

To our customers,

Old Company Name in Catalogs and Other Documents

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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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3P4J, 3P4J-Z, 3P4J-ZK**3 A MOLD THYRISTOR**

The 3P4J, 3P4J-Z, and 3P4J-ZK are a P gate all diffused mold type Thyristor granted 3 A On-state Average Current ($T_c = 103^\circ\text{C}$) with rated voltages up to 400 V.

<R> FEATURES

- For a small and light package, miniaturization of a set is easy.
- Suitable for capacitor discharge applications with high pulse current rating.
- $I_{GT} \leq 100 \mu\text{A}$
- Surface mounting (3P4J-Z, 3P4J-ZK)

<R> APPLICATIONS

- Contact-less switch for electronic devices, ignition devices, electronic household appliances and other light industry equipment

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MAXIMUM RATINGS

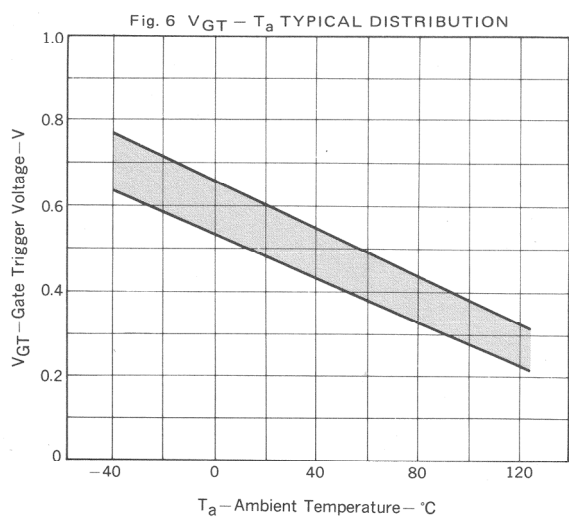
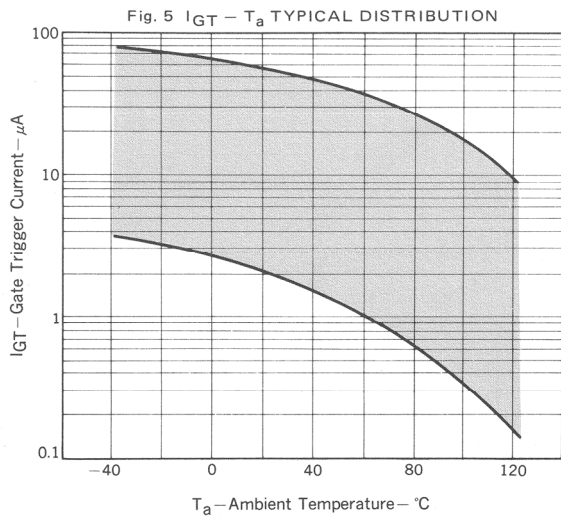
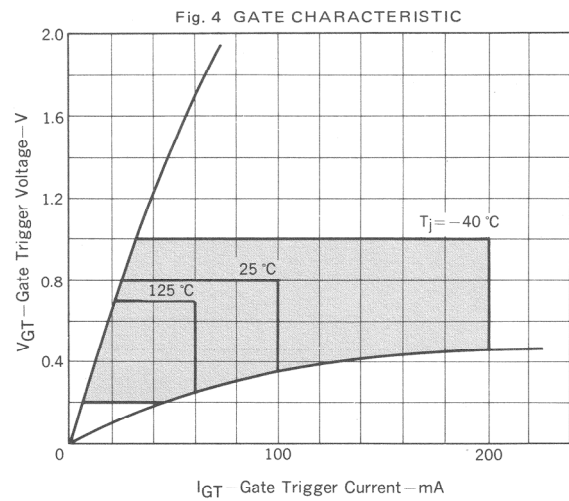
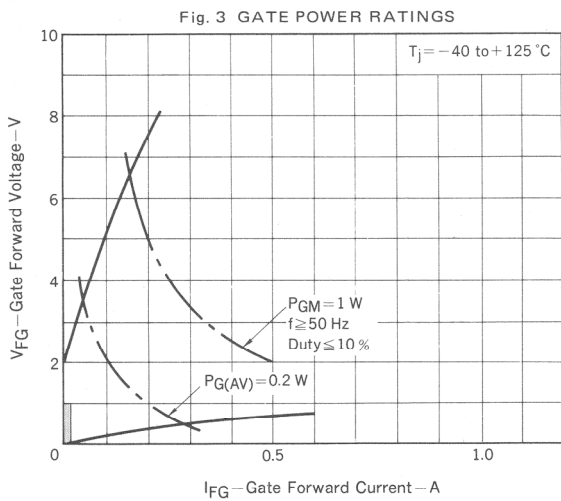
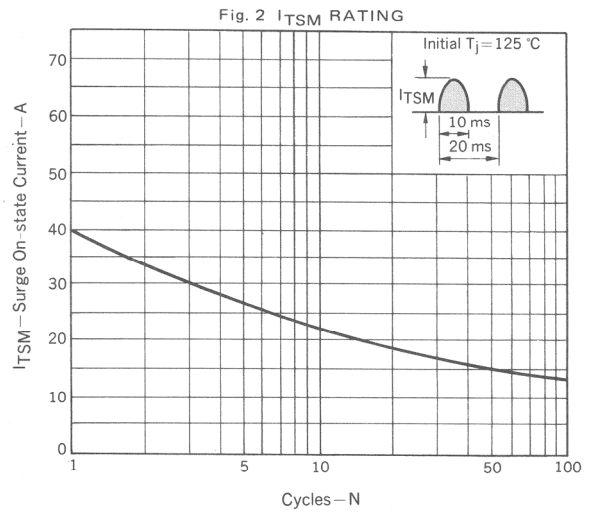
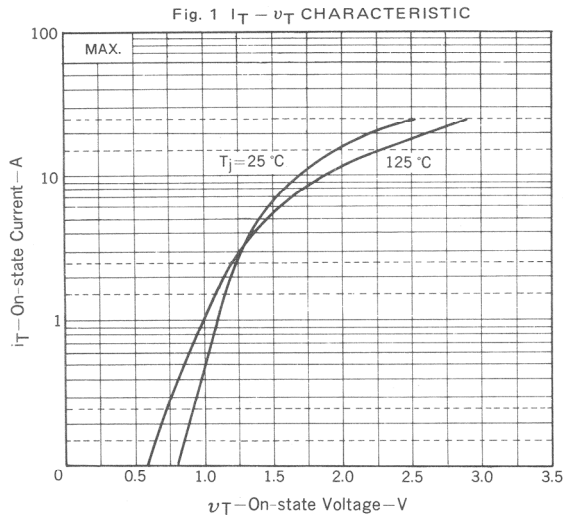
CHARACTERISTICS	SYMBOL	3P4J, 3P4J-Z, 3P4J-ZK	UNIT	REMARK
Non-repetitive Peak Reverse Voltage	V_{RSM}	500	V	$R_{GK} = 1\text{ k}\Omega$
Non-repetitive Peak Off-state Voltage	V_{DSM}	500	V	$R_{GK} = 1\text{ k}\Omega$
Repetitive Peak Reverse Voltage	V_{RRM}	400	V	$R_{GK} = 1\text{ k}\Omega$
Repetitive Peak Off-state Voltage	V_{DRM}	400	V	$R_{GK} = 1\text{ k}\Omega$
Average On-state Current	$I_{T(AV)}$	3 ($T_c = 103^\circ\text{C}$, $\theta = 180^\circ$, Single phase half wave)	A	See Fig. 11
Effective On-state Current	$I_{T(RMS)}$	4	A	
Surge On-state Current	I_{TSM}	40 (f = 50 Hz, sine half wave, 1 cycle)	A	See Fig. 2
Fusing Current	$\int i^2 dt$	6 (1 ms $\leq t \leq$ 10 ms)	A ² s	–
Critical Rate Rise of On-state Current	di_T/dt	50	A/ μs	–
Peak Gate Power Dissipation	P_{GM}	1 (f \geq 50 Hz, Duty \leq 10%)	W	–
Average Gate Power Dissipation	$P_{G(AV)}$	0.2	W	–
Peak Gate Forward Current	I_{FGM}	0.5 (f \geq 50 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}	–55 to +150	$^\circ\text{C}$	–

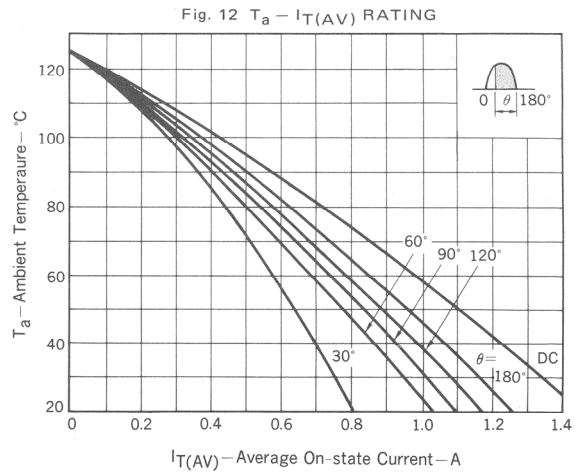
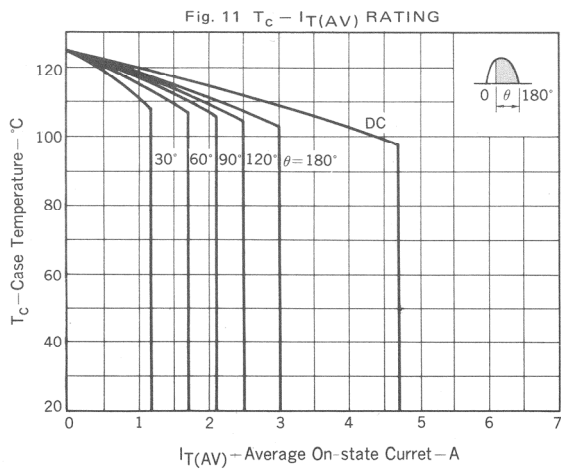
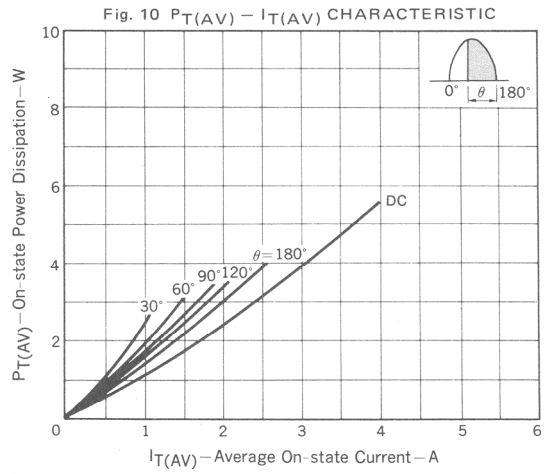
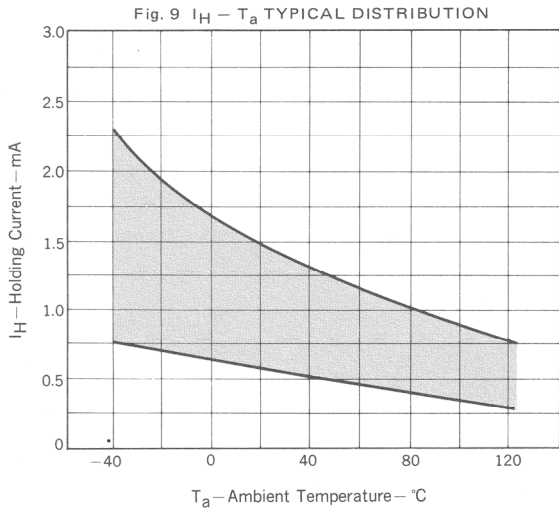
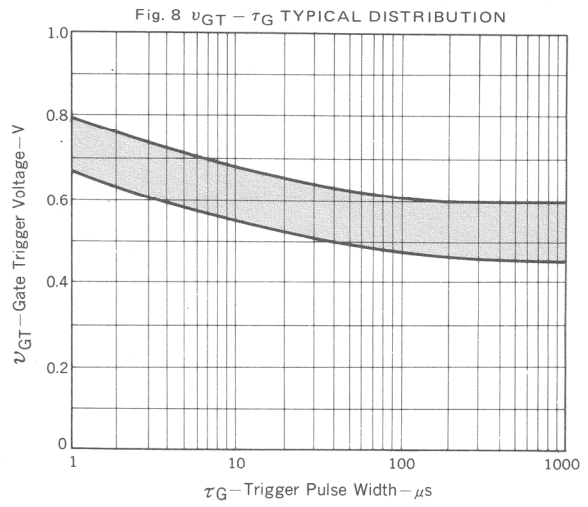
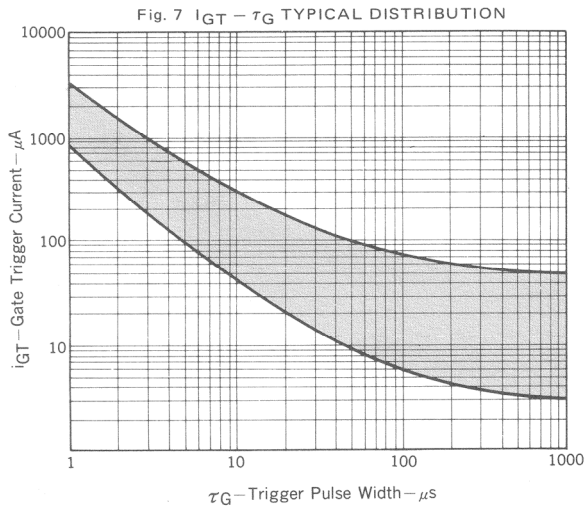
<R> ELECTRICAL CHARACTERISTICS ($T_j = 25^\circ\text{C}$, $R_{GK} = 1\text{ k}\Omega$)

CHARACTERISTICS	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT	
Repetitive Peak Reverse Current	I_{RRM}	$V_{RM} = 400\text{ V}$	$T_j = 25^\circ\text{C}$	–	–	50	μA
			$T_j = 125^\circ\text{C}$	–	–	1	mA
Repetitive Peak Off-state Current	I_{DRM}	$V_{DM} = 400\text{ V}$	$T_j = 25^\circ\text{C}$	–	–	50	μA
			$T_j = 125^\circ\text{C}$	–	–	1	mA
Critical Rate Rise of Off-state Voltage	dV_D/dt	$V_{DM} = 270\text{ V}$, $T_j = 125^\circ\text{C}$	–	10	–	V/ μs	
On-state Voltage	V_{TM}	$I_{TM} = 4\text{ A}$	–	–	1.4	V	
Gate-trigger Current	I_{GT}	$V_{DM} = 6\text{ V}$, $R_L = 100\ \Omega$	–	–	100	μA	
Gate-trigger Voltage	V_{GT}	$V_{DM} = 6\text{ V}$, $R_L = 100\ \Omega$	–	–	0.8	V	
Gate Non-trigger Voltage	V_{GD}	$V_{DM} = 200\text{ V}$, $T_j = 125^\circ\text{C}$	0.2	–	–	V	
Holding Current	I_H	$V_{DM} = 24\text{ V}$, $I_{TM} = 5\text{ A}$	–	–	5	mA	
Circuit Commuted Turn-off Time	t_q	$I_{TM} = 2\text{ A}$, $V_R \geq 25\text{ V}$ $V_{DM} = 270\text{ V}$, $di_T/dt = 15\text{ A}/\mu\text{s}$ $dV_D/dt = 1\text{ V}/\mu\text{s}$, $T_j = 125^\circ\text{C}$	–	30	–	μs	
Thermal Resistance	$R_{th(j-c)}$	Junction to case DC	–	–	4.0	$^\circ\text{C}/\text{W}$	
	$R_{th(j-a)}$	Junction to ambient DC ^{Note}	–	–	62.5		

Note Mount on 2 x 3.75 cm² ceramic substrate

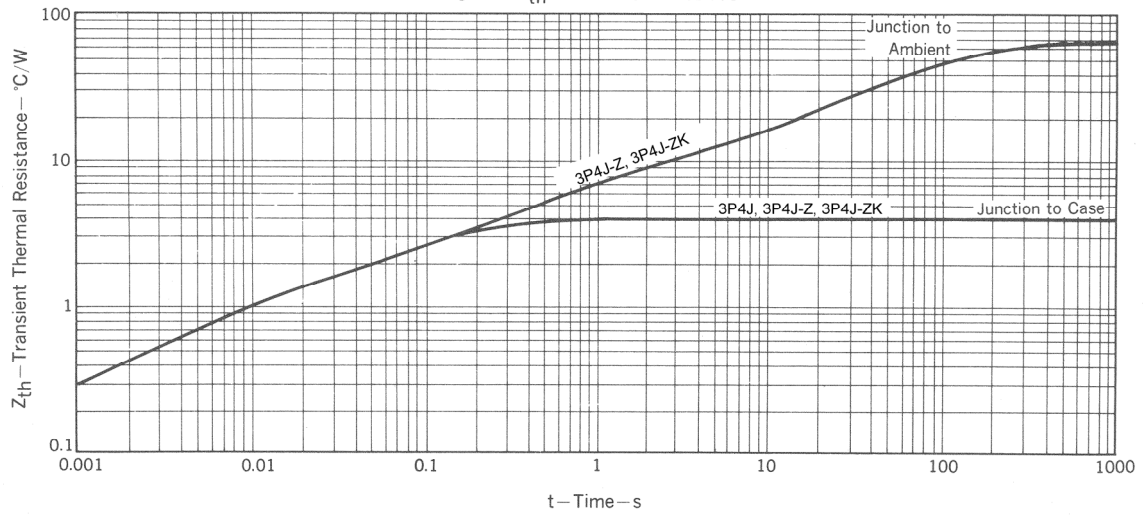
TYPICAL CHARACTERISTICS





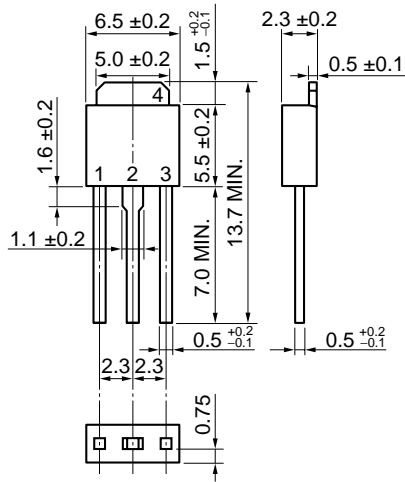
<R>

Fig. 13 Z_{th} CHARACTERISTIC

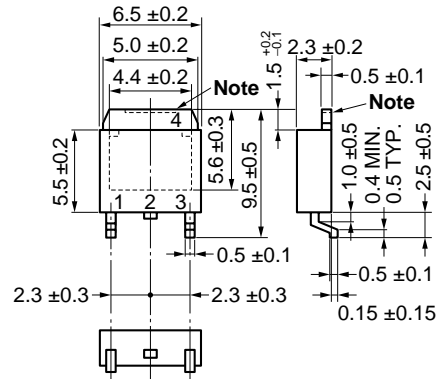


<R> PACKAGE DRAWING (Unit: mm)

▪ 3P4J



▪ 3P4J-Z



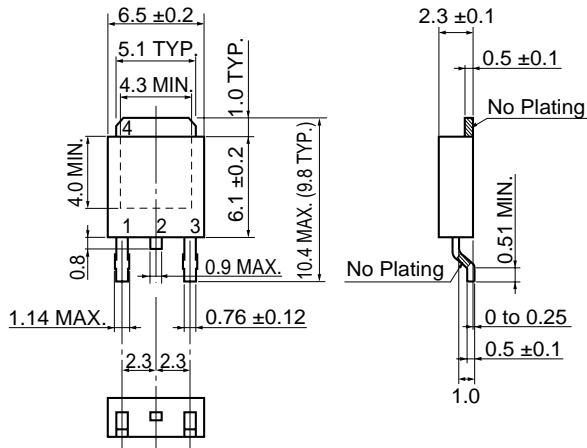
Pin Connection

1. Cathode
2. Anode
3. Gate
4. Fin (Anode)

Standard weight: 0.3 g

Note The depth of notch at the top of the fin is from 0 to 0.2 mm.

▪ 3P4J-ZK



Pin Connection

1. Cathode
2. Anode
3. Gate
4. Fin (Anode)

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