

# Zero Bias Schottky Diodes for Mixers and Detectors

## Technical Data

**HSCH-3206/07**  
**HSCH-3486**

### Features

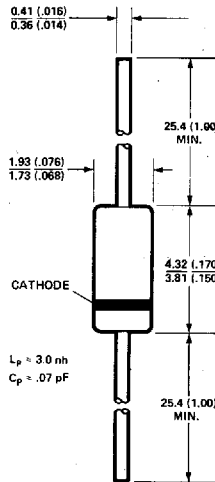
- High Voltage Sensitivity
- No Bias Required
- Choice of High or Low Video Impedance

### Description/ Applications

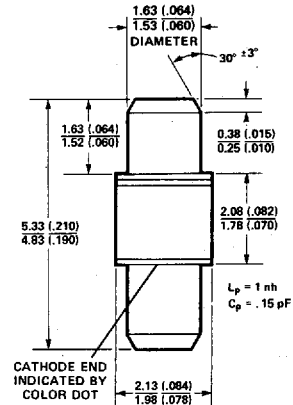
The high zero bias voltage sensitivity of these Schottky barrier diodes makes them ideally suited for narrow bandwidth video detectors, ECM receivers, and measurement equipment. These diodes also make excellent mixers for use with low power LO.

### Package Characteristics

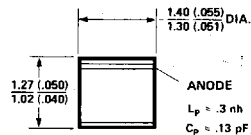
The HP Outline 15 package has a glass hermetic seal with gold plated Dumet leads which should be restricted so that the bend starts at least 1/16" (1.6 mm) from the glass body. With this restriction, it will meet MIL-STD-750, Method 2036, Condition A (4 lb. [1.8 kg] tension for 30 minutes). The maximum soldering temperature is 230°C for 5 seconds. Marking is by digital coding with a cathode band.



**Outline 15**



**Outline 49**



DIMENSIONS IN MILLIMETERS AND (INCHES).

**Outline 44**

The HP Outline 49 package has a metal-ceramic hermetic seal. The anode and cathode studs are gold-plated Kovar. The maximum soldering temperature is 230°C for 5 seconds. Stud-stud TIR is 0.010" max.

The HP Outline 44 package is a hermetically sealed ceramic package. The anode and cathode are gold-plated Kovar. The maximum soldering temperature is 230°C for 5 seconds.

### Maximum Ratings

Operating and Storage Temperature Range ..... -65°C to +150 °C  
 CW Power Dissipation at  $T_{CASE} = 25^{\circ}C$

HSCH-3206, -3207 ..... 200 mW

HSCH-3486 ..... 300 mW

Derate Linearly to 0 W at 150°C

Pulse Power Dissipation at  $T_{CASE} = 25^{\circ}C$

Peak power incident.

1  $\mu$ s pulse,  $D_u = 0.001$  ..... 1 W

These diodes are ESD sensitive. Handle with care to avoid static discharge through the diode.

### Electrical Specifications at $T_A = 25^{\circ}C$

| Part Number     | Package Outline | Maximum Tangential Sensitivity TSS (dBm)       | Minimum Voltage Sensitivity $\gamma$ (mV/ $\mu$ W)                                  | Video Resistance $R_V$ (K $\Omega$ ) |      | Typical Total Capacitance $C_T$ (pF) |
|-----------------|-----------------|--|---|--------------------------------------|------|--------------------------------------|
|                 |                 |  |   | Min.                                 | Max. |                                      |
| HSCH-3207       | 44              | -42  | 8   | 80                                   | 300  | 0.30                                 |
| HSCH-3206       | 49              | -42  | 8   | 80                                   | 300  | 0.30                                 |
| HSCH-3486       | 15              | -54  | 7.5   | 2                                    | 8    | 0.30                                 |
| Test Conditions |                 | Video Bandwidth = 2 MHz<br>$f_{test} = 10$ GHz | Power in = -30 dBm<br>$f_{test} = 10$ GHz<br>$R_L = 10$ M $\Omega$ , $I_{bias} = 0$ |                                      |      | $V_R = 0$ V<br>$f = 1$ MHz           |

### Typical Characteristics

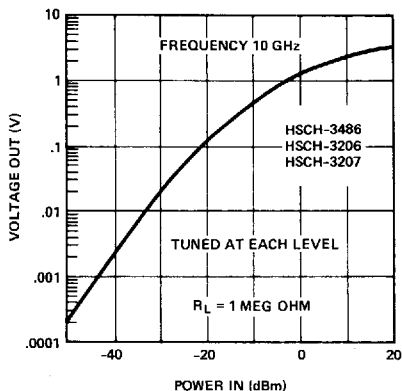


Figure 1. Typical Dynamic Transfer Characteristics.

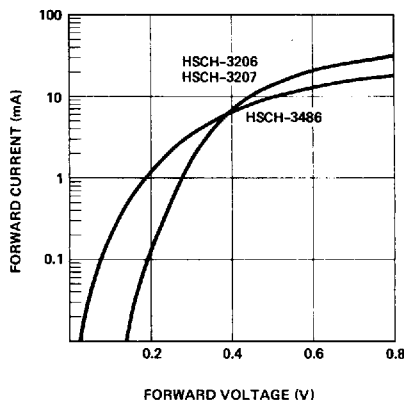
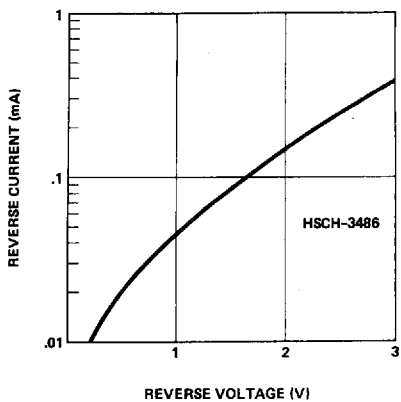
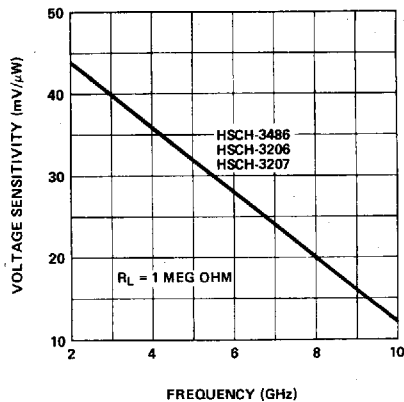


Figure 2. Typical Forward Characteristics at  $T_A = 25^{\circ}C$ .

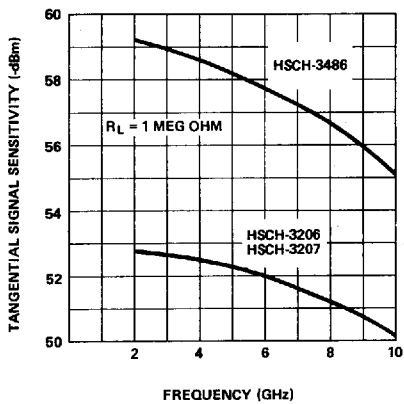
**Typical Characteristics (cont.)**



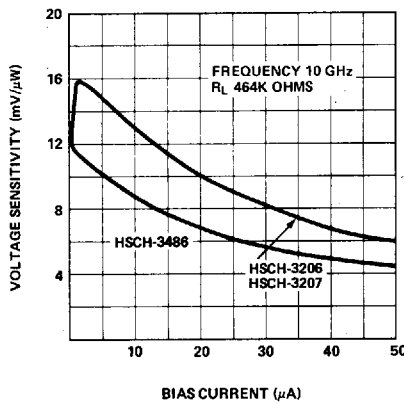
**Figure 3. Typical Reverse Characteristics at  $T_A = 25^\circ\text{C}$ .**



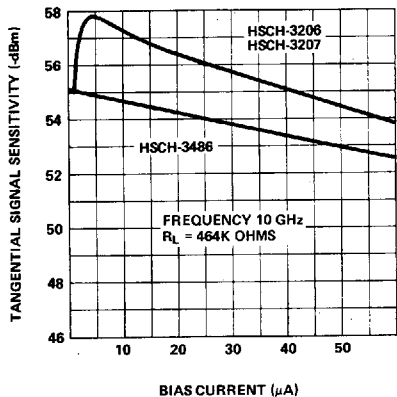
**Figure 4. Typical Voltage Sensitivity vs. Frequency.**



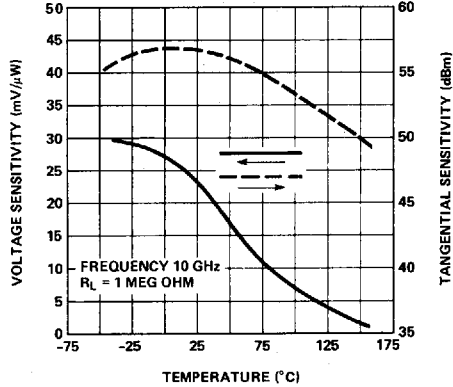
**Figure 5. Typical Tangential Sensitivity vs. Frequency.**



**Figure 6. Typical Voltage Sensitivity vs. Bias Current.**

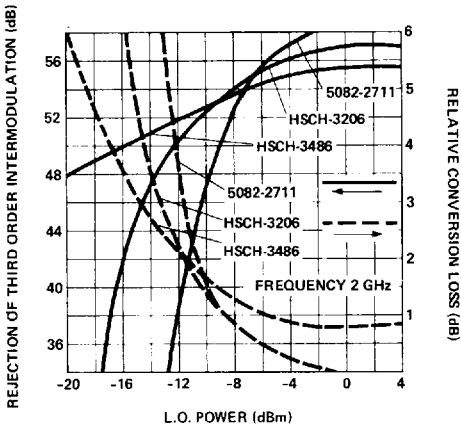


**Figure 7. Typical Tangential Sensitivity vs. Bias Current.**

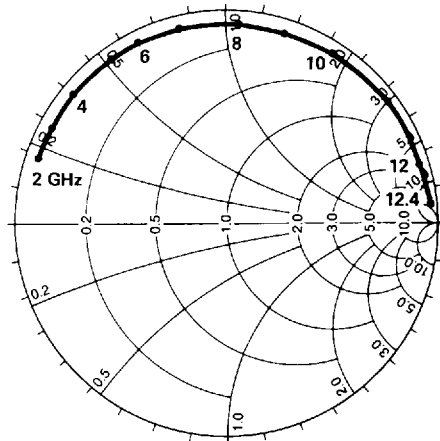


**Figure 8. Effect of Temperature on HSCH-3486.**

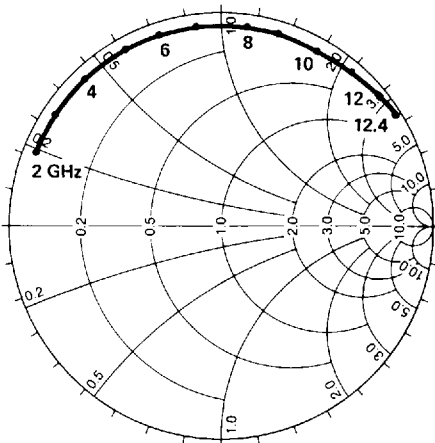
**Typical Characteristics (cont.)**



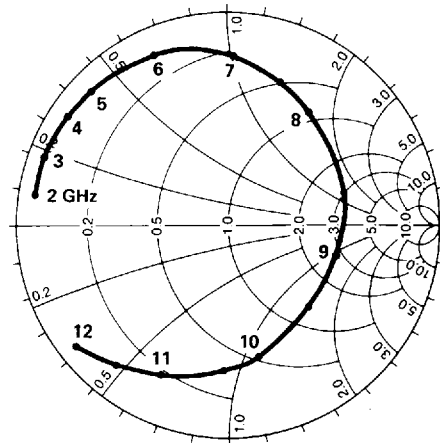
**Figure 9. Mixer Performance.**



**Figure 10. Typical Admittance Characteristics, HSCH-3206.**



**Figure 11. Typical Admittance Characteristics, HSCH-3207.**



**Figure 12. Typical Admittance Characteristics, HSCH-3486.**