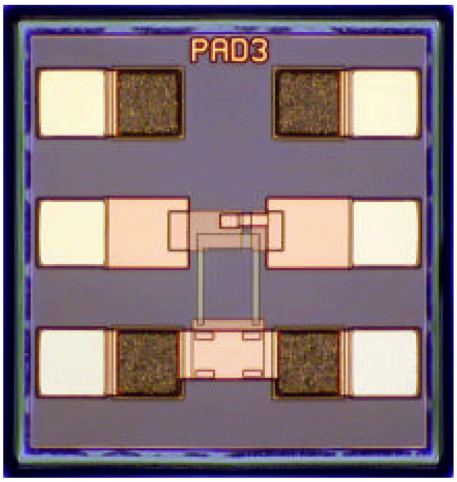
# Keysight 1GC1-4059
# DC-120 GHz 3 dB Pad

Data Sheet




## Features

- Small – ½ mm x ½ mm
- Lower ripple than thin-film
- Small gain slope compensates for bonding
- 20 dBm power handling in
- Match
  12 dB to 120 GHz
  24 dB to 20 GHz

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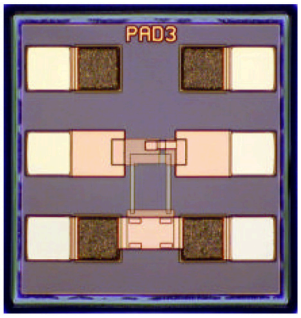
# Description

The 1GC1-4059 is a 3 dB pad with a slight positive gain slope. It is fabricated using Keysight Techonology, Inc.'s GaAs MMIC process, and uses precision patterning to minimize size and amplitude ripple.




- Chip size: 500 x 520 µm (19.7 x 20.5 mils)
- Chip size tolerance: ± 10 µm (± 0.4 mils)
- Chip thickness: 130 ± 15 µm (5 ± 0.6 mils)
- Pad dimensions: 80 x 80 mm (3.2 x 3.2 mils)

## Absolute maximum ratings[1]

| Symbol | Parameters/conditions | Min | Max | Units |
|---|---|---|---|---|
| $P_{in}$ | Input power (w/ 50 Ohm termination | | 20 | dBm |
| $P_{in}$ | Input power (w/short circuit termination) | | 13 | dBm |
| $T_A$ | Backside ambient temperature | –55 | 120 | °C |
| $T_{case}$ | Operating case temperature | –55 | | °C |
| $T_{stg}$ | Storage temperature | –55 | 165 | °C |

1. Operation in excess of any one of these conditions may result in permanent damage to this device. TA = 25 °C except for $T_{ch}$, $T_{stg}$, and $T_{max}$.

## DC specifications/physical properties

| Symbol | Parameters/conditions | Min | Typ | Max | Units |
|---|---|---|---|---|---|
| $V_{RMS\ in}$ | Acceptable input voltage (RMS) | | | 2.25 | Volts |
| $V_{RMS\ out}$ | Acceptable output voltage (RMS) | | | 1.59 | mA |

## RR specifications[1]

| Symbol | Parameters/conditions | | Min | Typ | Max | Units |
|---|---|---|---|---|---|---|
| BW | Bandwidth | | 0 | | 120 | GHz |
| $S_{21}$ | Gain [slope from –3 at DC to –2 at 100 GHz) | | –3.2 | –3.0 | –1.7 | dB |
| $S_{11}$ | Reflection | 0 - 20 GHz | | –24 | –9.5 | dB |
| | | 20 - 120 GHz | | –12 | | |

1. Measured on wafer with $T_{chuck}$ = 25 °C. Numbers given are across the 0-120 GHz band unless otherwise noted

# Applications

The 1GC1-4059 can be used in instrumentation, communications, radar, ECM, EW and many other systems requiring a broadband attenuator with a flat response across frequency.

# Assembly Techniques

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. Keysight Technologies *GaAs MMIC ESD, Die Attach and Bonding Guidelines - Application Note*, literature number 5991-3484EN provides basic information on these subjects.

# RoHS Compliance

This part is RoHS compliant, meeting the requirements of the EU Restriction of Hazardous Substances Directive 2011/65/EU, commonly known as RoHS. Six substances are regulated: lead, mercury, cadmium, chromium VI (hexavalent chromium), polybrominated biphenyls (PBB), and polybrominated biphenyl ethers (PBDE). RoHS compliance requires that any residual concentration of these substances is below the Directive's maximum concentration values (MCV): cadmium 100 ppm by weight and all others 1000 ppm by weight.

## Pad center locations

Referenced to lower-left corner

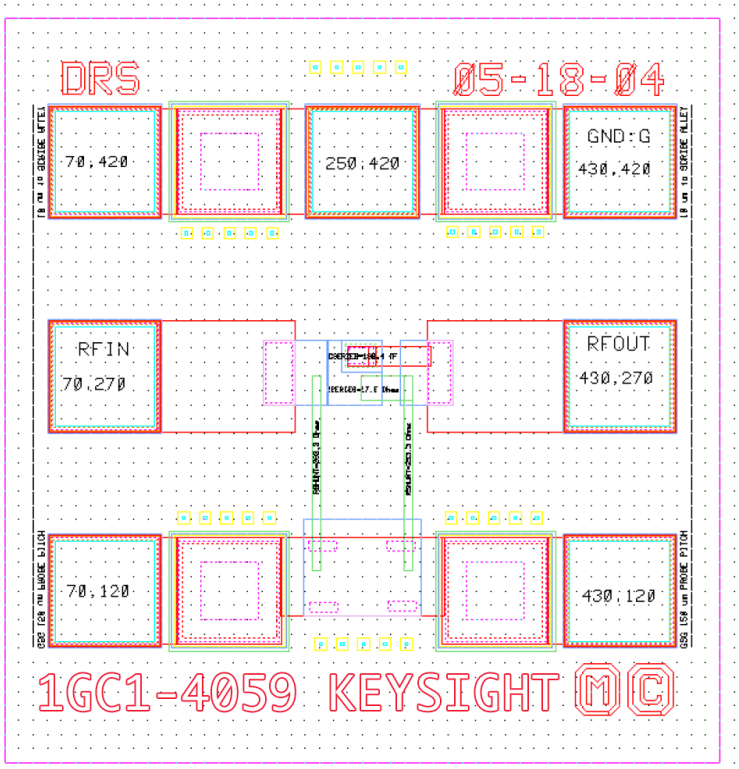



Figure 1. Pad Center Locations

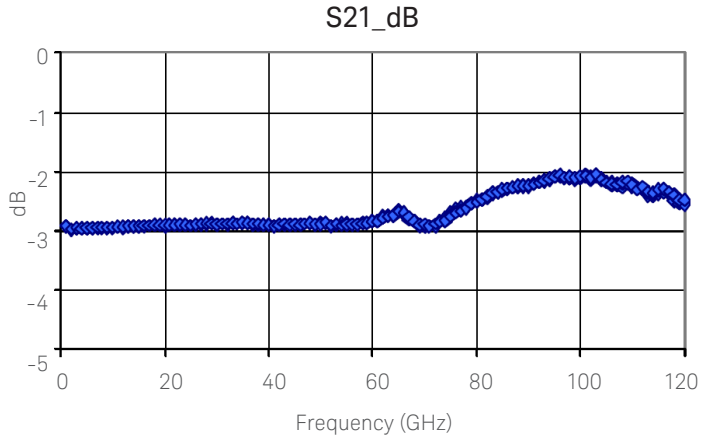



Figure 2. $S_{21}$ dB

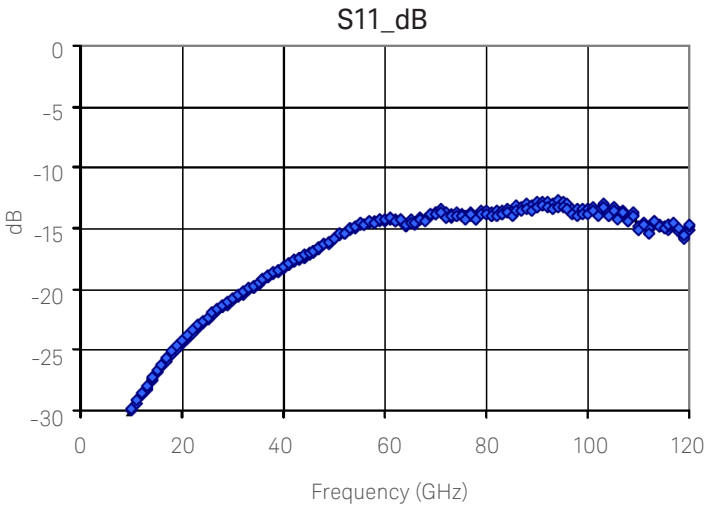



Figure 3. $S_{11}$ dB

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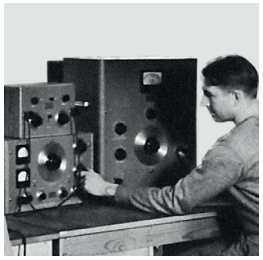

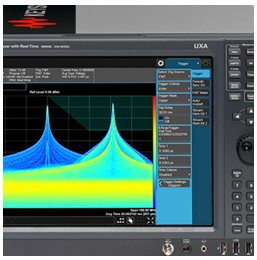

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This data sheet contains a variety of typical and guaranteed performance data. The information supplied should not be interpreted as a complete list of circuit specifications. Customers considering the use of this, or other Keysight Technologies GaAs 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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