1. Description

- The M0090A is a limiter fabricated using GaAs PIN MMIC process. The device operates from 1 to 6GHz, with an insertion loss of less than 0.55dB, input and output return losses of less than -13dB, a power handling capability of 53dBm (400us,10%), and a flat leakage of 16.5 dBm. No input or output DC-blocking capacitors are integrated on-chip.

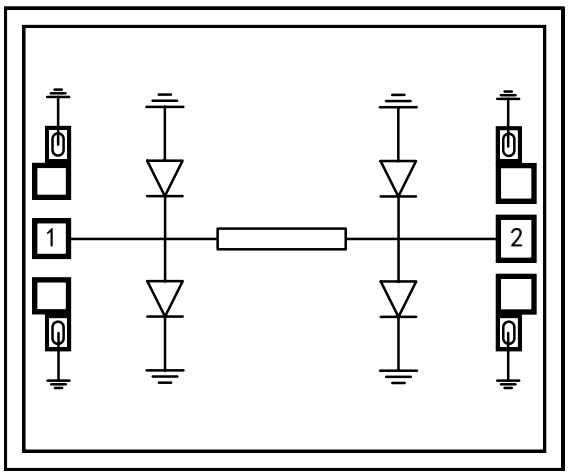


Figure 1. M0090A Functional Block Diagram

2. Applications

- TX/RX Modules

3. Features

- Operating Frequency: 1-6GHz
- Insertion Loss: -0.55dB
- Input/Output Return Loss: -13dB / -14dB
- Power Handling Capability: 53dBm(400us,10%)
- Flat Leakage: 16.5dBm
- Die Size: 1.5 x 1.2 x 0.1mm

4. Brief Typical Performance

Table 1. Brief Typical Performance

Parameter	1-6GHz	Units
Insertion Loss	-0.5	dB
Input Return Loss	-13	dB
Output Return Loss	-14	dB
Power Handing Capability	53	dBm
Flat Leakage at P_{IN}>20dBm	16.5	dBm

- Test condition: Input signal pulsed, Pulse width =400us, Duty cycle = 10%

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5. Recommended Operating Conditions

Table 2. Recommended Operating Conditions

Parameter	Min.	Typ.	Max.	Units
Operating Temperature Range	-55	25	125	°C
Operating Frequency	1	-	6	GHz
Maximum Input Power	-	-	53	dBm

6. RF Characteristics (T_C = 25˚C)

Table 3. RF Characteristics[1]

Parameter	Symbol	Min.	Typ.	Max.	Units
Operating Frequency	Freq	1	-	6	GHz
Insertion Loss @ 6GHz	IL	-	-0.55	-	dB
Input Return Loss	RLin	-	-13	-	dB
Output Return Loss	RLout	-	-14	-	dB
Power Handing Capability	Pc	-	53	-	dBm
Flat Leakage	FL	-	16.5	-	dBm

[1]. Test condition: Input signal pulsed, Pulse width =400us, Duty cycle = 10%

7. Typical Performance Curve

■ Small-signal Characteristics Curve

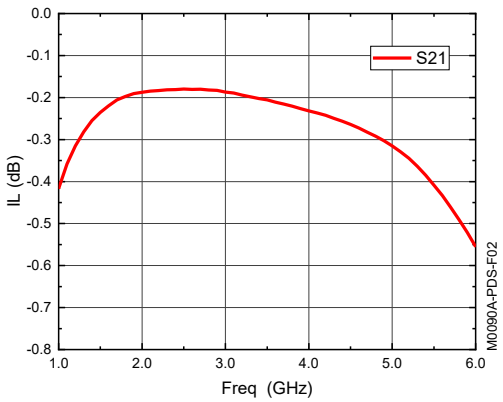


Figure 2. Insertion Loss Characteristics

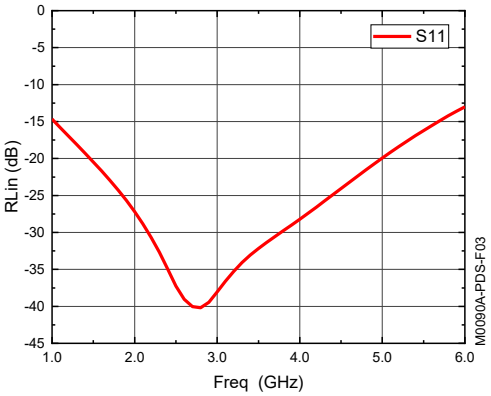


Figure 3. Input Return Loss Characteristics

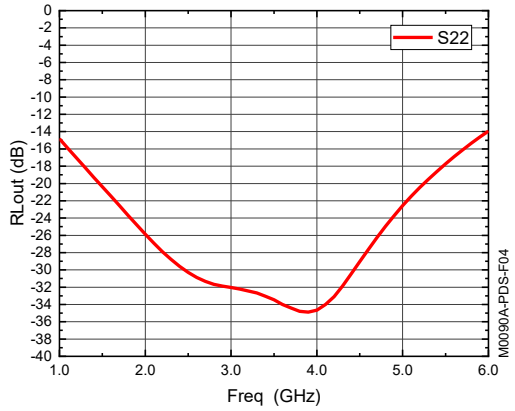


Figure 4. Output Return Loss Characteristics

■ Power Characteristics

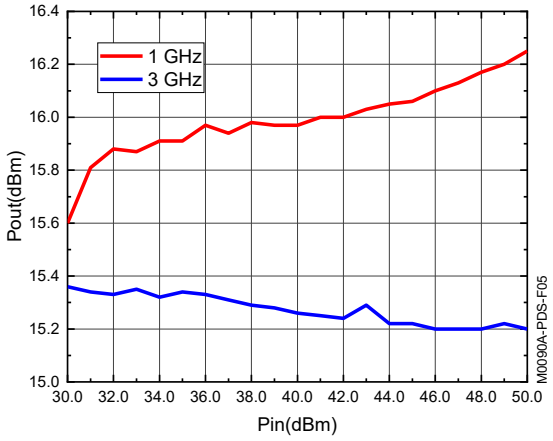
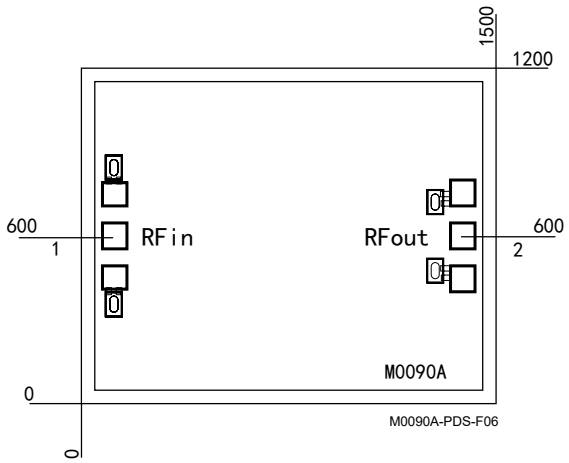


Figure 5. Flat Leakage Characteristics

8. Outline Dimensions



- Dimensions shown in micrometre

Figure 6. M0090A Outline Dimensions

Table 4. Pad Description

Pad	Symbol	Description
1	RFin	RF Input
2	RFout	RF Output

9. Assembly Information

■ Assembly Diagram

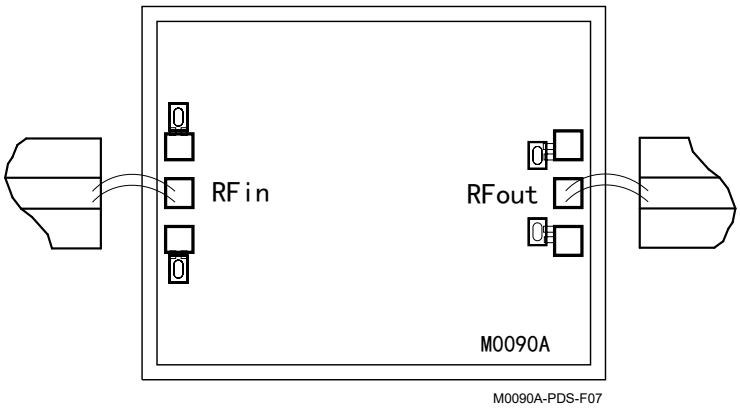


Figure 7. M0090A Assembly Diagram

- **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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