GRF5115

Advance

32.8 dBm Power-LNA™
Tuning Range: 0.1 – 2.7 GHz

Features

Reference: 5V/300mA/1.85GHz

- Gain: 14.4 dB
- OP1dB: 32.8 dBm
- OIP3: 47.6 dBm
- Eval Board NF: 1.3 dB
- Flexible Bias Voltage and Current
- Process: GaAs pHEMT

Applications

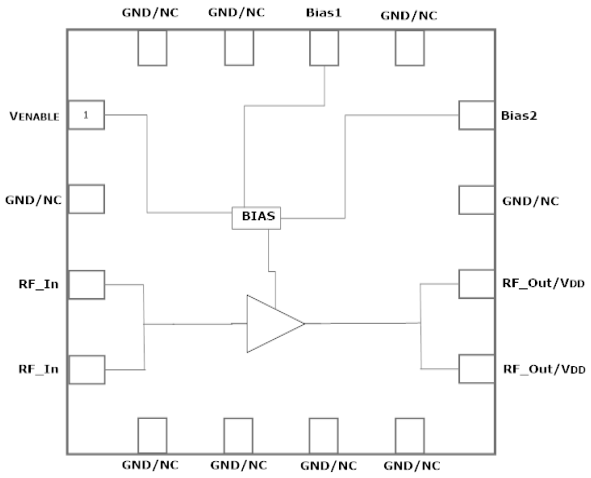
- Power Amplifier
- Linear Driver Amplifier for High PAR Waveforms
- Multi-stage LNA

Product Description

The GRF5115 is a high linearity PA /Linear Driver with low noise figure (NF). It delivers excellent P1dB of almost 2 watts, IP3 and NF and is tunable from 100 MHz up to 2.7 GHz.

The device can be biased with Vdd over a range from 2.7 to 5.0 volts and Iddq can be adjusted for optimal linearity and efficiency.

Consult with the GRF applications engineering team for custom tuning/evaluation board data and device s-parameters.



Absolute Ratings:

Parameter	Symbol	Min.	Max.	Unit
Drain Voltage	V_{DD}		6.0	V
Transient Average RF Input Power: (Load VSWR < 2:1; Duration: <1 hour)	$P_{IN\ MAX}$		26.0	dBm
Operating Temperature (Package Heat Sink)	T_{AMB}	-40	105	°C
Maximum Channel Temperature (MTTF > 10^6 Hours)	T_{MAX}		170	°C
Maximum Dissipated Power	$P_{DISS\ MAX}$		2.0	W
Electrostatic Discharge:				
Charged Device Model: (TBD)	CDM	1500		V
Human Body Model: (TBD)	HBM	250		V
Storage:				
Storage Temperature	T_{STG}	-65	150	°C
Moisture Sensitivity Level	MSL		1	--

RoHS Compliant

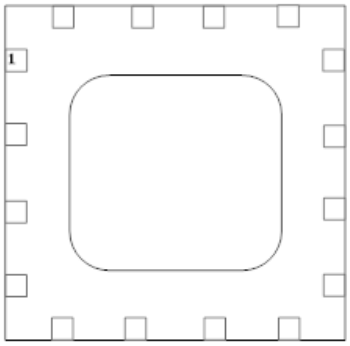
Caution! ESD Sensitive Device

Exceeding Absolute Maximum Rating conditions may cause permanent damage to the device.

Note: For package dimensions and manufacturing information, see the Guerrilla-RF.com website for the following document located on the GRF5115 landing page: Manufacturing Note—MN-001 Product Tape and Reel, Solderability and Package Outline Specification.

Link to manufacturing note

Pin Out (Top View)



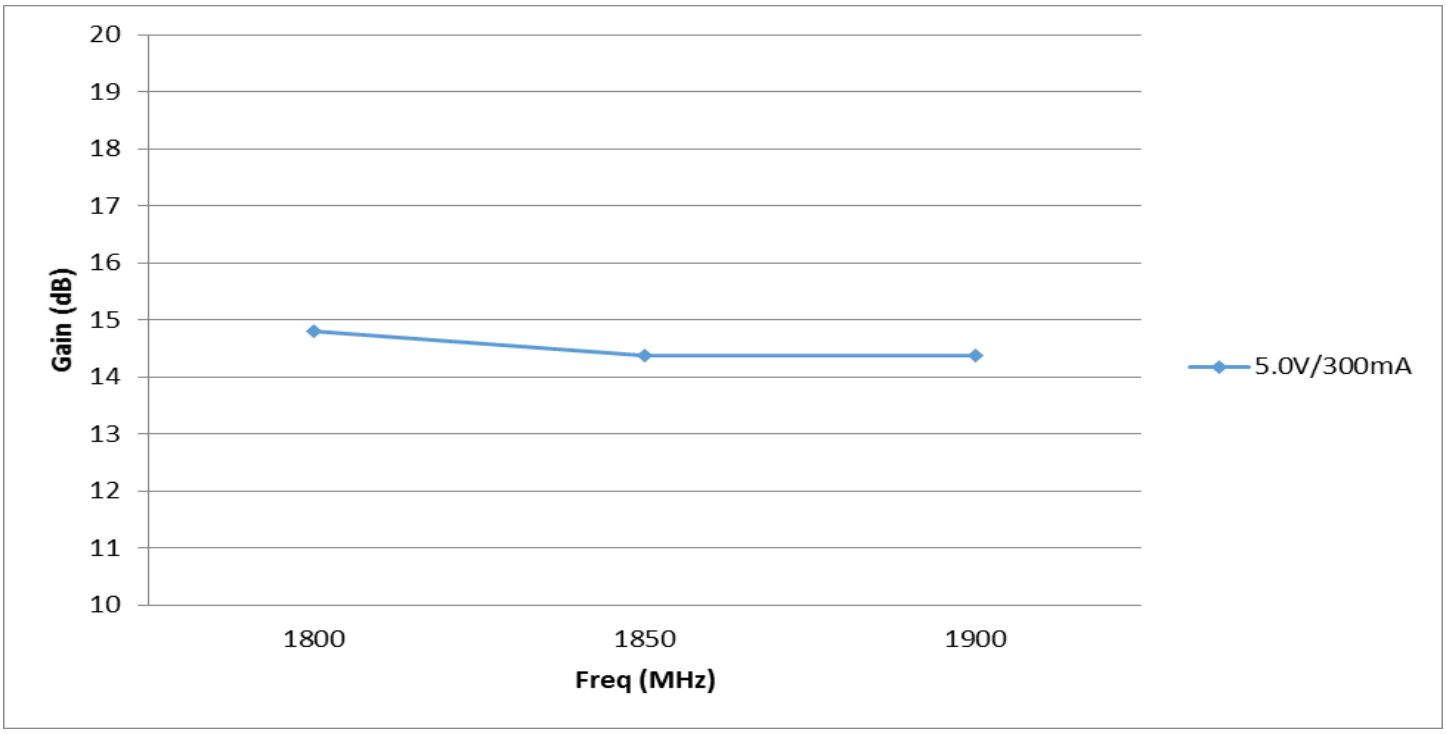
Pin Assignments:

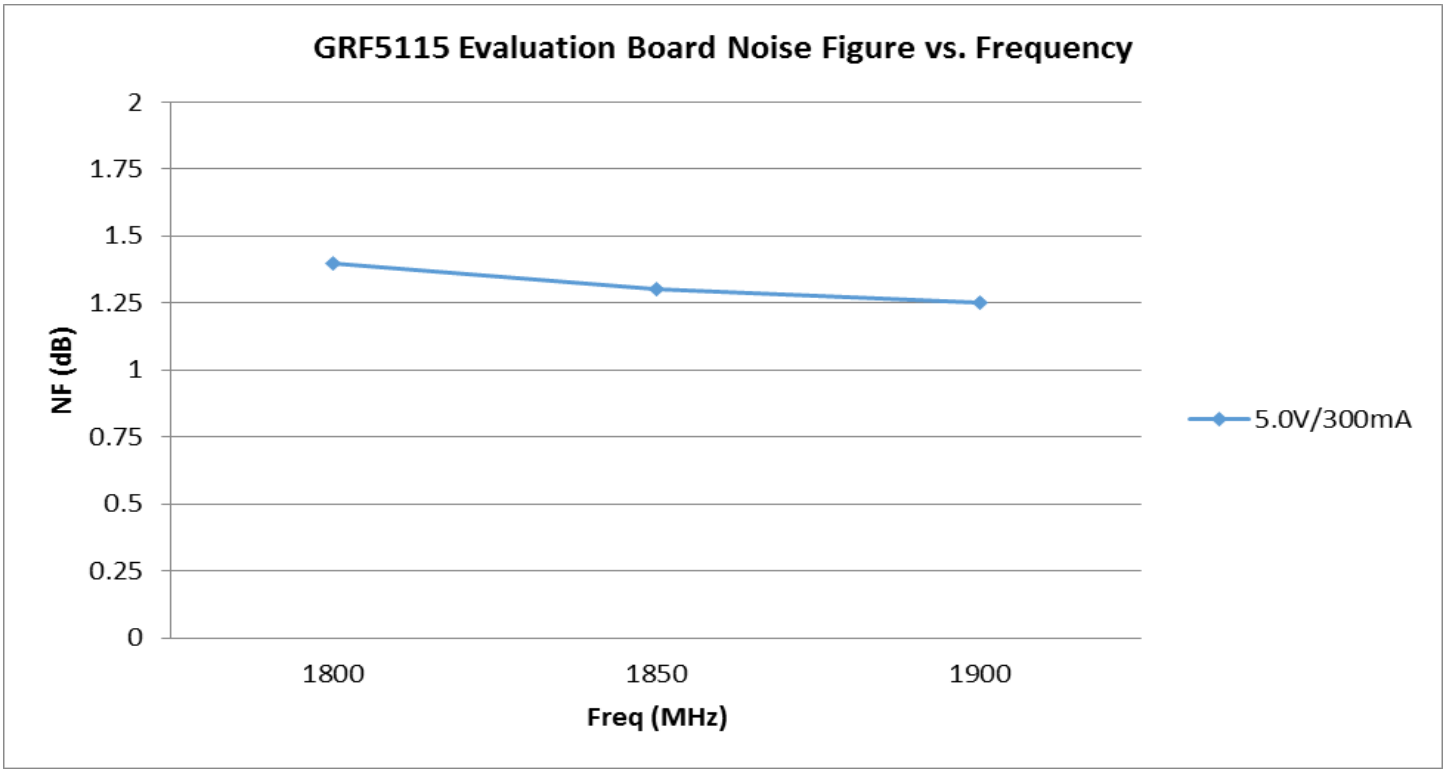
Pin	Name	Description	Note
1	V_{ENABLE}	Enable Voltage Input	Venable and series resistor M5 set the device Iddq. Venable < 0.1 volts disables the device
2	NC	No Connect or Ground	No internal connection to die
3	RF_In	RF Input	Pins 3-4 tied together on system board
4	RF_In	RF Input	Pins 3-4 tied together on system board
5	NC	No Connect or Ground	No internal connection to die
6	NC	No Connect or Ground	No internal connection to die
7	NC	No Connect or Ground	No internal connection to die
8	NC	No Connect or Ground	No internal connection to die
9	RF_Out/V_{DD}	PA Output/Bias	Pins 9-10 tied together on system board. Supply Vdd here.
10	RF_Out/V_{DD}	PA Output/Bias	Pins 9-10 tied together on system board. Supply Vdd here.
11	NC	No Connect or Ground	No internal connection to die
12	Bias2	Bias Circuit Supply	Connect to V_{DD} through external resistor
13	NC	No Connect or Ground	No internal connection to die
14	Bias1	Bias Circuit Ground	Consult application schematic
15	NC	No Connect or Ground	No internal connection to die
16	NC	No Connect or Ground	No internal connection to die
PKG BASE	GND	Ground	Connect to system board ground

Nominal Operating Parameters:

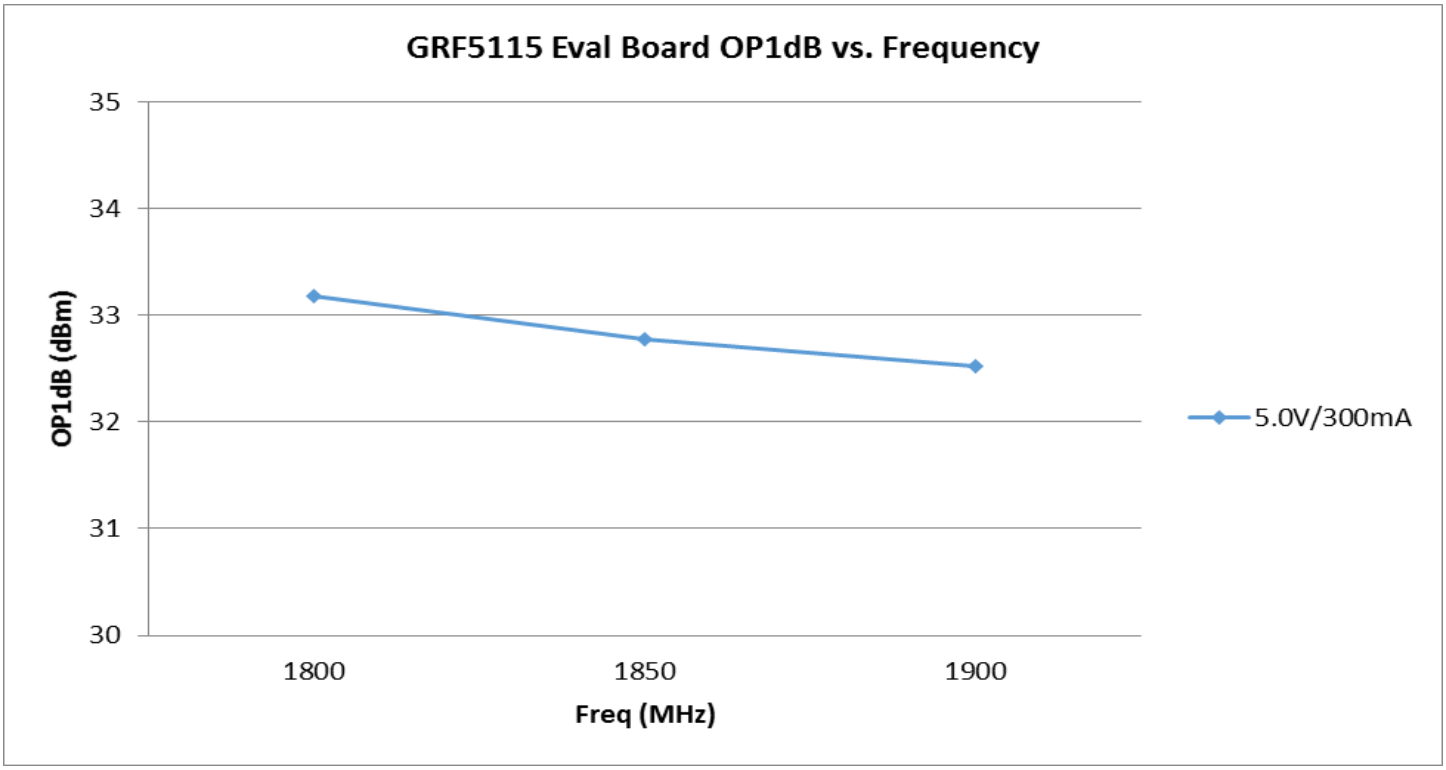
Parameter	Symbol	Specification			Unit	Condition
		Min.	Typ.	Max.		
Target Performance (1.8 to 1.9 GHz Tune)						**Bias: 5.0 V and 300 mA unless otherwise noted. (+25C)**
Test Frequency	F_{TEST}		1.85		GHz	
Gain	S(2,1)		14.4		dB	
Noise Figure (Evaluation Board)	NF		1.3		dB	
Output 1dB Compression Point	OP1dB		32.8		dBm	
Output Third Order Intercept Point	OIP3		47.6		dBm	2 MHz Tone Spacing
Switching Rise Time	T_{RISE}		500		ns	
Switching Fall Time	T_{FALL}		500		ns	
Quiescent Supply Current	I_{DDQ}		300		mA	
Enable Current	I_{ENABLE}		1.0		mA	
Disabled Mode						
Supply Current (Leakage)	I_{DD}		TBD		uA	
Thermal Data						
Thermal Resistance: (IR Scan Method)	Θjc		34		°C/W	
Channel Temperature @ +85C Reference (package heat sink)	$T_{CHANNEL}$		136		°C	V_{DD}: 5.0 volts; I_{DDQ}: 300 mA P_{DISS}: 1500 mW; No RF

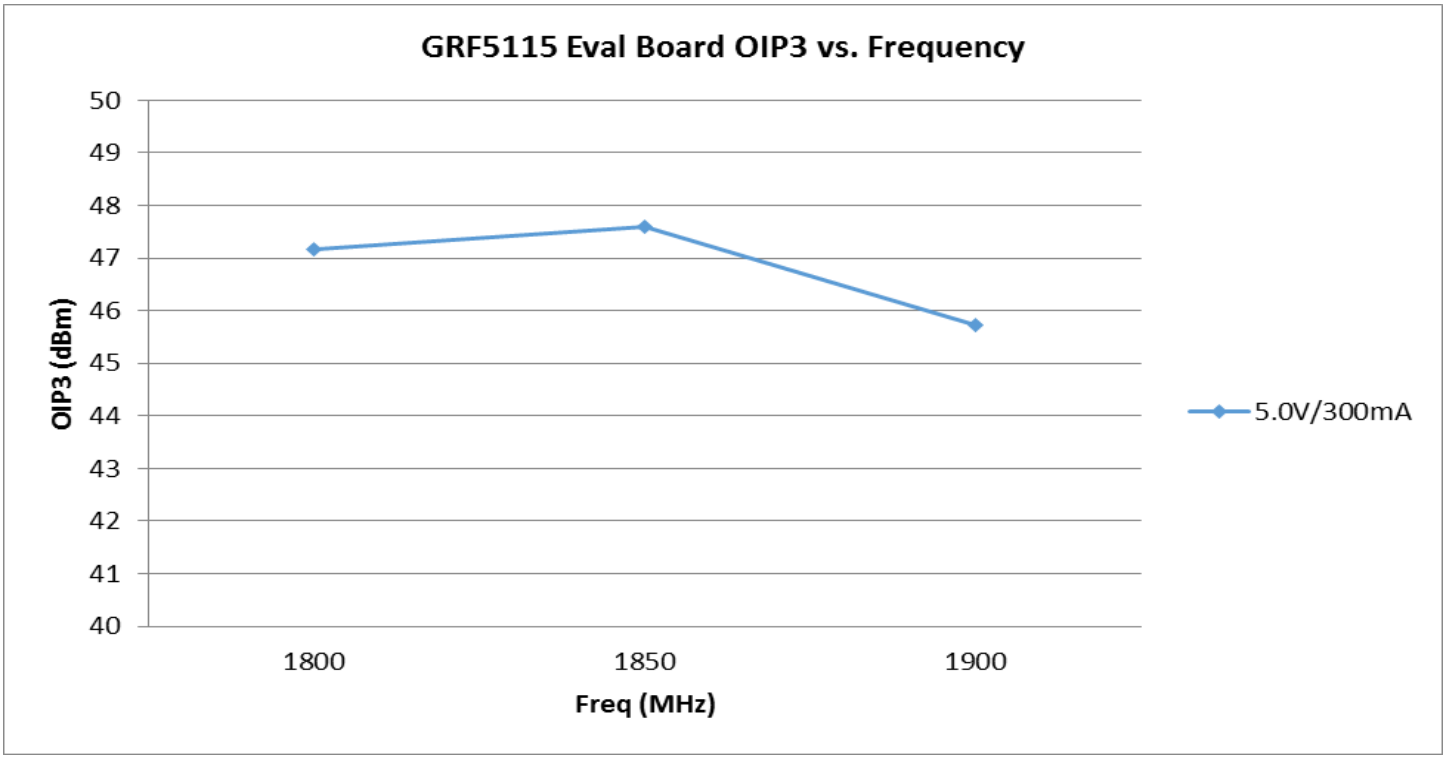
GRF5115 Evaluation Board Data: (1.8 to 1.9 GHz Tune)



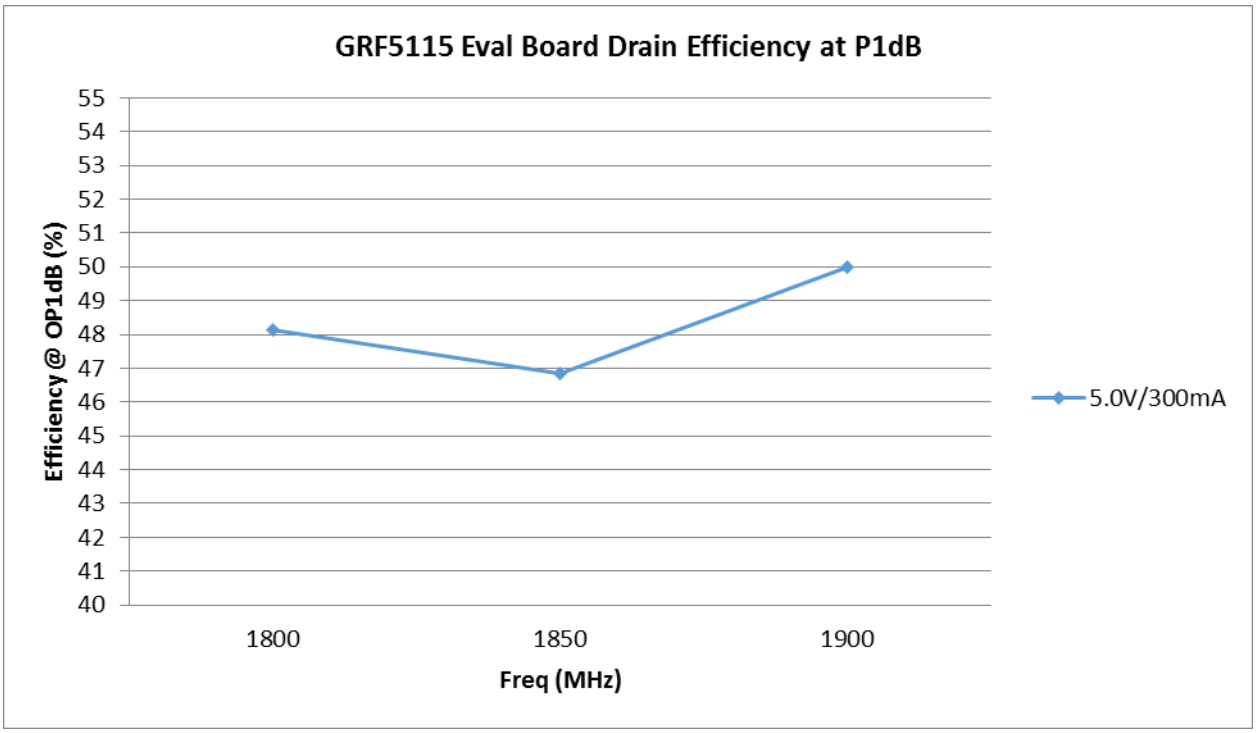


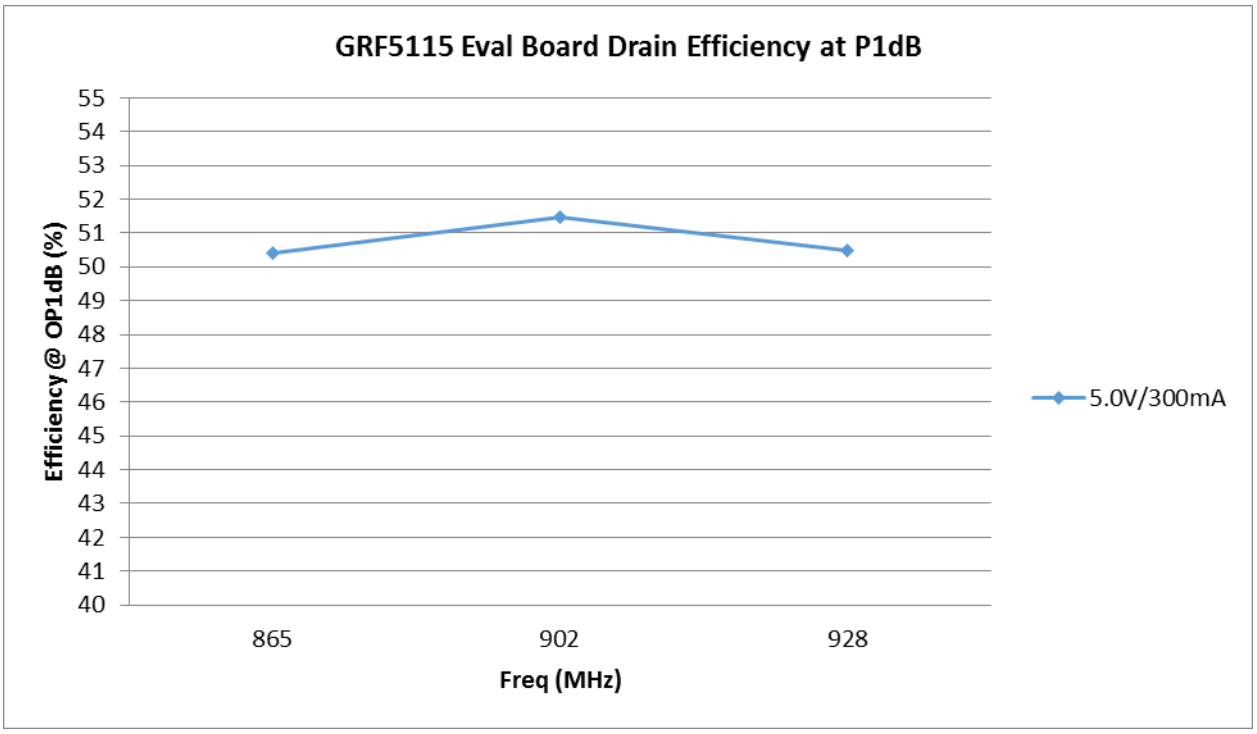
GRF5115 Evaluation Board Data: (1.8 to 1.9 GHz Tune)



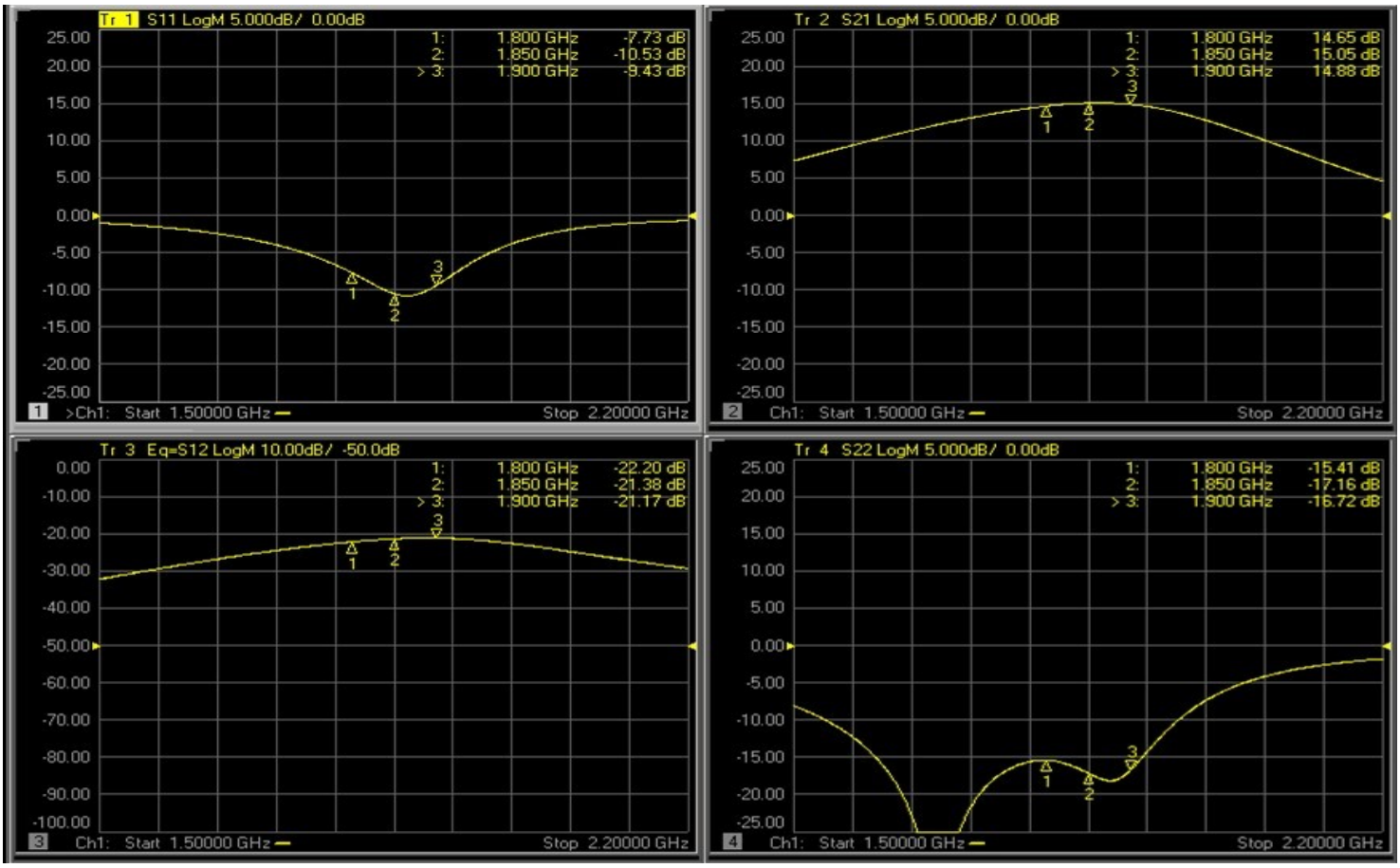


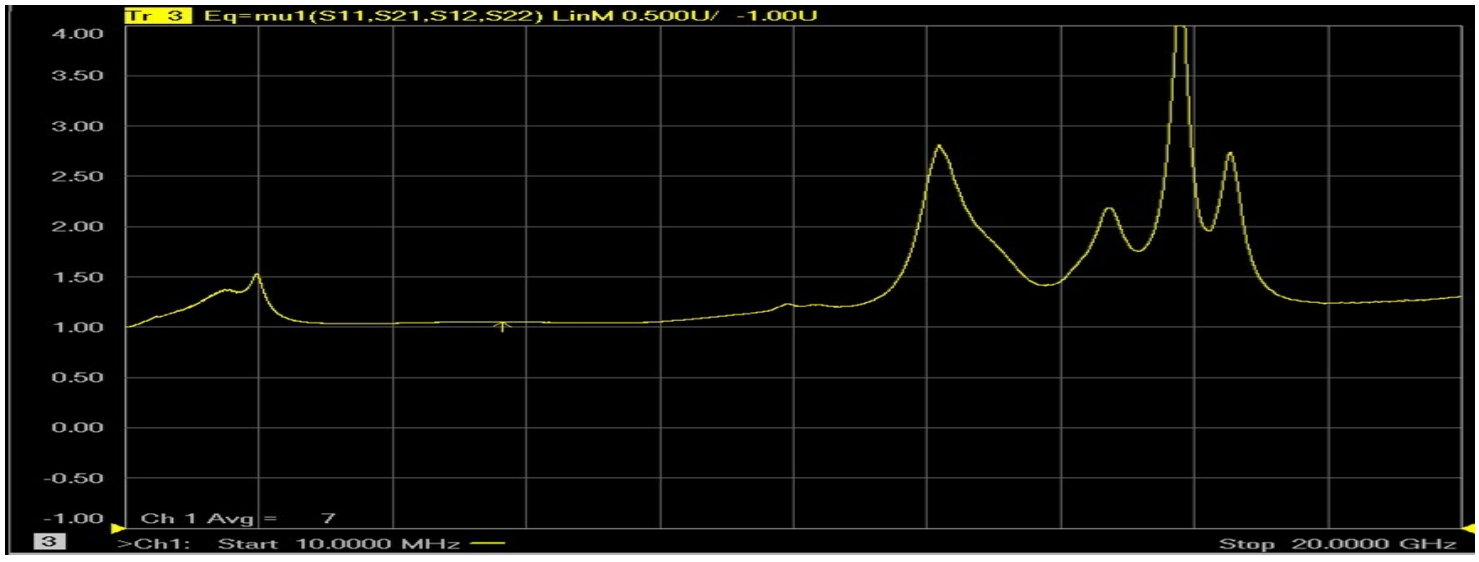
GRF5115 Evaluation Board Data: (0.9 and 1.8 GHz Tunes)





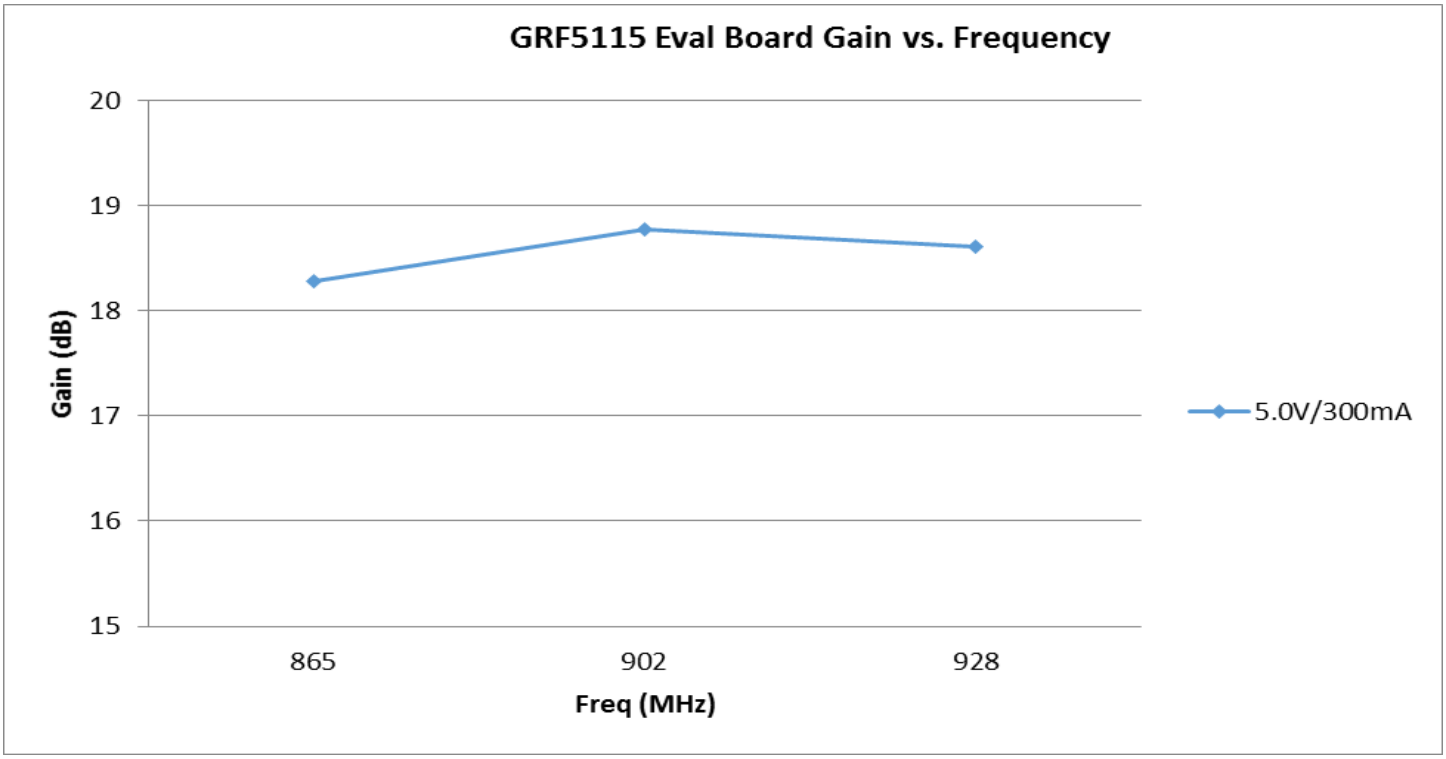
GRF5115 Evaluation Board S-Pars: (1.8 to 1.9 GHz Tune)

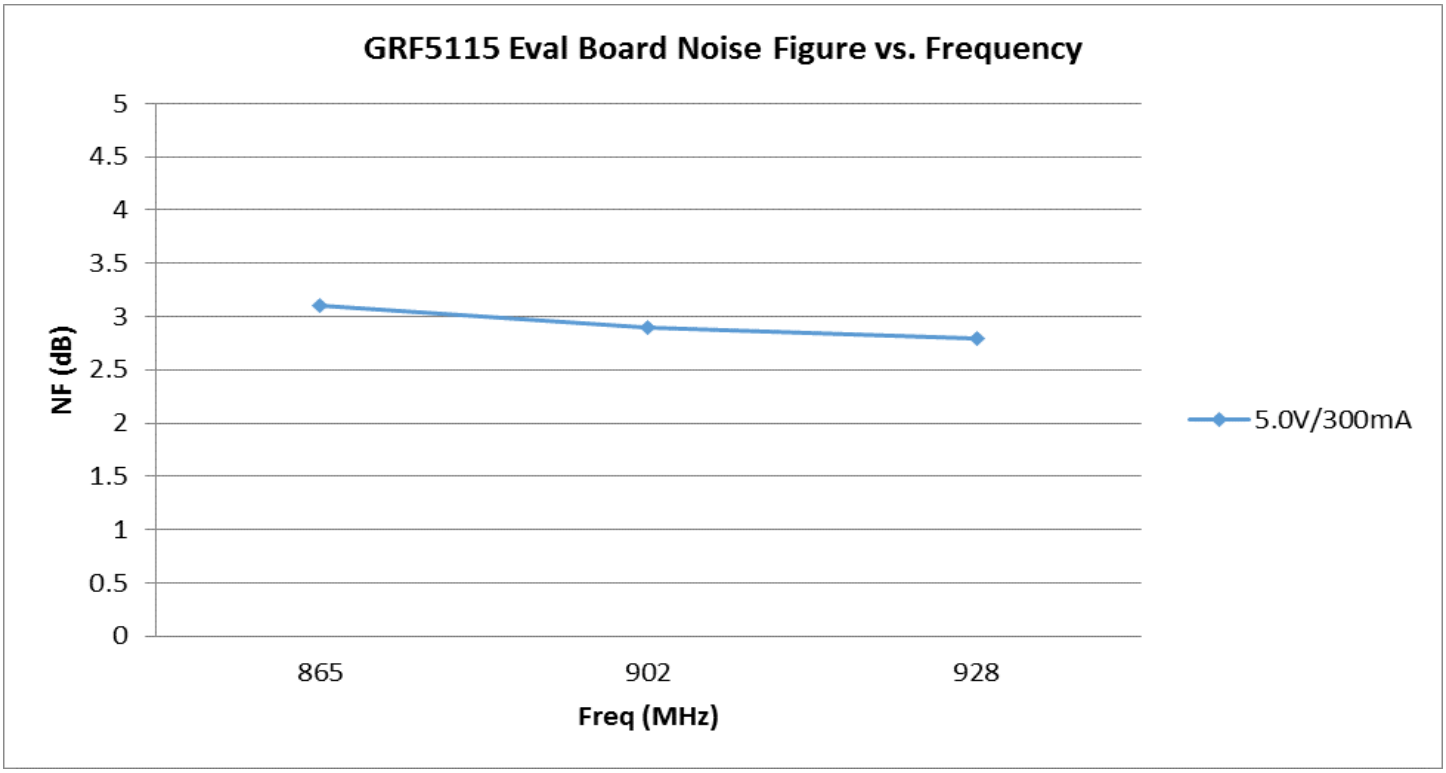




Note: Mu factor >= 1.0 implies unconditional stability.

GRF5115 Evaluation Board Data: (865 to 928 MHz Tune)





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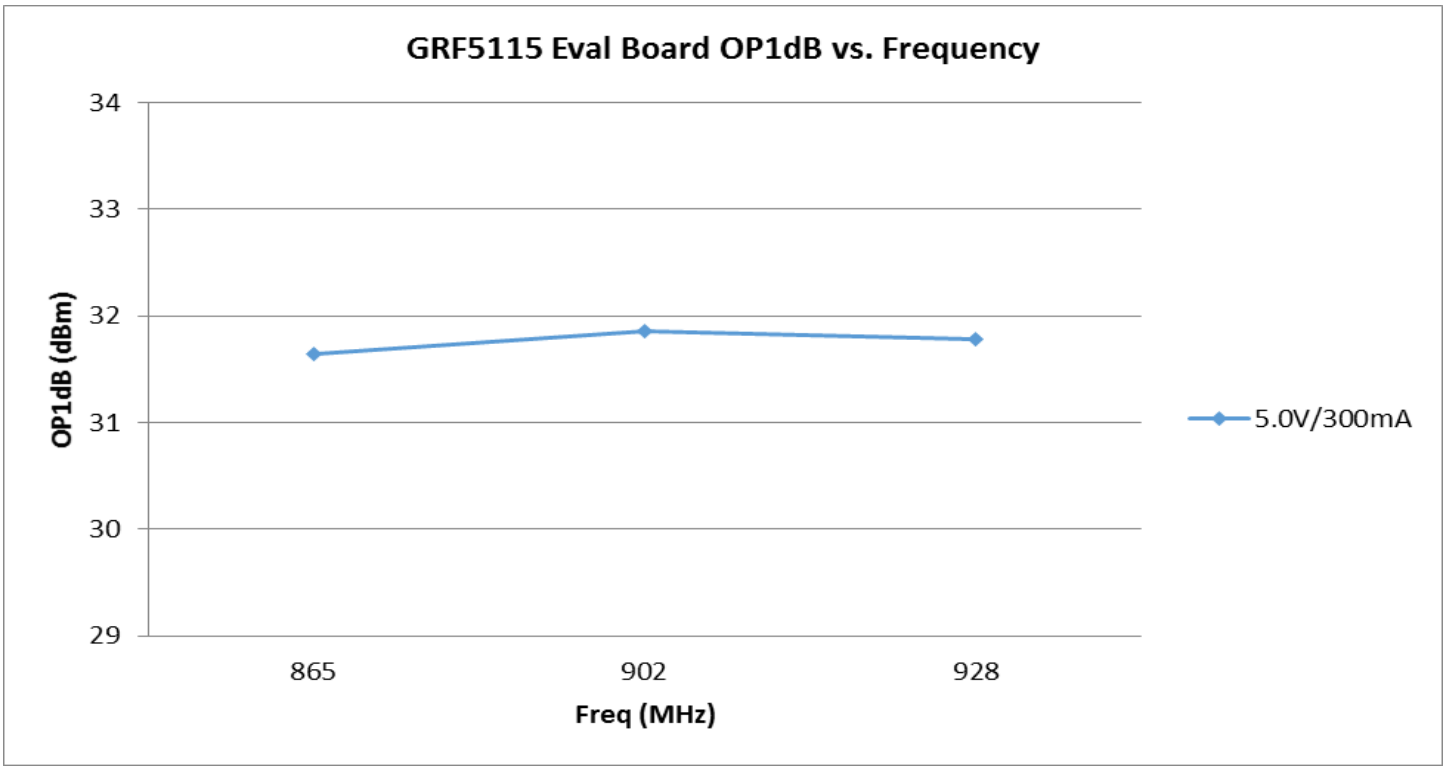

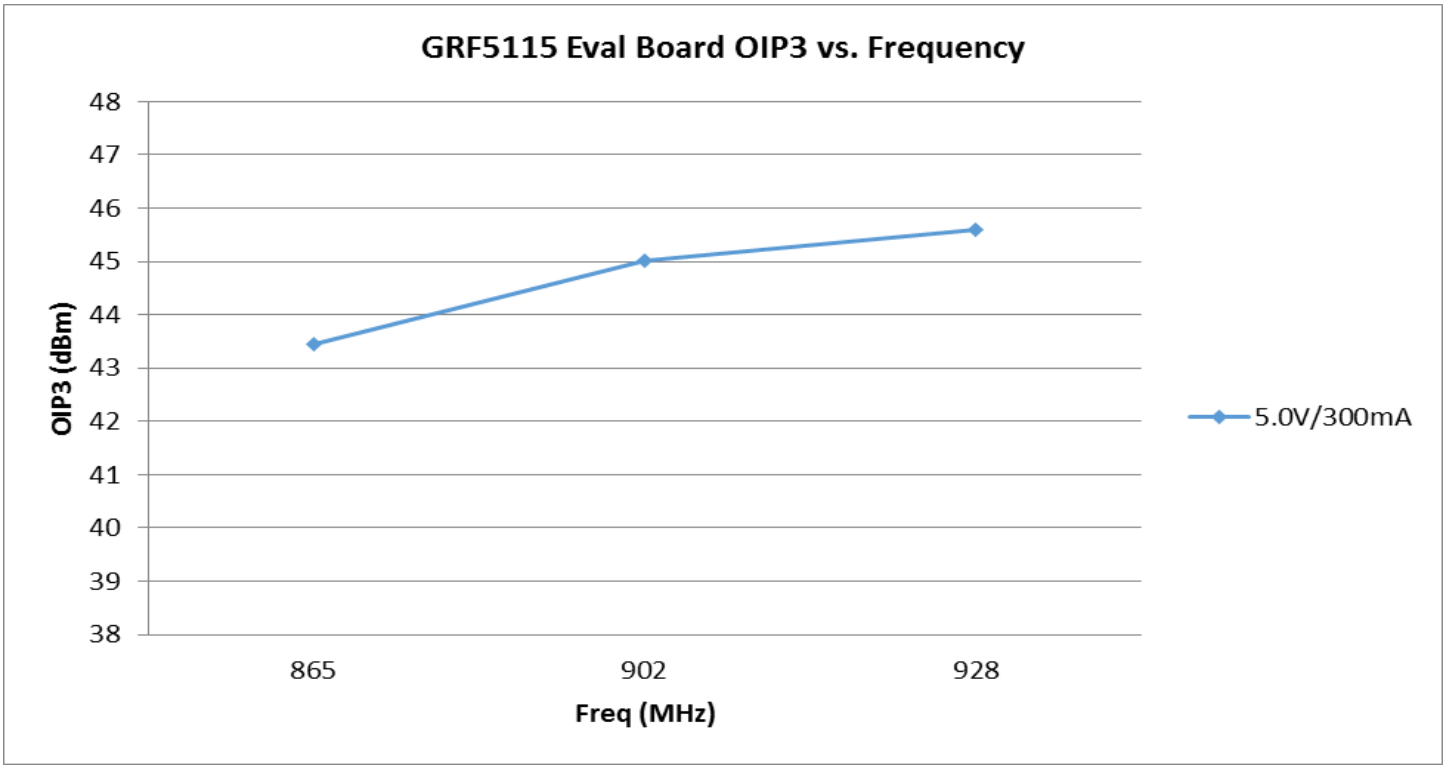

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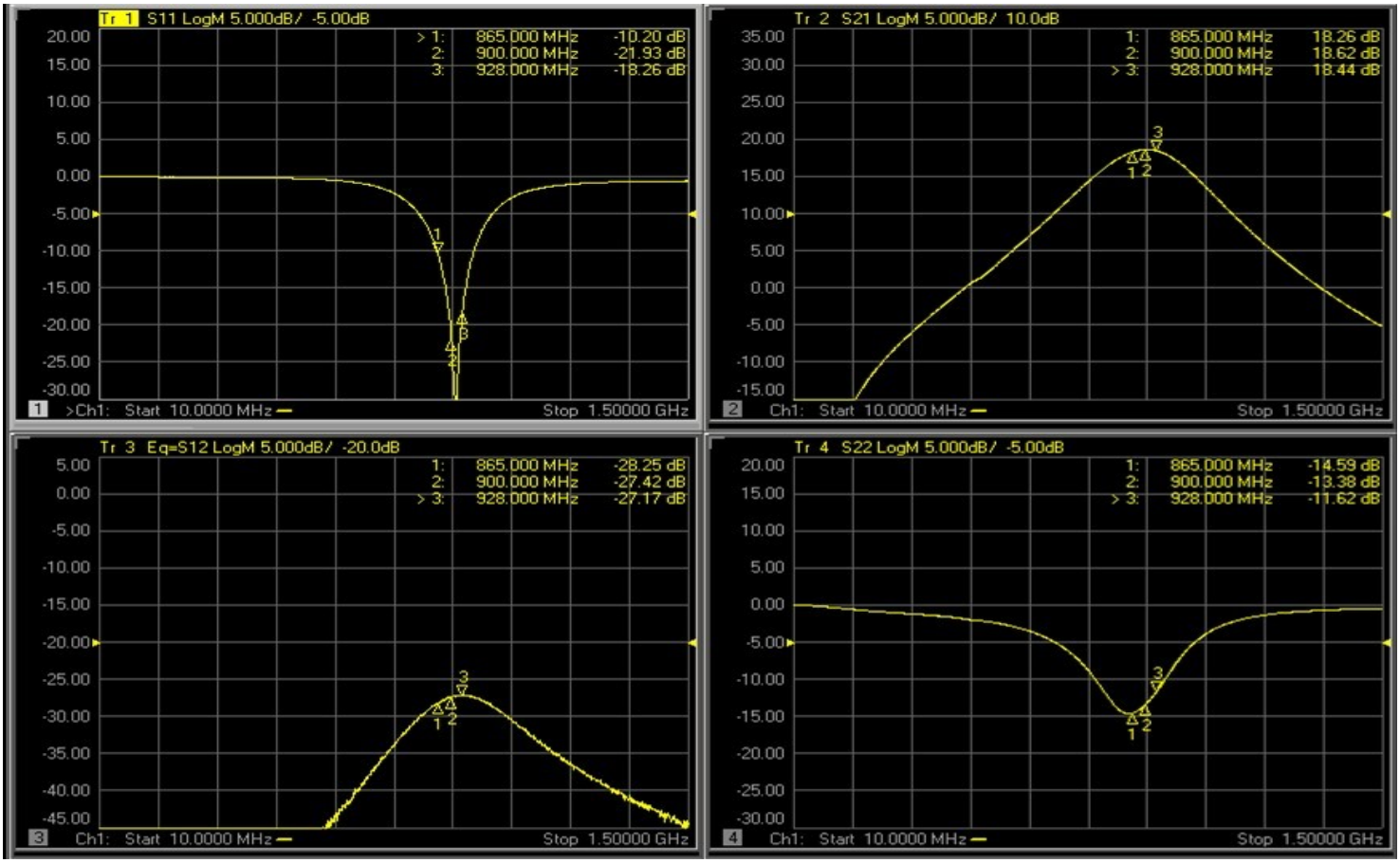

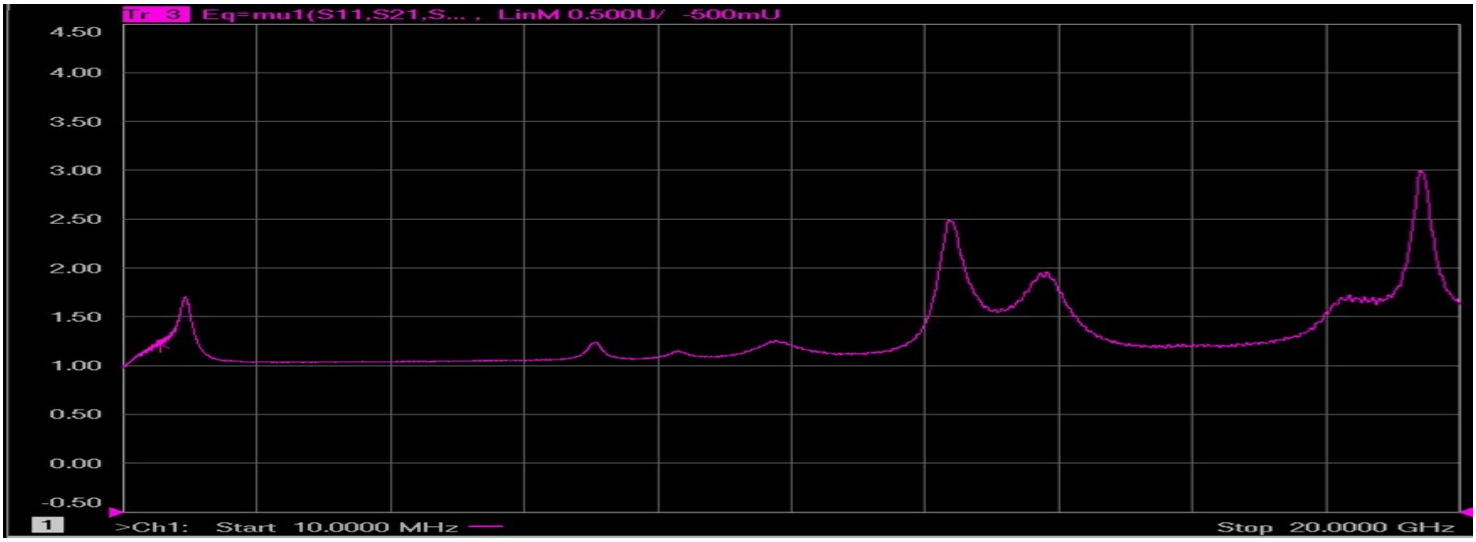

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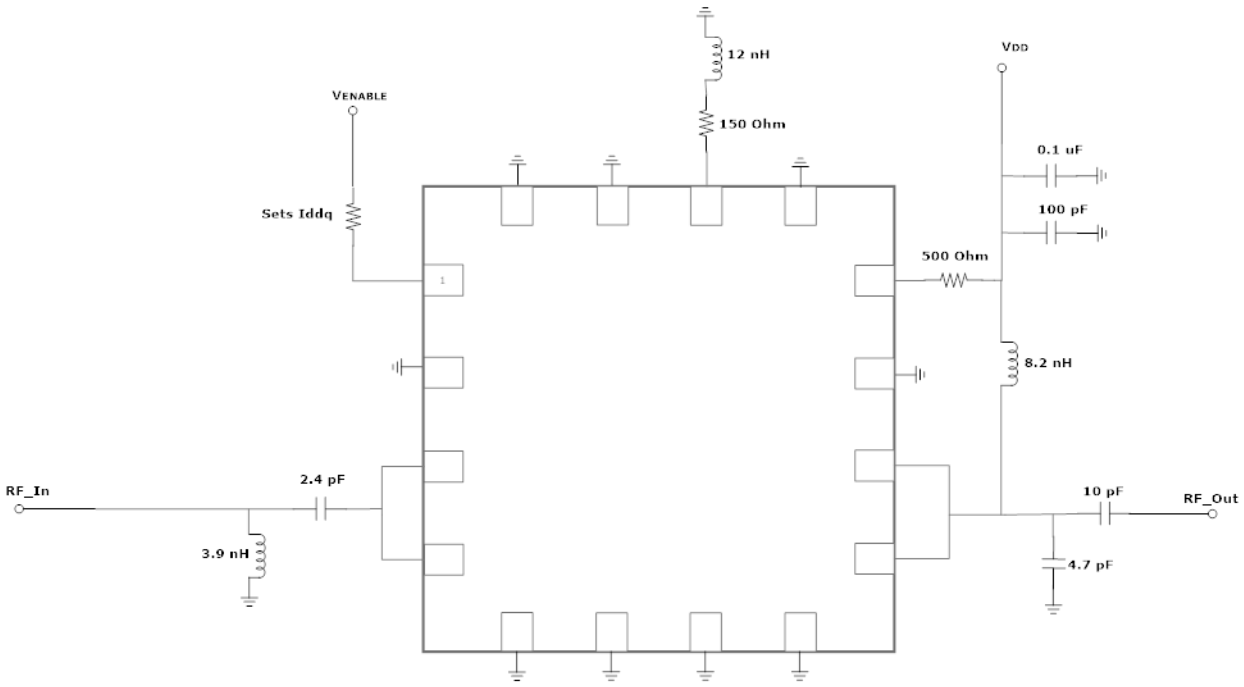

GRF5115 Application Schematic: (1.8 to 1.9 GHz)

Advance

Data Sheet Release Status:	Notes
Advance	S-parameter and NF data based on EM simulations for the fully packaged device using foundry supplied transistor s-parameters. Linearity estimates based on device size, bias condition and experience with related devices.
Preliminary	All data based on evaluation board measurements in the Guerrilla RF Applications Lab.
Released	All data based on device qualification data. Typically, this data is nearly identical to the data found in the preliminary version. Max and min values for key RF parameters are included.