



# RFMA1214-0.5W-Q7

UPDATED: 04-24-2008

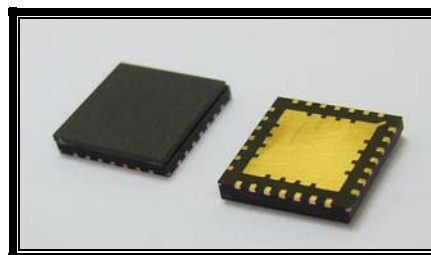
## 12.5– 14.5GHz High Gain Surface-Mounted PA

### FEATURES

- 12.5 – 14.5GHz 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<sub>B</sub>=25 °C)

SYMBOL	PARAMETER/TEST CONDITIONS	MIN	TYP	MAX	UNITS
F	Operating Frequency Range	12.5		14.5	GHz
P <sub>1dB</sub>	Output Power @1dB Gain Compression	25.5	26.5		dBm
G <sub>1dB</sub>	Gain @1dB Gain Compression	26.0	29.0		dB
OIMD3	Output 3 <sup>rd</sup> 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 <sub>D1</sub>	Drain Current <sup>1</sup>		180	220	mA
I <sub>D2</sub>	Drain Current <sup>1</sup>		400	460	mA
V <sub>D1</sub> , V <sub>D2</sub>	Drain Voltage		7	8	V
V <sub>G1</sub> , V <sub>G2</sub>	Gate Voltage	-2.5		-0.25	V
R <sub>th</sub>	Thermal Resistance <sup>2</sup>		13		°C/W
T <sub>b</sub>	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<sub>th</sub> is mounting dependent. Measured result when used with Excelics recommended evaluation board.

### MAXIMUM RATINGS AT 25°C<sup>3,4</sup>

SYMBOL	CHARACTERISTIC	ABSOLUTE	CONTINUOUS
V <sub>D1</sub> , V <sub>D2</sub>	Drain to Source Voltage	12V	8 V
V <sub>G1</sub> , V <sub>G2</sub>	Gate to Source Voltage	-5V	-2.5 V
I <sub>D1</sub> , I <sub>D2</sub>	Drain Current	I <sub>dss</sub>	220, 460mA
P <sub>IN</sub>	Input Power	20dBm	@ 3dB compression
T <sub>CH</sub>	Channel Temperature	175°C	150°C
T <sub>STG</sub>	Storage Temperature	-65/175°C	-65/150°C
P <sub>T</sub>	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<sub>B</sub> = Temperature of Base Plate

Specifications are subject to change without notice.

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Revised May 2008

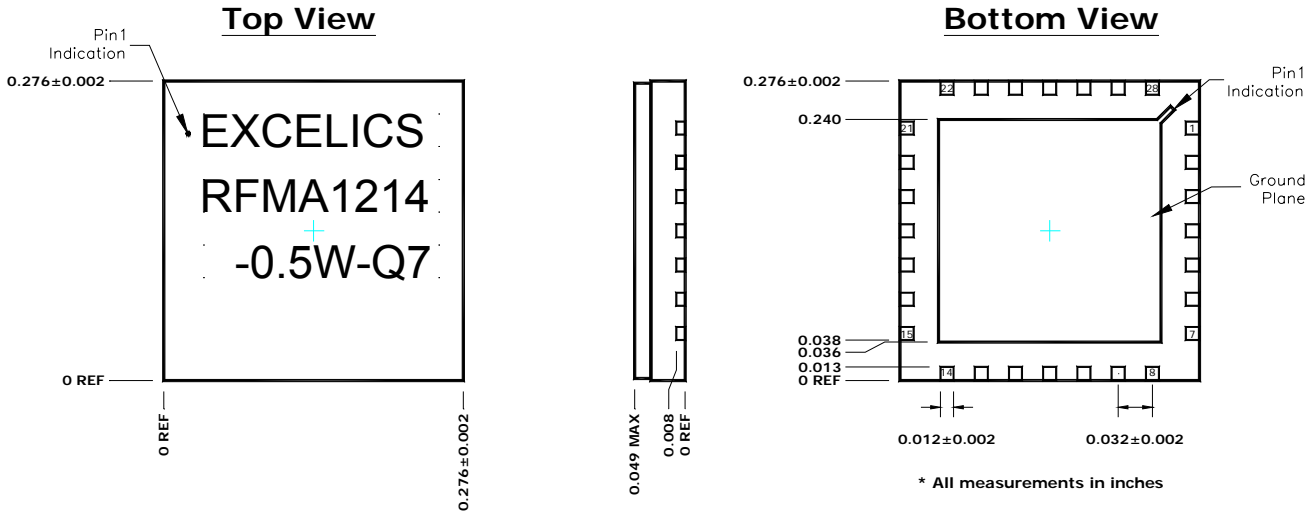


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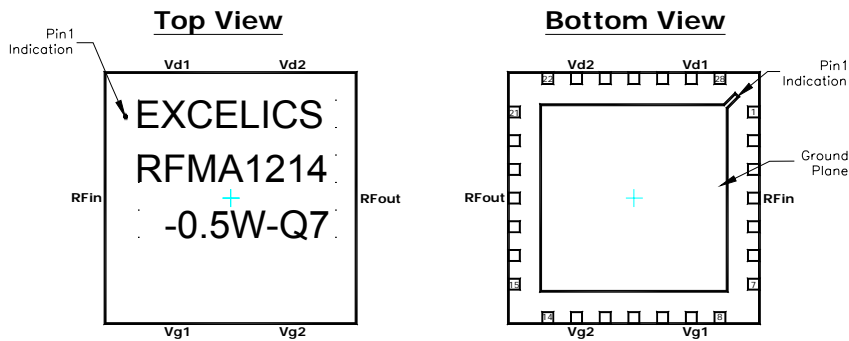
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## Package Dimension and Pin Assignment



### 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:



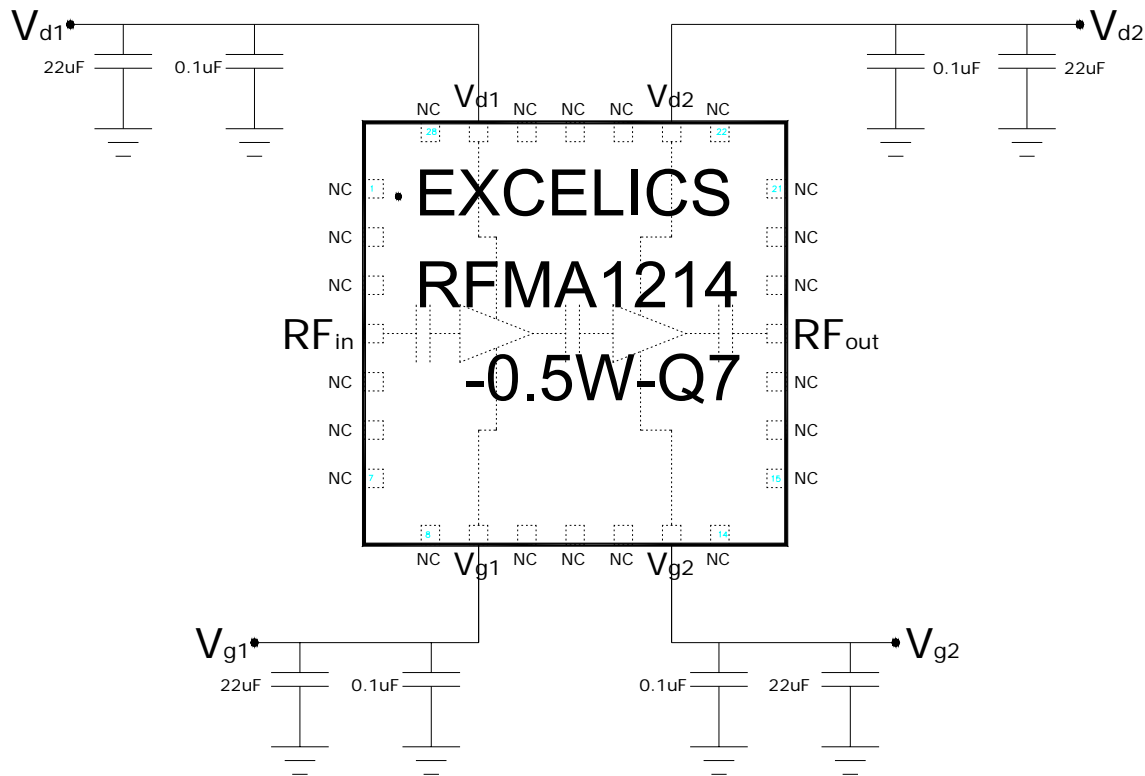
Pin	Assignment
1, 2, 3, 5, 6, 7, 8, 10, 11, 12, 14	NC
4	RF <sub>in</sub>
9	V <sub>g1</sub>
13	V <sub>g2</sub>
15, 16, 17, 19, 20, 21, 22, 24, 25, 26, 28	NC
18	RF <sub>out</sub>
23	V <sub>d2</sub>
27	V <sub>d1</sub>

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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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