Application Note

Evaluation Board : P/N VM017QE

VWA0000949AA Evaluation Board

LNA 7-13GHz in QFN 3x3 16L Evaluation Board

	Written	Controlled by	Approved by
Name	DLA		
Date	07/07/25		
Signature	OK		

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I. HISTORIC

Edition	Date	Description of Evolutions
1.0	07/07/25	Creation

II. SUMMARY

III. LIST OF ILLUSTRATION

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IV. INTRODUCTION

IV-1. Description

The VM017QE is an evaluation board of the VWA0000949AA QFN component. It is working in the [7-13] GHz frequency bandwidth.

The evaluation board is composed of 2 mains parts:

- **LNA 7-13GHz in QFN 3x3 power amplifier**
- **Test structure support: PCB's with SMA/DC connectors.**

The test structure support uses a RF PCB with SMA connectors and second order decoupling components and connectors to bias the component, all this on an aluminum mechanical support screwed on a heat sink (with fan).

Supply cables are not provided.

This document describes the way to use the VM017QE Evaluation board

Typical RF results are included.

IV-2. Evaluation Board photo

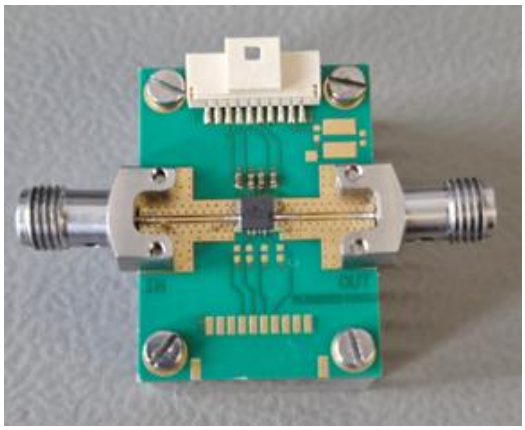

Figure 1. VM017QE evaluation board with its dissipator

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V. INTERFACE AND COMPONENTS

V-1. VM017QE interface

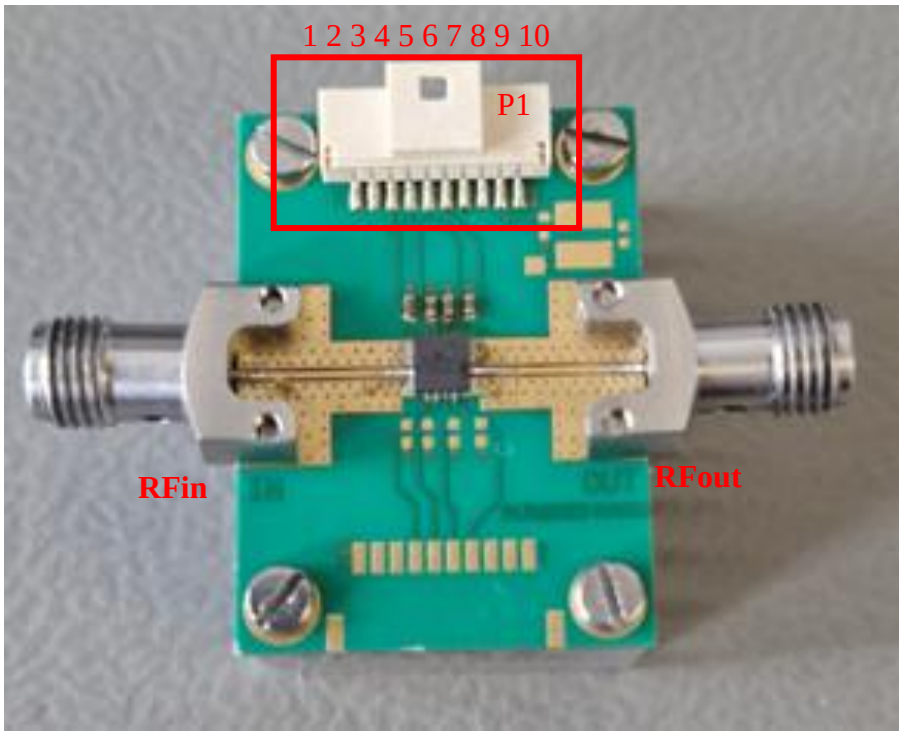

Figure 2. Evaluation board VM017QE interface

Connector	Type	Allocation
P1	DC connectors	- V_D power supply - V_G power supply - GND
RF IN	SMA female	PA RF input
RF OUT	SMA female	PA RF output

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Table 1. PINOUT identification

P1	
PIN	**P1 Identification**
1	N/A
2	N/A
3	VG1
4	VD1
5	VG2
6	VD2
7	N/A
8	N/A
9	N/A
10	GND

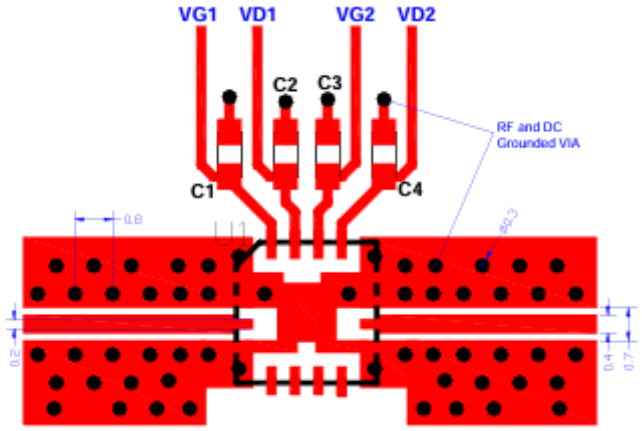
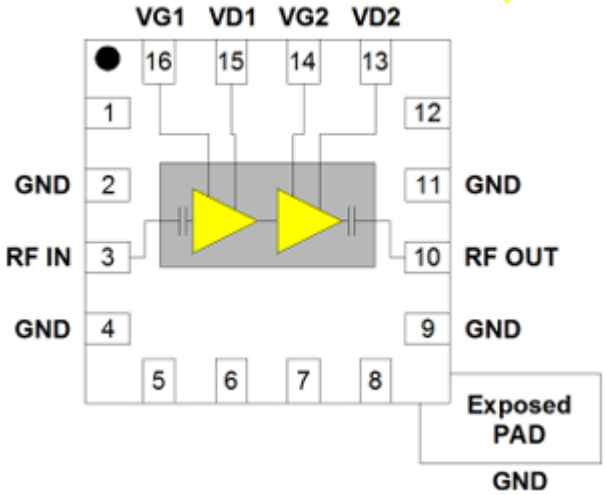


Figure 3. PCB cabling



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Components	Value	Type
C1 = C2 = C3 = C4	1µF/16V	0402

Table 2. External decoupling

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VI. BIASING PROCEDURE AND OPERATING CONDITIONS

VI-1. Electrical operating conditions

- **VG1 = VD1= VG2= VD2= +5V**
- **Total typical Supply current (IG1 = ID1= IG2= ID2) = 70mA**
- **RF CW**
- **Room temperature 25°C**

VI-2. Biasing procedure

Switch on

1. **Set VG1 = VD1= VG2= VD2 to 5V**
2. **- Total typical Supply current 70mA**
3. **Turn RF (CW) ON**

Switch off

1. **Turn RF OFF**
2. **Set VG1 = VD1= VG2= VD2 to OV**

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VII. ABSOLUTE MAXIMUM RATING

Symbols	Parameter	Min	Max	Units
V_D	Drain voltage		+6	V
V_G	Gate voltage		+6	V
I_{total}	Supply current		90	mA
Pin	CW Input Power		+20	dBm
Top	Operating temperature	-40	+85	°C

Table 5. Absolute Maximum Rating

Operation of this device above any of these parameters may cause permanent damages.

VIII. TYPICAL EVB MEASUREMENTS RESULTS

VIII-1. Measurements conditions

Reference plane measurements :

SMA connectors

Losses estimation :

For information, the losses of a 50Ohms line in the same structure and dimensions that the VM209FE Evaluation board RF PCB :

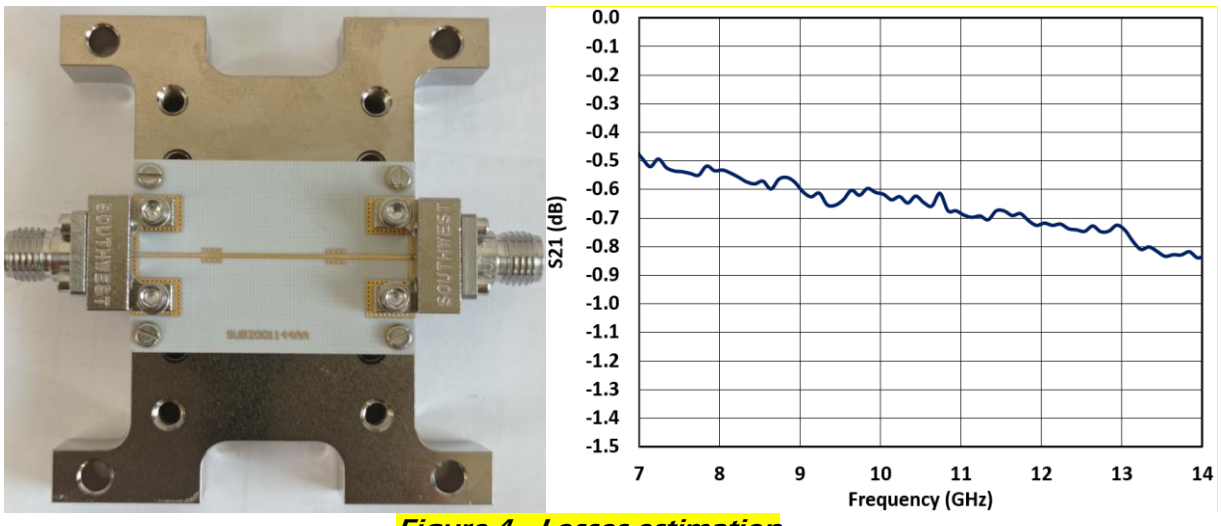

Figure 4. Losses estimation

50Ohms line S2P files can be provided on demand

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VIII-2. S-Parameters

RF CW (Pin =-25 dBm).

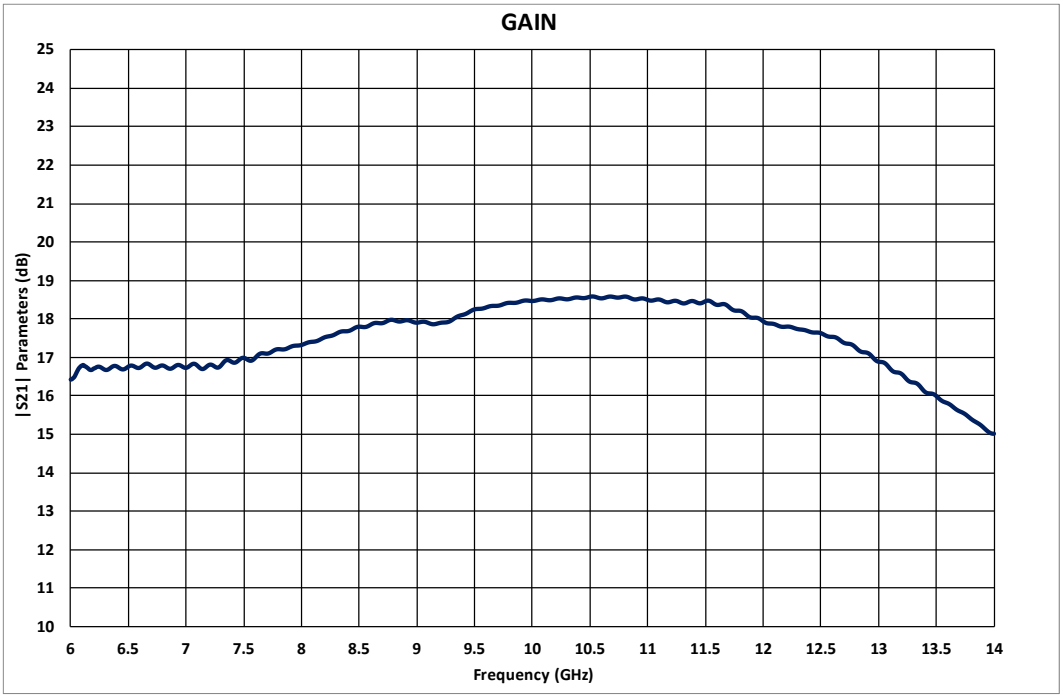

Figure 5. Gain (S21)

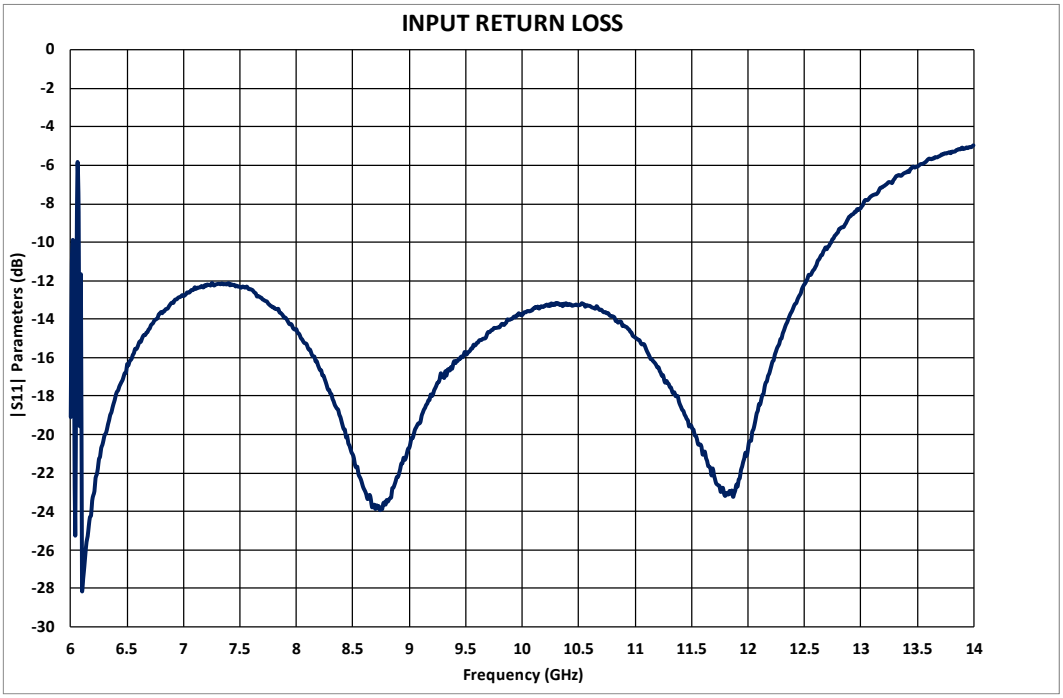

Figure 6. Input return loss (S11)

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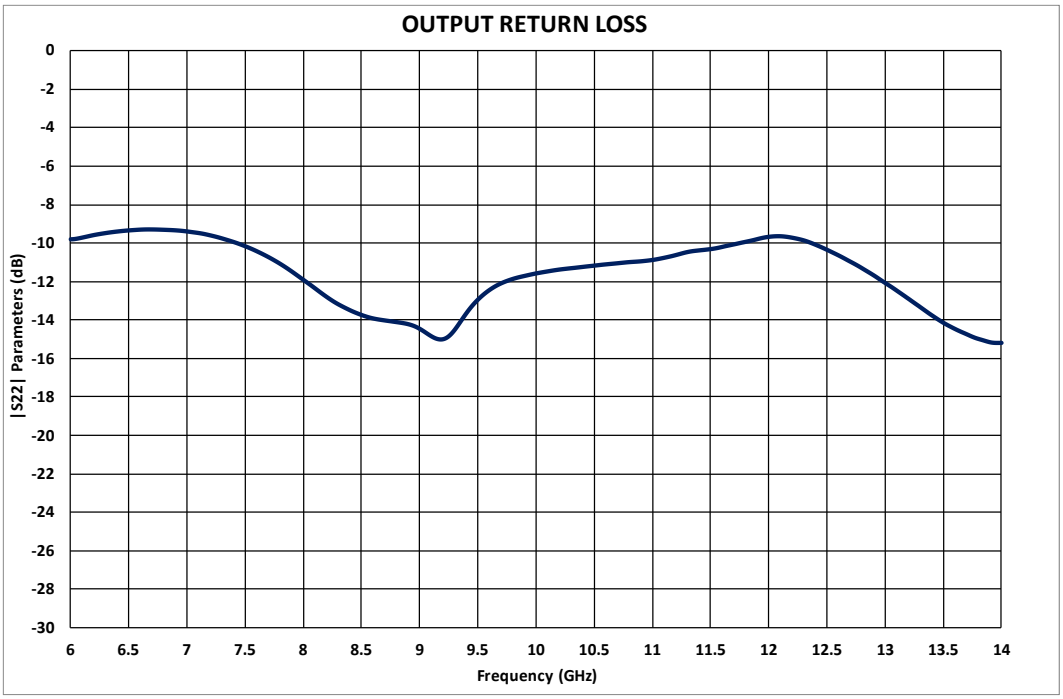

Figure 7. Output return loss (S22)

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VIII-3. Large Signal

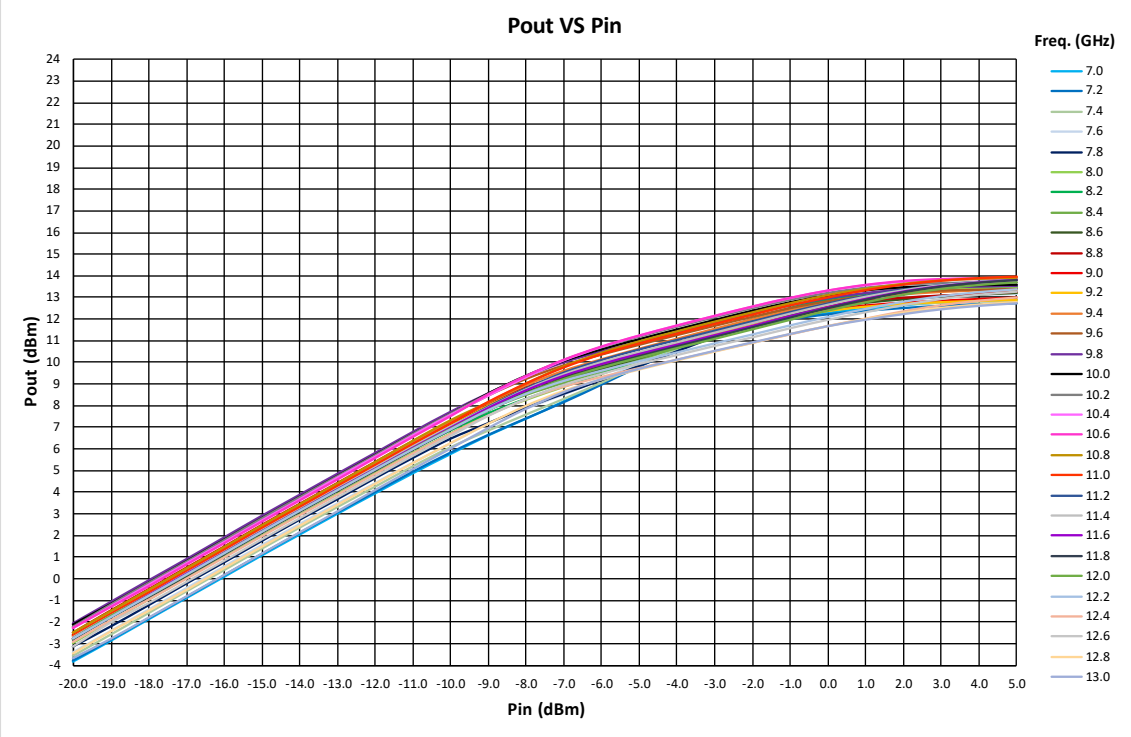

Figure 8. Output Power vs Input Power vs Frequency

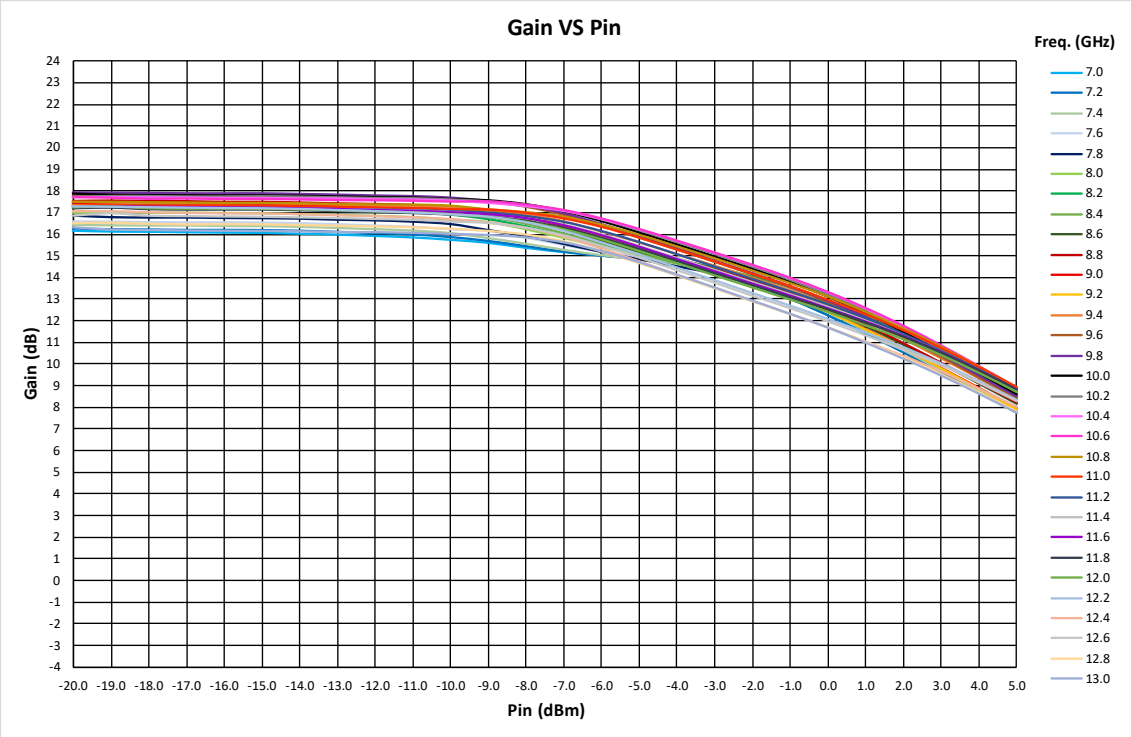

Figure 9. Gain vs Input Power vs Frequency

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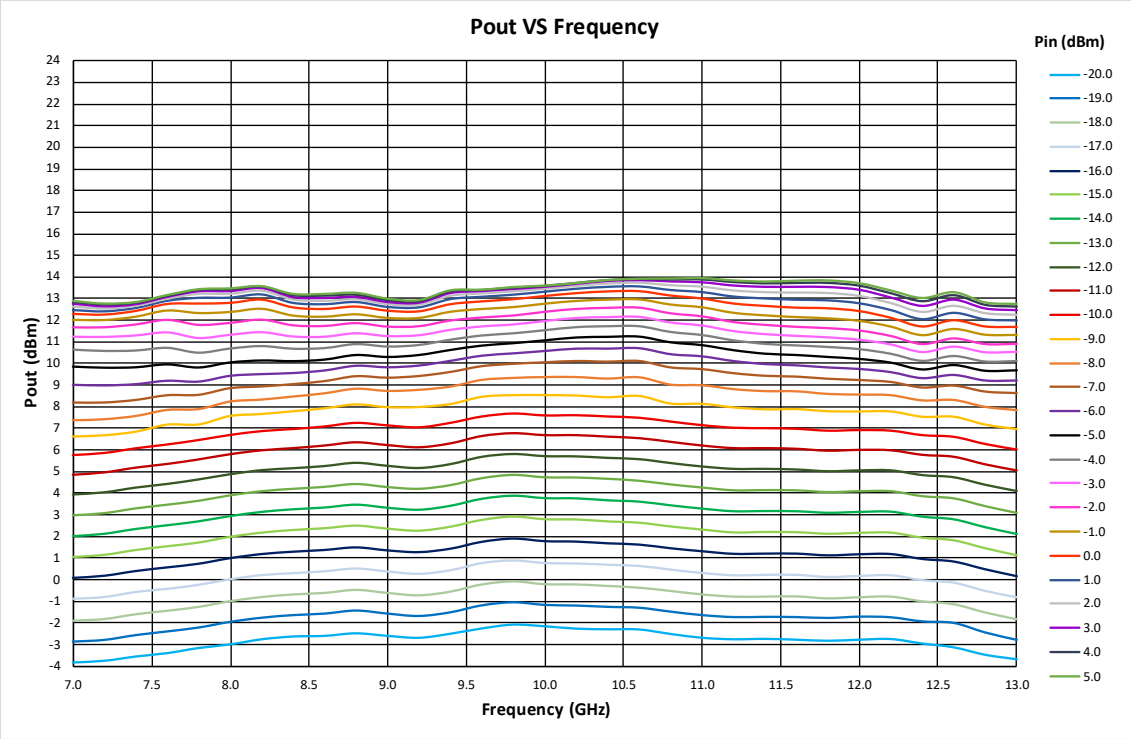

Figure 10. Output Power vs Frequency vs Input Power

VIII-4. Noise figure

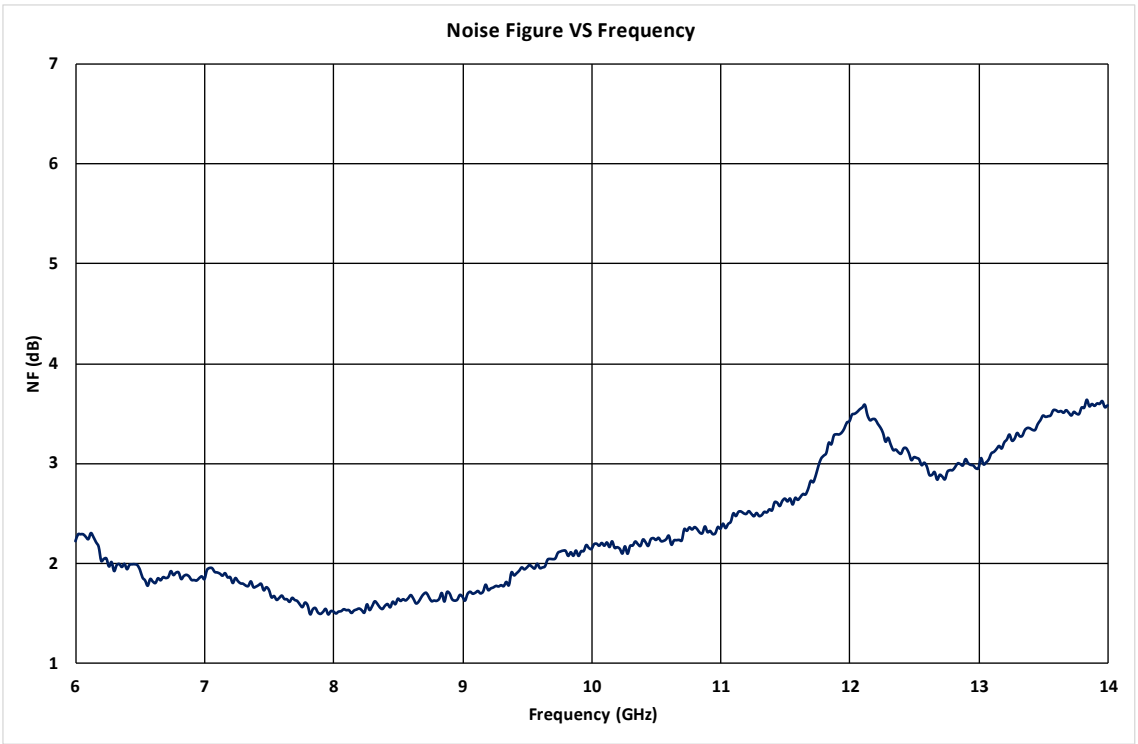

Figure 11. Noise figure vs Frequency

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