

THYRISTORS  
5P4SMA, 5P6SMA

5 A MOLD ISOLATED SCR

DESCRIPTION

The 5P4SMA and 5P6SMA are P gate all diffused mold type thyristor granted 5 A on-state average current ( $T_c = 94^\circ\text{C}$ ), with rated voltages up to 600 V.

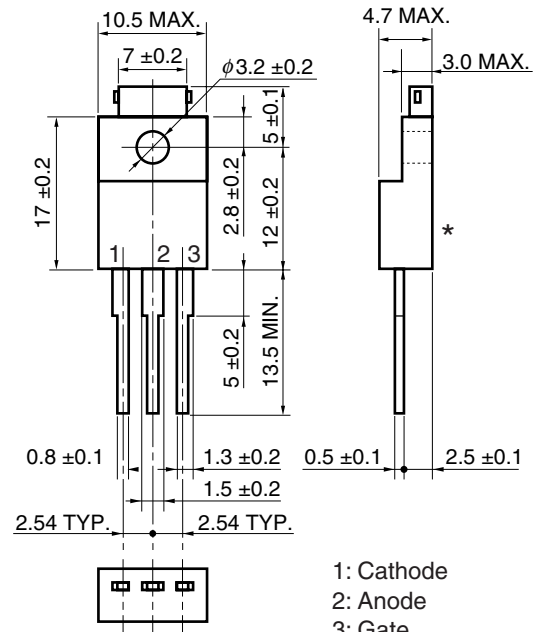
FEATURES

- Mold isolated plastic package
- 80 A surge current
- High voltage:  $V_{DRM}, V_{RRM} = 400\text{ V}$  (5P4SMA)  
 $V_{DRM}, V_{RRM} = 600\text{ V}$  (5P6SMA)

APPLICATIONS

- Motor speed control for household appliance
- Temperature control for heater and constant temperature box
- Constant voltage power source and battery charger
- Automotive application such as regulator
- Various solid state relay, etc.

★ PACKAGE DRAWING (Unit: mm)



★:  $T_c$  test bench-mark

Standard weight: 2 g

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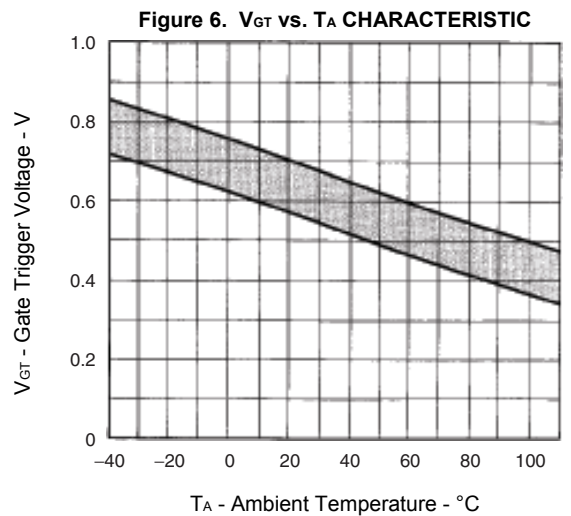
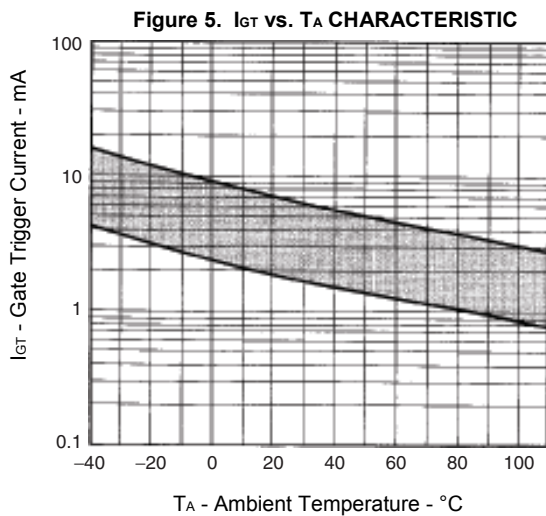
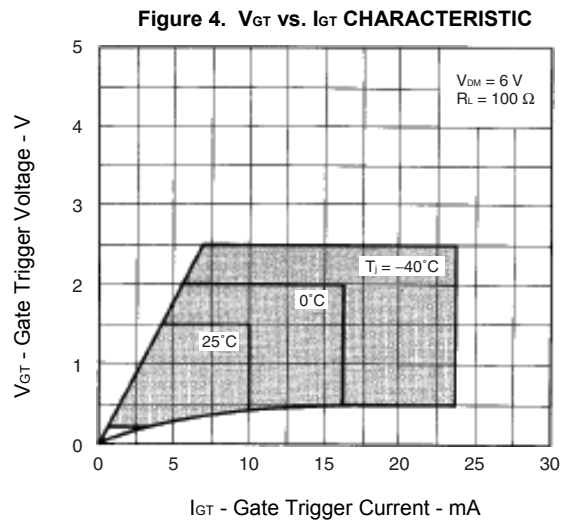
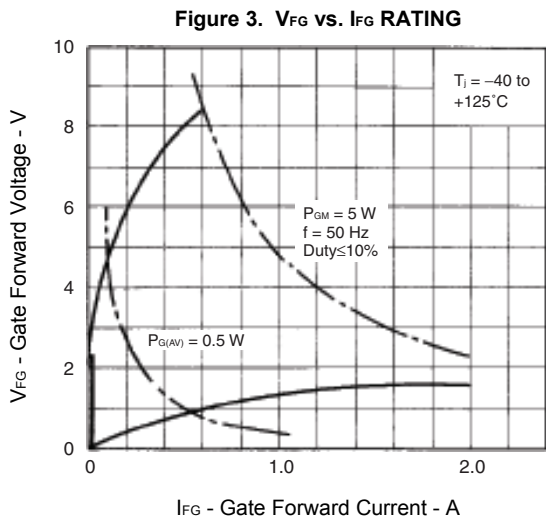
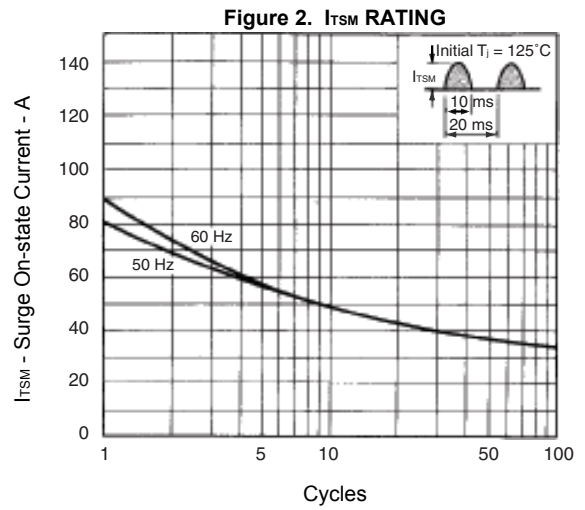
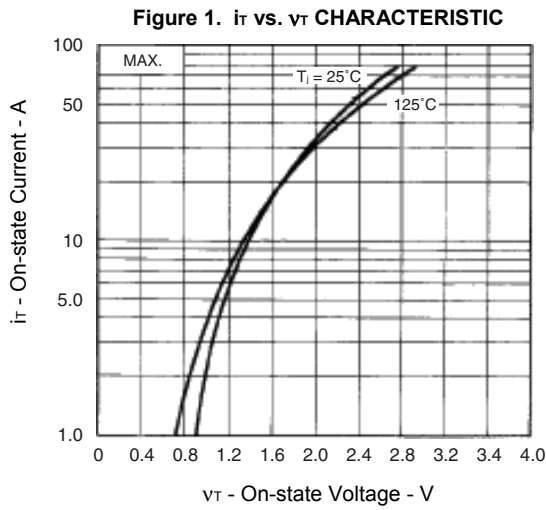
★ MAXIMUM RATINGS

Parameter	Symbol	5P4SMA	5P6SMA	Unit	Remarks
Non-repetitive Peak Reverse Voltage	$V_{RSM}$	500	700	V	–
Non-repetitive Peak Off-state Voltage	$V_{DSM}$	500	700	V	–
Repetitive Peak Reverse Voltage	$V_{RRM}$	400	600	V	–
Repetitive Peak Off-state Voltage	$V_{DRM}$	400	600	V	–
Average On-state Current	$I_{T(AV)}$	5 ( $T_C = 94^\circ\text{C}$ , single phase half wave, $\theta = 180^\circ$ )		A	Refer to <b>Figure 11</b> .
Effective On-state Current	$I_{T(RMS)}$	8		A	
Surge On-state Current	$I_{TSM}$	80 (50 Hz, sine half wave, 1 cycle) 88 (60 Hz, sine half wave, 1 cycle)		A	Refer to <b>Figure 2</b> .
Fusing Current	$\int i_t^2 dt$	28 (1 ms $\leq t \leq$ 10 ms)		A <sup>2</sup> s	–
Critical Rate Rise of On-state Current	$di/dt$	50		A/ $\mu\text{s}$	–
Peak Gate Power Dissipation	$P_{GM}$	5 ( $f \geq 50$ Hz, Duty $\leq 10\%$ )		W	Refer to <b>Figure 3</b> .
Average Gate Power Dissipation	$P_{G(AV)}$	0.5		W	
Peak Gate Forward Current	$I_{FGM}$	2 ( $f \geq 50$ Hz, Duty $\leq 10\%$ )		A	–
Peak Gate Reverse Voltage	$V_{RGM}$	10		V	–
Junction Temperature	$T_j$	–40~+125		°C	–
Storage Temperature	$T_{stg}$	–55~+150		°C	–

★ ELECTRICAL CHARACTERISTICS ( $T_j = 25^\circ\text{C}$ )

Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit	Remarks	
Repetitive Peak Reverse Current	$I_{RRM}$	$V_{RM} = V_{RRM}$	$T_j = 25^\circ\text{C}$	–	–	100	$\mu\text{A}$	–
			$T_j = 125^\circ\text{C}$	–	–	2	mA	–
Repetitive Peak Off-state Current	$I_{DRM}$	$V_{DM} = V_{DRM}$	$T_j = 25^\circ\text{C}$	–	–	100	$\mu\text{A}$	–
			$T_j = 125^\circ\text{C}$	–	–	2	mA	–
On-state Voltage	$V_{TM}$	$I_{TM} = 10$ A	–	–	1.4	V	Refer to <b>Figure 1</b> .	
Gate Trigger Current	$I_{GT}$	$V_{DM} = 6$ V, $R_L = 100$ $\Omega$	–	–	10	mA	Refer to <b>Figure 4</b> .	
Gate Trigger Voltage	$V_{GT}$	$V_{DM} = 6$ V, $R_L = 100$ $\Omega$	–	–	1.5	V		
Gate Non-trigger Voltage	$V_{GD}$	$T_j = 125^\circ\text{C}$ , $V_{DM} = \frac{1}{2} V_{DRM}$	0.2	–	–	V	–	
Holding Current	$I_H$	$V_{DM} = 24$ V, $I_{TM} = 10$ A	–	6	–	mA	–	
Critical Rate Rise of Off-state Voltage	$dv/dt$	$T_j = 125^\circ\text{C}$ , $V_{DM} = \frac{2}{3} V_{DRM}$	–	40	–	V/ $\mu\text{s}$	–	
Circuit Commuted Turn-off Time	$t_q$	$T_j = 125^\circ\text{C}$ , $I_{TM} = 5$ A, $di/dt = 15$ A/ $\mu\text{s}$ , $V_R \geq 25$ V, $V_{DM} = \frac{2}{3} V_{DRM}$ , $dV_D/dt = 10$ V/ $\mu\text{s}$	–	50	–	$\mu\text{s}$	–	
Thermal Resistance <sup>Note</sup>	$R_{th(j-c)}$	Junction to case DC	–	–	4.2	°C/W	Refer to <b>Figure 13</b> .	
	$R_{th(j-a)}$	Junction to ambient DC	–	–	60	°C/W		

★ TYPICAL CHARACTERISTICS



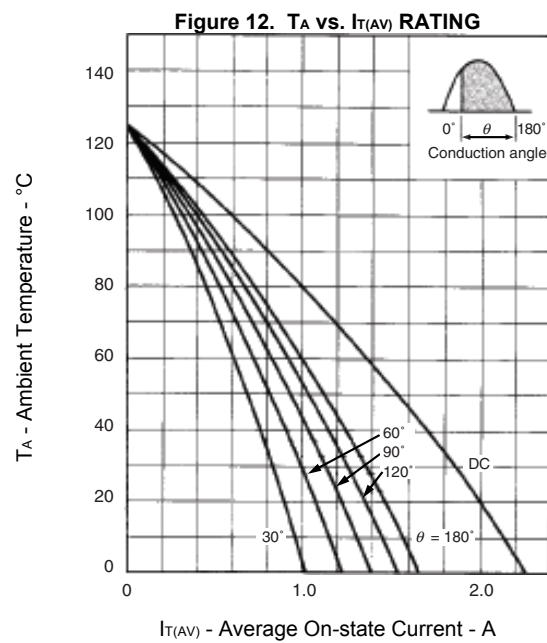
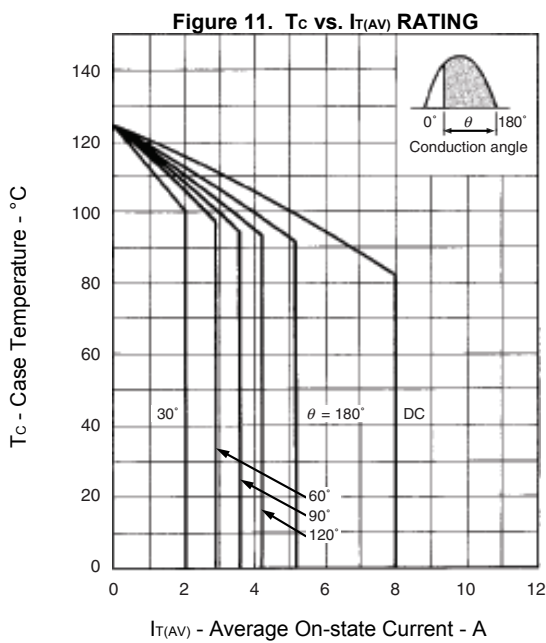
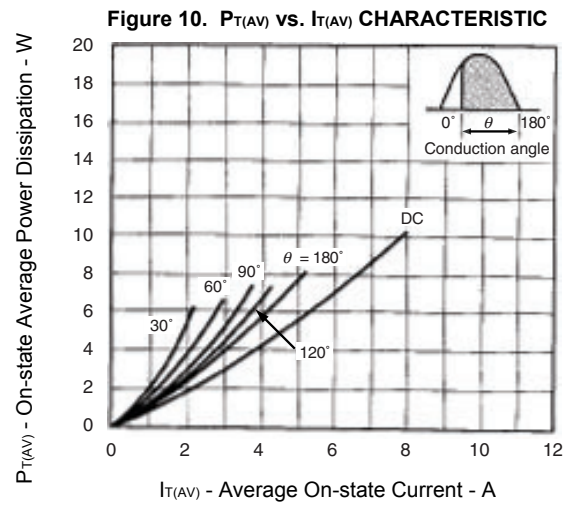
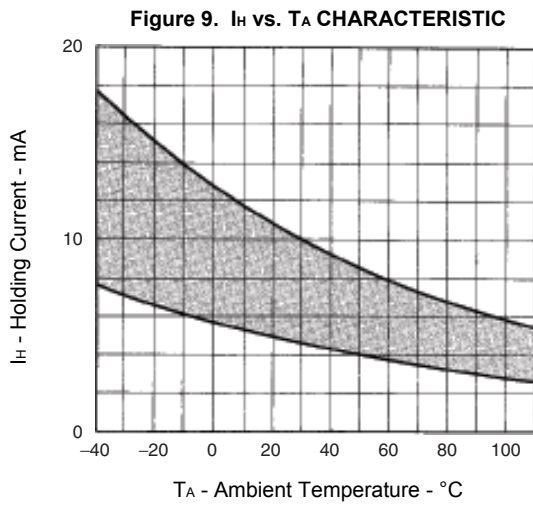
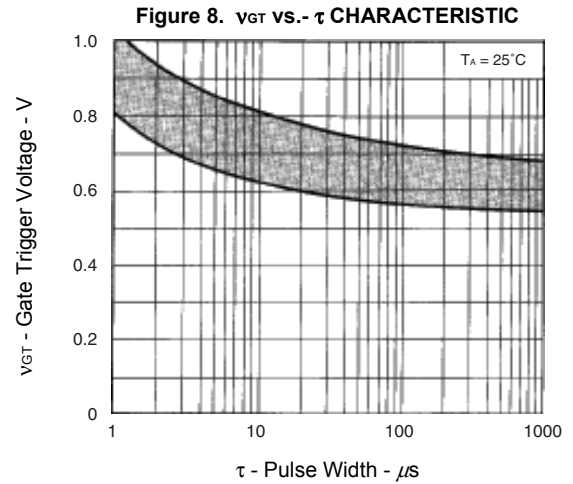
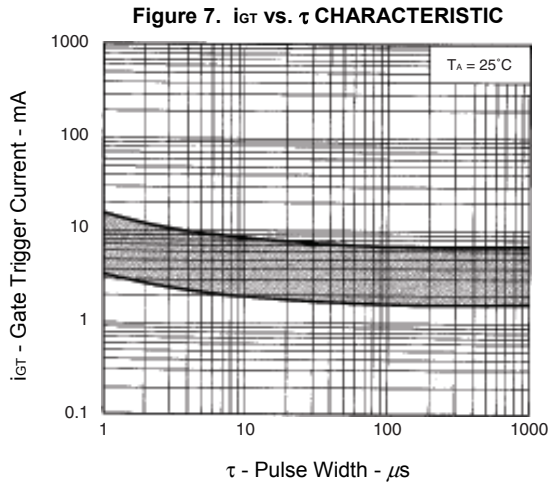
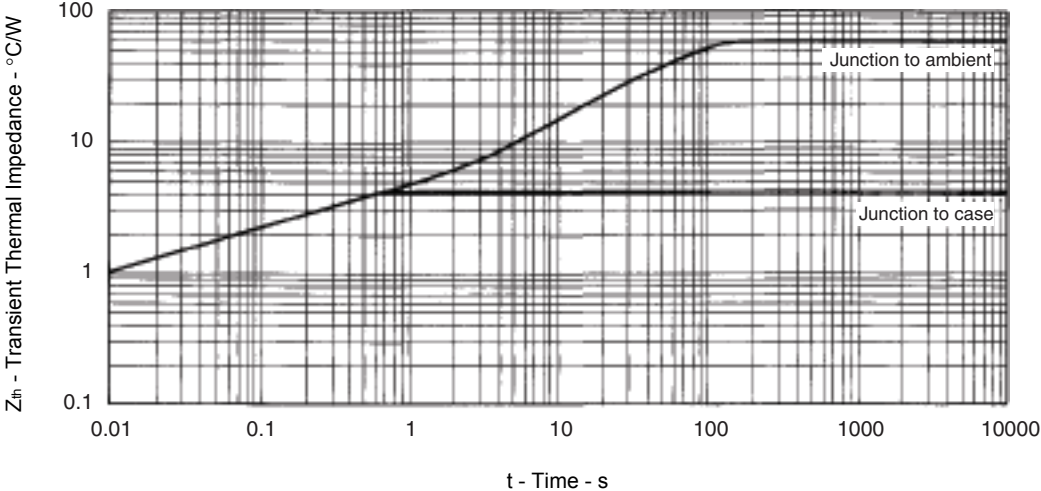


Figure 13.  $Z_{th}$  CHARACTERISTIC



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