



1、Description

PNPN devices designed for high volume consumer applications such as temperature, light and speed control; process and remote control, and warning systems where reliability of operation is important.

2、Features

- Sensitive gate allows triggering by micro-controllers and other logic circuits
- Flat, Rugged, Thermopad Construction for Low Thermal Resistance, High Heat Dissipation and Durability
- Practical Level Triggering and Holding Characteristics
- Glass-Passivated Surface for Reliability and Uniformity
- Blocking voltage to 400 thru 600 volts

3、Pinning information

PIN	Description	Simplified outline	Symbol
1	Cathode (K)	 TO-126	
2	Anode (A)		
3	Gate (G)		

4、Quick reference data

SYMBOL	PARAMETER	MAX	UNIT
V_{DRM} V_{RRM}	Repetitive peak off-state voltages	400	V
$I_{T(AV)}$	Average on-state current	2.5	A
$I_{T(RMS)}$	RMS on-state current	4	A
I_{TSM}	Non-repetitive peak on-state current	20	A
I_{GT}	Gate trigger current	200	μA

5、Thermal characteristics

SYMBOL	PARAMETER	CONDITIONS	MIN	TYP	MAX	UNIT
$R_{\theta JC}$	Thermal resistance, -- Junction to Case		-	-	3.0	$^{\circ}C/W$
$R_{\theta JA}$	Thermal resistance --Junction to Ambient				75	$^{\circ}C/W$
T_L	Lead Solder Temperature	<1/16" from case, 10 secs max	-	260	-	$^{\circ}C$

6、Limiting value

Limiting values in accordance with the Maximum System(IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN	MAX	UNIT
V_{DRM} V_{RRM}	Repetitive peak off-state voltages		-	400	V
$I_{T(AV)}$	Average on-state current	180° Conduction Angles, TC = 80°C	-	2.5	A
$I_{T(RMS)}$	RMS on-state current	180° Conduction Angles, TC = 80°C	-	4	A
I_{TSM}	Non-repetitive peak on-state current	1/2 Cycle, Sine Wave, 60 Hz, T _J = +110°C	-	20	A
I^2t	Circuit Fusing Considerations	$t = 8 \cdot 3 \text{ ms}$	-	1.65	A ² s
di_T/dt	Repetitive rate of rise of on-state current after triggering	$I_{TM} = 10 \text{ A}$; $I_G = 50 \text{ mA}$; $di_G/dt = 50 \text{ mA/s}$	-	50	A/μs
I_{GM}	Peak gate current	Pulse Width _1.0 sec, TC = 80 °C	-	0.2	A
V_{RGM}	Peak reverse gate voltage	$I_{GR} = 10 \text{ A}$	-	6	V
P_{GM}	Peak gate power	Pulse Width _1.0 sec, TC = 80 °C	-	0.5	W
$P_{G(AV)}$	Average gate power	Pulse Width _1.0 sec, TC = 80 °C	-	0.1	W
T_{stg}	Storage temperature		-40	150	°C
T_J	Operating junction temperature		-	125	°C

7、Characteristics

T_J = 25°C unless otherwise stated

SYMBOL	PARAMETER	CONDITIONS	MIN	TYP	MAX	UNIT
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Static characteristics

I_{DRM} , I_{RRM}	Peak Repetitive Forward Or Reverse Blocking Current	$V_D = \text{Rated } V_{DRM} \text{ and } V_{RRM}, R_{GK} = 1 \text{ K}\Omega$ TC=25°C TC=110°C	- -	- -	10 200	μA μA
V_{TM}	Peak Forward On-State Voltage	$I_{TM} = 4 \text{ A}$			2.2	V
I_{GT}	Gate trigger current (Continuous dc)	$V_{AK} = 6 \text{ Vdc}$, $R_L = 100 \text{ Ohms}$ T _J = 25 °C T _J = -40 °C	- -	15 35	200 500	μA
I_L	Latching current	$V_{AK} = 6 \text{ V}$; $I_{GT} = 20 \text{ mA}$ T _J = 25 °C T _J = -40 °C	- -	0.20 0.35	5.0 7.0	mA
I_H	Holding current	$V_{AK} = 6 \text{ V}$; (Initiating Current = 20 mA, Gate Open) T _J = 25 °C T _J = -40°C	- -	0.19 0.33	3.0 6.0	mA
V_{GT}	Gate trigger voltage	$V_{AK} = 6 \text{ V}$; $I_T = 0.1 \text{ A}$ T _J = 25 °C T _J = -40°C	0.4 0.5	0.60 0.75	0.8 1.0	V
V_{GD}	Off-state leakage Voltage	$V_{AK} = 12 \text{ V}$, $R_L = 100 \text{ Ohms}$, T _J = 110 °C)	0.2	-	-	V

Dynamic Characteristics

dv_D/dt	Critical rate of rise of off-state voltage	$V_{AK} = \text{Rated } V_{DRM}$, Exponential Waveform, $R_{GK} = 1000 \text{ Ohms}$, T _J = 110 °C)	-	8.0	-	V/μs
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8、Electrical Characteristics Curve

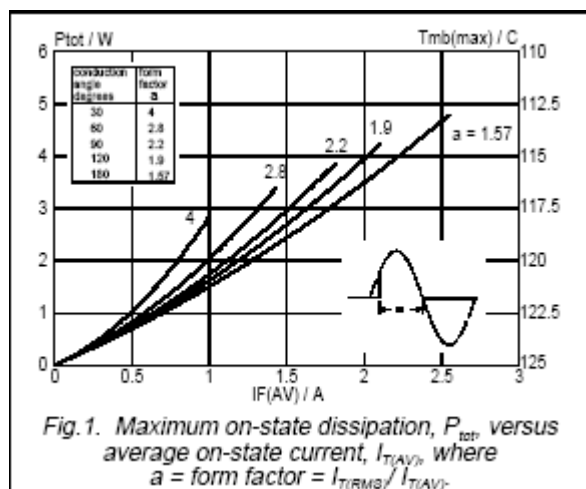


Fig.1. Maximum on-state dissipation, P_{tot} , versus average on-state current, $I_{T(AV)}$, where $a = \text{form factor} = I_{T(RMS)} / I_{T(AV)}$.

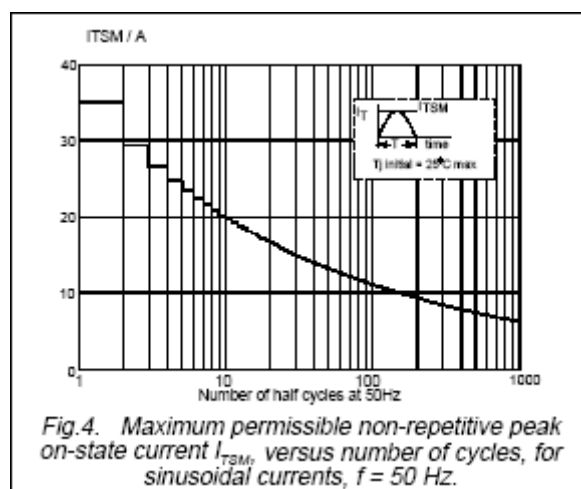


Fig.4. Maximum permissible non-repetitive peak on-state current I_{TSM} , versus number of cycles, for sinusoidal currents, $f = 50 \text{ Hz}$.

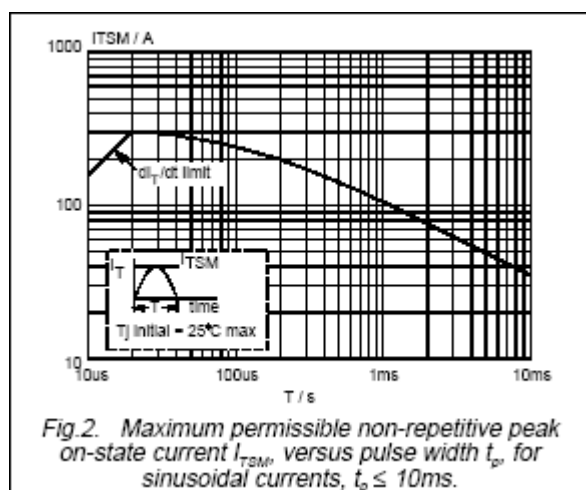


Fig.2. Maximum permissible non-repetitive peak on-state current I_{TSM} , versus pulse width t_p , for sinusoidal currents, $t_p \leq 10 \text{ ms}$.

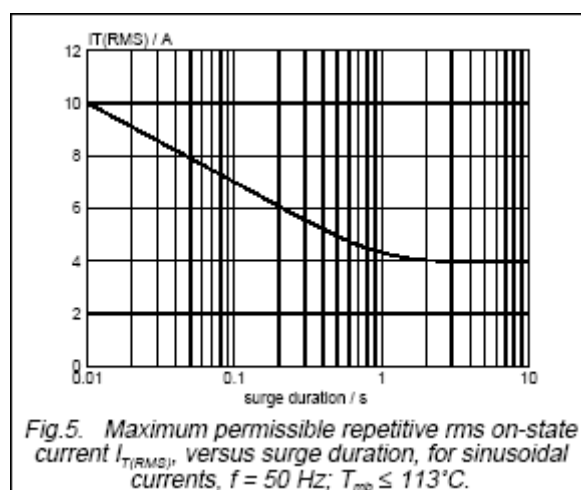


Fig.5. Maximum permissible repetitive rms on-state current $I_{T(RMS)}$, versus surge duration, for sinusoidal currents, $f = 50 \text{ Hz}$; $T_m \leq 113^\circ\text{C}$.

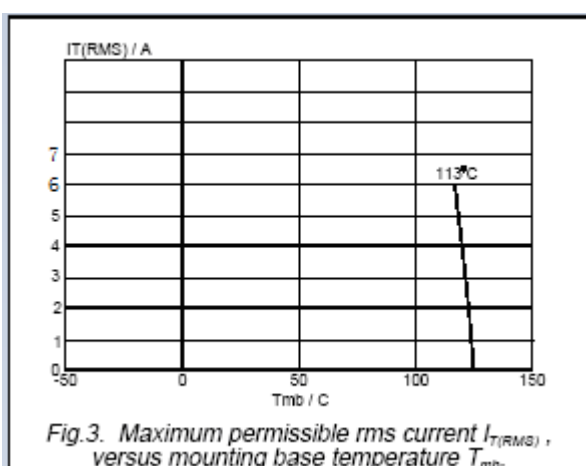


Fig.3. Maximum permissible rms current $I_{T(RMS)}$, versus mounting base temperature T_{mb} .

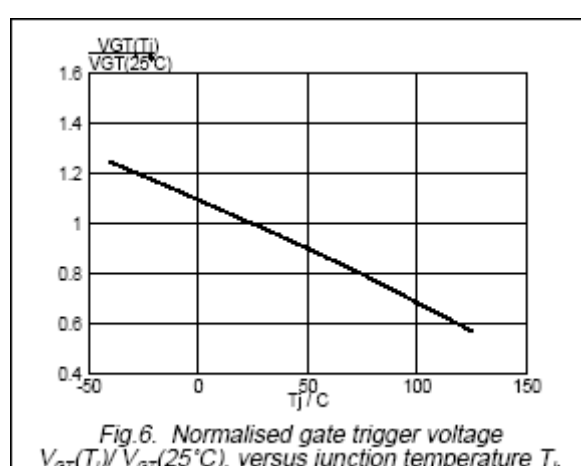
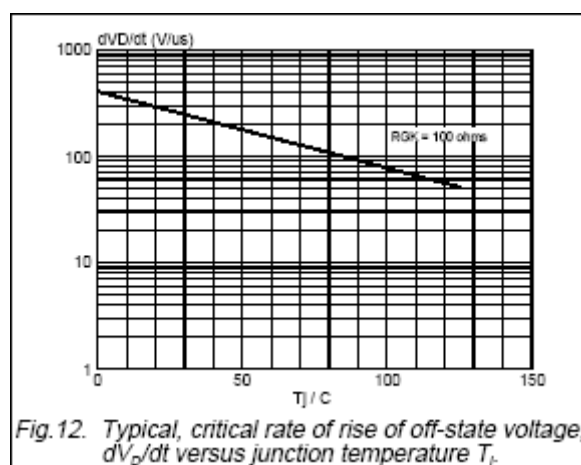
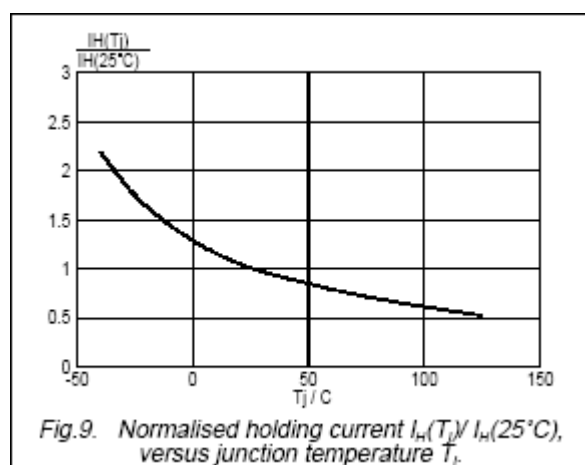
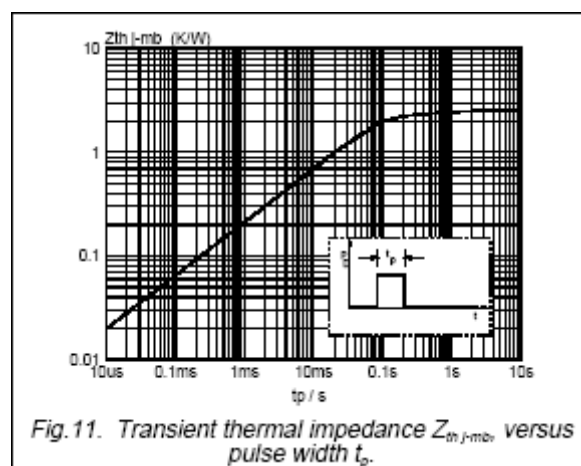
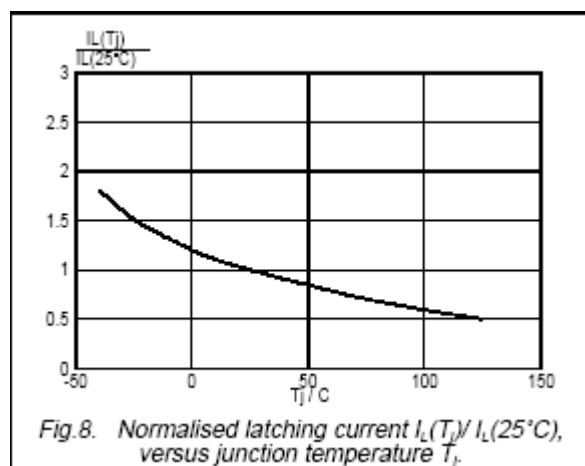
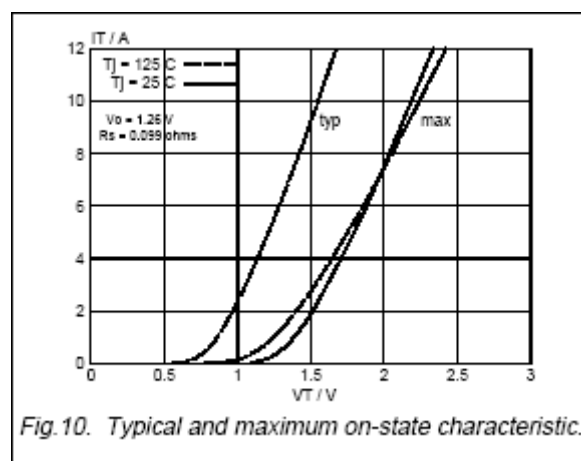
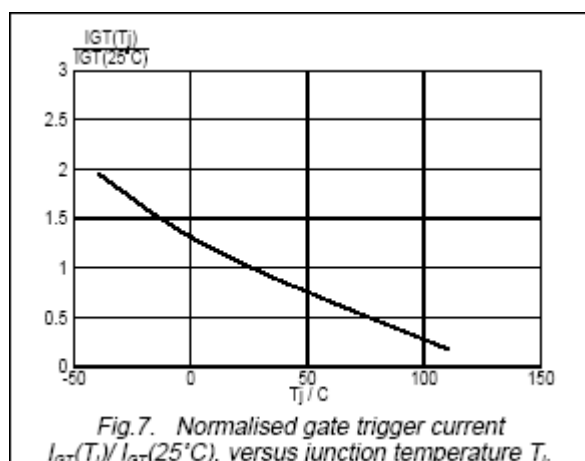
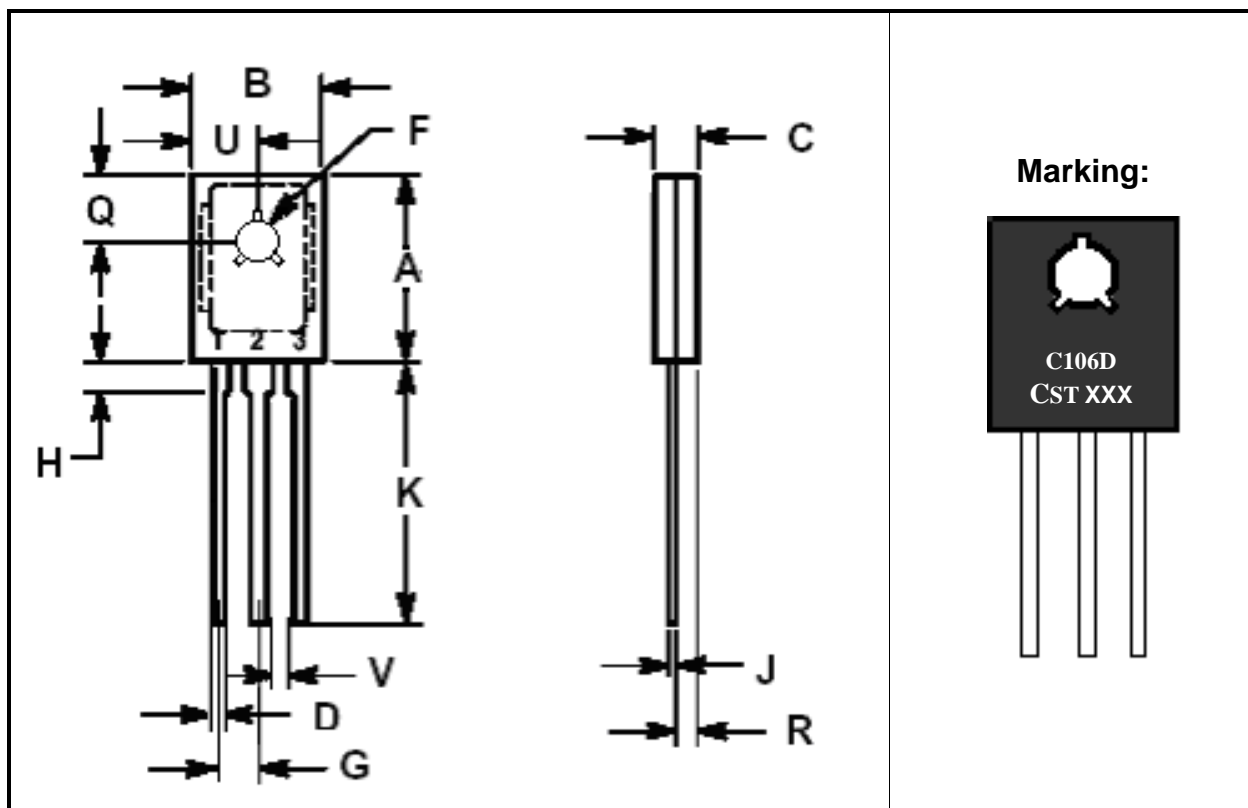


Fig.6. Normalised gate trigger voltage $V_{GT}(T_j) / V_{GT}(25^\circ\text{C})$, versus junction temperature T_j .



9、Package outline(TO-126)



DIM	Inches			Milimeters		
	Min	Type	Max	Min	Type	Max
A	0.419	-	0.429	10.65	-	10.89
B	0.284	-	0.312	7.22	-	7.92
C	0.091	0.100	0.109	2.30	2.54	2.76
K	0.520	-	0.598	13.20	-	15.20
D	0.025	0.029	0.031	0.64	0.73	0.80
J	0.011	-	0.020	0.28	-	0.52
G	0.087	0.091	0.094	2.20	2.30	2.40
V	0.040	-	-	1.02	-	-
F	0.115	0.122	0.130	2.93	3.10	3.30
U	0.142	-	0.157	3.60	-	4.00
Q	0.151	-	0.163	3.83	-	4.13
H	0.071	0.102	0.114	1.80	2.6	2.90
R	0.045	-	0.065	1.15	-	1.65