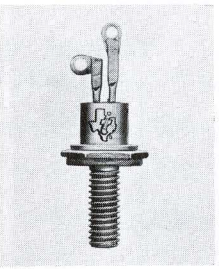
TYPES TI 130, 131, 132, 133, 134
DIFFUSED SILICON PNPN CONTROLLED RECTIFIER

3 AMPERES • 50 to 400 VOLTS PIV

All welded construction
Ruggedized to meet stringent military requirements
Highly sensitive operation

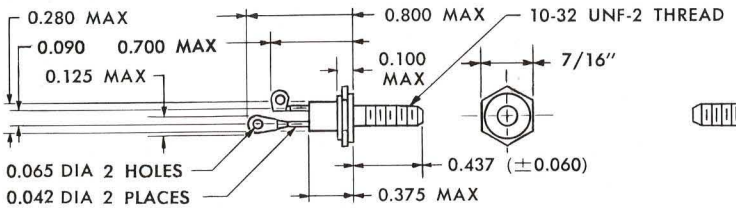
The TI 130 series PNPN controlled rectifiers are four layer (3 junction) solid state thryatron devices for use in power switching applications up to 3 amperes average rectified forward current.

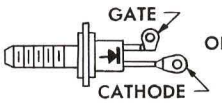


ACTUAL SIZE

mechanical data

Welded case with glass-to-metal hermetic seal between case and leads. Approximate weight is 4.5 grams. Anode is attached to stud for high heat transfer.





OPERATING TEMPERATURE
−65°C to 150°C

maximum ratings

	TI 130	TI 131	TI 132	TI 133	TI 134	unit
Average Rectified Forward Current (I_F) at +75°C	3	3	3	3	3	amps
Average Rectified Forward Current (I_F) at +125°C	1	1	1	1	1	amps
Recurrent Peak Current (i_ρ) at +75°C	10	10	10	10	10	amps
Recurrent Peak Current (i_ρ) at +125°C	3	3	3	3	3	amps
Surge Current, 1 cycle at 60 cps at +75°C	25	25	25	25	25	amps
Peak Inverse Voltage −65°C to +125°C	50	100	200	300	400	volts
Storage Temperature	150	150	150	150	150	°C
Forward dc Gate Current (I_{GF} Max)	100	100	100	100	100	ma
Gate Peak Inverse Voltage (−65°C to +150°C)	5	5	5	5	5	volts
Stud Torque	15					in−lbs

All temperatures are stud temperatures.

specifications 25°C stud temperature

	TI 130	TI 131	TI 132	TI 133	TI 134	unit
Minimum breakover voltage (V_{BO}) (Note 1)	+50	+100	+200	+300	+400	volts
Minimum Reverse Breakdown Voltage (V_{RO}) (Note 2)	−60	−120	−240	−360	−480	volts
Maximum Forward Voltage Drop (V_F) at 3 amperes dc	2	2	2	2	2	volts
Maximum dc Reverse Current at PIV	−1	−1	−1	−1	−1	ma

	min	typical	max	unit
Gate Current Required to Turn Device on (I_{GF}) (Note 5)	—	5	20	ma
Forward Current (I_H) Required to Hold Device in "On" Condition with I_{GF} = 0	0.1	5	25	ma
Gate Breakdown Voltage (V_{GRO}) (Note 2)	6			volts
Forward Gate Voltage Drop (V_{GF}) at 25 ma Gate Current With Anode Current = 0	—	1.5	3	volts

notes

1. Test conditions-Forward current less than 1.0 milliamperes measured with 1 K resistor between gate and cathode.
2. Breakdown voltage under reverse bias condition on the gate or across the entire device is defined as the voltage at which the current is 10 milliamperes.
3. Thermal impedance measurements indicate a typical value of approximately 5.0°C/watts between the junction and stud.
4. Stud temperatures were measured using a 0.042 hole drilled in the middle of the flat of one side of the hex base.
5. Test conditions—Anode source voltage = + 50 volts and load resistance = 2000 ohms.
6. Typical turn-off times are approximately 10 times the turn-on time.

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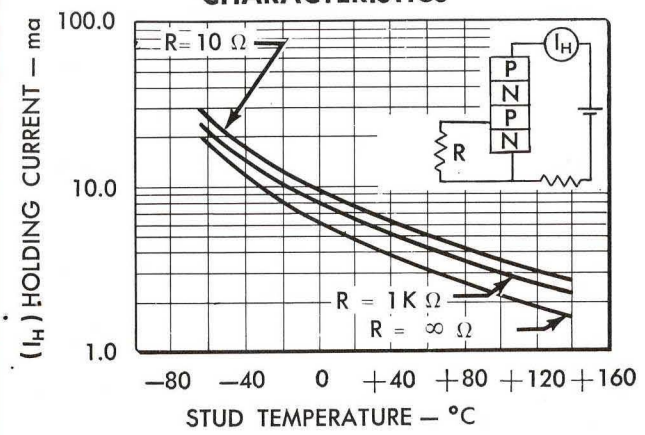
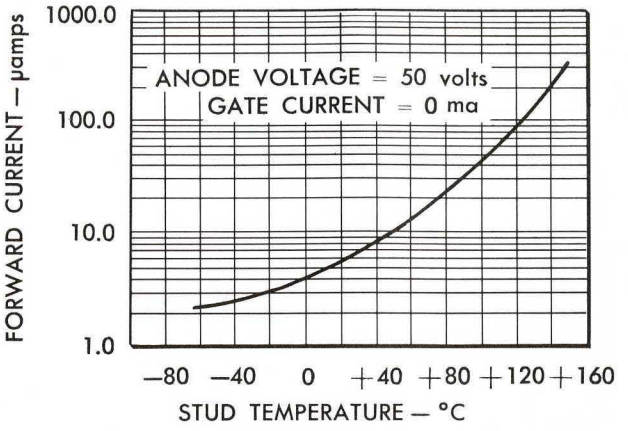
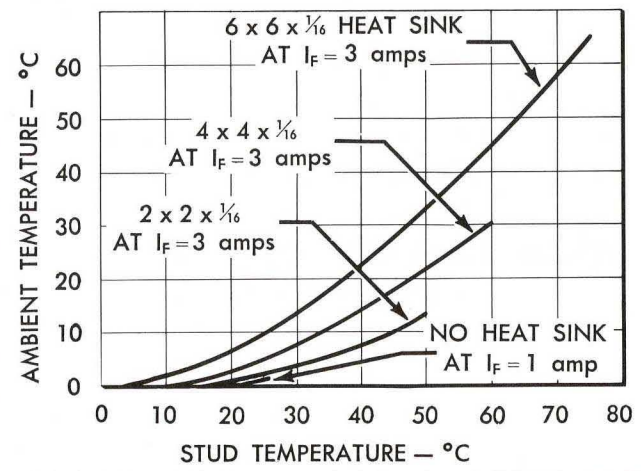
TYPICAL HOLDING CURRENT CHARACTERISTICS



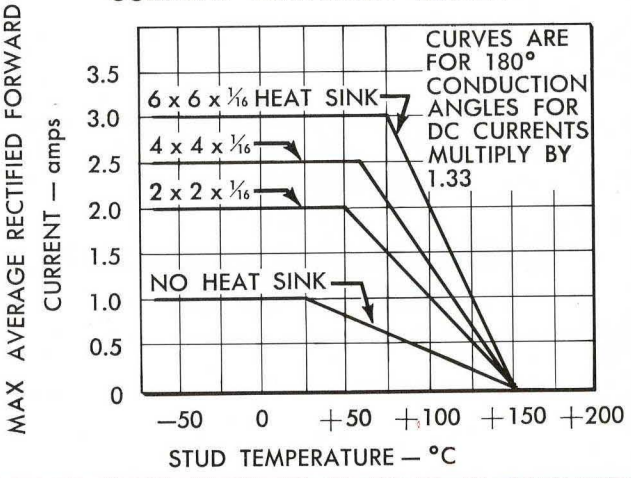
TYPICAL FORWARD CURRENT "OFF" CHARACTERISTICS



TYPICAL TEMPERATURE CHARACTERISTICS



CURRENT DERATING CURVE



definitions

1. V_{BO} — (Breakover voltage). The value of positive voltage between anode and cathode that will switch the device on.
2. V_F — Forward voltage between anode and cathode when device is on.
3. V_{GF} — Positive voltage between gate and cathode.
4. V_{GR} — Negative voltage between gate and cathode.
5. V_{RO} — Anode reverse breakdown voltage.
6. V_{GRO} — Reverse gate breakdown voltage with anode circuit open.
7. I_H — Anode sustaining current required to hold the device in the on condition with gate circuit open.
8. I_{GS} — Gate current required to saturate the device.
9. I_{GF} — Gate current required to turn the device on with a specified load line.

design notes

Types TI 130 series PNPN silicon controlled rectifiers are designed to meet or exceed the environmental requirements of MIL-T-19500A as follows:

test	paragraph
Solderability	4.6.23
Temperature Cycling	4.6.24
Moisture Resistance	4.6.26
Shock	4.6.28
Centrifuge	4.6.29
Vibration Fatigue	4.6.30
Salt Spray	4.6.35

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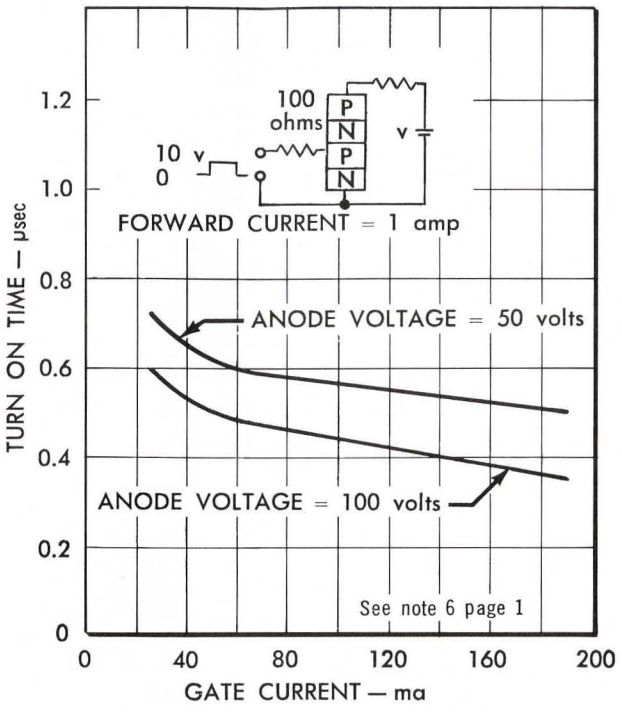
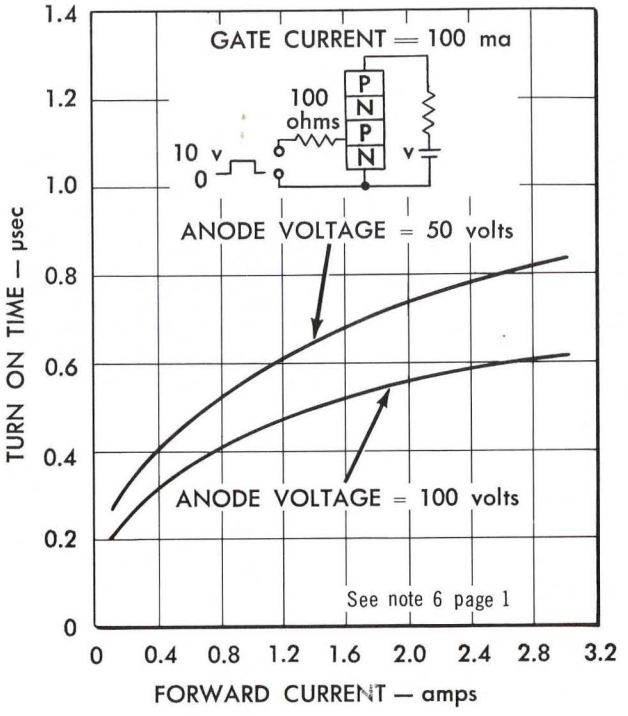
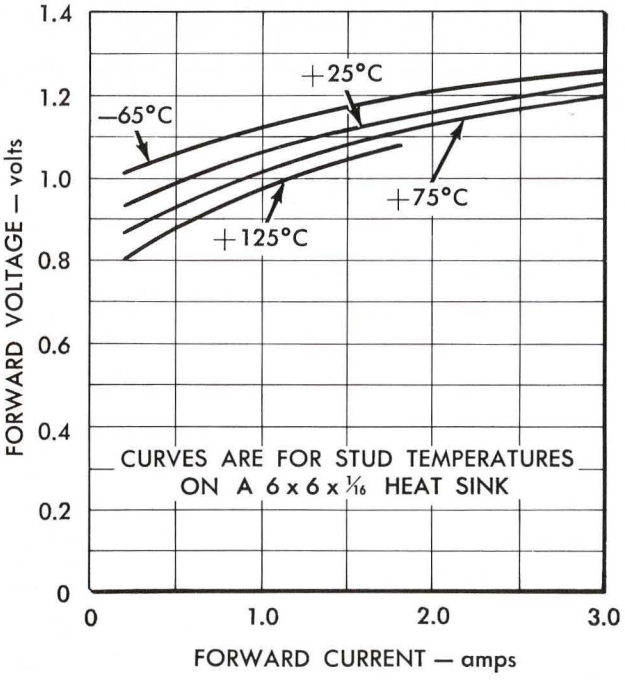
TYPICAL GATE TURN ON CHARACTERISTICS



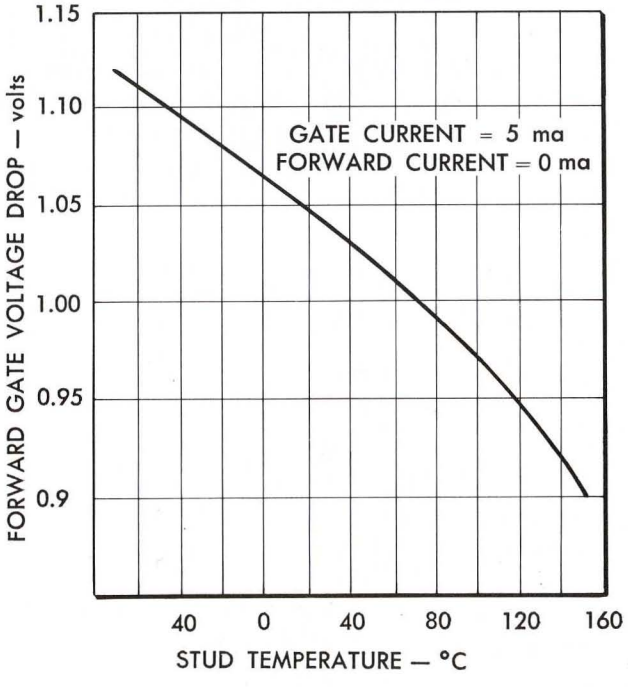
TYPICAL ANODE TURN ON CHARACTERISTICS



TYPICAL FORWARD CONDUCTION CHARACTERISTICS

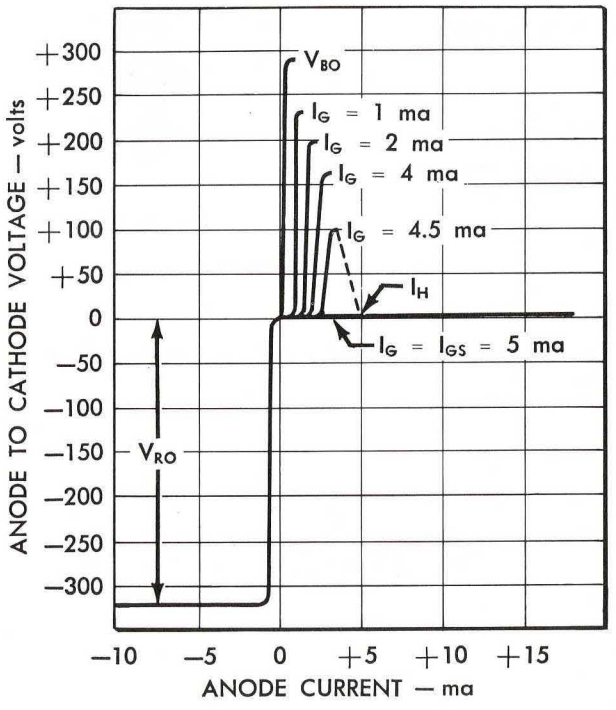


TYPICAL FORWARD GATE VOLTAGE DROP vs STUD TEMPERATURE

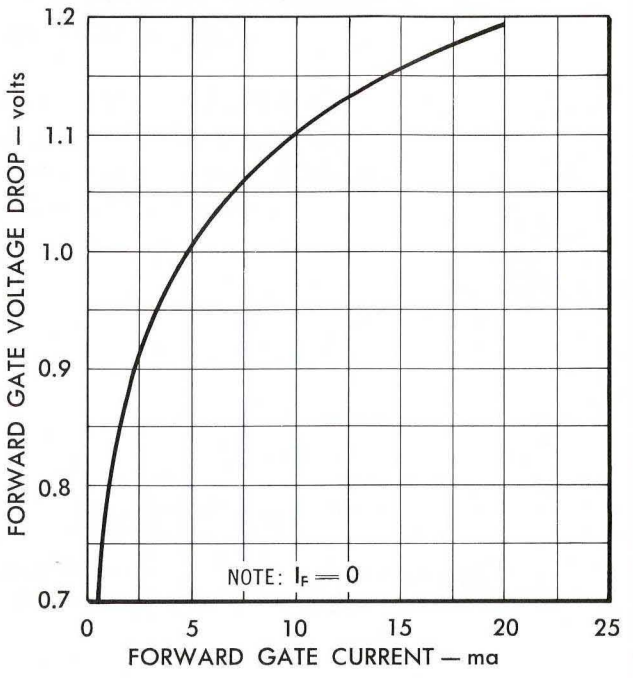


TYPICAL CHARACTERISTICS

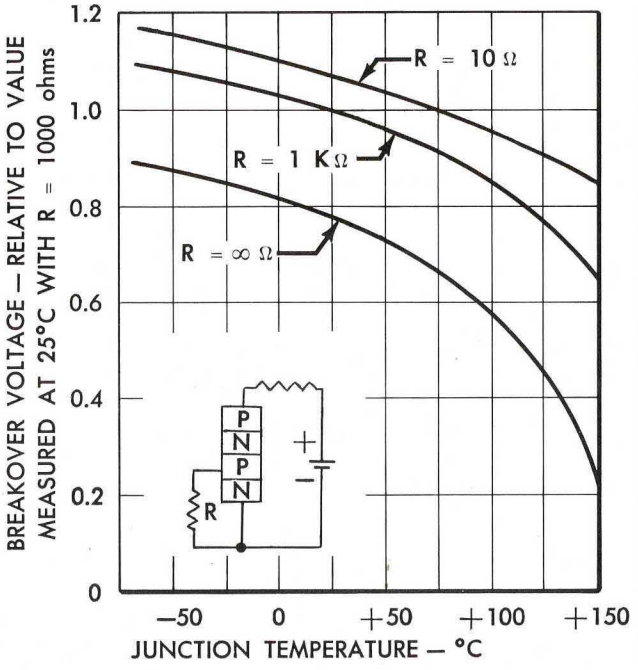
TYPICAL V-I CHARACTERISTICS



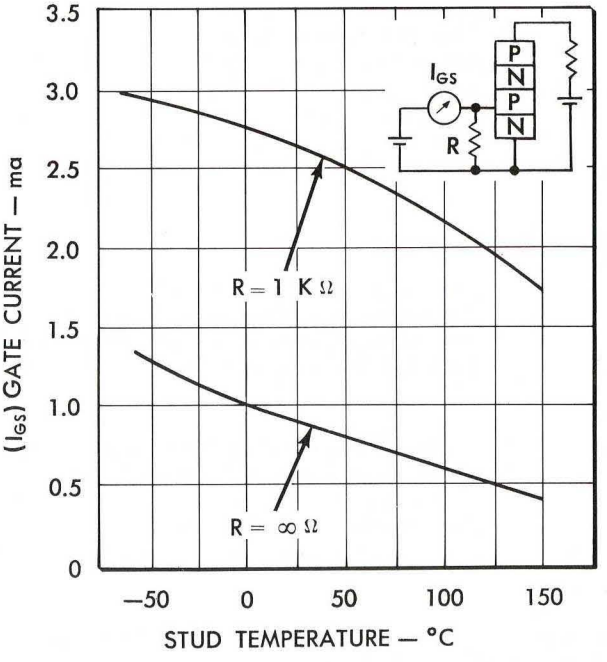
TYPICAL DC GATE CHARACTERISTICS 25°C STUD TEMPERATURE



TYPICAL V_{BO} CHARACTERISTICS vs TEMPERATURE



TYPICAL GATE SATURATION CURRENT CHARACTERISTICS



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