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Measurement Procedure

EIRP measurement is based on industry-standard method described in CTIA OTA Test Plan (current version 3.9.4). Peak gain (Horizontal and Vertical Polarization) is calculated by subtracting Conducted Power from the measured maximum EIRP. Testing is performed with Antenna integrated in the product.

Setup
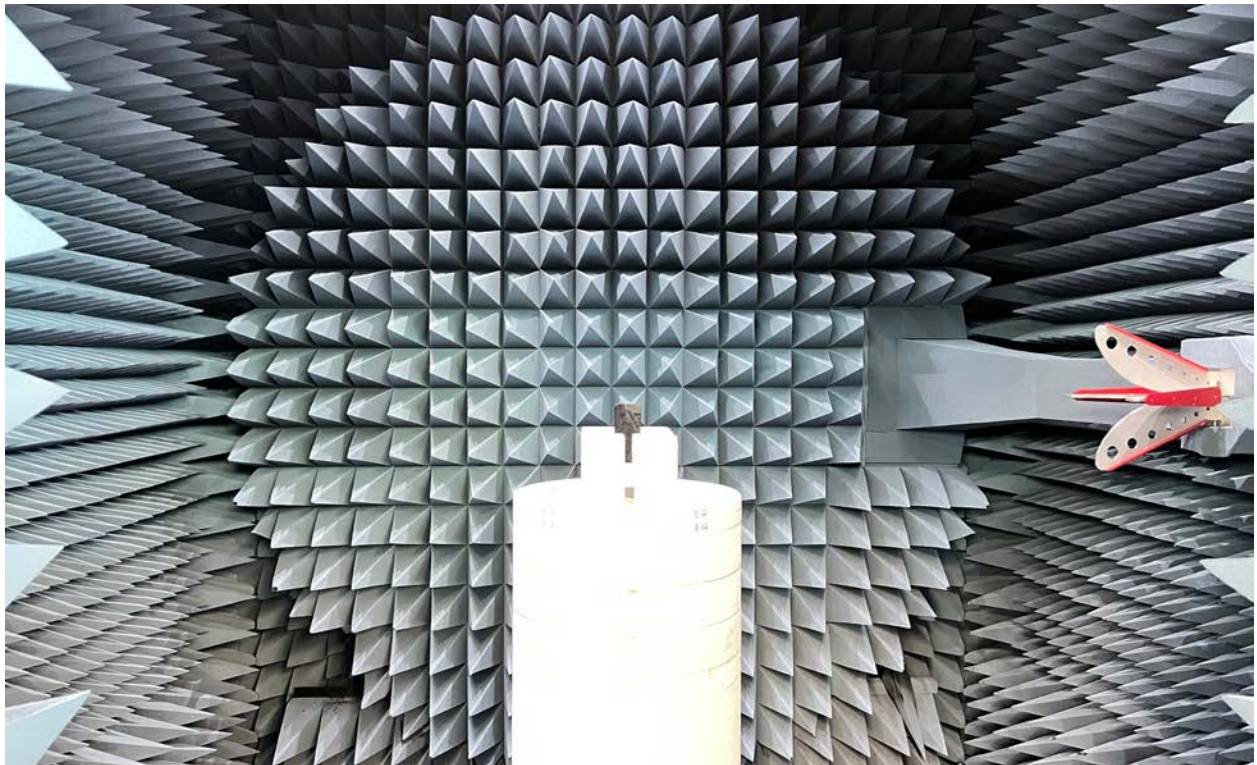
Calibration Information

Antenna measurement system calibration is based on industry-standard method described in CTIA OTA Test Plan (current version 3.9.4). Below is the measurement summary from the specification:

Figure 4-2 shows a typical real world configuration for measuring the path loss. In this case, a reference antenna with known gain is used in place of the theoretical isotropic source. The path loss may then be determined from the power into the reference antenna by adding the gain of the reference antenna. That is:

<div align="right">EQUATION 4.2</div>

$$P_{ISO} = P_{RA} + G_{RA}$$

where P_{RA} is the power radiated by reference antenna, and G_{RA} is the gain of the reference antenna, so that:

<div align="right">EQUATION 4.3</div>

$$PL = P_{RA} + G_{RA} - P_{TE}$$

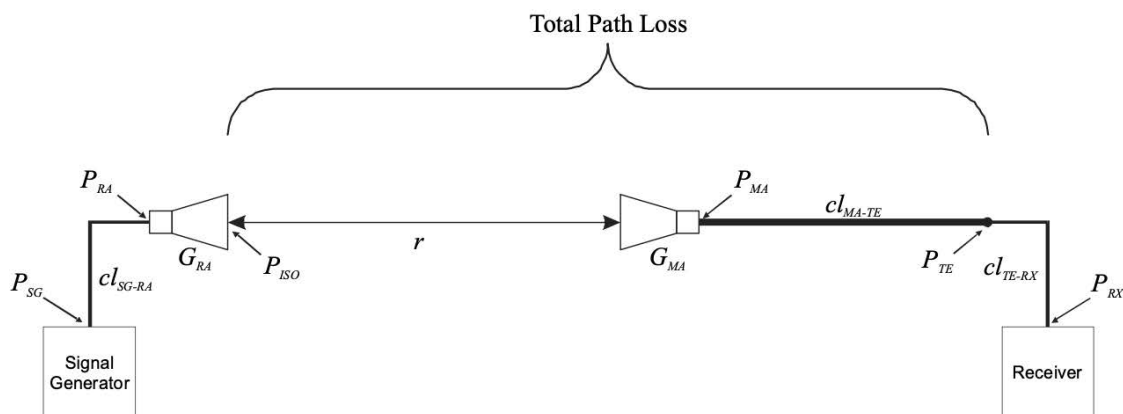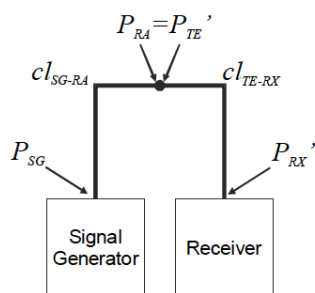FIGURE 4-2   TYPICAL CONFIGURATION FOR MEASURING PATH LOSS

FIGURE 4-3   CABLE REFERENCE CALIBRATION CONFIGURATION

$$P_{RA} = P_{TE}'$$

$$cl_{SG-RA} \qquad cl_{TE-RX}$$

$$P_{SG} \qquad P_{RX}'$$

| Signal Generator | Receiver |

where P_{RX}' is the power measured at the receiver during the cable reference test, and P_{RX} is the power measured at the receiver during the range path loss measurement in Figure 4-2. Note that this formulation assumes that the effects of the reference antenna VSWR are accounted for in the gain of the reference antenna. For more information on this subject, refer to [1]. Thus, the path loss is then just given by:

EQUATION 4.5

$$PL = G_{RA} + P_{RX}' - P_{RX}$$

Equipment Details

Category	Test Equipment Details	Function
Antenna Measurement System	Fully Anechoic OTA Chamber (Ver: EMQuest V1.14)	Provides fully anechoic chamber environment, dual-polarized measurement antenna, mechanical positioners of Theta and Phi axes, and RF path switching
Power Measuring Instrument	Power Meter (Model: NRP, NRP-Z11)	Measures EIRP for each point in 3D measurement
Communication Test Set (As needed)	R&S CMW500 or Keysight UXM or Commands/Script. (Ver: UXM: TA v17.16.19; R&S CMW500: Base V3.7.42, LTE V3.7.30)	Ensures that DUT consistently transmits at Max Power/Duty Cycle for the entire duration of the test on correct Band/Frequency.

*All the equipment's mentioned are calibrated to manufacture's specifications during testing.