

# MGA-675T6

Low Noise Amplifier with Shutdown Mode  
in Low Profile Package for 4.9 – 6 GHz Application



## Data Sheet

### Description

Avago Technologies' MGA-675T6 is an economical, easy-to-use wideband GaAs MMIC Low Noise Amplifier (LNA) with Shutdown mode. The LNA has low noise and high linearity achieved through the use of Avago Technologies' proprietary 0.5um GaAs Enhancement-mode pHEMT process. The shutdown mode enables the LNA to be turned off when not in use and reduce current consumption. It is housed in a low profile 2 x 1.3 x 0.4mm 6-pin Ultra Thin Package. The compact footprint and low profile coupled with low noise, high linearity makes the MGA-675T6 an ideal choice as a low noise amplifier for mobile receiver in the WLAN applications.

### Component Image

2.0 x 1.3 x 0.4 mm<sup>3</sup> 6-lead Ultra Thin Package



Top View

Note:

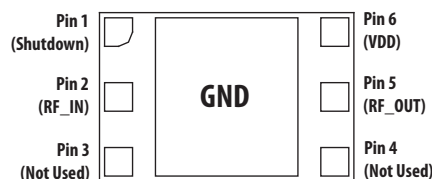
Package marking provides orientation and identification

"7F" = Product Code

"Y" = Year of Manufacture

"M" = Month of Manufacture

### Pin Configuration



Top View

### Features

- Low operating current
- Low Noise Figure
- 4.9 GHz – 6 GHz operating range
- GaAs E-pHEMT Technology<sup>[1]</sup>
- Best in class linearity and input power compression
- Low profile package size: 2.0 x 3.0 x 0.4 mm<sup>3</sup>
- Excellent uniformity in product specifications
- Tape-and-Reel packaging option available

### Specifications

5.5 GHz; 3V, 10mA (typ):

- 17.8 dB Gain
- 1.75 dB Noise Figure
- -3 dBm Input IP3
- -10 dBm Input Power at 1dB gain compression
- S11 of -8.5dB, S22 of -9dB for NF match.
- <0.5mA current consumption in Shutdown Mode

### Applications

- Low noise amplifier for mobile receiver for WLAN.
- Other ultra low noise application in the 4.9 – 6 GHz band e.g 5.8 GHz WiMax.

Note:

1. Enhancement mode technology employs positive Vgs, thereby eliminating the need of negative gate voltage associated with conventional depletion mode devices.



**Attention: Observe precautions for handling electrostatic sensitive devices.**

ESD Machine Model = 50 V

ESD Human Body Model = 250 V

Refer to Avago Application Note A004R:

*Electrostatic Discharge, Damage and Control.*

## Absolute Maximum Ratings <sup>[1]</sup>T<sub>A</sub> = 25 °C

| Symbol              | Parameter               | Units | Absolute Max. |
|---------------------|-------------------------|-------|---------------|
| V <sub>dd</sub>     | Device Voltage          | V     | 3.6           |
| P <sub>in,max</sub> | CW RF Input Power       | dBm   | 12            |
| P <sub>diss</sub>   | Total Power Dissipation | mW    | 45            |
| T <sub>j</sub>      | Junction Temperature    | °C    | 150           |
| T <sub>STG</sub>    | Storage Temperature     | °C    | -65 to 150    |

## Thermal Resistance <sup>[2,3]</sup>

(V<sub>dd</sub> = 3.0V, I<sub>d</sub> = 10mA) , θ<sub>jc</sub> = 65 °C/W

Notes:

1. Operation of this device in excess of any of these limits may cause permanent damage.
2. Thermal resistance measured using Infra-Red Measurement Technique.
3. Board temperature T<sub>B</sub> is 25 °C , for T<sub>B</sub> > 147 °C, Derate the device power at 15.4 mW per °C rise in board ( Package belly) temperature.

## Electrical Specifications<sup>[4,5]</sup>

T<sub>A</sub> = 25 °C, V<sub>dd</sub> = V<sub>shutdown</sub> = 3V @ 10mA, RF performance at 5.5 GHz, measured on demo board (see Figure 4) unless otherwise specified.

| Symbol                | Parameter and Test Condition        | Units | Min. | Typ. | Max. |
|-----------------------|-------------------------------------|-------|------|------|------|
| V <sub>dd</sub>       | Supply Voltage                      | V     |      | 3    |      |
| V <sub>Shutdown</sub> | Shutdown Voltage                    | V     |      | 3    |      |
| I <sub>ds</sub>       | Supply Current                      | mA    | 6.8  | 10   | 13   |
| Gain                  | Gain                                | dB    | 16.3 | 17.8 | 19.3 |
| IIP3 <sup>[5]</sup>   | Input Third Order Intercept Point   | dBm   | -    | -3   | -    |
| NF                    | Noise Figure                        | dB    | -    | 1.75 | 2.1  |
| IP1dB                 | Input Power at 1dB Gain Compression | dBm   | -    | -10  | -    |
| S11                   | Input Return Loss, 50Ω source       | dB    | -    | -8.5 | -    |
| S22                   | Output Return Loss, 50Ω load        | dB    | -    | -9   | -    |

Notes:

4. Measurements at 5.5GHz obtained using demo board described in Figure 1.
5. LNA Mode IIP3 test condition: F<sub>RF1</sub> = 5.5 GHz, F<sub>RF2</sub> = 5.505 GHz with input power of -30dBm per tone.

## The LNA operation configuration

|               | V <sub>dd</sub> | V <sub>Shutdown</sub> |
|---------------|-----------------|-----------------------|
| LNA Mode      | 3V              | 3V                    |
| Shutdown Mode | 3V              | 0V                    |

## Product Consistency Distribution Charts<sup>[1]</sup>

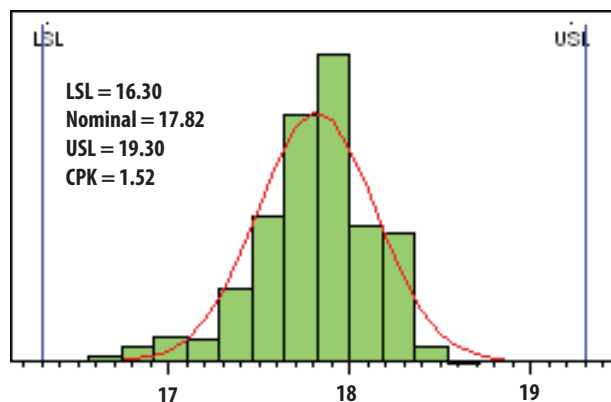


Figure 1. Gain @ 5.5 GHz, Vd 3V; Vshutdown 3 V

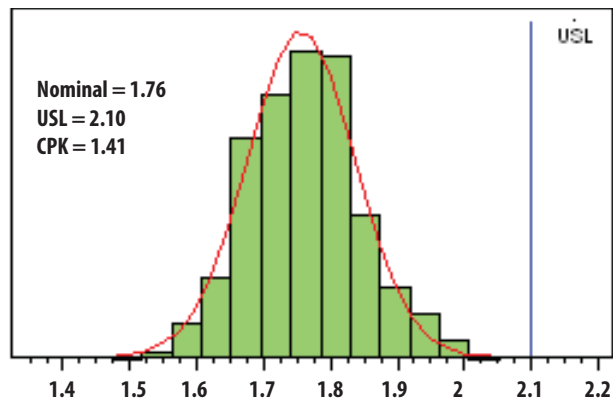


Figure 2. NF @ 5.5 GHz, Vd 3V; Vshutdown 3 V

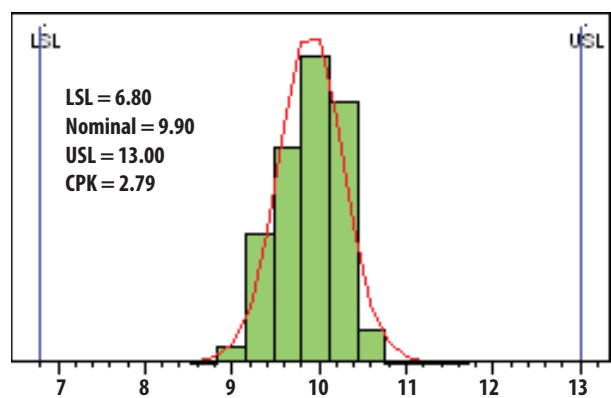


Figure 3. Idd @ 5.5 GHz, Vd 3V; Vshutdown 3 V

### Notes:

1. Distribution data sample size are 6000 samples taken from 3 different wafers and 3 different lots. Future wafers allocated to this product may have nominal values anywhere between the upper and lower limits.

## 5.5 GHz Tuned Demo Board Layout

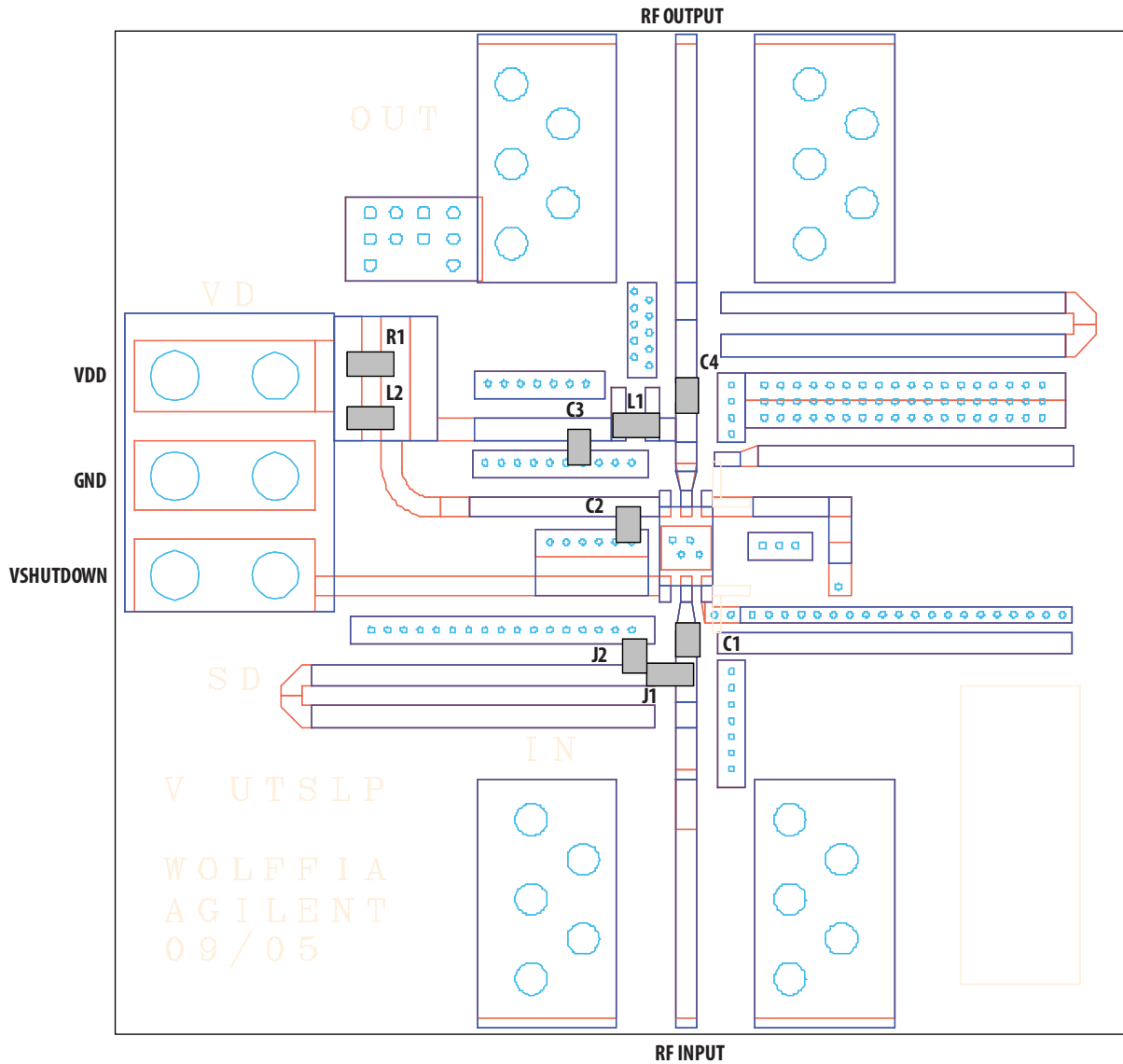


Figure 4 . Demo Board Layout For 5.5 GHz operation <sup>[1,2]</sup>

Notes:

1. Performance in a specified frequency band can be optimized by changing component values in the demo board above to suit the application at that frequency.
2. Jumpers [J1,J2] indicated in the demo board are not needed in actual application board; this is because generic demo board were used for development.

### Demo Board Components

| Components | Value  | P/N              | Components | Value  | P/N                   |
|------------|--------|------------------|------------|--------|-----------------------|
| J1,J2      | 0 ohm  | RK73Z1E000 (KOA) | L1         | 1 nH   | LL1005-FHL1N0S (TOKO) |
| C1         | 2.4 pF | Rohm             | L2         | 10 nH  | LL1005-FHL10NJ (TOKO) |
| C2         | 1.6 pF | Rohm             | R1         | 51 ohm | RK73B1ETTP (KOA)      |
| C3         | 3 pF   | Kyocera          | C4         | 2pF    | Rohm                  |

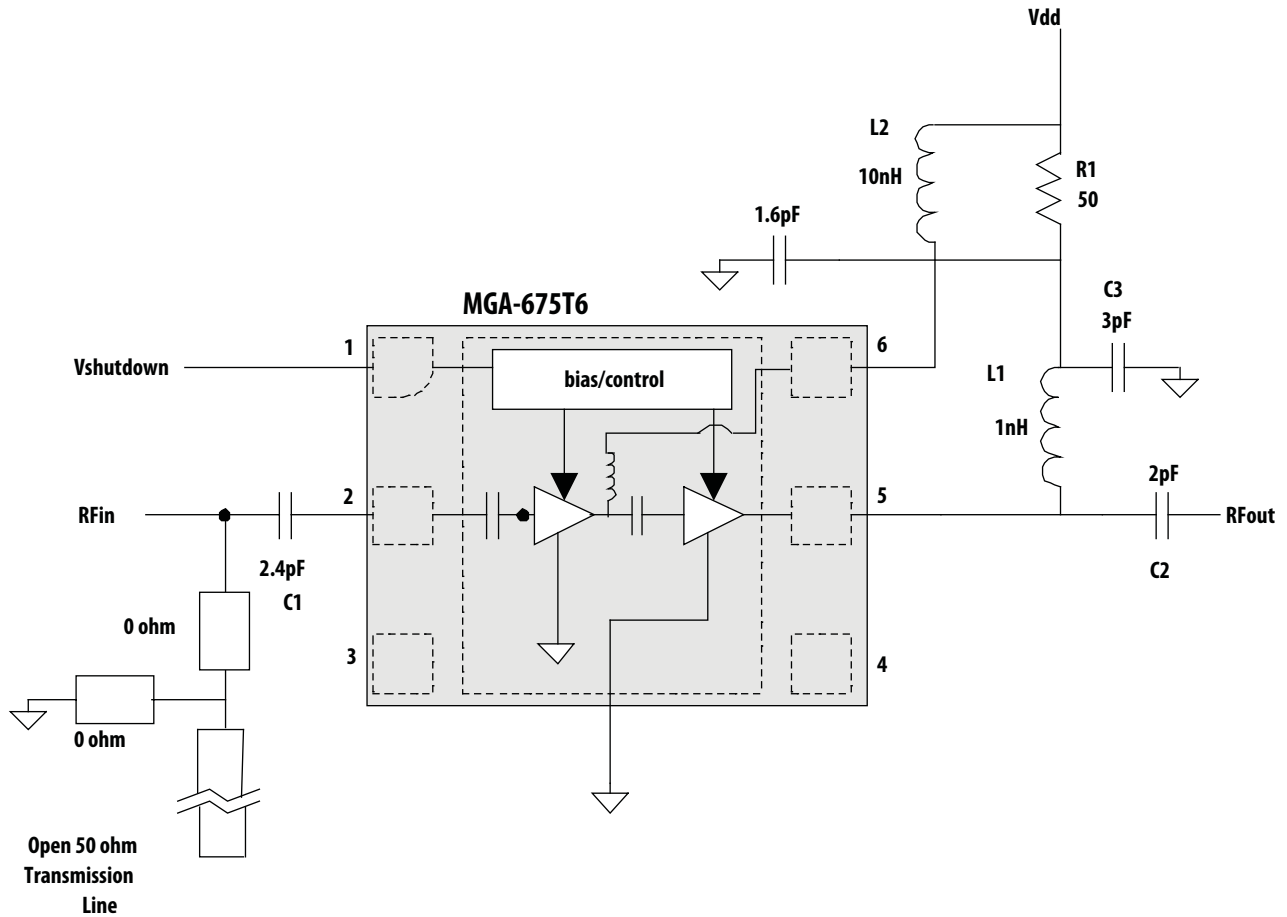


Figure 5. Demo Board Schematic Diagram

Notes:

1. The 0 Ohm resistors at the input are inductive, they are used as recommended matching elements in place of inductors. An alternative is to use shunt transmission lines, but this method is much more repeatable.
2. L2 and R1 are used to isolate the LNA demoboard from external power supply variations. They may not be needed in actual applications.
3. C1, C2, C3 and L1 are input and output matching components.

## MGA-675T6 Typical Performance

$T_A = +25^\circ\text{C}$ ,  $V_{dd} = 3\text{V}$ ,  $I_{ds} = 10\text{mA}$ , RF measurement at 5.5 GHz, Input Signal = CW unless stated otherwise.

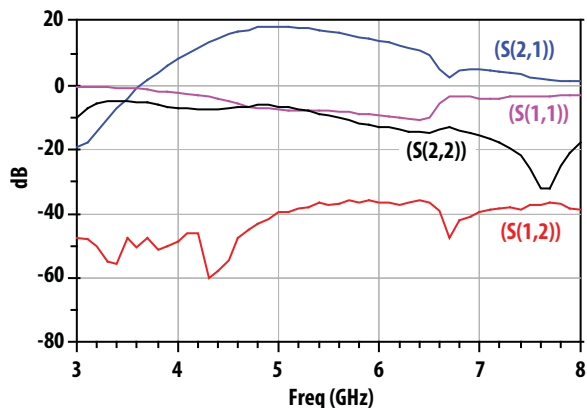


Figure 6. S21, S11, S22, S12 vs Frequency

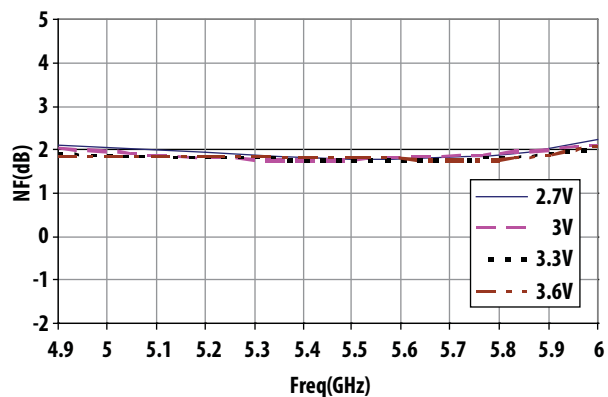


Figure 7. Noise Figure vs Frequency vs Vdd

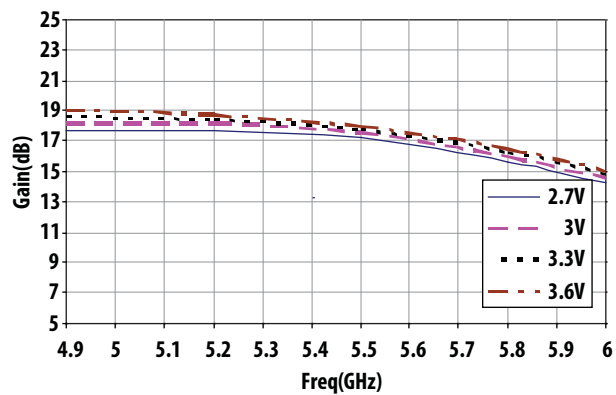


Figure 8. Gain vs Frequency vs Vdd

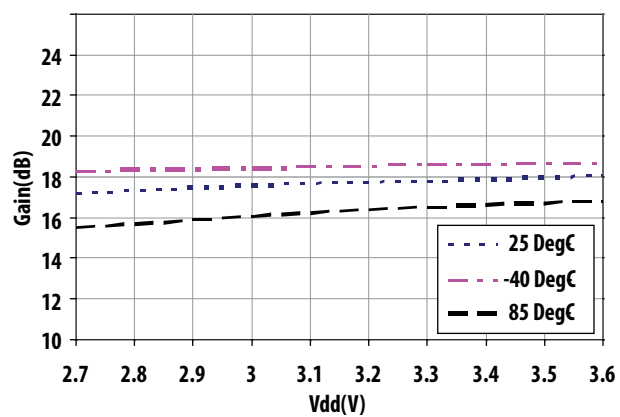


Figure 9. Gain vs Vdd vs Temperature

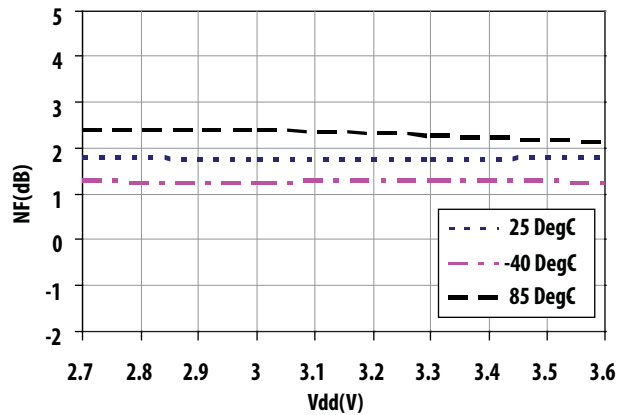


Figure 10. Noise Figure vs Vdd vs Temperature

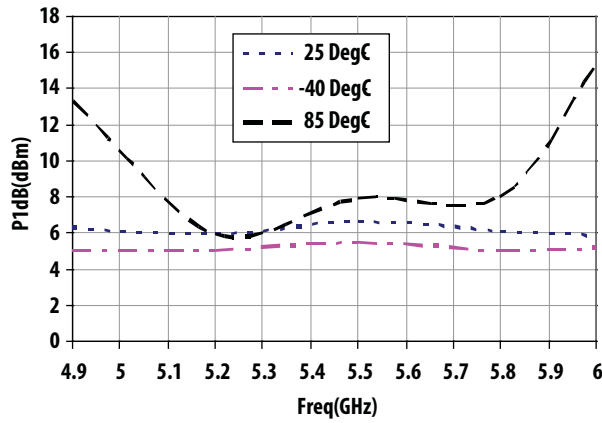


Figure 11. OP1dB vs Frequency vs Temperature

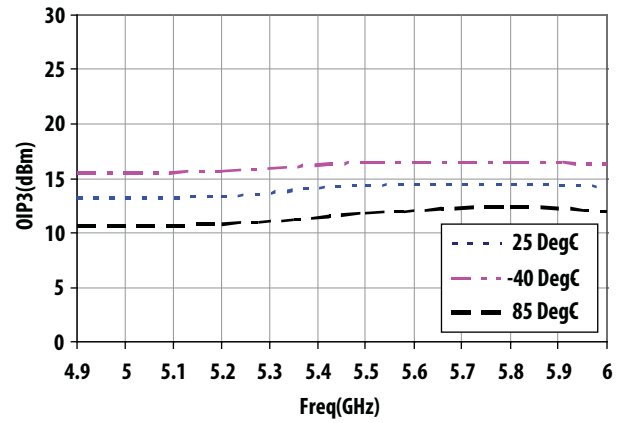


Figure 12 . OIP3 vs Frequency vs Temperature

### Test Circuit For S and Noise parameter measurement [1]

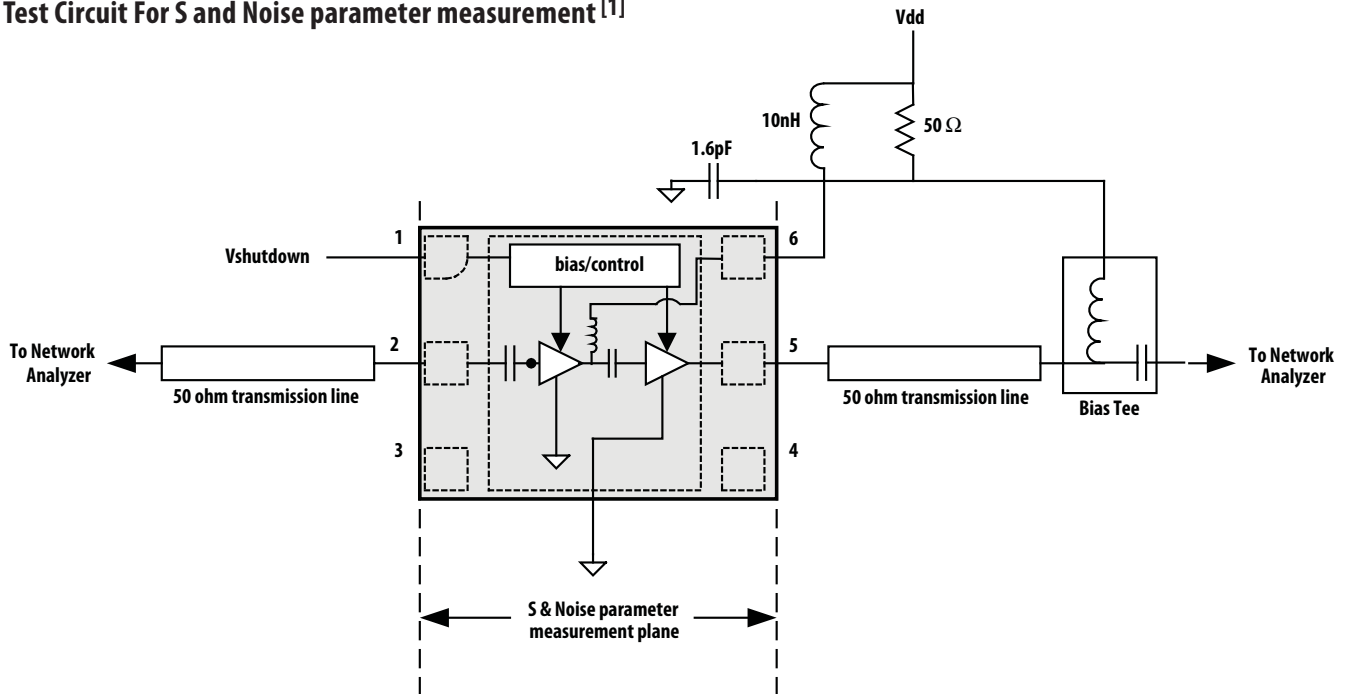


Figure 13. S-parameter measurement schematic

Note 1: The measurement is calibrated up to the input (RFin) and output (RFout) pin of the package.

**MGA-675T6 typical scattering parameters at 25C, Vdd = 2.7V ; Id = 10mA**

| Freq.<br>(GHz) | S11  |         | S21    |      | S12    |        | S22    |         | Mag  | Ang    |
|----------------|------|---------|--------|------|--------|--------|--------|---------|------|--------|
|                | Mag  | Ang     | (dB)   | Mag  | Ang    | (dB)   | Mag    | Ang     |      |        |
| 0.1            | 0.99 | -2.59   | 3.69   | 1.53 | 30.71  | -67.96 | 0.0004 | -177.55 | 0.13 | 106.81 |
| 0.2            | 0.97 | -3.79   | 7.27   | 2.31 | -33.14 | -60    | 0.001  | 27.88   | 0.29 | 71.85  |
| 0.3            | 0.98 | -5.33   | 2.35   | 1.31 | -43.02 | -61.94 | 0.0008 | 167.54  | 0.38 | 55.09  |
| 0.4            | 0.97 | -6.64   | -1.01  | 0.89 | -43.52 | -60    | 0.001  | 63.37   | 0.45 | 44.25  |
| 0.5            | 0.97 | -8.55   | -2.97  | 0.71 | -40.29 | -64.44 | 0.0006 | 151.25  | 0.49 | 35.45  |
| 0.6            | 0.97 | -10.2   | -7.96  | 0.4  | -28.99 | -64.44 | 0.0006 | 146.8   | 0.52 | 29.67  |
| 0.7            | 0.96 | -12.53  | -0.09  | 0.99 | -18.06 | -67.96 | 0.0004 | 17.47   | 0.54 | 24.42  |
| 0.8            | 0.97 | -13.26  | -7.96  | 0.4  | -39.81 | -70.46 | 0.0003 | 111.69  | 0.55 | 21.06  |
| 0.9            | 0.96 | -15.37  | -12.04 | 0.25 | -5.49  | -59.17 | 0.0011 | 126.32  | 0.57 | 17.33  |
| 1              | 0.97 | -17.3   | -8.64  | 0.37 | 24.51  | -61.94 | 0.0008 | 100.62  | 0.57 | 14.31  |
| 1.1            | 0.96 | -19.09  | -9.12  | 0.35 | -6.95  | -61.94 | 0.0008 | 119.41  | 0.58 | 11.99  |
| 1.2            | 0.97 | -20.67  | -13.15 | 0.22 | 39.62  | -60    | 0.001  | 111.76  | 0.58 | 9.5    |
| 1.3            | 0.95 | -23.28  | -7.74  | 0.41 | 39.77  | -58.42 | 0.0012 | 163.47  | 0.59 | 7.02   |
| 1.4            | 0.94 | -24.92  | -9.63  | 0.33 | 8.82   | -61.94 | 0.0008 | 131.07  | 0.6  | 5.15   |
| 1.5            | 0.94 | -25.77  | -18.42 | 0.12 | 44.26  | -60    | 0.001  | 130.93  | 0.6  | 3.62   |
| 1.6            | 0.94 | -27.82  | -14.89 | 0.18 | 93.1   | -58.42 | 0.0012 | 137.92  | 0.6  | 1.53   |
| 1.7            | 0.94 | -29.65  | -11.37 | 0.27 | 104.96 | -57.72 | 0.0013 | 124.53  | 0.61 | 0.35   |
| 1.8            | 0.94 | -31.87  | -8.87  | 0.36 | 109.69 | -60    | 0.001  | 149.79  | 0.61 | -2.02  |
| 1.9            | 0.94 | -34.31  | -7.54  | 0.42 | 109.02 | -58.42 | 0.0012 | 144.32  | 0.62 | -3.5   |
| 2              | 0.92 | -36.01  | -8.18  | 0.39 | 107.97 | -59.17 | 0.0011 | 123.65  | 0.62 | -6.32  |
| 2.1            | 0.92 | -37.2   | -9.9   | 0.32 | 129.9  | -57.72 | 0.0013 | 156.26  | 0.63 | -8.21  |
| 2.2            | 0.94 | -38.86  | -7.96  | 0.4  | 157.86 | -59.17 | 0.0011 | 138.53  | 0.63 | -10.52 |
| 2.3            | 0.95 | -41.52  | -2.5   | 0.75 | 167.32 | -57.72 | 0.0013 | 105.16  | 0.62 | -12.73 |
| 2.4            | 0.94 | -45.18  | 1.21   | 1.15 | 158.87 | -60.92 | 0.0009 | 101.67  | 0.62 | -15.48 |
| 2.5            | 0.91 | -48     | 3.81   | 1.55 | 147.62 | -66.02 | 0.0005 | 36.3    | 0.61 | -17.99 |
| 2.6            | 0.86 | -48.6   | 4.08   | 1.6  | 137.6  | -60.92 | 0.0009 | -24.46  | 0.61 | -21.26 |
| 2.7            | 0.86 | -48.44  | 4.03   | 1.59 | 141.78 | -63.1  | 0.0007 | 6.74    | 0.59 | -26.43 |
| 2.8            | 0.86 | -52.93  | 9.6    | 3.02 | 148.27 | -52.77 | 0.0023 | 10.01   | 0.53 | -28.03 |
| 2.9            | 0.82 | -51.17  | 7.23   | 2.3  | 110.62 | -51.7  | 0.0026 | -70.77  | 0.55 | -33.46 |
| 3              | 0.83 | -51.87  | 5.62   | 1.91 | 109.58 | -50.17 | 0.0031 | -65.16  | 0.51 | -41.28 |
| 3.1            | 0.83 | -52.62  | 4.81   | 1.74 | 109.89 | -52.04 | 0.0025 | -66.06  | 0.44 | -49.62 |
| 3.2            | 0.83 | -53.67  | 4.14   | 1.61 | 109.81 | -50.46 | 0.003  | -64.77  | 0.36 | -57.82 |
| 3.3            | 0.83 | -54.86  | 3.86   | 1.56 | 120.94 | -52.77 | 0.0023 | -58.95  | 0.25 | -68.53 |
| 3.4            | 0.83 | -56.61  | 5.01   | 1.78 | 126.62 | -49.9  | 0.0032 | -64.57  | 0.14 | -72.73 |
| 3.5            | 0.82 | -57.87  | 4.14   | 1.61 | 125.04 | -50.46 | 0.003  | -72.22  | 0.06 | -78.31 |
| 3.6            | 0.83 | -58.86  | 4.45   | 1.67 | 143.01 | -51.7  | 0.0026 | -64.33  | 0.05 | 93.79  |
| 3.7            | 0.83 | -60.33  | 6.61   | 2.14 | 148.43 | -52.4  | 0.0024 | -71.24  | 0.15 | 79.52  |
| 3.8            | 0.83 | -62.18  | 8.16   | 2.56 | 148.25 | -56.48 | 0.0015 | -51.97  | 0.22 | 70.75  |
| 3.9            | 0.83 | -64.06  | 9.31   | 2.92 | 146.97 | -54.89 | 0.0018 | -39.72  | 0.28 | 63.76  |
| 4              | 0.83 | -66.07  | 10.21  | 3.24 | 144.72 | -53.56 | 0.0021 | -44.21  | 0.33 | 58.56  |
| 4.1            | 0.83 | -68.08  | 11.36  | 3.7  | 144.46 | -53.56 | 0.0021 | -18.91  | 0.36 | 53.26  |
| 4.2            | 0.83 | -70.26  | 12.17  | 4.06 | 142.99 | -50.46 | 0.003  | -5.36   | 0.39 | 48.44  |
| 4.3            | 0.83 | -73.21  | 13.2   | 4.57 | 140.51 | -50.75 | 0.0029 | 23.05   | 0.41 | 43.34  |
| 4.4            | 0.83 | -76.36  | 14.1   | 5.07 | 138.4  | -46.38 | 0.0048 | 14.6    | 0.43 | 38.09  |
| 4.5            | 0.83 | -80.17  | 15.04  | 5.65 | 132.9  | -44.29 | 0.0061 | 22.37   | 0.43 | 32.27  |
| 4.6            | 0.82 | -84.42  | 15.72  | 6.11 | 128.41 | -42.85 | 0.0072 | 20.69   | 0.43 | 25.71  |
| 4.7            | 0.8  | -89.3   | 16.1   | 6.38 | 122.35 | -40.45 | 0.0095 | 22.19   | 0.43 | 18.82  |
| 4.8            | 0.79 | -94.44  | 16.81  | 6.93 | 116.19 | -38.79 | 0.0115 | 12.23   | 0.41 | 10.97  |
| 4.9            | 0.76 | -99.04  | 17.12  | 7.18 | 110.18 | -37.99 | 0.0126 | 9.31    | 0.39 | 2.39   |
| 5              | 0.73 | -104.23 | 17.33  | 7.35 | 103.26 | -37.2  | 0.0138 | 7.09    | 0.36 | -6.66  |
| 5.1            | 0.69 | -109.26 | 17.27  | 7.3  | 97     | -36.25 | 0.0154 | -0.29   | 0.32 | -16.38 |
| 5.2            | 0.65 | -113.85 | 17.12  | 7.18 | 90.4   | -35.81 | 0.0162 | -6.73   | 0.28 | -25.81 |
| 5.3            | 0.61 | -118.16 | 16.81  | 6.93 | 84.93  | -35.44 | 0.0169 | -8.69   | 0.24 | -34.44 |
| 5.4            | 0.57 | -121.95 | 16.38  | 6.59 | 79.15  | -35.09 | 0.0176 | -9.87   | 0.21 | -43.78 |
| 5.5            | 0.54 | -125.86 | 15.93  | 6.26 | 73.94  | -35.09 | 0.0176 | -13.04  | 0.18 | -52.76 |
| 5.6            | 0.52 | -129.8  | 15.37  | 5.87 | 70.49  | -34.85 | 0.0181 | -15.94  | 0.16 | -61.58 |
| 5.7            | 0.5  | -132.62 | 14.7   | 5.43 | 67.4   | -35.04 | 0.0177 | -17.02  | 0.14 | -70.58 |
| 5.8            | 0.48 | -135.91 | 14.08  | 5.06 | 64.04  | -34.89 | 0.018  | -18.14  | 0.13 | -77.46 |
| 5.9            | 0.47 | -139.49 | 13.48  | 4.72 | 62.99  | -35.34 | 0.0171 | -18.65  | 0.12 | -83.07 |
| 6              | 0.46 | -142.88 | 12.91  | 4.42 | 60.97  | -35.65 | 0.0165 | -19.02  | 0.11 | -88.39 |

**MGA-675T6 typical scattering parameters at 25C, Vdd = 3V ; Id = 10mA**

| Freq.<br>(GHz) | S11  |         | S21    |      | S12    |        | S22    |        | Mag  | Ang    |
|----------------|------|---------|--------|------|--------|--------|--------|--------|------|--------|
|                | Mag  | Ang     | (dB)   | Mag  | Ang    | (dB)   | Mag    | Ang    |      |        |
| 0.1            | 0.98 | -2.59   | 4.61   | 1.7  | 32.83  | -57.72 | 0.0013 | -69.46 | 0.15 | 121.22 |
| 0.2            | 0.97 | -3.76   | 8.23   | 2.58 | -31.93 | -64.44 | 0.0006 | 49.69  | 0.29 | 79.38  |
| 0.3            | 0.97 | -5.34   | 3.46   | 1.49 | -41.84 | -66.02 | 0.0005 | -6.57  | 0.38 | 60.53  |
| 0.4            | 0.98 | -6.72   | 0.17   | 1.02 | -42.59 | -64.44 | 0.0006 | 81.29  | 0.44 | 48.29  |
| 0.5            | 0.98 | -8.71   | -1.72  | 0.82 | -39.8  | -70.46 | 0.0003 | -0.79  | 0.48 | 39.02  |
| 0.6            | 0.97 | -10.33  | -6.74  | 0.46 | -28.34 | -63.1  | 0.0007 | 148.94 | 0.51 | 32.6   |
| 0.7            | 0.96 | -12.45  | 1.06   | 1.13 | -17.8  | -63.1  | 0.0007 | 100.29 | 0.53 | 27.07  |
| 0.8            | 0.97 | -13.61  | -6.74  | 0.46 | -39.49 | -73.98 | 0.0002 | 108.89 | 0.55 | 23.41  |
| 0.9            | 0.96 | -15.73  | -10.75 | 0.29 | -5.22  | -61.94 | 0.0008 | 99.59  | 0.56 | 19.44  |
| 1              | 0.96 | -17.68  | -7.33  | 0.43 | 23.81  | -64.44 | 0.0006 | 176.73 | 0.57 | 16.28  |
| 1.1            | 0.96 | -19.34  | -7.74  | 0.41 | -7.3   | -67.96 | 0.0004 | 114.33 | 0.57 | 13.76  |
| 1.2            | 0.96 | -21.26  | -11.7  | 0.26 | 38.87  | -64.44 | 0.0006 | 130.66 | 0.58 | 11.27  |
| 1.3            | 0.95 | -23.87  | -6.38  | 0.48 | 38.85  | -60.92 | 0.0009 | 140.3  | 0.59 | 8.72   |
| 1.4            | 0.94 | -25.36  | -8.4   | 0.38 | 8.15   | -58.42 | 0.0012 | 155.61 | 0.59 | 6.56   |
| 1.5            | 0.94 | -26.54  | -17.08 | 0.14 | 41.7   | -60    | 0.001  | 123.69 | 0.6  | 5.03   |
| 1.6            | 0.94 | -28.43  | -13.56 | 0.21 | 91.48  | -63.1  | 0.0007 | 108.74 | 0.6  | 2.8    |
| 1.7            | 0.94 | -30.46  | -10.17 | 0.31 | 102.93 | -70.46 | 0.0003 | 137.38 | 0.6  | 1.32   |
| 1.8            | 0.94 | -32.57  | -7.74  | 0.41 | 108.09 | -60.92 | 0.0009 | 147.12 | 0.61 | -0.9   |
| 1.9            | 0.93 | -35.04  | -6.38  | 0.48 | 107.23 | -67.96 | 0.0004 | -179.6 | 0.61 | -2.48  |
| 2              | 0.91 | -36.7   | -6.94  | 0.45 | 105.79 | -67.96 | 0.0004 | 170.99 | 0.61 | -5.14  |
| 2.1            | 0.91 | -37.85  | -8.87  | 0.36 | 127.65 | -59.17 | 0.0011 | 177.81 | 0.62 | -7.27  |
| 2.2            | 0.93 | -39.65  | -6.74  | 0.46 | 156.13 | -57.08 | 0.0014 | 145.6  | 0.62 | -9.87  |
| 2.3            | 0.94 | -42.52  | -1.31  | 0.86 | 165.39 | -63.1  | 0.0007 | 105.37 | 0.61 | -12.03 |
| 2.4            | 0.93 | -46.22  | 2.41   | 1.32 | 156.28 | -67.96 | 0.0004 | 70.45  | 0.61 | -14.6  |
| 2.5            | 0.9  | -48.77  | 4.91   | 1.76 | 145.22 | -64.44 | 0.0006 | 2.3    | 0.59 | -17.2  |
| 2.6            | 0.86 | -49.41  | 5.25   | 1.83 | 135.16 | -63.1  | 0.0007 | 3.87   | 0.59 | -20.85 |
| 2.7            | 0.85 | -49.59  | 5.11   | 1.8  | 139.21 | -63.1  | 0.0007 | -9.1   | 0.57 | -26.09 |
| 2.8            | 0.85 | -53.75  | 10.66  | 3.41 | 144.59 | -54.42 | 0.0019 | 3.6    | 0.5  | -26.81 |
| 2.9            | 0.81 | -52.13  | 8.23   | 2.58 | 107.52 | -52.77 | 0.0023 | -71.16 | 0.53 | -32.63 |
| 3              | 0.82 | -52.76  | 6.57   | 2.13 | 106.6  | -52.4  | 0.0024 | -67.84 | 0.48 | -40.48 |
| 3.1            | 0.81 | -53.59  | 5.67   | 1.92 | 106.84 | -51.37 | 0.0027 | -86.26 | 0.41 | -48.5  |
| 3.2            | 0.81 | -54.87  | 4.96   | 1.77 | 106.93 | -51.7  | 0.0026 | -70.69 | 0.32 | -56.18 |
| 3.3            | 0.82 | -55.89  | 4.66   | 1.71 | 118.37 | -51.06 | 0.0028 | -70.45 | 0.22 | -65.52 |
| 3.4            | 0.82 | -57.7   | 5.71   | 1.93 | 124.35 | -51.7  | 0.0026 | -77.41 | 0.11 | -64.58 |
| 3.5            | 0.81 | -58.69  | 4.91   | 1.76 | 122.96 | -50.17 | 0.0031 | -84.78 | 0.03 | -47.85 |
| 3.6            | 0.81 | -59.94  | 5.25   | 1.83 | 140.95 | -52.04 | 0.0025 | -90.85 | 0.08 | 83.09  |
| 3.7            | 0.81 | -61.58  | 7.35   | 2.33 | 146.62 | -52.04 | 0.0025 | -88.66 | 0.17 | 76.97  |
| 3.8            | 0.82 | -63.37  | 8.94   | 2.8  | 146.43 | -52.77 | 0.0023 | -80.13 | 0.24 | 70.01  |
| 3.9            | 0.81 | -64.83  | 10.05  | 3.18 | 145.42 | -57.08 | 0.0014 | -48.45 | 0.3  | 64.18  |
| 4              | 0.82 | -67.27  | 11     | 3.55 | 142.87 | -55.92 | 0.0016 | -63.4  | 0.35 | 59.07  |
| 4.1            | 0.81 | -69.26  | 12.13  | 4.04 | 142.8  | -56.48 | 0.0015 | -34.76 | 0.38 | 54.18  |
| 4.2            | 0.81 | -71.59  | 12.95  | 4.44 | 141.1  | -54.42 | 0.0019 | -21.47 | 0.41 | 49.56  |
| 4.3            | 0.82 | -74.35  | 14     | 5.01 | 138.88 | -53.15 | 0.0022 | -0.19  | 0.43 | 44.74  |
| 4.4            | 0.82 | -77.71  | 14.9   | 5.56 | 136.49 | -49.12 | 0.0035 | 18.8   | 0.44 | 39.96  |
| 4.5            | 0.81 | -81.35  | 15.82  | 6.18 | 130.99 | -46.02 | 0.005  | 21.99  | 0.45 | 34.32  |
| 4.6            | 0.8  | -86.25  | 16.51  | 6.69 | 126.3  | -44.01 | 0.0063 | 19.55  | 0.45 | 28.09  |
| 4.7            | 0.79 | -90.48  | 16.89  | 6.99 | 120.18 | -42.5  | 0.0075 | 27.49  | 0.44 | 21.66  |
| 4.8            | 0.77 | -96.17  | 17.56  | 7.55 | 113.85 | -40    | 0.01   | 16.38  | 0.43 | 13.96  |
| 4.9            | 0.74 | -100.89 | 17.85  | 7.81 | 107.79 | -39.09 | 0.0111 | 11.08  | 0.4  | 5.99   |
| 5              | 0.7  | -106.34 | 18.02  | 7.96 | 100.78 | -37.86 | 0.0128 | 6.64   | 0.36 | -2.82  |
| 5.1            | 0.67 | -110.9  | 17.95  | 7.9  | 94.75  | -37.27 | 0.0137 | 1.32   | 0.32 | -11.37 |
| 5.2            | 0.63 | -115.89 | 17.76  | 7.73 | 87.84  | -37.08 | 0.014  | -5.27  | 0.28 | -20.37 |
| 5.3            | 0.58 | -120.09 | 17.41  | 7.42 | 82.47  | -36.42 | 0.0151 | -5.9   | 0.24 | -27.88 |
| 5.4            | 0.55 | -124.02 | 16.96  | 7.05 | 77.09  | -36.19 | 0.0155 | -9.69  | 0.21 | -36.56 |
| 5.5            | 0.53 | -128.18 | 16.5   | 6.68 | 71.71  | -35.7  | 0.0164 | -10.94 | 0.18 | -44.5  |
| 5.6            | 0.5  | -131.65 | 15.95  | 6.27 | 68.62  | -35.7  | 0.0164 | -14.41 | 0.15 | -53.18 |
| 5.7            | 0.48 | -134.91 | 15.27  | 5.8  | 65.41  | -36.14 | 0.0156 | -16.94 | 0.13 | -61.03 |
| 5.8            | 0.46 | -138.4  | 14.62  | 5.38 | 62.06  | -35.97 | 0.0159 | -17.8  | 0.11 | -67.41 |
| 5.9            | 0.46 | -142.15 | 14.03  | 5.03 | 60.88  | -36.31 | 0.0153 | -16.37 | 0.11 | -73.23 |
| 6              | 0.45 | -145.59 | 13.4   | 4.68 | 59.06  | -36.36 | 0.0152 | -14.34 | 0.1  | -78.59 |

**MGA-675T6 typical scattering parameters at 25C, Vdd = 3.3V ; Id = 10mA**

| Freq.<br>(GHz) | S11  |         | S21    |      | S12    |        | S22    |        | Mag  | Ang    |
|----------------|------|---------|--------|------|--------|--------|--------|--------|------|--------|
|                | Mag  | Ang     | (dB)   | Mag  | Ang    | (dB)   | Mag    | Ang    |      |        |
| 0.1            | 0.99 | -2.75   | 5.39   | 1.86 | 32.62  | -61.94 | 0.0008 | 154.78 | 0.16 | 128.17 |
| 0.2            | 0.97 | -3.91   | 9.16   | 2.87 | -30.82 | -64.44 | 0.0006 | 114.74 | 0.29 | 84.42  |
| 0.3            | 0.97 | -5.54   | 4.4    | 1.66 | -41.07 | -70.46 | 0.0003 | 29.9   | 0.38 | 64.45  |
| 0.4            | 0.97 | -6.99   | 1.21   | 1.15 | -42.19 | -73.98 | 0.0002 | 96.9   | 0.44 | 51.63  |
| 0.5            | 0.97 | -8.89   | -0.82  | 0.91 | -38.51 | -63.1  | 0.0007 | 72.31  | 0.48 | 41.81  |
| 0.6            | 0.97 | -10.64  | -5.51  | 0.53 | -27.99 | -73.98 | 0.0002 | -39.74 | 0.51 | 35.03  |
| 0.7            | 0.96 | -12.82  | 2.14   | 1.28 | -17.94 | -66.02 | 0.0005 | 94.97  | 0.53 | 29.15  |
| 0.8            | 0.97 | -13.94  | -5.85  | 0.51 | -39.17 | -60.92 | 0.0009 | 139.33 | 0.54 | 25.29  |
| 0.9            | 0.96 | -15.92  | -9.63  | 0.33 | -5.26  | -70.46 | 0.0003 | 89.65  | 0.56 | 21.27  |
| 1              | 0.96 | -17.92  | -6.2   | 0.49 | 23.75  | -61.94 | 0.0008 | 131.57 | 0.56 | 17.98  |
| 1.1            | 0.95 | -19.7   | -6.56  | 0.47 | -6.99  | -64.44 | 0.0006 | 122.86 | 0.57 | 15.36  |
| 1.2            | 0.96 | -21.54  | -10.75 | 0.29 | 38.13  | -64.44 | 0.0006 | 179.8  | 0.57 | 12.6   |
| 1.3            | 0.95 | -24.45  | -5.35  | 0.54 | 37.6   | -60    | 0.001  | 110.06 | 0.58 | 10.11  |
| 1.4            | 0.93 | -25.89  | -7.33  | 0.43 | 7.43   | -59.17 | 0.0011 | 134.35 | 0.59 | 7.85   |
| 1.5            | 0.93 | -27.13  | -15.92 | 0.16 | 39.32  | -59.17 | 0.0011 | 139.06 | 0.59 | 6.05   |
| 1.6            | 0.94 | -28.86  | -12.4  | 0.24 | 89.6   | -57.72 | 0.0013 | 144.61 | 0.59 | 3.91   |
| 1.7            | 0.94 | -31.06  | -8.87  | 0.36 | 101.54 | -61.94 | 0.0008 | 145.19 | 0.6  | 2.46   |
| 1.8            | 0.93 | -33.25  | -6.74  | 0.46 | 106.38 | -64.44 | 0.0006 | 145.54 | 0.6  | 0.12   |
| 1.9            | 0.93 | -35.76  | -5.35  | 0.54 | 105.18 | -59.17 | 0.0011 | 160.8  | 0.61 | -1.54  |
| 2              | 0.91 | -37.42  | -6.02  | 0.5  | 103.87 | -59.17 | 0.0011 | 160.25 | 0.61 | -4.3   |
| 2.1            | 0.9  | -38.81  | -7.96  | 0.4  | 125.24 | -54.42 | 0.0019 | 162.3  | 0.61 | -6.41  |
| 2.2            | 0.92 | -40.3   | -5.68  | 0.52 | 154.67 | -59.17 | 0.0011 | 126.89 | 0.61 | -8.92  |
| 2.3            | 0.93 | -43.23  | -0.35  | 0.96 | 163.27 | -60    | 0.001  | 159.64 | 0.6  | -11.21 |
| 2.4            | 0.92 | -47.01  | 3.35   | 1.47 | 154.25 | -64.44 | 0.0006 | 161.41 | 0.59 | -13.91 |
| 2.5            | 0.89 | -49.71  | 5.85   | 1.96 | 142.91 | -67.96 | 0.0004 | 50.77  | 0.58 | -16.28 |
| 2.6            | 0.85 | -50.38  | 6.15   | 2.03 | 133.07 | -58.42 | 0.0012 | -32.8  | 0.57 | -20.09 |
| 2.7            | 0.84 | -50.33  | 5.98   | 1.99 | 136.89 | -60.92 | 0.0009 | -55.06 | 0.55 | -24.98 |
| 2.8            | 0.84 | -54.84  | 11.5   | 3.76 | 141.33 | -53.56 | 0.0021 | -22.51 | 0.49 | -25.36 |
| 2.9            | 0.8  | -53.02  | 9.07   | 2.84 | 104.86 | -51.06 | 0.0028 | -66.02 | 0.51 | -31.37 |
| 3              | 0.81 | -53.56  | 7.31   | 2.32 | 103.75 | -51.7  | 0.0026 | -68.81 | 0.45 | -39.29 |
| 3.1            | 0.8  | -54.6   | 6.44   | 2.1  | 103.97 | -52.04 | 0.0025 | -80.45 | 0.38 | -46.7  |
| 3.2            | 0.81 | -55.72  | 5.71   | 1.93 | 104.61 | -50.75 | 0.0029 | -69.64 | 0.29 | -53.36 |
| 3.3            | 0.81 | -57.09  | 5.34   | 1.85 | 115.96 | -51.7  | 0.0026 | -81.78 | 0.19 | -60.37 |
| 3.4            | 0.8  | -58.74  | 6.36   | 2.08 | 121.9  | -52.4  | 0.0024 | -82.48 | 0.08 | -50.34 |
| 3.5            | 0.8  | -59.77  | 5.53   | 1.89 | 121.06 | -50.46 | 0.003  | -81.35 | 0.03 | 8.74   |
| 3.6            | 0.8  | -60.99  | 5.85   | 1.96 | 138.93 | -50.75 | 0.0029 | -96.45 | 0.1  | 76.5   |
| 3.7            | 0.8  | -62.54  | 7.92   | 2.49 | 144.56 | -52.4  | 0.0024 | -91.3  | 0.19 | 74.04  |
| 3.8            | 0.8  | -64.1   | 9.57   | 3.01 | 144.67 | -55.39 | 0.0017 | -93.5  | 0.26 | 68.91  |
| 3.9            | 0.8  | -66.11  | 10.68  | 3.42 | 143.65 | -54.89 | 0.0018 | -88.3  | 0.32 | 63.56  |
| 4              | 0.8  | -68.12  | 11.62  | 3.81 | 141.42 | -60    | 0.001  | -82.14 | 0.36 | 59.23  |
| 4.1            | 0.8  | -70.18  | 12.77  | 4.35 | 141.04 | -58.42 | 0.0012 | -35.3  | 0.4  | 54.59  |
| 4.2            | 0.8  | -72.53  | 13.57  | 4.77 | 139.54 | -57.08 | 0.0014 | -25.4  | 0.42 | 50.33  |
| 4.3            | 0.8  | -75.74  | 14.66  | 5.41 | 137.24 | -55.92 | 0.0016 | 15.87  | 0.44 | 45.87  |
| 4.4            | 0.8  | -78.97  | 15.53  | 5.98 | 134.81 | -51.7  | 0.0026 | 24.52  | 0.46 | 41.03  |
| 4.5            | 0.8  | -82.69  | 16.47  | 6.66 | 129.21 | -49.37 | 0.0034 | 22.58  | 0.47 | 35.73  |
| 4.6            | 0.79 | -87.35  | 17.13  | 7.19 | 124.5  | -45.19 | 0.0055 | 26.13  | 0.46 | 29.86  |
| 4.7            | 0.77 | -92.53  | 17.5   | 7.5  | 118.07 | -43.35 | 0.0068 | 27.16  | 0.46 | 23.54  |
| 4.8            | 0.75 | -97.47  | 18.14  | 8.07 | 111.75 | -41.83 | 0.0081 | 11.85  | 0.44 | 16.26  |
| 4.9            | 0.72 | -102.29 | 18.42  | 8.34 | 105.9  | -39.74 | 0.0103 | 13.29  | 0.41 | 8.53   |
| 5              | 0.68 | -107.9  | 18.58  | 8.49 | 98.7   | -38.86 | 0.0114 | 6.79   | 0.37 | 0.66   |
| 5.1            | 0.65 | -112.67 | 18.49  | 8.4  | 92.7   | -37.86 | 0.0128 | 2.18   | 0.33 | -7.41  |
| 5.2            | 0.61 | -117.77 | 18.29  | 8.21 | 86.02  | -37.39 | 0.0135 | -4.09  | 0.29 | -15.43 |
| 5.3            | 0.57 | -122.2  | 17.92  | 7.87 | 80.47  | -37.33 | 0.0136 | -5.77  | 0.25 | -22.47 |
| 5.4            | 0.54 | -126.08 | 17.49  | 7.49 | 75.41  | -36.95 | 0.0142 | -7.44  | 0.21 | -29.74 |
| 5.5            | 0.51 | -130.3  | 17.03  | 7.1  | 70.07  | -37.14 | 0.0139 | -8.12  | 0.18 | -36.43 |
| 5.6            | 0.48 | -134.36 | 16.4   | 6.61 | 66.71  | -36.48 | 0.015  | -14.54 | 0.15 | -43.57 |
| 5.7            | 0.46 | -137.46 | 15.69  | 6.09 | 63.81  | -36.89 | 0.0143 | -13.84 | 0.12 | -51.05 |
| 5.8            | 0.45 | -140.98 | 15.1   | 5.69 | 60.67  | -36.77 | 0.0145 | -14.83 | 0.11 | -56.47 |
| 5.9            | 0.44 | -144.85 | 14.45  | 5.28 | 59.42  | -37.2  | 0.0138 | -12.85 | 0.1  | -61.36 |
| 6              | 0.43 | -148.33 | 13.87  | 4.94 | 57.55  | -37.08 | 0.014  | -15.1  | 0.09 | -66.02 |

**MGA-675T6 typical scattering parameters at 25C, Vdd = 3.6V ; Id = 10mA**

| Freq.<br>(GHz) | S11  |         | S21    |      | S12    |        | S22    |         | Mag  | Ang    |
|----------------|------|---------|--------|------|--------|--------|--------|---------|------|--------|
|                | Mag  | Ang     | (dB)   | Mag  | Ang    | (dB)   | Mag    | Ang     |      |        |
| 0.1            | 0.98 | -2.73   | 6.11   | 2.02 | 34.32  | -57.72 | 0.0013 | -49.5   | 0.17 | 131.85 |
| 0.2            | 0.97 | -4.04   | 9.8    | 3.09 | -29.59 | -60.92 | 0.0009 | 133.51  | 0.29 | 88.39  |
| 0.3            | 0.97 | -5.65   | 5.15   | 1.81 | -40.52 | -63.1  | 0.0007 | -58.56  | 0.38 | 67.44  |
| 0.4            | 0.97 | -7.18   | 1.94   | 1.25 | -41.68 | -66.02 | 0.0005 | 40.59   | 0.44 | 53.88  |
| 0.5            | 0.97 | -9.17   | -0.09  | 0.99 | -38.14 | -59.17 | 0.0011 | 44.89   | 0.48 | 43.72  |
| 0.6            | 0.97 | -11.14  | -4.73  | 0.58 | -27.74 | -64.44 | 0.0006 | 108.49  | 0.51 | 36.72  |
| 0.7            | 0.96 | -13.04  | 2.98   | 1.41 | -18.39 | -70.46 | 0.0003 | 136.44  | 0.53 | 30.69  |
| 0.8            | 0.97 | -14.44  | -4.88  | 0.57 | -38.99 | -67.96 | 0.0004 | 138.77  | 0.54 | 26.75  |
| 0.9            | 0.96 | -16.49  | -8.87  | 0.36 | -5.06  | -60.92 | 0.0009 | 147.61  | 0.56 | 22.56  |
| 1              | 0.96 | -18.51  | -5.35  | 0.54 | 23.03  | -61.94 | 0.0008 | 110.04  | 0.56 | 18.96  |
| 1.1            | 0.95 | -20.15  | -5.85  | 0.51 | -6.31  | -63.1  | 0.0007 | 159.42  | 0.57 | 16.46  |
| 1.2            | 0.96 | -21.98  | -9.9   | 0.32 | 37.59  | -63.1  | 0.0007 | 111.08  | 0.57 | 13.58  |
| 1.3            | 0.94 | -24.8   | -4.44  | 0.6  | 36.76  | -60    | 0.001  | 130.43  | 0.58 | 10.94  |
| 1.4            | 0.93 | -26.59  | -6.56  | 0.47 | 6.95   | -60    | 0.001  | 138.39  | 0.59 | 8.77   |
| 1.5            | 0.93 | -27.78  | -15.39 | 0.17 | 37.41  | -60    | 0.001  | 130.16  | 0.59 | 7.1    |
| 1.6            | 0.93 | -29.7   | -11.37 | 0.27 | 88.53  | -59.17 | 0.0011 | 112.69  | 0.59 | 4.83   |
| 1.7            | 0.93 | -31.59  | -8.18  | 0.39 | 99.96  | -60.92 | 0.0009 | 141.18  | 0.6  | 3.21   |
| 1.8            | 0.93 | -34.13  | -5.85  | 0.51 | 104.93 | -60.92 | 0.0009 | 163.35  | 0.6  | 0.9    |
| 1.9            | 0.92 | -36.49  | -4.58  | 0.59 | 103.53 | -64.44 | 0.0006 | 144.84  | 0.61 | -0.82  |
| 2              | 0.9  | -38.21  | -5.19  | 0.55 | 102.51 | -59.17 | 0.0011 | 153.04  | 0.61 | -3.54  |
| 2.1            | 0.9  | -39.46  | -7.13  | 0.44 | 123.42 | -58.42 | 0.0012 | 135.81  | 0.61 | -5.73  |
| 2.2            | 0.91 | -41.27  | -4.88  | 0.57 | 152.98 | -60    | 0.001  | 152.49  | 0.6  | -8.26  |
| 2.3            | 0.93 | -44.21  | 0.34   | 1.04 | 161.29 | -58.42 | 0.0012 | 163.48  | 0.59 | -10.46 |
| 2.4            | 0.91 | -47.84  | 4.08   | 1.6  | 152.75 | -60.92 | 0.0009 | -175.57 | 0.59 | -12.95 |
| 2.5            | 0.88 | -50.51  | 6.49   | 2.11 | 141.06 | -73.98 | 0.0002 | 108.04  | 0.57 | -15.64 |
| 2.6            | 0.84 | -51.29  | 6.85   | 2.2  | 130.99 | -66.02 | 0.0005 | -27.29  | 0.56 | -19.14 |
| 2.7            | 0.84 | -51.6   | 6.69   | 2.16 | 134.74 | -67.96 | 0.0004 | -56.92  | 0.54 | -24.18 |
| 2.8            | 0.83 | -55.72  | 12.15  | 4.05 | 138.7  | -55.39 | 0.0017 | -26.93  | 0.47 | -23.73 |
| 2.9            | 0.8  | -54.26  | 9.63   | 3.03 | 102.64 | -53.15 | 0.0022 | -87.43  | 0.49 | -30.11 |
| 3              | 0.8  | -54.77  | 7.89   | 2.48 | 101.36 | -51.37 | 0.0027 | -88.19  | 0.43 | -37.32 |
| 3.1            | 0.79 | -55.87  | 6.97   | 2.23 | 101.3  | -51.37 | 0.0027 | -91.6   | 0.35 | -44.03 |
| 3.2            | 0.79 | -56.93  | 6.24   | 2.05 | 102.28 | -50.17 | 0.0031 | -88.77  | 0.26 | -48.94 |
| 3.3            | 0.79 | -58.26  | 5.8    | 1.95 | 113.9  | -51.06 | 0.0028 | -77.82  | 0.16 | -52.42 |
| 3.4            | 0.79 | -60.03  | 6.81   | 2.19 | 119.81 | -50.46 | 0.003  | -82.32  | 0.08 | -28.67 |
| 3.5            | 0.78 | -60.93  | 5.93   | 1.98 | 119.47 | -49.63 | 0.0033 | -91.23  | 0.06 | 30.86  |
| 3.6            | 0.78 | -61.98  | 6.28   | 2.06 | 137.24 | -49.63 | 0.0033 | -100.44 | 0.13 | 70.3   |
| 3.7            | 0.78 | -63.46  | 8.33   | 2.61 | 143.03 | -53.15 | 0.0022 | -109.08 | 0.21 | 70.42  |
| 3.8            | 0.78 | -65.28  | 9.99   | 3.16 | 143.15 | -53.56 | 0.0021 | -102.03 | 0.28 | 66.53  |
| 3.9            | 0.78 | -67.04  | 11.13  | 3.6  | 142.27 | -52.77 | 0.0023 | -101.87 | 0.34 | 62.19  |
| 4              | 0.78 | -69.2   | 12.06  | 4.01 | 139.96 | -56.48 | 0.0015 | -93.08  | 0.38 | 58.38  |
| 4.1            | 0.78 | -71.4   | 13.18  | 4.56 | 139.8  | -58.42 | 0.0012 | -79.41  | 0.41 | 54.29  |
| 4.2            | 0.78 | -73.72  | 14     | 5.01 | 138.08 | -60    | 0.001  | -34.42  | 0.44 | 50.24  |
| 4.3            | 0.78 | -76.54  | 15.09  | 5.68 | 135.87 | -56.48 | 0.0015 | 14.51   | 0.46 | 46.03  |
| 4.4            | 0.79 | -79.96  | 15.99  | 6.3  | 133.48 | -53.98 | 0.002  | 8.58    | 0.47 | 41.52  |
| 4.5            | 0.77 | -83.93  | 16.9   | 7    | 127.65 | -51.37 | 0.0027 | 25.79   | 0.48 | 36.57  |
| 4.6            | 0.77 | -88.88  | 17.55  | 7.54 | 122.81 | -47.74 | 0.0041 | 23.71   | 0.48 | 31.02  |
| 4.7            | 0.75 | -93.65  | 17.89  | 7.84 | 116.59 | -44.29 | 0.0061 | 23.67   | 0.47 | 25.08  |
| 4.8            | 0.73 | -99.06  | 18.54  | 8.45 | 110.07 | -42.97 | 0.0071 | 17.88   | 0.45 | 17.97  |
| 4.9            | 0.7  | -103.98 | 18.8   | 8.71 | 104.07 | -41.72 | 0.0082 | 14.83   | 0.42 | 11.06  |
| 5              | 0.67 | -109.45 | 18.95  | 8.86 | 96.99  | -39.91 | 0.0101 | 11.65   | 0.39 | 3.61   |
| 5.1            | 0.63 | -114.37 | 18.85  | 8.76 | 90.92  | -38.71 | 0.0116 | 1.6     | 0.34 | -3.72  |
| 5.2            | 0.59 | -119.48 | 18.61  | 8.52 | 84.41  | -39.02 | 0.0112 | -2.96   | 0.3  | -11.18 |
| 5.3            | 0.55 | -123.98 | 18.29  | 8.21 | 79.14  | -38.13 | 0.0124 | -5.94   | 0.26 | -17.17 |
| 5.4            | 0.52 | -128.13 | 17.8   | 7.76 | 73.75  | -37.92 | 0.0127 | -8.81   | 0.22 | -23.44 |
| 5.5            | 0.5  | -132.47 | 17.29  | 7.32 | 68.61  | -37.72 | 0.013  | -9.09   | 0.18 | -28.95 |
| 5.6            | 0.47 | -136.65 | 16.74  | 6.87 | 65.31  | -37.33 | 0.0136 | -10.54  | 0.15 | -34.66 |
| 5.7            | 0.45 | -139.8  | 16     | 6.31 | 62.42  | -37.52 | 0.0133 | -13.35  | 0.13 | -39.63 |
| 5.8            | 0.44 | -143.63 | 15.37  | 5.87 | 59.31  | -37.39 | 0.0135 | -14.27  | 0.11 | -43.79 |
| 5.9            | 0.43 | -147.45 | 14.76  | 5.47 | 58.28  | -37.92 | 0.0127 | -13.94  | 0.1  | -48.11 |
| 6              | 0.42 | -151.21 | 14.1   | 5.07 | 56.36  | -37.65 | 0.0131 | -14.32  | 0.09 | -52.14 |

**MGA-675T6 typical noise parameters at 25C, Vdd = 2.7V ; Id = 10mA**

| Freq.(GHz) | Fmin (dB) | $\Gamma_{opt}$ Mag | $\Gamma_{opt}$ Ang | Rn/50    |
|------------|-----------|--------------------|--------------------|----------|
| 4.9        | 1.35126   | 0.53697            | 64.949             | 0.323956 |
| 5.2        | 1.43217   | 0.40326            | 68.0102            | 0.305117 |
| 5.5        | 1.49122   | 0.40548            | 77.4672            | 0.279867 |
| 5.8        | 1.82744   | 0.33439            | 94.8074            | 0.235282 |
| 6          | 2.04859   | 0.25328            | 118.4296           | 0.203811 |

**MGA-675T6 typical noise parameters at 25C, Vdd = 3V ; Id = 10mA**

| Freq.(GHz) | Fmin (dB) | $\Gamma_{opt}$ Mag | $\Gamma_{opt}$ Ang | Rn/50    |
|------------|-----------|--------------------|--------------------|----------|
| 4.9        | 1.35601   | 0.45657            | 62.0252            | 0.310886 |
| 5.2        | 1.39364   | 0.38634            | 65.7949            | 0.289666 |
| 5.5        | 1.43979   | 0.38199            | 75.883             | 0.271336 |
| 5.8        | 1.72404   | 0.32152            | 93.9554            | 0.226681 |
| 6          | 1.95541   | 0.23419            | 124.0041           | 0.185029 |

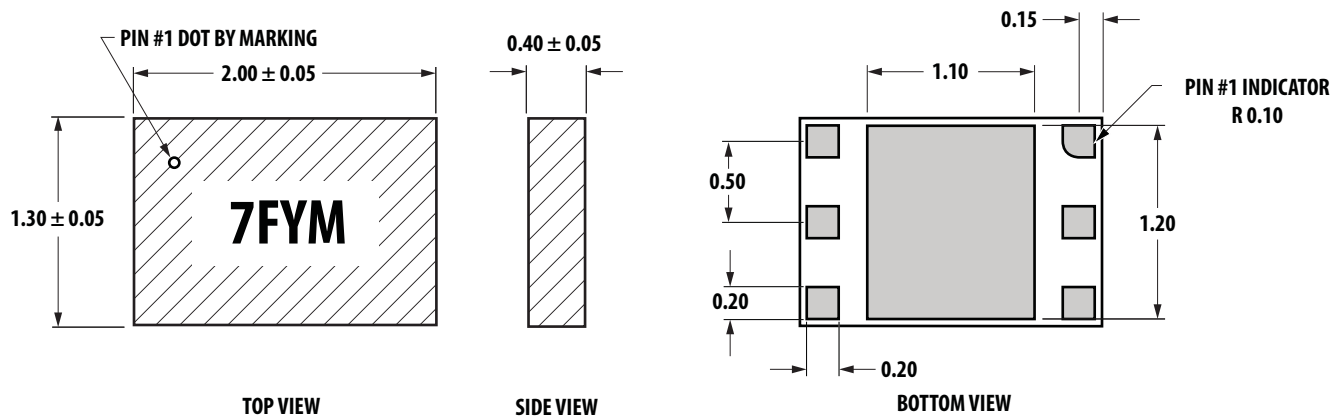
**MGA-675T6 typical noise parameters at 25C, Vdd = 3.3V ; Id = 10mA**

| Freq.(GHz) | Fmin (dB) | $\Gamma_{opt}$ Mag | $\Gamma_{opt}$ Ang | Rn/50    |
|------------|-----------|--------------------|--------------------|----------|
| 4.9        | 1.29085   | 0.45051            | 62.7022            | 0.288653 |
| 5.2        | 1.35494   | 0.36239            | 64.2459            | 0.278086 |
| 5.5        | 1.40731   | 0.35846            | 76.9741            | 0.246368 |
| 5.8        | 1.70062   | 0.29237            | 92.6917            | 0.224477 |
| 6          | 1.86238   | 0.2634             | 130.4643           | 0.146939 |

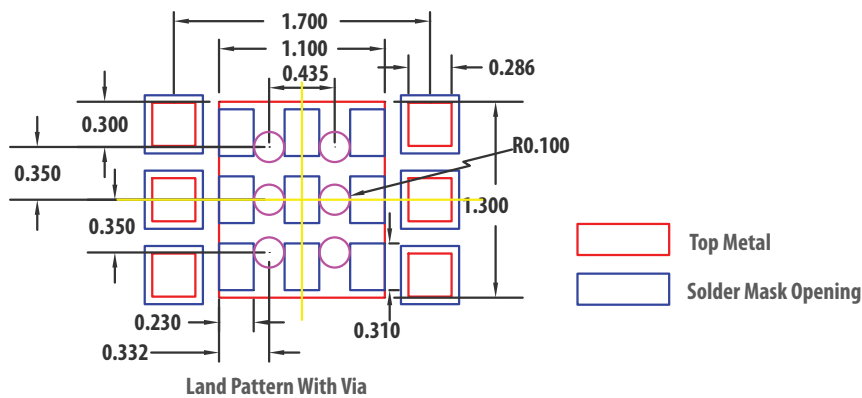
**MGA-675T6 typical noise parameters at 25C, Vdd = 3.6V ; Id = 10mA**

| Freq.(GHz) | Fmin (dB) | $\Gamma_{opt}$ Mag | $\Gamma_{opt}$ Ang | Rn/50    |
|------------|-----------|--------------------|--------------------|----------|
| 4.9        | 1.2867    | 0.41338            | 60.6672            | 0.282774 |
| 5.2        | 1.32897   | 0.35595            | 65.0199            | 0.252703 |
| 5.5        | 1.39274   | 0.34038            | 76.2336            | 0.235472 |
| 5.8        | 1.68828   | 0.28043            | 93.1996            | 0.211577 |
| 6          | 1.82103   | 0.24344            | 134.5497           | 0.139986 |

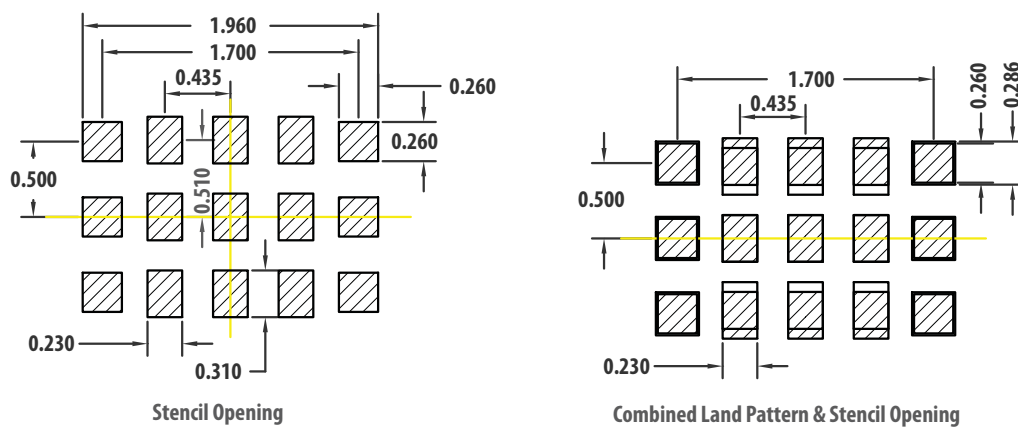
## Package Dimensions



## PCB Land Pattern



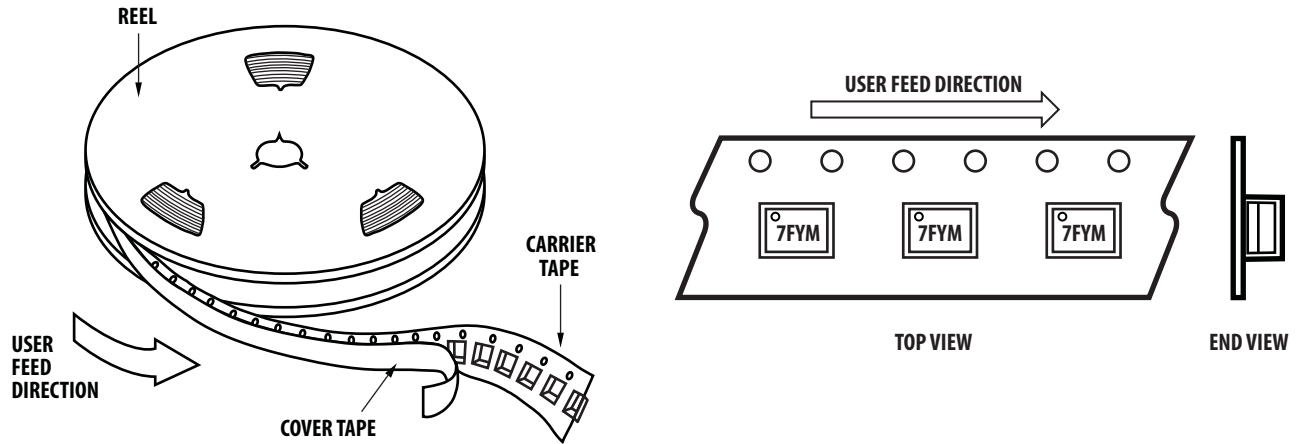
## Stencil Outline Drawing and Combined Land Pattern & Stencil Layout



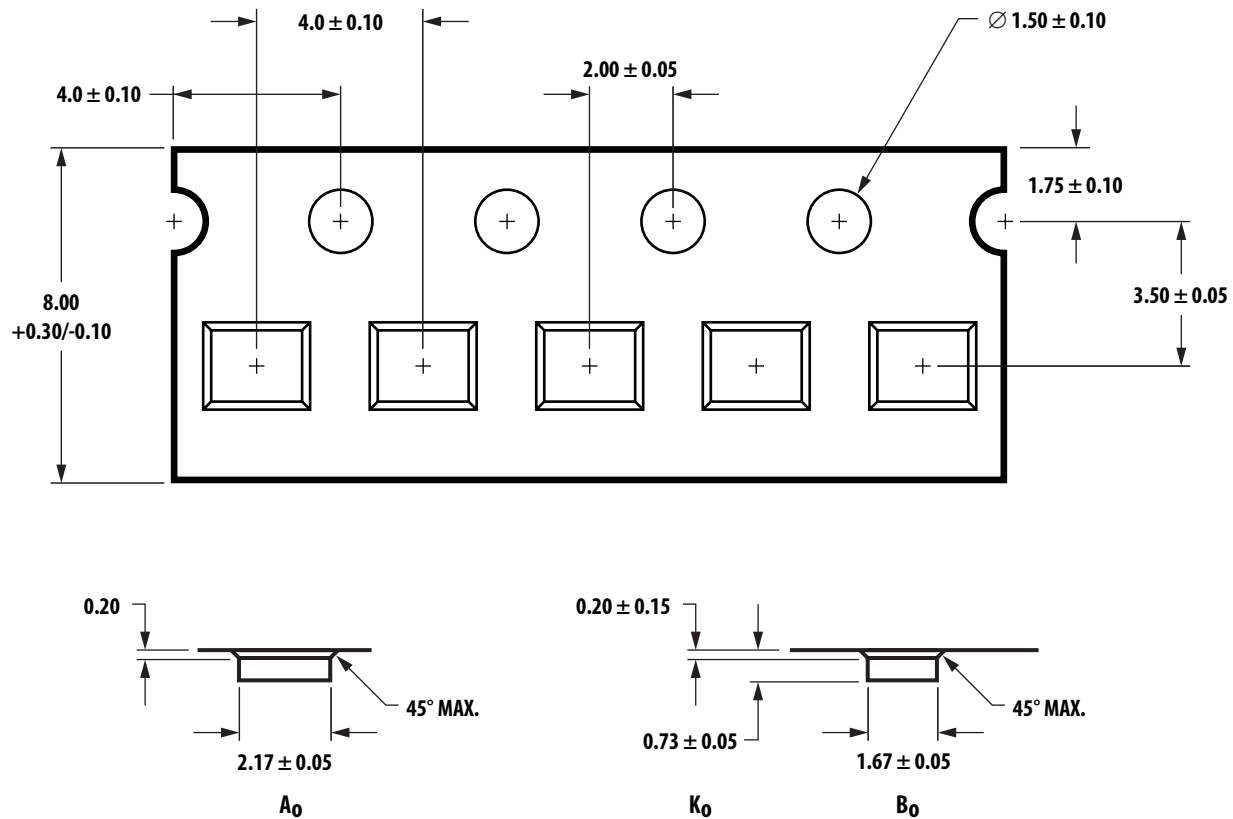
### Notes:

1. All dimension are in MM
2. Via hole is optional.
3. Recommend to use standard 4 mils Stencil thickness

## Device Orientation



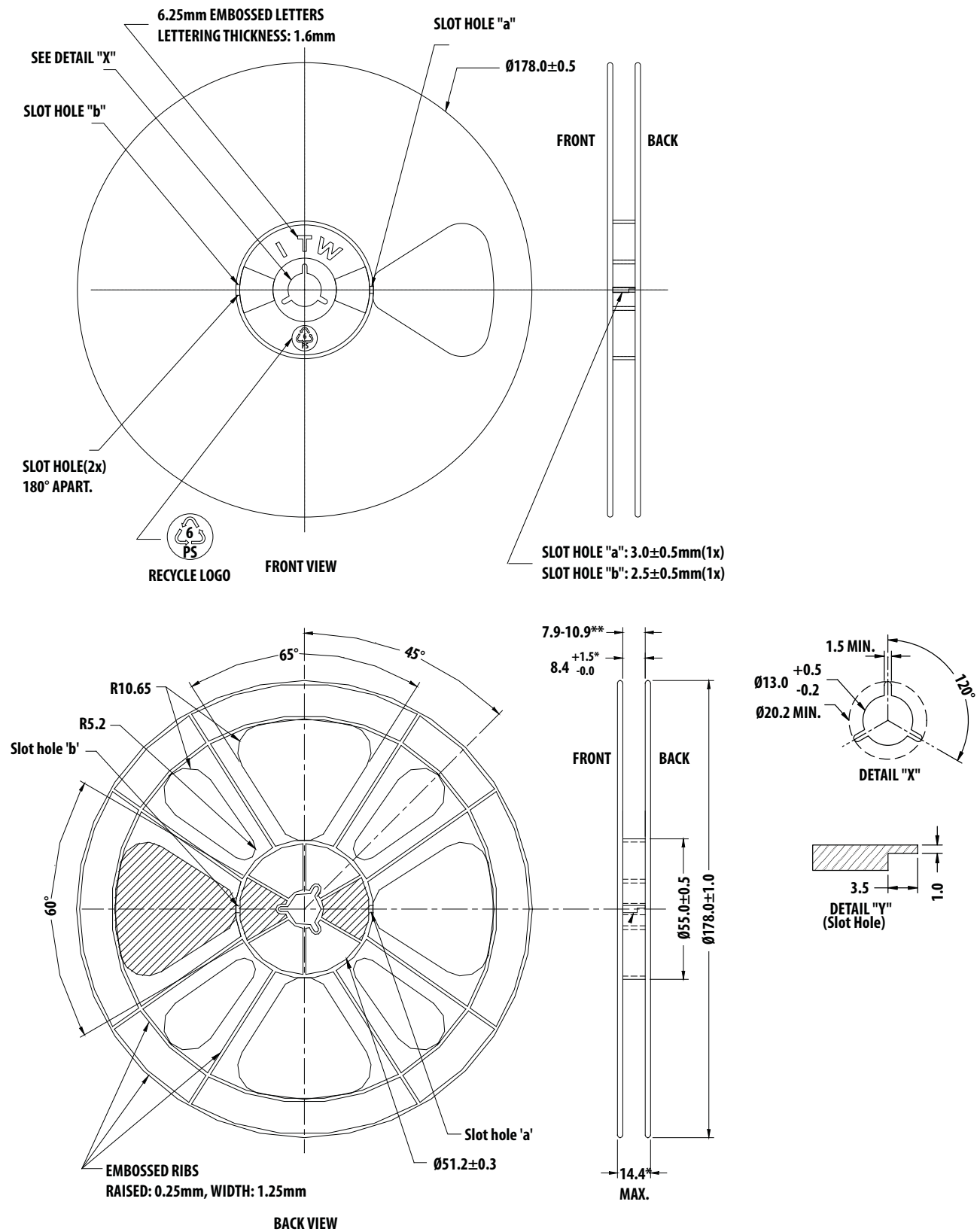
## Tape Dimensions



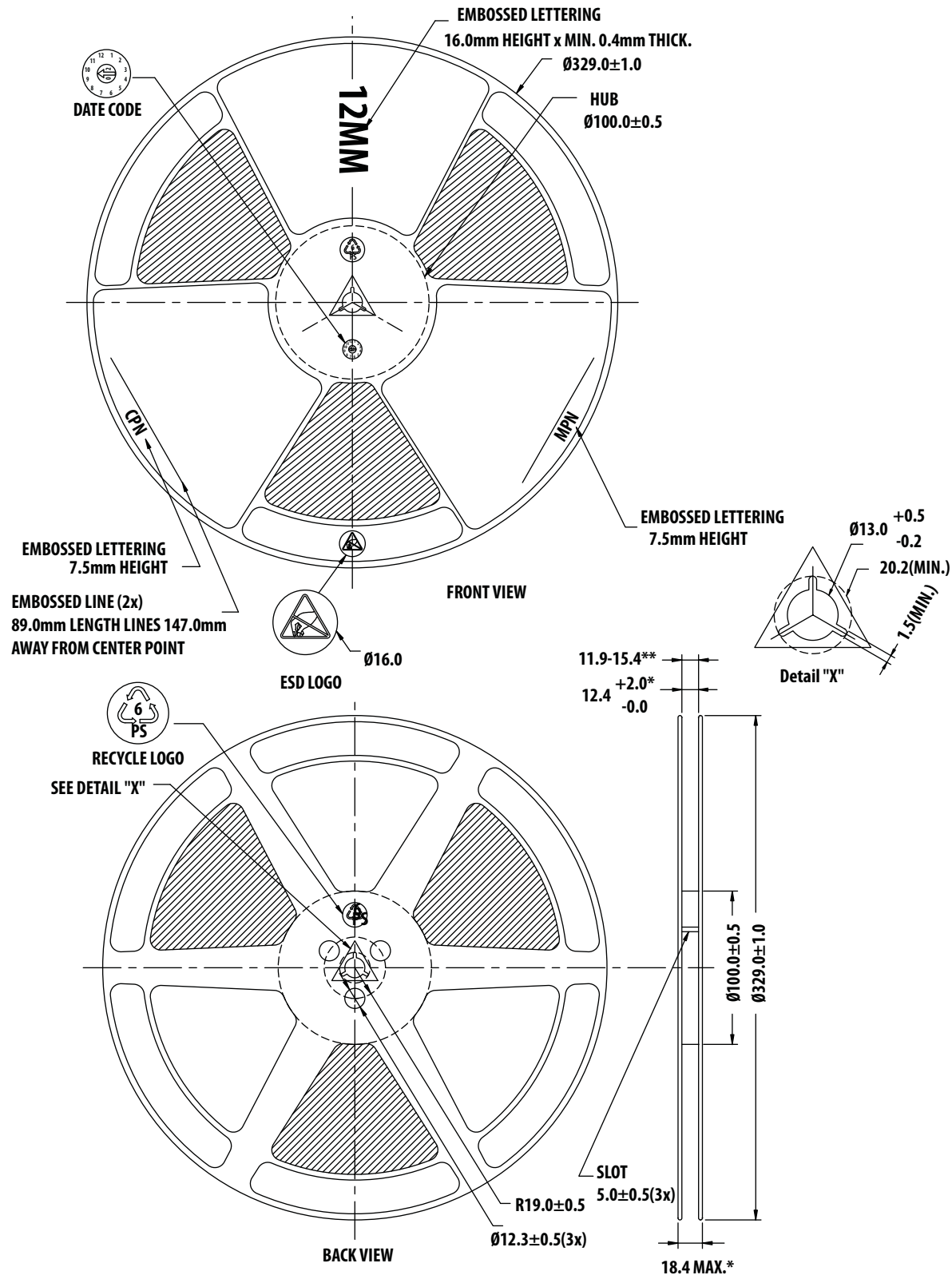
## Part Number Ordering Information

| Part Number    | Quantity | Container      |
|----------------|----------|----------------|
| MGA-675T6-BLKG | 100      | antistatic bag |
| MGA-675T6-TR1G | 3000     | 7" Reel        |
| MGA-675T6-TR2G | 10000    | 13" Reel       |

## Reel Dimensions - 7 Inch



## Reel Dimensions - 13 Inch x 12mm



For product information and a complete list of distributors, please go to our web site: [www.avagotech.com](http://www.avagotech.com)

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