

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

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

FEATURES

- Easy installation by TO-220AB package.
- 80 A surge current.
- High Voltage.

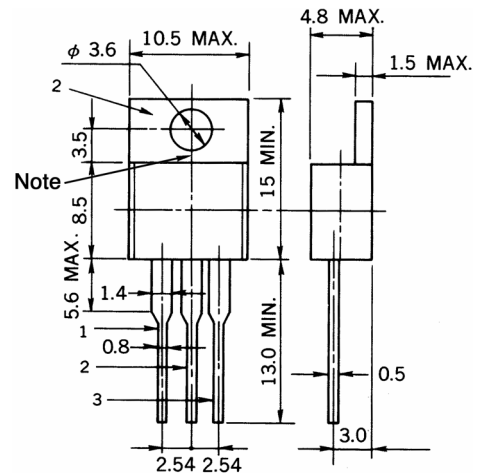
: V_{DRM} , $V_{RRM} = 400\text{ V}$ (5P4M)

: 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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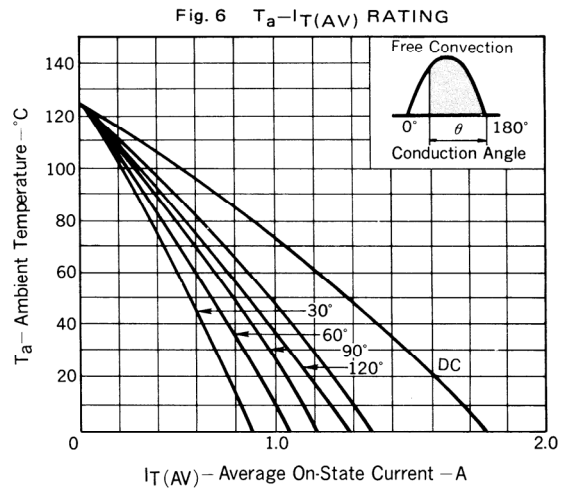
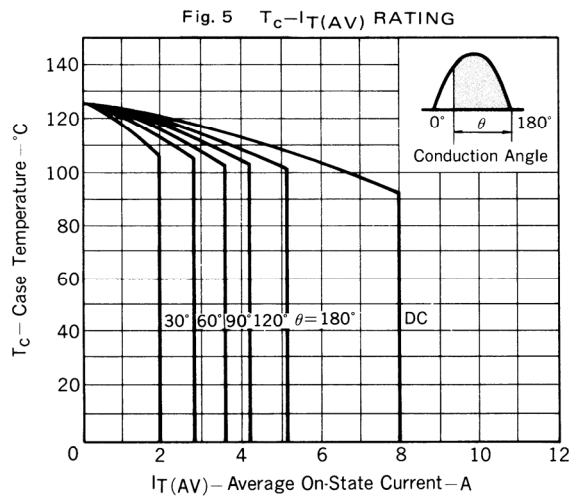
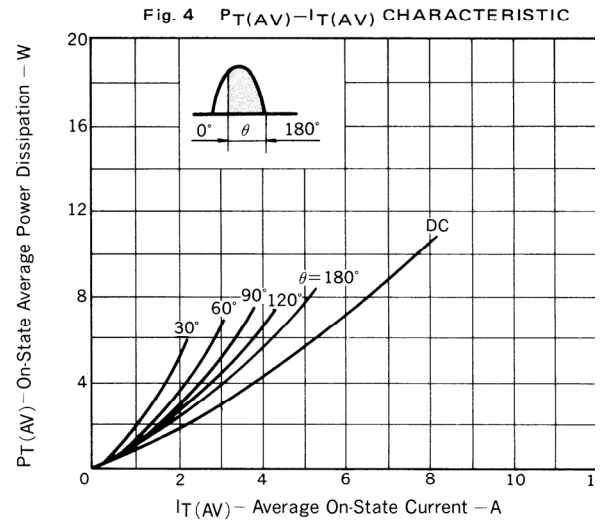
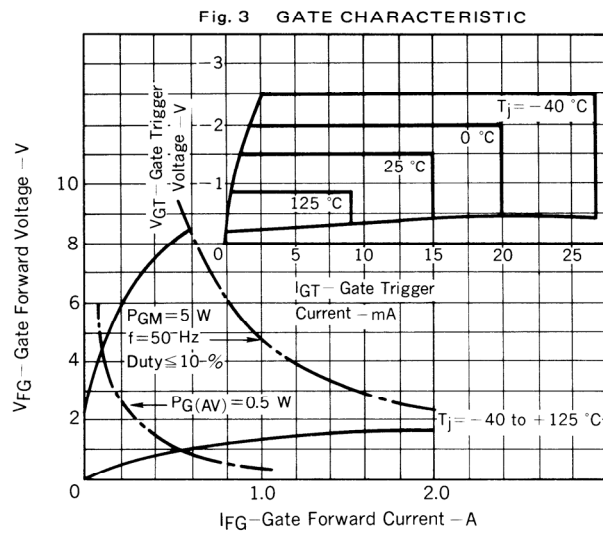
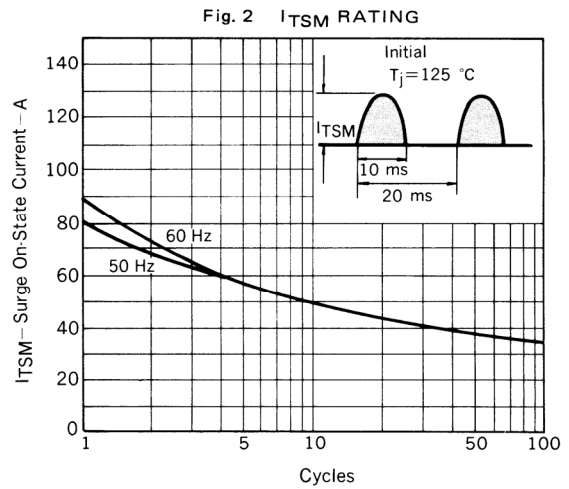
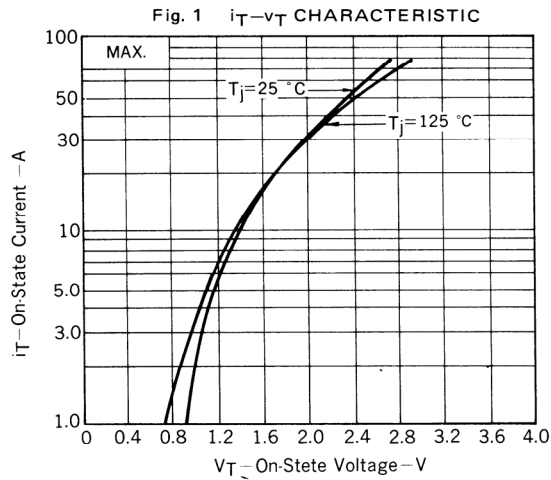
<R> MAXIMUM RATINGS

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	$\int i^2 dt$	28 (1 ms $\leq t \leq$ 10 ms)		A ² s	—
Critical Rate Rise of On-state Current	di_T/dt	50		A/ μs	—
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 ($T_j = 25^\circ\text{C}$)

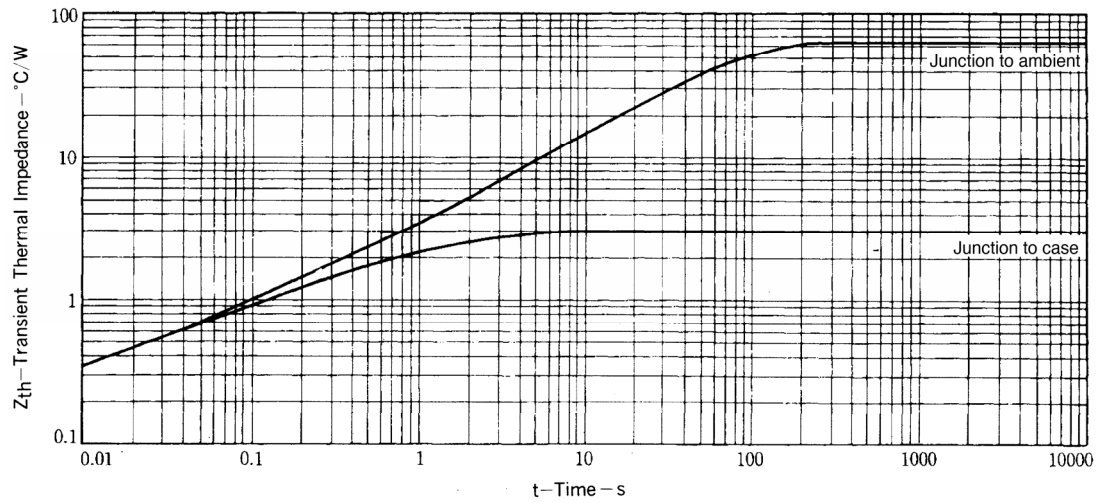
CHARACTERISTICS	SYMBOL	TEST CONDITIONS		MIN.	TYP.	MAX.	UNIT	REMARK
Repetitive Peak Reverse Current	I _{RRM}	V _{RM} = V _{RRM}	T _J = 25°C	—	—	100	μA	—
			T _J = 125°C	—	—	2	mA	—
Repetitive Peak Off-state Current	I _{DRM}	V _{DM} = V _{DRM}	T _J = 25°C	—	—	100	μA	—
			T _J = 125°C	—	—	2	mA	—
Critical Rate Rise of Off-state Voltage	dV _D /dt	V _{DM} = 2/3 V _{DRM} , T _J = 125°C		—	40	—	V/μs	—
On-state Voltage	V _{TM}	I _{TM} = 10 A		—	—	1.4	V	See Fig. 1
Gate-trigger Current	I _{GT}	V _{DM} = 6 V, R _L = 100 Ω		—	—	10	mA	See Fig. 3
Gate-trigger Voltage	V _{GT}	V _{DM} = 6 V, R _L = 100 Ω		—	—	1.5	V	
Gate Non-trigger Voltage	V _{GD}	V _{DM} = 1/2 V _{DRM} , T _J = 125°C		0.2	—	—	V	
Holding Current	I _H	V _{DM} = 24 V, I _{TM} = 10 A		—	6	—	mA	—
Circuit Commuted Turn-off Time	t _q	I _{TM} = 5 A, V _R ≥ 25 V V _{DM} = 2/3 V _{DRM} , diR/dt = 15 A/μs dV _D /dt = 10 V/μs, T _J = 125°C		—	50	—	μs	—
Thermal Resistance	R _{th(j-c)}	Junction to case DC		—	—	3	°C/W	See Fig. 7
	R _{th(j-a)}	Junction to ambient DC		—	—	65	°C/W	

TYPICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$)



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Fig. 7 Z_{th} CHARACTERISTIC



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