Keysight Technologies
HSCH-9161 HSCH-9162
GaAs Detector Diode

Features
- Low junction capacitance
- $f_c > 200$ GHz
- Lower temperature coefficient than silicon
- Durable construction
  Typical 6 gram beam lead strength
- High power handling capability
Description

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

Absolute Maximum Ratings

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Parameters/conditions</th>
<th>Typ.</th>
<th>Min.</th>
<th>Max.</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>T_{op}</td>
<td>Operating temperature range</td>
<td>-65</td>
<td>150</td>
<td>°C</td>
<td></td>
</tr>
<tr>
<td>T_{stg}</td>
<td>Storage temperature range</td>
<td>-65</td>
<td>200</td>
<td>°C</td>
<td></td>
</tr>
<tr>
<td>P_B</td>
<td>Burnout power</td>
<td>20</td>
<td></td>
<td>dBm</td>
<td></td>
</tr>
</tbody>
</table>

DC Specifications/Physical Properties

(T_A = 25 °C)

<table>
<thead>
<tr>
<th>Part number</th>
<th>Junction capacitance (pF)</th>
<th>Video resistance (kΩ)</th>
<th>Voltage sensitivity strength (mV/μW)</th>
<th>Beam lead strength</th>
</tr>
</thead>
<tbody>
<tr>
<td>HSCH-9161</td>
<td>0.035</td>
<td>2.5</td>
<td>7.5</td>
<td>0.5</td>
</tr>
<tr>
<td>HSCH-9162</td>
<td>0.035</td>
<td>1.8</td>
<td>7.5</td>
<td>0.5</td>
</tr>
</tbody>
</table>
1. Note: Each graph line represents a different value of \( R_V \) or \( \gamma \) at room temperature.
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.

*Beam Lead Diode Bonding and Handling Procedures, Application Note (5991-3513EN)* provides basic information on these subjects.

Typical small signal parameters as a function of bias

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Bias voltage</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>~4.0 V</td>
</tr>
<tr>
<td>$R_s (\Omega)$</td>
<td>20</td>
</tr>
<tr>
<td>$R_j (\Omega)$</td>
<td>440</td>
</tr>
<tr>
<td>$C_j (\text{pF})$</td>
<td>0.019</td>
</tr>
</tbody>
</table>

Note: Parameter values extracted from 26–40 GHz S-parameter data at –20 dBm.

Notes

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 TCA GaAs ICs, for their design should obtain the current production specifications from Keysight Technologies, Inc. In this data sheet the term typical refers to the 50th percentile performance. For additional information and support email: mmic_helpline@keysight.com.
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