1. Description

- The M0015_4F is a temperature-compensated attenuator, fabricated using GaAs MMIC process. The device operates from DC to 40GHz. The M0015_4F is grounded through backside metal via holes. All chips undergo 100% RF measurement.

2. Applications

- TX/RX Modules

3. Features

- Operating Frequency: DC-40GHz
- Insertion Loss: 2.3dB(@20GHz)
- Attenuation: 3dB
- Temperature Compensated Range: -55-85℃
- Operating Bias: -5V
- Die Size: 0.8 x 0.75 x 0.1mm

4. Brief Typical Performance

Table 1. Brief Typical Performance

Parameter		Units
Operating Frequency	DC-40	GHz
Insertion Loss（@20GHz）	2.3	dB
Attenuation	3	dB
Temperature Compensated Range	-55-85	℃
Operating Bias	-5	V

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5. Recommended Operating Conditions

Table 2. Recommended Operating Conditions

Parameter	Min.	Typ.	Max.	Units
Operating Temperature Range	-55	25	85	°C
Operating Frequency	DC	-	40	GHz

6. RF Characteristics

Table 3. RF Characteristics[1]

Parameter	Symbol	Min.	Typ.	Max.	Units
Insertion Loss (TC = 25˚C)	IL	2	2.3	2.8	dB
Attenuation	Att	2.9	3	3.5	dB
Temperature Compensated Range	Temp	-55	-	85	℃
Return Loss	S11/S22	-30	-20	-15	dB

[1]. Test condition: Input signal CW

7. Typical Performance Curve

■ Small-signal Characteristics Curve

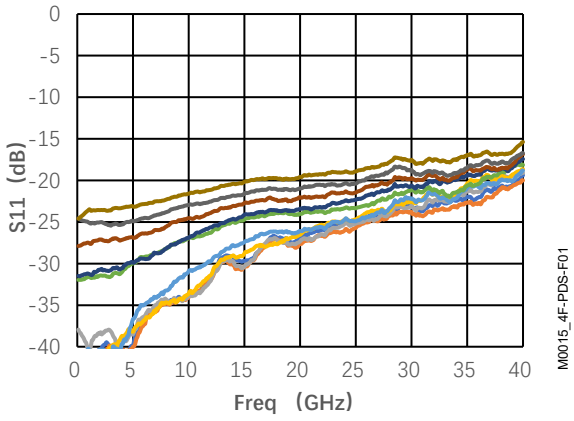


Figure 1. Input/Output Return Loss Characteristics

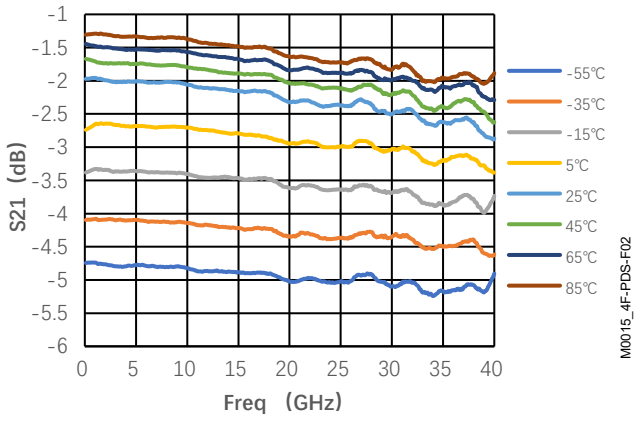


Figure 2. Insertion Loss VS Frequency

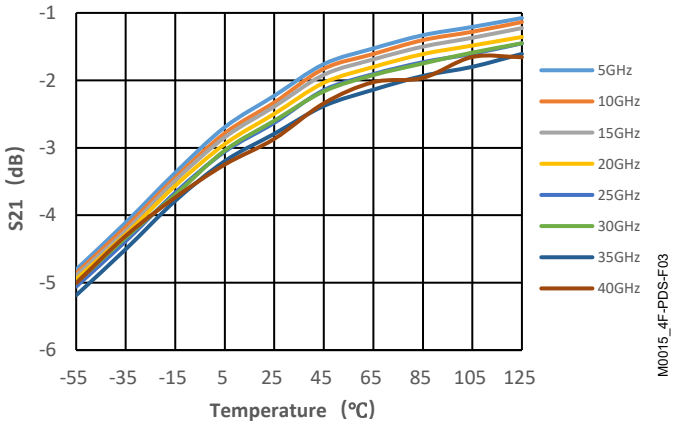
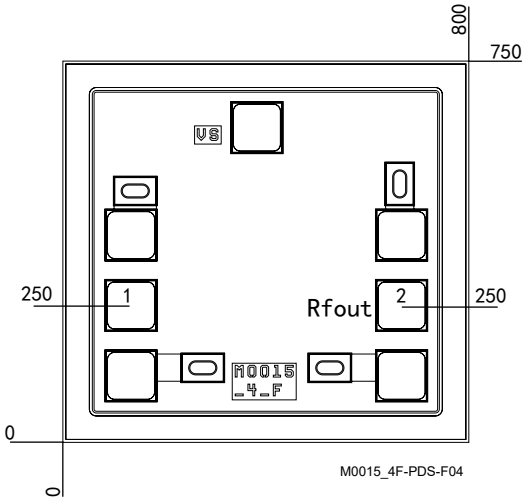


Figure 3. Insertion Loss VS Temperature

8. Outline Dimensions



- Dimensions shown in micrometre

Figure 4. M0015_4F Outline Dimensions

Table 4. Pad Description

Pad	Symbol	Description
1	RF1	RF Input
2	RF2	RF Output

9. Assembly Information

■ Assembly Diagram

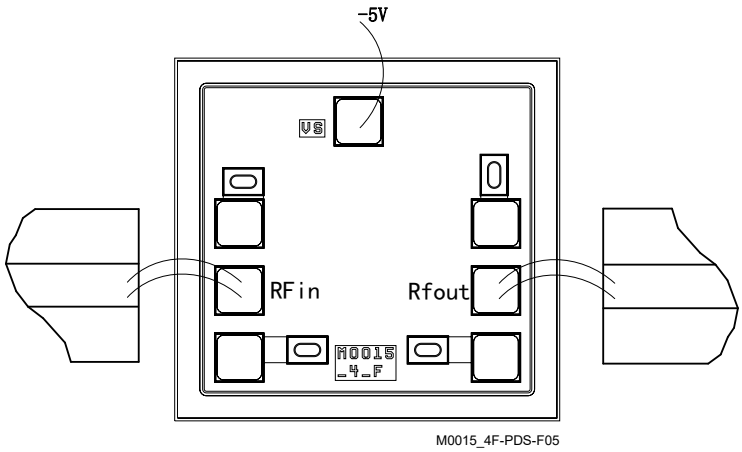


Figure 5. M0015_4F Assembly Diagram

- **Eutectic Die Attach:** It is best to use an 80% Au/20% Sn preform. Do not expose the chip to a temperature greater than 300°C for more than 30sec.
- **Wire Bonding:** RF bonds made with 1mil gold wire are recommended for the RF ports. Keep all bonds as short as possible, less than 0.35mm.

10. Handling Precautions

- **Storage**
  All bare dies ship in either Waffle or Gel Pak, which is an ESD protective container, and then sealed in an ESD protective bag. After opening the sealed ESD protective bag, all dies must be stored in a dry nitrogen environment.
- **Cleanliness**
  Handle the dies in a clean environment. Never use liquid cleaning systems to clean the dies.
- **ESD Caution**
  ESD (electrostatic discharge) sensitive device. Charged devices and circuit boards can discharge without detection. Although this product features patented or proprietary protection circuitry, damage may occur on devices subjected to high energy ESD. Therefore proper ESD precautions should be taken to avoid performance degradation or loss of functionality.



11. Contact Information

For the latest specifications, additional product information, technical support and sales support, please contact:

- **Email:** RF.support@raytrontek.com
- **Web:** www.raytrontek.com

12. Disclaimer

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