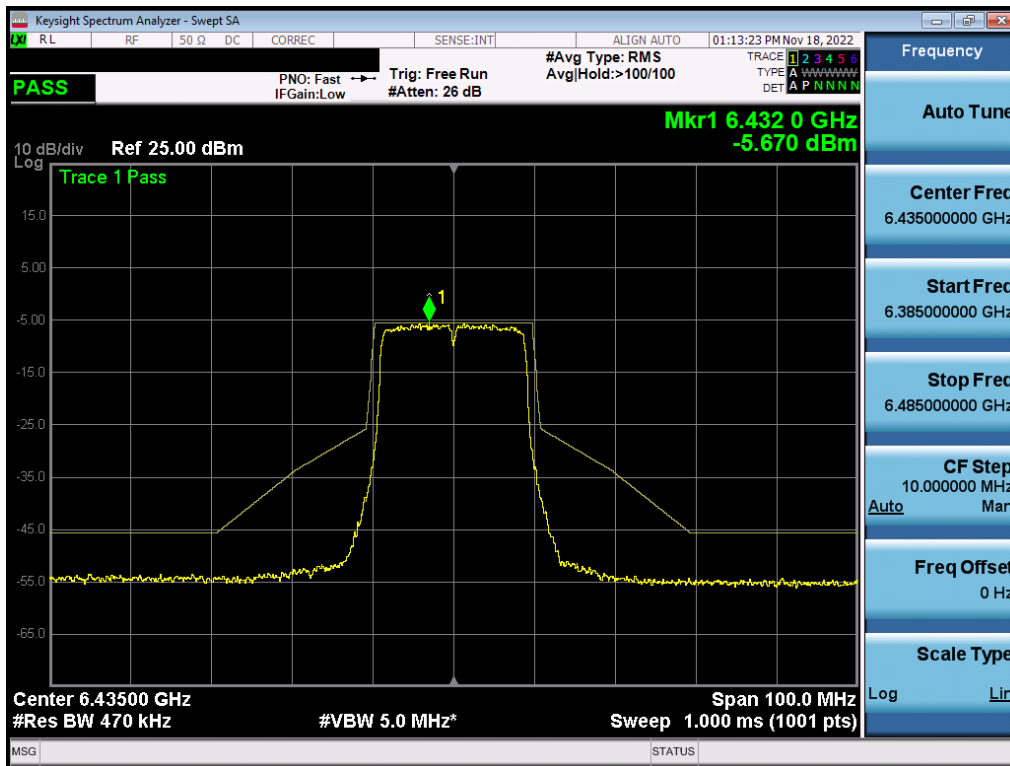


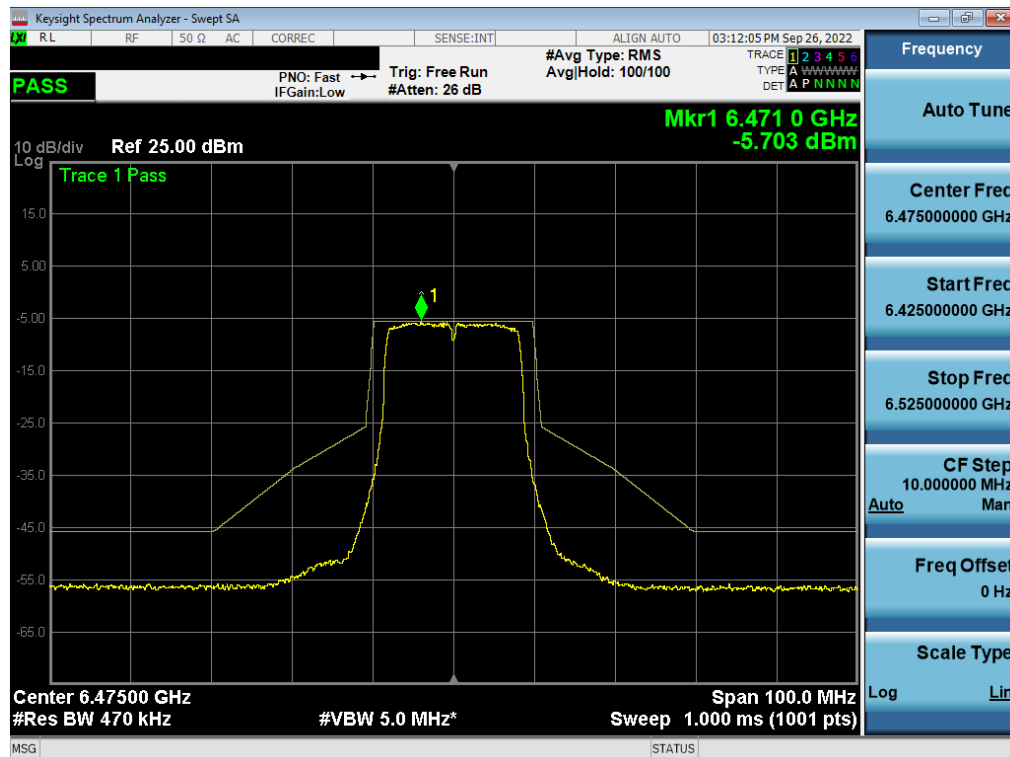
Plot 7-275. In-Band Emission Plot Measurement MIMO ANT2 (160MHz 802.11ax (UNII Band 5) – Ch. 79)

FCC: A3LSMS911U	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2209010096-15.A3L	Test Dates: 9/3/2022 – 11/22/2022	EUT Type: Portable Handset	Page 168 of 239

MIMO Antenna-2 In-Band Emission Plot Measurement - (UNII Band 6)

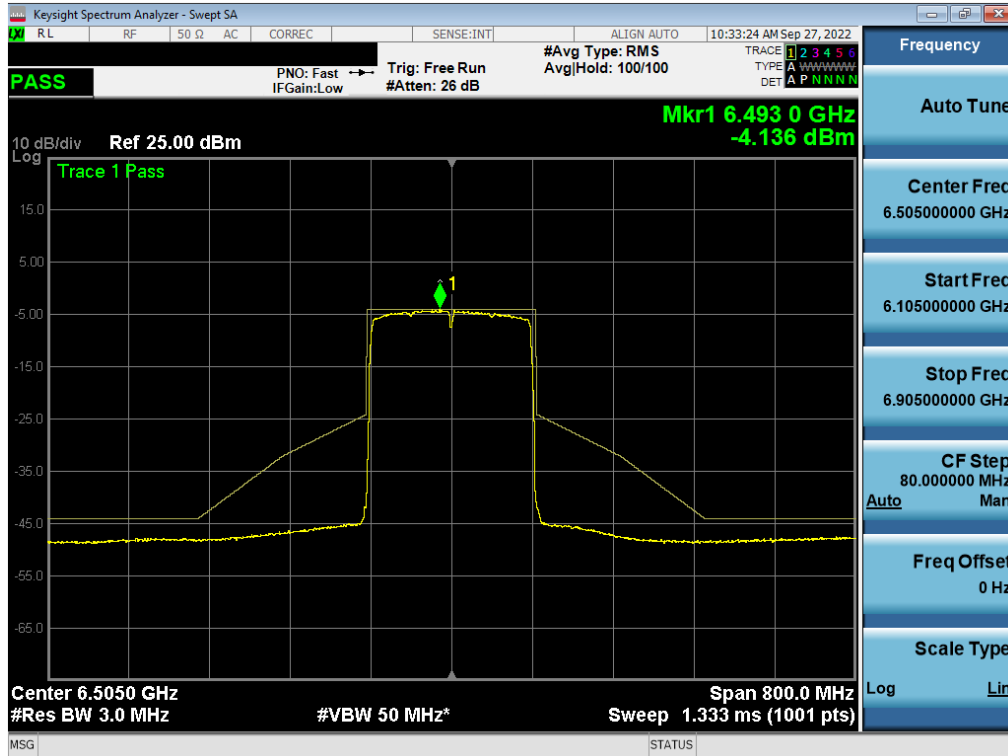


Plot 7-276. In-Band Emission Plot Measurement MIMO ANT2 (20MHz 802.11a (UNII Band 6) – Ch. 97)



Plot 7-277. In-Band Emission Plot Measurement MIMO ANT2 (20MHz 802.11a (UNII Band 6) – Ch. 105)

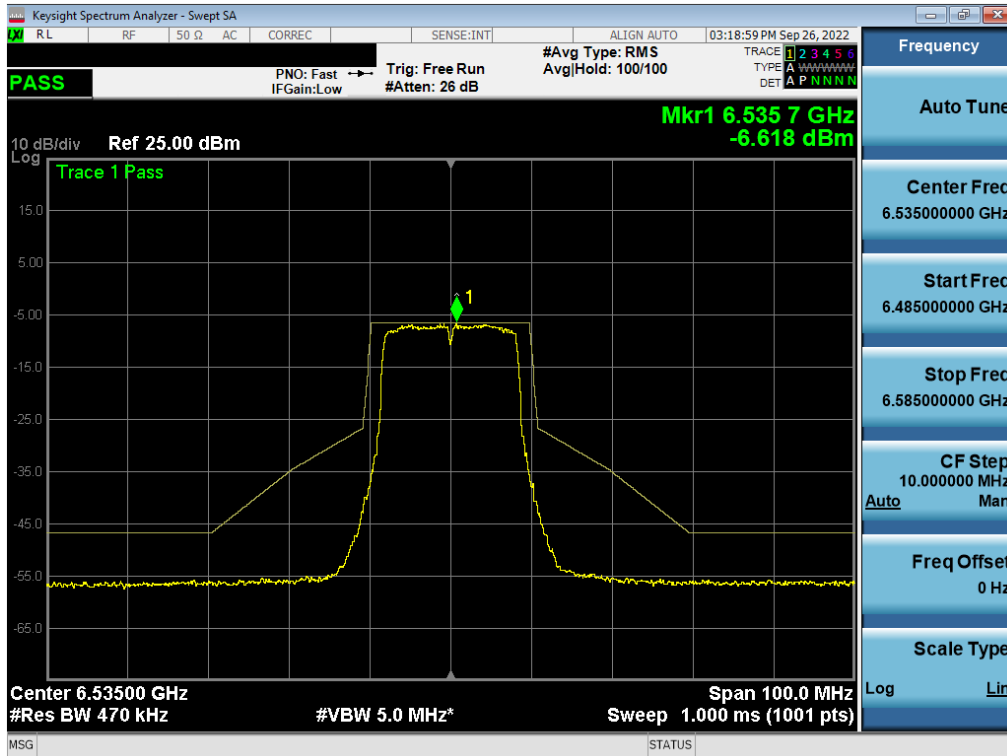
FCC: A3LSMS911U	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2209010096-15.A3L	Test Dates: 9/3/2022 – 11/22/2022	EUT Type: Portable Handset	Page 169 of 239



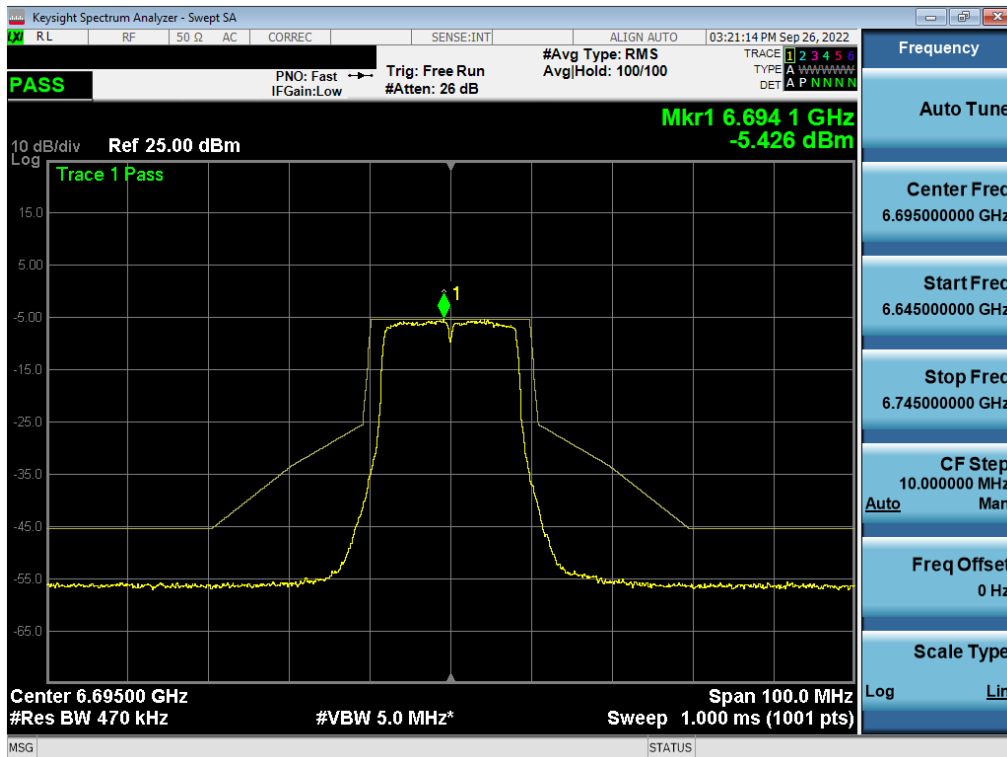
Plot 7-286. In-Band Emission Plot Measurement MIMO ANT2 (160MHz 802.11ax (UNII Band 6) – Ch. 111)

FCC: A3LSMS911U	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
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MIMO Antenna-2 In-Band Emission Plot Measurement - (UNII Band 7)

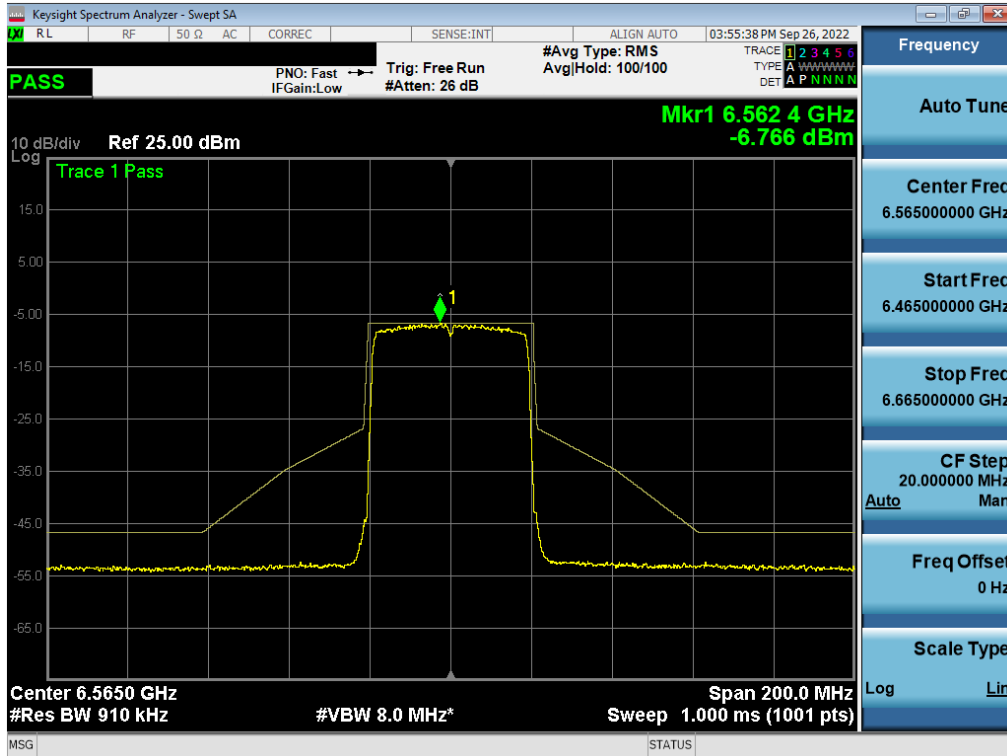


Plot 7-287. In-Band Emission Plot Measurement MIMO ANT2 (20MHz 802.11a (UNII Band 7) – Ch. 117)

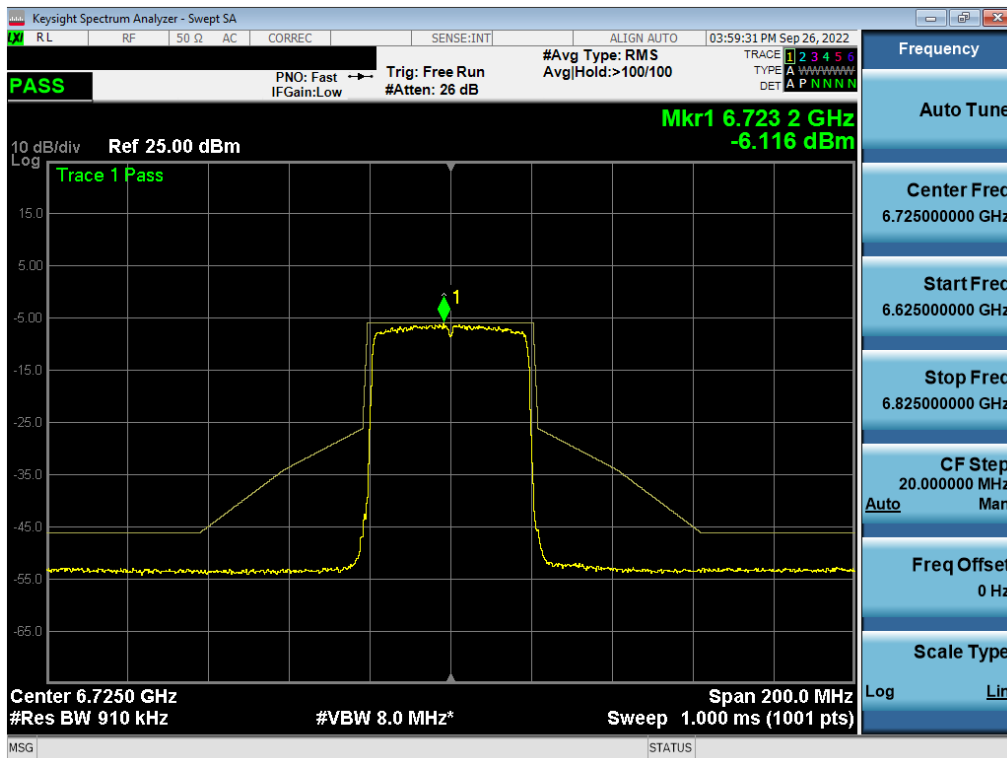


Plot 7-288. In-Band Emission Plot Measurement MIMO ANT2 (20MHz 802.11a (UNII Band 7) – Ch. 149)

MEASUREMENT REPORT (CERTIFICATION)			Approved by: Technical Manager
FCC: A3LSMS911U	Test Report S/N: 1M2209010096-15.A3L	Test Dates: 9/3/2022 – 11/22/2022	Page 175 of 239
EUT Type: Portable Handset			



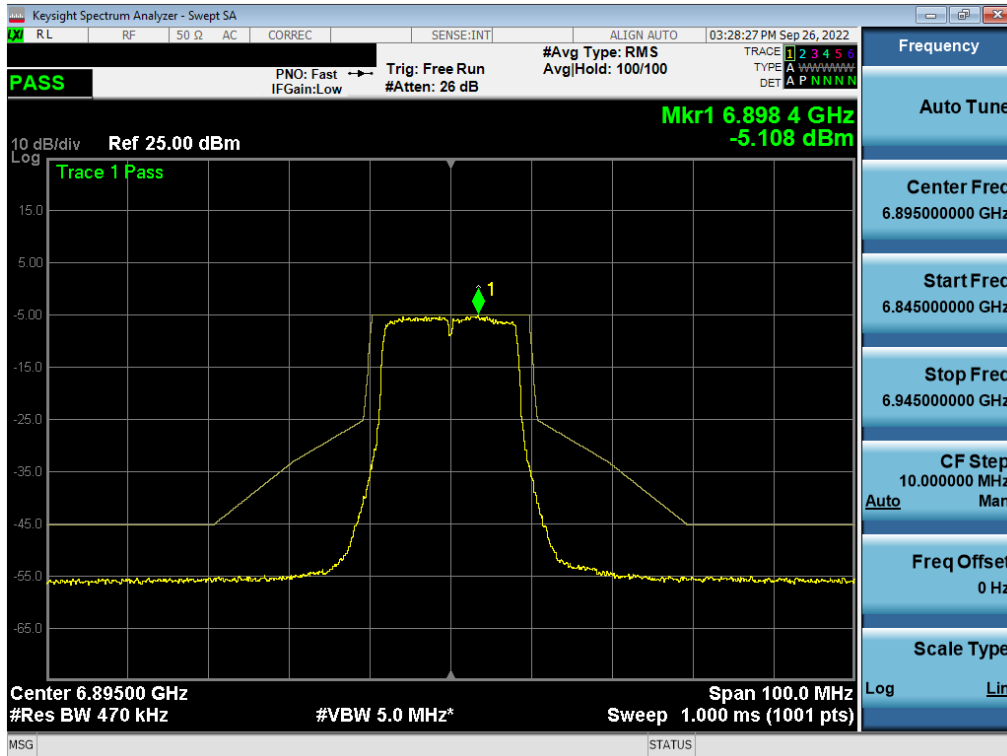
Plot 7-293. In-Band Emission Plot Measurement MIMO ANT2 (40MHz 802.11ax (UNII Band 7) – Ch. 123)



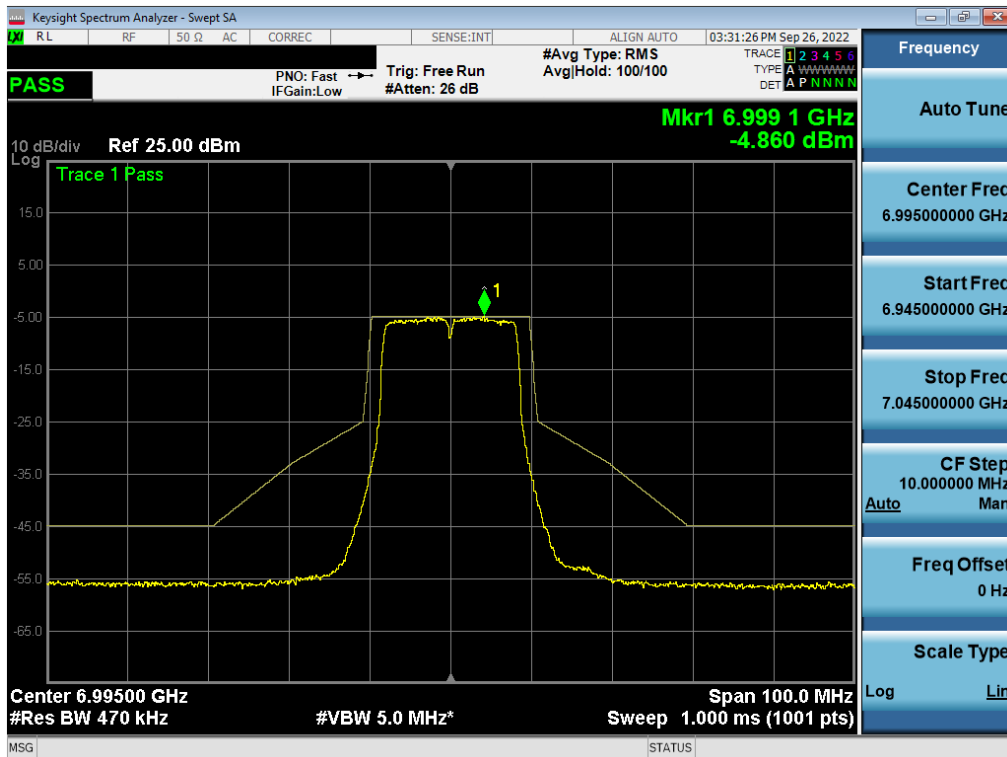
Plot 7-294. In-Band Emission Plot Measurement MIMO ANT2 (40MHz 802.11ax (UNII Band 7) – Ch. 155)

FCC: A3LSMS911U	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
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MIMO Antenna-2 In-Band Emission Plot Measurement - (UNII Band 8)

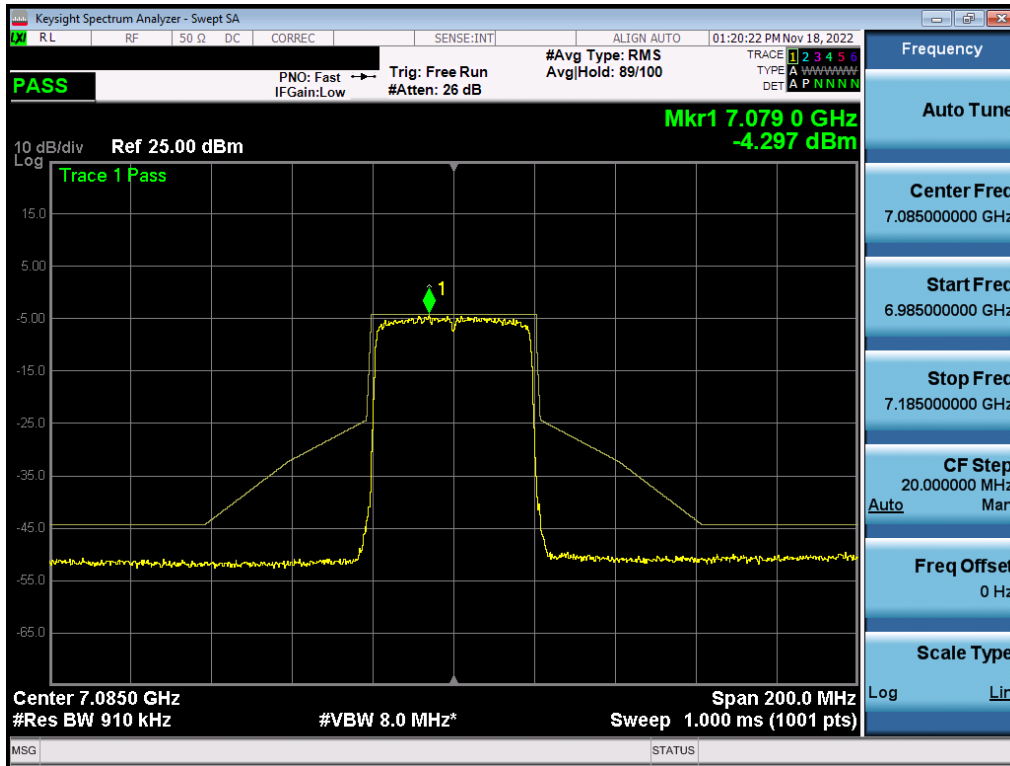


Plot 7-301. In-Band Emission Plot Measurement MIMO ANT2 (20MHz 802.11a (UNII Band 8) – Ch. 189)

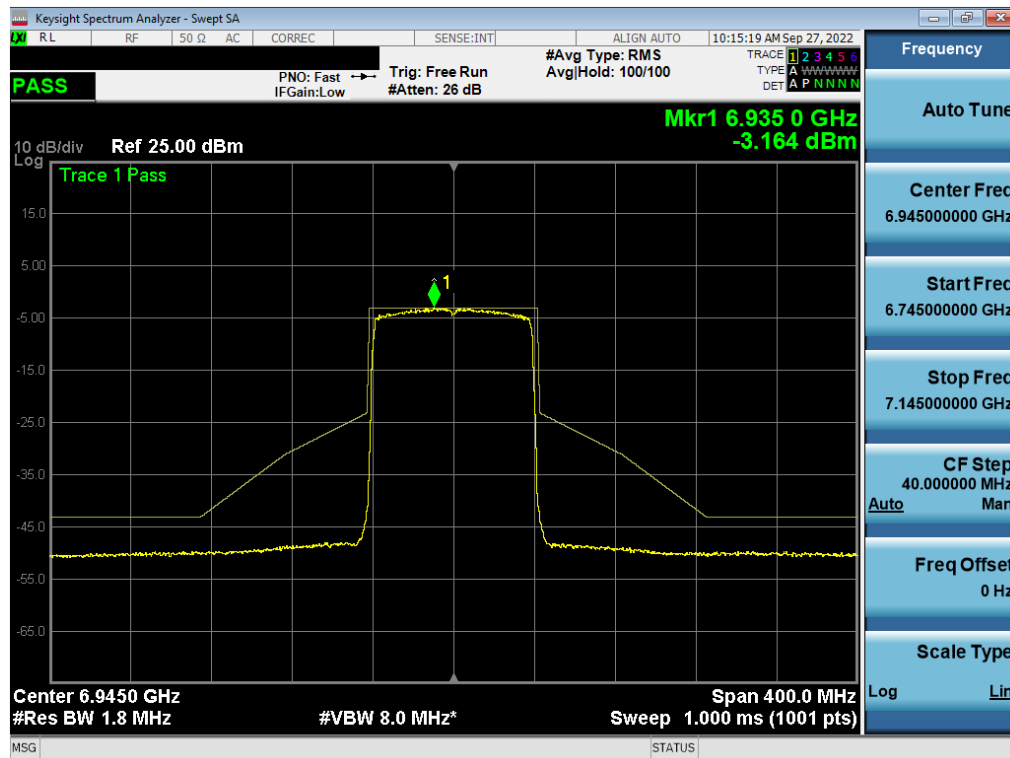


Plot 7-302. In-Band Emission Plot Measurement MIMO ANT2 (20MHz 802.11a (UNII Band 8) – Ch. 209)

MEASUREMENT REPORT (CERTIFICATION)			Approved by: Technical Manager
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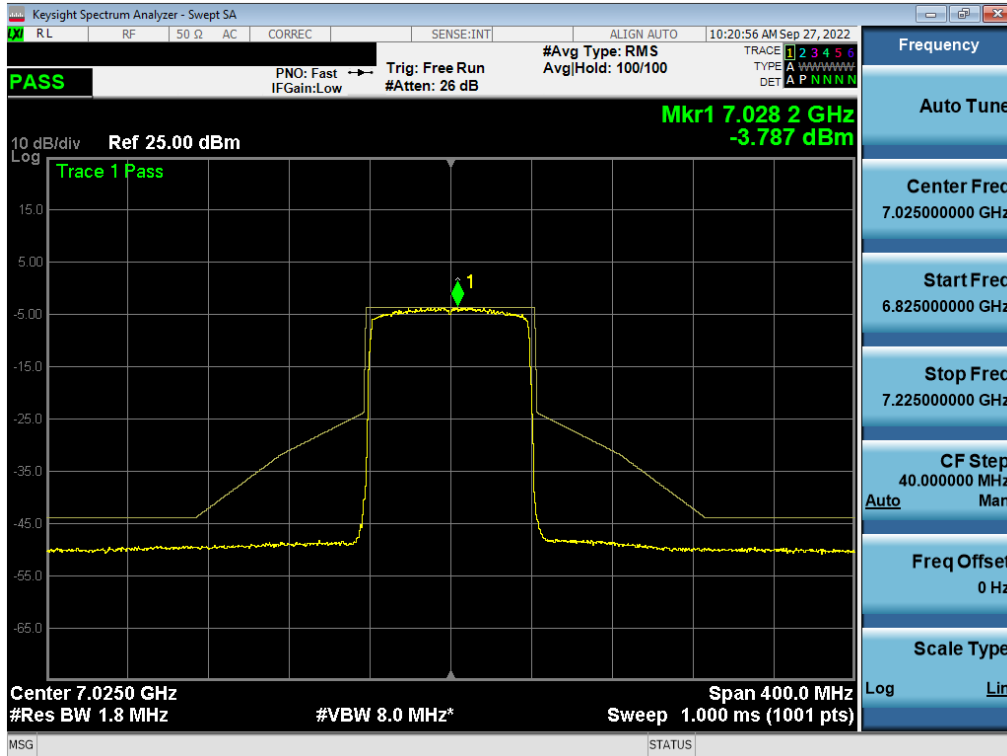


Plot 7-309. In-Band Emission Plot Measurement MIMO ANT2 (40MHz 802.11ax (UNII Band 8) – Ch. 227)

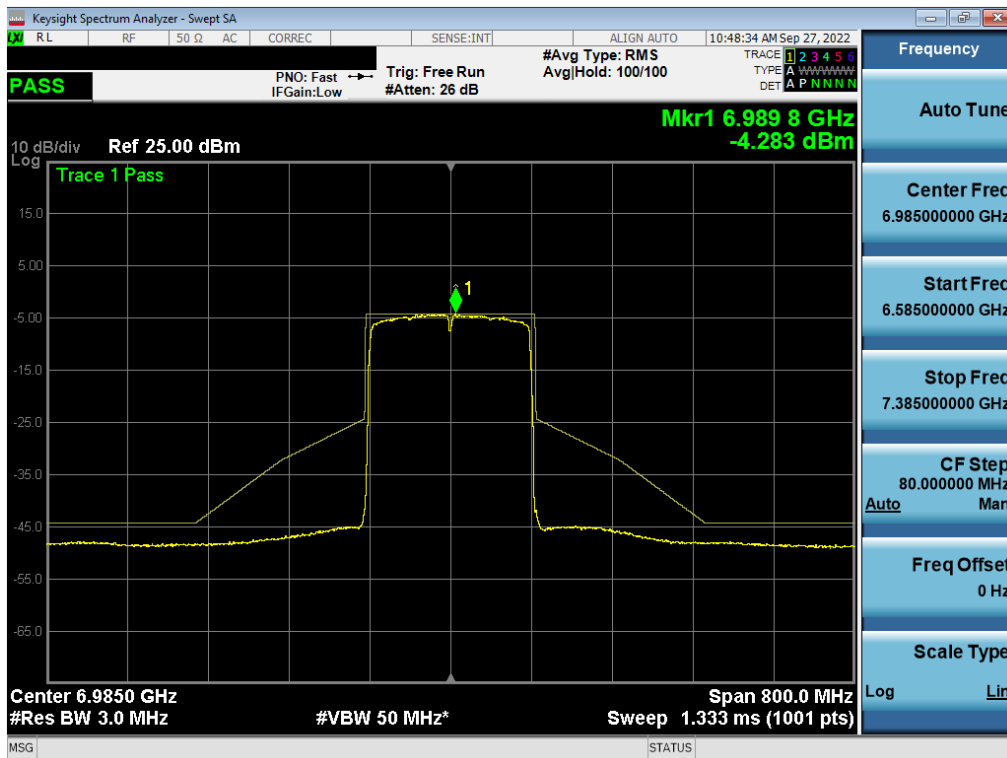


Plot 7-310. In-Band Emission Plot Measurement MIMO ANT2 (80MHz 802.11ax (UNII Band 8) – Ch. 199)

FCC: A3LSMS911U	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
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Plot 7-311. In-Band Emission Plot Measurement MIMO ANT2 (80MHz 802.11ax (UNII Band 8) – Ch. 215)



Plot 7-312. In-Band Emission Plot Measurement MIMO ANT2 (160MHz 802.11ax (UNII Band 8) – Ch. 207)

FCC: A3LSMS911U	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2209010096-15.A3L	Test Dates: 9/3/2022 – 11/22/2022	EUT Type: Portable Handset	Page 187 of 239



7.6 Contention Based Protocol – 802.11a/ax
§15.407(d)(6)

Test Overview and Limit

Indoor access points, subordinate devices and client devices operating in the 5.925-7.125 GHz band (herein referred to as unlicensed devices) are required to use technologies that include a contention-based protocol to avoid co-channel interference with incumbent devices sharing the band. To ensure incumbent co-channel operations are detected in a technology-agnostic manner, unlicensed devices are required to detect co-channel radio frequency energy (energy detect) and avoid simultaneous transmission.

Unlicensed indoor low-power devices must detect co-channel radio frequency power that is at least -62 dBm or lower. Upon detection of energy in the band, unlicensed low power indoor devices must vacate the channel and stay off the channel as long as detected radio frequency power is equal to or greater than the threshold (-62 dBm). The -62 dBm (or lower) threshold is referenced to a 0 dBi antenna gain.

To ensure incumbent operations are reliably detected in the band, low power indoor devices must detect RF energy throughout their intended operating channel.

Test Procedure Used

KDB 987594 D02 v01r01

Test Settings

1. Configure the EUT to transmit with a constant duty cycle.
2. Set the operating parameters of the EUT including power level, operating frequency, modulation and bandwidth.
3. Set the signal analyzer center frequency to the nominal EUT channel center frequency. The span range of the signal analyzer shall be between two times and five times the OBW of the EUT. Connect the output port of the EUT to the signal analyzer 2. Ensure that the attenuator 2 provides enough attenuation to not overload the signal analyzer 2 receiver.
4. Monitoring the signal analyzer 2, verify the EUT is operating and transmitting with the parameters set at step two.
5. Using an AWGN signal source, generate (but do not transmit, i.e., RF OFF) a 10 MHz-wide AWGN signal. Use Table 1 to determine the center frequency of the 10 MHz AWGN signal relative to the EUT’s channel bandwidth and center frequency.
6. Set the AWGN signal power to an extremely low level (more than 20 dB below the -62 dBm threshold). Connect the AWGN signal source, via a 3-dB splitter, to the signal analyzer 1 and the EUT as shown in Figure 2.
7. Transmit the AWGN signal (RF ON) and verify its characteristics on the signal analyzer 1.
8. Monitor the signal analyzer 2 to verify if the AWGN signal has been detected and the EUT has ceased transmission. If the EUT continues to transmit, then incrementally increase the AWGN signal power level until the EUT stops transmitting.
9. (Including all losses in the RF paths) Determine and record the AWGN signal power level (at the EUT’s antenna port) at which the EUT ceased transmission. Repeat the procedure at least 10 times to verify the EUT can detect an AWGN signal with 90% (or better) level of certainty.
10. Refer to Table 1 of KDB 987594 D02 v01r01 to determine number of times the detection threshold testing needs to be repeated. If testing is required more than once, then go back to step 5, choose a different center frequency for the AWGN signal and repeat the process.

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Test Setup

The EUT and measurement equipment were set up as shown in the diagram below.

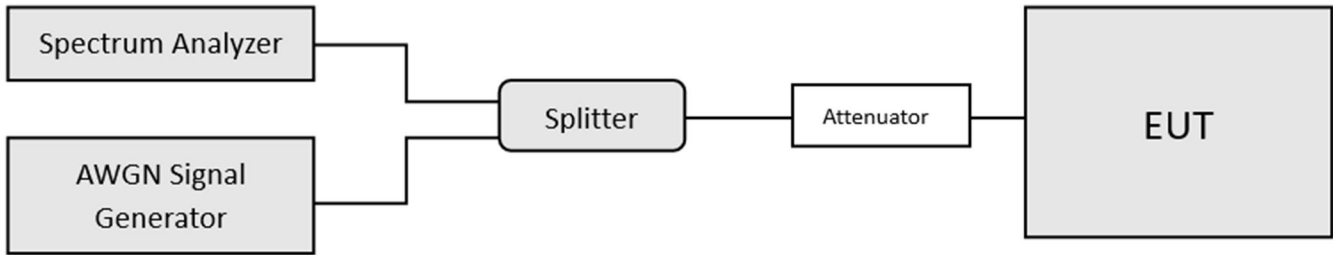


Figure 7-5. Contention-based protocol test setup, conducted method

Test Notes

1. Per guidance from KDB 987594 D02 v01r01, contention based protocol was tested using an AWGN signal with a bandwidth of 10MHz (see Plot 7-313). The amplitude of the signal was increased until detected by the EUT, signaled by the ceasing of transmission (see Plot 7-329), M1 indicates the point at which the AWGN signal is introduced. D1 indicates where the AWGN signal is terminated, at least 10 seconds following M1.
2. 15 trials were ran in order to assure that at least 90% of certainty was met.
3. Per Guidance from KDB 987594 D04 v01, contention based protocol was tested with receiver with the lowest antenna gain.
4. All CBP Timing Plots shown are for the ceased condition. Some spikes that may be shown are from adjacent portions of the spectrum that are still transmitting.

$$\text{Detection Level} = \text{Injected AWGN Power (dBm)} - \text{Antenna Gain (dBi)} + \text{Path Loss (dB)}$$

Equation 7-1. Detection Level Calculation

Band	Channel	Channel Freq [MHz]	Channel BW [MHz]	Incumbent Freq [MHz]	Injected (AWGN) [dBm]	Antenna Gain [dBi]	Adjusted Power Level [dBm]	Detection Limit [dBm]	Margin [dB]
UNII Band 5	53	6215	20	6215	-73.48	-7.62	-65.86	-62.0	-3.86
				6110	-70.69	-7.62	-63.07	-62.0	-1.07
	47	6185	160	6185	-70.06	-7.62	-62.44	-62.0	-0.44
				6260	-74.85	-7.62	-67.23	-62.0	-5.23
UNII Band 6	101	6455	20	6455	-81.92	-4.98	-76.94	-62.0	-14.94
				6430	-73.98	-4.98	-69.00	-62.0	-7.00
	111	6505	160	6505	-69.72	-4.98	-64.74	-62.0	-2.74
				6580	-74.02	-4.98	-69.04	-62.0	-7.04
UNII Band 7	149	6695	20	6695	-80.18	-7.18	-73.00	-62.0	-11.00
				6750	-73.48	-7.18	-66.30	-62.0	-4.30
	175	6825	160	6825	-69.52	-7.18	-62.34	-62.0	-0.34
				6900	-72.37	-7.18	-65.19	-62.0	-3.19
UNII Band 8	197	6935	20	6935	-79.01	-7.35	-71.66	-62.0	-9.66
				6910	-70.49	-7.35	-63.14	-62.0	-1.14
	207	6985	160	6985	-70.87	-7.35	-63.52	-62.0	-1.52
				7060	-72.16	-7.35	-64.81	-62.0	-2.81

Table 7-8. Contention Based Protocol – Incumbent Detection Results

FCC: A3LSMS911U	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
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Band	Channel	Channel Freq [MHz]	Channel BW [MHz]	Incumbent Freq [MHz]	Antenna Gain [dBi]	EUT Transmission Status			Detection Limit [dBm]	Margin [dB]
						Adjusted AWGN Power (dBm)				
						Normal	Minimal	Ceased		
UNII Band 5	53	6215	20	6215	-7.62	-68.66	-66.66	-65.86	-62.0	-3.86
				6110	-7.62	-68.57	-66.57	-63.07	-62.0	-1.07
	47	6185	160	6185	-7.62	-62.84	-62.54	-62.44	-62.0	-0.44
				6260	-7.62	-67.83	-67.43	-67.23	-62.0	-5.23
UNII Band 6	101	6455	20	6455	-4.98	-82.64	-80.64	-76.94	-62.0	-14.94
				6430	-4.98	-70.30	-69.30	-69.00	-62.0	-7.00
	111	6505	160	6505	-4.98	-67.64	-65.64	-64.74	-62.0	-2.74
				6580	-4.98	-70.54	-69.54	-69.04	-62.0	-7.04
UNII Band 7	149	6695	20	6695	-7.18	-82.40	-80.40	-73.00	-62.0	-11.00
				6750	-7.18	-70.70	-66.70	-66.30	-62.0	-4.30
	175	6825	160	6825	-7.18	-62.94	-62.74	-62.34	-62.0	-0.34
				6900	-7.18	-69.69	-67.69	-65.19	-62.0	-3.19
UNII Band 8	197	6935	20	6935	-7.35	-75.66	-74.66	-71.66	-62.0	-9.66
				6910	-7.35	-68.44	-66.44	-63.14	-62.0	-1.14
	207	6985	160	6985	-7.35	-64.12	-63.62	-63.52	-62.0	-1.52
				7060	-7.35	-68.41	-67.41	-64.81	-62.0	-2.81

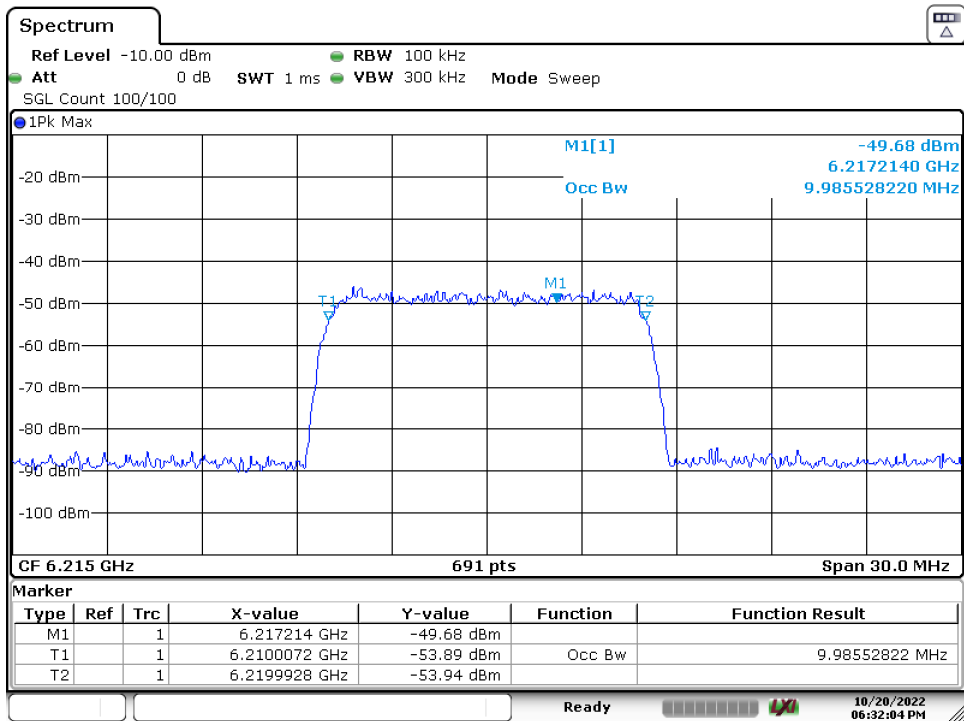
Table 7-9. Contention Based Protocol – Detection Results – All Tx Cases

CBP Detection (1 = Detection, Blank = No Detection)																					
Band	Channel	Channel Freq [MHz]	Channel BW [MHz]	Incumbent Freq [MHz]	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	Detection Rate (%)	
UNII Band 5	53	6215	20	6215	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	100	
				6110	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	47	6185	160	6185	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	100
				6260	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
UNII Band 6	101	6455	20	6455	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	100
				6430	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	111	6505	160	6505	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	100
				6580	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
UNII Band 7	149	6695	20	6695	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	100
				6750	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	175	6825	160	6825	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	100
				6900	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
UNII Band 8	197	6935	20	6935	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	100
				6910	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	207	6985	160	6985	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	100
				7060	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

Table 7-10. Contention Based Protocol – Incumbent Detection Trial Results

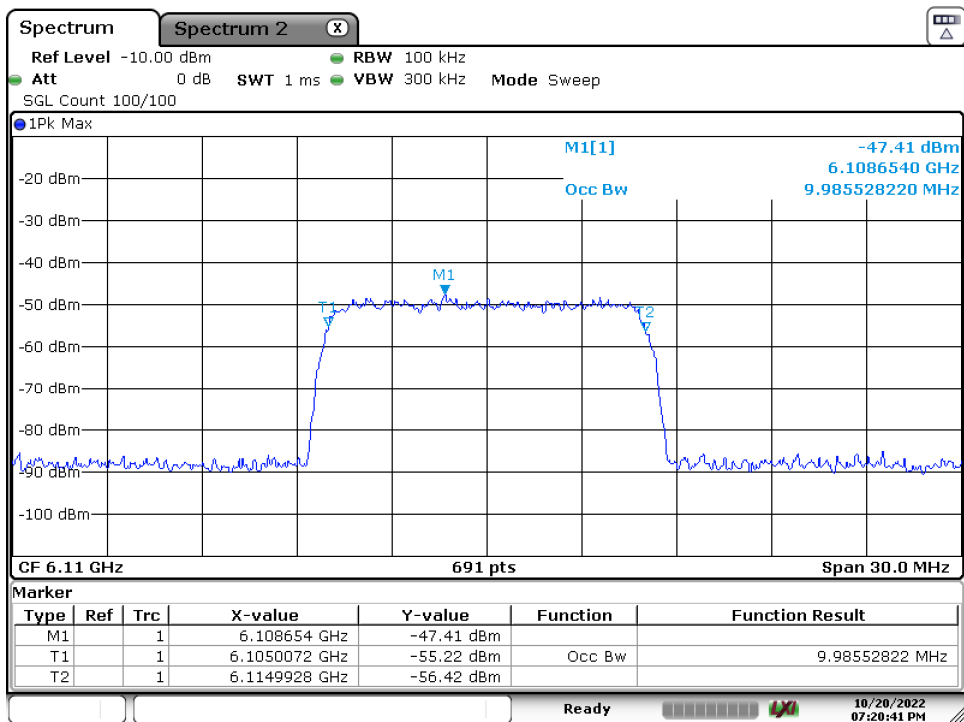
FCC: A3LSMS911U	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
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AWGN Plots



Date: 20.OCT.2022 18:32:03

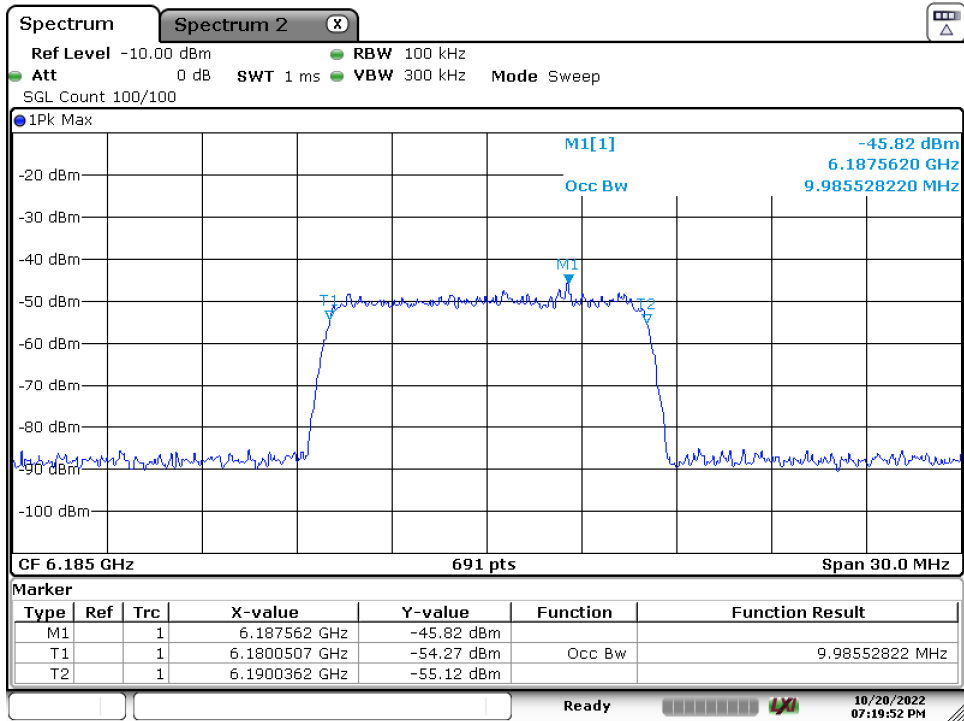
Plot 7-313. AWGN Signal – UNII 5 – 20MHz



Date: 20.OCT.2022 19:20:41

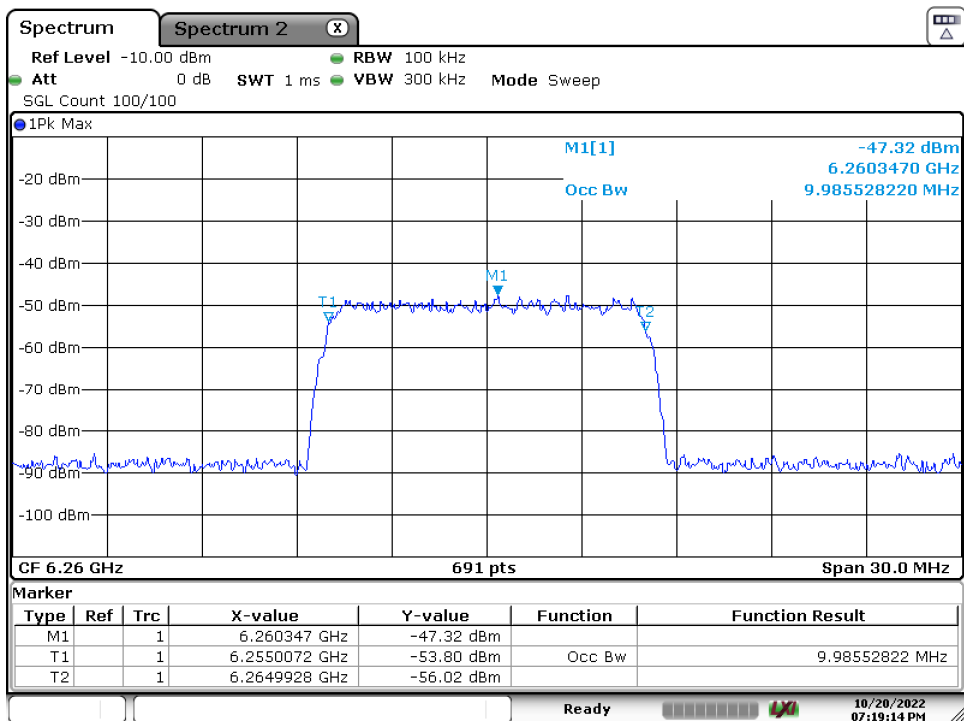
Plot 7-314. AWGN Signal – UNII 5 – 160MHz - Low

FCC: A3LSMS911U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
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Date: 20.OCT.2022 19:19:52

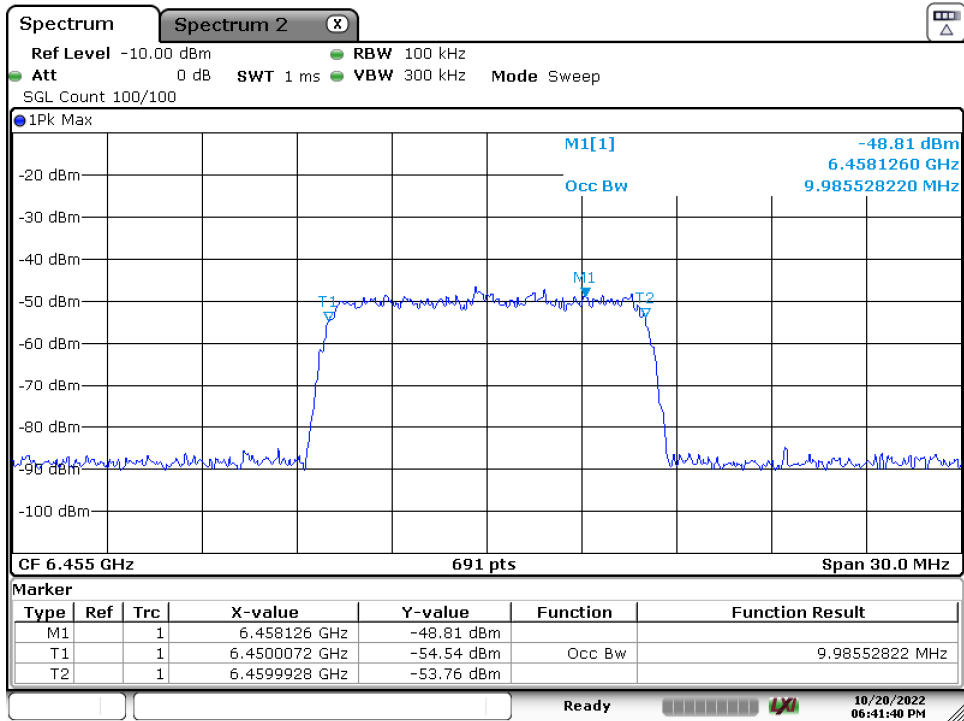
Plot 7-315. AWGN Signal – UNII 5 – 160MHz - Mid



Date: 20.OCT.2022 19:19:13

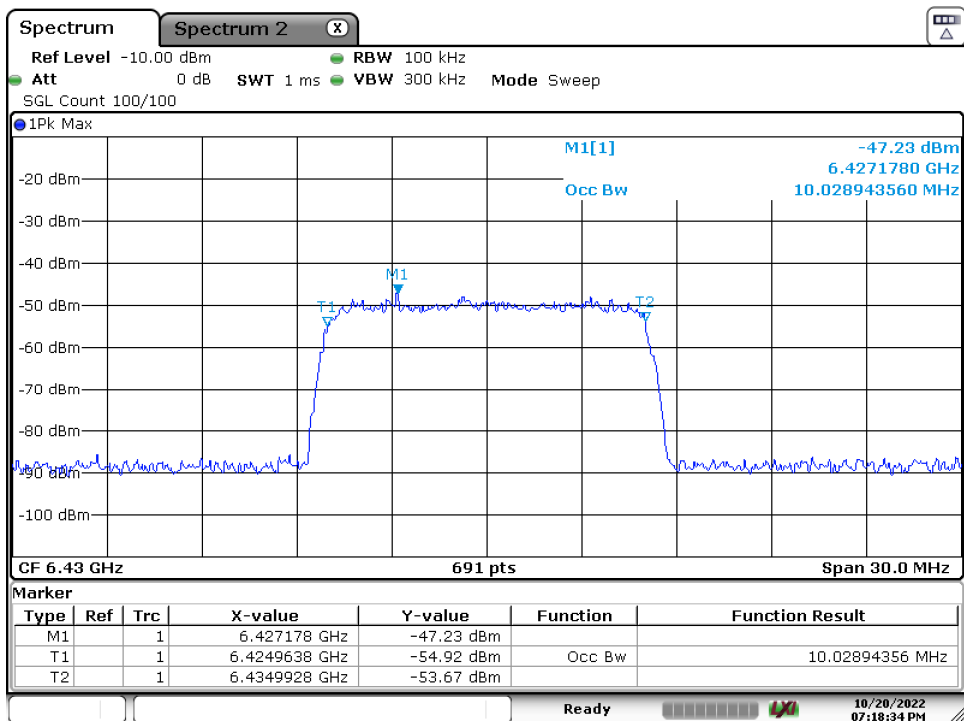
Plot 7-316. AWGN Signal – UNII 5 – 160MHz - High

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Date: 20.OCT.2022 18:41:40

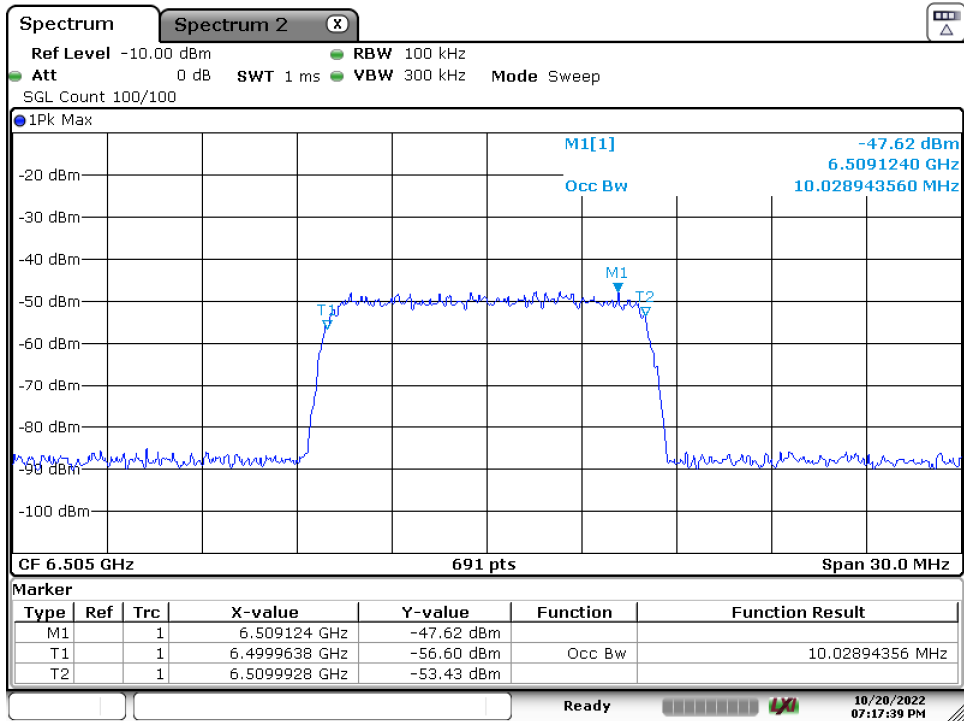
Plot 7-317. AWGN Signal – UNII 6 – 20MHz



Date: 20.OCT.2022 19:18:34

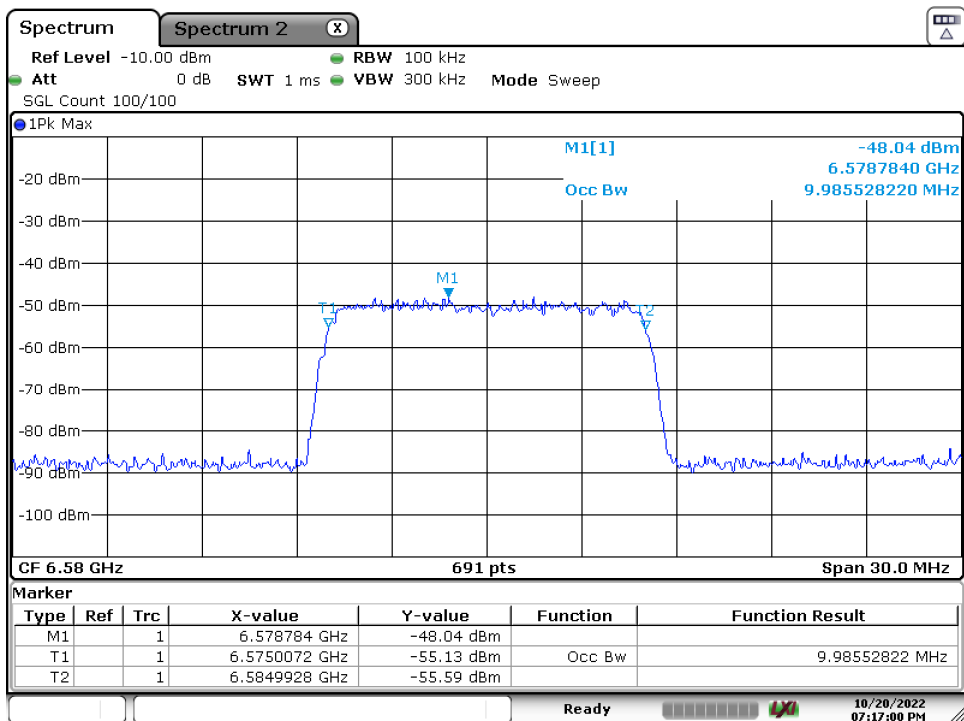
Plot 7-318. AWGN Signal – UNII 6 – 160MHz - Low

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Date: 20.OCT.2022 19:17:39

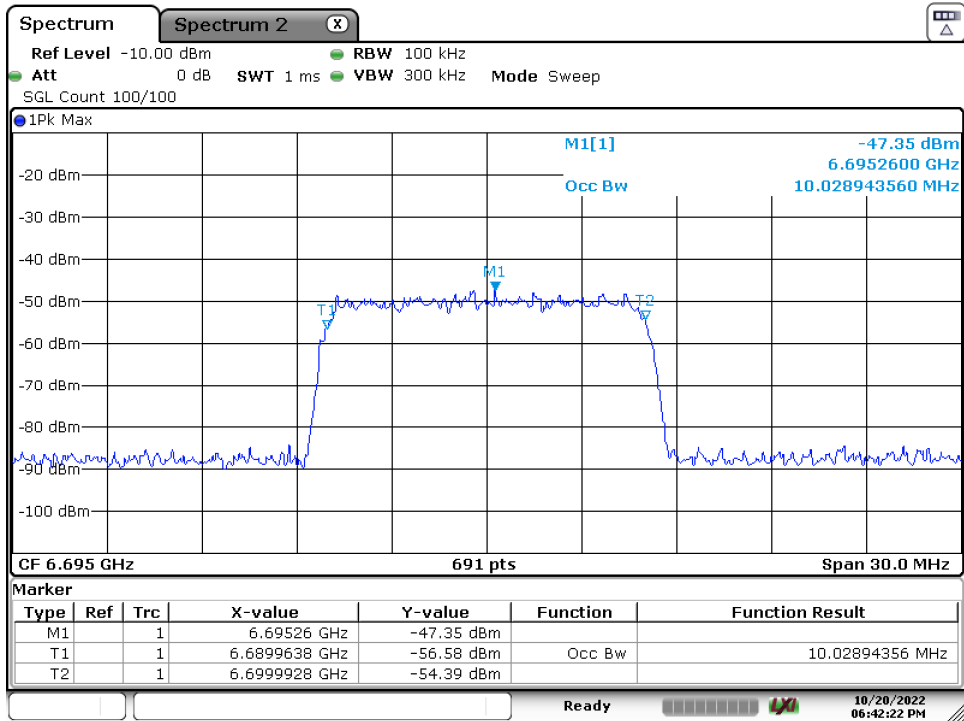
Plot 7-319. AWGN Signal – UNII 6 – 160MHz - Mid



Date: 20.OCT.2022 19:17:00

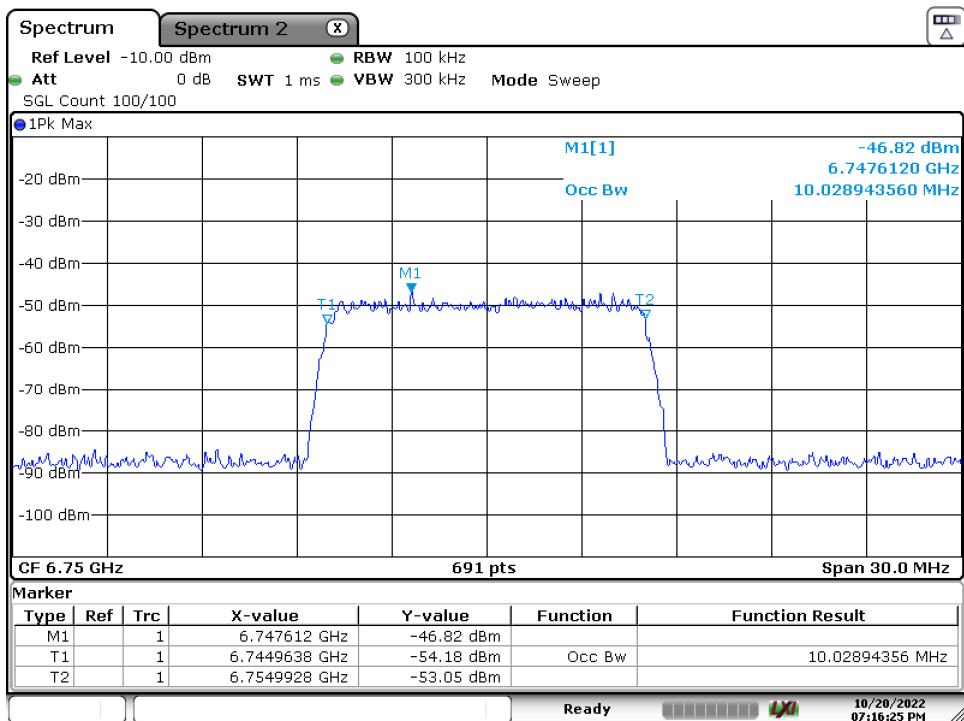
Plot 7-320. AWGN Signal – UNII 6 – 160MHz - High

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Date: 20.OCT.2022 18:42:21

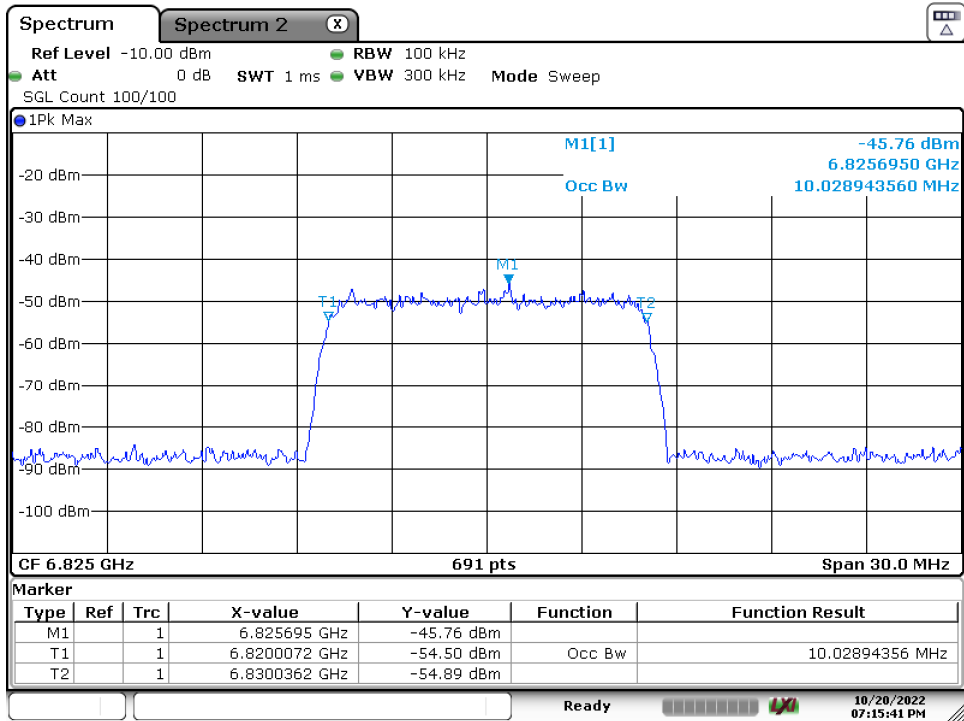
Plot 7-321. AWGN Signal – UNII 7 – 20MHz



Date: 20.OCT.2022 19:16:25

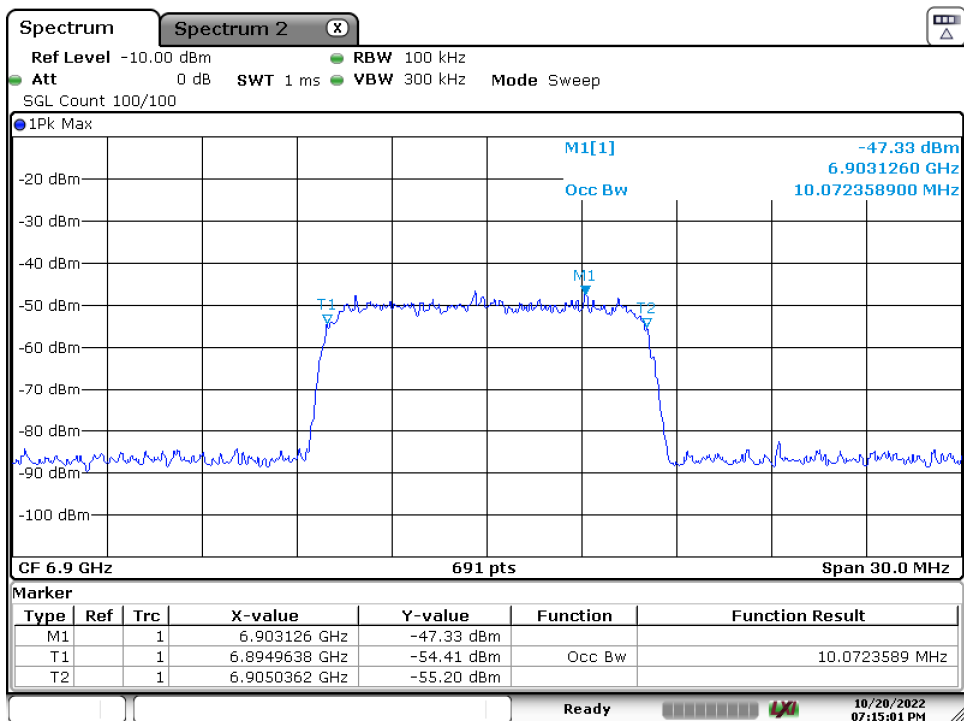
Plot 7-322. AWGN Signal – UNII 7 – 160MHz - Low

MEASUREMENT REPORT (CERTIFICATION)			Approved by: Technical Manager
FCC: A3LSMS911U	Test Report S/N: 1M2209010096-15.A3L	Test Dates: 9/3/2022 – 11/22/2022	EUT Type: Portable Handset
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Date: 20.OCT.2022 19:15:40

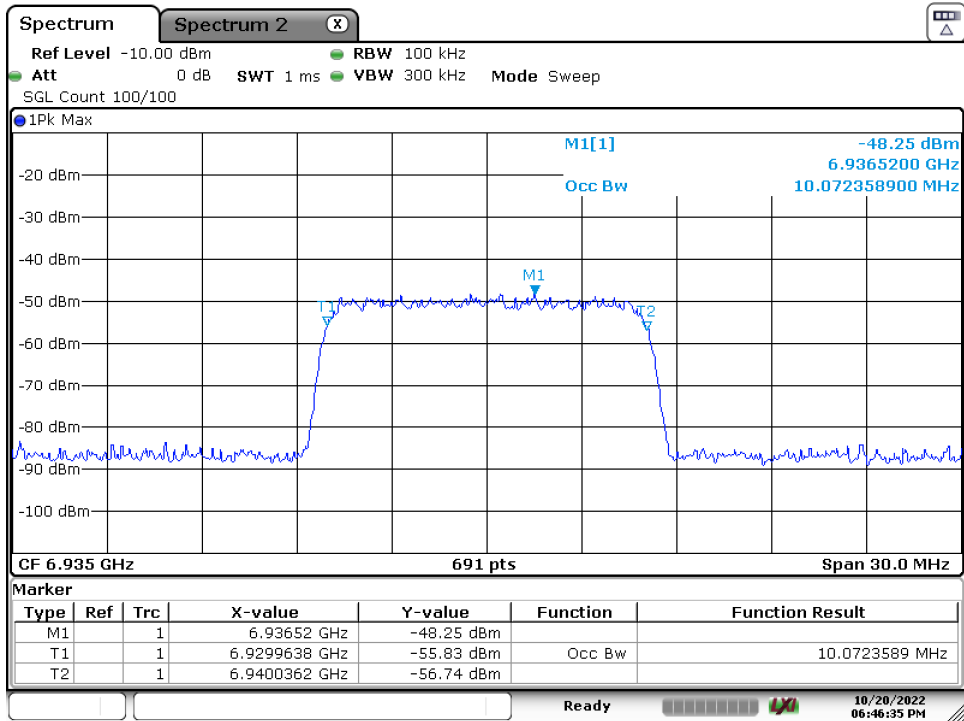
Plot 7-323. AWGN Signal – UNII 7 – 160MHz - Mid



Date: 20.OCT.2022 19:15:01

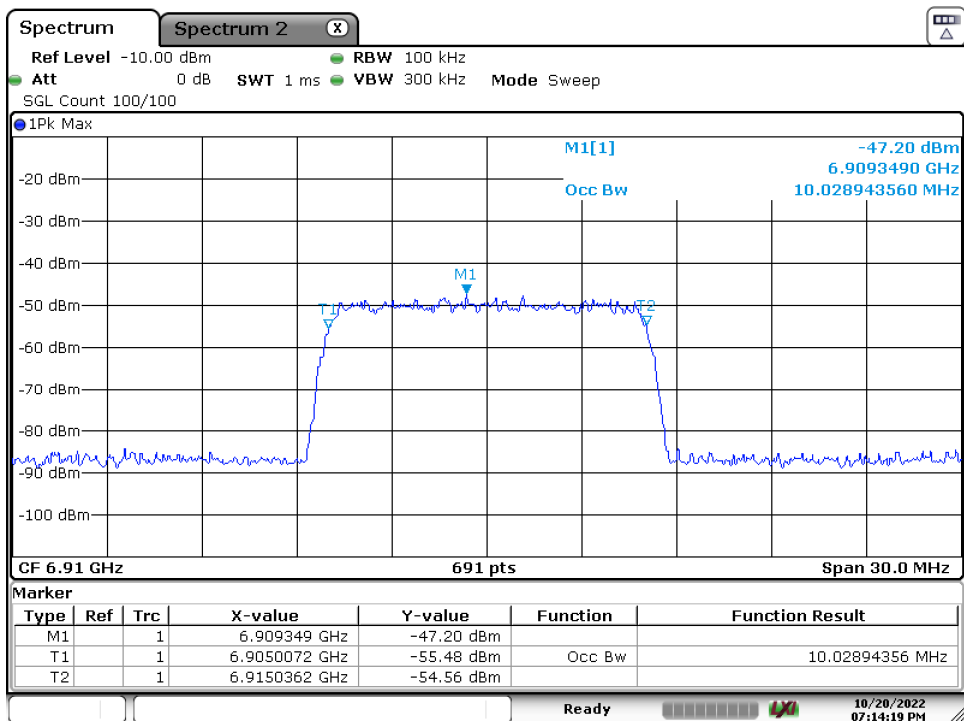
Plot 7-324. AWGN Signal – UNII 7 – 160MHz - High

FCC: A3LSMS911U	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
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Date: 20.OCT.2022 18:46:35

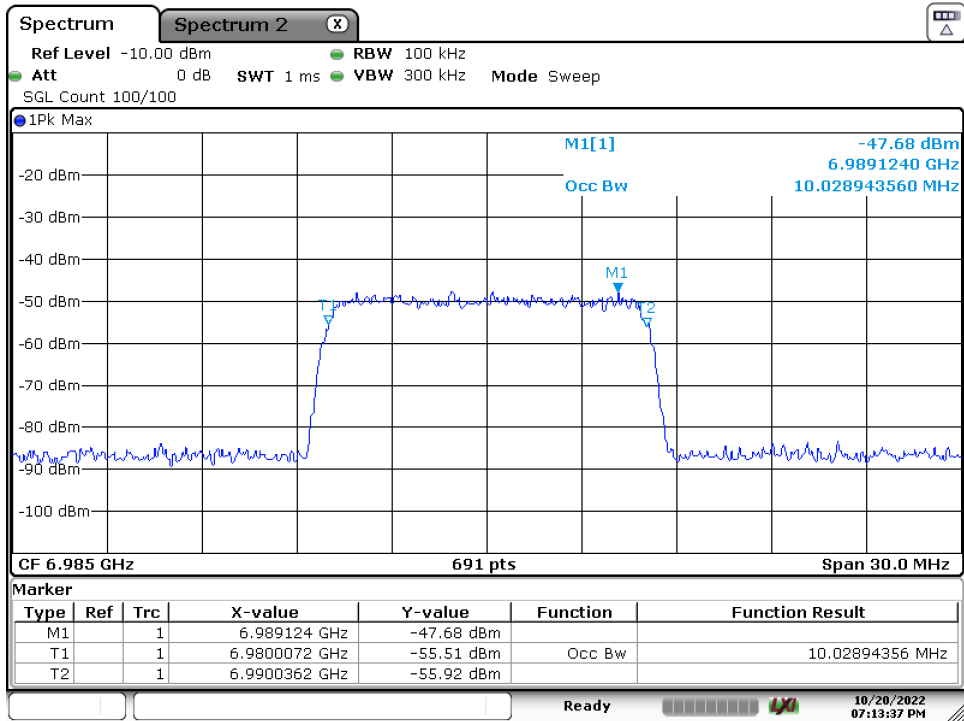
Plot 7-325. AWGN Signal – UNII 8 – 20MHz



Date: 20.OCT.2022 19:14:18

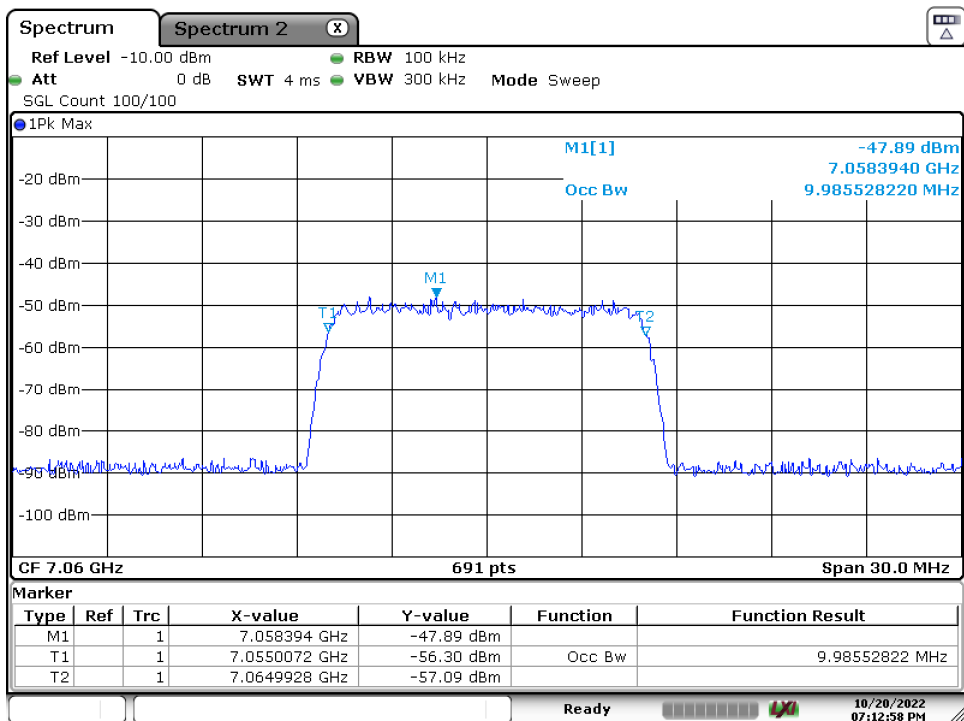
Plot 7-326. AWGN Signal – UNII 8 – 160MHz - Low

MEASUREMENT REPORT (CERTIFICATION)			Approved by: Technical Manager
FCC: A3LSMS911U	Test Report S/N: 1M2209010096-15.A3L	Test Dates: 9/3/2022 – 11/22/2022	EUT Type: Portable Handset
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Date: 20.OCT.2022 19:13:37

Plot 7-327. AWGN Signal – UNII 8 – 160MHz - Mid

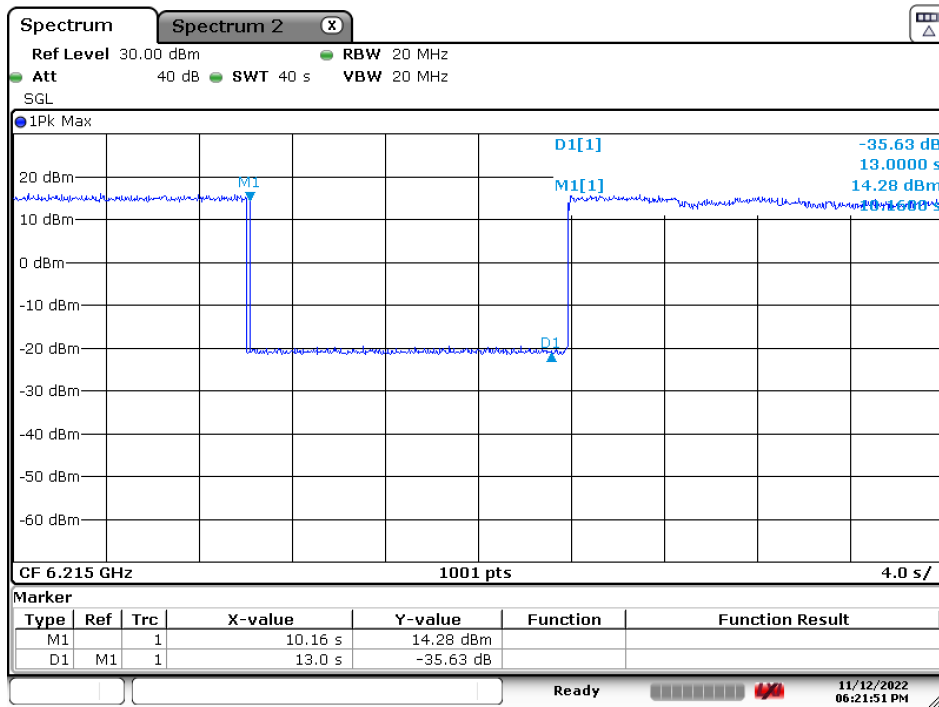


Date: 20.OCT.2022 19:12:58

Plot 7-328. AWGN Signal – UNII 8 – 160MHz - High

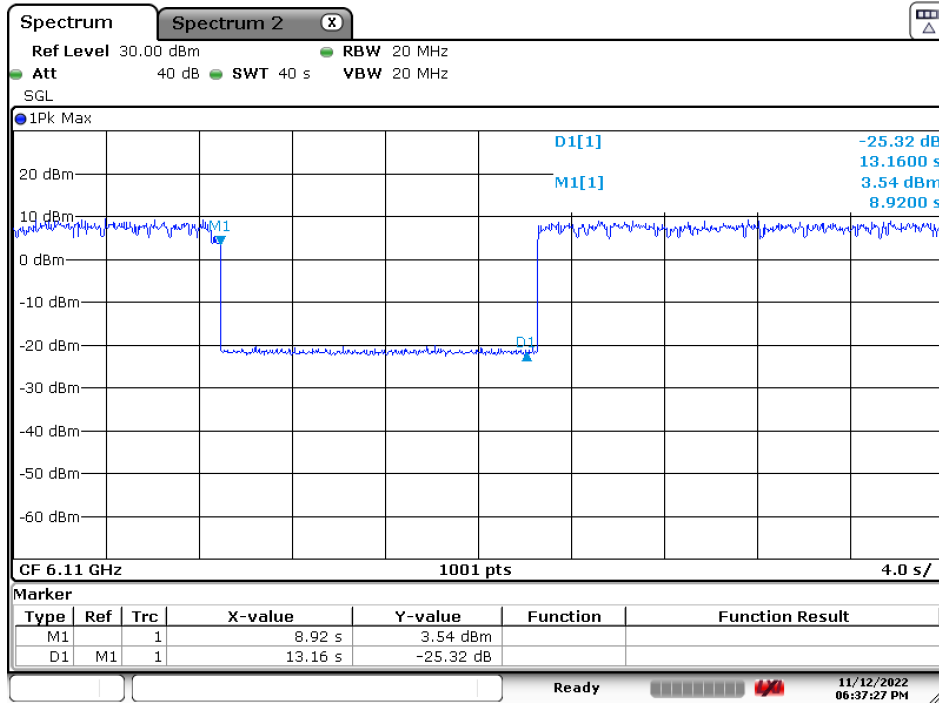
MEASUREMENT REPORT (CERTIFICATION)			Approved by: Technical Manager
FCC: A3LSMS911U	Test Report S/N: 1M2209010096-15.A3L	Test Dates: 9/3/2022 – 11/22/2022	EUT Type: Portable Handset
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CBP Timing Plots



Date: 12.NOV.2022 18:21:51

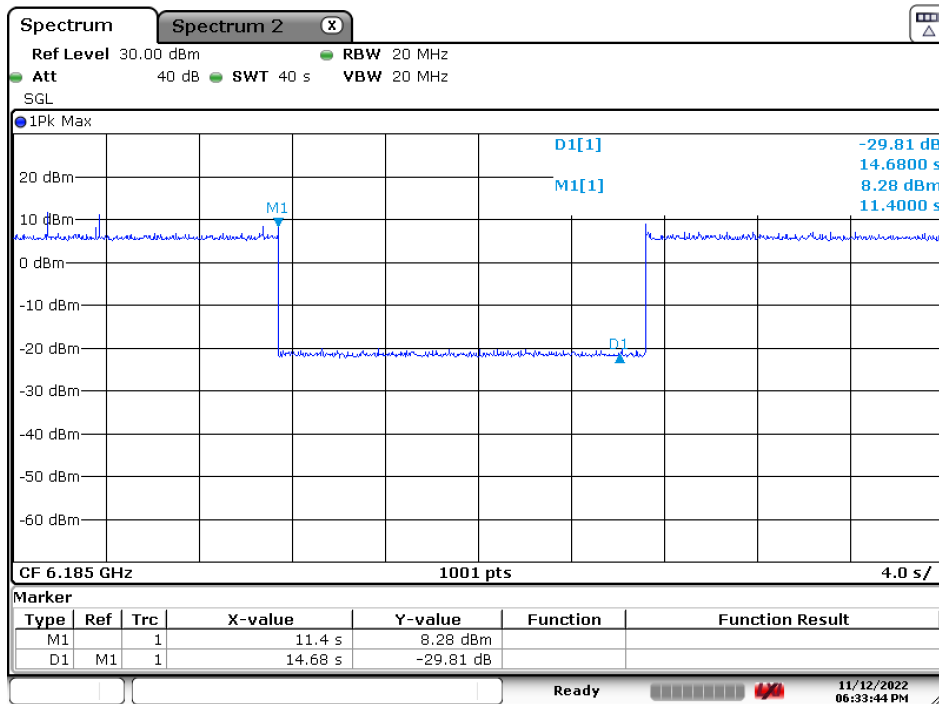
Plot 7-329. Contention Based Protocol Timing Plot – UNII 5 – 20MHz Ch53



Date: 12.NOV.2022 18:37:27

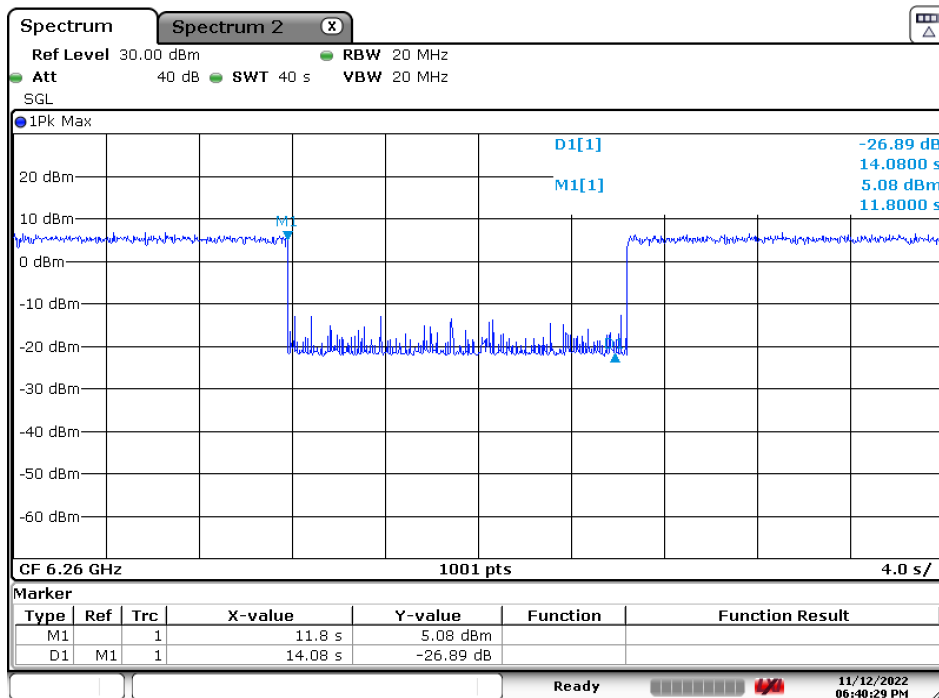
Plot 7-330. Contention Based Protocol Timing Plot – UNII 5 – 160MHz Ch47 – Low

MEASUREMENT REPORT (CERTIFICATION)			Approved by: Technical Manager
FCC: A3LSMS911U	Test Dates: 9/3/2022 – 11/22/2022	EUT Type: Portable Handset	Page 199 of 239



Date: 12.NOV.2022 18:33:44

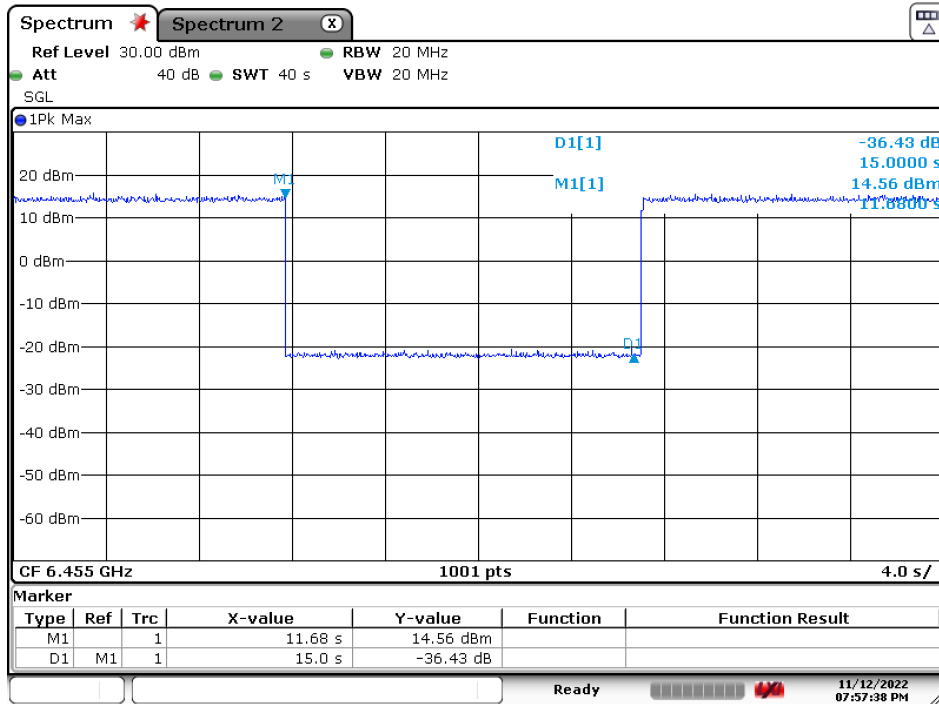
Plot 7-331. Contention Based Protocol Timing Plot – UNII 5 – 160MHz Ch47 – Mid



Date: 12.NOV.2022 18:40:28

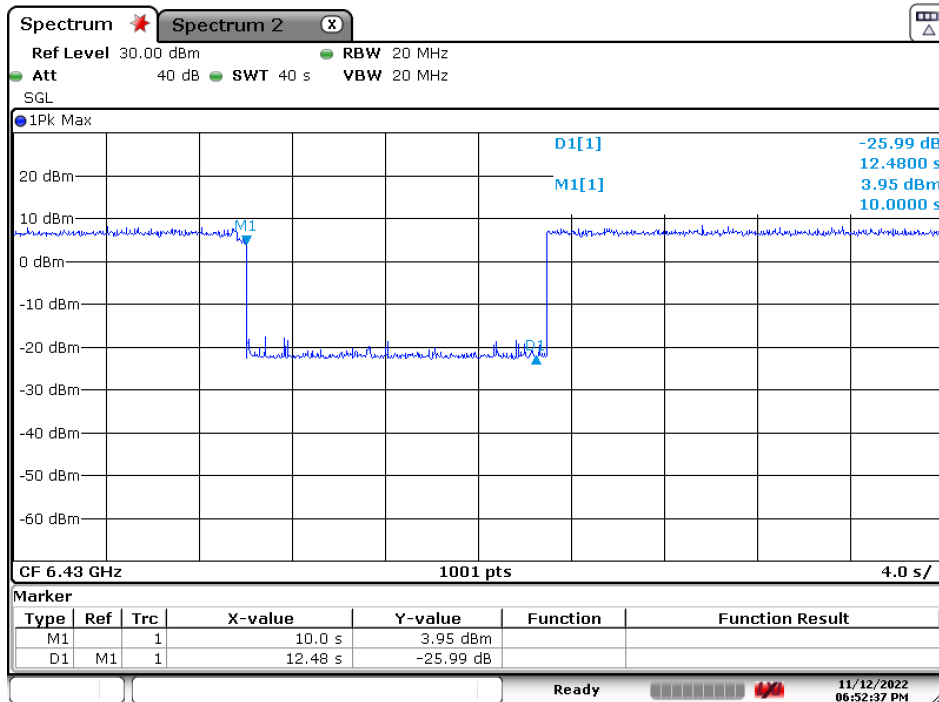
Plot 7-332. Contention Based Protocol Timing Plot – UNII 5 – 160MHz Ch47 - High

FCC: A3LSMS911U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2209010096-15.A3L	Test Dates: 9/3/2022 – 11/22/2022	EUT Type: Portable Handset		Page 200 of 239



Date: 12.NOV.2022 19:57:38

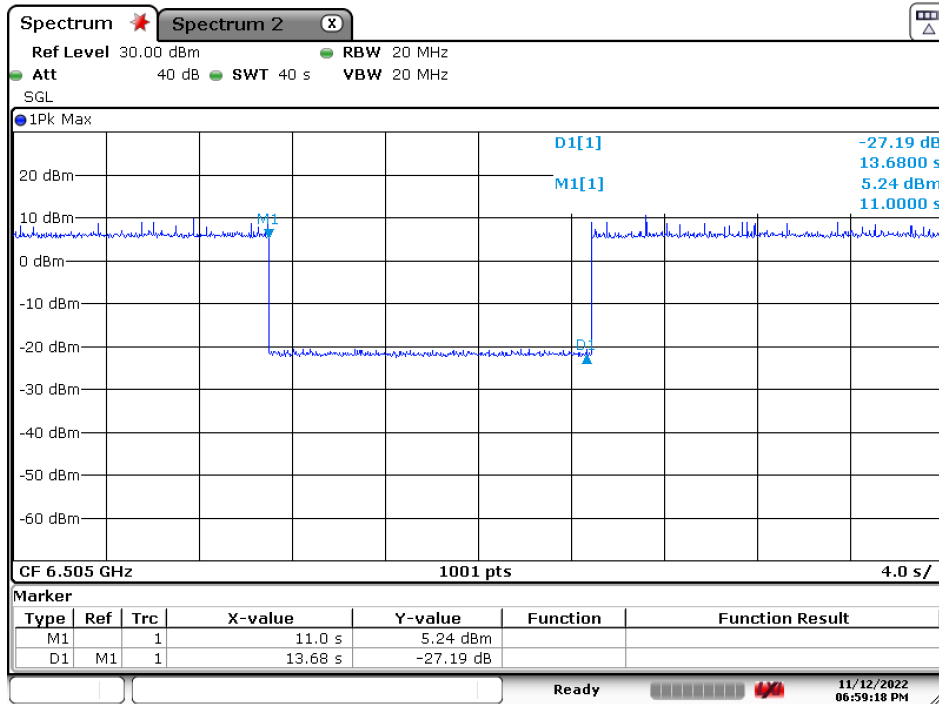
Plot 7-333. Contention Based Protocol Timing Plot – UNII 6 – 20MHz Ch101



Date: 12.NOV.2022 18:52:37

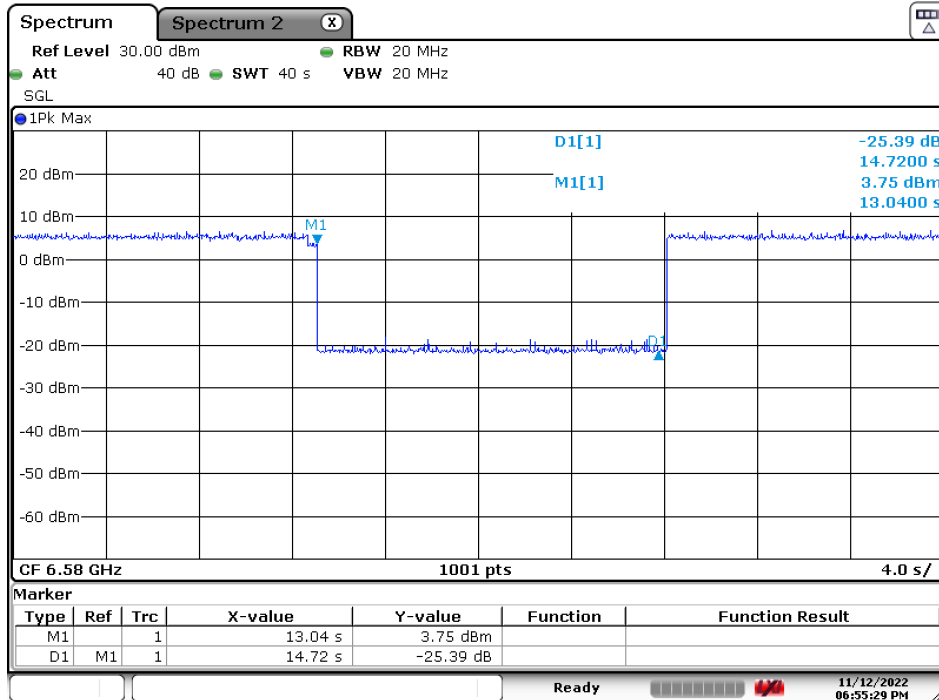
Plot 7-334. Contention Based Protocol Timing Plot – UNII 6 – 160MHz Ch111 – Low

FCC: A3LSMS911U	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2209010096-15.A3L	Test Dates: 9/3/2022 – 11/22/2022	EUT Type: Portable Handset	Page 201 of 239



Date: 12.NOV.2022 18:59:18

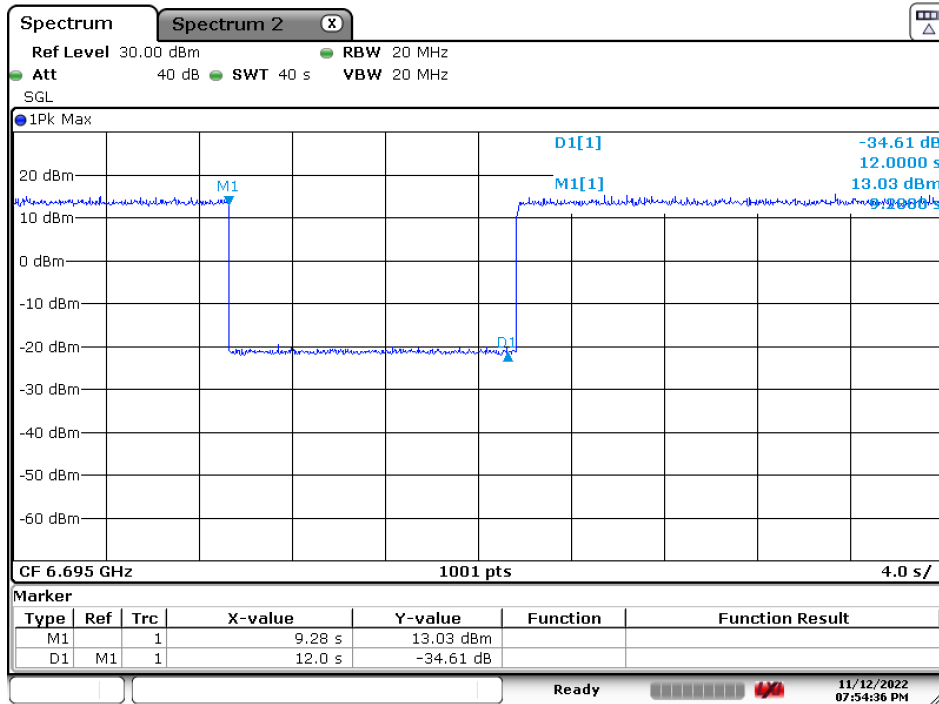
Plot 7-335. Contention Based Protocol Timing Plot – UNII 6 – 160MHz Ch111 – Mid



Date: 12.NOV.2022 18:55:29

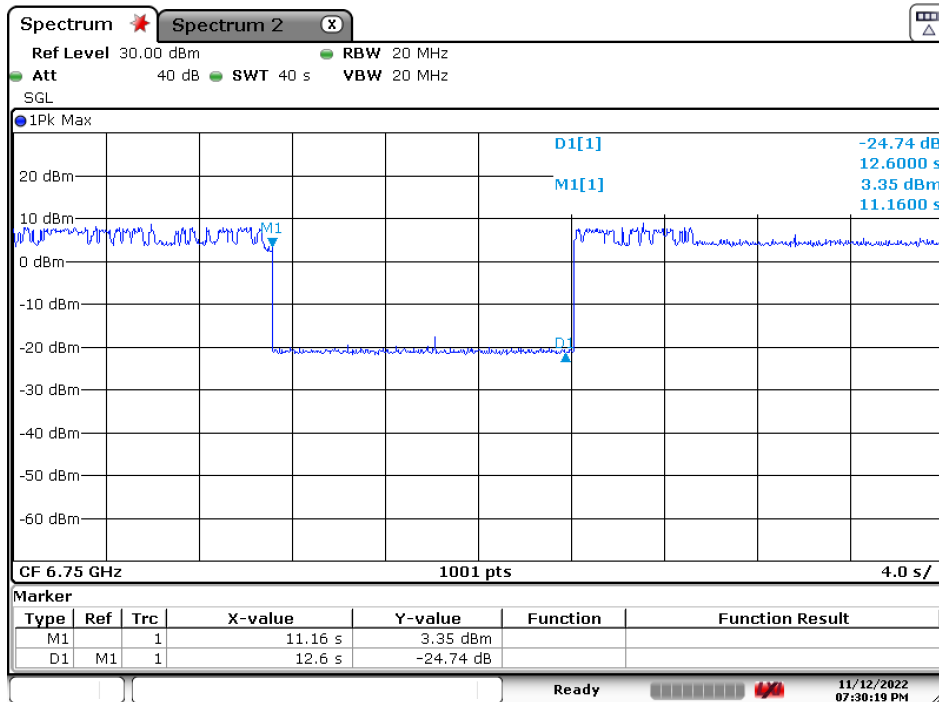
Plot 7-336. Contention Based Protocol Timing Plot – UNII 6 – 160MHz Ch111 - High

FCC: A3LSMS911U	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2209010096-15.A3L	Test Dates: 9/3/2022 – 11/22/2022	EUT Type: Portable Handset	Page 202 of 239



Date: 12.NOV.2022 19:54:35

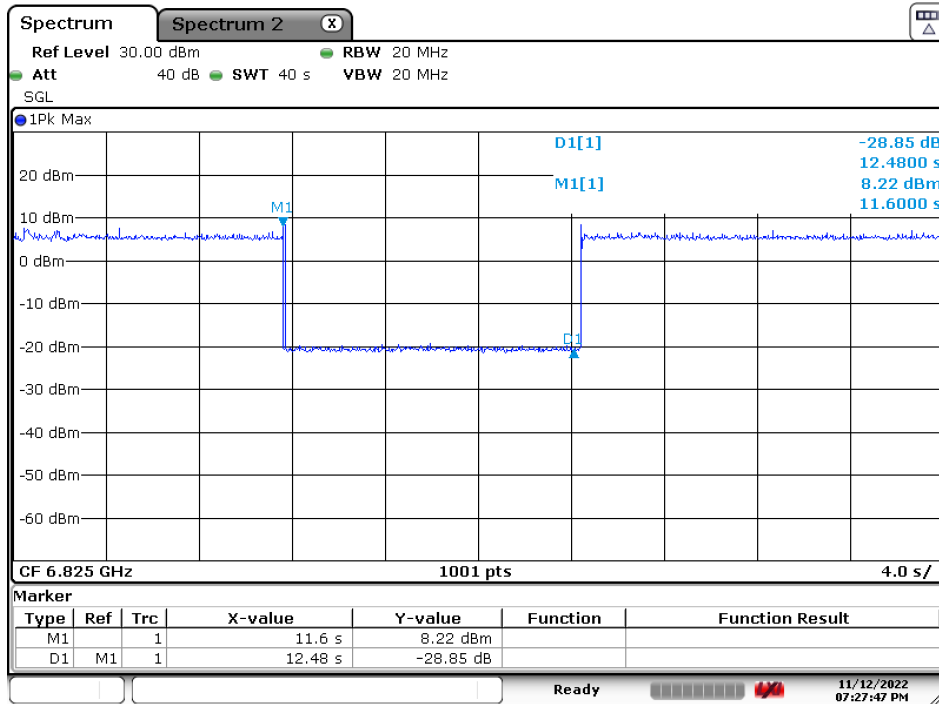
Plot 7-337. Contention Based Protocol Timing Plot – UNII 7 – 20MHz Ch149



Date: 12.NOV.2022 19:30:18

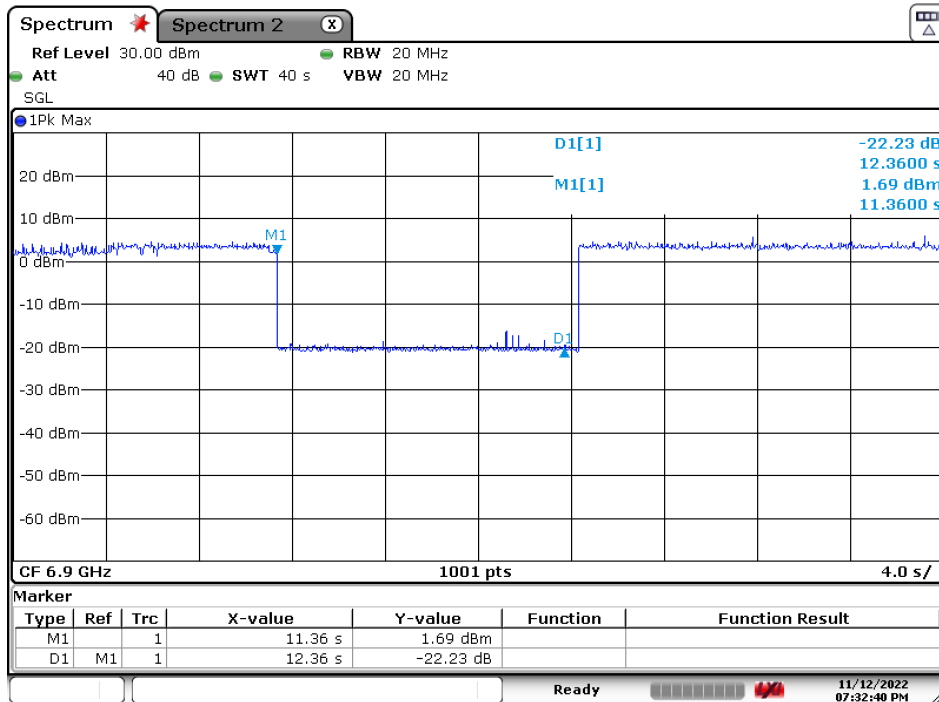
Plot 7-338. Contention Based Protocol Timing Plot – UNII 7 – 160MHz Ch175 – Low

MEASUREMENT REPORT (CERTIFICATION)			Approved by: Technical Manager
FCC: A3LSMS911U	Test Report S/N: 1M2209010096-15.A3L	Test Dates: 9/3/2022 – 11/22/2022	EUT Type: Portable Handset
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Date: 12.NOV.2022 19:27:47

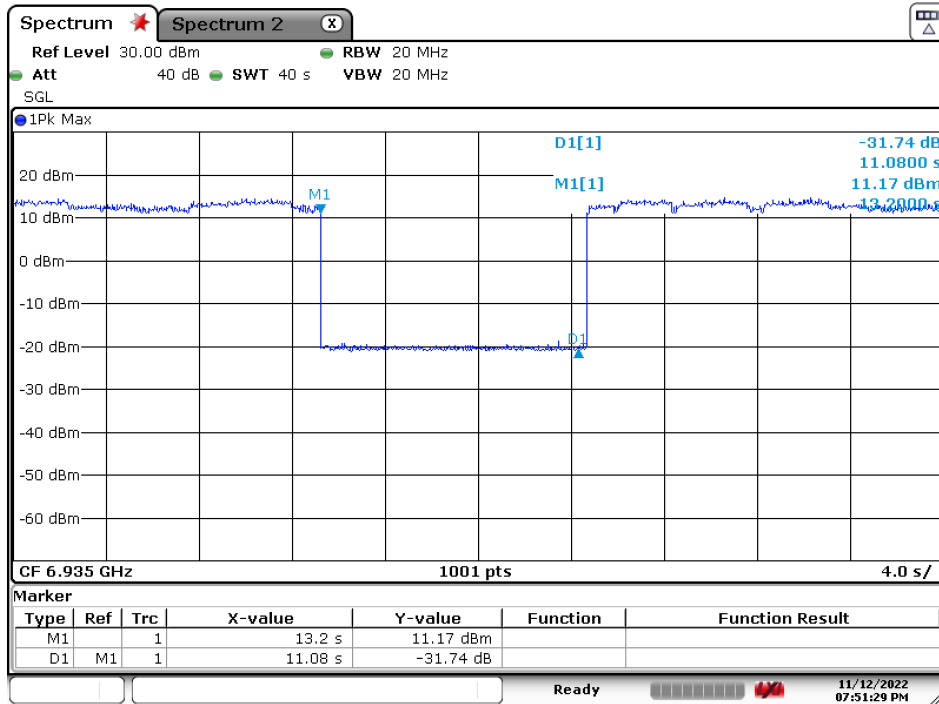
Plot 7-339. Contention Based Protocol Timing Plot – UNII 7 – 160MHz Ch175 – Mid



Date: 12.NOV.2022 19:32:40

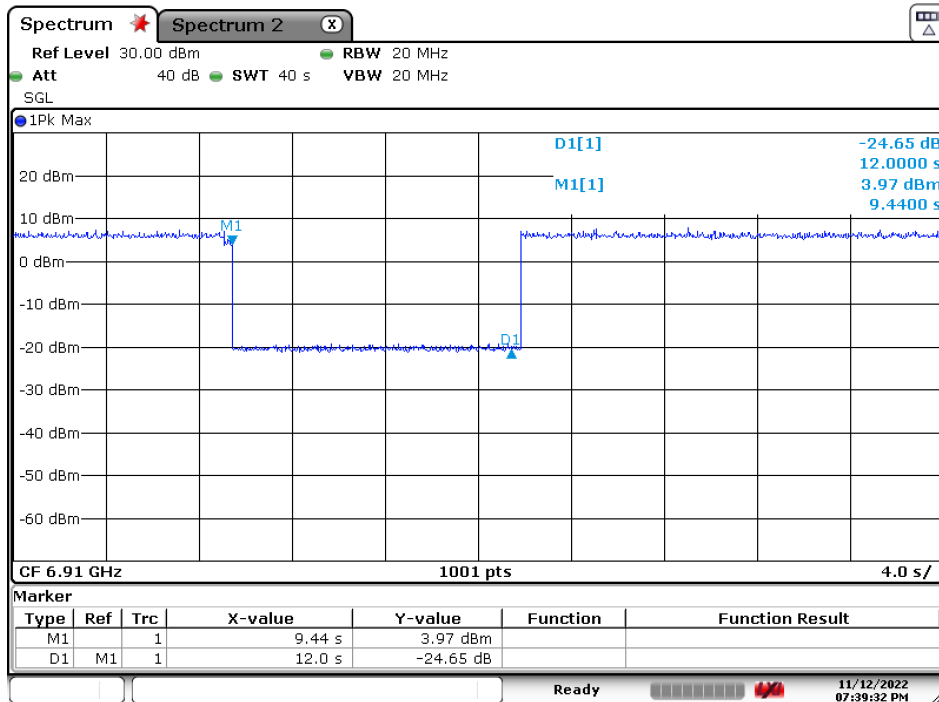
Plot 7-340. Contention Based Protocol Timing Plot – UNII 7 – 160MHz Ch175 - High

FCC: A3LSMS911U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
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Date: 12.NOV.2022 19:51:29

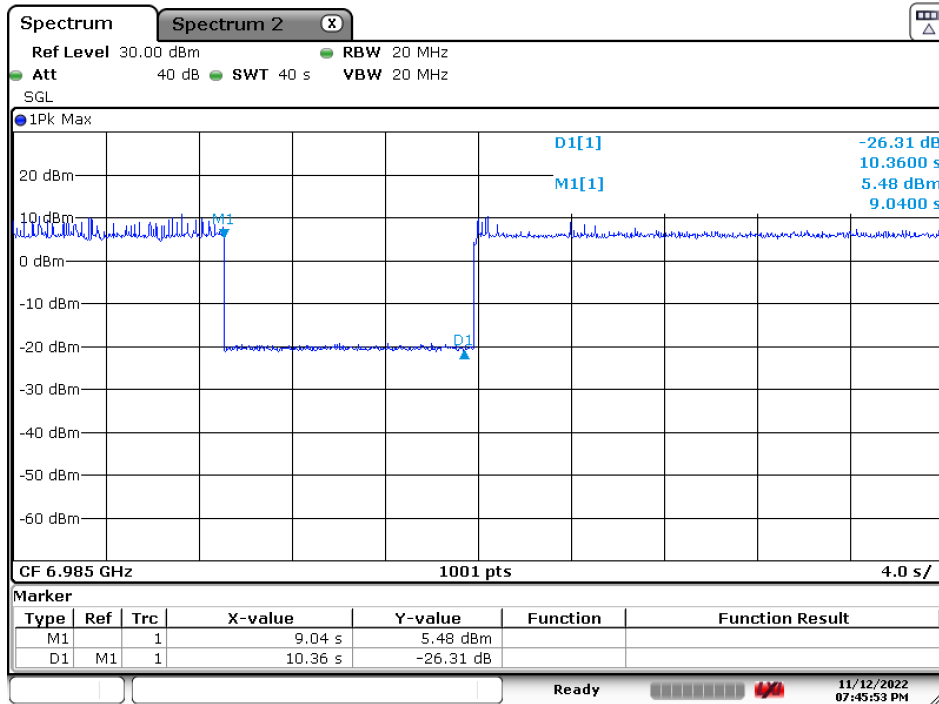
Plot 7-341. Contention Based Protocol Timing Plot – UNII 8 – 20MHz Ch197



Date: 12.NOV.2022 19:39:32

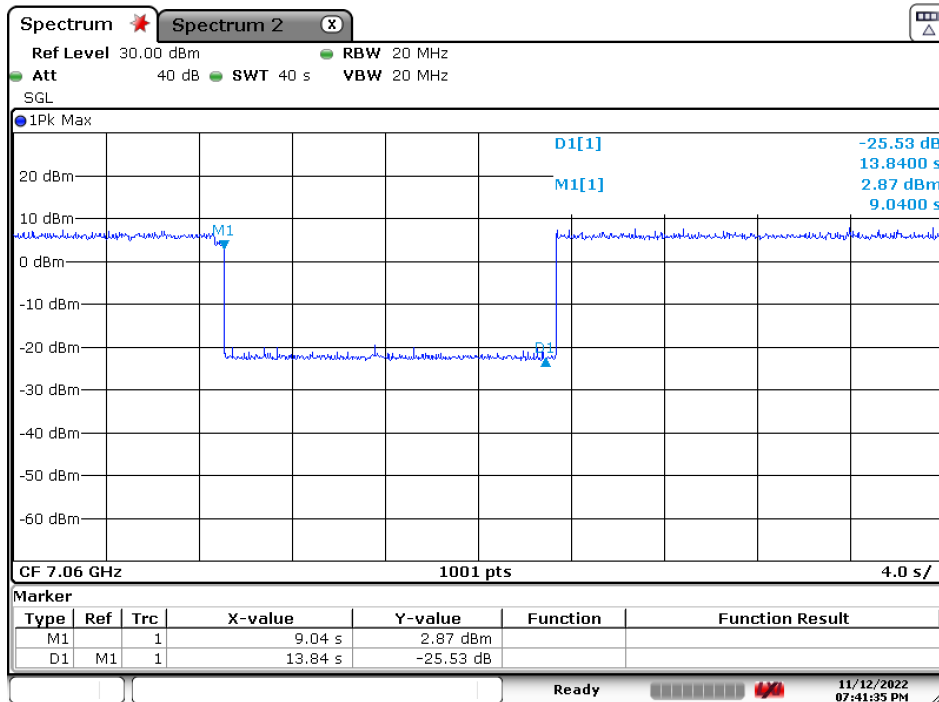
Plot 7-342. Contention Based Protocol Timing Plot – UNII 8 – 160MHz Ch207 – Low

FCC: A3LSMS911U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2209010096-15.A3L	Test Dates: 9/3/2022 – 11/22/2022	EUT Type: Portable Handset		Page 205 of 239



Date: 12.NOV.2022 19:45:52

Plot 7-343. Contention Based Protocol Timing Plot – UNII 8 – 160MHz Ch207 – Mid



Date: 12.NOV.2022 19:41:34

Plot 7-344. Contention Based Protocol Timing Plot – UNII 8 – 160MHz Ch207 - High

FCC: A3LSMS911U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2209010096-15.A3L	Test Dates: 9/3/2022 – 11/22/2022	EUT Type: Portable Handset		Page 206 of 239

7.7 Radiated Spurious Emission Measurements – Above 1GHz

§15.205, §15.209, §15.407(b)(6)

Test Overview and Limit

All out of band radiated spurious emissions are measured with a spectrum analyzer connected to a receive antenna while the EUT is operating at its maximum duty cycle, at its maximum power control level, as defined in ANSI C63.10-2013 and KDB 789033 D02 v02r01, and at the appropriate frequencies. All channels, modes (e.g. 802.11a, 802.11ax (20/40/80/160MHz), and modulations/data rates were investigated among all UNII bands. Only the radiated emissions of the configuration that produced the worst case emissions are reported in this section.

For transmitters operating in the 5.925-7.125 GHz band: All emissions outside of the 5.925-7.125 GHz band shall not exceed an EIRP of -27dBm/MHz (68.2dBuV/m at a 3m distance). Emissions found in a restricted band are subject to the limits of 15.209 as shown in the table below.

Frequency	Field Strength [$\mu\text{V/m}$]	Measured Distance [Meters]
Above 960.0 MHz	500	3

Table 7-11. Radiated Limits

Test Procedures Used

ANSI C63.10-2013 – Sections 12.7.7.2, 12.7.6, 12.7.5
KDB 789033 D02 v02r01 – Section G

Test Settings

Average Measurements above 1GHz (Method AD)

1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. RBW = 1MHz
3. VBW = 3MHz
4. Detector = power average (RMS)
5. Number of measurement points = 1001 (Number of points must be $\geq 2 \times \text{span/RBW}$)
6. Averaging type = power (RMS)
7. Sweep time = auto couple
8. Trace was averaged over 100 sweeps

Peak Measurements above 1GHz

1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. RBW = 1MHz
3. VBW = 3MHz
4. Detector = peak
5. Sweep time = auto couple
6. Trace mode = max hold
7. Trace was allowed to stabilize

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Peak Measurements below 1GHz

1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. Span was set greater than 1MHz
3. RBW = 120kHz
4. Detector = CISPR quasi-peak
5. Sweep time = auto couple
6. Trace was allowed to stabilize

Test Setup

The EUT and measurement equipment were set up as shown in the diagram below.

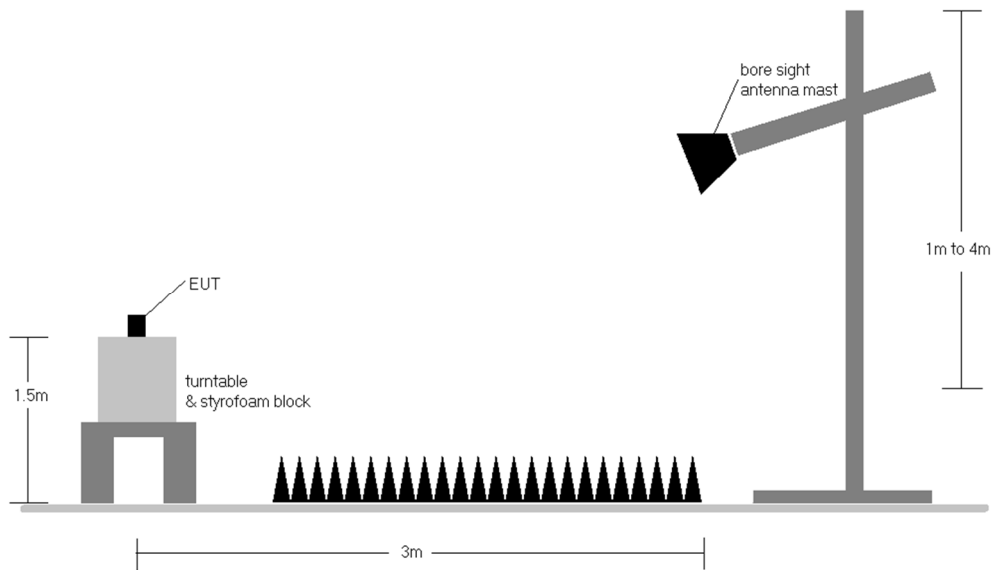


Figure 7-6. Test Instrument & Measurement Setup

FCC: A3LSMS911U	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
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Test Notes

1. All spurious emissions lying in restricted bands specified in §15.205 are below the limit shown in Table 7-11. All spurious emissions that do not lie in a restricted band are subject to an average limit of -27dBm/MHz. At a distance of 3 meters, the field strength limit in dBµV/m can be determined by adding a “conversion” factor of 95.2dB to the EIRP limit of -27dBm/MHz to obtain the limit for out of band spurious emissions of 68.2dBµV/m.
2. All spurious emissions that do not lie in a restricted band are subject to a peak limit not to exceed 20dB of the average limit [68.2dBµV/m]. If a peak measurement passes the average limit it was determined no further investigation is necessary.
3. The antenna is manipulated through typical positions, polarity and length during the tests. The EUT is manipulated through three orthogonal planes.
4. This unit was tested with its standard battery.
5. The spectrum is measured from 9kHz to the 10th harmonic of the fundamental frequency of the transmitter using CISPR quasi peak detector below 1GHz. Above 1 GHz, average and peak measurements were taken using linearly polarized horn antennas. The worst-case emissions are reported however emissions whose levels were not within 20dB of the respective limits were not reported.
6. Emissions below 18GHz were measured at a 3 meter test distance while emissions above 18GHz were measured at a 1 meter test distance with the application of a distance correction factor.
7. The wide spectrum spurious emissions plots shown on the following pages are used only for the purpose of emission identification. Any emissions found to be within 20dB of the limit are fully investigated and the results are shown in this section.
8. The "-" shown in the following RSE tables are used to denote a noise floor measurement.
9. In the case where a peak-detector measurement passed the given RMS limit it was determined sufficient to demonstrate compliance.

Sample Calculations

Determining Spurious Emissions Levels

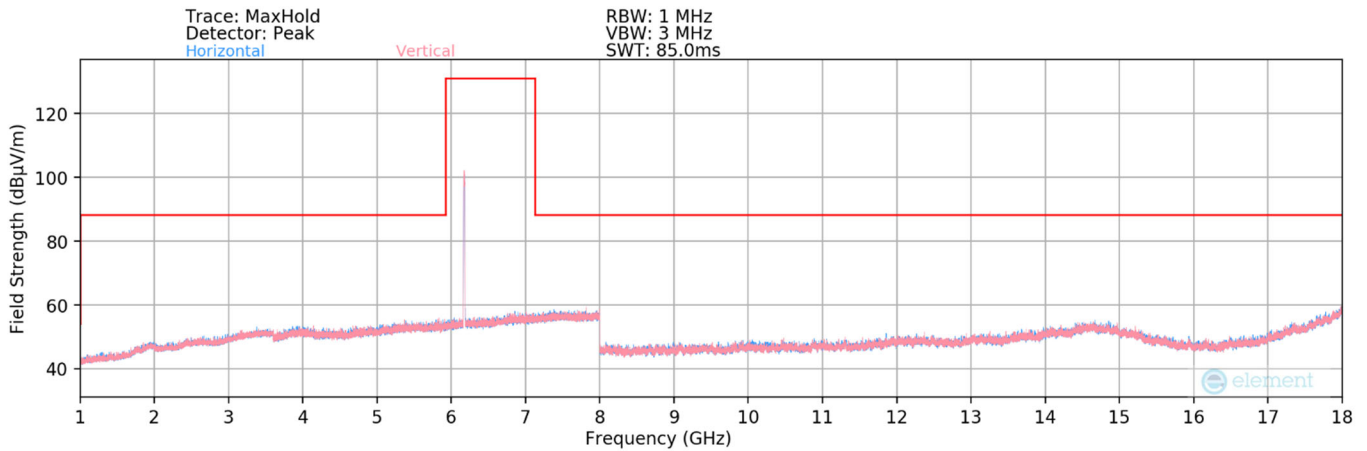
- Field Strength Level [dBµV/m] = Analyzer Level [dBm] + 107 + AFCL [dB/m]
- AFCL [dB/m] = Antenna Factor [dB/m] + Cable Loss [dB]
- Margin [dB] = Field Strength Level [dBµV/m] – Limit [dBµV/m]

Radiated Band Edge Measurement Offset

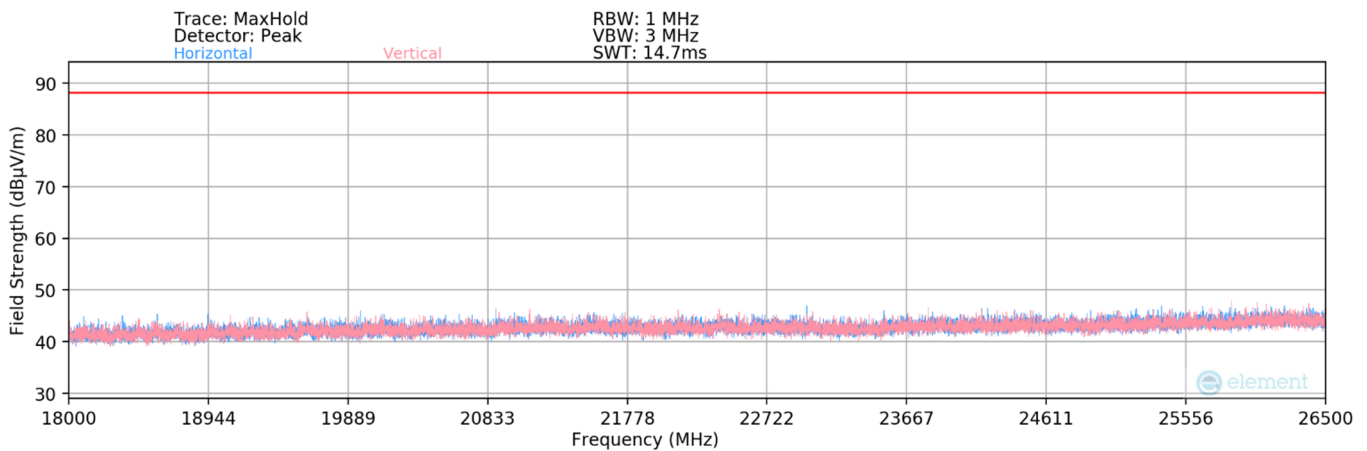
- The amplitude offset shown in the radiated restricted band edge plots was calculated using the formula:
Offset (dB) = (Antenna Factor + Cable Loss + Attenuator) – Preamplifier Gain

FCC: A3LSMS911U	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
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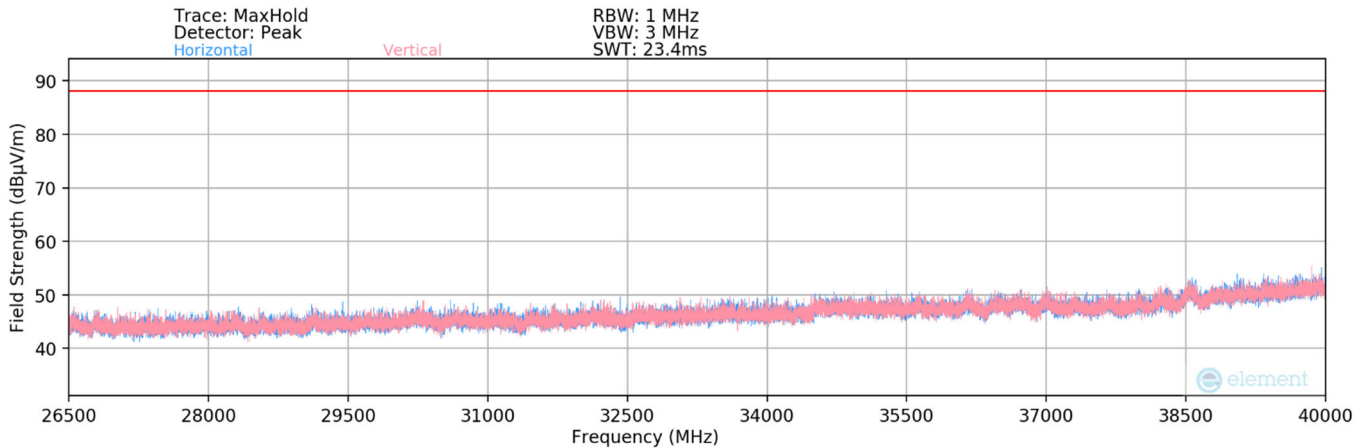
11.7.1 MIMO Radiated Spurious Emission Measurements



Plot 7-345. Radiated Spurious Plot above 1GHz MIMO (802.11ax – UNII Band 5 – 20MHz – Ch.45)



Plot 7-346. Radiated Spurious Plot above 18GHz - 26.5GHz – CH 45 - MIMO (802.11ax)



Plot 7-347. Radiated Spurious Plot 26.5GHz - 40GHz – CH 45 - MIMO (802.11ax)

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MIMO Radiated Spurious Emission Measurements
§15.407(b) §15.205 & §15.209

Worst Case Mode: 802.11a
 Worst Case Transfer Rate: 6Mbps
 Distance of Measurements: 1 & 3 Meters
 Operating Frequency: 5935MHz
 Channel: 2

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
* 11870.00	Average	H	-	-	-75.17	11.97	0.00	43.80	53.98	-10.18
* 11870.00	Peak	H	-	-	-63.83	11.97	0.00	55.14	73.98	-18.84
* 17805.00	Average	H	-	-	-77.41	19.16	0.00	48.75	53.98	-5.23
* 17805.00	Peak	H	-	-	-63.11	19.16	0.00	63.05	73.98	-10.93
* 23740.00	Average	H	-	-	-71.85	3.89	-9.54	29.50	53.98	-24.48
* 23740.00	Peak	H	-	-	-60.42	3.89	-9.54	40.93	73.98	-33.05
29675.00	Peak	H	-	-	-60.72	6.04	-9.54	42.78	68.20	-25.42

Table 7-12. Radiated Measurements MIMO (UNII Band 5 – Low Channel – 20MHz)

FCC: A3LSMS911U	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
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Worst Case Mode: 802.11a
 Worst Case Transfer Rate: 6Mbps
 Distance of Measurements: 1 & 3 Meters
 Operating Frequency: 6175MHz
 Channel: 45

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBμV/m]	Limit [dBμV/m]	Margin [dB]
* 12350.00	Average	H	-	-	-74.67	12.08	0.00	44.41	53.98	-9.57
* 12350.00	Peak	H	-	-	-62.15	12.08	0.00	56.93	73.98	-17.05
* 18525.00	Average	H	-	-	-66.28	1.68	-9.54	32.86	53.98	-21.12
* 18525.00	Peak	H	-	-	-55.72	1.68	-9.54	43.42	73.98	-30.56
24700.00	Peak	H	-	-	-55.29	4.25	-9.54	46.42	68.20	-21.78
30875.00	Peak	H	-	-	-55.81	6.73	-9.54	48.38	68.20	-19.82

Table 7-13. Radiated Measurements MIMO (UNII Band 5 – Mid Channel – 20MHz)

FCC: A3LSMS911U	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
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Worst Case Mode: 802.11a
Worst Case Transfer Rate: 6Mbps
Distance of Measurements: 1 & 3 Meters
Operating Frequency: 6415MHz
Channel: 93

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBμV/m]	Limit [dBμV/m]	Margin [dB]
12830.00	Peak	H	-	-	-62.29	12.39	0.00	57.10	68.20	-11.10
* 19245.00	Average	H	-	-	-66.17	2.45	-9.54	33.74	53.98	-20.24
* 19245.00	Peak	H	-	-	-55.40	2.45	-9.54	44.51	73.98	-29.47
25660.00	Peak	H	-	-	-55.76	4.57	-9.54	46.27	68.20	-21.93
32075.00	Peak	H	-	-	-55.47	6.88	-9.54	48.86	68.20	-19.34

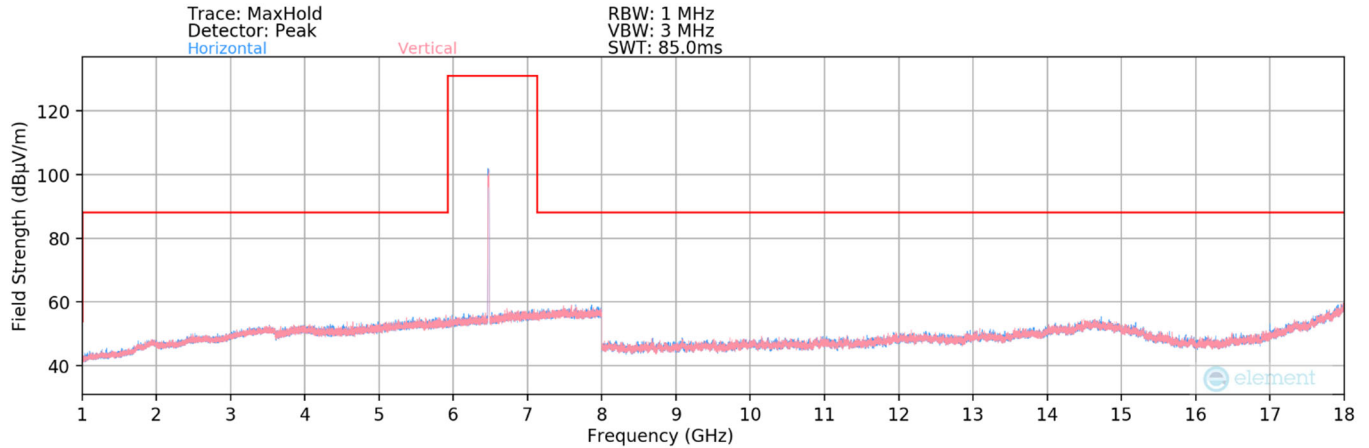
Table 7-14. Radiated Measurements MIMO (UNII Band 5 – High Channel – 20MHz)

Worst Case Mode: 802.11a
Worst Case Transfer Rate: 6Mbps
Distance of Measurements: 1 & 3 Meters
Operating Frequency: 6175MHz
Channel: 45

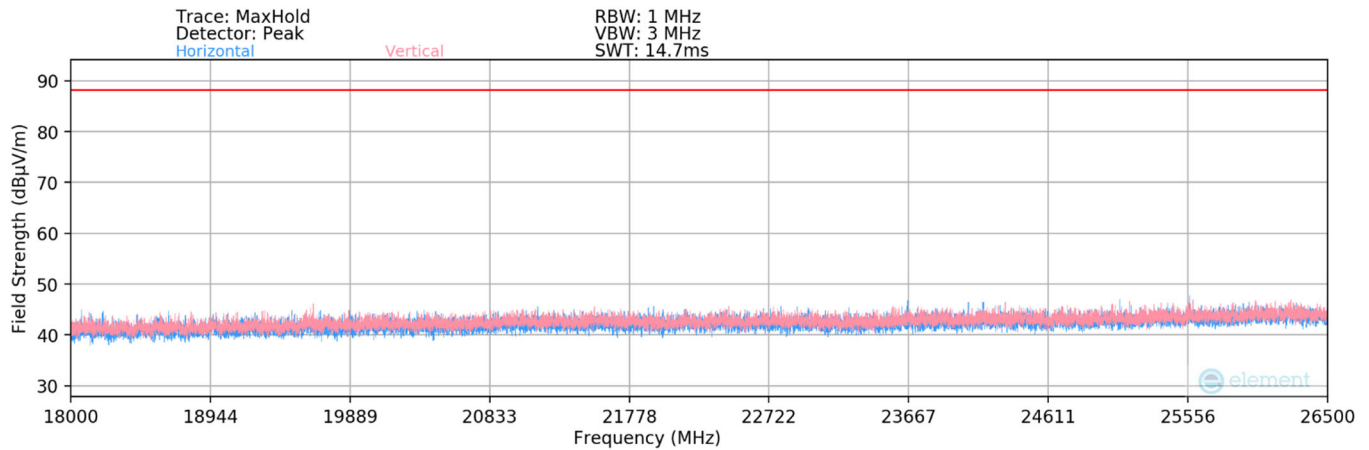
Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBμV/m]	Limit [dBμV/m]	Margin [dB]
* 12350.00	Average	H	-	-	-76.60	12.08	0.00	42.48	53.98	-11.50
* 12350.00	Peak	H	-	-	-65.83	12.08	0.00	53.25	73.98	-20.73
* 18525.00	Average	H	-	-	-66.16	1.68	-9.54	32.98	53.98	-21.00
* 18525.00	Peak	H	-	-	-55.06	1.68	-9.54	44.08	73.98	-29.90
24700.00	Peak	H	-	-	-55.21	4.25	-9.54	46.50	68.20	-21.70
30875.00	Peak	H	-	-	-55.86	6.73	-9.54	48.33	68.20	-19.87

Table 7-15. Radiated Measurements MIMO (UNII Band 5 – Mid Channel – 20MHz) with WCP

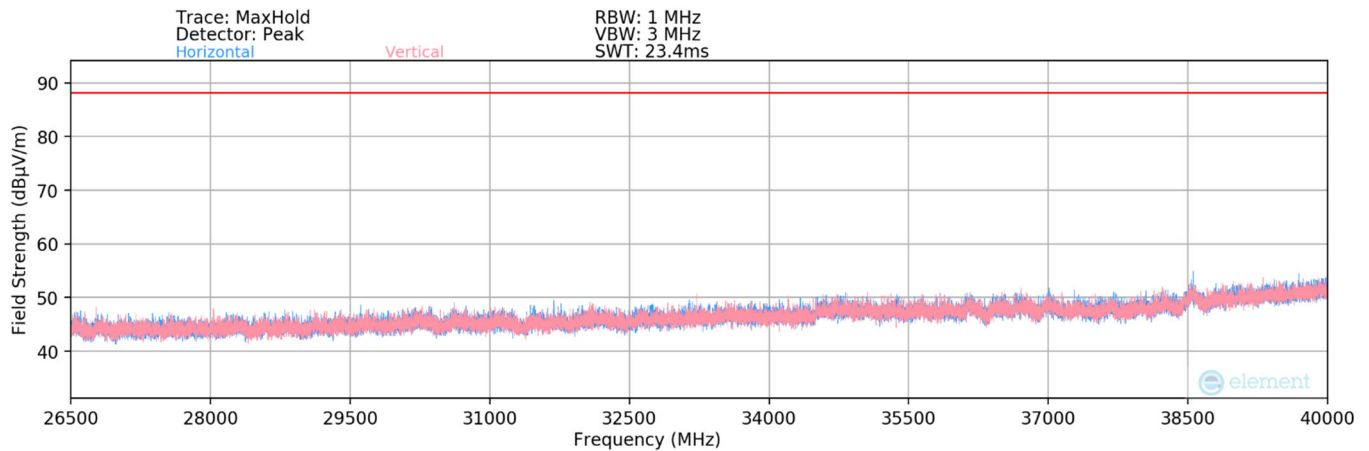
FCC: A3LSMS911U	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
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Plot 7-348. Radiated Spurious Plot above 1GHz MIMO (802.11ax- UNII Band 6 - 20MHz - Ch.105)



Plot 7-349. Radiated Spurious Plot above 18GHz - 26.5GHz - CH 105 - MIMO (802.11ax)



Plot 7-350. Radiated Spurious Plot 26.5GHz - 40GHz - CH 105 - MIMO (802.11ax)

FCC: A3LSMS911U	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
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MIMO Radiated Spurious Emission Measurements

§15.407(b) §15.205 & §15.209

Worst Case Mode: 802.11a
 Worst Case Transfer Rate: 6Mbps
 Distance of Measurements: 1 & 3 Meters
 Operating Frequency: 6435MHz
 Channel: 97

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
12870.00	Peak	H	-	-	-65.03	12.51	0.00	54.48	68.20	-13.72
* 19305.00	Average	H	-	-	-66.18	2.29	-9.54	33.57	53.98	-20.41
* 19305.00	Peak	H	-	-	-55.66	2.29	-9.54	44.09	73.98	-29.89
25740.00	Peak	H	-	-	-55.90	4.49	-9.54	46.04	68.20	-22.16
32175.00	Peak	H	-	-	-55.15	7.04	-9.54	49.35	68.20	-18.85

Table 7-16. Radiated Measurements MIMO (UNII Band 6 – Low Channel – 20MHz)

Worst Case Mode: 802.11a
 Worst Case Transfer Rate: 6Mbps
 Distance of Measurements: 1 & 3 Meters
 Operating Frequency: 6475MHz
 Channel: 105

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
12950.00	Peak	H	-	-	-66.02	12.67	0.00	53.65	68.20	-14.55
* 19425.00	Average	H	-	-	-66.50	2.36	-9.54	33.32	53.98	-20.66
* 19425.00	Peak	H	-	-	-55.86	2.36	-9.54	43.96	73.98	-30.02
25900.00	Peak	H	-	-	-55.32	4.84	-9.54	46.97	68.20	-21.23
32375.00	Peak	H	-	-	-56.00	6.78	-9.54	48.24	68.20	-19.96

Table 7-17. Radiated Measurements MIMO (UNII Band 6 – Mid Channel – 20MHz)

FCC: A3LSMS911U	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
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Worst Case Mode: 802.11a
 Worst Case Transfer Rate: 6Mbps
 Distance of Measurements: 1 & 3 Meters
 Operating Frequency: 6515MHz
 Channel: 113

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
13030.00	Peak	H	-	-	-66.44	12.83	0.00	53.39	68.20	-14.81
* 19545.00	Average	H	-	-	-72.31	2.31	-9.54	27.46	53.98	-26.52
* 19545.00	Peak	H	-	-	-61.97	2.31	-9.54	37.80	73.98	-36.18
26060.00	Peak	H	-	-	-61.05	4.92	-9.54	41.33	68.20	-26.87
32575.00	Peak	H	-	-	-59.26	6.55	-9.54	44.75	68.20	-23.45

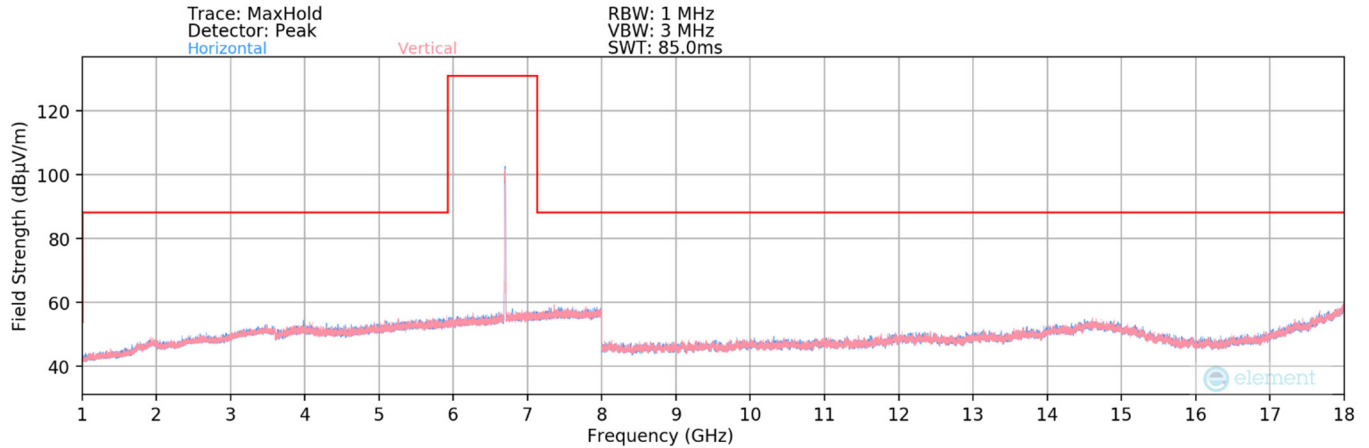
Table 7-18. Radiated Measurements MIMO (UNII Band 6 – High Channel – 20MHz)

Worst Case Mode: 802.11a
 Worst Case Transfer Rate: 6Mbps
 Distance of Measurements: 1 & 3 Meters
 Operating Frequency: 6475MHz
 Channel: 105

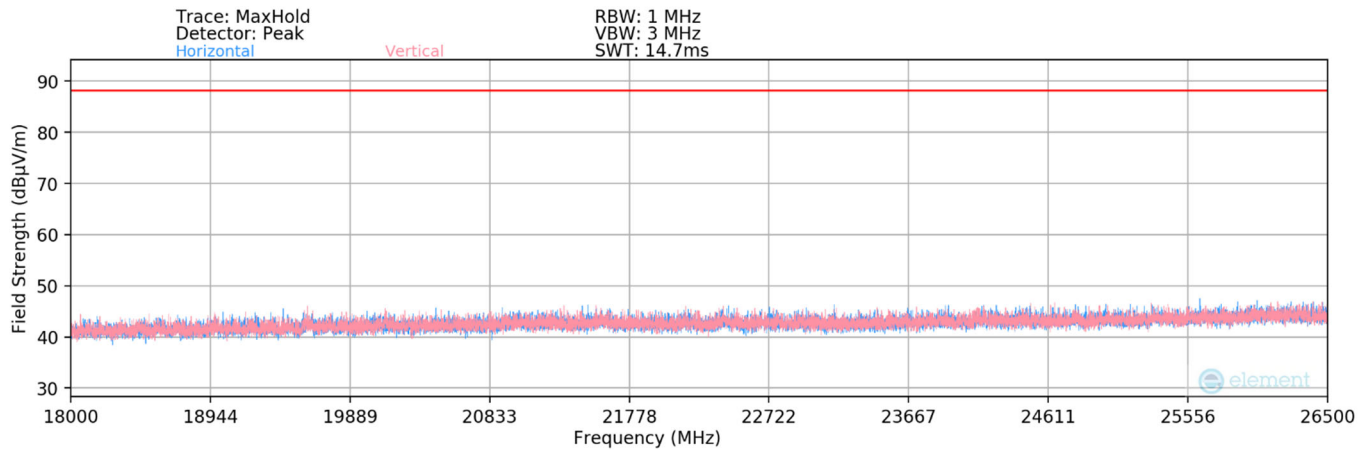
Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
12950.00	Peak	H	-	-	-66.06	12.67	0.00	53.61	68.20	-14.59
* 19425.00	Average	H	-	-	-66.50	2.36	-9.54	33.32	53.98	-20.66
* 19425.00	Peak	H	-	-	-56.27	2.36	-9.54	43.55	73.98	-30.43
25900.00	Peak	H	-	-	-55.67	4.84	-9.54	46.62	68.20	-21.58
32375.00	Peak	H	-	-	-56.80	6.78	-9.54	47.44	68.20	-20.76

Table 7-19. Radiated Measurements MIMO (UNII Band 6 – Mid Channel – 20MHz) with WCP

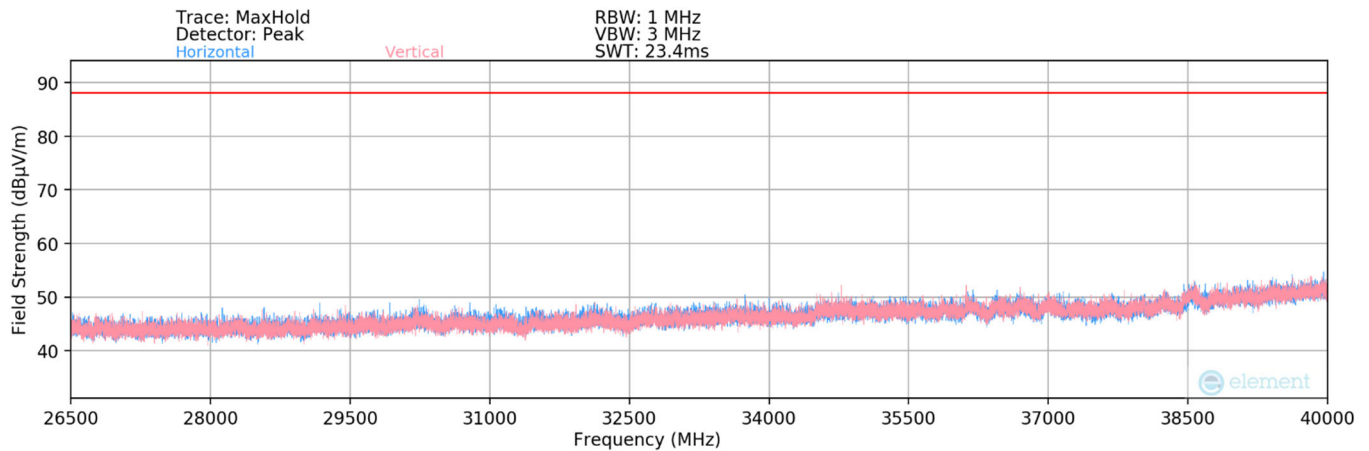
FCC: A3LSMS911U	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2209010096-15.A3L	Test Dates: 9/3/2022 – 11/22/2022	EUT Type: Portable Handset	Page 216 of 239



Plot 7-351. Radiated Spurious Plot above 1GHz MIMO (802.11ax- UNII Band 7 - 20MHz - Ch.149)



Plot 7-352. Radiated Spurious Plot above 18GHz - 26.5GHz - CH 149 - MIMO (802.11ax)



Plot 7-353. Radiated Spurious Plot 26.5GHz - 40GHz - CH 149 - MIMO (802.11ax)

FCC: A3LSMS911U	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2209010096-15.A3L	Test Dates: 9/3/2022 - 11/22/2022	EUT Type: Portable Handset	Page 217 of 239



MIMO Radiated Spurious Emission Measurements
§15.407(b) §15.205 & §15.209

Worst Case Mode: 802.11a
 Worst Case Transfer Rate: 6Mbps
 Distance of Measurements: 1 & 3 Meters
 Operating Frequency: 6535MHz
 Channel: 117

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
13070.00	Peak	H	-	-	-66.13	12.94	0.00	53.81	68.20	-14.39
* 19605.00	Average	H	-	-	-66.31	2.79	-9.54	33.94	53.98	-20.04
* 19605.00	Peak	H	-	-	-55.31	2.79	-9.54	44.94	73.98	-29.04
26140.00	Peak	H	-	-	-55.54	4.83	-9.54	46.75	68.20	-21.45
32675.00	Peak	H	-	-	-55.26	6.85	-9.54	49.05	68.20	-19.15

Table 7-20. Radiated Measurements MIMO (UNII Band 7 – Low Channel – 20MHz)

Worst Case Mode: 802.11a
 Worst Case Transfer Rate: 6Mbps
 Distance of Measurements: 1 & 3 Meters
 Operating Frequency: 6695MHz
 Channel: 149

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
* 13390.00	Average	H	-	-	-79.08	12.97	0.00	40.89	53.98	-13.09
* 13390.00	Peak	H	-	-	-65.75	12.97	0.00	54.22	73.98	-19.76
* 20085.00	Average	H	-	-	-66.44	3.04	-9.54	34.06	53.98	-19.92
* 20085.00	Peak	H	-	-	-55.72	3.04	-9.54	44.78	73.98	-29.20
26780.00	Peak	H	-	-	-55.36	5.16	-9.54	47.26	68.20	-20.94
33475.00	Peak	H	-	-	-54.98	7.26	-9.54	49.74	68.20	-18.46

Table 7-21. Radiated Measurements MIMO (UNII Band 7 – Mid Channel – 20MHz)

FCC: A3LSMS911U	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2209010096-15.A3L	Test Dates: 9/3/2022 – 11/22/2022	EUT Type: Portable Handset	Page 218 of 239

Worst Case Mode: 802.11a
 Worst Case Transfer Rate: 6Mbps
 Distance of Measurements: 1 & 3 Meters
 Operating Frequency: 6875MHz
 Channel: 185

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
13750.00	Peak	H	-	-	-66.09	13.83	0.00	54.74	68.20	-13.46
* 20625.00	Average	H	-	-	-67.44	3.28	-9.54	33.30	53.98	-20.68
* 20625.00	Peak	H	-	-	-56.68	3.28	-9.54	44.06	73.98	-29.92
27500.00	Peak	H	-	-	-55.81	4.79	-9.54	46.43	68.20	-21.77
34375.00	Peak	H	-	-	-55.01	7.69	-9.54	50.14	68.20	-18.06

Table 7-22. Radiated Measurements MIMO (UNII Band 7 – High Channel – 20MHz)

Worst Case Mode: 802.11a
 Worst Case Transfer Rate: 6Mbps
 Distance of Measurements: 1 & 3 Meters
 Operating Frequency: 6535MHz
 Channel: 117

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
* 13390.00	Average	H	-	-	-77.08	12.97	0.00	42.89	53.98	-11.09
* 13390.00	Peak	H	-	-	-65.91	12.97	0.00	54.06	73.98	-19.92
* 20085.00	Average	H	-	-	-66.09	3.04	-9.54	34.41	53.98	-19.57
* 20085.00	Peak	H	-	-	-55.57	3.04	-9.54	44.93	73.98	-29.05
26780.00	Peak	H	-	-	-55.10	5.16	-9.54	47.52	68.20	-20.68
33475.00	Peak	H	-	-	-55.04	7.26	-9.54	49.68	68.20	-18.52

Table 7-23. Radiated Measurements MIMO (UNII Band 7 – Mid Channel – 20MHz) with WCP

FCC: A3LSMS911U	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2209010096-15.A3L	Test Dates: 9/3/2022 – 11/22/2022	EUT Type: Portable Handset	Page 219 of 239