

Bi-Directional Triode Thyristor

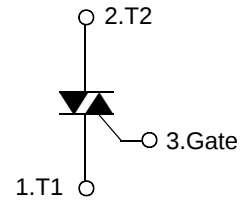
Features

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

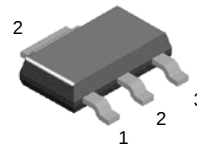
General Description

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.

Symbol



SOT-223



Absolute Maximum Ratings ($T_J = 25^\circ\text{C}$ 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	$T_C = 77^\circ\text{C}$, Full Sine wave	2	A
I_{TSM}	Surge On-State Current	One Cycle, 50Hz/60Hz, Peak, Non-Repetitive	20/22	A
I_t^2	I_t^2 for Fusing	$t_p = 10\text{ms}$	2	A^2s
P_{GM}	Peak Gate Power Dissipation	$T_C = 77^\circ\text{C}$, Pulse width $\leq 1.0\mu\text{s}$	5	W
$P_{G(AV)}$	Average Gate Power Dissipation	Over any 20ms period	0.5	W
I_{GM}	Peak Gate Current	$t_p = 20\mu\text{s}$, $T_J = 125^\circ\text{C}$	2	A
V_{GM}	Peak Gate Voltage	$t_p = 20\mu\text{s}$, $T_J = 125^\circ\text{C}$	5	V
T_J	Operating Junction Temperature		- 40 ~ 125	$^\circ\text{C}$
T_{STG}	Storage Temperature		- 40 ~ 150	$^\circ\text{C}$
	Mass		0.11	g

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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 $\leq 300\mu\text{s}$, Duty cycle $\leq 2\%$



Fig 1. Gate Characteristics

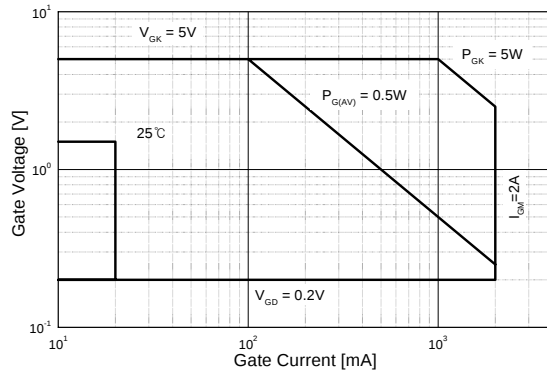


Fig 2. On-State Voltage

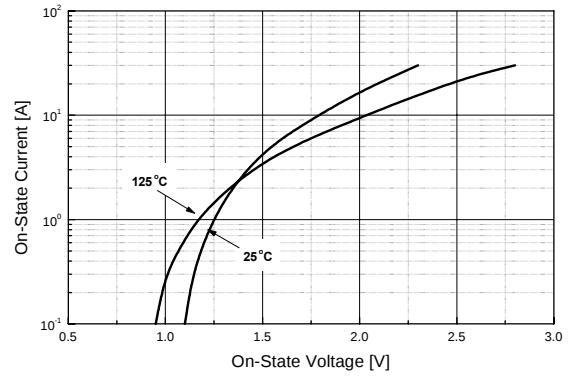


Fig 3. On State Current vs. Maximum Power Dissipation

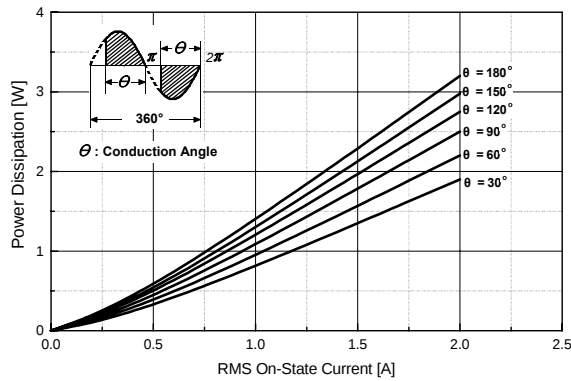


Fig 4. On State Current vs. Allowable Case Temperature

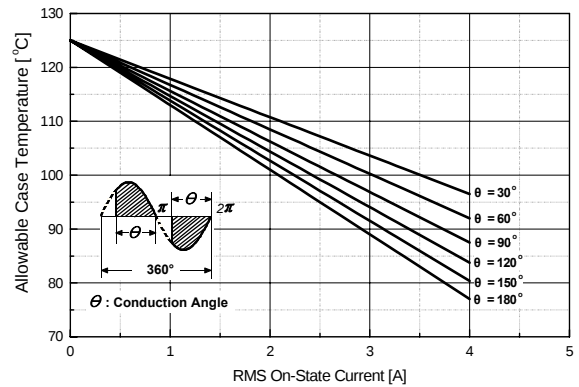


Fig 5. Surge On-State Current Rating (Non-Repetitive)

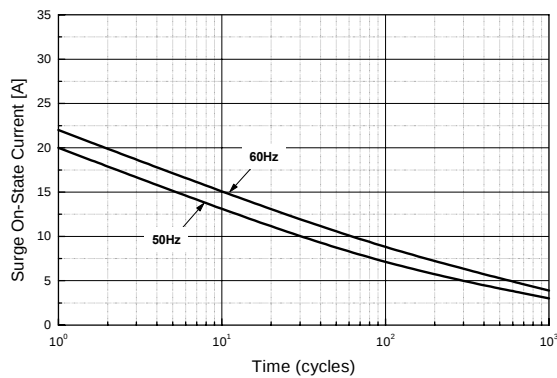
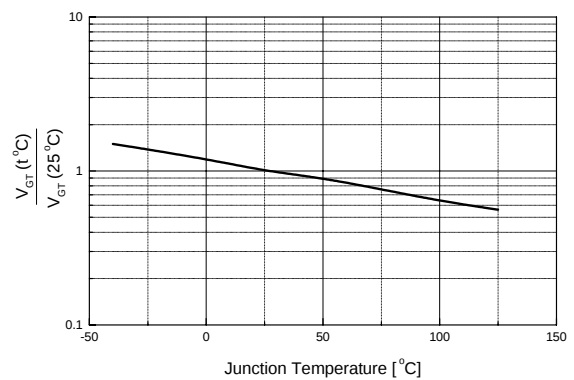


Fig 6. Gate Trigger Voltage vs. Junction Temperature



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Fig 7. Gate Trigger Current vs. Junction Temperature

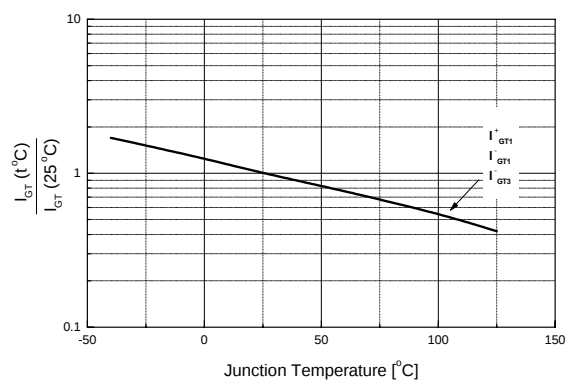


Fig 8. Transient Thermal Impedance

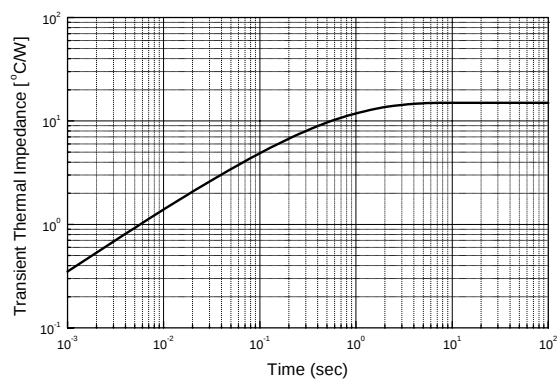
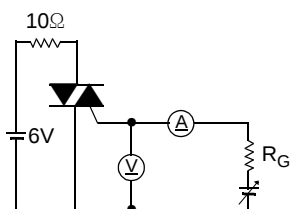
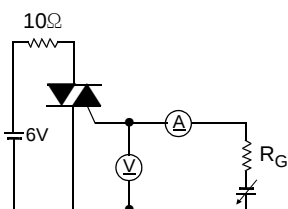


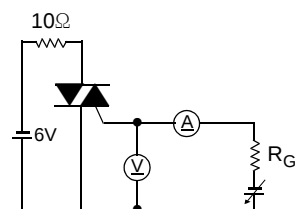
Fig 9. Gate Trigger Characteristics Test Circuit



Test Procedure I

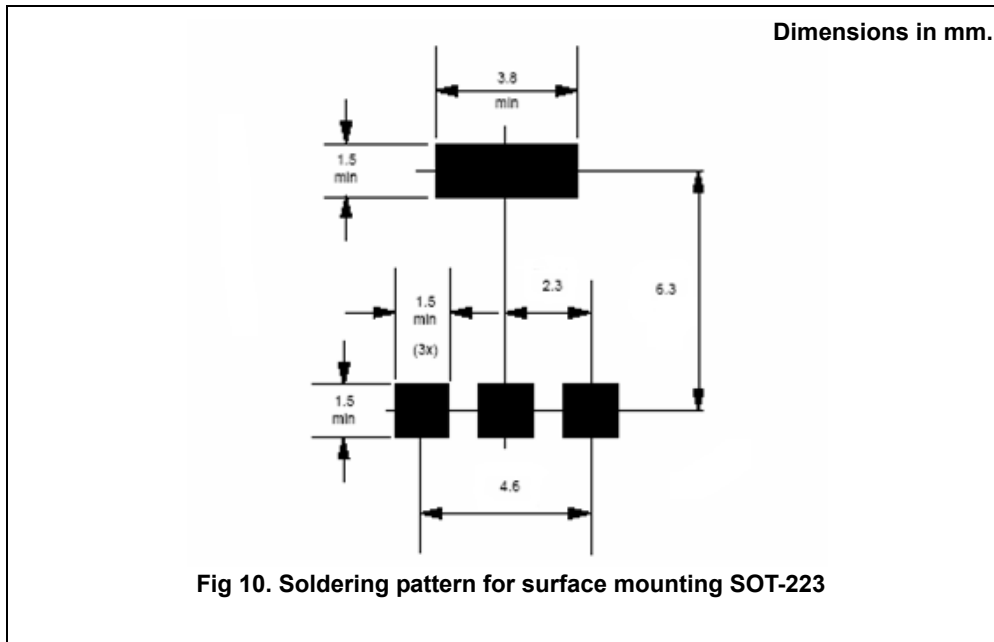


Test Procedure II

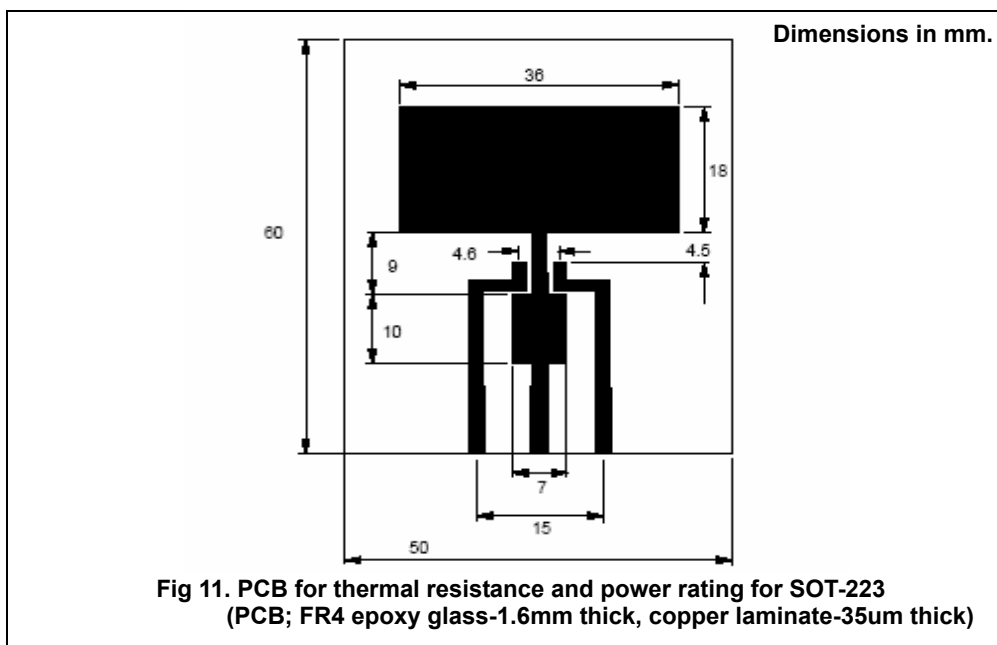


Test Procedure III

Mounting Instructions



Printed Circuit Board



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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					

