

To our customers,

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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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5 A (8 Ar.m.s.) THYRISTOR

The 5P4M and 5P6M are a P gate all diffused mold type Thyristor <R> granted 5 A On-state Average Current ($T_c = 103^\circ\text{C}$).

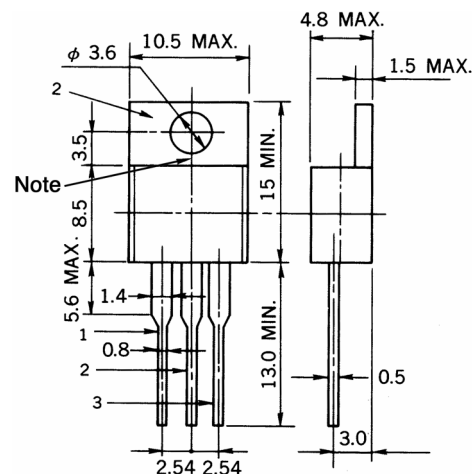
FEATURES

- Easy installation by TO-220AB package.
- 80 A surge current.
- <R> • High Voltage.
 - : $V_{DRM}, V_{RRM} = 400\text{ V}$ (5P4M)
 - : $V_{DRM}, V_{RRM} = 600\text{ V}$ (5P6M)

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)



Pin Connection

1. Cathode
2. Anode
3. Gate

Standard weight: 2 g

Note T_c test point

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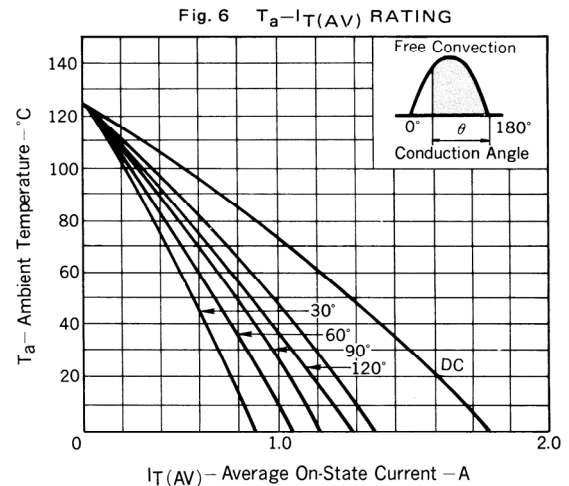
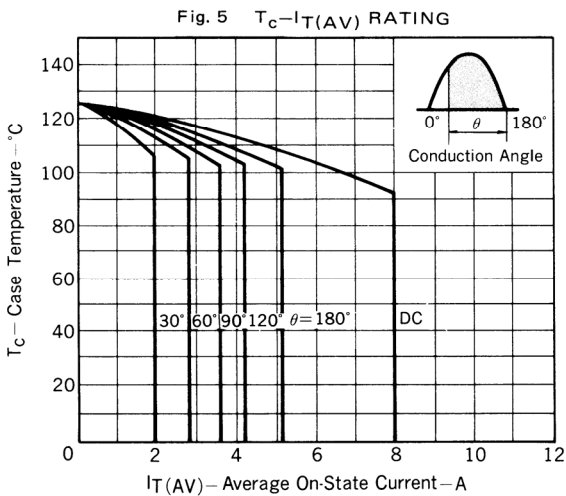
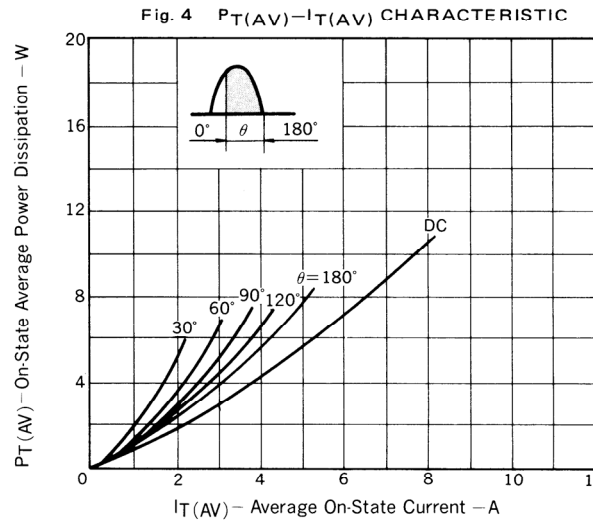
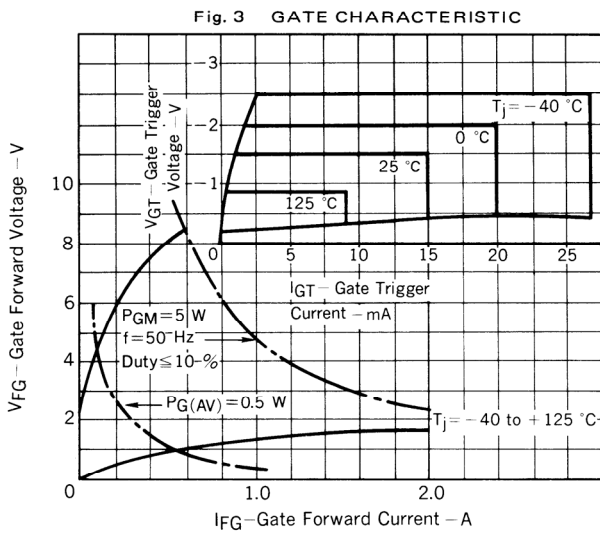
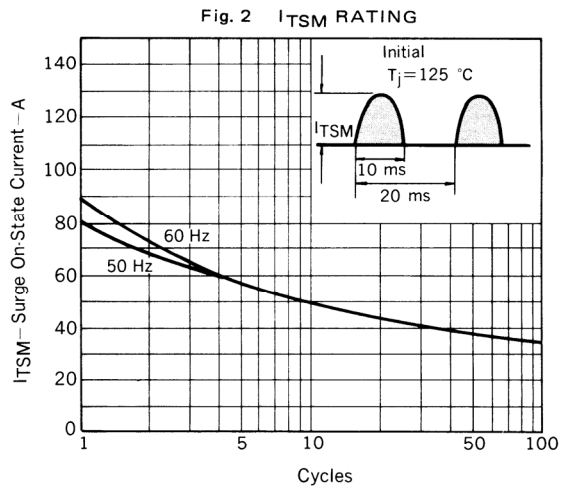
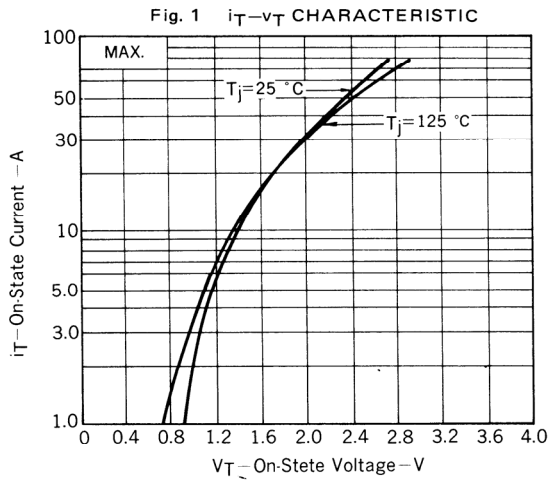
<R> **MAXIMUM RATINGS**

CHARACTERISTICS	SYMBOL	5P4M	5P6M	UNIT	REMARK
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 ($T_c = 103^\circ\text{C}$, $\theta = 180^\circ$, Single phase half wave)		A	See Fig. 5
Effective On-state Current	$I_{T(RMS)}$	8		A	
Surge On-state Current	I_{TSM}	80 (f = 50 Hz, sine half wave, 1 cycle) 88 (f = 60 Hz, sine half wave, 1 cycle)		A	See Fig. 2
Fusing Current	$\int i_t^2 dt$	28 (1 ms \leq t \leq 10 ms)		A ² s	-
Critical Rate Rise of On-state Current	di_t/dt	50		A/ μ s	-
Peak Gate Power Dissipation	P_{GM}	5 (f \geq 50 Hz, Duty \leq 10%)		W	See Fig. 3
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 to +125		$^\circ\text{C}$	-
Storage Temperature	T_{stg}	-55 to +150		$^\circ\text{C}$	-

<R> **ELECTRICAL CHARACTERISTICS ($T_j = 25^\circ\text{C}$)**

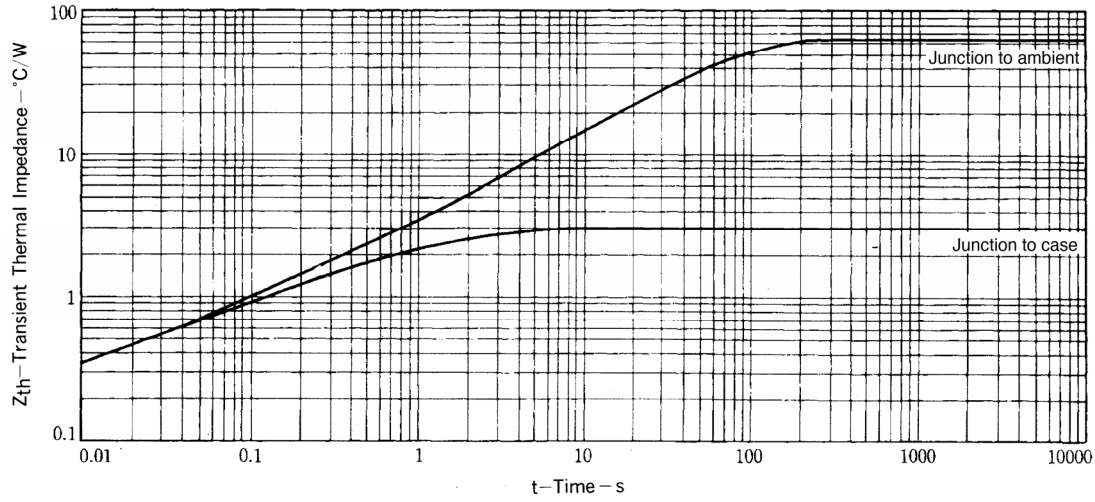
CHARACTERISTICS	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT	REMARK	
Repetitive Peak Reverse Current	I_{RRM}	$V_{RM} = V_{RRM}$	$T_j = 25^\circ\text{C}$	-	-	100	μA	-
			$T_j = 125^\circ\text{C}$	-	-	2	mA	-
Repetitive Peak Off-state Current	I_{DRM}	$V_{DM} = V_{DRM}$	$T_j = 25^\circ\text{C}$	-	-	100	μA	-
			$T_j = 125^\circ\text{C}$	-	-	2	mA	-
Critical Rate Rise of Off-state Voltage	dV_D/dt	$V_{DM} = 2/3 V_{DRM}$, $T_j = 125^\circ\text{C}$	-	40	-	V/ μ s	-	
On-state Voltage	V_{TM}	$I_{TM} = 10 \text{ A}$	-	-	1.4	V	See Fig. 1	
Gate-trigger Current	I_{GT}	$V_{DM} = 6 \text{ V}$, $R_L = 100 \Omega$	-	-	10	mA	See Fig. 3	
Gate-trigger Voltage	V_{GT}	$V_{DM} = 6 \text{ V}$, $R_L = 100 \Omega$	-	-	1.5	V		
Gate Non-trigger Voltage	V_{GD}	$V_{DM} = 1/2 V_{DRM}$, $T_j = 125^\circ\text{C}$	0.2	-	-	V		
Holding Current	I_H	$V_{DM} = 24 \text{ V}$, $I_{TM} = 10 \text{ A}$	-	6	-	mA	-	
Circuit Commuted Turn-off Time	t_q	$I_{TM} = 5 \text{ A}$, $V_R \geq 25 \text{ V}$ $V_{DM} = 2/3 V_{DRM}$, $di_R/dt = 15 \text{ A}/\mu\text{s}$ $dV_D/dt = 10 \text{ V}/\mu\text{s}$, $T_j = 125^\circ\text{C}$	-	50	-	μs	-	
Thermal Resistance	$R_{th(j-c)}$	Junction to case DC	-	-	3	$^\circ\text{C}/\text{W}$	See Fig. 7	
	$R_{th(j-a)}$	Junction to ambient DC	-	-	65	$^\circ\text{C}/\text{W}$		

TYPICAL CHARACTERISTICS (T_A = 25°C)



<R>

Fig. 7 Z_{th} CHARACTERISTIC



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