Standard Circuit

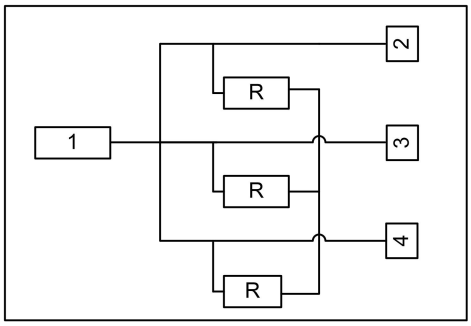
# GPD-08123

## GaAs MMI C Monolithic Integrated 3-way 0-degree Power Divider, 8-12GHz

### Performance characteristics

- Frequency range: 8 -12 GHz
- Insertion loss : 0.3 dB
- 50Ohm input / output
- 100% on-wafer testing
- Chip size: 1.75 x 1.2 x 0.1mm

### Functional Block Diagram




### Product Introduction

The GPD-08123 monolithic integrated 3-way 0- degree power divider has low insertion loss and excellent port standing wave characteristics in the frequency range of 8~12GHz , with an isolation of 29dB , and is very suitable for microwave hybrid integrated circuits and multi-chip modules. The chip uses on-chip through-hole metallization technology to ensure good grounding, does not require additional grounding measures, and is simple and convenient to use.

| Use restriction parameter [1] | |
|---|---|
| Maximum input power | +40dBm |
| Operating temperature | -55 ~ +85°C |
| storage temperature | -65 ~ +150°C |

【1】 Exceeding any of these maximum limits may cause permanent damage.

| Electrical performance parameters ( TA = +25°C) | | | | |
|---|---|---|---|---|
| index | Minimum | Typical Value | Maximum | unit |
| Frequency Range | 8-12 | | | GHz |
| Insertion loss | 0.2 | 0.3 | 0.4 | dB |
| Insertion loss fluctuation | | ± 0.1 | | dB |
| Isolation | 23 | 29 | - | dB |
| Input return loss | 17 | 22 | - | dB |
| Output return loss | 21 | 25 | - | dB |

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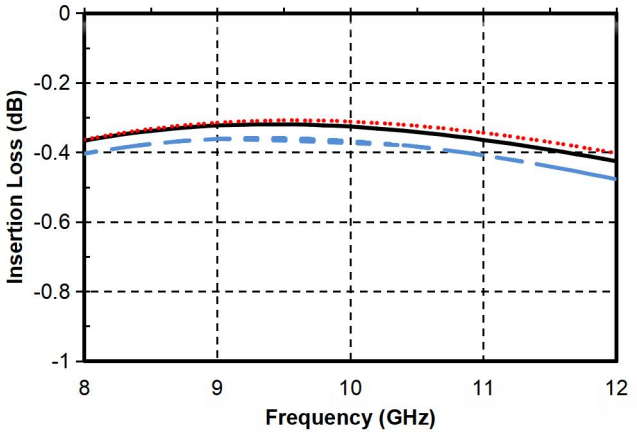
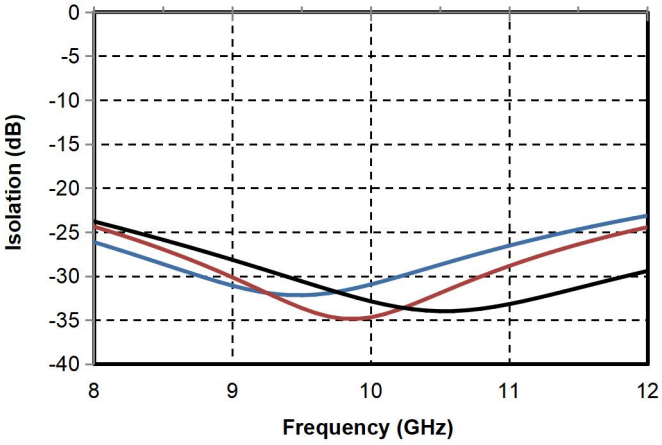
## Main index test curve

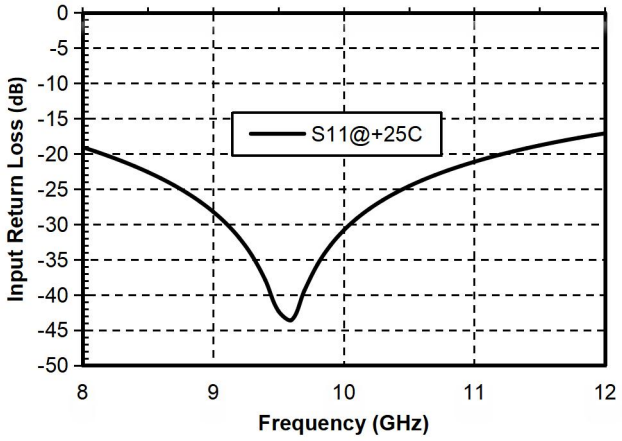
Insertion Loss vs. Operating Frequency



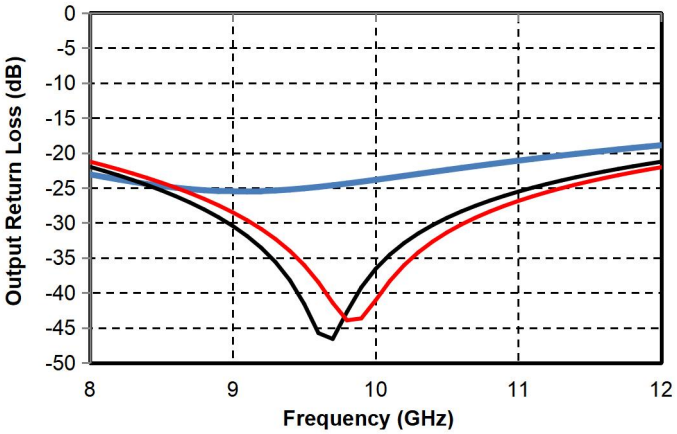

Isolation vs. Operating Frequency



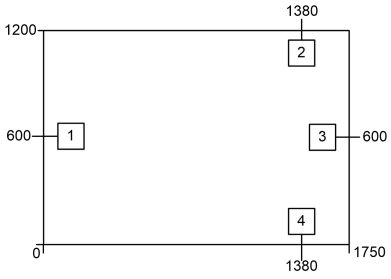

Input Return Loss vs. Operating Frequency




Output Return Loss vs. Operating Frequency




## Appearance structure [2]




【 2 】All units in the figure are micrometers

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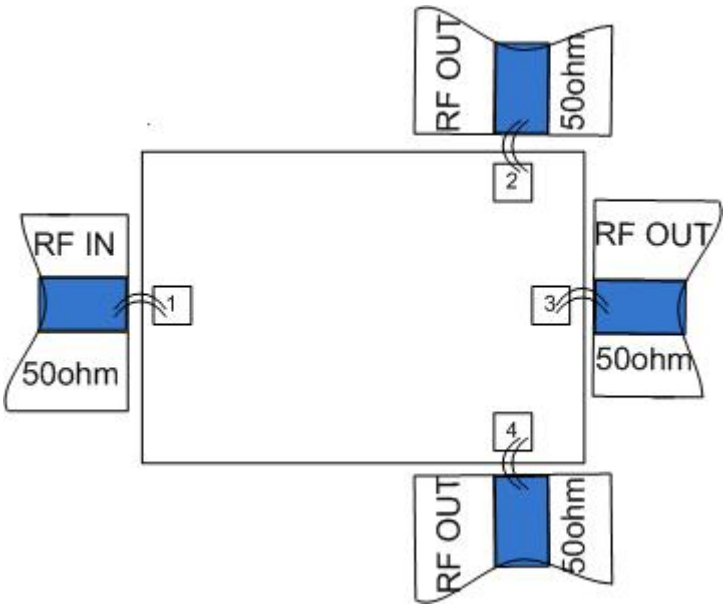
| Bonding point definition | | | |
|---|---|---|---|
| Bonding point number | Function Symbol | Functional Description | Equivalent Circuit |
| 1 | RF IN | RF signal input terminal |   |
| 2, 3, 4 | RF OUT | RF signal output terminal |   |
| Chip bottom | GND | The bottom of the chip needs to be well grounded to RF and DC |   |

## Recommended assembly drawing




## Precautions for use

- The chip needs to be stored in an anti-static container and kept in a nitrogen environment.
- Do not attempt to clean the bare die surface using wet chemical methods.
- Please strictly comply with ESD protection requirements to avoid electrostatic damage to bare chips.
- General operation: Please use precision pointed tweezers to pick up bare chips. Avoid touching the chip surface with tools or fingers during operation.
- Rack mounting operation suggestions: Bare chip mounting can be done by AuSn solder eutectic sintering or conductive adhesive bonding. The mounting surface must be clean and flat.
- Sintering process: It is recommended to use AuSn solder sheets with a gold-tin ratio of 80/20 .

The working surface temperature reaches 255 ℃ and the tool ( vacuum chuck ) temperature reaches 265 ℃. When the high-temperature mixed gas (nitrogen-hydrogen ratio of 90/10 ) is blown to the chip, the temperature at the top of the tool should be raised to 290 ℃. Do not let the chip exceed 320 ℃ for more than 20 seconds. The friction time should not exceed 3 seconds.

- Bonding process: The amount of conductive glue dispensed should be as small as possible. After the chip is placed in the installation position , the conductive glue should be vaguely visible around it . For curing conditions, please follow the information provided by the conductive glue manufacturer.
- Bonding operation suggestions: Use Φ0.025mm (1mil) gold wire for both ball and wedge bonding. Thermo-ultrasonic bonding temperature is 150 °C. The pressure of the wedge for ball bonding is 40~50gf , and the pressure of the wedge bonding is 18~22gf . Use the smallest possible ultrasonic energy. The bonding starts at the pressure point on the chip and ends at the package (or substrate) .