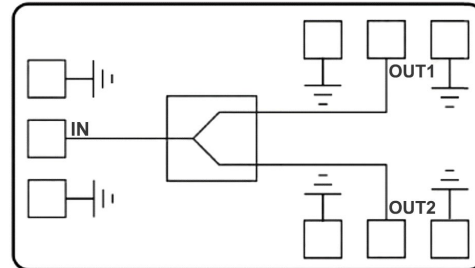


Features

- Frequency: DC-6GHz
- Insertion Loss: 0.7dB Typical
- Isolation: 22dB Typical
- Input/Output: 50Ω
- Chip Size: 1.89 x 1.74 x 0.1mm

Functional Block Diagram



Typical Applications

- Test Instrumentation
- Microwave Radio & VSAT
- Military & Space
- Telecom Infrastructure
- Fiber Optics

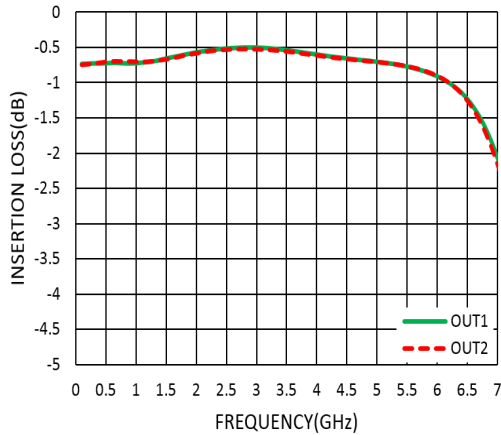
Electrical Specifications

TA = +25°C ,Pin=0dBm

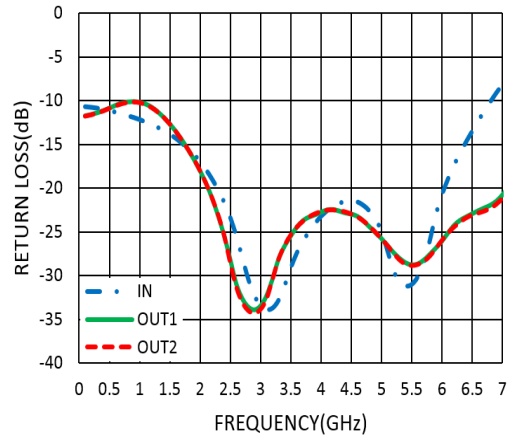
| Parameters | Min. | Typ. | Max. | Units |
|-------------------------|------|-------|------|-------|
| Frequency | DC | | 6 | GHz |
| Nominal Splitter Loss | | 3 | | dB |
| Insertion Loss | | 0.7 | 1.0 | dB |
| Insertion Loss Flatness | | ±0.2 | | dB |
| Amplitude Imbalance | | ±0.03 | | dB |
| Phase Imbalance | | ±1 | | deg |
| Isolation | 20 | 22 | | dB |
| Input Return Loss | | -21 | | dB |
| Output Return Loss | | -22 | | dB |



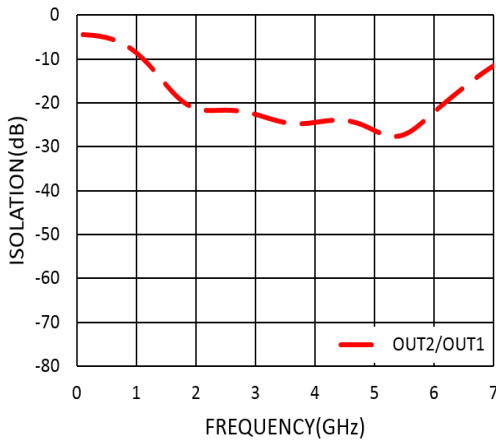
Insertion Loss vs. Frequency



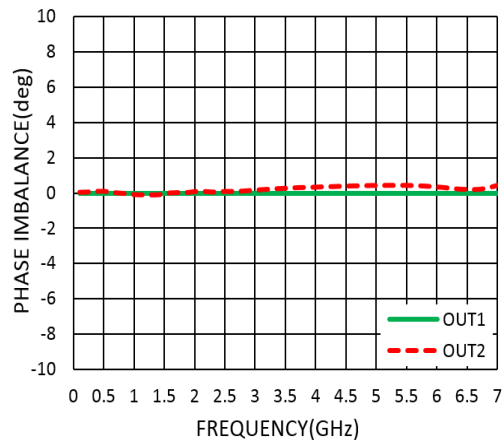
Return Loss vs. Frequency



Isolation vs. Frequency

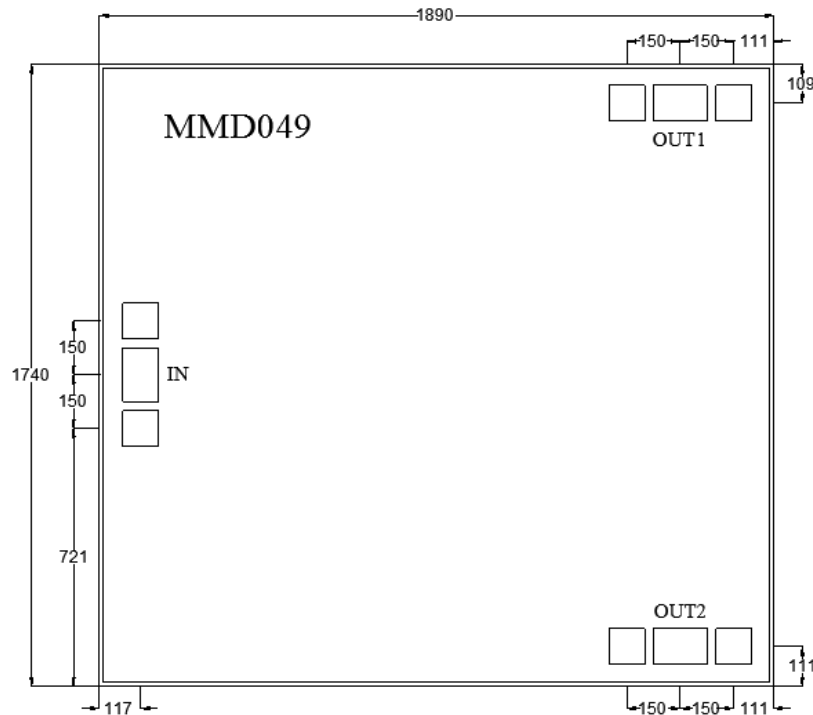


Phase Imbalance vs. Frequency





Outline Drawing: All Dimensions in μm



Absolute Maximum Ratings

| | |
|-----------------------|-----------------|
| RF Input Power | +30dBm |
| Operating Temperature | -55°C to +80°C |
| Storage Temperature | -65°C to +150°C |

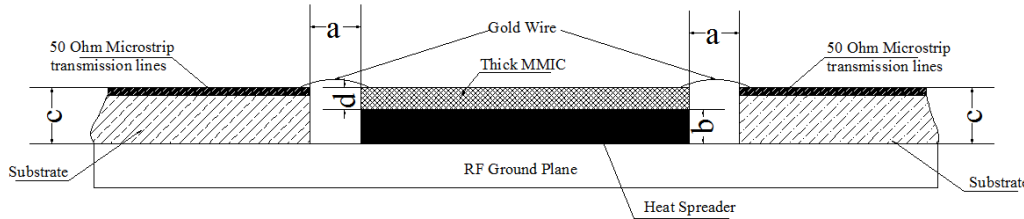
Notes:

1. Die thickness: 100 μm
2. IN bond pad is 100*150 μm^2
3. OUT bond pad is 150*100 μm^2
4. Bond pad metalization: Gold
5. Backside metalization: Gold

| No. | Function | Description |
|-----|-----------|-----------------|
| 1 | IN | RF Common Port |
| 2 | OUT1,OUT2 | RF Branch Ports |



Mounting & Bonding Techniques for MMICs



Direct Mounting

1. Typically, the die is mounted directly on the ground plane.
2. If the thickness difference between the substrate (thickness c) and the die (thickness d) exceeds 0.05 mm (i.e., $c - d > 0.05$ mm), it is recommended to first mount the die on a heat spreader, then attach the heat spreader to the ground plane.
3. Heat Spreader Material: Molybdenum-copper (MoCu) alloy is commonly used.
4. Heat Sink Thickness (b): Should be within the range of $(c - d - 0.05$ mm) to $(c - d + 0.05$ mm).
5. Spacing (a): The gap between the bare die and the 50Ω transmission line should typically be 0.05 mm to 0.1 mm. If the application frequency is higher than 40GHz, then this gap is recommended to be 0.05mm

Wire Bonding Interconnection

The connection between the die and the 50Ω transmission line is usually made using 25 μm diameter gold (Au) wires, bonded via wedge bonding or ball bonding processes.

Die Attachment Methods

1. Conductive Epoxy:

After adhesive application, cure according to the manufacturer's recommended temperature profile.

2. Au-Sn80/20 Eutectic Bonding:

Use preformed Au-Sn80/20 solder preforms.

Perform bonding in an inert atmosphere (N_2 or forming gas: 90% N_2 + 10% H_2).

Keep the time above 320°C to less than 20 seconds to prevent excessive intermetallic formation.

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