



RFMA1415-0.5W-Q7

UPDATED: 04-24-2008

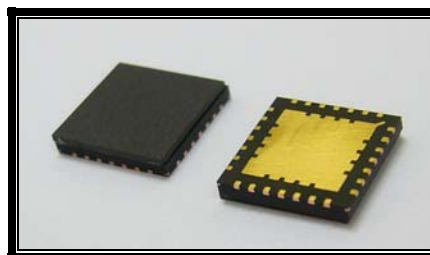
14.40– 15.40GHz High Gain Surface-Mounted PA

FEATURES

- 14.40 – 15.40GHz Operating Frequency Range
- 26.5dBm Output Power @1dB Compression
- 29.0dB Typical Power Gain @1dB Compression
- -41dBc OIMD3 @Pout 16.5dBm/tone
- 7X7mm QFN Package

APPLICATIONS

- Point-to-point and point-to-multipoint radio
- Military Radar Systems



ELECTRICAL CHARACTERISTICS (T_B=25 °C)

SYMBOL	PARAMETER/TEST CONDITIONS	MIN	TYP	MAX	UNITS
F	Operating Frequency Range	14.4		15.4	GHz
P _{1dB}	Output Power @1dB Gain Compression	25.5	26.5		dBm
G _{1dB}	Gain @1dB Gain Compression	26.0	29.0		dB
OIMD3	Output 3 rd Order Intermodulation Distortion @Δf=10MHz, Pout = 16.5dBm/tone		-41	-38	dBc
Input RL	Input Return Loss		-10	-8	dB
Output RL	Output Return Loss		-8		dB
I _{D1}	Drain Current ¹		180	220	mA
I _{D2}	Drain Current ¹		400	460	mA
V _{D1} , V _{D2}	Drain Voltage		7	8	V
V _{G1} , V _{G2}	Gate Voltage	-2.5		-0.25	V
R _{th}	Thermal Resistance ²		13		°C/W
T _b	Operating Base Plate Temperature	-30		+80	°C

1. Recommended to bias each amplifier stage separately using a gate voltage range, starting from -2.5 to -0.3V to achieve typical current levels.

2. R_{th} is mounting dependent. Measured result when used with Excelics recommended evaluation board.

MAXIMUM RATINGS AT 25°C^{3,4}

SYMBOL	CHARACTERISTIC	ABSOLUTE	CONTINUOUS
V _{D1} , V _{D2}	Drain to Source Voltage	12V	8 V
V _{G1} , V _{G2}	Gate to Source Voltage	-5V	-2.5 V
I _{D1} , I _{D2}	Drain Current	I _{dss}	220, 460mA
P _{IN}	Input Power	20dBm	@ 3dB compression
T _{CH}	Channel Temperature	175°C	150°C
T _{STG}	Storage Temperature	-65/175°C	-65/150°C
P _T	Total Power Dissipation	8.8W	7.4W

3. Operation beyond *absolute* or *continuous* ratings may result in permanent damage or reduction of MTTF respectively.

4. Bias conditions must also satisfy the following equation $V_{DS} \cdot I_{DS} < (T_{CH} - T_B) / R_{TH}$, where T_B = Temperature of Base Plate

Specifications are subject to change without notice.

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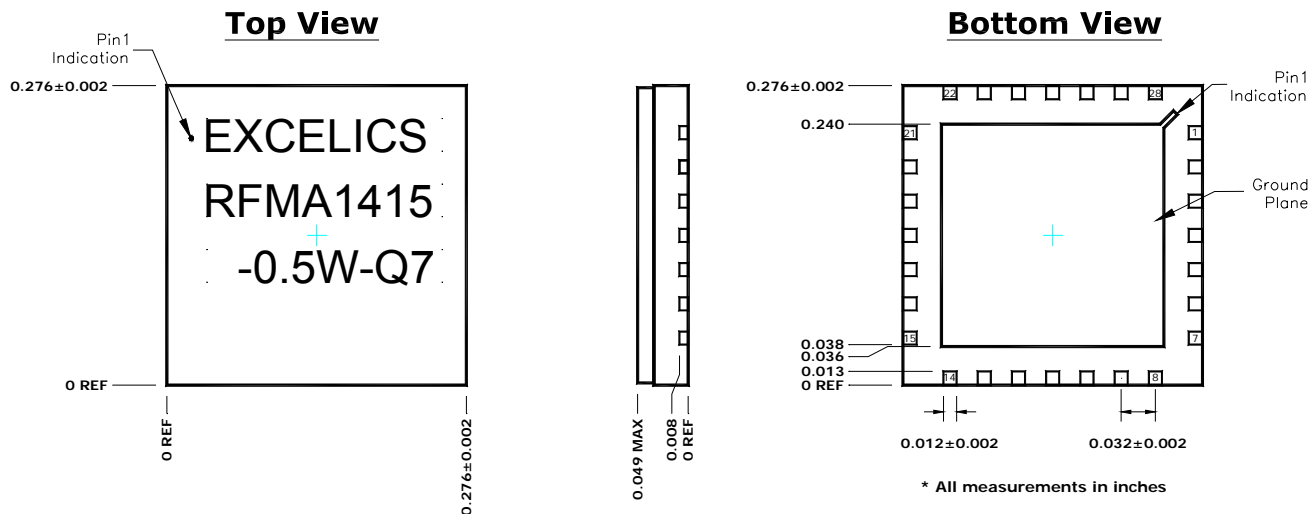
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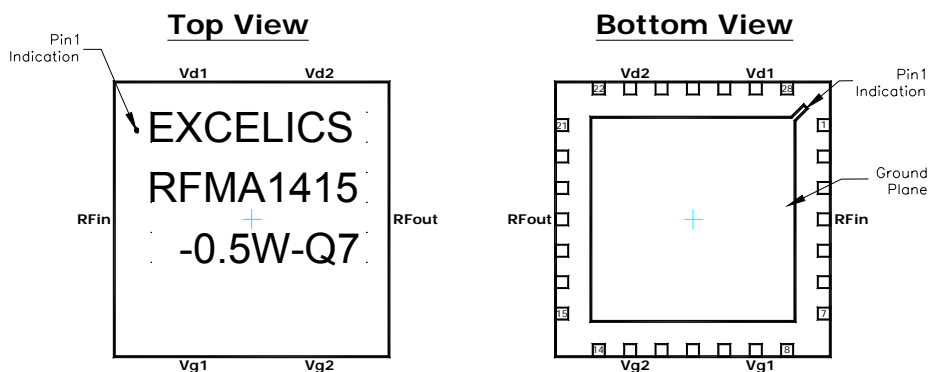
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Package Dimension and Pin Assignment



Additional Notes:

- 1) Ground Plane must be soldered to PCB RF ground
- 2) All dimensions are in inches
- 3) Refer to Excelics application notes on QFNs for further guidelines
- 4) Pin Assignment:



Pin	Assignment
1, 2, 3, 5, 6, 7, 8, 10, 11, 12, 14	NC
4	RF _{in}
9	V _{g1}
13	V _{g2}
15, 16, 17, 19, 20, 21, 22, 24, 25, 26, 28	NC
18	RF _{out}
23	V _{d2}
27	V _{d1}

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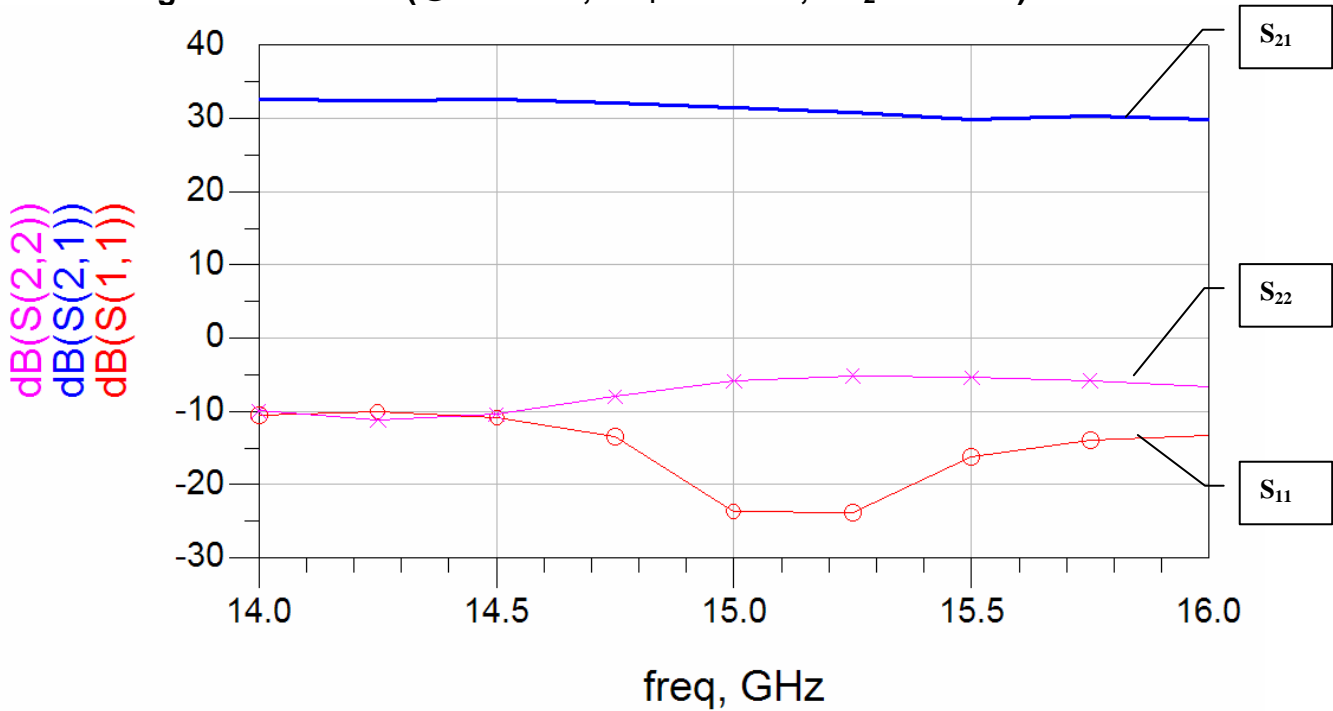
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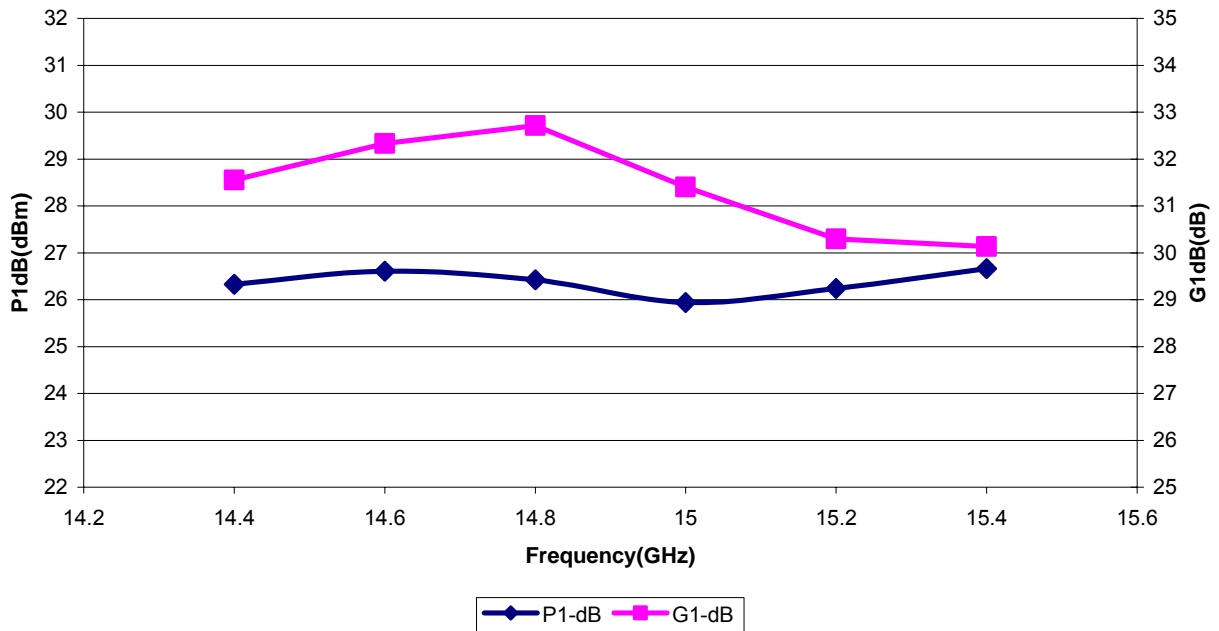
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Typical Performance:

1. Small-Signal Parameters (@Vds = 7V, Ids₁ = 180mA, Ids₂ = 400mA)

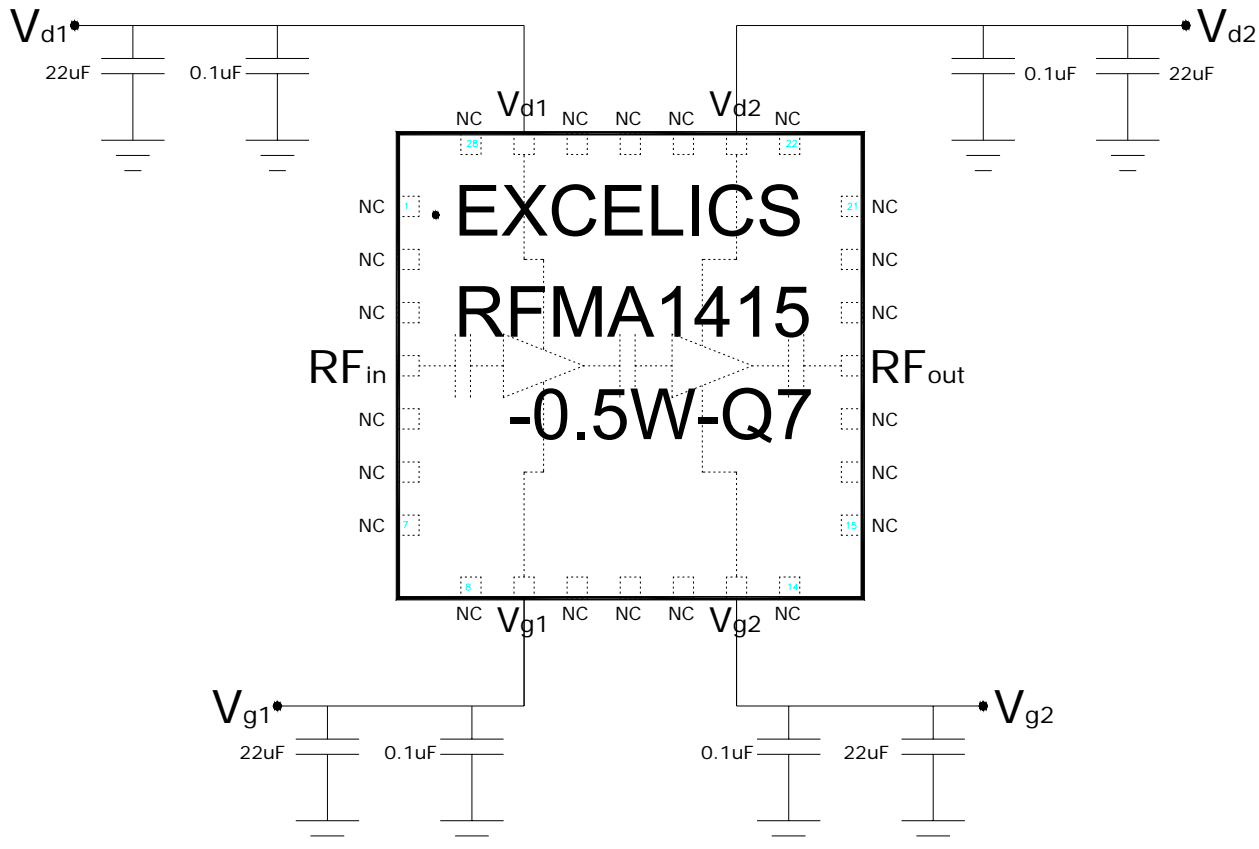


2. P1-dB & G1-dB (@Vds = 7V, Ids₁ = 180mA, Ids₂ = 400mA)



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Recommended Circuit Schematic:



Notes:

- 1) External bypass capacitors should be placed as close to the package as possible.
- 2) Dual biasing sequence required:
 - a. Turn-on Sequence: Apply $V_{g1} = -2.5V$, $V_{g2} = -2.5V$, followed by $V_{d1} = V_{d2} = 7V$, lastly increase V_{g1} & V_{g2} in sequence until required I_{d1} and I_{d2} is obtained.
 - b. Turn-off Sequence: Turn off V_{d1} & V_{d2} , followed by V_{g1} & V_{g2}
- 3) Demonstration board available upon request.



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