

QPA9442 - 2.3-2.4GHz Reference Design

Product Overview

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 3rd 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.

APPLICATION NOTE: QPA9442 - 2.3-2.4GHz Reference Design

Typical Performance, 2.3 – 2.4 GHz Reference Design

Parameter	Conditions	Typical Value			Units
Frequency		2300	2350	2400	MHz
Gain		17.9	17.9	17.6	dB
Input Return Loss		10.3	11.2	9.0	dB
Output Return Loss		15.9	23.5	19.9	dB
Output P1dB		+30.1	+29.7	+29.0	dB
Output P3dB		+31.1	+30.6	+29.8	dBm
Output IP3	Pout = +15dBm/tone, Δf = 1MHz	+39.5	+40.0	+41.3	dBm
ACPR	Pout=+17 dBm, 1C LTE, 20MHz, 8.5dB PAR	-48.5	-49.2	-51.5	dBc
Device Current	V _{CC} and V _{BIAS} combined	240			mA

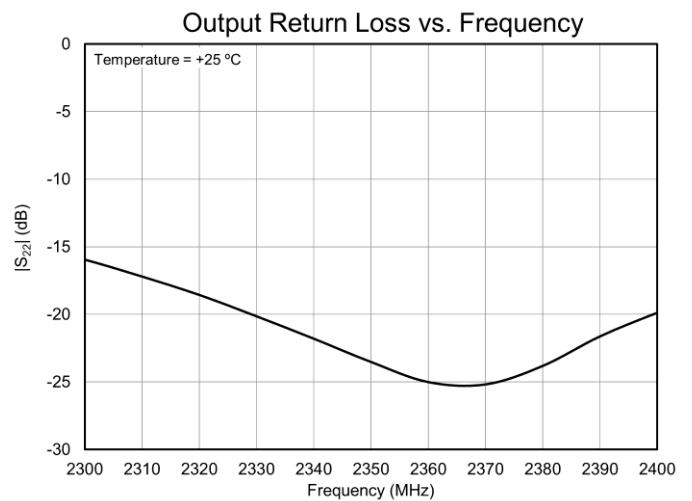
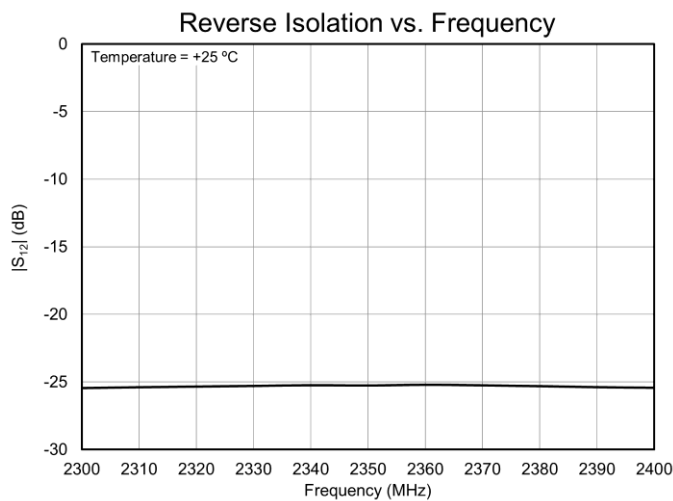
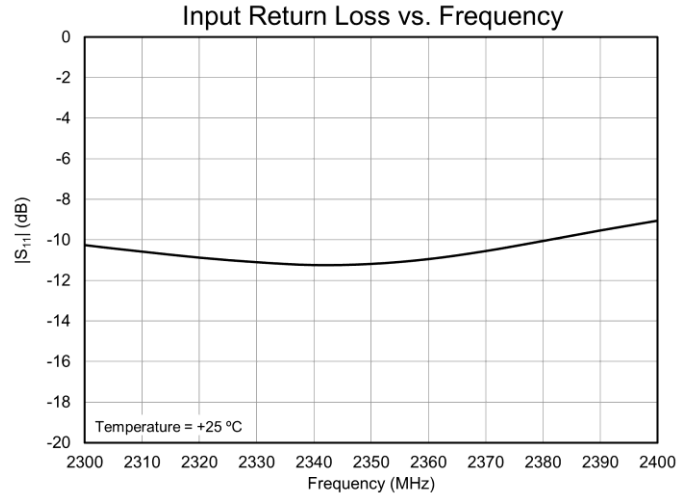
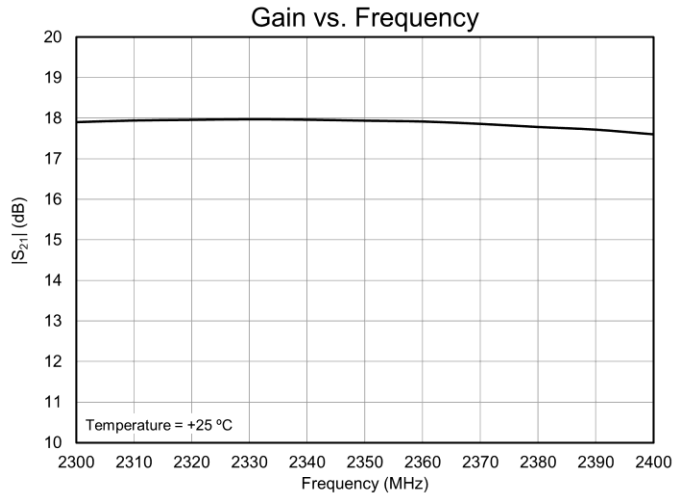
Notes:

1. Test Conditions unless otherwise noted: V_{CC} = V_{BIAS} = +5.0 V, V_{PD} = +1.8 V, I_{OQ} = 235 mA, Temp = +25 °C, 50 Ω system.

APPLICATION NOTE: QPA9442 - 2.3-2.4GHz Reference Design

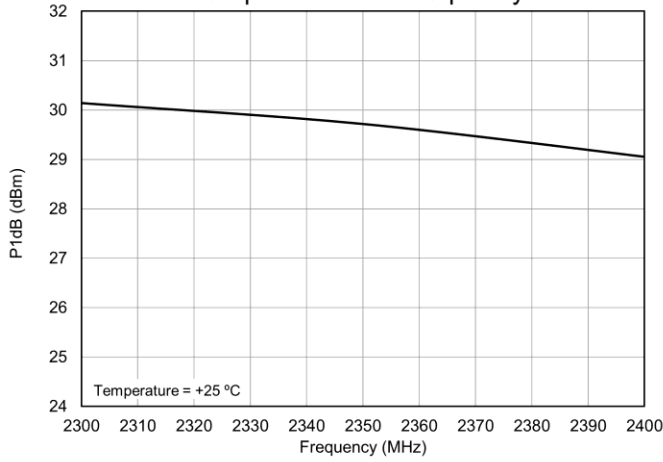
Performance Plots

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

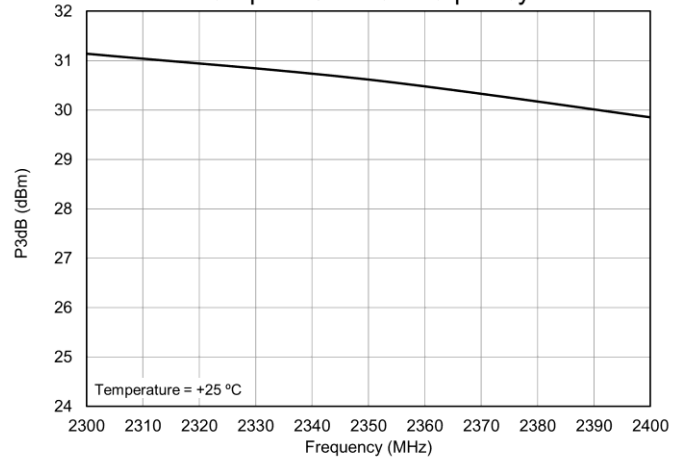


APPLICATION NOTE: QPA9442 - 2.3-2.4GHz Reference Design

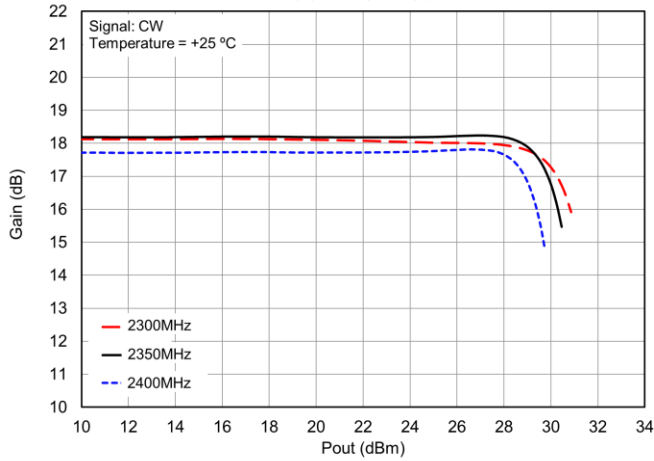
Output P1dB vs. Frequency



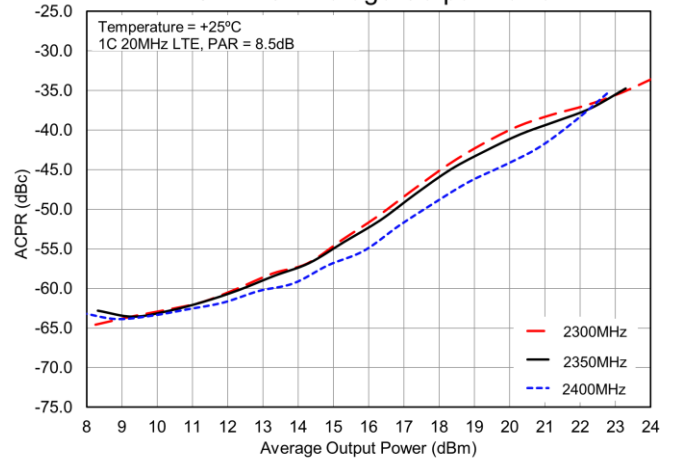
Output P3dB vs. Frequency



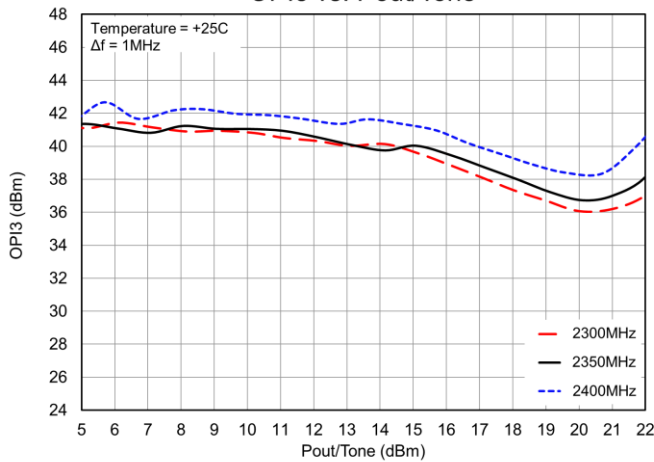
Gain vs. Pout



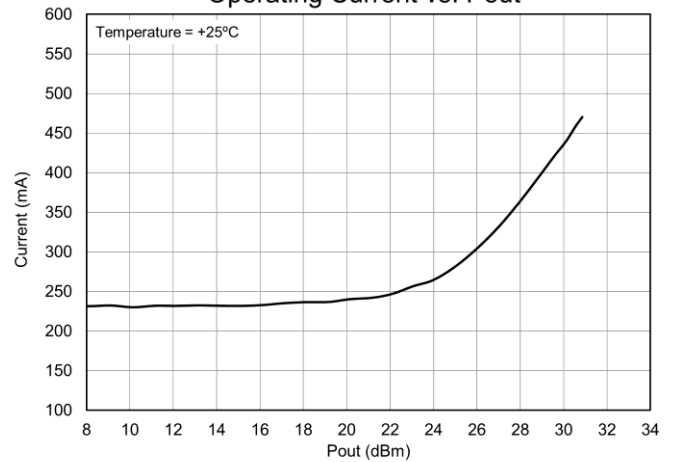
ACPR vs. Average Output Power



OPI3 vs. Pout/Tone



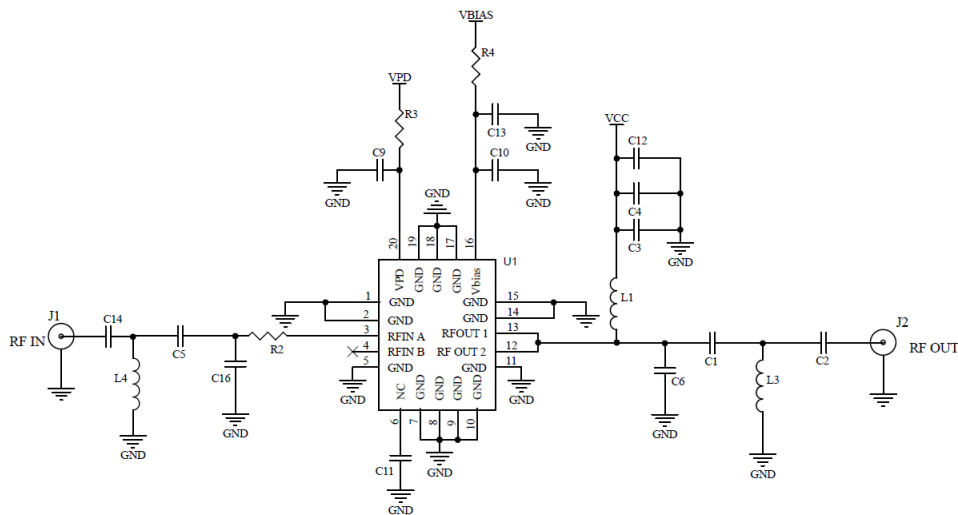
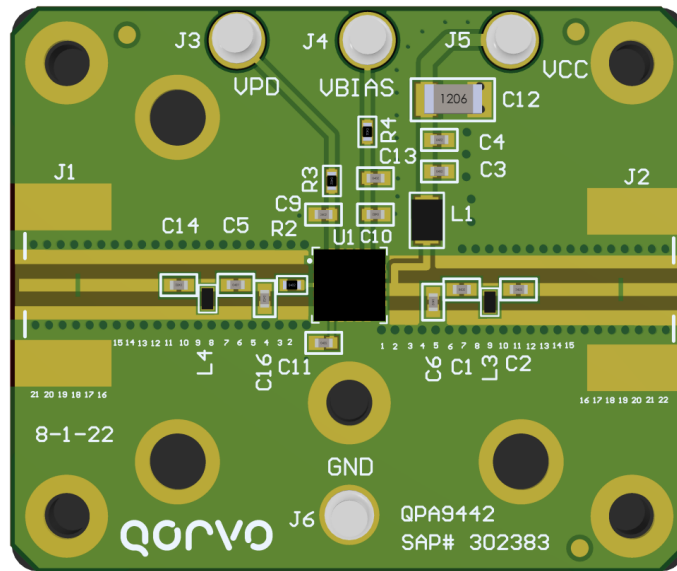
Operating Current vs. Pout



APPLICATION NOTE: QPA9442 - 2.3-2.4GHz Reference Design

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.

APPLICATION NOTE: QPA9442 - 2.3-2.4GHz Reference Design

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
C2, C14	22 pF	CAP, 0402, 5%, 50V, HI-Q	Various	
C3, C9, C10	220 pF	CAP, 0402, 5%, 50V, C0G	Various	
C4, C13	1 uF	CAP, 0402, 10%, 10V, X7S	Various	
C5, C16	0.9 pF	CAP, 0402, ± 0.1 pF, 50V, HI-Q	Various	
C6	2.7 pF	CAP, 0402, ± 0.1 pF, 50V, HI-Q	Various	
C11, L4	DNP	n/a	n/a	
C12	10 μ F	CAP, 1206, 10%, 25V, X7R	Various	
L1	5.6 nH	IND, 0805, 2%, W/W	Murata	
L3	0.7 pF	CAP, 0402, ± 0.1 pF, 50V, HI-Q	Murata	
R2	1 Ω	RES, 0402, 1/10W	Various	
C1, R3, R4	0 Ω	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:

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