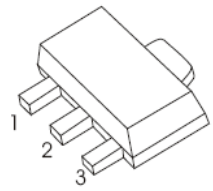
Sensitive Gate Silicon Controlled Rectifiers

SOT-89





Features

- Repetitive Peak Off-State Voltage : 600V
- R.M.S On-State Current ($I_{T(RMS)}$= 0.8 A)
- Low On-State Voltage (1.2V(Typ.)@ I_{TM})
- Available with tape & reel

General Description

Sensitive triggering SCR is suitable for the application where gate current limited such as small motor control, gate driver for large SCR, sensing and detecting circuits.

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

Symbol	Parameter	Condition	Ratings	Units
V_{DRM}	Repetitive Peak Off-State Voltage		600	V
$I_{T(AV)}$	Average On-State Current	Half Sine Wave : T_C = 112 °C	0.5	A
$I_{T(RMS)}$	R.M.S On-State Current	All Conduction Angle	0.8	A
I_{TSM}	Surge On-State Current	1/2 Cycle, 60Hz, Sine Wave Non-Repetitive	10	A
I^2t	I^2t for Fusing	t = 8.3ms	0.415	A^2S
P_{GM}	Forward Peak Gate Power Dissipation		2	W
$P_{G(AV)}$	Forward Average Gate Power Dissipation		0.1	W
I_{FGM}	Forward Peak Gate Current		1	A
V_{RGM}	Reverse Peak Gate Voltage		5.0	V
T_J	Operating Junction Temperature		- 40 ~ 125	°C
T_{STG}	Storage Temperature		- 40 ~ 150	°C

Electrical Characteristics (T_C = 25 °C unless otherwise noted)

Symbol	Items	Conditions	Ratings			Unit
			Min.	Typ.	Max.	
I_{DRM}	Repetitive Peak Off-State Current	V_{AK} = V_{DRM} or V_{RRM} ; R_{GK} = 1000 Ω T_C = 25 °C T_C = 125 °C	— —	— —	10 200	μA
V_{TM}	Peak On-State Voltage (1)	(I_{TM} = 1 A, Peak)	—	1.2	1.7	V
I_{GT}	Gate Trigger Current (2)	V_{AK} = 6 V, R_L=100 Ω T_C = 25 °C T_C = - 40 °C	— —	— —	200 500	μA
V_{GT}	Gate Trigger Voltage (2)	V_D = 7 V, R_L=100 Ω T_C = 25 °C T_C = - 40 °C	— —	— —	0.8 1.2	V
V_{GD}	Non-Trigger Gate Voltage (1)	V_{AK} = 12 V, R_L=100 Ω T_C = 125 °C	0.2	—	—	V
dv/dt	Critical Rate of Rise Off-State Voltage	V_D = Rated V_{DRM} , Exponential wave-form , R_{GK} = 1000 Ω T_J = 125 °C	500	800	—	V/μs
di/dt	Critical Rate of Rise On-State Current	I_{PK} = 20A ; P_W = 10μs ; di_G/dt = 1A/μs Igt = 20mA	—	—	50	A/μs
I_H	Holding Current	V_{AK} = 12 V, Gate Open Initiating Curent = 20mA T_C = 25 °C T_C = - 40 °C	— —	2 —	5.0 10	mA
$R_{th(j-c)}$	Thermal Impedance	Junction to case	—	—	15	°C/W
$R_{th(j-a)}$	Thermal Impedance	Junction to Ambient	—	—	125	°C/W

※ Notes :

1. Pulse Width ≤ 1.0 ms , Duty cycle ≤ 1%
2. Does not include R_{GK} in measurement.

■ Typical Characteristics

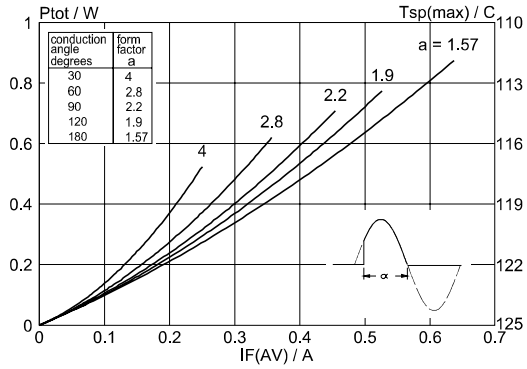


Fig.1. Maximum on-state dissipation, P_{tot}, versus average on-state current, $I_{T(AV)}$, where a = form factor = $I_{T(RMS)}/I_{T(AV)}$.

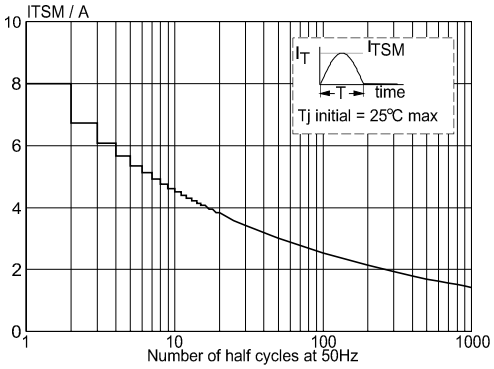


Fig.4. Maximum permissible non-repetitive peak on-state current I_{TSM}, versus number of cycles, for sinusoidal currents, f = 50 Hz.

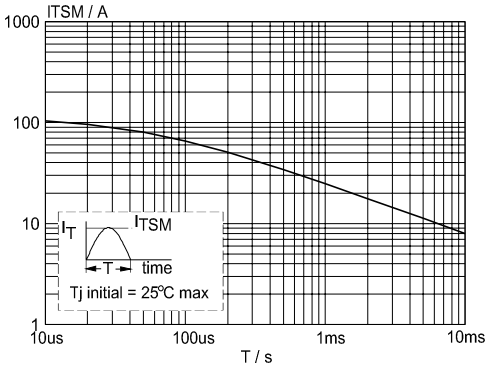


Fig.2. Maximum permissible non-repetitive peak on-state current I_{TSM}, versus pulse width t_p, for sinusoidal currents, $t_p \leq 10ms$.

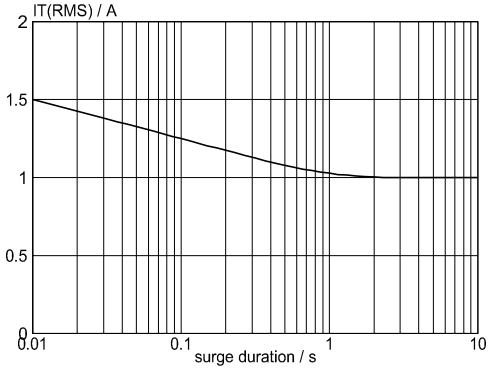


Fig.5. Maximum permissible repetitive rms on-state current $I_{T(RMS)}$, versus surge duration, for sinusoidal currents, f = 50 Hz; $T_{sp} \leq 112^{\circ}C$.

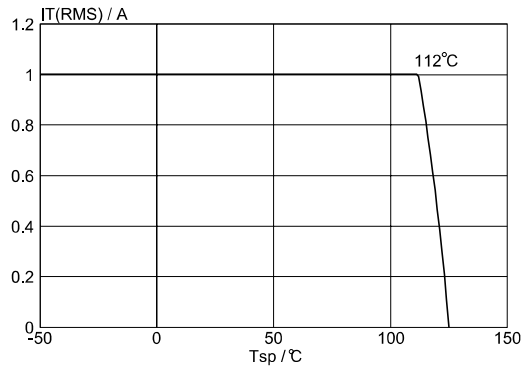


Fig.3. Maximum permissible rms current $I_{T(RMS)}$, versus solder point temperature T_{sp}.

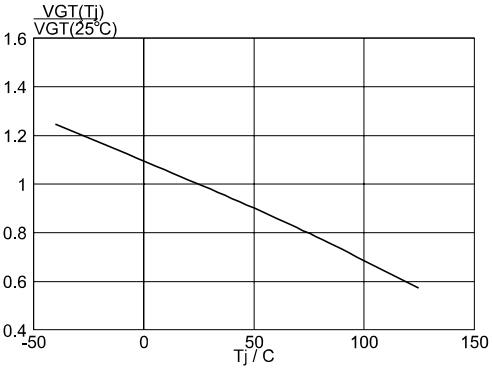


Fig.6. Normalised gate trigger voltage $V_{GT}(T_j)/V_{GT}(25^{\circ}C)$, versus junction temperature T_j.

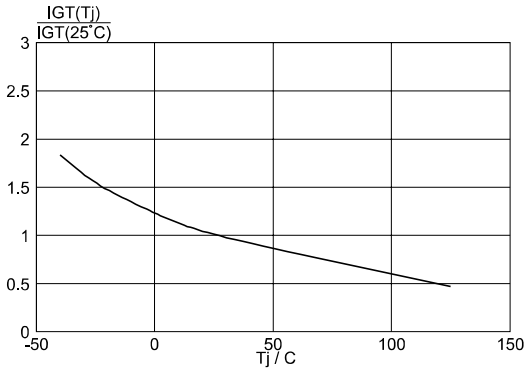


Fig.7. Normalised gate trigger current $I_{GT}(T_j)/ I_{GT}(25˚C)$, versus junction temperature T_j.

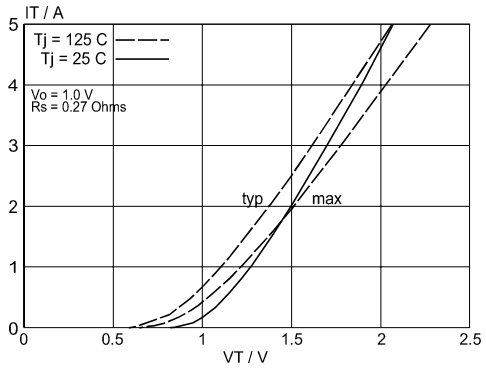


Fig.10. Typical and maximum on-state characteristic.

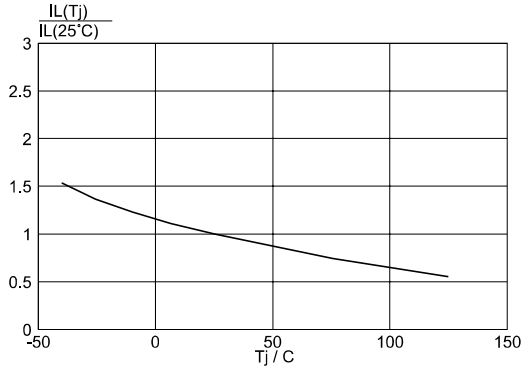


Fig.8. Normalised latching current $I_L(T_j)/ I_L(25˚C)$, versus junction temperature T_j, R_{GK} = 1 kΩ.

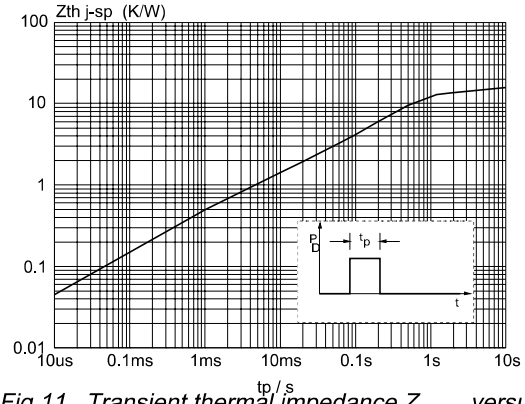


Fig.11. Transient thermal impedance $Z_{th\ j\text{-}sp}$, versus pulse width t_p.

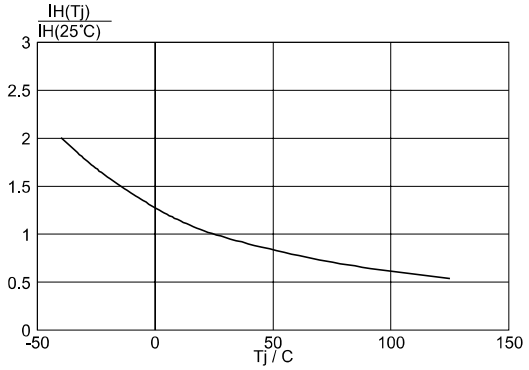


Fig.9. Normalised holding current $I_H(T_j)/ I_H(25˚C)$, versus junction temperature T_j, R_{GK} = 1 kΩ.

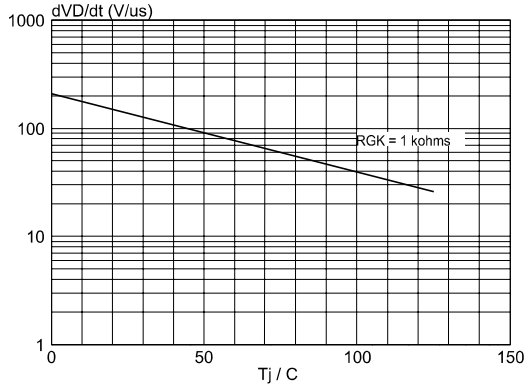


Fig.12. Typical, critical rate of rise of off-state voltage, dV_D/dt versus junction temperature T_j.