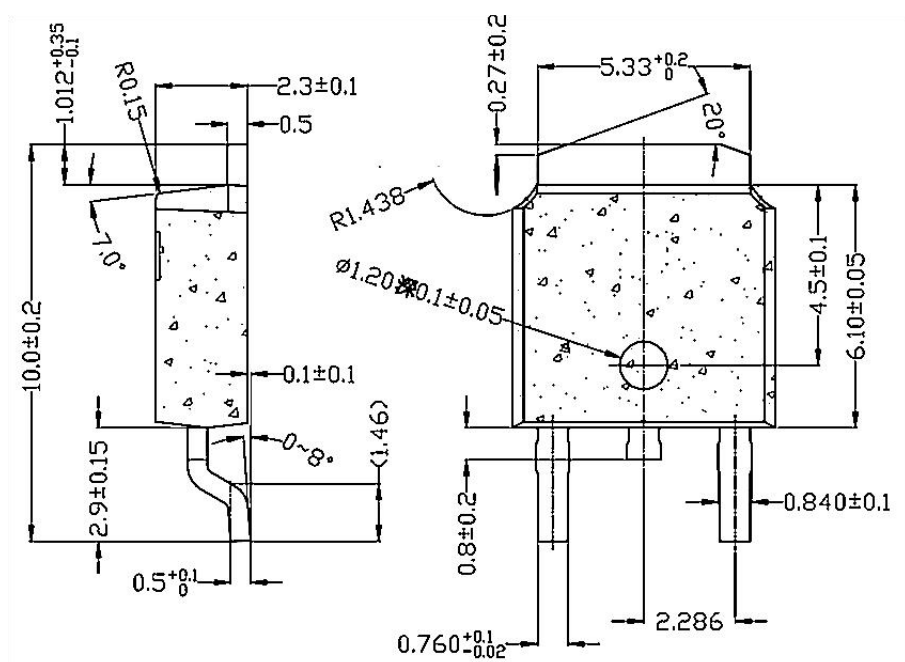


Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	3.300	3.700	0.130	0.146
A1	1.100	1.400	0.043	0.055
b	0.380	0.550	0.015	0.022
c	0.360	0.510	0.014	0.020
D	4.400	4.700	0.173	0.185
D1	3.430		0.135	
E	4.300	4.700	0.169	0.185
e	1.270 TYP		0.050 TYP	
e1	2.440	2.640	0.096	0.104
L	14.100	14.500	0.555	0.571
Φ		1.600		0.063
h	0.000	0.380	0.000	0.015

MAC97A6&MAC97A8

TRIAC

TO - 252 Package Outline Dimensions



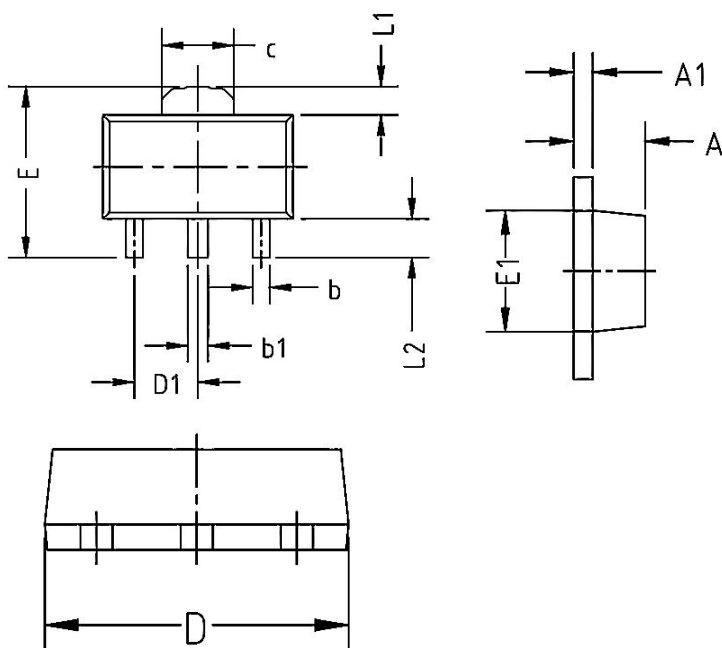
TO - 252 PACKING INFORMATION

Package version	Reel dimensions $\phi \times H$ (mm)	Per Reel (pcs)	Reels per box	Inner box dimensions L×W×H(mm)	Outer box (pcs)	Outer box dimensions L×W×H (mm)
TO-252	$\phi 330 \times 20$	2500	2	360×340×50	25000	375×375×280

MAC97A6&MAC97A8

TRIAC

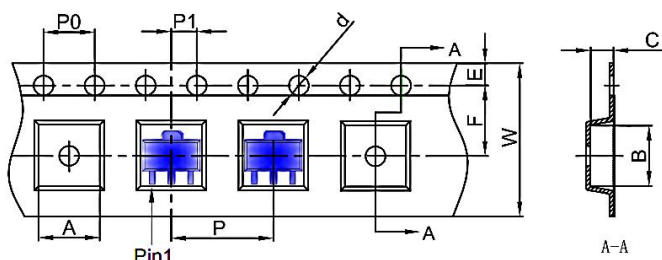
SOT89 PACKAGE OUTLINE DIMENSIONS



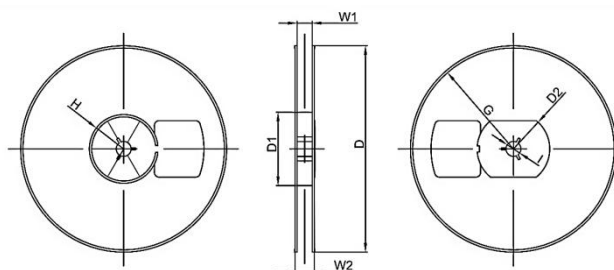
COMMON DIMENSION(MM)			
PKG	SOT-89		
Symbol	MIN	MON	MAX
A	1.450	1.500	1.550
A1	0.350	0.400	0.450
b	0.350	0.400	0.48
b1	0.430	0.480	0.550
C	1.500	1.550	1.650
D	4.450	4.550	4.700
D1	1.470	1.500	1.550
E	4.100	4.200	4.300
E1	2.500	2.550	2.650
L1	0.650	0.700	0.750
L2	0.900	0.950	1.000

SOT89 PACKAGING INFORMATION

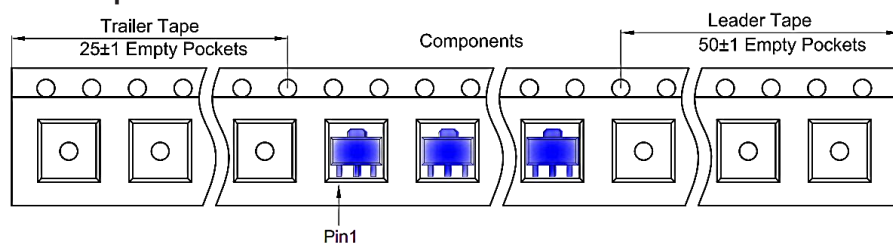
SOT-89 Embossed Carrier Tape



SOT-89 Reel



SOT-89 Tape Leader and Trailer



REEL	Reel Size
1000 pcs	7 Inch

Dimensions are in millimeter										
Pkg type	A	B	C	d	E	F	P0	P	P1	W
SOT-89-3L	4.85	4.45	1.85	Ø1.50	1.75	5.50	4.00	8.00	2.00	12.00

Dimensions are in millimeter								
Reel Option	D	D1	D2	G	H	I	W1	W2
7" Dia	Ø180.00	60.00	R32.00	R86.50	R30.00	Ø13.00	13.20	16.50