EMP214

UPDATED 05/08/2008

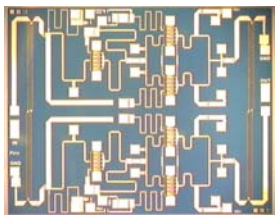
12.50 – 15.50 GHz Power Amplifier MMIC

FEATURES

- **12.5 – 15.5 GHz Operating Frequency Range**
- **29.5dBm Output Power at 1dB Compression**
- **16.0 dB Typical Small Signal Gain**
- **-42dBc OIMD3 @Each Tone Pout 18.5dBm**

APPLICATIONS

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



Dimension: 2650um X 2140um
Thickness: 85um ± 15um

Caution! ESD sensitive device.

ELECTRICAL CHARACTERISTICS (T_a = 25 °C, 50 ohm, VDD=7V, IDQ=750mA)

SYMBOL	PARAMETER/TEST CONDITIONS		MIN	TYP	MAX	UNITS
F	Operating Frequency Range	EMP214	12.5		15.5	GHz
		EMP214H	13.5		15.5	
		EMP214L	12.5		14.5	
P1dB	Output Power at 1dB Gain Compression		28.5	29.5		dBm
Gss	Small Signal Gain		13.0	16.0		dB
OIMD3	Output 3rd Order Intermodulation Distortion @Δf=10MHz, Each Tone Pout 18.5dBm Ids=60%±10%Idss			-42	-39	dBc
Input RL	Input Return Loss			-15	-10	dB
Output RL	Output Return Loss			-15	-10	dB
Idss	Saturate Drain Current V_{DS} =3V, V_{GS} =0V		920	1150	1380	mA
V_{DD}	Power Supply Voltage			7		V
Rth	Thermal Resistance (Au-Sn Eutectic Attach)			11		°C/W
Tb	Operating Base Plate Temperature		-35		+85	°C

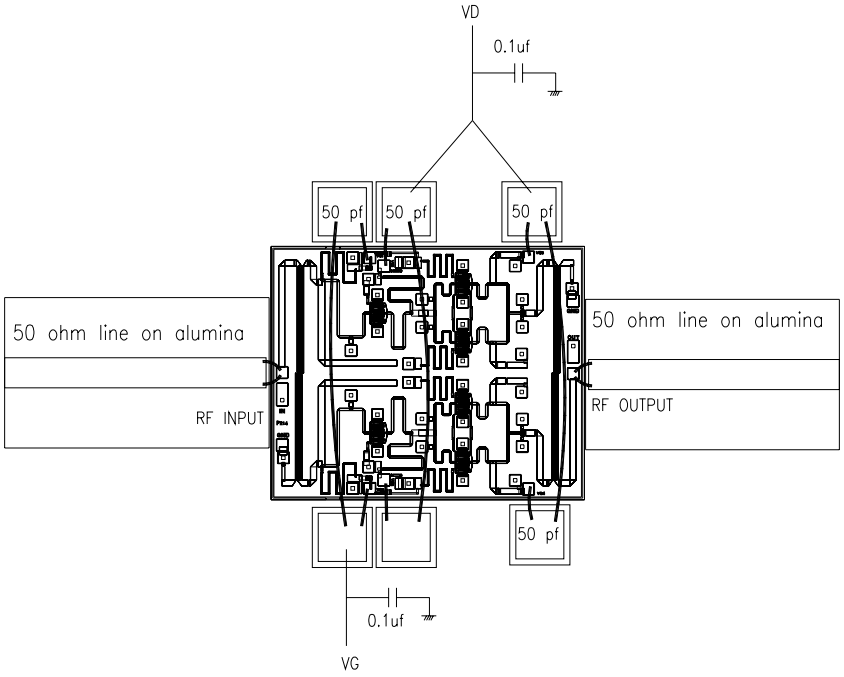
MAXIMUM RATINGS AT 25°C[1,2]

SYMBOL	CHARACTERISTIC	ABSOLUTE	CONTINUOUS
V_{DS}	Drain to Source Voltage	12 V	8 V
V_{GS}	Gate to Source Voltage	-8 V	-4 V
I_{DD}	Drain Current	Idss	1300mA
I_{GSF}	Forward Gate Current	114mA	19mA
P_{IN}	Input Power	27dBm	@ 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	12.4W	10.4W

1. Operating the device beyond any of the above rating may result in permanent damage.
2. Bias conditions must also satisfy the following equation $V_{DS}*I_{DS} < (T_{CH} - T_{HS})/R_{TH}$; where T_{HS} = Base Plate temperature

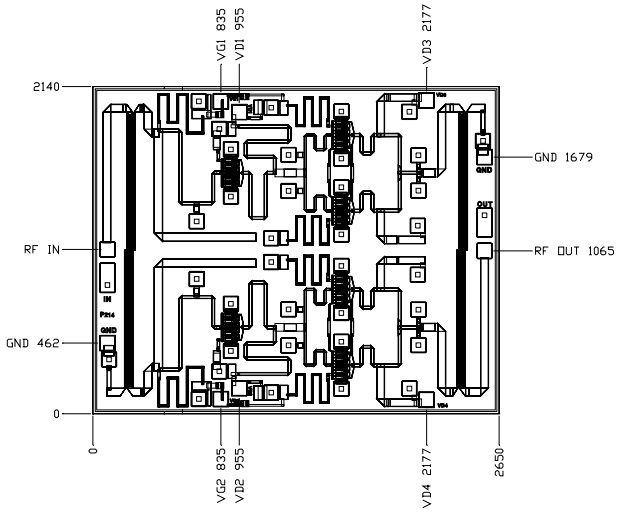
UPDATED 05/08/2008

ASSEMBLY DRAWING



The length of RF wires should be as short as possible. Use at least two wires between RF pad and 50 ohm line and separate the wires to minimize the mutual inductance.

CHIP OUTLINE



Chip Size 2140 x 2650 microns
Chip Thickness: 85 ± 15 microns
PAD Dimensions: 100 x 100 microns
All Dimensions in Microns

ORDERING INFORMATION

Part Number	Frequency (GHz)
EMP214	12.50-15.50 GHz
EMP214H	13.50-15.50 GHz
EMP214L	12.50-14.50 GHz

Notes: Contact factory for military and hi-rel grades.

DISCLAIMER

EXCELICS SEMICONDUCTOR RESERVES THE RIGHT TO MAKE CHANGES WITHOUT FURTHER NOTICE TO ANY PRODUCTS HEREIN TO IMPROVE RELIABILITY, FUNCTION OR DESIGN. EXCELICS DOES NOT ASSUME ANY LIABILITY ARISING OUT OF THE APPLICATION OR USE OF ANY PRODUCT OR CIRCUIT DESCRIBED HEREIN.

LIFE SUPPORT POLICY

EXCELICS SEMICONDUCTOR PRODUCTS ARE NOT AUTHORIZED FOR USE AS CRITICAL COMPONENTS IN LIFE SUPPORT DEVICES OR SYSTEMS WITHOUT THE EXPRESS WRITTEN APPROVAL OF EXCELICS SEMICONDUCTOR, INC.

AS HERE IN:

1. Life support devices or systems are devices or systems which, (a) are intended for surgical implant into the body, or (b) support or sustain life, or (c) whose failure to perform when properly used in accordance with instructions for use provided in the labeling, can be reasonably expected to result in significant injury to the user.
2. A critical component is any component of a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.