

Agilent HSCH-9101/9201/9251 GaAs Beam Lead Schottky Barrier Diodes

Data Sheet

Features

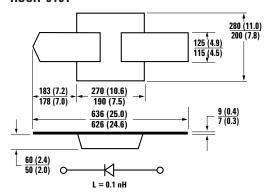
- Gold tri-metal system for improved reliability
- Low capacitance
- · Low series resistance
- · High cutoff frequency
- Polyimide passivation
- · Multiple configurations

Description

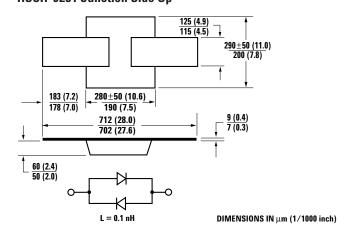
The HSCH-9101 single, the HSCH-9201 series pair, and the HSCH-9251 anti-parallel pair are advanced gallium arsenide Schottky barrier diodes. These devices are fabricated utilizing molecular beam epitaxy (MBE) manufacturing techniques and feature rugged construction and consistent electrical performance. A polyimide coating provides scratch protection and resistance to contamination.

+ SCH-9201 • Mo • Mo

HSCH-9101



HSCH-9251 Junction Side Up





Applications

This line of Schottky diodes is optimized for use in mixer applications at millimeter wave frequencies. Some suggested mixer types are single ended and single balanced for the single and series pair. The anti-parallel pair is ideal for harmonic mixers.

Assembly Techniques

Diodes are ESD sensitive. ESD preventive measures must be em ployed in all aspects of storage, handling, and assembly.

Diode ESD precautions, handling considerations, and bonding methods are critical factors in successful diode performance and reliability. Agilent application note #55, "Beam Lead Diode Bonding and Handling Procedures" provides basic information on these subjects.

Maximum Ratings

Power Dissipation at $T_{LEAD} = 25^{\circ}C$	75 mW per junction			
Measured in an infinite heat sink derated linearly				
to zero at maximum rated temperature				
Operating Temperature	65°C to +150°C			
Storage Temperature	65°C to +150°C			
Mounting Temperature	. 235°C for 10 seconds			
Minimum Lead Strength	6 grams			

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

Symbol	Parameters and	Part Number HSCH-9101 HSCH-9251								 51	
	Test Conditions	Units	Min.	Тур.	Max.	Min.	Typ.	Max.	Min.	Typ.	Max.
C _j ^[1]	Junction Capacitance V _R = 0 V, f = 1 MHz	pF		0.040	0.050		0.040	0.050		0.040	
$\Delta C_j^{[1]}$	Junction Capacitance Variation V _R = 0 V, f = 1 MHz	pF					0.005	0.010			
R _S ^[2]	Series Resistance	W			6			6			6
V _{F1}	Forward Voltage I _F = 1 mA	mV		700	800		700	800		700	800
V _{F10}	Forward Voltage I _F = 10 mA	mV		800	850		800	850		800	850
ΔV_{F}	Forward Voltage Variation I _F = 1 mA and 10 mA	mV						15			15
V _{BR}	Reverse Breakdown Voltage $V_R = V_{BR}$ measure $I_R \leq 10~\mu\text{A}$ (per junction)	V	4.5			4.5					

Notes:

- 1. Junction capacitance is determined by measuring total device capacitance and subtracting the calculated parasitic capacitance (0.035 pF).
- 2. Series resistance is determined by measuring the dynamic resistance and subtracting the calculated junction resistance of 6Ω.

Typical Parameters

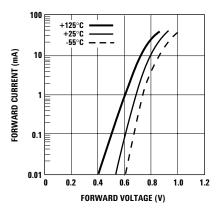


Figure 1. Typical Forward Characteristics for HSCH-9101, HSCH-9201, and HSCH-9251.

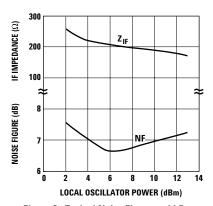


Figure 2. Typical Noise Figure and I.F. Impedance vs. Local Oscillator Power, for HSCH-9101 and HSCH-9201.

SPICE Parameters

Parameter	Units	HSCH-9XXX				
B _V	V	5				
C _{J0}	pF	0.04				
E _G	eV	1.43				
I _{BV}	А	10E-5				
I _s	А	1.6 x 10E-13				
N		1.20				
R _S	Ω	5				
P _B	V	0.7				
P _T		2				
M		0.5				

This data sheet contains a variety of typical and guaranteed performance data. The information supplied should not be interpreted as a complete list of circuit specifications. In this data sheet the term *typical* refers to the 50th percentile performance. For additional information contact your local Agilent Technologies sales representative.

