Features

- Frequency: 2-18GHz
- Insertion Loss: 0.7dB Typical
- Coupling: 15dB Typical
- Input/Output: 50Ω
- Chip Size: 2.49 x 1.29 x 0.1mm

Functional Block Diagram

Typical Applications

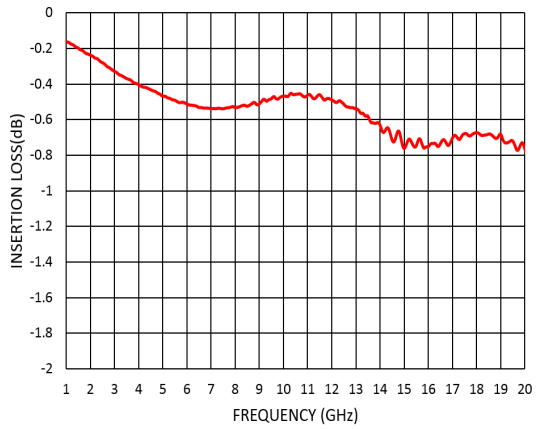
- Test Instrumentation
- Microwave Radio & VSAT
- Military & Space
- Telecom Infrastructure
- Fiber Optics

Electrical Specifications

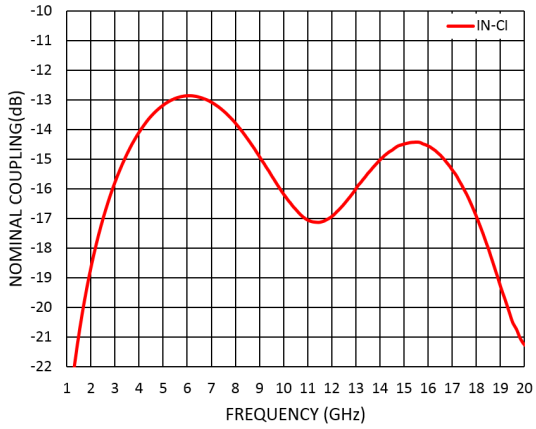
TA = +25°C

Parameters	Min.	Typ.	Max.	Min.	Typ.	Max.	Units
Frequency	**2**		**12**	**12**		**18**	**GHz**
Insertion Loss		**0.5**			**0.7**		**dB**
Nominal Coupling		**15**			**15**		**dB**
Frequency Sensitivity		**±2.5**			**±1.5**		**dB**
Isolation		**31**			**23**		**dB**
Input port Return Loss		**-25**			**-20**		**dB**
Output port Return Loss		**-25**			**-20**		**dB**
Coupling port Return Loss		**-18**			**-14**		**dB**

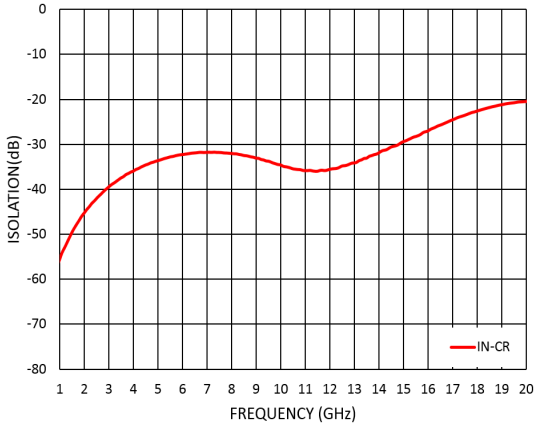
Insertion Loss vs. Frequency



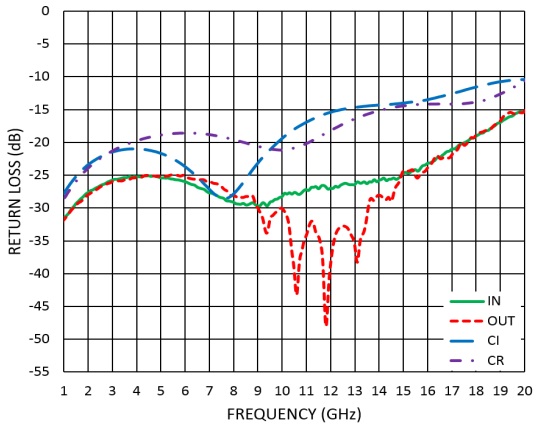
Nominal Coupling vs. Frequency



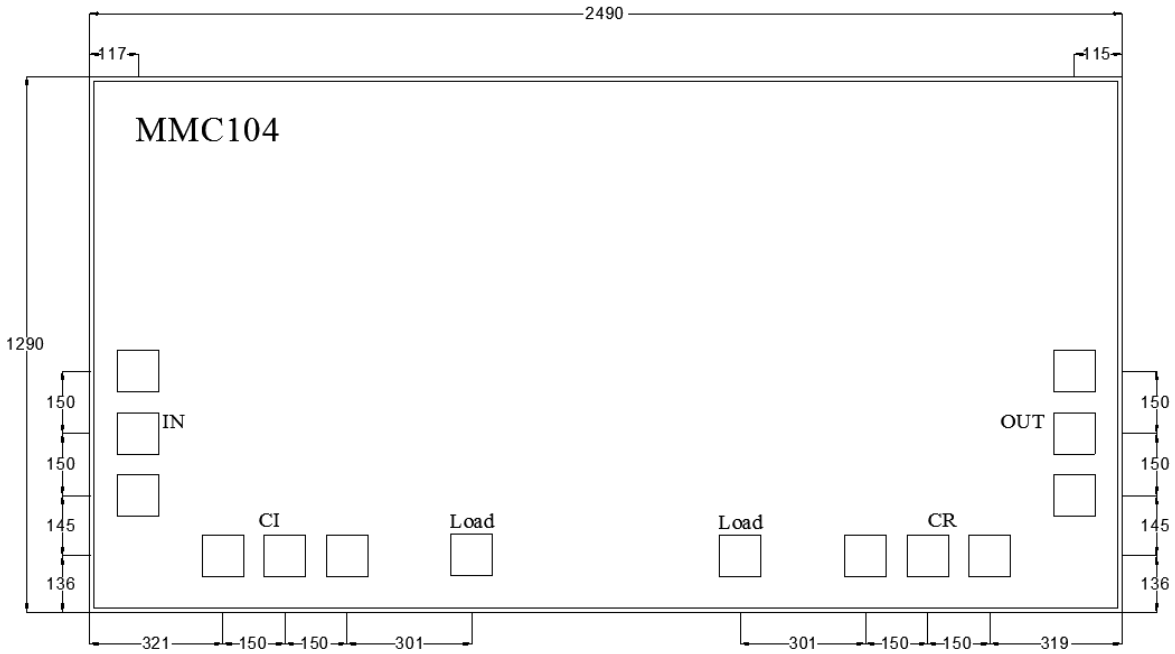
Isolation vs. Frequency



Return Loss vs. Frequency



Outline Drawing: All Dimensions in µm



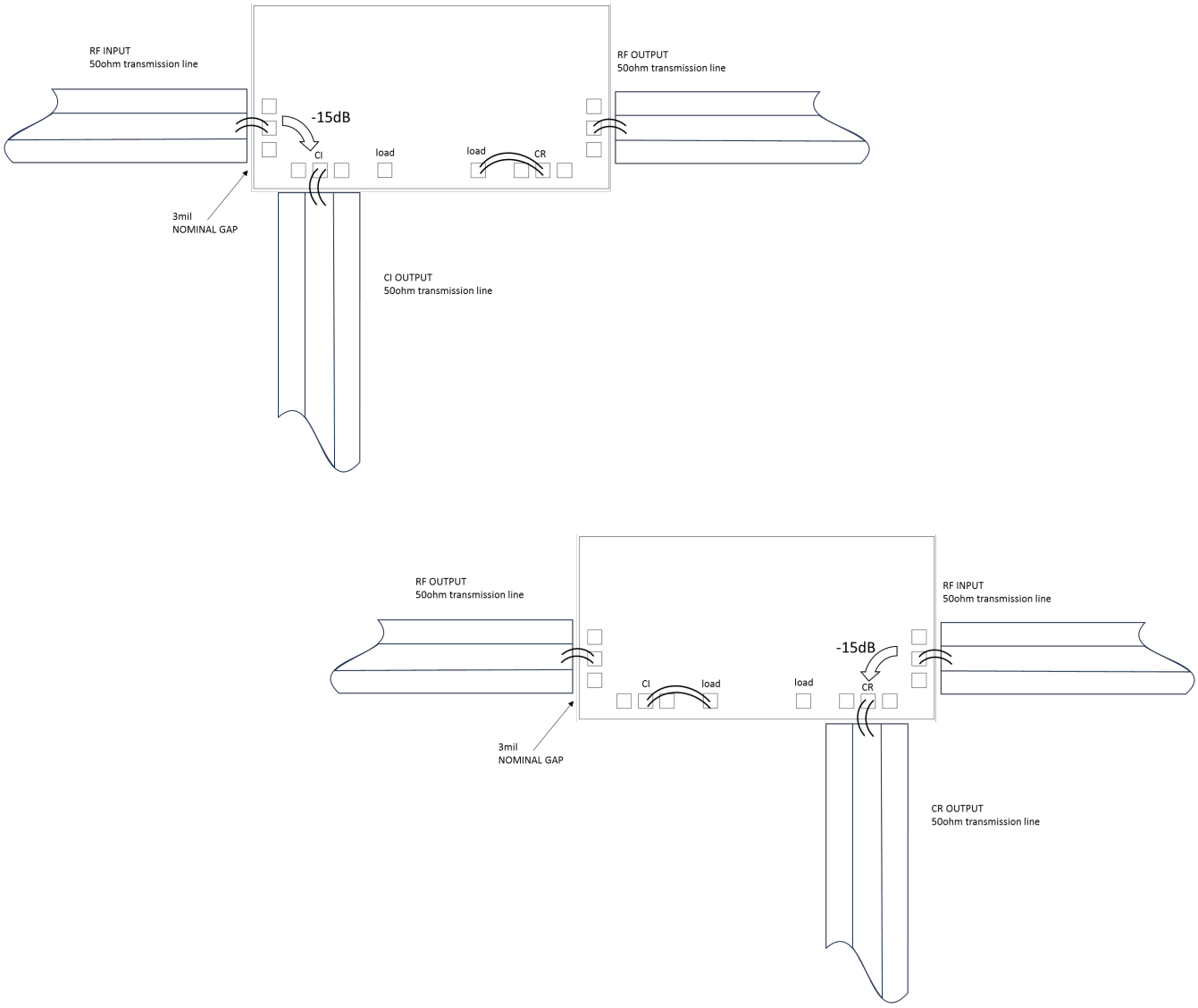
Notes:

1. **Die thickness: 100µm**
2. **Bond pad is 100*100µm²**
3. **Bond pad metalization: Gold**
4. **Backside metalization: Gold**
5. **Backside of the die (GND)**

Absolute Maximum Ratings

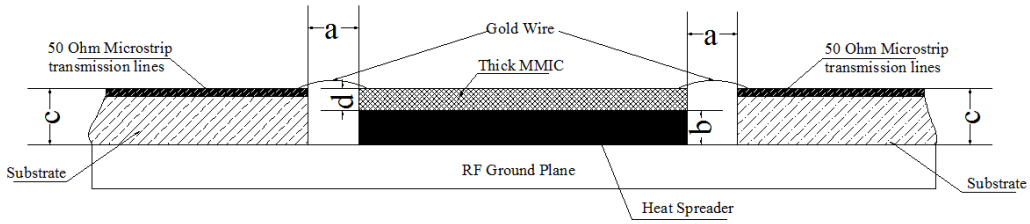
RF Input Power (RFIN)	+40dBm
Operating Temperature	-55°C to +85°C
Storage Temperature	-65°C to +150°C

Assembly Drawing



No	Function	Description
1	RF IN	RF signal input or RF signal output
2	RF OUT	RF signal input or RF signal output
3	CI,CR	Coupled or Isolation ports, when used as isolation port, 50 ohm load must be connected.
4	LOAD	50 ohm Load
5	Die Bottom	Die bottom must be connected to RF ground.

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.