RENESAS

THYRISTORS
5P4M,5P6M

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°C). <R>

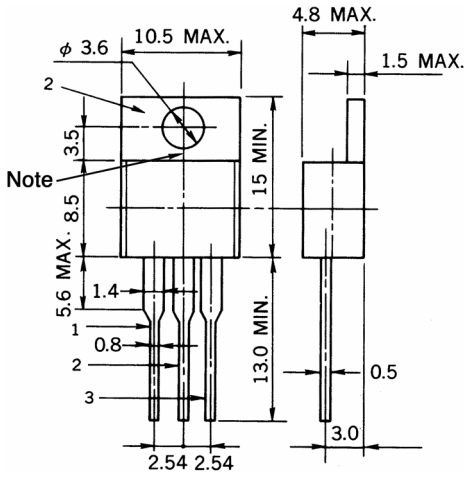
FEATURES

- Easy installation by TO-220AB package.
- 80 A surge current.
- <R> High Voltage.
  : V_{DRM}, V_{RRM} = 400 V (5P4M)
  : V_{DRM}, V_{RRM} = 600 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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The mark <R> shows major revised points.
The revised points can be easily searched by copying an "<R>" in the PDF file and specifying it in the "Find what:" field.

<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°C, θ = 180°, 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 ≤ t ≤ 10 ms)		A^2s	–
Critical Rate Rise of On-state Current	dI_T/dt	50		A/μs	–
Peak Gate Power Dissipation	P_{GM}	5 (f ≥ 50 Hz, Duty ≤ 10%)		W	See Fig. 3
Average Gate Power Dissipation	$P_{G(AV)}$	0.5		W	
Peak Gate Forward Current	I_{FGM}	2 (f ≥ 50 Hz, Duty ≤ 10%)		A	–
Peak Gate Reverse Voltage	V_{RGM}	10		V	–
Junction Temperature	T_j	–40 to +125		°C	–
Storage Temperature	T_{stg}	–55 to +150		°C	–

<R> ELECTRICAL CHARACTERISTICS (T_j = 25°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°C)

Fig. 1 i_T–v_T CHARACTERISTIC

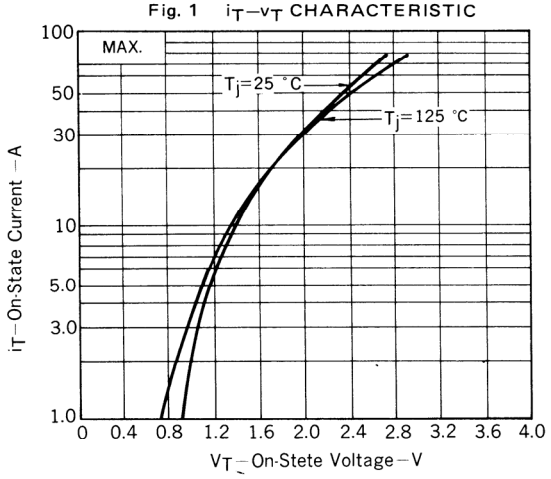

Fig. 2 I_{TSM} RATING

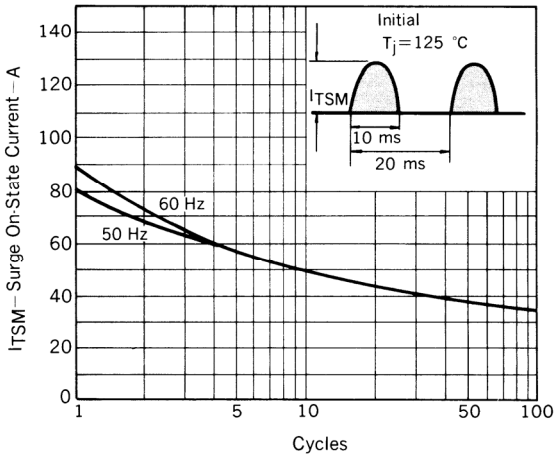

Fig. 3 GATE CHARACTERISTIC

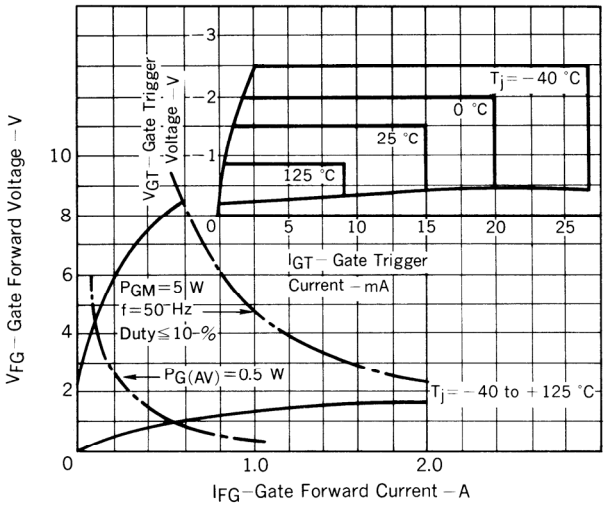

Fig. 4 $P_{T(AV)}$–$I_{T(AV)}$ CHARACTERISTIC

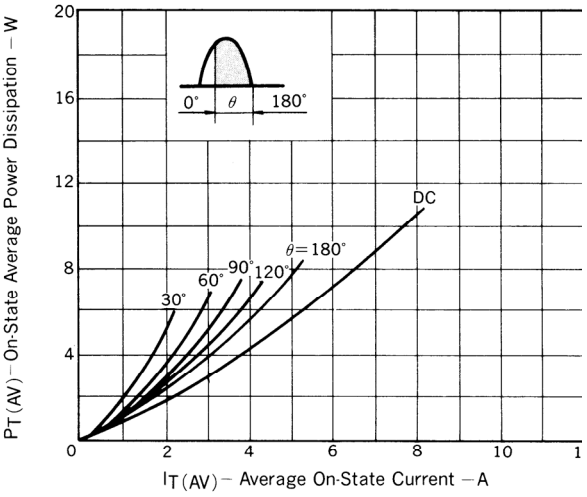

Fig. 5 T_c–$I_{T(AV)}$ RATING

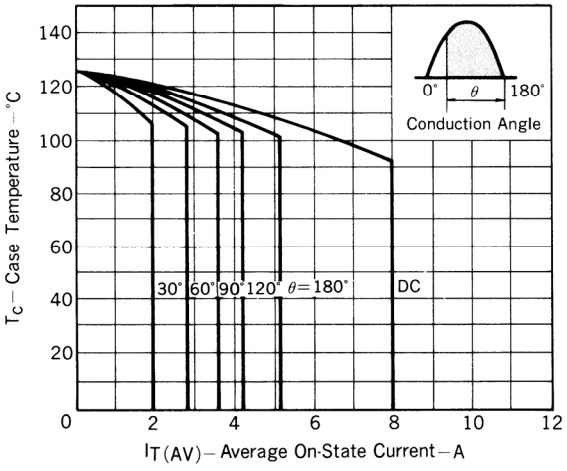

Fig. 6 T_a–$I_{T(AV)}$ RATING

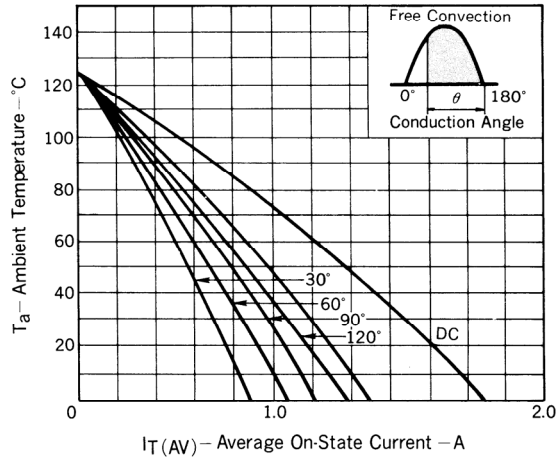

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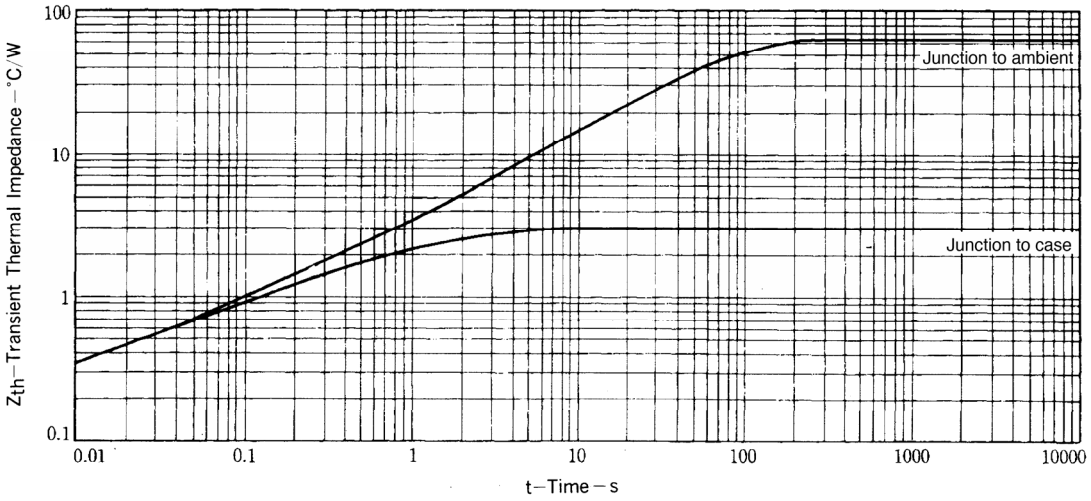
Fig. 7 Z_{th} CHARACTERISTIC



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