APPLICATION NOTE

Classification | PRIVATE

QPA9801 - 1.215-1.7GHz Reference Design

Product Overview

The QPA9801 is a balanced amplifier module with embedded hybrid couplers to convert to single ended input and output ports. The module has an enable pin to allow for shutting down of the amplifier. The module requires minimal external components which are VCC choke inductors, decoupling caps and resistors for bias control.

The QPA9801 provides 26 dBm P1dB with 20 dB gain and 42 dBm OIP3 across a wide frequency range of 1805-2400 MHz to cover the 3GPP Bands 1, 2, 3, 4, 10, 23 and 30. The linear driver amplifier is targeted for use in wireless infrastructure where high linearity, medium power and high integration is required. The balanced amplifier configuration provides very good input and output VSWR and is especially ideal as the output stage in a Macrocell transceiver board that connects to the high power amplifier (HPA) board through a long cable or microstrip trace.

The QPA9801 is packaged in a small 5 x 5 mm leadless package that is internally matched to 50 Ω on all RF ports.

Referenced Documents

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

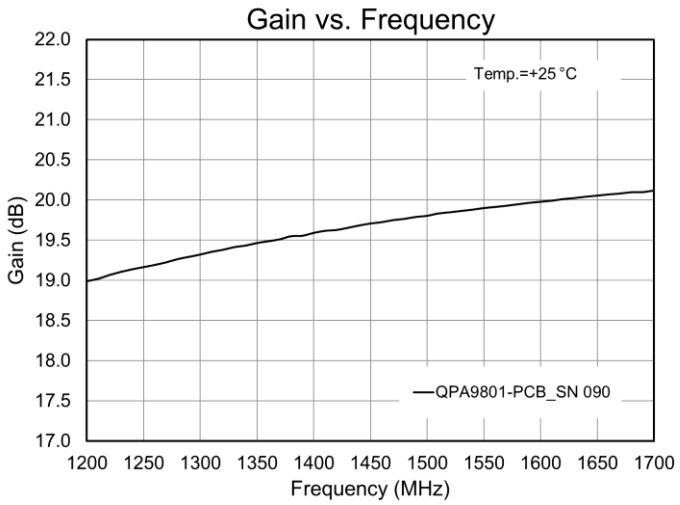
QPA9801 Data Sheet.

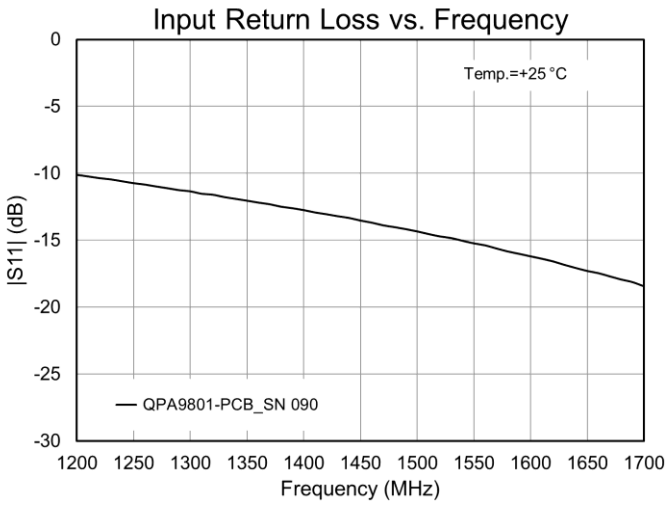
Application Electrical Performance

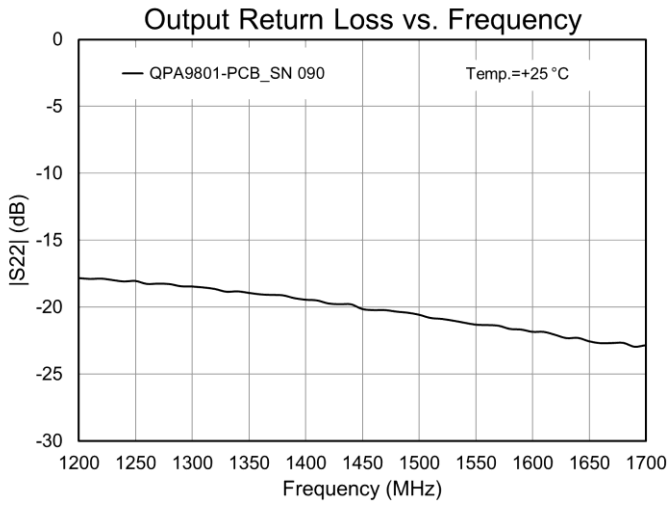
Qorvo Field and Factory Applications Engineers are available to provide technical assistance for determining appropriate matching networks for a particular application.

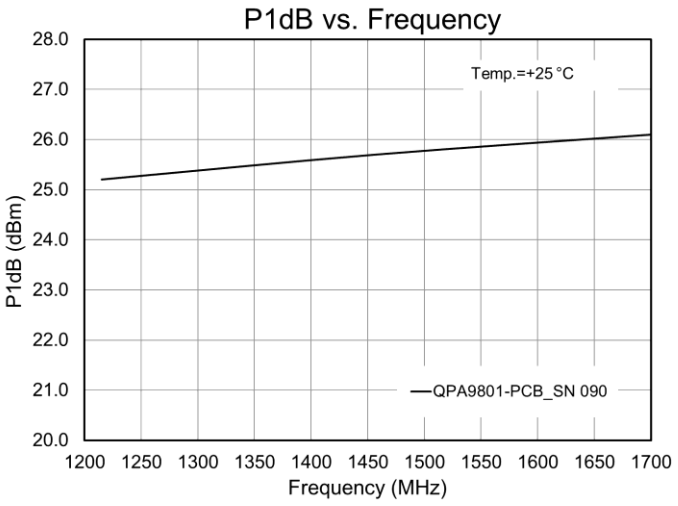
Parameter	Conditions	Typical Value			Units
Frequency		1215	1457	1700	MHz
Gain		19.1	19.7	20.1	dB
Input Return Loss		10.3	13.4	17.2	dB
Output Return Loss		17.3	20.2	22.8	dB
Output P1dB		+25.2	+25.7	+26.1	dBm
OIP3	Pout = +10dBm/tone, Δf = 1 MHz	+43.1	+41.6	+41.0	
Device Current	IVCC_A and IVCC_B	296			mA

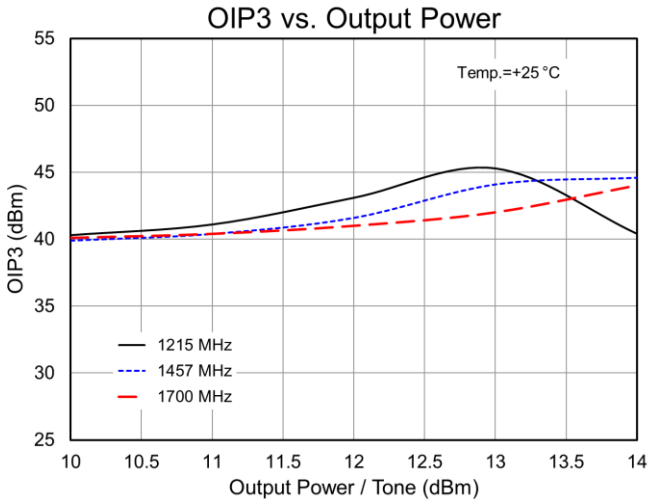
Test conditions unless otherwise noted: VccA = VccB = Vcc_cntrl1s = +5V, Ven = +1.8V, Icq=296mA Temp = +25 °C, 50 Ω system.





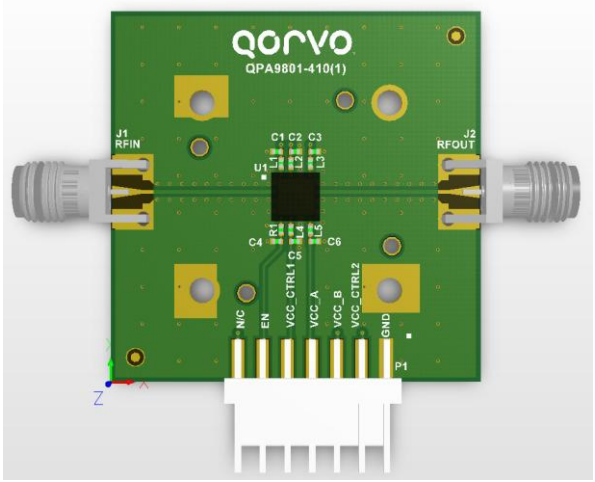


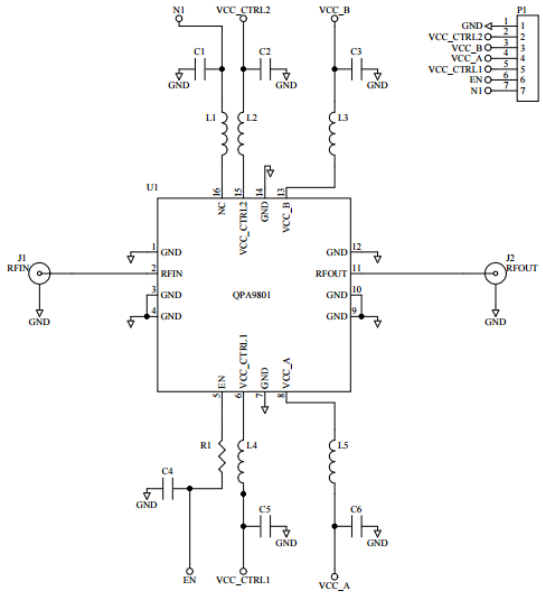




Evaluation Board Information

Evaluation Board and Schematic





Notes:

1. Components shown on PCB layout but not on the schematic are not used.

Evaluation Board – Bill of Material

Reference Des.	Value	Description	Manuf.	Part Number
n/a	n/a	Printed Circuit Board		
U1	n/a	1/4 Watt Balanced Amplifier	Qorvo	QPA9801
L3, L5	18 nH	Inductor, wire wound	Coilcraft	
R1, L4	0 Ω	Resistor, Chip, Jumper	Various	
C3, C6	1 uF	Capacitor, Chip, 10%, 10V, X5R	Various	
C5	100 pF	Capacitor, Chip, NPO, 5%, 50V, NPO/COG	Various	
L1, C1, L2, C2, C4		DNI		

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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