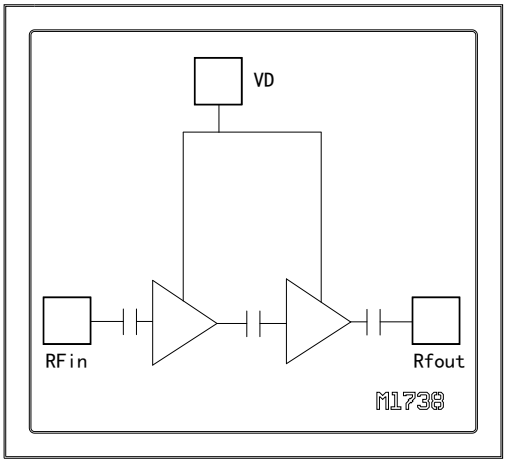
1. Description

- The M1738 is an 14-18GHz power amplifier manufactured using a 0.25μm gate-length gallium arsenide high electron mobility transistor (HEMT) process. The M1738 is grounded through backside metal via holes. All chips undergo 100% RF measurement.



M1738-PDS-F01

Figure 1. M1738 Functional Block Diagram

2. Applications

- TX/RX Modules
- Wireless Communications

3. Features[1]

- Frequency Range: 14-18GHz
- Small Signal Gain: 22dB
- Input Return Loss: -11dB
- Output Return Loss: -14dB
- Output Power (P_{-1dB}): 18dBm
- Operating Bias: 5V (V_D), I_{DQ}=40mA
- Die Size: 1.10 x 1.00 x 0.10mm

[1] On-wafer Test

4. Brief Typical Performance

Table 1. Brief Typical Performance

Parameter	14-18GHz	Units
Small Signal Gain	22	dB
Input Return Loss	-11	dB
Output Return Loss	-14	dB
Output Power at 1dB Compression	18	dBm
Drain Dynamic Current	60	mA

- Test condition: CW Test

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5. Absolute Maximum Ratings

Table 2. Absolute Maximum Ratings

Parameter	Symbol	Rating	Units
Drain-Source Voltage	V_{DS}	6	V
Maximum Input Power	P_{IN}	15	dBm
Storage Temperature Range	T_{STG}	- 65 ~ +150	°C

6. Recommended Operating Conditions

Table 3. Recommended Operating Conditions

Parameter	Min.	Typ.	Max.	Units
Operating Temperature Range	-55	25	85	°C
Supply Voltage, V_D	-	5	-	V
Supply Current, I_D	-	40	-	mA

7. RF Characteristics (T_C = 25˚C)

Table 4. RF Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Units
Small Signal Gain	G_{lin}	21	22	23	dB
Input Return Loss	S11	-	-11	-	dB
Output Return Loss	S22	-	-14	-	dB
Output Power for 1dB Compression	OP_{-1dB}	18	18.5	-	dBm
Drain Dynamic Current	Id	-	60	-	mA

• Test condition: CW Test

8. Typical Performance Curve

■ Small signal Characteristics Curve (TC = 25˚C)

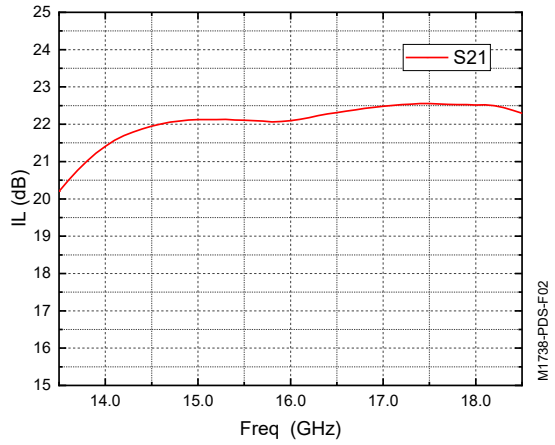


Figure 2. Small Signal Gain vs. Frequency

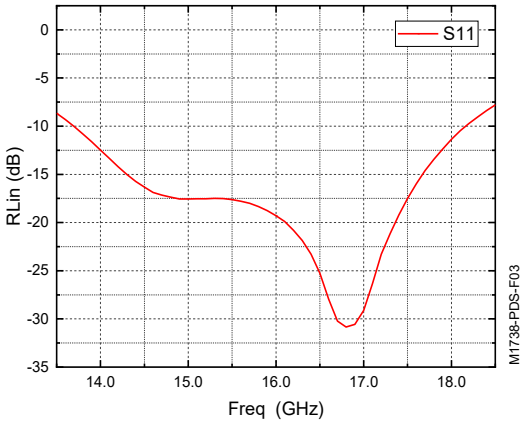


Figure 3. Input Return Loss vs. Frequency

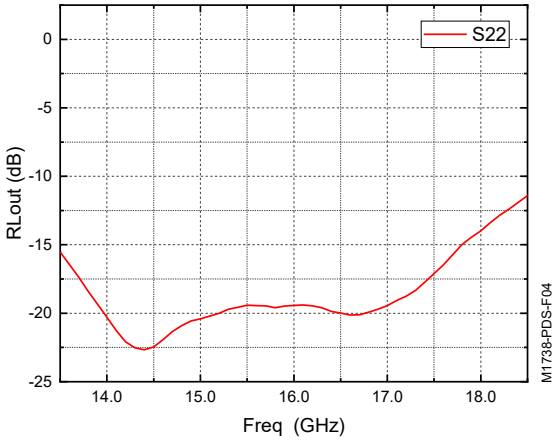


Figure 4. Output Return Loss vs. Frequency

■ Power Characteristic Curve

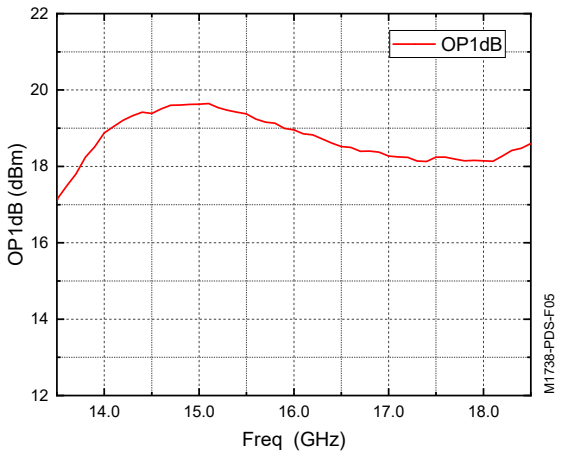
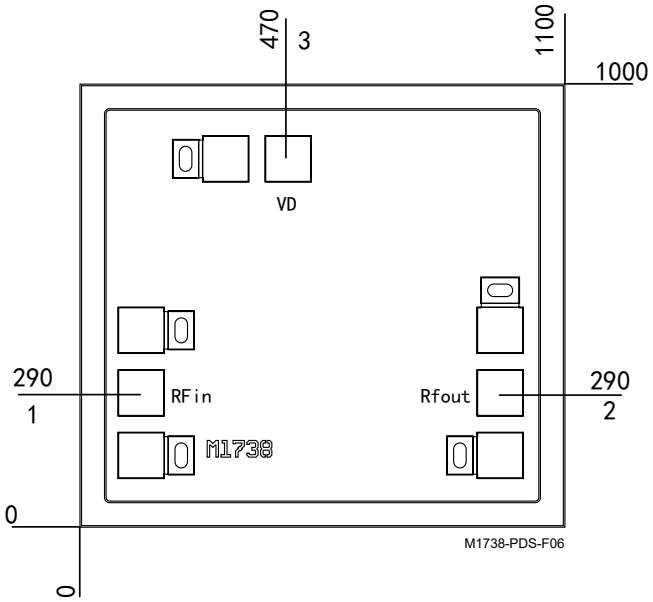


Figure 5. OP-1dB Characteristics

9. Outline Dimensions



• Dimensions shown in micrometre

Figure 6. M1738 Outline Dimensions

Table 5. Pad Description

Pad	Symbol	Description
1	RF_{IN}	RF Input. 50Ohms. DC blocking capacitor is not required.
2	RF_{OUT}	RF Output. 50Ohms. DC blocking capacitor is not required.
3	V_D	Supply Voltage. Bypass network required, refer to Figure 7.

10. Assembly Information

■ Assembly Diagram

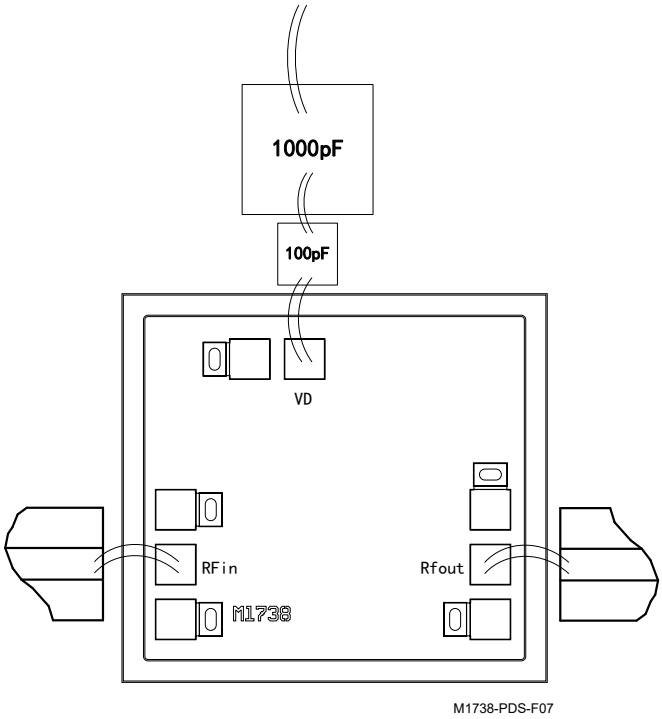


Figure 7. M1738 Assembly Diagram

- **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.

11. 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.



12. 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

13. Disclaimer

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