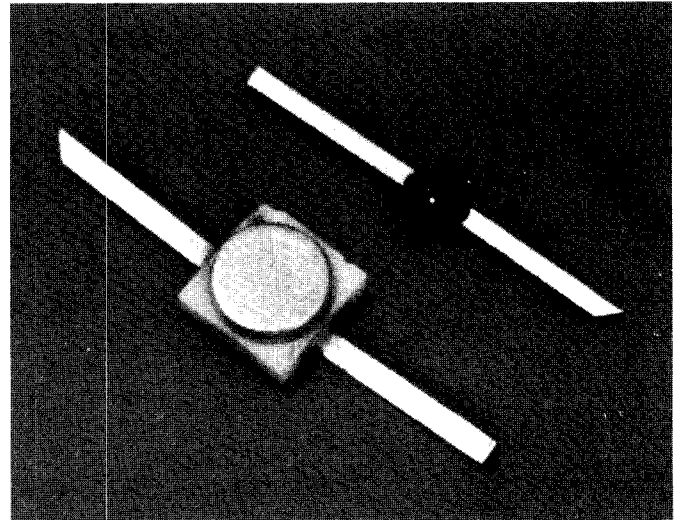


## Features

- SMALL SIZE**
- LOW NOISE FIGURE**  
6 dB Typical at 9 GHz
- RUGGED DESIGN**
- HIGH UNIFORMITY**
- HIGH BURNOUT RATING**  
1 W RF Pulse Power Incident
- BOTH MEDIUM AND LOW BARRIER AVAILABLE**



SCHOTTKY BARRIER DIODES &  
HIGH CONDUCTANCE DIODES

3

## Description/Applications

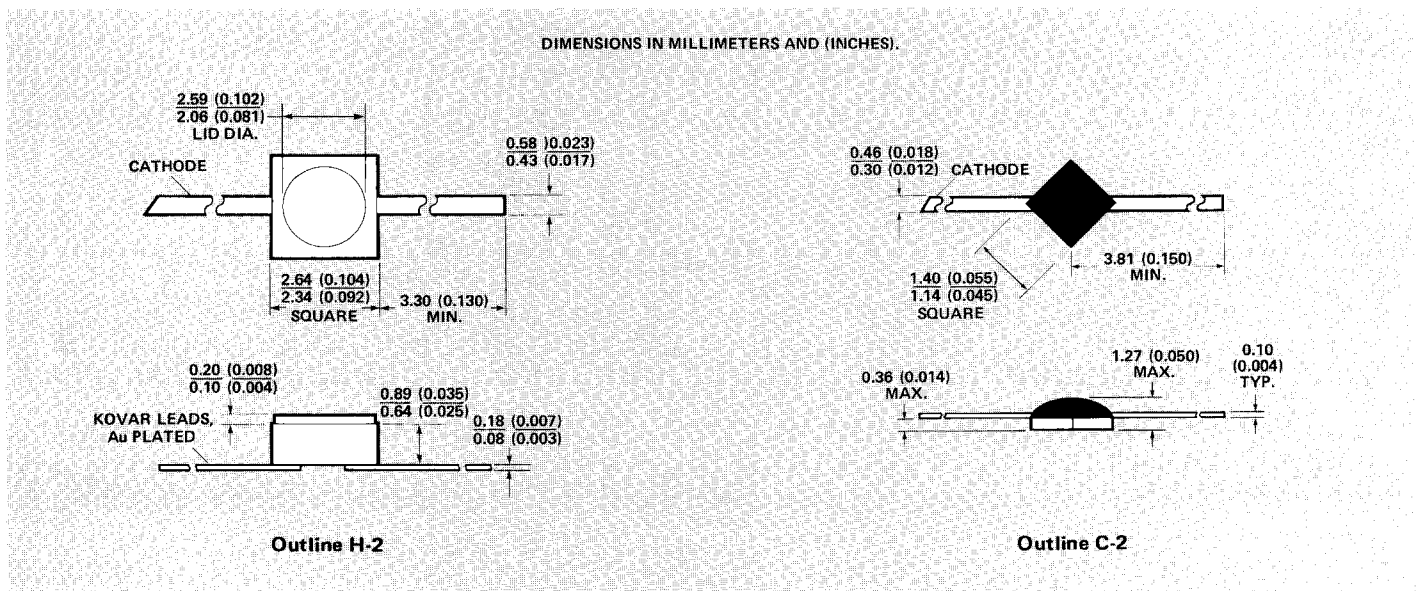
This family consists of medium barrier and low barrier beam lead diodes mounted in easily handled carrier packages. Low barrier diodes provide optimum noise figure at low local oscillator drive levels. Medium barrier diodes provide a wider dynamic range for lower distortion mixer designs. The family provides a range of both dc and rf specified diodes. Application Note 940 gives recommended handling and bonding techniques. Application Note 963 presents impedance matching techniques for mixer and detector circuits.

## Mechanical Specifications

The HP outlines C2 and H2 are designed for microstrip and stripline use. The leads provide good continuity of transmission line impedance to the diode. Outline C2 is a plastic on ceramic package. Outline H2 has a metal ceramic hermetic seal. The ceramic is alumina. Metal parts are gold plated kovar.

The hermetic package, outline H2, is capable of passing many of the environmental tests of MIL-STD-750. The applicable solderability test is reference 2031.1: 260° C, 10 seconds.

## Package Dimensions



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

Part Number 5082-	Batch Matched 5082-	Recommended Frequency	Barrier	Maximum Noise Figure NF (dB)	IF Impedance $Z_{IF}$ ( $\Omega$ )		Maximum SWR	Package	Typical Capacitance $C_T$ (pF)
					Min.	Max.			
2200	2201	1-12 GHz	Medium	6.0	200	400	1.5:1	H-2	.3
2202	2203		Medium	6.5	200	400	2.0:1		
2765	2766		Low	6.0	100	250	1.5:1		
2785	2786		Low	6.5	100	250	2.0:1		
2207	2208	1-18 GHz	Medium	6.0	250	500	1.5:1	C-2	.22
2209	2210		Medium	6.5	250	500	2.0:1		
2774	2775		Low	6.0	200	400	1.5:1		
2794	2795		Low	6.5	200	400	2.0:1		
Test Conditions	$\Delta NF \leq 0.3\text{dB}$ $\Delta Z_{IF} \leq 25\Omega$	L.O. Test Frequency 9.375 GHz	DC Load Resistance = $0\Omega$ L.O. Power = 1 mW IF = 30 MHz, 1.5 dB NF						V = 0

## Typical Detector Parameters

Parameter	Symbol	Typical Value	Units	Test Conditions
Tangential Sensitivity	TSS	-54	dBm	20 $\mu\text{A}$ Bias Video Bandwidth = 2 MHz $R_L = 100\text{K}\Omega$ $f = 10\text{ GHz}$
Voltage Sensitivity	$\gamma$	6.6	mV/ $\mu\text{W}$	
Video Resistance	$R_V$	1400	$\Omega$	

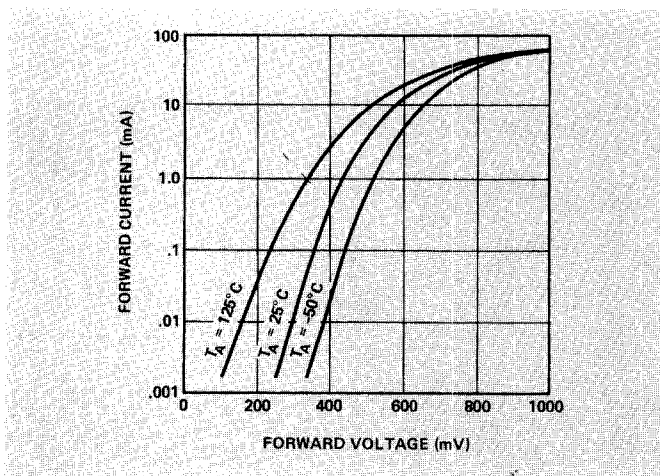


Figure 1. Typical Forward Characteristics, 5082-2200, -2207.

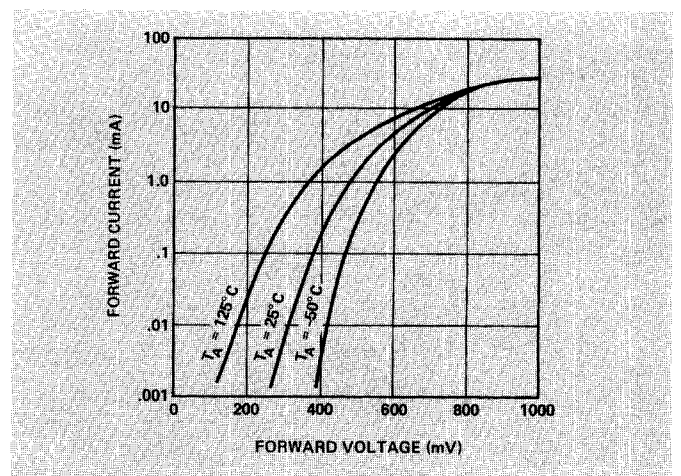


Figure 2. Typical Forward Characteristics, 5082-2202, -2209.

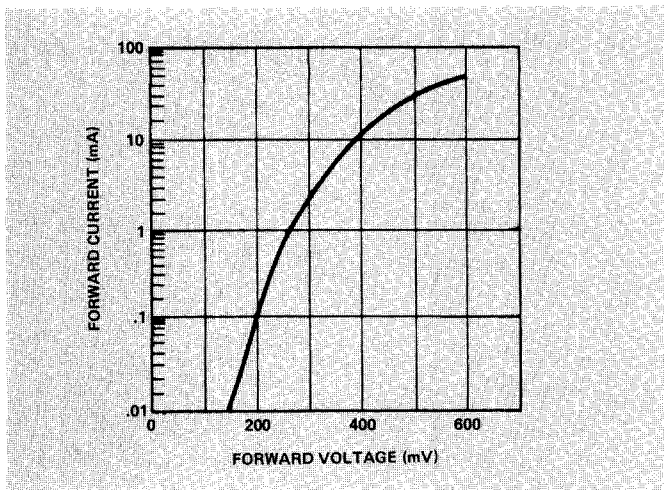


Figure 3. Typical Forward Characteristics, 5082-2765, -2774 at  $T_A = 25^\circ\text{C}$ .

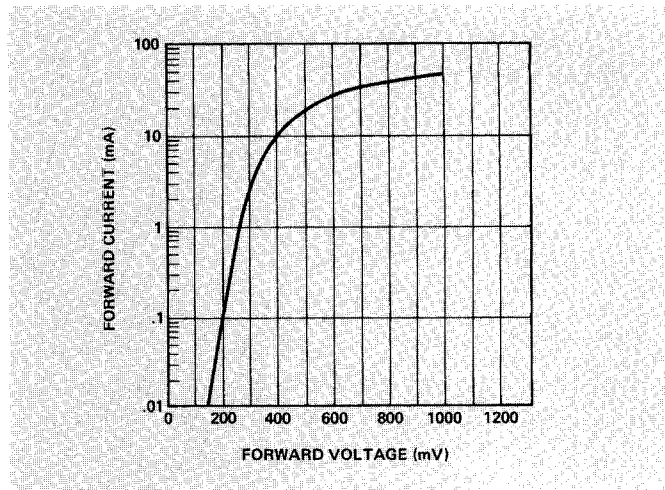


Figure 4. Typical Forward Characteristics, 5082-2785 -2794 at  $T_A = 25^\circ\text{C}$ .

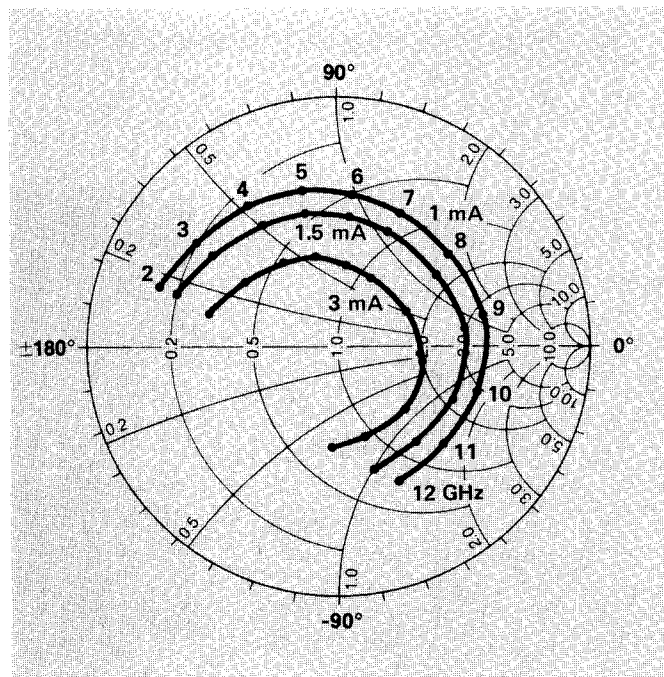


Figure 5. Typical Admittance Characteristics, 5082-2200 with self bias.

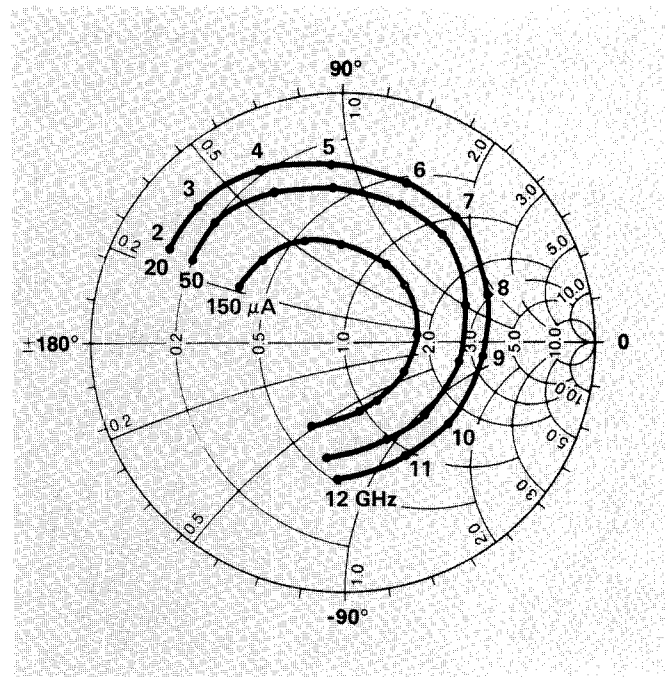


Figure 6. Typical Admittance Characteristics, 5082-2200 with external bias.

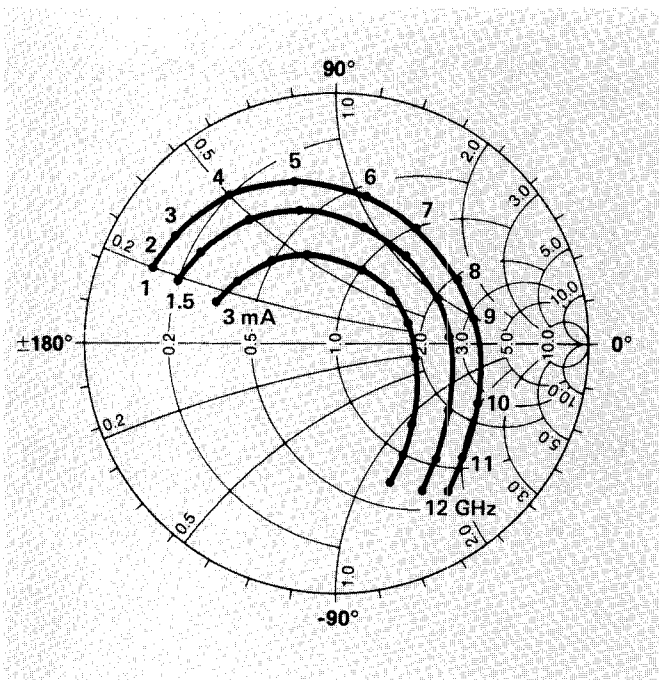


Figure 7. Typical Admittance Characteristics, 5082-2202 with self bias.

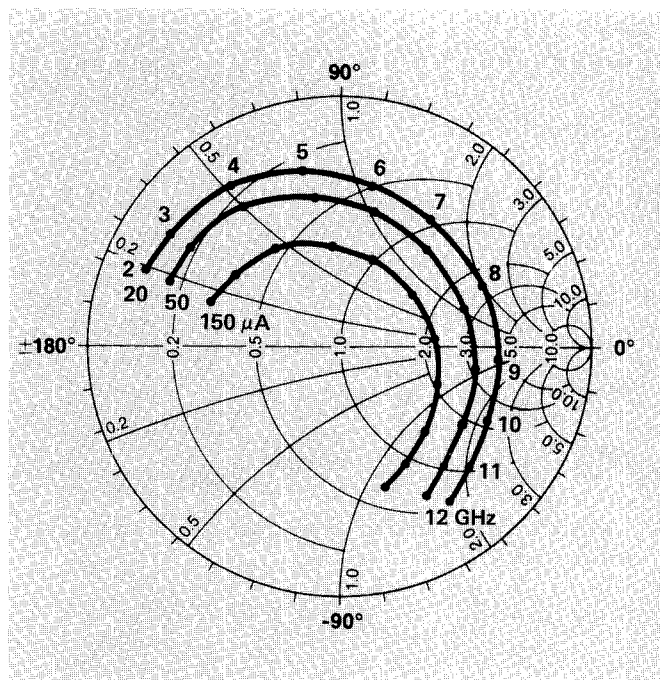


Figure 8. Typical Admittance Characteristics, 5082-2202 with external bias.

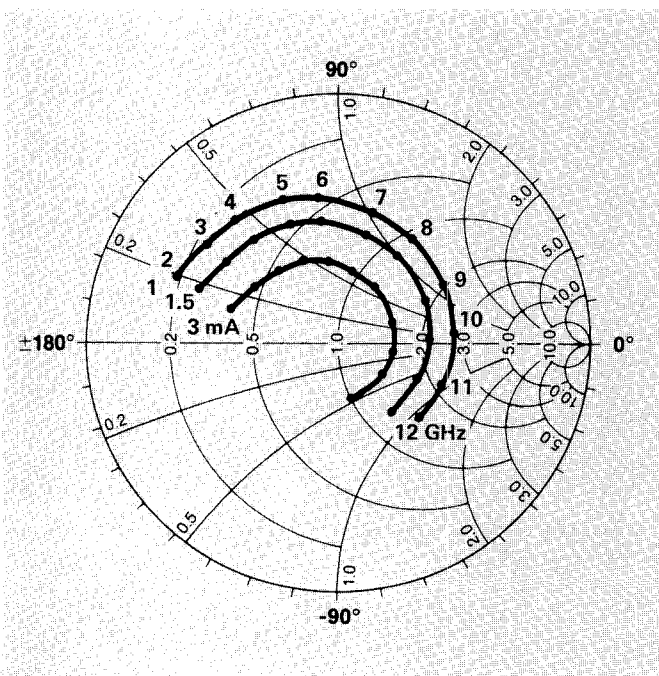


Figure 9. Typical Admittance Characteristics, 5082-2765 with self bias.

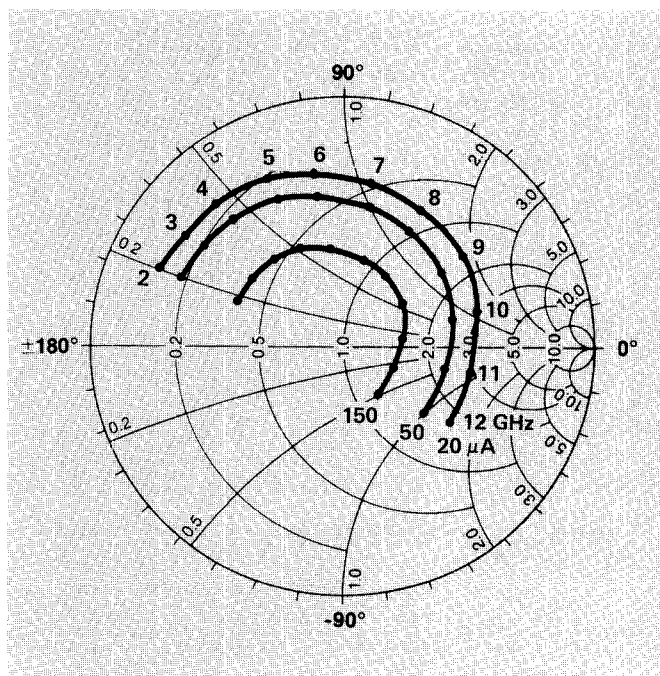


Figure 10. Typical Admittance Characteristics, 5082-2765 with external bias.



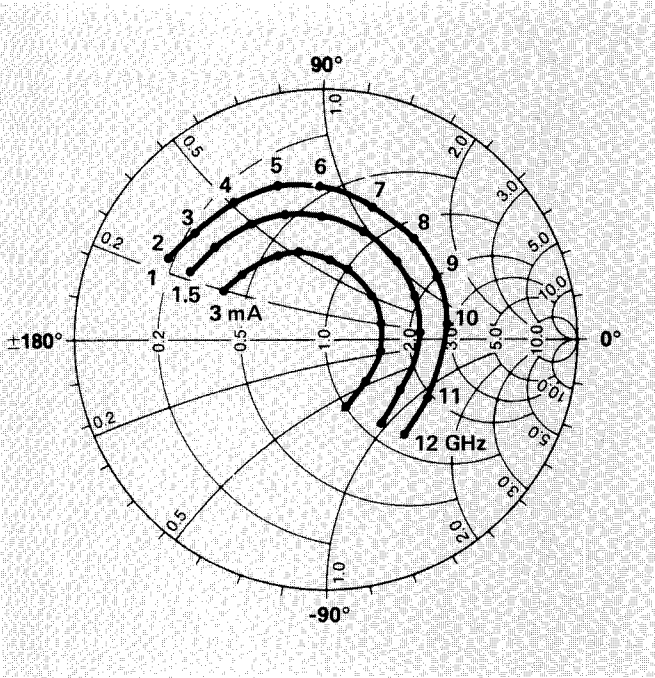


Figure 11. Typical Admittance Characteristics, 5082-2785 with self bias.

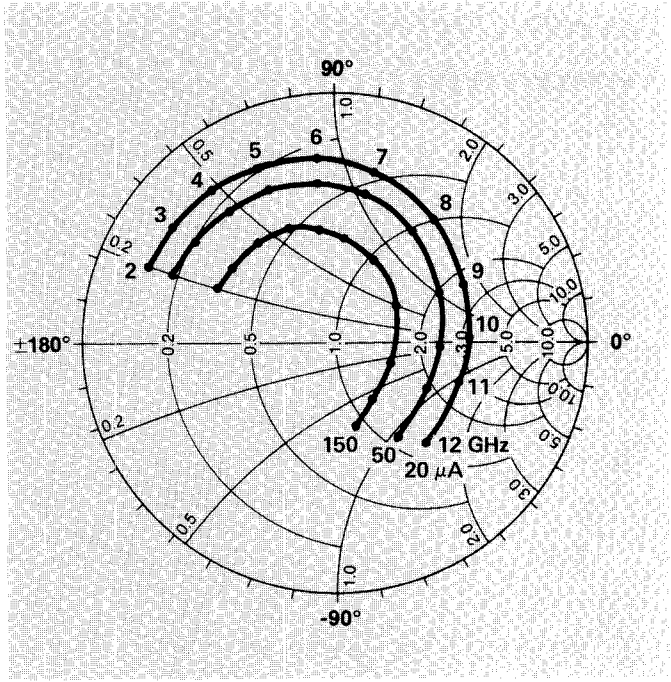


Figure 12. Typical Admittance Characteristics, 5082-2785 with external bias.

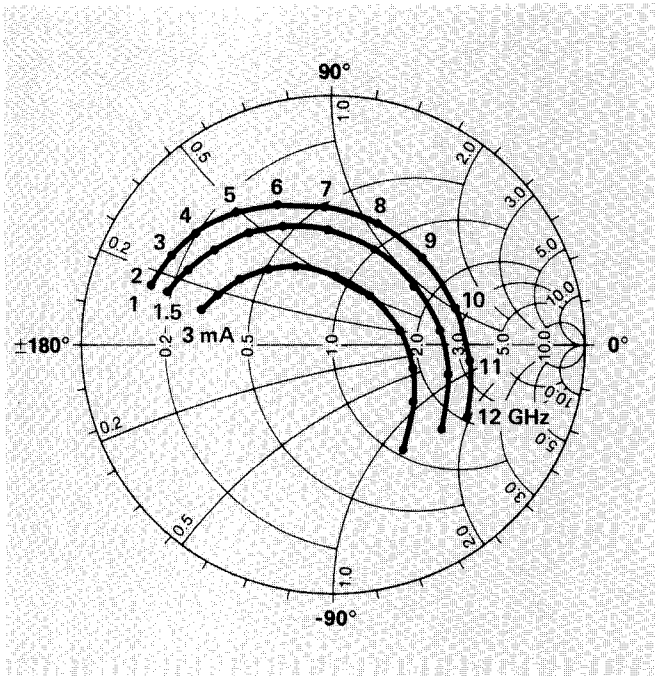


Figure 13. Typical Admittance Characteristics, 5082-2207 with self bias.

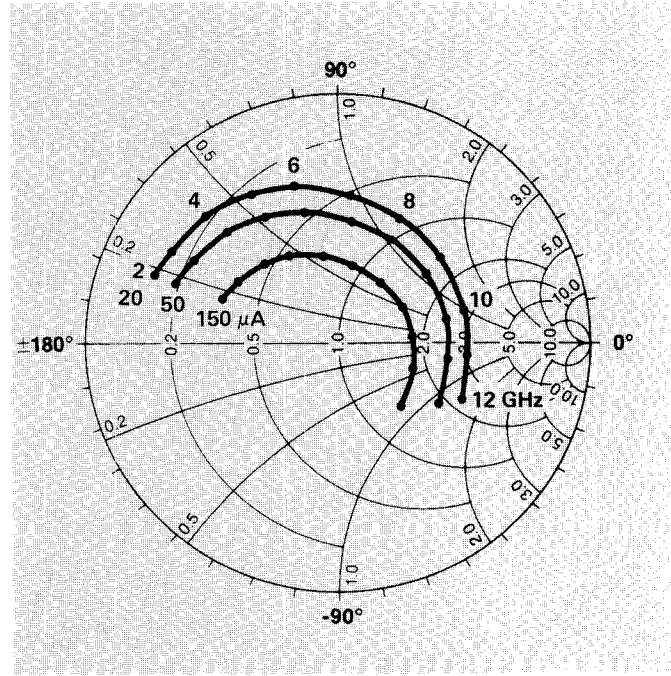


Figure 14. Typical Admittance Characteristics, 5082-2207 with external bias.

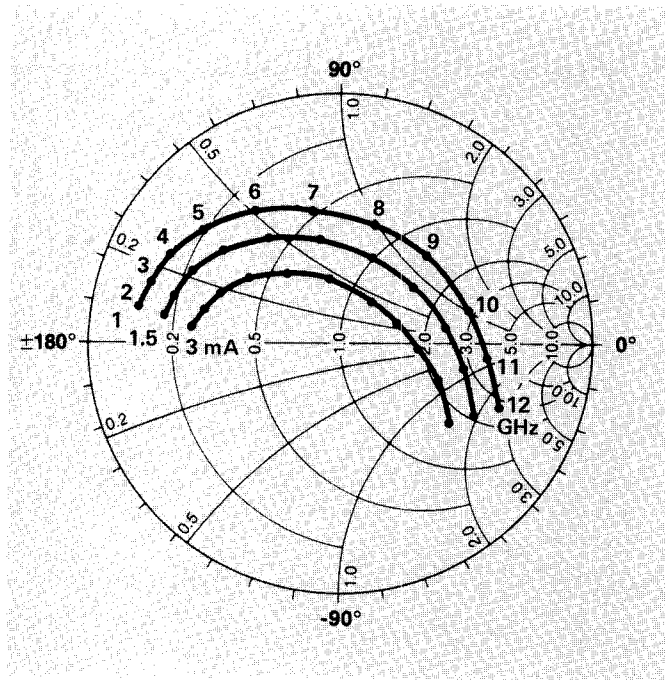


Figure 15. Typical Admittance Characteristics, 5082-2209 with self bias.

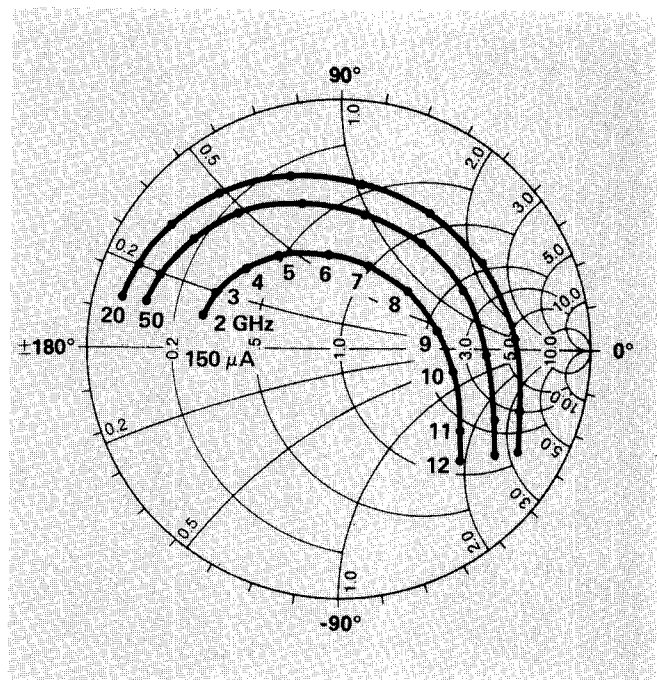


Figure 16. Typical Admittance Characteristics, 5082-2209 with external bias.

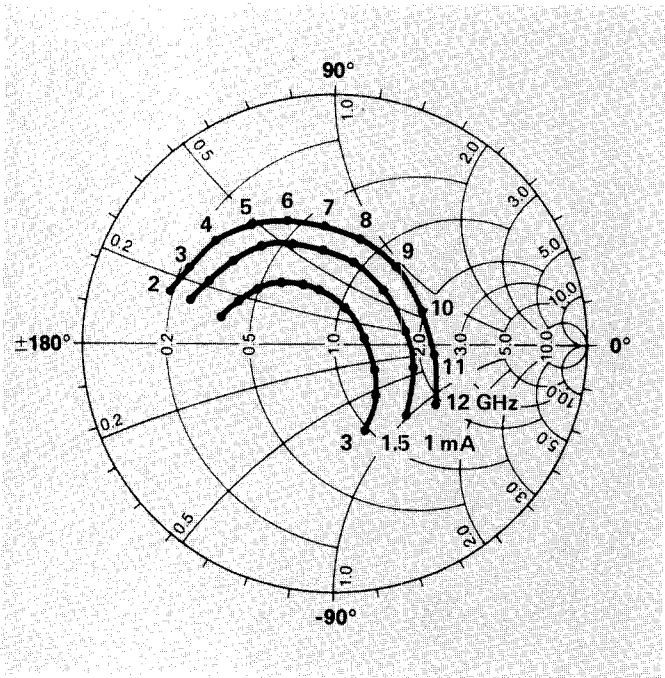


Figure 17. Typical Admittance Characteristics, 5082-2774 with self bias.

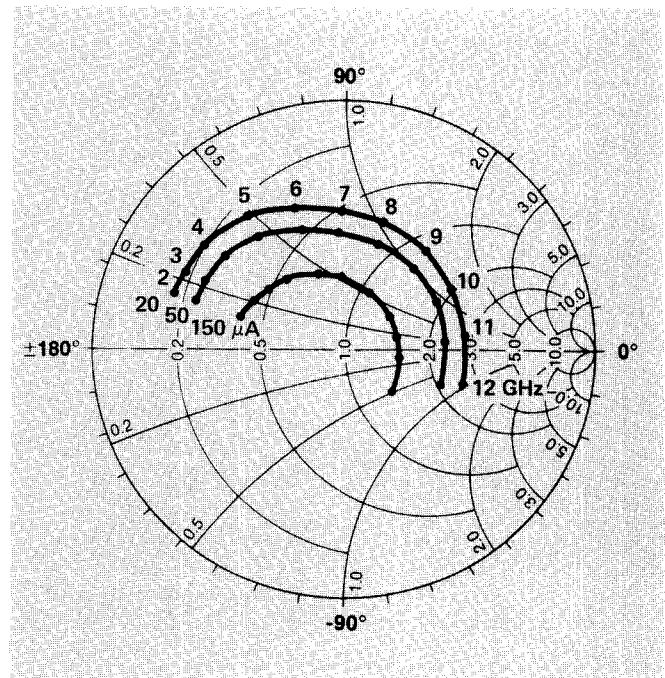


Figure 18. Typical Admittance Characteristics, 5082-2774 with external bias.

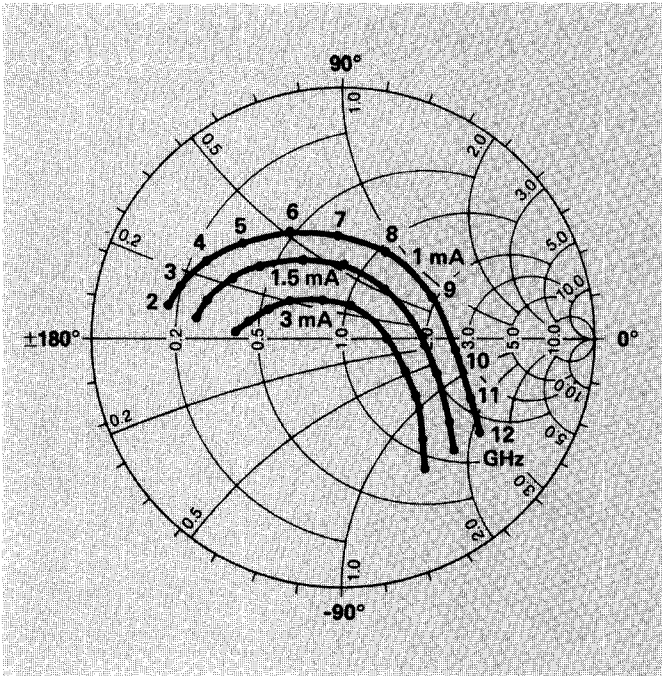


Figure 19. Typical Admittance Characteristics, 5082-2794 with self bias.

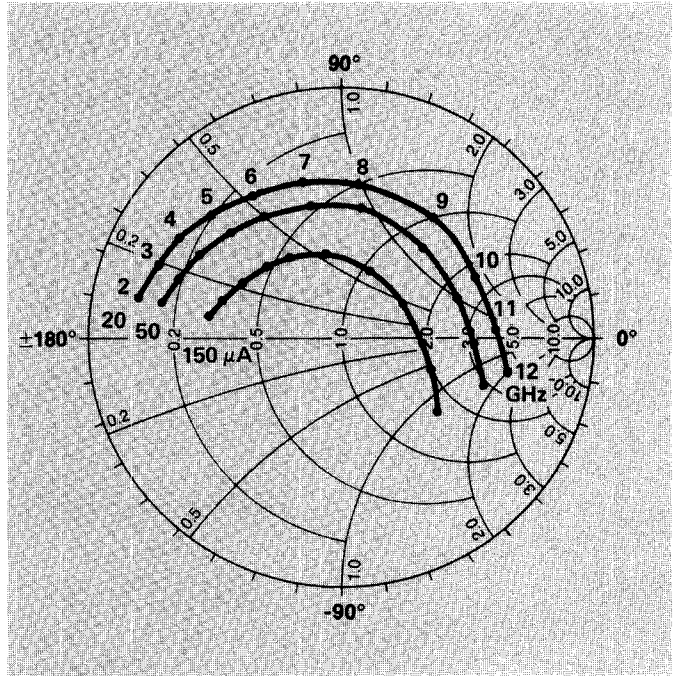


Figure 20. Typical Admittance Characteristics, 5082-2794 with external bias.

## Maximum Ratings at $T_{CASE} = 25^{\circ}C$

Pulse Power Incident ..... 1 W  
(1  $\mu s$  pulse,  $D_u = .001$  for 1 minute)

CW Power Dissipation  
(Mounted in infinite Heat Sink) ..... 125 mW  
(Derate linearly to Zero at Maximum Operating Temperature)

Junction Operating and Storage Temperature Range  
C-2 Packaged Diodes .....  $-65^{\circ}C$  to  $+125^{\circ}C$   
H-2 Packaged Diodes .....  $-65^{\circ}C$  to  $+150^{\circ}C$

*Operation of these devices within the above temperature ratings will assure a device Mean Time Between Failure (MTBF) of approximately  $1 \times 10^7$  hours.*

Diode Mounting Temperature  
C-2 and H-2 Packaged  
Diodes .....  $235^{\circ}C$  for 10 sec. max.  
Peak Inverse Voltage ..... 3 V

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

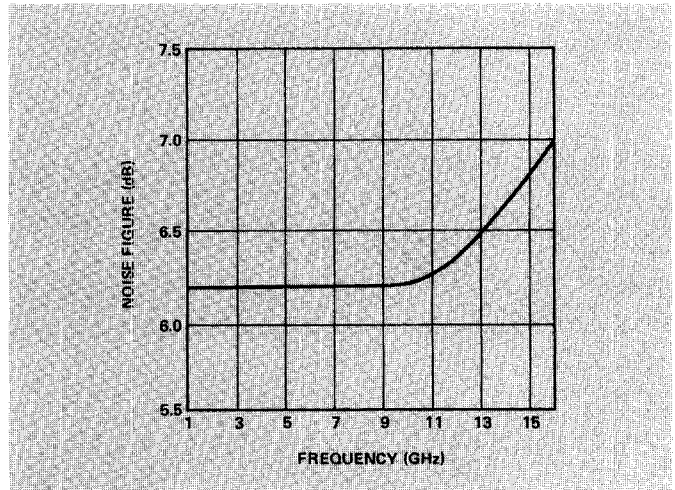


Figure 21. Typical Noise Figure vs. Frequency for 5082-2202, -2209, -2785, -2794

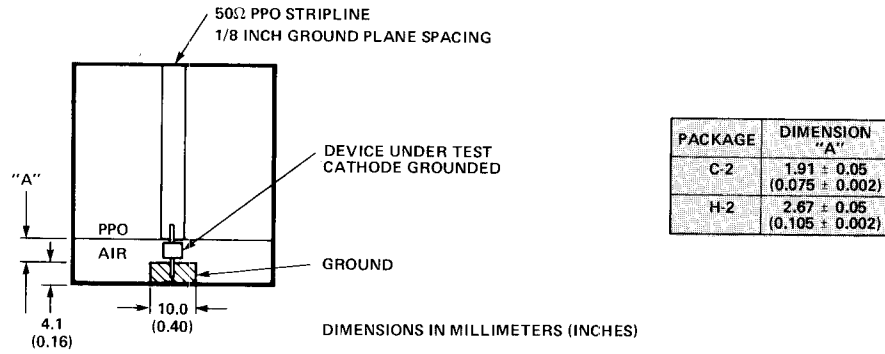
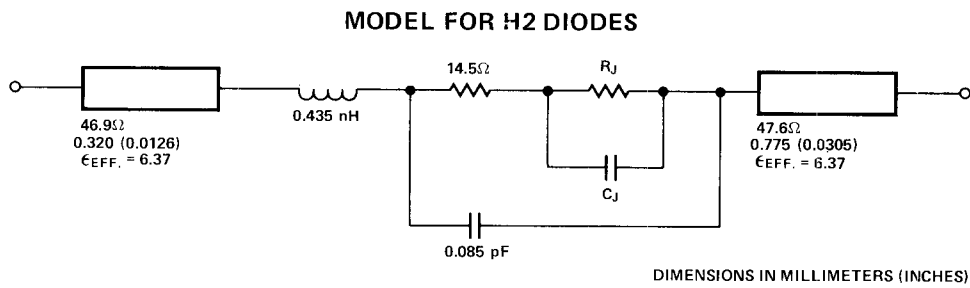
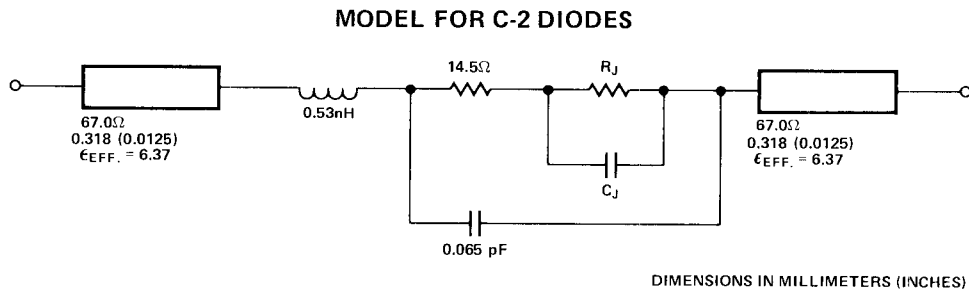


Figure 22. Admittance Test Circuit for C2 and H2 Diodes.



Parameter	Symbol	1 mA Rect. Current		20 μA Ext. Bias		Units
		5082-2200	5082-2765	5082-2200	5082-2765	
Junction Resistance	$R_J$	258	290	545	495	Ohms
Junction Capacitance	$C_J$	0.255	0.189	0.302	0.173	pF



Parameter	Symbol	1 mA Rect. Current		20 μA Ext. Bias		Units
		5082-2207	5082-2774	5082-2207	5082-2774	
Junction Resistance	$R_J$	338	255	421	340	Ohms
Junction Capacitance	$C_J$	0.189	0.180	0.195	0.168	pF