

To our customers,

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## Old Company Name in Catalogs and Other Documents

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April 1<sup>st</sup>, 2010  
Renesas Electronics Corporation

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**Phase-out/Discontinued**

# THYRISTORS 8P2SMA, 8P4SMA

## 8 A RESIN MOLD TYPE SCR

### <R> DESCRIPTION

The 8P2SMA and 8P4SMA are resin mold type SCRs with an average on-state current 8 A ( $T_c = 88^\circ\text{C}$ ), repetitive peak off-state voltage 200 V and 400 V.

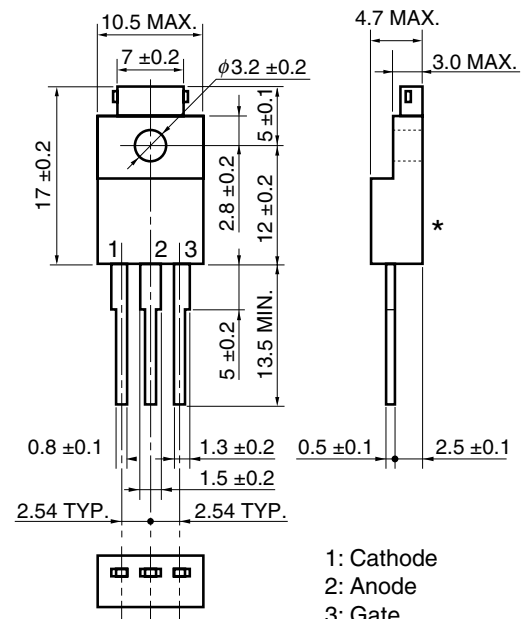
### <R> FEATURES

- Can be replaced with TO-220AB package
- High allowable on-current when using a single unit

### 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.

### <R> PACKAGE DRAWING (Unit: mm)



\*:  $T_c$  test bench-mark

Standard weight: 2 g

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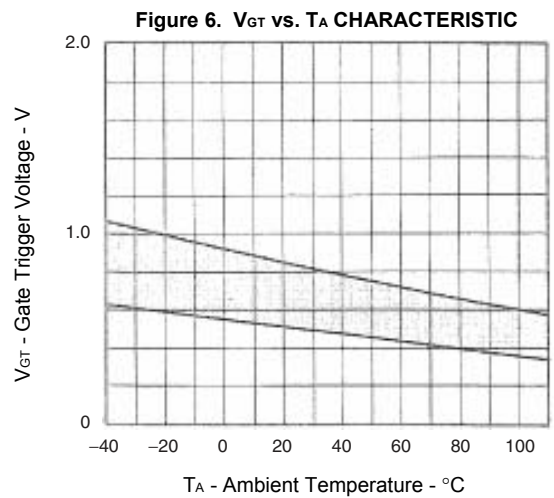
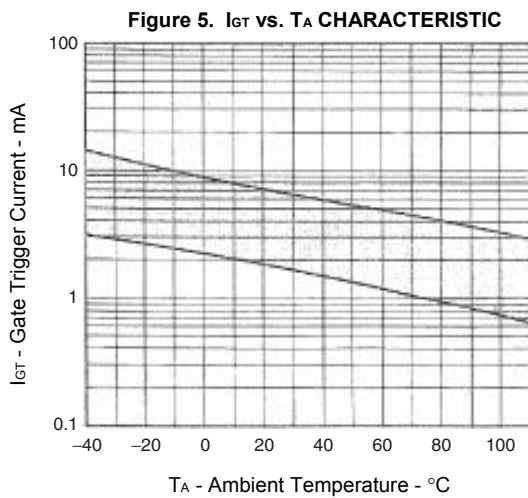
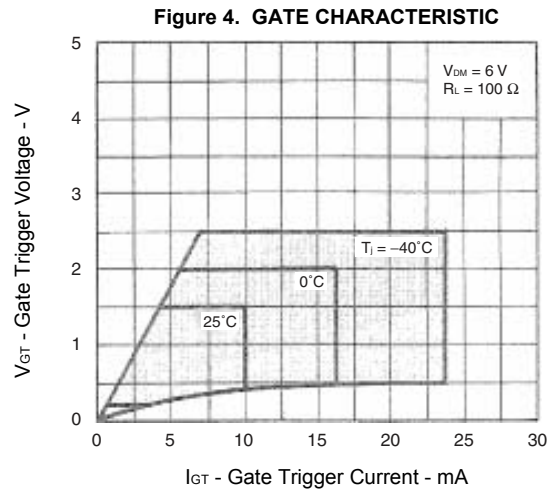
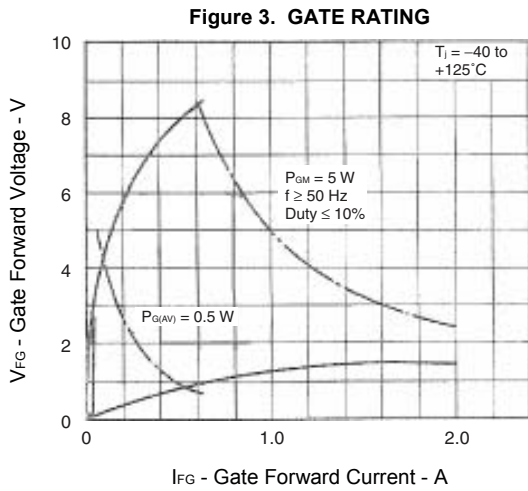
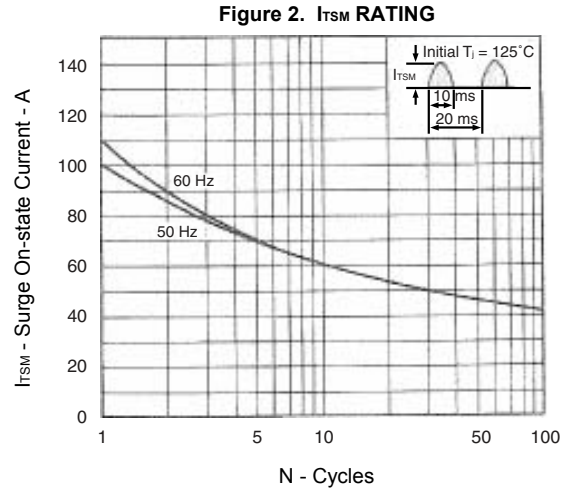
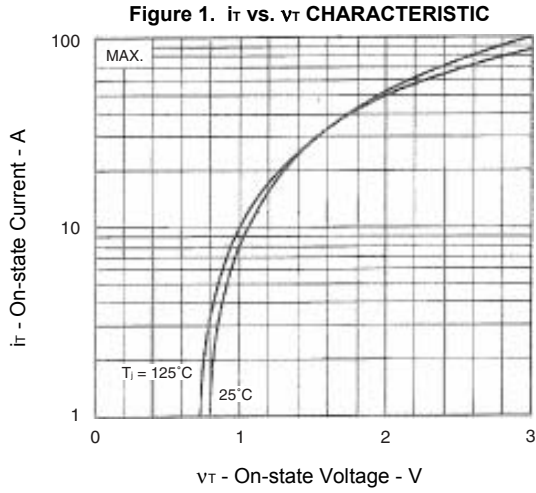
**MAXIMUM RATINGS**

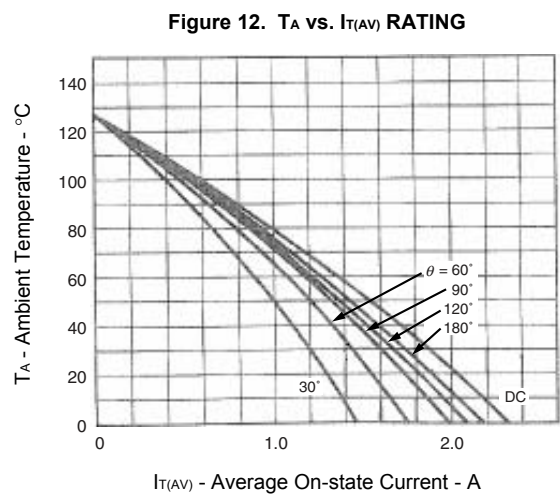
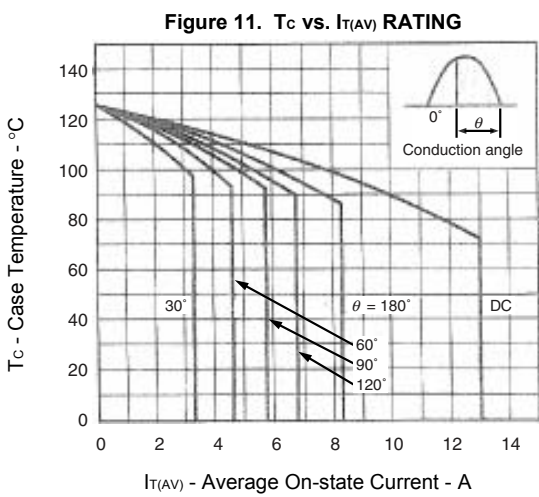
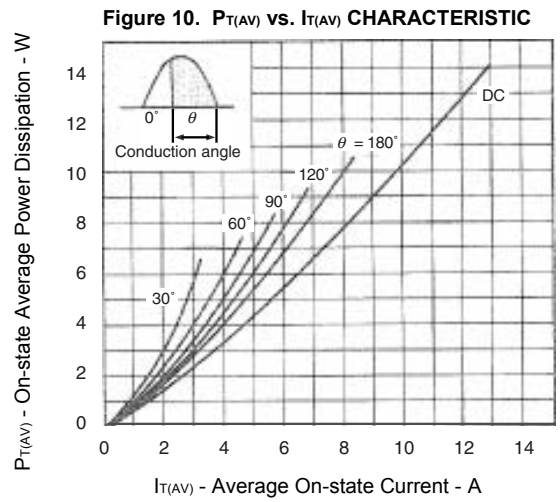
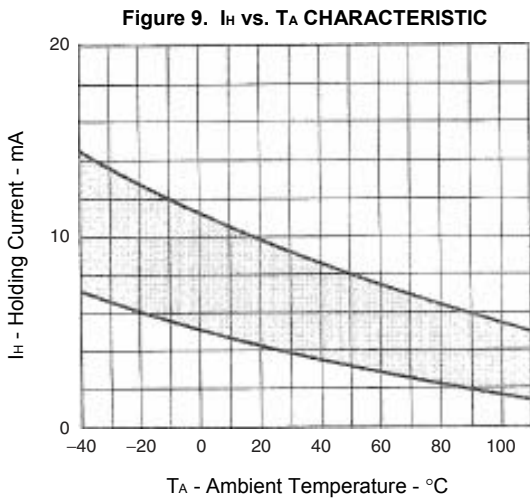
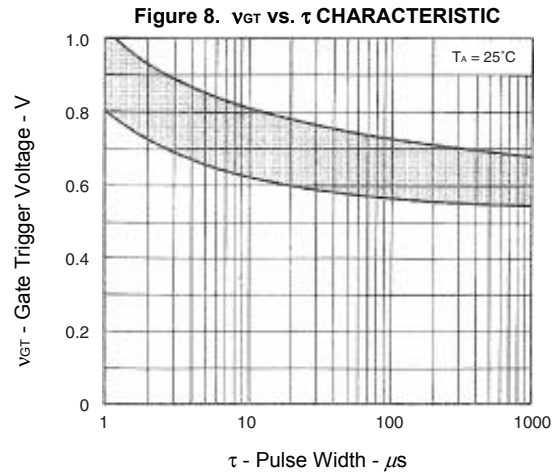
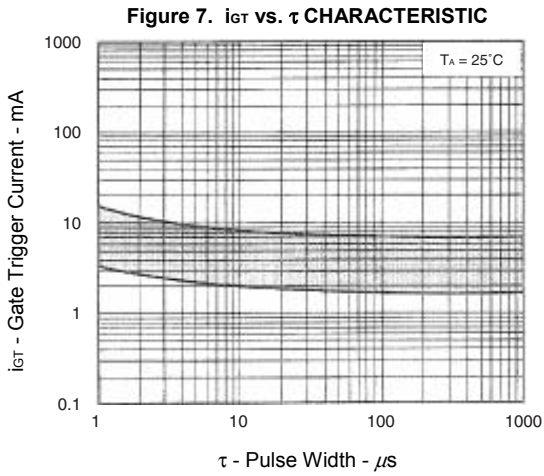
Parameter	Symbol	8P2SMA	8P4SMA	Unit	Remarks
Non-repetitive Peak Reverse Voltage	V <sub>RSM</sub>	300	500	V	–
Non-repetitive Peak Off-state Voltage	V <sub>DSM</sub>	300	500	V	–
Repetitive Peak Reverse Voltage	V <sub>RRM</sub>	200	400	V	–
Repetitive Peak Off-state Voltage	V <sub>DRM</sub>	200	400	V	–
Average On-state Current	I <sub>T(AV)</sub>	8 (T <sub>C</sub> = 88°C, single phase half wave, θ = 180°)		A	Refer to <b>Figure 11</b> and <b>12</b> .
Effective On-state Current	I <sub>T(RMS)</sub>	12.6		A	
Surge On-state Current	I <sub>TSM</sub>	100 (f = 50 Hz, sine half wave, 1 cycle) 110 (f = 60 Hz, sine half wave, 1 cycle)		A	Refer to <b>Figure 2</b> .
Fusing Current	$\int i_t^2 dt$	45 (1 ms ≤ t ≤ 10 ms)		A <sup>2</sup> s	–
Critical Rate Rise of On-state Current	dI <sub>T</sub> /dt	50		A/μs	–
Peak Gate Power Dissipation	P <sub>GM</sub>	5 (f ≥ 50 Hz, Duty ≤ 10%)		W	Refer to <b>Figure 3</b> .
Average Gate Power Dissipation	P <sub>G(AV)</sub>	0.5		W	
Peak Gate Forward Current	I <sub>FGM</sub>	2 (f ≥ 50 Hz, Duty ≤ 10%)		A	–
Peak Gate Reverse Voltage	V <sub>RGM</sub>	10		V	–
Junction Temperature	T <sub>j</sub>	–40 to +125		°C	–
Storage Temperature	T <sub>stg</sub>	–55 to +150		°C	–

**ELECTRICAL CHARACTERISTICS (T<sub>j</sub> = 25°C)**

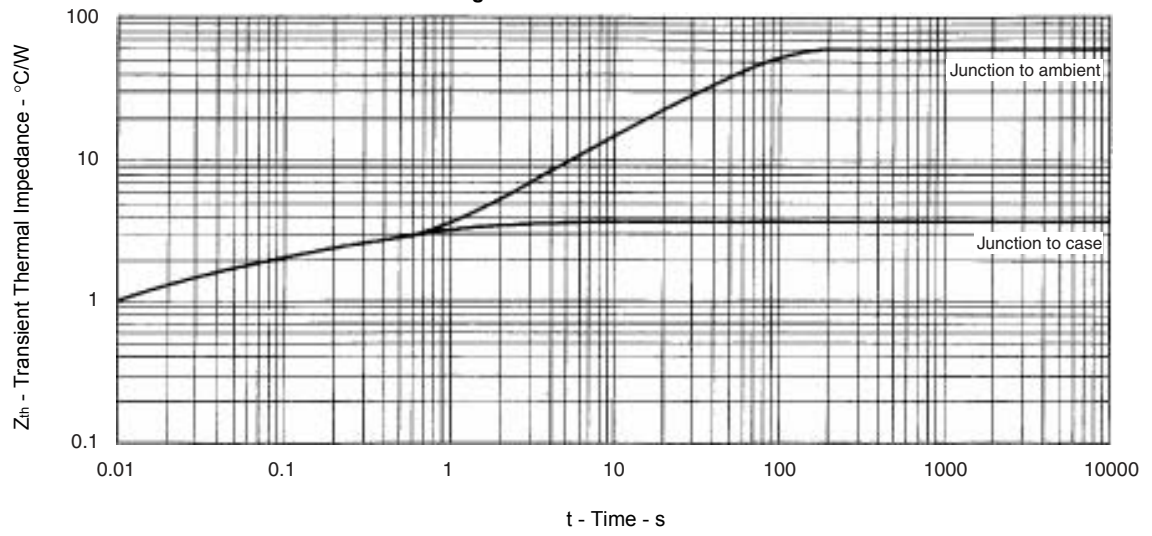
Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit	Remarks	
Repetitive Peak Reverse Current	I <sub>RRM</sub>	V <sub>RM</sub> = V <sub>RRM</sub>	T <sub>j</sub> = 25°C	–	–	100	μA	–
			T <sub>j</sub> = 125°C	–	–	2	mA	–
Repetitive Peak Off-state Current	I <sub>DRM</sub>	V <sub>DM</sub> = V <sub>DRM</sub>	T <sub>j</sub> = 25°C	–	–	100	μA	–
			T <sub>j</sub> = 125°C	–	–	2	mA	–
On-state Voltage	V <sub>TM</sub>	I <sub>TM</sub> = 25 A	–	–	1.4	V	Refer to <b>Figure 1</b> .	
Gate Trigger Current	I <sub>GT</sub>	V <sub>DM</sub> = 6 V, R <sub>L</sub> = 100 Ω	–	–	10	mA	Refer to <b>Figure 4</b> .	
Gate Trigger Voltage	V <sub>GT</sub>	V <sub>DM</sub> = 6 V, R <sub>L</sub> = 100 Ω	–	–	1.5	V		
Gate Non-trigger Voltage	V <sub>GD</sub>	T <sub>j</sub> = 125°C, V <sub>DM</sub> = $\frac{1}{2}$ V <sub>DRM</sub>	0.2	–	–	V	–	
Holding Current	I <sub>H</sub>	V <sub>DM</sub> = 24 V, I <sub>TM</sub> = 25 A	–	6	–	mA	–	
Critical Rate Rise of Off-state Voltage	dv/dt	T <sub>j</sub> = 125°C, V <sub>DM</sub> = $\frac{2}{3}$ V <sub>DRM</sub>	–	40	–	V/μs	–	
Circuit Commuted Turn-off Time	t <sub>q</sub>	T <sub>j</sub> = 125°C, I <sub>TM</sub> = 8 A di <sub>R</sub> /dt = 15 A/μs, V <sub>R</sub> ≥ 25 V, V <sub>DM</sub> = $\frac{2}{3}$ V <sub>DRM</sub> , dV <sub>D</sub> /dt = 10 V/μs	–	100	–	μs	–	
Thermal Resistance <sup>Note</sup>	R <sub>th(j-c)</sub>	Junction to case DC	–	–	3.7	°C/W	Refer to <b>Figure 13</b> .	
	R <sub>th(j-a)</sub>	Junction to ambient DC	–	–	60	°C/W		

**TYPICAL CHARACTERISTICS**





**Figure 13.  $Z_{th}$  CHARACTERISTIC**



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