NEC
ELECTRON DEVICE

THYRISTORS
8P4J, 8P4J-Z

8 A MOLD THYRISTOR

DESCRIPTION

The 8P4J and 8P4J-Z are P-gate all diffused mold type THYRISTOR granted average on-state current 8 Amps (T_C = 90 °C), with rated voltages up to 400 Volts.

FEATURES

- Small and Surface Mount package.
- High junction temperature provides free application design.
- 80 A surge current.

APPLICATIONS

Automotive application such as regulator, Speed control of motor.
Various temperature control, Electronic jar.
Various solid state relay etc.

MAXIMUM RATINGS

ITEM	SYMBOL	MAXIMUM RATINGS	UNIT	NOTE
Non-Repetitive Peak Reverse Voltage	V_{RSM}	500	V	
Non-Repetitive Peak-off Voltage	V_{DSM}	500	V	
Repetitive Reverse Voltage	V_{RRM}	400	V	
Repetitive Peak-off Voltage	V_{DRM}	400	V	
On-state Current	$I_{T(AV)}$	8 (T_C = 90 °C, θ = 180 ° Single Phase half wave)	A	Fig. 11
	$I_{T(RSM)}$	12.6		
Surge On-state Current	I_{TSM}	80	A	Fig. 2
Critical Rate-Rise of On-State Current	di/dt	50	A/μs	
Gate Power Dissipation	P_{GM}	5 (f ≥ 50 Hz, Duty ≤ 10 %)	W	Fig. 3
Gate Power Dissipation	$P_{G(AV)}$	0.5	W	
Gate Forward Current	I_{FGM}	2 (f ≥ 50 Hz, Duty ≤ 10 %)	A	
Gate Reverse Voltage	V_{RGM}	10	V	
Junction Temperature	T_j	−40 to +125	°C	
Storage Temperature	T_{stg}	−55 to +150	°C	

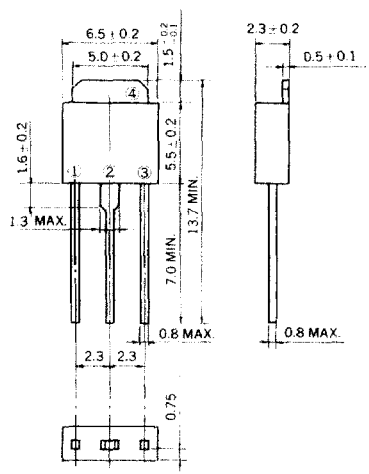
ELECTRICAL CHARACTERISTICS (T_j = 25 °C)

CHARACTERISTIC	SYMBOL	CONDITION	MIN.	TYP.	MAX.	UNIT	NOTE
Repetitive Peak Reverse Current	I_{RRM}	V_{RM} = 400 V, T_j = 125 °C, R_{GK} = 1 kΩ	–	–	2	mA	
Repetitive Peak Off-state Current	I_{DRM}	V_{DM} = 400 V, T_j = 125 °C, R_{GK} = 1 kΩ	–	–	2	mA	
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. 5 Fig. 7
Gate-Trigger Voltage	V_{GT}	V_{DM} = 6 V, R_L = 100 Ω	–	–	1.5	V	See Fig. 6 Fig. 8
Gate Non-Trigger Voltage	V_{GD}	V_{DM} = 200 V, T_j = 125 °C	0.2	–	–	V	
Critical Rate-of-Rise of Off-state Voltage	dv/dt	V_{DM} = 270 V, T_j = 125 °C	–	40	–	V/μS	
Holding Current*	I_H	V_D = 24 V, I_{TM} = 10 A	–	6	–	mA	See Fig. 9
Thermal Resistance	$R_{th(j-c)}$	Junction to Case	–	–	2.3	°C/W	See Fig. 13
	$R_{th(j-a)}$	Junction to Ambient*	–	–	62.5		

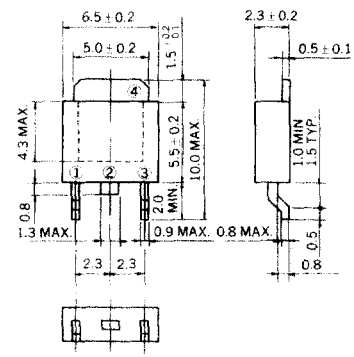
* Mount on 7.5 cm² × 0.7 mm ceramic substrate

PACKAGE DIMENSIONS (in millimeters)

8P4J



8P4J-Z



Pin Connection

1. Cathode
2. Anode
3. Gate
4. Fin (Anode)

CHARACTERISTIC

Fig. 1 $I_T - v_T$ CHARACTERISTIC

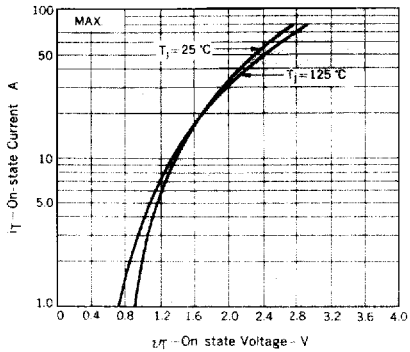


Fig. 2 I_{TSM} RATING

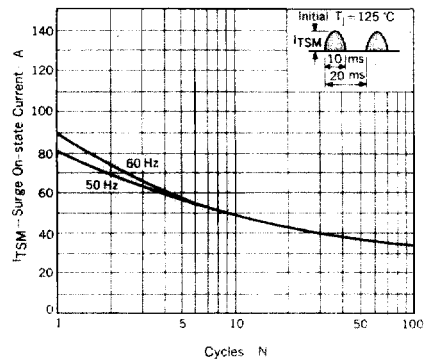


Fig. 3 GATE POWER RATINGS

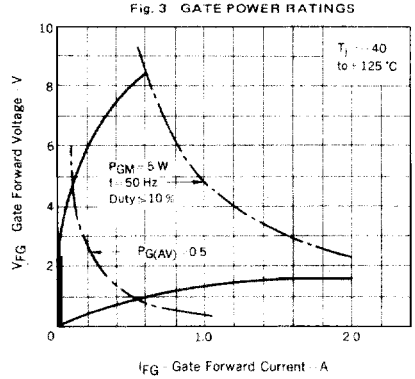


Fig. 4 GATE CHARACTERISTIC

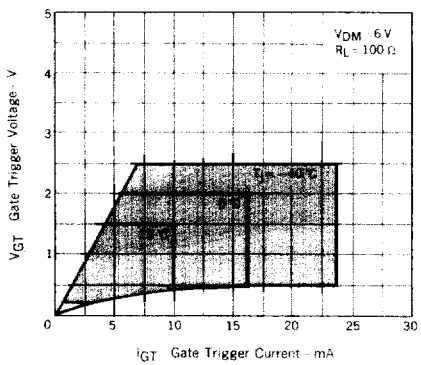


Fig. 5 $I_{GT} - T_a$ TYPICAL DISTRIBUTION

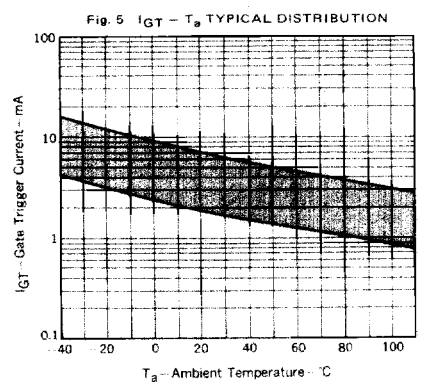


Fig. 6 $V_{GT} - T_a$ TYPICAL DISTRIBUTION

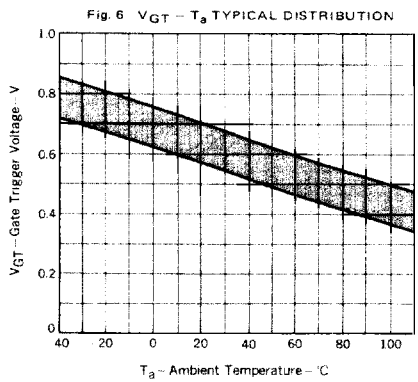


Fig. 7 I_{GT} – τ_G TYPICAL DISTRIBUTION

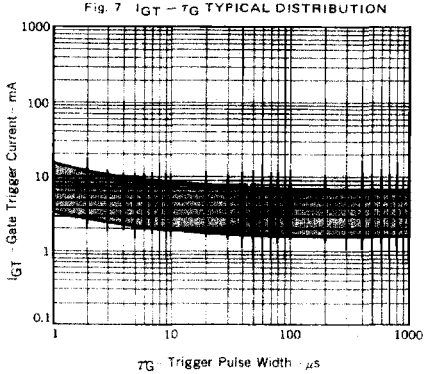


Fig. 8 v_{GT} – τ_G TYPICAL DISTRIBUTION

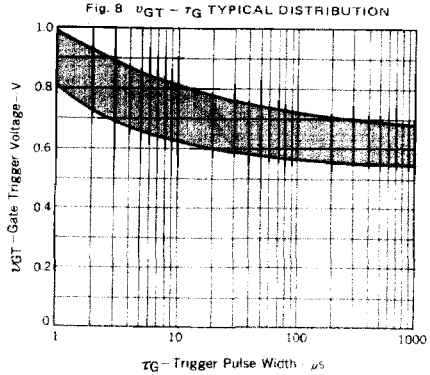


Fig. 9 I_H – T_a TYPICAL DISTRIBUTION

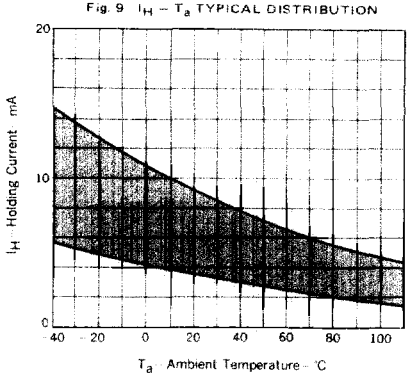


Fig. 10 $P_{T(AV)}$ – $I_{T(AV)}$ CHARACTERISTIC

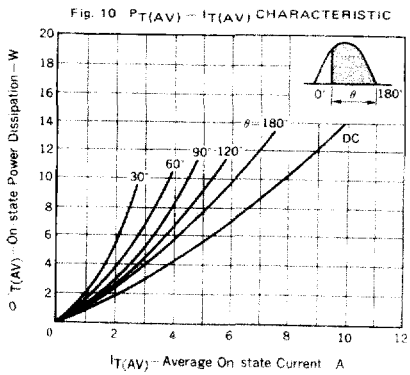


Fig. 11 T_c – $I_{T(AV)}$ RATING

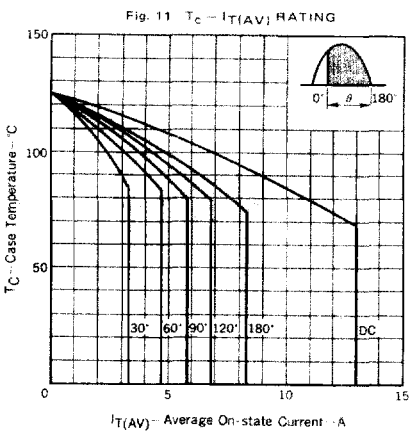


Fig. 12 T_a – $I_{T(AV)}$ RATING

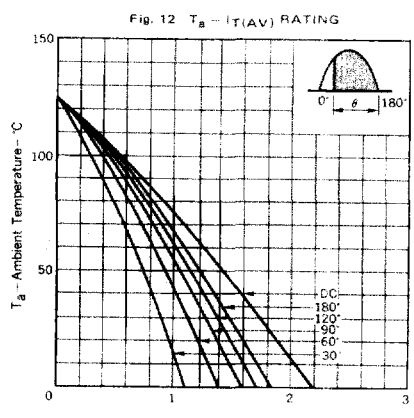


Fig. 13 Z_{th} CHARACTERISTIC