

EMP213-Q5

12.5 - 16.5 GHz Surface-Mounted PA

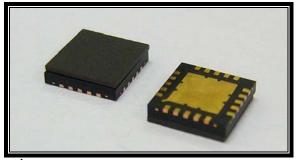
UPDATED: 04/24/2008

FEATURES

- 12.5 16.5 GHz Operating Frequency Range
- 26.5 dBm Output Power at 1dB Compression
- 14.0 dB Typical Small Signal Gain
- -40dBc OIMD3 @Each Tone Pout 16.5dBm

APPLICATIONS

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





Caution! ESD sensitive device.

ELECTRICAL CHARACTERISTICS (Ta = 25 °C, 50 ohm, VDD=7V, IDQ=400mA)

SYMBOL	PARAMETER/TEST CONDITIONS	MIN	TYP	MAX	UNITS
F	Operating Frequency Range	12.5		16.5	GHz
P1dB	Output Power at 1dB Gain Compression	25.0	26.5		dBm
Gss	Small Signal Gain	12.0	14.0		dB
OIMD3	Output 3 rd Order Intermodulation Distortion @∆f=10MHz, Each Tone Pout 16.5dBm		-40	-37	dBc
Input RL	Input Return Loss		-10		dB
Output RL	Output Return Loss		-8		dB
ldss	Saturate Drain Current V _{DS} =3V, V _{GS} =0V	500	620	750	mA
V_{DD}	Power Supply Voltage		7	8	V
Rth	Thermal Resistance ¹		22		°C/W
Tb	Operating Base Plate Temperature	-35		+85	°C

ABSOLUTE MAXIMUM RATINGS FOR CONTINUOUS OPERATION^{2,3}

SYMBOL	CHARACTERISTIC	CONTINUOUS		
V_{DS}	Drain to Source Voltage	8 V		
V_{GS}	Gate to Source Voltage	-4 V		
I_{DD}	Drain Current	ldss		
I_{GSF}	Forward Gate Current	7.5mA		
P_{IN}	Input Power	@ 3dB compression		
T_CH	Channel Temperature	150°C		
T_{STG}	Storage Temperature	-65/150°C		
P_T	Total Power Dissipation	6.0W		

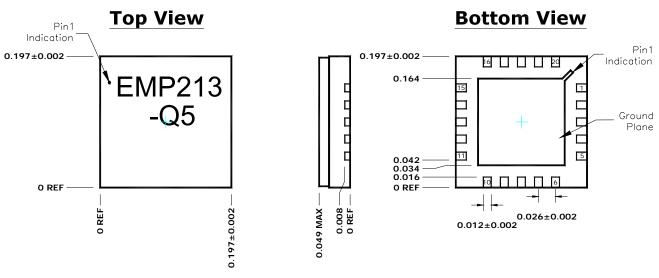
- 1. R_{th} is mounting dependent. Measured result when used with Excelics recommended evaluation board.
- 2. Operating the device beyond any of the above rating may result in permanent damage.
- 3. Bias conditions must also satisfy the following equation $V_{DS}*I_{DS} < (\dot{T}_{CH} T_{HS})/R_{TH}$; where T_{HS} = ambient temperature



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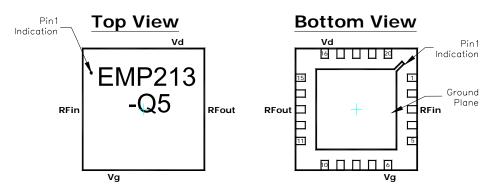
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CHIP OUTLINE AND PIN ASSIGNMENT



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:



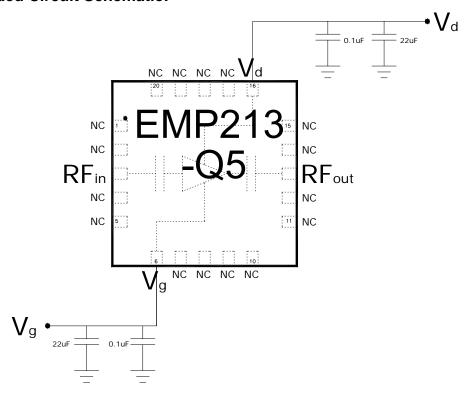
Pin	Assignment
1, 2, 4, 5	NC
3	RF _{in}
6	V_{g}
7, 8, 9, 10, 11, 12, 14, 15	NC
13	RF _{out}
16	V_d
17, 18, 19, 20	NC



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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.

