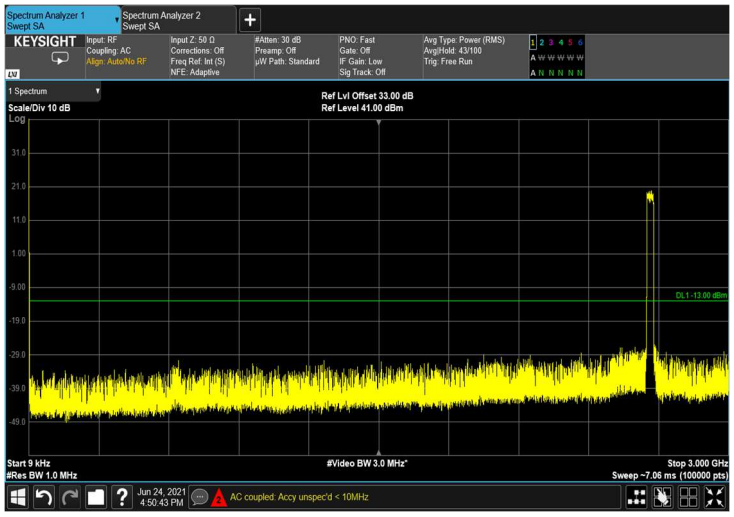

Figure 436: 9kHz-3GHz

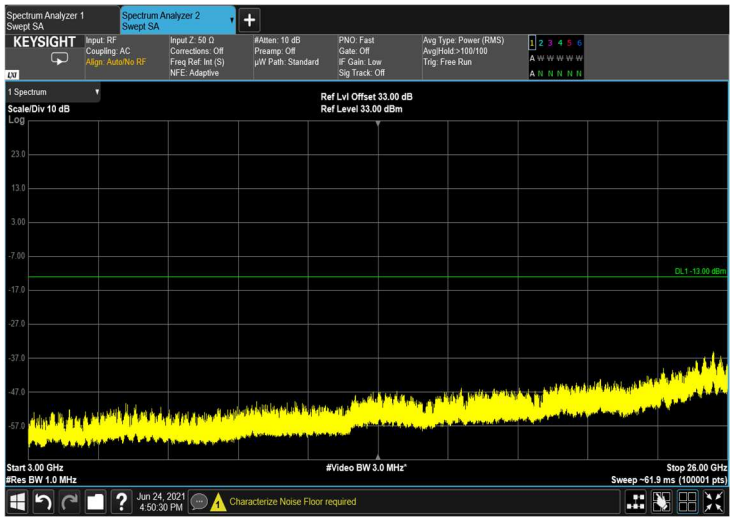

Figure 437: 3GHz-26GHz

Spurious Emissions at Antenna Terminal QPSK 40MHz B.W.; 2670.0MHz, 60kHz

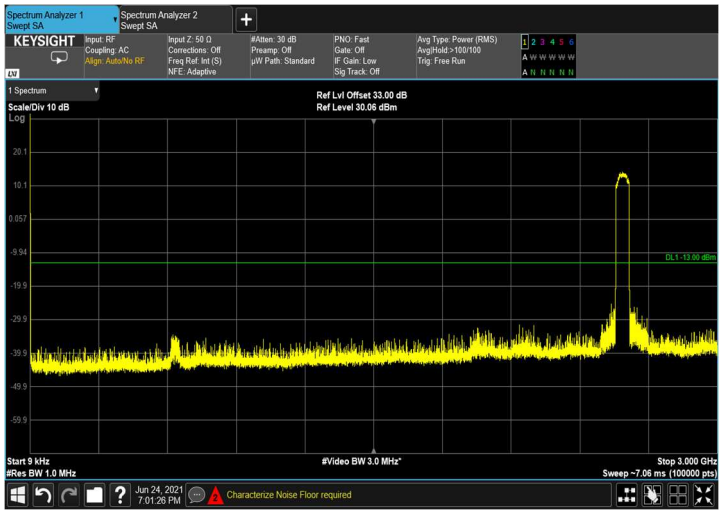

Figure 438: 9kHz-3GHz

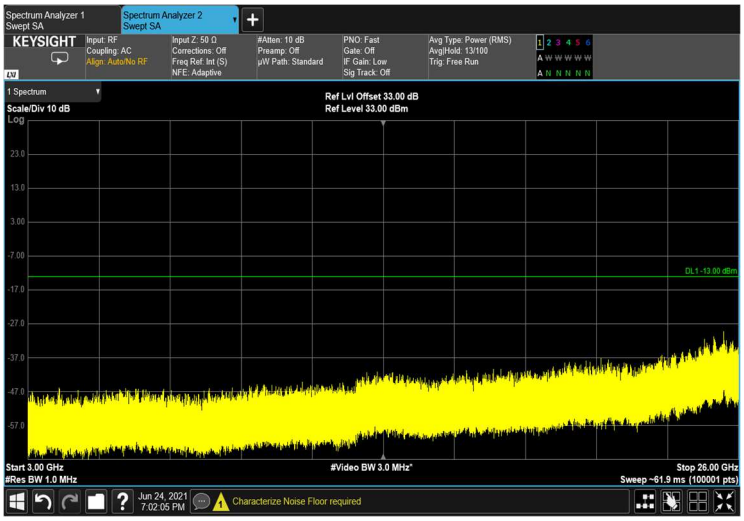

Figure 439: 3GHz-26GHz

Spurious Emissions at Antenna Terminal QPSK 60MHz B.W.; 2526.0MHz, 30kHz

Figure 440: 9kHz-3GHz

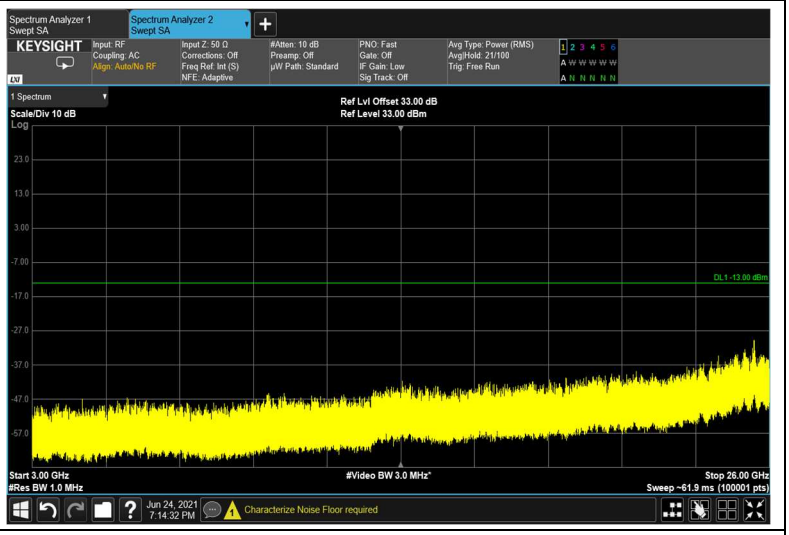

Figure 441: 3GHz-26GHz

Spurious Emissions at Antenna Terminal QPSK 60MHz B.W.; 2593.0MHz, 30kHz

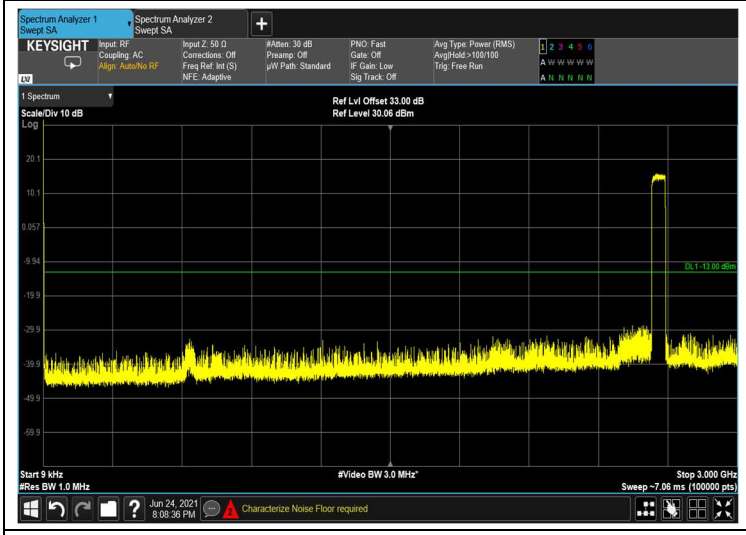

Figure 442: 9kHz-3GHz

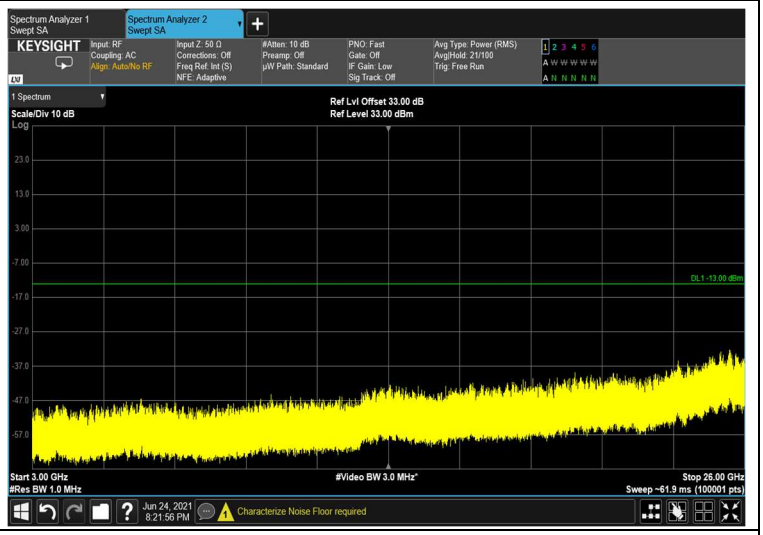

Figure 443: 3GHz-26GHz

Spurious Emissions at Antenna Terminal QPSK 60MHz B.W.; 2660.0MHz, 30kHz

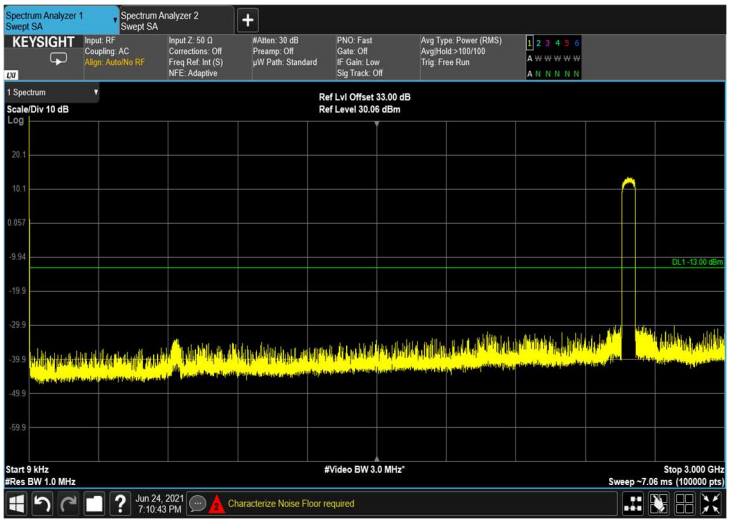

Figure 444: 9kHz-3GHz

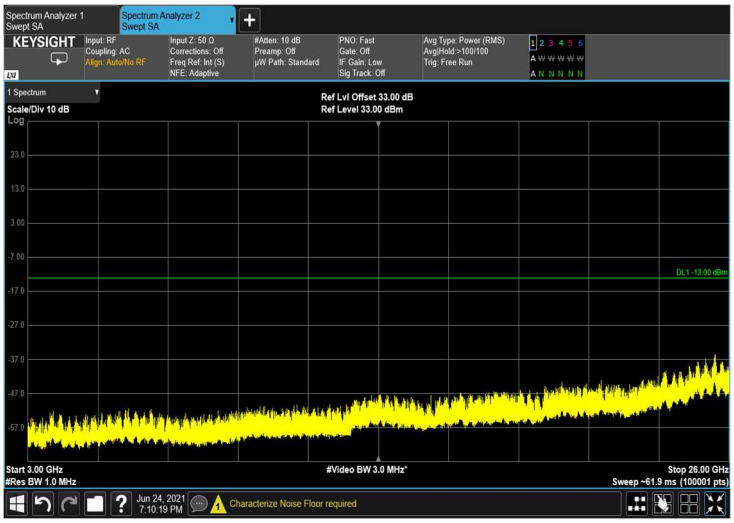

Figure 445: 3GHz-26GHz

Spurious Emissions at Antenna Terminal QPSK 60MHz B.W.; 2526.0MHz, 60kHz

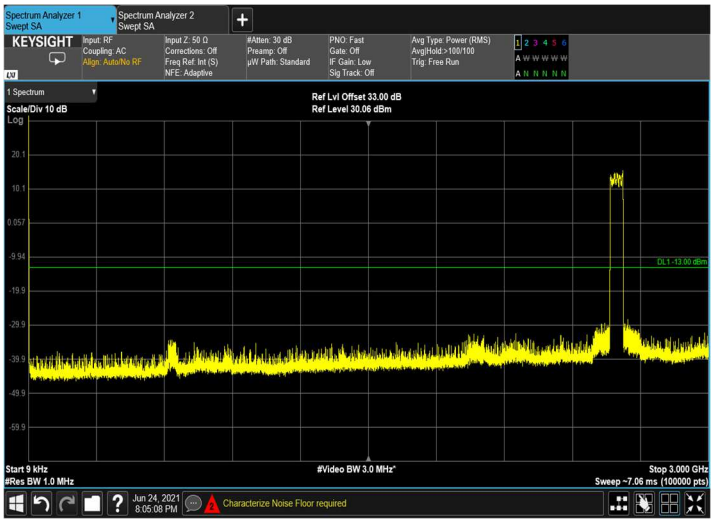

Figure 446: 9kHz-3GHz

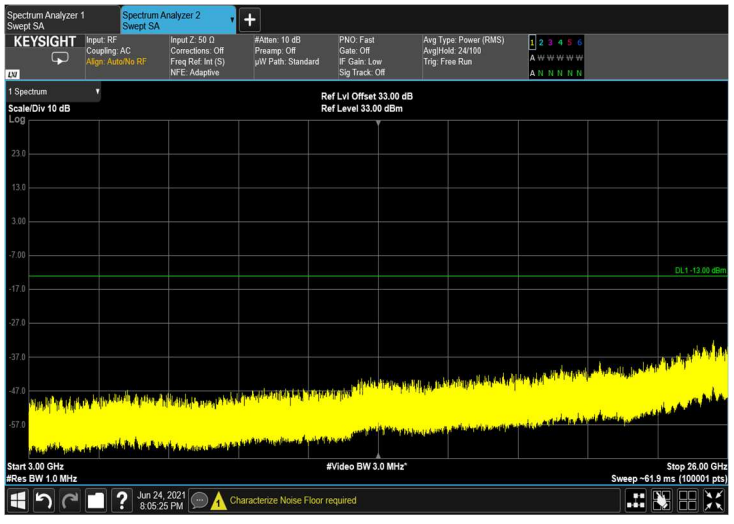

Figure 447: 3GHz-26GHz

Spurious Emissions at Antenna Terminal QPSK 60MHz B.W.; 2593.0MHz, 60kHz

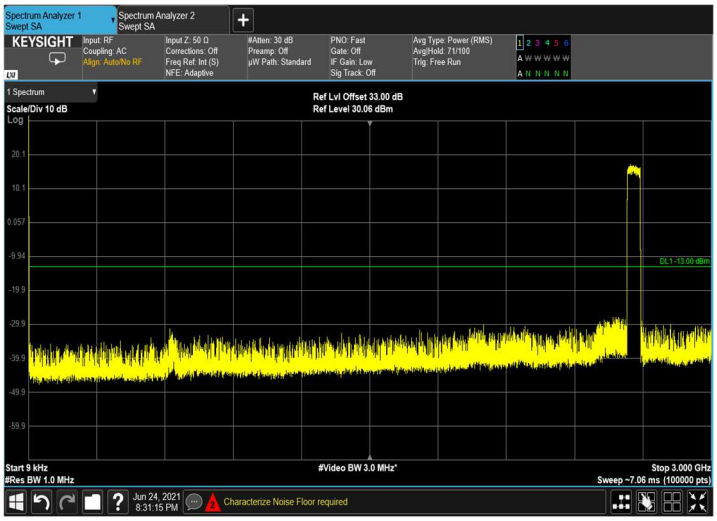

Figure 448: 9kHz-3GHz

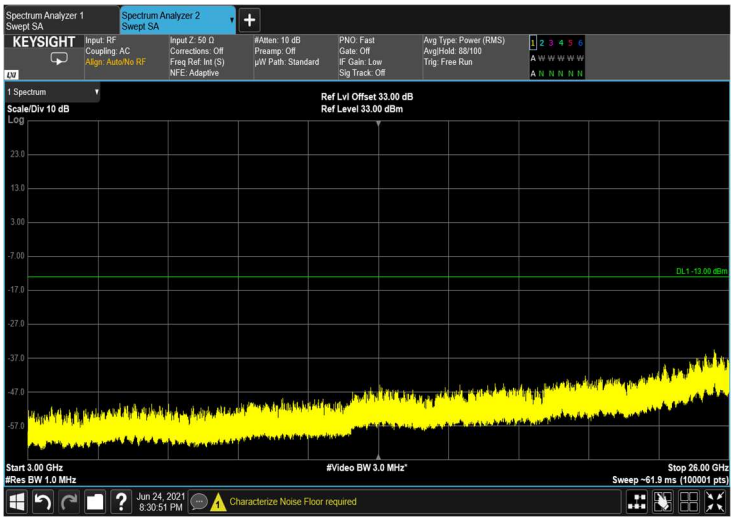

Figure 449: 3GHz-26GHz

Spurious Emissions at Antenna Terminal QPSK 60MHz B.W.; 2660.0MHz, 60kHz

4G

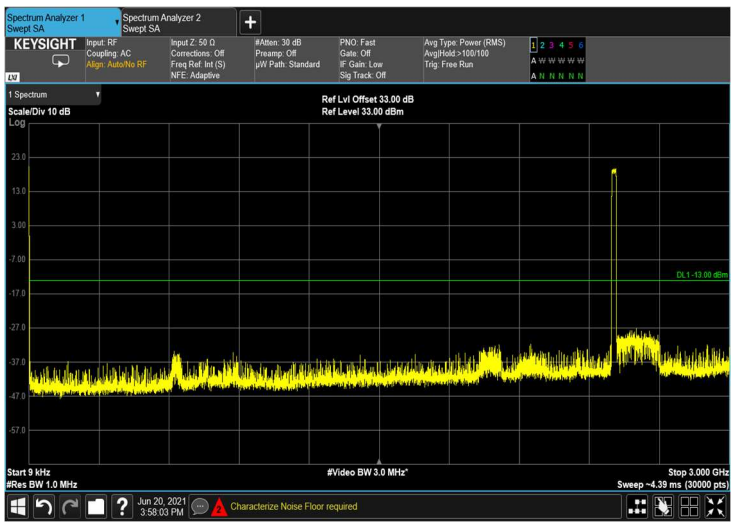

Figure 450: 9kHz-3GHz

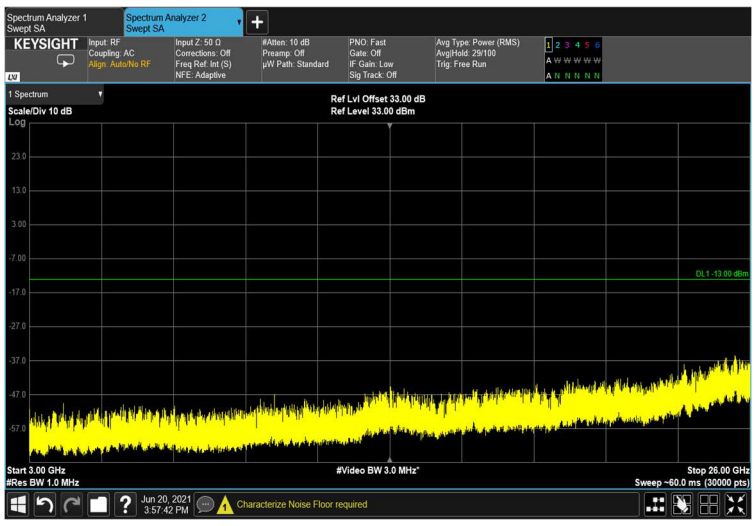

Figure 451: 3GHz-26GHz

Spurious Emissions at Antenna Terminal 16QAM 20MHz B.W.; 2506.0MHz

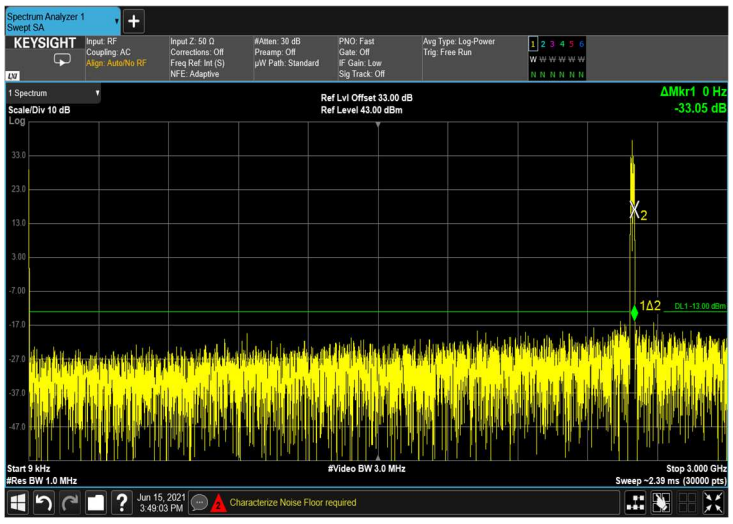

Figure 452: 9kHz-3GHz

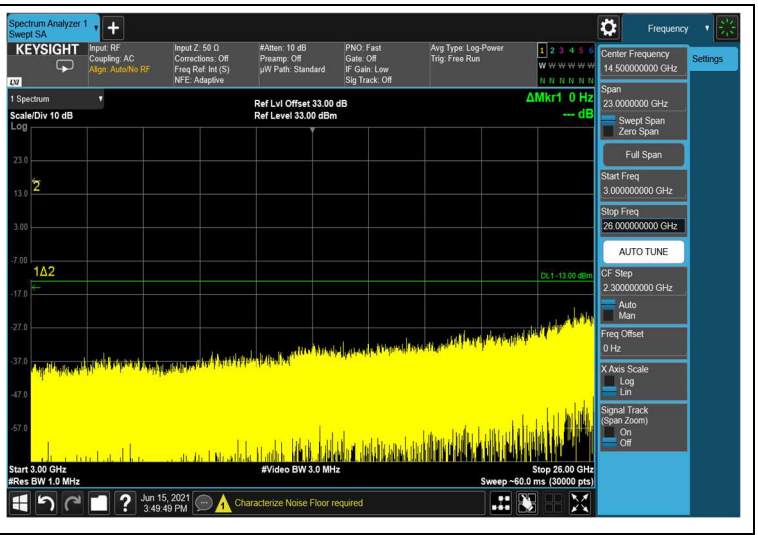

Figure 453: 3GHz-26GHz

Spurious Emissions at Antenna Terminal 16QAM 20MHz B.W.; 2593.0MHz

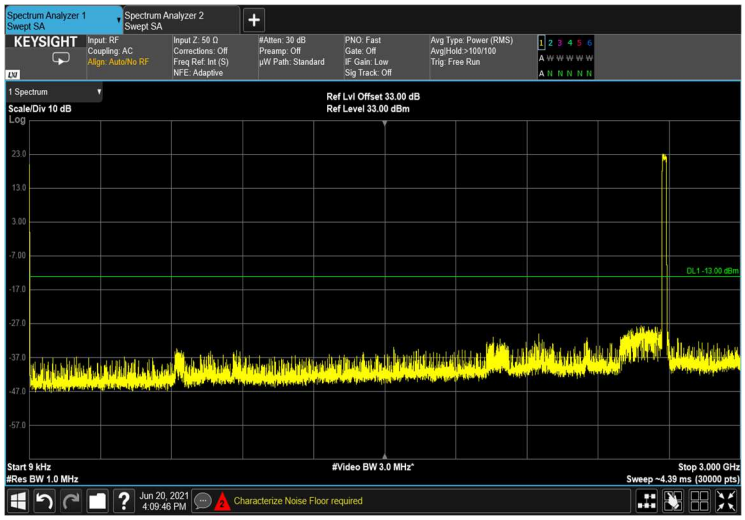

Figure 454: 9kHz-3GHz

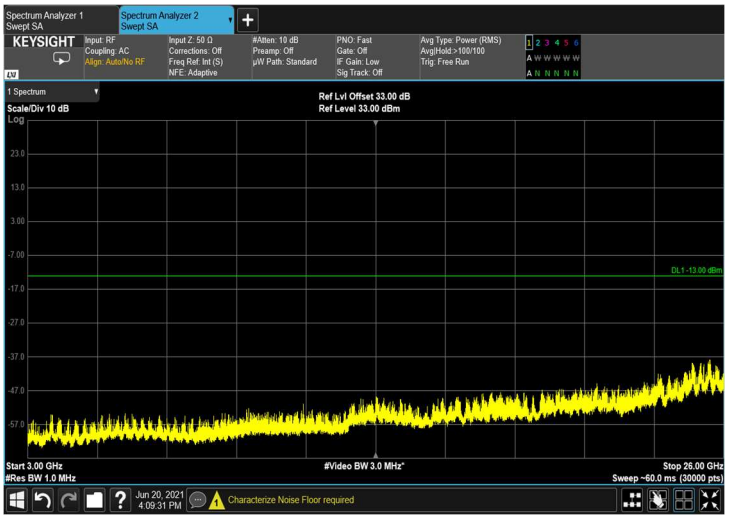

Figure 455: 3GHz-26GHz

Spurious Emissions at Antenna Terminal 16QAM 20MHz B.W.; 2680.0MHz

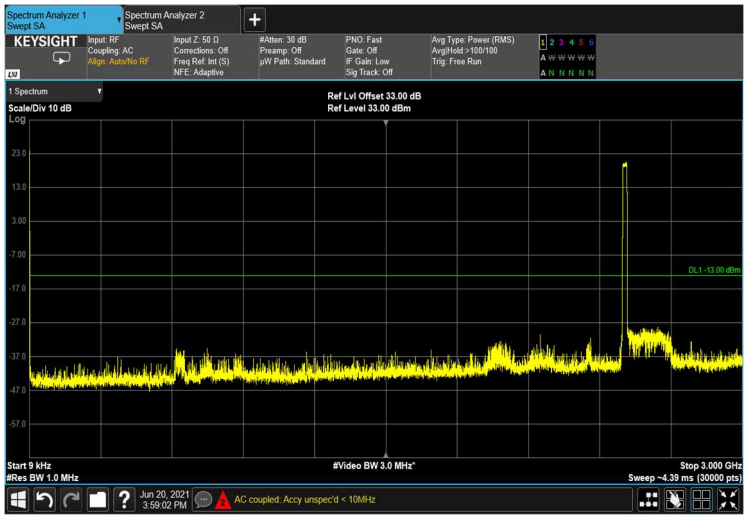

Figure 456: 9kHz-3GHz

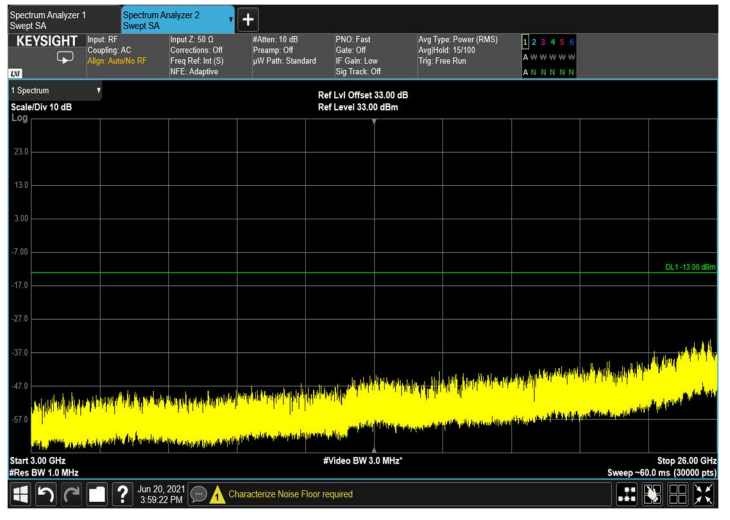

Figure 457: 3GHz-26GHz

Spurious Emissions at Antenna Terminal 64QAM 20MHz B.W.; 2506.0MHz

Figure 458: 9kHz-3GHz

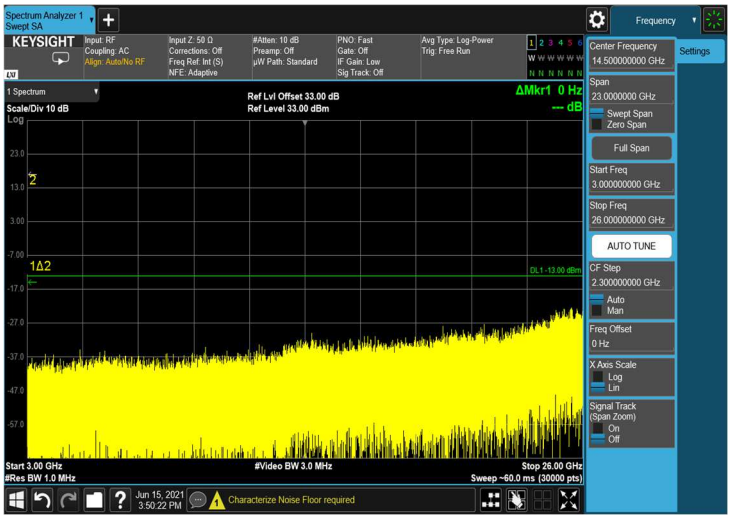

Figure 459: 3GHz-26GHz

Spurious Emissions at Antenna Terminal 64QAM 20MHz B.W.; 2593.0MHz

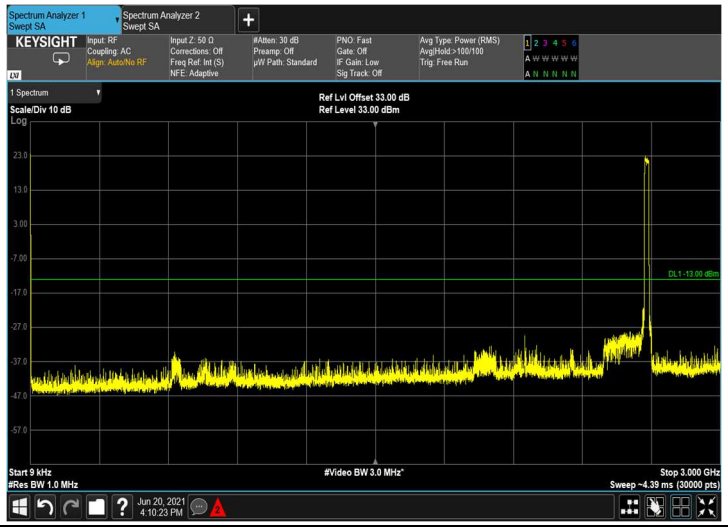

Figure 460: 9kHz-3GHz

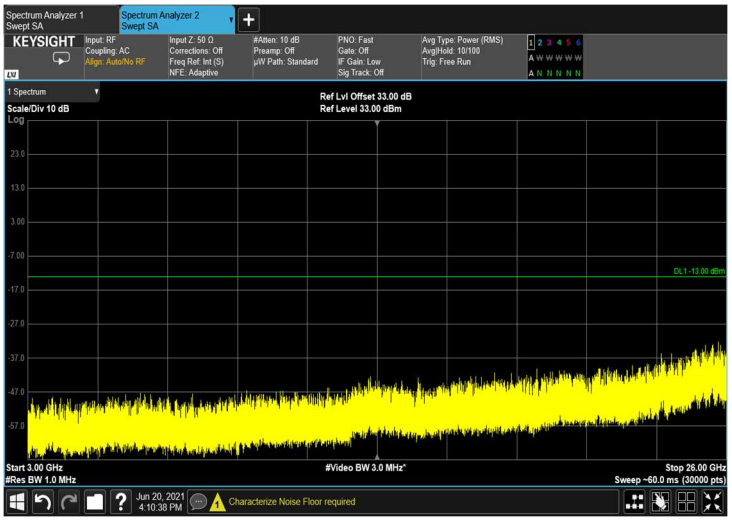

Figure 461: 3GHz-26GHz

Spurious Emissions at Antenna Terminal 64QAM 20MHz B.W.; 2680.0MHz

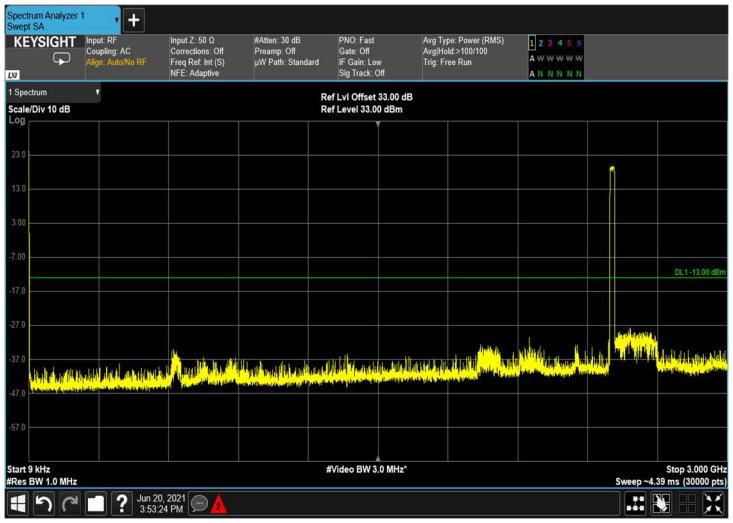

Figure 462: 9kHz-3GHz

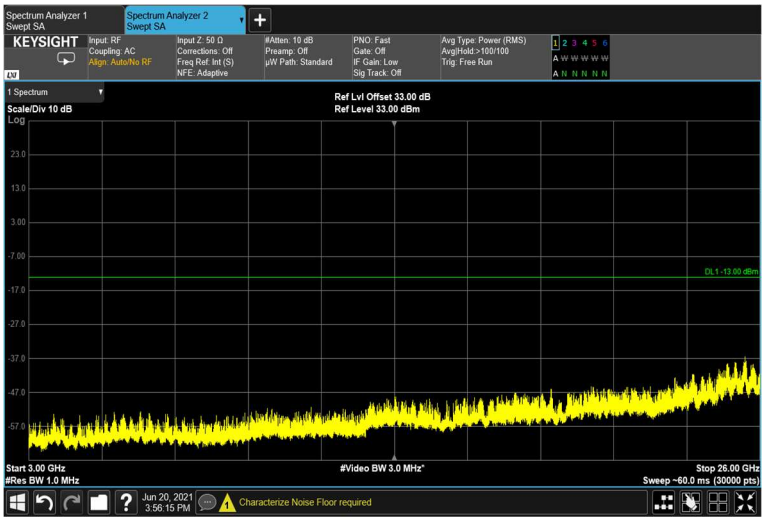

Figure 463: 3GHz-26GHz

Spurious Emissions at Antenna Terminal QPSK 20MHz B.W.; 2506.0MHz

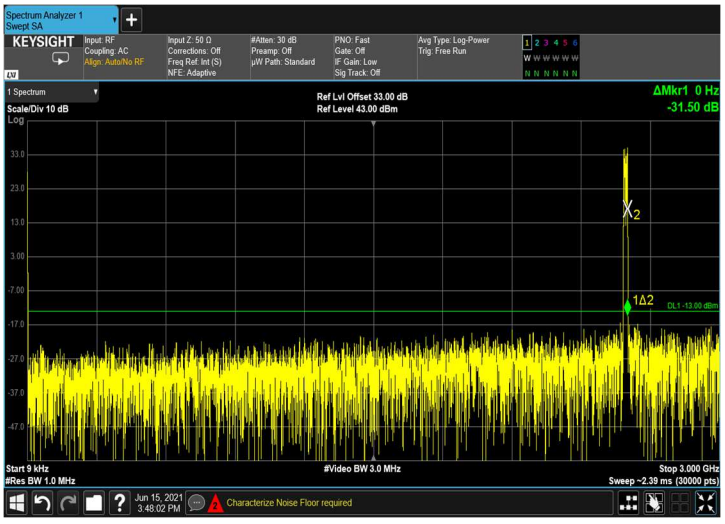

Figure 464: 9kHz-3GHz

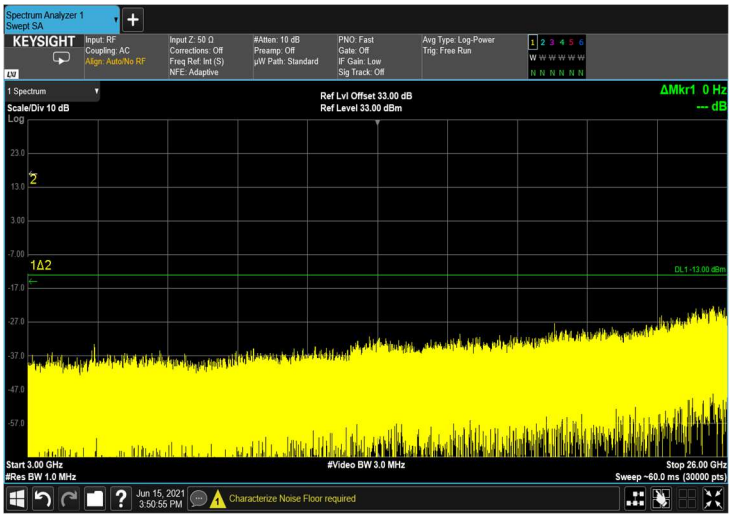

Figure 465: 3GHz-26GHz

Spurious Emissions at Antenna Terminal QPSK 20MHz B.W.; 2593.0MHz

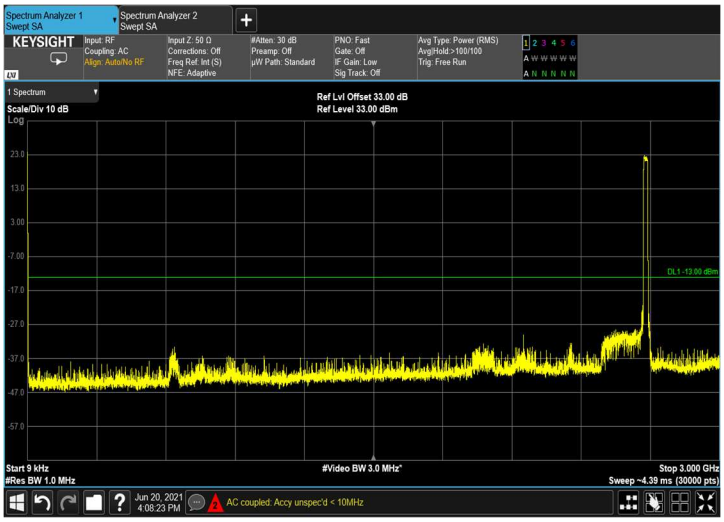

Figure 466: 9kHz-3GHz

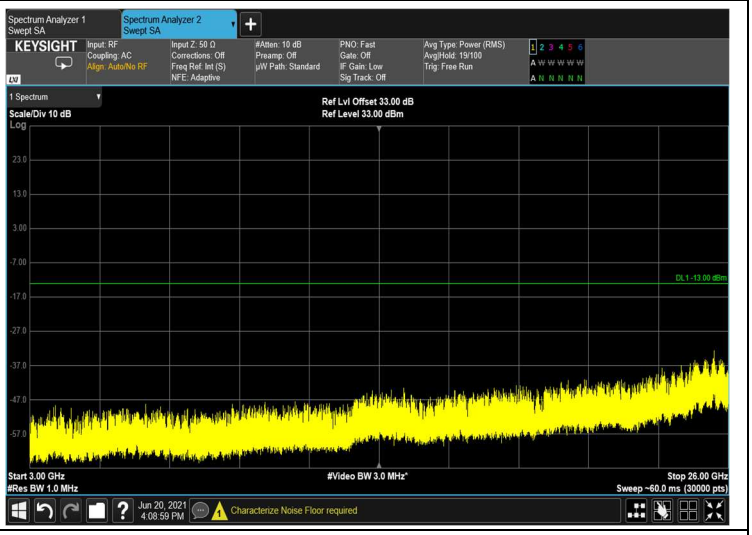

Figure 467: 3GHz-26GHz

Spurious Emissions at Antenna Terminal QPSK 20MHz B.W.; 2680.0MHz

8.4 Equipment Used; Spurious Emissions at Antenna Terminals

Instrument	Manufacturer	Model	Serial Number	Calibration	
				Last Calibration	Calibration Due
EXA signal Analyzer	Keysight	UXA N9040B	MY56080119	January 31, 2020	January 31, 2022
EXG Vector Signal Generator	Agilent Technologies	N5172B	MY53051952	January 17, 2019	January 17, 2022
40 dB Attenuator	Weinschel Associates	WA 39-40-33	-	November 1, 2020	November 1, 2021
RF Coaxial Cable	Huber-Suner	SLLS210B	-	November 1, 2020	November 1, 2021

Table 30 Test Equipment Used

9 Spurious Radiated Emission

9.1 Test Specification

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

9.2 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-26.0GHz:

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 -26.0GHz 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:

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

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.

9.3 Test Limit

The power of any emission outside of the authorized operating frequency ranges (862 - 894 MHz) must be attenuated below the transmitting power (P) by a factor of at least 43 + log (P) dB, yielding –13dBm.

9.4 Test Results

No emissions were detected above the EMI receiver noise level which is at least 20 dB margin below the limit.

Judgement: Passed

9.5 Test Instrumentation Used; Radiated Measurements

Instrument	Manufacturer	Model	Serial Number	Calibration	
				Last Calibration	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	Apr 24, 2021	Apr 24, 2023
Antenna Log Periodic	EMCO	3146	9505-4081	Apr 27, 2021	Apr 27, 2023
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 31 Test Equipment Used

10 Out-of-Band Rejection

10.1 Test Specification

KDB 935210 D05 v01r01, Section 3.3

10.2 Test Procedure

(Temperature (21°C)/ Humidity (35%RH))

The E.U.T. antenna terminal was connected to the spectrum analyzer through an external attenuator and an appropriate coaxial cable (max Loss= 41.1 dB).

The signal and spectrum analyzer frequency range was set to ±250% of the passband, Dwell time set to approximately 10msec.

RBW was set between 1% to 5% of the E.U.T passband and VBW set to ≥3*RBW.

10.3 Test Limit

N/A

10.4 Test Results

JUDGEMENT: Passed

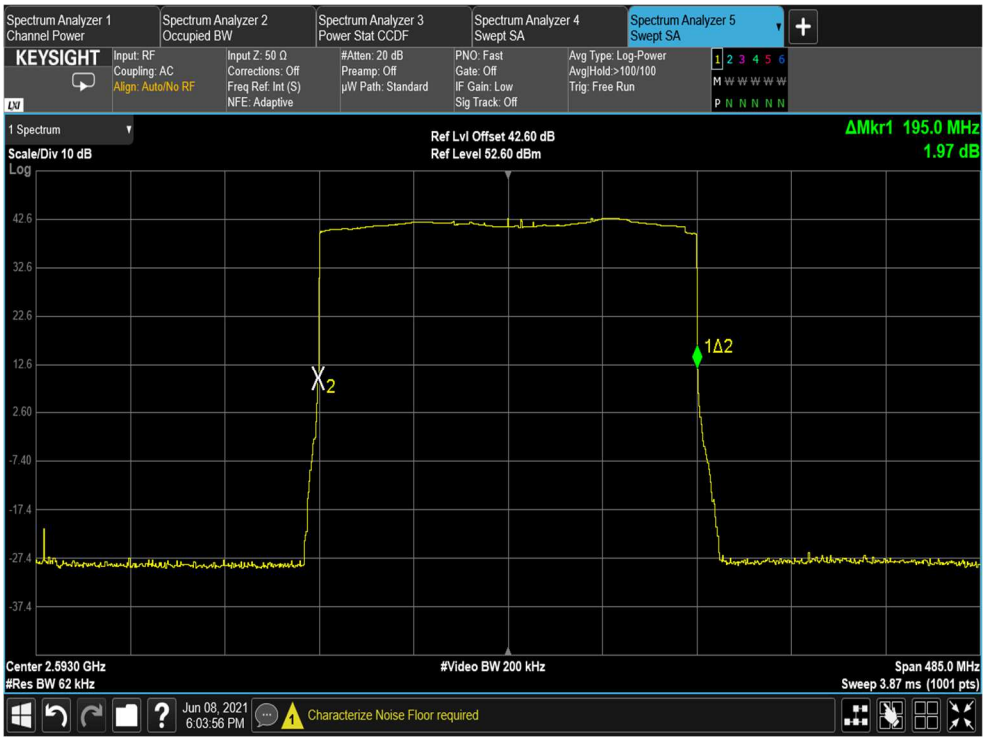

Figure 468. Out-of-Band Rejection Plot

10.5 Test Equipment Used; Out-of-Band Rejection

Instrument	Manufacturer	Model	Serial Number	Calibration	
				Last Calibration	Next Calibration
EXA signal Analyzer	Keysight	UXA N9040B	MY56080119	January 31, 2020	January 31, 2022
EXG Vector Signal Generator	Agilent Technologies	N5172B	MY53051952	January 17, 2019	January 17, 2022
40 dB Attenuator	Weinschel Associates	WA 39-40-33	-	November 1, 2020	November 1, 2021
RF Coaxial Cable	Huber-Suner	SLLS210B	-	November 1, 2020	November 1, 2021

Table 32 Test Equipment Used

11 APPENDIX A - CORRECTION FACTORS

11.1 For ITL #1911 OATS RF Cable

Frequency (MHz)	Cable Loss (dB)		Frequency (MHz)	Cable Loss (dB)
1.0	0.5		450.00	5.83
10.00	1.0		500.00	6.33
20.00	1.34		550.00	6.67
30.00	1.5		600.00	6.83
50.00	1.83		650.00	7.17
100.00	2.67		700.00	7.66
150.00	3.17		750.00	7.83
200.00	3.83		800.00	8.16
250.00	4.17		850.00	8.5
300.00	4.5		900.00	8.83
350.00	5.17		950.00	8.84
400.00	5.5		1000.00	9.0

11.2 For ITL #1840 Anechoic Chamber RF Cable

Frequency (MHz)	Cable Loss (dB)		Frequency (MHz)	Cable Loss (dB)
1000.0	-1.4		10000.0	-6.0
1500.0	-1.7		10500.0	-6.2
2000.0	-2.0		11000.0	-6.2
2500.0	-2.3		11500.0	-6.0
3000.0	-2.6		12000.0	-6.0
3500.0	-2.8		12500.0	-6.1
4000.0	-3.1		13000.0	-6.3
4500.0	-3.3		13500.0	-6.5
5000.0	-3.6		14000.0	-6.7
5500.0	-3.7		14500.0	-7.0
6000.0	-4.0		15000.0	-7.3
6500.0	-4.4		15500.0	-7.5
7000.0	-4.7		16000.0	-7.6
7500.0	-4.8		16500.0	-8.0
8000.0	-5.0		17000.0	-8.0
8500.0	-5.1		17500.0	-8.1
9000.0	-5.6		18000.0	-8.2
9500.0	-5.8			

11.3 For ITL # 1075 Active Loop Antenna

Frequency (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	-40.0	11.5
3	-40.0	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	11.0
10	-40.5	11.0
20	-41.5	10.0
30	-43.5	8.0

11.4 For ITL #1356 Biconical Antenna

Frequency (MHz)	AF (dB/m)
30	13.00
35	10.89
40	10.59
45	10.63
50	10.12
60	9.26
70	7.74
80	6.63
90	8.23
100	11.12
120	13.16
140	13.07
160	14.80
180	16.95
200	17.17

11.5 For ITL # 1349 Log Periodic Antenna

Frequency (MHz)	AF (dB/m)
200	11.58
250	12.04
300	14.76
400	15.55
500	17.85
600	18.66
700	20.87
800	21.15
900	22.32
1000	24.22