

To our customers,

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## Old Company Name in Catalogs and Other Documents

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Renesas Electronics website: <http://www.renesas.com>

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

Issued by: Renesas Electronics Corporation (<http://www.renesas.com>)

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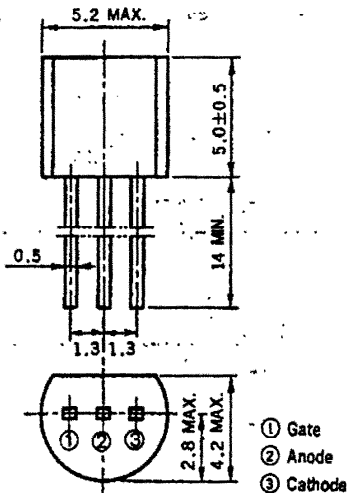
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# 03P2M, 03P4M

### 0.47 A(R.M.S.) ALL DIFFUSED MOLD TYPE SCR

#### PACKAGE DIMENSIONS

in millimeters



#### DESCRIPTION

The 03P2M and 03P4M are P-gate all diffused mold type SCR rated at 0.47 Amps RMS maximum on-state current, with rated voltages up to 400 volts.

#### FEATURES

- Plastic TO-92 package.
- 200  $\mu$ A gate sensitivity.
- 5 mA holding current.
- 8 A surge current.

#### APPLICATIONS

Cassette tape recorder, Television  
 Automobile equipment  
 Photoflash  
 Automatic gas lighter,  
 Solid-state relay  
 Light display equipment  
 Motor, solenoid and temperature control etc.

#### MAXIMUM RATINGS ( $R_{\theta K} = 1 \text{ k}\Omega$ )

ITEM	SYMBOL	03P2M	03P4M	UNIT
Non-Repetitive Peak Reverse Voltage	$V_{RSM}$	300	500	V
Non-Repetitive Peak Off-State Voltage	$V_{DSM}$	300	500	V
Repetitive Peak Reverse Voltage	$V_{RRM}$	200	400	V
Repetitive Peak Off-State Voltage	$V_{DRM}$	200	400	V
Average On-State Current	$I_T(AV)$	0.3 ( $T_g = 30^\circ\text{C}$ , Single phase half wave)		A
RMS On-State Current	$I_T(RMS)$	0.47		A
Surge On-State Current	$I_{TSM}$	8 ( $f = 50 \text{ Hz}$ , 1 cycle)		A
Fusing Current	$\int i_T^2 dt$	0.15 ( $1 \text{ ms} \leq t \leq 10 \text{ ms}$ )		$\text{A}^2\text{s}$
Peak Gate Power Dissipation	$P_{GM}$	0.1 ( $f \geq 50 \text{ Hz}$ , duty $\leq 10\%$ )		W
Average Gate Power Dissipation	$P_{G(AV)}$	0.01		W
Peak Gate Forward Current	$I_{FGM}$	0.1 ( $f \geq 50 \text{ Hz}$ , duty $\leq 10\%$ )		A
Peak Gate Reverse Voltage	$V_{RGM}$	6		V
Junction Temperature	$T_j$	-40 to +125		$^\circ\text{C}$
Storage Temperature	$T_{stg}$	-40 to +150		$^\circ\text{C}$

ELECTRICAL CHARACTERISTICS ( $T_j = 25^\circ\text{C}$ ,  $R_{GK} = 1\text{ k}\Omega$ )

ITEM	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT	
Repetitive Peak Reverse Current	$I_{RRM}$	$V_{RM} = V_{RRM}$	$T_j = 25^\circ\text{C}$	—	—	10	$\mu\text{A}$
			$T_j = 125^\circ\text{C}$	—	—	100	
Repetitive Peak Off-State Current	$I_{DRM}$	$V_{DM} = V_{DRM}$	$T_j = 25^\circ\text{C}$	—	—	10	$\mu\text{A}$
			$T_j = 125^\circ\text{C}$	—	—	100	
Critical Rate of Rise of Off-State Voltage	$dv/dt$	$V_{DM} = \frac{2}{3} V_{DRM}$ , $T_j = 125^\circ\text{C}$	—	40	—	$\text{V}/\mu\text{s}$	
On-State Voltage	$V_{TM}$	$I_{TM} = 4\text{ A}$	—	—	2.5	V	
Gate Trigger Current	$I_{GT}$	$V_{DM} = 6\text{ V}$ , $R_L = 100\ \Omega$	—	—	200	$\mu\text{A}$	
Gate Trigger Voltage	$V_{GT}$	$V_{DM} = 6\text{ V}$ , $R_L = 100\ \Omega$	—	—	0.8	V	
Gate Non-Trigger Voltage	$V_{GD}$	$V_{DM} = \frac{1}{2} V_{DRM}$ , $T_j = 125^\circ\text{C}$	0.1	—	—	V	
Holding Current	$I_H$	$V_{DM} = 24\text{ V}$ , $I_{TM} = 4\text{ A}$	—	—	5	$\text{mA}$	
Commutating Turn-Off Time	$t_q$	$I_{TM} = 200\text{ mA}$ , $di/dt = 15\text{ A}/\mu\text{s}$ $V_{RM} \geq 25\text{ V}$ , $V_{DM} = \frac{2}{3} V_{DRM}$ $dv/dt = 20\text{ V}/\mu\text{s}$ , $T_j = 125^\circ\text{C}$	—	25	—	$\mu\text{s}$	
			Thermal Resistance	$R_{th(j-c)}$	Junction to Case (flat side of case is temperature reference point)	—	—
$R_{th(j-a)}$	Junction to Ambient	—	—	230			

Fig. 1  $I_{TM} - V_{TM}$  CHARACTERISTICS

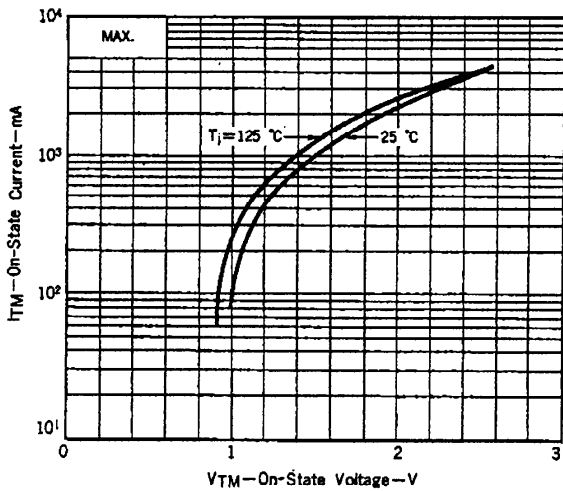


Fig. 2  $I_{TSM}$  RATING

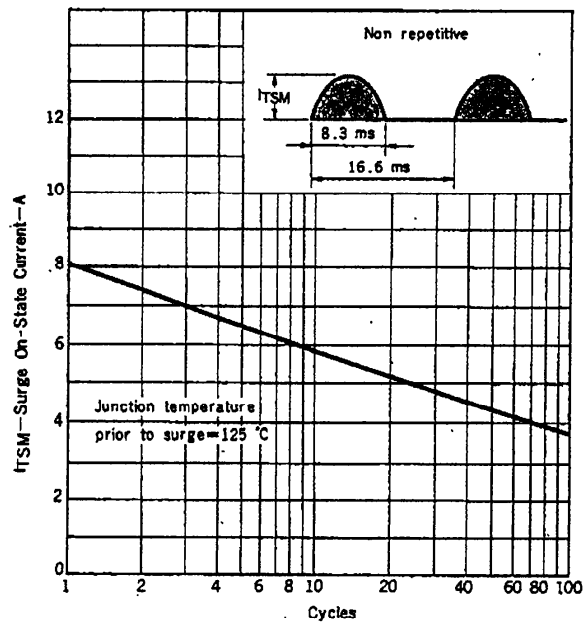


Fig. 3 GATE POWER RATINGS

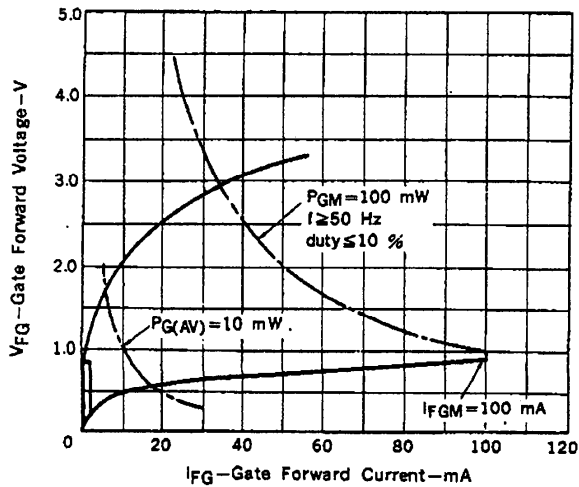


Fig. 4  $I_{GS} - V_{GT}$  DISTRIBUTION

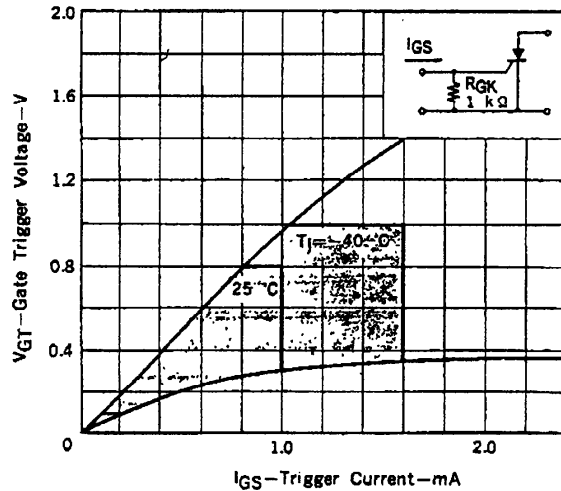


Fig. 5  $I_{GT} - T_a$  TYPICAL DISTRIBUTION

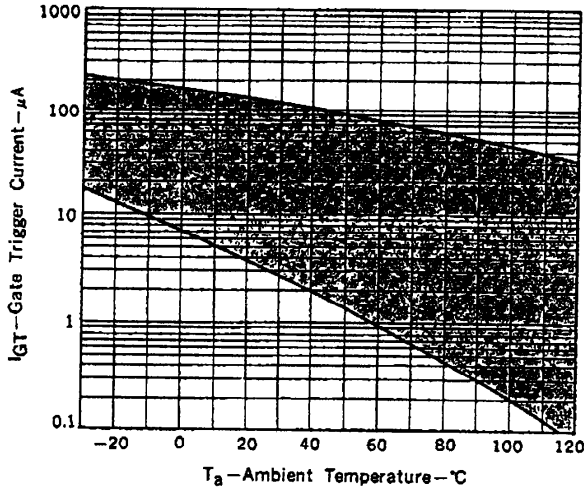


Fig. 6  $V_{GT} - T_a$  TYPICAL DISTRIBUTION

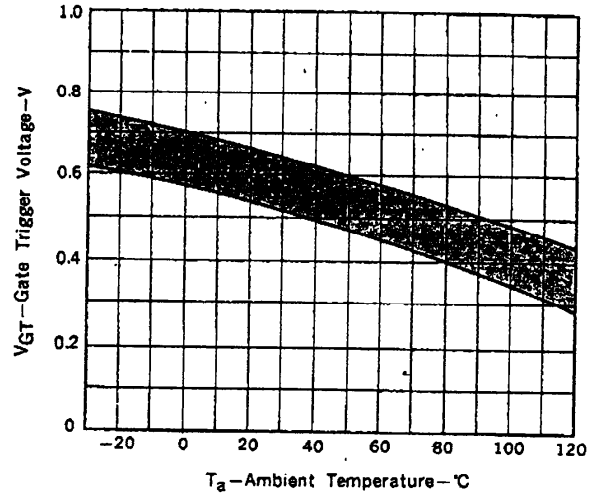


Fig. 7  $I_{GS} - \tau_G$  TYPICAL DISTRIBUTION

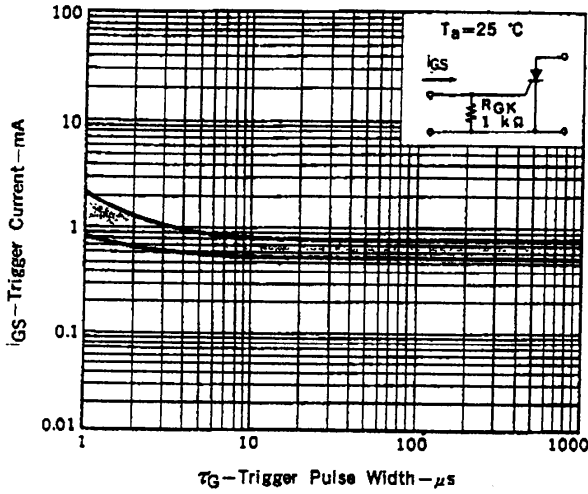


Fig. 8  $V_{GT} - \tau_G$  TYPICAL DISTRIBUTION

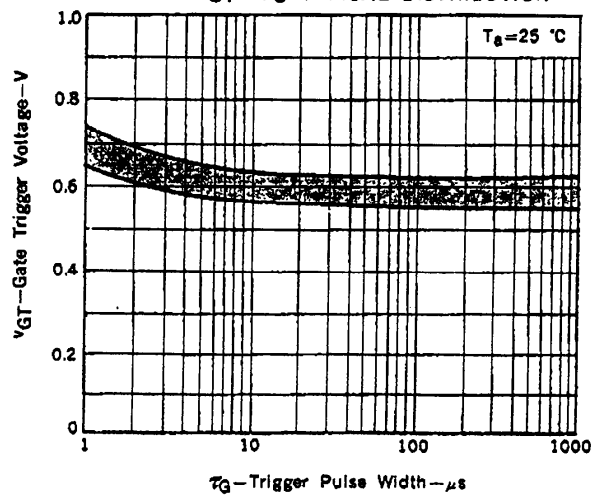


Fig. 9  $P_{T(AV)} - I_{T(AV)}$  CHARACTERISTICS

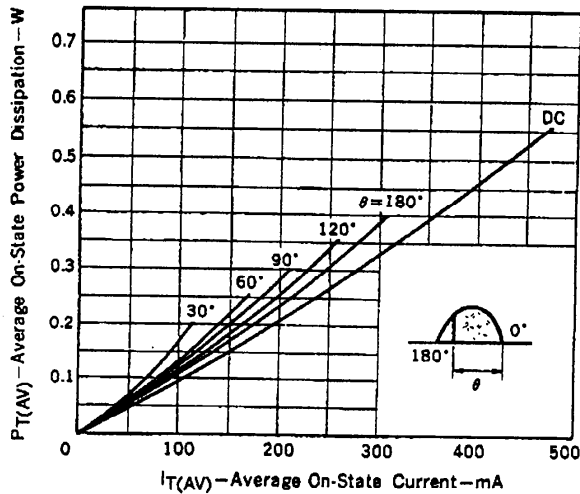


Fig. 10  $I_{T(AV)} - T_a$  RATINGS

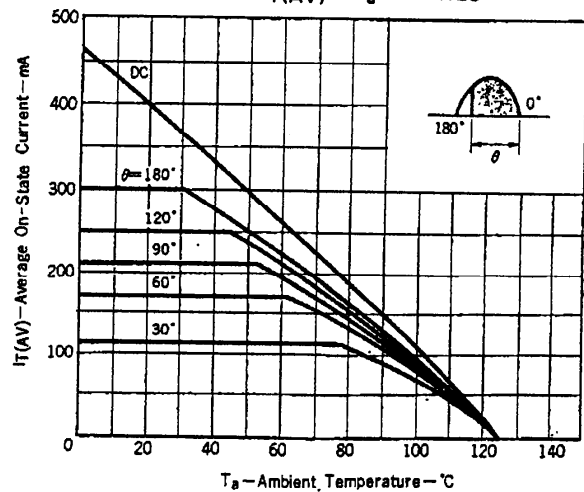


Fig. 11  $I_H - T_a$  TYPICAL DISTRIBUTION

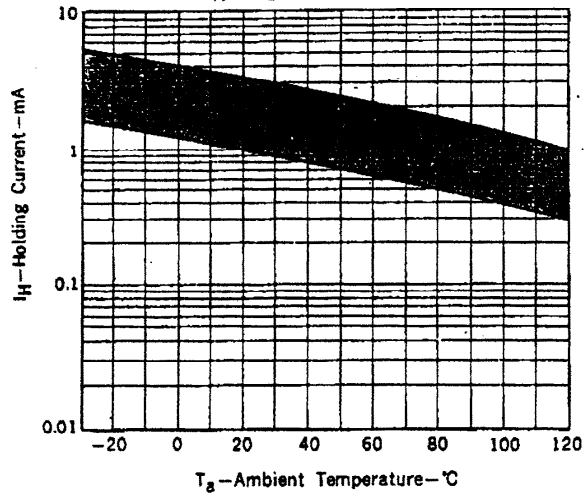
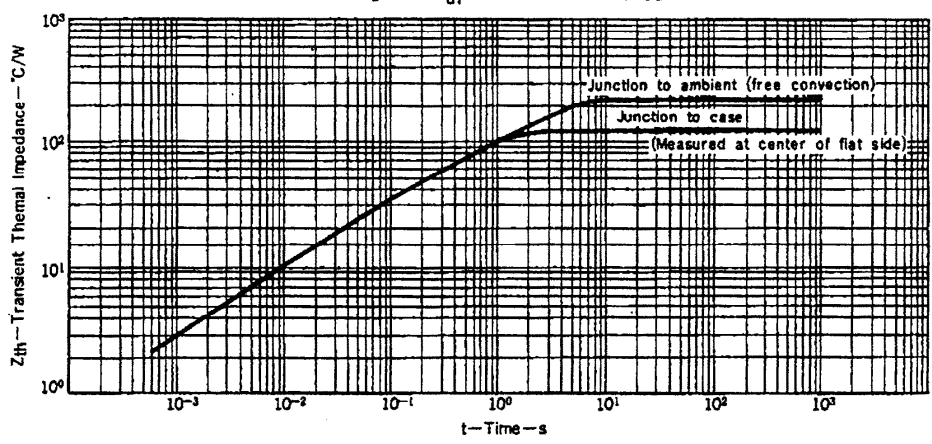


Fig. 12  $Z_{th}$  CHARACTERISTICS



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