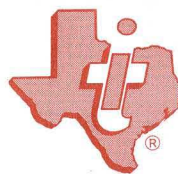


TENTATIVE SPECIFICATIONS

**TYPES 1N588 AND 1N589**  
**GROWN JUNCTION SILICON RECTIFIERS**

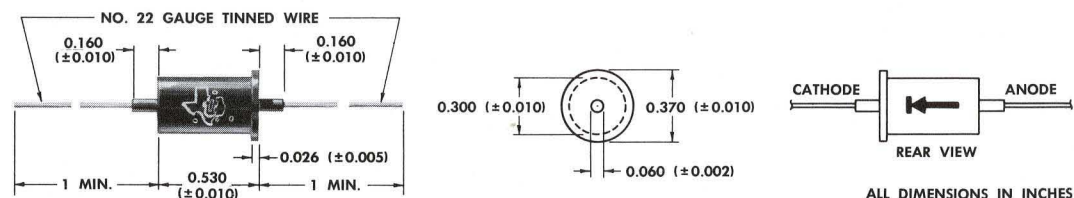


Texas Instruments Types 1N588 and 1N589 grown junction silicon rectifiers are designed for stable operation at high ambient temperatures (to 150°C) and feature extremely high breakdown voltage (1500 V min.). Ideal for miniaturization purposes, they are hermetically sealed in metal and glass axial enclosures and will withstand extreme conditions of shock, vibration, and humidity. Axial construction allows point-to-point wiring and the insulated case may be clamped directly to a metal chassis for greater heat dissipation.

To assure maximum reliability, stability, and long life, all units are of welded construction and are heat cycled from -55°C to +150°C for four cycles. All units are thoroughly tested for rigid adherence to design characteristics.

**mechanical data**

Welded case with glass-to-metal hermetic seal between case and leads. Approximate weight is 3 grams.



**absolute maximum ratings\***

	1N588	1N589	unit
Recurrent Peak Inverse Voltage			
-55°C	1500	1500	v
+25°C	1500	1500	v
+100°C	1250	1250	v
+150°C	1000	1000	v
Average Rectified Forward Current at Maximum PIV†			
-55°C	25	50	ma
+25°C	25	50	ma
+100°C	15	35	ma
+150°C	10	25	ma
Case Temperature‡	160	160	°C
Altitude at Maximum Rating	60,000	60,000	ft
Recurrent Peak Current (-55°C to +150°C)	150	250	ma

**electrical specifications**

D. C. Test at 25°C

Maximum Reverse Leakage at -1500 volts d. c.	100	100	μa
Maximum Forward Voltage Drop at 10 ma	10	-	v
Maximum Forward Voltage Drop at 50 ma	-	8	v
Minimum Leads-to-Case Breakdown Voltage	2000	2000	v

Operating Test (See half-wave circuit on reverse side)

Before acceptance, each device must operate satisfactorily as a half-wave rectifier under the following conditions:

type	E <sub>pp</sub>	I <sub>o</sub>	time	C <sub>L</sub>	temperature	transformer resistance
1N588	350 V	10 mA	10 Minutes	8 μfd	150°C	250 Ohms
1N589	350 V	25 mA	10 Minutes	8 μfd	150°C	250 Ohms

\*Unless otherwise specified, all temperatures shown are ambient.

†Ratings in free air. When operated at or near maximum ratings at temperatures above 100°C ambient, provisions should be made for either adequate air circulation or heat sinking the metal case to prevent the case temperature from exceeding 160°C.

‡The welded case is electrically insulated from the active elements of the rectifier.

LICENSED UNDER BELL SYSTEM PATENTS

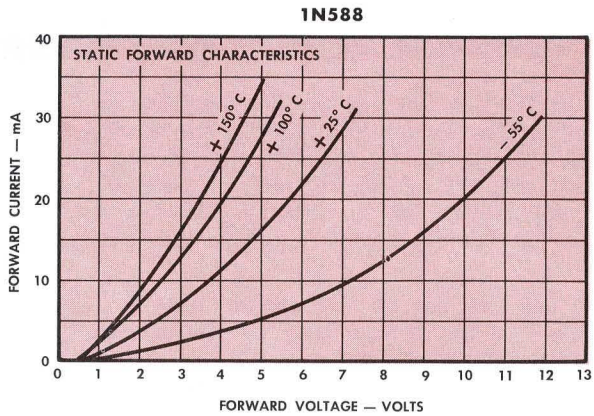
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SEMICONDUCTOR-COMPONENTS DIVISION  
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DALLAS, TEXAS

**SEMICONDUCTOR-COMPONENTS DIVISION**

# TYPES 1N588 AND 1N589

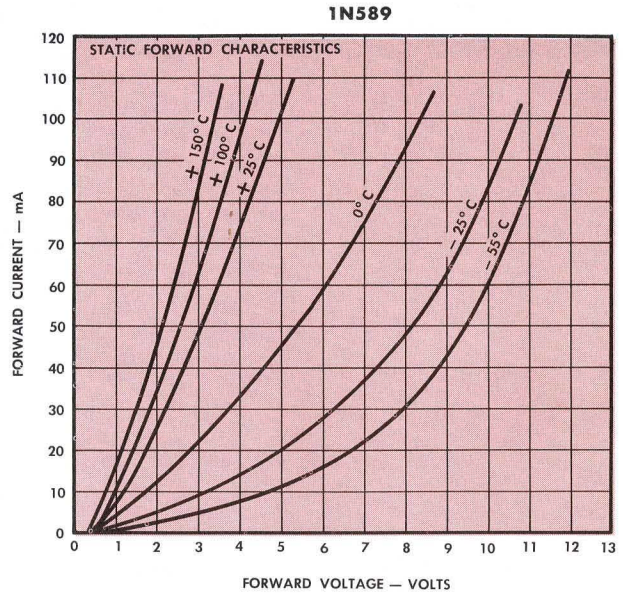
## TYPICAL CHARACTERISTICS



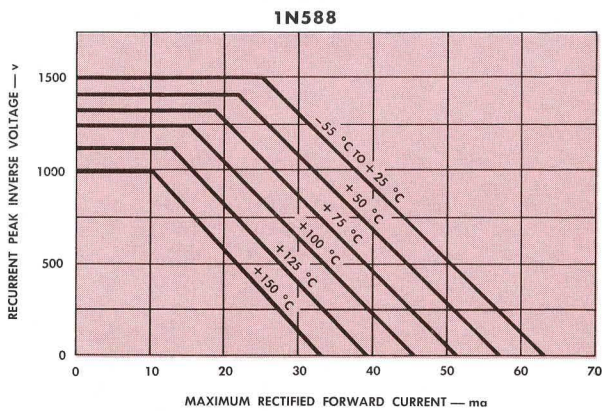
FORWARD CURRENT VS. FORWARD VOLTAGE AT SEVERAL AMBIENT TEMPERATURES

	-55°C	0°C	+25°C	+85°C	+100°C	+150°C
<b>1N588</b>	0.025	0.12	0.30	5	10	100
<b>1N589</b>	0.030	0.15	0.40	6.4	13	250

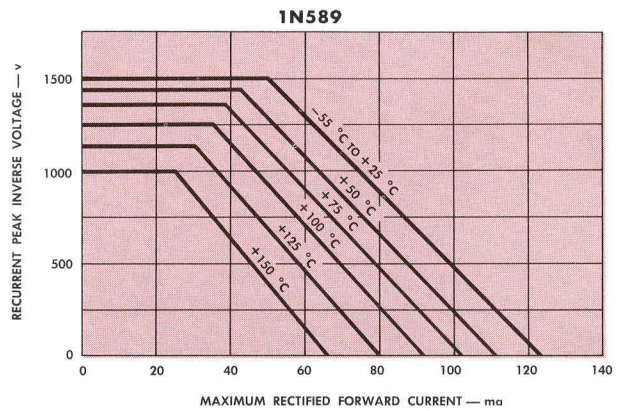
Typical Reverse Current ( $\mu\text{A}$ ) at  $-1000\text{V}$  VS. Ambient Temperature



FORWARD CURRENT VS. FORWARD VOLTAGE AT SEVERAL AMBIENT TEMPERATURES

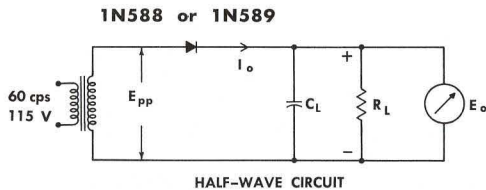


RECURRENT PEAK INVERSE VOLTAGE VS. FORWARD CURRENT  
(WITH 100 TO 120 CFM AIR CIRCULATION)



RECURRENT PEAK INVERSE VOLTAGE VS. FORWARD CURRENT  
(WITH 100 TO 120 CFM AIR CIRCULATION)

## TYPICAL CIRCUIT AND DATA



**1N589** ( $C_L = 8 \mu\text{fd}$ )

temperature	$E_{pp}$	$I_o$	$E_o$
-55°C	350 V	25 mA	450 V
+25°C	350 V	25 mA	455 V
+150°C	350 V	25 mA	460 V

- NOTES:
- All temperatures shown are ambient unless otherwise specified.
  - The rectification efficiency of the 1N589 is typically 99% in a full-wave circuit at 60 cps at 25°C and approximately 93% at 400 cps at 25°C. Efficiency increases as temperature increases.
  - Capacity is approximately 2  $\mu\text{f}$  and 5  $\mu\text{f}$  for the 1N588 and 1N589 respectively at  $-600\text{VDC}$  and decreases with increased voltage.
  - At 150°C ambient temperature, the forward resistance of the rectifier is low and, with capacitor input, the peak currents are increased. To prevent overloading of power supply components and excessive heating of the rectifier, these high peak currents must be reduced by use of a minimum transformer resistance in the order of 250 ohms or addition of series resistance to make the total series resistance approximately 250 ohms.
  - Case temperatures may be measured by soldering a thermocouple to the case.

TEXAS INSTRUMENTS RESERVES THE RIGHT TO MAKE CHANGES AT ANY TIME IN ORDER TO IMPROVE DESIGN.

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