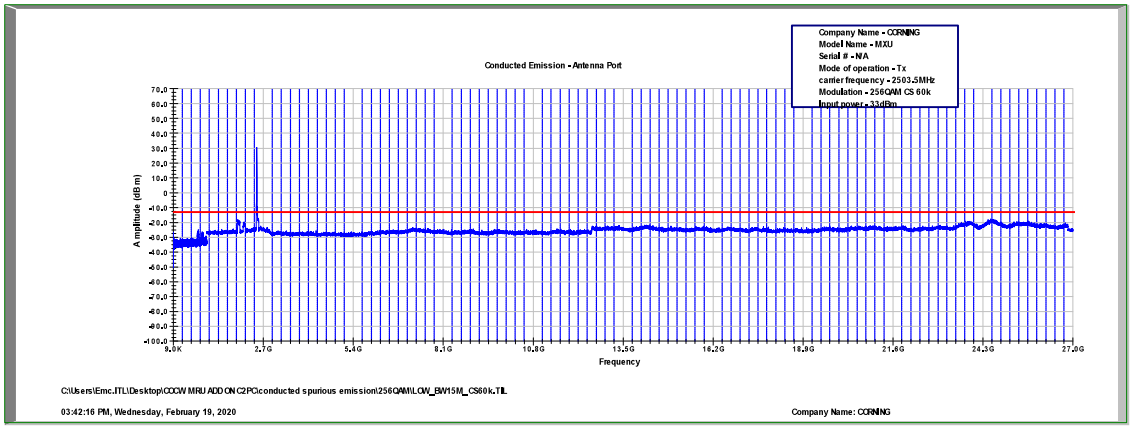

Figure 557: Spurious Emissions at Antenna Terminal 256QAM, 2503.5MHz, B.W. 15MHz, Sub Carrier 60kHz

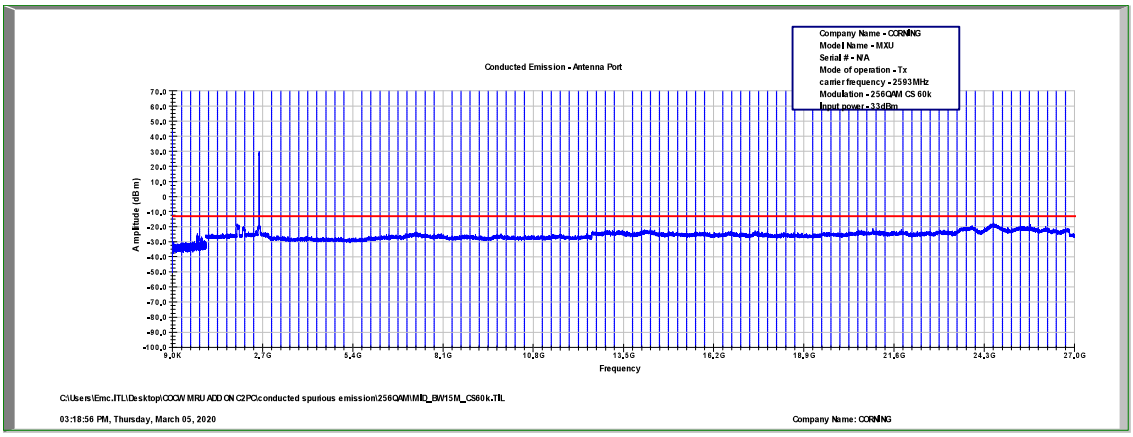

Figure 558: Spurious Emissions at Antenna Terminal 256QAM, 2593.0MHz, B.W. 15MHz, Sub Carrier 60kHz

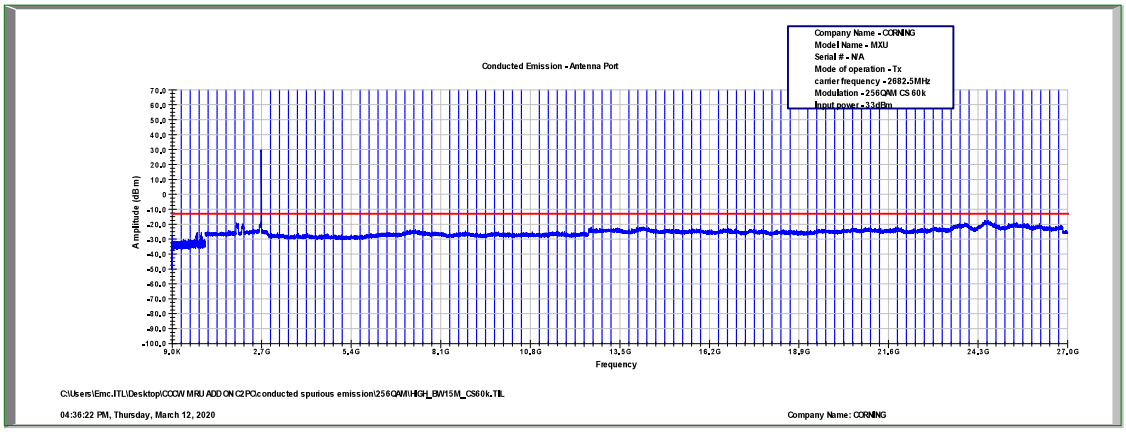

Figure 559: Spurious Emissions at Antenna Terminal 256QAM, 2682.5MHz, B.W. 15MHz, Sub Carrier 60kHz

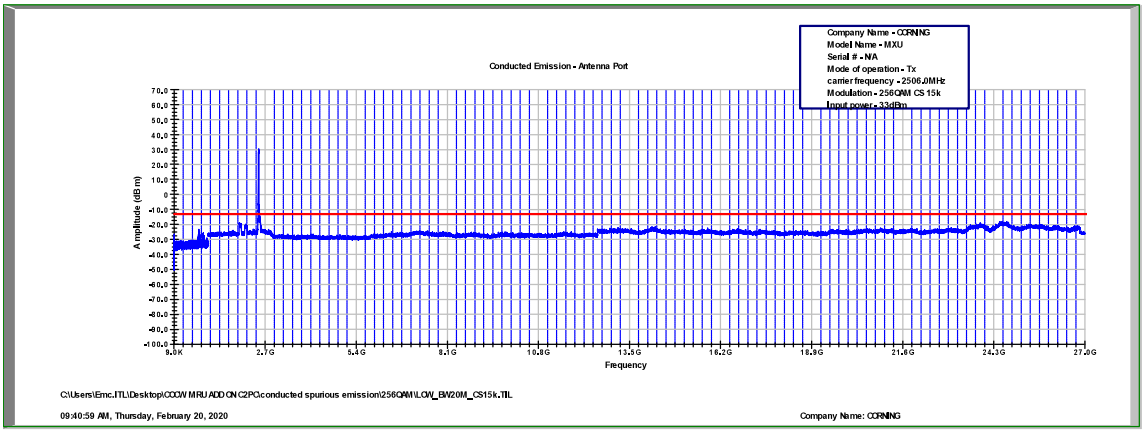

Figure 560: Spurious Emissions at Antenna Terminal 256QAM, 2506.0MHz, B.W. 20MHz, Sub Carrier 15kHz

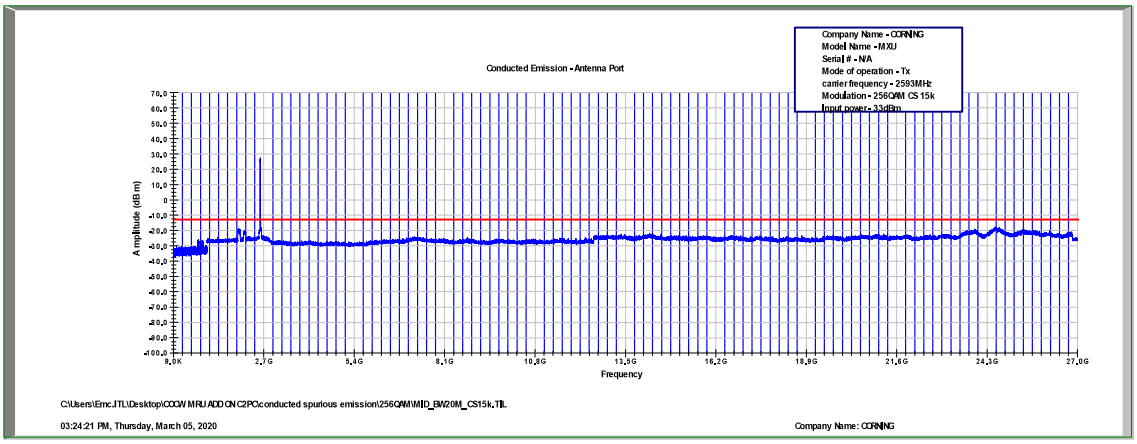

Figure 561: Spurious Emissions at Antenna Terminal 256QAM, 2593.0MHz, B.W. 20MHz, Sub Carrier 15kHz

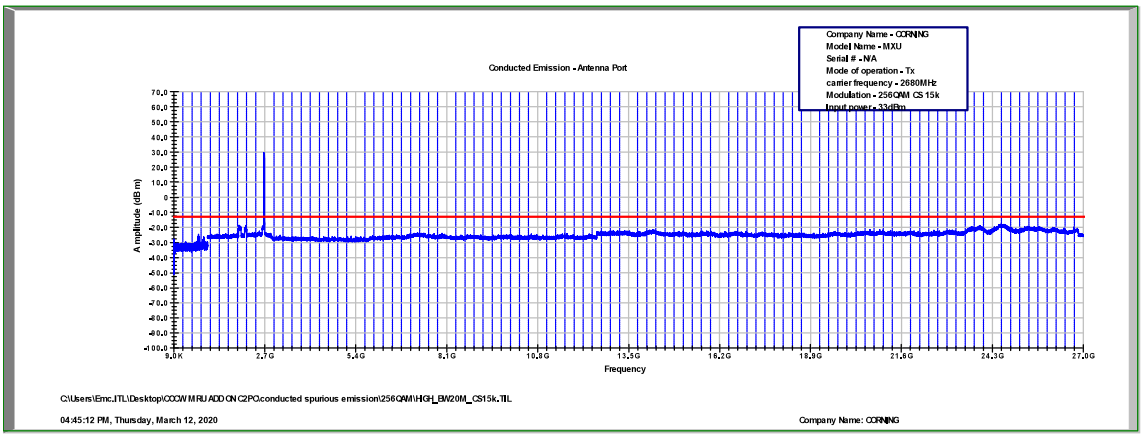

Figure 562: Spurious Emissions at Antenna Terminal 256QAM, 2680.0MHz, B.W. 20MHz, Sub Carrier 15kHz

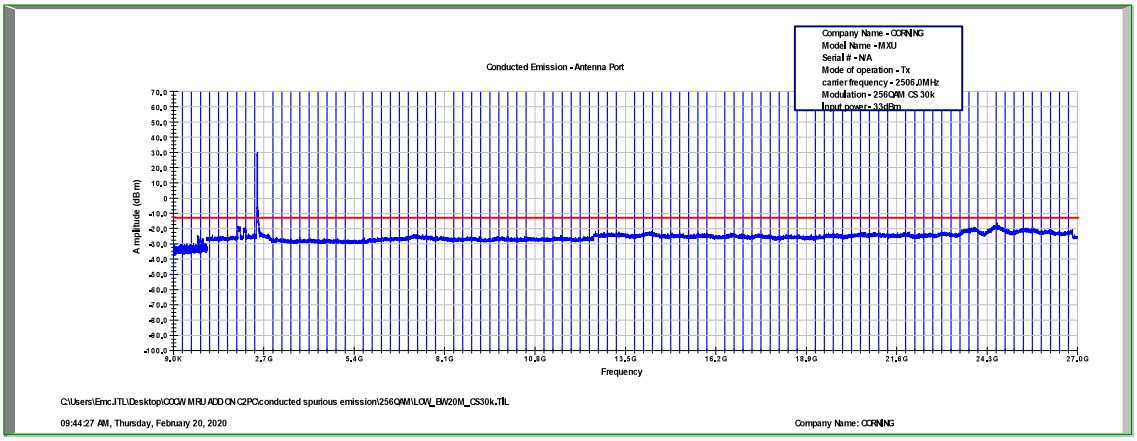

Figure 563: Spurious Emissions at Antenna Terminal 256QAM, 2506.0MHz, B.W. 20MHz, Sub Carrier 30kHz

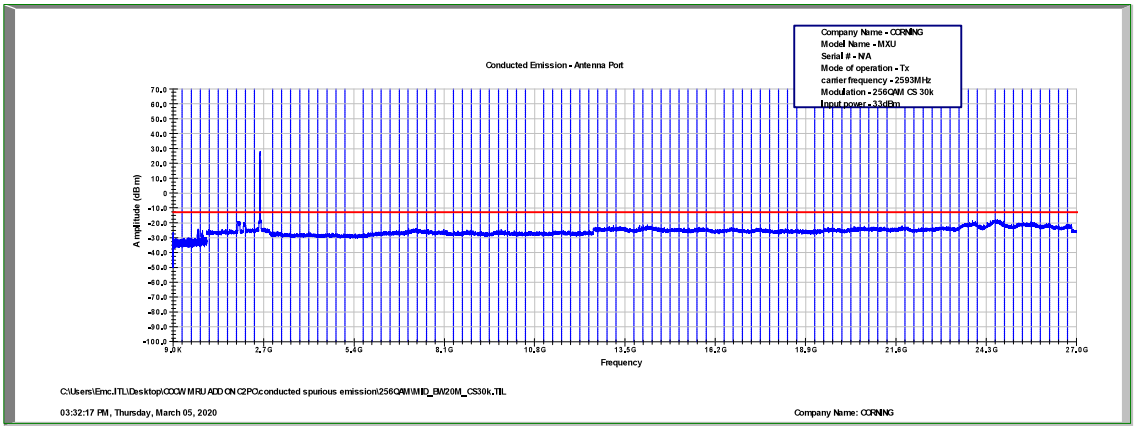

Figure 564: Spurious Emissions at Antenna Terminal 256QAM, 2593.0MHz, B.W. 20MHz, Sub Carrier 30kHz

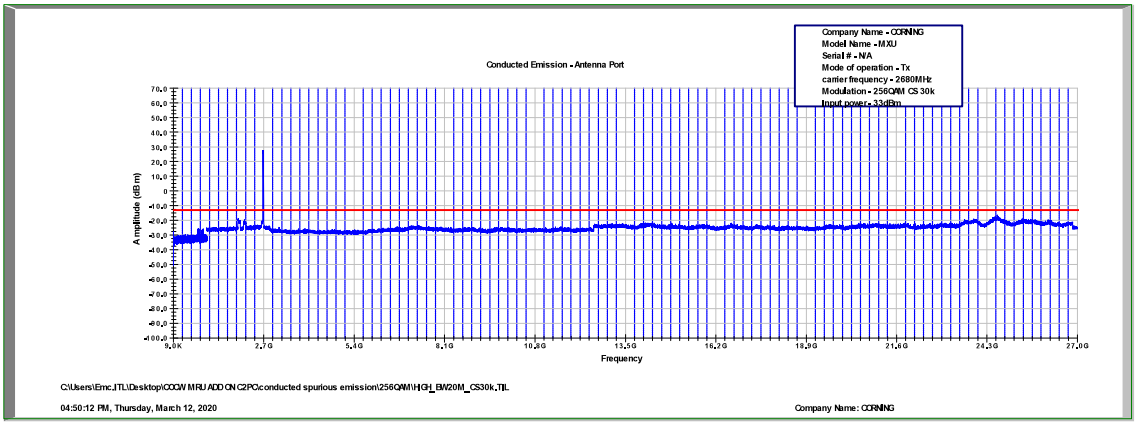

Figure 565: Spurious Emissions at Antenna Terminal 256QAM, 2680.0MHz, B.W. 20MHz, Sub Carrier 30kHz

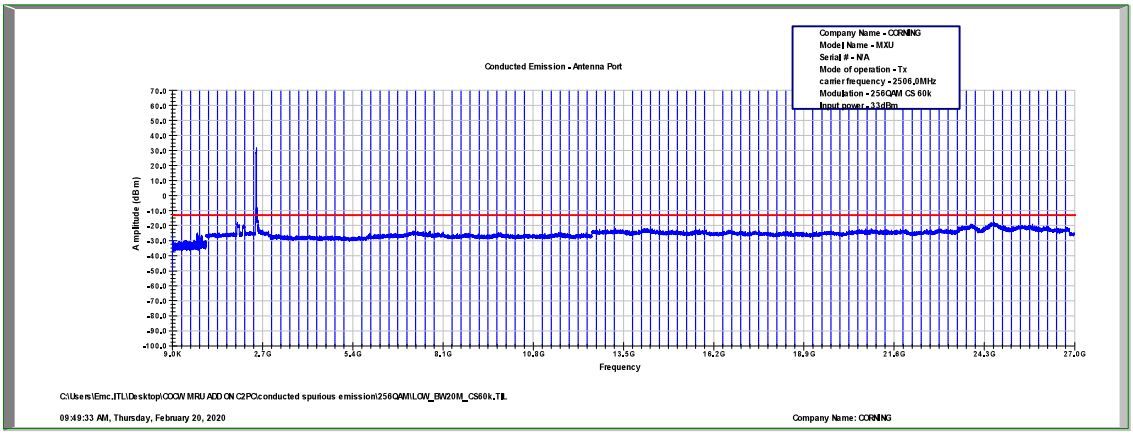

Figure 566: Spurious Emissions at Antenna Terminal 256QAM, 2506.0MHz, B.W. 20MHz, Sub Carrier 60kHz

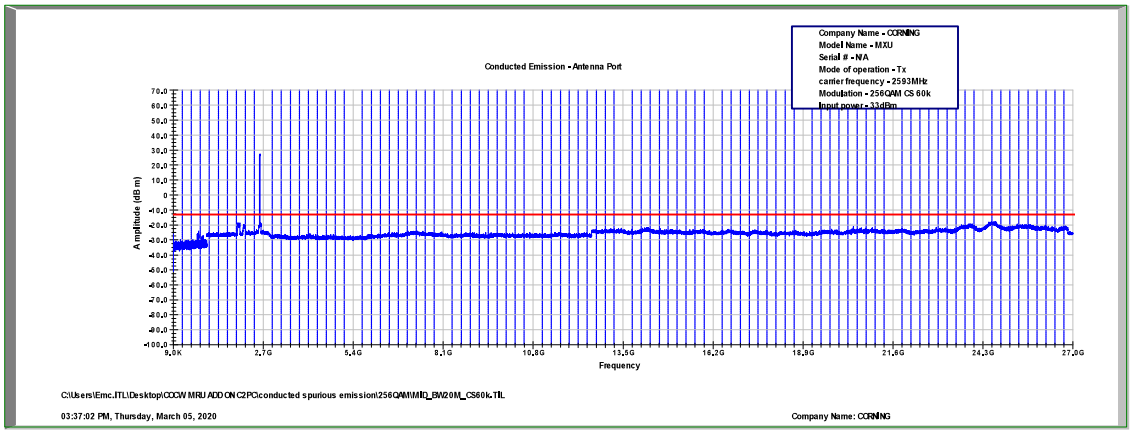

Figure 567: Spurious Emissions at Antenna Terminal 256QAM, 2593.0MHz, B.W. 20MHz, Sub Carrier 60kHz

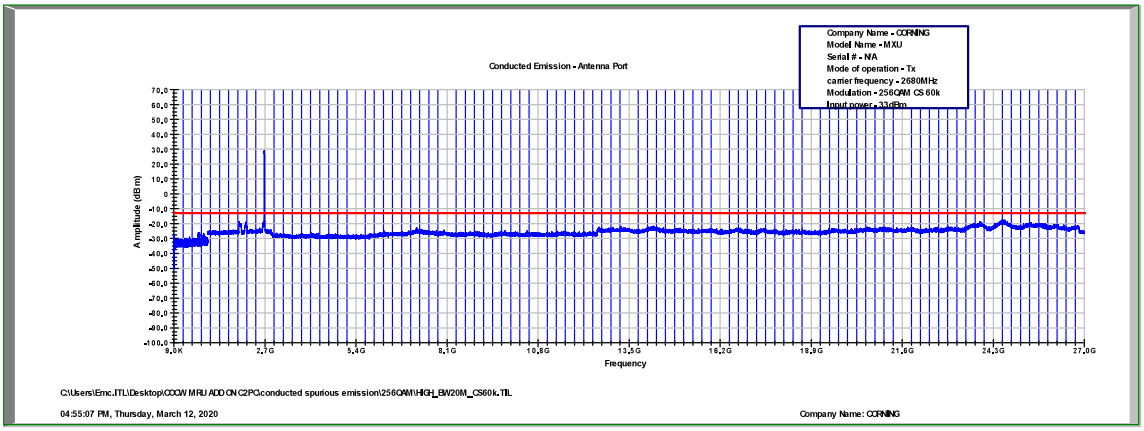

Figure 568: Spurious Emissions at Antenna Terminal 256QAM, 2680.0MHz, B.W. 20MHz, Sub Carrier 60kHz

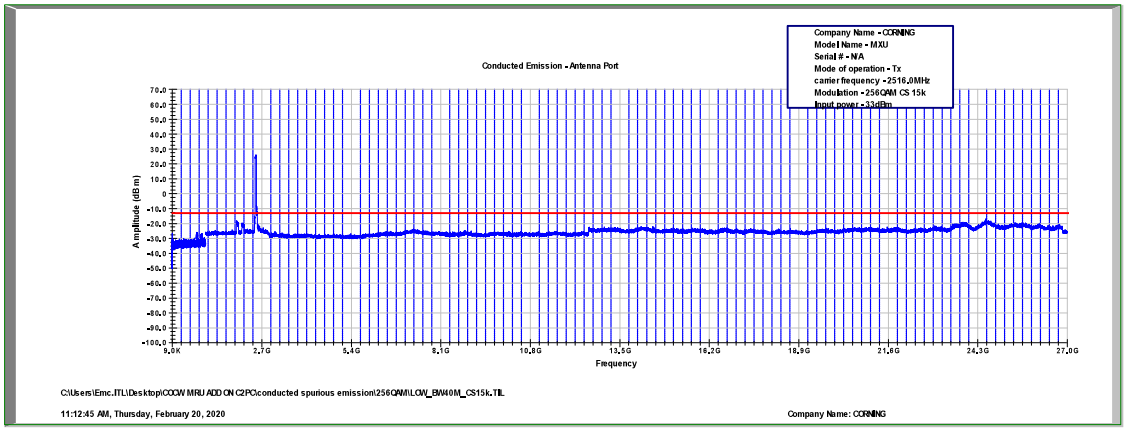

Figure 569: Spurious Emissions at Antenna Terminal 256QAM, 2516.0MHz, B.W. 40MHz, Sub Carrier 15kHz

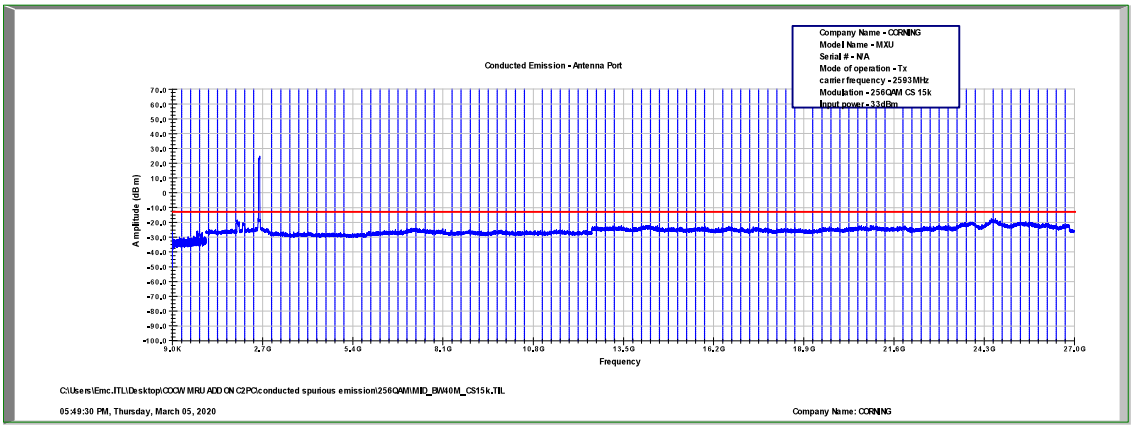

Figure 570: Spurious Emissions at Antenna Terminal 256QAM, 2593.0MHz, B.W. 40MHz, Sub Carrier 15kHz

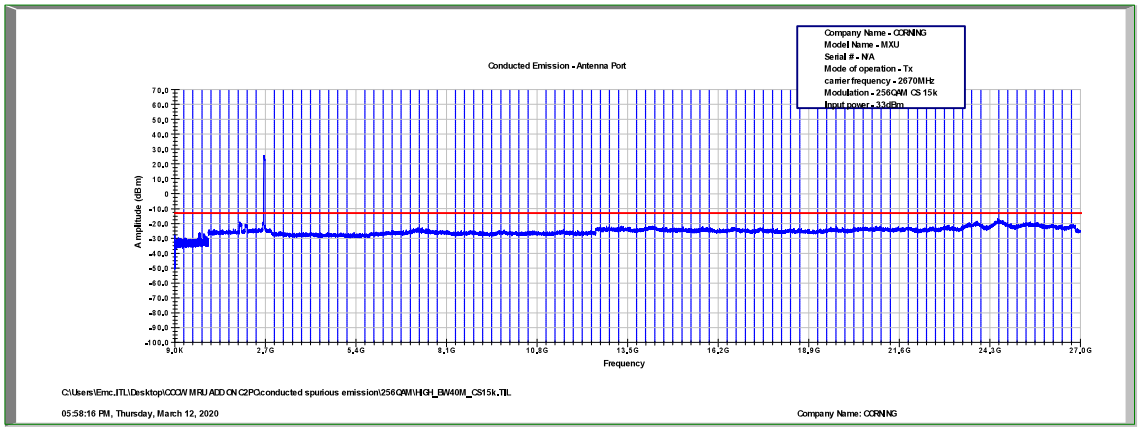

Figure 571: Spurious Emissions at Antenna Terminal 256QAM, 2670.0MHz, B.W. 40MHz, Sub Carrier 15kHz

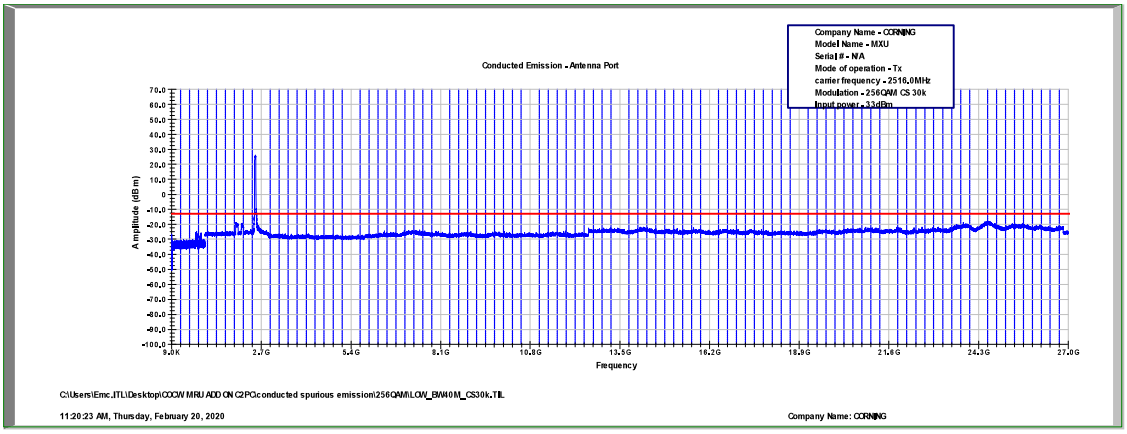

Figure 572: Spurious Emissions at Antenna Terminal 256QAM, 2516.0MHz, B.W. 40MHz, Sub Carrier 30kHz

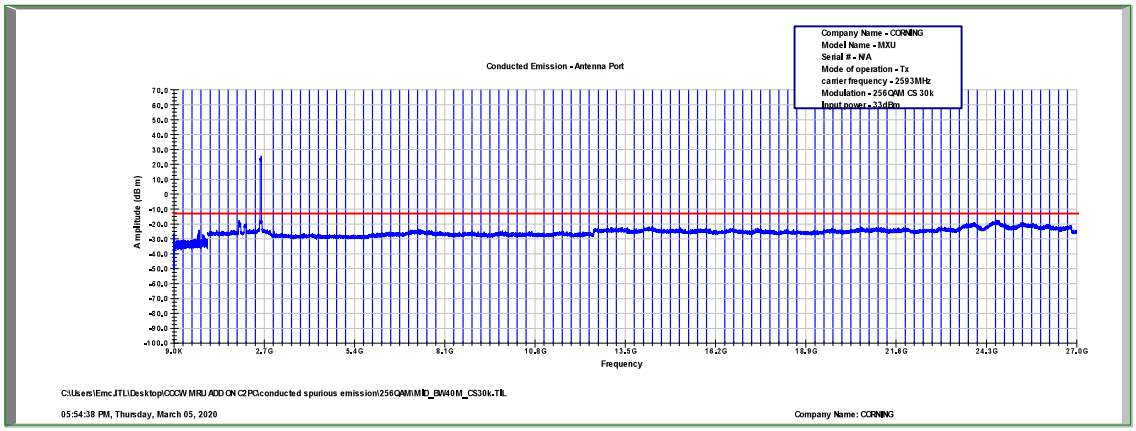

Figure 573: Spurious Emissions at Antenna Terminal 256QAM, 2593.0MHz, B.W. 40MHz, Sub Carrier 30kHz

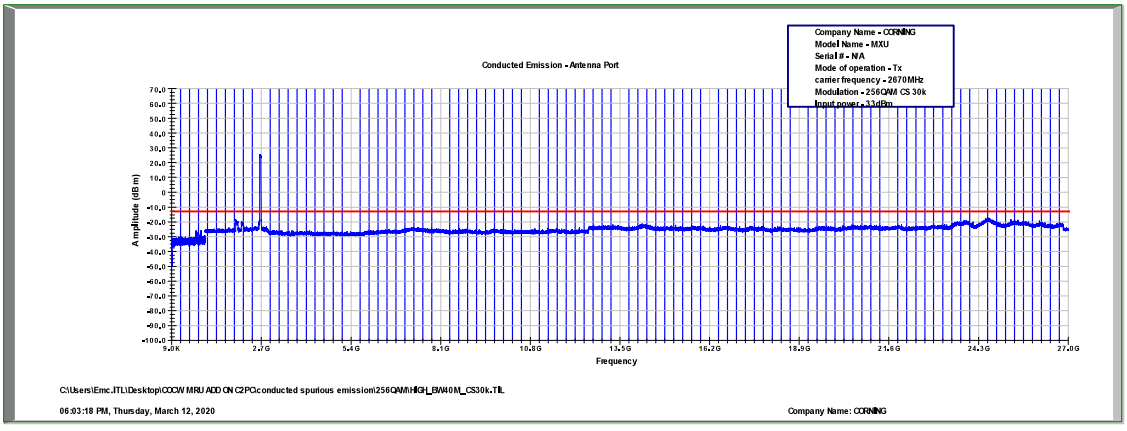

Figure 574: Spurious Emissions at Antenna Terminal 256QAM, 2670.0MHz, B.W. 40MHz, Sub Carrier 30kHz

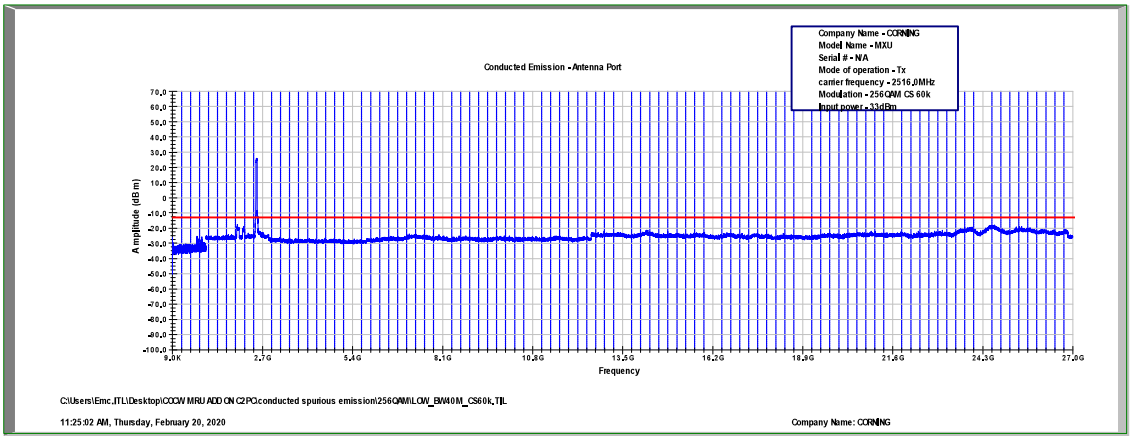

Figure 575: Spurious Emissions at Antenna Terminal 256QAM, 2516.0MHz, B.W. 40MHz, Sub Carrier 60kHz

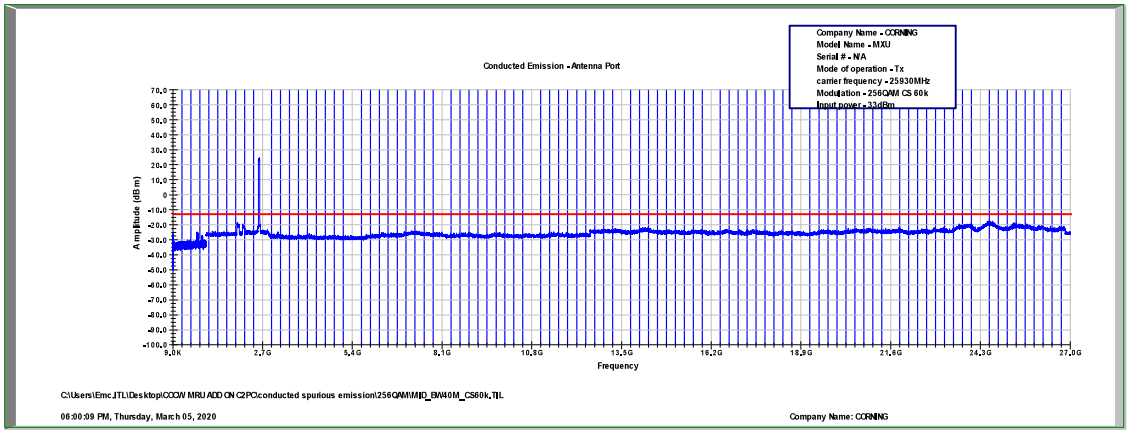

Figure 576: Spurious Emissions at Antenna Terminal 256QAM, 2593.0MHz, B.W. 40MHz, Sub Carrier 60kHz

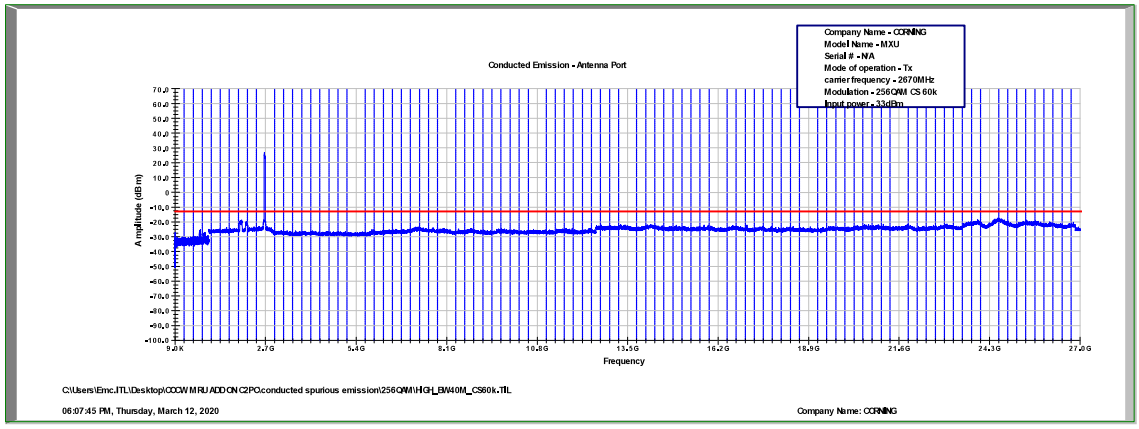

Figure 577: Spurious Emissions at Antenna Terminal 256QAM, 2670.0MHz, B.W. 40MHz, Sub Carrier 60kHz

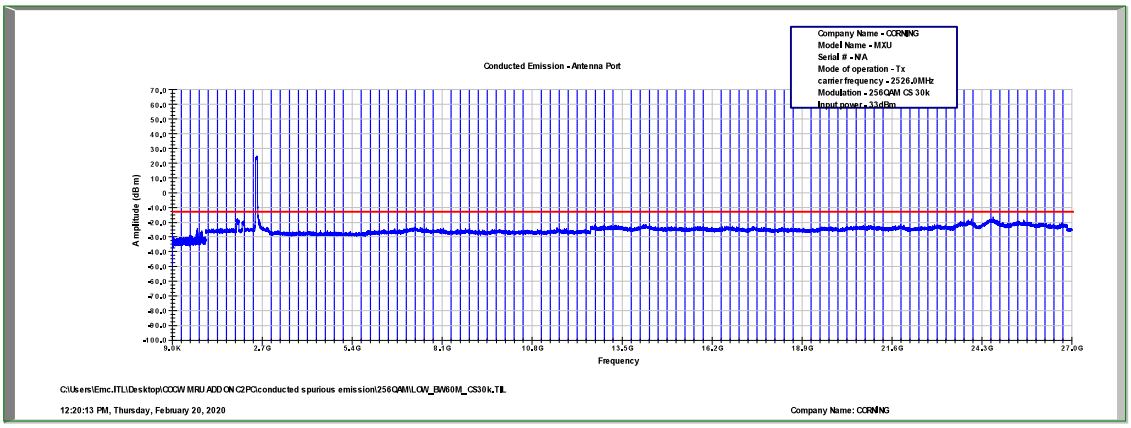

Figure 578: Spurious Emissions at Antenna Terminal 256QAM, 2526.0MHz, B.W. 60MHz, Sub Carrier 30kHz

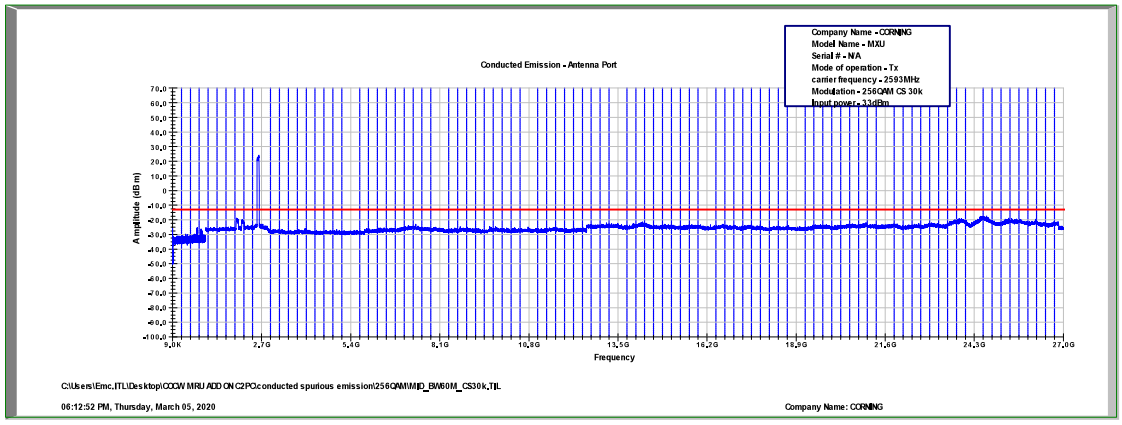

Figure 579: Spurious Emissions at Antenna Terminal 256QAM, 2593.0MHz, B.W. 60MHz, Sub Carrier 30kHz

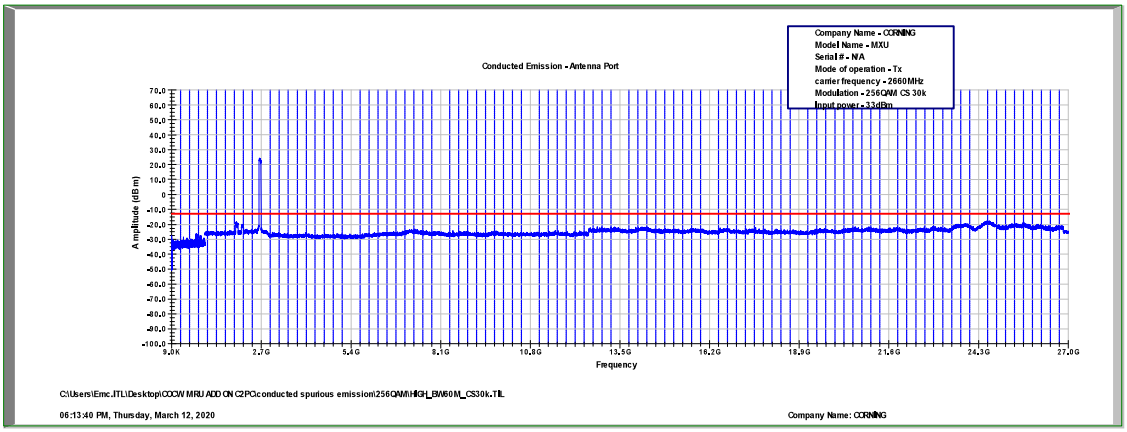

Figure 580: Spurious Emissions at Antenna Terminal 256QAM, 2660.0MHz, B.W. 60MHz, Sub Carrier 30kHz

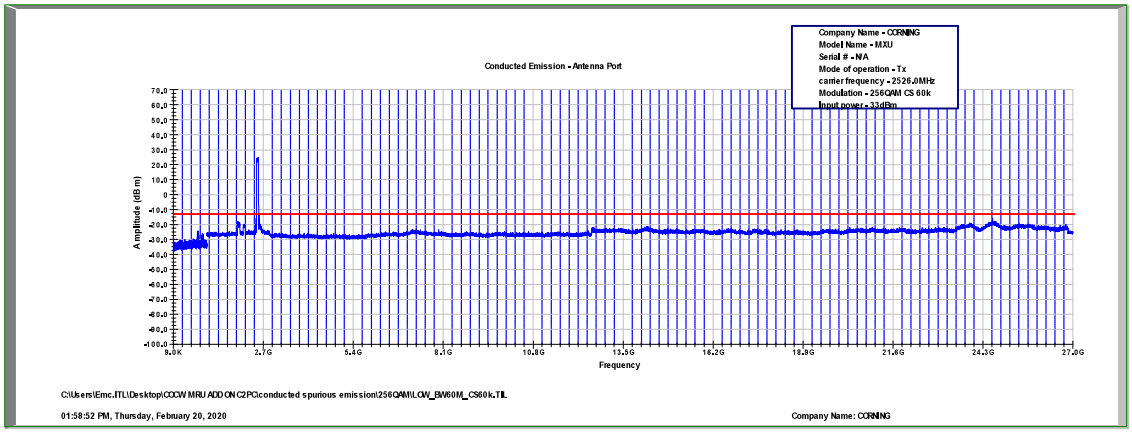

Figure 581: Spurious Emissions at Antenna Terminal 256QAM, 2526.0MHz, B.W. 60MHz, Sub Carrier 60kHz

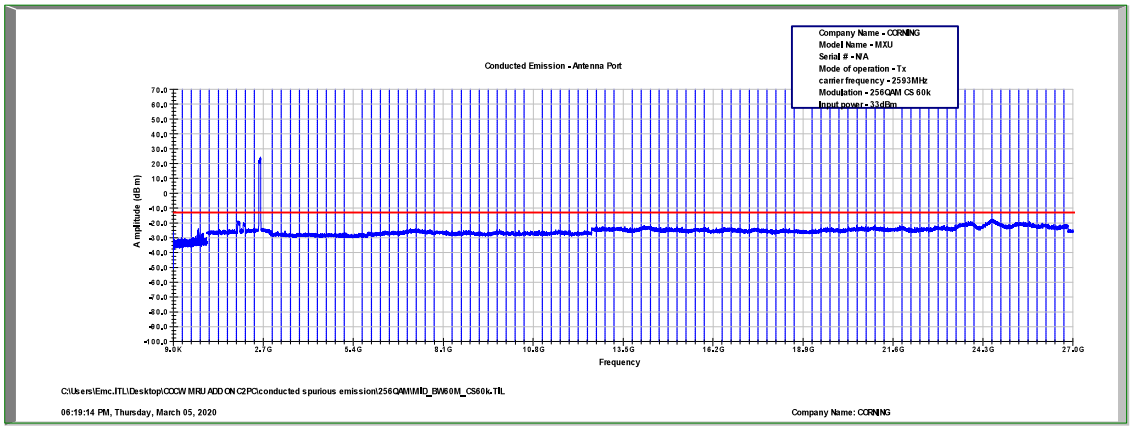

Figure 582: Spurious Emissions at Antenna Terminal 256QAM, 2593.0MHz, B.W. 60MHz, Sub Carrier 60kHz

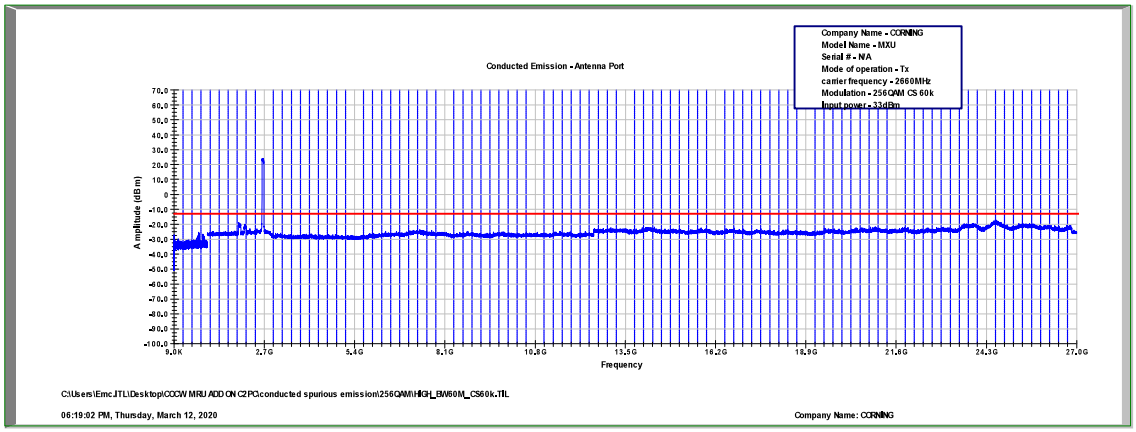

Figure 583: Spurious Emissions at Antenna Terminal 256QAM, 2660.0MHz, B.W. 60MHz, Sub Carrier 60kHz

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
20 dB Attenuator	Bird	8304-N20DB	-	24 December 2019	24 December 2020

Table 21 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:

$P_d(dBm) = P_g(dBm) – Cable\ Loss\ (dB) + Substitution\ Antenna\ Gain\ (dBd)$

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 (MHz) must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log (P) dB, yielding –13dBm

7.4 Test Results

No emissions were detected above the EMI receiver noise level which is at least 20 dB 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	February 28, 2019	February 28, 2020
RF Filter Section	HP	85420E	3705A00248	February 28, 2019	February 28, 2020
EMI Receiver	R&S	ESCI7	100724	February 27, 2019	February 28, 2020
Spectrum Analyzer	HP	8593EM	3536A00120ADI	February 26, 2019	February 28, 2020
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
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 22 Test Equipment Used

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