

# THYRISTORS

## 5P4J, 5P6J

### 5 A SMALL MOLD THYRISTOR

#### DESCRIPTION

The 5P4J and 5P6J are P gate all diffused mold type Thyristor granted 5 Amps On-state Average Current ( $T_c = 95^\circ\text{C}$ ), with rated voltages up to 600 volts.

#### FEATURES

- Small and Surface mount package.
- 65 A surge current.
- High Voltage. :  $V_{DRM}, V_{RRM} = 400\text{ V}$  (5P4J)  
 $V_{DRM}, V_{RRM} = 600\text{ V}$  (5P6J)

#### 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

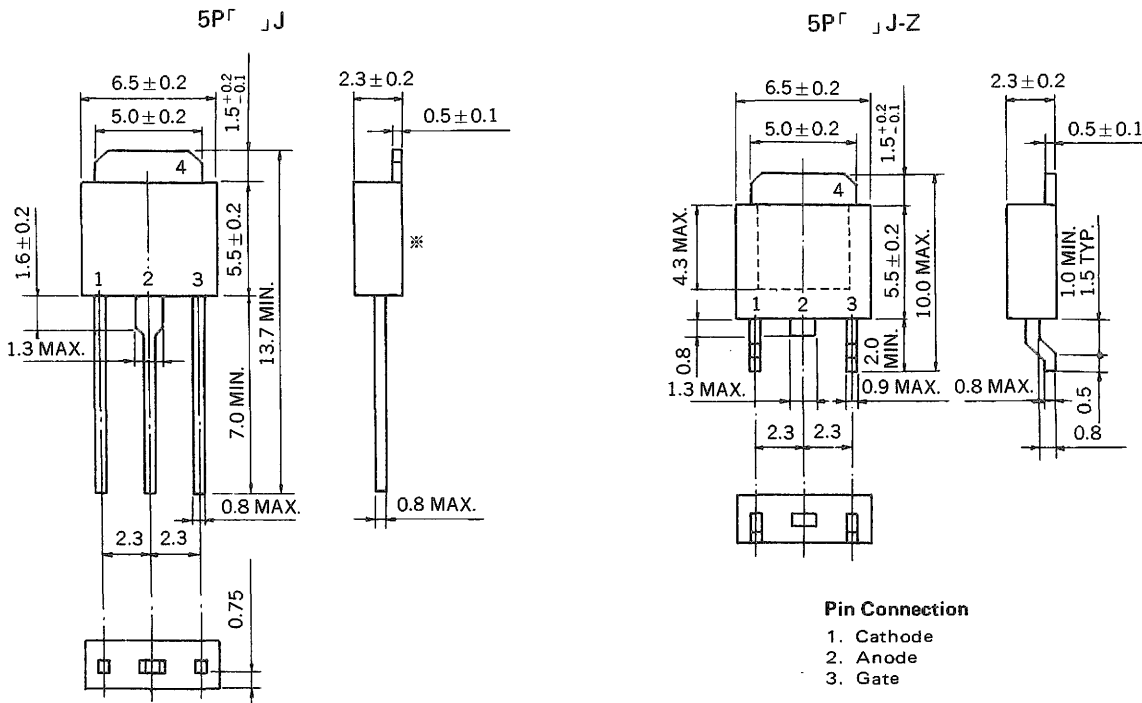
CHARACTERISTIC	SYMBOL	5P4J	5P6J	UNIT	NOTE
Non-Repetitive Peak Reverse Voltage	$V_{RSM}$	500	700	V	$R_{GK} = 1\text{ k}\Omega$
Non-Repetitive Peak Off-State Voltage	$V_{DSM}$	500	700	V	$R_{GK} = 1\text{ k}\Omega$
Repetitive Peak Reverse Voltage	$V_{RRM}$	400	600	V	$R_{GK} = 1\text{ k}\Omega$
Repetitive Peak Off-State Voltage	$V_{DRM}$	400	600	V	$R_{GK} = 1\text{ k}\Omega$
Average On-State Current	$I_{T(AV)}$	5 ( $T_c = 95^\circ\text{C}, \theta = 180^\circ$ Single phase half wave)		A	See Fig. 11
Surge On-State Current	$I_{TSM}$	65 ( $f = 50\text{ Hz, ONE cycle}$ )		A	See Fig. 2
Fusing Current	$\int i_T^2 dt$	20 ( $1\text{ ms} \leq t \leq 10\text{ ms}$ )		$\text{A}^2\text{s}$	
Peak Gate Power Dissipation	$P_{GM}$	2 ( $f \geq 50\text{ Hz, Duty} \leq 10\%$ )		W	See Fig. 3
Average Gate Power Dissipation	$P_{G(AV)}$	0.2		W	
Peak Gate Forward Current	$I_{FGM}$	1 ( $f \geq 50\text{ Hz, Duty} \leq 10\%$ )		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		$^\circ\text{C}$	

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

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	$V_{TM}$	$I_{TM} = 10\text{ A}$	-	-	1.6	V	See Fig. 1
Gate-Trigger Current	$I_{GT}$	$V_{DM} = 6\text{ V}$ , $R_L = 100\ \Omega$	-	-	200	$\mu\text{A}$	See Fig. 4
Gate-Trigger Voltage	$V_{GT}$	$V_{DM} = 6\text{ V}$ , $R_L = 100\ \Omega$	-	-	0.8	V	
Gate Non-Trigger Voltage	$V_{GD}$	$V_{DM} = \frac{1}{2} V_{DRM}$ , $T_j = 125^\circ\text{C}$	0.2	-	-	V	
Critical Rate of Rise of Off-State Voltage	$dv/dt$	$V_{DM} = \frac{2}{3} V_{DRM}$ , $T_j = 125^\circ\text{C}$	-	3	-	$\text{V}/\mu\text{s}$	
Holding Current	$I_H$	$V_D = 24\text{ V}$	-	1	-	mA	
Circuit Commuted Turn-Off Time	$t_q$	$I_{TM} = 3\text{ A}$ , $V_R \geq 25\text{ V}$	-	80	-	$\mu\text{s}$	
		$V_{DM} = \frac{2}{3} V_{DRM}$ , $diR/dt = 15\text{ A}/\mu\text{s}$ $dv/dt = 3\text{ V}/\mu\text{s}$ , $T_j = 125^\circ\text{C}$					
Thermal Resistance	$R_{th(j-c)}$	Junction to case	-	-	3	$^\circ\text{C}/\text{W}$	See Fig. 13
	$R_{th(j-a)}^*$	Junction to Ambient	-	-	60	$^\circ\text{C}/\text{W}$	

\* Mounted on ceramic substrate of  $7.5\text{ cm}^2 \times 0.7\text{ mm}$

PACKAGE DIMENSIONS (Unit : mm)



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

Fig. 1  $i_T - V_T$  CHARACTERISTICS

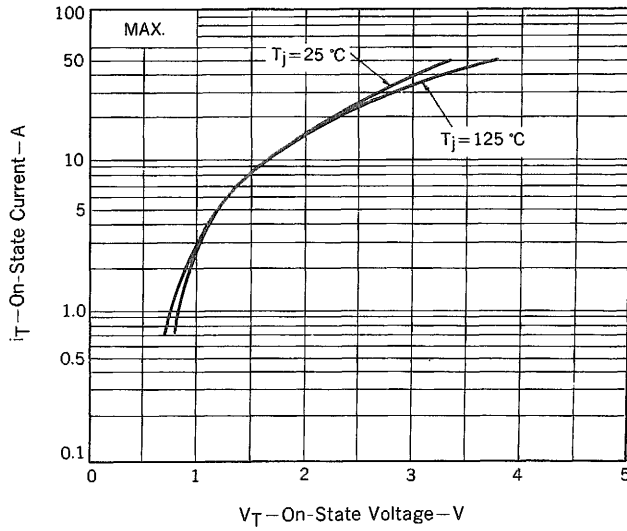


Fig. 2  $I_{TSM}$  RATING

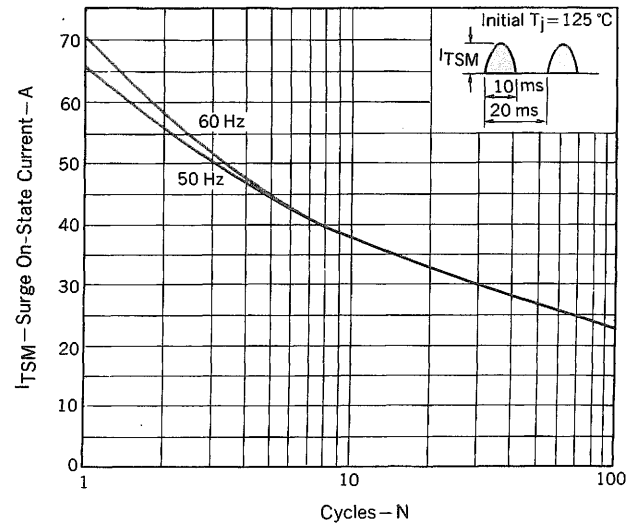


Fig. 3  $V_G - I_G$  RATING

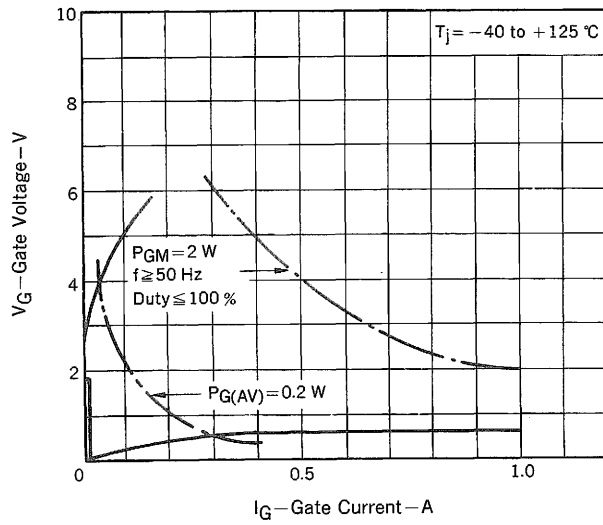


Fig. 4  $V_{GT} - I_{GT}$  CHARACTERISTIC

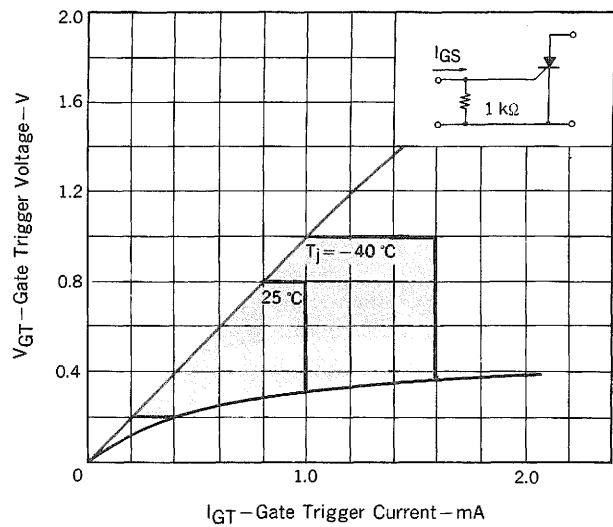


Fig. 5  $I_{GT} - T_a$  TYPICAL DISTRIBUTION

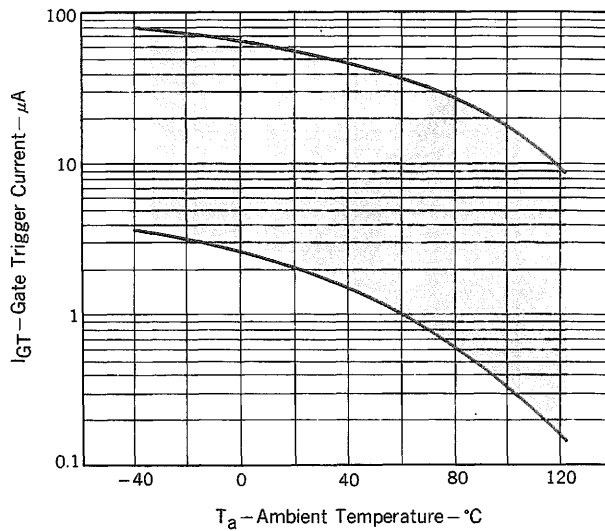


Fig. 6  $V_{GT} - T_a$  TYPICAL DISTRIBUTION

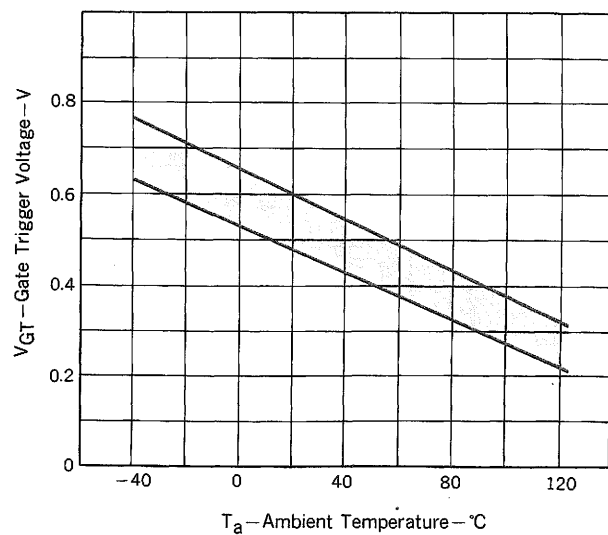


Fig. 7  $I_{GT} - \tau$  TYPICAL DISTRIBUTION

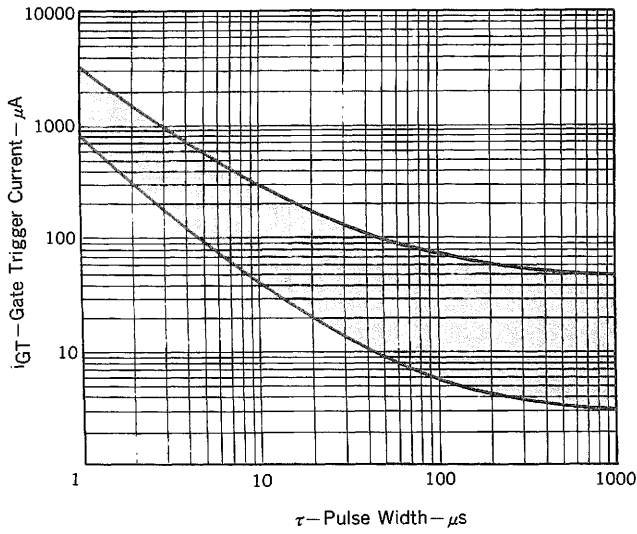


Fig. 8  $V_{GT} - \tau$  TYPICAL DISTRIBUTION

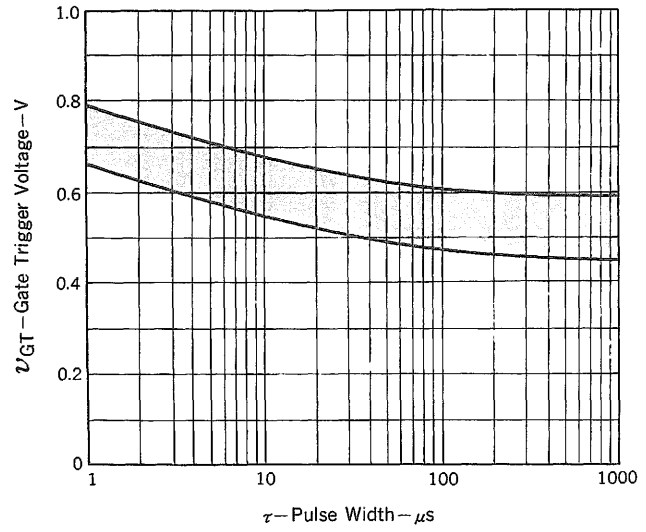


Fig. 9  $I_H - T_a$  TYPICAL DISTRIBUTION

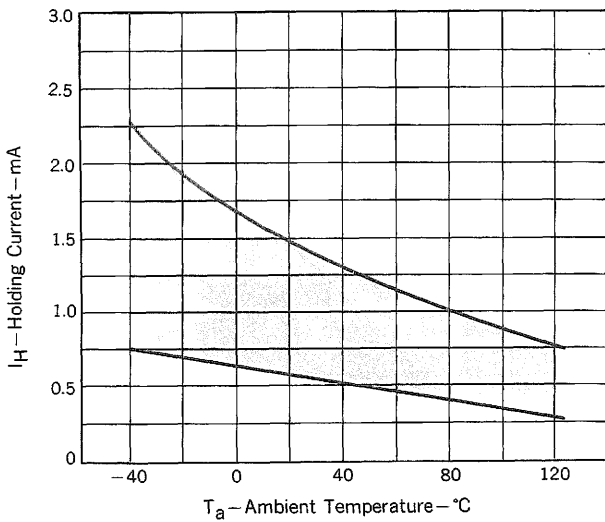


Fig. 10  $P_T(AV) - I_T(AV)$  CHARACTERISTIC

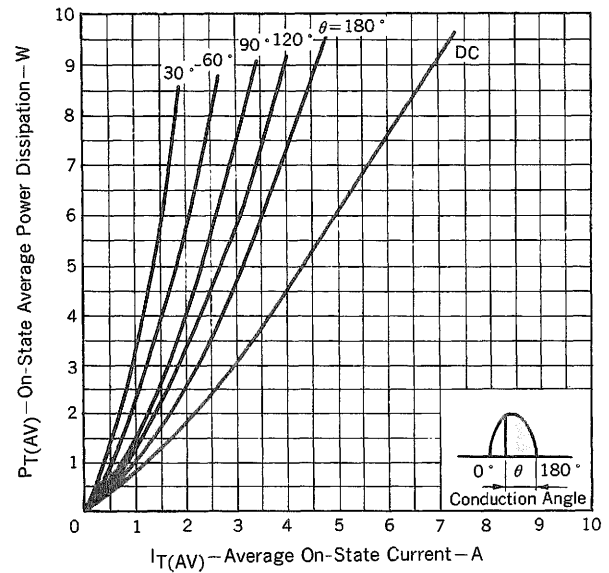


Fig. 11  $T_c - I_T(AV)$  RATING

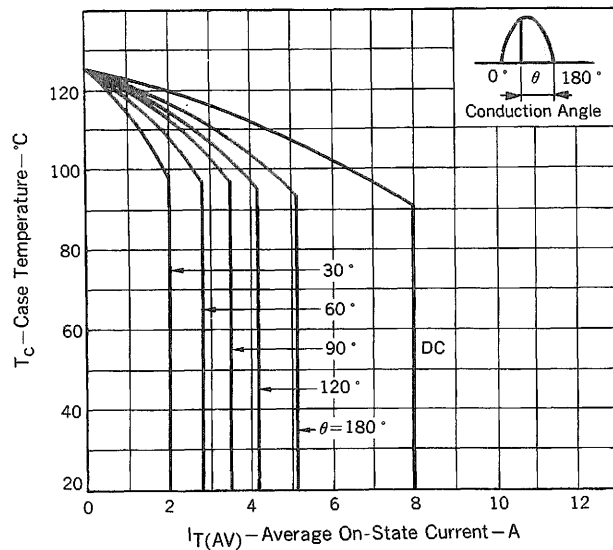


Fig. 12  $T_a - I_T(AV)$  RATING

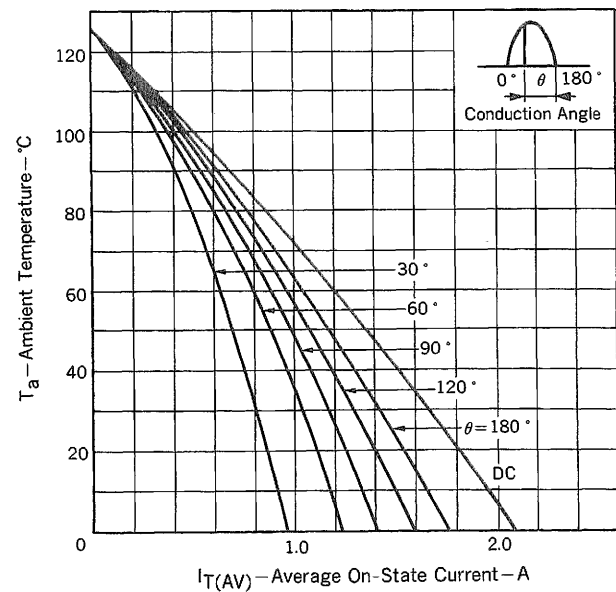


Fig. 13  $Z_{th}$  CHARACTERISTIC

