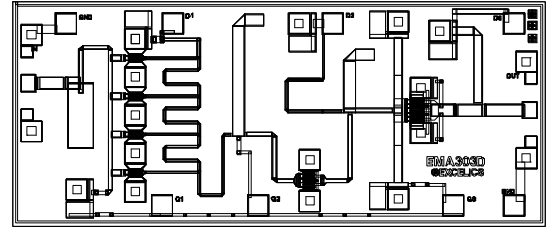


DATA SHEET

Release Date: March 7, 2003

19.5 - 24 GHz Medium Power MMIC
FEATURES

- 19.5 -24 GHz BANDWIDTH
- +22 dBm OUTPUT POWER @1dB Gain Compression
- 22 dB TYPICAL SMALL SIGNAL GAIN
- DUAL BIAS SUPPLY
- 0.3 MICRON RECESSED "MUSHROOM" GATE
- Si₃N₄ 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 CHARACTERISTICS¹ (T_a = 25 °C)

SYMBOL	PARAMETERS/TEST CONDITIONS	MIN	TYP	MAX	UNIT
F	Operating Frequency Range	19.5		24	GHz
P_{1dB}	Output Power at 1dB Gain Compression				
	@ V _{dd} =8V ; I _d = 0.5 I _{dss}	21.5	23		dBm
	@ V _{dd} =6V ; I _d = 0.5 I _{dss}	19.5	21		
G_{ss}	Small Signal Gain @ V _{dd} =6V ; I _d = 0.5 I _{dss}	20	22		dB
ΔG_{ss}	Small Signal Gain Flatness		± 1.5		dB
NF	Noise Figure @ f=18GHz, V _{dd} =3.5V, I _d =140mA		4		dB
Input RL	Input Return Loss	9			dB
Output RL	Output Return Loss	8			dB
I_{dd}	Power Supply Current		140		mA
V_{dd}	Power Supply Voltage		6	8	V

MAXIMUM RATINGS AT 25°C

SYMBOLS	PARAMETERS	ABSOLUTE ¹	CONTINUOUS ²
V_{ds}	Drain-Source Voltage	12V	8V
V_{gs}	Gate-Source Voltage	-8V	-3V
I_{ds}	Drain Current	I _{dss}	215mA
I_{gf}	Forward Gate Current	50 mA	8.5mA
P_{in}	Input Power	15dBm	@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	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.

DATA SHEET

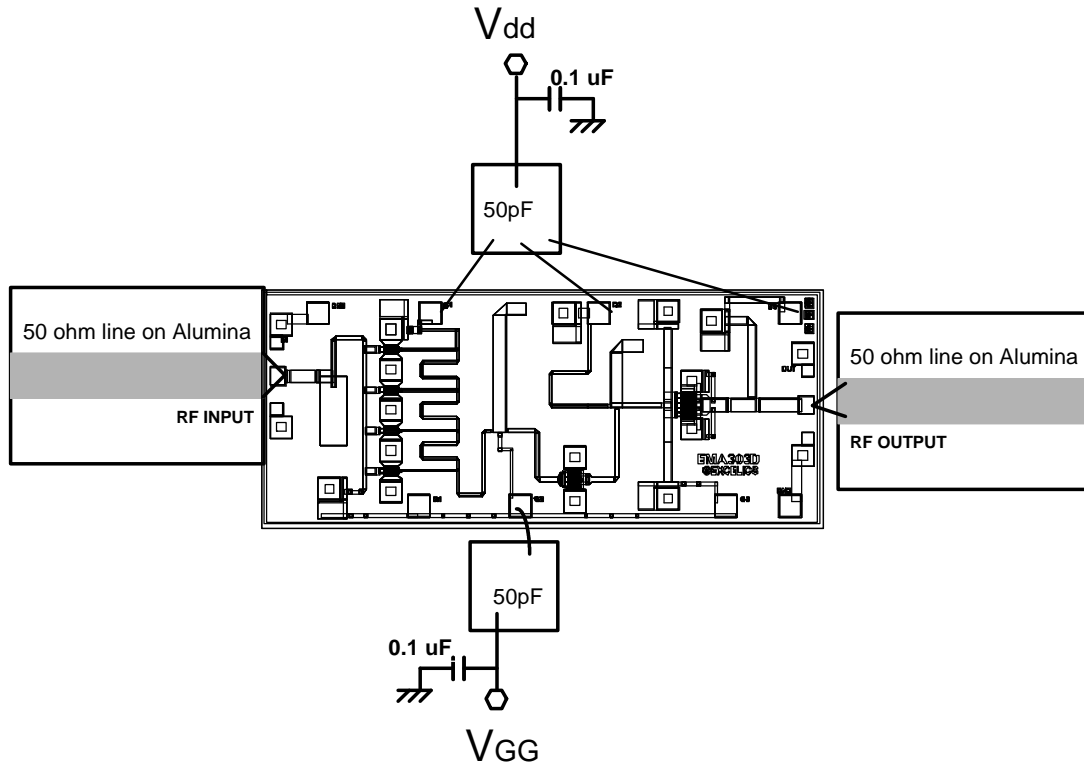
19.5 - 24 GHz Medium Power MMIC

S-PARAMETERS (On wafer S_{ij} measurements)								
6V, 1/2 I_{dss}								
FREQ (GHz)	--- S11 ---		--- S21 ---		--- S12 ---		--- S22 ---	
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
11.0	0.46	165.5	2.26	62.4	0.0007	113.9	0.92	131.9
11.5	0.49	163.4	2.88	51.1	0.0007	113.0	0.92	127.8
12.0	0.51	159.7	3.61	34.5	0.0011	93.0	0.88	122.4
12.5	0.53	154.7	4.55	16.1	0.0011	95.3	0.87	117.2
13.0	0.54	148.9	5.62	-2.3	0.0007	90.5	0.88	111.6
13.5	0.54	142.4	6.86	-21.6	0.0005	75.3	0.89	105.0
14.0	0.53	136.3	8.26	-41.7	0.0004	107.5	0.91	96.8
14.5	0.51	130.9	9.72	-61.3	0.0002	138.1	0.95	89.7
15.0	0.50	125.8	11.62	-83.4	0.0005	112.6	0.94	77.0
15.5	0.48	121.0	13.59	-108.0	0.0008	102.4	0.88	61.0
16.0	0.46	116.3	15.19	-133.7	0.0008	104.4	0.76	43.3
16.5	0.44	111.5	16.35	-158.8	0.0010	102.7	0.61	24.6
17.0	0.42	106.4	17.30	176.7	0.0011	112.3	0.44	3.6
17.5	0.41	100.4	17.91	152.2	0.0011	116.9	0.27	-20.5
18.0	0.39	93.3	18.09	128.2	0.0010	86.1	0.12	-50.2
18.5	0.36	83.9	18.21	105.4	0.0007	65.2	0.03	-110.2
19.0	0.31	72.8	18.21	82.9	0.0005	7.2	0.04	164.3
19.5	0.25	61.7	18.07	60.2	0.0006	-17.8	0.05	152.3
20.0	0.18	51.4	17.87	38.4	0.0006	-5.7	0.07	152.6
20.5	0.10	43.0	17.76	16.2	0.0002	73.6	0.08	154.9
21.0	0.03	71.6	17.25	-5.4	0.0003	-157.9	0.09	149.2
21.5	0.06	159.1	16.73	-26.3	0.0006	167.5	0.08	151.5
22.0	0.13	158.3	16.54	-46.0	0.0010	163.9	0.06	160.8
22.5	0.19	148.8	16.62	-66.8	0.0013	163.6	0.07	-161.2
23.0	0.25	136.2	16.82	-88.2	0.0012	163.1	0.09	-142.1
23.5	0.29	121.5	16.79	-111.0	0.0012	131.5	0.14	-141.7
24.0	0.32	105.3	16.58	-134.5	0.0010	134.8	0.19	-144.1
24.5	0.33	88.8	16.07	-158.3	0.0007	130.4	0.22	-148.2
25.0	0.33	71.5	15.44	177.1	0.0008	110.6	0.27	-152.4
25.5	0.31	55.4	14.50	152.7	0.0007	124.6	0.31	-157.3
26.0	0.28	40.0	13.40	128.1	0.0004	92.4	0.34	-162.3
26.5	0.24	26.9	12.21	103.4	0.0005	94.3	0.38	-167.0
27.0	0.21	16.2	10.98	78.8	0.0006	118.2	0.41	-171.9
27.5	0.18	10.7	9.73	54.0	0.0007	104.2	0.44	-176.7
28.0	0.16	10.4	8.51	29.2	0.0011	82.6	0.45	178.5
28.5	0.17	11.3	7.29	4.4	0.0012	88.0	0.47	174.5
29.0	0.20	9.3	6.11	-20.1	0.0016	57.2	0.47	170.8
29.5	0.24	2.1	5.06	-43.9	0.0019	49.0	0.48	167.9
30.0	0.29	-7.9	4.13	-66.6	0.0010	28.0	0.49	165.4
30.5	0.33	-18.8	3.35	-88.2	0.0008	-15.6	0.50	162.9
31.0	0.37	-29.7	2.70	-108.5	0.0004	-64.6	0.52	160.2

DATA SHEET

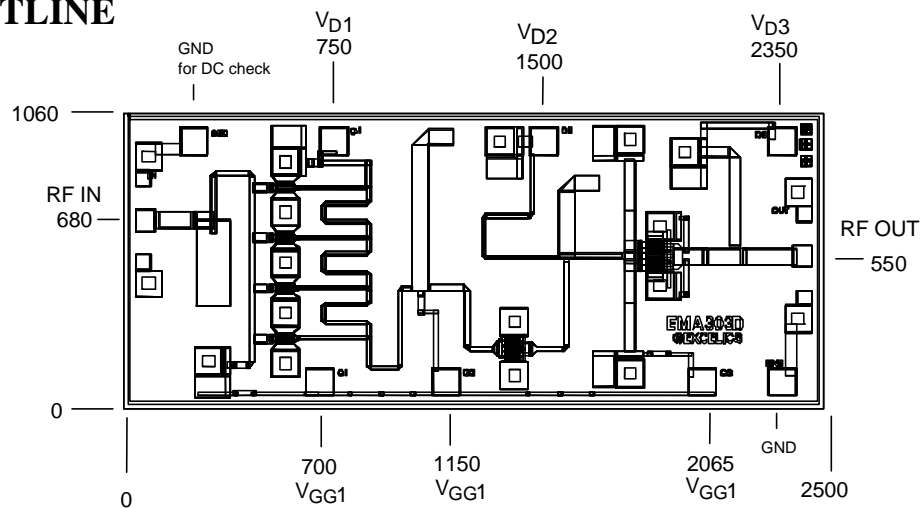
19.5 - 24 GHz Medium Power MMIC

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

DATA SHEET

19.5 - 24 GHz Medium Power MMIC

TYPICAL PERFORMANCE DATA

