

TQP3M9035 – 0.05-0.5GHz Reference Design

Product Overview

The TQP3M9035 is a high-linearity, low noise gain block amplifier in a low-cost surface-mount package. At 1900 MHz, the amplifier typically provides 16.5 dB gain, +37 dBm OIP3, and 0.65 dB Noise Figure. The LNA is also designed to be broadband without the requirement for external matching. The device is housed in a lead-free/green/RoHScompliant industry-standard 2x2 mm package.

The TQP3M9035 has the benefit of having high linearity while also providing very low noise across a broad range of frequencies. This allows the device to be used in both receive and transmit chains for high performance systems. The amplifier is internally matched using a high performance E-pHEMT process and only requires an external RF choke and blocking/bypass capacitors for operation from a single +5V supply. The low noise amplifier integrates a shut-down biasing capability to allow for operation for TDD applications.

The TQP3M9035 covers the 50–6000 MHz frequency band and is targeted for wireless infrastructure or other applications requiring high linearity and/or low noise figure.

Referenced Documents

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

TQP3M9035 Data Sheet.

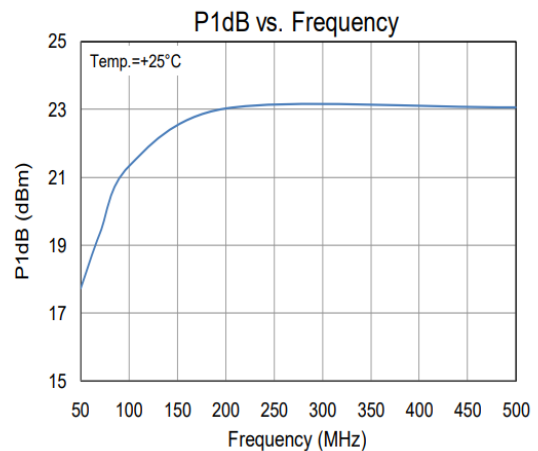
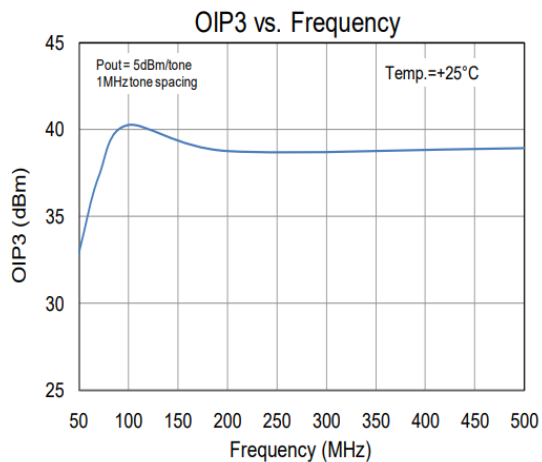
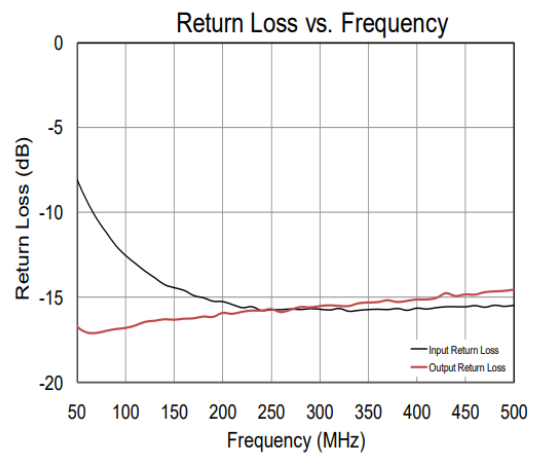
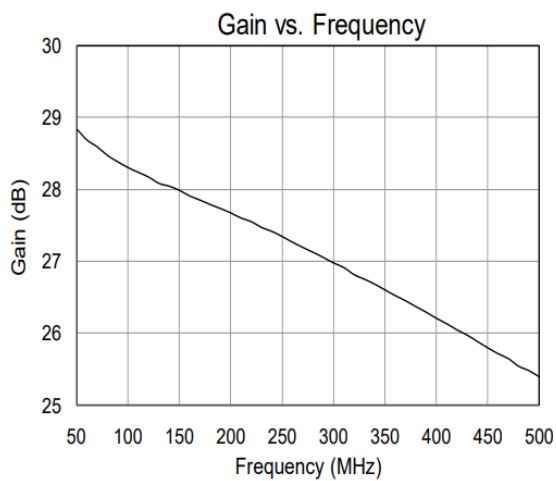
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Application Electrical Performance

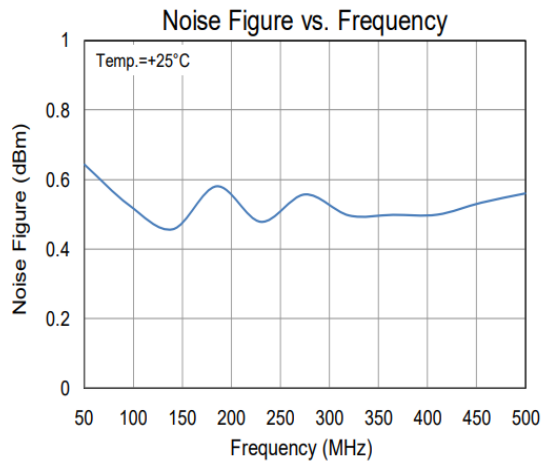
Qorvo Field and Factory Applications Engineers are available to provide technical assistance for determining appropriate matching networks for a particular application.

Parameter	Conditions	Typical Value				Units
Frequency		50	100	200	500	MHz
Gain		28.8	28.3	27.7	25.4	dB
Input Return Loss		8.0	12.5	15.2	15.4	dB
Output Return Loss		16.7	16.8	15.9	14.5	dB
Output P1dB		17.7	21.3	23.0	23.1	dBm
OIP3	Pout=+5 dBm/tone, Δf=1 MHz	32.9	40.3	38.8	28.9	dBm
Noise Figure	De-embedded	0.64	0.52	0.56	0.56	dB
Device Current, I _{DD}		115				mA

Test conditions unless otherwise noted: VDD = +5 V, Temp = +25°C, 50 Ω system.



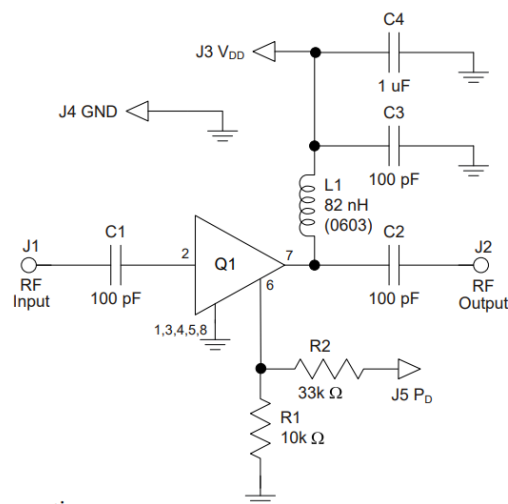
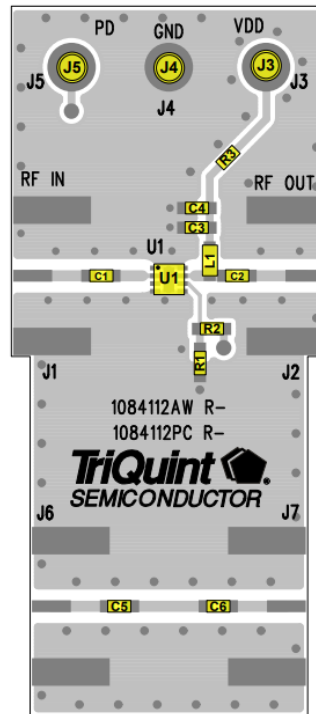
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Evaluation Board Information

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	High Linearity LNA Gain Block	Qorvo	TQP3M9035
R1	10 K Ω	Resistor, Chip, 0402, 5%, 1/16W	Various	
R2	33 K Ω	Resistor, Chip, 0402, 5%, 1/16W	Various	
R3	0 Ω	Resistor, Chip, 0402, 5%, 1/16W	Various	
L1	82 nH	Inductor, 0603, 5%, Ceramic	Various	
C4	1.0 μ F	Cap., Chip, 0402, 10%, 10V, X5R	Various	
C1, C2, C3, C5, C6	100 pF	Cap., Chip, 0402, 5%, 50V, NPO/COG	Various	

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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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