To our customers,

Old Company Name in Catalogs and Other Documents

On April 1st, 2010, NEC Electronics Corporation merged with Renesas Technology Corporation, and Renesas Electronics Corporation took over all the business of both companies. Therefore, although the old company name remains in this document, it is a valid Renesas Electronics document. We appreciate your understanding.

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

April 1st, 2010
Renesas Electronics Corporation

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

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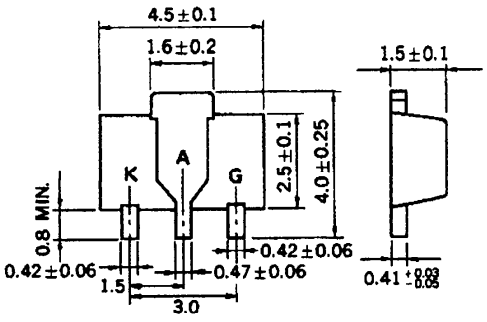
RENESAS

THYRISTORS

03P2J, 03P4J, 03P5J

0.47 $A_{r.m.s.}$ ALL DIFFUSED TYPE SCR
POWER MINI MOLD

PACKAGE DIMENSIONS
in millimeters



K: Cathode
A: Anode
G: Gate SOT-89

DESCRIPTION

The 03P2J, 03P4J and 03P5J are designed for many switching applications, especially in Hybrid Integrated Circuits.

FEATURES

- World Standard Miniature Package: SOT-89
- High Anode to Cathode Voltage
  : V_{DRM}, V_{RRM} = 200 V (03P2J)
  : V_{DRM}, V_{RRM} = 400 V (03P4J)
  : V_{DRM}, V_{RRM} = 500 V (03P5J)

APPLICATIONS

- Cassette tape recorder
- Solid-state relay
- Strobo flasher
- Ground fault detector
- Automobile equipment

MAXIMUM RATINGS (R_{GK} = 1 kΩ)

ITEM	SYMBOL	03P2J	03P4J	03P5J	UNIT
Non-Repetitive Peak Reverse Voltage	V_{RSM}	300	500	600	V
Non-Repetitive Peak Off-State Voltage	V_{DSM}	300	500	600	V
Repetitive Peak Reverse Voltage	V_{RRM}	200	400	500	V
Repetitive Peak Off-State Voltage	V_{DRM}	200	400	500	V
Average On-State Current	$I_{T(AV)}$	0.3 (T_a = 77 °C, Single phase half wave)			A
RMS On-State Current	$I_{T(RMS)}$	0.47			A
Surge On-State Current	I_{TSM}	6 (f = 50 Hz, 1 cycle)			A
Fusing Current	$\int i_T^2 dt$	0.15 (1 ms ≦ t ≦ 10 ms)			A^2s
Peak Gate Power Dissipation	P_{GM}	0.1 (f ≧ 50 Hz, duty ≦ 10 %)			W
Average Gate Power Dissipation	$P_{G(AV)}$	0.01			W
Peak Gate Forward Current	I_{FGM}	0.1 (f ≧ 50 Hz, duty ≦ 10 %)			A
Peak Gate Reverse Voltage	V_{RGM}	6			V
Junction Temperature	T_j	−55 to +125			°C
Storage Temperature	T_{stg}	−55 to +150			°C

NEC Corporation

ELECTRICAL CHARACTERISTICS (T_j = 25 °C, R_{GK} = 1 kΩ)

ITEM	SYMBOL	TEST CONDITIONS		MIN.	TYP.	MAX.	UNIT
Repetitive Peak Reverse Current	I_{RRM}	$V_{RM} = V_{RRM}$	T_j = 25 °C	–	–	10	μA
			T_j = 125 °C	–	–	100	
Repetitive Peak Off-State Current	I_{DRM}	$V_{DM} = V_{DRM}$	T_j = 25 °C	–	–	10	μA
			T_j = 125 °C	–	–	100	
Critical Rate of Rise of Off-State Voltage	dv/dt	$V_{DM} = \frac{2}{3}V_{DRM}$, T_j = 125 °C		–	40	–	V/μs
On-State Voltage	V_{TM}	I_{TM} = 1 A		–	–	1.6	V
Gate Trigger Current	I_{GT}	V_{DM} = 6 V, R_L = 100 Ω		–	–	200	μA
Gate Trigger Voltage	V_{GT}	V_{DM} = 6 V, R_L = 100 Ω		–	–	0.8	V
Gate Non-Trigger Voltage	V_{GD}	$V_{DM} = \frac{1}{2}V_{DRM}$, T_j = 125 °C		0.1	–	–	V
Holding Current	I_H	V_{DM} = 24 V, I_{TM} = 1 A		–	–	5	mA
Commutating Turn-Off Time	t_q	I_{TM} = 200 mA, di_T/dt = 15 A/μs $V_{RM} \geq$ 25 V, $V_{DM} = \frac{2}{3}V_{DRM}$ dv/dt = 20 V/μs, T_j = 125 °C		–	25	–	μs
Thermal Resistance	$R_{th(j-a)}$	Junction to Ambient*		–	–	65	°C/W

*Mounted on 0.7 mm x 2.5 cm² ceramic substrate

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

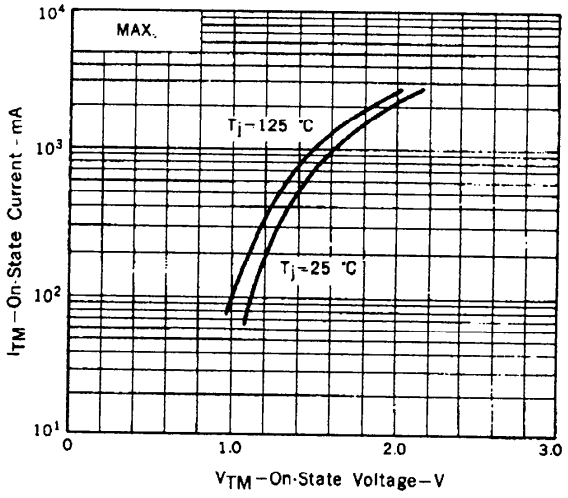


Fig. 2 I_{TSM} RATING

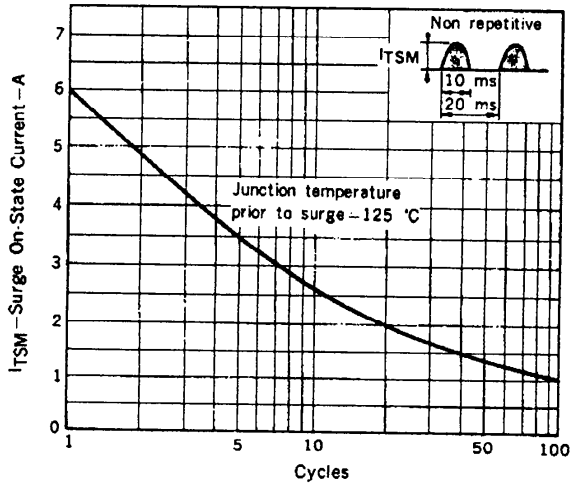


Fig. 3 GATE POWER RATINGS

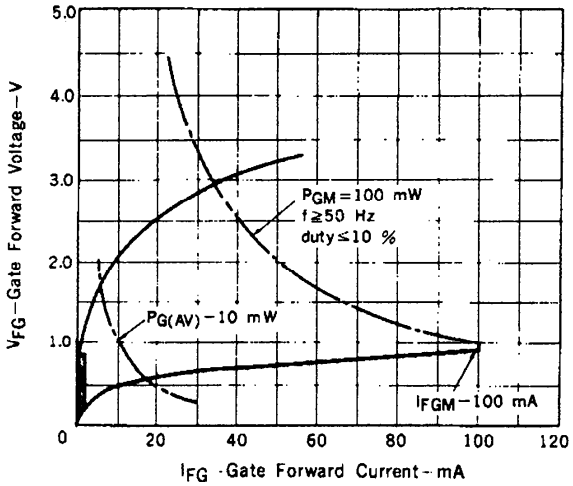


Fig. 4 $I_{GS} - V_{GT}$ DISTRIBUTION

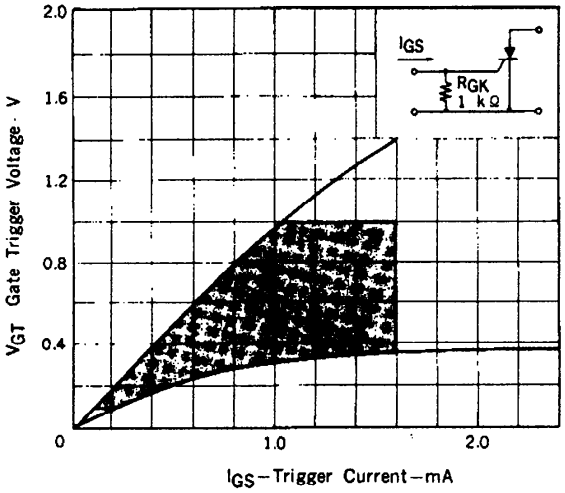


Fig. 5 $I_{GT} - T_a$ TYPICAL DISTRIBUTION

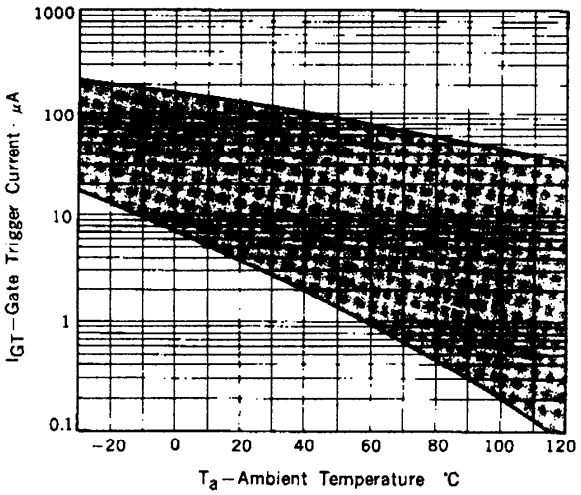


Fig. 6 $V_{GT} - T_a$ TYPICAL DISTRIBUTION

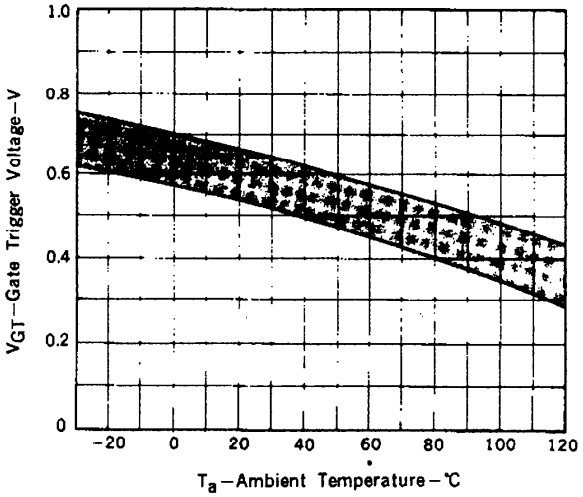


Fig. 7 $I_{GS} - \tau_G$ TYPICAL DISTRIBUTION

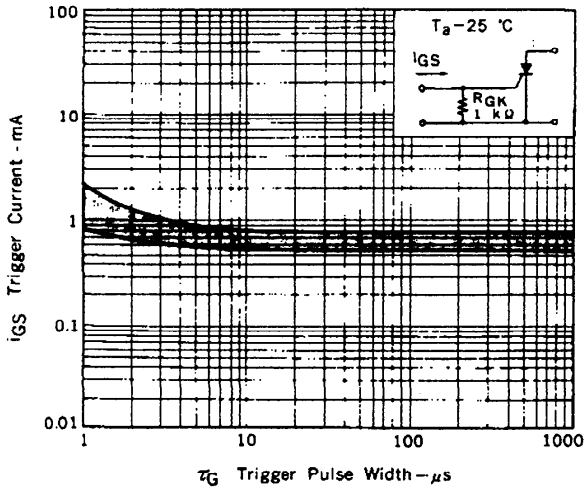


Fig. 8 $V_{GT} - \tau_G$ TYPICAL DISTRIBUTION

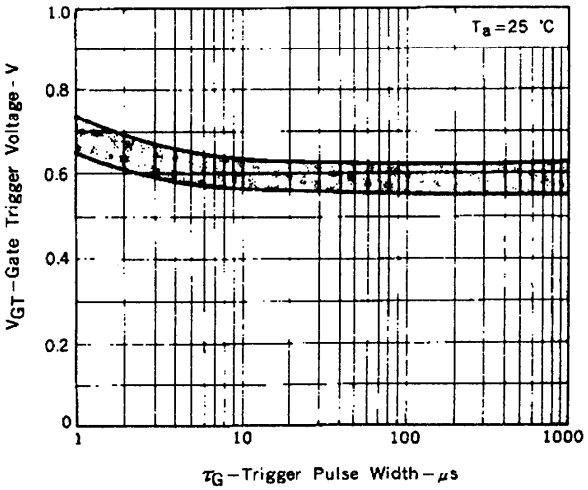


Fig. 9 $P_{T(AV)} - I_{T(AV)}$ CHARACTERISTICS

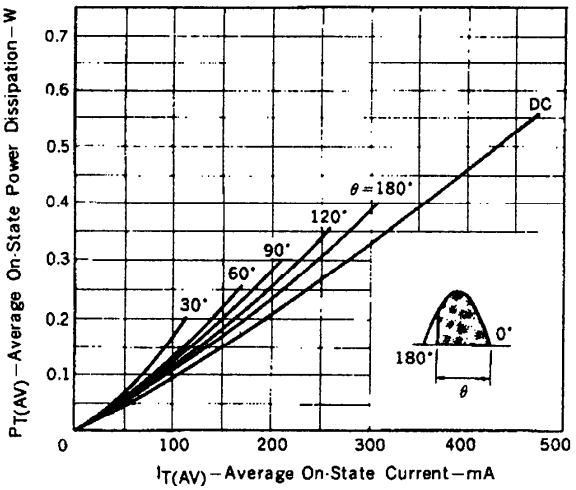


Fig. 10 $I_{T(AV)} - T_a$ RATINGS

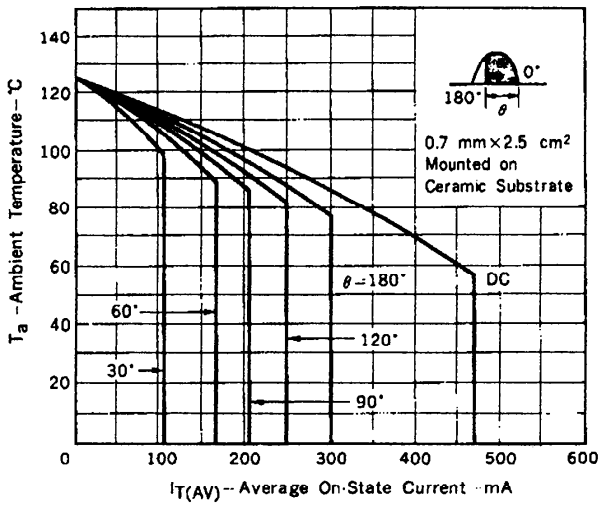
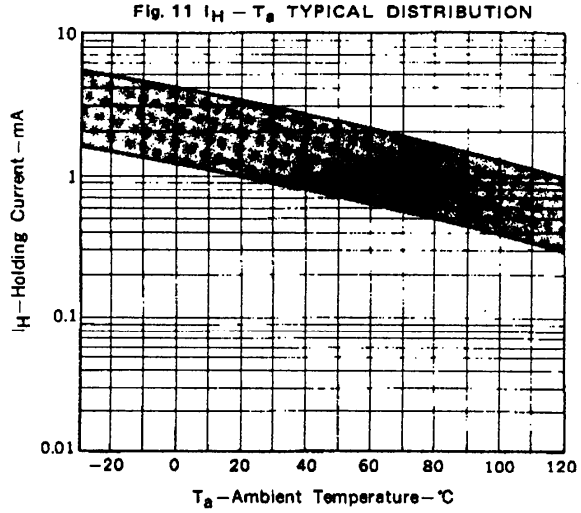


Fig. 11 $I_H - T_a$ TYPICAL DISTRIBUTION



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