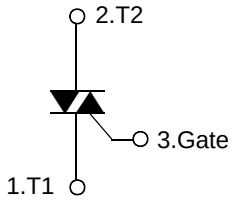
Bi-Directional Triode Thyristor

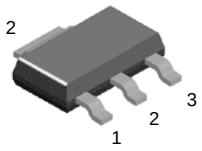
Symbol



Features

- ◆ Repetitive Peak Off-State Voltage : 600V
- ◆ R.M.S On-State Current ($I_{T(RMS)}$= 2 A)
- ◆ High Commutation dv/dt (3-Quadrant)
- ◆ Surface Mount Package

SOT-223



General Description

This device is suitable for low power AC switching application, phase control application such as fan speed and temperature modulation control, lighting control and static switching relay.

Absolute Maximum Ratings (T_J = 25°C unless otherwise specified)

Symbol	Parameter	Condition	Ratings	Units
V_{DRM}	Repetitive Peak Off-State Voltage	Sine wave, 50 to 60 Hz, Gate open	600	V
$I_{T(RMS)}$	R.M.S On-State Current	T_C =77 °C, Full Sine wave	2	A
I_{TSM}	Surge On-State Current	One Cycle, 50Hz/60Hz, Peak, Non-Repetitive	20/22	A
I^2t	I^2t for Fusing	tp = 10ms	2	A^2s
P_{GM}	Peak Gate Power Dissipation	T_C = 77 °C, Pulse width ≤ 1.0us	5	W
$P_{G(AV)}$	Average Gate Power Dissipation	Over any 20ms period	0.5	W
I_{GM}	Peak Gate Current	tp = 20us, T_J=125°C	2	A
V_{GM}	Peak Gate Voltage	tp = 20us, T_J=125°C	5	V
T_J	Operating Junction Temperature		- 40 ~ 125	°C
T_{STG}	Storage Temperature		- 40 ~ 150	°C
	Mass		0.11	g

Electrical Characteristics

Symbol	Items		Conditions	Ratings			Unit
				Min.	Typ.	Max.	
I_{DRM}	Repetitive Peak Off-State Current		$V_D = V_{DRM}$, Single Phase, Half Wave T_J = 125 °C	—	—	0.5	mA
V_{TM}	Peak On-State Voltage		I_T = 2.1 A, Inst. Measurement	—	—	1.6	V
I^+_{GT1}	Ⅰ	Gate Trigger Current	V_D = 6 V, R_L=10 Ω	—	—	20	mA
I^-_{GT1}	Ⅱ			—	—	20	
I^-_{GT3}	Ⅲ			—	—	20	
V^+_{GT1}	Ⅰ	Gate Trigger Voltage	V_D = 6 V, R_L=10 Ω	—	—	1.5	V
V^-_{GT1}	Ⅱ			—	—	1.5	
V^-_{GT3}	Ⅲ			—	—	1.5	
V_{GD}	Non-Trigger Gate Voltage		T_J = 125 °C, V_D = 1/2 V_{DRM}	0.2	—	—	V
dv/dt	Critical Rate of Rise Off-State Voltage		T_J = 125 °C, V_D=2/3 V_{DRM} exponential waveform, gate open circuit	1000	—	—	V/μs
(dv/dt)c	Critical Rate of Rise Off-State Voltage at Commutation		T_J = 125 °C, [di/dt]c = -0.75 A/ms, V_D=2/3 V_{DRM}	5.0	—	—	V/μs
I_H	Holding Current			—	5	—	mA
$R_{th(j-sp)}$	Thermal Impedance		Junction to solder point	—	—	15	°C/W
$R_{th(j-a)}$	Thermal Impedance (pcb mounted)		Junction to Ambient(minimum footprint)	—	—	156	°C/W
			Junction to Ambient(pad area as in fig 11.)	—	—	70	°C/W

※ Notes :

1. Pulse Width ≤ 300us , Duty cycle ≤ 2%

Fig 1. Gate Characteristics

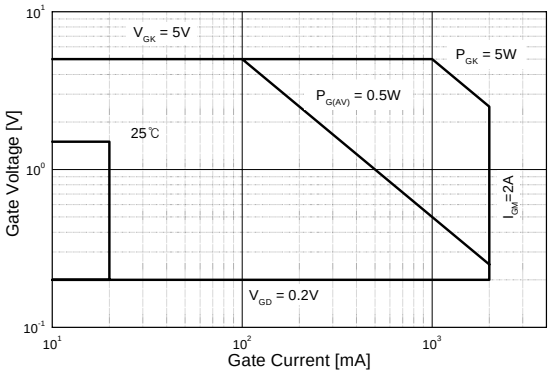


Fig 2. On-State Voltage

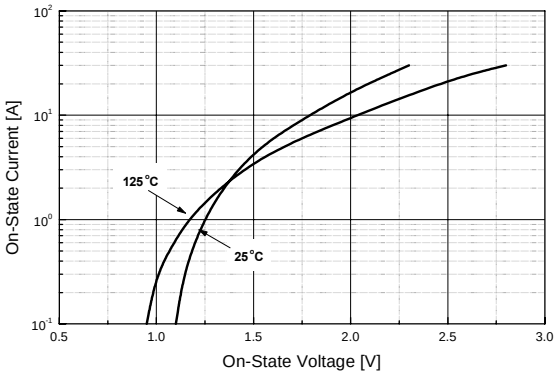


Fig 3. On State Current vs. Maximum Power Dissipation

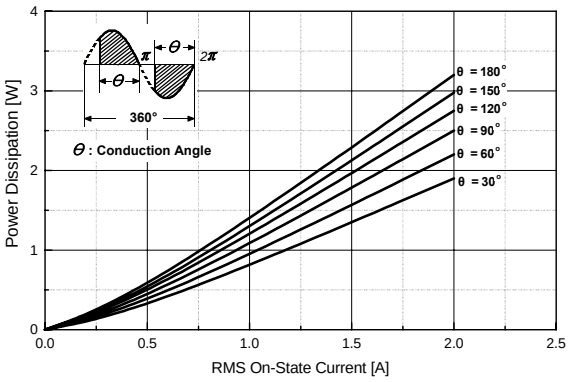


Fig 4. On State Current vs. Allowable Case Temperature

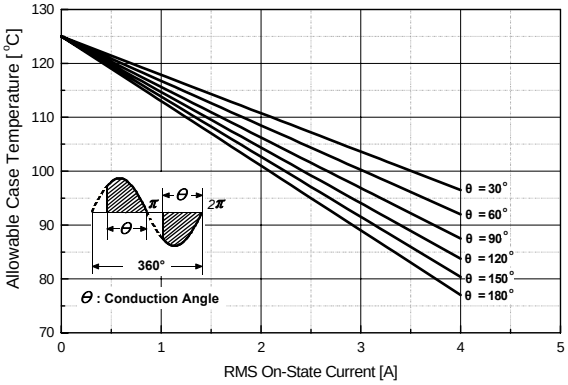


Fig 5. Surge On-State Current Rating (Non-Repetitive)

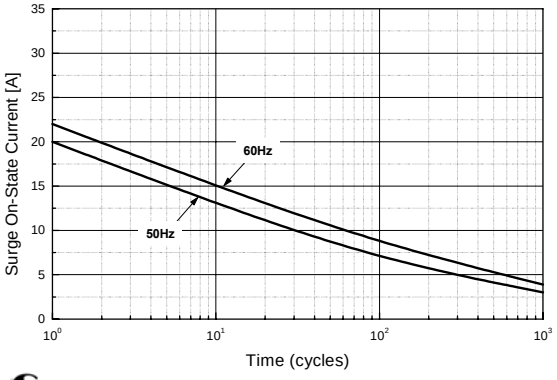


Fig 6. Gate Trigger Voltage vs. Junction Temperature

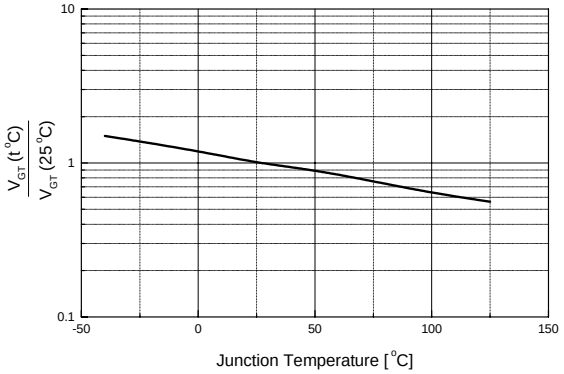


Fig 7. Gate Trigger Current vs. Junction Temperature

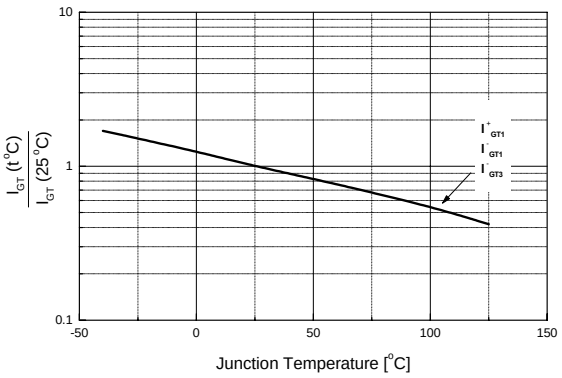


Fig 8. Transient Thermal Impedance

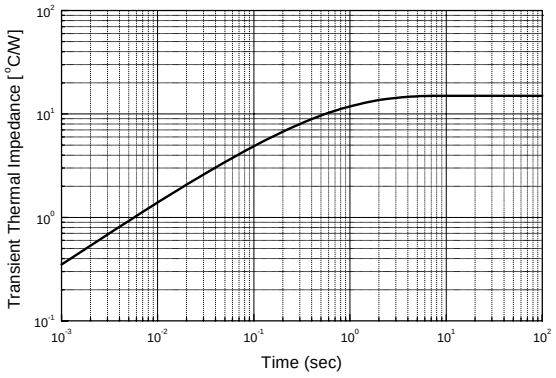
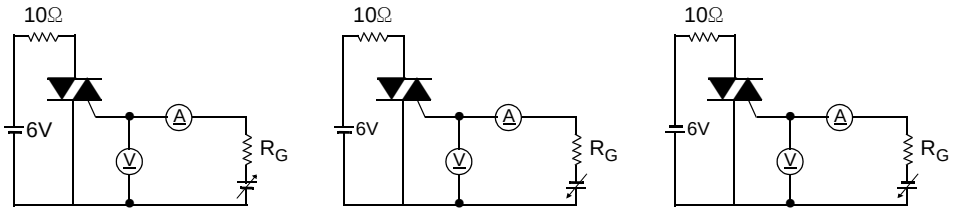


Fig 9. Gate Trigger Characteristics Test Circuit



Mounting Instructions

Dimensions in mm.

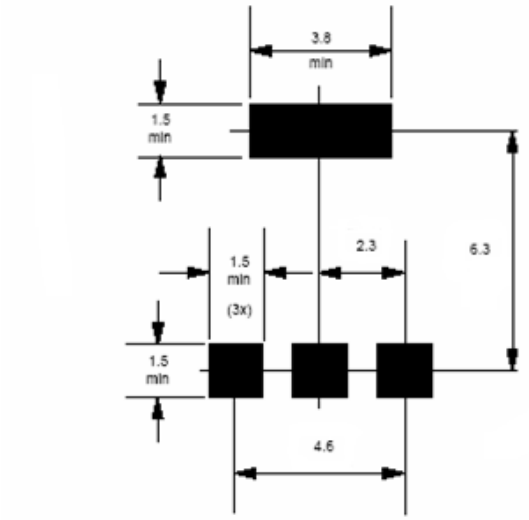


Fig 10. Soldering pattern for surface mounting SOT-223

Printed Circuit Board

Dimensions in mm.

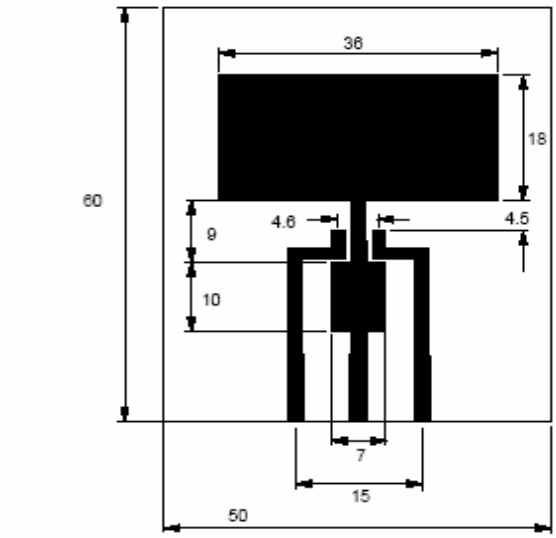


Fig 11. PCB for thermal resistance and power rating for SOT-223 (PCB; FR4 epoxy glass-1.6mm thick, copper laminate-35um thick)

SOT-223 Package Dimension

Dim.	mm			Inch		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A			1.80			0.071
A1	0.02		0.1	0.0008		0.004
B	0.60	0.70	0.85	0.024	0.027	0.034
B1	2.90	3.00	3.15	0.114	0.118	0.124
C	0.24	0.26	0.35	0.009	0.010	0.014
D	6.30	6.50	6.70	0.248	0.256	0.264
e		2.3			0.090	
e1		4.6			0.181	
E	3.30	3.50	3.70	0.130	0.138	0.146
H	6.70	7.00	7.30	0.264	0.276	0.287
V	10° Max