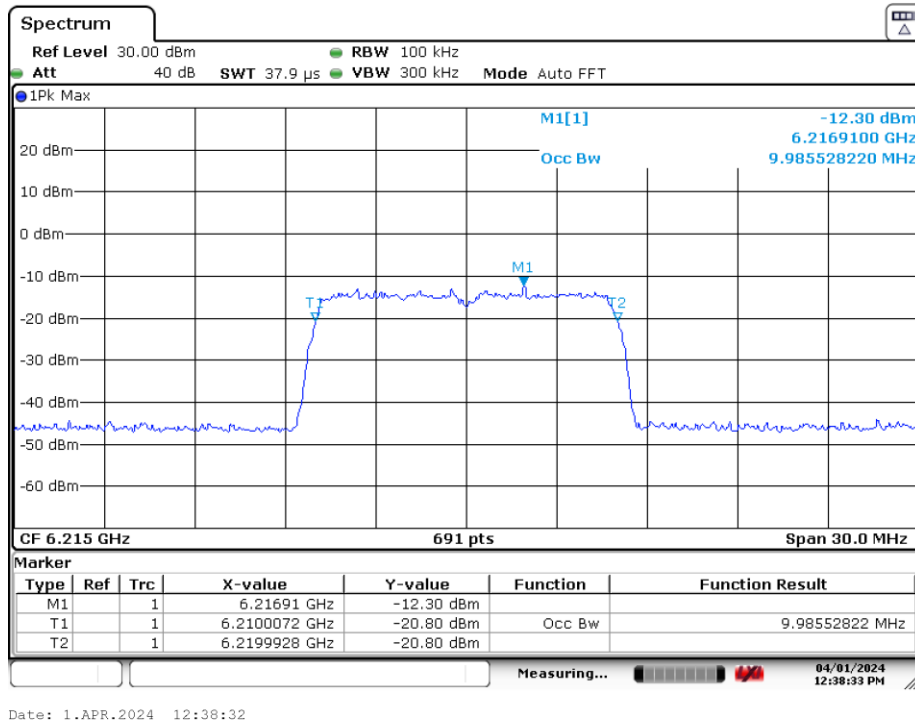


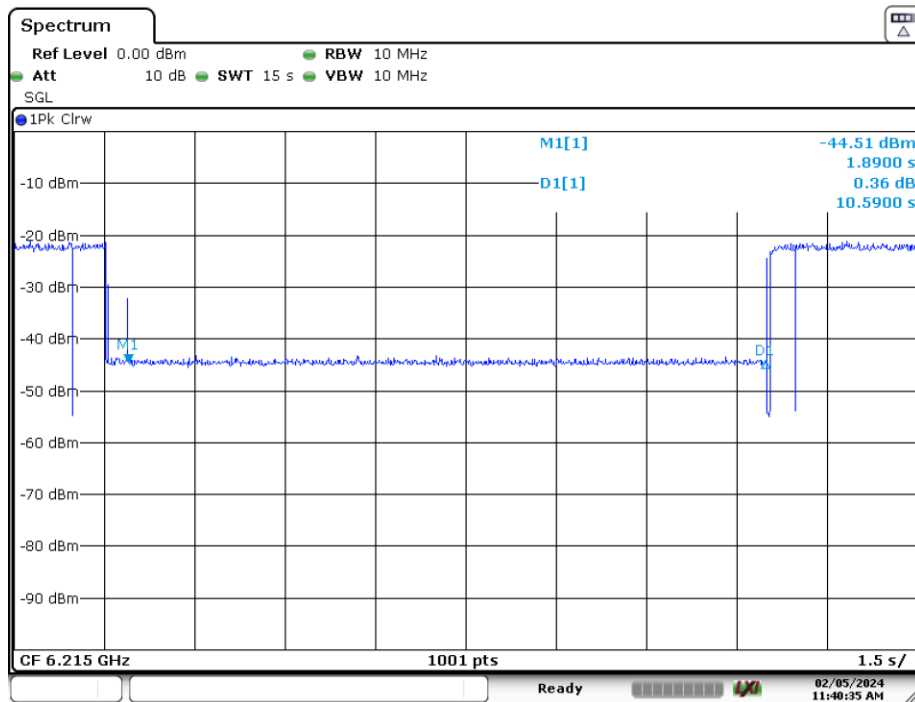
### 7.6.1 AWGN Plots



**Plot 7-192. AWGN Signal (Demonstration)**

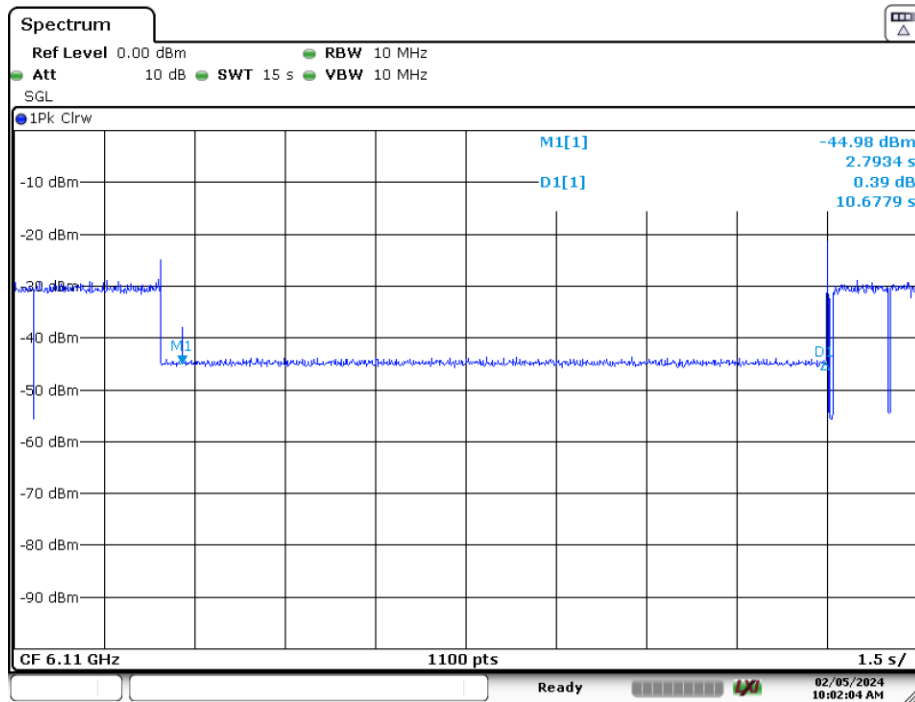
FCC ID: C3K2077 IC: 3048A-2077	<b>MEASUREMENT REPORT</b>		Approved by: Technical Manager
Test Report S/N: 1M2312040120-21-R2.C3K	Test Dates: 12/14/2023 - 05/20/2024	EUT Type: Portable Computing Device	Page 135 of 169

## 7.6.2 CBP Timing Plots



Date: 5.FEB.2024 11:40:36

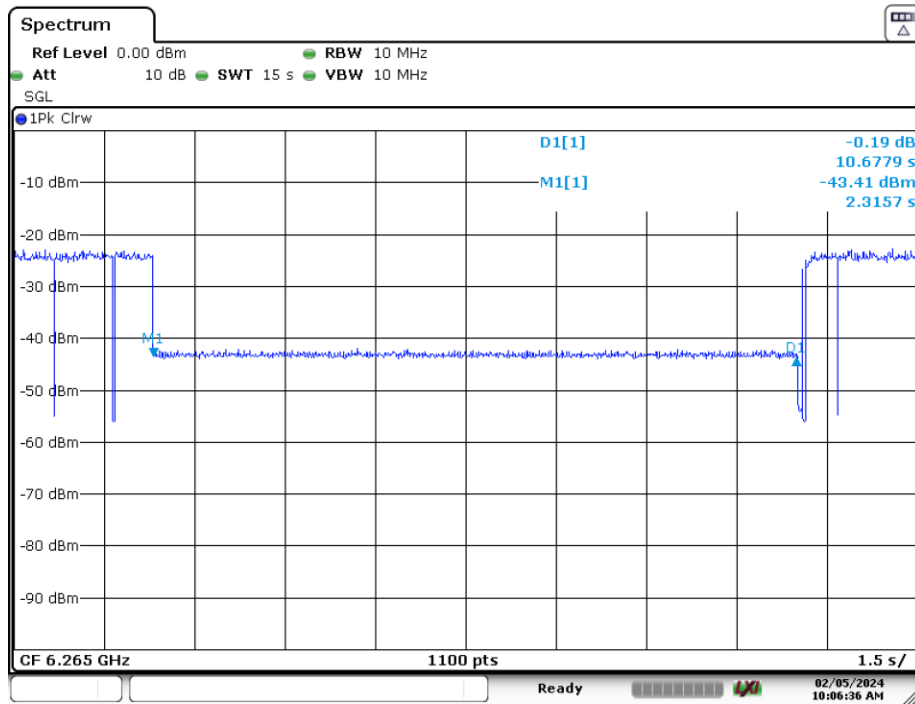
**Plot 7-193. Contention Based Protocol Timing Plot (20MHz (UNII Band 5) – Ch. 53)**



Date: 5.FEB.2024 10:02:04

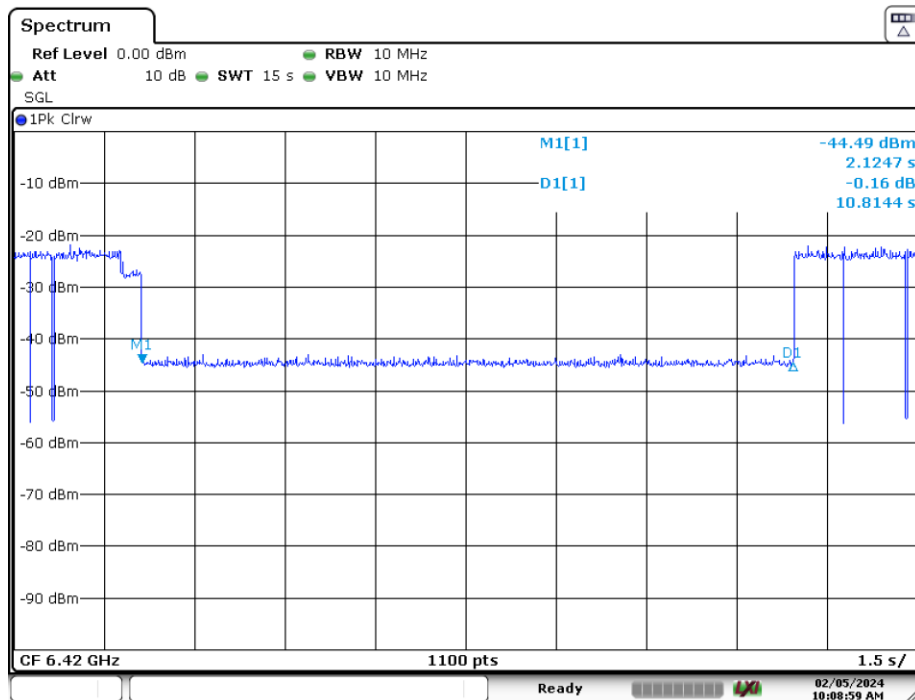
**Plot 7-194. Contention Based Protocol Timing Plot (320MHz (UNII Band 5) – Ch. 31 Low)**

FCC ID: C3K2077 IC: 3048A-2077	<b>MEASUREMENT REPORT</b>		Approved by: Technical Manager
Test Report S/N: 1M2312040120-21-R2.C3K	Test Dates: 12/14/2023 - 05/20/2024	EUT Type: Portable Computing Device	Page 136 of 169



Date: 5.FEB.2024 10:06:36

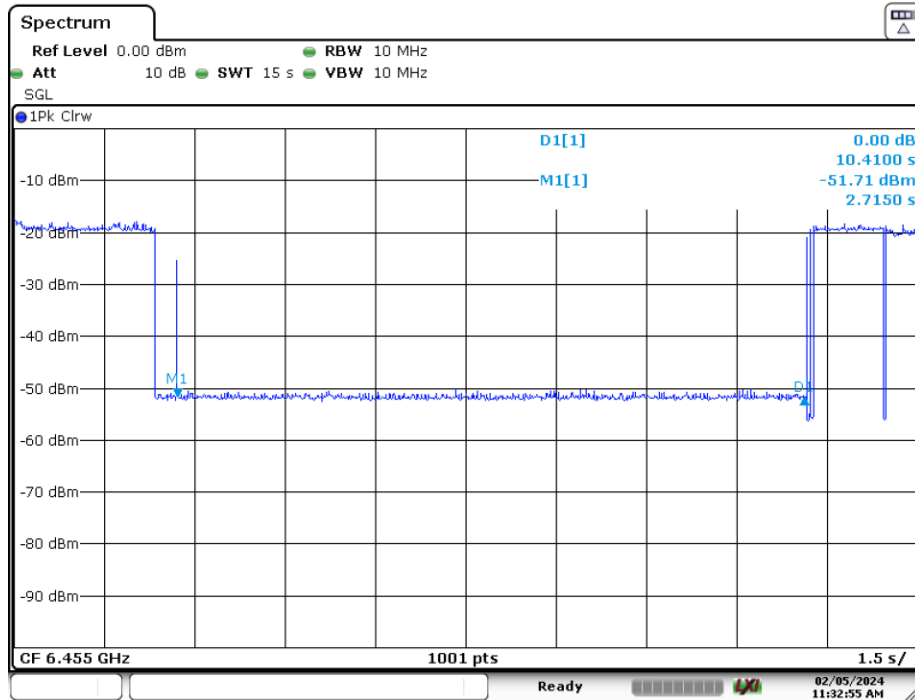
**Plot 7-195. Contention Based Protocol Timing Plot (320MHz (UNII Band 5) – Ch. 31 Mid)**



Date: 5.FEB.2024 10:08:59

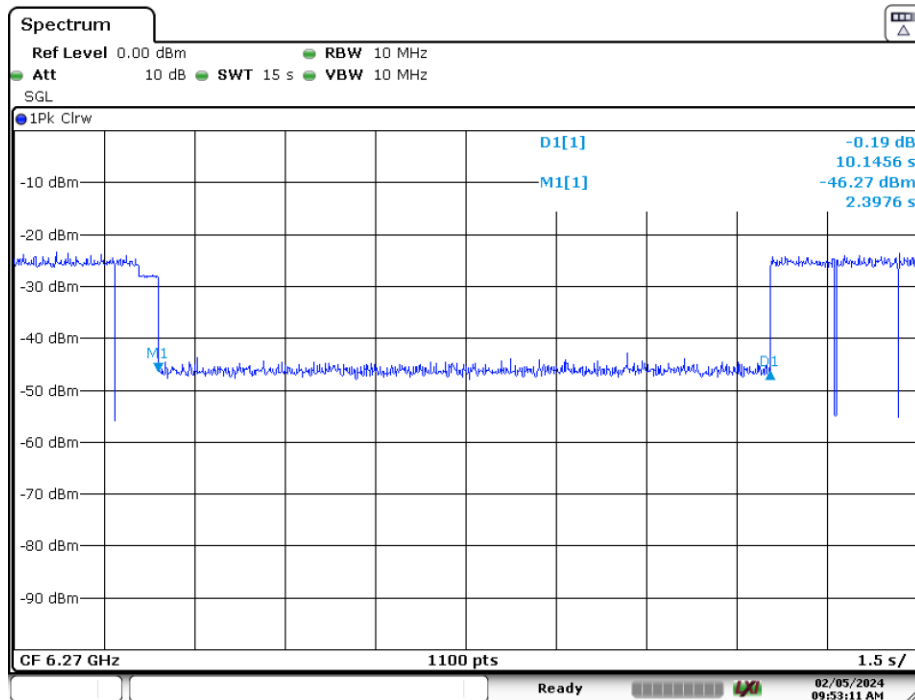
**Plot 7-196. Contention Based Protocol Timing Plot (320MHz (UNII Band 5) – Ch. 31 High)**

FCC ID: C3K2077 IC: 3048A-2077	<b>MEASUREMENT REPORT</b>		Approved by: Technical Manager
Test Report S/N: 1M2312040120-21-R2.C3K	Test Dates: 12/14/2023 - 05/20/2024	EUT Type: Portable Computing Device	Page 137 of 169



Date: 5.FEB.2024 11:32:55

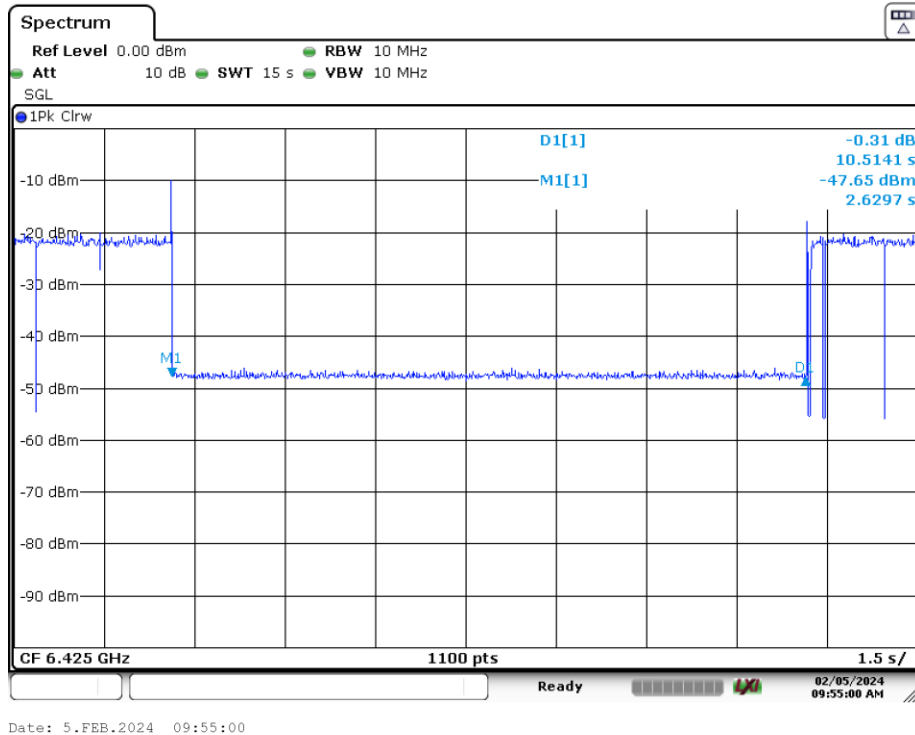
**Plot 7-197. Contention Based Protocol Timing Plot (20MHz (UNII Band 6) – Ch. 101)**



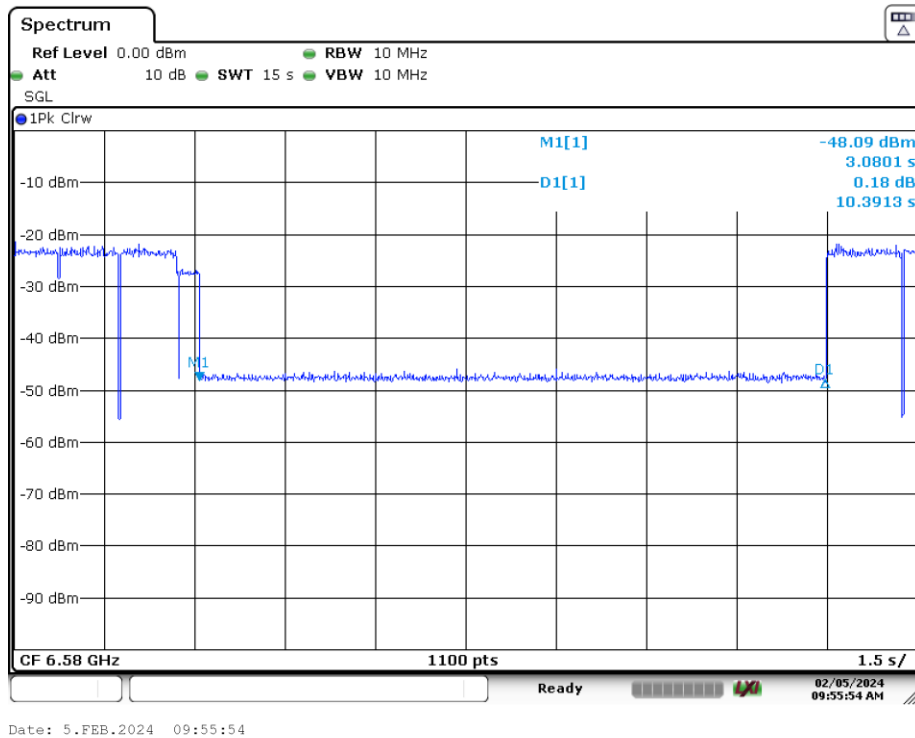
Date: 5.FEB.2024 09:53:11

**Plot 7-198. Contention Based Protocol Timing Plot (320MHz (UNII Band 6) – Ch. 95 Low)**

FCC ID: C3K2077 IC: 3048A-2077	<b>MEASUREMENT REPORT</b>		Approved by: Technical Manager
Test Report S/N: 1M2312040120-21-R2.C3K	Test Dates: 12/14/2023 - 05/20/2024	EUT Type: Portable Computing Device	Page 138 of 169

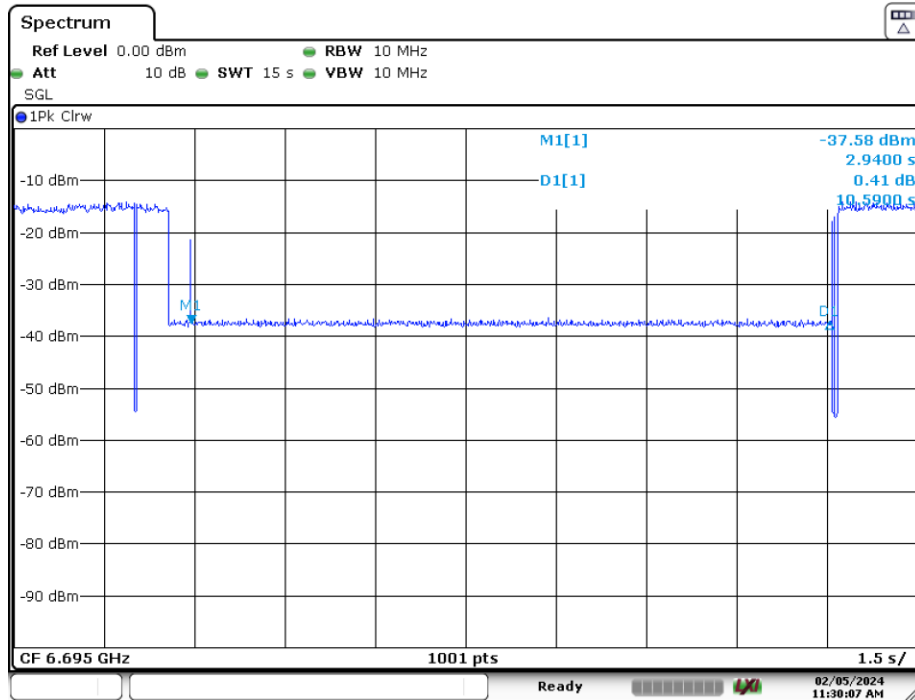


**Plot 7-199. Contention Based Protocol Timing Plot (320MHz (UNII Band 6) – Ch. 95 Mid)**



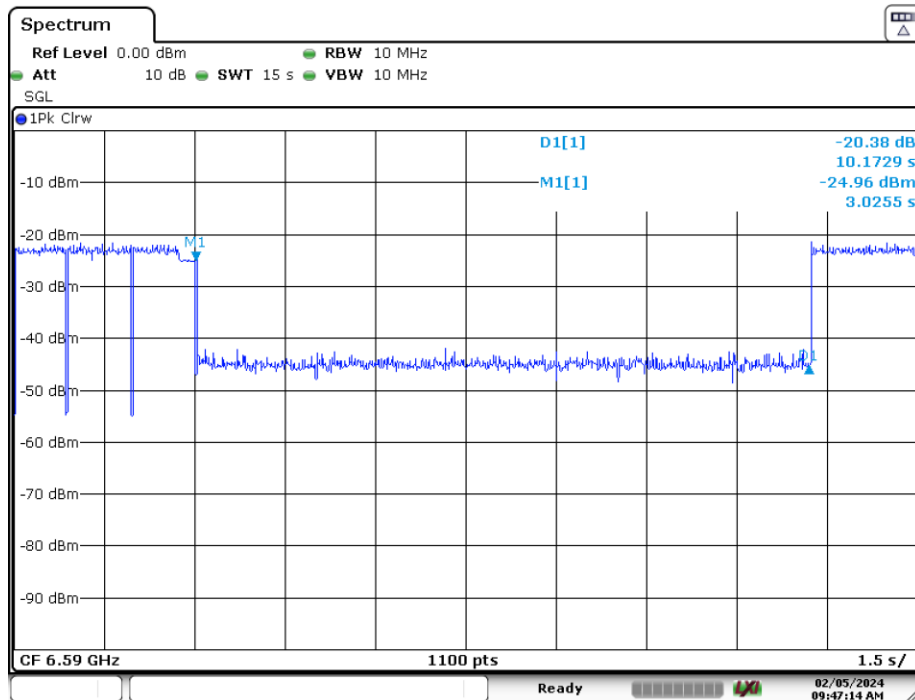
**Plot 7-200. Contention Based Protocol Timing Plot (320MHz (UNII Band 6) – Ch. 95 High)**

FCC ID: C3K2077 IC: 3048A-2077	<b>MEASUREMENT REPORT</b>		Approved by: Technical Manager
Test Report S/N: 1M2312040120-21-R2.C3K	Test Dates: 12/14/2023 - 05/20/2024	EUT Type: Portable Computing Device	Page 139 of 169



Date: 5.FEB.2024 11:30:08

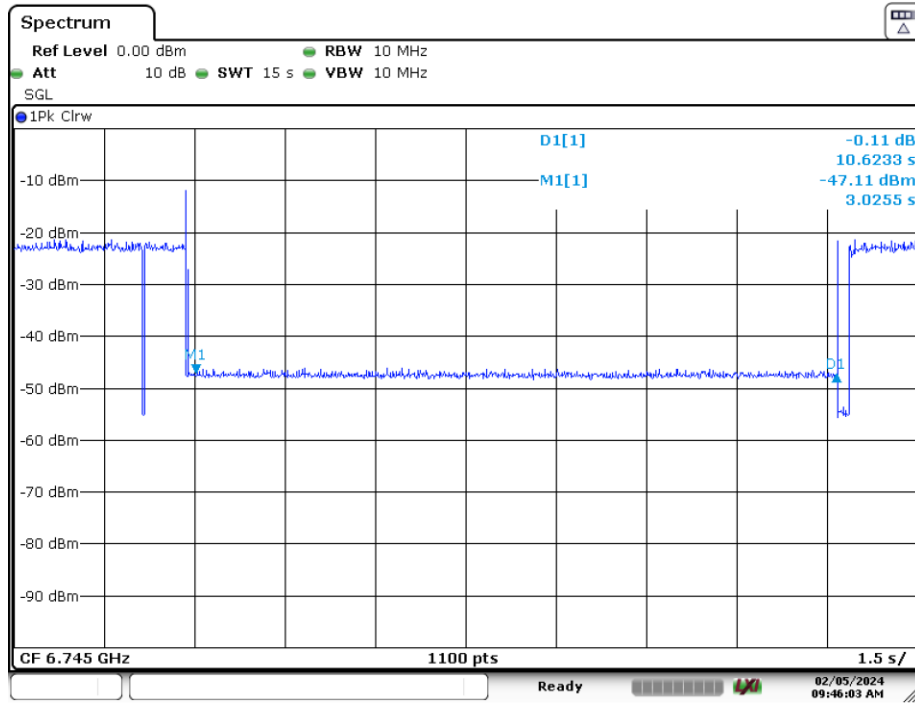
**Plot 7-201. Contention Based Protocol Timing Plot (20MHz (UNII Band 7) – Ch. 149)**



Date: 5.FEB.2024 09:47:15

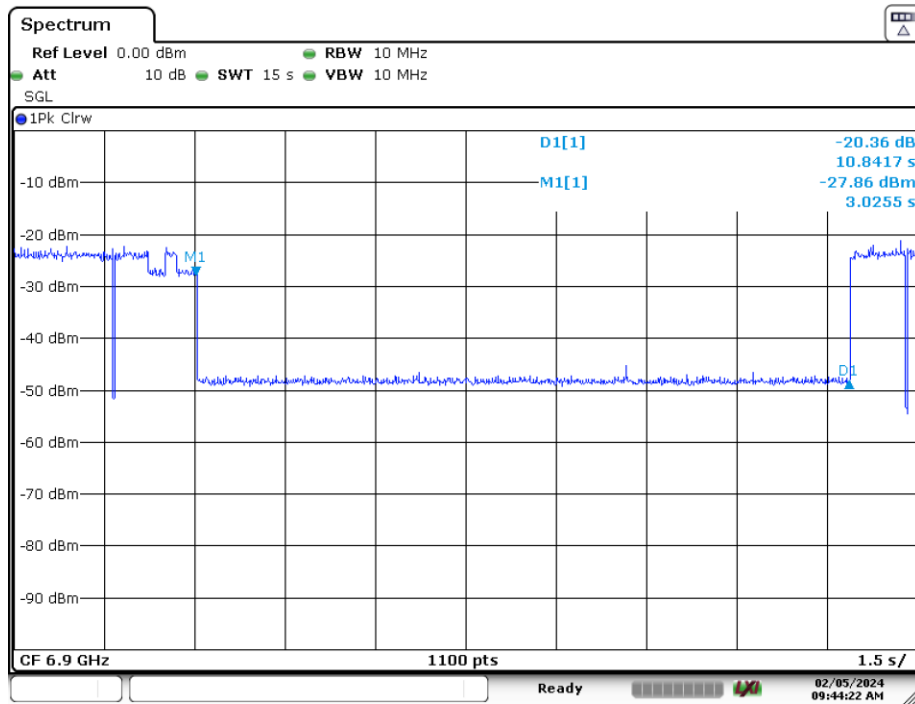
**Plot 7-202. Contention Based Protocol Timing Plot (320MHz (UNII Band 7) – Ch. 159 Low)**

FCC ID: C3K2077 IC: 3048A-2077	<b>MEASUREMENT REPORT</b>		Approved by: Technical Manager
Test Report S/N: 1M2312040120-21-R2.C3K	Test Dates: 12/14/2023 - 05/20/2024	EUT Type: Portable Computing Device	Page 140 of 169



Date: 5.FEB.2024 09:46:03

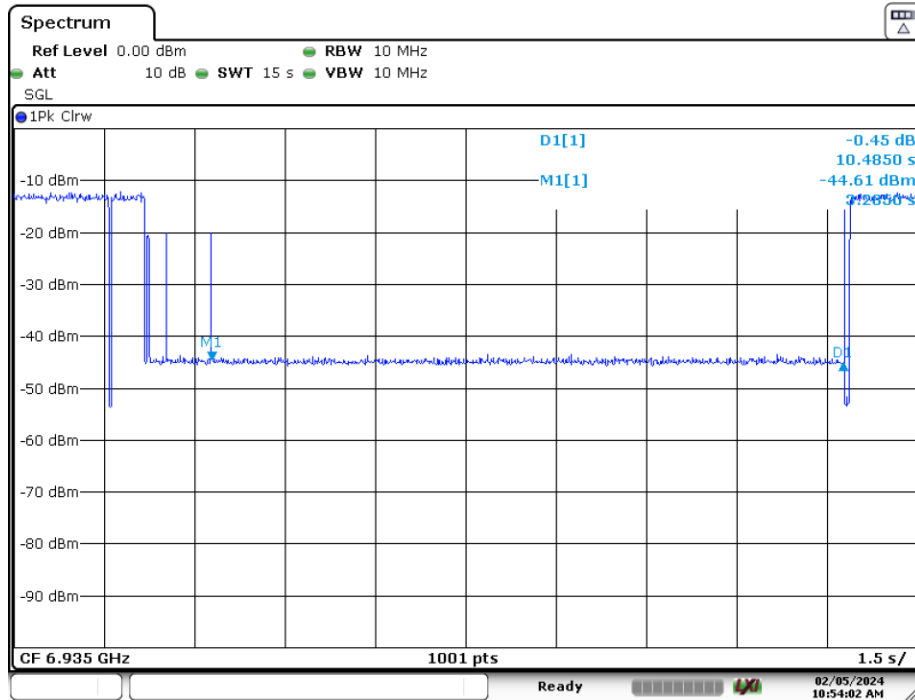
**Plot 7-203. Contention Based Protocol Timing Plot (320MHz (UNII Band 7) – Ch. 159 Mid)**



Date: 5.FEB.2024 09:44:23

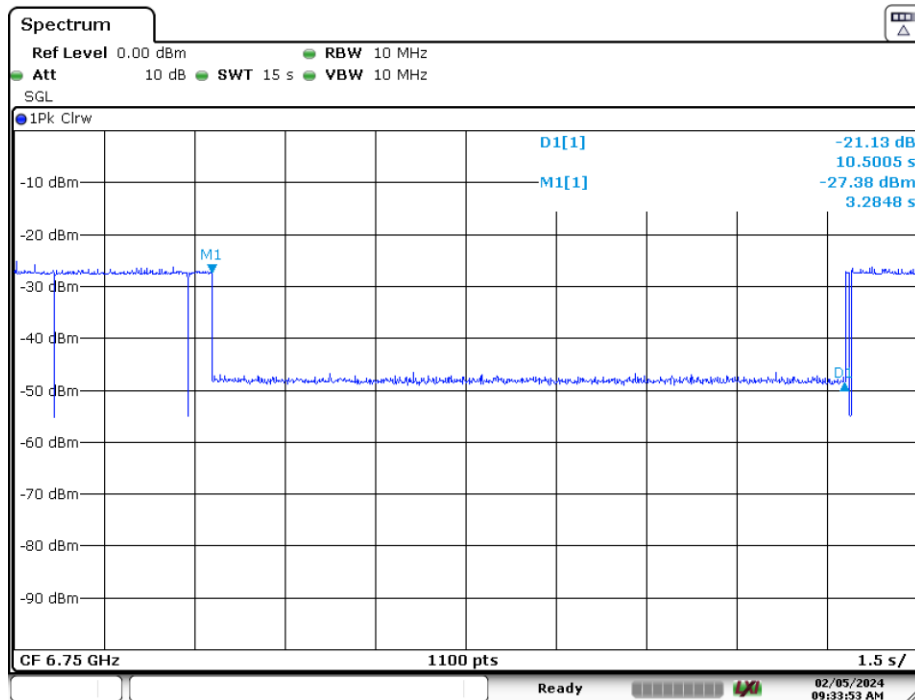
**Plot 7-204. Contention Based Protocol Timing Plot (320MHz (UNII Band 7) – Ch. 159 High)**

FCC ID: C3K2077 IC: 3048A-2077	<b>MEASUREMENT REPORT</b>		Approved by: Technical Manager
Test Report S/N: 1M2312040120-21-R2.C3K	Test Dates: 12/14/2023 - 05/20/2024	EUT Type: Portable Computing Device	Page 141 of 169



Date: 5.FEB.2024 10:54:02

**Plot 7-205. Contention Based Protocol Timing Plot (20MHz (UNII Band 8) – Ch. 197)**

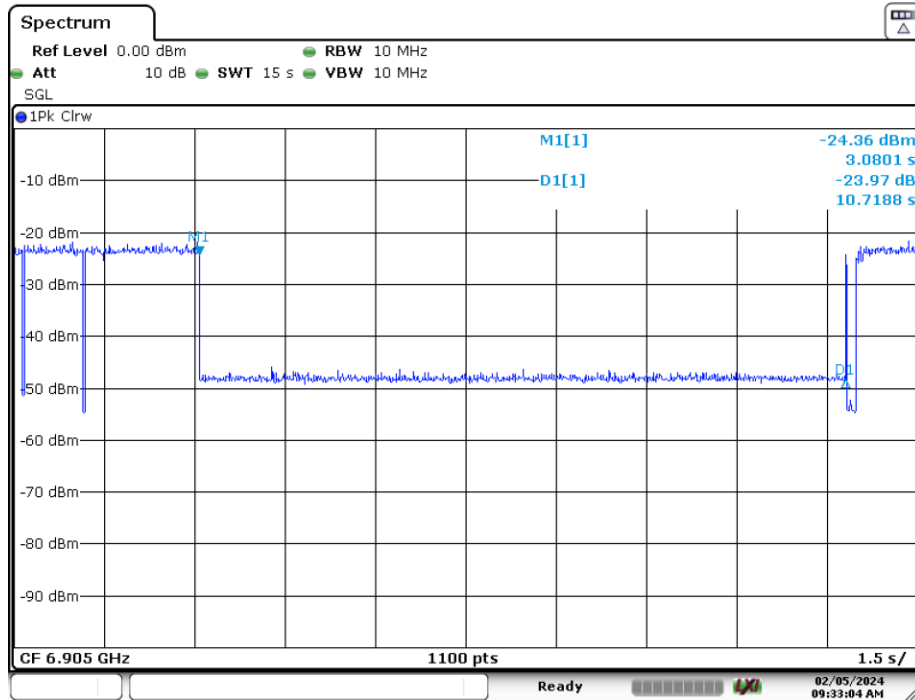


Date: 5.FEB.2024 09:33:54

**Plot 7-206. Contention Based Protocol Timing Plot (320MHz (UNII Band 8) – Ch. 191 Low)**

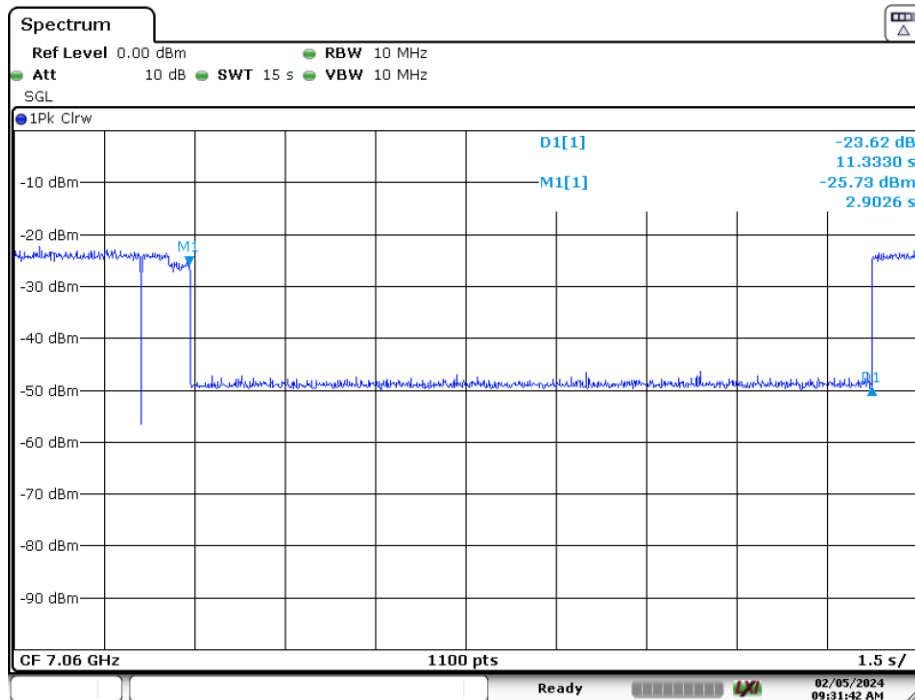
FCC ID: C3K2077 IC: 3048A-2077	<b>MEASUREMENT REPORT</b>		Approved by: Technical Manager
Test Report S/N: 1M2312040120-21-R2.C3K	Test Dates: 12/14/2023 - 05/20/2024	EUT Type: Portable Computing Device	Page 142 of 169





Date: 5.FEB.2024 09:33:04

**Plot 7-207. Contention Based Protocol Timing Plot (320MHz (UNII Band 8) – Ch. 191 Mid)**



Date: 5.FEB.2024 09:31:42

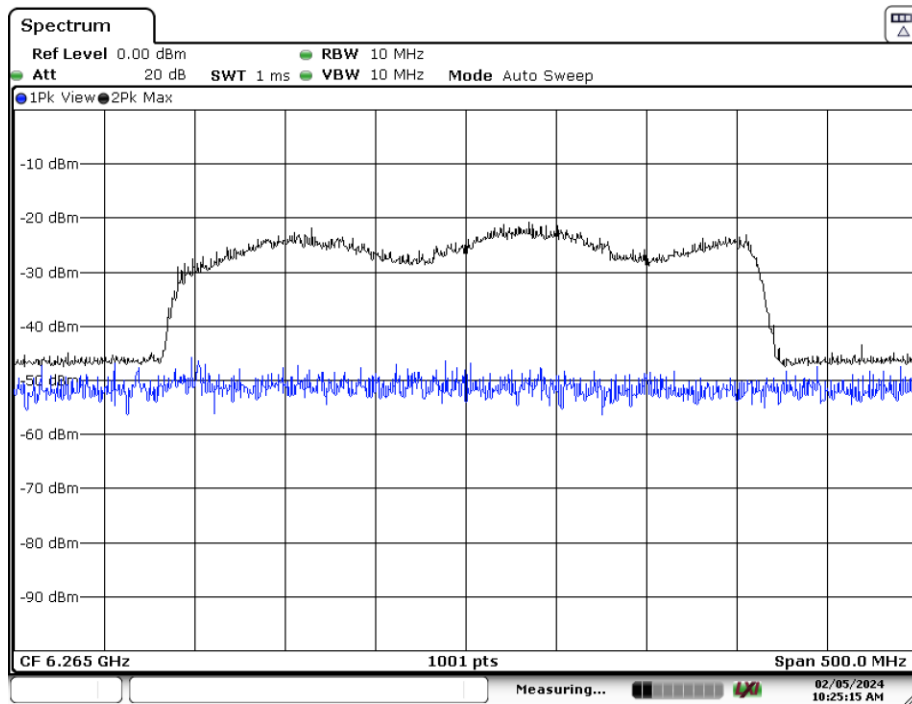
**Plot 7-208. Contention Based Protocol Timing Plot (320MHz (UNII Band 8) – Ch. 191 High)**

FCC ID: C3K2077 IC: 3048A-2077	<b>MEASUREMENT REPORT</b>		Approved by: Technical Manager
Test Report S/N: 1M2312040120-21-R2.C3K	Test Dates: 12/14/2023 - 05/20/2024	EUT Type: Portable Computing Device	Page 143 of 169

### 7.6.3 Channel Move Plots

This section demonstrates the effect of injecting the AWGN signal at various locations throughout the 320MHz signal. The black trace shows the full 320MHz signal prior to AWGN injection while the blue trace shows the spectrum following AWGN injection. The following items were observed as demonstrated in the three plots shown below:

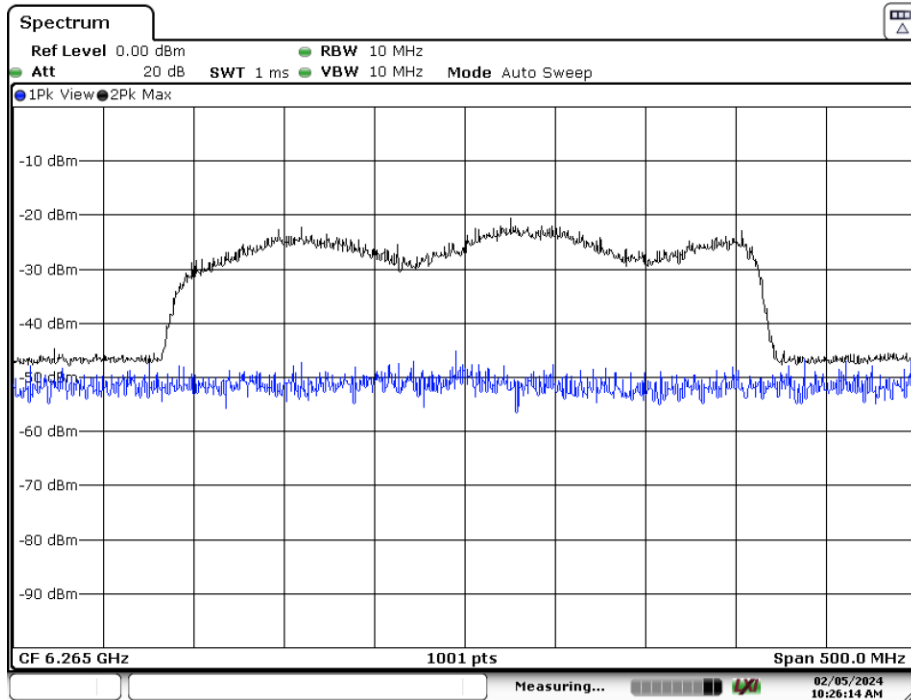
- When a 10 MHz AWGN signal centered at 6110 MHz (lower edge of channel) is injected, the channel completely stops transmitting.
- When a 10 MHz AWGN signal centered at 6265 MHz (middle of channel) is injected, the channel completely stops transmitting.
- When a 10 MHz AWGN signal centered at 6420 MHz (upper edge of channel) is injected, the channel reduces its operating bandwidth to 160MHz at the lower end of the spectrum.



Date: 5.FEB.2024 10:25:16

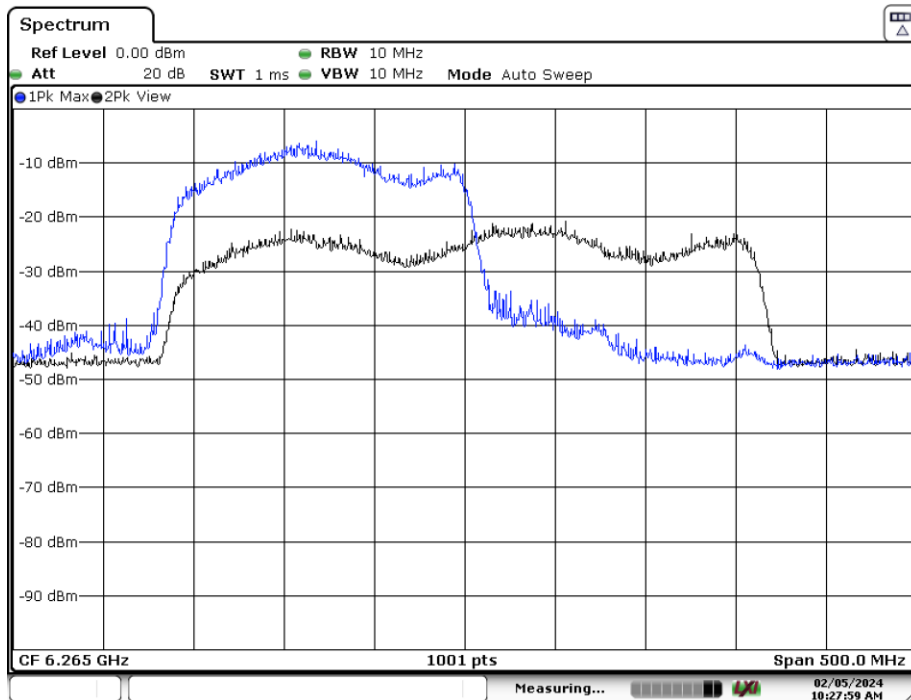
**Plot 7-209. CBP 320MHz Channel - Injection Lower Edge – [6110 MHz]**

FCC ID: C3K2077 IC: 3048A-2077	<b>MEASUREMENT REPORT</b>		Approved by: Technical Manager
Test Report S/N: 1M2312040120-21-R2.C3K	Test Dates: 12/14/2023 - 05/20/2024	EUT Type: Portable Computing Device	Page 144 of 169



Date: 5.FEB.2024 10:26:14

**Plot 7-210. CBP 320MHz Channel - Injection Center – [6265 MHz]**



Date: 5.FEB.2024 10:27:59

**Plot 7-211. CBP 320MHz Channel - Injection Upper Edge – [6420 MHz]**

FCC ID: C3K2077 IC: 3048A-2077	<b>MEASUREMENT REPORT</b>		Approved by: Technical Manager
Test Report S/N: 1M2312040120-21-R2.C3K	Test Dates: 12/14/2023 - 05/20/2024	EUT Type: Portable Computing Device	Page 145 of 169

## 7.7 Radiated Emission Measurements

### 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 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 [ $\mu$ V/m]	Measured Distance [Meters]
0.009 – 0.490 MHz	2400\F (kHz)	300
0.490 – 1.705 MHz	24000\F (kHz)	30
1.705 – 30.00 MHz	30	30
30.00 – 88.00 MHz	100	3
88.00 – 216.0 MHz	150	3
216.0 – 960.0 MHz	200	3
Above 960.0 MHz	500	3

**Table 7-42. Radiated Limits**

### Test Procedures Used

ANSI C63.10-2013 – Sections 12.7.7.2, 12.7.6, 12.7.5

### Test Settings – Above 1GHz

#### Average Field Strength Measurements (Method AD – Average Detection)

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  $\geq 2 \times \text{span} \backslash \backslash \text{RBW}$ )
6. Sweep time = auto
7. Trace (RMS) averaging was performed over at least 100 traces.

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**Peak Field Strength Measurements**

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.

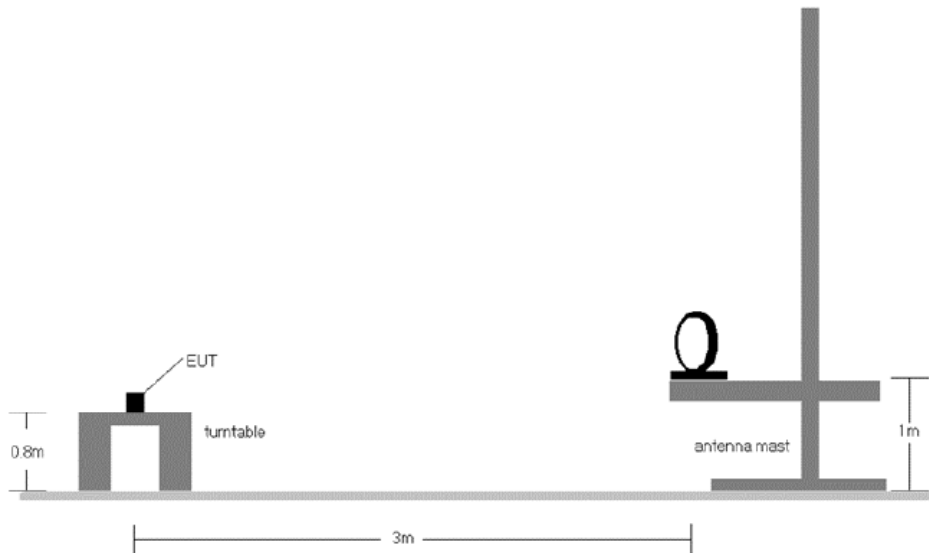
**Test Settings – Below 1GHz**

**Quasi-Peak Field Strength Measurements**

1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest.
2. RBW = 120kHz (for emissions from 30MHz – 1GHz)
3. Detector = quasi-peak
4. Sweep time = auto couple
5. Trace mode = max hold
6. Trace was allowed to stabilize.

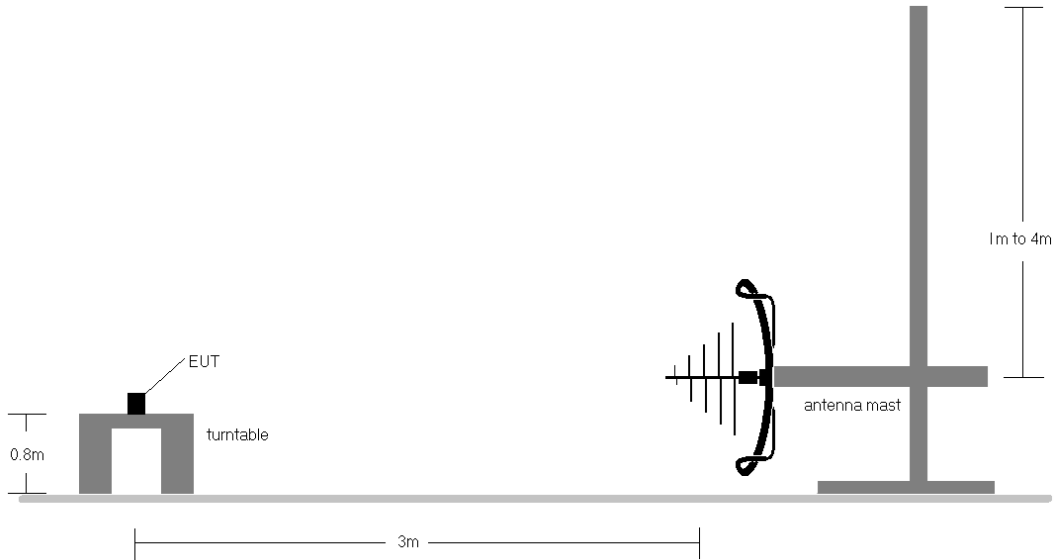
**Test Setup**

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

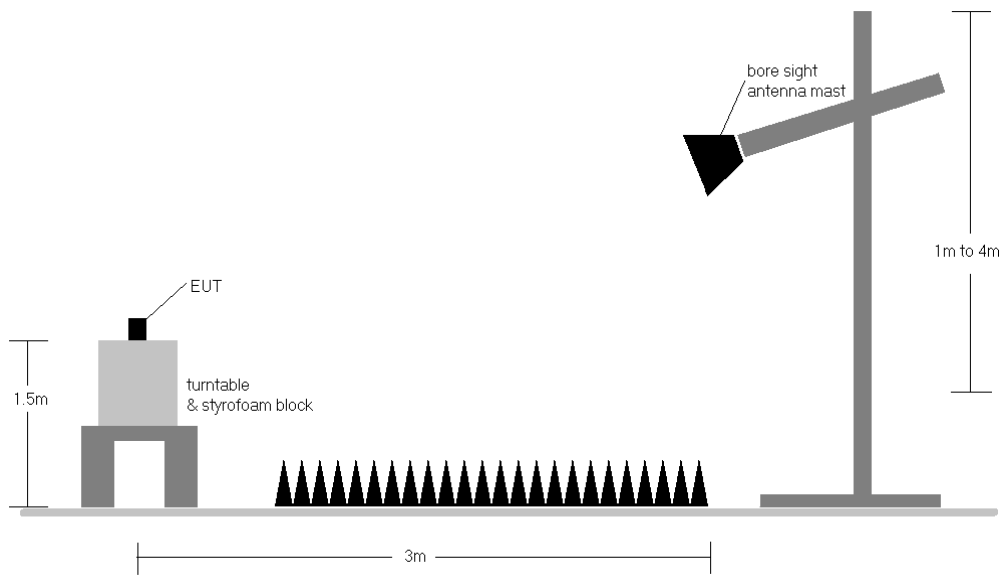


**Figure 7-6. Radiated Test Setup < 30MHz**

<b>FCC ID:</b> C3K2077 <b>IC:</b> 3048A-2077	<b>MEASUREMENT REPORT</b>		<b>Approved by:</b> Technical Manager
<b>Test Report S/N:</b> 1M2312040120-21-R2.C3K	<b>Test Dates:</b> 12/14/2023 - 05/20/2024	<b>EUT Type:</b> Portable Computing Device	Page 147 of 169



**Figure 7-7. Radiated Test Setup < 1GHz**



**Figure 7-8. Radiated Test Setup > 1GHz**

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<b>Test Report S/N:</b> 1M2312040120-21-R2.C3K	<b>Test Dates:</b> 12/14/2023 - 05/20/2024	<b>EUT Type:</b> Portable Computing Device	Page 148 of 169

**Test Notes**

1. All spurious emissions lying in restricted bands specified in §15.205 are below the limits specified in §15.209. All spurious emissions that do not lie in a restricted band are subject to an average limit of -27dBm/MHz. At 3 meters, the field strength limit in dB $\mu$ V/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 68.2dB $\mu$ V/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 [68.2dB $\mu$ V/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. The "-" shown in the following RSE tables are used to denote a noise floor measurement.
8. In the case where a peak-detector measurement passed the given RMS limit it was determined sufficient to demonstrate compliance.
9. The results recorded using the broadband antenna are known to correlate with the results obtained by using a tuned dipole with an acceptable degree of accuracy. The VSWR for the measurement antenna was found to be less than 2:1.

**Sample Calculations**

**Determining Spurious Emissions Levels**

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

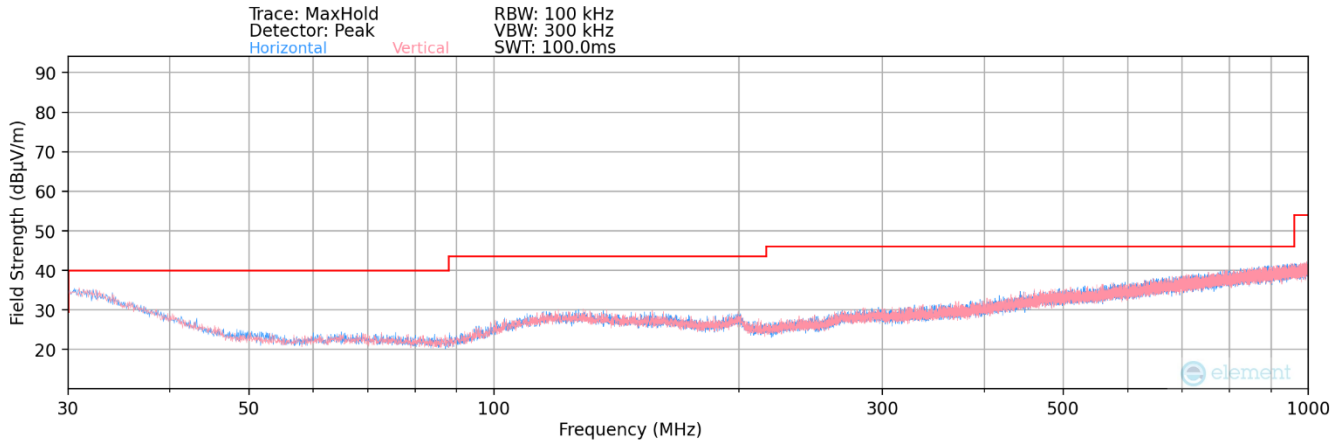
**Radiated Band Edge Measurement Offset**

The amplitude offset shown in the radiated restricted band edge plots was calculated using the formula:

$$\text{Offset (dB)} = (\text{Antenna Factor} + \text{Cable Loss} + \text{Attenuator}) - \text{Preamplifier Gain}$$

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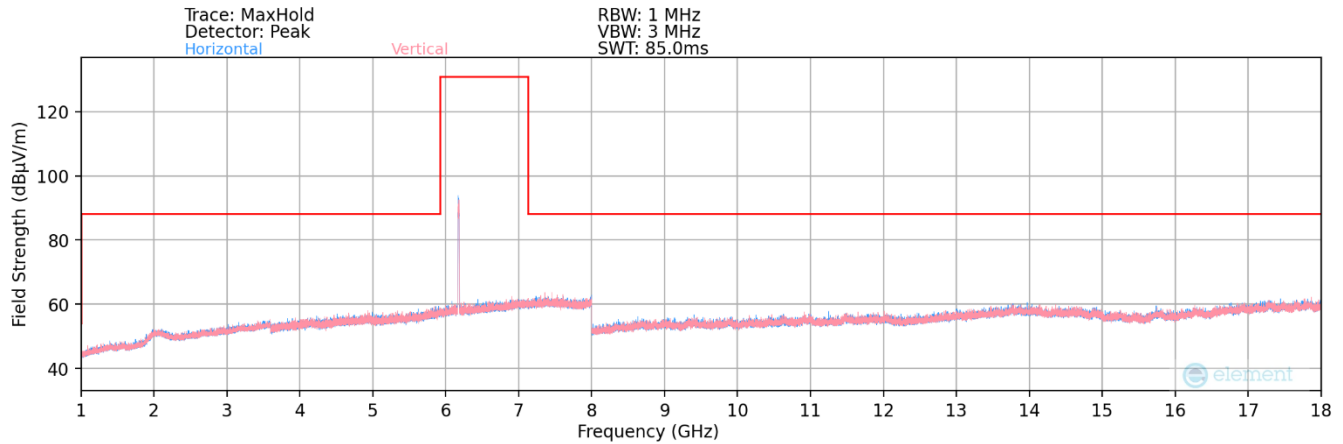
### 7.7.1 MIMO Radiated Spurious Emission Measurements



Plot 7-212. Radiated Spurious Plot below 1GHz MIMO (802.11a)

FCC ID: C3K2077 IC: 3048A-2077	<b>MEASUREMENT REPORT</b>		Approved by: Technical Manager
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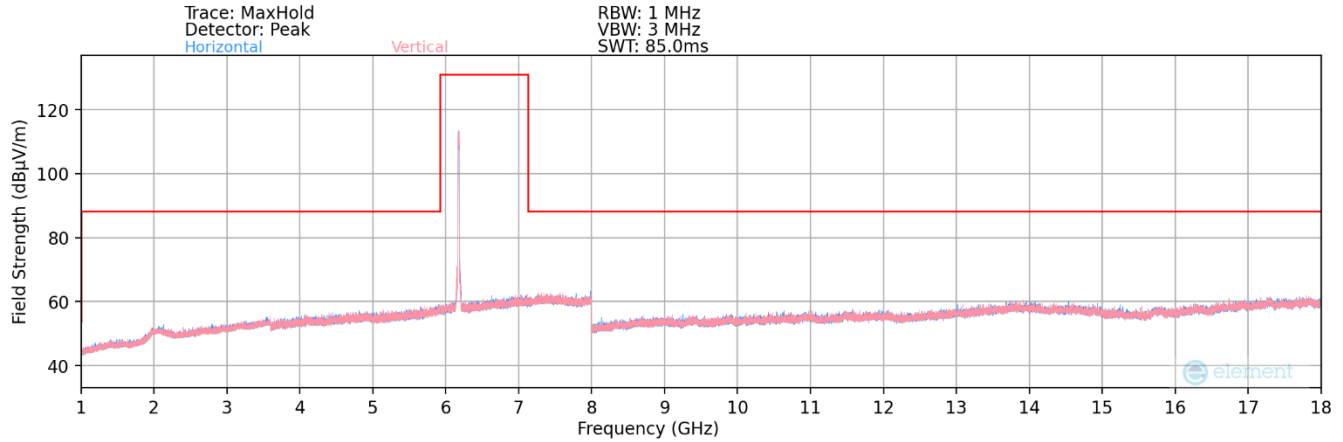


**Plot 7-213. Radiated Spurious Plot 1GHz – 18GHz MIMO (802.11a – UNII Band 5 Ch. 45 – LPI)**

Mode	Antenna	UNII Band	Channel	Test Channel Freq. [MHz]	Restricted	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]			
802.11a	MIMO	5	2	5935	*	11870.00	Average	V	-	-	-87.36	18.29	0.00	37.93	53.98	-16.05			
					*	11870.00	Peak	V	-	-	-76.78	18.29	0.00	48.51	73.98	-25.47			
					*	17805.00	Average	V	-	-	-84.76	26.25	0.00	48.49	53.98	-5.49			
					*	17805.00	Peak	V	-	-	-73.94	26.25	0.00	59.31	73.98	-14.67			
					*	23740.00	Average	V	-	-	-64.73	3.69	-9.54	36.42	53.98	-17.56			
					*	23740.00	Peak	V	-	-	-55.62	3.69	-9.54	45.54	73.98	-28.44			
									29675.00	Peak	V	-	-	-54.70	5.69	-9.54	48.45	68.20	-19.75
									12350.00	Average	V	-	-	-82.14	18.91	0.00	43.77	53.98	-10.21
									12350.00	Peak	V	-	-	-72.64	18.91	0.00	53.27	73.98	-20.71
									18525.00	Average	V	-	-	-64.54	1.35	-9.54	34.26	53.98	-19.72
									18525.00	Peak	V	-	-	-54.97	1.35	-9.54	43.84	73.98	-30.14
									24700.00	Peak	V	-	-	-55.38	3.92	-9.54	46.00	68.20	-22.20
									30875.00	Peak	V	-	-	-55.20	6.52	-9.54	48.77	68.20	-19.43
									12830.00	Peak	V	-	-	-72.37	20.01	0.00	54.64	68.20	-13.56
									19245.00	Average	V	-	-	-64.24	2.14	-9.54	35.36	53.98	-18.62
									19245.00	Peak	V	-	-	-54.56	2.14	-9.54	45.04	73.98	-28.94
									25660.00	Peak	V	-	-	-55.05	4.06	-9.54	46.47	68.20	-21.73
									32075.00	Peak	V	-	-	-54.88	7.31	-9.54	49.89	68.20	-18.31

**Table 7-43. Radiated Measurements MIMO – LPI**

FCC ID: C3K2077 IC: 3048A-2077	<b>MEASUREMENT REPORT</b>		Approved by: Technical Manager
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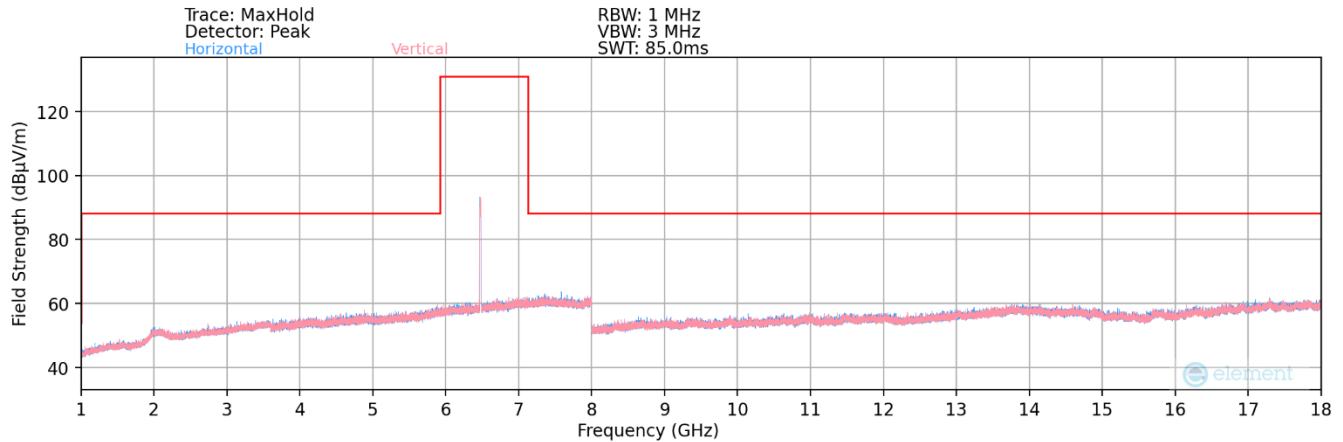


**Plot 7-214. Radiated Spurious Plot 1GHz – 18GHz MIMO (802.11a – UNII Band 5 Ch. 45 – SP)**

Mode	Antenna	UNII Band	Channel	Test Channel Freq. [MHz]	Restricted	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]
802.11a	MIMO	5	2	5935	*	11870.00	Average	V	-	-	-82.52	18.29	0.00	42.77	53.98	-11.21
					*	11870.00	Peak	V	-	-	-72.10	18.29	0.00	53.19	73.98	-20.79
					*	17805.00	Average	V	-	-	-82.45	26.25	0.00	50.80	53.98	-3.18
					*	17805.00	Peak	V	-	-	-72.42	26.25	0.00	60.83	73.98	-13.15
					*	23740.00	Average	V	-	-	-63.64	3.69	-9.54	37.52	53.98	-16.46
					*	23740.00	Peak	V	-	-	-54.69	3.69	-9.54	46.47	73.98	-27.51
			*	29675.00	Peak	V	-	-	-54.85	5.69	-9.54	48.30	68.20	-19.90		
			45	6175	*	12350.00	Average	V	-	-	-82.21	18.91	0.00	43.70	53.98	-10.28
					*	12350.00	Peak	V	-	-	-72.38	18.91	0.00	53.53	73.98	-20.45
					*	18525.00	Average	V	-	-	-63.81	1.35	-9.54	35.00	53.98	-18.98
					*	18525.00	Peak	V	-	-	-54.36	1.35	-9.54	44.45	73.98	-29.53
						24700.00	Peak	V	-	-	-54.43	3.92	-9.54	46.95	68.20	-21.25
			93	6415		30875.00	Peak	V	-	-	-54.46	6.52	-9.54	49.52	68.20	-18.68
						12830.00	Peak	V	-	-	-71.17	20.01	0.00	55.84	68.20	-12.36
					*	19245.00	Average	V	-	-	-63.66	2.14	-9.54	35.94	53.98	-18.04
					*	19245.00	Peak	V	-	-	-53.94	2.14	-9.54	45.66	73.98	-28.32
						25660.00	Peak	V	-	-	-54.26	4.06	-9.54	47.26	68.20	-20.94
				32075.00	Peak	V	-	-	-54.09	7.31	-9.54	50.67	68.20	-17.53		

**Table 7-44. Radiated Measurements MIMO - SP**

FCC ID: C3K2077 IC: 3048A-2077	<b>MEASUREMENT REPORT</b>		Approved by: Technical Manager
Test Report S/N: 1M2312040120-21-R2.C3K	Test Dates: 12/14/2023 - 05/20/2024	EUT Type: Portable Computing Device	Page 152 of 169

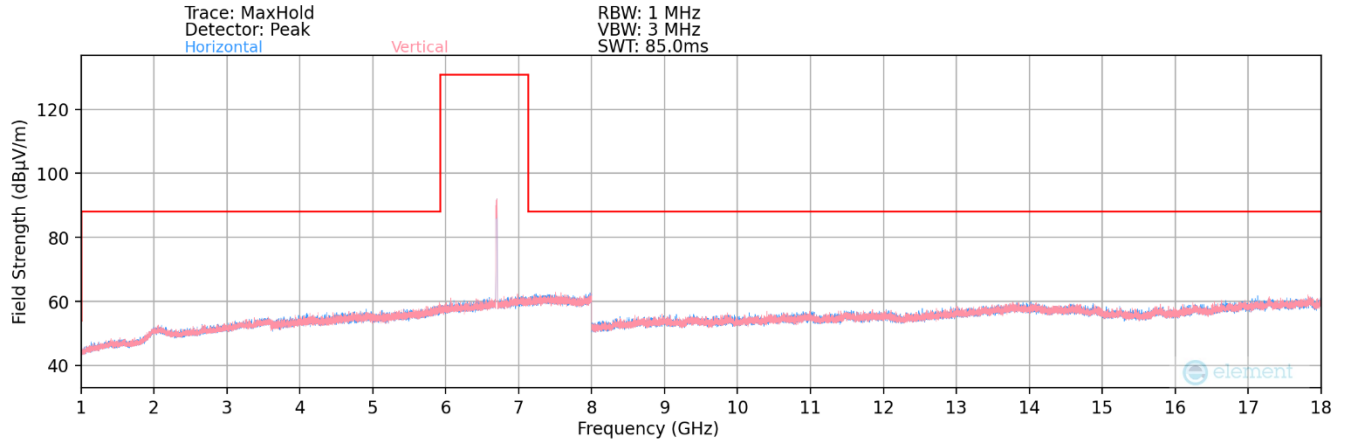


**Plot 7-215. Radiated Spurious Plot 1GHz – 18GHz MIMO (802.11a – UNII Band 6 Ch. 105 – LPI)**

Mode	Antenna	UNII Band	Channel	Test Channel Freq. [MHz]	Restricted	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]
802.11a	MIMO	6	97	6435		12870.00	Peak	V	-	-	-71.78	19.90	0.00	55.12	68.20	-13.08
					*	19305.00	Average	V	-	-	-63.95	1.91	-9.54	35.42	53.98	-18.56
					*	19305.00	Peak	V	-	-	-55.30	1.91	-9.54	44.07	73.98	-29.91
						25740.00	Peak	V	-	-	-55.53	4.17	-9.54	46.10	68.20	-22.10
						32175.00	Peak	V	-	-	-54.39	7.29	-9.54	50.36	68.20	-17.84
			105	6475		12950.00	Peak	V	-	-	-72.42	19.98	0.00	54.56	68.20	-13.64
					*	19425.00	Average	V	-	-	-64.03	2.00	-9.54	35.43	53.98	-18.55
					*	19425.00	Peak	V	-	-	-55.52	2.00	-9.54	43.94	73.98	-30.04
						25900.00	Peak	V	-	-	-54.62	4.35	-9.54	47.19	68.20	-21.01
						32375.00	Peak	V	-	-	-54.19	6.96	-9.54	50.23	68.20	-17.97
			113	6515		13030.00	Peak	V	-	-	-73.11	20.51	0.00	54.40	68.20	-13.80
					*	19545.00	Average	V	-	-	-63.91	2.03	-9.54	35.58	53.98	-18.40
					*	19545.00	Peak	V	-	-	-54.35	2.03	-9.54	45.14	73.98	-28.84
						26060.00	Peak	V	-	-	-54.88	4.52	-9.54	47.09	68.20	-21.11
						32575.00	Peak	V	-	-	-53.97	6.28	-9.54	49.77	68.20	-18.43

**Table 7-45. Radiated Measurements MIMO – LPI**

FCC ID: C3K2077 IC: 3048A-2077	<b>MEASUREMENT REPORT</b>		Approved by: Technical Manager
Test Report S/N: 1M2312040120-21-R2.C3K	Test Dates: 12/14/2023 - 05/20/2024	EUT Type: Portable Computing Device	Page 153 of 169

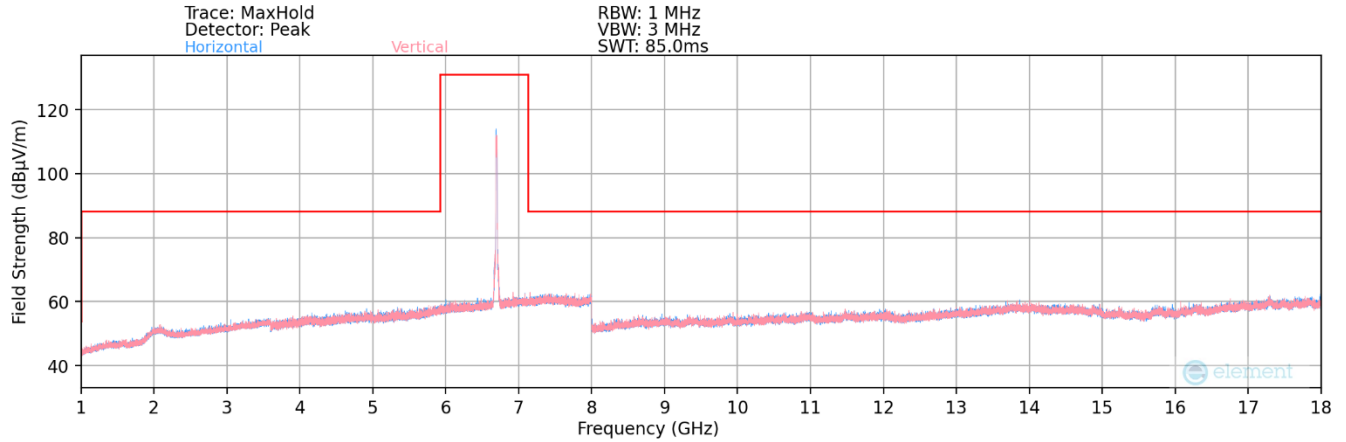


**Plot 7-216. Radiated Spurious Plot 1GHz – 18GHz MIMO (802.11a – UNII Band 7 Ch. 149 – LPI)**

Mode	Antenna	UNII Band	Channel	Test Channel Freq. [MHz]	Restricted	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]
802.11a	MIMO	7	117	6535		13070.00	Peak	V	-	-	-72.60	20.30	0.00	54.70	68.20	-13.50
					*	19605.00	Average	V	-	-	-63.29	2.44	-9.54	36.61	53.98	-17.37
					*	19605.00	Peak	V	-	-	-53.78	2.44	-9.54	46.12	73.98	-27.86
						26140.00	Peak	V	-	-	-53.59	4.36	-9.54	48.23	68.20	-19.97
						32675.00	Peak	V	-	-	-54.11	6.52	-9.54	49.86	68.20	-18.34
			149	6695	*	13390.00	Average	V	-	-	-82.53	20.99	0.00	45.46	53.98	-8.52
					*	13390.00	Peak	V	-	-	-72.11	20.99	0.00	55.88	73.98	-18.10
					*	20085.00	Average	V	-	-	-63.41	2.83	-9.54	36.88	53.98	-17.10
					*	20085.00	Peak	V	-	-	-54.03	2.83	-9.54	46.27	73.98	-27.71
						26780.00	Peak	V	-	-	-54.09	4.33	-9.54	47.71	68.20	-20.49
			185	6875		13750.00	Peak	V	-	-	-72.15	21.49	0.00	56.34	68.20	-11.86
					*	20625.00	Average	V	-	-	-63.46	3.19	-9.54	37.19	53.98	-16.79
					*	20625.00	Peak	V	-	-	-54.59	3.19	-9.54	46.07	73.98	-27.91
						27500.00	Peak	V	-	-	-53.84	4.29	-9.54	47.91	68.20	-20.29
						34375.00	Peak	V	-	-	-54.07	7.64	-9.54	51.03	68.20	-17.17

**Table 7-46. Radiated Measurements MIMO – LPI**

FCC ID: C3K2077 IC: 3048A-2077	<b>MEASUREMENT REPORT</b>		Approved by: Technical Manager
Test Report S/N: 1M2312040120-21-R2.C3K	Test Dates: 12/14/2023 - 05/20/2024	EUT Type: Portable Computing Device	Page 154 of 169

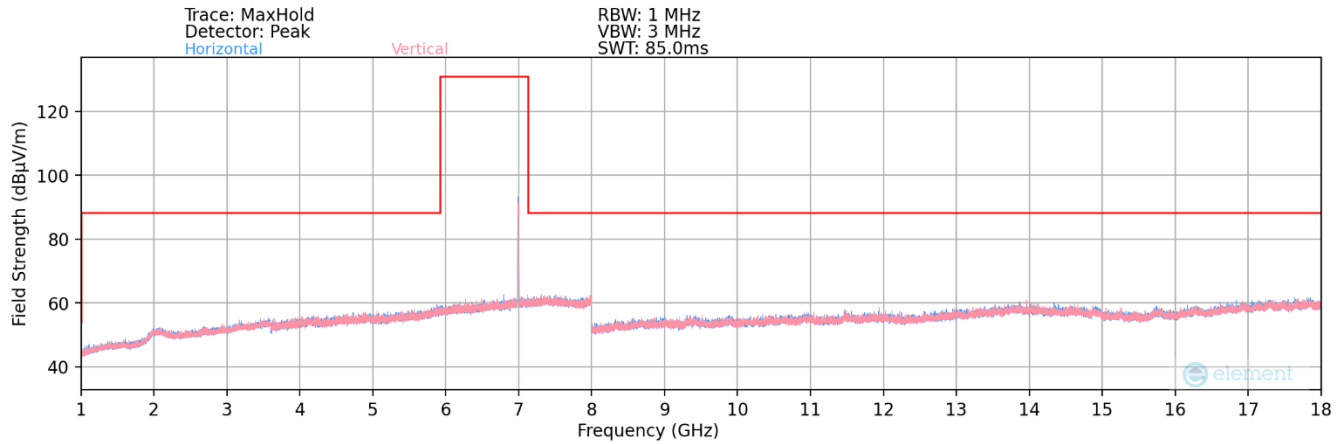


**Plot 7-217. Radiated Spurious Plot 1GHz – 18GHz MIMO (802.11a – UNII Band 7 Ch. 149 – SP)**

Mode	Antenna	UNII Band	Channel	Test Channel Freq. [MHz]	Restricted	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]
802.11a	MIMO	7	117	6535		13070.00	Peak	V	-	-	-71.62	20.30	0.00	55.68	68.20	-12.52
					*	19605.00	Average	V	-	-	-63.10	1.91	-9.54	36.27	53.98	-17.71
					*	19605.00	Peak	V	-	-	-54.26	1.91	-9.54	45.11	73.98	-28.87
						26140.00	Peak	V	-	-	-53.19	4.17	-9.54	48.44	68.20	-19.76
						32675.00	Peak	V	-	-	-54.39	7.29	-9.54	50.35	68.20	-17.85
			149	6695	*	13390.00	Average	V	-	-	-83.35	20.99	0.00	44.64	53.98	-9.34
					*	13390.00	Peak	V	-	-	-72.10	20.99	0.00	55.89	73.98	-18.09
					*	20085.00	Average	V	-	-	-63.11	2.00	-9.54	36.35	53.98	-17.63
					*	20085.00	Peak	V	-	-	-54.15	2.00	-9.54	45.31	73.98	-28.67
						26780.00	Peak	V	-	-	-54.63	4.35	-9.54	47.18	68.20	-21.02
			185	6875		33475.00	Peak	V	-	-	-54.14	6.96	-9.54	50.28	68.20	-17.92
						13750.00	Peak	V	-	-	-72.42	21.49	0.00	56.07	68.20	-12.13
					*	20625.00	Average	V	-	-	-63.65	2.03	-9.54	35.84	53.98	-18.14
					*	20625.00	Peak	V	-	-	-53.87	2.03	-9.54	45.62	73.98	-28.36
						27500.00	Peak	V	-	-	-54.51	4.52	-9.54	47.47	68.20	-20.73
	34375.00	Peak	V	-	-	-53.86	6.28	-9.54	49.88	68.20	-18.32					

**Table 7-47. Radiated Measurements MIMO – SP**

FCC ID: C3K2077 IC: 3048A-2077	<b>MEASUREMENT REPORT</b>		Approved by: Technical Manager
Test Report S/N: 1M2312040120-21-R2.C3K	Test Dates: 12/14/2023 - 05/20/2024	EUT Type: Portable Computing Device	Page 155 of 169

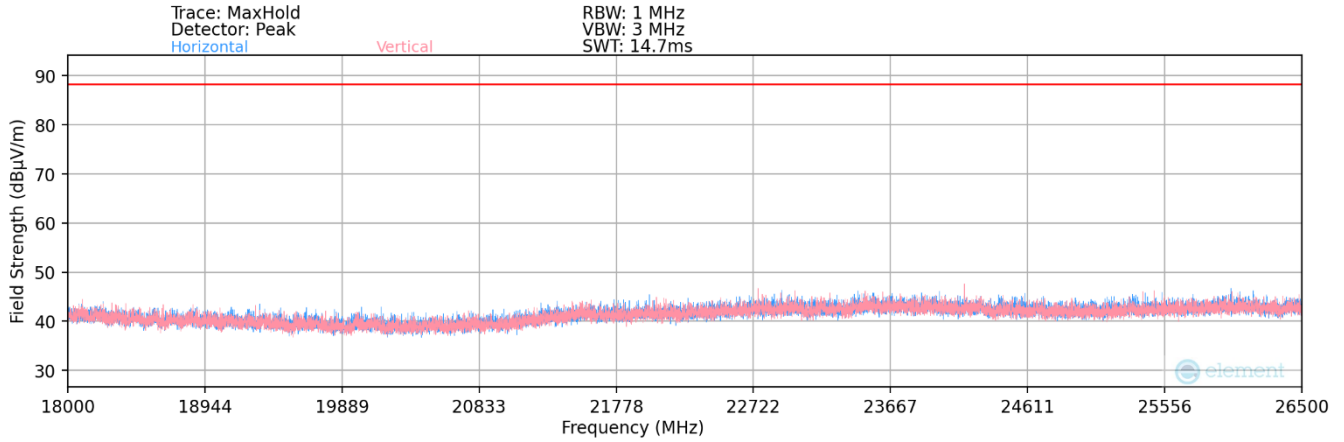


**Plot 7-218. Radiated Spurious Plot 1GHz – 18GHz MIMO (802.11a – U Band 8 Ch. 209 – LPI)**

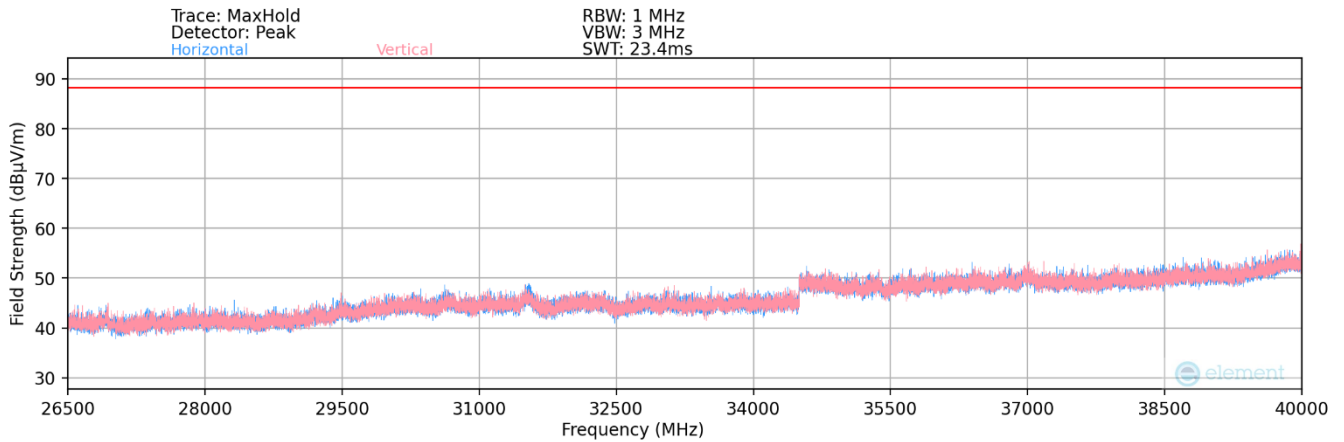
Mode	Antenna	UNII Band	Channel	Test Channel Freq. [MHz]	Restricted	Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
802.11a	MIMO	8	189	6895		13790.00	Peak	V	-	-	-71.27	21.54	0.00	57.27	68.20	-10.93
					*	20685.00	Average	V	-	-	-63.90	3.44	-9.54	37.00	53.98	-16.98
					*	20685.00	Peak	V	-	-	-55.04	3.44	-9.54	45.86	73.98	-28.12
						27580.00	Peak	V	-	-	-53.93	4.41	-9.54	47.93	68.20	-20.27
						34475.00	Peak	V	-	-	-54.01	7.51	-9.54	50.97	68.20	-17.23
			209	6995		13990.00	Peak	V	-	-	-71.01	21.22	0.00	57.21	68.20	-10.99
					*	20985.00	Average	V	-	-	-63.75	3.43	-9.54	37.14	53.98	-16.84
					*	20985.00	Peak	V	-	-	-54.92	3.43	-9.54	45.97	73.98	-28.01
						27980.00	Peak	V	-	-	-54.51	4.64	-9.54	47.59	68.20	-20.61
						34975.00	Peak	V	-	-	-53.20	7.84	-9.54	52.10	68.20	-16.10
			233	7115		14230.00	Peak	V	-	-	-71.58	21.98	0.00	57.40	68.20	-10.80
					*	21345.00	Average	V	-	-	-64.05	3.85	-9.54	37.26	53.98	-16.71
					*	21345.00	Peak	V	-	-	-54.98	3.85	-9.54	46.34	73.98	-27.64
						28460.00	Peak	V	-	-	-54.76	4.80	-9.54	47.50	68.20	-20.70
						35575.00	Peak	V	-	-	-53.50	7.95	-9.54	51.91	68.20	-16.29

**Table 7-48. Radiated Measurements MIMO – LPI**

FCC ID: C3K2077 IC: 3048A-2077	<b>MEASUREMENT REPORT</b>		Approved by: Technical Manager
Test Report S/N: 1M2312040120-21-R2.C3K	Test Dates: 12/14/2023 - 05/20/2024	EUT Type: Portable Computing Device	Page 156 of 169



**Plot 7-219. Radiated Spurious Plot 18GHz - 26.5GHz (802.11a)**

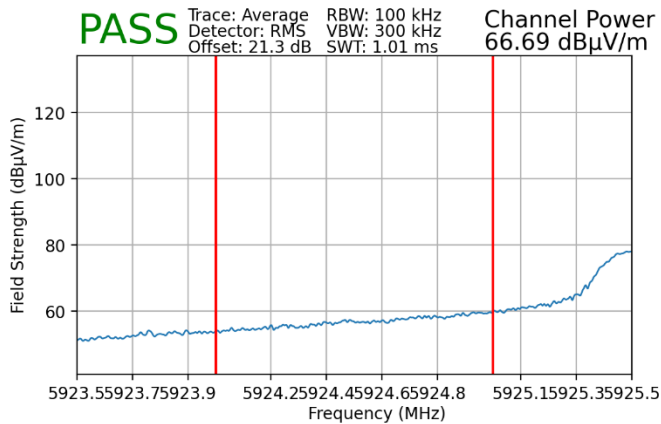


**Plot 7-220. Radiated Spurious Plot 26.5GHz - 40GHz (802.11a)**

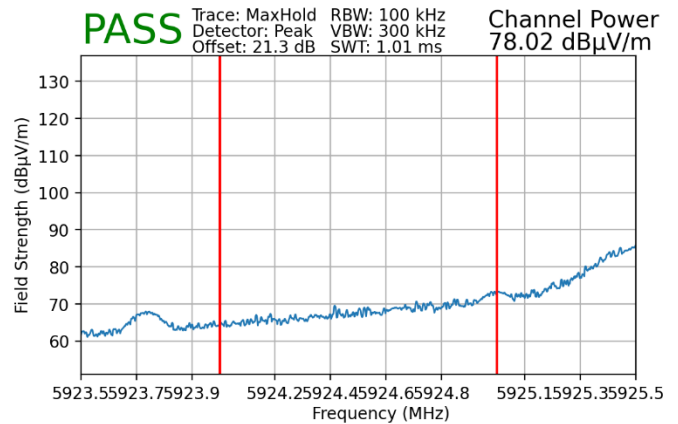
<b>FCC ID:</b> C3K2077 <b>IC:</b> 3048A-2077	<b>MEASUREMENT REPORT</b>		<b>Approved by:</b> Technical Manager
<b>Test Report S/N:</b> 1M2312040120-21-R2.C3K	<b>Test Dates:</b> 12/14/2023 - 05/20/2024	<b>EUT Type:</b> Portable Computing Device	Page 157 of 169

## 7.7.2 MIMO Radiated Band Edge Measurements (20MHz BW)

Worst Case Mode:	802.11be
Worst Case Transfer Rate:	MCS0
Distance of Measurements:	3 Meters
Operating Frequency:	5935MHz
Channel:	2

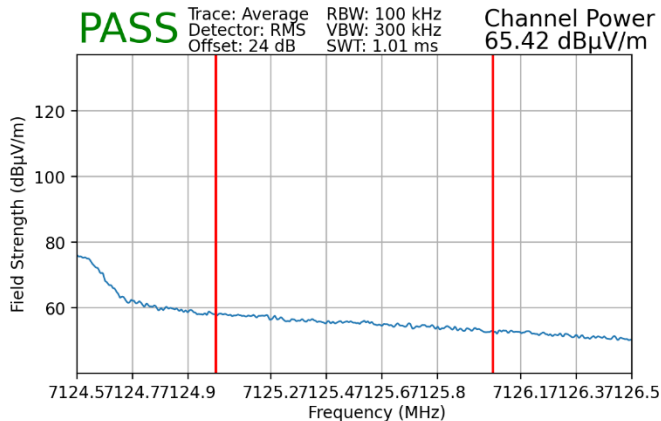


**Plot 7-221. Radiated Lower Band Edge Plot MIMO (Average – UNII Band 5)**

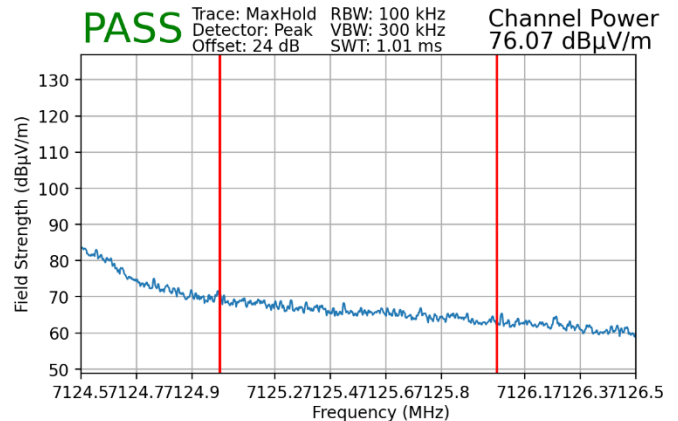


**Plot 7-222. Radiated Lower Band Edge Plot MIMO (Peak – UNII Band 5)**

Worst Case Mode:	802.11ax
Worst Case Transfer Rate:	MSC0
Distance of Measurements:	3 Meters
Operating Frequency:	7115MHz
Channel:	233



**Plot 7-223. Radiated Upper Band Edge Plot MIMO (Average – UNII Band 8)**



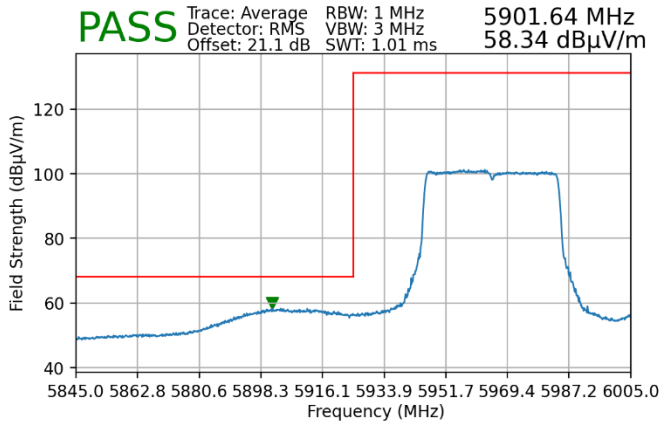
**Plot 7-224. Radiated Upper Band Edge Plot MIMO (Peak – UNII Band 8)**

FCC ID: C3K2077 IC: 3048A-2077	<b>MEASUREMENT REPORT</b>		Approved by: Technical Manager
Test Report S/N: 1M2312040120-21-R2.C3K	Test Dates: 12/14/2023 - 05/20/2024	EUT Type: Portable Computing Device	Page 158 of 169

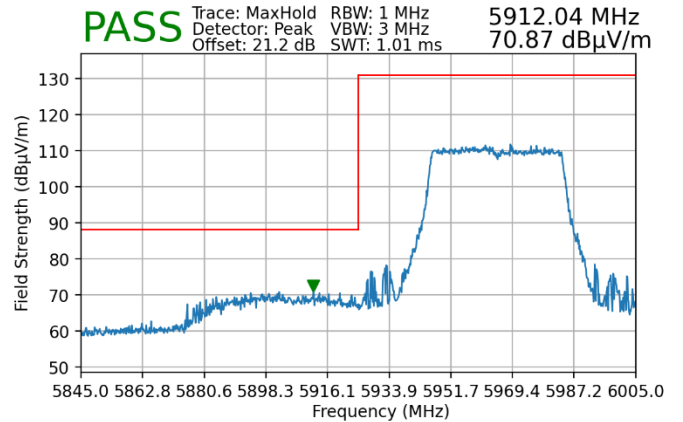


### 7.7.3 MIMO Radiated Band Edge Measurements (40MHz BW)

Worst Case Mode:	802.11ax
Worst Case Transfer Rate:	MCS0
Distance of Measurements:	3 Meters
Operating Frequency:	5965MHz
Channel:	3

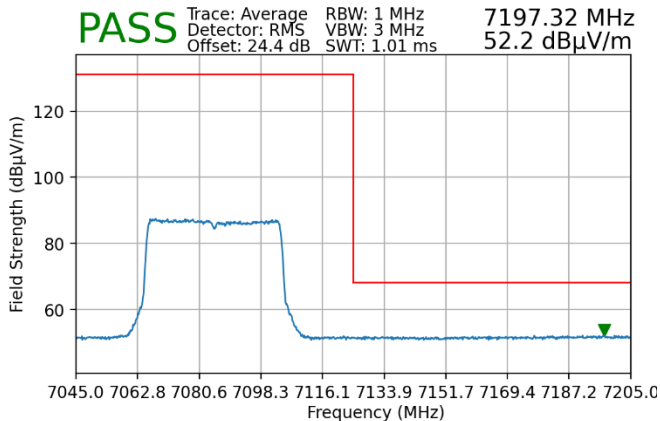


**Plot 7-225. Radiated Lower Band Edge Plot MIMO (Average – UNII Band 5)**

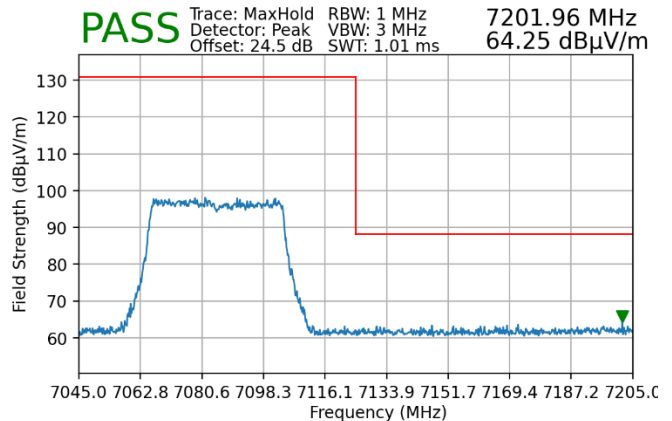


**Plot 7-226. Radiated Lower Band Edge Plot MIMO (Peak – UNII Band 5)**

Worst Case Mode:	802.11be
Worst Case Transfer Rate:	MCS0
Distance of Measurements:	3 Meters
Operating Frequency:	7085MHz
Channel:	227



**Plot 7-227. Radiated Upper Band Edge Plot MIMO (Average – UNII Band 8)**

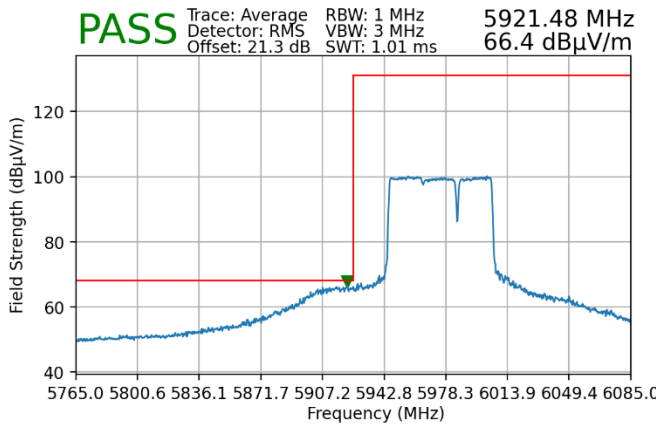


**Plot 7-228. Radiated Upper Band Edge Plot MIMO (Peak – UNII Band 8)**

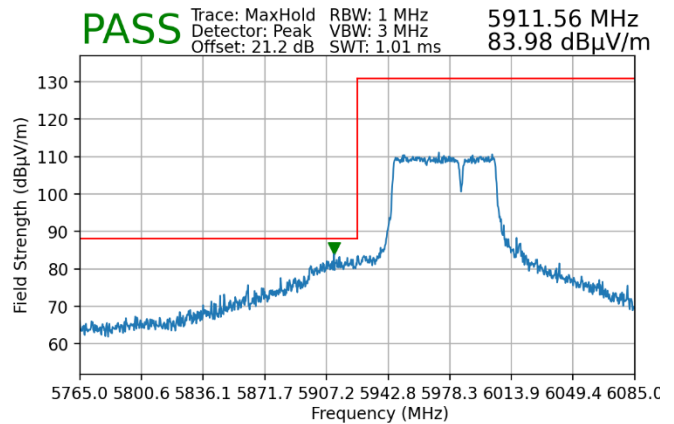
FCC ID: C3K2077 IC: 3048A-2077	<b>MEASUREMENT REPORT</b>		Approved by: Technical Manager
Test Report S/N: 1M2312040120-21-R2.C3K	Test Dates: 12/14/2023 - 05/20/2024	EUT Type: Portable Computing Device	Page 159 of 169

### 7.7.4 MIMO Radiated Band Edge Measurements (80MHz BW)

Worst Case Mode:	802.11be
Worst Case Transfer Rate:	MCS0
Distance of Measurements:	3 Meters
Operating Frequency:	5985MHz
Channel:	7

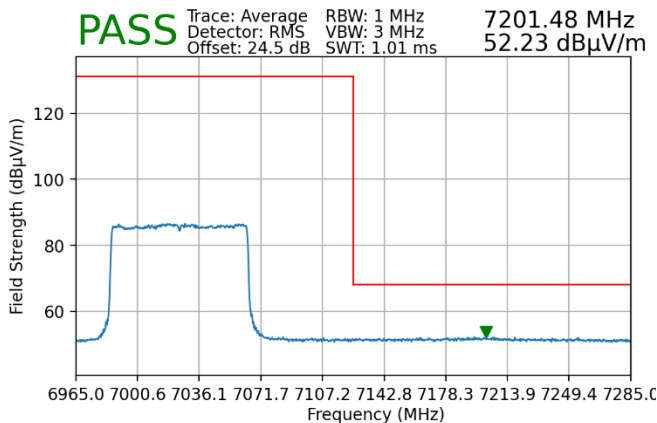


**Plot 7-229. Radiated Lower Band Edge Plot MIMO (Average – UNII Band 5)**

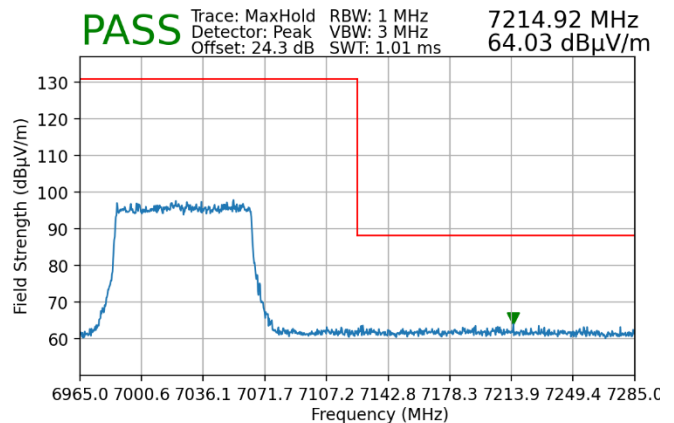


**Plot 7-230. Radiated Lower Band Edge Plot MIMO (Peak – UNII Band 5)**

Worst Case Mode:	802.11ax
Worst Case Transfer Rate:	MCS0
Distance of Measurements:	3 Meters
Operating Frequency:	7025MHz
Channel:	215



**Plot 7-231. Radiated Upper Band Edge Plot MIMO (Average – UNII Band 8)**

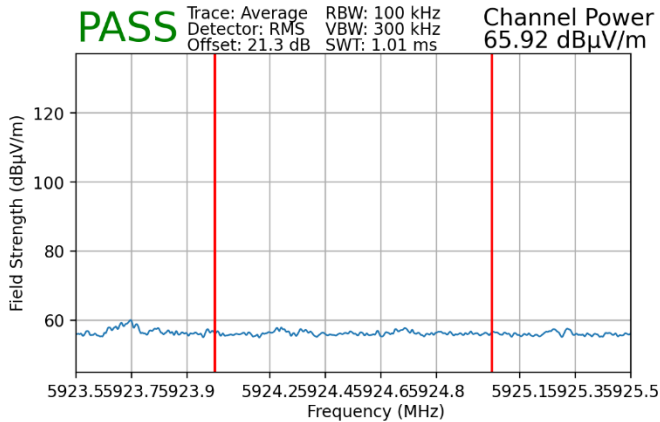


**Plot 7-232. Radiated Upper Band Edge Plot MIMO (Peak – UNII Band 8)**

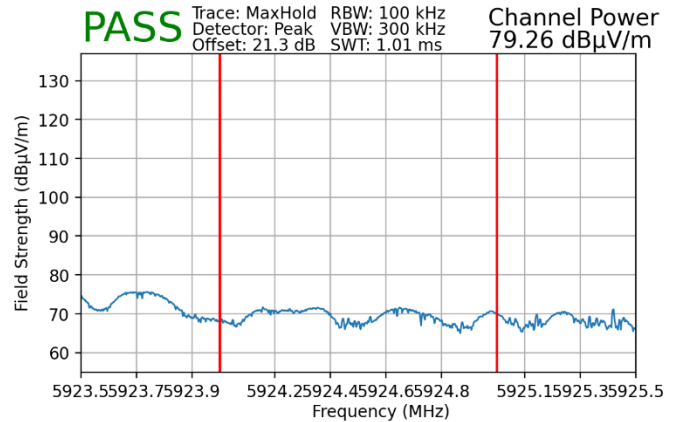
FCC ID: C3K2077 IC: 3048A-2077	<b>MEASUREMENT REPORT</b>		Approved by: Technical Manager
Test Report S/N: 1M2312040120-21-R2.C3K	Test Dates: 12/14/2023 - 05/20/2024	EUT Type: Portable Computing Device	Page 160 of 169

### 7.7.5 MIMO Radiated Band Edge Measurements (160MHz BW)

Worst Case Mode:	802.11be
Worst Case Transfer Rate:	MCS0
Distance of Measurements:	3 Meters
Operating Frequency:	6025MHz
Channel:	15

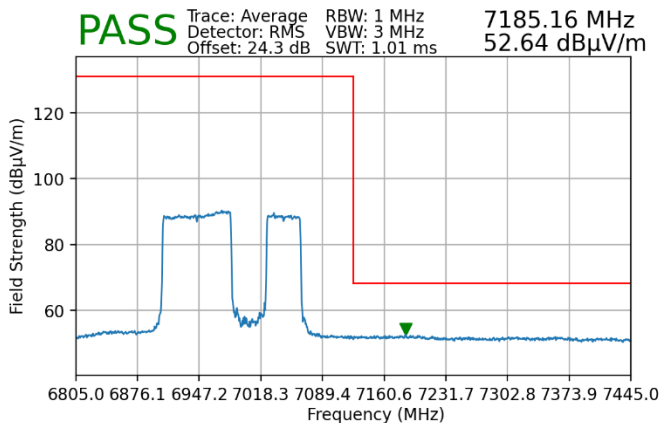


**Plot 7-233. Radiated Lower Band Edge Plot MIMO (Average – UNII Band 5)**

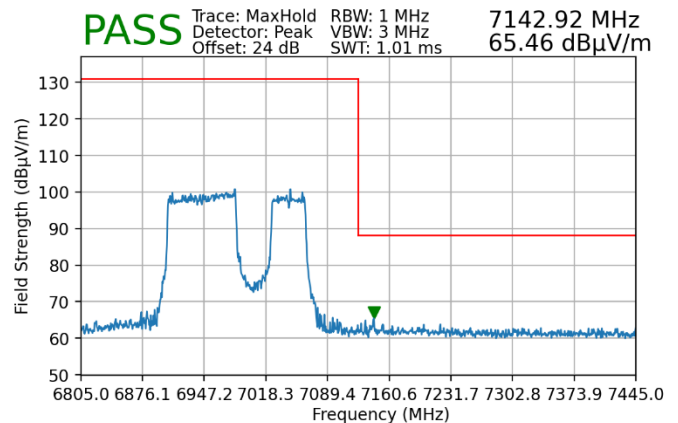


**Plot 7-234. Radiated Lower Band Edge Plot MIMO (Peak – UNII Band 5)**

Worst Case Mode:	802.11be
Worst Case Transfer Rate:	MCS0
Distance of Measurements:	3 Meters
Operating Frequency:	6985MHz
Channel:	207



**Plot 7-235. Radiated Upper Band Edge Plot MIMO (Average – UNII Band 8)**

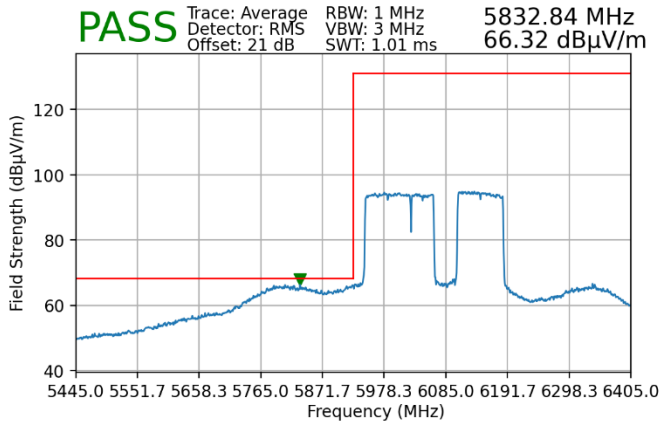


**Plot 7-236. Radiated Upper Band Edge Plot MIMO (Peak – UNII Band 8)**

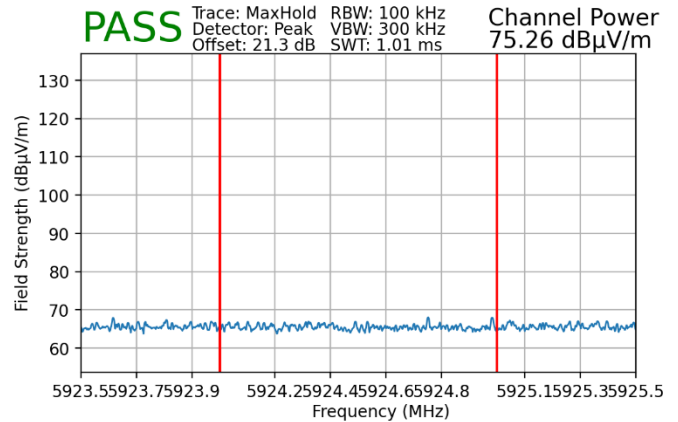
FCC ID: C3K2077 IC: 3048A-2077	<b>MEASUREMENT REPORT</b>		Approved by: Technical Manager
Test Report S/N: 1M2312040120-21-R2.C3K	Test Dates: 12/14/2023 - 05/20/2024	EUT Type: Portable Computing Device	Page 161 of 169

### 7.7.6 MIMO Radiated Band Edge Measurements (320MHz BW)

Worst Case Mode:	802.11be
Worst Case Transfer Rate:	MCS0
Distance of Measurements:	3 Meters
Operating Frequency:	6105MHz
Channel:	31

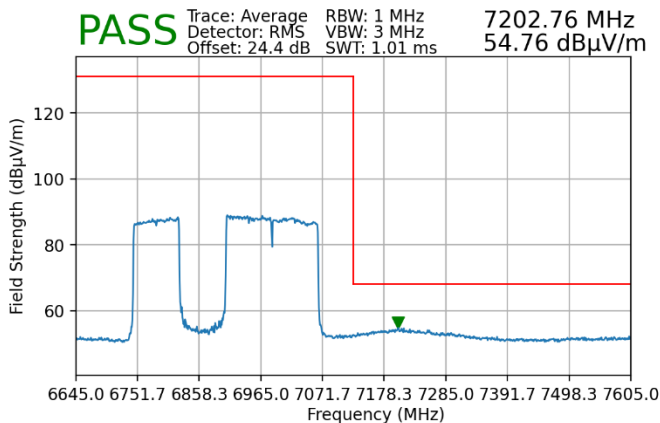


**Plot 7-237. Radiated Lower Band Edge Plot MIMO (Average – UNII Band 5)**

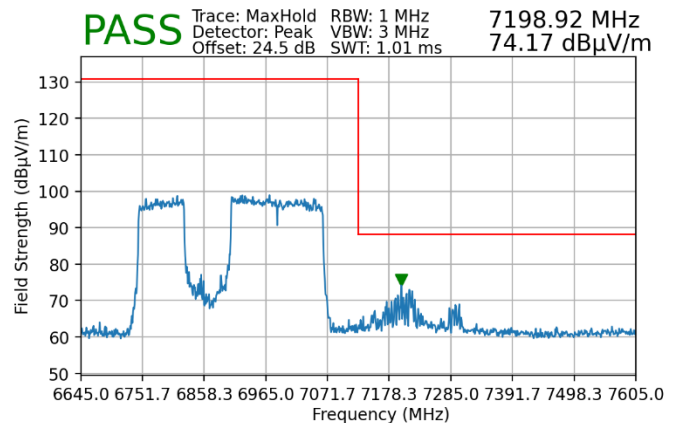


**Plot 7-238. Radiated Lower Band Edge Plot MIMO (Peak – UNII Band 5)**

Worst Case Mode:	802.11be
Worst Case Transfer Rate:	MCS0
Distance of Measurements:	3 Meters
Operating Frequency:	6905MHz
Channel:	191



**Plot 7-239. Radiated Upper Band Edge Plot MIMO (Average – UNII Band 8)**



**Plot 7-240. Radiated Upper Band Edge Plot MIMO (Peak – UNII Band 8)**

FCC ID: C3K2077 IC: 3048A-2077	<b>MEASUREMENT REPORT</b>		Approved by: Technical Manager
Test Report S/N: 1M2312040120-21-R2.C3K	Test Dates: 12/14/2023 - 05/20/2024	EUT Type: Portable Computing Device	Page 162 of 169

## 7.8 Line Conducted Test Data

### Test Overview and Limit

All AC line conducted spurious emissions are measured with a receiver connected to a grounded LISN while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies. All data rates and modes were investigated for conducted spurious emissions. Only the conducted emissions of the configuration that produced the worst-case emissions are reported in this section.

**All conducted emissions must not exceed the limits shown in the table below, per Section 15.207.**

Frequency of emission (MHz)	Conducted Limit (dB $\mu$ V)	
	Quasi-peak	Average
0.15 – 0.5	66 to 56*	56 to 46*
0.5 – 5	56	46
5 – 30	60	50

**Table 7-49. Conducted Limits**

\*Decreases with the logarithm of the frequency.

### Test Procedures Used

ANSI C63.10-2013, Section 6.2

### Test Settings

#### Quasi-Peak Field Strength Measurements

1. Analyzer center frequency was set to the frequency of the spurious emission of interest.
2. RBW = 9kHz (for emissions from 150kHz – 30MHz)
3. Detector = quasi-peak
4. Sweep time = auto couple
5. Trace mode = max hold
6. Trace was allowed to stabilize.

#### Average Field Strength Measurements

1. Analyzer center frequency was set to the frequency of the spurious emission of interest.
2. RBW = 9kHz (for emissions from 150kHz – 30MHz)
3. Detector = RMS
4. Sweep time = auto couple
5. Trace mode = max hold
6. Trace was allowed to stabilize.

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### Test Setup

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

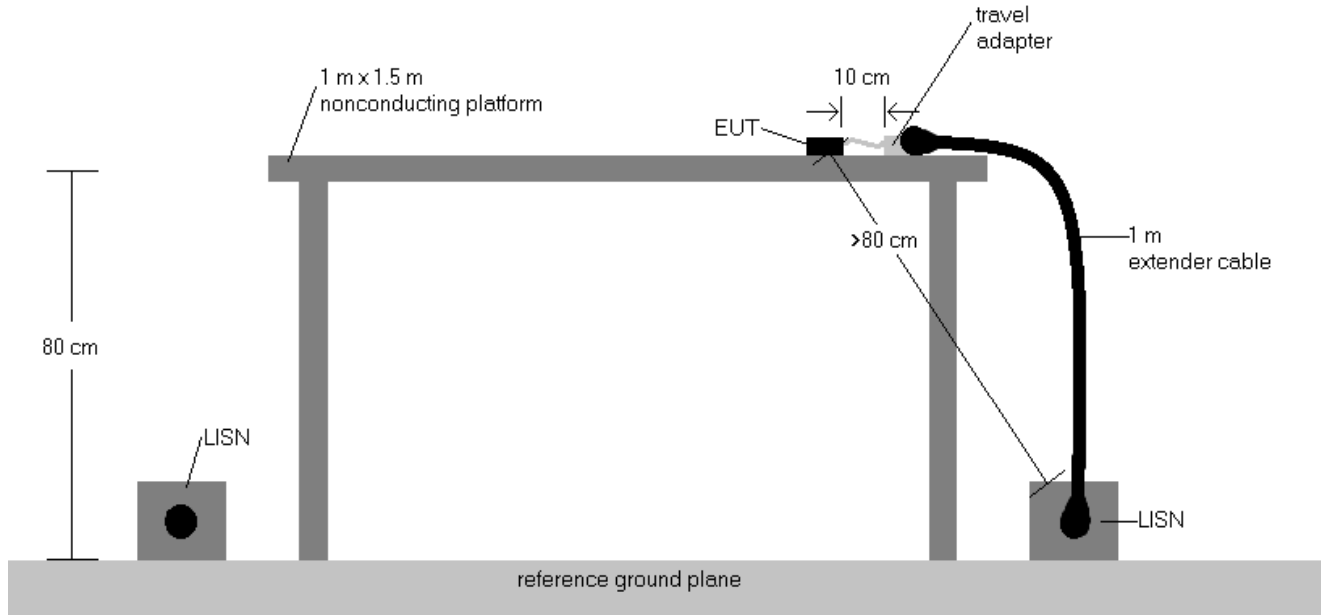
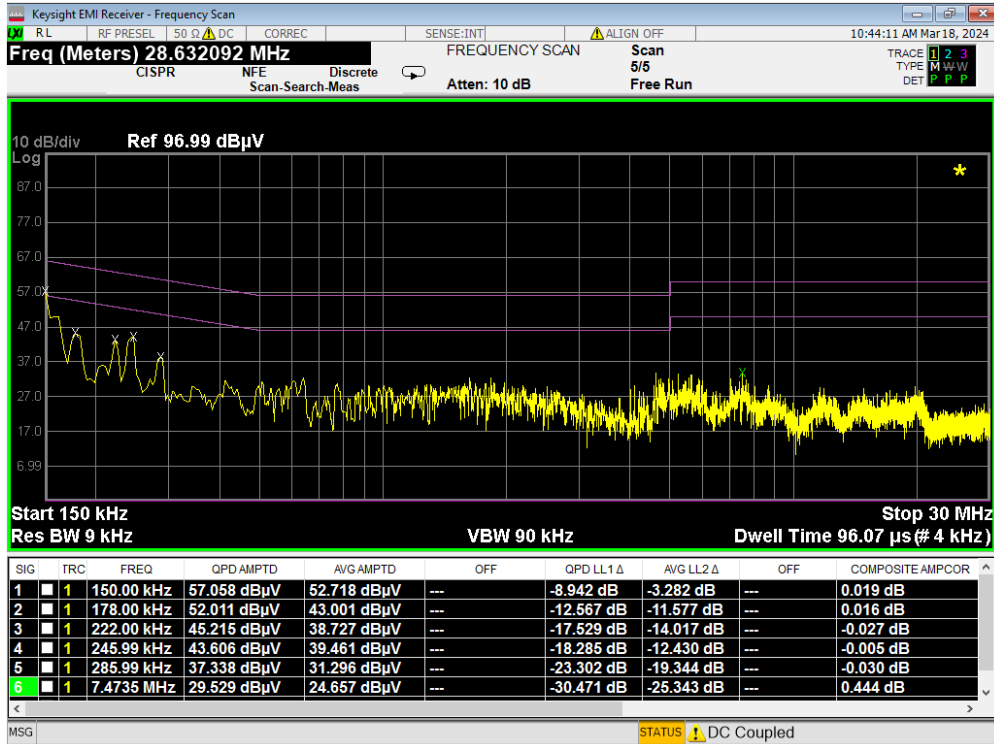


Figure 7-9. Test Instrument & Measurement Setup

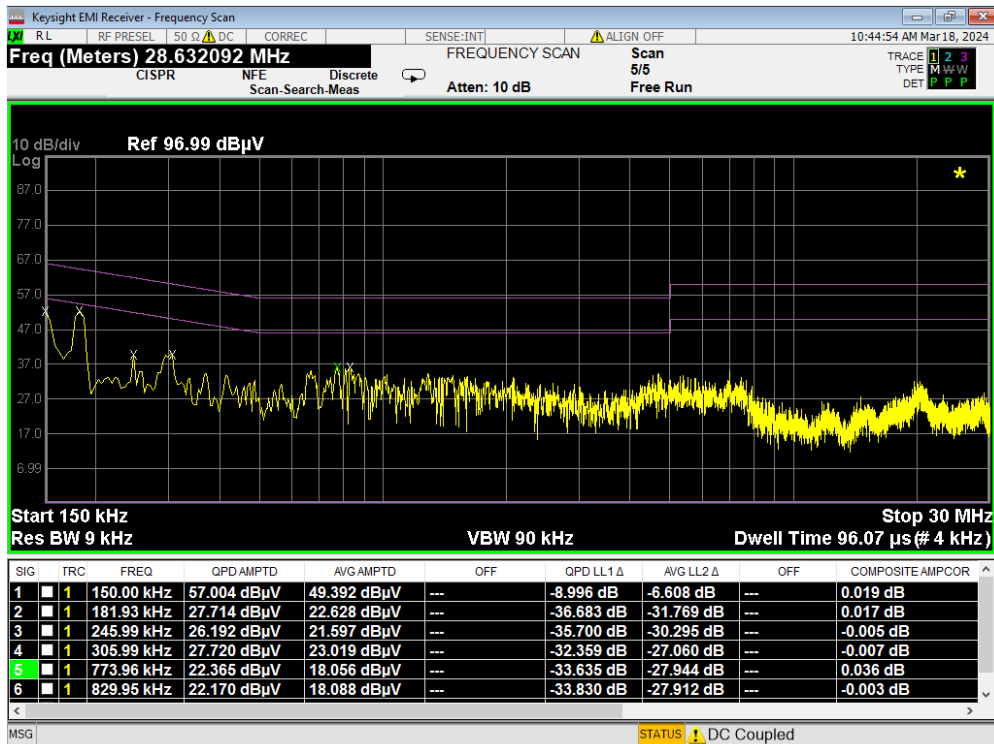
### Test Notes

1. All modes of operation were investigated, and the worst-case emissions are reported using mid channel. The emissions found were not affected by the choice of channel used during testing.
2. The limit for an intentional radiator from 150kHz to 30MHz is specified in 15.207.
3.  $\text{Corr. (dB)} = \text{Cable loss (dB)} + \text{LISN insertion factor (dB)}$
4.  $\text{QP/AV Level (dB}\mu\text{V)} = \text{QP/AV Analyzer/Receiver Level (dB}\mu\text{V)} + \text{Corr. (dB)}$
5.  $\text{Margin (dB)} = \text{QP/AV Limit (dB}\mu\text{V)} - \text{QP/AV Level (dB}\mu\text{V)}$
6. Traces shown in plot are made using a peak detector.
7. Deviations to the Specifications: None.

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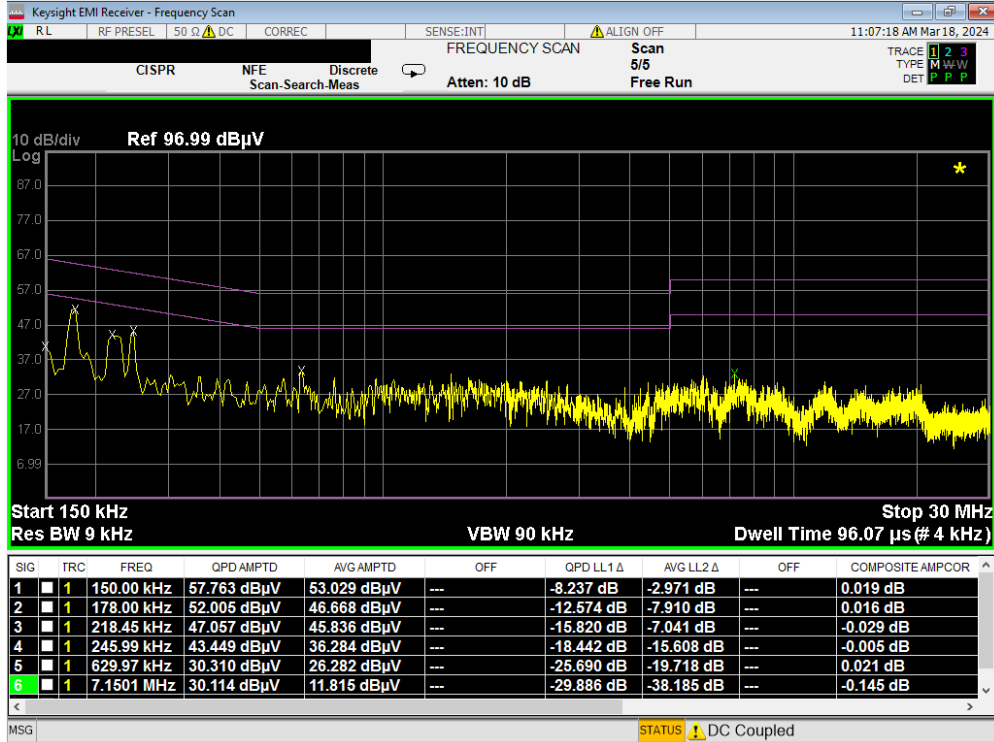


Plot 7-241. Line Conducted Plot with 802.11a UNII Band 5 (L1)

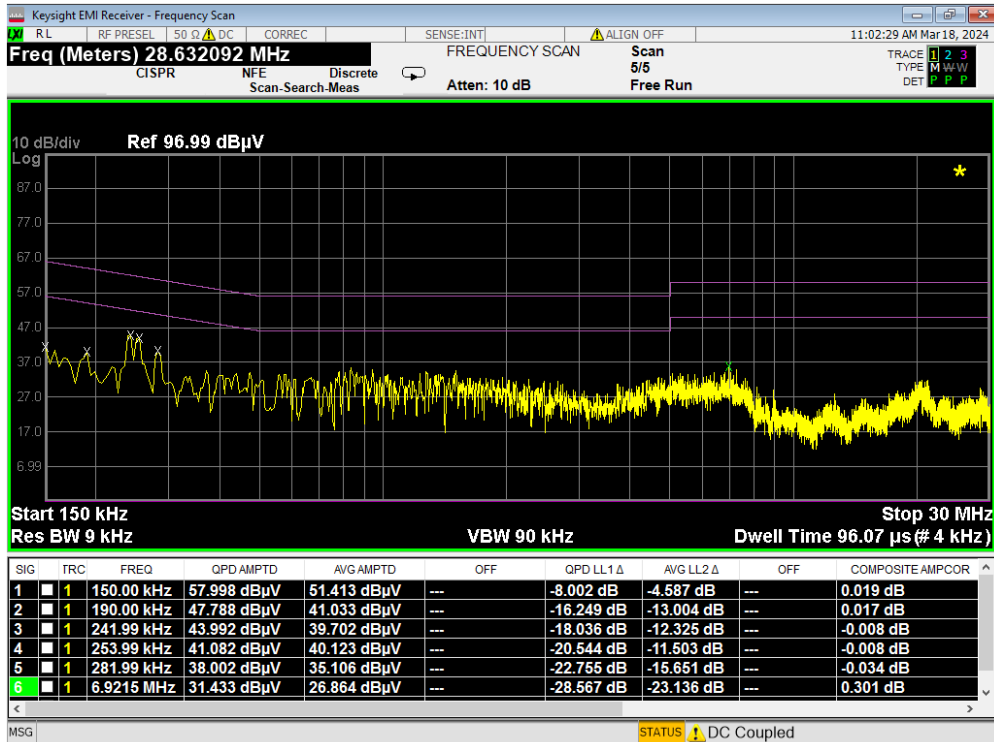


Plot 7-242. Line Conducted Plot with 802.11a UNII Band 5 (N)

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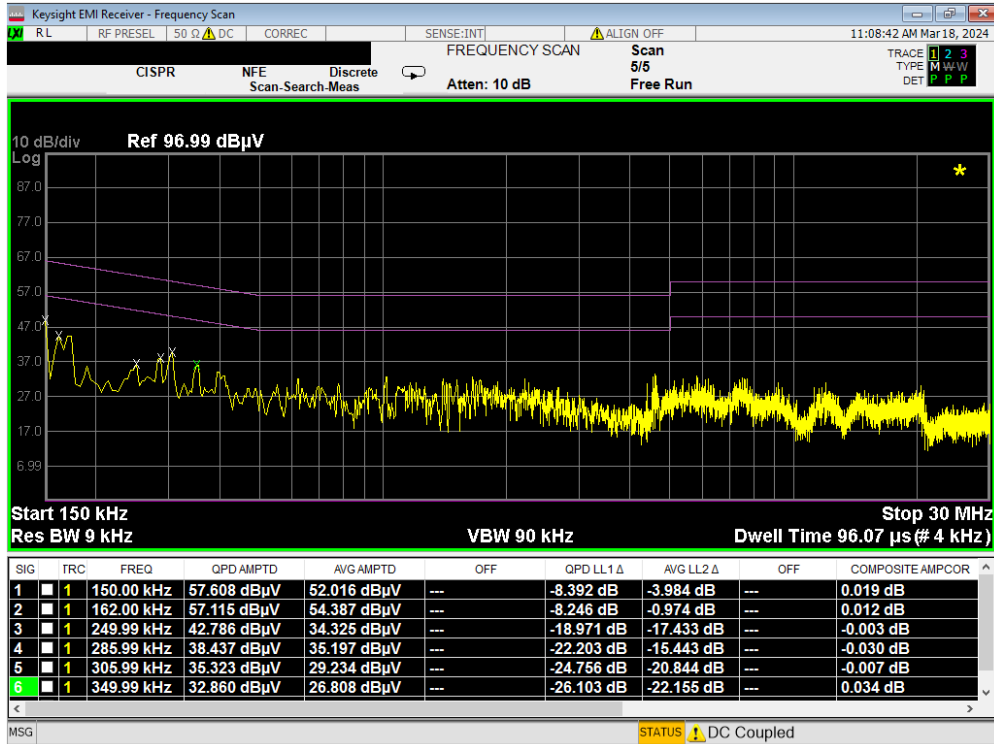
Plot 7-243. Line Conducted Plot with 802.11a UNII Band 6 (L1)



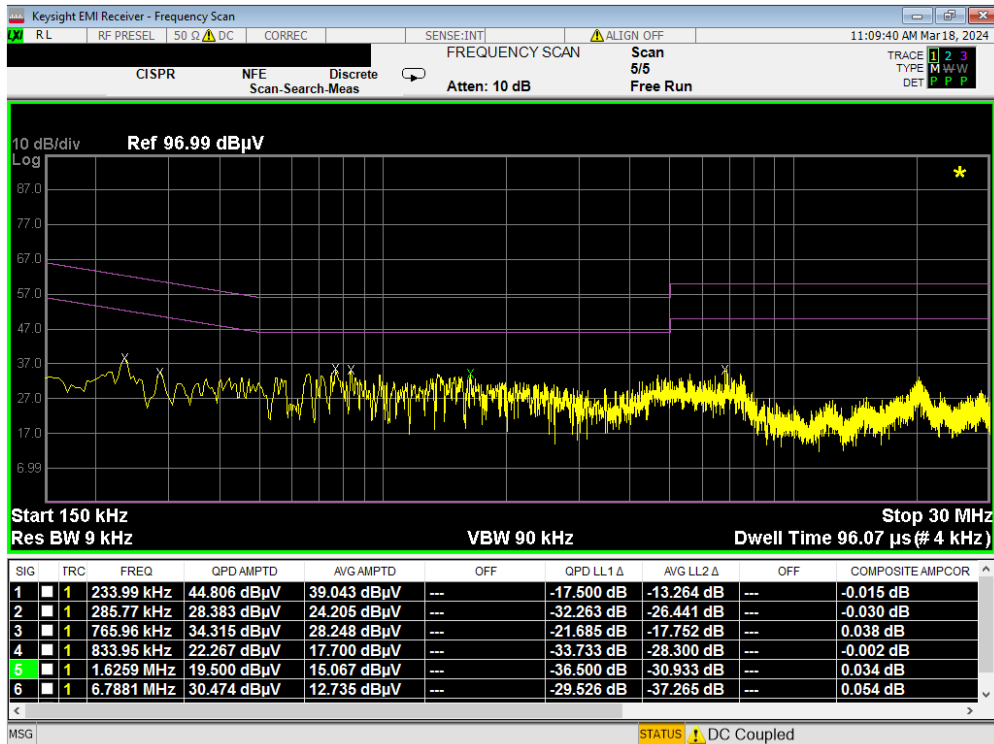
Plot 7-244. Line Conducted Plot with 802.11a UNII Band 6 (N)

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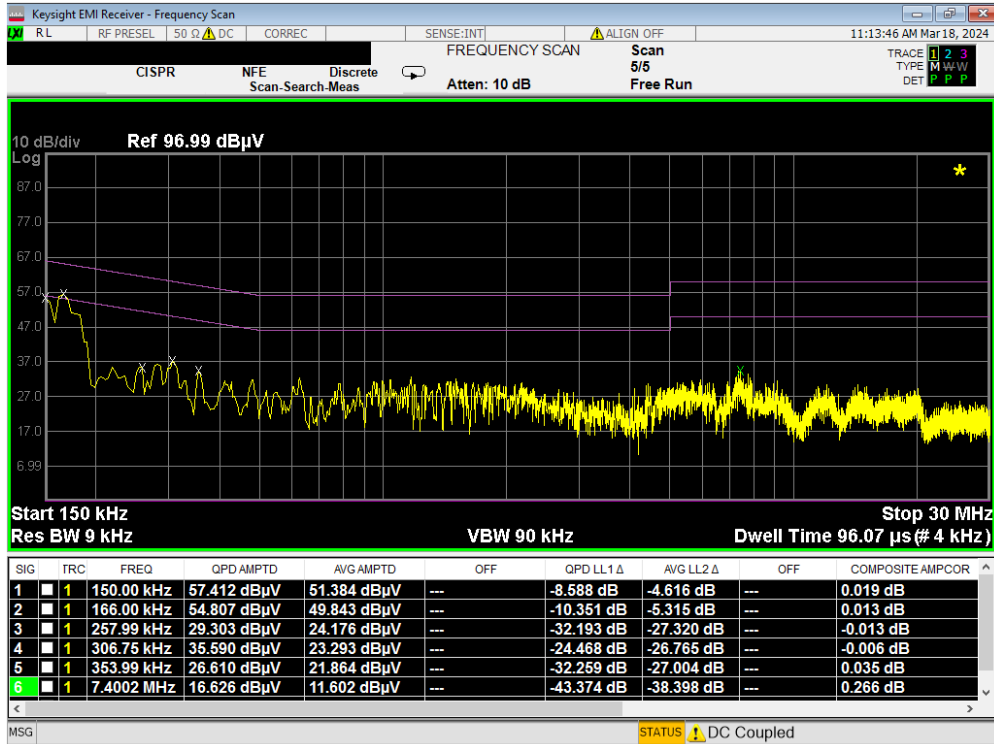


Plot 7-245. Line Conducted Plot with 802.11a UNII Band 7 (L1)

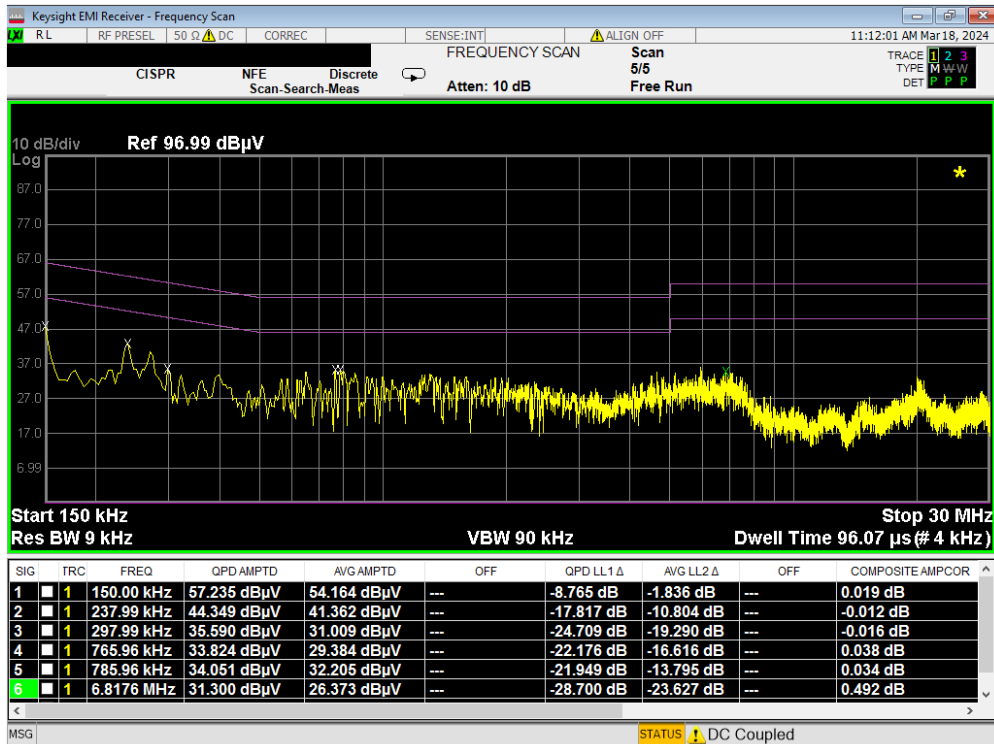


Plot 7-246. Line Conducted Plot with 802.11a UNII Band 7 (N)

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Plot 7-247. Line Conducted Plot with 802.11a UNII Band 8 (L1)



Plot 7-248. Line Conducted Plot with 802.11a UNII Band 8 (N)

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## 8.0 CONCLUSION

The data collected relate only the item(s) tested and show that the **Microsoft Corporation Portable Computing Device FCC ID: C3K2077 / IC: 3048A-2077** is in compliance with Part 15.407 of the FCC rules and RSS-248 of the ISED rules.

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