## Product Features

Operating Frequency: 2GHz ~ 18GHz

Slope: 6dB

## Application

Fixed Satellite

Mobile

Radio Location

Space Research

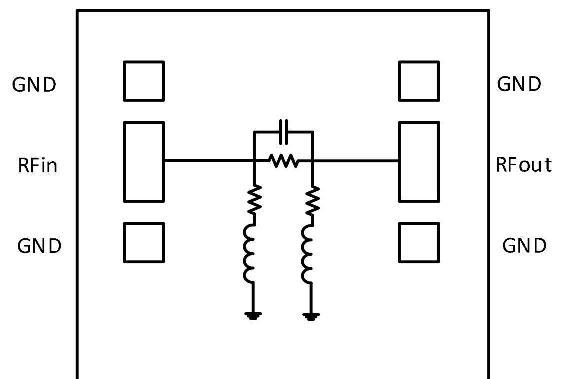
## Ordering Information

| Part Number | Package | Description |
|---|---|---|
| BR9319LD | DIE | 2GHz~18GHz<br>6dB Equalizer |

## General Description

BR9319LD is an absorptive gain equalizer fabricated using GaAs IPD MMIC process, incorporating resistors, capacitors and inductors having negative insertion loss slope. Covering a frequency range of 2GHz to 18GHz, BR9319LD has a nominal attenuation slope of 6dB with Π structure topology. The product has the advantage of the wide band of frequencies, low insertion loss, and good equalization slope, which can meet the gain equalization compensation of amplifier, receiver and transmitter system to improve the gain flatness in the working frequency band.

## Functional Block Diagram



## Electrical Specifications

| Parameters | Test Condition | Min. | Typ. | Max. | Units |
|---|---|---|---|---|---|
| Insertion Loss | 2GHz | - | -6.90 | - | dB |
| | 6GHz | - | -5.38 | - | dB |
| | 12GHz | - | -2.53 | - | dB |
| | 18GHz | - | -1.04 | - | dB |
| Input Return | 2GHz | - | -19.53 | - | dB |
| | 6GHz | - | -17.15 | - | dB |
| | 12GHz | - | -16.40 | - | dB |
| | 18GHz | - | -11.40 | - | dB |
| Output Return | 2GHz | - | -21.77 | - | dB |
| | 6GHz | - | -18.59 | - | dB |
| | 12GHz | - | -17.88 | - | dB |
| | 18GHz | - | -12.43 | - | dB |
| Test Condition: TA=+25℃ | | | | | |

**Absolute Maximum Ratings**

Maximum RF input Power: +28dBm;

**Recommended Operating Conditions**

Storage Temperature: -65℃ ~ +150℃

Operating Temperature: -55℃ ~ +125℃

Note: Operation of the device outside the parameter ranges given absolute-maximum-ratings conditions may cause permanent damage, and. exposure to absolute-maximum-ratings conditions for extended periods will affect the reliability.

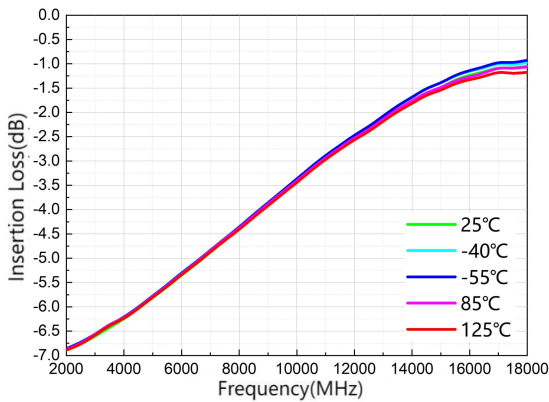
**ESD WARNING**

**ELECTROSTATIC SENSITIVE DEVICE**

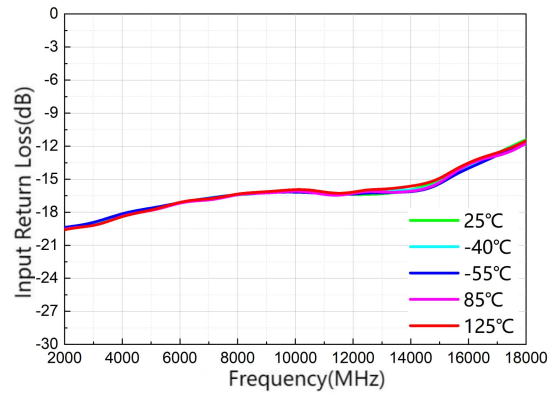
**OBSERVE HANDLING PRECAUTIONS**

## Typical Performance(EVB test results)

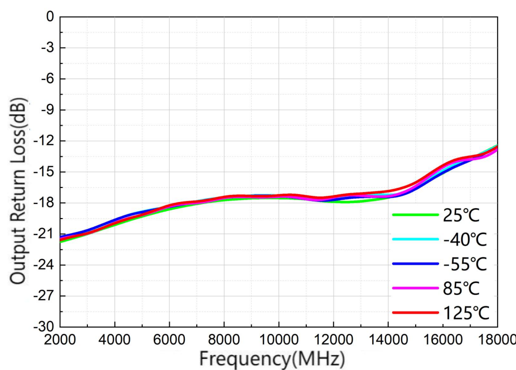
| Parameters | Typ. | | | | | | | | Units |
|---|---|---|---|---|---|---|---|---|---|
| Frequency | 2000 | 3000 | 4000 | 5000 | 6000 | 7000 | 8000 | 9000 | MHz |
| Insertion Loss | -6.90 | -6.62 | -6.27 | -5.83 | -5.38 | -4.92 | -4.40 | -3.90 | dB |
| Input Return | -19.53 | -19.02 | -18.34 | -17.73 | -17.15 | -16.72 | -16.42 | -16.20 | dB |
| Output Return | -21.77 | -21.00 | -20.12 | -19.29 | -18.59 | -18.07 | -17.71 | -17.53 | dB |
| **Parameters** | **Typ.** | | | | | | | | **Units** |
| Frequency | 11000 | 12000 | 13000 | 14000 | 15000 | 16000 | 17000 | 18000 | MHz |
| Insertion Loss | -2.95 | -2.53 | -2.13 | -1.78 | -1.50 | -1.24 | -1.07 | -1.04 | dB |
| Input Return | -16.28 | -16.40 | -16.35 | -15.96 | -14.51 | -13.92 | -12.64 | -11.40 | dB |
| Output Return | -17.61 | -17.88 | -17.86 | -17.50 | -16.53 | -15.10 | -13.73 | -12.43 | dB |
| Test Condition: Pin=0dBm, Temp=+25℃ | | | | | | | | | |




**Insertion Loss**

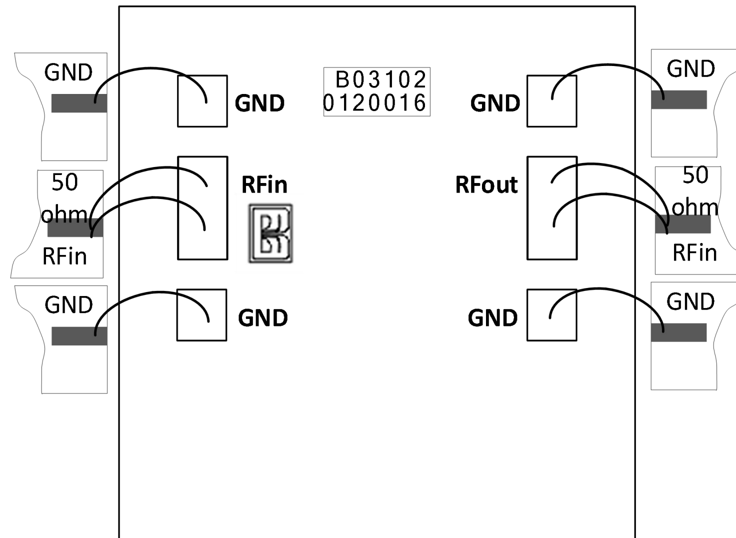



**Input Return Loss**




**Output Return Loss**

## Assembly Diagram




## Handling Precautions:

1. **Storage:** All bare die are placed in ESD protective containers, and then sealed in an ESD protective bag for shipment. Once the sealed ESD protective bag has been opened, all die should be stored in a dry nitrogen environment.

2. **Cleanliness**: Handle the chips in a clean environment. DO NOT attempt to clean the chip using liquid cleaning systems.

3. **Electrostatic protection:** Follow ESD precautions to protect against ESD strikes

4. **General Handling**: Handle the chip along the edges with a vacuum collet or with a sharp pair of bent tweezers. The surface of the chip should not be touched with vacuum collet, tweezers, or fingers.

5. **Mouning:** The chip is back-metallized and can be die mounted with AuSn eutectic preforms or with electrically conductive epoxy. The mounting surface should be clean and flat.

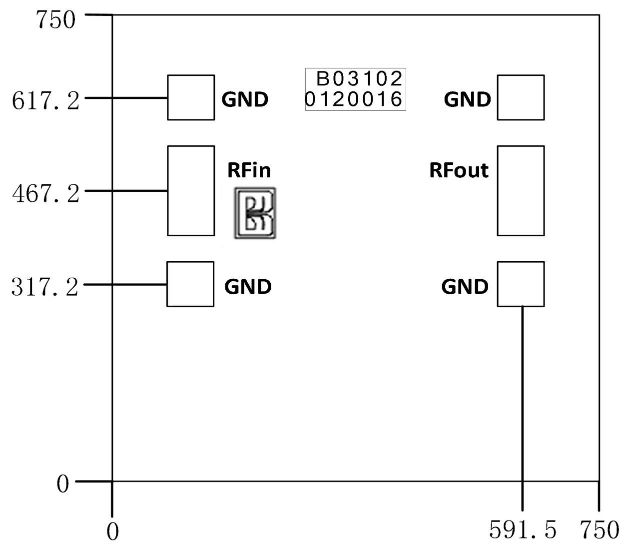
6. **Eutectic Die Attach**: A 80/20 gold tin preform is recommended with a work surface temperature of 255 °C and a tool temperature of 265 °C. When hot 90/10 nitrogen/hydrogen gas is applied, tool tip temperature should be 290 °C. DO NOT expose the chip to a temperature greater than 320 °C for more than 20 seconds. No more than 3 seconds of scrubbing should be required for attachment

7. **Conductive epoxy Die Attach:** Apply conductive epoxy to the mounting surface so that the overflow of conductive epoxy on all four sides should not be less than 75%, and the height of conductive epoxy climbing on all four sides should not exceed the surface of the chip. Cure conductive epoxy per the manufacturer's schedule.

8. **Die bonding process unless otherwise noted**: Ball or wedge bond with 0.025mm (1 mil) diameter pure gold wire. Thermosonic wirebonding with a nominal stage temperature of 150 °C is recommended. Use the minimum level of ultrasonic energy to achieve reliable wirebonds. Wirebonds should be started on the chip and terminated on the package or substrate.

**9.** If you have any questions, please contact customer service.

## Mechanical Information（Units：mm）




## Notes:

1. Backside and bond pad metal: Gold
2. Backside is RF and DC ground
3. PAD size: RFin: 75um×150um; RFout: 75um×150um;
4. Cannot be bonded on the via;
5. Overall dimension tolerance: ±30um.

## Pad Description

| PAD | Description |
|---|---|
| RFin | RF Input, matched to 50 Ohms. |
| RFout | RF Output, matched to 50 Ohms. |
| GND | Connected to DC/RF ground. |