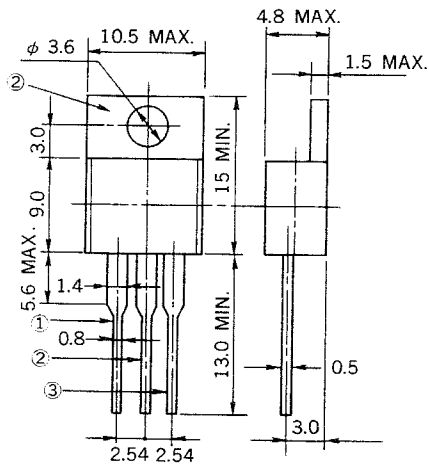


# THYRISTORS

## 5P4M, 5P5M, 5P6M

### 5 A (8 A<sub>r.m.s.</sub>) THYRISTOR

#### PACKAGE DIMENSIONS in millimeters



#### Pin Connection

- ① Cathode
- ② Anode
- ③ Gate

The 5P4M to 5P6M are a P gate all diffused mold type Thyristor granted 5Amp On-state Average Current ( $T_C=103^{\circ}\text{C}$ )

#### FEATURES

- Easy installation by TO-220 AB package.
- 80 A surge current.
- High Voltage.
  - :  $V_{\text{DRM}}, V_{\text{RRM}} = 400\text{ V}$  (5P4M)
  - :  $V_{\text{DRM}}, V_{\text{RRM}} = 500\text{ V}$  (5P5M)
  - :  $V_{\text{DRM}}, V_{\text{RRM}} = 600\text{ V}$  (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.

## MAXIMUM RATINGS

CHARACTERISTIC	SYMBOL	5P4M	5P5M	5P6M	UNIT	NOTE
Non-Repetitive Peak Reverse Voltage	$V_{RSM}$	500	600	700	V	
Non-Repetitive Peak Off-State Voltage	$V_{DSM}$	500	600	700	V	
Repetitive Peak Reverse Voltage	$V_{RRM}$	400	500	600	V	
Repetitive Peak Off-State Voltage	$V_{DRM}$	400	500	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
Surge On-State Current	$I_{TSM}$	80			A	See Fig. 2
Fusing Current	$\int i_T^2 dt$	28 ( $1\text{ ms} \leq t \leq 10\text{ ms}$ )			$\text{A}^2\text{s}$	
Peak Gate Power Dissipation	$P_{GM}$	5 ( $f \geq 50\text{ Hz}$ , Duty $\leq 10\%$ )			W	See Fig. 3
Average Gate Power Dissipation	$P_{G(AV)}$	0.5			W	
Peak Gate Forward Current	$I_{FGM}$	2 ( $f \geq 50\text{ Hz}$ , Duty $\leq 10\%$ )			A	
Peak Gate Reverse Voltage	$V_{RGM}$	10			V	
Junction Temperature	$T_j$	-40 to +125			$^\circ\text{C}$	
Storage Temperature	$T_{stg}$	-40 to +150			$^\circ\text{C}$	
Weight		2			g	

ELECTRICAL CHARACTERISTICS ( $T_j = 25^\circ\text{C}$ )

CHARACTERISTIC	SYMBOL	CONDITION	MIN.	TYP.	MAX.	UNIT	NOTE
Repetitive Peak Reverse Current	$I_{RRM}$	$V_{RM} = V_{RRM}$ , $T_j = 125^\circ\text{C}$	—	—	2	mA	
Repetitive Peak Off-State Current	$I_{DRM}$	$V_{DM} = V_{DRM}$ , $T_j = 125^\circ\text{C}$	—	—	2	mA	
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	
Critical Rate of Rise of Off-State Voltage	$dv/dt$	$V_{DM} = V_{DRM}$ , $T_j = 125^\circ\text{C}$	—	40	—	$\text{V}/\mu\text{s}$	
Holding Current	$I_H$	$V_D = 24\text{ V}$	—	10	—	mA	
Circuit Commuted Turn-Off Time	$t_q$	$I_{TM} = 5\text{ A}$ , $V_R \geq 25\text{ V}$ $V_{DM} = 2/3 V_{DRM}$ , $di/dt = 15\text{ A}/\mu\text{s}$ $dv/dt = 10\text{ V}/\mu\text{s}$ , $T_j = 125^\circ\text{C}$	—	80	—	$\mu\text{s}$	
Thermal Resistance	$R_{th}$	Junction to case	—	—	3	$^\circ\text{C}/\text{W}$	See Fig. 7

Fig. 1  $i_T-v_T$  CHARACTERISTIC

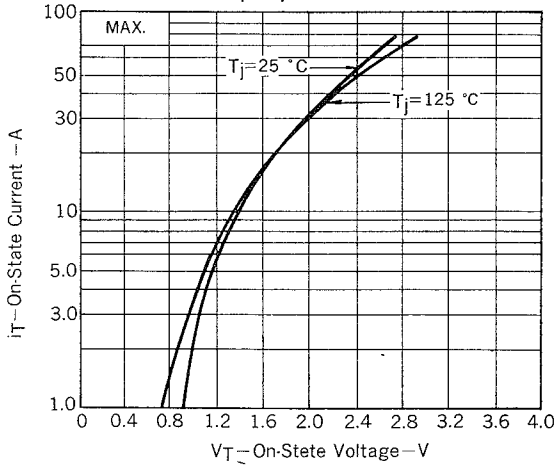


Fig. 2  $I_{TSM}$  RATING

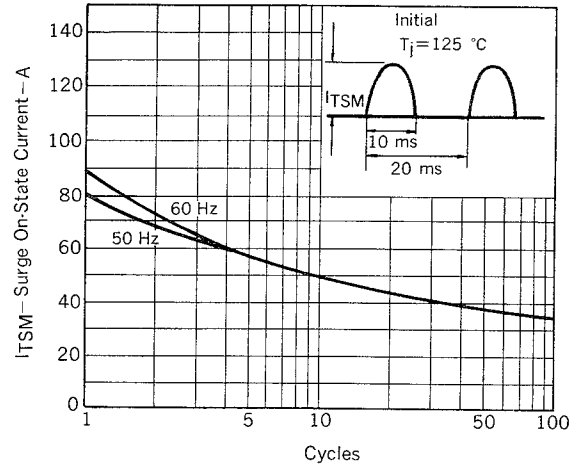


Fig. 3 GATE CHARACTERISTIC

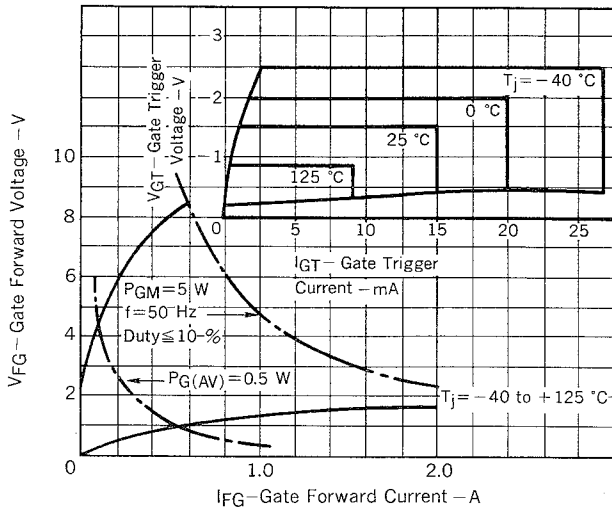


Fig. 4  $P_T(I_{T(AV)})$  CHARACTERISTIC

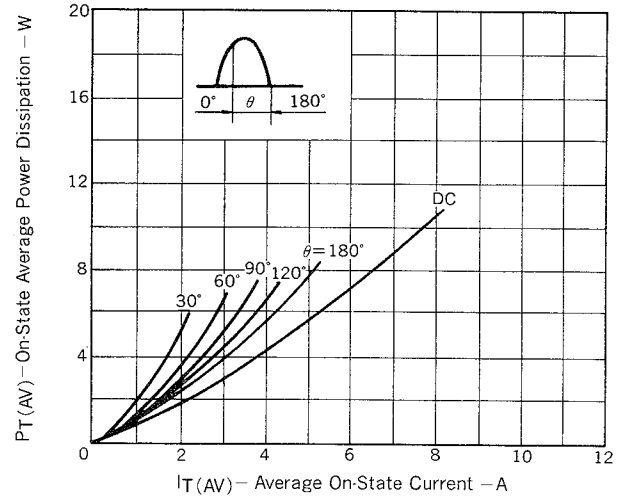


Fig. 5  $T_c-I_{T(AV)}$  RATING

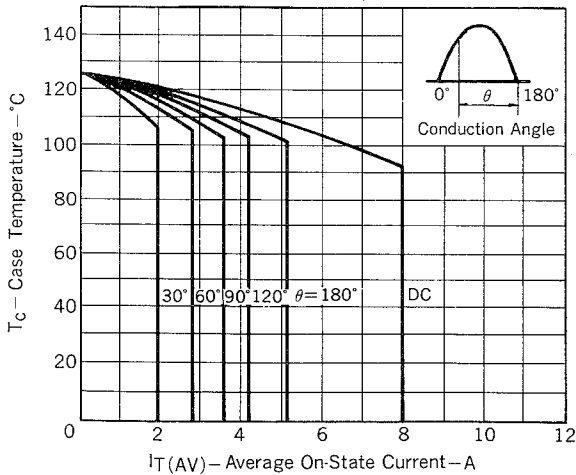
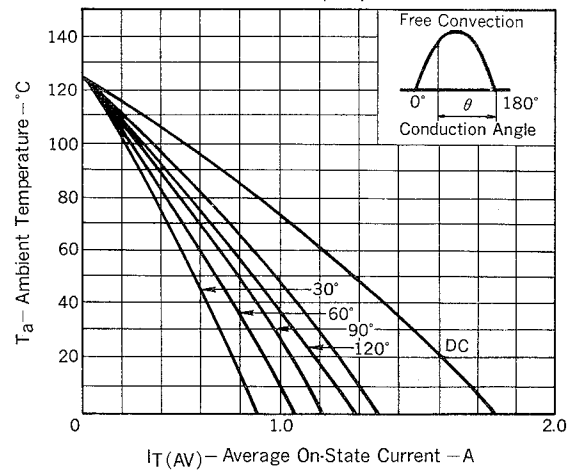
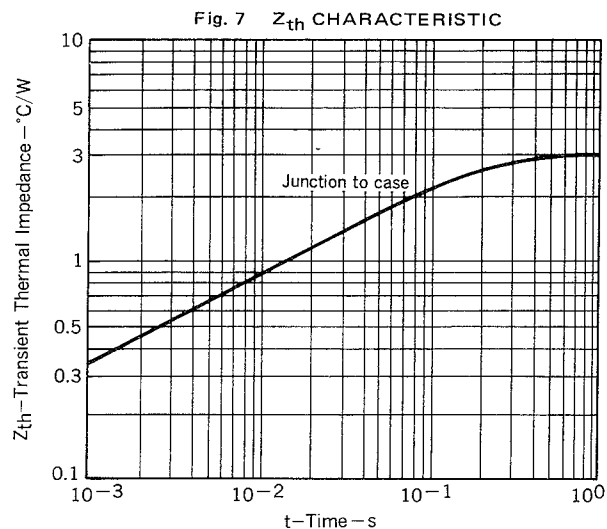


Fig. 6  $T_a-I_{T(AV)}$  RATING





#### NOTICE FOR INSTALLATION

1. Electrode leads are not granted to be bent because of wet-proof. However it is required inevitably that a mechanical stress should not be put on mold case. Fix tightly between the mold case and the area to be formed or dent.
2. Electrode leads are not granted to be bent more than twice over  $90^\circ$  and avoid the bending within 1.5 mm from the neck of the mold case.
3. The surface of heat sink for thermal radiator is to be smooth without any foreign matter.
4. Suitable torque value is around 3kg-cm.

## NEC Corporation

INTERNATIONAL ELECTRON DEVICES DIV.  
 SUMITOMO MITA Building, 37-8,  
 Shiba Gochome, Minato-ku, Tokyo 108, Japan  
 Tel: Tokyo 456-3111  
 Telex Address: NECTOK J22686  
 Cable Address: NEC TOKYO