DATA SHEET

NEC

THYRISTORS

3P4J,3P4J-Z,3P4J-ZK

3 A MOLD THYRISTOR

The 3P4J, 3P4J-Z, and 3P4J-ZK are a P gate all diffused mold type Thyristor granted 3 A On-state Average Current (T_C = 103°C) with rated voltages up to 400 V.

<R> FEATURES

- For a small and light package, miniaturization of a set is easy.
- Suitable for capacitor discharge applications with high pulse current rating.
- $I_{GT} \leq 100\ \mu A$
- Surface mounting (3P4J-Z, 3P4J-ZK)

<R> APPLICATIONS

- Contact-less switch for electronic devices, ignition devices, electronic household appliances and other light industry equipment

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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.

MAXIMUM RATINGS

<R>

CHARACTERISTICS	SYMBOL	3P4J, 3P4J-Z, 3P4J-ZK	UNIT	REMARK
Non-repetitive Peak Reverse Voltage	V_{RSM}	500	V	R_{GK} = 1 kΩ
Non-repetitive Peak Off-state Voltage	V_{DSM}	500	V	R_{GK} = 1 kΩ
Repetitive Peak Reverse Voltage	V_{RRM}	400	V	R_{GK} = 1 kΩ
Repetitive Peak Off-state Voltage	V_{DRM}	400	V	R_{GK} = 1 kΩ
Average On-state Current	$I_{T(AV)}$	3 (T_C = 103°C, θ = 180°, Single phase half wave)	A	See Fig. 11
Effective On-state Current	$I_{T(RMS)}$	4	A	
Surge On-state Current	I_{TSM}	40 (f = 50 Hz, sine half wave, 1 cycle)	A	See Fig. 2
Fusing Current	$\int i_T^2 dt$	6 (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}	1 (f ≥ 50 Hz, Duty ≤ 10%)	W	–
Average Gate Power Dissipation	$P_{G(AV)}$	0.2	W	–
Peak Gate Forward Current	I_{FGM}	0.5 (f ≥ 50 Hz, Duty ≤ 10%)	A	–
Peak Gate Reverse Voltage	V_{RGM}	6	V	–
Junction Temperature	T_j	−40 to +125	°C	–
Storage Temperature	T_{stg}	−55 to +150	°C	–

<R> ELECTRICAL CHARACTERISTICS (T_j = 25°C, R_{GK} = 1 kΩ)

CHARACTERISTICS	SYMBOL	TEST CONDITIONS		MIN.	TYP.	MAX.	UNIT
Repetitive Peak Reverse Current	I_{RRM}	V_{RM} = 400 V	T_j = 25°C	–	–	50	μA
			T_j = 125°C	–	–	1	mA
Repetitive Peak Off-state Current	I_{DRM}	V_{DM} = 400 V	T_j = 25°C	–	–	50	μA
			T_j = 125°C	–	–	1	mA
Critical Rate Rise of Off-state Voltage	dV_D/dt	V_{DM} = 270 V, T_j = 125°C		–	10	–	V/μs
On-state Voltage	V_{TM}	I_{TM} = 4 A		–	–	1.4	V
Gate-trigger Current	I_{GT}	V_{DM} = 6 V, R_L = 100 Ω		–	–	100	μA
Gate-trigger Voltage	V_{GT}	V_{DM} = 6 V, R_L = 100 Ω		–	–	0.8	V
Gate Non-trigger Voltage	V_{GD}	V_{DM} = 200 V, T_j = 125°C		0.2	–	–	V
Holding Current	I_H	V_{DM} = 24 V, I_{TM} = 5 A		–	–	5	mA
Circuit Commuted Turn-off Time	t_q	I_{TM} = 2 A, V_R ≥ 25 V V_{DM} = 270 V, dI_R/dt = 15 A/μs dV_D/dt = 1 V/μs, T_j = 125°C		–	30	–	μs
Thermal Resistance	$R_{th(j-c)}$	Junction to case DC		–	–	4.0	°C/W
	$R_{th(j-a)}$	Junction to ambient DC **Note**		–	–	62.5	

Note Mount on 2 x 3.75 cm^2 ceramic substrate

TYPICAL CHARACTERISTICS

Fig. 1 $I_T - v_T$ CHARACTERISTIC

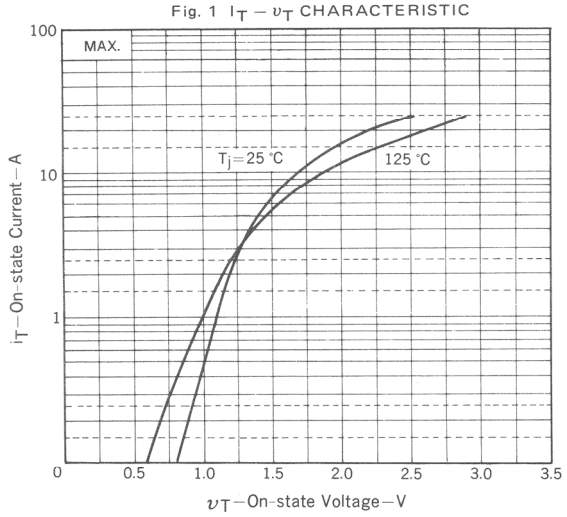

Fig. 2 I_{TSM} RATING

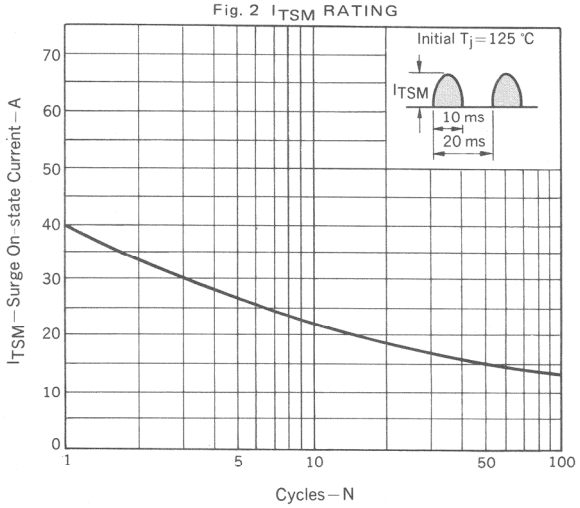

Fig. 3 GATE POWER RATINGS

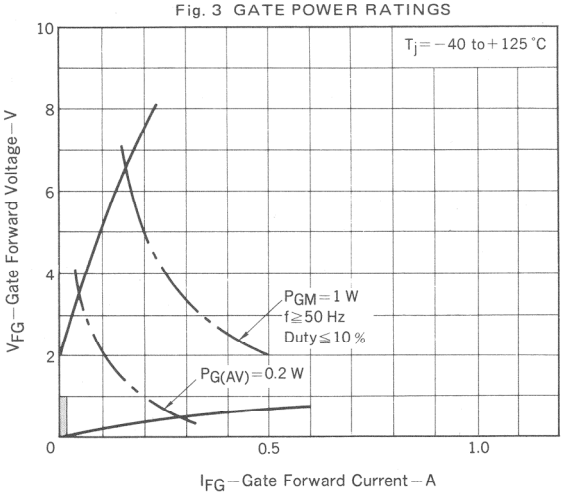

Fig. 4 GATE CHARACTERISTIC

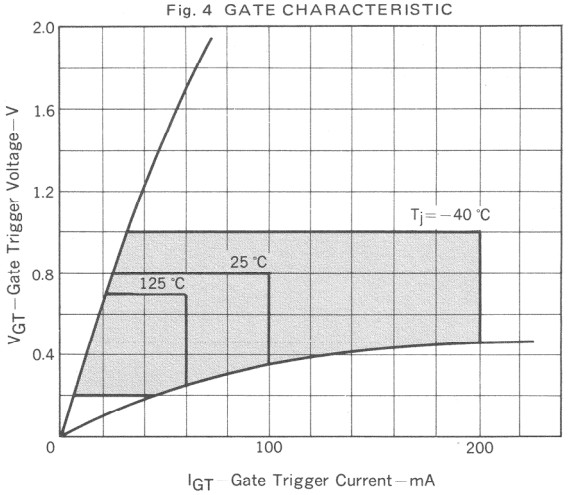

Fig. 5 $I_{GT} - T_a$ TYPICAL DISTRIBUTION

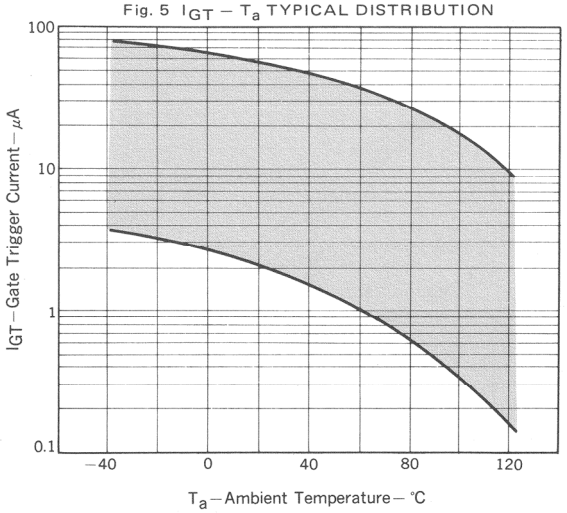

Fig. 6 $V_{GT} - T_a$ TYPICAL DISTRIBUTION

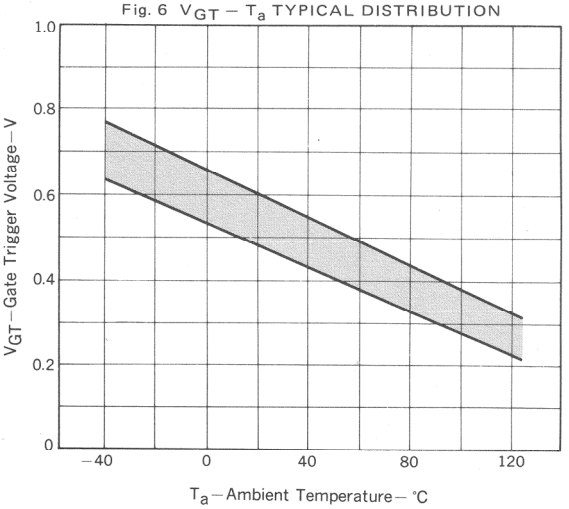

Fig. 7 $I_{GT} - \tau_G$ TYPICAL DISTRIBUTION

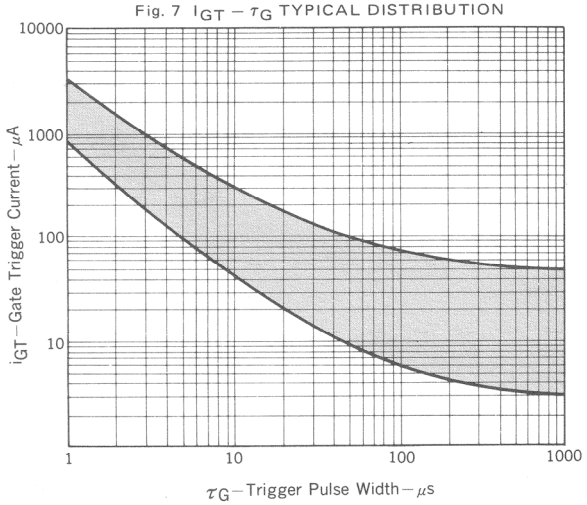

Fig. 8 $v_{GT} - \tau_G$ TYPICAL DISTRIBUTION

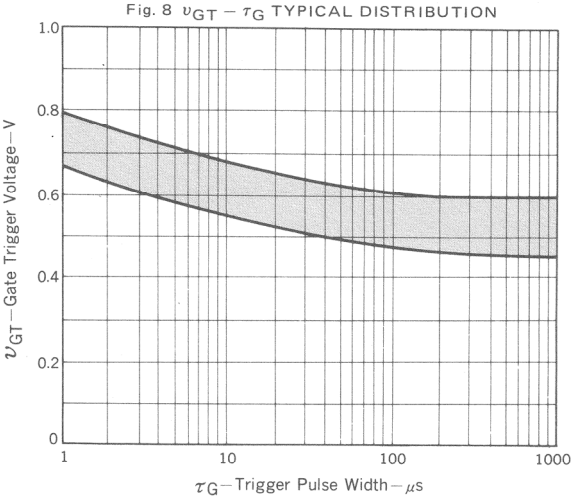

Fig. 9 $I_H - T_a$ TYPICAL DISTRIBUTION

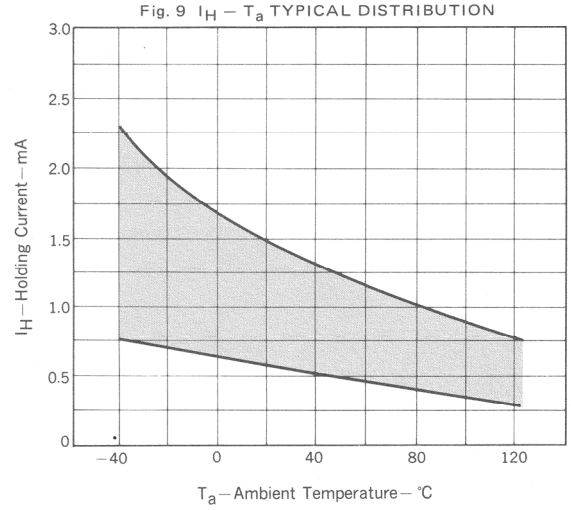

Fig. 10 $P_{T(AV)} - I_{T(AV)}$ CHARACTERISTIC

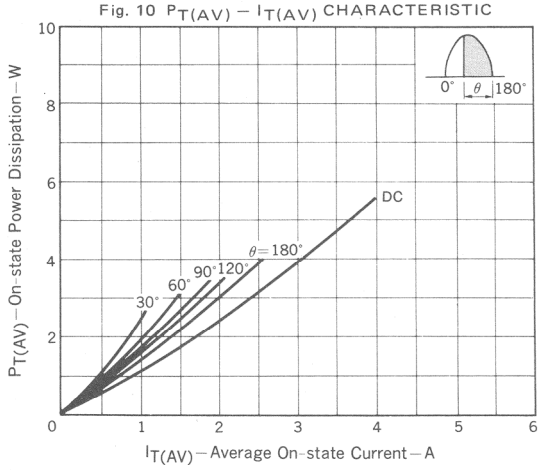

Fig. 11 $T_c - I_{T(AV)}$ RATING

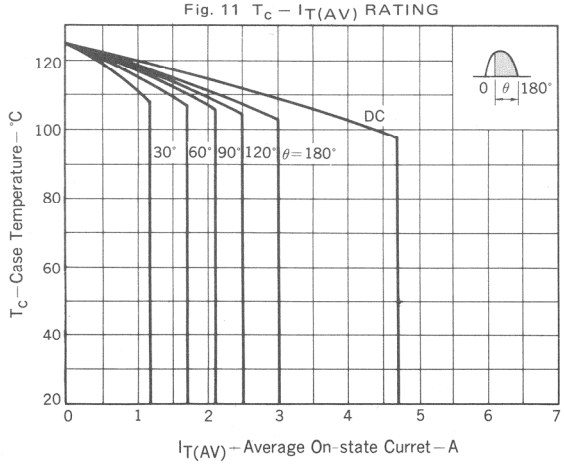

Fig. 12 $T_a - I_{T(AV)}$ RATING

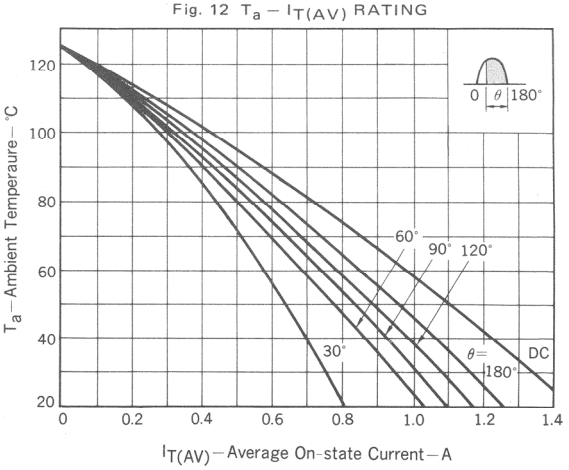

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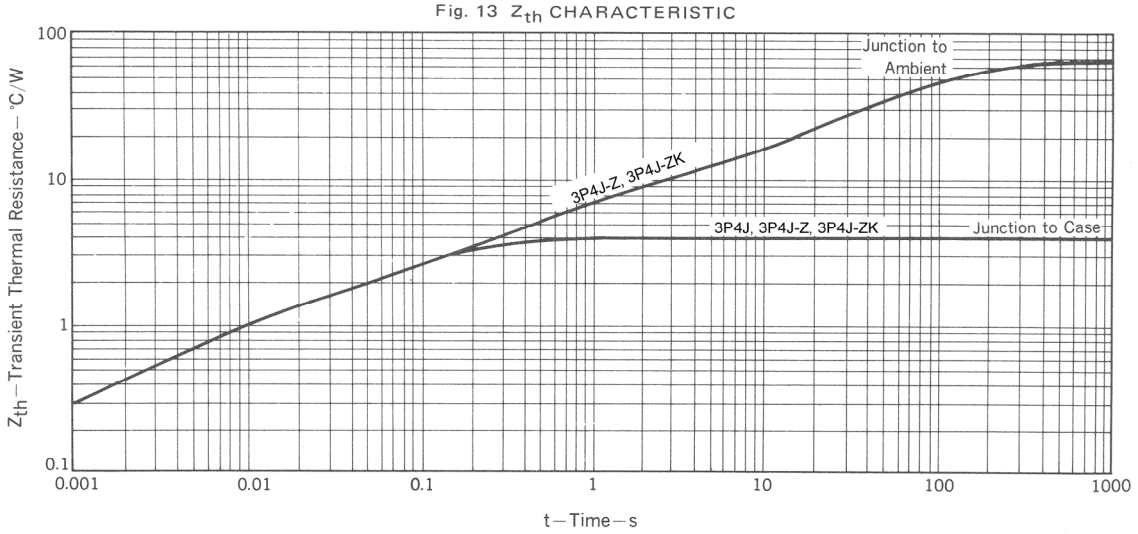
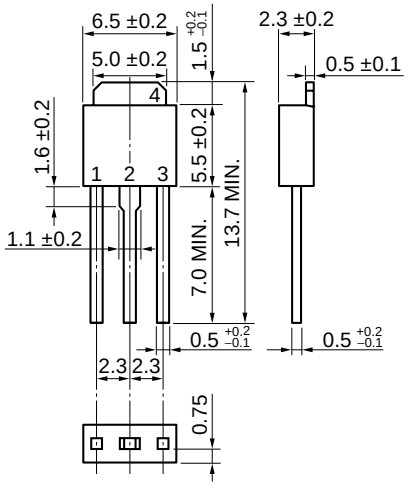
Fig. 13 Z_{th} CHARACTERISTIC



<R> **PACKAGE DRAWING (Unit: mm)**

▪ **3P4J**

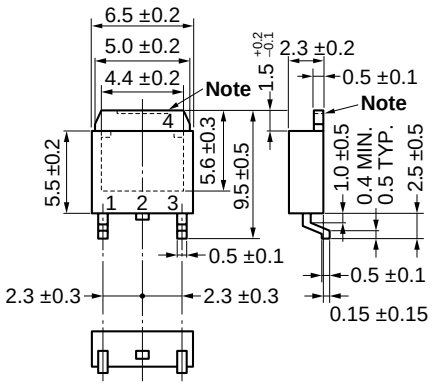


Pin Connection

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

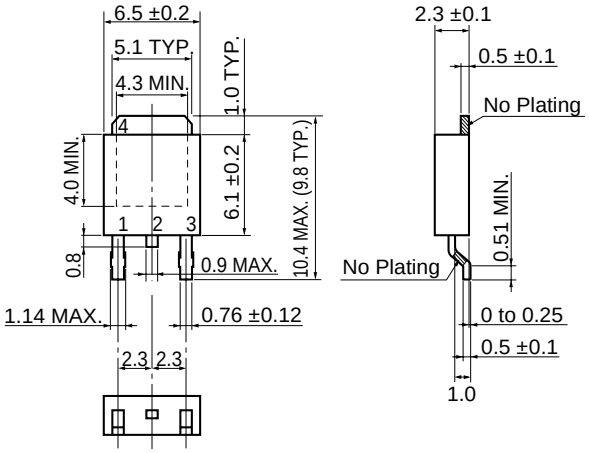
Standard weight: 0.3 g

▪ **3P4J-Z**



Note The depth of notch at the top of the fin is from 0 to 0.2 mm.

▪ **3P4J-ZK**



Pin Connection

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

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