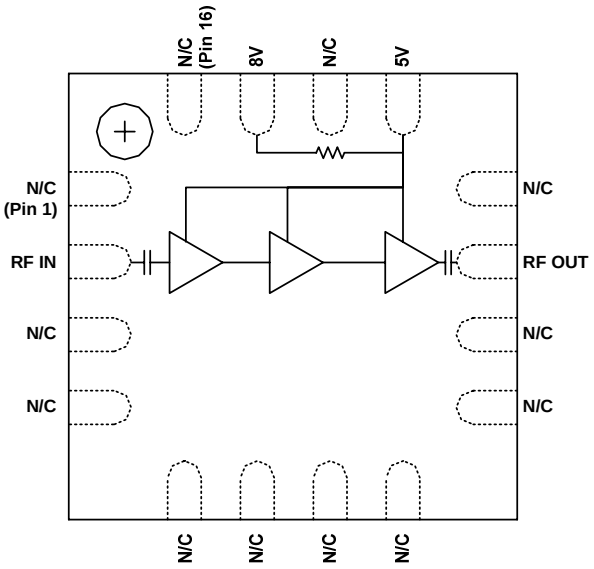
Tyco Electronics

Amplifier, Driver 4.9—8.5 GHZ

M/A-COM Products
RoHS Compliant

Features

- Over 23 dB Gain
- Good Gain Flatness over Individual Bands
- Good Input and Output Return Losses
- Designed for Linear Applications
- 5 or 8 Volt Single-Supply Operation
- RoHS Compliant



Description

The MAAM-007523-PKG003 is a 3-stage driver amplifier for cellular and WiMax backhaul. It is available in a 16 lead, 4 mm PQFN plastic package. The input and output ports are matched to 50 ohms and are DC blocked. This part incorporates a self-biased design, requiring only a drain supply for biasing.

Each device is 100% RF tested to ensure performance compliance. The MAAM-007523-PKG003 is fabricated using M/A-COM's Multifunction Self-Aligned Gate (MSAG) Process, for excellent linearity and reliability. The MTTF is >1 million hours at a 170°C junction temperature.

The 4 mm PQFN package is RoHS compliant and compatible with industry standard lead-free solder reflow processes up to 260°C. This low cost package is ideal for high volume microwave applications.

Primary Applications

- Point-to-Point Radio Links
  - 6, 7, and 8 GHz Bands
- Satellite Communications
- WiMAX Backhaul

Ordering Information

Description	Die	Tape & Reel (500)	Tape & Reel (1000)	Plastic Sample Board
Part Number	MAAM-007523-DIE000	MAAM-007523-TR0500	MAAM-007523-TR1000	MAAM-07523-SMB003

Electrical Characteristics: T_c=25°C[1], Z_0=50Ω, V_{DD}=5V

Parameter	Symbol	Minimum	Typical	Maximum	Units
Bandwidth	f	4.9	—	8.5	GHz
Small Signal Gain	G	20	24		dB
Input VSWR	VSWR		1.8:1	2.5:1	—
Output VSWR	VSWR		2:1	2.5:1	—
Noise Figure	NF		4		dB
1-dB Compression Point	P1dB		18		dBm
Third Order Intercept Single Carrier Level = 5dBm	IP3		32		dBm

1. **T_c = Case Temperature.**

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Maximum Ratings[2]

Parameter	Symbol	Absolute Maximum	Units
Input Power	P_{IN}	10.0	dBm
Drain Supply Voltage at 5V Lead	V_{DD}	5.5	V
Drain Supply Voltage at 8V Lead	V_{DD}	8.5	V
Junction Temperature	T_J	170	°C
Storage Temperature	T_{STG}	-55 to +150	°C

2. Operation beyond these limits may result in permanent damage to the part. Exceeding any one or combination of these limits may cause permanent damage to this device.

Recommended Operating Conditions[3]

Parameter	Symbol	Min	Typ	Max	Unit
Drain Voltage at 5V Lead	V_{DD}	4.5	5.0	5.5	V
Drain Voltage at 8V Lead	V_{DD}	7.0	8.0	8.5	V
Input Power	P_{IN}		0	10	dBm
Junction Temperature	T_J			170	°C
Thermal Resistance with Bias at 5V Lead	Θ_{JC}		67.8		°C/W
Thermal Resistance with Bias at 8V Lead	Θ_{JC}		53.0		°C/W
Package Case Temperature	T_C			Note 4	°C

3. Operation outside of these ranges may reduce product reliability.
4. Case Temperature = 170°C — Θ_{JC}* V_{DD} * I_{DD}

Operating Instructions

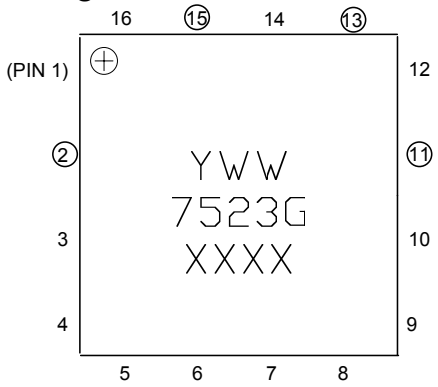
This device is static sensitive. Please handle with care. To operate the device, follow these steps.

Apply V_{DD} = 5V (on 5V Pin)

Or

V_{DD} = 8V (on 8V Pin)

Pin Designations



Pin	Function	Pin	Function
1	NC	9	NC
2	Input	10	NC
3	NC	11	Output
4	NC	12	NC
5	NC	13	5V
6	NC	14	NC
7	NC	15	8V
8	NC	16	NC

Exposed pad on bottom is ground

5. Apply supply voltage to either pin 15 (8V) or pin 13 (5V), not to both.

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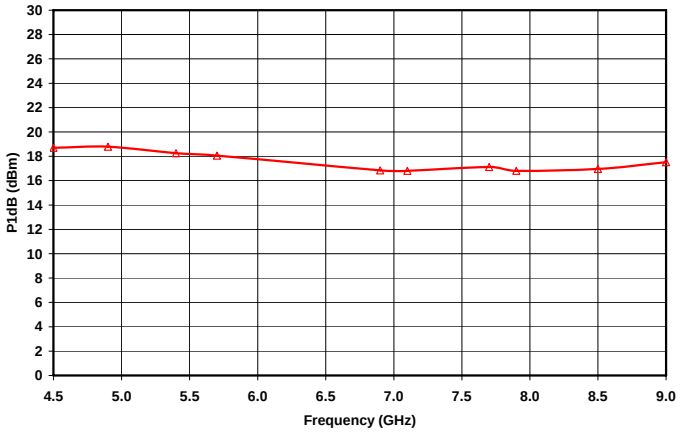

Figure 1. P1dB vs. Frequency

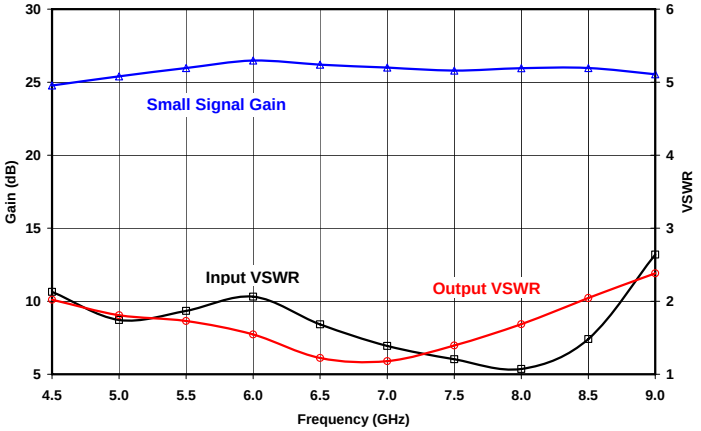

Figure 2. Small Signal Gain and Input & Output VSWR vs. Frequency

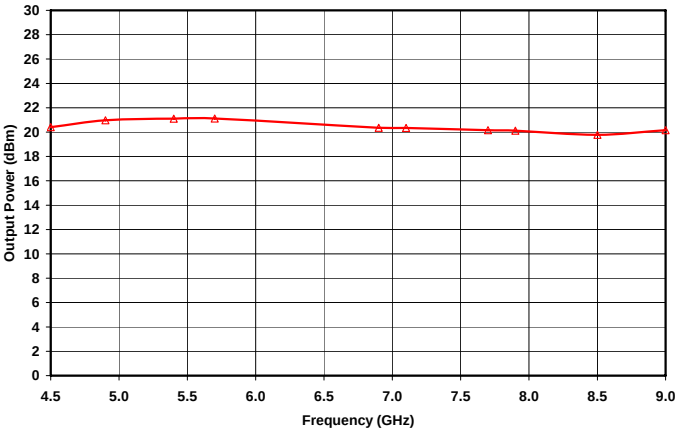

Figure 3. Saturated Output Power vs. Frequency

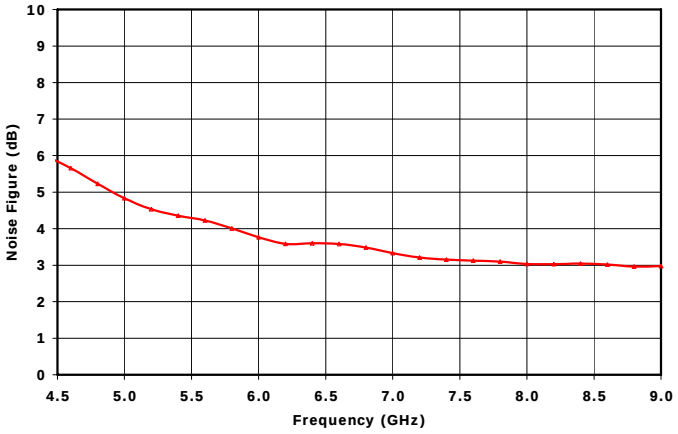

Figure 4. Noise Figure vs. Frequency

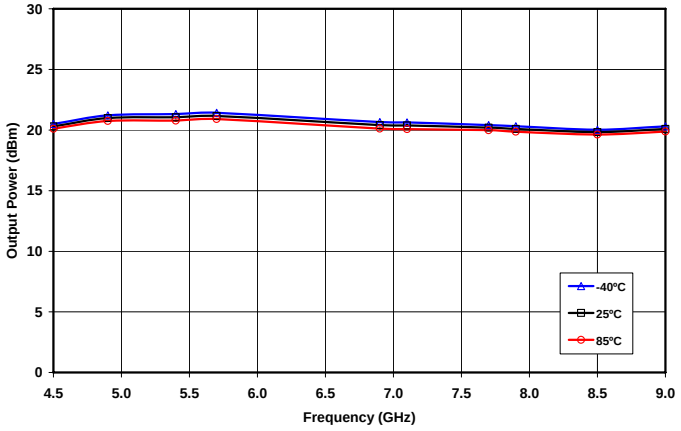

Figure 5. Saturated Output Power vs. Frequency and Case Temperature

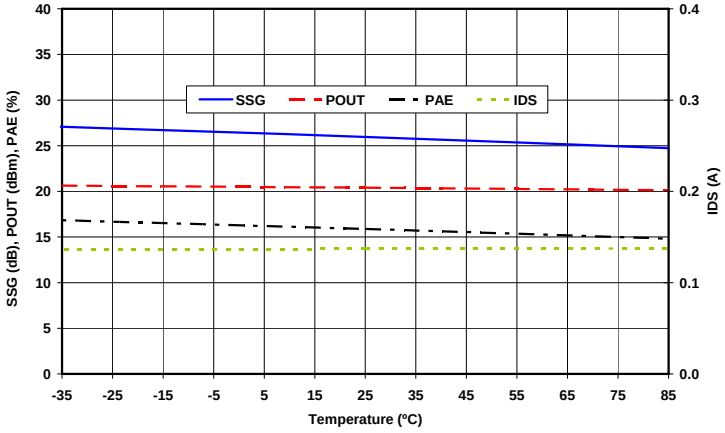

Figure 6. Small Signal Gain & Saturated Output Power, Power Added Efficiency and Drain Current vs. Case Temperature at 6.9GHZ

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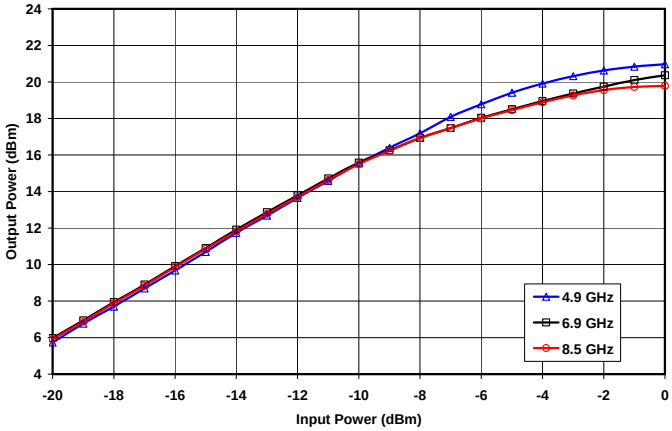

Figure 7. Output Power vs. Input Power and Frequency

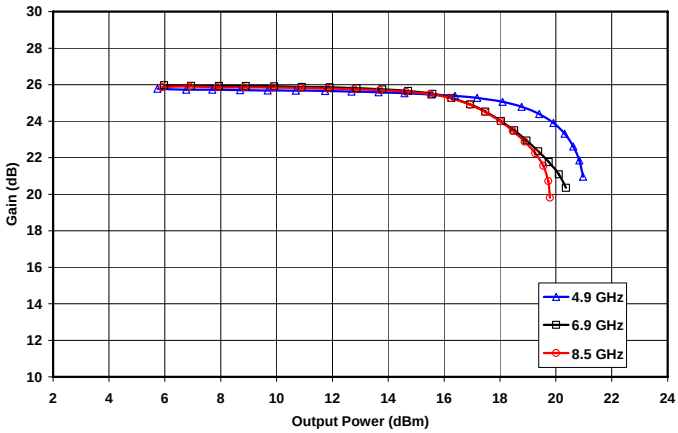

Figure 8. Gain vs. Output Power and Frequency

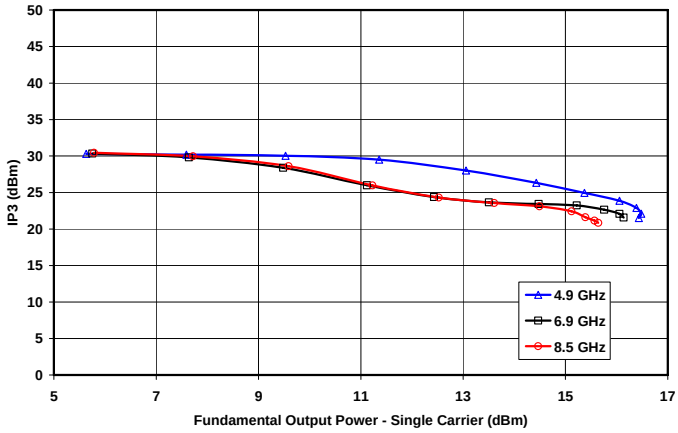

Figure 9. Third Order Intercept vs. Output Power and Frequency

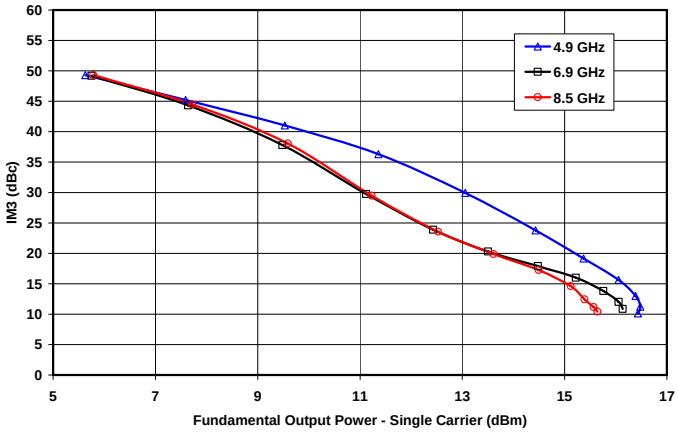

Figure 10. Third Order Intermod vs. Output Power and Frequency

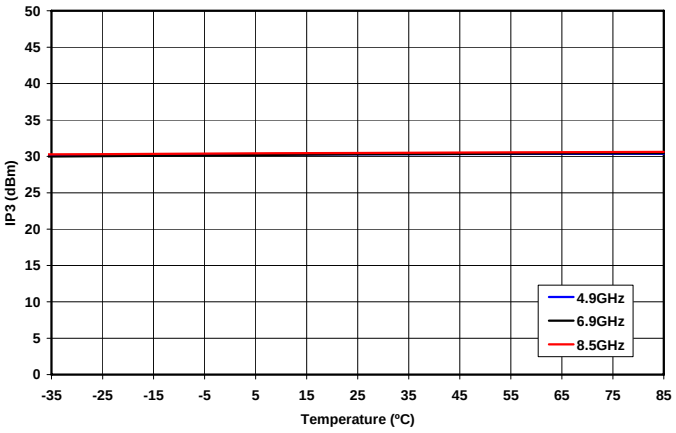

Figure 11. Third Order Intercept vs. Temperature and Frequency
Single Carrier Output Power = 6dBm

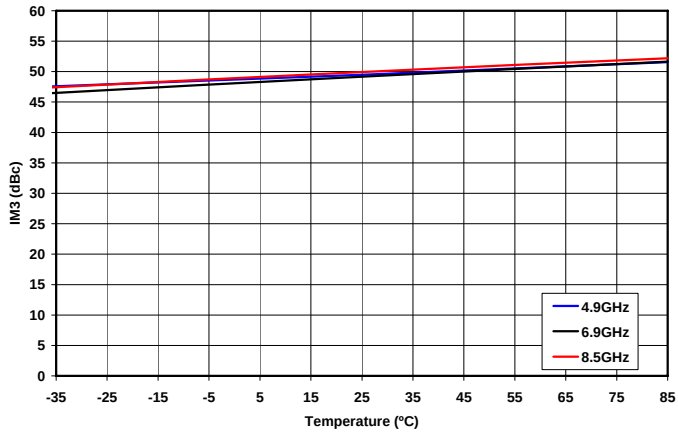

Figure 12. Third Order Intermod vs. Temperature and Frequency
Single Carrier Output Power = 6dBm

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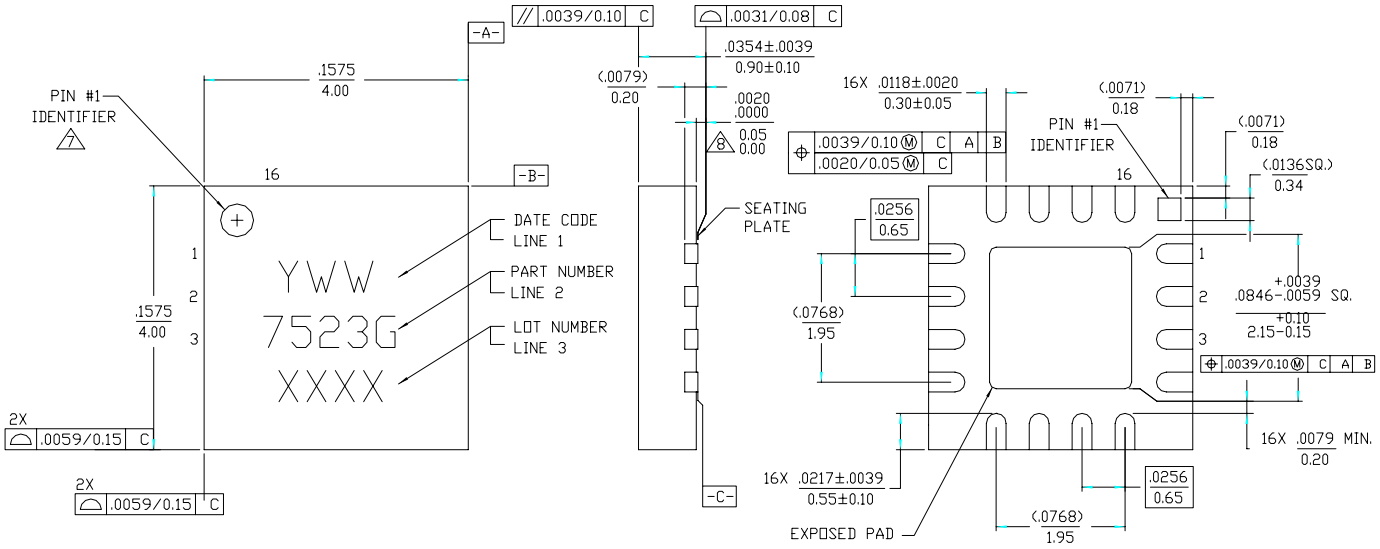

Figure 13. 4x4 mm 16-Lead PQFN Package.

RF ports are internally DC blocked.

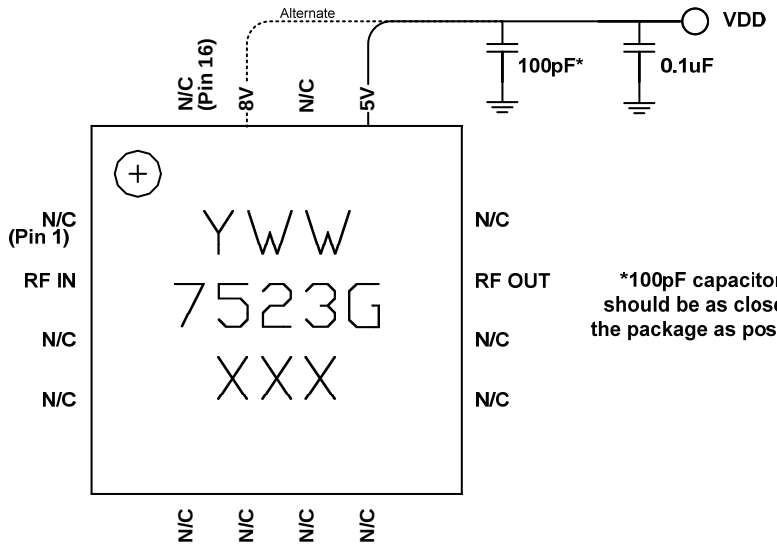

Figure 14. Recommended Bias Configuration.

Note: The exposed pad centered on the package bottom must be connected to RF and dc ground for proper electrical and thermal operation.

*Application Notes can be found by going to http://www.macom.com/Application%20Notes/default.asp and searching for the required Application Note.

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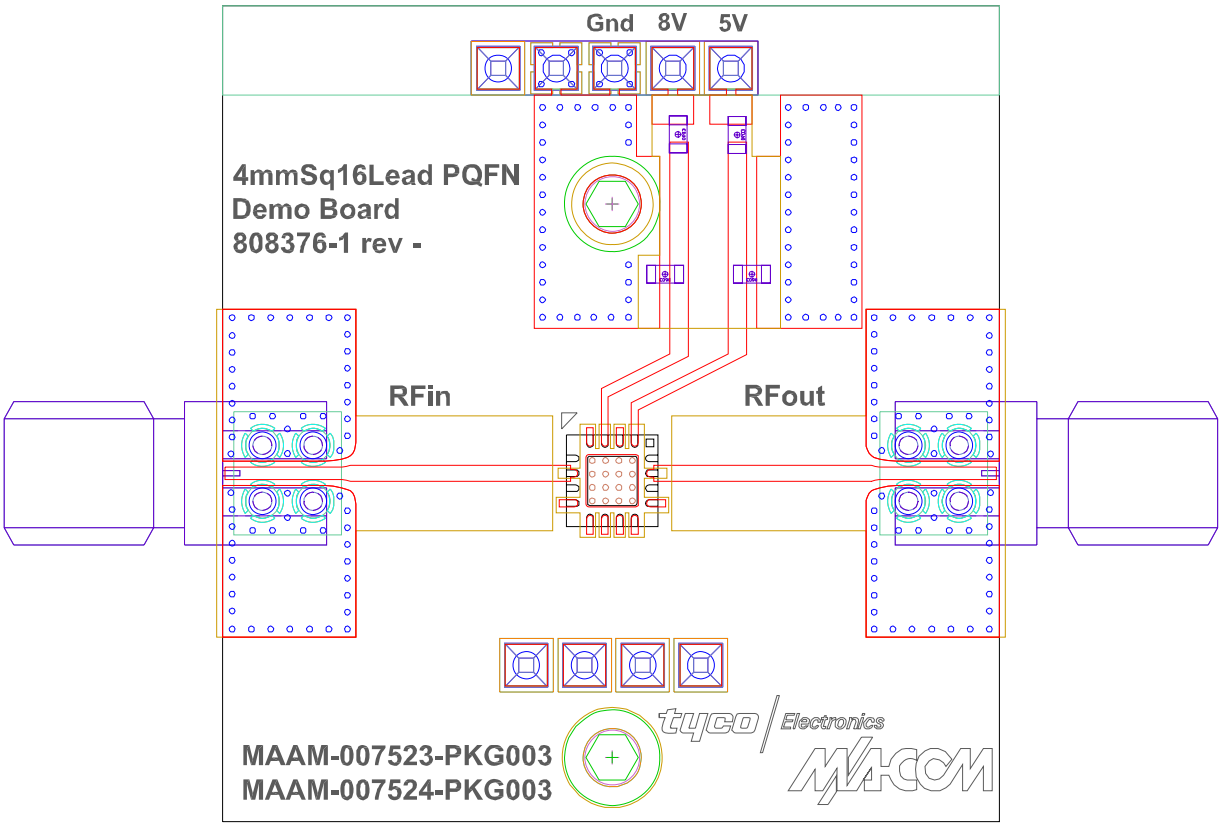

Figure 15. Demonstration Board PN MAAM-007523-SMB003 (available upon request).

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