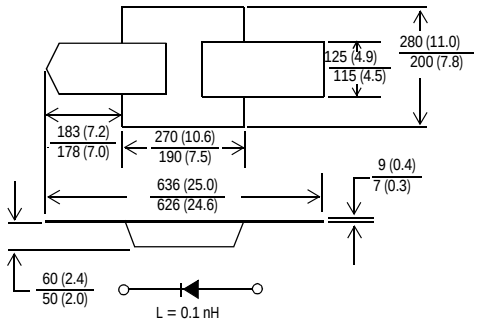
Agilent HSCH-9101, -9201, and -9251 GaAs Beam Lead Schottky Barrier Diodes

Data Sheet

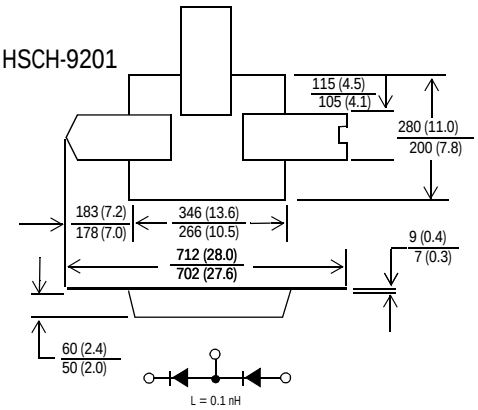
Features

- Gold Tri-Metal System For Improved Reliability
- Low Capacitance
- Low Series Resistance
- High Cutoff Frequency
- Polyimide Passivation
- Multiple Configurations

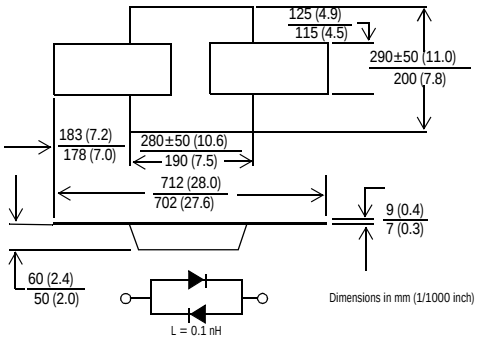
HSCH-9101



HSCH-9201



HSCH-9251
Junction Side Up



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.

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 employed 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°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 @ T_A = 25°C

Symbol	Parameters and Test Conditions	Part Number									Units
		HSCH-9101			HSCH-9201TC494			HSCH-9251			
		Min.	Typ.	Max.	Min.	Typ.	Max.	Min.	Typ.	Max.	
C_j[1]	Junction Capacitance V_R = 0 V, F = 1 MHz		0.040	0.050		0.040	0.050		0.040		pF
ΔC_j[1]	Junction Capacitance V_R = 0 V, F = 1 MHz					0.005	0.010				pF
R_S[2]	Series Resistance			6			6			6	W
V_{F1}	Forward Voltage I_F = 1 mA		700	800		700	800		700	800	mV
V_{F10}	Forward Voltage I_F = 10 mA		800	850		800	850		800	850	mV
ΔV_F	Forward Voltage I_F = 1 mA and 10 mA						15			15	mV
V_{BR}	Reverse Breakdown Voltage $V_R = V_{BR}$ measure $I_R \leq 10\ \mu A$ (per junction)	4.5			4.5						V

[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

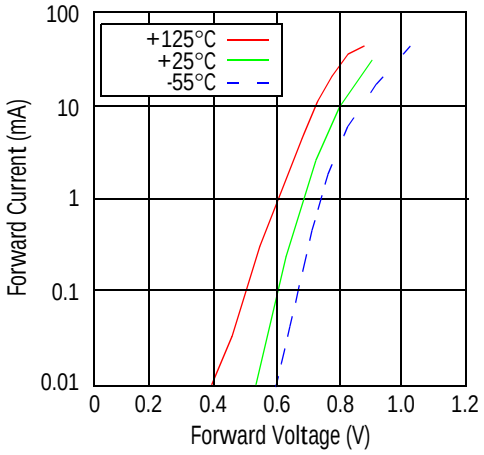


Figure 1.
Typical Forward Characteristics for
HSCH-9101, HSCH-9201, and HSCH-9251

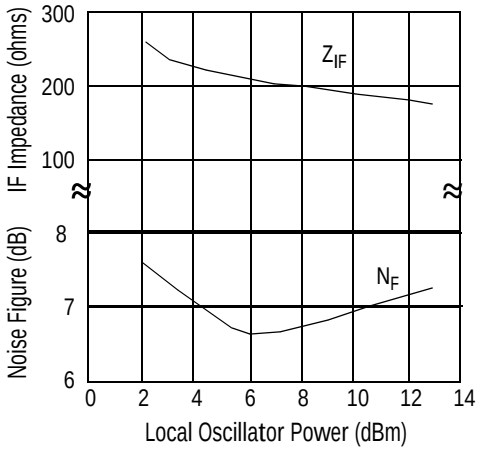


Figure 2.
Typical Noise Figure and I.F.
Impedance vs. Local Oscillator Power, for
HSCH-9101 and HSCH-9201

SPICE Parameters

Parameter	Units	HSCH-9XXX
B_V	V	5
C_{J0}	pF	0.04
E_G	eV	1.43
I_{BV}	A	10E-5
I_S	A	1.6 x 10E-13
N		1.20
R_S	W	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.

Notes: