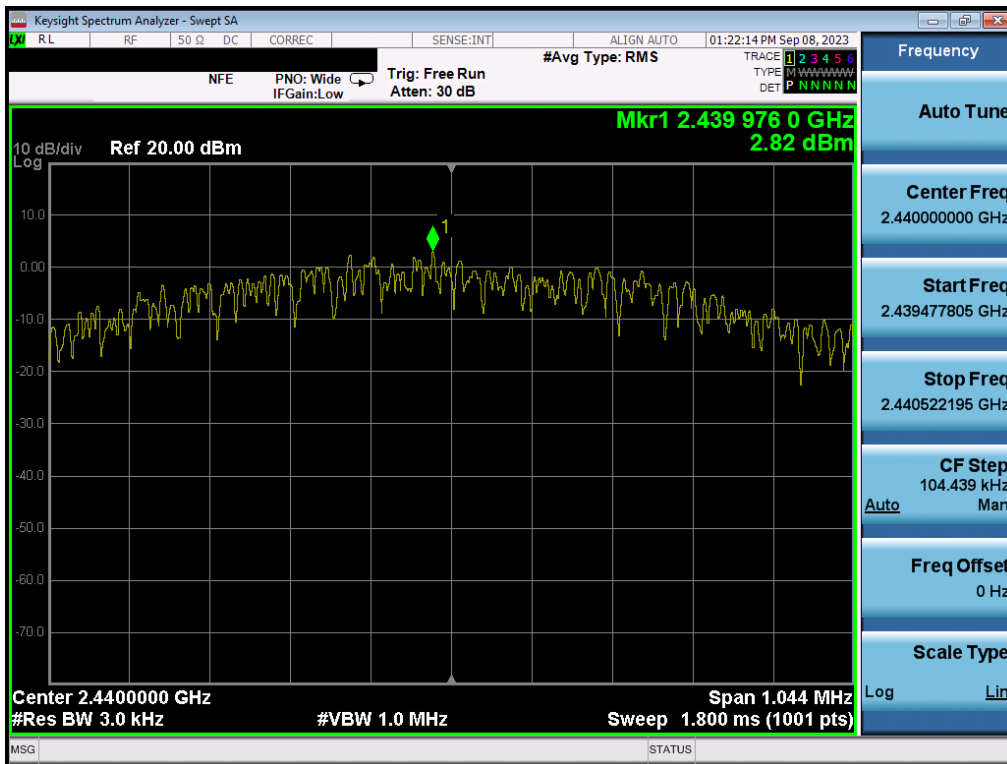
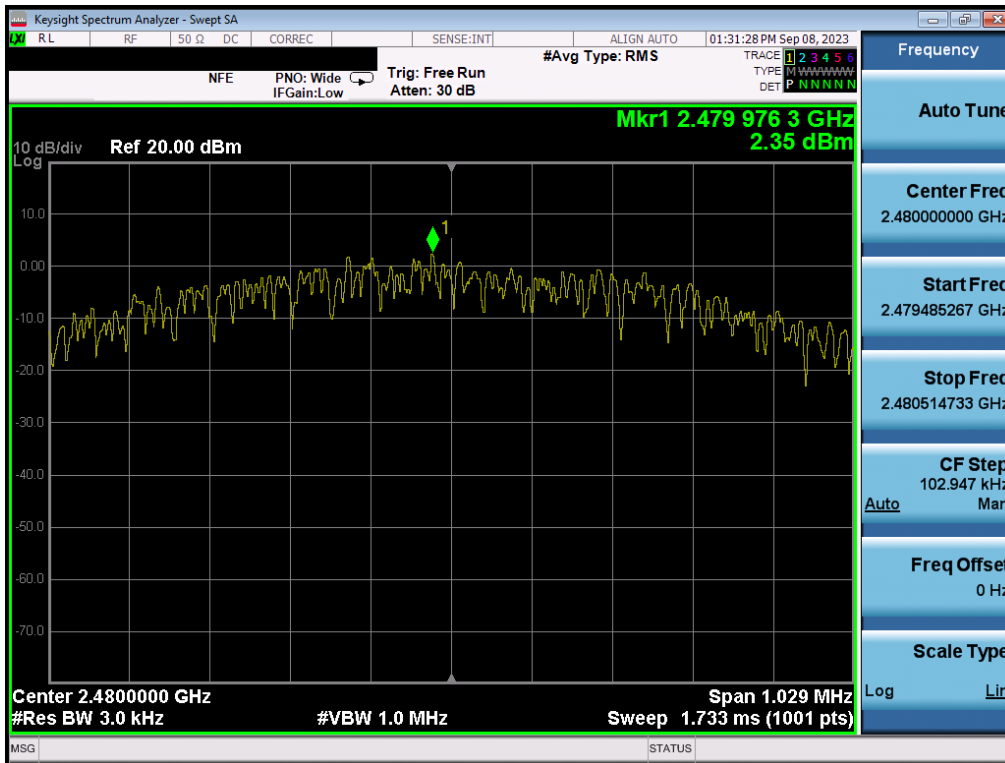


Plot 7-91. Power Spectral Density Plot (Bluetooth (LE), 1Mbps – Ch. 0) – ANT2

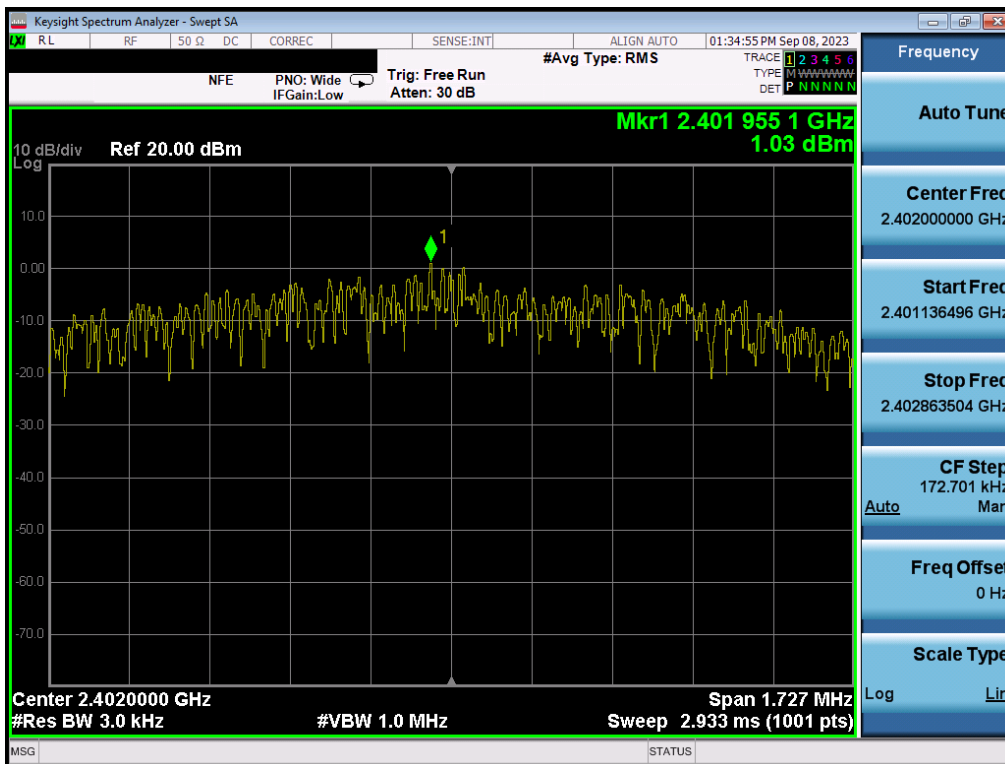


Plot 7-92. Power Spectral Density Plot (Bluetooth (LE), 1Mbps – Ch. 19) – ANT2

FCC ID: A3LSMS928U	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2308210092-10.A3L	Test Dates: 9/6/2023 - 11/06/2023	EUT Type: Portable Handset	Page 69 of 121

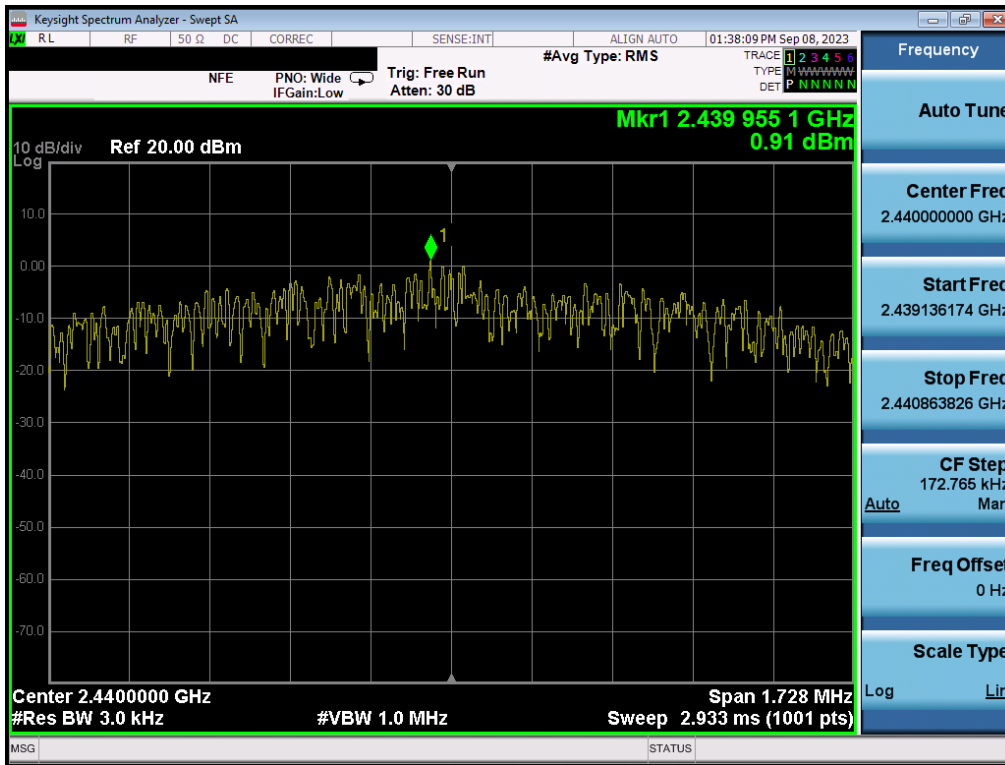


Plot 7-93. Power Spectral Density Plot (Bluetooth (LE), 1Mbps – Ch. 39) – ANT2

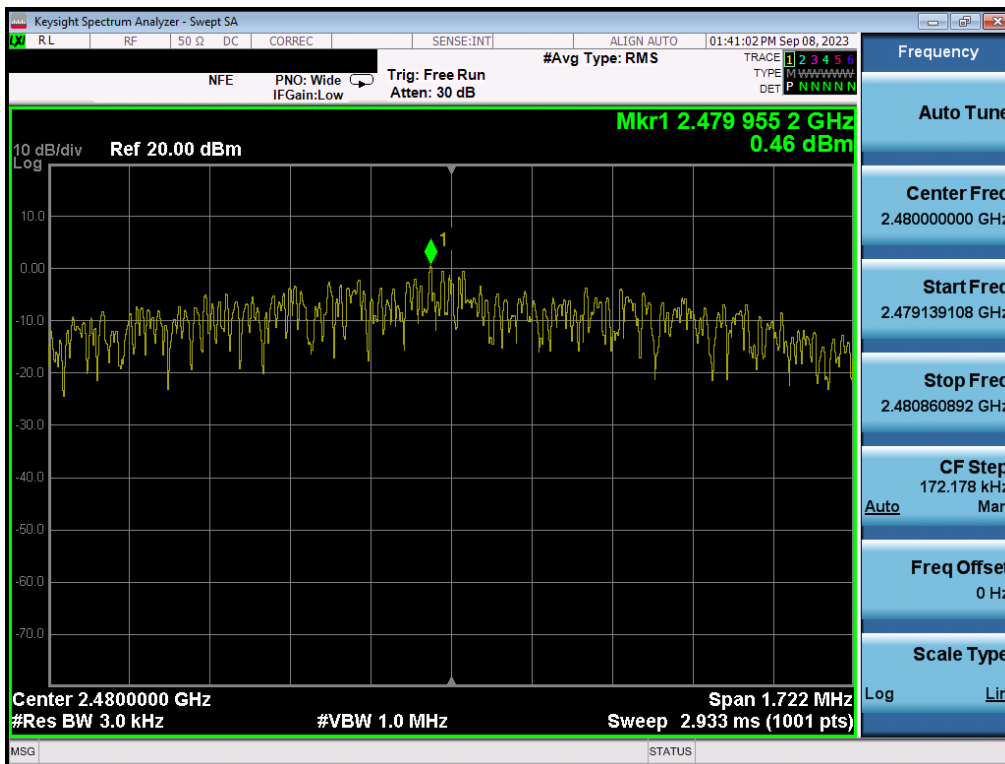


Plot 7-94. Power Spectral Density Plot (Bluetooth (LE), 2Mbps – Ch. 0) – ANT2

FCC ID: A3LSMS928U	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2308210092-10.A3L	Test Dates: 9/6/2023 - 11/06/2023	EUT Type: Portable Handset	Page 70 of 121



Plot 7-95. Power Spectral Density Plot (Bluetooth (LE), 2Mbps – Ch. 19) – ANT2



Plot 7-96. Power Spectral Density Plot (Bluetooth (LE), 2Mbps – Ch. 39) – ANT2

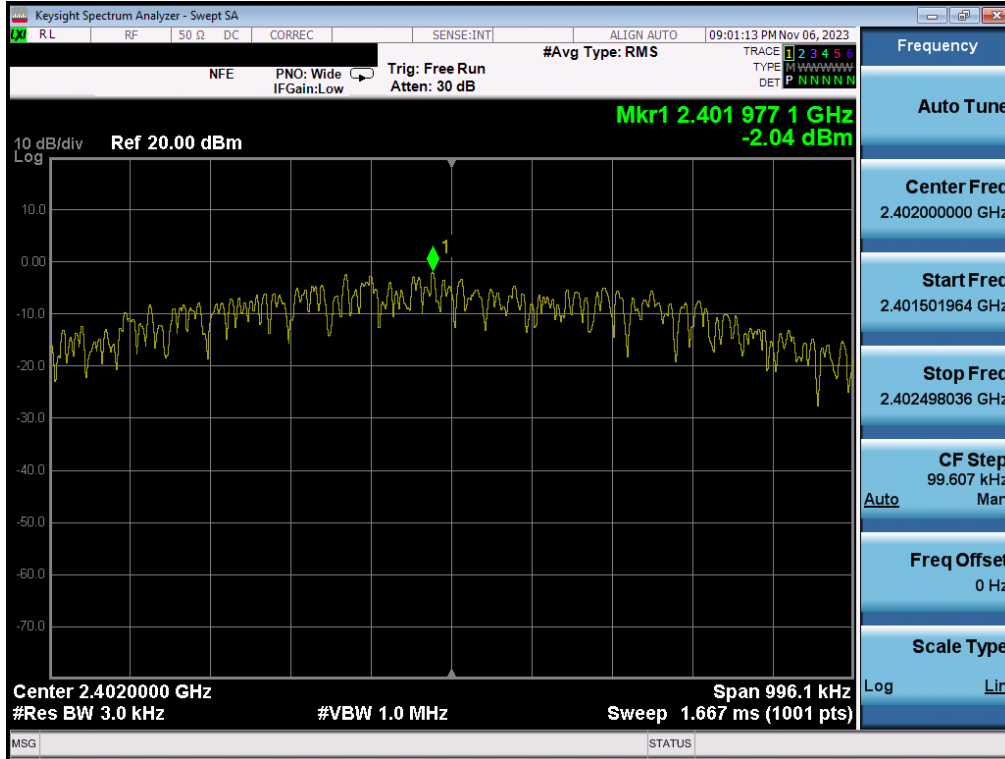
FCC ID: A3LSMS928U	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2308210092-10.A3L	Test Dates: 9/6/2023 - 11/06/2023	EUT Type: Portable Handset	Page 71 of 121



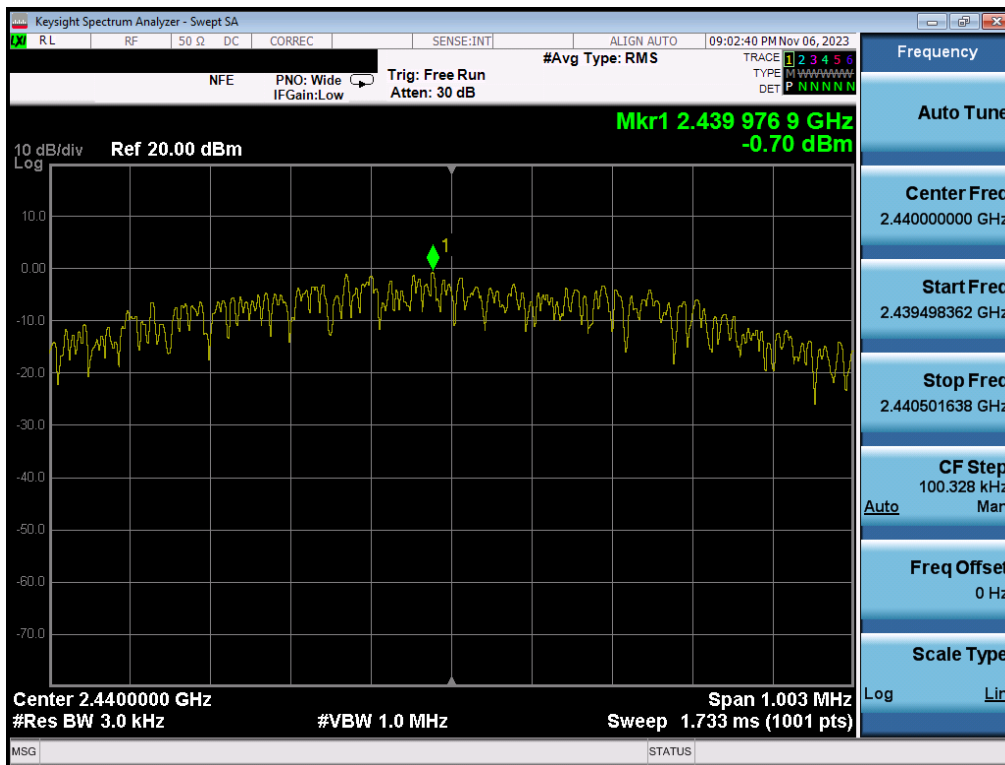
Frequency [MHz]	Data Rate [Mbps]	Channel No.	Bluetooth Mode	ANT 1 Power Spectral Density [dBm]	ANT 2 Power Spectral Density [dBm]	Summed MIMO Power Spectral Density [dBm]	Maximum Permissible Power Density [dBm / 3kHz]	Margin [dB]
2402	1 Mbps	0	LE	-2.04	-1.07	1.48	8.0	-6.52
2440	1 Mbps	19	LE	-0.70	-2.25	1.60	8.0	-6.40
2480	1 Mbps	39	LE	-1.04	-2.14	1.45	8.0	-6.55
2402	2 Mbps	0	LE	-4.11	-3.10	-0.57	8.0	-8.57
2440	2 Mbps	19	LE	-2.83	-4.35	-0.51	8.0	-8.51
2480	2 Mbps	39	LE	-3.42	-4.45	-0.90	8.0	-8.90

Table 7-11. Conducted Power Density Measurements – Dual

FCC ID: A3LSMS928U	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
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Plot 7-97. Power Spectral Density Plot (Bluetooth (LE), 1Mbps – Ch. 0) – Dual ANT1



Plot 7-98. Power Spectral Density Plot (Bluetooth (LE), 1Mbps – Ch. 19) – Dual ANT1

FCC ID: A3LSMS928U	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2308210092-10.A3L	Test Dates: 9/6/2023 - 11/06/2023	EUT Type: Portable Handset	Page 73 of 121

7.5 Conducted Emissions at the Band Edge

§15.247(d); RSS-247 [5.5]

Test Overview and Limit

For the following out of band conducted spurious emissions plots at the band edge, the EUT was set to transmit at maximum power with the largest packet size available. These settings produced the worst-case emissions.

The limit for out-of-band spurious emissions at the band edge is 20dB below the fundamental emission level, as determined from the in-band power measurement of the DTS channel performed in a 100kHz bandwidth.

Test Procedure Used

ANSI C63.10-2013 – Section 11.11.3
KDB 558074 D01 v05r02 – Section 8.7.2

Test Settings

1. Start and stop frequency were set such that the band edge would be placed in the center of the plot
2. Span was set large enough so as to capture all out of band emissions near the band edge
3. RBW = 100kHz
4. VBW = 300kHz
5. Detector = Peak
6. Number of sweep points $\geq 2 \times \text{Span/RBW}$
7. Trace mode = max hold
8. Sweep time = auto couple
9. The trace was allowed to stabilize

Test Setup

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

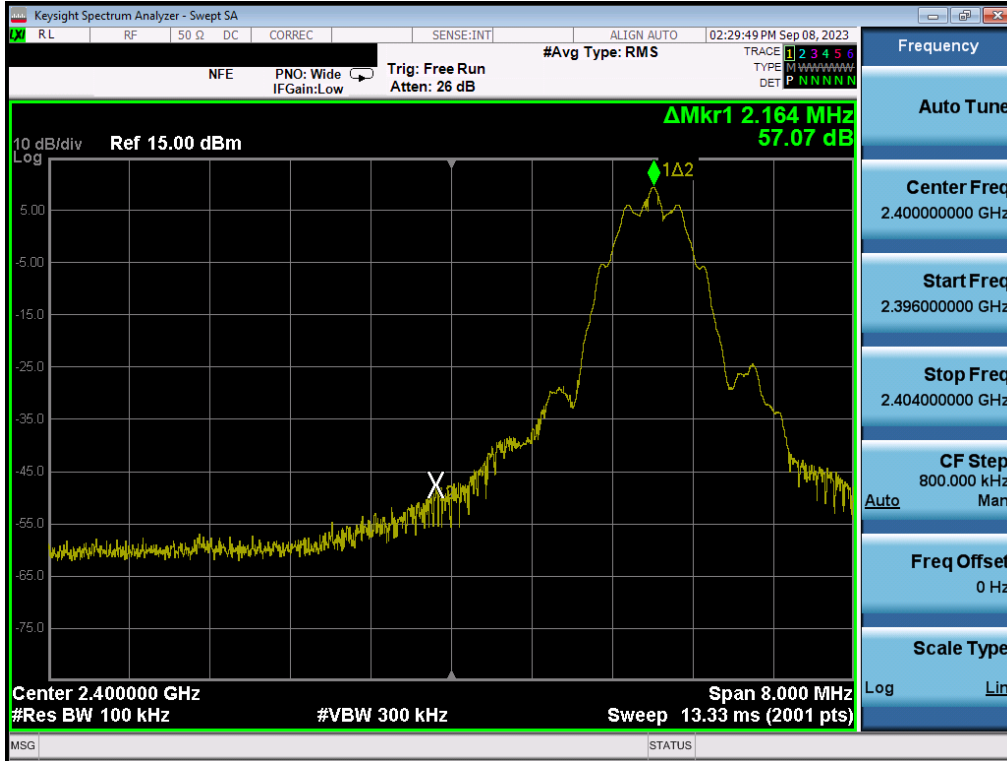


Figure 7-4. Test Instrument & Measurement Setup

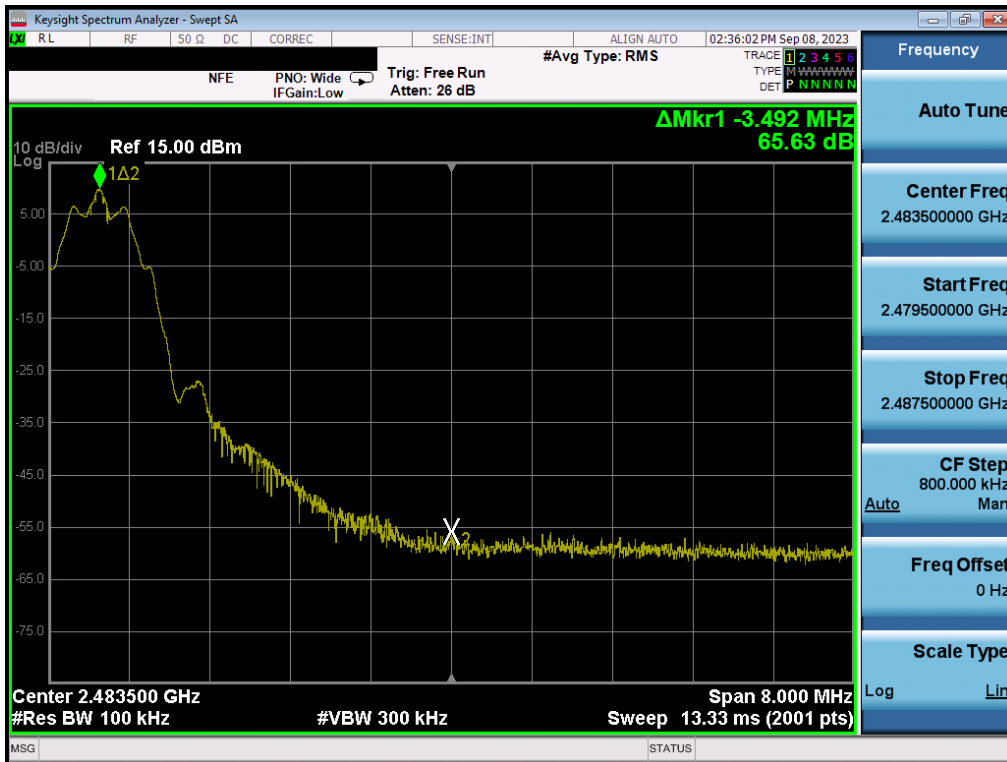
Test Notes

None

FCC ID: A3LSMS928U	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2308210092-10.A3L	Test Dates: 9/6/2023 - 11/06/2023	EUT Type: Portable Handset	Page 79 of 121

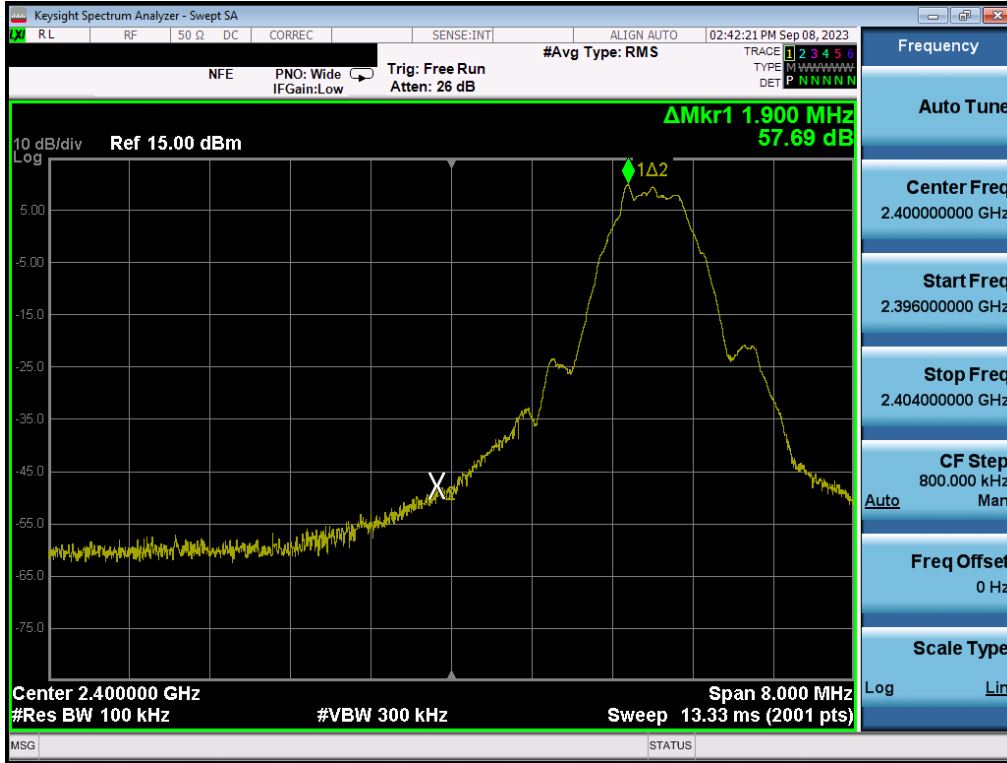


Plot 7-109. Band Edge Plot (Bluetooth (LE), 125kbps – Ch. 0) – ANT1

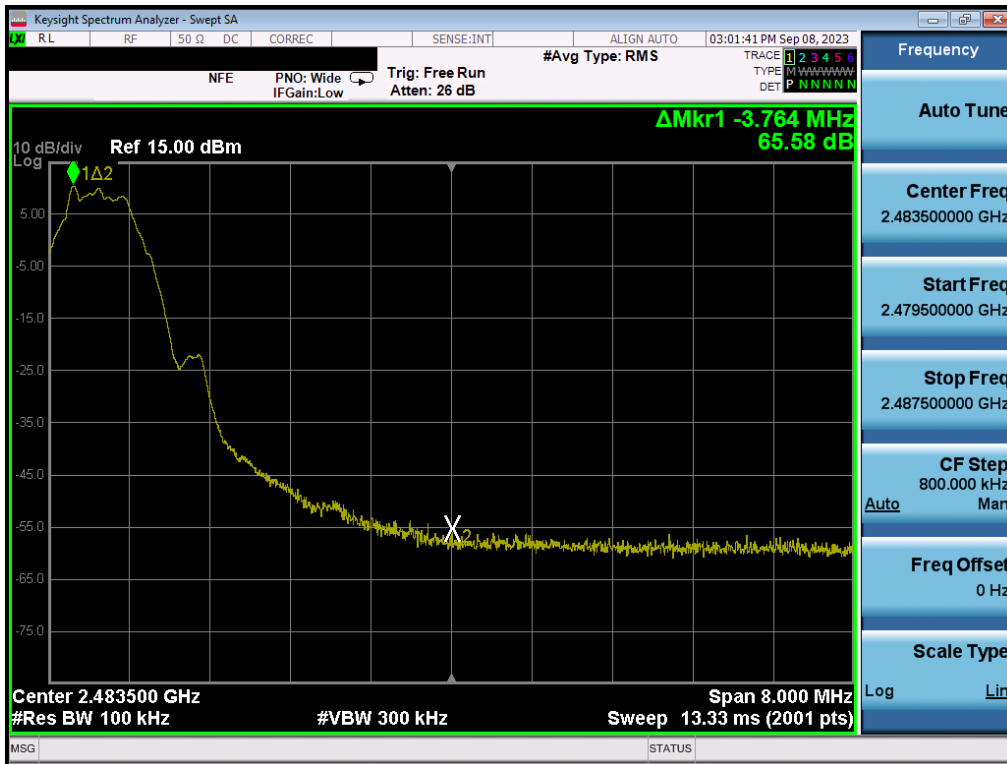


Plot 7-110. Band Edge Plot (Bluetooth (LE), 125kbps – Ch. 39) – ANT1

FCC ID: A3LSMS928U	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2308210092-10.A3L	Test Dates: 9/6/2023 - 11/06/2023	EUT Type: Portable Handset	Page 80 of 121



Plot 7-111. Band Edge Plot (Bluetooth (LE), 500kbps – Ch. 0) – ANT1



Plot 7-112. Band Edge Plot (Bluetooth (LE), 500kbps – Ch. 39) – ANT1

FCC ID: A3LSMS928U	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2308210092-10.A3L	Test Dates: 9/6/2023 - 11/06/2023	EUT Type: Portable Handset	Page 81 of 121



Plot 7-113. Band Edge Plot (Bluetooth (LE), 1Mbps – Ch. 0) – ANT1



Plot 7-114. Band Edge Plot (Bluetooth (LE), 1Mbps – Ch. 39) – ANT1

FCC ID: A3LSMS928U	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2308210092-10.A3L	Test Dates: 9/6/2023 - 11/06/2023	EUT Type: Portable Handset	Page 82 of 121

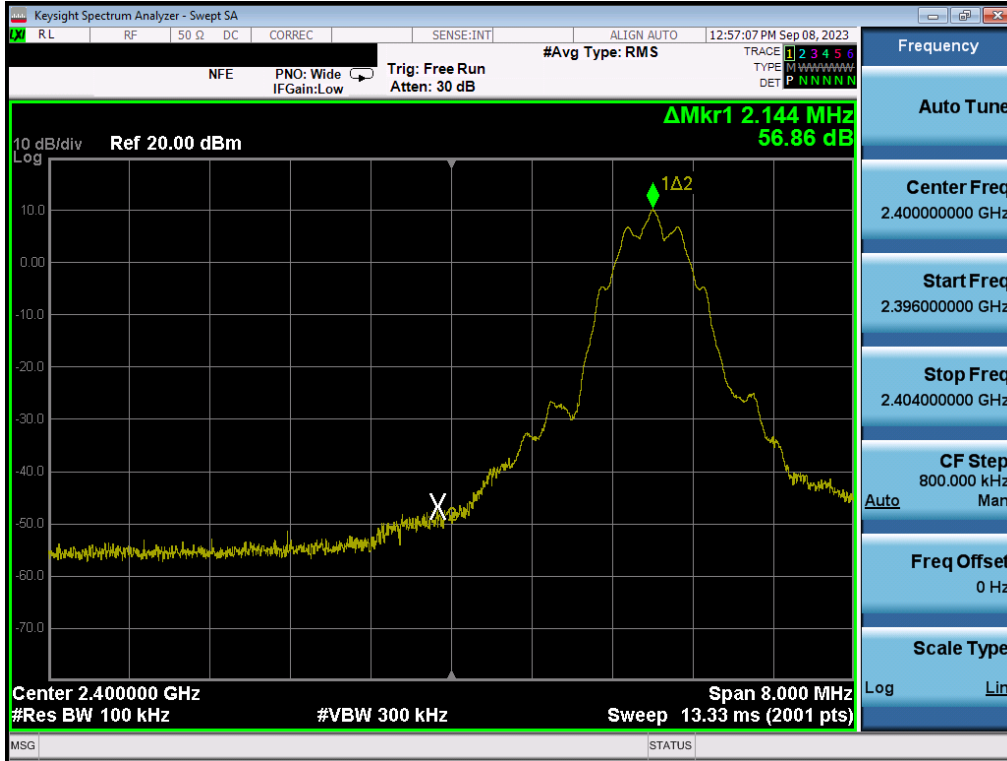


Plot 7-115. Band Edge Plot (Bluetooth (LE), 2Mbps – Ch. 0) – ANT1

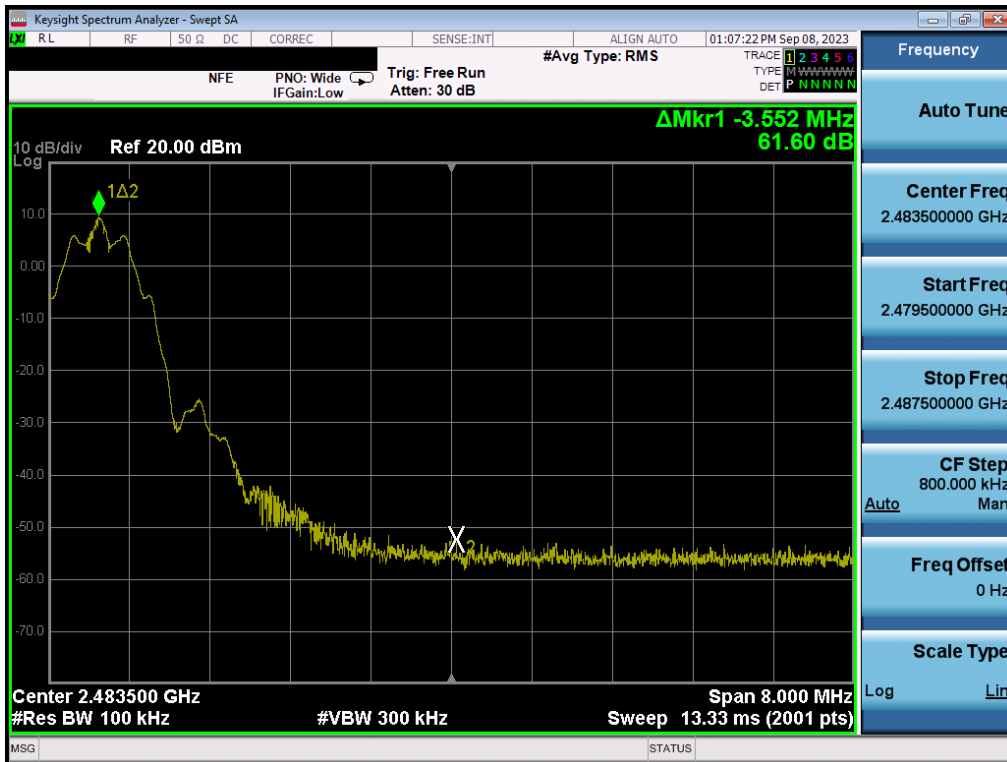


Plot 7-116. Band Edge Plot (Bluetooth (LE), 2Mbps – Ch. 39) – ANT1

FCC ID: A3LSMS928U	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2308210092-10.A3L	Test Dates: 9/6/2023 - 11/06/2023	EUT Type: Portable Handset	Page 83 of 121

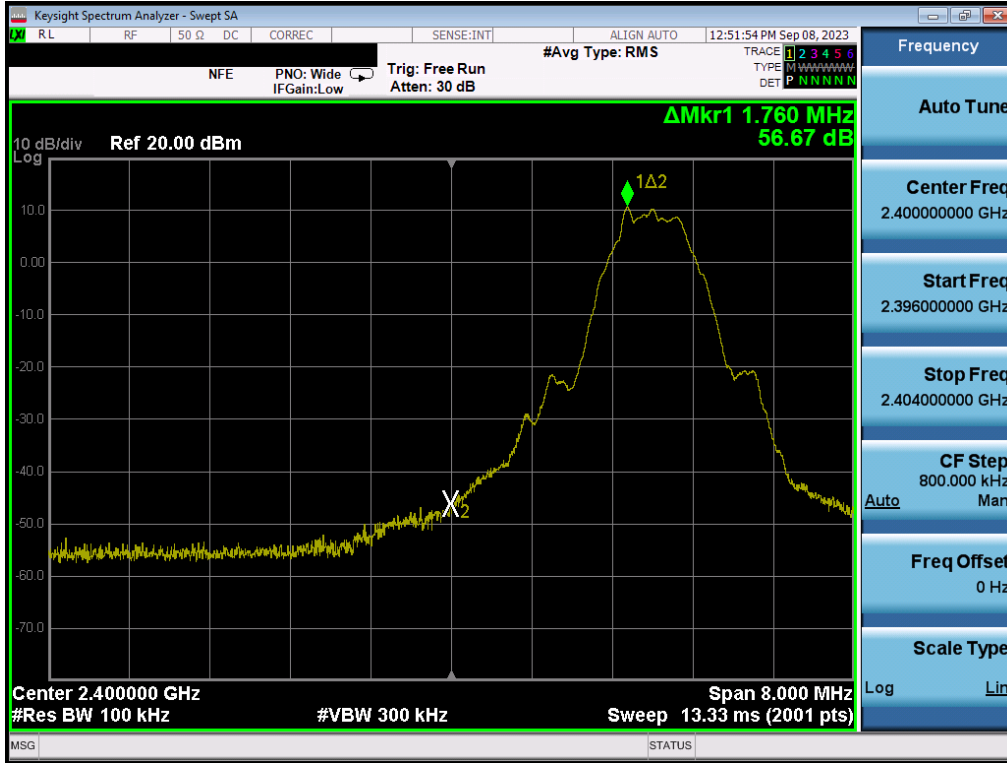


Plot 7-117. Band Edge Plot (Bluetooth (LE), 125kbps – Ch. 0) – ANT2

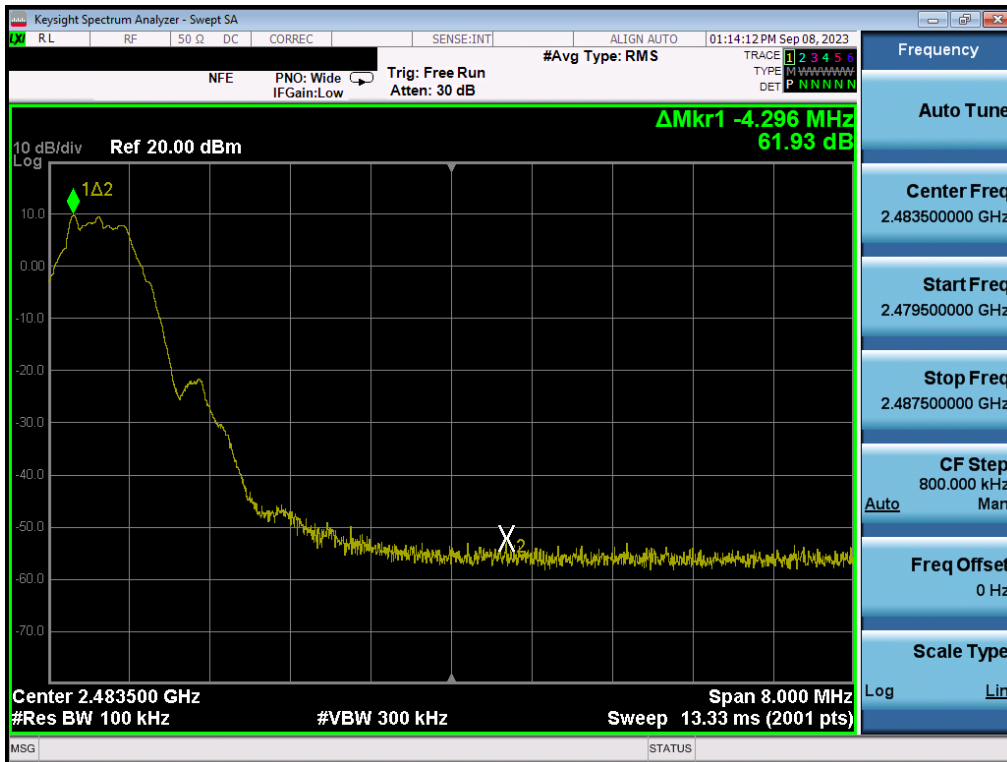


Plot 7-118. Band Edge Plot (Bluetooth (LE), 125kbps – Ch. 39) – ANT2

FCC ID: A3LSMS928U	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2308210092-10.A3L	Test Dates: 9/6/2023 - 11/06/2023	EUT Type: Portable Handset	Page 84 of 121



Plot 7-119. Band Edge Plot (Bluetooth (LE), 500kbps – Ch. 0) – ANT2

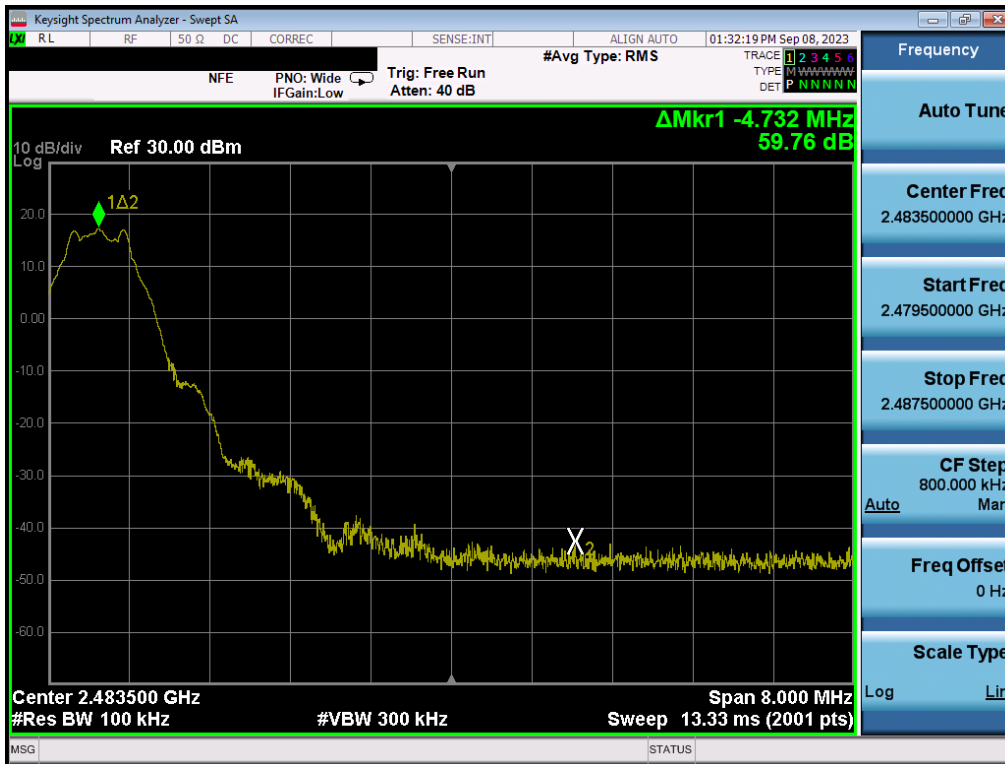


Plot 7-120. Band Edge Plot (Bluetooth (LE), 500kbps – Ch. 39) – ANT2

FCC ID: A3LSMS928U	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
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Plot 7-121. Band Edge Plot (Bluetooth (LE), 1Mbps – Ch. 0) – ANT2



Plot 7-122. Band Edge Plot (Bluetooth (LE), 1Mbps – Ch. 39) – ANT2

FCC ID: A3LSMS928U	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2308210092-10.A3L	Test Dates: 9/6/2023 - 11/06/2023	EUT Type: Portable Handset	Page 86 of 121

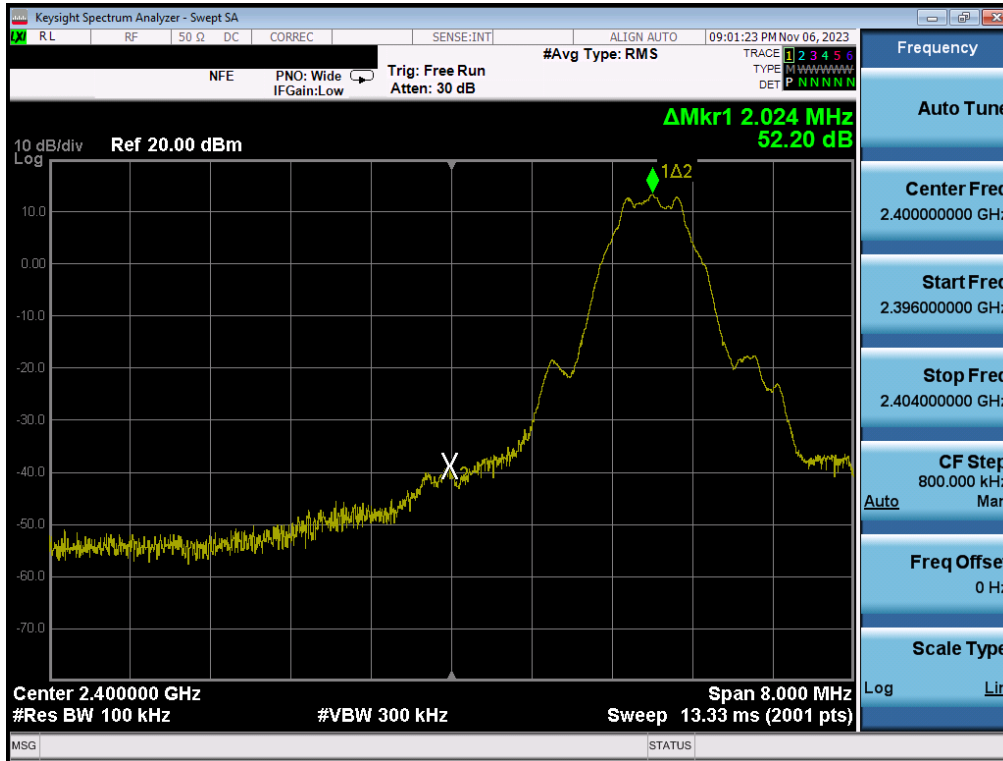


Plot 7-123. Band Edge Plot (Bluetooth (LE), 2Mbps – Ch. 0) – ANT2

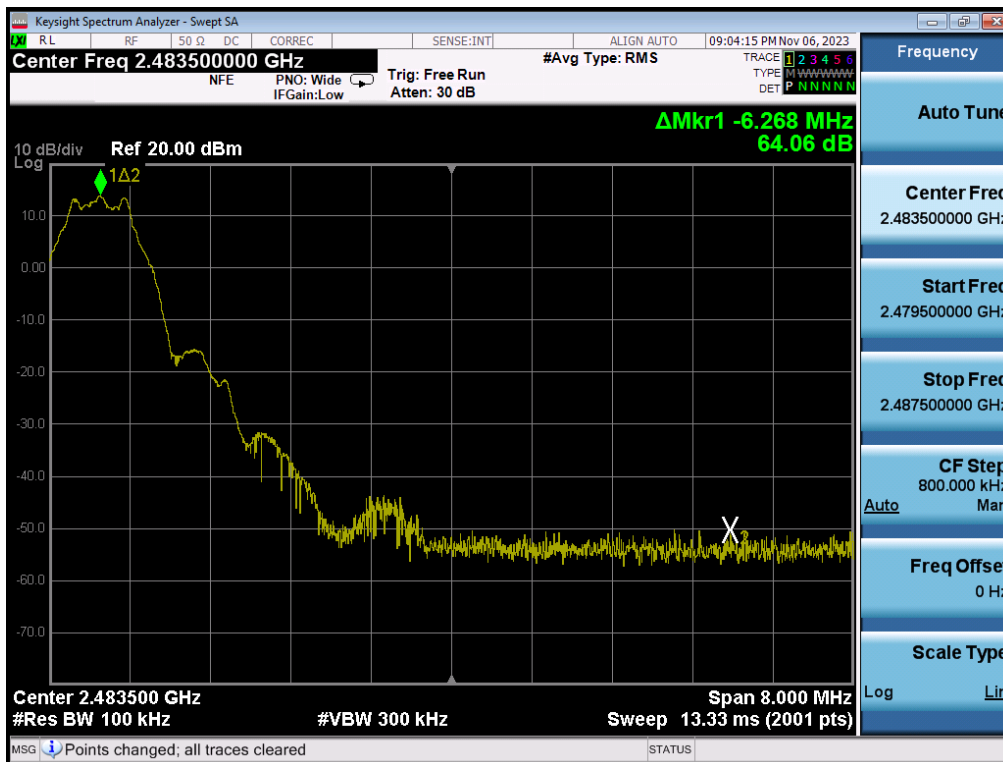


Plot 7-124. Band Edge Plot (Bluetooth (LE), 2Mbps – Ch. 39) – ANT2

FCC ID: A3LSMS928U	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
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Plot 7-125. Band Edge Plot (Bluetooth (LE), 1Mbps – Ch. 0) – Dual ANT1



Plot 7-126. Band Edge Plot (Bluetooth (LE), 1Mbps – Ch. 39) – Dual ANT1

FCC ID: A3LSMS928U	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2308210092-10.A3L	Test Dates: 9/6/2023 - 11/06/2023	EUT Type: Portable Handset	Page 88 of 121

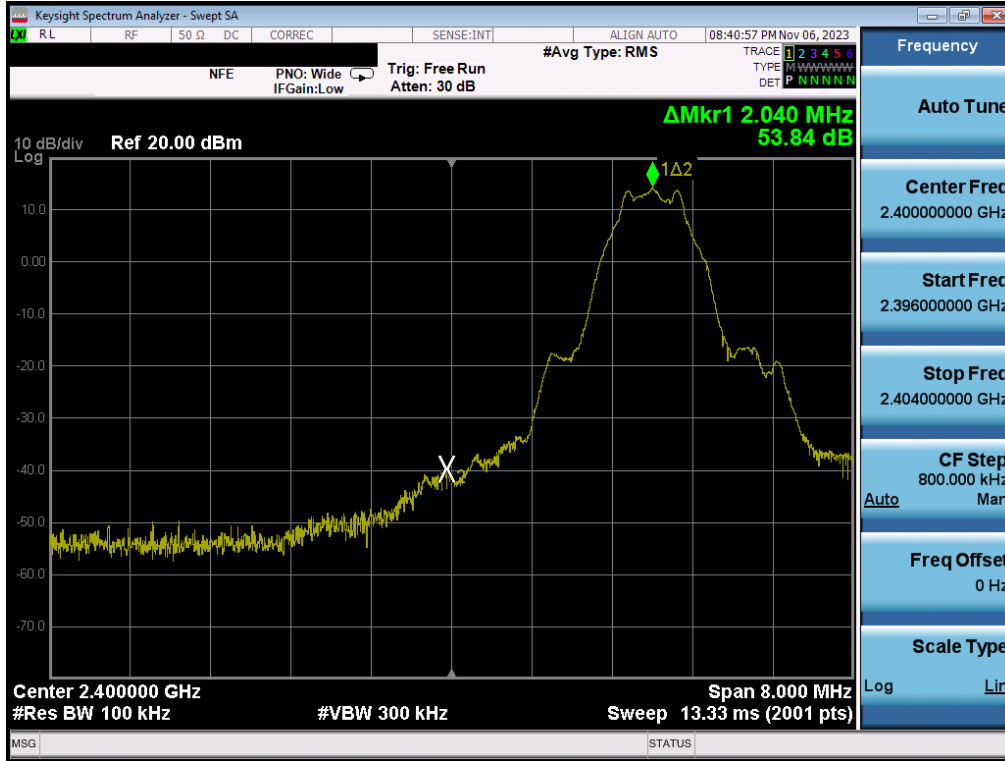


Plot 7-127. Band Edge Plot (Bluetooth (LE), 2Mbps – Ch. 0) – Dual ANT1

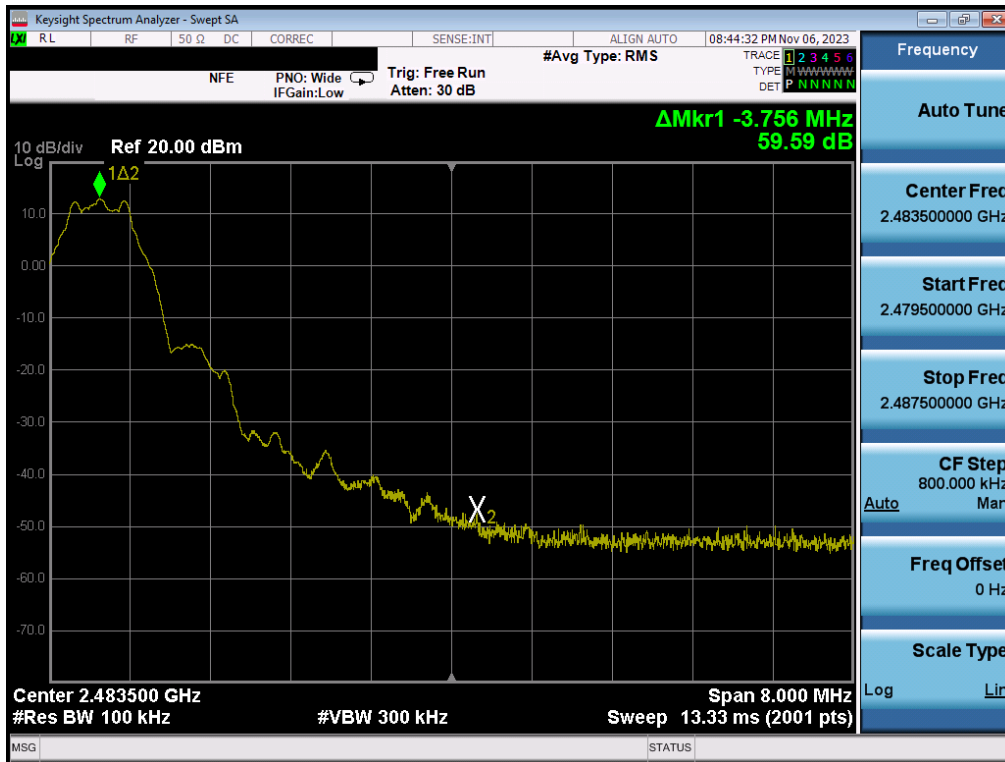


Plot 7-128. Band Edge Plot (Bluetooth (LE), 2Mbps – Ch. 39) – Dual ANT1

FCC ID: A3LSMS928U	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2308210092-10.A3L	Test Dates: 9/6/2023 - 11/06/2023	EUT Type: Portable Handset	Page 89 of 121



Plot 7-129. Band Edge Plot (Bluetooth (LE), 1Mbps – Ch. 0) – Dual ANT2

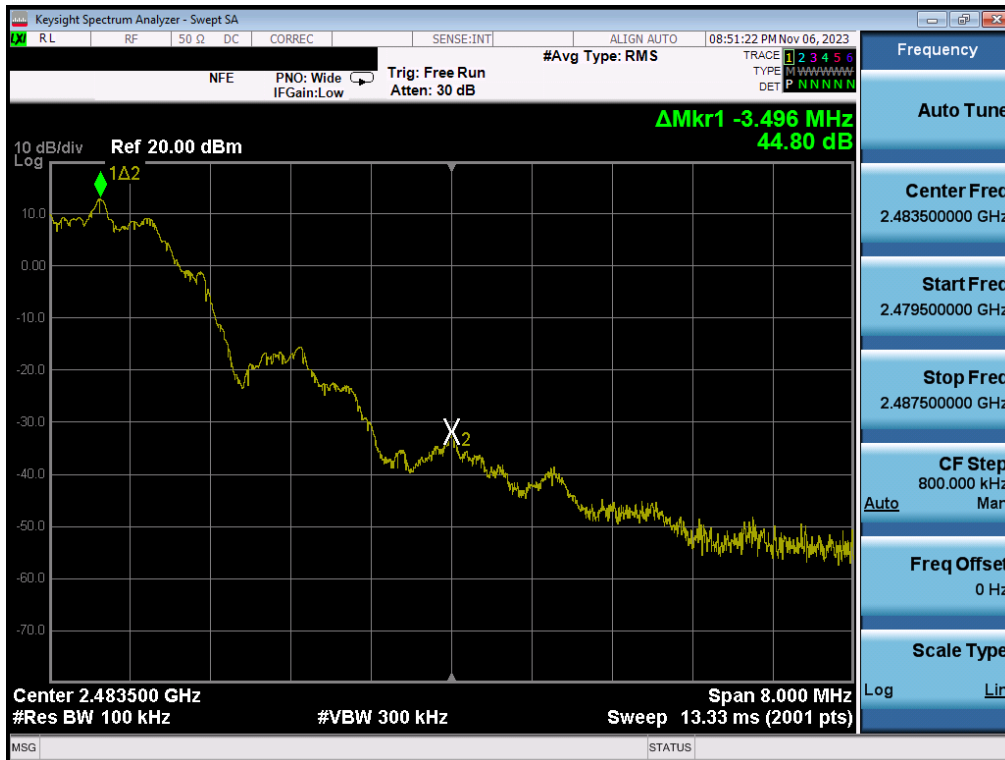


Plot 7-130. Band Edge Plot (Bluetooth (LE), 1Mbps – Ch. 39) – Dual ANT2

FCC ID: A3LSMS928U	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
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Plot 7-131. Band Edge Plot (Bluetooth (LE), 2Mbps – Ch. 0) – Dual ANT2



Plot 7-132. Band Edge Plot (Bluetooth (LE), 2Mbps – Ch. 39) – Dual ANT2

FCC ID: A3LSMS928U	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2308210092-10.A3L	Test Dates: 9/6/2023 - 11/06/2023	EUT Type: Portable Handset	Page 91 of 121

7.6 Conducted Spurious Emissions

§15.247(d); RSS-247 [5.5]

Test Overview and Limit

For the following out of band conducted spurious emissions plots, the EUT was set to transmit at maximum power with the largest packet size available. The worst case spurious emissions were found in this configuration.

The limit for out-of-band spurious emissions at the band edge is 20dB below the fundamental emission level, as determined from the in-band power measurement of the DTS channel performed in a 100kHz bandwidth per the procedure in Section 8.5 of KDB 558074 D01 v05r02 and Section 11.11.3 of ANSI C63.10-2013.

Test Procedure Used

ANSI C63.10-2013 – Section 11.11.3
KDB 558074 D01 v05r02 – Section 8.5

Test Settings

1. Start frequency was set to 30MHz and stop frequency was set to 25GHz (separated into two plots per channel)
2. RBW = 1MHz
3. VBW = 3MHz
4. Detector = Peak
5. Trace mode = max hold
6. Sweep time = auto couple
7. The trace was allowed to stabilize

Test Setup

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



Figure 7-5. Test Instrument & Measurement Setup

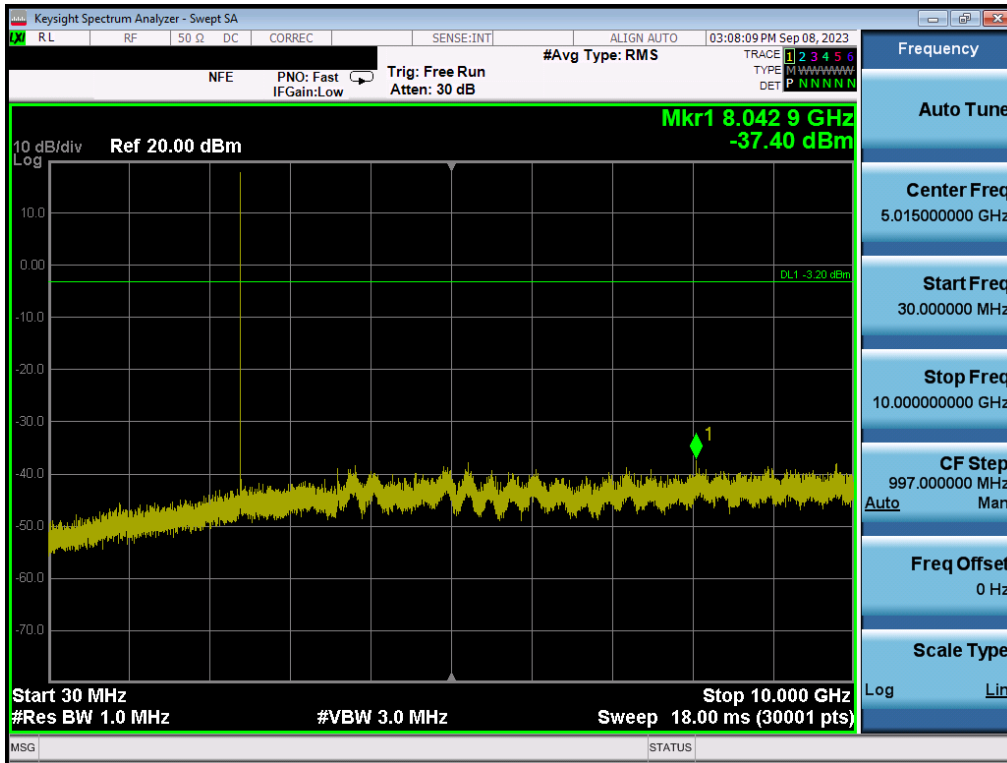
FCC ID: A3LSMS928U	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2308210092-10.A3L	Test Dates: 9/6/2023 - 11/06/2023	EUT Type: Portable Handset	Page 92 of 121



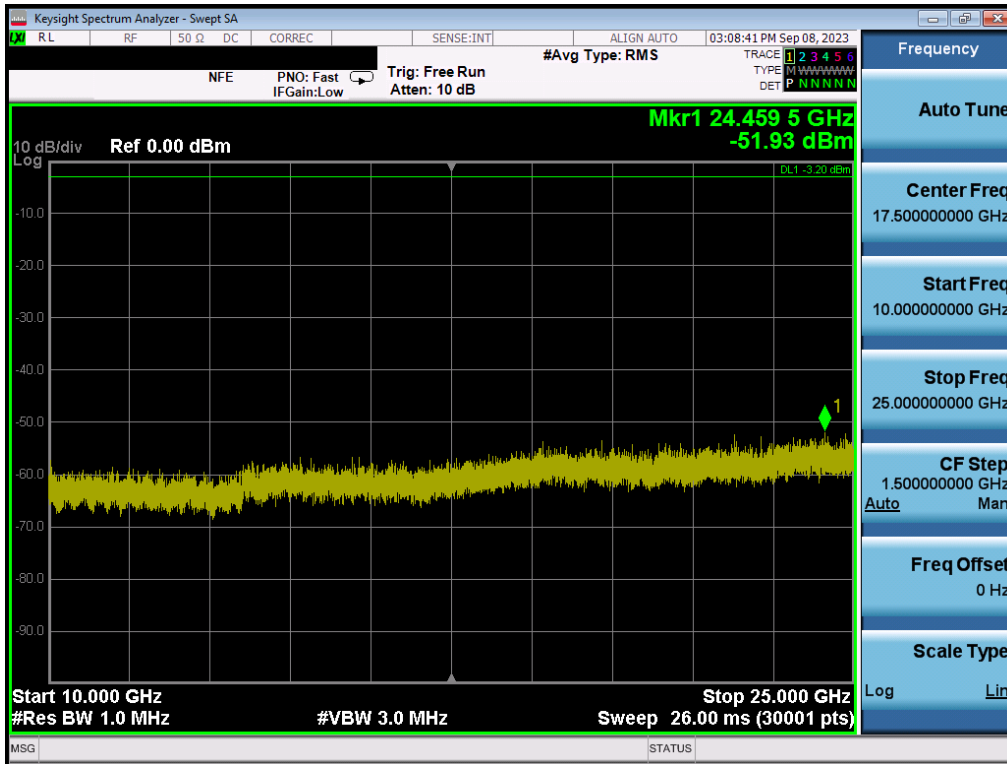
Test Notes

1. RBW was set to 1MHz rather than 100kHz in order to increase the measurement speed.
2. The display line shown in the following plots denotes the limit at 20dB below the fundamental emission level measured in a 100kHz bandwidth. However, since the traces in the following plots are measured with a 1MHz RBW, the display line may not necessarily appear to be 20dB below the level of the fundamental in a 1MHz bandwidth.
3. For plots showing conducted spurious emissions near the limit, the frequencies were investigated with a reduced RBW to ensure that no emissions were present.

FCC ID: A3LSMS928U	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
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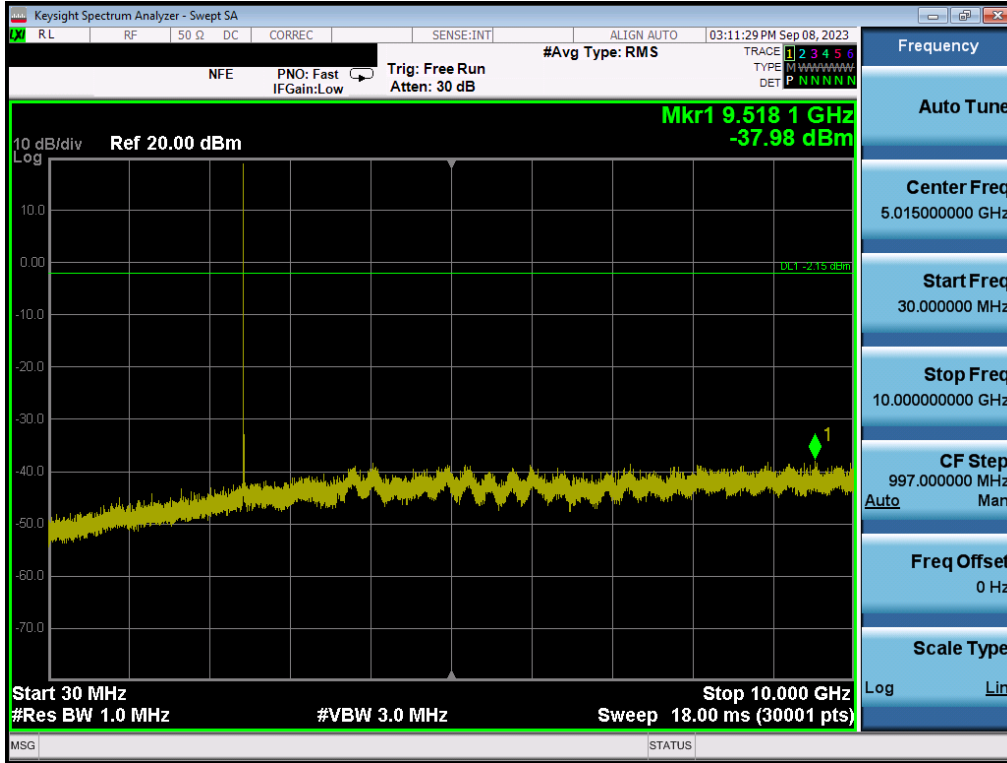


Plot 7-133. Conducted Spurious Plot (Bluetooth (LE), 1Mbps – Ch. 0) – ANT1

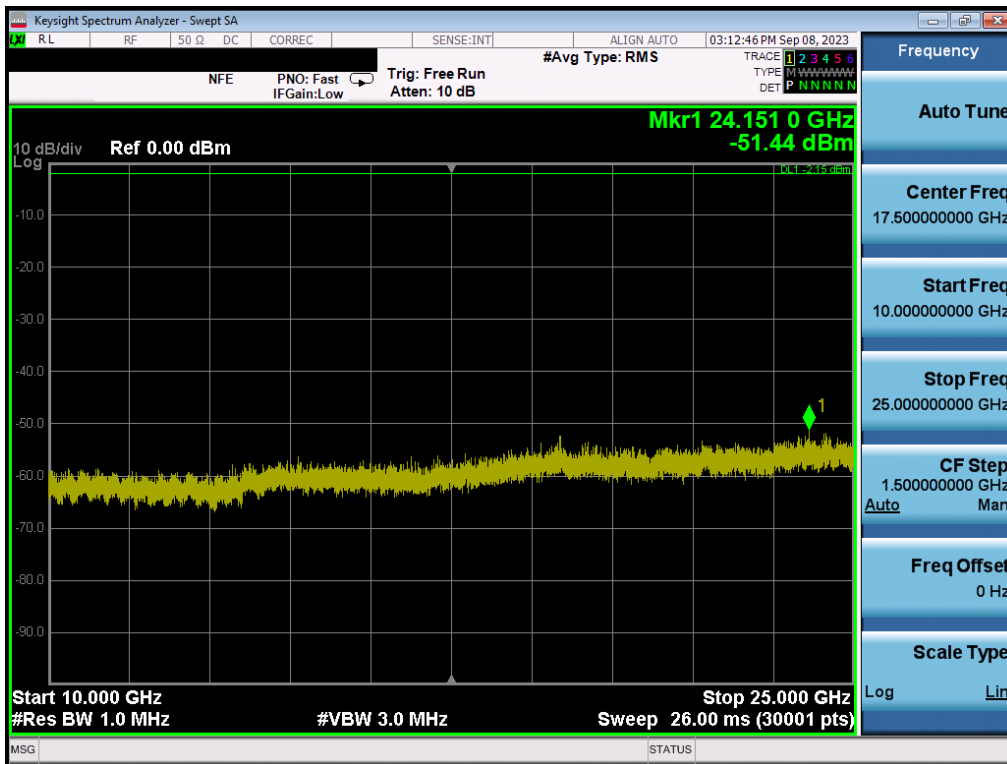


Plot 7-134. Conducted Spurious Plot (Bluetooth (LE), 1Mbps – Ch. 0) – ANT1

FCC ID: A3LSMS928U	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
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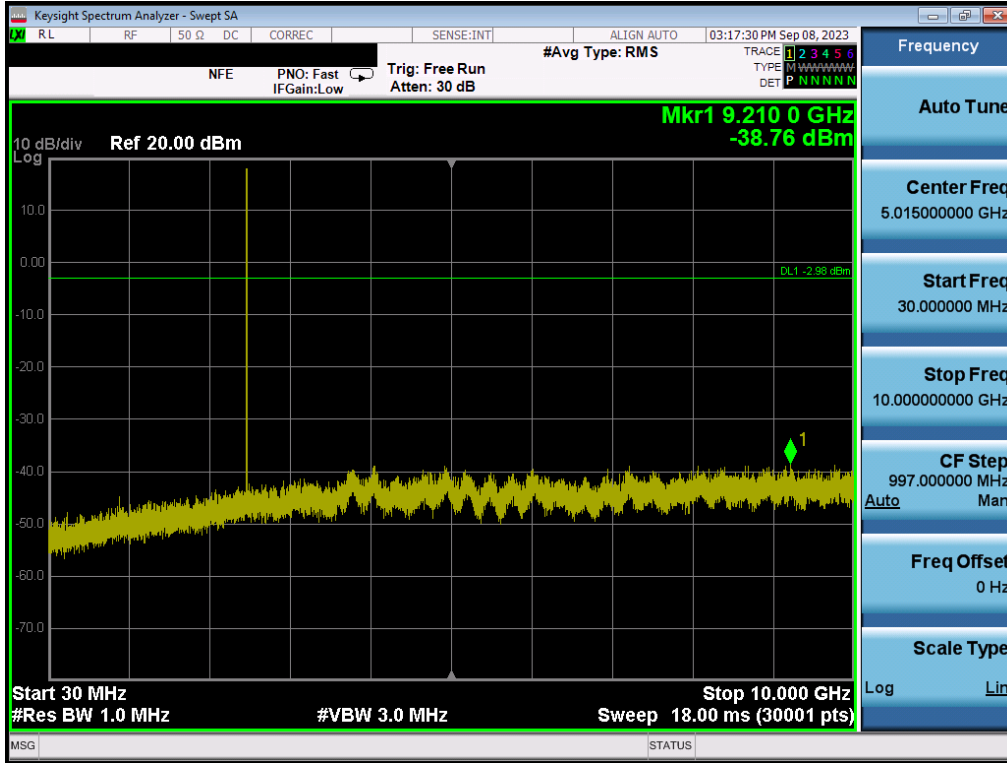


Plot 7-135. Conducted Spurious Plot (Bluetooth (LE), 1Mbps – Ch. 19) – ANT1

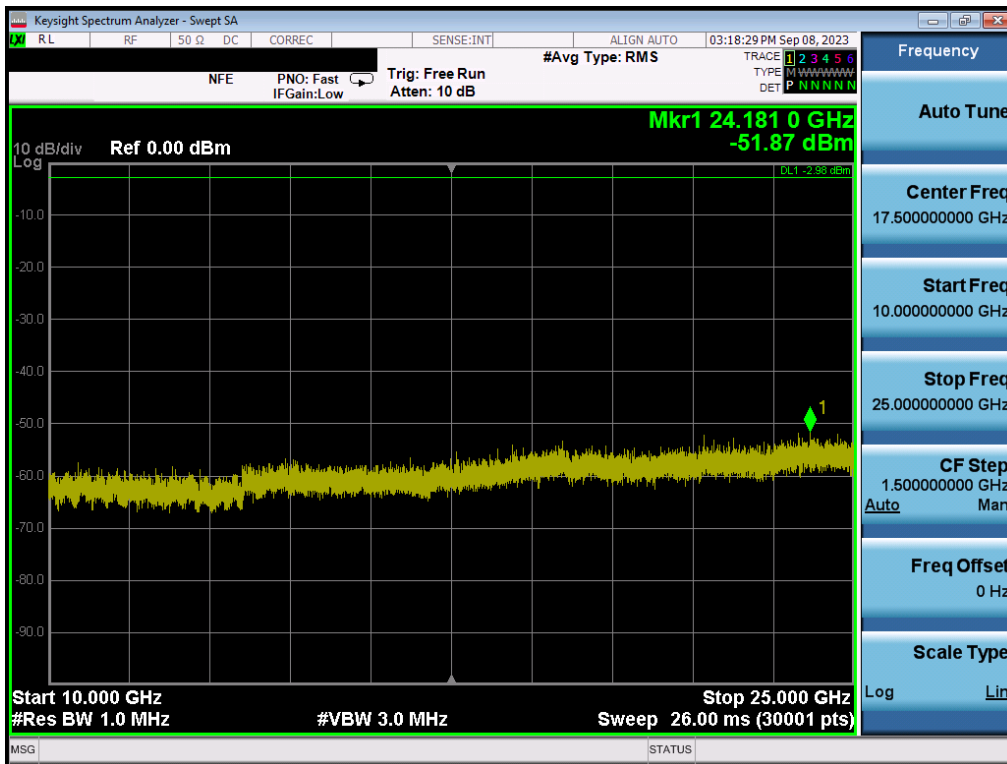


Plot 7-136. Conducted Spurious Plot (Bluetooth (LE), 1Mbps – Ch. 19) – ANT1

FCC ID: A3LSMS928U	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
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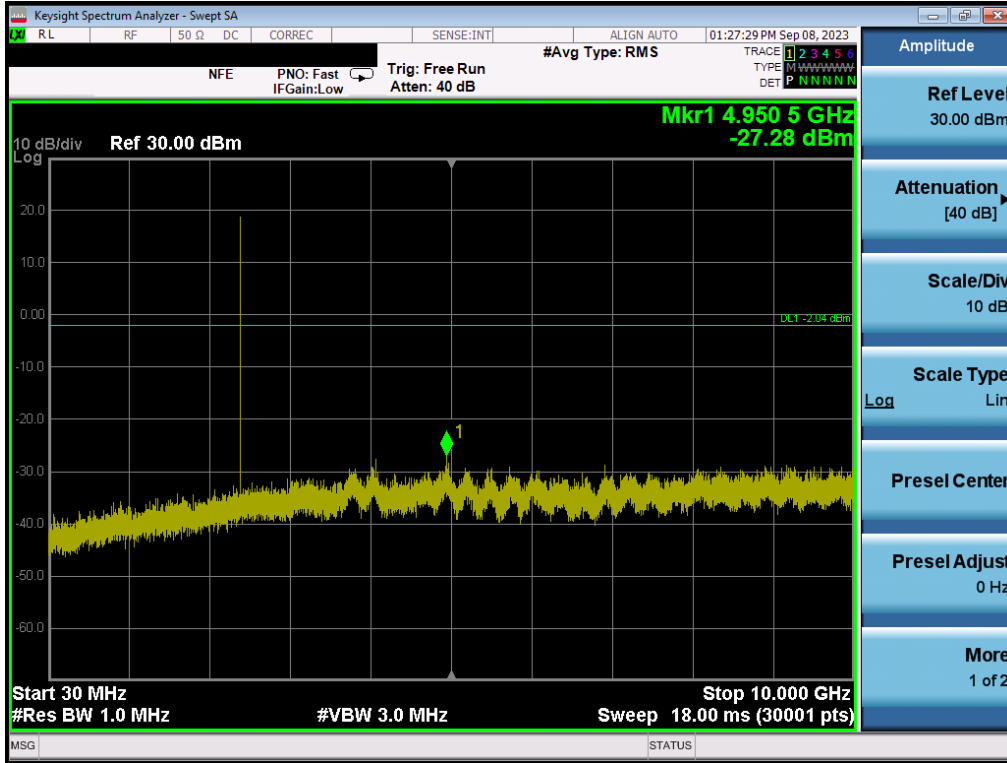


Plot 7-137. Conducted Spurious Plot (Bluetooth (LE), 1Mbps – Ch. 39) – ANT1

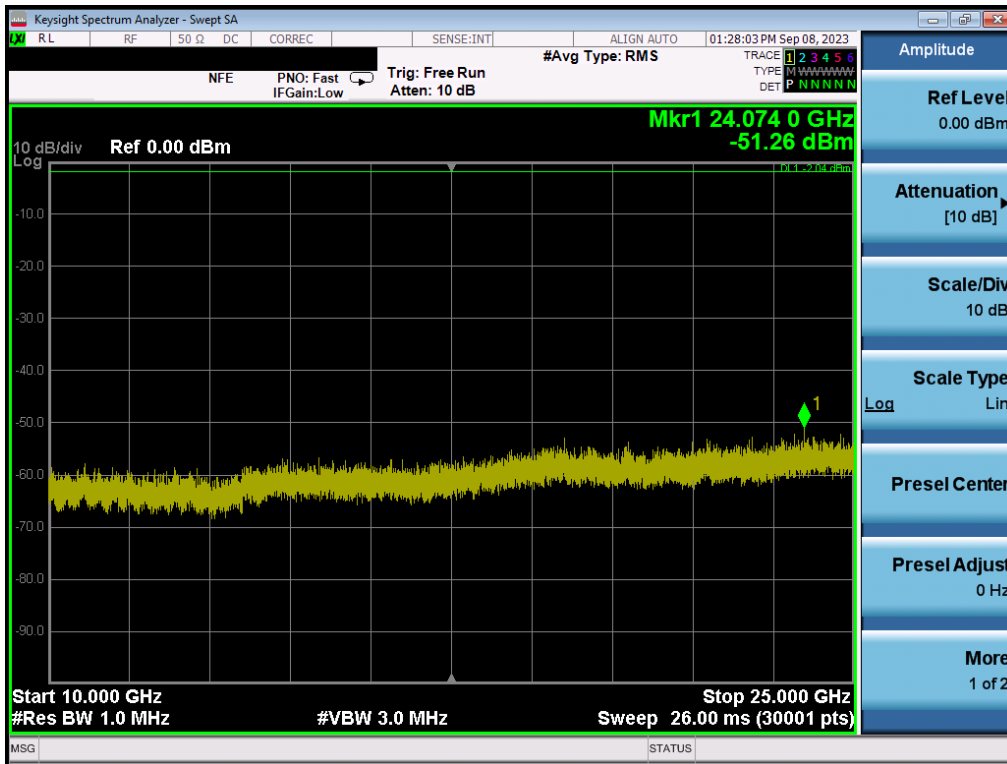


Plot 7-138. Conducted Spurious Plot (Bluetooth (LE), 1Mbps – Ch. 39) – ANT1

FCC ID: A3LSMS928U	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2308210092-10.A3L	Test Dates: 9/6/2023 - 11/06/2023	EUT Type: Portable Handset	Page 96 of 121

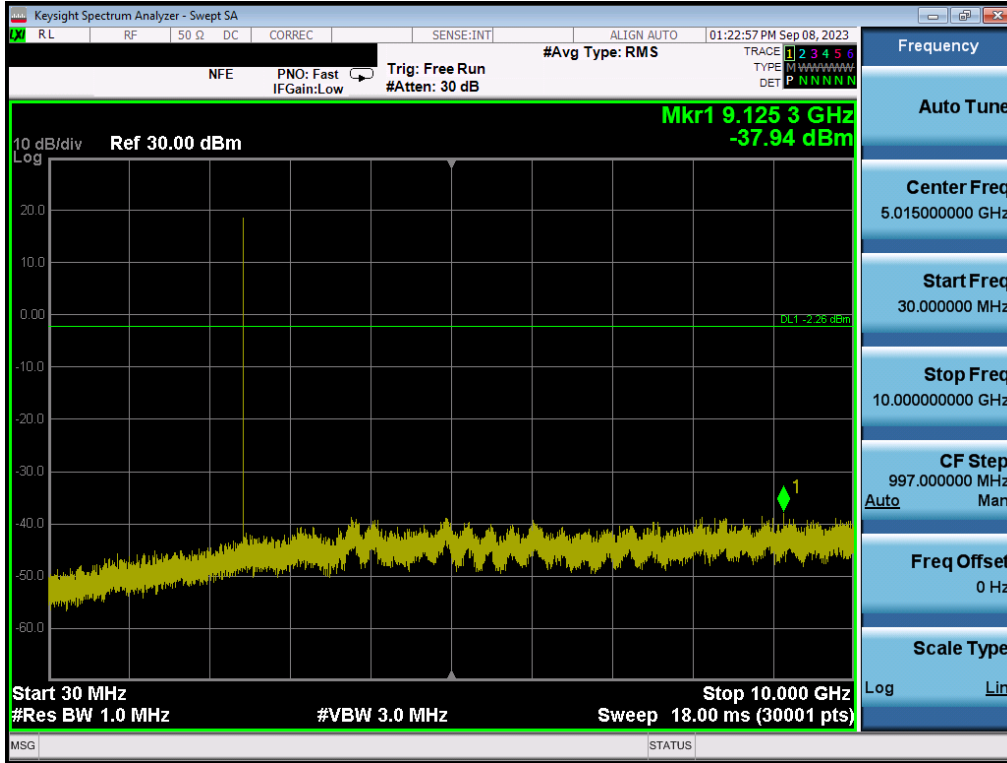


Plot 7-139. Conducted Spurious Plot (Bluetooth (LE), 1Mbps – Ch. 0) – ANT2



Plot 7-140. Conducted Spurious Plot (Bluetooth (LE), 1Mbps – Ch. 0) – ANT2

FCC ID: A3LSMS928U	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2308210092-10.A3L	Test Dates: 9/6/2023 - 11/06/2023	EUT Type: Portable Handset	Page 97 of 121

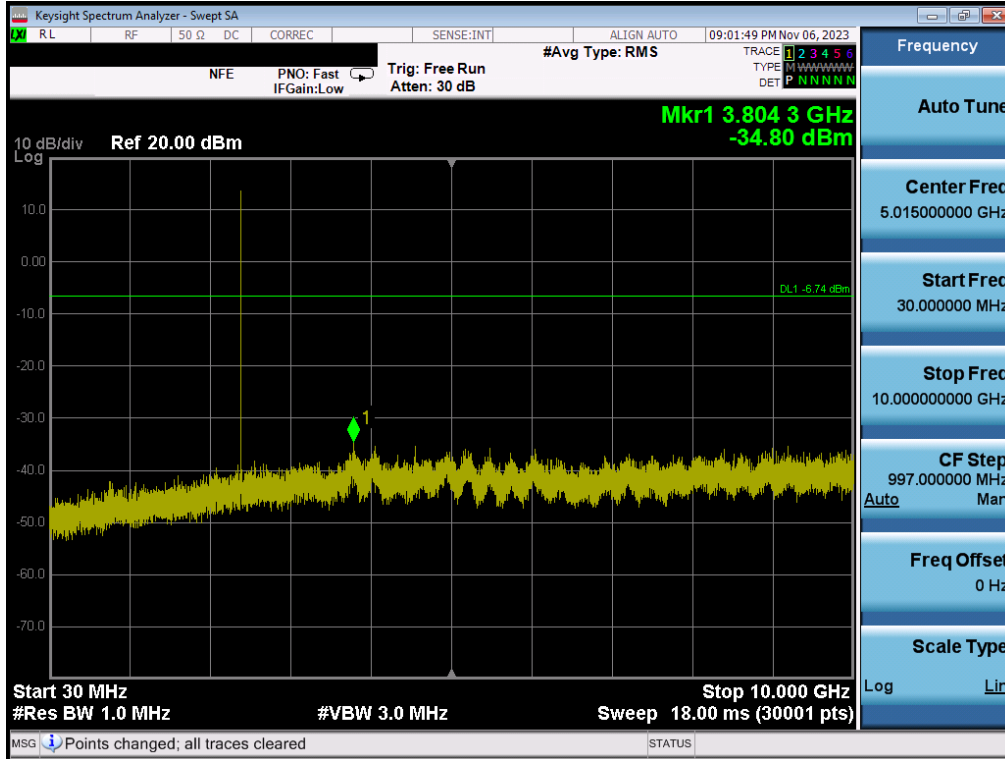


Plot 7-141. Conducted Spurious Plot (Bluetooth (LE), 1Mbps – Ch. 19) – ANT2

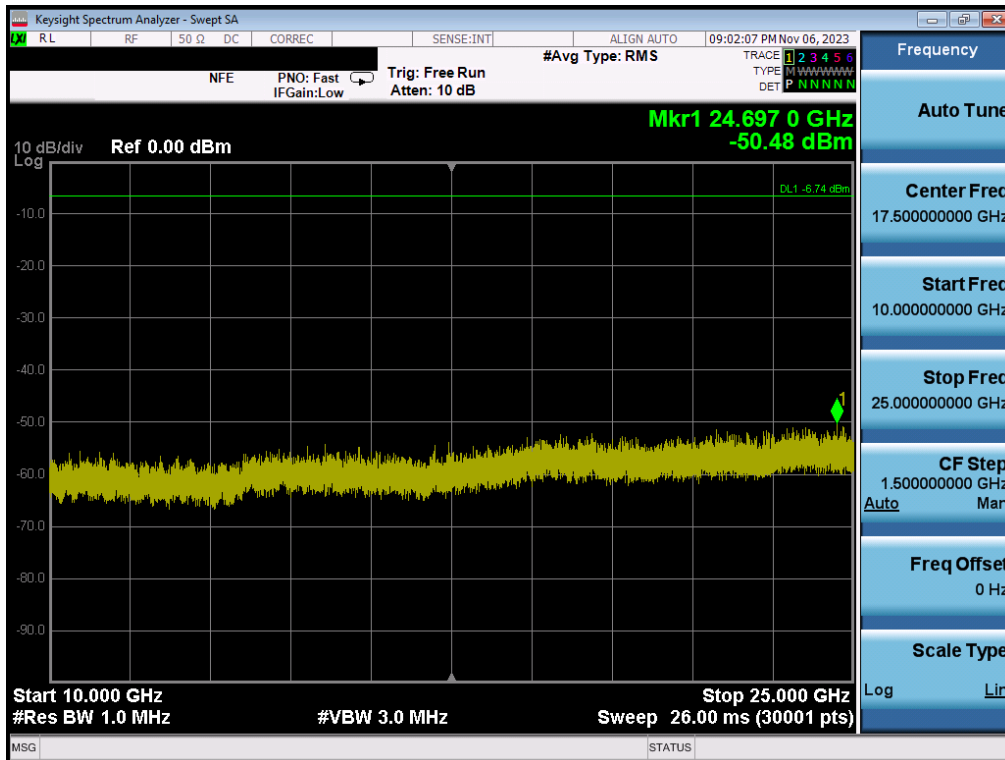


Plot 7-142. Conducted Spurious Plot (Bluetooth (LE), 1Mbps – Ch. 19) – ANT2

FCC ID: A3LSMS928U	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2308210092-10.A3L	Test Dates: 9/6/2023 - 11/06/2023	EUT Type: Portable Handset	Page 98 of 121

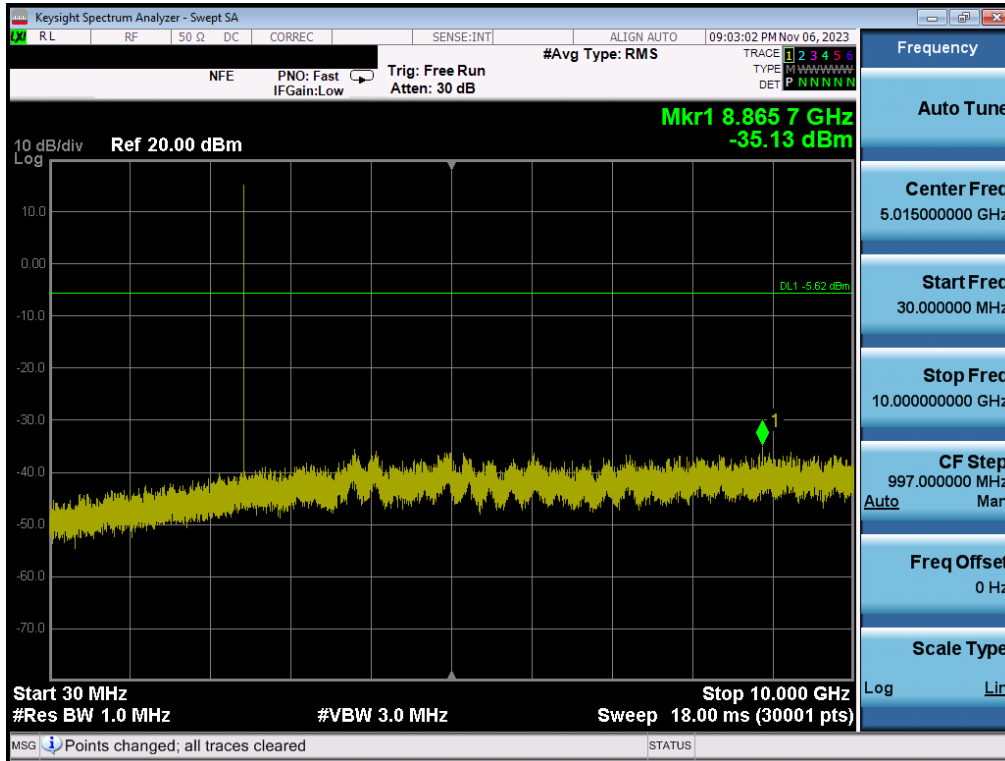


Plot 7-145. Conducted Spurious Plot (Bluetooth (LE), 1Mbps – Ch. 0) – Dual ANT1

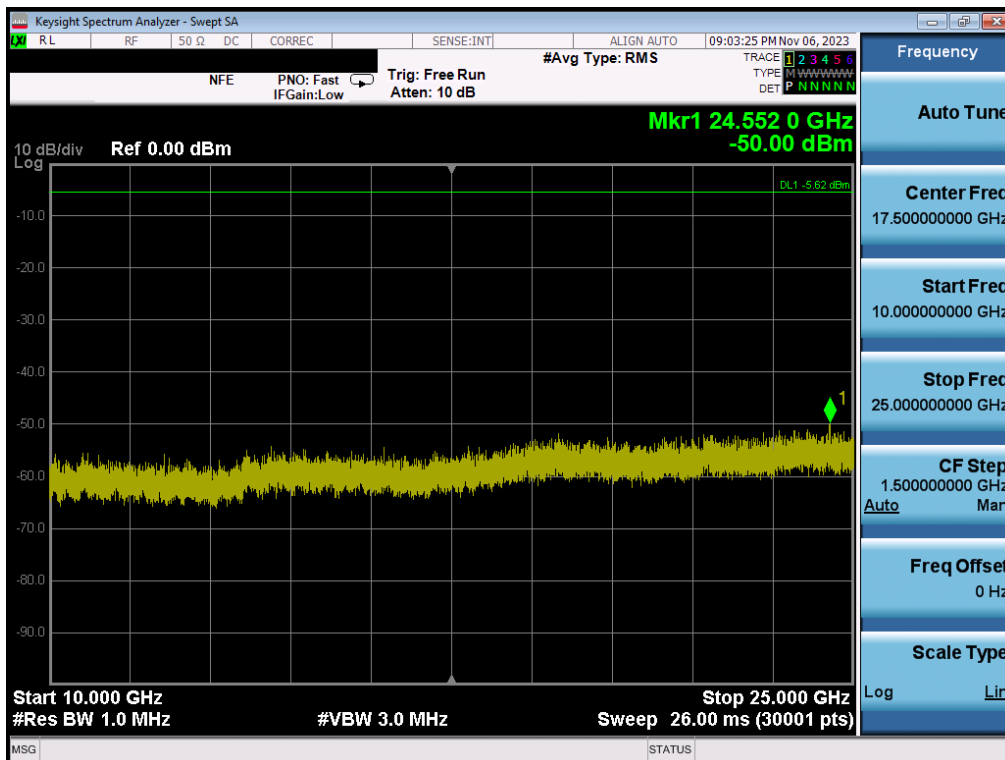


Plot 7-146. Conducted Spurious Plot (Bluetooth (LE), 1Mbps – Ch. 0) – Dual ANT1

FCC ID: A3LSMS928U	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
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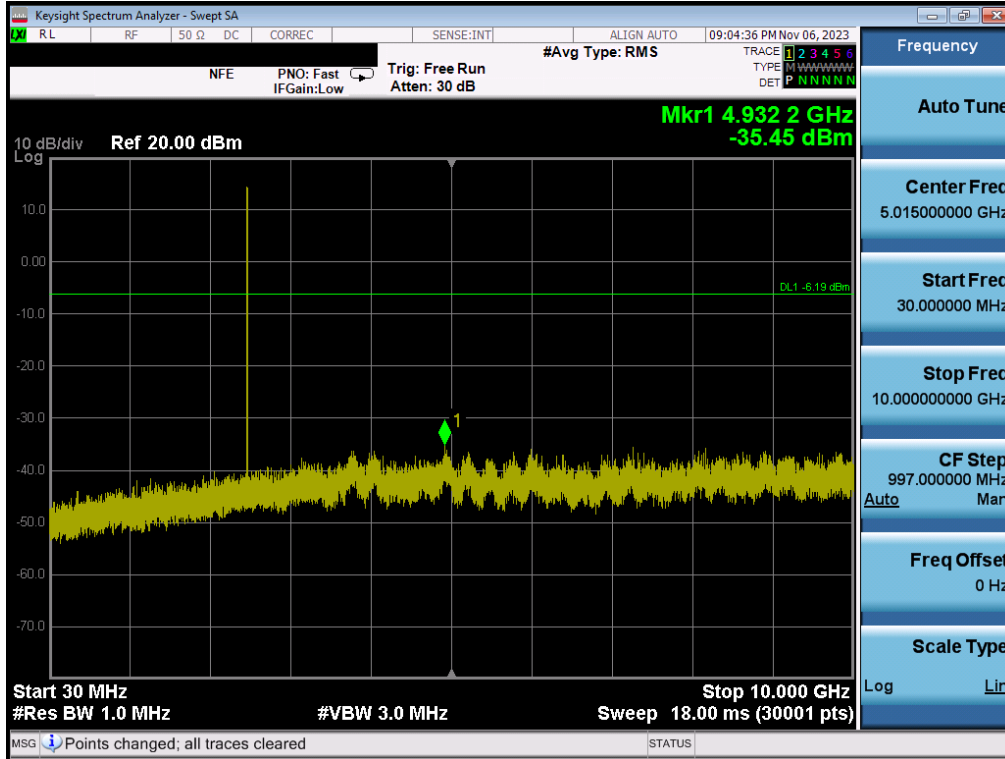


Plot 7-147. Conducted Spurious Plot (Bluetooth (LE), 1Mbps – Ch. 19) – Dual ANT1

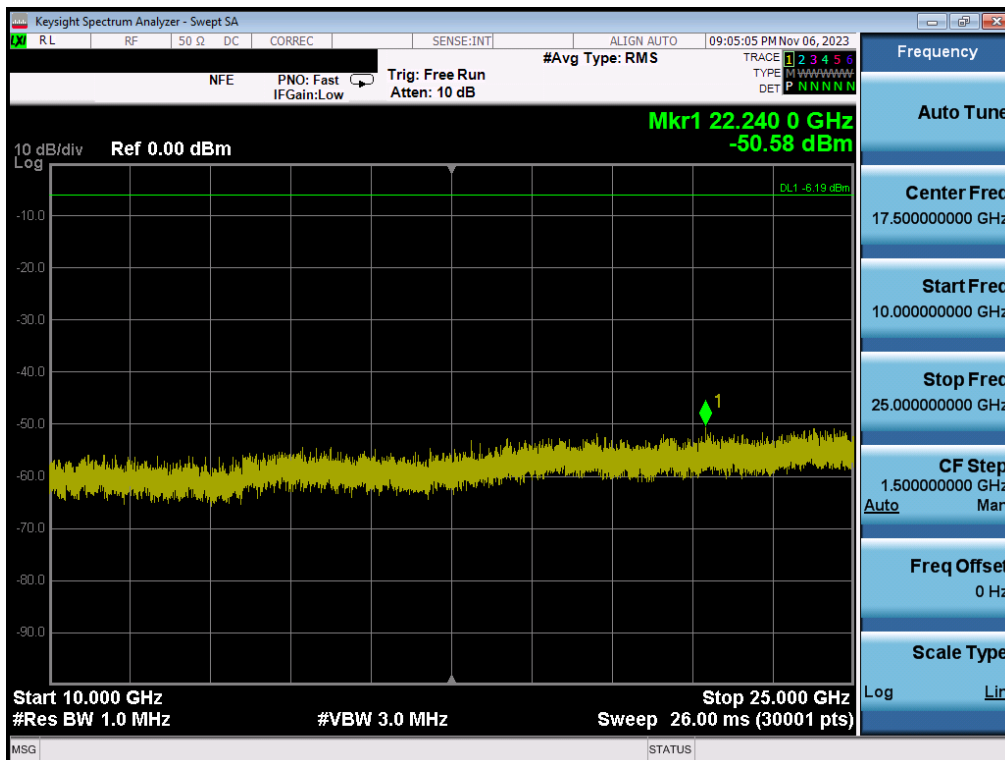


Plot 7-148. Conducted Spurious Plot (Bluetooth (LE), 1Mbps – Ch. 19) – Dual ANT1

FCC ID: A3LSMS928U	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2308210092-10.A3L	Test Dates: 9/6/2023 - 11/06/2023	EUT Type: Portable Handset	Page 101 of 121

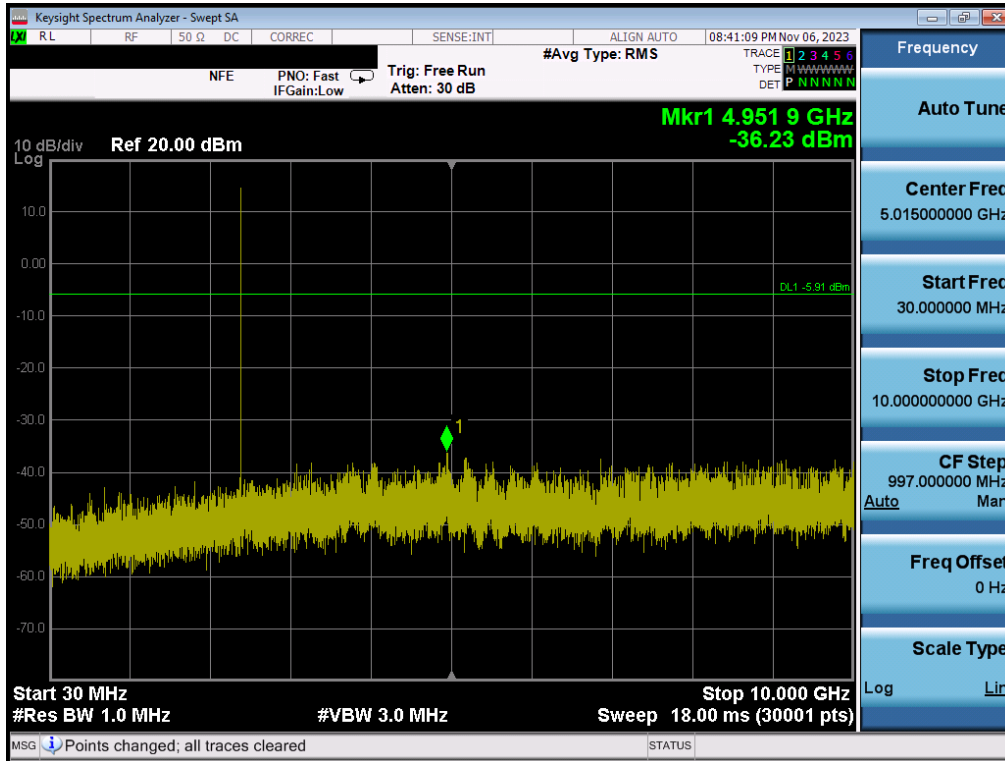


Plot 7-149. Conducted Spurious Plot (Bluetooth (LE), 1Mbps – Ch. 39) – Dual ANT1

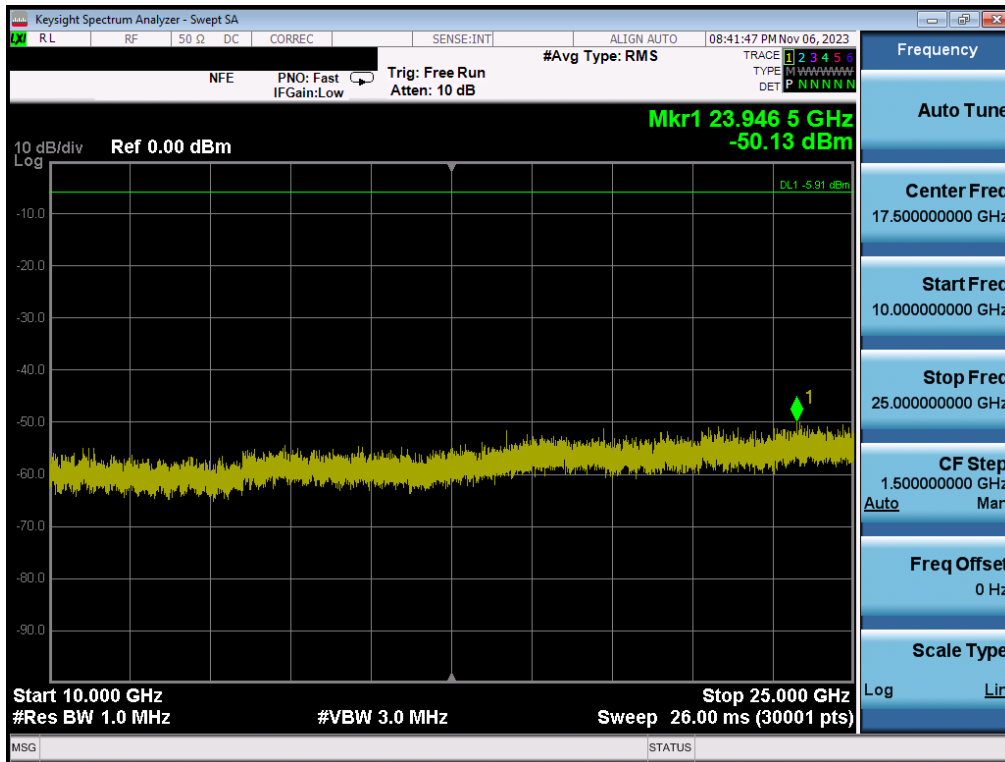


Plot 7-150. Conducted Spurious Plot (Bluetooth (LE), 1Mbps – Ch. 39) – Dual ANT1

FCC ID: A3LSMS928U	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
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Plot 7-151. Conducted Spurious Plot (Bluetooth (LE), 1Mbps – Ch. 0) – Dual ANT2



Plot 7-152. Conducted Spurious Plot (Bluetooth (LE), 1Mbps – Ch. 0) – Dual ANT2

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7.7 Radiated Spurious Emission Measurements
§15.205 §15.209 §15.247(d); RSS-Gen [8.9]

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 maximum power and at the appropriate frequencies. Only the radiated emissions of the configuration that produced the worst case emissions are reported in this section.

All out of band emissions appearing in a restricted band as specified in Section 15.205 of the Title 47 CFR and Table 6 of RSS-Gen (8.10) must not exceed the limits shown in Table 7-12 per Section 15.209 and RSS-Gen (8.9).

Frequency	Field Strength [μ 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 7-12. Radiated Limits

Test Procedures Used

ANSI C63.10-2013 – Section 6.6.4.3

KDB 558074 D01 v05r02 – Section 8.6, 8.7

Test Settings

Average Field Strength Measurements

1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. RBW = 1MHz
3. VBW = 3kHz > 1/T
4. Averaging type was set to RMS to ensure that video filtering was applied in the power domain
5. Detector = peak
6. Sweep time = auto
7. Trace mode = max hold
8. Trace was allowed to run for at least 50 times (1/duty cycle) 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 is set depending on measurement frequency, as specified in Table 7-13 below
3. VBW = 3MHz
4. Detector = peak
5. Sweep time = auto couple
6. Trace mode = max hold
7. Trace was allowed to stabilize

Frequency	RBW
9 – 150kHz	200 – 300Hz
0.15 – 30MHz	9 – 10kHz
30 – 1000MHz	100 – 120kHz
> 1000MHz	1MHz

Table 7-13. RBW as a Function of Frequency

Test Setup

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

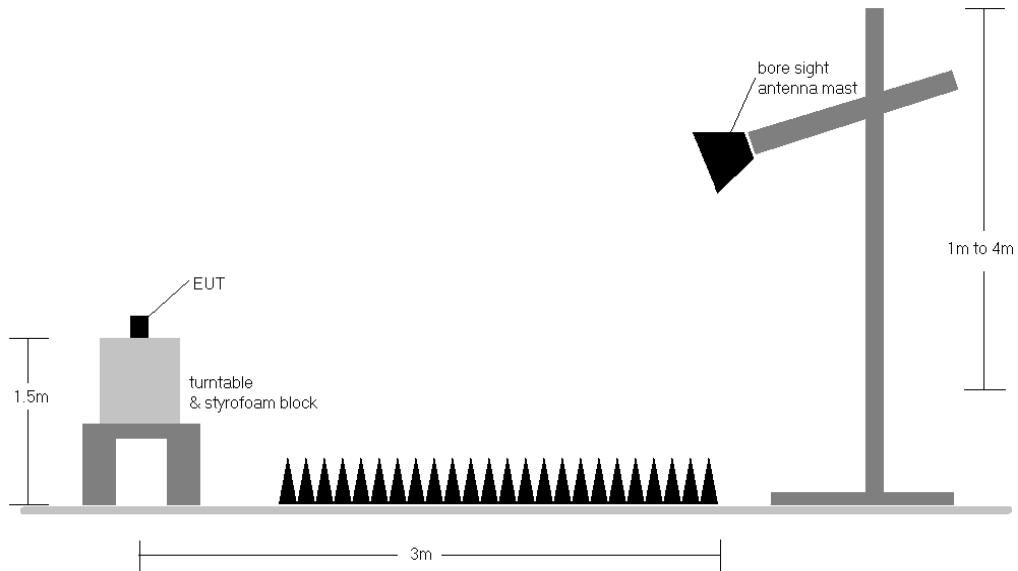


Figure 7-6. Radiated Test Setup >1GHz

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Test Notes

1. The optional test procedures for antenna port conducted measurements of unwanted emissions per the guidance of KDB 558074 D01 v05r02 were not used to evaluate this device for compliance to radiated limits. All radiated spurious emissions levels were measured in a radiated test setup.
2. All emissions lying in restricted bands specified in §15.205 and Section 8.10 of RSS-Gen are below the limit shown in Table 7-12.
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. Average measurements were recorded using a VBW of 3kHz, per Section 4.1.4.2.3 of ANSI C63.10-2013, since 1/T is equal to just under 3kHz. This method was used because the EUT could not be configured to operate with a duty cycle > 98%. Both average and peak measurements were made using a peak detector
7. 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.
8. No significant radiated band edge emissions were found in the 2310 – 2390MHz restricted band.
9. The "-" shown in the following RSE tables are used to denote a noise floor measurement.

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 in Section 7.8 was calculated using the formula:

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

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Radiated Spurious Emission Measurements
§15.205 §15.209 §15.247(d); RSS-Gen [8.9]

Bluetooth Mode: LE
 Distance of Measurements: 3 Meters
 Operating Frequency: 2402MHz
 Channel: 0

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
4804.00	Avg	H	-	-	-81.28	9.22	34.94	53.98	-19.04
4804.00	Peak	H	-	-	-69.39	9.22	46.83	73.98	-27.15
12010.00	Avg	H	-	-	-84.02	22.37	45.35	53.98	-8.63
12010.00	Peak	H	-	-	-72.01	22.37	57.36	73.98	-16.62

Table 7-14. Radiated Measurements @ 3 meters – ANT1

Bluetooth Mode: LE
 Distance of Measurements: 3 Meters
 Operating Frequency: 2440MHz
 Channel: 19

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
4880.00	Avg	H	-	-	-81.23	9.54	35.31	53.98	-18.67
4880.00	Peak	H	-	-	-69.32	9.54	47.22	73.98	-26.76
7320.00	Avg	H	-	-	-70.80	15.01	51.21	53.98	-2.77
7320.00	Peak	H	-	-	-82.91	15.01	39.10	73.98	-34.88
12200.00	Avg	H	-	-	-84.67	22.98	45.31	53.98	-8.67
12200.00	Peak	H	-	-	-72.89	22.98	57.09	73.98	-16.89

Table 7-15. Radiated Measurements @ 3 meters– ANT1

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Radiated Spurious Emission Measurements
 §15.205 §15.209 §15.247(d); RSS-Gen [8.9]

Bluetooth Mode: LE
 Distance of Measurements: 3 Meters
 Operating Frequency: 2480MHz
 Channel: 39

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
4960.00	Avg	H	160	318	-81.05	9.57	35.52	53.98	-18.46
4960.00	Peak	H	160	318	-68.75	9.57	47.82	73.98	-26.16
7440.00	Avg	H	-	-	-83.06	15.20	39.14	53.98	-14.84
7440.00	Peak	H	-	-	-69.99	15.20	52.21	73.98	-21.77
12400.00	Avg	H	-	-	-84.67	23.25	45.58	53.98	-8.40
12400.00	Peak	H	-	-	-72.16	23.25	58.09	73.98	-15.89

Table 7-16. Radiated Measurements @ 3 meters– ANT1

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Radiated Spurious Emission Measurements
 §15.205 §15.209 §15.247(d); RSS-Gen [8.9]

Bluetooth Mode: LE
 Distance of Measurements: 3 Meters
 Operating Frequency: 2402MHz
 Channel: 0

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
4804.00	Avg	H	-	-	-81.21	9.22	35.01	53.98	-18.97
4804.00	Peak	H	-	-	-69.15	9.22	47.07	73.98	-26.91
12010.00	Avg	H	-	-	-84.16	22.37	45.21	53.98	-8.77
12010.00	Peak	H	-	-	-71.49	22.37	57.88	73.98	-16.10

Table 7-17. Radiated Measurements @ 3 meters – ANT2

Bluetooth Mode: LE
 Distance of Measurements: 3 Meters
 Operating Frequency: 2440MHz
 Channel: 19

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
4880.00	Avg	H	-	-	-81.23	9.54	35.31	53.98	-18.67
4880.00	Peak	H	-	-	-69.53	9.54	47.01	73.98	-26.97
7320.00	Avg	H	-	-	-82.67	15.01	39.34	53.98	-14.64
7320.00	Peak	H	-	-	-69.98	15.01	52.03	73.98	-21.95
12200.00	Avg	H	-	-	-84.71	22.98	45.27	53.98	-8.71
12200.00	Peak	H	-	-	-72.90	22.98	57.08	73.98	-16.90

Table 7-18. Radiated Measurements @ 3 meters– ANT2

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Radiated Spurious Emission Measurements
 §15.205 §15.209 §15.247(d); RSS-Gen [8.9]

Bluetooth Mode: LE
 Distance of Measurements: 3 Meters
 Operating Frequency: 2480MHz
 Channel: 39

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
4960.00	Avg	H	-	-	-81.23	9.57	35.34	53.98	-18.64
4960.00	Peak	H	-	-	-68.75	9.57	47.82	73.98	-26.16
7440.00	Avg	H	-	-	-82.96	15.20	39.24	53.98	-14.74
7440.00	Peak	H	-	-	-70.13	15.20	52.07	73.98	-21.91
12400.00	Avg	H	-	-	-84.98	23.25	45.27	53.98	-8.71
12400.00	Peak	H	-	-	-73.29	23.25	56.96	73.98	-17.02

Table 7-19. Radiated Measurements @ 3 meters– ANT2

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Radiated Spurious Emission Measurements
§15.205 §15.209 §15.247(d); RSS-Gen [8.9]

Bluetooth Mode: LE
 Distance of Measurements: 3 Meters
 Operating Frequency: 2402MHz
 Channel: 0

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
4804.00	Avg	H	-	-	-78.04	2.39	31.35	53.98	-22.63
4804.00	Peak	H	-	-	-66.44	2.39	42.95	73.98	-31.03
12010.00	Avg	H	-	-	-80.41	13.40	39.99	53.98	-13.99
12010.00	Peak	H	-	-	-68.60	13.40	51.80	73.98	-22.18

Table 7-20. Radiated Measurements @ 3 meters – Dual

Bluetooth Mode: LE
 Distance of Measurements: 3 Meters
 Operating Frequency: 2440MHz
 Channel: 19

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
4880.00	Avg	H	-	-	-78.19	2.84	31.65	53.98	-22.33
4880.00	Peak	H	-	-	-66.16	2.84	43.68	73.98	-30.30
7320.00	Avg	H	-	-	-78.85	8.91	37.06	53.98	-16.92
7320.00	Peak	H	-	-	-66.45	8.91	49.46	73.98	-24.52
12200.00	Avg	H	-	-	-80.43	12.94	39.51	53.98	-14.47
12200.00	Peak	H	-	-	-69.19	12.94	50.75	73.98	-23.23

Table 7-21. Radiated Measurements @ 3 meters– Dual

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Radiated Spurious Emission Measurements
 §15.205 §15.209 §15.247(d); RSS-Gen [8.9]

Bluetooth Mode: LE
 Distance of Measurements: 3 Meters
 Operating Frequency: 2480MHz
 Channel: 39

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
4960.00	Avg	H	-	-	-78.46	3.05	31.59	53.98	-22.39
4960.00	Peak	H	-	-	-66.40	3.05	43.65	73.98	-30.33
7440.00	Avg	H	-	-	-79.24	8.67	36.43	53.98	-17.55
7440.00	Peak	H	-	-	-67.24	8.67	48.43	73.98	-25.55
12400.00	Avg	H	-	-	-80.80	12.99	39.19	53.98	-14.78
12400.00	Peak	H	-	-	-69.16	12.99	50.83	73.98	-23.14

Table 7-22. Radiated Measurements @ 3 meters– Dual

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7.8 Radiated Restricted Band Edge Measurements

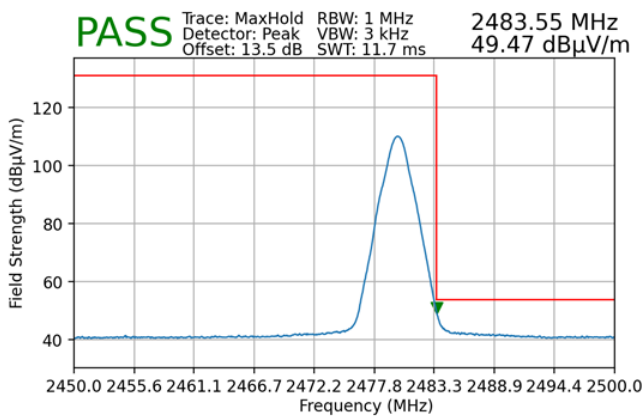
§15.205 §15.209; RSS-Gen [8.9]

The radiated restricted band edge measurements are measured with an EMI test receiver connected to the receive antenna while the EUT is transmitting.

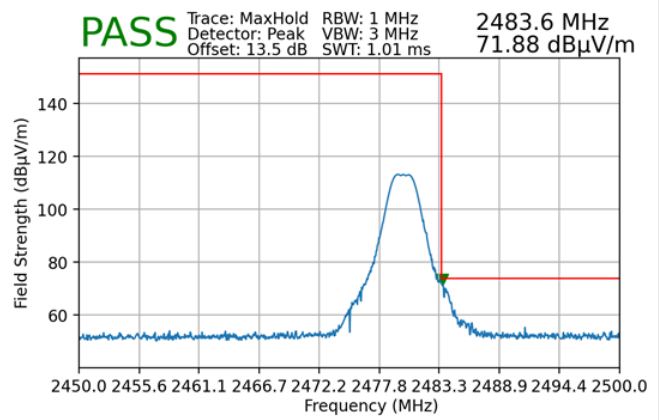
The amplitude offset shown in the following plots for average measurements was calculated using the formula:

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

Bluetooth Mode:	LE
Measurement Distance:	3 Meters
Operating Frequency:	2480MHz
Channel:	39

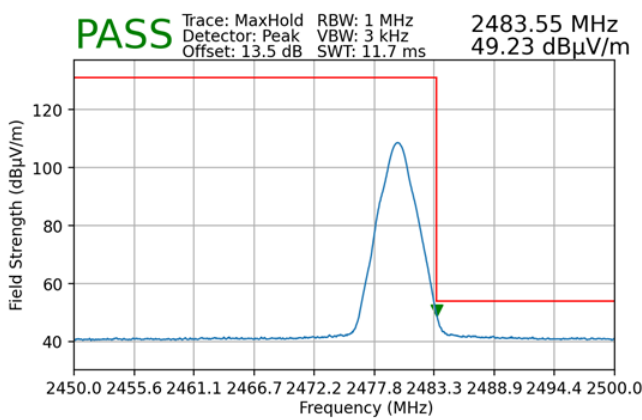


Plot 7-157. Radiated Restricted Upper Band Edge Measurement (Average) ANT1

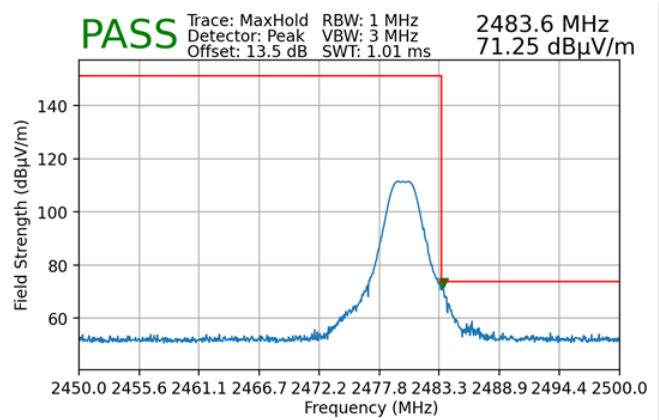


Plot 7-158. Radiated Restricted Upper Band Edge Measurement (Peak) ANT1

Bluetooth Mode:	LE
Measurement Distance:	3 Meters
Operating Frequency:	2480MHz
Channel:	39



Plot 7-159. Radiated Restricted Upper Band Edge Measurement (Average) ANT2

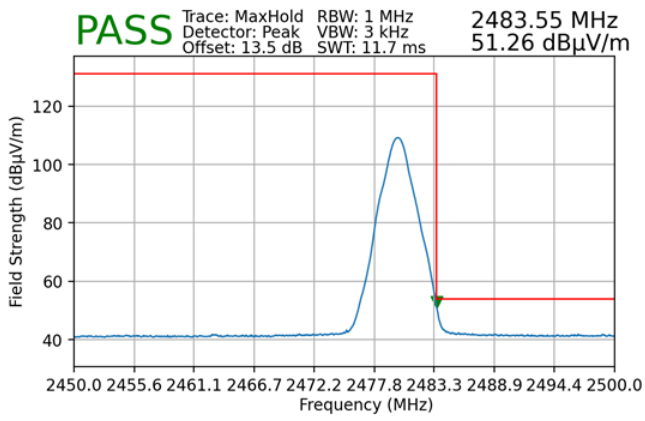


Plot 7-160. Radiated Restricted Upper Band Edge Measurement (Peak) ANT2

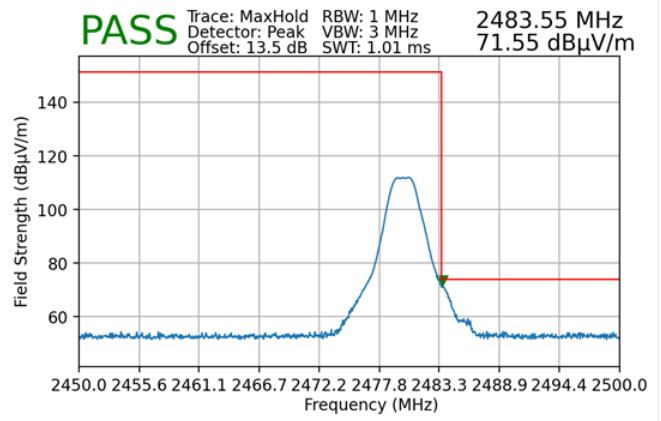
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Bluetooth Mode: LE
 Measurement Distance: 3 Meters
 Operating Frequency: 2480MHz
 Channel: 39



Plot 7-161. Radiated Restricted Upper Band Edge Measurement (Average) Dual



Plot 7-162. Radiated Restricted Upper Band Edge Measurement (Peak) Dual

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7.9 Line-Conducted Test Data
§15.207; RSS-Gen [8.8]

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 and RSS-Gen (8.8).

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

Table 7-23. 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.

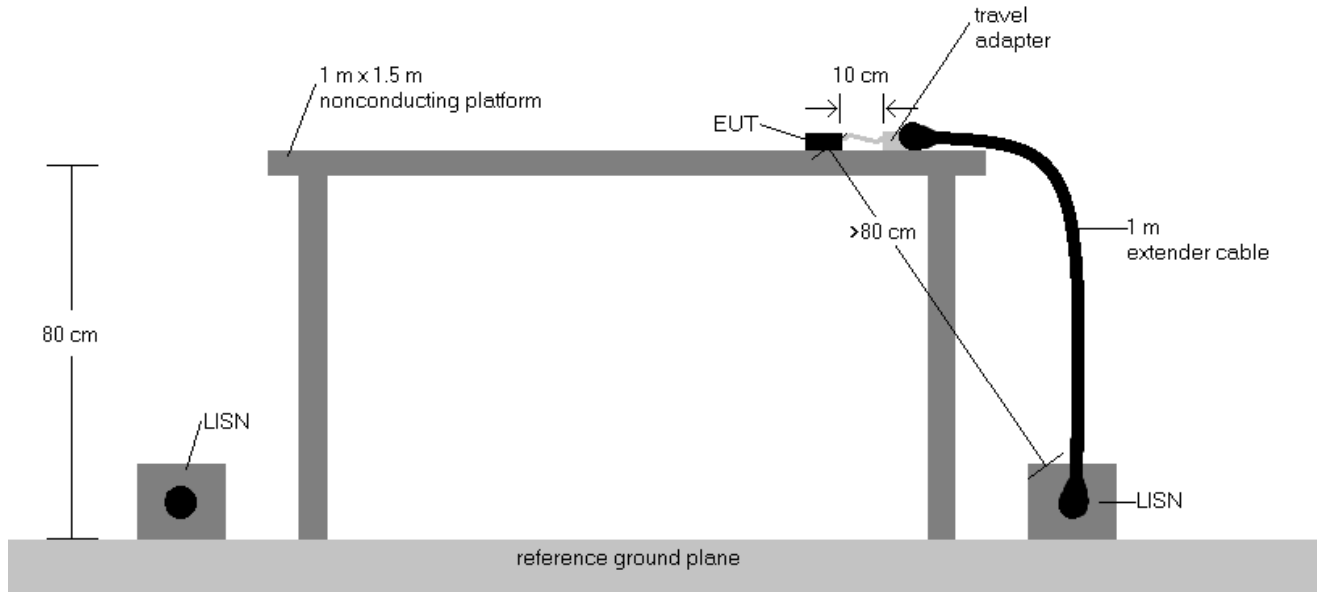
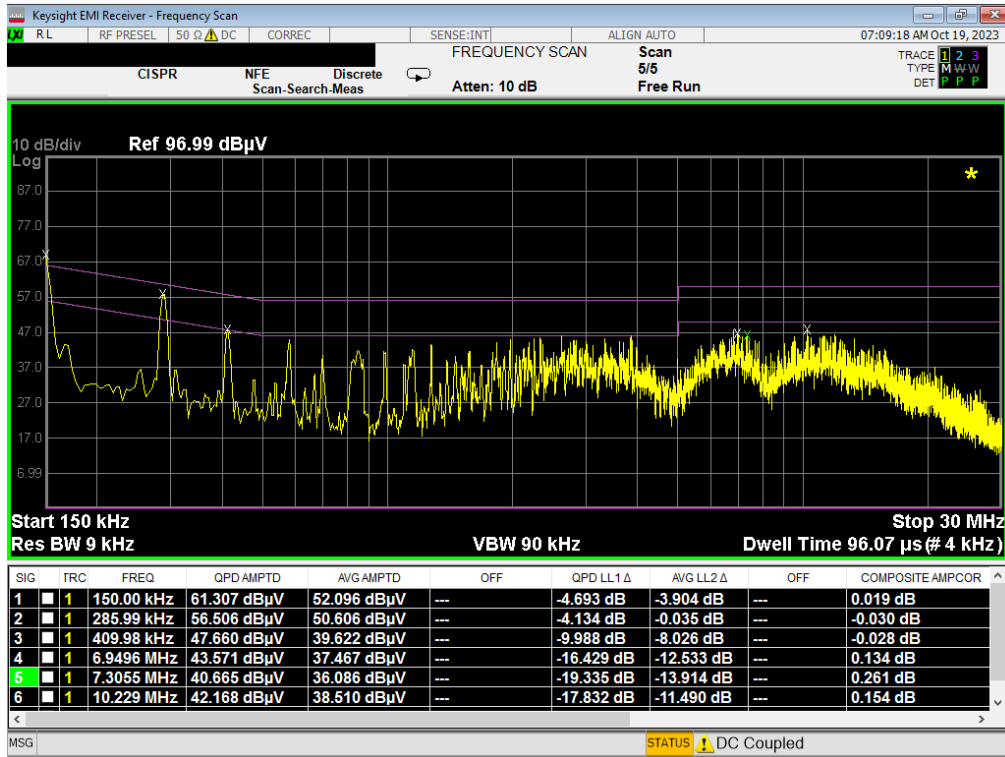


Figure 7-7. Test Instrument & Measurement Setup

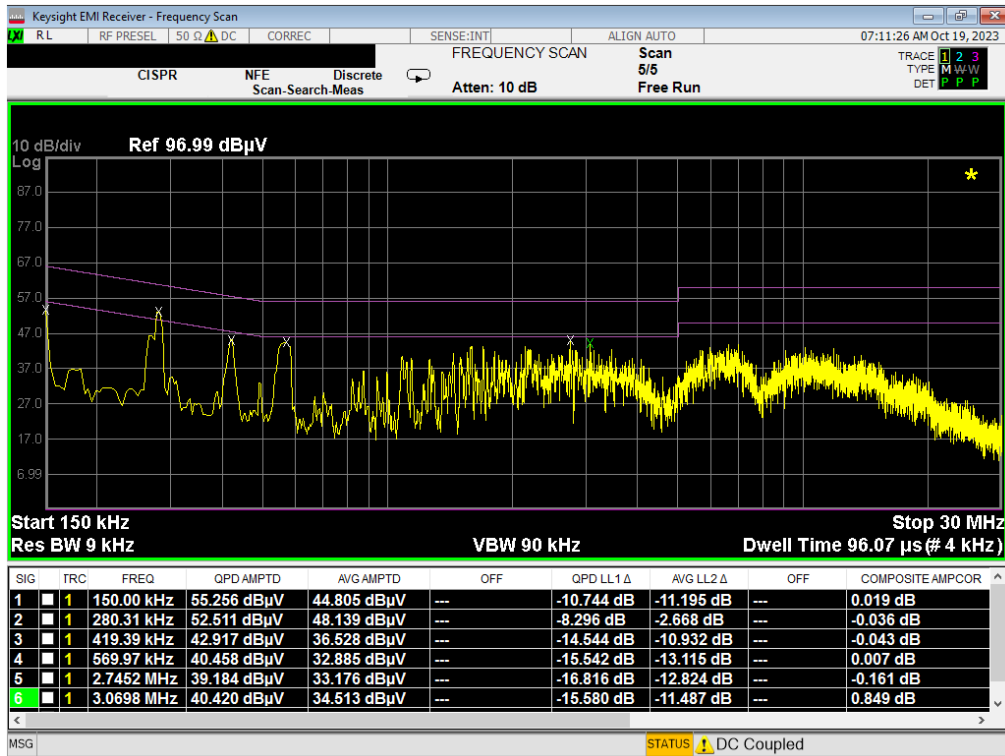
Test Notes

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 are specified in Part 15.207 and RSS-Gen (8.8).
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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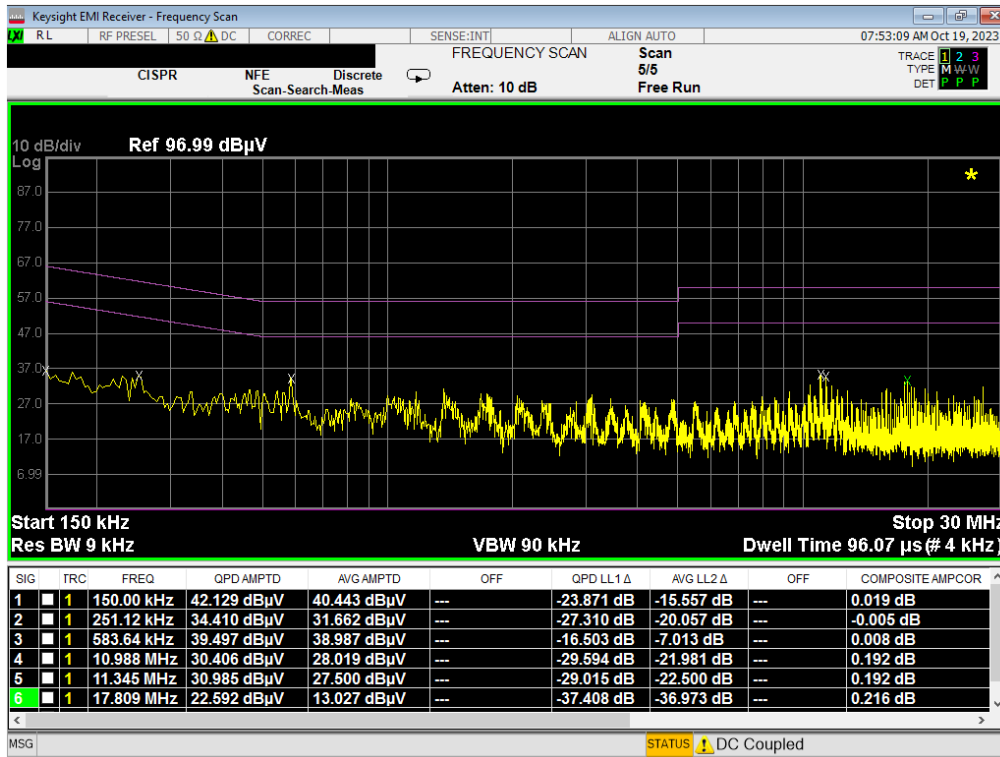


Plot 7-163. Line Conducted Plot with Bluetooth LE (L1)

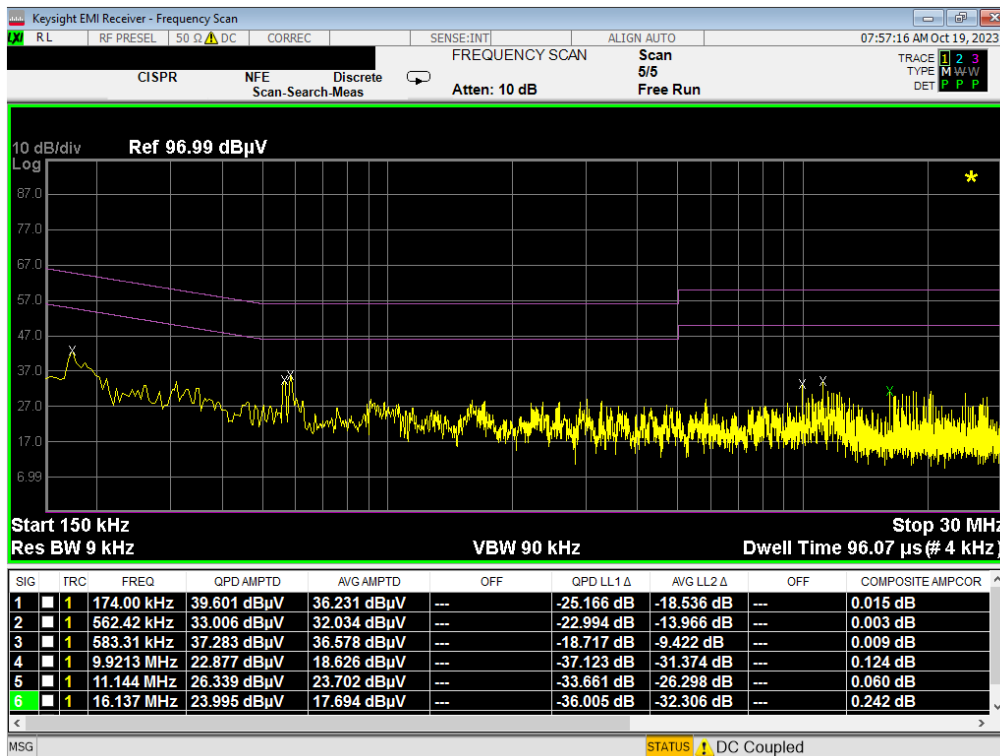


Plot 7-164. Line Conducted Plot with Bluetooth LE (N)

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Plot 7-165. Line Conducted Plot with Bluetooth LE (L1) WCP



Plot 7-166. Line Conducted Plot with Bluetooth LE (N) WCP

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8.0 CONCLUSION

The data collected relate only the item(s) tested and show that the **Samsung Portable Handset FCC ID: A3LSMS928U** is in compliance with Part 15 Subpart C (15.247) of the FCC Rules.

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