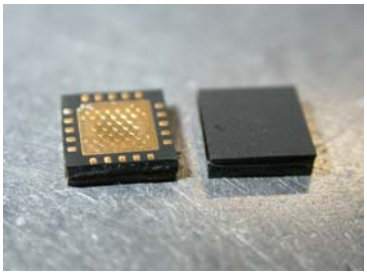
EMP107-Q5

5.8 – 8.0 GHz Surface-Mounted PA



FEATURES

- **5.8 – 8.0 GHz Operating Frequency Range**
- **24.0dBm Output Power at 1dB Compression**
- **18.0 dB Typical Small Signal Gain**
- **-40dBc OIMD3 @Each Tone Pout 14dBm**

APPLICATIONS

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

Caution! ESD sensitive device.

ELECTRICAL CHARACTERISTICS (T_b = 25 °C, 50 ohm, VDD=7V, IDQ=200mA)

SYMBOL	PARAMETER/TEST CONDITIONS	MIN	TYP	MAX	UNITS
F	Operating Frequency Range	5.8		8.0	GHz
P1dB	Output Power at 1dB Gain Compression	22.5	24.0		dBm
Gss	Small Signal Gain	15.0	18.0		dB
OIMD3	Output 3rd Order Intermodulation Distortion @Δf=10MHz, Each Tone Pout 14dBm, V_{DS} = 7V, I_{DS} = 60% to 70% Idss		-40	-37	dBc
Input RL	Input Return Loss		-10		dB
Output RL	Output Return Loss		-5		dB
Idss	Saturate Drain Current V_{DS} =3V, V_{GS} =0V	240	310	370	mA
V_{DD}	Power Supply Voltage		7	8	V
Rth	Thermal Resistance		44		°C/W
Tb	Operating Base Plate Temperature	-35		+85	ºC

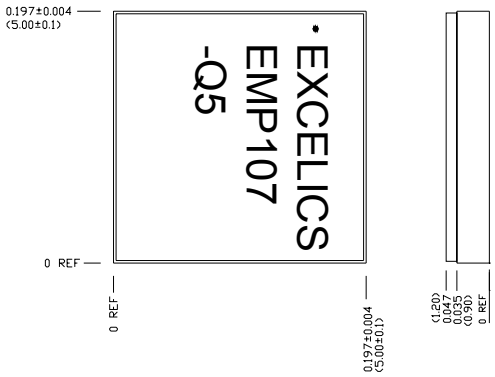
MAXIMUM RATING (T_b = 25 °C)

Symbol	Characteristic	ABSOLUTE[1]	OPERATING[2]
V_{DS}	Drain-Source Voltage	8.5 V	8 V
V_{GS}	Gate-Source Voltage	-4 V	-3 V
I_{DD}	Drain Current	Idss	70% Idss
I_{GSF}	Forward Gate Current	30 mA	4.5 mA
P_{IN}	Input Power	@ 3dB compression	@ 3dB compression
T_{CH}	Channel Temperature	175 °C	150 °C
T_{STG}	Storage Temperature	-65 °C to +175 °C	-65 °C to +175 °C
P_T	Total Power Dissipation	2.6 W	2.6 W

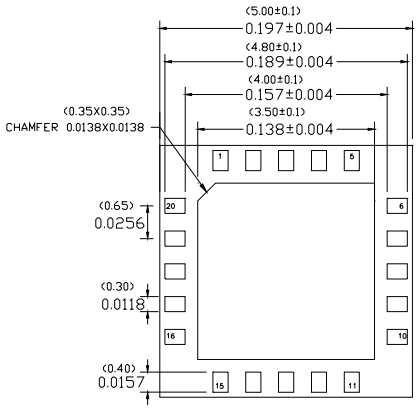
Note: 1. Exceeding any of the above ratings may result in permanent damage.
2. Exceeding any of the above ratings may reduce MTTF below design goals.

CHIP OUTLINE AND PIN ASSIGNMENT

Top View

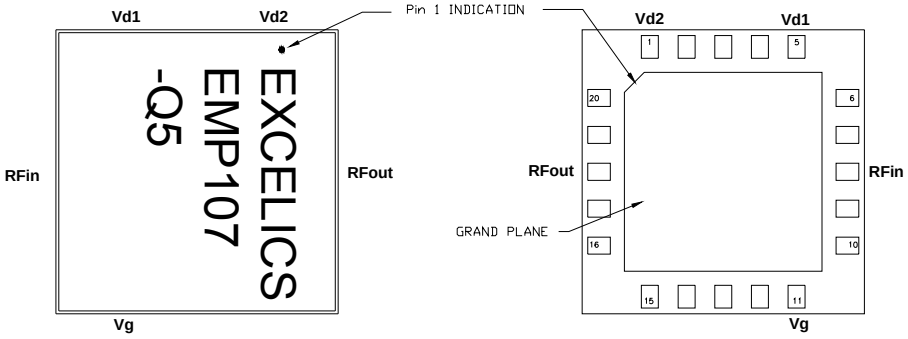


Bottom View



Additional Notes:

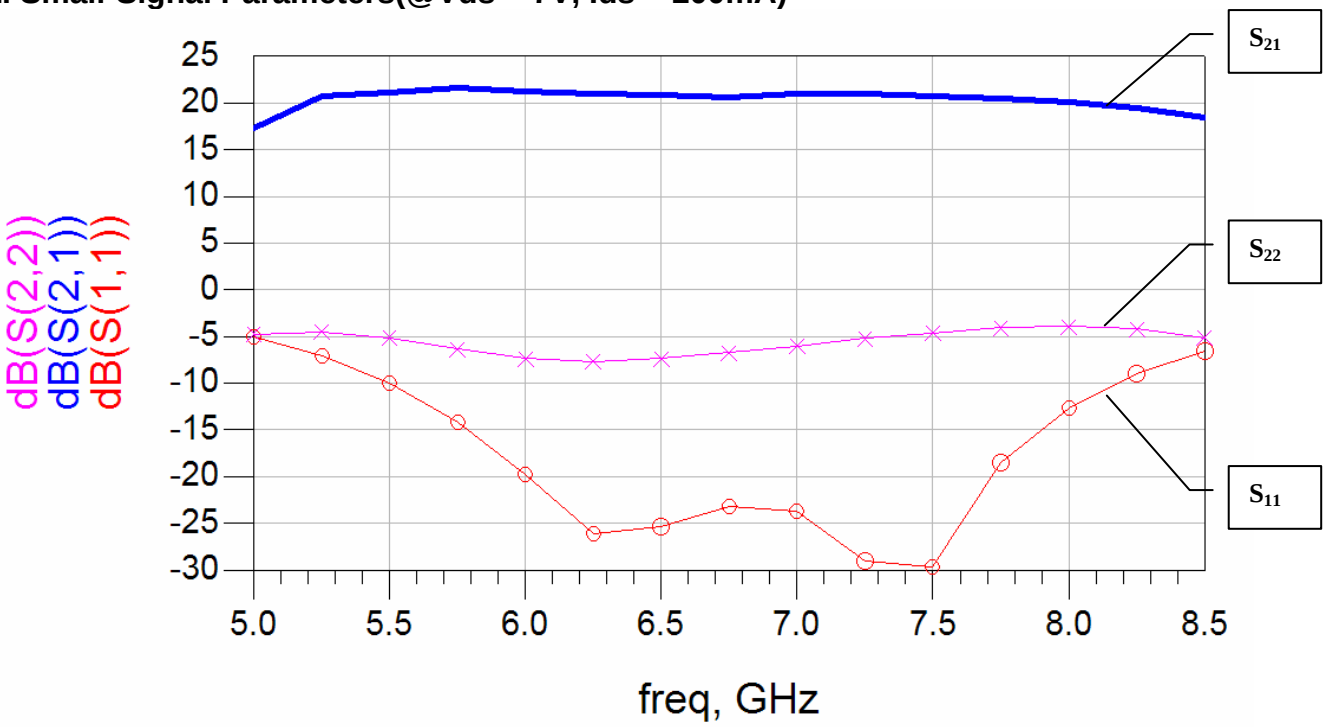
1) Ground Plane must be soldered to PCB RF ground
2) All dimensions are in inches (mm)
3) Refer to Excelics application notes on QFNs for further guidelines
4) Pin Assignment:



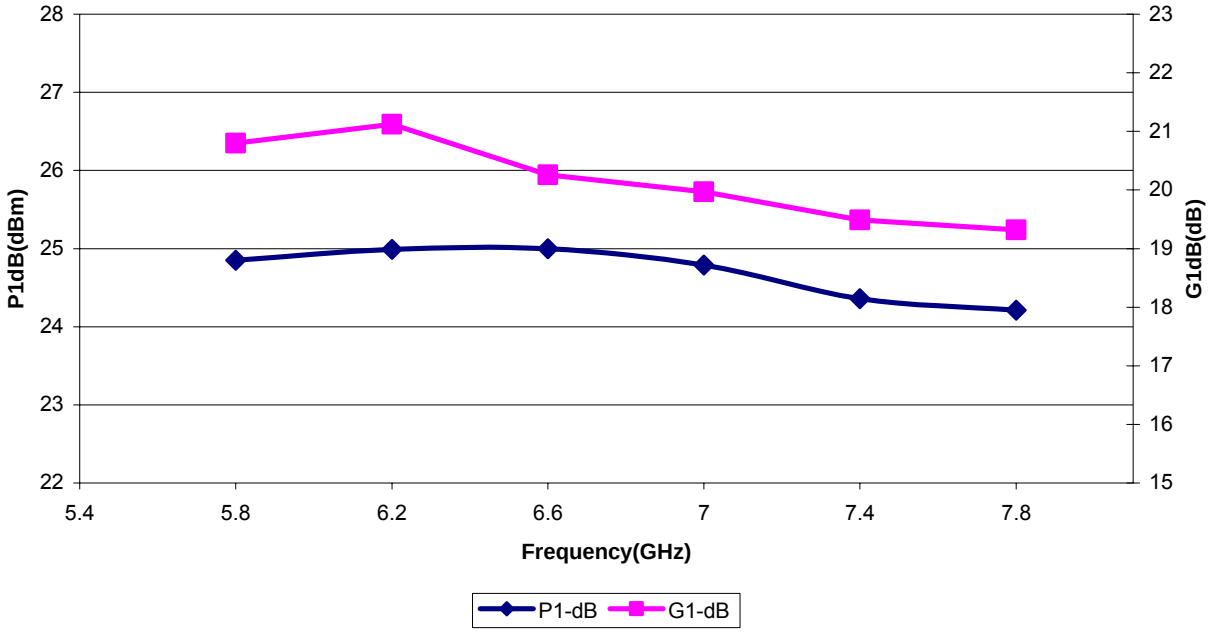
Pin	Assignment
2, 3, 4, 6, 7	NC
8	RF_{in}
11	V_g
9, 10, 12, 13, 14, 15	NC
18	RF_{out}
1	V_{d2}
16, 17, 19, 20	NC
5	V_{d1}

Typical Performance:

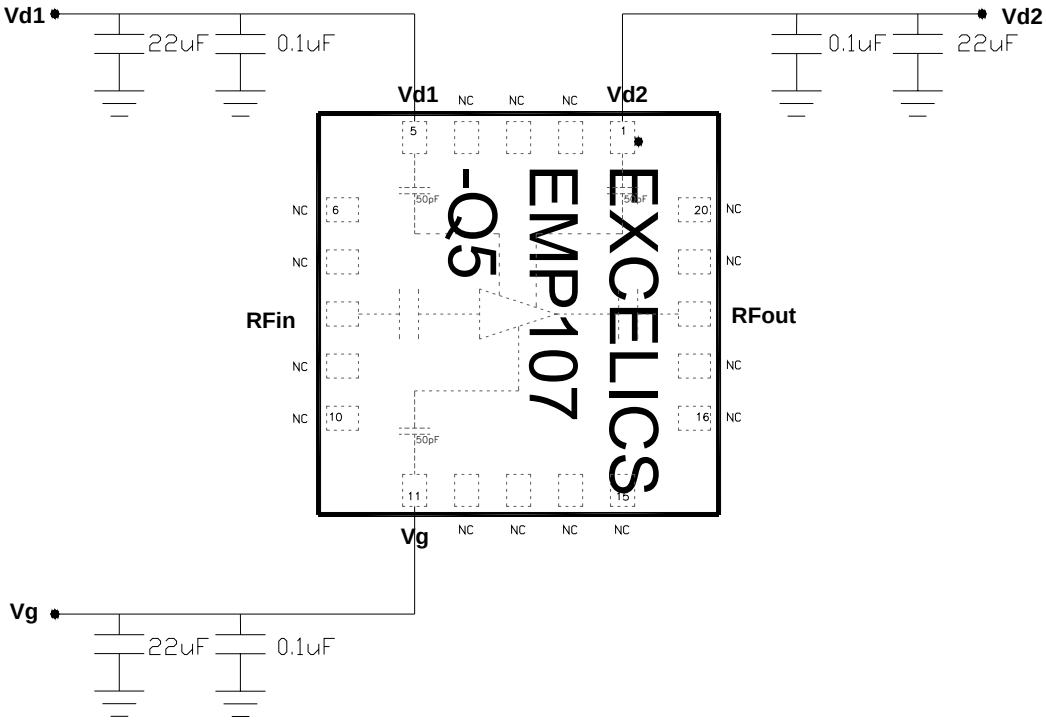
1. Small-Signal Parameters(@Vds = 7V, Ids = 200mA)



2. P1-dB & G1-dB (@Vds = 7V, Ids = 200mA)

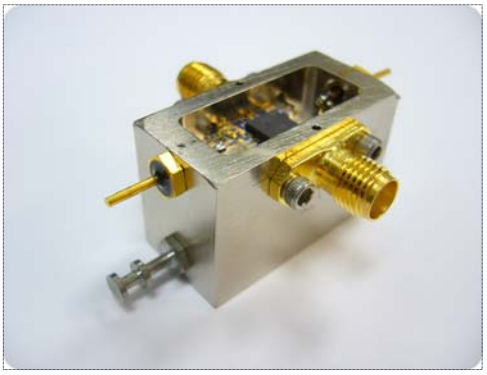


Recommended Circuit Schematic:



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_{d1} and V_{d2} = 7V, lastly increase V_g until required I_{dq}
   b. Turn-off Sequence: Turn off V_{d1} and V_{d2}, followed by V_g
3) Demonstration board available upon request.



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