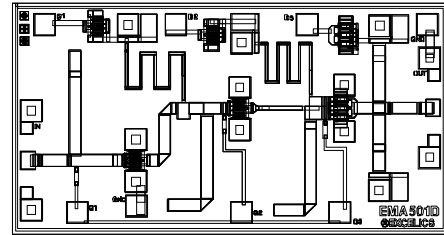


TENTATIVE DATA SHEET
36 - 40 GHz Medium Power MMIC
FEATURES

- 36 -40 GHz BANDWIDTH
- +21 dBm OUTPUT POWER @1dB Gain Compression
- 23 dB TYPICAL POWER 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 2000 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 | 36 | | 40 | GHz |
| P_{1dB} | Output Power at 1dB Gain Compression @ V _{dd} =8V | | 21 | | dBm |
| G_{ss} | Small Signal Gain | | 23 | | dB |
| ΔG_{ss} | Small Signal Gain Flatness | | ± 3 | | dB |
| NF | Noise Figure @ V _{dd} =3.5V, I _d =100mA | | 6 | | dB |
| VSWR_{in} | Input VSWR | | 3.0:1 | | |
| VSWR_{out} | Output VSWR | | 3.0:1 | | |
| I_{dd} | Power Supply Current | | 100 | | 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} | 150mA |
| I_{gf} | Forward Gate Current | 36 mA | 6mA |
| 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 | 0.7 W | 0.6 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.

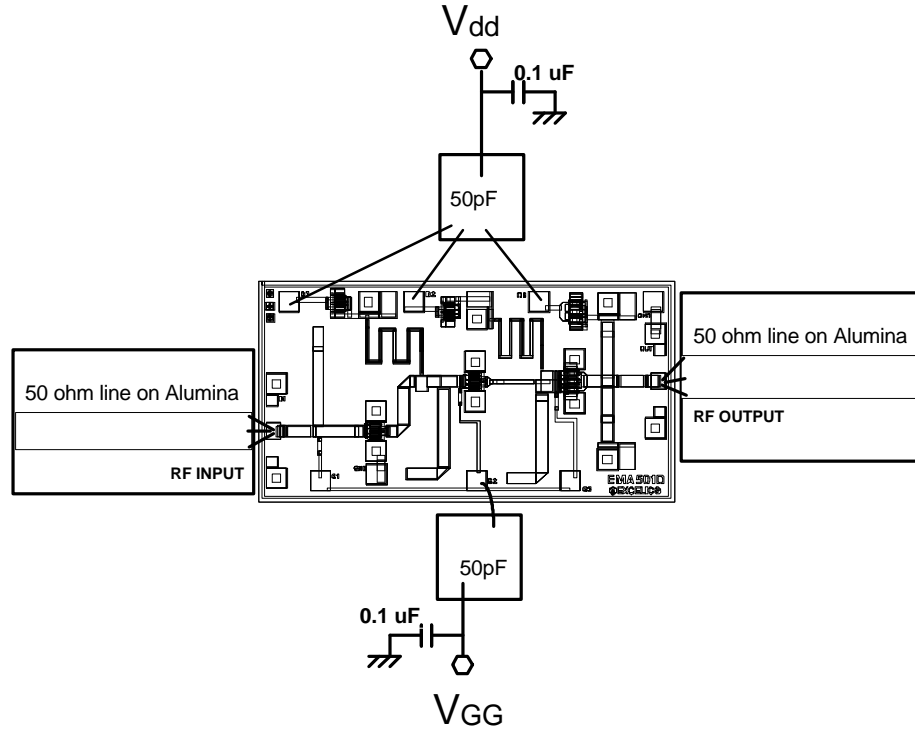
TENTATIVE DATA SHEET

36 - 40 GHz Medium Power MMIC

S-PARAMETERS (On wafer Sij measurements)
6V, 1/2 Idss

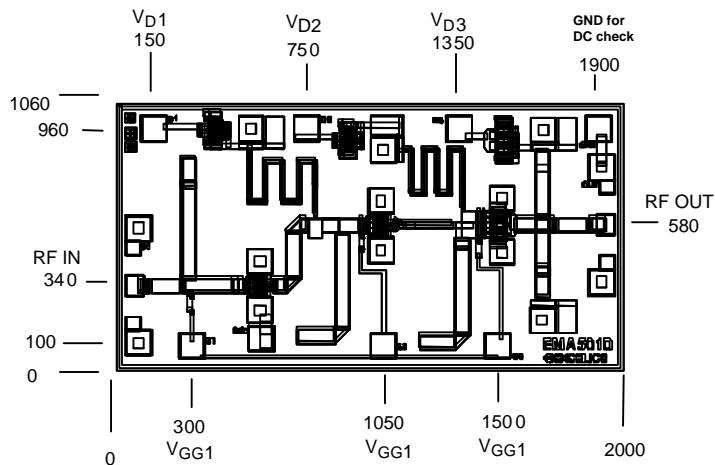
| FREQ (GHz) | --- S11 --- | | --- S21 --- | | --- S12 --- | | --- S22 --- | |
|---------------|-------------|---------|-------------|---------|-------------|---------|-------------|---------|
| | MAG | ANG | MAG | ANG | MAG | ANG | MAG | ANG |
| 20 | 0.88 | 95.78 | 0.54 | -131.62 | 0.00774 | -73.25 | 0.77 | 169.14 |
| 20.5 | 0.88 | 56.78 | 0.51 | 179.1 | 0.01004 | -119.89 | 0.74 | 116.47 |
| 21 | 0.88 | 16.47 | 0.5 | 129.26 | 0.0196 | -157.56 | 0.7 | 64.36 |
| 21.5 | 0.87 | -22.14 | 0.54 | 81.91 | 0.00955 | 138.43 | 0.68 | 10.98 |
| 22 | 0.87 | -60.86 | 0.58 | 29.04 | 0.0091 | 19.45 | 0.66 | -43.72 |
| 22.5 | 0.89 | -100.53 | 0.6 | -28.44 | 0.01221 | 45.26 | 0.68 | -104.2 |
| 23 | 0.9 | -141.74 | 0.55 | -79.42 | 0.01159 | -27.16 | 0.64 | -157.52 |
| 23.5 | 0.9 | 178.2 | 0.53 | -127.32 | 0.01764 | -97.15 | 0.66 | 150.18 |
| 24 | 0.89 | 137.16 | 0.56 | -178.49 | 0.01938 | -157.25 | 0.7 | 97.11 |
| 24.5 | 0.88 | 97.89 | 0.56 | 131.81 | 0.0171 | 127.52 | 0.7 | 44.62 |
| 25 | 0.89 | 58.37 | 0.59 | 82.52 | 0.00817 | 169.71 | 0.82 | -7.94 |
| 25.5 | 0.9 | 18.71 | 0.61 | 31.95 | 0.01686 | 24.15 | 0.84 | -65.12 |
| 26 | 0.89 | -20.57 | 0.62 | -17.95 | 0.01075 | 7.41 | 0.83 | -120.08 |
| 26.5 | 0.9 | -60.59 | 0.66 | -68.68 | 0.0053 | -61.16 | 0.85 | -175.03 |
| 27 | 0.89 | -99.22 | 0.68 | -120.71 | 0.00661 | -115.41 | 0.84 | 131.47 |
| 27.5 | 0.9 | -138.01 | 0.71 | -168.08 | 0.01248 | 128.84 | 0.82 | 80.43 |
| 28 | 0.9 | -175.23 | 0.75 | 140.45 | 0.01793 | 146.77 | 0.82 | 29.89 |
| 28.5 | 0.91 | 147.69 | 0.79 | 90.11 | 0.0209 | 67.84 | 0.82 | -22.13 |
| 29 | 0.92 | 110.9 | 0.85 | 39.36 | 0.01016 | 11.78 | 0.8 | -75.59 |
| 29.5 | 0.91 | 74.51 | 0.92 | -10.36 | 0.01996 | -30.36 | 0.83 | -128.62 |
| 30 | 0.92 | 38.82 | 1.04 | -62.03 | 0.01277 | -106.17 | 0.83 | 178.04 |
| 30.5 | 0.91 | 2.44 | 1.18 | -111.89 | 0.00432 | -134.92 | 0.83 | 125 |
| 31 | 0.93 | -33.92 | 1.38 | -162.21 | 0.01081 | -162.42 | 0.82 | 75.11 |
| 31.5 | 0.93 | -74.1 | 1.64 | 143.59 | 0.02166 | 102.48 | 0.79 | 24.92 |
| 32 | 0.92 | -113.7 | 1.95 | 90.07 | 0.01219 | 41.32 | 0.74 | -28.29 |
| 32.5 | 0.92 | -152.54 | 2.37 | 36.06 | 0.03323 | 3.33 | 0.7 | -85.82 |
| 33 | 0.87 | 163.71 | 2.85 | -21.9 | 0.02723 | -59.98 | 0.69 | -143.25 |
| 33.5 | 0.86 | 124 | 3.5 | -79.66 | 0.02304 | -109.88 | 0.7 | 160.32 |
| 34 | 0.82 | 84.44 | 4.39 | -135.98 | 0.01801 | 176 | 0.7 | 107.12 |
| 34.5 | 0.76 | 44.2 | 5.67 | 162.42 | 0.02775 | 126.35 | 0.68 | 54.65 |
| 35 | 0.72 | 8.33 | 7.38 | 96.75 | 0.03777 | 38.52 | 0.64 | 8.22 |
| 35.5 | 0.5 | -29.82 | 9.61 | 28.53 | 0.01464 | 37.61 | 0.61 | -41.38 |
| 36 | 0.47 | -57.01 | 11.63 | -46.76 | 0.01766 | -29.11 | 0.58 | -96.55 |
| 36.5 | 0.42 | -82.11 | 12.09 | -126.76 | 0.02014 | -71.2 | 0.52 | -160.03 |
| 37 | 0.5 | -120.85 | 10.95 | 162.06 | 0.02283 | -131.79 | 0.43 | 139.76 |
| 37.5 | 0.43 | -164.88 | 11.18 | 95.73 | 0.00925 | -160.55 | 0.35 | 69.42 |
| 38 | 0.35 | 149.59 | 11.59 | 25.16 | 0.00764 | 117.19 | 0.2 | 1.53 |
| 38.5 | 0.23 | 103.09 | 11.75 | -48.41 | 0.01062 | 156.47 | 0.04 | 36.25 |
| 39 | 0.12 | 24.58 | 11.32 | -119.9 | 0.01383 | 128.72 | 0.23 | 39.95 |
| 39.5 | 0.15 | -135.91 | 11.23 | 163.55 | 0.01914 | 104.31 | 0.45 | -15.91 |
| 40 | 0.42 | 128.14 | 10.4 | 83.06 | 0.02972 | 25.72 | 0.62 | -85.03 |

TENTATIVE DATA SHEET
36 - 40 GHz Medium Power MMIC
ASSEMBLY DRAWING



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

CHIP OUTLINE



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
 All Dimensions In Microns

TENTATIVE DATA SHEET 36 - 40 GHz Medium Power MMIC

TYPICAL APPLICATION PERFORMANCE

