1. Description

- The M1003E is a Gain Equalizer fabricated on GaAs IPD MMIC process. It operates over 6-24GHz, provides attenuation slope of 6dB with insertion loss of 0.7dB.

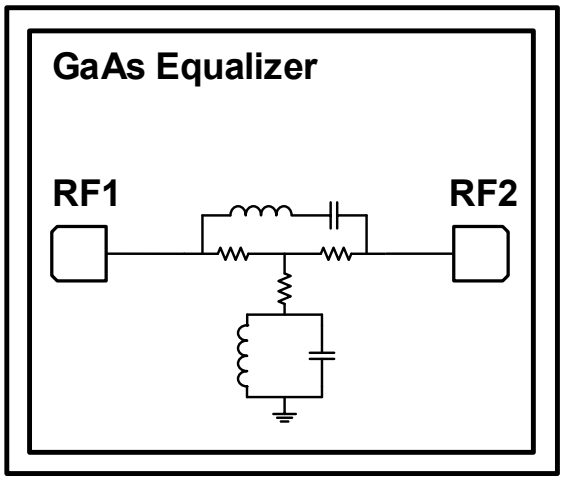


Figure 1. M1003E Functional Block Diagram

2. Applications

- TX/RX Modules
- Telecommunications
- Radar
- Defense

3. Features

- Frequency Range: 6-24GHz
- Attenuation Slope: 6dB
- Return Loss: -20dB (Typ.)
- Die Size: 0.65 x 0.70 x 0.16mm

4. Brief Typical Performance

Table 1. Brief Typical Performance

Parameter	6-24GHz	Units
Attenuation Slope	6	dB
Insertion Loss@24GHz	0.7	dB
Input/Output Return Loss	-20	dB

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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

6. RF Characteristics (T_C = 25˚C)

Table 3. RF Characteristics[1]

Parameter	Symbol	Min.	Typ.	Max.	Units
Attenuation Slope	Eq	-	6	-	dB
Insertion Loss @24GHz	IL	-	0.7	-	dB
Input/Output Return Loss	RL_{IN}/ RL_{OUT}	-	-19	-	dB
Power Handling Capability	$P_{IN\ MAX}$	-	30	-	dBm

[1]. Test condition: Input signal CW

7. Typical Performance Curve

■ Small-signal Characteristics Curve

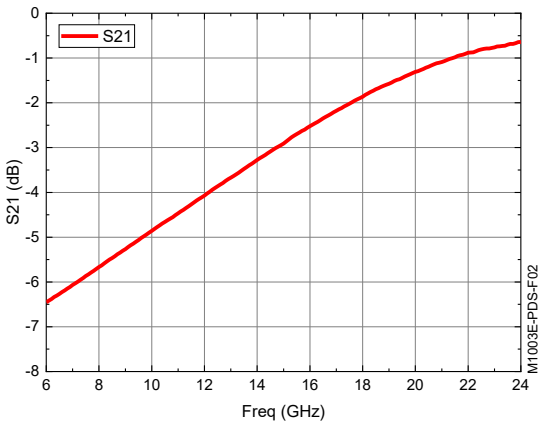


Figure 2. Insertion Loss Characteristics

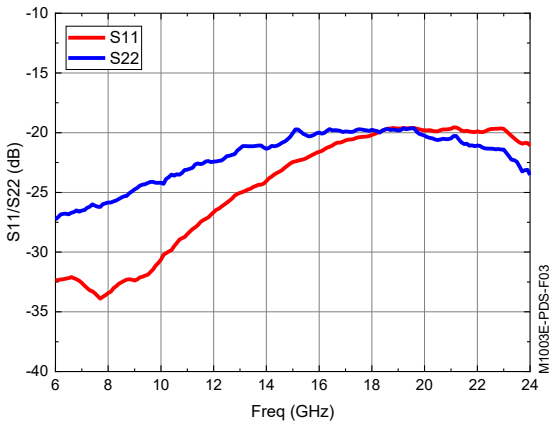
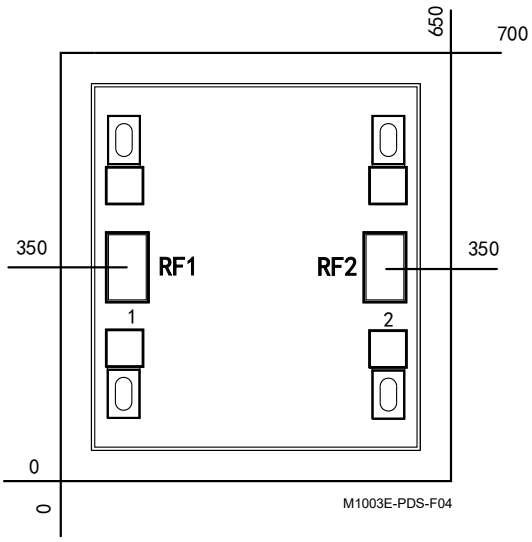


Figure 3. Input/Output Return Loss Characteristics

8. Outline Dimensions



- Dimensions shown in micrometre

Figure 4. M1003E Outline Dimensions

Table 4. Pad Description

Pad	Symbol	Description
1	RF1	RF Input
2	RF2	RF Output

9. Assembly Information

■ Assembly Diagram

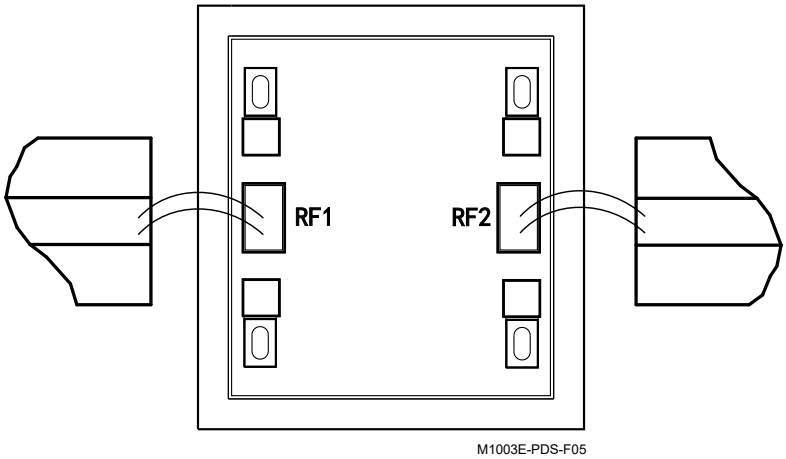


Figure 5. M1003E Assembly Diagram

- **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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