

Figure 91: Spurious Emissions at Antenna Terminal 256QAM, 2355.0MHz, B.W. 10MHz, Sub Carrier 15kHz

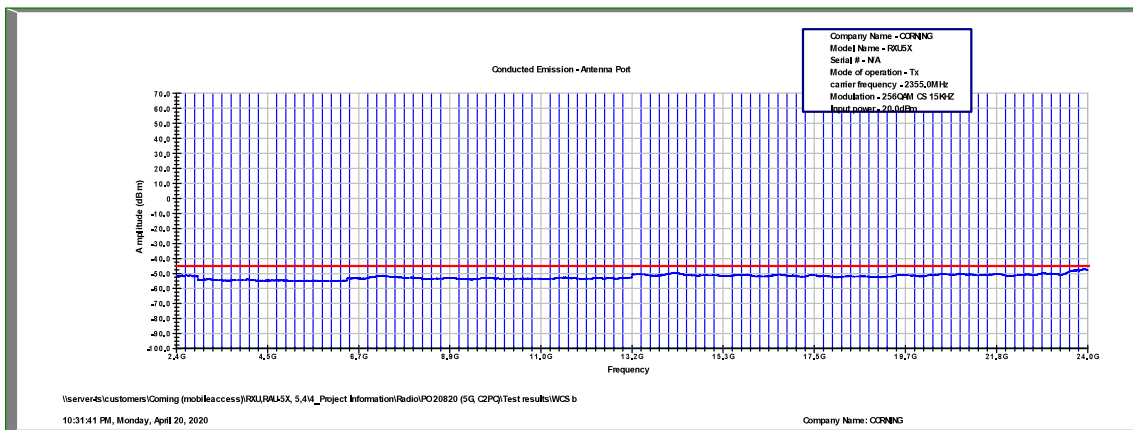


Figure 92: Spurious Emissions at Antenna Terminal 256QAM, 2355.0MHz, B.W. 10MHz, Sub Carrier 15kHz

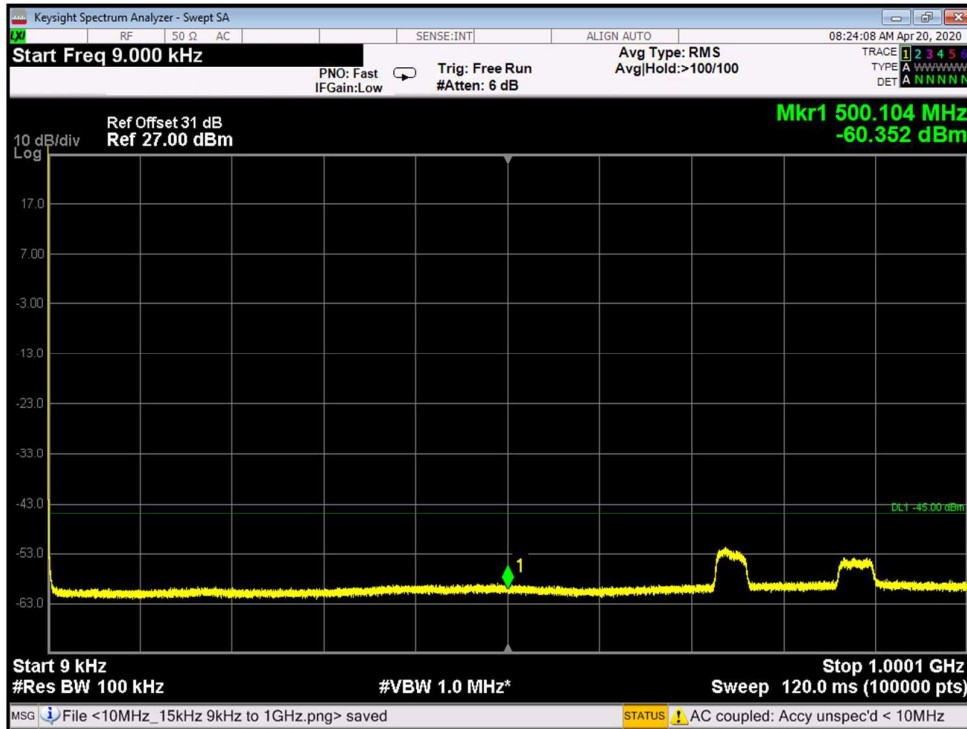


Figure 93: Spurious Emissions at Antenna Terminal 256QAM, 2355.0MHz, B.W. 10MHz, Sub Carrier 30kHz

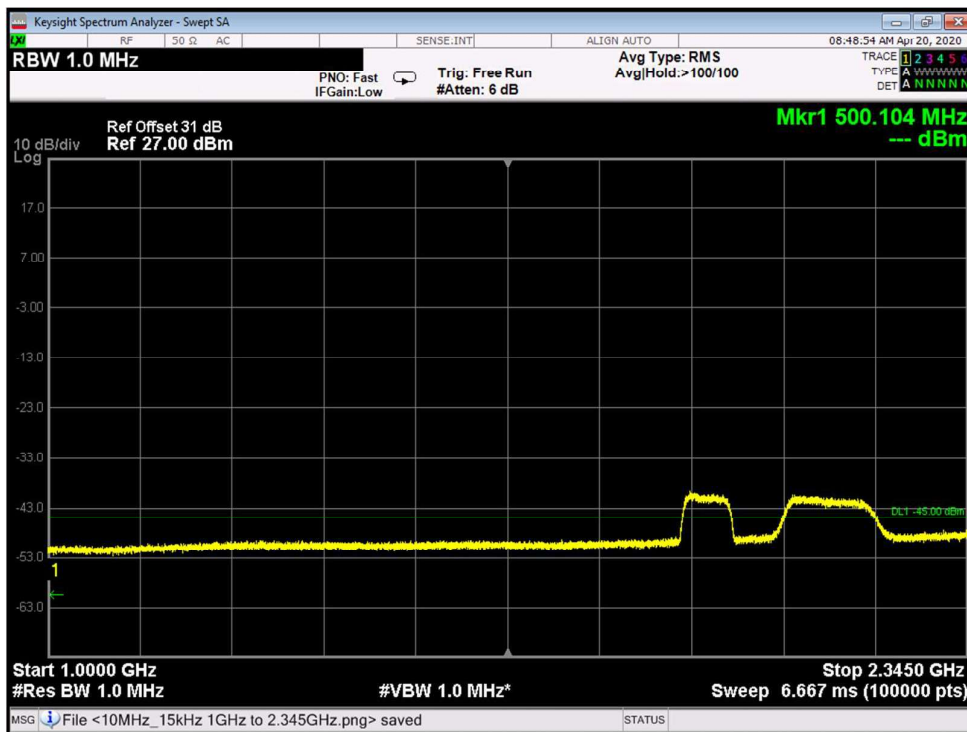


Figure 94: Spurious Emissions at Antenna Terminal 256QAM, 2355.0MHz, B.W. 10MHz, Sub Carrier 30kHz

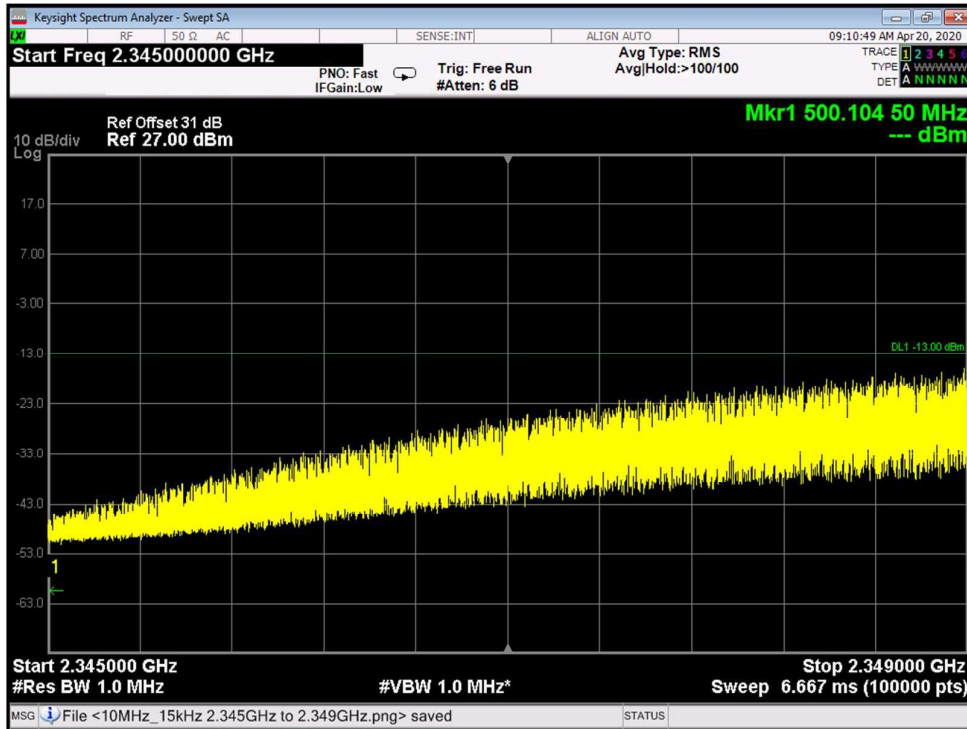


Figure 95: Spurious Emissions at Antenna Terminal 256QAM, 2355.0MHz, B.W. 10MHz, Sub Carrier 30kHz

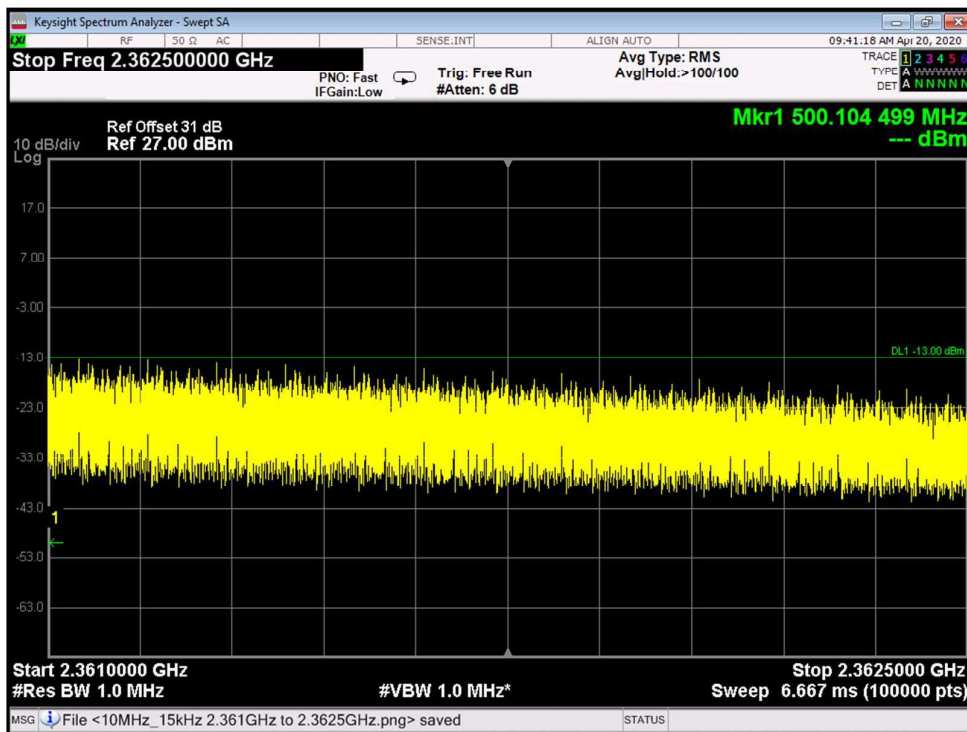


Figure 96: Spurious Emissions at Antenna Terminal 256QAM, 2355.0MHz, B.W. 10MHz, Sub Carrier 30kHz

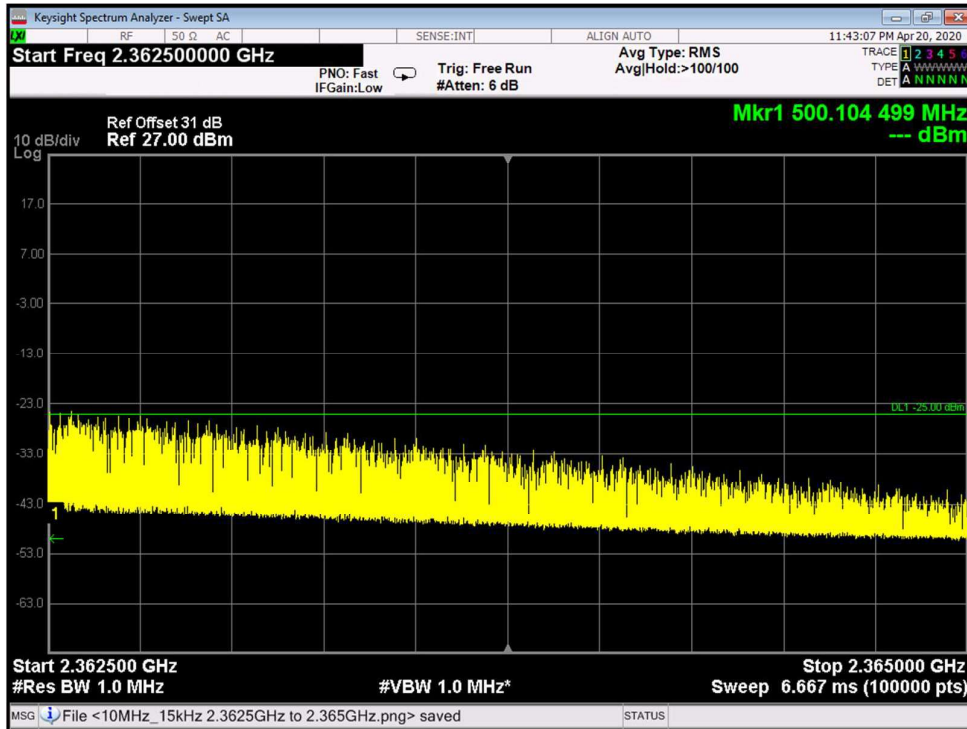


Figure 97: Spurious Emissions at Antenna Terminal 256QAM, 2355.0MHz, B.W. 10MHz, Sub Carrier 30kHz

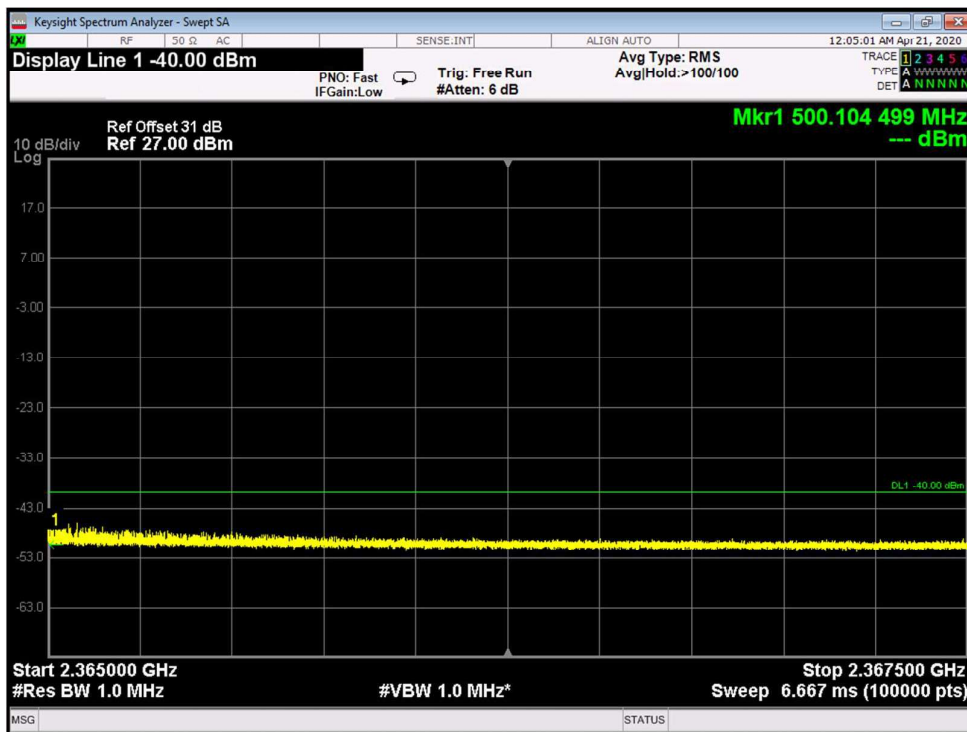


Figure 98: Spurious Emissions at Antenna Terminal 256QAM, 2355.0MHz, B.W. 10MHz, Sub Carrier 30kHz

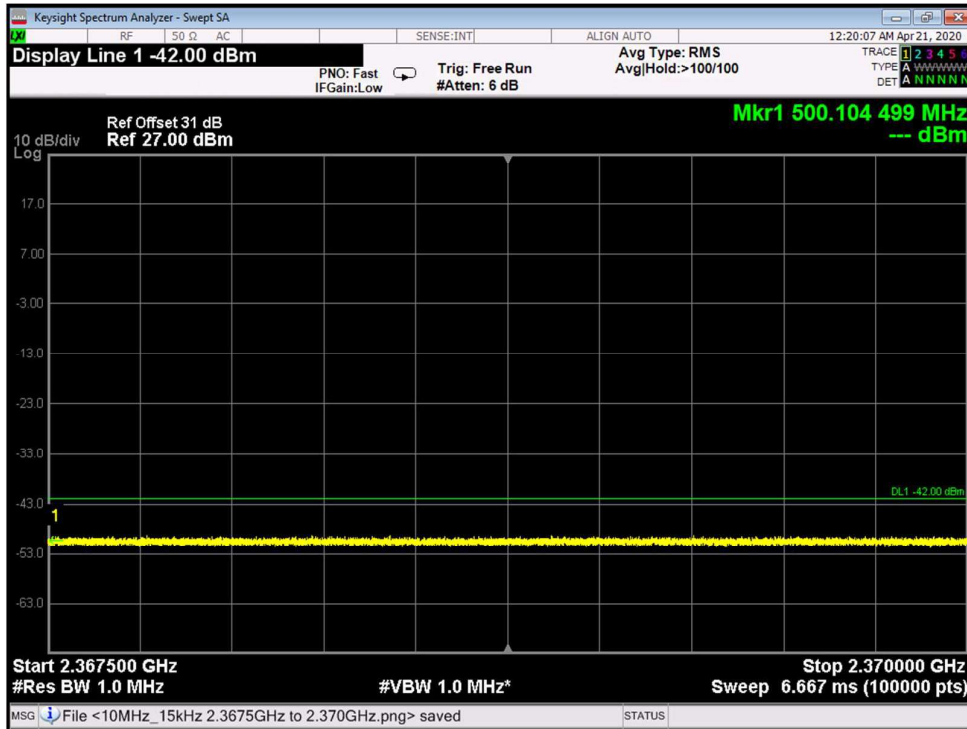


Figure 99: Spurious Emissions at Antenna Terminal 256QAM, 2355.0MHz, B.W. 10MHz, Sub Carrier 30kHz

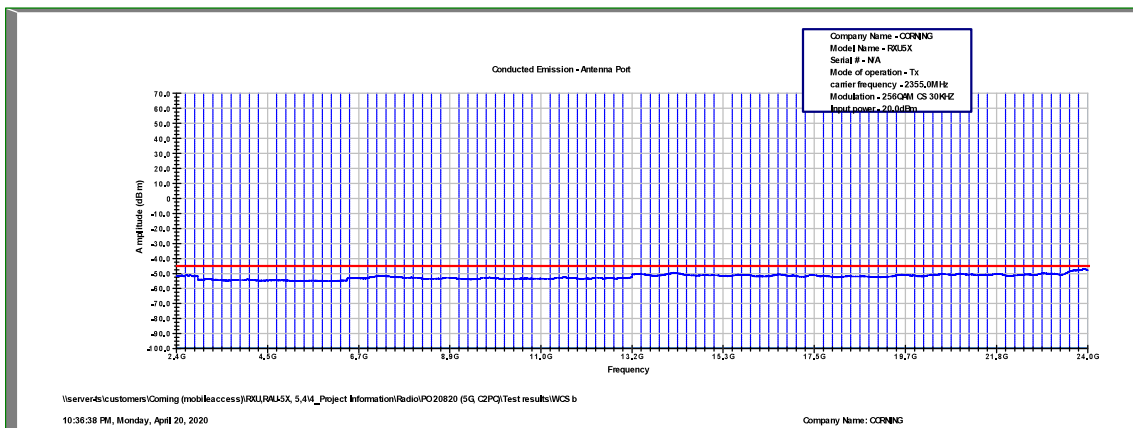


Figure 100: Spurious Emissions at Antenna Terminal 256QAM, 2355.0MHz, B.W. 10MHz, Sub Carrier 30kHz

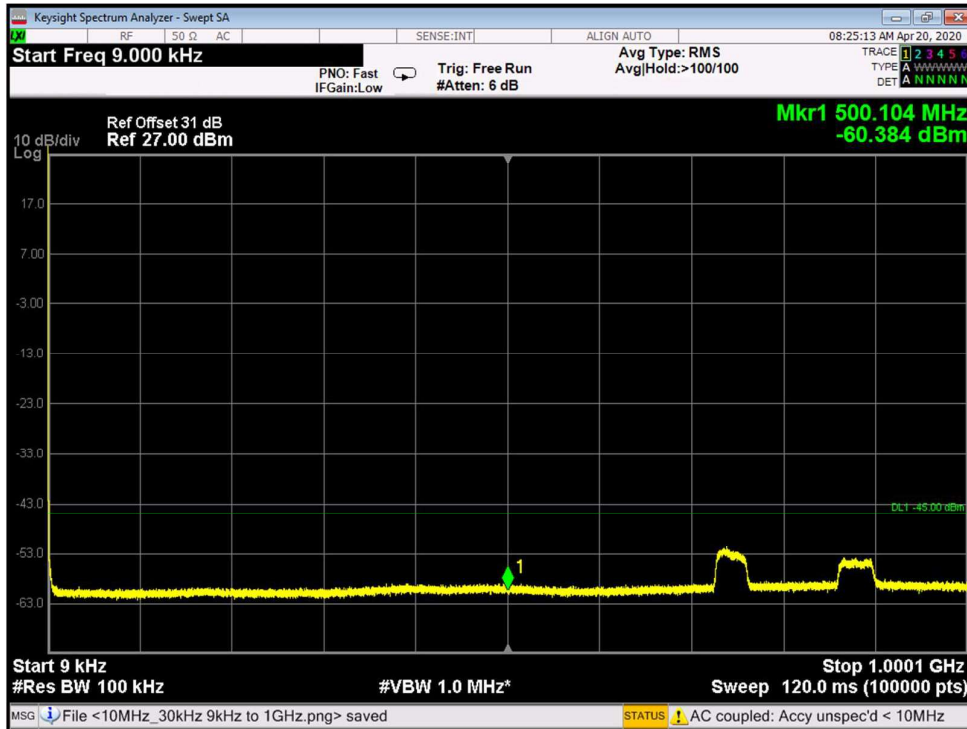


Figure 101: Spurious Emissions at Antenna Terminal 256QAM, 2355.0MHz, B.W. 10MHz, Sub Carrier 60kHz

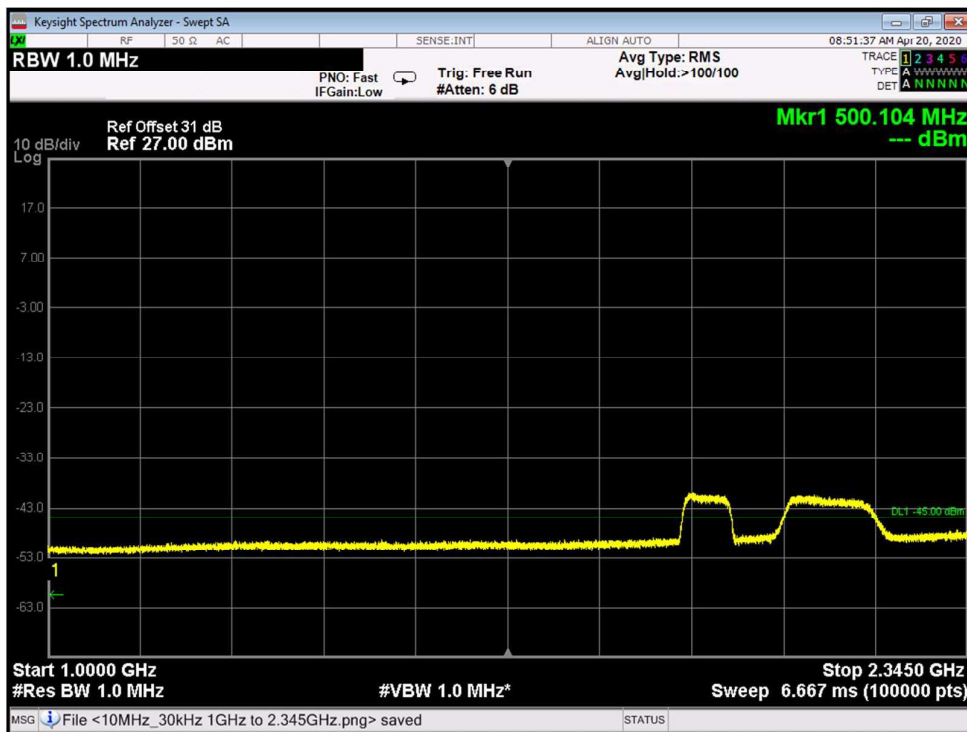


Figure 102: Spurious Emissions at Antenna Terminal 256QAM, 2355.0MHz, B.W. 10MHz, Sub Carrier 60kHz

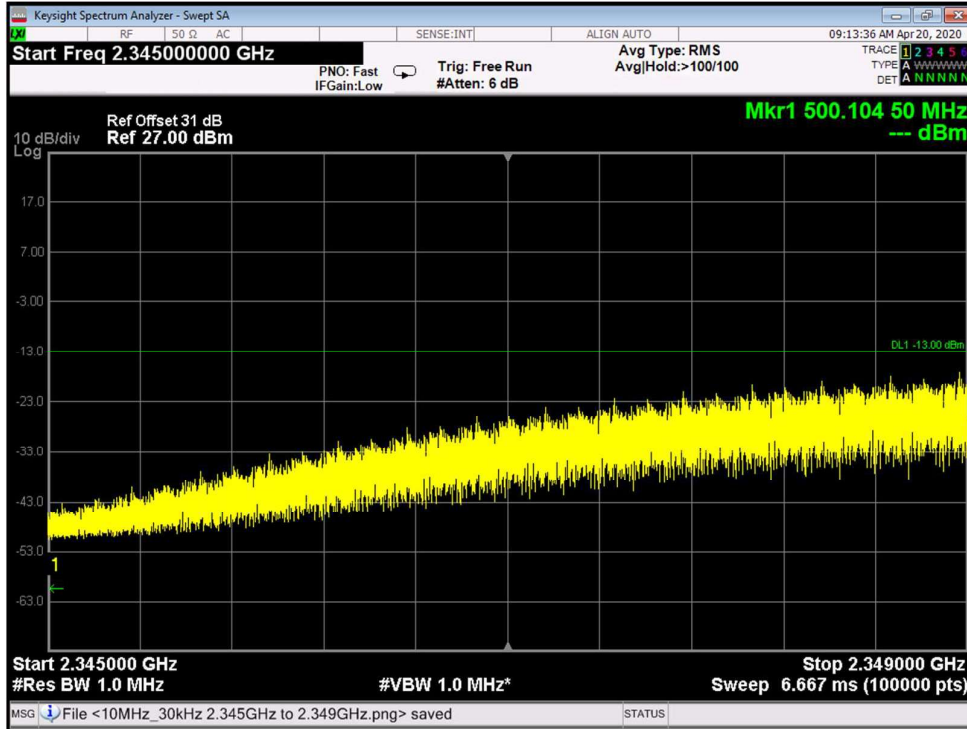


Figure 103: Spurious Emissions at Antenna Terminal 256QAM, 2355.0MHz, B.W. 10MHz, Sub Carrier 60kHz

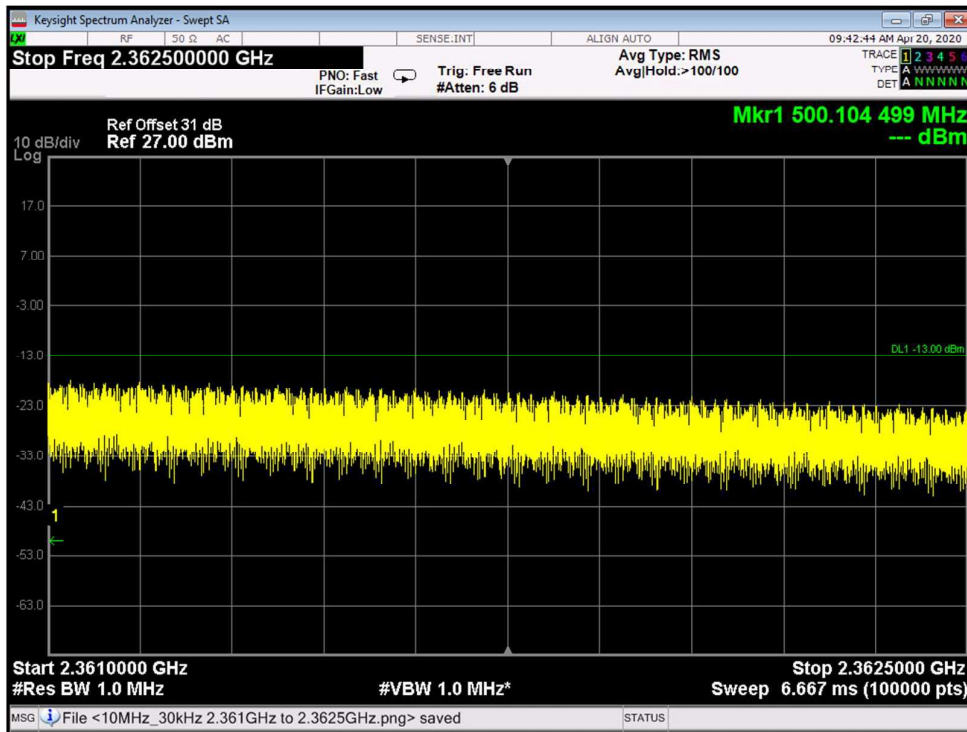


Figure 104: Spurious Emissions at Antenna Terminal 256QAM, 2355.0MHz, B.W. 10MHz, Sub Carrier 60kHz

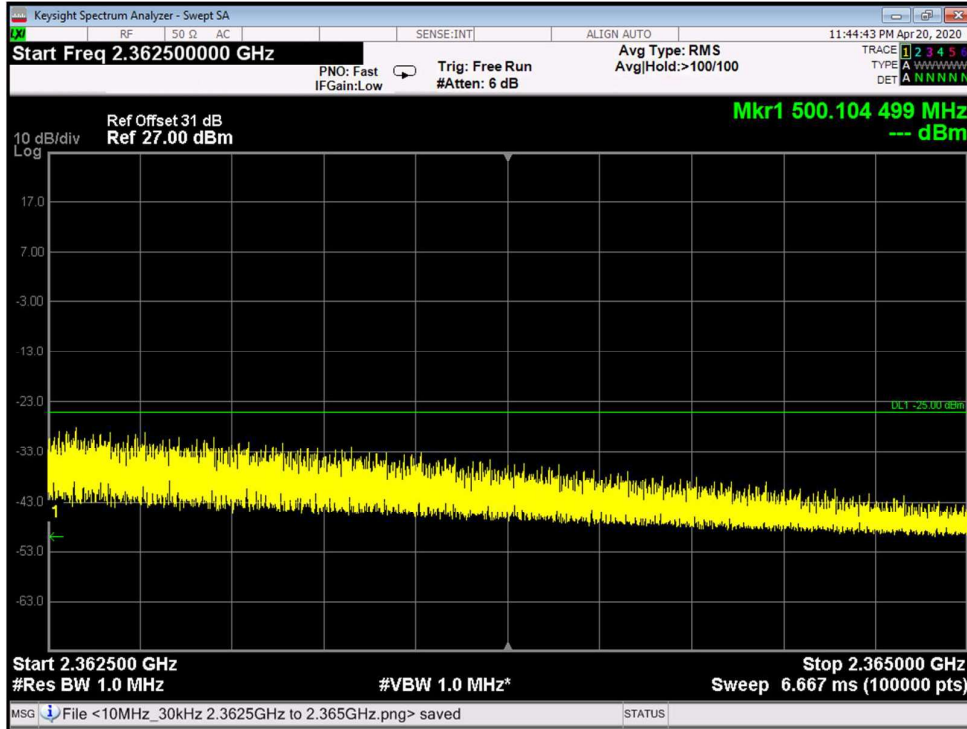


Figure 105: Spurious Emissions at Antenna Terminal 256QAM, 2355.0MHz, B.W. 10MHz, Sub Carrier 60kHz

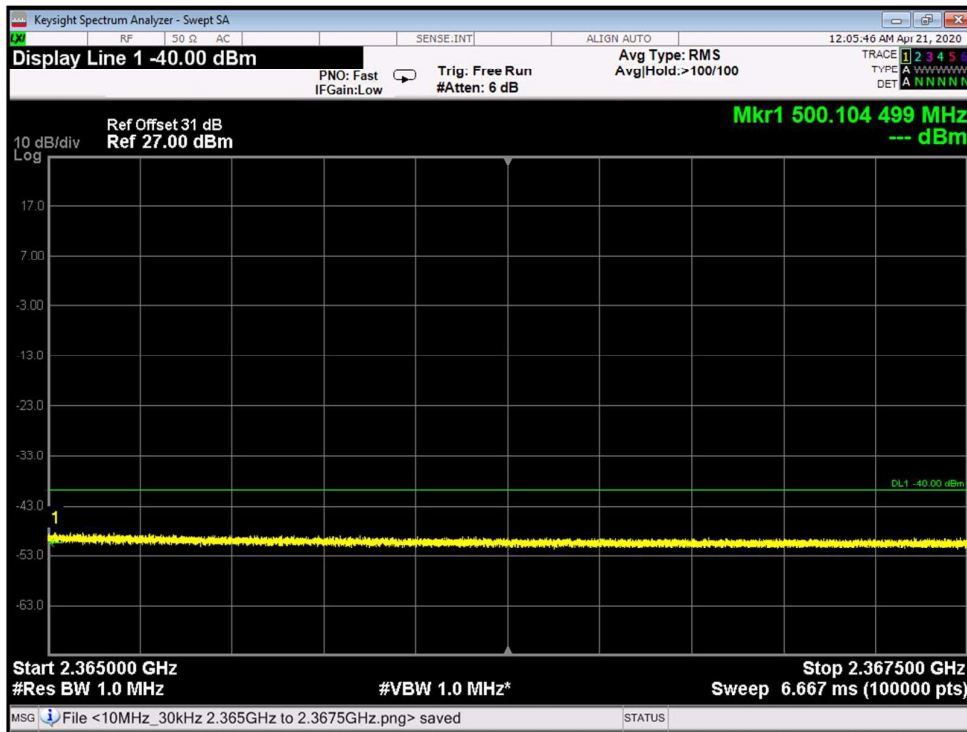


Figure 106: Spurious Emissions at Antenna Terminal 256QAM, 2355.0MHz, B.W. 10MHz, Sub Carrier 60kHz

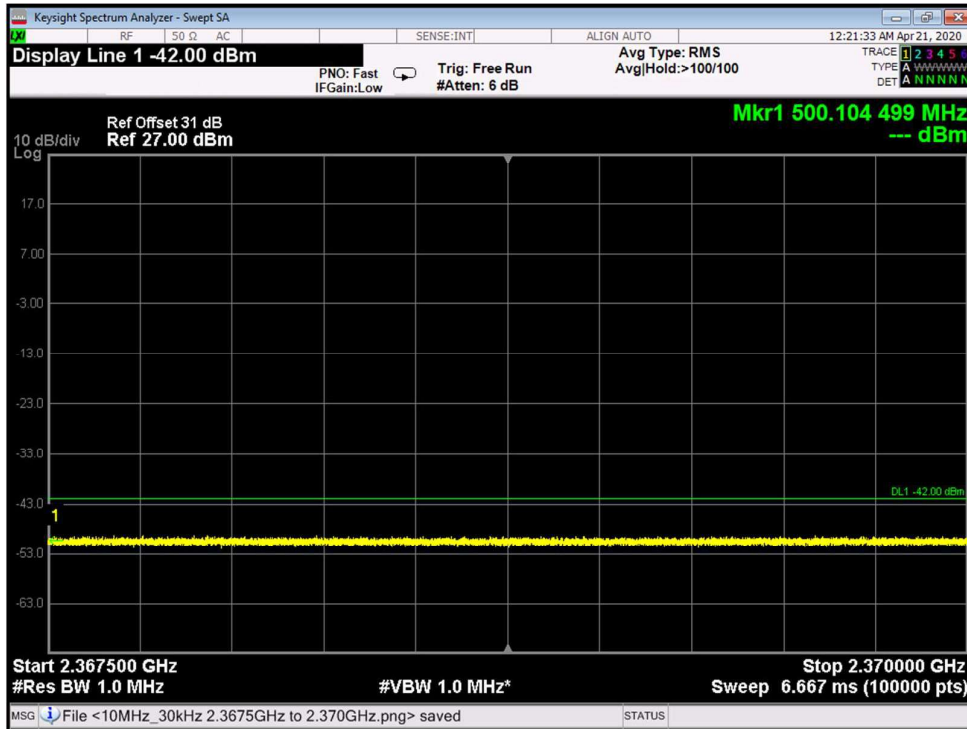


Figure 107: Spurious Emissions at Antenna Terminal 256QAM, 2355.0MHz, B.W. 10MHz, Sub Carrier 60kHz

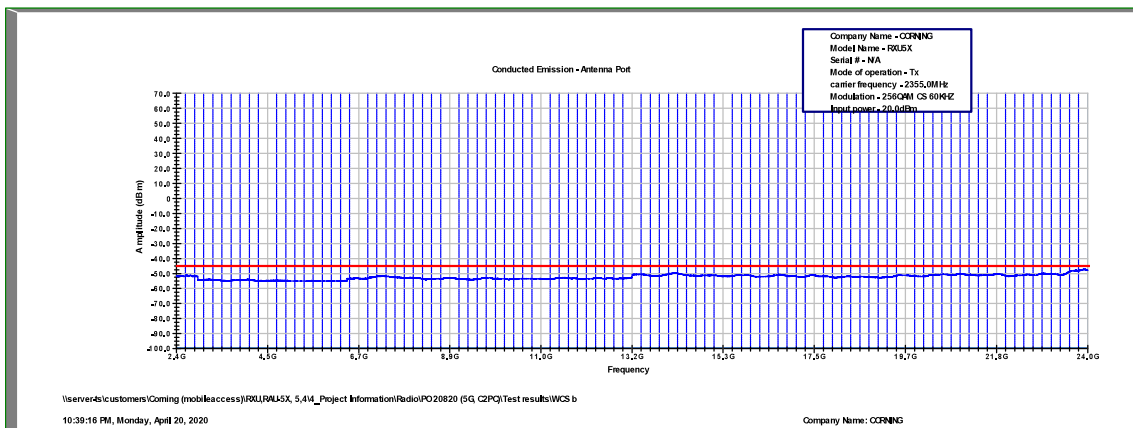


Figure 108: Spurious Emissions at Antenna Terminal 256QAM, 2355.0MHz, B.W. 10MHz, Sub Carrier 60kHz

6.5 Test Equipment Used; Spurious Emissions at Antenna Terminals

Instrument	Manufacturer	Model	Serial Number	Calibration	
				Last Calibration Date	Next Calibration Due
EXA signal Analyzer	Agilent Technologies	N9010A	MY52220686	28 November 2018	28 November 2020
EXG Vector Signal Generator	Agilent Technologies	N5172B	MY51350437	03 December 2018	03 December 2020
30 dB Attenuator	MCL	BW-S30W5	533	24 December 2019	24 December 2020

Table 6 Test Equipment Used

7 Spurious Radiated Emission

7.1 Test Specification

FCC, Part 27, Subpart C, Section 27.53 (g)

7.2 Test Procedure

(Temperature (23°C)/ Humidity (47%RH))

The test method was based on ANSI/TIA-603-D: 2010, Section 2.2.12 Unwanted Emissions: Radiated Spurious.

For measurements between 0.009MHz-30MHz:

The E.U.T was tested inside the shielded room at a distance of 3 meters and the E.U.T was placed on a non-metallic table, 1.5 meters above the ground. The frequency range 0.009MHz-30MHz was scanned. The readings were maximized by the turntable azimuth between 0-360°, and the antenna polarization.

The emissions were measured at a distance of 3 meters.

For measurements between 30.0MHz-1.0GHz:

A preliminary measurement to characterize the E.U.T was performed inside the shielded room at a distance of 3 meters, using peak detection mode and broadband antennas. The preliminary measurements produced a list of the highest emissions. The E.U.T was then transferred to the open site, and placed on a remote-controlled turntable. The E.U.T was placed on a non-metallic table, 0.8 meters above the ground. The frequency range 30.0MHz -1.0GHz was scanned and the list of the highest emissions was verified and updated accordingly.

The readings were maximized by adjusting the antenna height between 1-4 meters, the turntable azimuth between 0-360°, and the antenna polarization.

The emissions were measured at a distance of 3 meters.

For measurements between 1.0GHz-27.0GHz:

The E.U.T was tested inside the shielded room at a distance of 3 meters and the E.U.T was placed on a non-metallic table, 1.5 meters above the ground. The frequency range 1.0GHz -27.0GHz was scanned. The readings were maximized by the turntable azimuth between 0-360°, and the antenna polarization.

The emissions were measured at a distance of 3 meters.

The E.U.T. was replaced by a substitution antenna (dipole 30MHz-1GHz, Horn Antenna above 1GHz) driven by a signal generator.

The height was readjusted for maximum reading. The signal generator level was adjusted to obtain the same reading on the EMI receiver as in step (a).

The signals observed in step (a) were converted to radiated power using:

$$P_d(\text{dBm}) = P_g(\text{dBm}) - \text{Cable Loss (dB)} + \text{Substitution Antenna Gain (dBd)}$$

P_d = Dipole equivalent power (result).

P_g = Signal generator output level.

A Peak detector was used for this test.

Testing was performed when the RF port was connected to 50 Ω termination.

Evaluation was performed for all possible modulations, bandwidths, and sub carriers.

7.3 Test Limit

The power of any emission outside of the authorized operating frequency ranges (2345-2360 MHz) must be attenuated below the transmitting power (P) by a factor of at least as specified in this section.

Frequency Band (MHz)	Calculated Factor (dBc)
f<2285.0	$75+10*\log(0.1)=65.0$
2285.0MHz<f<2287.5MHz	$72+10*\log(0.1)=62.0$
2287.5MHz<f<2300.0MHz	$70+10*\log(0.1)=60.0$
2300.0MHz<f<2305.0MHz	$43+10*\log(0.1)=33.0$
2305.0MHz<f<2320.0MHz	$43+10*\log(0.1)=33.0$
2320.0MHz<f<2345.0MHz	$75+10*\log(0.1)=65.0$
2345.0MHz<f<2360.0MHz	$43+10*\log(0.1)=33.0$
2360.0MHz<f<2362.5MHz	$43+10*\log(0.1)=33.0$
2362.5MHz<f<2365.0MHz	$55+10*\log(0.1)=45.0$
2365.0MHz<f<2367.5MHz	$70+10*\log(0.1)=60.0$
2367.5MHz<f<2370.0MHz	$72+10*\log(0.1)=62.0$
2370.0<f	$75+10*\log(0.1)=65.0$

Figure 109 Mask Limit Table

7.4 Test Results

No emissions were detected above the EMI receiver noise level which is at least 10 dB margin below the limit.

Judgement: Passed

7.5 Test Instrumentation Used; Radiated Measurements

Instrument	Manufacturer	Model	Serial Number	Calibration	
				Last Calibration Date	Next Calibration Due
EMI Receiver	HP	8542E	3906A00276	March 03, 2020	March 03, 2021
RF Filter Section	HP	85420E	3705A00248	March 03, 2020	March 03, 2021
Spectrum Analyzer	HP	8593EM	3536A00120ADI	March 10, 2020	March 10, 2021
Active Loop Antenna	EMCO	6502	9506-2950	February 5, 2019	February 28, 2021
Antenna Biconical	EMCO	3110B	9912-3337	May 21, 2019	May 31, 2020
Antenna Log Periodic	EMCO	3146	9505-4081	May 31, 2018	May 31, 2020
Horn Antenna 1G-18G	ETS	3115	29845	May 31, 2018	May 31, 2021
Horn Antenna 18G-26.5G	ARA	SWH-28	1007	December 13, 2017	December 31, 2020
Low Noise Amplifier	Narda	LNA-DBS-0411N313	013	December 24, 2019	December 31, 2020
Low Noise Amplifier	Sophia Wireless	LNA 28-B	232	December 24, 2019	December 31, 2020
Vector Signal Generator	VIAVI	MTS 5800	WMNK0071690263	July 1, 2018	July 1, 2021
Semi Anechoic Civil Chamber	ETS	S81	SL 11643	NCR	NCR
Antenna Mast	ETS	2070-2	-	NCR	NCR
Turntable	ETS	2087	-	NCR	NCR
Mast & Table Controller	ETS/EMCO	2090	9608-1456	NCR	NCR

Table 7 Test Equipment Used

Note: Spurious radiated emission testing was performed on April 13, 2020.

8 APPENDIX A - CORRECTION FACTORS

8.1 Correction factors for RF OATS Cable 35m ITL #1784

Frequency (MHz)	Cable loss (dB)
10.0	0.3
20.0	0.2
50.0	-0.1
100.0	-0.6
200.0	-1.2
500.0	-2.3
1000.0	-3.6

**8.2 Correction factors for RF OATS Cable 10m
ITL #1794**

Frequency(MHz)	Cable loss(dB)
10.0	-0.3
20.0	-0.3
50.0	-0.5
100.0	-0.7
200.0	-1.1
500.0	-1.8
1000.0	-2.7

8.3 Correction factors for

Horn Antenna

**Model: SWH-28
at 1 meter range.**

FREQUENCY (GHz)	AFE (dB /m)	Gain (dB1)
18.0	40.3	16.1
19.0	40.3	16.3
20.0	40.3	16.1
21.0	40.3	16.3
22.0	40.4	16.8
23.0	40.5	16.4
24.0	40.5	16.6
25.0	40.5	16.7
26.0	40.6	16.4

8.4 Correction factors for Horn Antenna

Model: 3115

Antenna serial number: 29845

3 meter range

f(GHz)	AF(dB/m)	GA(dB)
0.75	25	3
1G	23.5	7
1.5G	26	8
2G	29	7
2.5G	27.5	10
3G	30	10
3.5G	31.5	10
4G	32.5	9.5
4.5G	32.5	10.5
5G	33	10.5
5.5G	35	10.5
6G	36.5	9.5
6.5G	36.5	10
7G	37.5	10
7.5G	37.5	10
8G	37.5	11
8.5G	38	11
9G	37.5	11.5
9.5G	38	11.5
10G	38.5	11.5
10.5G	38.5	12
11G	38.5	12.5
11.5G	38.5	13
12G	38	13.5
12.5G	38.5	13
13G	40	12
13.5G	41	12
14G	40	13
14.5G	39	14
15G	38	15.5
15.5G	37.5	16
16G	37.5	16
16.5G	39	15
17G	40	15
17.5G	42	13.5
18G	42.5	13

8.5 Correction factors for Log Periodic Antenna
EMCO, Model 3146,
Serial #9505-4081

Frequency [MHz]	AF [dB/m]
200.0	11.47
250.0	12.06
300.0	14.77
400.0	15.77
500.0	18.01
600.0	18.84
700.0	20.93
800.0	21.27
900.0	22.44
1000.0	24.10

8.6 Correction factors for Biconical Antenna
EMCO, Model 3110B,
Serial #9912-3337

Frequency [MHz]	AF [dB/m]
30.0	14.18
35.0	13.95
40.0	12.84
45.0	11.23
50.0	11.10
60.0	10.39
70.0	9.34
80.0	9.02
90.0	9.31
100.0	8.95
120.0	11.53
140.0	12.20
160.0	12.56
180.0	13.49
200.0	15.27

8.7 Correction factors for ACTIVE LOOP ANTENNA
Model 6502
S/N 9506-2950

f(MHz)	MAF(dBs/m)	AF(dB/m)
0.01	-33.1	18.4
0.02	-37.2	14.3
0.03	-38.2	13.3
0.05	-39.8	11.7
0.1	-40.1	11.4
0.2	-40.3	11.2
0.3	-40.3	11.2
0.5	-40.3	11.2
0.7	-40.3	11.2
1	-40.1	11.4
2	-40	11.5
3	-40	11.5
4	-40.1	11.4
5	-40.2	11.3
6	-40.4	11.1
7	-40.4	11.1
8	-40.4	11.1
9	-40.5	11
10	-40.5	11
20	-41.5	10
30	-43.5	8