Excelics EMA406C

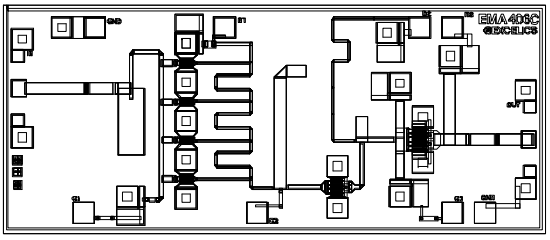
TENTATIVE DATA SHEET

26 - 32 GHz Low Noise MMIC

FEATURES

- **26 -32 GHz BANDWIDTH**
- **+20.0 dBm TYPICAL OUTPUT POWER**
- **21 dB ± 1.5 dB TYPICAL POWER GAIN**
- **FOUR SECTION, DISTRIBUTED AMPLIFIER**
- **DUAL BIAS SUPPLY**
- **0.3 MICRON RECESSED "MUSHROOM" GATE**
- **Si_3N_4 PASSIVATION**
- **ADVANCED EPITAXIAL HETEROJUNCTION**

PROFILE PROVIDES EXTRA HIGH POWER EFFICIENCY, AND HIGH RELIABILITY



Chip Size 1060 x 2500 microns
Chip Thickness: 75 ± 13 microns
All Dimensions In Microns

ELECTRICAL CHARACTERISTICS[1] (T_a = 25 ^{O}C)

SYMBOL	PARAMETERS/TEST CONDITIONS	MIN	TYP	MAX	UNIT
F	Operating Frequency Range	26		32	GHz
P_{1dB}	Ouput Power at 1dB Gain Compression		20		dBm
Gss	Small Signal Gain		21		dB
ΔGss	Small Signal Gain Flatness		± 1.5		dB
NF	Noise Figure		6		dB
VSWR in	Input VSWR		2.0:1		
VSWR out	Output VSWR		3.0:1		
Idd	Power Supply Current		140		mA
Vdd	Power Supply Voltage		5	8	V

MAXIMUM RATINGS AT 25^{O}C

SYMBOLS	PARAMETERS	ABSOLUTE[1]	CONTINUOUS[2]
Vds	Drain-Source Voltage	12V	8V
Vgs	Gate-Source Voltage	-8V	-3V
Ids	Drain Current	Idss	215mA
Igf	Forward Gate Current	50 mA	8.5mA
Pin	Input Power	15dBm	@3dB Compression
Tch	Channel Temperature	175^{o}C	150^{o}C
Tstg	Storage Temperature	-65/175^{o}C	-65/150^{o}C
Pt	Total Power Dissipation	1 W	0.85 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.

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S-PARAMETERS (On wafer Sij measurements)

5V, 1/2 Idss

FREQ	--- S11 ---		--- S21 ---		--- S12 ---		--- S22 ---	
(GHz)	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
20.00	0.33	77.79	1.28	-95.95	0.0008	44.60	0.96	85.42
20.50	0.32	68.81	1.41	-106.07	0.0011	42.01	0.96	80.89
21.00	0.30	59.18	1.57	-115.93	0.0010	52.46	0.97	75.97
21.50	0.29	48.60	1.79	-125.92	0.0014	89.17	0.97	70.79
22.00	0.27	37.50	2.09	-136.41	0.0016	91.70	0.98	65.27
22.50	0.25	25.58	2.49	-147.65	0.0006	98.47	0.99	59.31
23.00	0.24	11.90	3.02	-159.81	0.0003	98.74	1.00	52.73
23.50	0.23	-3.74	3.72	-173.45	0.0010	34.03	1.00	45.39
24.00	0.22	-20.84	4.67	171.42	0.0012	26.69	1.00	36.93
24.50	0.22	-38.46	5.89	153.98	0.0009	64.11	1.00	26.90
25.00	0.23	-56.48	7.47	134.19	0.0018	35.00	1.00	15.59
25.50	0.24	-74.69	9.29	111.36	0.0017	23.11	1.00	2.57
26.00	0.24	-92.54	11.07	86.85	0.0020	3.86	0.93	-11.48
26.50	0.25	-110.29	12.61	60.91	0.0028	-2.64	0.83	-25.69
27.00	0.25	-127.45	13.95	34.87	0.0030	-33.85	0.70	-40.01
27.50	0.26	-143.64	14.79	8.57	0.0034	-33.53	0.56	-52.60
28.00	0.25	-158.95	15.29	-17.59	0.0034	-46.81	0.43	-61.28
28.50	0.24	-173.35	15.27	-43.11	0.0019	-76.82	0.33	-63.93
29.00	0.22	171.21	15.04	-67.65	0.0023	-138.41	0.27	-60.16
29.50	0.19	155.15	14.71	-90.91	0.0029	-169.26	0.25	-54.40
30.00	0.15	138.97	14.44	-113.14	0.0042	173.19	0.26	-51.72
30.50	0.11	119.25	14.21	-135.14	0.0045	168.43	0.27	-53.13
31.00	0.05	89.26	14.12	-157.28	0.0050	138.57	0.30	-57.53
31.50	0.03	-10.38	14.03	-179.93	0.0066	110.64	0.33	-63.39
32.00	0.08	-63.92	14.02	156.67	0.0067	104.86	0.36	-71.39
32.50	0.14	-86.84	13.83	132.18	0.0074	104.16	0.40	-81.21
33.00	0.18	-103.57	13.45	106.66	0.0071	104.21	0.44	-91.19
33.50	0.21	-117.45	12.82	80.81	0.0071	116.13	0.48	-102.55
34.00	0.25	-129.30	12.12	53.53	0.0086	114.18	0.53	-114.85
34.50	0.26	-140.80	10.88	26.05	0.0100	99.52	0.55	-128.52
35.00	0.26	-149.75	9.50	-1.43	0.0112	90.23	0.55	-141.63
35.50	0.25	-153.15	8.12	-27.78	0.0099	72.51	0.54	-152.84
36.00	0.25	-156.29	6.90	-54.90	0.0141	24.34	0.50	-163.71
36.50	0.26	-151.97	5.53	-80.97	0.0137	8.68	0.46	-170.54
37.00	0.30	-149.76	4.37	-105.16	0.0128	-3.35	0.43	-175.21
37.50	0.36	-151.29	3.44	-126.85	0.0108	-11.68	0.43	-178.10
38.00	0.42	-156.26	2.71	-148.14	0.0046	-2.18	0.44	178.29
38.50	0.48	-162.95	2.14	-168.76	0.0019	54.40	0.44	173.94
39.00	0.52	-170.50	1.66	170.83	0.0036	74.41	0.44	170.08
39.50	0.56	-176.61	1.35	152.84	0.0051	78.45	0.44	166.96
40.00	0.59	178.86	1.17	138.10	0.0054	78.89	0.44	164.74

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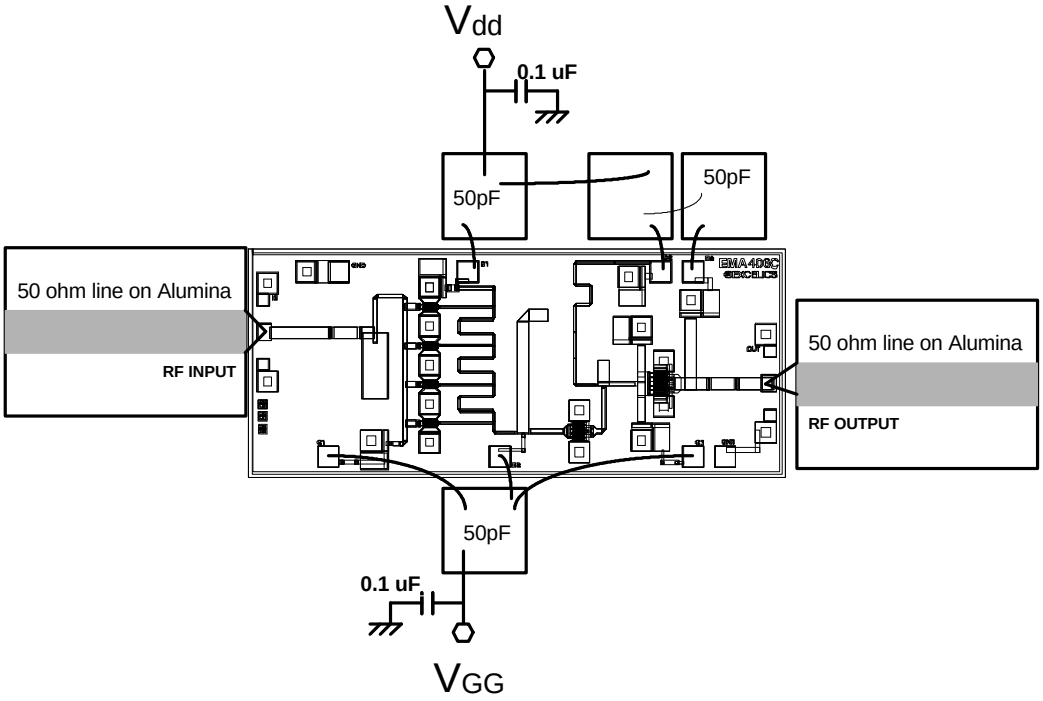
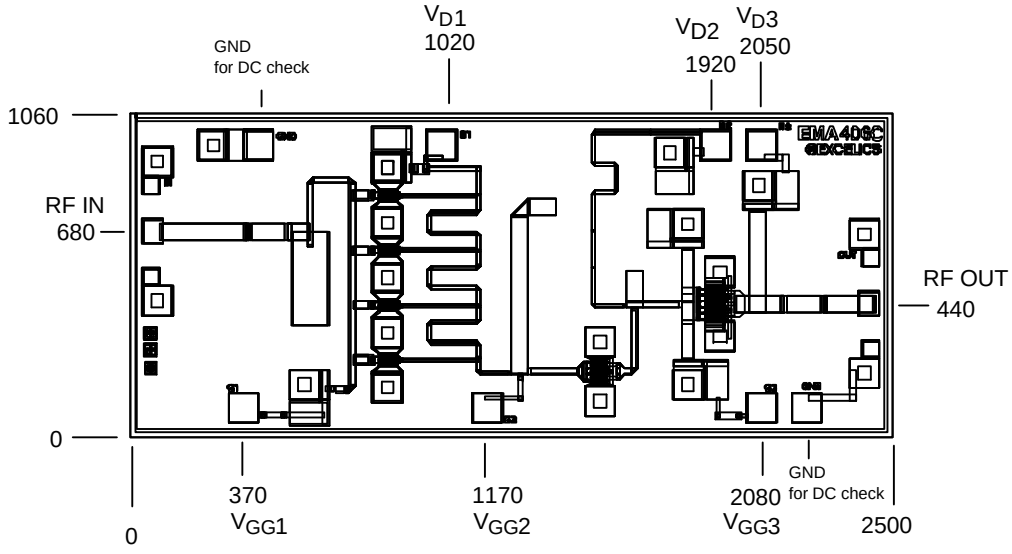
ASSEMBLY DRAWING



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.

CHIP OUTLINE



Chip Size 1060 x 2500 microns
Chip Thickness: 75 ± 13 microns
PAD Dimensions: 1. DC 100 x 100 microns
2. RF 80 x 68 microns
All Dimensions In Microns

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TYPICAL APPLICATION PERFORMANCE