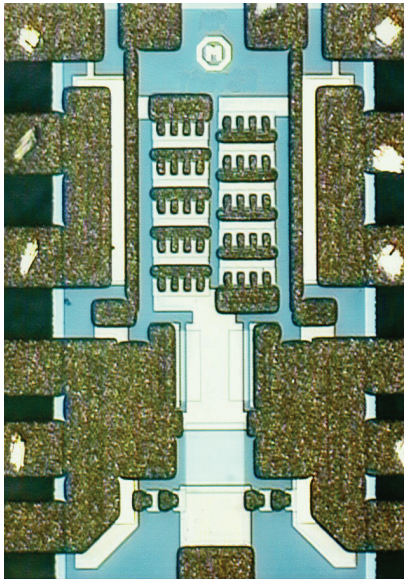


# Keysight 1GG5-4040

## Broadband Integrated Diode

### Data Sheet



### Features

- Dual power range for wide dynamic range square law operation
- Plus and minus output Detection for high power & low power paths
- Integrated resistors and capacitors
- Low junction capacitance
- Durable construction  
Typical 6 gram beam lead strength
- High power handling capability

## Description

The 1GG5-4040 is an integrated, beam-lead diode fabricated using the Keysight Technologies, Inc. modified barrier Schottky Diode process. The device has diodes, capacitors, and resistors integrated on one chip and is useful for true average, wide dynamic range power sensor applications.

### Absolute maximum ratings

Symbol	Parameters/conditions	Min	Typ	Max	Units
$T_{op}$	Operating temperature range	-65		175	°C
$T_{stg}$	Storage temperature range	-65		175	°C
$B_p$	Burnout power		29		dBm

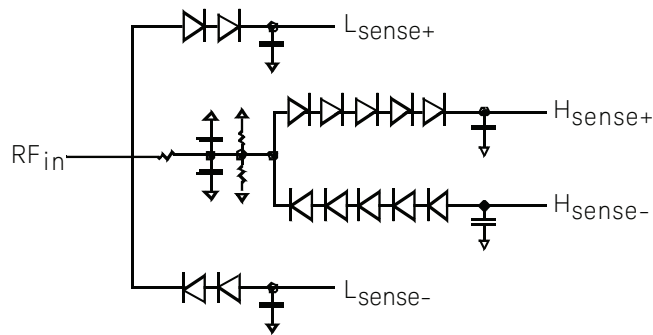
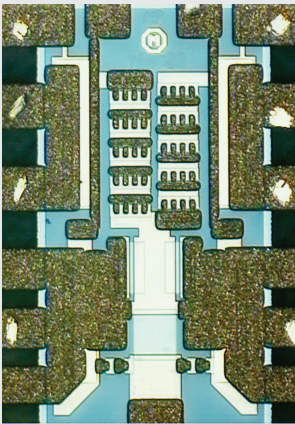


Figure 1. 1GG5-4040 schematic



– Chip size: 810 x 1180  $\mu\text{m}$

## Applications

The 1GG5-4040 from Keysight Technologies, Inc. is suitable for broadband coax power sensing and can be mounted in microstrip or coplanar circuits. Performance has been demonstrated in power sensing applications up to 18 GHz.

## Bonding, Handling & Assembly Techniques

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

The Keysight *Beam Lead Diode Bonding and Handling Procedures - Application Note* (5991-3513EN) provides basic information on ESD preventive measures.

Detailed bonding and handling information is available in the WPTC Design Guidelines. See Section 1, GaAs Integrated Diode, Assembly and Handling.

## Assembly Techniques

Solder die attach using a AuSn solder preform is the recommended assembly method. Gold thermosonic wedge bonding with 0.7 mil wire is recommended for all bonds. Tool force should be 22 grams  $\pm$ 1 gram, stage temperature is 150  $\pm$ 2 °C, and ultrasonic power of 64  $\pm$ 1 dB and 76  $\pm$ 8 msec, respectively. The top and bottom metallization is gold. GaAs MMICs are ESD sensitive. ESD preventive measures must be employed in all aspects of storage, handling, and assembly.

MMIC ESD precautions, handling considerations, die attach and bonding methods are critical factors in successful GaAs MMIC performance and reliability. *The Keysight GaAs MMIC ESD, Die Attach and Bonding Guidelines - Application Note* (5991-3484EN) provides basic information on these subjects.

## RoHS Compliance

This device is RoHS Compliant. This means the component meets the requirements of the European Parliament and the Council of the European Union Restriction of Hazardous Substances Directive 2011/65/EU, commonly known as RoHS. The six regulated substances are lead, mercury, cadmium, chromium VI (hexavalent), polybrominated biphenyls (PBB) and polybrominated biphenyl ethers (PBDE). RoHS compliance implies that any residual concentration of these substances is below the RoHS Directive's maximum concentration values (MVC); being less than 1000 ppm by weight for all substances except for cadmium which is less than 100 ppm by weight.

Path specifications

(T<sub>A</sub> = 25 °C)

Device Test	Test conditions							Test specs.						Units
	If mA	Ir ma	Vf V	Vr V	Ires mA	Vcap V	f MHz	Low path			High path			
								Min.	Typ.	Max.	Min.	Typ.	Max.	
RV			.015	.015				2.0		4.0	1.0		2.0	k Ohms
Gamma			.015	.015				0.15		0.6	.08		0.4	mv /uW
Vf (.1mA)	.1	.1						.06		.18	.05		.16	V
Vf (10mA)	10	10						.06		2	0.8		2.5	V

Other specifications

Device Test	Test conditions							Test specs.			Units
	If mA	Ir ma	Vf V	Vr V	Ires mA	Vcap V	f MHz	Min.	Typ.	Max.	
Rin1					10			40		60	Ohms
Rin2					10			8		12	Ohms
C							1.0	6		18	pF

Reliability tests performed

Test	Conditions
High temperature	I <sub>f</sub> = 7 mA
Operating life	T <sub>A</sub> = 175 °C
Humidity storage	RH = 90%, T <sub>A</sub> = 65 °C

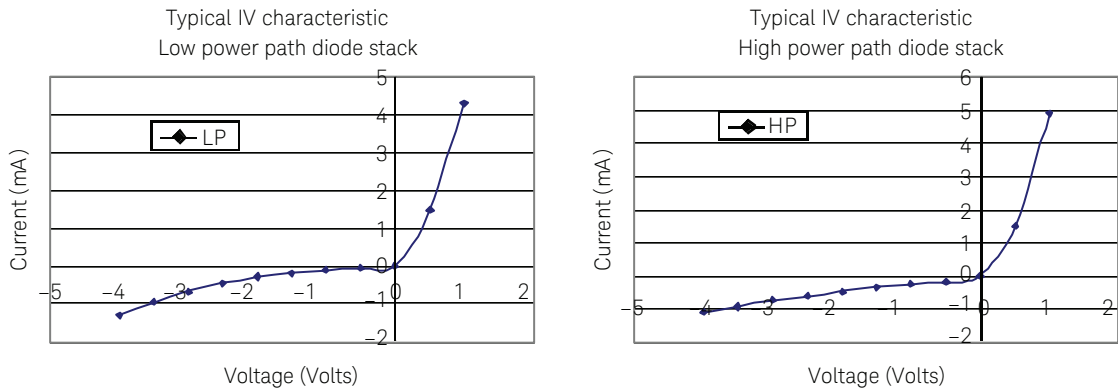


Figure 2. Typical IV characteristics

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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 Keysight Technologies GaAs ICs, for their design should obtain the current production specifications from Keysight. In this data sheet the term typical refers to the 50th percentile performance. For additional information contact Keysight at MMIC\_Helpline@keysight.com.

The product described in this data sheet is RoHS Compliant. See RoHS Compliance section for more details.

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