

SENSITIVE GATE SCR

FEATURES

- $I_T(\text{RMS}) = 1 \text{ A}$
- $V_{\text{DRM}} = 400 \text{ V} / 600 \text{ V} / 800 \text{ V}$
- $I_{\text{GT}} \leq 200 \mu\text{A}$

DESCRIPTION

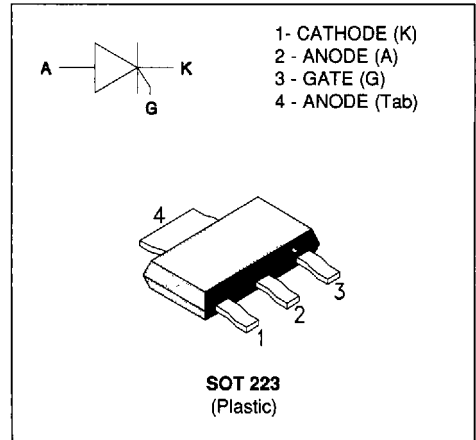
The TS120F high voltage series of Silicon Controlled Rectifiers use a high performance planar diffused PNPn, glass passivated sensitive gate technology. Packaged in SOT 223, suitable for surface mounting.

These parts are intended for general purpose switching and phase control applications.

ABSOLUTE RATINGS (limiting values)

Symbol	Parameter	Value	Unit
$I_T(\text{RMS})$	RMS on-state current Single phase circuit (180° conduction angle)	$T_{\text{tab}} = 95^\circ\text{C}$ 1	A
$I_T(\text{AV})$	Mean on-state current Single phase circuit (180° conduction angle)	$T_{\text{tab}} = 95^\circ\text{C}$ 0.65	A
I_{TSM}	Non repetitive surge peak on-state current (T_j initial = 25°C)	$t_p = 8.3 \text{ ms}$	7.5
		$t_p = 10 \text{ ms}$	7
I^2t	I^2t Value for fusing	$t_p = 10 \text{ ms}$ 0.25	A ² s
di/dt	Critical rate of rise of on-state current $I_G = 10 \text{ mA}$ $di_G/dt = 0.1 \text{ A}/\mu\text{s}$.	50	A/ μs
T_{stg} T_j	Storage and operating junction temperature range	- 40, + 125 - 40, + 125	°C
T_l	Maximum lead temperature for soldering during 10s	260	°C

Symbol	Parameter	TS120			Unit
		-400F	-600F	-800F	
V_{DRM} V_{RRM}	Repetitive peak off-state voltage $T_j = 125^\circ\text{C}$ $R_{\text{GK}} = 1\text{K}\Omega$	400	600	800	V



THERMAL RESISTANCES

Symbol	Parameter	Value	Unit
Rth (j - t)	Junction to tab for D.C	25	°C/W
Rth (j - a)	Junction to ambient with 5 cm ² copper surface under tab	60	

GATE CHARACTERISTICS (maximum values)

$P_{GM} = 2 \text{ W}$ ($t_p = 20 \mu\text{s}$) $P_G (AV) = 100 \text{ mW}$ $I_{FGM} = 1 \text{ A}$ ($t_p = 20 \mu\text{s}$) $V_{FGM} = 10 \text{ V}$ ($t_p = 20 \mu\text{s}$) $V_{RGM} = 5 \text{ V}$.

ELECTRICAL CHARACTERISTICS

Symbol	Test Conditions			Value	Unit	
I _{GT}	V _D =12V (DC) R _L =140Ω	T _J = 25°C	MAX	200	μA	
V _{GT}	V _D =12V (DC) R _L =140Ω	T _J = 25°C	MAX	0.8	V	
V _{GD}	V _D =V _{DRM} R _L =3.3kΩ R _{GK} = 1 KΩ	T _J = 125°C	MIN	0.1	V	
t _{gd}	V _D =V _{DRM} I _G = 10mA dI _G /dt = 0.15A/μs	T _J = 25°C	MAX	0.5	μs	
I _L	I _G =1mA R _{GK} = 1 KΩ	T _J = 25°C	TYP	6	mA	
			MAX	8		
I _H	I _T = 50mA R _{GK} = 1 KΩ	T _J = 25°C	TYP	4	mA	
			MAX	6		
V _{TM}	I _{TM} = 2A t _p = 380μs	T _J = 25°C	MAX	2.1	V	
I _{DRM} I _{RRM}	V _{DRM} Rated V _{RRM} Rated	TS120-400F	T _J = 125°C	MAX	0.1	mA
		TS120-600F			0.1	
		TS120-800F			0.5	
t _q	I _T = 2A V _R =35V V _D =67%V _{DRM} dI _T /dt=30A/μs R _{GK} = 1 KΩ	T _J = 125°C	MAX	200	μs	
dV/dt	Linear slope up to V _D =67%V _{DRM}	R _{GK} = 1 KΩ	T _J = 125°C	MIN	50	V/μs
		R _{GK} = 1 KΩ C _{GK} =4.7nF		MIN	500	

Fig.1 : Maximum average power dissipation versus average on-state current.

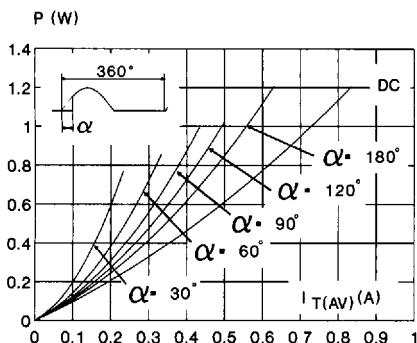


Fig.2 : Correlation between maximum average power dissipation and maximum allowable temperatures (T_{amb} and T_{tab}).

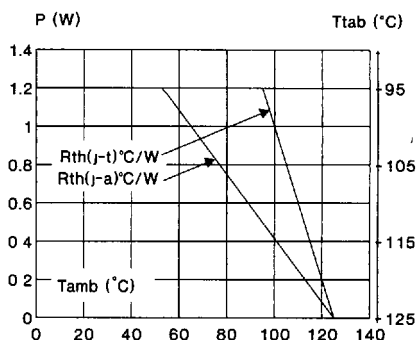


Fig.3 : Average on-state current versus tab temperature.

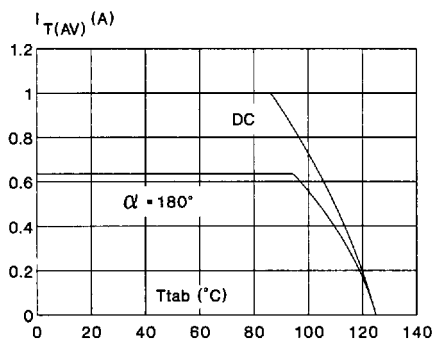


Fig.4 : Relative variation of holding current versus gate-cathode resistance (typical values).

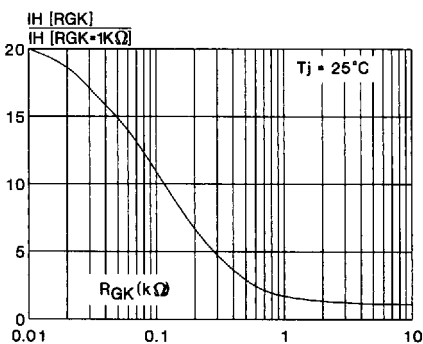


Fig.5 : Relative variation of gate trigger current and holding current versus junction temperature.

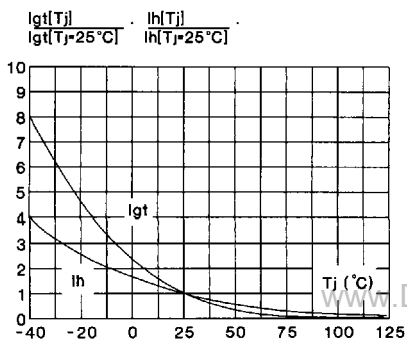


Fig.6 : Non Repetitive surge peak on-state current versus number of cycles.

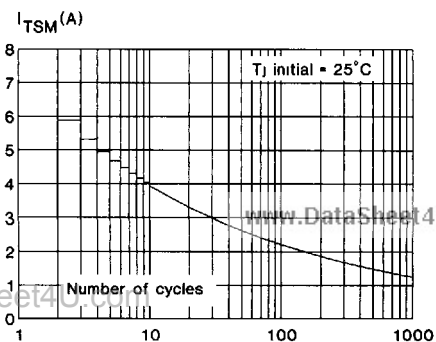


Fig.7 : Non repetitive surge peak on-state current for a sinusoidal pulse with width : $t \leq 10\text{ms}$, and corresponding value of I^2t .

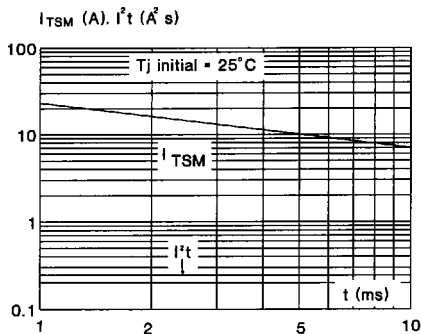


Fig.8 : On-state characteristics (maximum values).

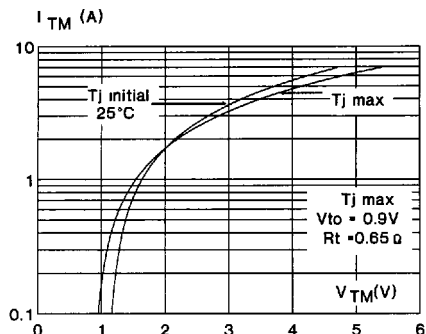


Fig.9 : Relative variation of dV/dt immunity versus gate-cathode capacitance (typical values).

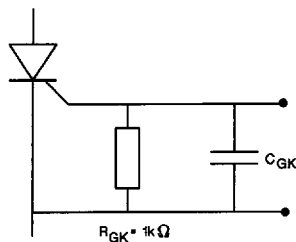
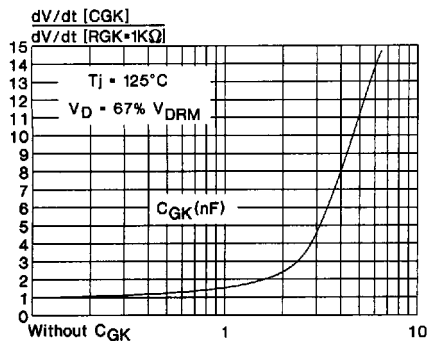
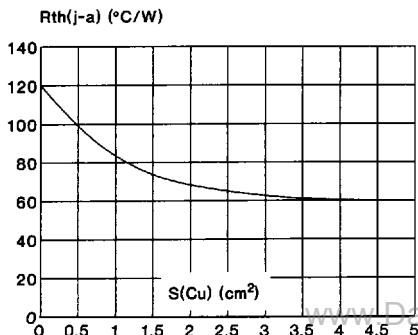
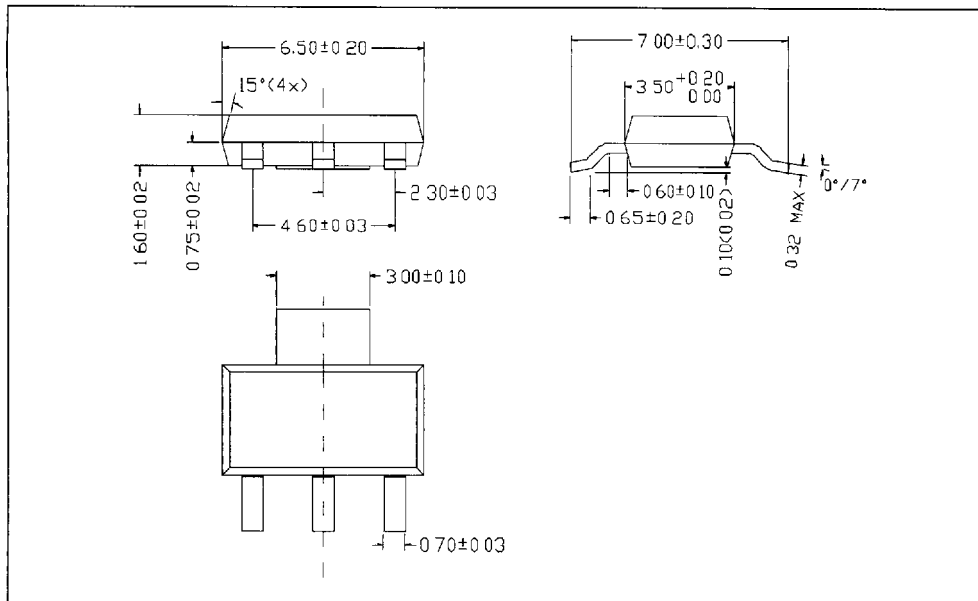


Fig.10 : Thermal resistance junction to ambient versus copper surface under tab.



PACKAGE MECHANICAL DATA (in millimeters)
SOT 223 Plastic



Cooling method : C
Marking : Type number
Weight : 0.11 g
Polarity : N A
Stud torque : N A