

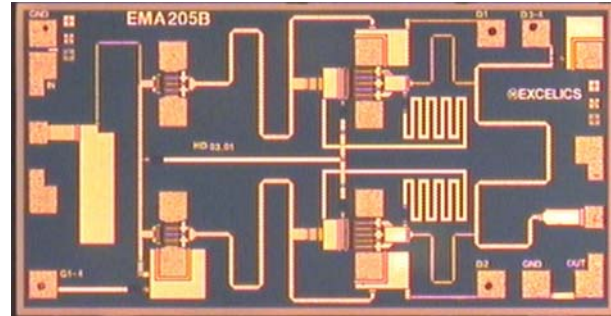


EMA205B

9-16 GHz Medium Power MMIC

FEATURES

- 9-16 GHz BANDWIDTH
- +18.0 dBm TYPICAL OUTPUT POWER
- 14 dB \pm 1.5 dB TYPICAL POWER GAIN
- TWO SECTION, DISTRIBUTED AMPLIFIER
- DUAL BIAS SUPPLY
- 0.3 MICRON RECESSED “MUSHROOM” GATE
- Si₃N₄ PASSIVATION
- ADVANCED EPITAXIAL HETEROJUNCTION PROFILE PROVIDES EXTRA HIGH POWER EFFICIENCY, AND HIGH RELIABILITY



APPLICATIONS

- Analog and Digital Wireless Systems
- Military Applications
- C-Band Terrestrial Radio



Caution! ESD sensitive device.

Chip Size 1060 x 2000 microns
Chip Thickness: 75 \pm 13 microns
All Dimensions In Microns

ELECTRICAL CHARACTERISTICS (T_a = 25°C)

SYMBOL	PARAMETERS/TEST CONDITIONS ¹	MIN	TYP	MAX	UNITS
F	Operating Frequency Range	9		16	GHz
P _{1dB}	Output Power at 1dB Gain Compression @ V _{dd} =6V 50% Id _{ss}	16.5	18.0		dBm
G _{ss}	Small Signal Gain	12	14		dB
Δ G _{ss}	Small Signal Gain Flatness		\pm 1.5	\pm 2.0	dB
NF	Noise Figure		4		dB
Input RL	Input Return Loss	9			dB
Output RL	Output Return Loss	7			dB
I _{dd}	Power Supply Current		160		mA
V _{dd}	Power Supply Voltage		5	8	V

Notes:

1. Tested with 100 Ohm gate resistor.
2. S.C.L. = Single Carrier Level.
3. Overall R_{th} depends on case mounting.

Specifications are subject to change without notice.

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ABSOLUTE MAXIMUM RATINGS FOR CONTINUOUS OPERATION^{1,2}

SYMBOL	CHARACTERISTIC	VALUE
V _{DS}	Drain to Source Voltage	8 V
V _{GS}	Gate to Source Voltage	-3 V
I _{DS}	Drain Current	225 mA
I _{GSF}	Forward Gate Current	9 mA
P _{IN}	Input Power	@ 3dB compression
P _T	Total Power Dissipation	900 mW
T _{CH}	Channel Temperature	150°C
T _{STG}	Storage Temperature	-65/+150°C

Notes:

- Operating the device beyond any of the above ratings may result in permanent damage or reduction of MTTF.
- Bias conditions must also satisfy the following equation $P_T < (T_{CH} - T_{PKG})/R_{TH}$; where T_{PKG} = temperature of package, and $P_T = (V_{DS} * I_{DS}) - (P_{OUT} - P_{IN})$.

S-PARAMETERS (On wafer Sij measurements) 5V, 1/2 Idss

FREQ (GHz)	--- S11 ---		--- S21 ---		--- S12 ---		--- S22 ---	
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
1	0.365	-129.2	0.276	82.1	0.0038	-28.6	0.620	-112.2
2	0.471	-172.2	0.441	47.4	0.0011	-88.5	0.844	-167.7
3	0.450	172.4	0.416	3.6	0.0008	-125.9	0.810	158.0
4	0.422	162.0	0.389	16.1	0.0006	-139.8	0.732	130.9
5	0.389	154.2	0.826	35.4	0.0007	-175.1	0.614	104.5
6	0.350	148.0	1.825	8.7	0.0011	160.0	0.430	73.8
7	0.312	143.6	3.185	-29.7	0.0020	139.7	0.185	34.2
8	0.276	141.4	4.559	-73.3	0.0030	97.5	0.078	-139.8
9	0.250	138.6	5.385	-117.5	0.0037	58.0	0.245	168.1
10	0.234	136.9	5.626	-159.0	0.0045	18.1	0.300	137.5
11	0.226	139.7	5.497	166.2	0.0052	-10.6	0.275	115.0
12	0.221	141.9	5.350	136.0	0.0052	-34.2	0.214	99.9
13	0.222	140.6	5.326	107.4	0.0060	-54.4	0.149	95.2
14	0.220	135.3	5.360	79.5	0.0067	-76.5	0.092	109.1
15	0.235	131.2	5.594	50.3	0.0077	-103.0	0.088	149.1
16	0.271	127.6	6.062	18.7	0.0101	-130.2	0.132	172.4
17	0.385	119.2	6.709	-17.2	0.0122	-160.7	0.205	176.3
18	0.511	89.3	6.771	-59.4	0.0122	160.1	0.314	172.1
19	0.577	53.6	5.973	-105.7	0.0111	115.1	0.457	159.6
20	0.577	21.6	4.309	-151.4	0.0072	74.4	0.608	141.4
21	0.564	-2.5	2.567	171.8	0.0022	33.0	0.711	119.8
22	0.589	-23.7	1.423	155.1	0.0004	127.1	0.733	98.4
23	0.606	-42.8	1.095	146.8	0.0018	108.7	0.686	81.3
24	0.623	-58.4	0.917	130.5	0.0021	87.5	0.628	69.0
25	0.6426	-70.4	0.754	112.2	0.0023	72.2	0.585	59.3
26	0.664	-79.7	0.607	94.3	0.0027	75.1	0.555	50.8
27	0.694	-88.2	0.487	76.6	0.0031	76.8	0.531	42.8
28	0.732	-98.1	0.399	58.6	0.0026	68.9	0.511	34.9
29	0.761	-106.2	0.330	41.6	0.0015	58.9	0.496	27.0
30	0.791	-114.1	0.271	24.2	0.0014	23.6	0.480	19.1

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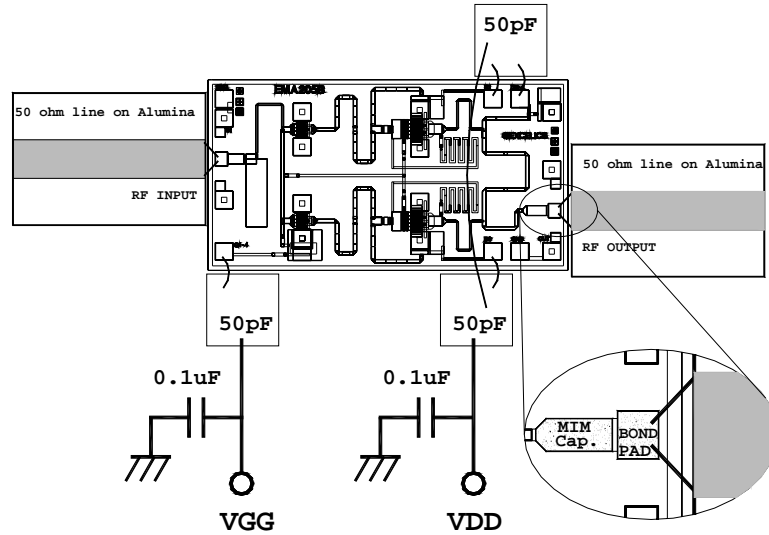
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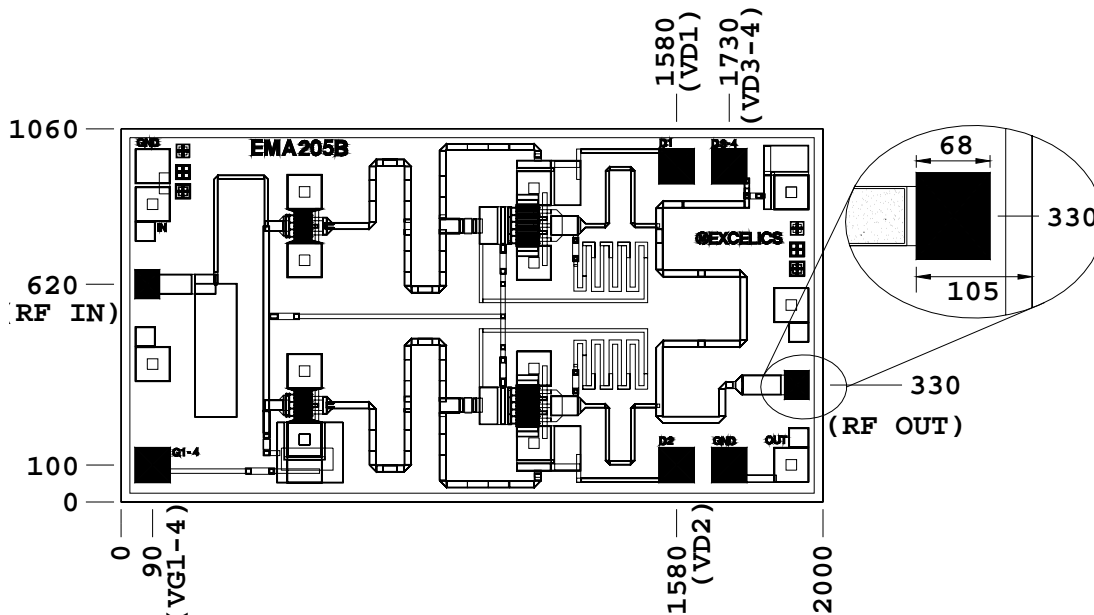
ASSEMBLY DRAWING



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.

CAUTION: Bonding tip and wires **MUST** stay within pad dimensions as illustrated in CHIP OUTLINE below. Violation may cause damages on components in chip (especially damaging output MIM capacitor as shown on above zoom-in graph).

CHIP OUTLINE (dimensions in microns)



Chip Size 1060 x 2000 microns
Chip Thickness: 75 ± 13 microns

PAD Dimensions: 1. DC 100 x 100 microns
2. RF 80 x 68 microns

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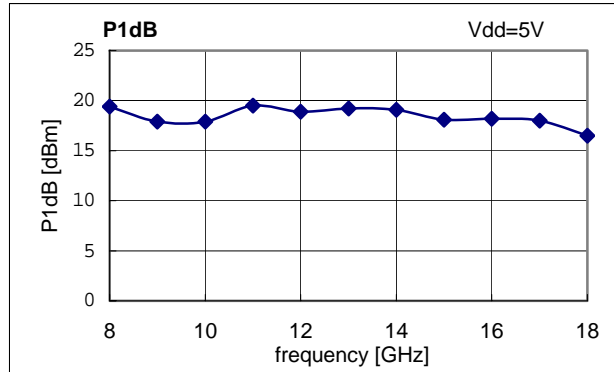
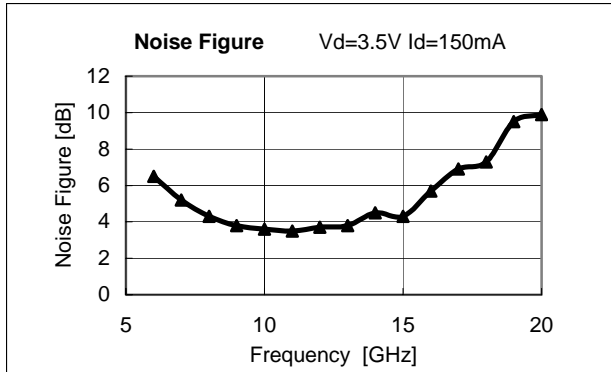
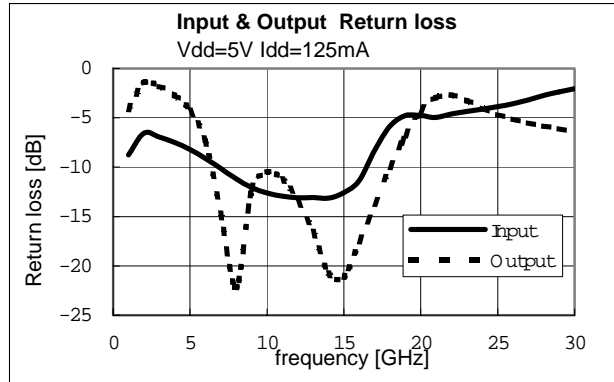
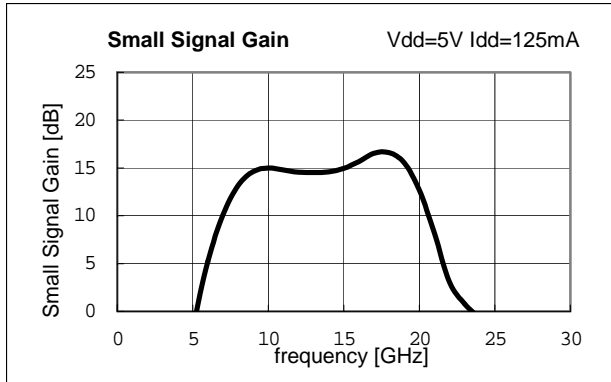
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TYPICAL APPLICATION PERFORMANCE



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