60 GHz Antenna Gain Measurement Procedure

Step-1: Two calibrated test systems with known antenna gain and cable loss, with equivalent impedance and matching polarity are used to derive the path loss "Distance" coefficient.

Step-2: A signal generator is used to produce an unmodulated CW at the test frequency and power level matching that of the DUT. This power level is measured at the receive antenna and recorded as "Reference".

Step-3: The reference transmitter is then substituted with the DUTs antenna & RFIC and the new power level is measured and recorded as "DUT" power.

Step-4: The delta in the measured "reference" and "DUT" power is then used to derive the DUT's antenna gain from the Friis Equations.

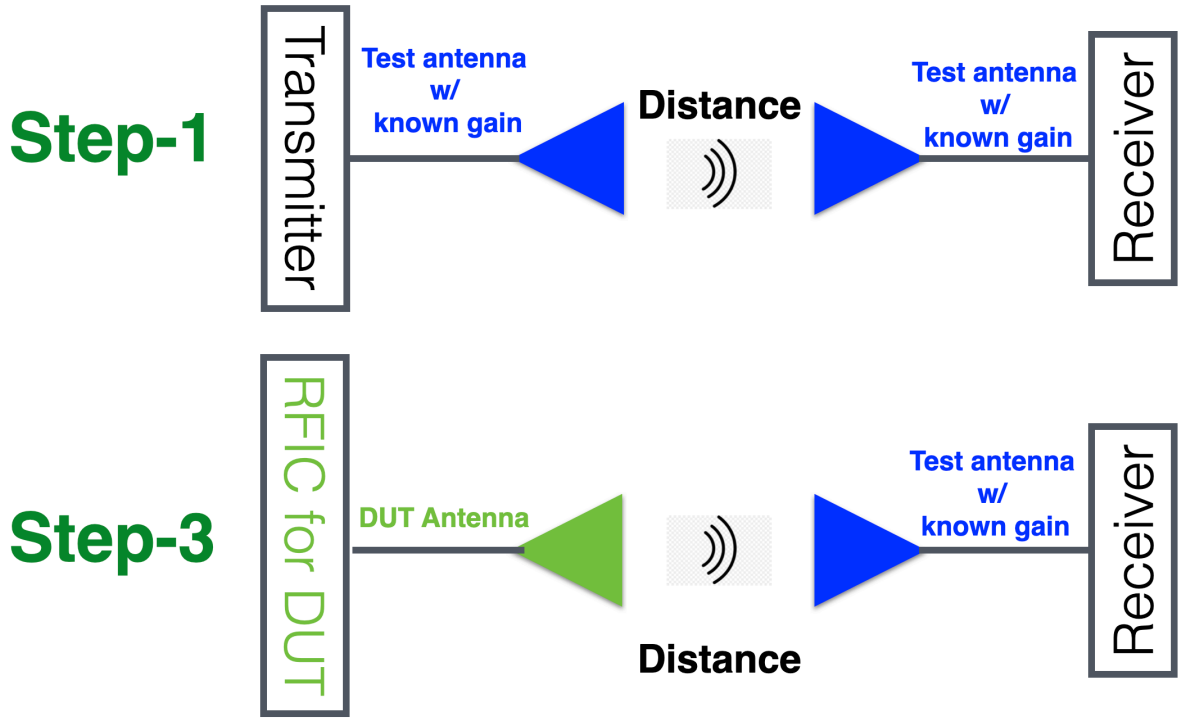

Figure 1 - Measurement setup

$$1] \quad P_{rx} = P_{tx} G_{tx} G_{rx} \left(\frac{c}{4\pi D_r f_0} \right)^2$$

$$2] \quad P_{rx}(dB) = P_{tx} + G_{tx} + G_{rx} + 20 \log_{10} \left(\frac{\lambda}{4\pi D_r} \right)$$

Figure 2 - Friis Equations

60 GHz Antenna Gain Result

60.5 GHz Antenna Gain 4.0 dBi, Type: antenna-in-package