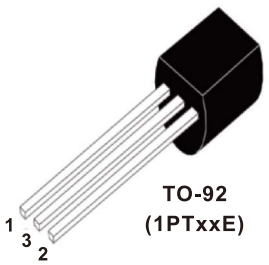
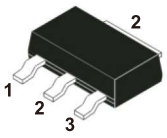
Sensitive gate SCRs, 1A

Main Features

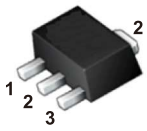
Symbol	Value	Unit
$I_{T(RMS)}$	1	A
V_{DRM}/V_{RRM}	600 to 800	V
I_{GT}	10 to 200	µA



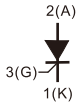
TO-92
(1PTxxE)



SOT-223
(1PTxxS)



SOT-89
(1PTxxN)



DESCRIPTION

Thanks to highly sensitive triggering levels, the 1PT gate current is limited, such as capacitive discharge ignitions, motor control in kitchen aids, overvoltage crowbar protection in low power supplies among others. Available in through-hole or surface-mount packages, they provide an optimized performance in a limited space area.

The 1PT SCR series provide high dV/dt rate with strong resistance to electromagnetic interface. They are especially recommended for use on residual current circuit breaker, straight hair dryer and igniter etc.

ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	TEST CONDITIONS		VALUE	UNIT
RMS on-state current full sine wave (180° conduction angle)	$I_{T(RMS)}$	TO-92	T_C = 50 °C	1	A
		SOT-89	T_C = 60 °C		
		SOT-223	T_C = 75 °C		
Average on-state current (180° conduction angle)	$I_{T(AV)}$	TO-92	T_C = 50 °C	0.6	A
		SOT-89	T_C = 60 °C		
		SOT-223	T_C = 75 °C		
Non repetitive surge peak on-state current (full cycle, T_j initial = 25°C)	I_{TSM}	F =50 Hz	T = 20 ms	12	A
		F =60 Hz	T = 16.7 ms	12.6	
I^2t Value for fusing	I^2t	t_p = 10 ms		0.72	A^2s
Critical rate of rise of on-state current $I_G = 2xI_{GT}$, $t_r \leq 100ns$	dI/dt	F = 60 Hz	T_J = 110°C	50	A/µs
Peak gate current	I_{GM}	T_p = 20 µs	T_J = 110°C	0.3	A
Forward peak gate power	P_{GM}	T_A=25°C, Pulse width ≤ 0.1µs		0.5	W
Average gate power dissipation	$P_{G(AV)}$	T_J =110°C		0.1	W
Repetitive peak off-state voltage	V_{DRM}	T_J =25°C		600 and 800	V
Repetitive peak reverse voltage	V_{RRM}				
Storage temperature range	T_{stg}			- 40 to + 150	°C
Operating junction temperature range	T_j			- 40 to + 110	

ELECTRICAL SPECIFICATIONS (T_J = 25 ºC unless otherwise specified)

SYMBOL	TEST CONDITIONS			1PTxxxx	Unit
I_{GT}	V_D = 12V, R_L = 100Ω		Min.	10	μA
			Max.	200	
V_{GT}			Max.	0.8	V
V_{GD}	$V_D = V_{DRM}$, R_L = 3.3KΩ R_{GK} = 1KΩ, T_j = 110°C		Min.	0.2	V
I_H	I_T = 50mA, R_{GK} = 1KΩ		Max.	5	mA
I_L	I_G = 1mA, R_{GK} = 1KΩ		Max.	6	mA
dV/dt	V_D = 67% V_{DRM}, R_{GK} = 1KΩ, T_j = 110°C		TYP.	200	V/μs
V_{TM}	I_T = 2.0A, t_P = 380 μs	T_J = 25°C	Max.	1.7	V
I_{DRM}	$V_D=V_{DRM}$, $V_R=V_{RRM}$	T_J = 25°C	Max.	5	μA
I_{RRM}	R_{GK} = 220Ω	T_J = 110°C	Max.	0.1	mA
V_{to}	Threshold voltage	T_J = 110°C	Max.	0.85	V
R_d	Dynamic resistance	T_J = 110°C	Max.	60	MΩ

THERMAL RESISTANCE

SYMBOL	Parameter		VALUE	UNIT
$R_{th(j-c)}$	Junction to case (AC)	TO-92	70	°C/W
		SOT-89	38	°C/W
		SOT-223	25	°C/W

PRODUCT SELECTOR

PART NUMBER	VOLTAGE (xx)		SENSITIVITY	PACKAGE
	600 V	800 V		
1PTxxE-03	V	V	10~30 μA	TO-92
1PTxxE-05	V	V	20~50 μA	TO-92
1PTxxE-06	V	V	30~60 μA	TO-92
1PTxxE-08	V	V	50~80 μA	TO-92
1PTxxE-S	V	V	70~200 μA	TO-92
1PTxxE	V	V	10~200 μA	TO-92
1PTxxS	V	V	10~200 μA	SOT-223
1PTxxN	V	V	10~200 μA	SOT-89

ORDERING INFORMATION

ORDERING TYPE	MARKING	PACKAGE	WEIGHT	BASE Q'TY	DELIVERY MODE
1PTxxE-yy	1PTxxE-yy	TO-92	0.23g	500	Bag
1PTxxS	1PTxxS	SOT-223	0.24g	4000	7"T&R
1PTxxN	1PTxxN	SOT-89	0.2g	4000	7"T&R

Note: xx = voltage, yy=sensitivity

ORDERING INFORMATION SCHEME

1 PT 06 E - S

Current
1 = 1A, $I_{T(RMS)}$

SCR series

Voltage Code
06 = 600V
08 = 800V

Package type
E = TO-92
N = SOT-89
S = SOT-223

IGT Sensitivity
03 = 10~30 μA
05 = 20~50 μA
06 = 30~60 μA
08 = 50~80 μA
S = 70~200 μA
Blank = 10~200 μA

Fig.1 Maximum power dissipation versus RMS on-state current

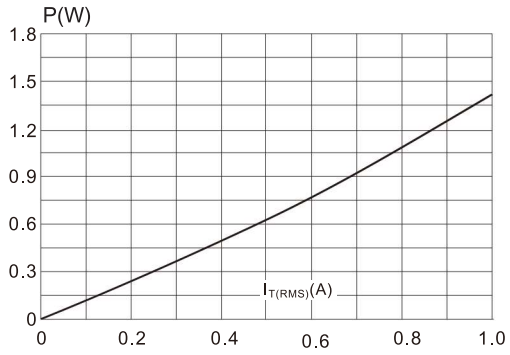


Fig.2 RMS on-state current versus case temperature (full cycle)

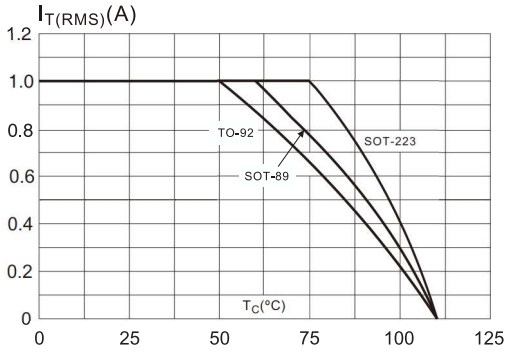


Fig.3 On-state characteristics (maximum values)

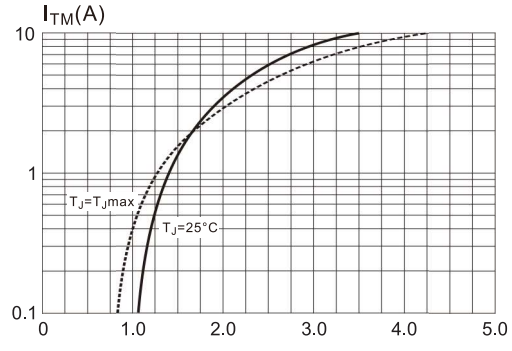


Fig.4 Surge peak on-state current versus number of cycles

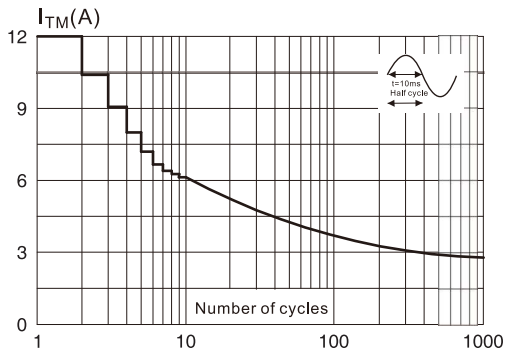


Fig.5 Non-repetitive surge peak on-state current for a sinusoidal pulse with width tp<10ms, and corresponding value of I^2t

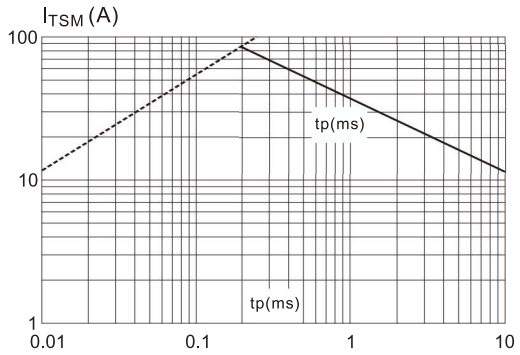
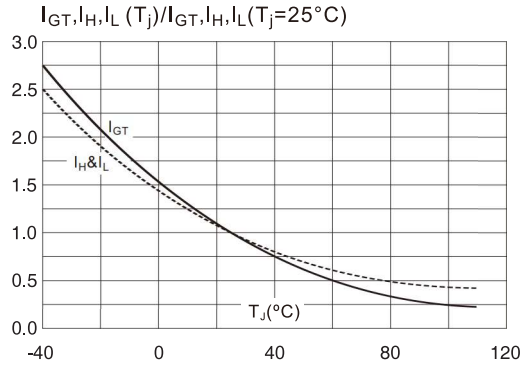
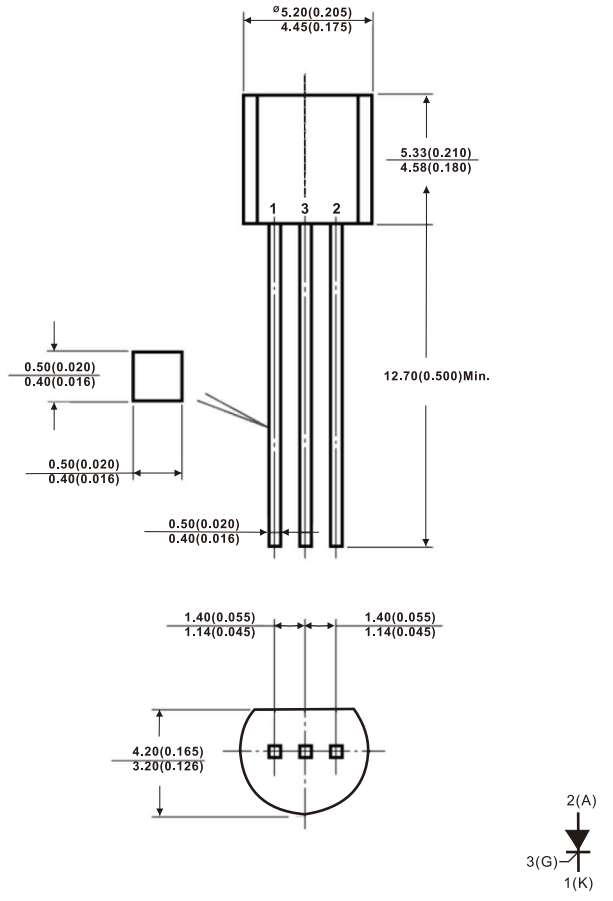


Fig.6 Relative variation of gate trigger current, holding current and latching current versus junction temperature (typical values)



Case Style

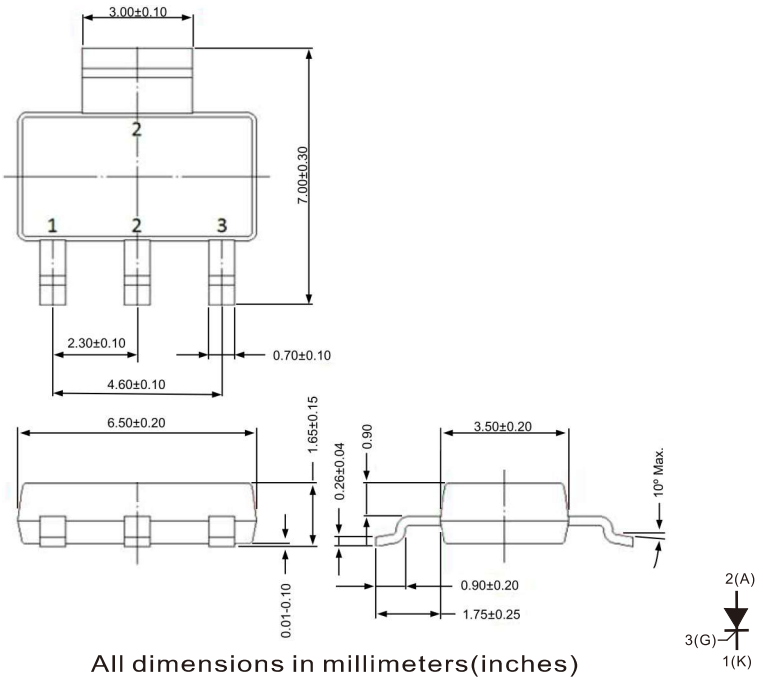
TO-92



All dimensions in millimeters(inches)

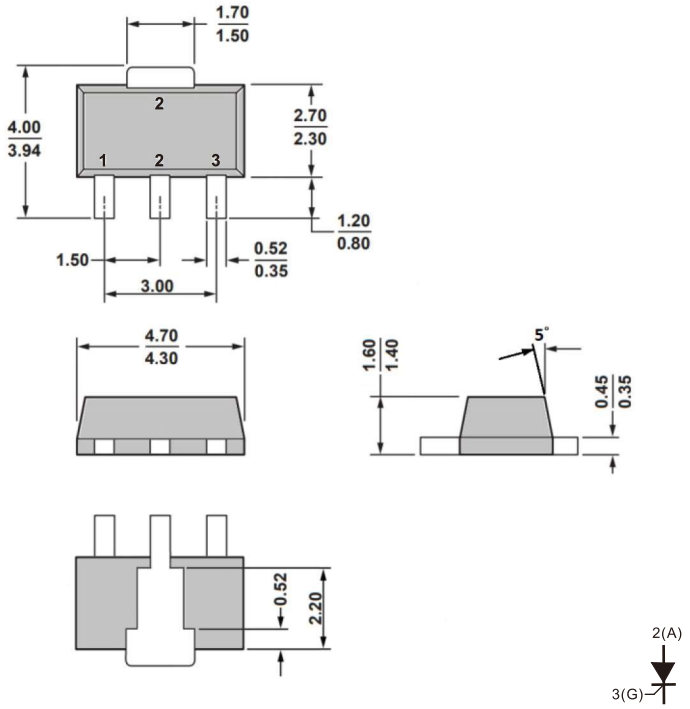
Case Style

SOT-223



All dimensions in millimeters(inches)

SOT-89



All dimensions in millimeters(inches)