1. Description

- The M0008 is a wideband adjustable attenuator fabricated on GaAs IPD MMIC process. It operates over DC-18GHz and provides adjustable attenuation from 0dB to 3.5dB with 0.5dB step.

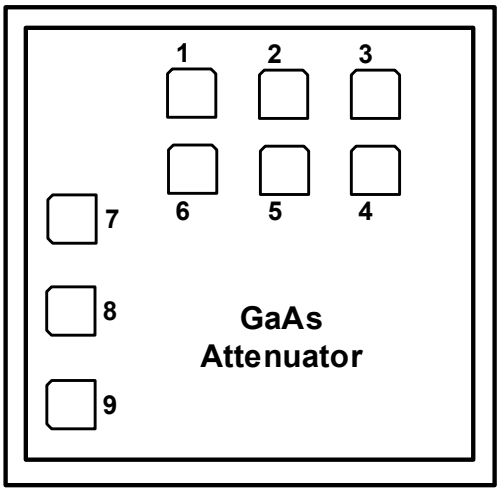


Figure 1. M0008 Functional Block Diagram

2. Applications

- TX/RX Modules

3. Features

- Frequency Range: DC-18GHz
- Attenuation Range: 0-3.5dB
- Attenuation Step: 0.5dB
- Input/Output VSWR: 1.2
- Die Size: 0.71 x 0.75 x 0.10mm

4. Brief Typical Performance

Table 1. Brief Typical Performance

Parameter	DC-18GHz	Units
Insertion Loss	0.2	dB
△Ai	±(0.3+5%Ai)	dB
Input/Output VSWR	1.2	-

Ai: Attenuation Value

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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
Insertion Loss	IL	-	0.1	-	dB
Attenuation accuracy[2]	△Ai	-(0.3+5%Ai)	-	0.3+5%Ai	-
Input/Output VSWR	VSWR	-	1.1	-	-
Power Handling Capability	$P_{IN\ MAX}$	-	30	-	dBm

[1] Test condition: Input signal Pulsed, Pulse width = 100ms, Duty cycle = 30%

[2] Ai: Attenuation Value

7. Typical Performance Curve

■ Small-signal Characteristics Curve

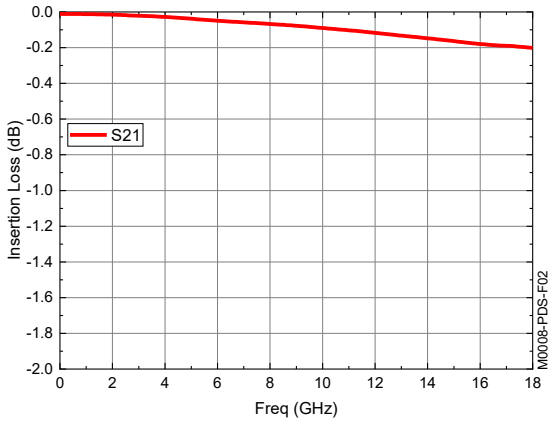


Figure 2. Insertion Loss Characteristics

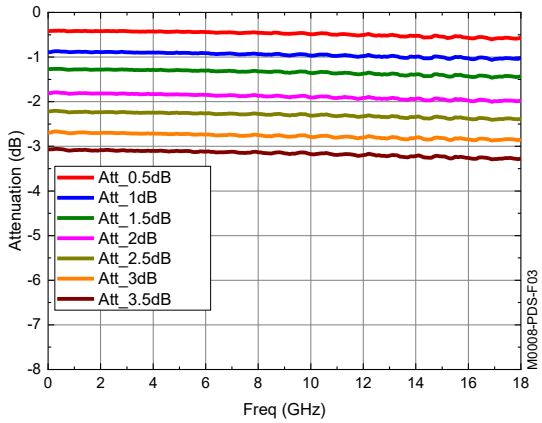


Figure 3. Attenuation Characteristics

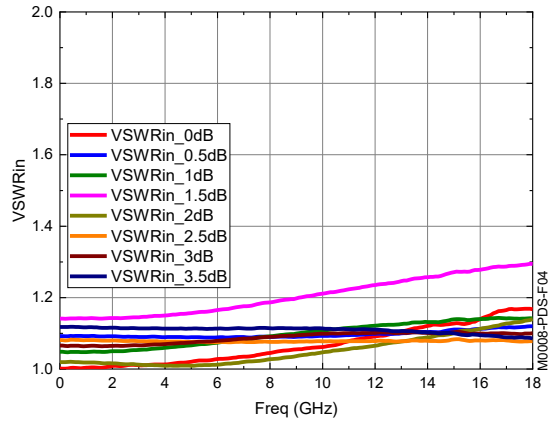


Figure 4. $VSWR_{IN}$ Characteristics

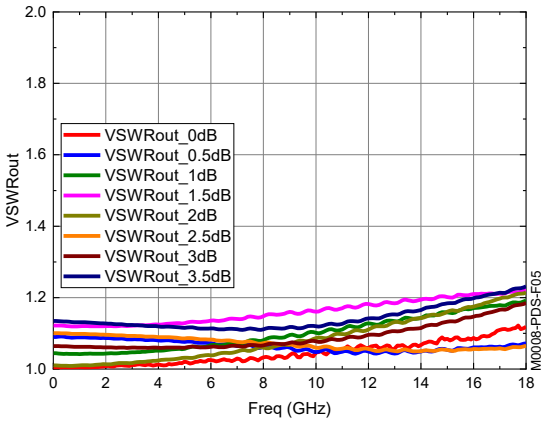


Figure 5. $VSWR_{OUT}$ Characteristics

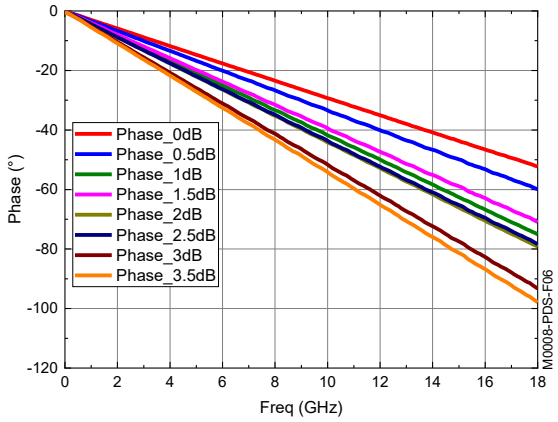
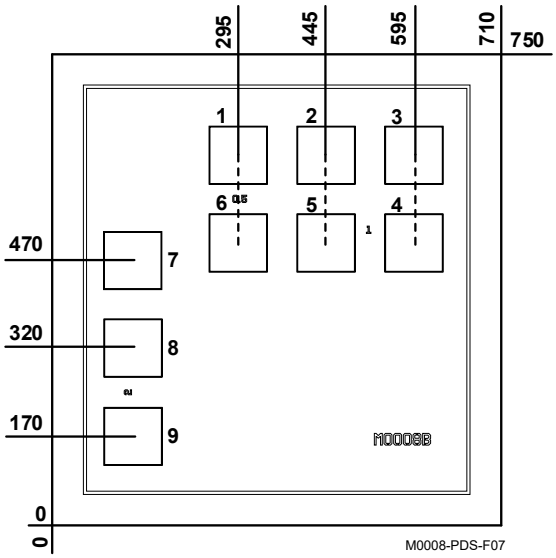


Figure 6. Phase Characteristics

8. Outline Dimensions



• Dimensions shown in micrometre

Figure 7. M0008 Outline Dimensions

9. Assembly Information

■ Assembly Diagram

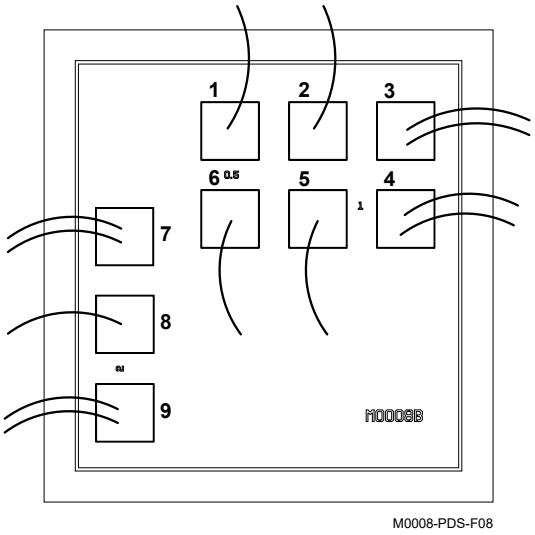


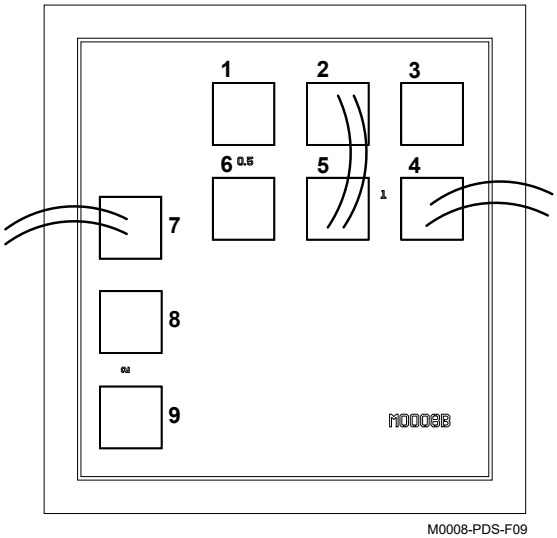
Figure 8. M0008 Assembly Diagram

(Detailed wire bond connection listed in table 4)

Table 4. Attenuation Table (Wire Bond Connection)

Wire Bond Connection			Attenuation		
Input	Connection	Output	Min.	Typ.	Max.
7	-	3	-	0.0dB	-
7	1 and 6	3	-	0.5dB	-
7	2 and 5	4	-	1.0dB	-
7	1 and 6 2 and 5	4	-	1.5dB	-
9	7 and 8	3	-	2.0dB	-
9	1 and 6 7 and 8	3	-	2.5dB	-
9	2 and 5 7 and 8	4	-	3.0dB	-
9	1 and 6 2 and 5 7 and 8	4	-	3.5dB	-

■ Typical Application Circuit



M0008-PDS-F09

Figure 9. M0008 Assembly Diagram
(e.g. 1dB Attenuation)

- **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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