HSCH-9161
HSCH-9162
GaAs Detector Diode

Data Sheet

Description

The HSCH-916x is a discrete, beam lead, GaAs diode fabricated using the modified barrier integrated diode (MBID) process.

Applications

This diode is suitable for medium– low barrier, zero bias detector applications.The HSCH-916x is functional through W–band (110 GHz) and can be mounted in microstrip, finline, and coplanar circuits.

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.

Additional References:
PN# 2, "TC611 Diode Model," and PN# 12, "TC611 GaAs Detector Diode Sensitivity Measurements."

Features

- Low Junction Capacitance
- fc >200 GHz
- Lower Temperature Coefficient than Silicon
- Durable Construction
    - Typical 6 gram beam lead strength
    - High power handling capability

231 (9.1)

250 (9.8)

250 (9.8)

231 (9.1)

120 (4.7)
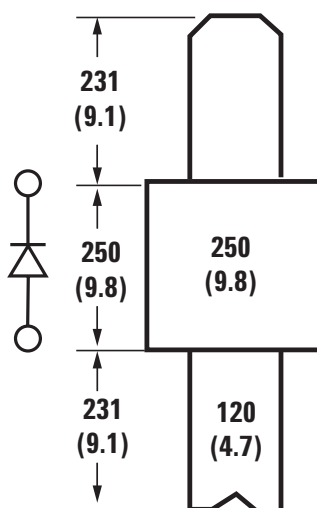
Note: All dimensions in microns (mils)

Beam Lead = 7-9 um

Die Thickness = 50-60 um
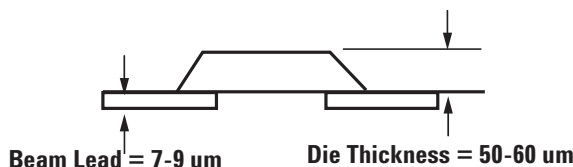
Absolute Maximum Ratings

| Symbol	Parameters/Conditions	Min.	Typ.	Max.	Units
T_{op}	Operating Temp. Range	–65		150	°C
T_{stg}	Storage Temp. Range	–65		200	°C
P_B	Burnout Power		20		dBm

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DC Specifications/Physical Properties (T_A = 25 °C)

Part Number	Junction Capacitance (pF)	Video Resistance (kW)		Voltage Sensitivity (mV/mW)		Beam Lead Strength	
	Typical	Min.	Max.	Min.	Typ.	Max.	Unit
HSCH-9161	.035	2.5	7.5	0.5		3	grams
HSCH-9162	.035	1.8	7.5	0.5		3	grams

Typical Diode IV Characteristic

Typical Diode IV Characteristic
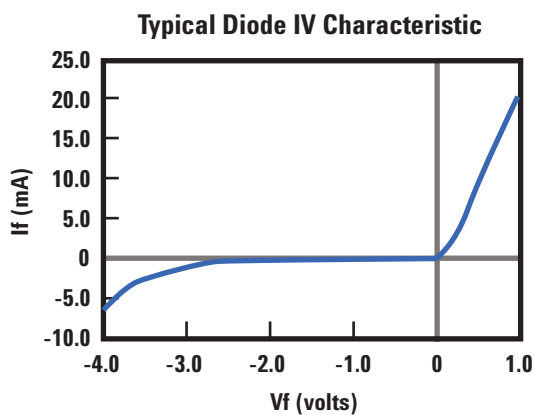
Diode Parameter Variation with Temperature

Rv - 7.0 KΩ @ 25 °C

Rv - 3.0 KΩ @ 25 °C

**GAMMA - 7.0 mV/μW @ °25 C**

GAMMA = 0.5 mV/μW @ 25 °C
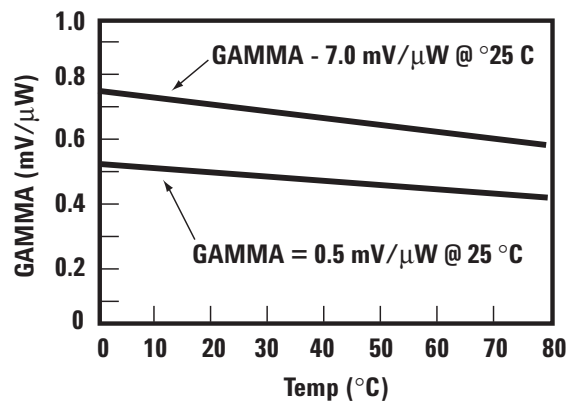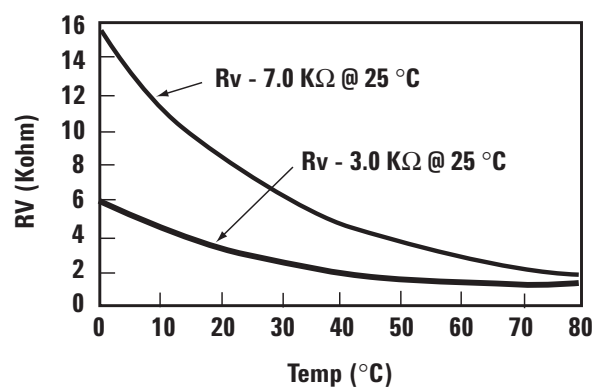
DC measurement assumes 50Ω load; ideal diode would be 1mV/μW,

Note: Each line represents a different value of RV oe Gamma at room temperature.

Typical Small Signal Parameters as a Function of Bias

Parameter	Bias Voltage			
	–4.0V	Zero Bias	+0.1V	+0.5V
Rs(Ω)	20	20	20	20
Rj(Ω)	440	3000	277	34
Cj(pF)	0.019	0.035	0.027	0.034

Note: Parameter values extracted from 26–40 GHz s–parameter data @ –20 dBm.

0.011 pF

Rs **Cj**

0.300 nH

Rj

$$Rv = Rj + Rs$$
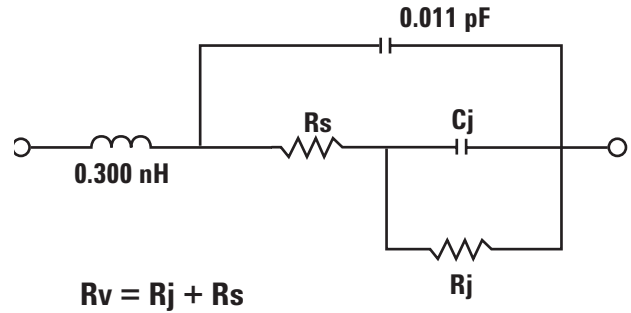
This data sheet contains a variety of typical and guaranteed performance data. The information supplied should not be interpreted as a complete list of circuit specifications. Customers considering the use of this, or other WPTC GaAs ICs, for their design should obtain the current production specifications from WPTC Marketing. In this data sheet the term typical refers to the 50th percentile performance. For additional information contact WPTC Marketing at 707-577-4482.

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