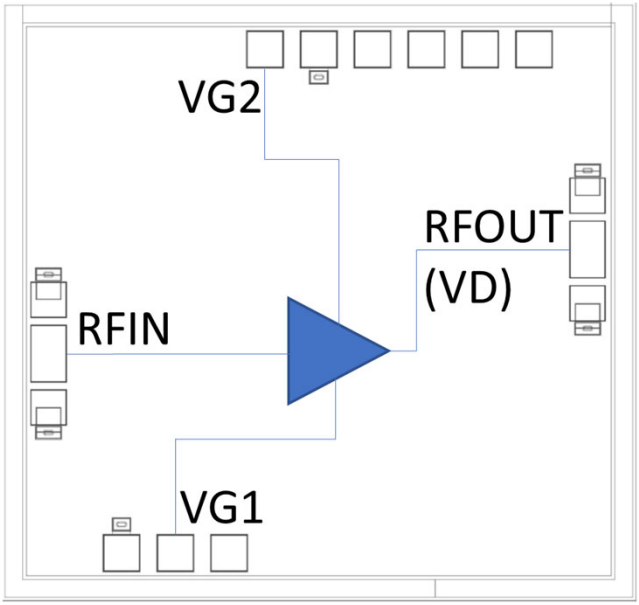
V1.0.1

GaAs MMIC
Wide-band Amplifier
DC-65GHz

Features

- Frequency: DC-65GHz
- Small Signal Gain: >12 dB
- Gain Flatness: ≤±1.0 dB@ 5-65GHz
- Noise Figure: <4 dB@35GHz
- P1dB = 13 dBm@35GHz
- Psat = 16.5 dBm@35GHz
- Power Supply: +4.5V/81mA
- Input/Output: 50Ω
- Die Size: 1.6 x 1.7 x 0.05 mm

Functional Block Diagram



Typical Applications

- Test Instrumentation
- Microwave Radio & VSAT
- Military & Space
- Telecom Infrastructure
- Fiber Optics

Electrical Specifications

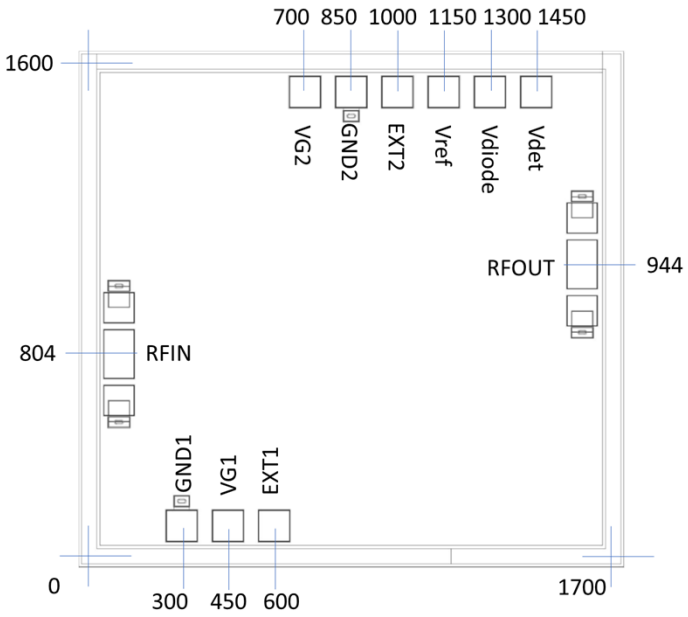
TA = +25°C, VD = +4.5V, VG1 = -0.35V, VG2 = 1.9V, ID = 81mA

Parameters	Min.	Typ.	Max.	Min.	Typ.	Max.	Min.	Typ.	Max.	Units
Frequency	DC-5			5-55			55-65			GHz
Small Signal Gain	12.5	15	14.7	11.5	12	12.5	11	12	12.5	dB
Gain Flatness		±1.5			±0.5			±1		dB
Noise Figure		5		3		5	4.5		6.5	dB
Output 1dB Compression (P1dB)	14.5		15	12		15	10		12	dBm
Saturated Output Power (Psat)	18		18.5	17		18.5	13		15	dBm
Input Return Loss	< 15			< 10			< 8			dB
Output Return Loss	< 10			< 10			< 10			dB

* Adjust VG1, VG2 slightly to obtain device current of 81mA.

Outline Drawing:

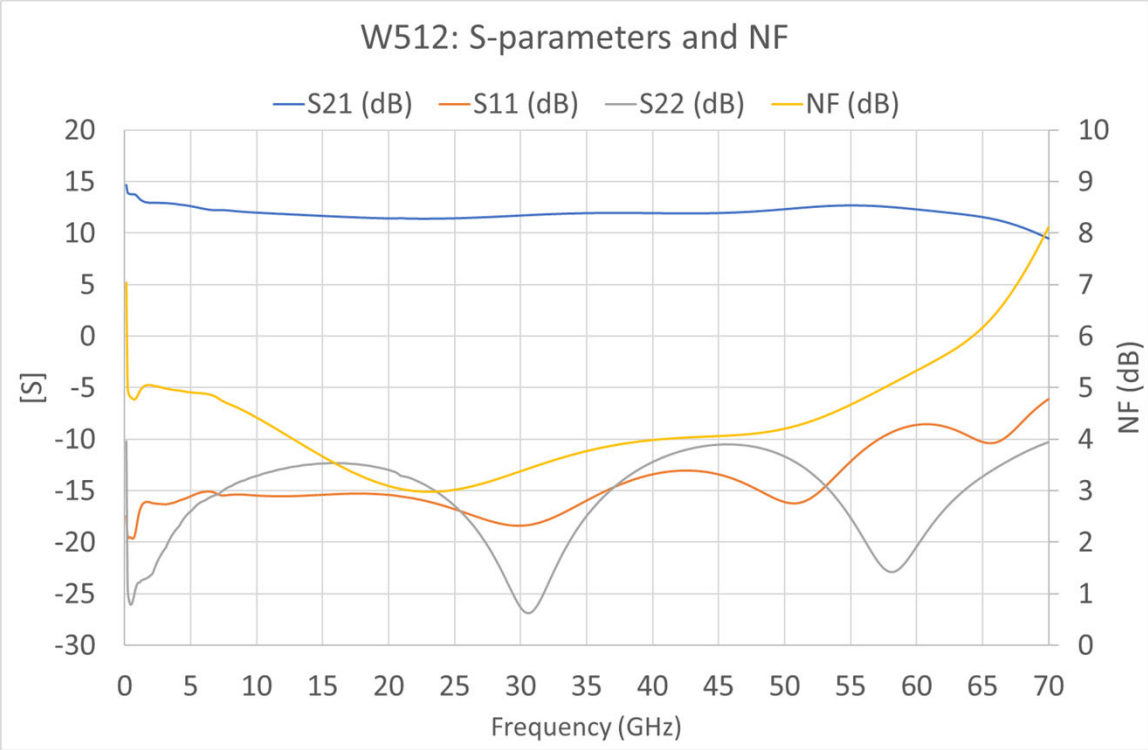
All Dimensions in μm



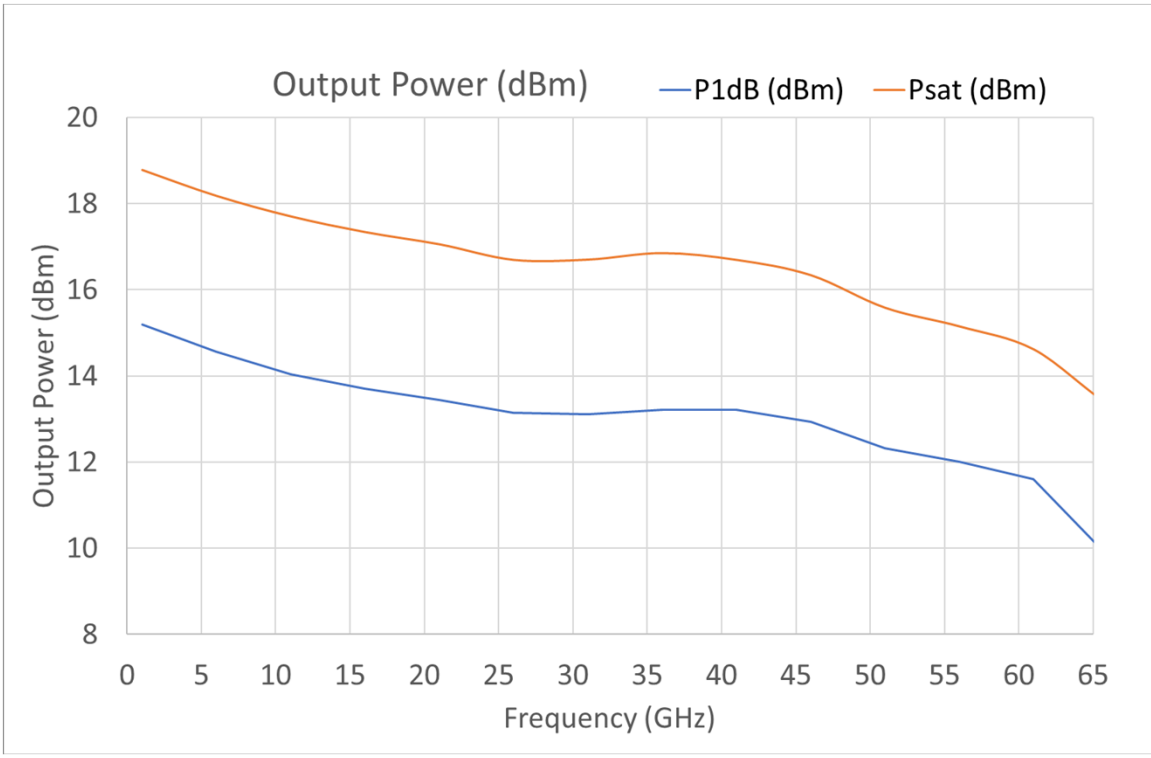
Pad Description

No	Function	Description
1	RF IN	Signal input terminal, connected to 50Ω circuit, DC-coupled
2	RF OUT	Signal output terminal, connected to 50Ω circuit; blocking capacitor required; external DC biasing network required.
3	VG1	Amplifier 1st gate bias; connect to external 1000pF and 0.01uF bypass capacitors.
4	VG2	Amplifier 2nd gate bias; connect to external 1000pF and 0.01uF bypass capacitors.
5	EXT1	External bypass pad; connect to external bypass capacitors.
6	EXT2	External bypass pad; connect to external bypass capacitors.
7	Vdiode	Diode biasing voltage
8	Vref	Reference diode output voltage
9	Vdet	Detector output voltage
10	GND1, GND2	Ground pads.

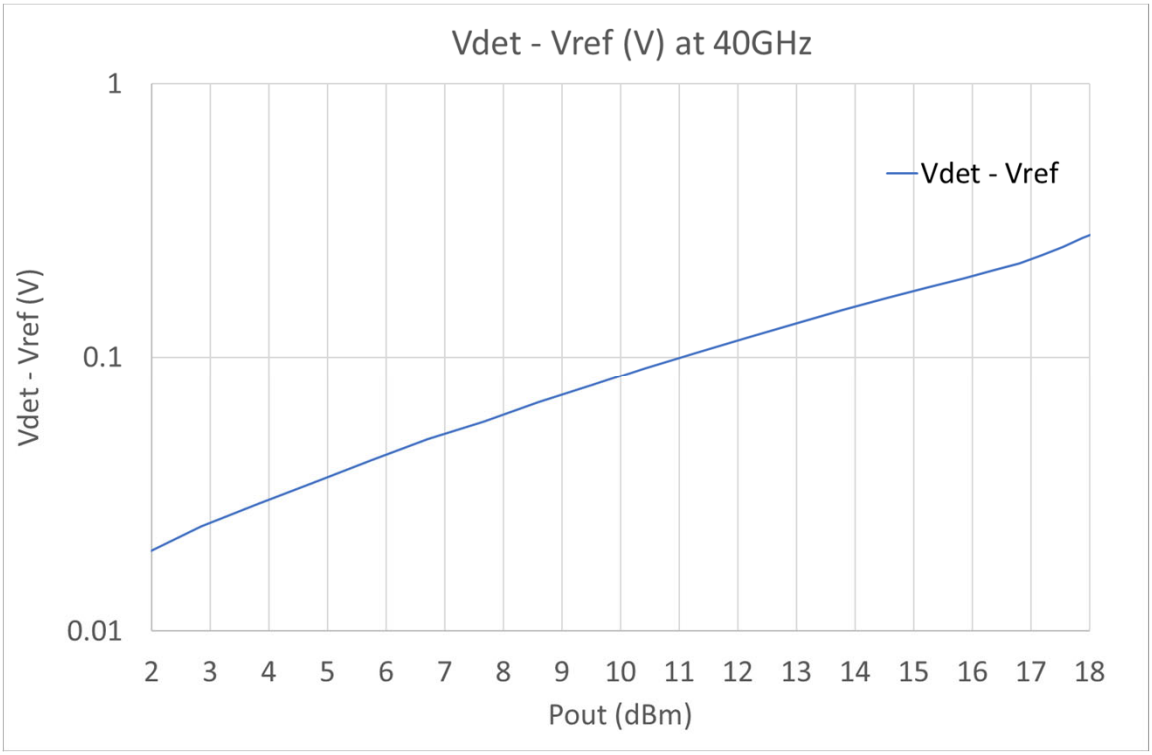
S-parameters and NF



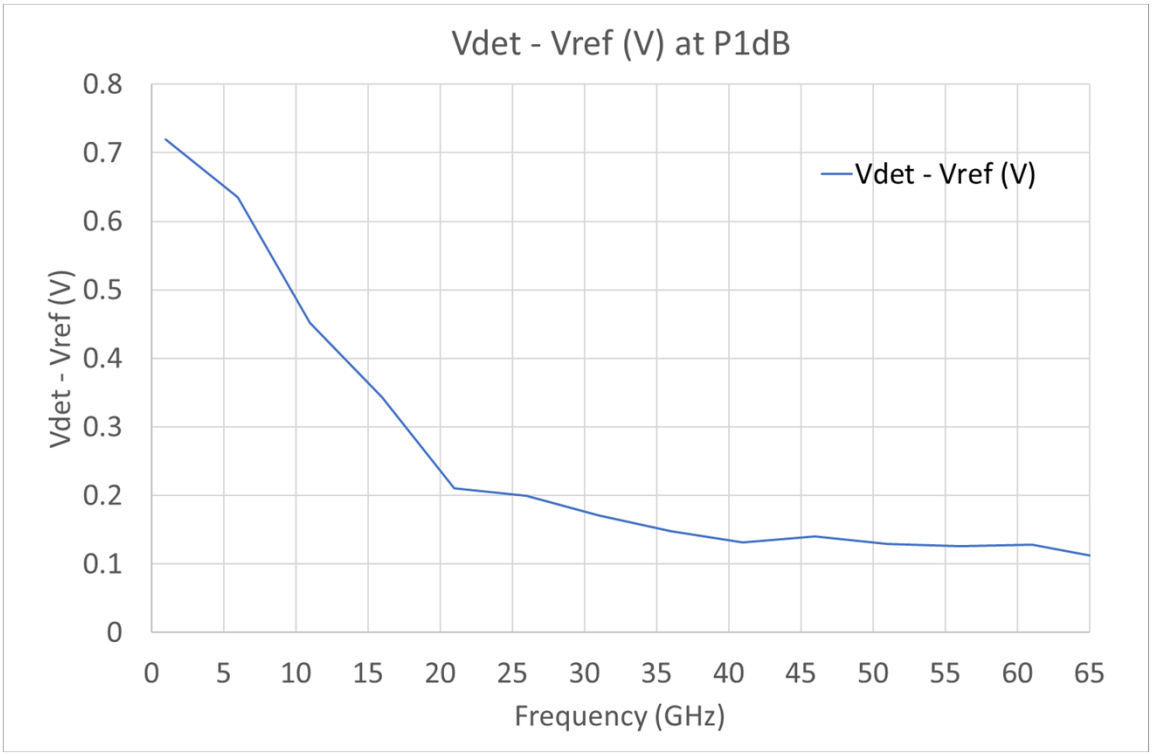
P1dB and Psat



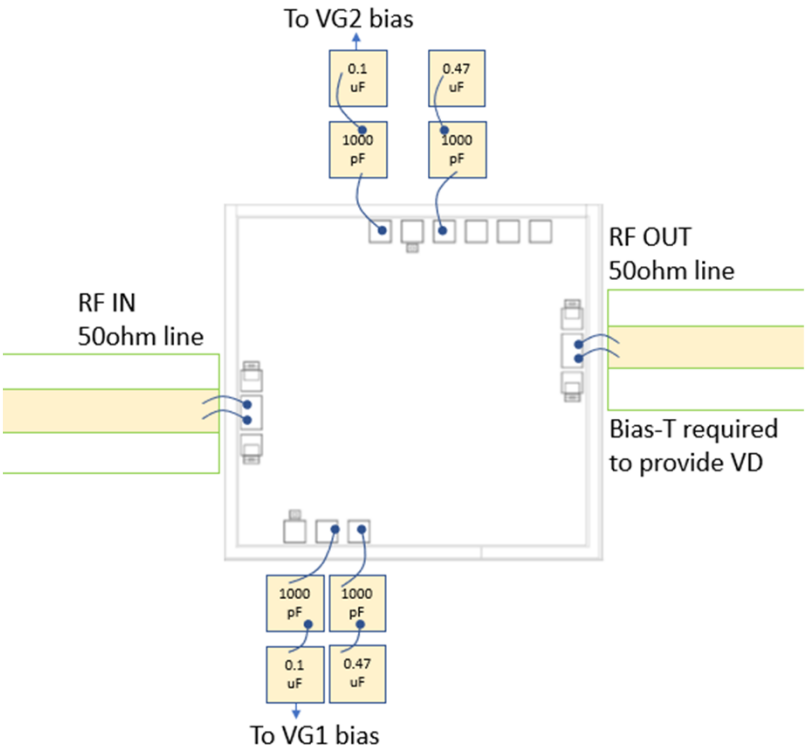
Power Detection: Vdet – Vref vs Pout at 40GHz, Vdiode = 1V



Power Detection: Vdet – Vref vs Frequency at P1dB, Vdiode = 1V



Assembly Drawing



Notes:

1. Die thickness: 50um
2. DC bond pad is 100 x 100 μm^2
3. RF IN/OUT bond pad is 100 x 160 μm^2
4. Bond pad metalization: Gold
5. Backside metalization: Gold
6. Backside of the die (GND)