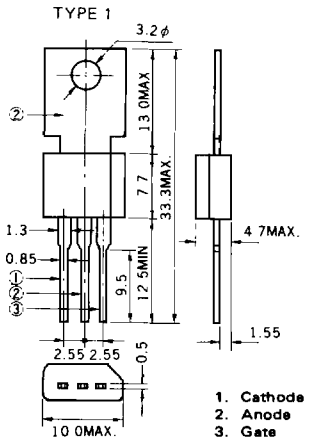
NEC
ELECTRON DEVICE

2A(4Arms)MOLD THYRISTOR
C106Q,Y,F,A,B,C,D,E,M

The C106Q ~ C106M are P-gate all diffused mold type SCR granted average on-state current 2Amps (Tc = 54°C). Being applied glassivation technique to pellets' surface, they feature a quite high reliability.

Outline Drawing (Unit: mm)



FEATURES

- The pellet surface is quite stable physically and electrically by applying glassivation technique.
- Easy installation by its miniature size and thin electrode leads.
- Less holding current distribution provides free application design.
- Low cost because of mass-production.

APPLICATIONS

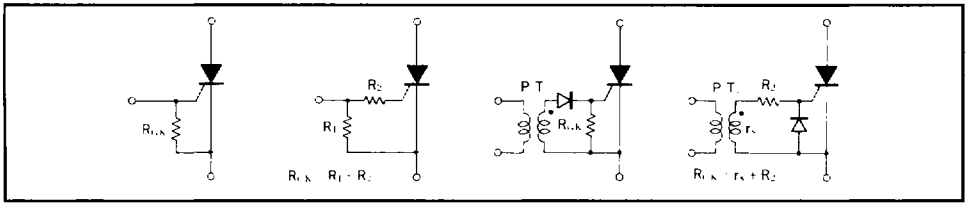
MOTOR CONTROL	Electric Model Trains Sewing Machines Movie Projectors Food Mixers Electric Fans Slot Racing Cars
LIGHT	Flame Detectors Moving-Light Signs (Chasers) Driver for Computer Readout Lights Harbor Buoy Flashers Automotive Warning Systems Nixie & Neon Drivers
TEMPERATURE	Range Surface Unit (Hybrid) Chemical Processing (Photographic, etc.) Food Warmer Tray Bearing Temperature Sensor Electric Blanket Control
PRESSURE	Auto Oil Pressure Gage Hot Water Boiler Safety Monitor
TIME	Photo Darkroom Exposure Oven Timer Vending Machine Logic Industrial Process Control
LIQUID LEVEL	Basement Sump Pump Automatic Coffee Maker Automatic Shutoff for Vending Machines
REMOTE CONTROL	Armchair TV Control Master Switching Stations for for Home Garage Door Openers Power Switch
DRYNESS	Clothes Dryness Sensor
PROXIMITY	Burglar Alarm Touch Swith Electric Door Openers
COUNTING	Low Speed Ring Counters Shift Registers
SWITCHING	Relay Replacement Solenoid Drivers Latching Relay Replacement Power Flip Flops Low Power Inverters Thyratron Tube Replacement
AMPLIFIERS	Gate Amplifier for Larger SCR's, Triacs —Blenders —Hand Tools
IGNITION	Small Gas Engines Gas Appliances
DETECTION	Voltage (Battery Charger) Current (Crowbar)

MAXIMUM RATINGS

Type	Repetitive Peak Reverse Voltage V_{RRM}	Repetitive Peak Off-state Voltage V_{DRM} R_{GK} = 1kΩ
C106Q	15 Volts	15 Volts
C106Y	30 Volts	30 Volts
C106F	50 Volts	50 Volts
C106A	100 Volts	100 Volts
C106B	200 Volts	200 Volts
C106C	300 Volts	300 Volts
C106D	400 Volts	400 Volts
C106E	500 Volts	500 Volts
C106M	600 Volts	600 Volts

Item	Symbol	Maximum Ratings	Units	Note
On-state Current	$I_{T(AV)}$	2 (T_C = 54°C, θ = 180° Single phase 1/2 wave)	A	
	$I_{T(RMS)}$	4		
Rise of Forward Current	di/dt	50 (non-repetitive)	A/μs	
Surge On-state Current	I_{TSM}	20 (non-repetitive)	A	
Gate Power Dissipation	P_{GM}	0.5 (f ≧ 50 Hz, duty ≧ 10%)	W	
Gate Power Dissipation	$P_{G(AV)}$	0.1	W	
Gate Forward Current	I_{FGM}	0.2 (f ≧ 50 Hz, duty ≧ 10%)	A	
Gate Reverse Voltage	V_{RGM}	6	V	
Junction Temperature	T_j	−40 ~ +110	°C	
Storage Temperature	T_{sg}	−40 ~ +150	°C	
Weight		1.4	g	

EXAMPLE OF R_{GK} INSERTION



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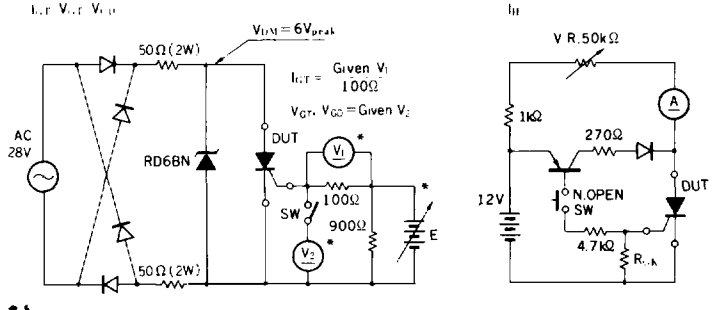
ELECTRICAL CHARACTERISTICS (T_j = 25°C)

Item	Symbol	Min.	Typ.	Max.	Units	Test Conditions
Repetitive Peak Reverse Current Repetitive Peak Off-state Current	I_{RRM} OR I_{DRM}	–	0.1	10	μA	V_{RRM} = V_{DRM} = Rated Value T_C = 25°C, R_{GK} = 1000 Ohms
		–	10	100	μA	V_{RRM} = V_{DRM} = Rated Value T_C = 110°C, R_{GK} = 1000 Ohms
Gate-Trigger Current	I_{GT}	–	30	200	μAdc	T_C = 25°C, V_D = 6Vdc, R_L = 100 Ohms R_{GK} = 1000 Ohms
		–	75	500	μAdc	T_C = −40°C, V_D = 6 Vdc, R_L = 100 Ohms R_{GK} = 1000 Ohms
Gate-Trigger Voltage	V_{GT}	0.4	0.5	0.8	Volts DC	T_C = 25°C, V_D = 6 Vdc, R_L = 100 Ohsm R_{GK} = 1000 Ohms
		0.5	0.7	1.0	Volts DC	T_C = −40°C, V_D = 6 Vdc, R_L = 100 Ohms R_{GK} = 1000 Ohms
		0.2	–	–	Volts DC	T_C = 110°C, V_D = Rated V_{DRM} Value R_L =3000 Ohms, R_{GK} = 1000 Ohms
On-state Voltage	V_{TM}	–	1.8	2.2	Volts	T_C = 25°C, I_{TM} = 4 Amperes Peak, Single Half Sine Wave Pulse, 2 Millisec. Wide
Holding Current	I_H	0.3	1.0	3.0	mAdc	T_C = 25°C, V_D = 12 Vdc, R_{GK} = 1000 Ohms
		0.4	1.5	5.0	mAdc	T_C = −40°C, V_D = 12 Vdc, R_{GK} = 1000 Ohms
		0.14	0.6	2.0	mAdc	T_C = 110°C, V_D = 12 Vdc, R_{GK} = 1000 Ohms
Latching Current	I_L	0.3	1.5	4.0	mAdc	T_C = 25°C, V_D = 12 Vdc, R_{GK} = 1000 Ohms
		0.4	2.5	7.0	mAdc	T_C = −40°C, V_D = 12 Vdc, R_{GK} = 1000 Ohms
Critical Rate-of-Rise of Off-state Voltage	dv/dt	–	8	–	Volts/ Micro-second	T_C = 110°C, V_D = Rated V_{DRM} Value R_{GK} = 1000 Ohms
Turn On Time	t_{ON}	–	1.2	–	Micro-seconds	T_C = 25°C, Rated V_{DRM} Value I_T = 1 Ampere, Gate Pulse = 4 Volts, 300 Ohms, 5 Microseconds Wide
Commutated Trun-Off Time	t_q	–	40	100	Micro-seconds	T_C = 110°C, rectangular current waveform Rate of rise of current < 10 amps/μsec. Rate of reversal of current < 5 amps/μsec. I_T = 1 Amp (50 μsec pulse). Repetition Rate = 60 pps. V_{RRM} = Rated V_R = 15 Volts Minimum. V_D = Rated Rate of Rise Reapplied Forward Blocking Voltage = 5 Volts/μsec. Gate Bias = 0 Volts, 100 Ohms (during turn-off time interval).

Case temperature (T_C) is measured in the center of the tab, 1.5mm from the body on Type 1 and Type 3 devices, and in the center of the anode lead, 1.5mm from the body on Type 2 devices.

MEASUREMENT CIRCUIT



* V_1: more than 100 kΩ at I_{GT} ≤ 10 μA
V_2: more than 1MΩ SW open
E : more than 20 kΩ

* Inner Resistance

Fig. 1 I_{TM} - V_{TM} Characteristics

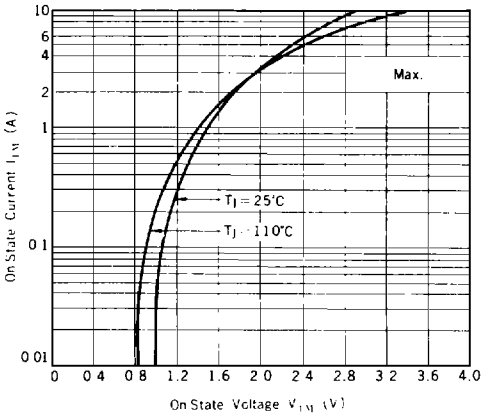


Fig. 2 $P_{T(AV)}$ - $I_{T(AV)}$ Characteristics

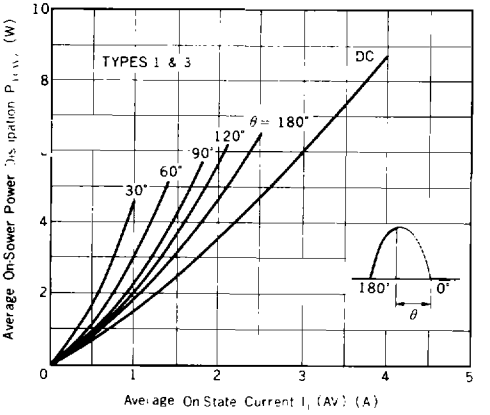


Fig. 3 T_C - $I_{T(AV)}$ Ratings

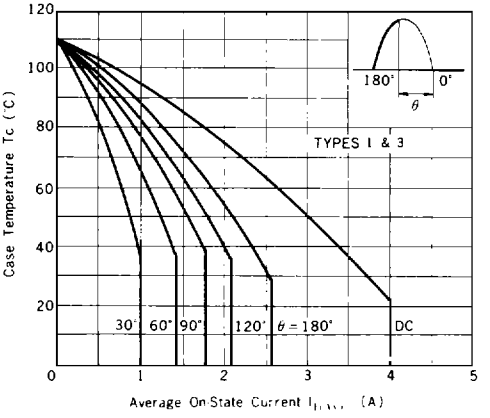


Fig. 4 Ta - $I_{T(AV)}$ Ratings

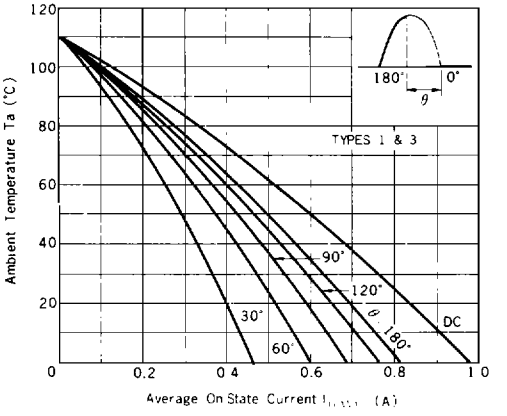


Fig. 5 I_{GT} - Ta Typical Distribution

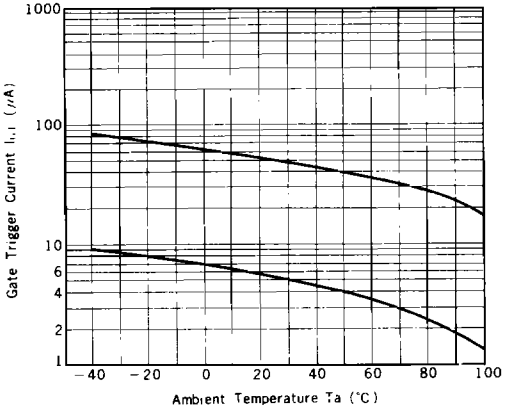


Fig. 6 V_{GT} - Ta Typical Distribution

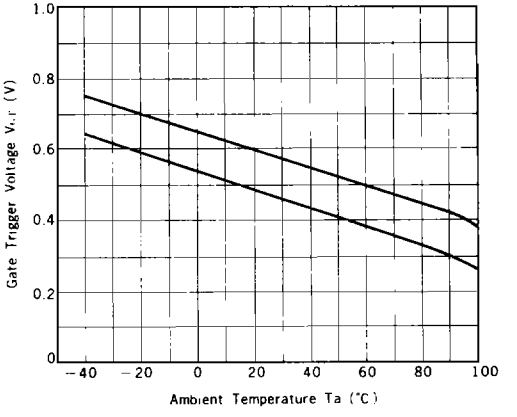


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Fig. 7 I_{GT} - τ_G Typical Distribution

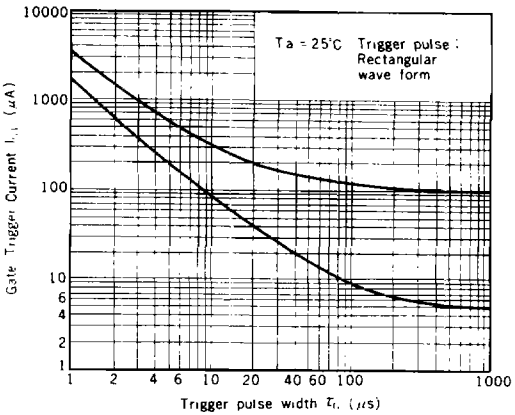


Fig. 8 V_{GT} - τ_G Typical Distribution

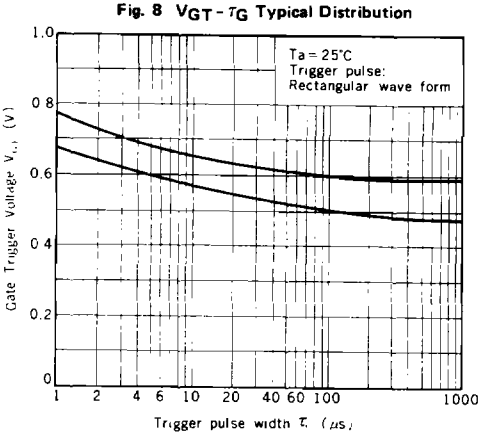


Fig. 9 I_H - Ta Typical Distribution

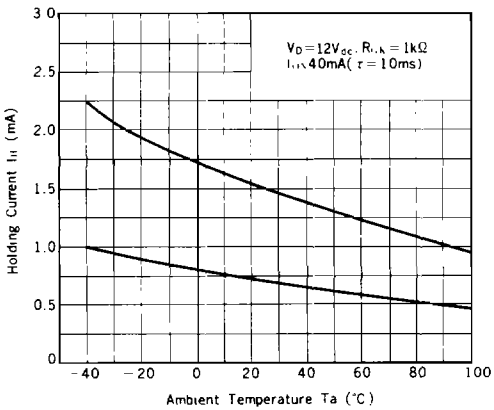


Fig. 10 I_{TSM} Ratings

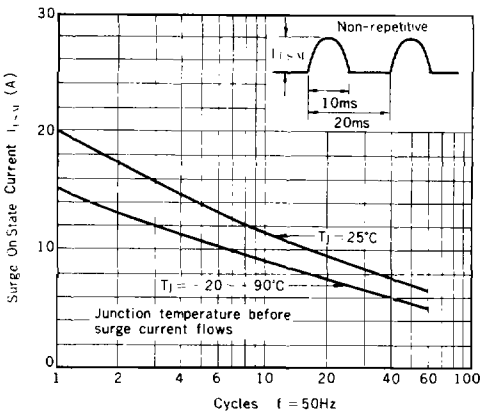
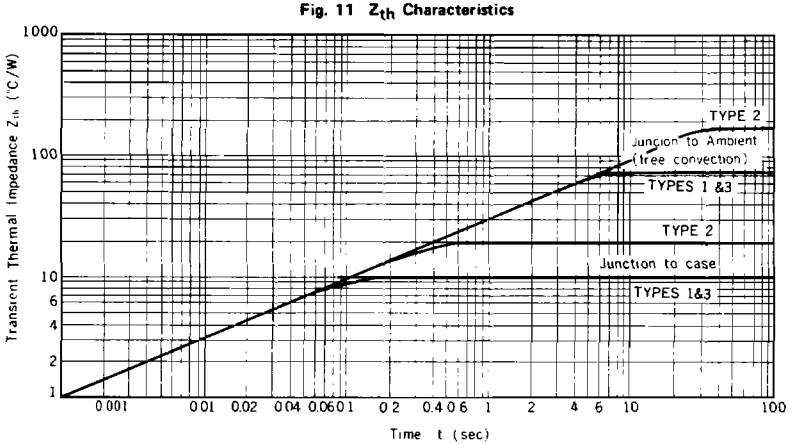
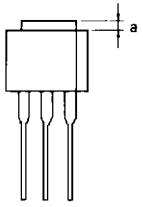


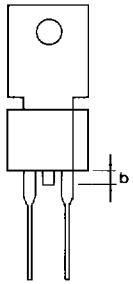
Fig. 11 Z_{th} Characteristics



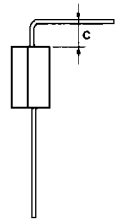
SPECIAL LEAD & HEAT TAB FORMINGS



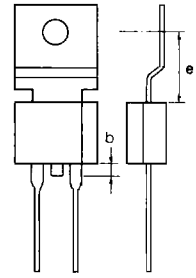
TYPE 2



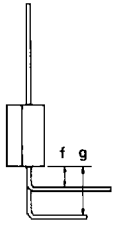
TYPE 3



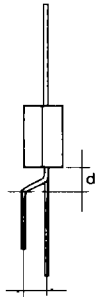
TYPE-BY



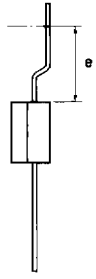
TYPE-AA



TYPE-YB



TYPE-YC



TYPE-AY

Outline Drawing (Unit: mm)			
a	1.0 ±0.2	e	9 ±0.2
b	1.5 ±0.3	f	2.5 ±0.2
c	3 ±0.3	g	5.5 ±0.2
d	3.0 ±0.3	h	2.5 ±0.5

NOTICE FOR INSTALLATION

1. Electrode leads (especially heat sink tablet) are not granted to be bent because of wet-proof. However in case it is required inevitably, a mechanical stress should not be put on mold. Fix tightly between the mold case and the area to be formed or bent.
2. Electrode leads should not to be bent more than twice over 90°. Avoid the bending within 1.5 mm from the neck of mold case.
3. The surface of heat sink for thermal radiator is to be smooth without any foreign matter.
4. Suitable torque value is 4 ~ 5 kg.cm.
5. Soldering
   - ○ Recommended solder: PbSu (4 : 6)
     Melting point 180°C
   - ○ Dimension from the neck of leads to dipping points . . . . . 4 ~ 6 mm
   - ○ Soldering temperature and period
     250°C . . . . . less than 5 μsec.
     230°C . . . . . less than 10 μsec.

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