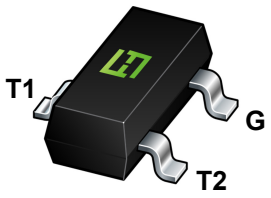
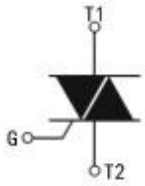
MAC97A6L

0.8A TRIAC

Features

- Direct interfacing to logic level ICs
- Direct interfacing to low power gate drivers and microcontrollers
- High blocking voltage capability
- Planar passivated for voltage ruggedness and reliability
- Triggering in all four quadrants
- Very sensitive gate





SOT-23

Applications

- General purpose low power phase control
- General purpose low power switching
- Solid-state relay

Marking: 97A6

Maximum Ratings

Symbol	Parameter	Conditions	Min	Max	Unit
V_{DRM}	Repetitive peak off-state voltag		-	400	V
$I_{T(RMS)}$	RMS on-state current	full sine wave; $T_{lead} \leq 50℃$	-	0.8	A
I_{TSM}	Non repetitive surge peak on-state current	full sine wave; $T_{j(init)} = 25℃$; $t_p = 20$ ms	-	8	A
		full sine wave; $T_{j(init)} = 25℃$; $t_p = 16.7$ ms	-	8.8	A
I^2t	I^2t Value for fusing	tp = 10 ms; SIN	-	0.32	A^2S
dI_T/dt	Critical rate of rise of on-state current	I_T=1 A; I_G=20mA; dI_G/dt=0.2 A/μs; T2+ G+	-	50	A/μS
		I_T=1 A; I_G=20mA; dI_G/dt=0.2 A/μs; T2+ G-	-	50	A/μS
		I_T=1 A; I_G=20mA; dI_G/dt=0.2 A/μs; T2- G-	-	50	A/μS
		I_T=1 A; I_G=20mA; dI_G/dt=0.2 A/μs; T2- G+	-	10	A/μS
I_{GM}	Peak gate current	t=20microsecs(max)	-	1	A
P_{GM}	Peak gate power	t=20microsecs(max)	-	5	W

Symbol	Parameter	Conditions	Min	Max	Unit
$P_{G(AV)}$	Average gate power	over any 20ms period ; $T_{(lead)}$≤80℃; t = 2 microseconds(max)	-	0.1	W
T_{stg}	Storage temperature		-40	150	℃
T_j	Junction temperature		-	125	℃

Static Characteristics

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
I_{GT}	Gate trigger current	V_D=12V; I_T=0.1 A; T2+ G+; T_j=25℃	-	1	5	mA
		V_D=12V; I_T=0.1 A; T2+ G-; T_j=25℃	-	2	5	mA
		V_D=12V; I_T=0.1 A; T2- G-; T_j=25℃	-	2	5	mA
		V_D=12V; I_T=0.1 A; T2- G+; T_j=25℃	-	4	7	mA
I_L	Latching current	V_D=12V; I_G=0.1A; T2+ G+; T_j=25℃	-	1	10	mA
		V_D=12V; I_G=0.1A; T2+ G-; T_j=25℃	-	5	10	mA
		V_D=12V; I_G=0.1A; T2- G-; T_j=25℃	-	1	10	mA
		V_D=12V; I_G=0.1A; T2- G+; T_j=25℃	-	2	10	mA
I_H	Holding current	V_D =12V; T_j=25℃	-	1	10	mA
V_T	On-state voltage	I_T=0.85A; T_j=25℃	-	1.4	1.9	V
V_{GT}	Gate trigger voltage	V_D=12V; I_T=0.1 A; T_j=25℃	-	0.9	1.5	V
		V_D=400V; I_T=0.1 A; T_j=110℃	0.1	0.7	-	V
I_D	Off-state current	V_D=400V; T_j=110℃	-	3	100	μA

Dynamic characteristics

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
dV_D/dt	Rate of rise of off-state voltage	V_{DM}=268V; T_j=110℃; (V_{DM}=67% of V_{DRM}); exponential waveform; gate open circuit;	30	45	-	V/μs
dV_{com}/dt	Rate of change of commutating voltage	V_D=400V; T_j=50℃; dI_{com}/dt=0.3 A/ ms; I_T=0.84 A; gate open circuit	-	5	-	V/μs
t_{gt}	Gate-controlled turn-on time	I_{TM}=1A; V_D=400V; I_G=25mA; dI_G/dt=5A/μs	-	2	-	μs

Thermal characteristics

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$R_{th(j-lead)}$	thermal resistance from junction to lead	full cycle;	-	-	60	K/W
		half cycle	-	-	80	K/W
$R_{th(j-a)}$	thermal resistance from junction to ambient	printed circuit board mounted: lead length=4mm	-	150	-	K/W

Fig. 1. RMS on-state current as a function of surge duration; maximum values

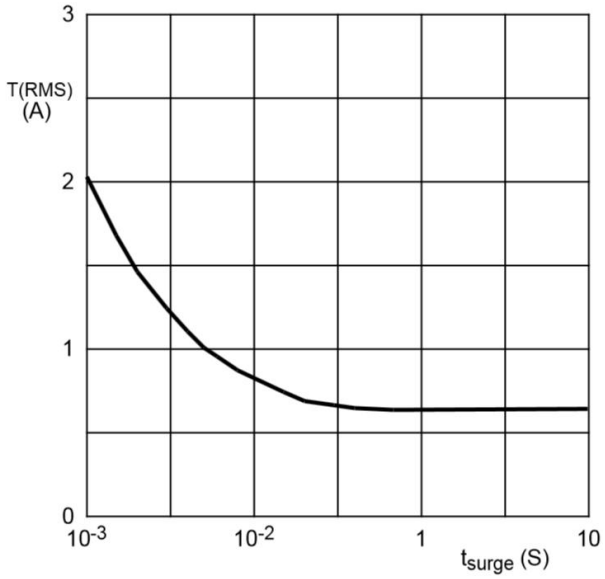


Fig. 2. RMS on-state current as a function of lead temperature; maximum values

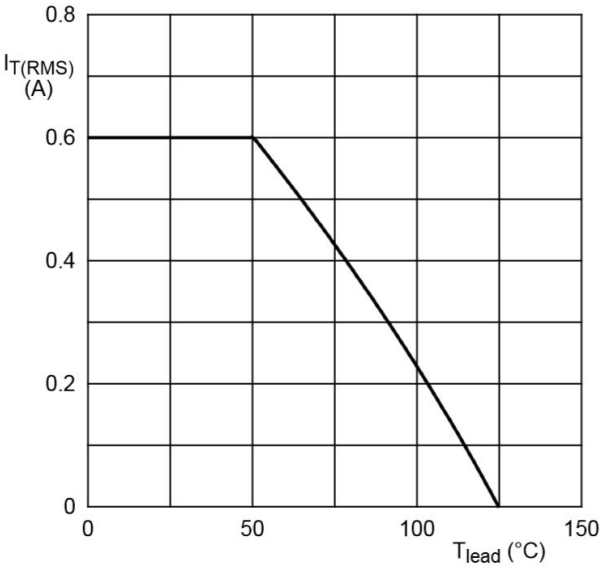


Fig. 3. Total power dissipation as a function of RMS on-state current; maximum values

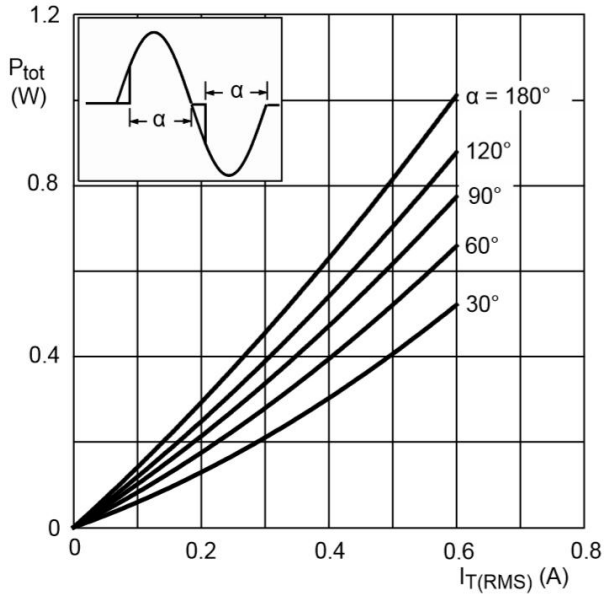
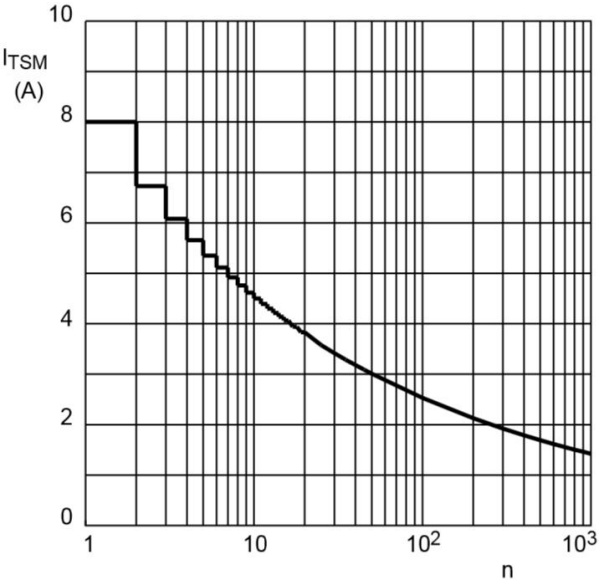


Fig. 4. Non-repetitive peak on-state current as a function of the number of sinusoidal current cycles; maximum values

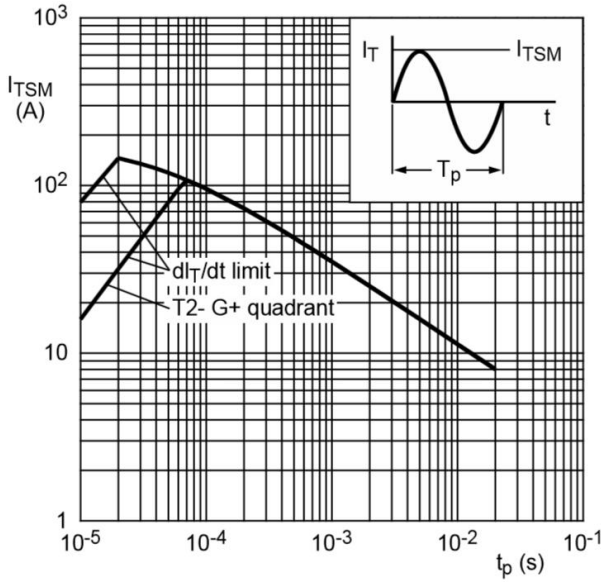


α = conduction angle

a = form factor = $I_{T(RMS)}$ / $I_{T(AV)}$

f = 50 Hz

Fig. 5. Non-repetitive peak on-state current as a function of pulse width; maximum values



tp ≤ 20 ms

Fig. 6. Transient thermal impedance from junction to ambient as a function of pulse width

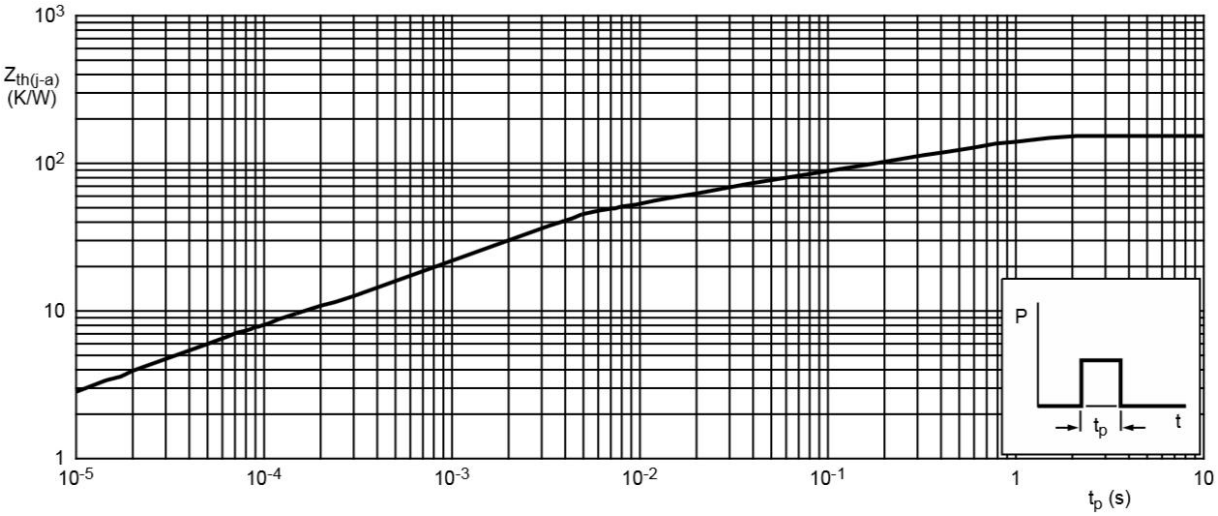
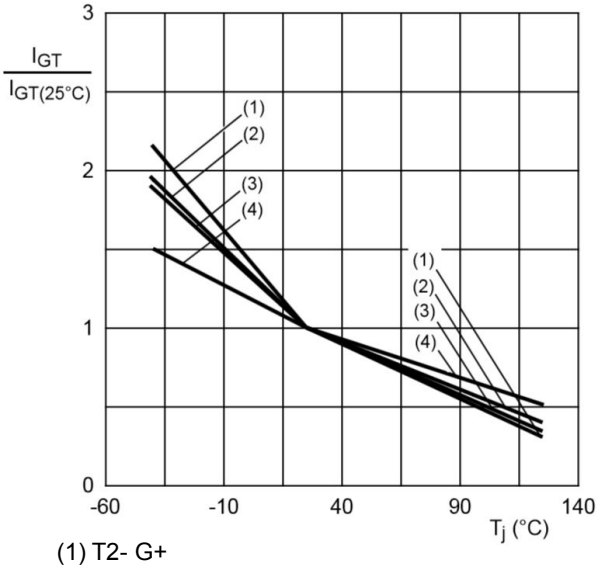


Fig. 7. Normalized gate trigger current as a function of junction temperature



(1) T2- G+

(2) T2- G-

(3) T2+ G-

(4) T2+ G+

Fig. 8. Normalized latching current as a function of junction temperature

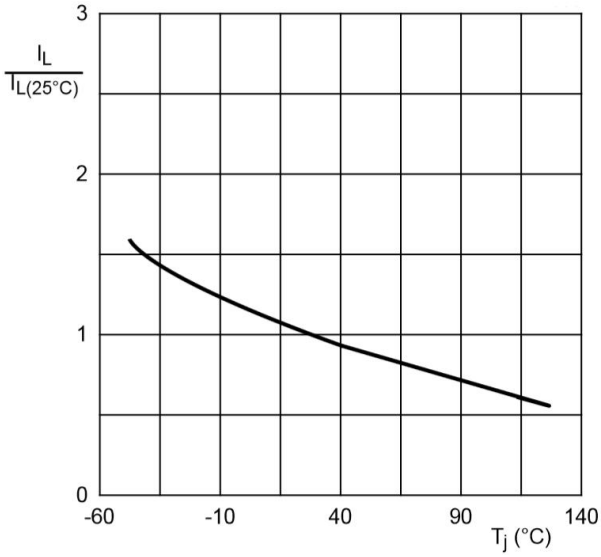


Fig. 9. Normalized holding current as a function of junction temperature

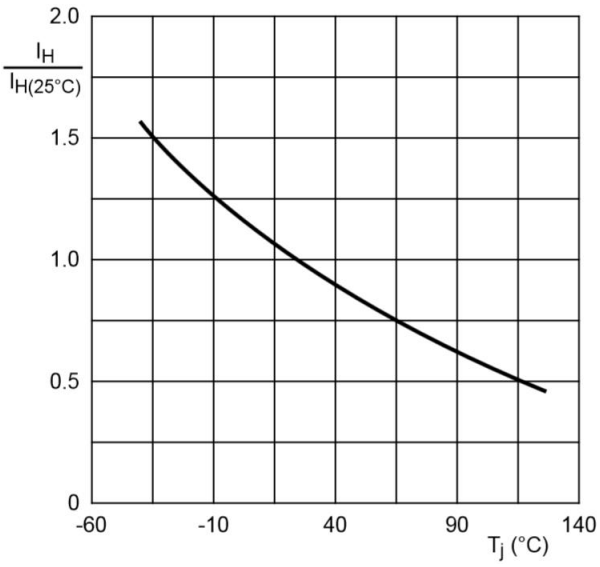
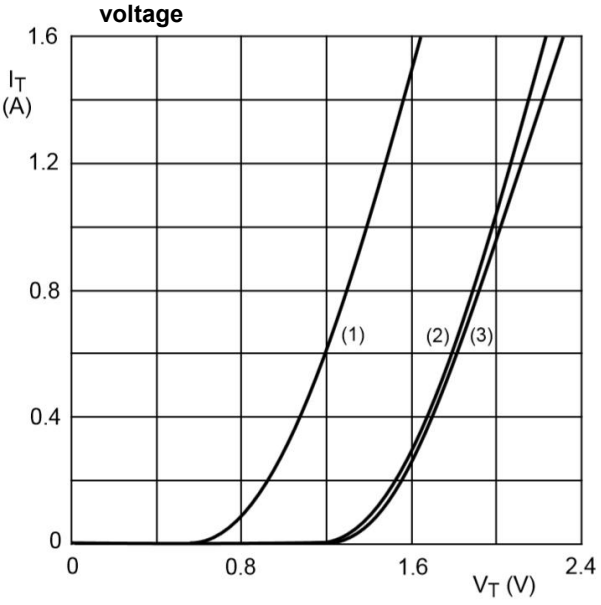


Fig. 10. On-state current as a function of on-state voltage



V_O = 1.45 V; R_S = 0.1875Ω

(1) T_j = 125℃; typical values

(2) T_j = 125℃; maximum values

(3) T_j = 25℃; maximum values

Fig. 11. Normalized gate trigger voltage as a function of junction temperature

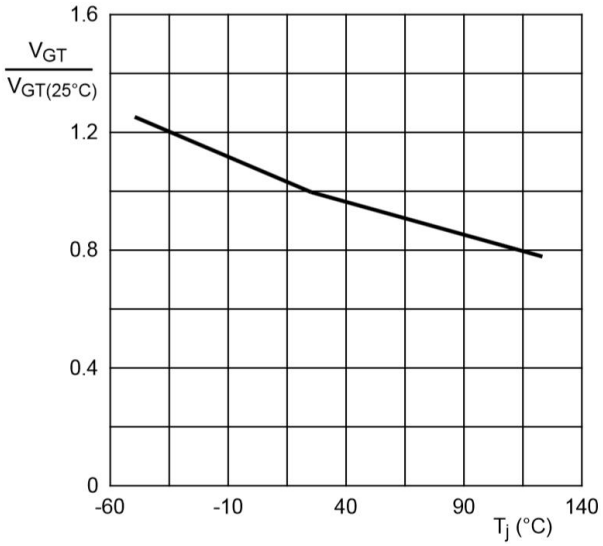
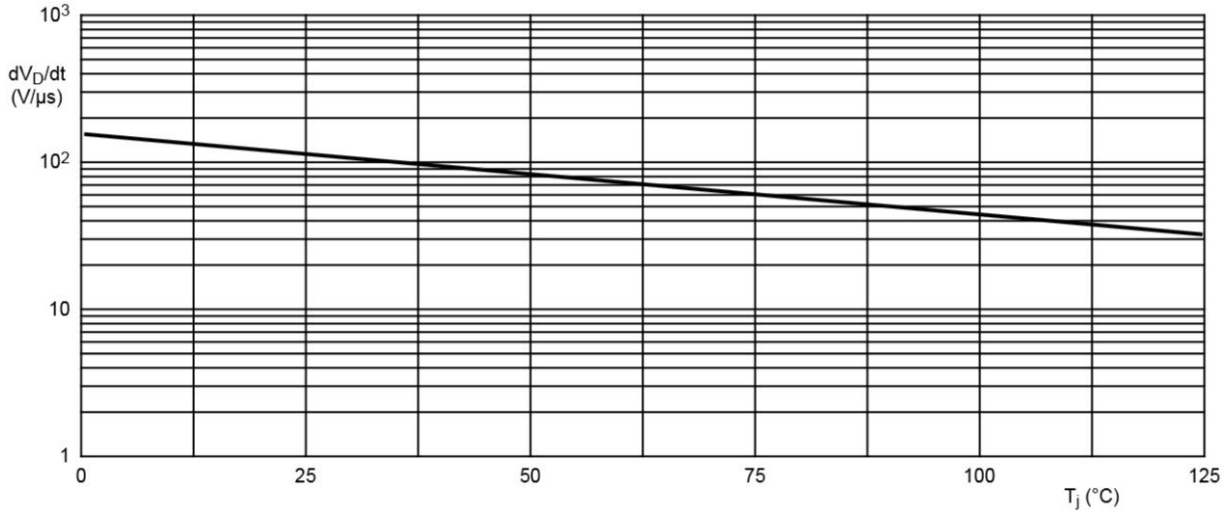
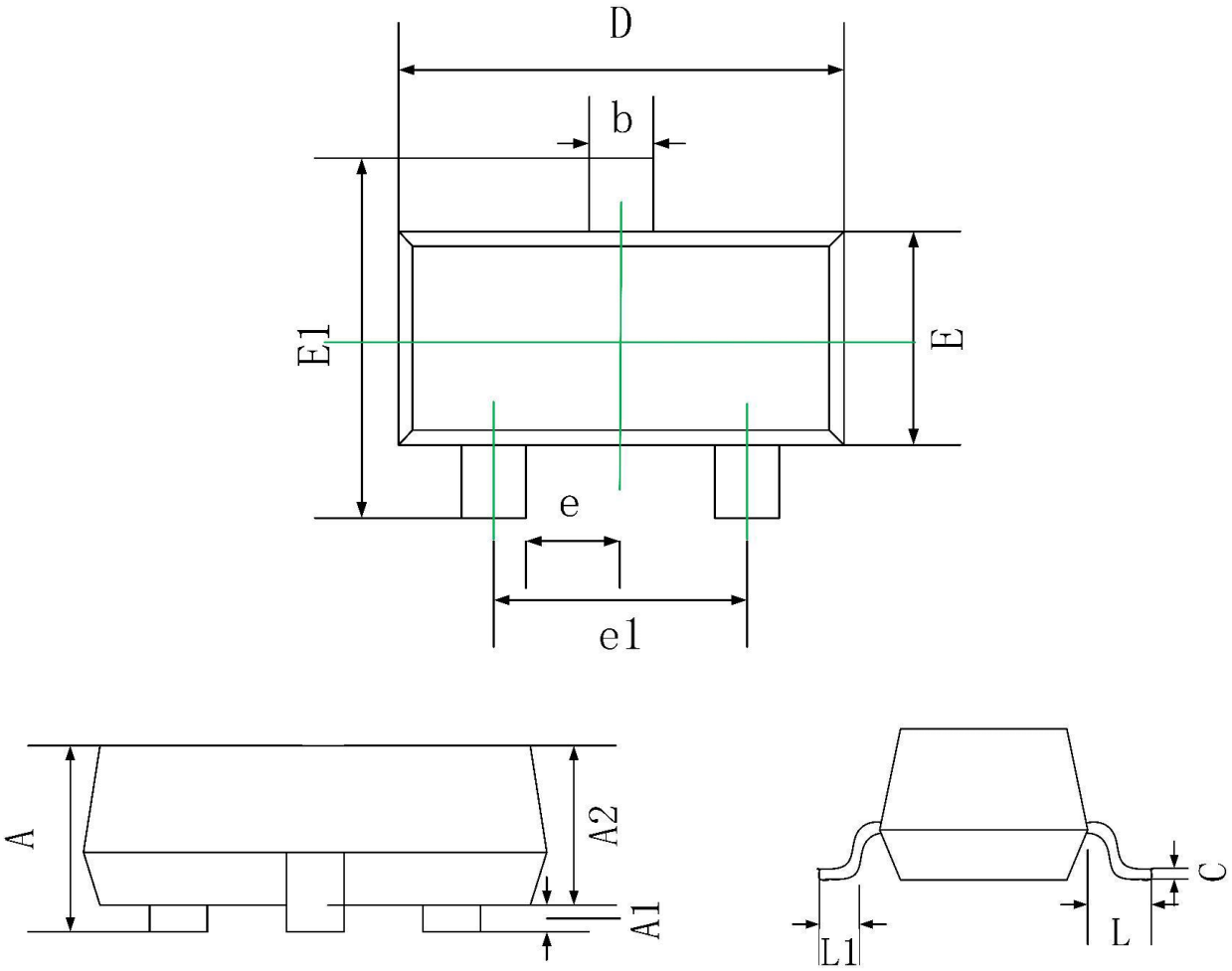


Fig. 12. Critical rate of rise of off-state voltage as a function of junction temperature; typical values



SOT-23 Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.900	1.150	0.035	0.045
A1	0.000	0.100	0.000	0.004
A2	0.900	1.050	0.035	0.041
b	0.300	0.500	0.012	0.020
c	0.080	0.150	0.003	0.006
D	2.800	3.000	0.110	0.118
E	1.200	1.400	0.047	0.055
E1	2.250	2.550	0.089	0.100
e	0.950 TYP.		0.037 TYP.	
e1	1.800	2.000	0.071	0.079
L	0.550 REF.		0.022 REF.	
L1	0.300	0.500	0.012	0.020