

#### UPDATED: 04/24/2008

# EMP111-Q5

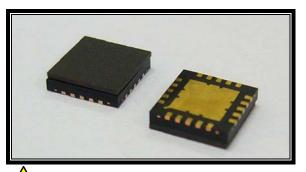
7.0 – 9.0 GHz Surface-Mounted PA

#### FEATURES

- 7.0 9.0 GHz Operating Frequency Range
- 27 dBm Output Power at 1dB Compression
- 16.0 dB Typical Small Signal Gain
- -40dBc OIMD3 @Each Tone Pout 17dBm

#### APPLICATIONS

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



Caution! ESD sensitive device.

### ELECTRICAL CHARACTERISTICS (T<sub>a</sub> = 25 °C, 50 ohm, VDD=7V, IDQ=400mA)

SYMBOL	PARAMETER/TEST CONDITIONS	MIN	ТҮР	MAX	UNITS
F	Operating Frequency Range	7.0		9.0	GHz
P1dB	Output Power at 1dB Gain Compression	25.5	27.0		dBm
Gss	Small Signal Gain	14.0	16.0		dB
OIMD3	Output 3 <sup>rd</sup> Order Intermodulation Distortion @∆f=10MHz, Each Tone Pout 17dBm		-40	-37	dBc
Input RL	Input Return Loss		-10		dB
Output RL	Output Return Loss		-5		dB
ldss	Saturate Drain Current $V_{DS} = 3V, V_{GS} = 0V$	490	620	750	mA
V <sub>DD</sub>	Power Supply Voltage		7	8	V
Rth	Thermal Resistance <sup>1</sup>		22		°C/W
Tb	Operating Base Plate Temperature	-35		+85	°C

## ABSOLUTE MAXIMUM RATINGS FOR CONTINUOUS OPERATION<sup>2,3</sup>

SYMBOL	CHARACTERISTIC	CONTINUOUS
V <sub>DS</sub>	Drain to Source Voltage	8 V
V <sub>GS</sub>	Gate to Source Voltage	-4 V
I <sub>DD</sub>	Drain Current	ldss
I <sub>GSF</sub>	Forward Gate Current	9mA
P <sub>IN</sub>	Input Power	@ 3dB compression
Т <sub>сн</sub>	Channel Temperature	150°C
T <sub>STG</sub>	Storage Temperature	-65/150°C
PT	Total Power Dissipation	5.2W

1. R<sub>th</sub> is mounting dependent. Measured result when used with Excelics recommended evaluation board.

2. Operating the device beyond any of the above rating may result in permanent damage.

3. Bias conditions must also satisfy the following equation  $V_{DS}*I_{DS} < (T_{CH} - T_{HS})/R_{TH}$ ; where  $T_{HS}$  = ambient temperature

Specifications are subject to change without notice. Excelics Semiconductor, Inc. 310 De Guigne Drive, Sunnyvale, CA 94085 Phone: 408-737-1711 Fax: 408-737-1868 Web: <u>www.excelics.com</u>

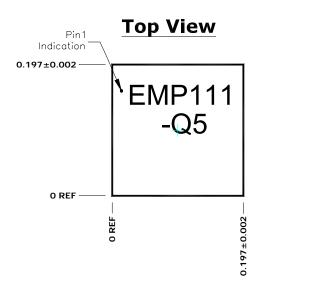
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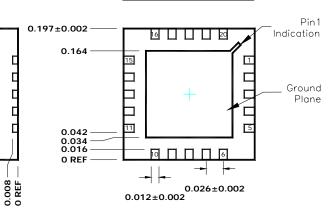
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### CHIP OUTLINE AND PIN ASSIGNMENT

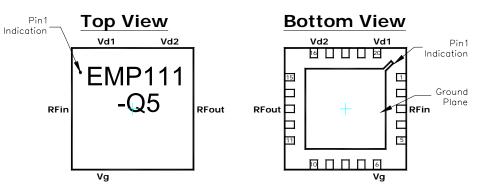


### **Bottom View**



#### 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:



0.049 MAX

Pin	Assignment
1, 2, 4, 5	NC
3	RF <sub>in</sub>
6	Vg
7, 8, 9, 10, 11, 12, 14, 15	NC
13	RF <sub>out</sub>
16	V <sub>d2</sub>
17, 18, 19	NC
20	V <sub>d1</sub>

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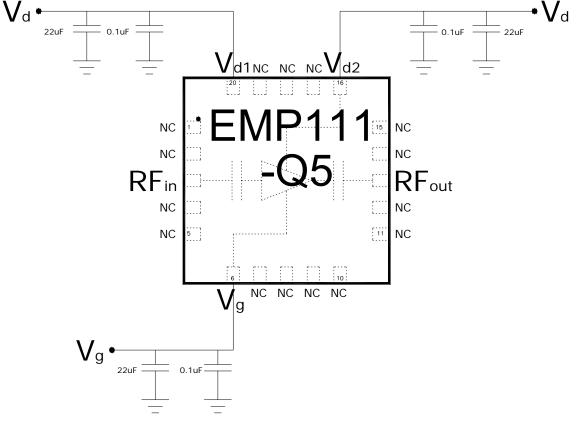


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### **Recommended Circuit Schematic:**



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  $V_g = -2.5V$ , followed by  $V_d = 7V$ , lastly increase  $V_g$  until required  $I_{dq}$
  - b. Turn-off Sequence: Turn off  $V_d$ , followed by  $V_g$
- 3) Demonstration board available upon request.

