

# QPA9442 – 1.68-2.3GHz Reference Design

## Product Overview

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The QPA9442 is a wideband, high linearity driver amplifier. With optimized tuning, this device can provide up to 19dB of gain and achieve an output P1dB of 1W. The amplifier can provide excellent linearity performance with +46dBm output 3<sup>rd</sup> order intercept (OIP3), making it perfectly suited for 5G base station applications.

The QPA9442 is tunable over all cellular bands in the entire operating frequency band of 0.6 – 5.0 GHz and incorporates a shut-down function through the  $V_{PD}$  pin.

The QPA9442 is housed in a 20-pin 4X4mm SMT package.

## Referenced Documents

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

QPA9442 Data Sheet.

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## Typical Performance, 1.68 – 2.3 GHz Reference Design

Parameter	Conditions	Typical Value			Units
Frequency		1680	2000	2300	MHz
Gain		15.0	15.1	14.6	dB
Input Return Loss		8.9	15.8	10.4	dB
Output Return Loss		10.9	10.0	16.9	dB
Output P1dB		29.0	28.8	29.6	dB
Output P3dB		TBD	TBD	TBD	dBm
Output IP3	Pout = +15dBm/tone, $\Delta f = 1\text{MHz}$	+40.1	+43.6	+46.4	dBm
ACPR	Pout=+17 dBm, 1C LTE, 20MHz, 8.5dB PAR	TBD	-62.3	TBD	dBc
Device Current	V <sub>CC</sub> and V <sub>BIAS</sub> combined	240			mA

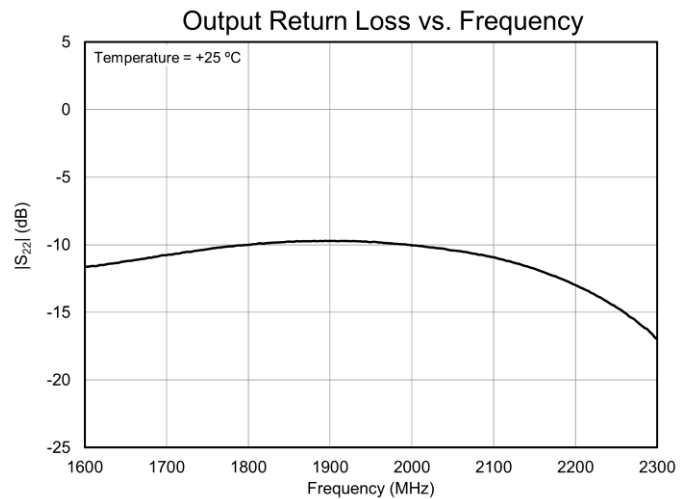
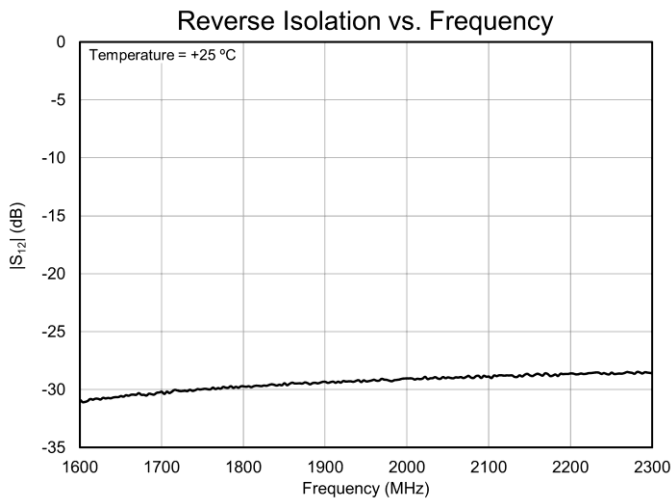
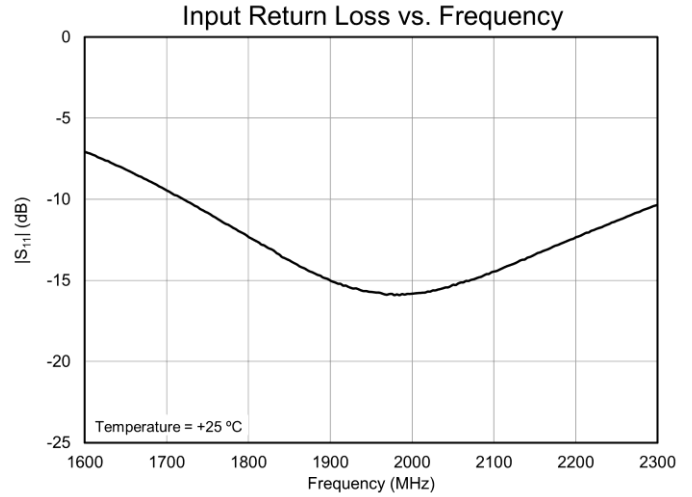
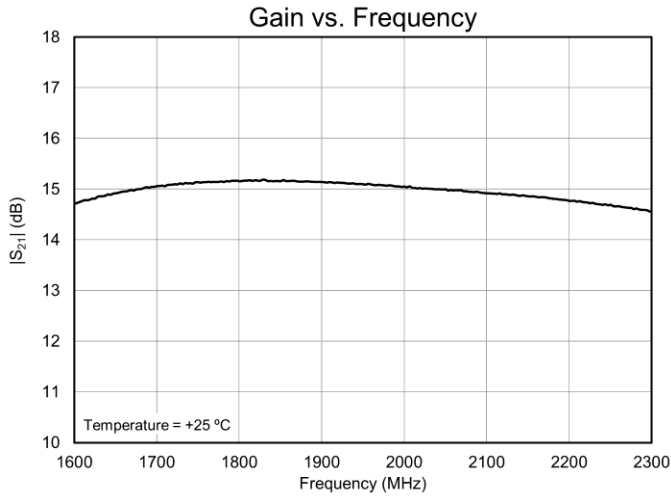
**Notes:**

1. Test Conditions unless otherwise noted: V<sub>CC</sub> = V<sub>BIAS</sub> = +5.0 V, V<sub>PD</sub> = +1.8 V, I<sub>OQ</sub> = 235 mA, Temp = +25 °C, 50 Ω system.

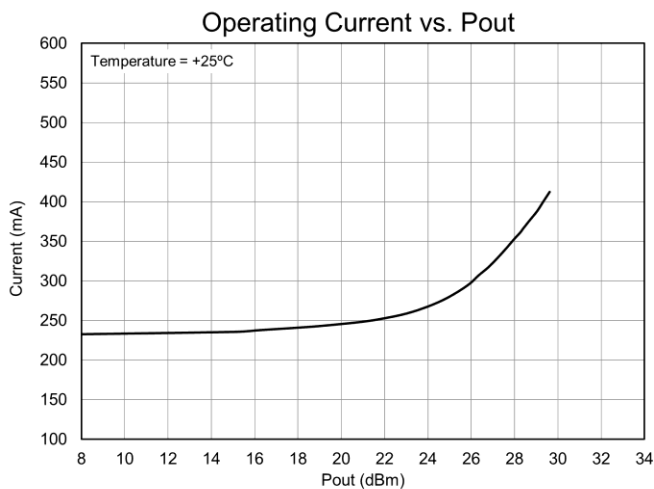
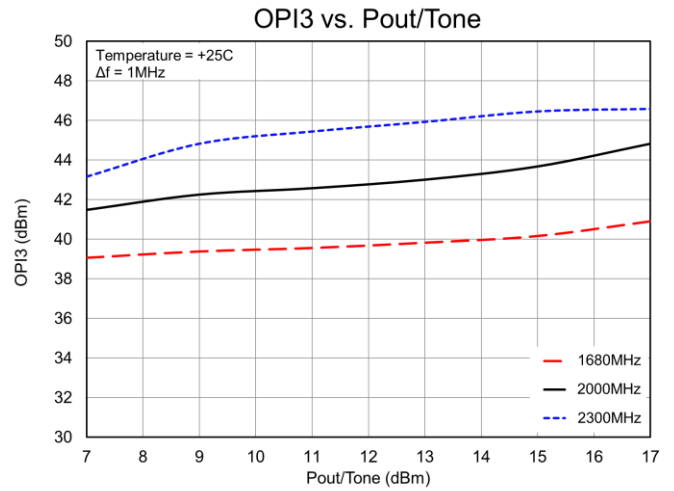
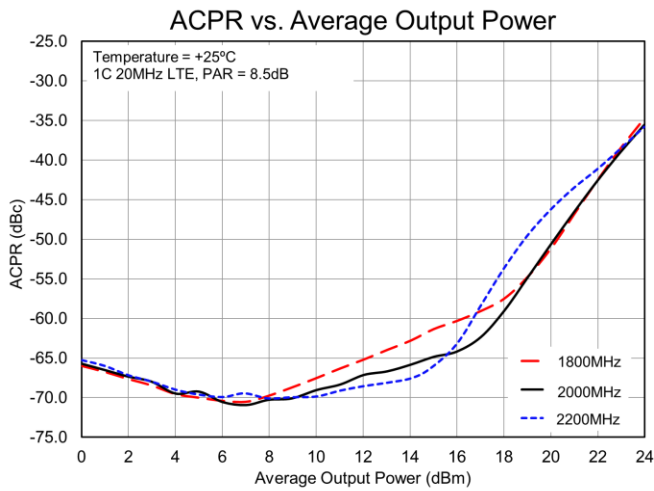
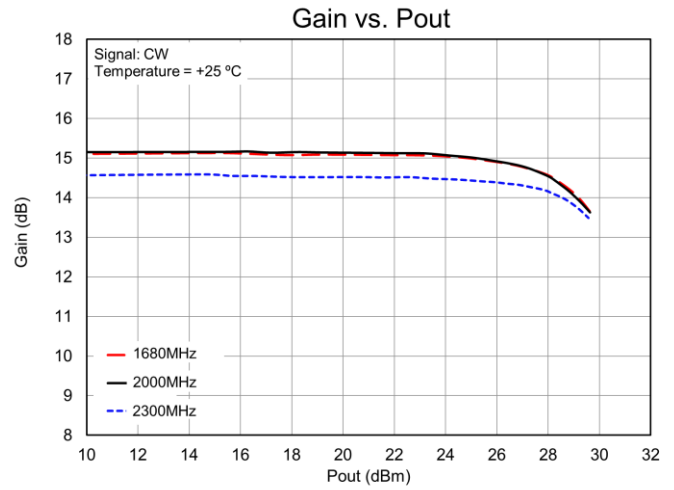
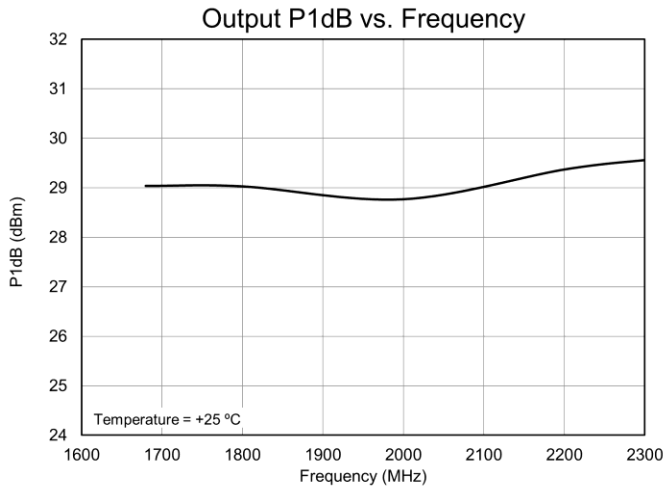
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## Performance Plots

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



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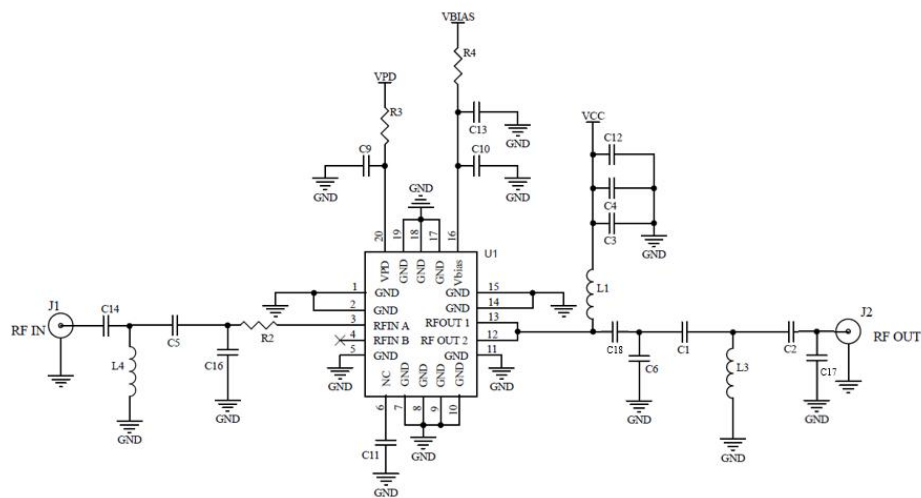
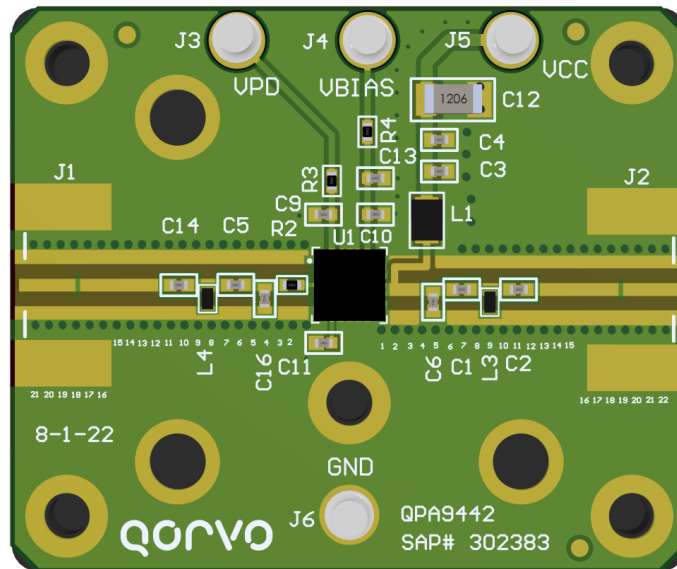


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## Evaluation Board Information

### Evaluation Board (EVB) Layout Assembly and Schematic



**Notes:**

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

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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	1 W High Linearity Amplifier	Qorvo	QPA9442
C1	2.7 pF	CAP, 0402, $\pm 0.1$ pF, 50V, HI-Q	Various	
C2	33 pF	CAP, 0402, 5%, 50V, HI-Q	Various	
C14, C18	22 pF	CAP, 0402, 5%, 50V, HI-Q	Various	
C3, C9, C10	220 pF	CAP, 0402, 5%, 50V, C0G	Various	
C5	1.4 pF	CAP, 0402, $\pm 0.1$ pF, 50V, HI-Q	Various	
C4, C13	1 $\mu$ F	CAP, 0402, 10%, 10V, X7S	Various	
C6	2.7 pF	CAP, 0402, $\pm 0.1$ pF, 50V, HI-Q	Various	
C11	DNP	n/a	n/a	
C12	10 $\mu$ F	CAP, 1206, 10%, 25V, X7R	Various	
C16	1.6 pF	CAP, 0402, $\pm 0.1$ pF, 50V, HI-Q	Various	
C17	0.4 pF	CAP, 0402, $\pm 0.1$ pF, 50V, HI-Q	Various	
L1	5.6 nH	IND, 0805, 2%, W/W	Murata	
L3	3.9 nH	IND, 0402, $\pm 0.1$ nH, W/W	Murata	
L4	5.1 nH	IND, 0402, $\pm 0.1$ nH, W/W	Various	
R2	4.3 $\Omega$	RES, 0402, 1/10W	Various	
R3, R4	0 $\Omega$	RES, 0402, 1/10W	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:

**Web:** [www.qorvo.com](http://www.qorvo.com)

**Tel:** 1-844-890-8163

**Email:** [customer.support@qorvo.com](mailto:customer.support@qorvo.com)

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