

TQP3M9041 –4.5-4.6GHz Reference Design

Product Overview

The TQP3M9041 is a high linearity, ultra-low noise figure dual device amplifier in a 4x4 mm package. At 2600 MHz in a balanced configuration, this LNA provides 18.4dB gain, 20.2 dBm IIP3 and 0.8 dB noise figure. The part does not require a negative supply for operation and is bias adjustable for both drain current and voltage. The device is housed in a green/RoHS compliant industry standard QFN package.

The TQP3M9041 consists of a single monolithic GaAs E-pHEMT die and integrates bias circuitry as well as shut-down capability allowing the LNA to be useful for both FDD and TDD applications.

The TQP3M9041 is optimized for the 2500–2700 MHz band and also can be used outside of the band. Qorvo offers pin-compatible dual LNAs for 500–1500 MHz (TQP3M9039) and 1500–2300 MHz (TQP3M9040). The balanced amplifier is optimized for high performance receivers in wireless infrastructure and can be used for base-station transceivers or tower-mounted amplifiers.

Referenced Documents

The reference documents below take precedence over the contents of this application note and should always be consulted for the latest information.

TQP3M9041 Data Sheet.

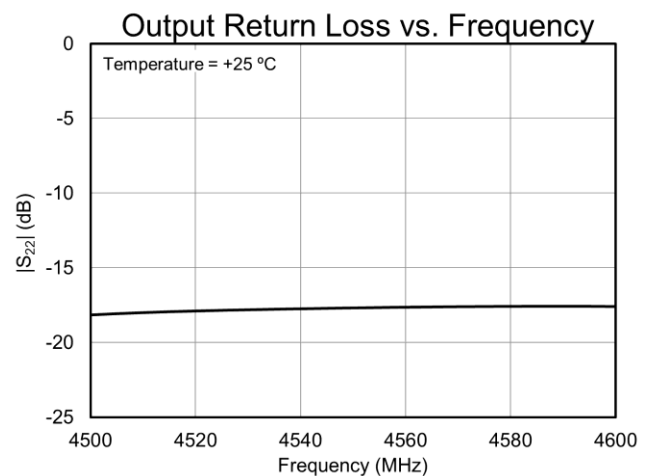
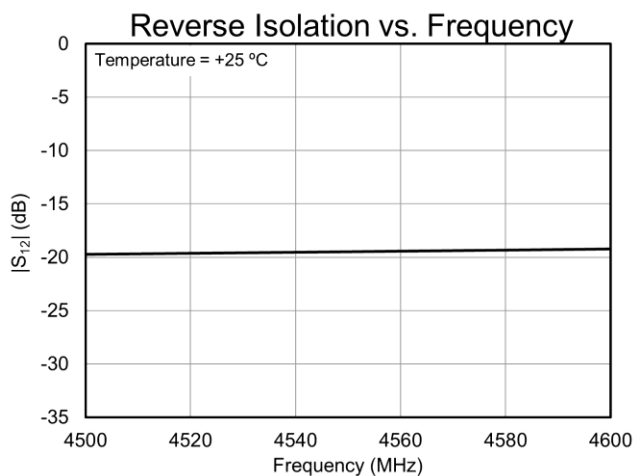
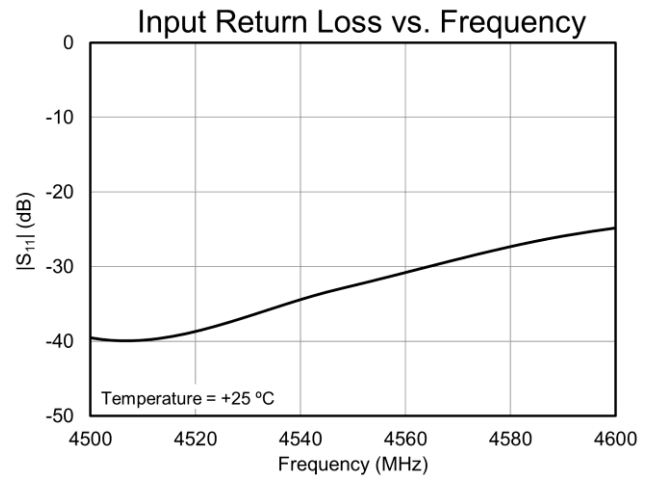
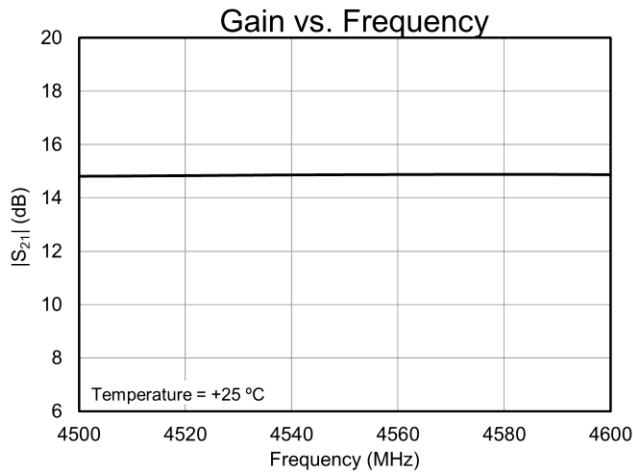
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Application Electrical Performance

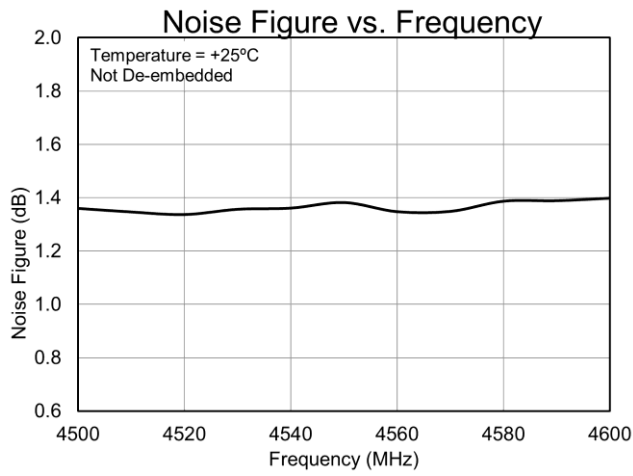
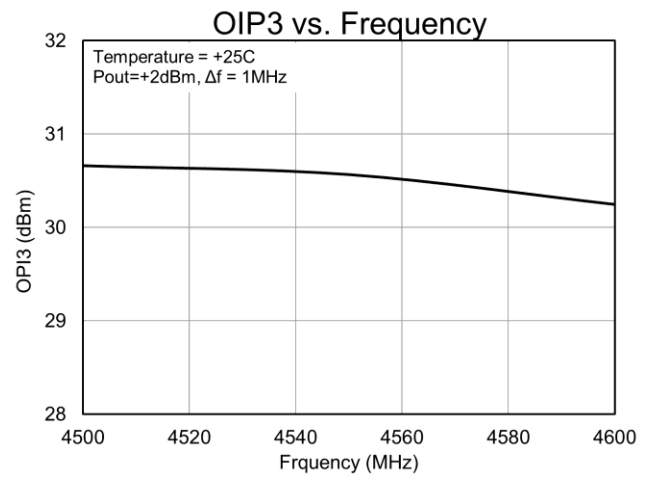
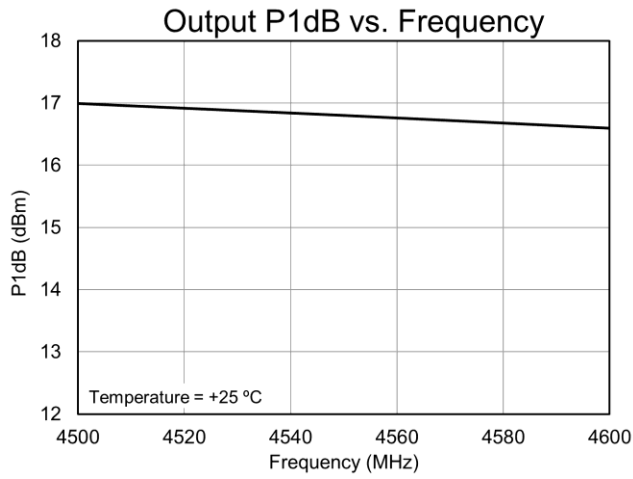
Qorvo Field and Factory Applications Engineers are available to provide technical assistance for determining appropriate matching networks for a particular application.

Parameter	Conditions	Typical Value			Units
		4500	4550	4600	
Frequency		4500	4550	4600	MHz
Gain		14.9	15.0	14.9	dB
Input Return Loss		39.8	34.0	25.6	dB
Output Return Loss		18.1	18.1	18.1	dB
Output P1dB		17.0	16.8	16.6	dBm
OIP3	Pout=+5 dBm/tone, Δf=1 MHz	30.6	30.6	30.2	dBm
Noise Figure	Not De-embedded	1.36	1.38	1.39	dB
Device Current, I _{DD}		57			mA

Test conditions unless otherwise noted: V_{cc} = +4.35 V, Temp = +25°C, 50 Ω system.



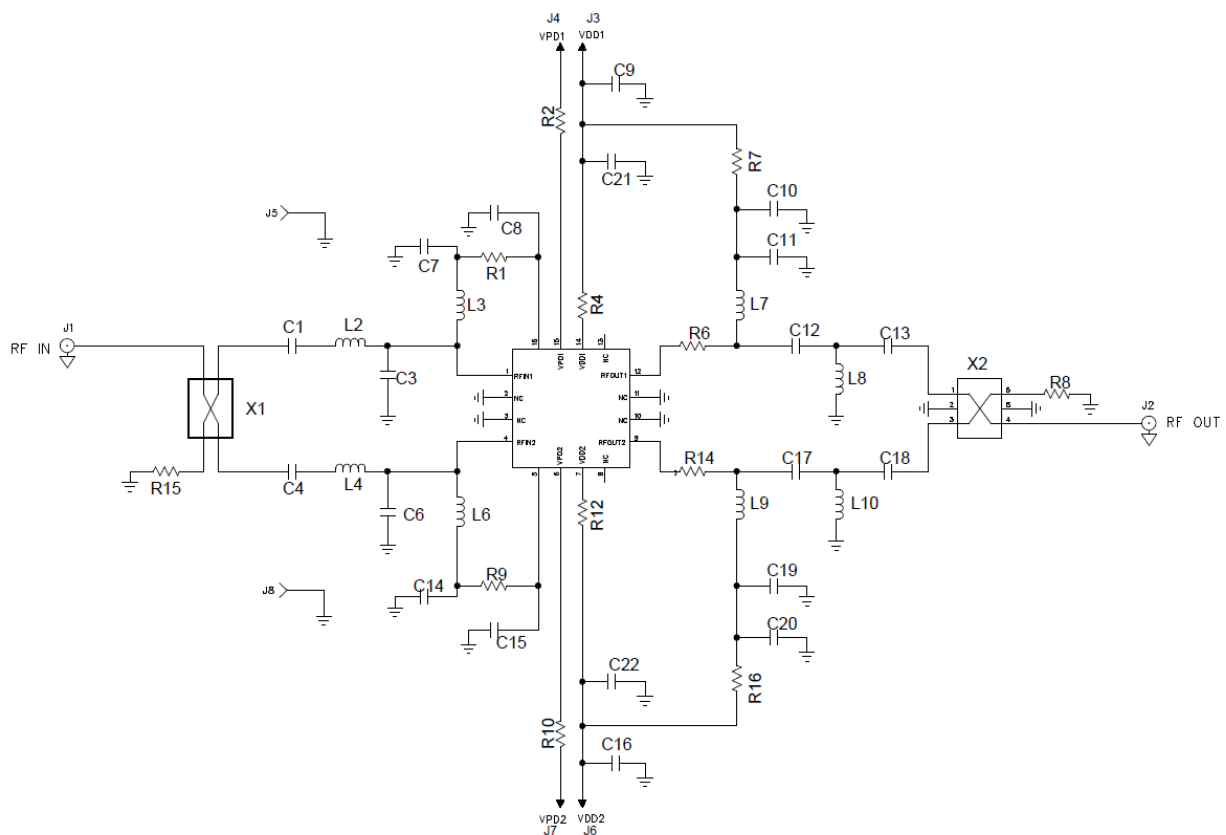
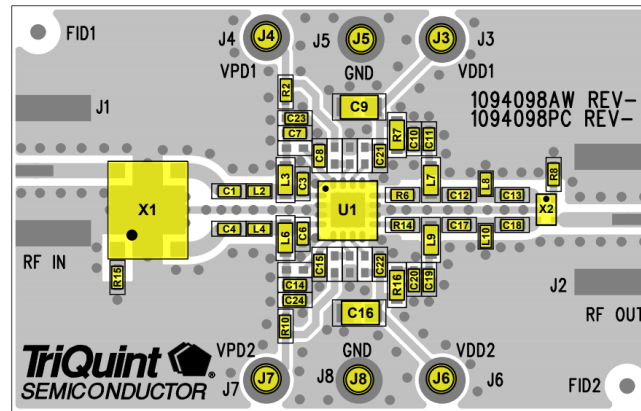
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Evaluation Board Information

Evaluation Board and Schematic



Notes:

1. See Evaluation Board PCB Information section for material and stack-up.

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Evaluation Board – Bill of Material

Reference Des.	Value	Description	Manuf.	Part Number
n/a	n/a	Printed Circuit Board	Qorvo	
U1	n/a	Dual LNA	Qorvo	TQP3M9041
X1, X2	n/a	Hybrid Coupler	RN2	CMX45E03
R1, R9	330 Ω	RES, 0402, +/-5%, 1/10W	Various	
R8, R15	51 Ω	RES, 0402, +/-5%, 1/10W	Various	
R4, R12	2.7K Ω	RES, 0402, +/-5%, 1/10W	Various	
R7, R16	6.8 Ω	RES, 0603, +/-5%, 1/8W	Various	
R2, R10, C1, C4, C13, C18	0 Ω	RES, 0402, +/-5%, 1/10W	Various	
R6, R14	1 nH	IND, 0402, +/-1%, 600mA	Toko	
L2, L4	0.95 pF	CAP, 0402, +/-0.02pF, 50V	AVX	
C12, C17	10 pF	CAP, 0402, +/-5%, 50V	Murata	
C11, C19, C21, C22	100 pF	CAP, 0402, +/-5%, 50V	Panasonic	ECJ-0EC1H101J
C7, C14	22 pF	CAP, 0402, +/-5%, 50V	Panasonic	ECJ-0EC1H220J
C9, C16	0.01 uF	CAP, 0805, +/-5%, 50V, X7R	Various	
C10, C20	1000 pF	CAP, 0402, +/-10%, 50V	Various	
L3, L6, L7, L9	18 nH	IND, 0603, +/-5%, 600mA	Coilcraft	0603CS-18NXJL
C8, C15, C3, C6, L8, L10	DNP			

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Additional Information

For information on ESD, Soldering Profiles, Packaging Standards, Handling and Assembly, please contact Qorvo for general guidelines.

Contact Information

For the latest specifications, additional product information, worldwide sales and distribution locations:

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