

Unit 1132, Antenna Gain Calculation

DMP 1132

Peak Gain = 1.3 dBi

Antenna gain is derived as follows. The Effective Isotropic Radiated Power (EIRP) is the product of the transmitter power and the transmitter antenna gain. The EIRP is reported in dBm. EIRP is measured at a distance of 3m from the EUT. The conducted power is measured directly at the output port from the transmitter module. The conducted power is a direct measurement of the transmitter power. The antenna gain is the difference, in dB, between the EIRP and the conducted power.

Figures 1 through 3 show the corrected measurement of the EIRP. The correction adds 107dB to convert from dBm to field strength; adds the loss of the transducer; adds the loss of the cable. The intermediate result converts dBm to field strength at the receive antenna. Next, 95.23dB is subtracted to convert from field strength at the receive antenna to EIRP at the EUT transmitter. Table 1 lists the corrected EIRP values and frequencies.

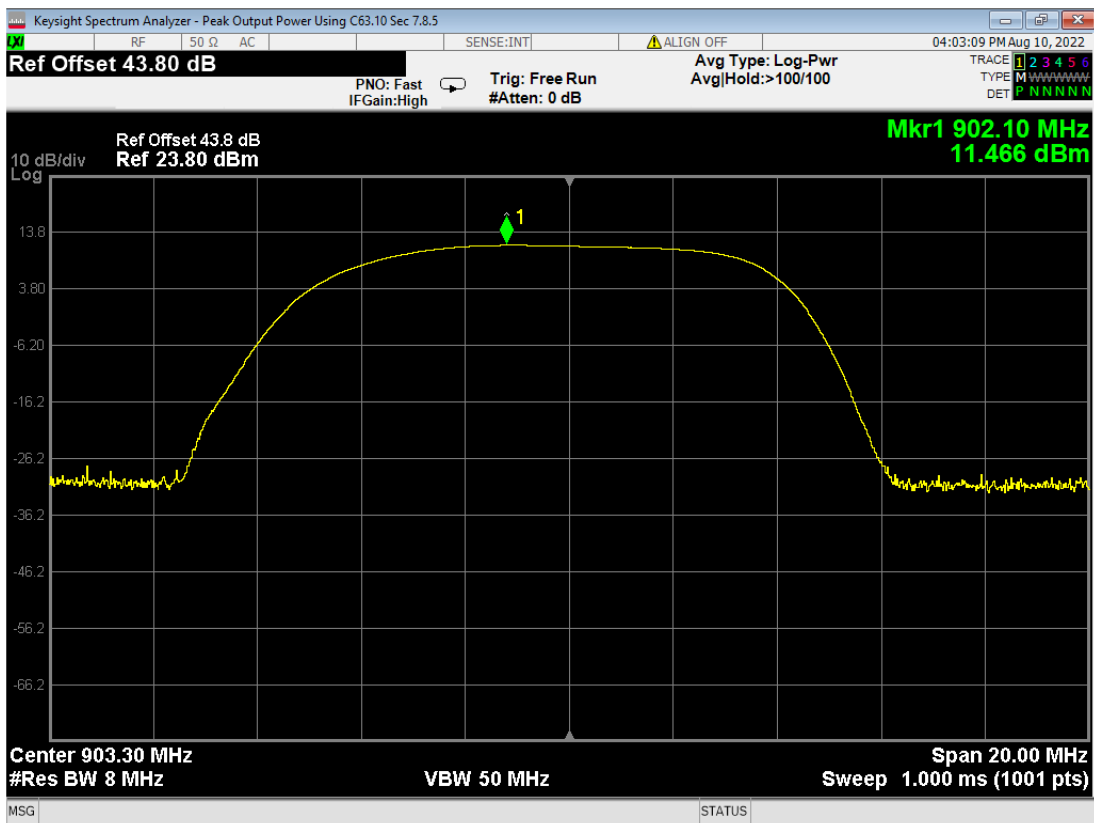


Figure 1. Corrected EIRP Measurement, Low Frequency

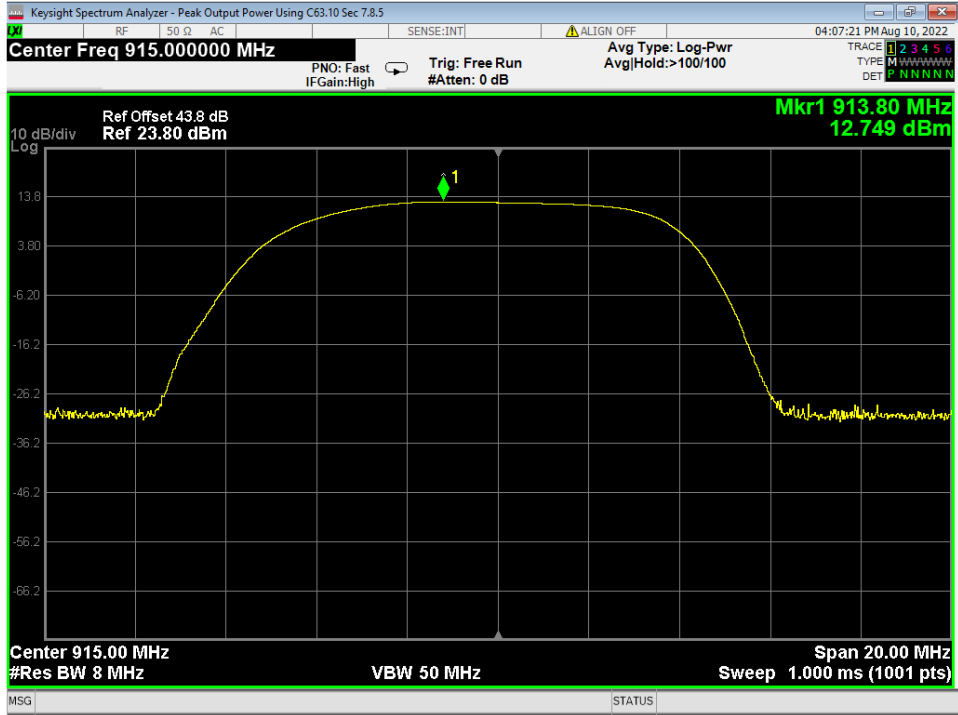


Figure 2. Corrected EIRP Measurement, Mid Frequency

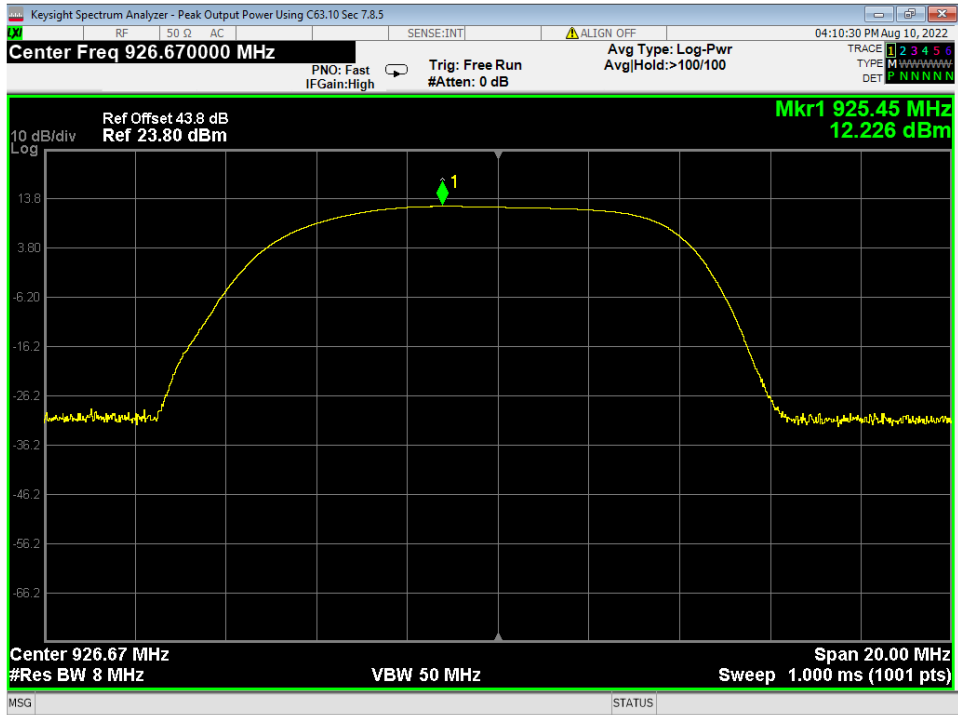


Figure 3. Corrected EIRP Measurement, High Frequency

Table 1: Corrected EIRP

Frequency (MHz)	Corrected EIRP (CEIRP dBm)
903.3	11.47
915.0	12.75
926.6	12.23

Figures 4 through 6 show the results of the conducted power measurements.

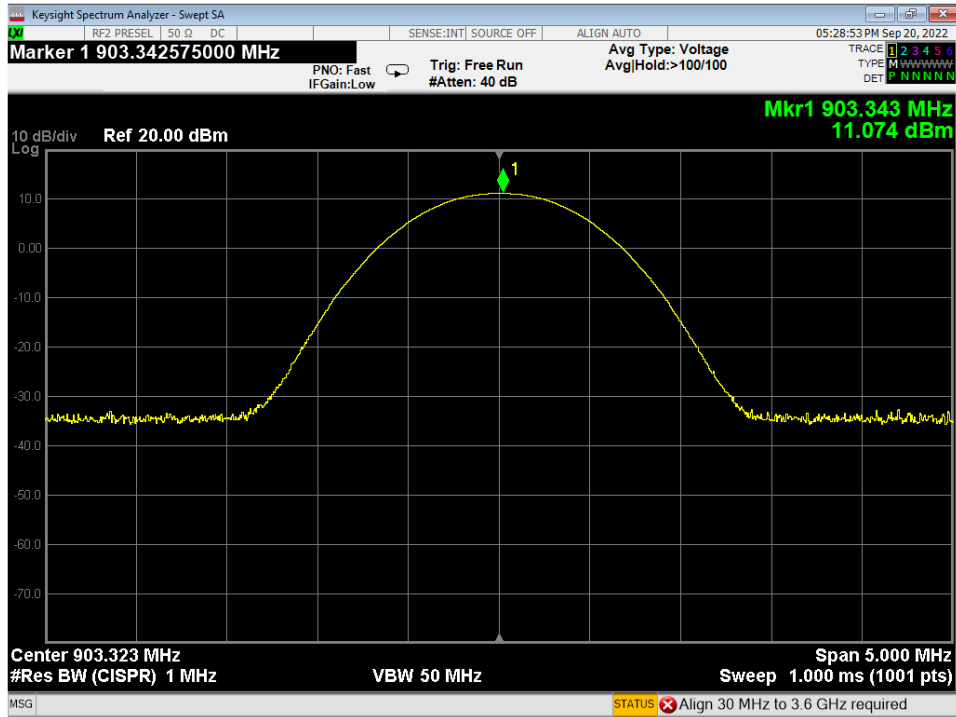


Figure 4. Conducted power, Low Frequency

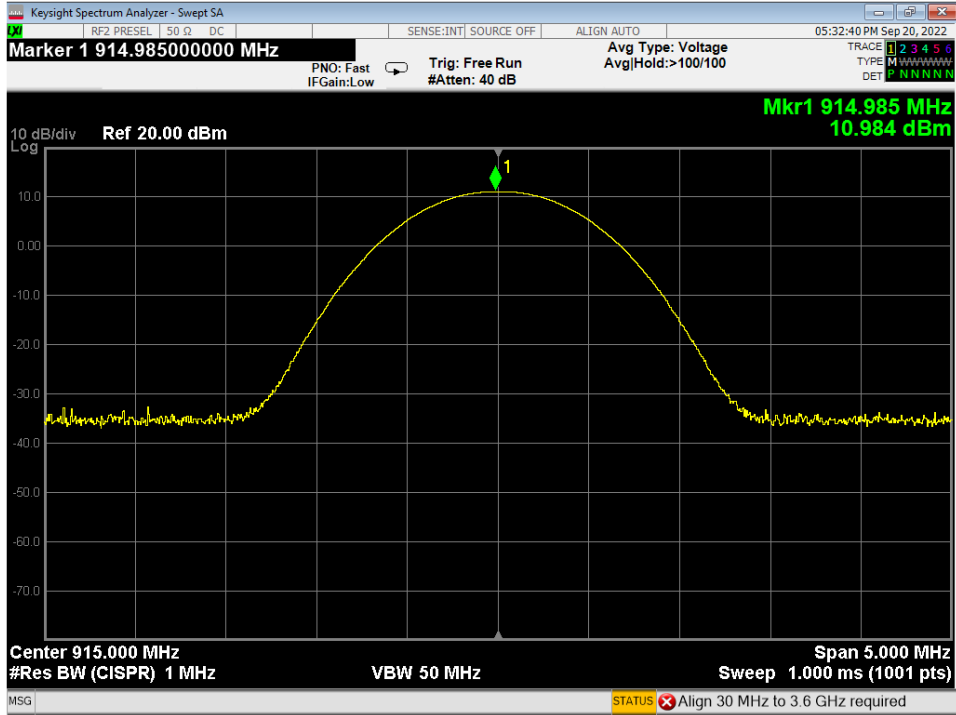


Figure 5. Conducted power, Mid Frequency

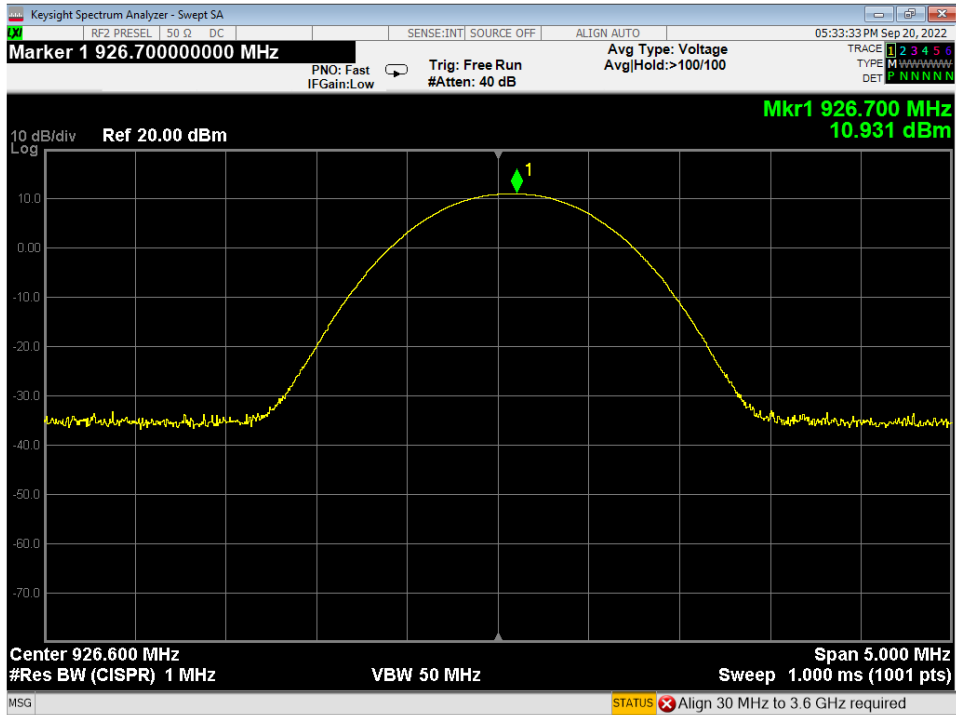


Figure 6. Conducted power, High Frequency

Table 2 shows the calculated antenna gain and frequencies.

Table 2. Antenna Gain

Frequency (MHz)	EIRP (dBm)	Conducted Power (dBm)	Peak Gain (dBi)
903.3	11.47	11.07	0.40
915.0	12.75	10.98	1.77
926.6	12.23	10.93	1.30