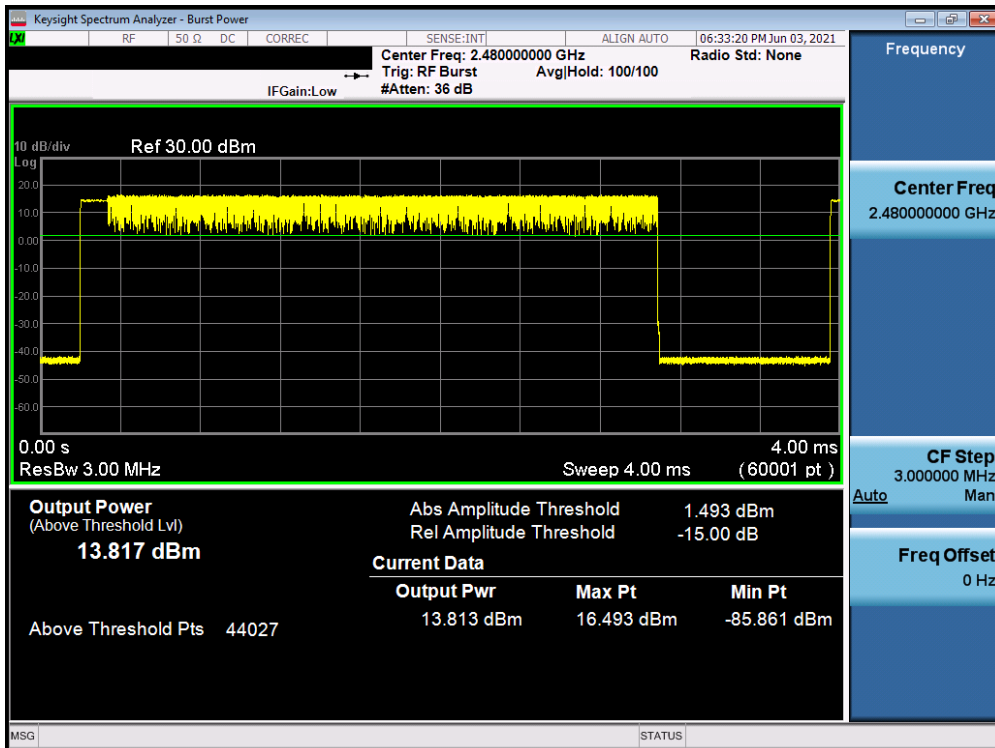
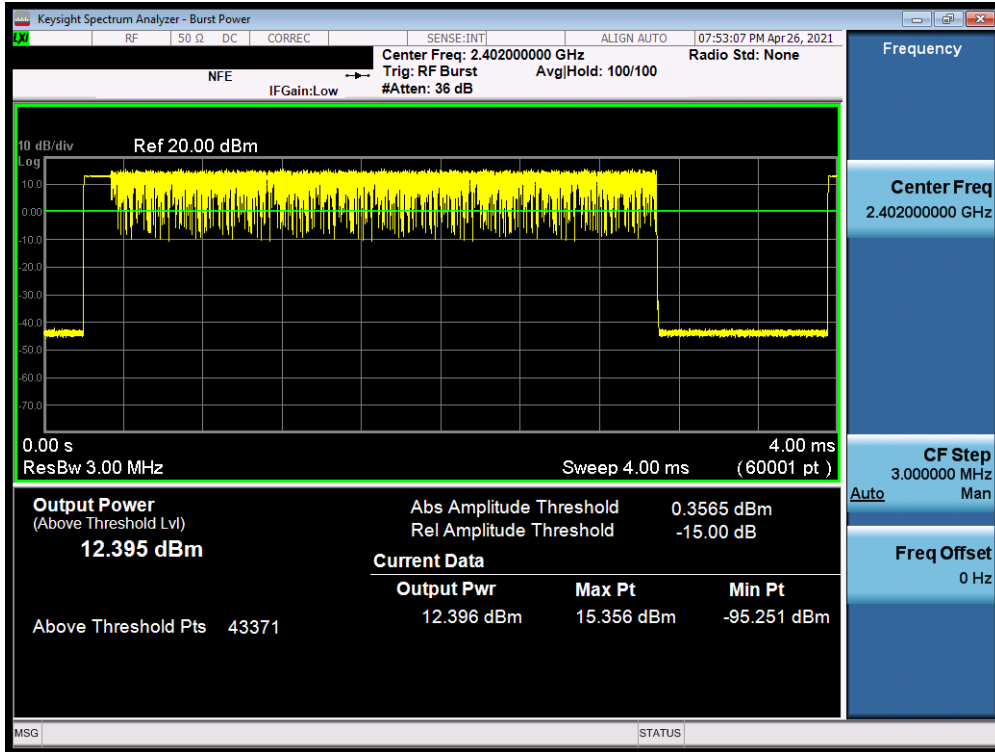


Plot 7-101. Average Conducted Power (2Mbps, iPA – Ch. 39) – ANT1

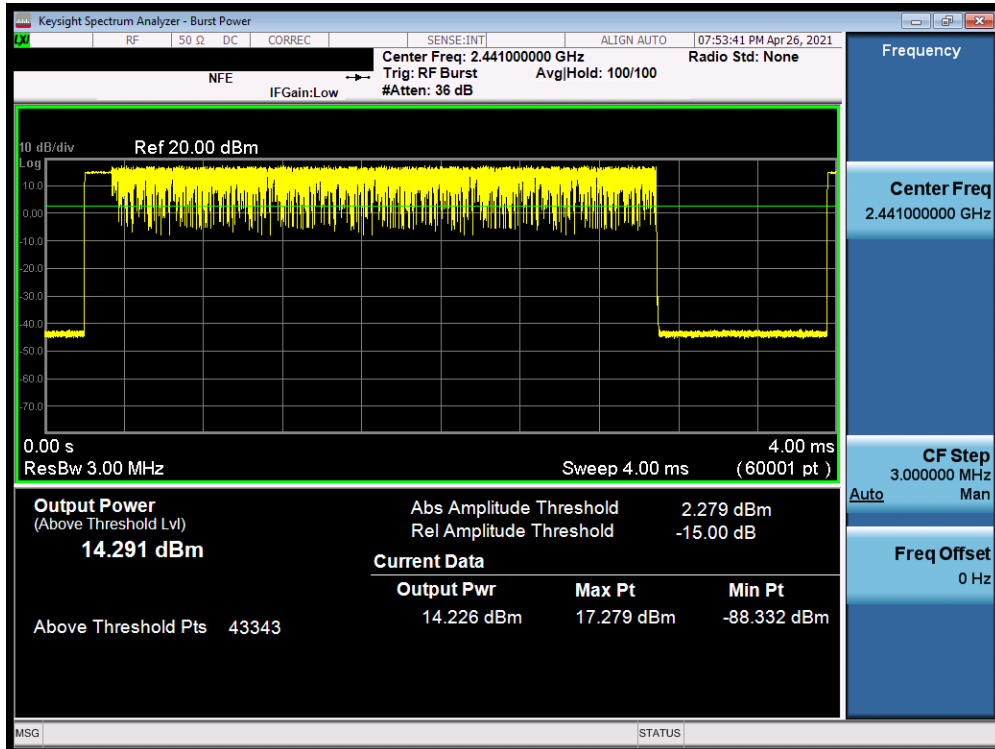


Plot 7-102. Average Conducted Power (2Mbps, iPA – Ch. 78) – ANT1

FCC ID: A3LSMF711U1	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
Test Report S/N: 1M2107290086-14.A3L	Test Dates: 04/16/2021 - 04/29/2021	EUT Type: Portable Handset		Page 69 of 139

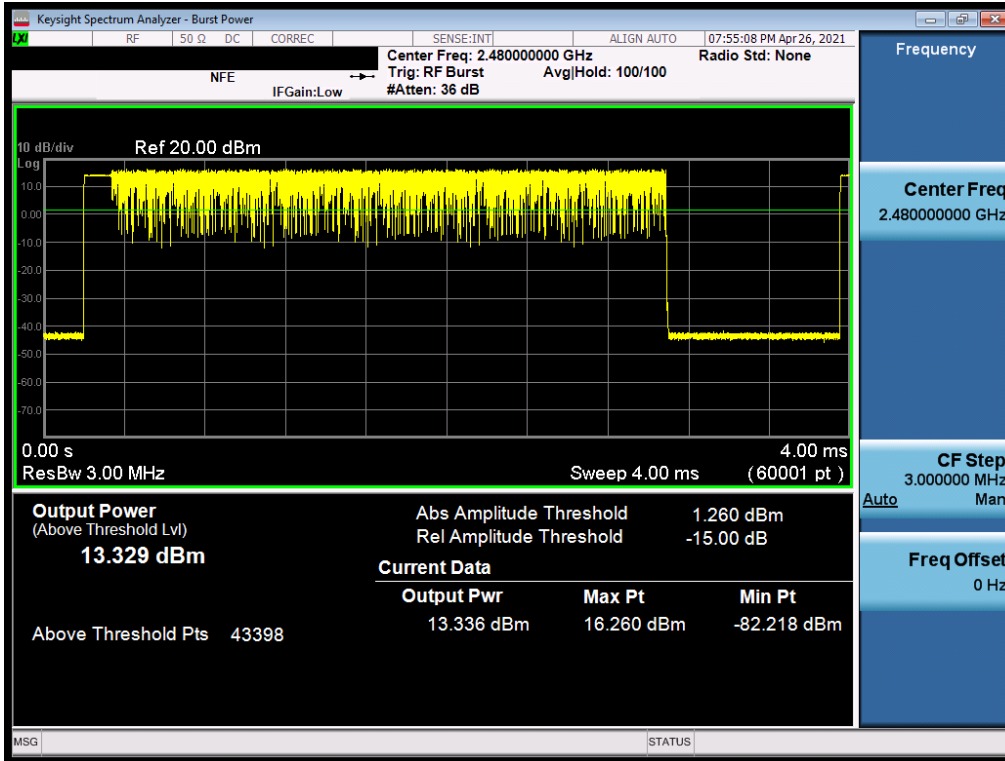


Plot 7-103. Average Conducted Power (3Mbps, ePA – Ch. 0) – ANT1

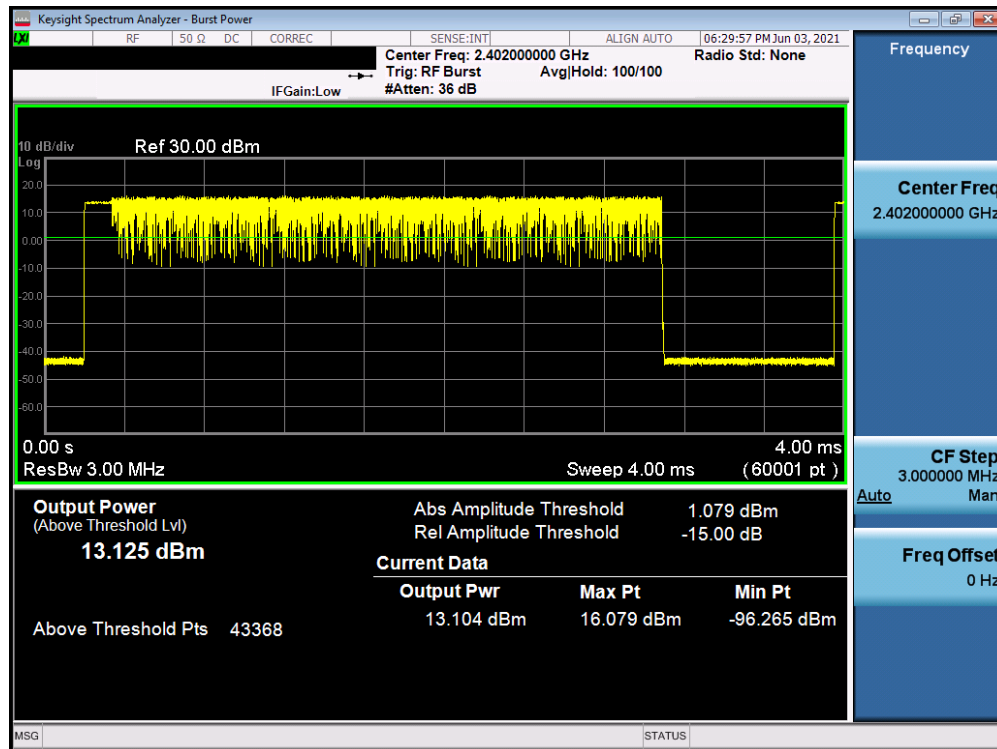


Plot 7-104. Average Conducted Power (3Mbps, ePA – Ch. 39) – ANT1

FCC ID: A3LSMF711U1	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
Test Report S/N: 1M2107290086-14.A3L	Test Dates: 04/16/2021 - 04/29/2021	EUT Type: Portable Handset		Page 70 of 139

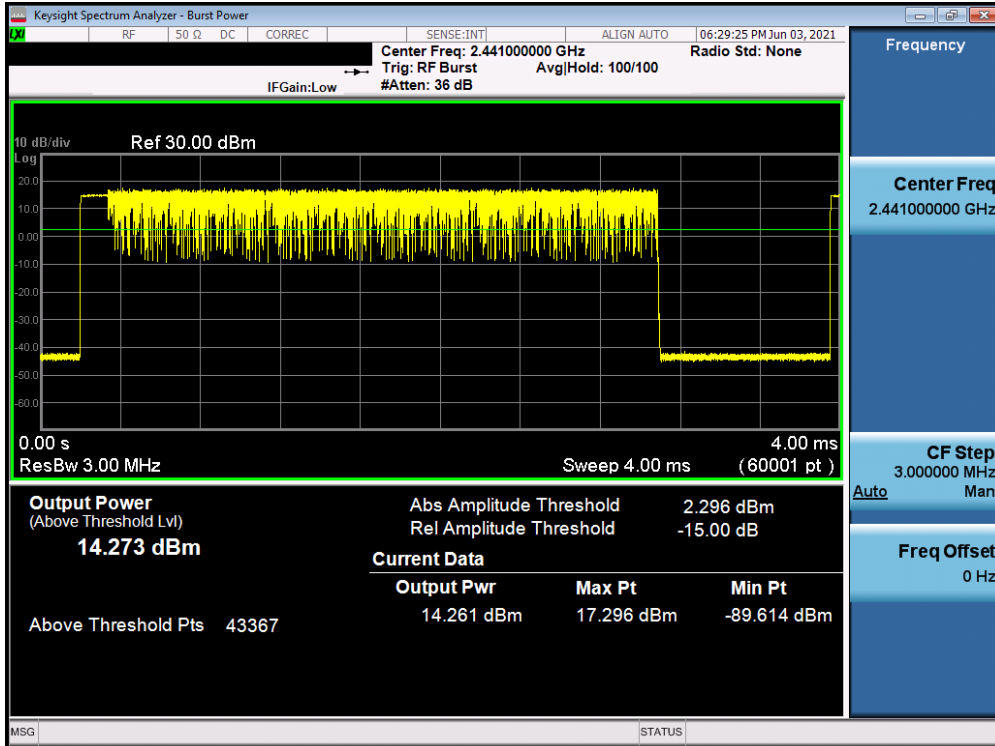


Plot 7-105. Average Conducted Power (3Mbps, ePA – Ch. 78) – ANT1

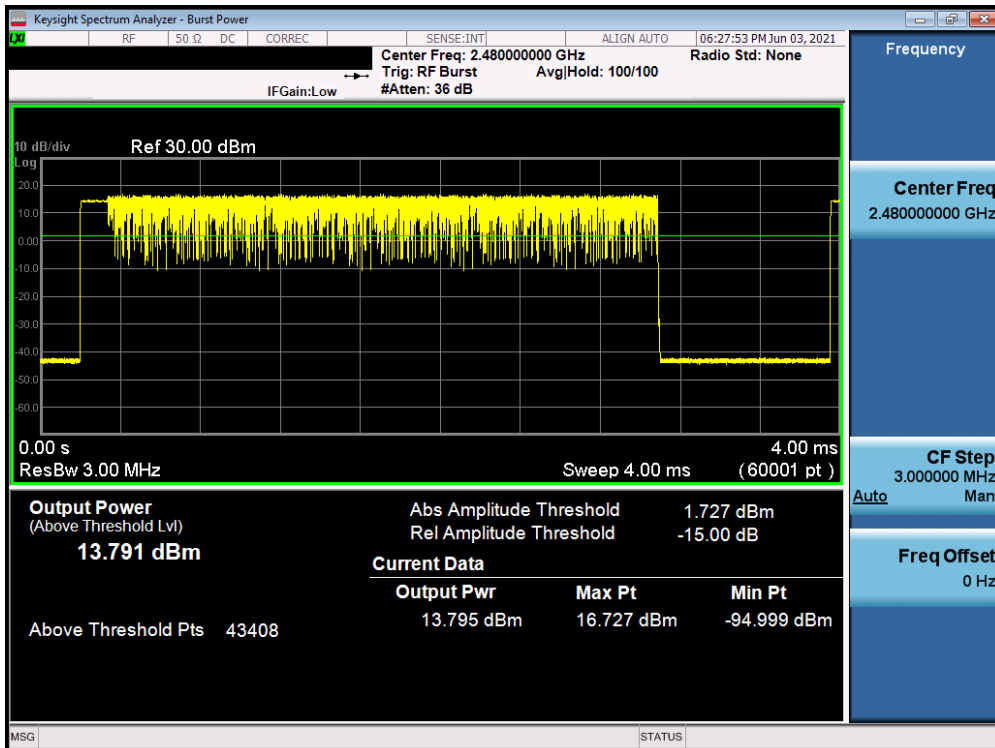


Plot 7-106. Average Conducted Power (3Mbps, iPA – Ch. 0) – ANT1

FCC ID: A3LSMF711U1	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
Test Report S/N: 1M2107290086-14.A3L	Test Dates: 04/16/2021 - 04/29/2021	EUT Type: Portable Handset		Page 71 of 139



Plot 7-107. Average Conducted Power (3Mbps, iPA – Ch. 39) – ANT1



Plot 7-108. Average Conducted Power (3Mbps, iPA – Ch. 78) – ANT1

FCC ID: A3LSMF711U1	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
Test Report S/N: 1M2107290086-14.A3L	Test Dates: 04/16/2021 - 04/29/2021	EUT Type: Portable Handset		Page 72 of 139

7.4 Band Edge Compliance

§15.247 (d); RSS-247 [5.5]

Test Overview and Limits

EUT operates in hopping and non-hopping transmission mode. Measurement is taken at the highest point located outside of the emission bandwidth. **The maximum permissible out-of-band emission level is 20 dBc.**

Test Procedure Used

ANSI C63.10-2013 – Section 6.10.4

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.

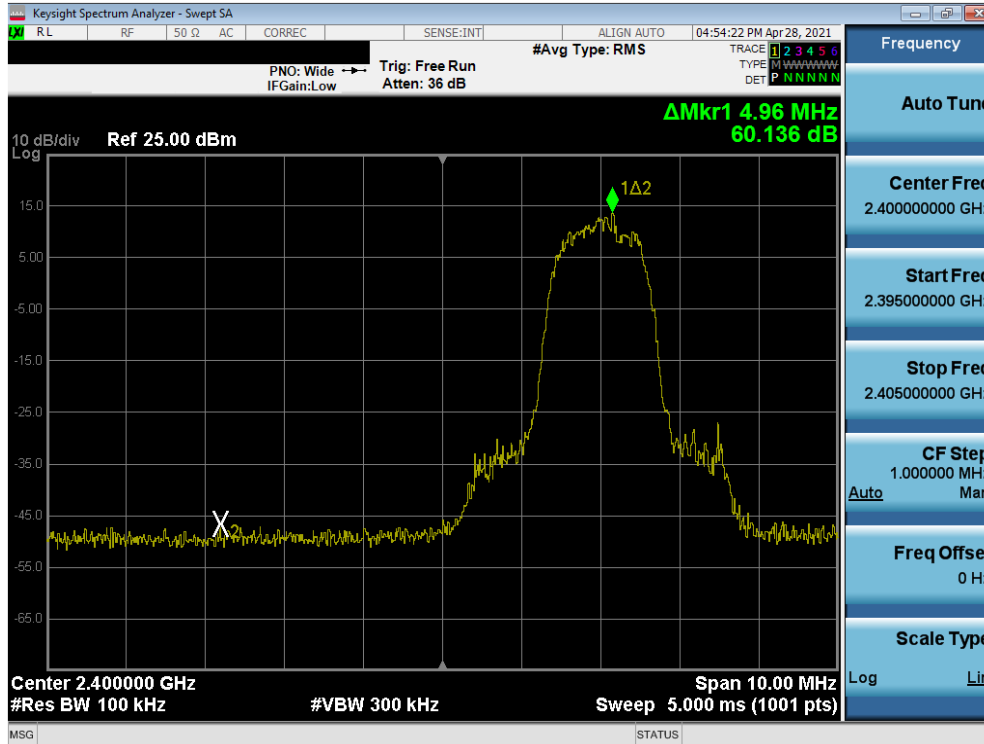


Figure 7-3. Test Instrument & Measurement Setup

FCC ID: A3LSMF711U1		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2107290086-14.A3L	Test Dates: 04/16/2021 - 04/29/2021	EUT Type: Portable Handset		Page 73 of 139

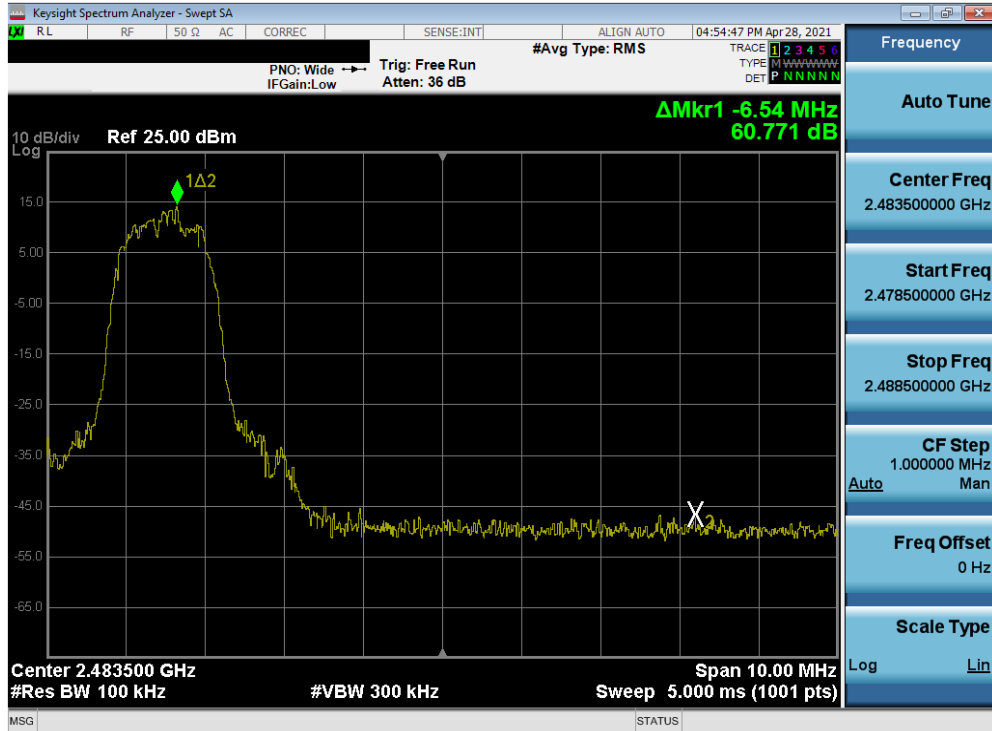
Test Notes

1. Out of band conducted spurious emissions at the band edge were investigated for all data rates in hopping and non-hopping modes. The worst case emissions were found with the EUT transmitting at 3 Mbps. Band edge emissions were also investigated with the EUT transmitting in all data rates. Plots of the worst case emissions are shown below.

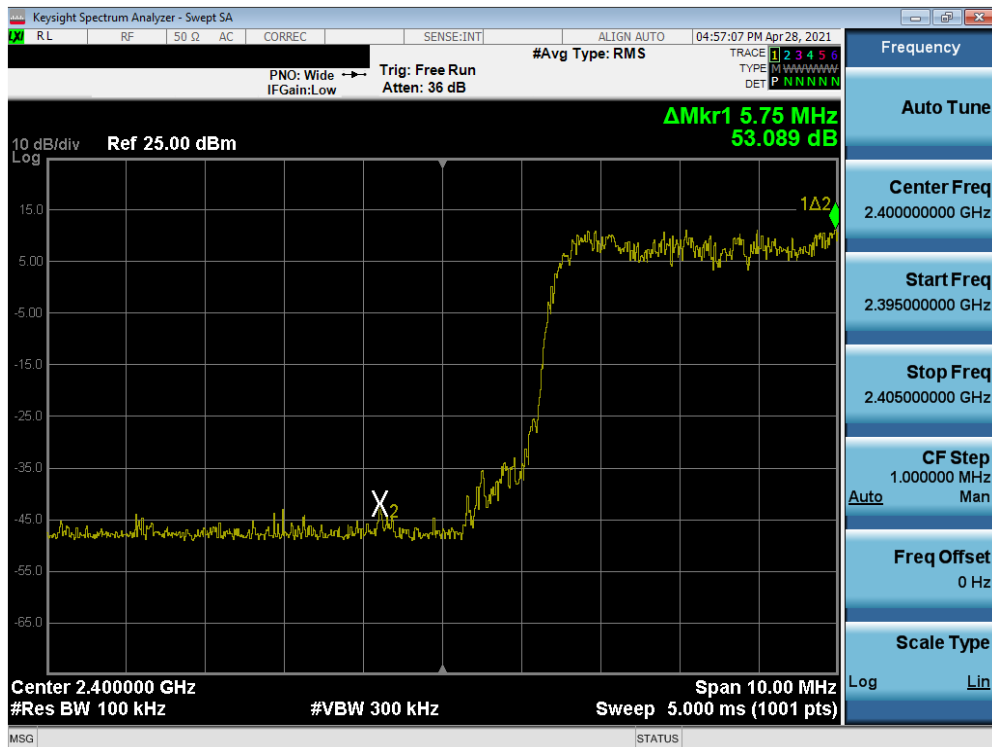


Plot 7-109. Band Edge Plot (Bluetooth with Hopping Disabled, ePA, 3 Mbps – Ch. 0) – ANT0

FCC ID: A3LSMF711U1		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2107290086-14.A3L	Test Dates: 04/16/2021 - 04/29/2021	EUT Type: Portable Handset		Page 74 of 139

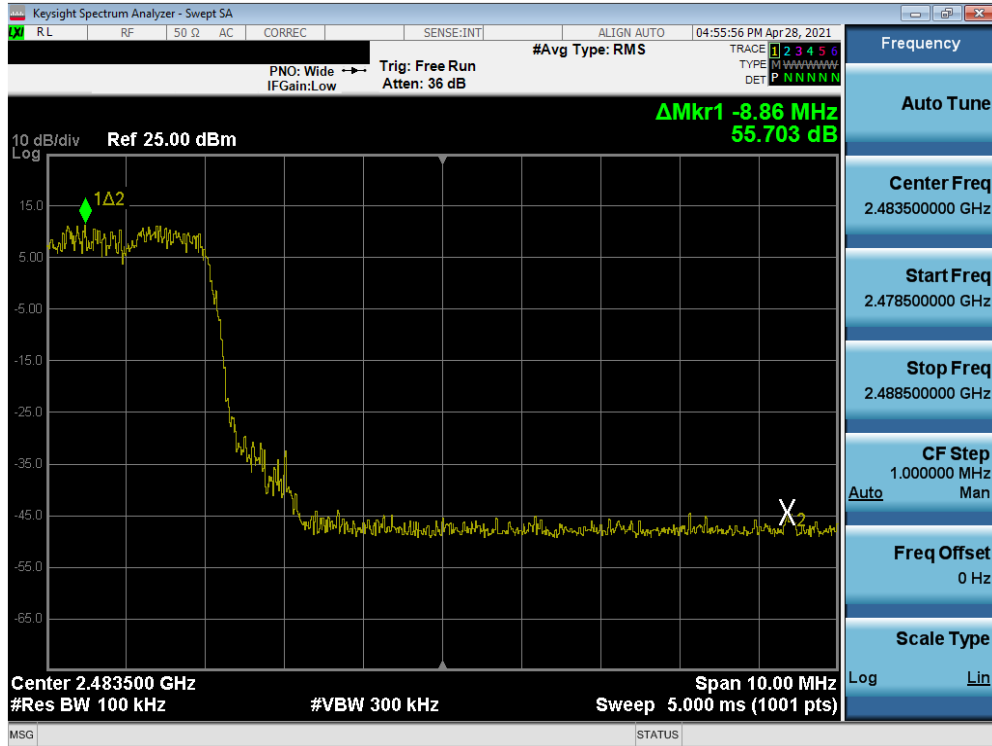


Plot 7-110. Band Edge Plot (Bluetooth with Hopping Disabled, ePA, 3 Mbps – Ch. 78) – ANT0

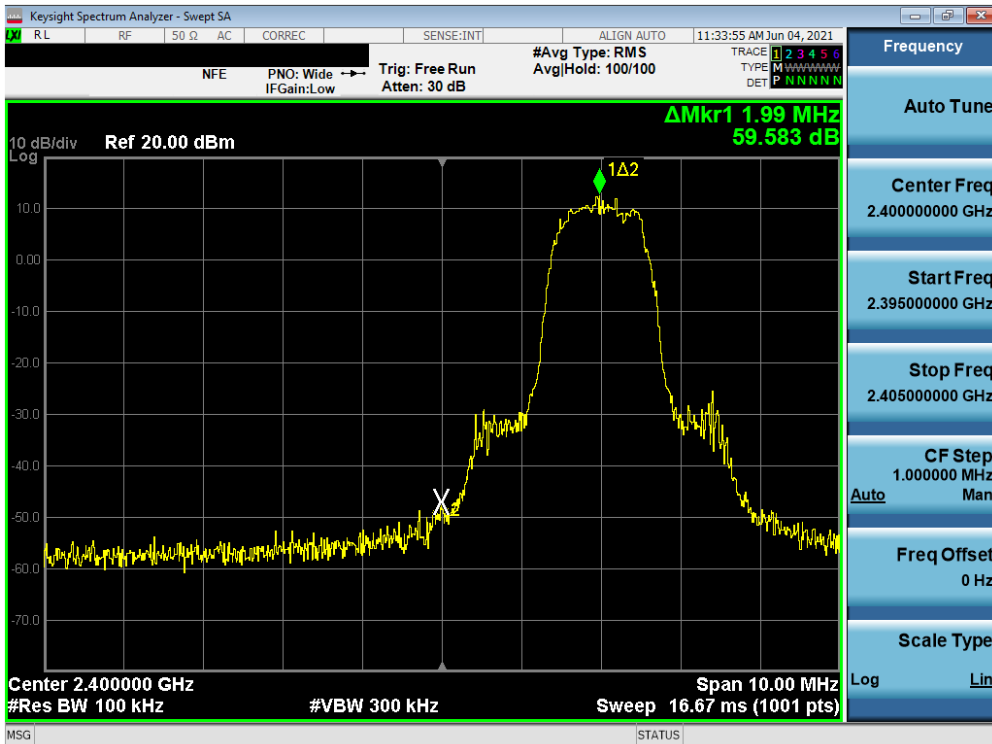


Plot 7-111. Band Edge Plot (Bluetooth with Hopping Enabled, ePA, 3 Mbps– Ch. 0) – ANT0

FCC ID: A3LSMF711U1	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
Test Report S/N: 1M2107290086-14.A3L	Test Dates: 04/16/2021 - 04/29/2021	EUT Type: Portable Handset		Page 75 of 139

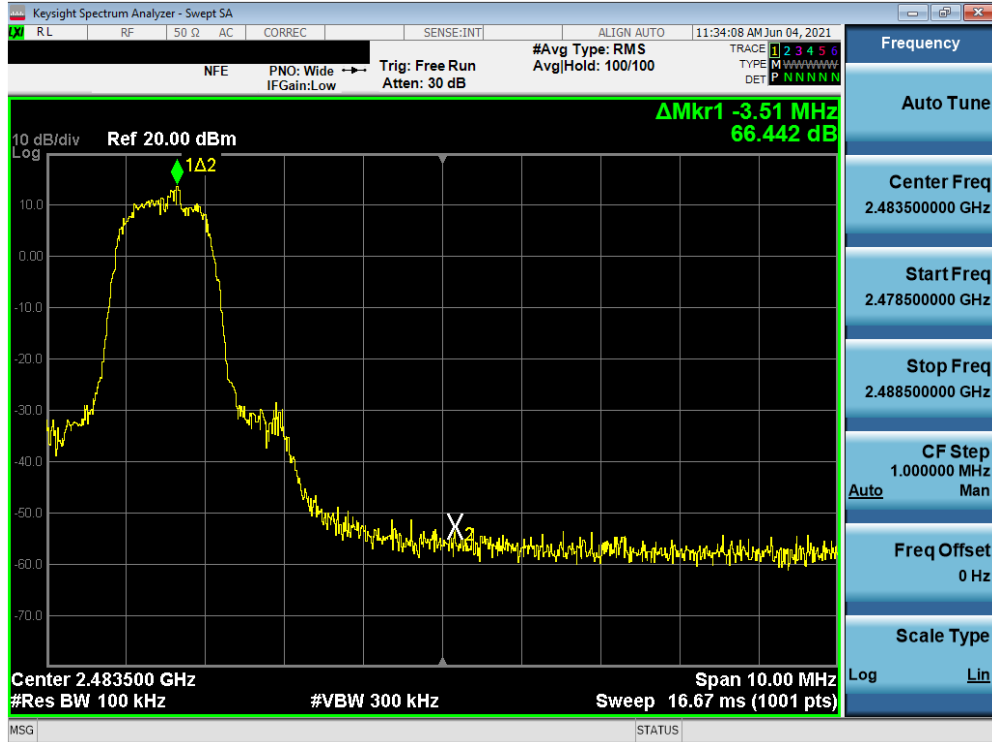


Plot 7-112. Band Edge Plot (Bluetooth with Hopping Enabled, ePA, 3 Mbps– Ch. 78) – ANT0

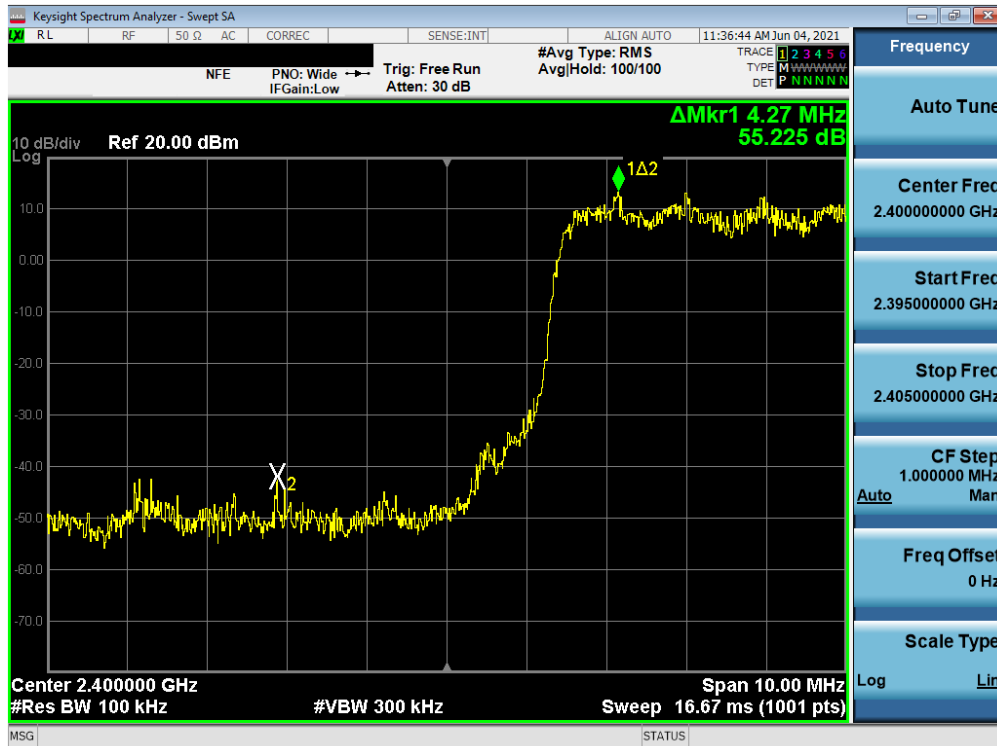


Plot 7-113. Band Edge Plot (Bluetooth with Hopping Disabled, iPA, 3 Mbps – Ch. 0) – ANT0

FCC ID: A3LSMF711U1	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
Test Report S/N: 1M2107290086-14.A3L	Test Dates: 04/16/2021 - 04/29/2021	EUT Type: Portable Handset		Page 76 of 139

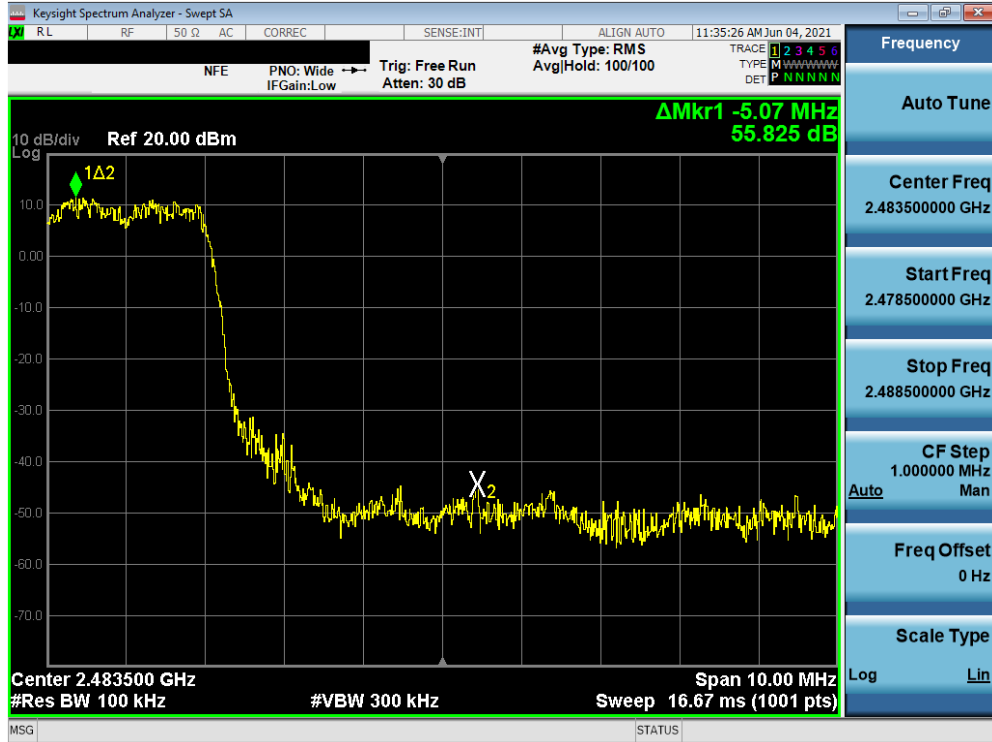


Plot 7-114. Band Edge Plot (Bluetooth with Hopping Disabled, iPA, 3 Mbps – Ch. 78) – ANT0

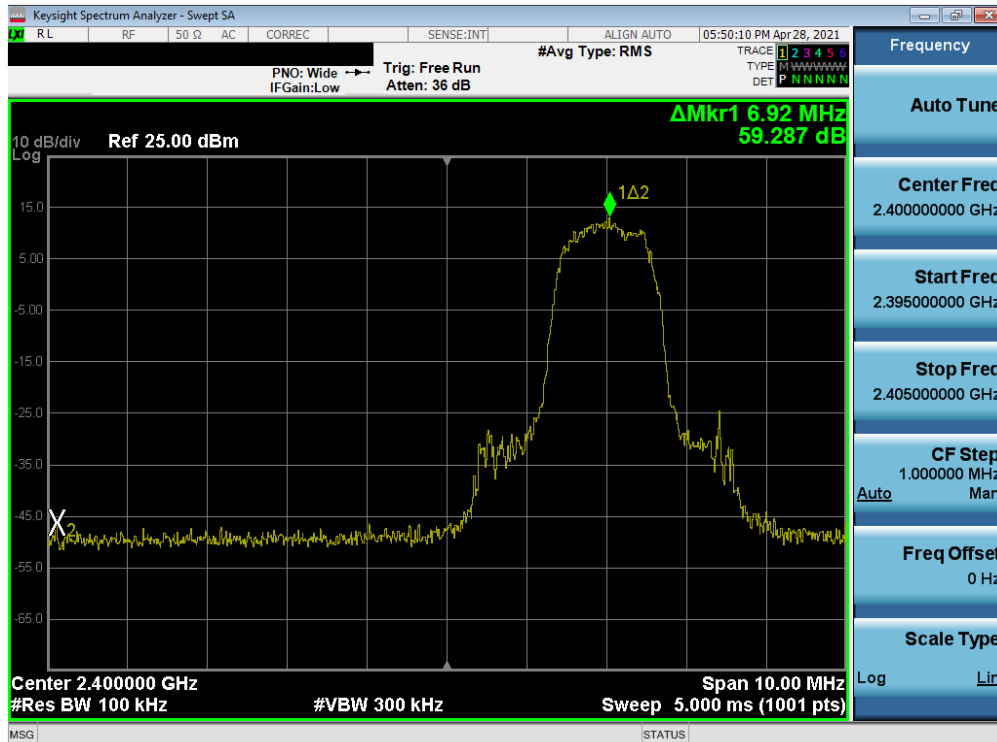


Plot 7-115. Band Edge Plot (Bluetooth with Hopping Enabled, iPA, 3 Mbps – Ch.0) – ANT0

FCC ID: A3LSMF711U1	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
Test Report S/N: 1M2107290086-14.A3L	Test Dates: 04/16/2021 - 04/29/2021	EUT Type: Portable Handset		Page 77 of 139

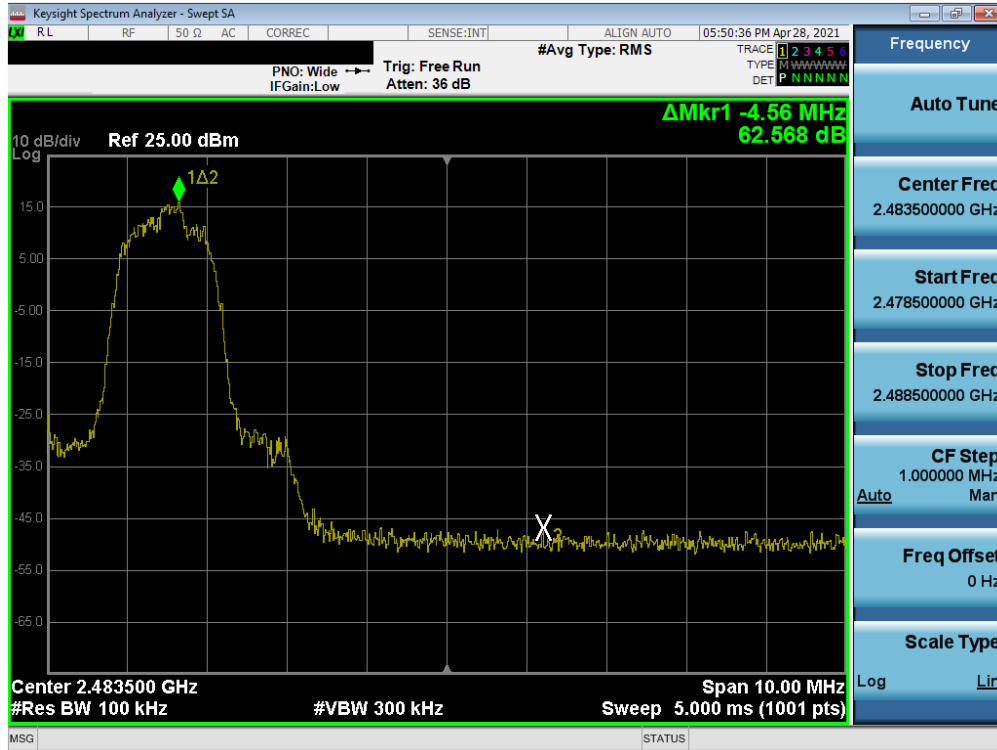


Plot 7-116. Band Edge Plot (Bluetooth with Hopping Enabled, iPA, 3 Mbps – Ch.78) – ANT0

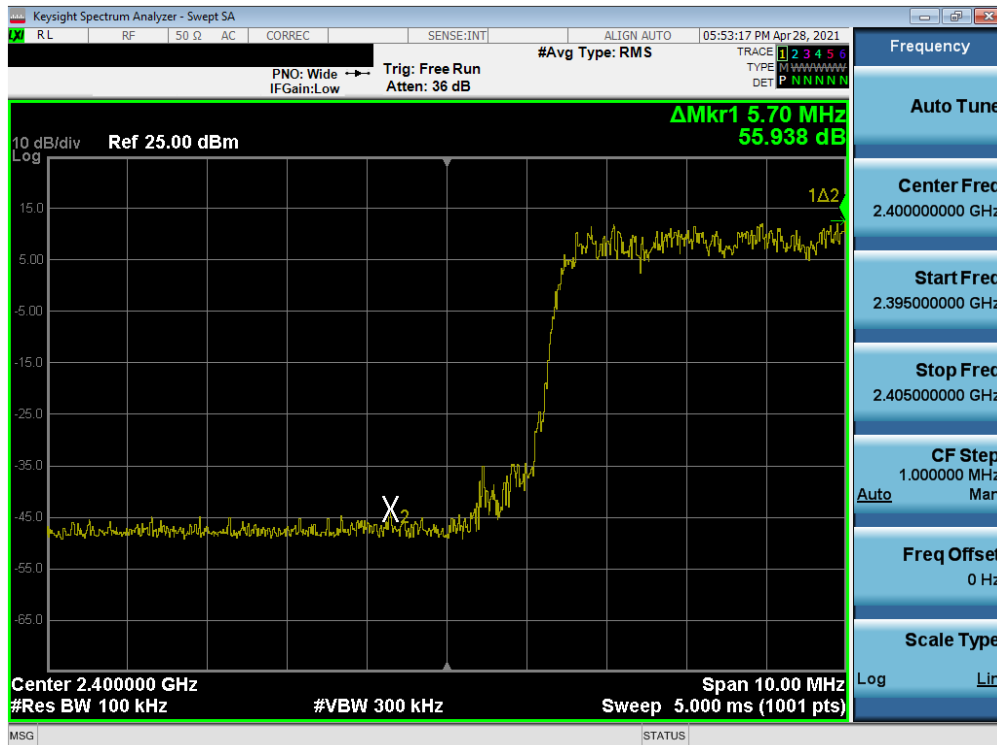


Plot 7-117. Band Edge Plot (Bluetooth with Hopping Disabled, ePA, 3 Mbps – Ch. 0) – ANT1

FCC ID: A3LSMF711U1	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
Test Report S/N: 1M2107290086-14.A3L	Test Dates: 04/16/2021 - 04/29/2021	EUT Type: Portable Handset		Page 78 of 139



Plot 7-118. Band Edge Plot (Bluetooth with Hopping Disabled, ePA, 3 Mbps – Ch. 78) – ANT1

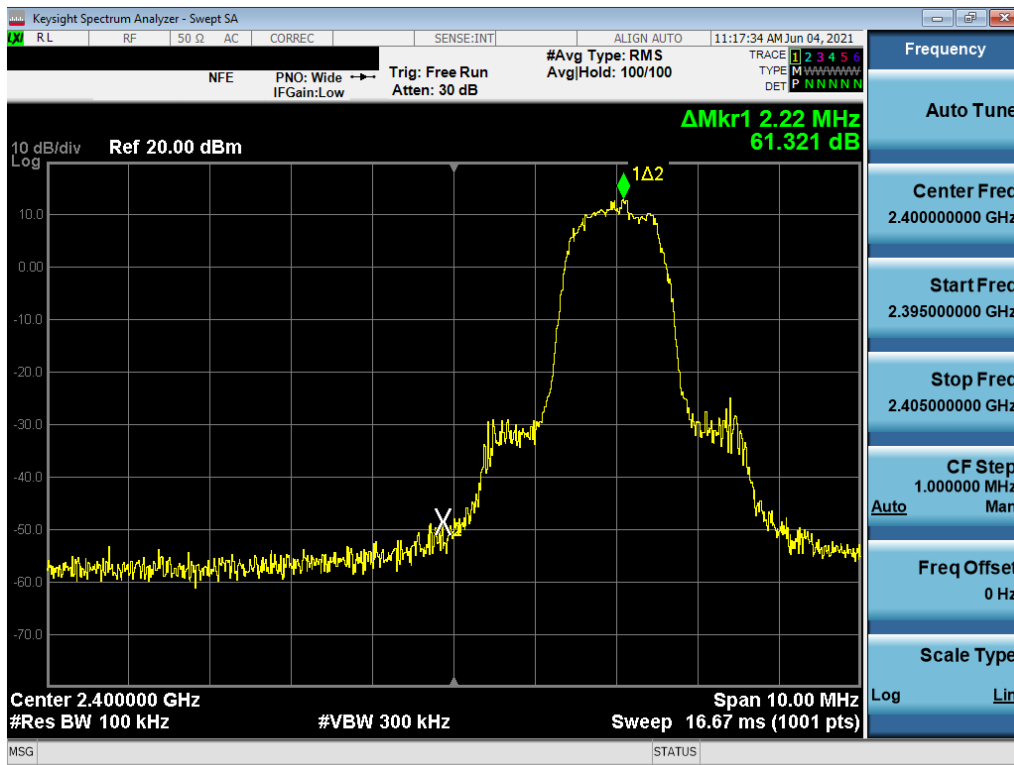


Plot 7-119. Band Edge Plot (Bluetooth with Hopping Enabled, ePA, 3 Mbps – Ch.0) – ANT1

FCC ID: A3LSMF711U1	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
Test Report S/N: 1M2107290086-14.A3L	Test Dates: 04/16/2021 - 04/29/2021	EUT Type: Portable Handset		Page 79 of 139

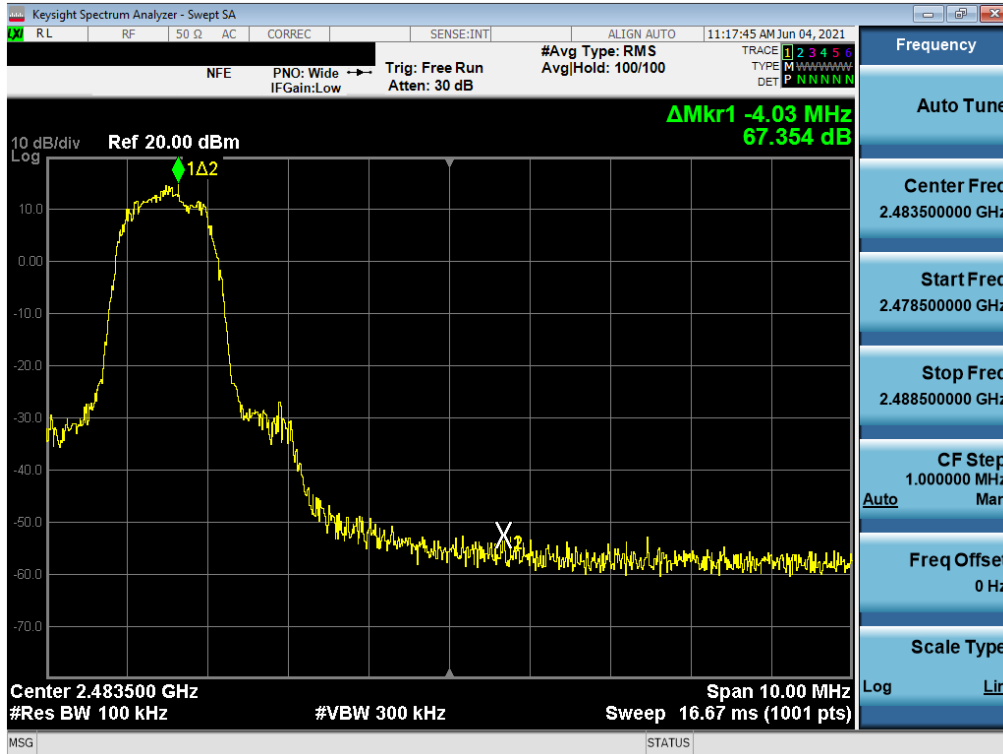


Plot 7-120. Band Edge Plot (Bluetooth with Hopping Enabled, ePA, 3 Mbps – Ch.78) – ANT1

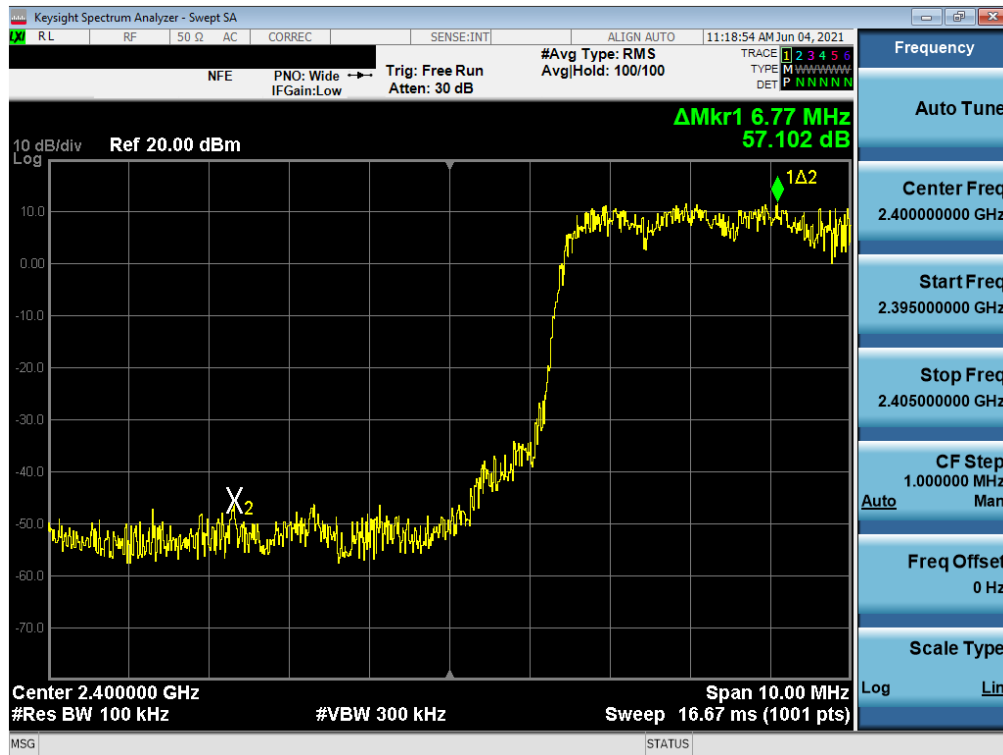


Plot 7-121. Band Edge Plot (Bluetooth with Hopping Disabled, iPA, 3 Mbps – Ch. 0) – ANT1

FCC ID: A3LSMF711U1	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
Test Report S/N: 1M2107290086-14.A3L	Test Dates: 04/16/2021 - 04/29/2021	EUT Type: Portable Handset		Page 80 of 139



Plot 7-122. Band Edge Plot (Bluetooth with Hopping Disabled, iPA, 3 Mbps – Ch. 78) – ANT1



Plot 7-123. Band Edge Plot (Bluetooth with Hopping Enabled, iPA, 3 Mbps – Ch.0) – ANT1

FCC ID: A3LSMF711U1	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
Test Report S/N: 1M2107290086-14.A3L	Test Dates: 04/16/2021 - 04/29/2021	EUT Type: Portable Handset		Page 81 of 139



Plot 7-124. Band Edge Plot (Bluetooth with Hopping Enabled, iPA, 3 Mbps – Ch.78) – ANT1

FCC ID: A3LSMF711U1		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2107290086-14.A3L	Test Dates: 04/16/2021 - 04/29/2021	EUT Type: Portable Handset		Page 82 of 139

7.5 Carrier Frequency Separation

§15.247 (a.1); RSS-247 [5.1(2)]

Test Overview and Limit

Measurement is made with EUT operating in hopping mode. **The minimum permissible channel separation for this system is 2/3 the value of the 20dB BW.**

Test Procedure Used

ANSI C63.10-2013 – Section 7.8.2

Test Settings

1. Span = Wide enough to capture peaks of two adjacent channels
2. RBW = 30% of channel spacing. Adjust as necessary to best identify center of each individual channel
3. VBW \geq RBW
4. Sweep = Auto
5. Detector = Peak
6. Trace mode = max hold
7. The trace was allowed to stabilize.
8. Marker-delta function used to determine separation between peaks of the adjacent channels

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

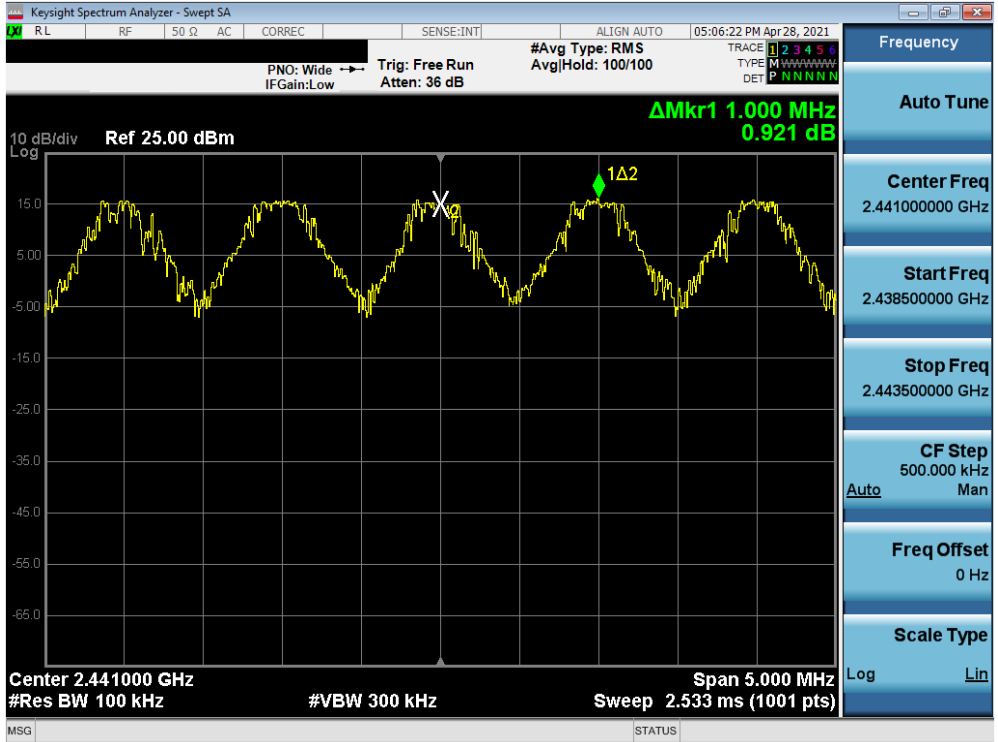
1. The EUT complies with the minimum channel separation requirement when it is operating in 1x/EDR mode using 79 channels and when operating in AFH mode using 20 channels.

FCC ID: A3LSMF711U1		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
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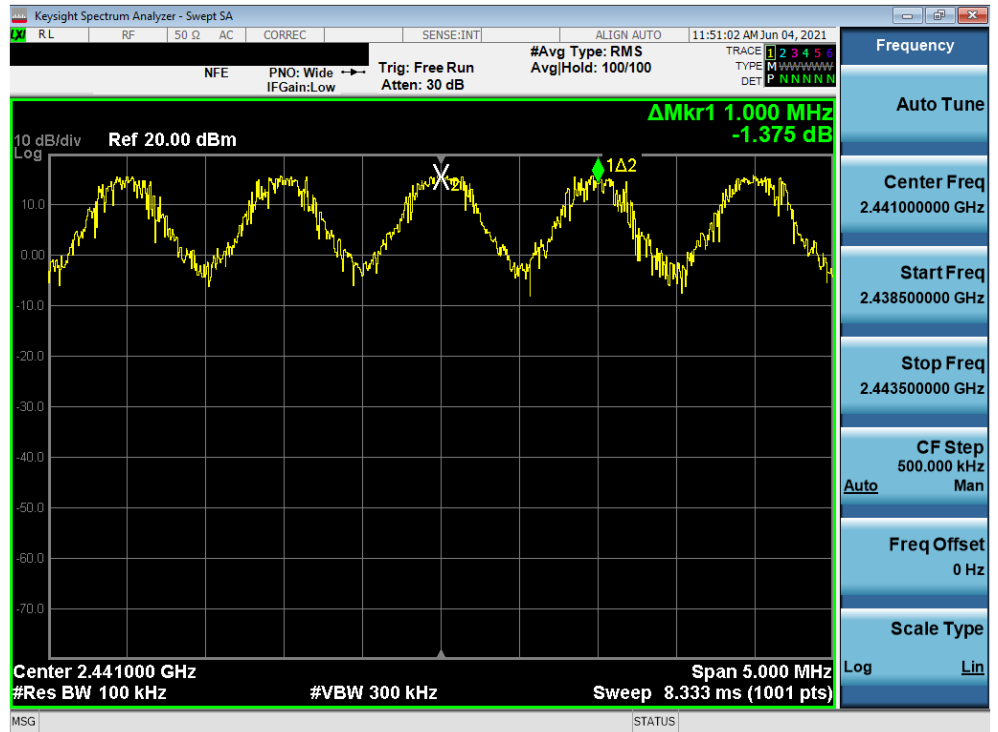
Frequency [MHz]	Data Rate [Mbps]	Mod.	Power Scheme	Channel No.	Min. Channel Separation [MHz]
2402	1.0	GFSK	ePA	0	0.614
2441	1.0	GFSK	ePA	39	0.622
2480	1.0	GFSK	ePA	78	0.624
2402	1.0	GFSK	iPA	0	0.617
2441	1.0	GFSK	iPA	39	0.622
2480	1.0	GFSK	iPA	78	0.626
2402	2.0	$\pi/4$ -DQPSK	ePA	0	0.879
2441	2.0	$\pi/4$ -DQPSK	ePA	39	0.895
2480	2.0	$\pi/4$ -DQPSK	ePA	78	0.902
2402	2.0	$\pi/4$ -DQPSK	iPA	0	0.902
2441	2.0	$\pi/4$ -DQPSK	iPA	39	0.854
2480	2.0	$\pi/4$ -DQPSK	iPA	78	0.905
2402	3.0	8DPSK	ePA	0	0.901
2441	3.0	8DPSK	ePA	39	0.789
2480	3.0	8DPSK	ePA	78	0.861
2402	3.0	8DPSK	iPA	0	0.840
2441	3.0	8DPSK	iPA	39	0.879
2480	3.0	8DPSK	iPA	78	0.866

Table 7-6. Minimum Channel Separation – ANT0

FCC ID: A3LSMF711U1		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2107290086-14.A3L	Test Dates: 04/16/2021 - 04/29/2021	EUT Type: Portable Handset		Page 84 of 139



Plot 7-125. Channel Spacing Plot (Bluetooth, ePA) – ANT0



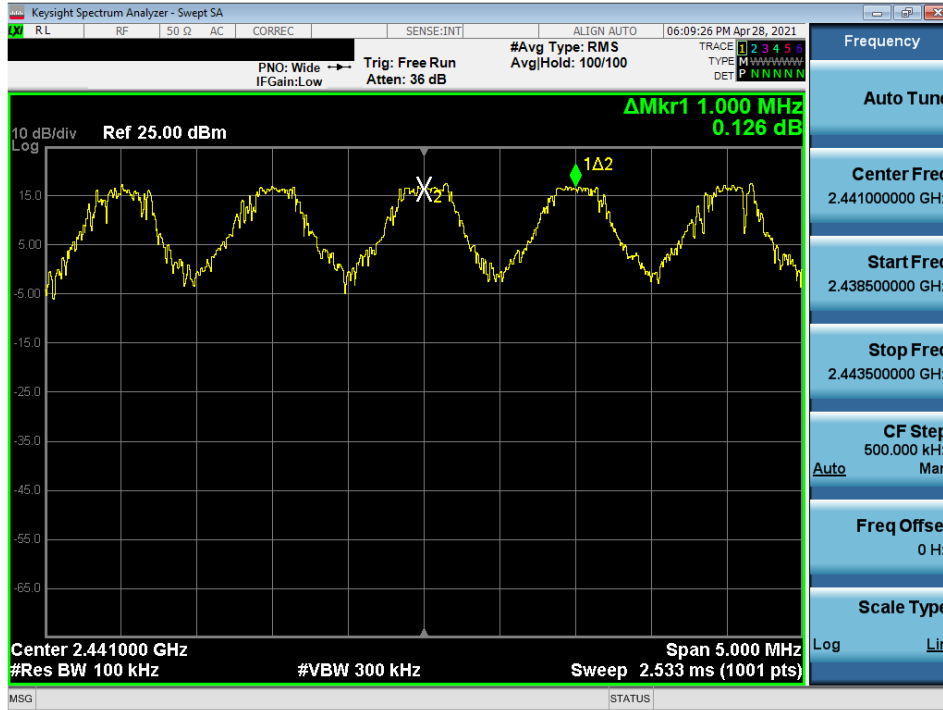
Plot 7-126. Channel Spacing Plot (Bluetooth, iPA) – ANT0

FCC ID: A3LSMF711U1	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
Test Report S/N: 1M2107290086-14.A3L	Test Dates: 04/16/2021 - 04/29/2021	EUT Type: Portable Handset		Page 85 of 139

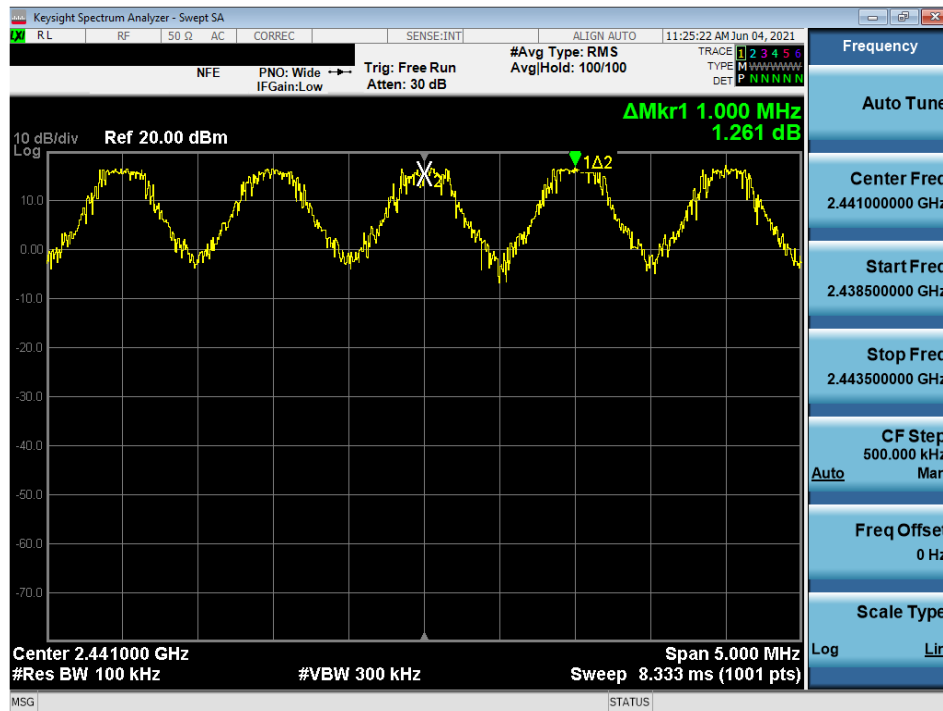
Frequency [MHz]	Data Rate [Mbps]	Mod.	Power Scheme	Channel No.	Min. Channel Separation [MHz]
2402	1.0	GFSK	ePA	0	0.617
2441	1.0	GFSK	ePA	39	0.622
2480	1.0	GFSK	ePA	78	0.626
2402	1.0	GFSK	iPA	0	0.619
2441	1.0	GFSK	iPA	39	0.631
2480	1.0	GFSK	iPA	78	0.635
2402	2.0	$\pi/4$ -DQPSK	ePA	0	0.902
2441	2.0	$\pi/4$ -DQPSK	ePA	39	0.854
2480	2.0	$\pi/4$ -DQPSK	ePA	78	0.905
2402	2.0	$\pi/4$ -DQPSK	iPA	0	0.863
2441	2.0	$\pi/4$ -DQPSK	iPA	39	0.833
2480	2.0	$\pi/4$ -DQPSK	iPA	78	0.874
2402	3.0	8DPSK	ePA	0	0.840
2441	3.0	8DPSK	ePA	39	0.879
2480	3.0	8DPSK	ePA	78	0.866
2402	3.0	8DPSK	iPA	0	0.842
2441	3.0	8DPSK	iPA	39	0.883
2480	3.0	8DPSK	iPA	78	0.865

Table 7-7. Minimum Channel Separation – ANT1

FCC ID: A3LSMF711U1		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
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Plot 7-127. Channel Spacing Plot (Bluetooth, ePA) – ANT1



Plot 7-128. Channel Spacing Plot (Bluetooth, iPA) – ANT1

FCC ID: A3LSMF711U1	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
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7.6 Time of Occupancy

§15.247 (a.1.iii); RSS-247 [5.1(4)]

Test Overview and Limit

Measurement is made while EUT is operating in hopping mode with the spectrum analyzer set to zero span. **The maximum permissible time of occupancy is 400 ms within a period of 400ms multiplied by the number of hopping channels employed.**

Test Procedure Used

ANSI C63.10-2013 – Section 7.8.4

Test Settings

1. Span = zero span, centered on a hopping channel
2. RBW \leq channel spacing and $\gg 1/T$, where T is expected dwell time per channel
3. Sweep = as necessary to capture entire dwell time. Second plot may be required to demonstrate two successive hops on a channel
4. Trigger is set with appropriate trigger delay to place pulse near the center of the plot
5. Detector = peak
6. Trace mode = max hold
7. Marker-delta function used to determine transmit time per hop

Test Setup

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

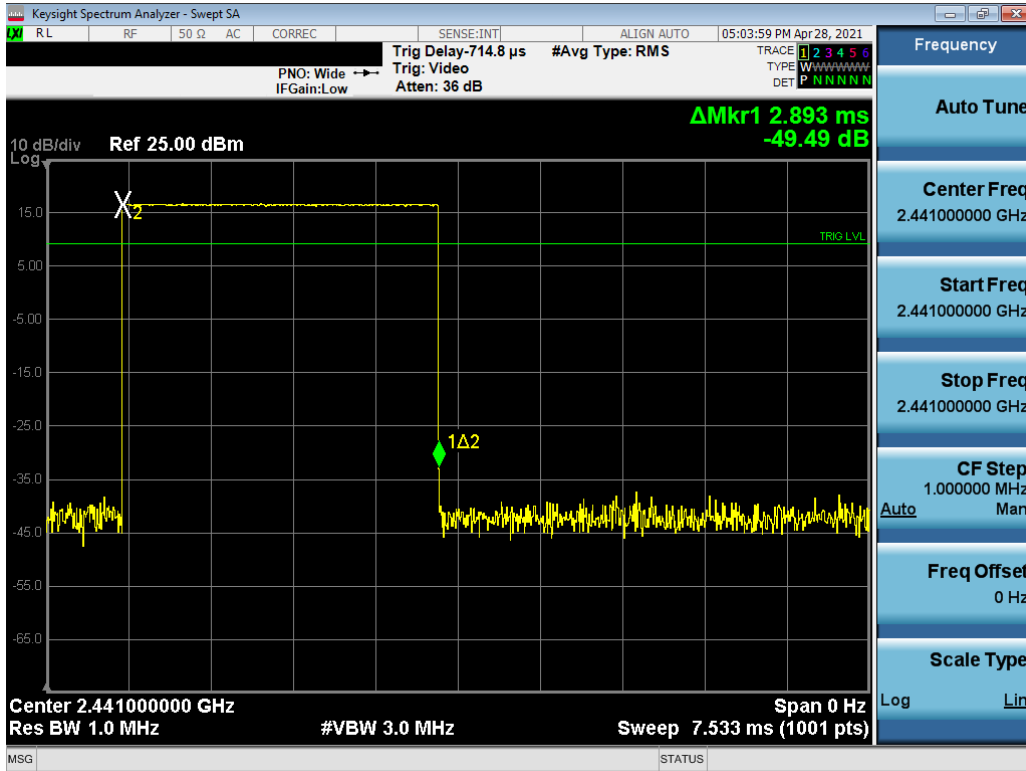


Figure 7-5. Test Instrument & Measurement Setup

Test Notes

This device will be manufactured using two different WIFI chipsets (N and Q). Both two chipsets are tested, and both conducted emissions data is shown in this report.

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Plot 7-129. Time of Occupancy Plot (Bluetooth, ePA) – ANT0

Bluetooth Time of Occupancy Calculation

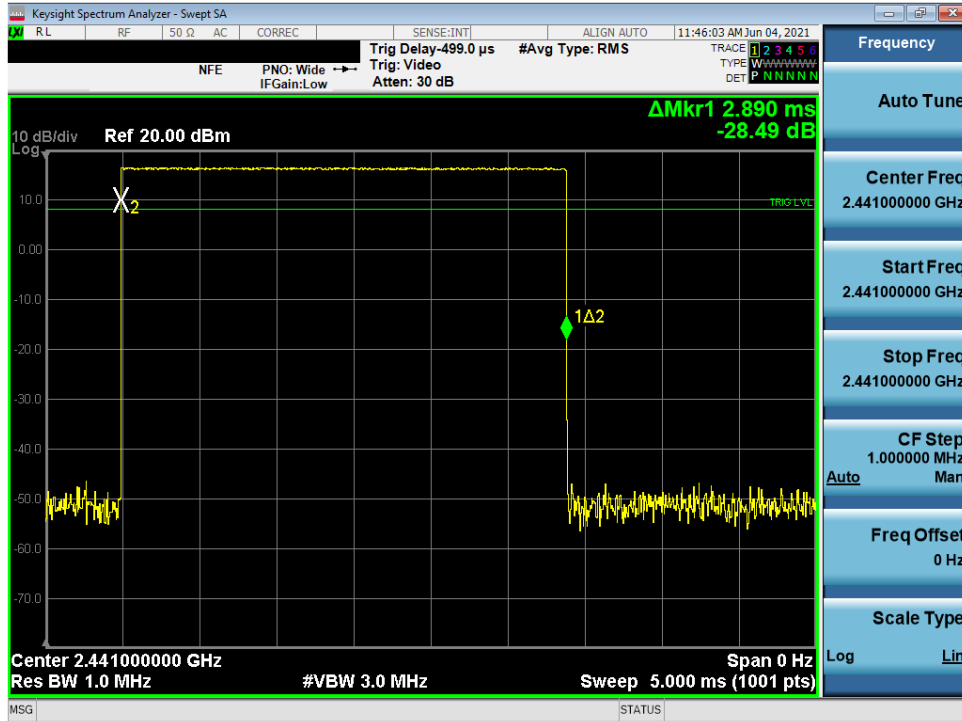
Typically, Bluetooth 1x/EDR mode has a channel hopping rate of 1600 hops/s. Since 1x/EDR modes use 5 transmit and 1 receive slot, for a total of 6 slots, the Bluetooth transmitter is actually hopping at a rate of $1600 / 6 = 266.67$ hops/s/slot

- $400\text{ms} \times 79$ hopping channels = 31.6 sec (Time of Occupancy Limit)
- Worst case BT has 266.67 hops/second (for 1x/EDR modes with DH5 operation)
- $266.67 \text{ hops/second} / 79$ channels = 3.38 hops/second (# of hops/second on one channel)
- $3.38 \text{ hops/second/channel} \times 31.6$ seconds = 106.67 hops (# hops over a 31.6 second period)
- $106.67 \text{ hops} \times 2.893 \text{ ms/channel}$ = 308.60 ms (worst case dwell time for one channel in 1x/EDR modes)

With AFH, the number of channels is reduced to a minimum of 20 channels and the channel hopping rate is reduced by 50% to 800 hops/s. AFH mode also uses 6 total slots so the Bluetooth transmitter hops at a rate of $800 / 6 = 133.3$ hops/s/slot

- $400\text{ms} \times 20$ hopping channels = 8 sec (Time of Occupancy Limit)
- Worst case BT has 133.3 hops/second/slot (for AFH mode with DH5 operation)
- $133.3 \text{ hops/s} / 20$ channels = 6.67 hops/second (# of hops/second on one channel)
- $6.67 \text{ hops/s} / \text{channel} \times 8$ seconds = 53.34 hops (# hops over a 8 second period)
- $53.34 \text{ hops} \times 2.893 \text{ ms/channel}$ = 154.31 ms (worst case dwell time for one channel in AFH mode)

FCC ID: A3LSMF711U1	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
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Plot 7-130. Time of Occupancy Plot (Bluetooth, iPA) – ANTO

Bluetooth Time of Occupancy Calculation

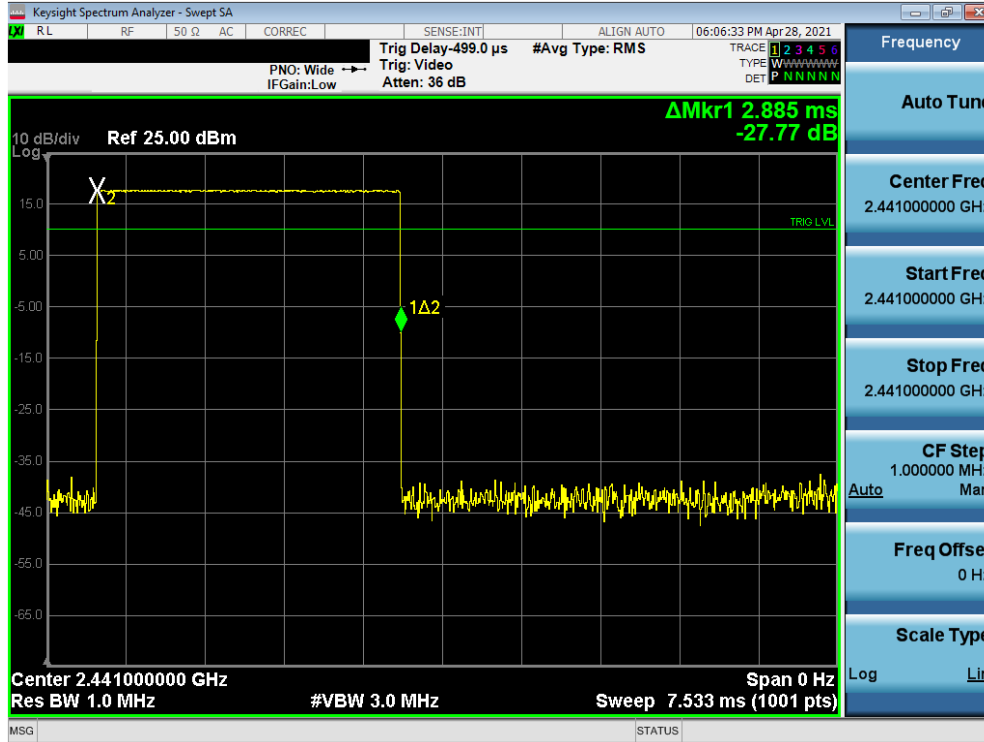
Typically, Bluetooth 1x/EDR mode has a channel hopping rate of 1600 hops/s. Since 1x/EDR modes use 5 transmit and 1 receive slot, for a total of 6 slots, the Bluetooth transmitter is actually hopping at a rate of $1600 / 6 = 266.67$ hops/s/slot

- $400\text{ms} \times 79$ hopping channels = 31.6 sec (Time of Occupancy Limit)
- Worst case BT has 266.67 hops/second (for 1x/EDR modes with DH5 operation)
- $266.67 \text{ hops/second} / 79$ channels = 3.38 hops/second (# of hops/second on one channel)
- $3.38 \text{ hops/second/channel} \times 31.6$ seconds = 106.67 hops (# hops over a 31.6 second period)
- $106.67 \text{ hops} \times 2.890 \text{ ms/channel}$ = 308.28 ms (worst case dwell time for one channel in 1x/EDR modes)

With AFH, the number of channels is reduced to a minimum of 20 channels and the channel hopping rate is reduced by 50% to 800 hops/s. AFH mode also uses 6 total slots so the Bluetooth transmitter hops at a rate of $800 / 6 = 133.3$ hops/s/slot

- $400\text{ms} \times 20$ hopping channels = 8 sec (Time of Occupancy Limit)
- Worst case BT has 133.3 hops/second/slot (for AFH mode with DH5 operation)
- $133.3 \text{ hops/s} / 20$ channels = 6.67 hops/second (# of hops/second on one channel)
- $6.67 \text{ hops/s} / \text{channel} \times 8$ seconds = 53.34 hops (# hops over a 8 second period)
- $53.34 \text{ hops} \times 2.890 \text{ ms/channel}$ = 154.15 ms (worst case dwell time for one channel in AFH mode)

FCC ID: A3LSMF711U1	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
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Plot 7-131. Time of Occupancy Plot (Bluetooth, ePA) – ANT1

Bluetooth Time of Occupancy Calculation

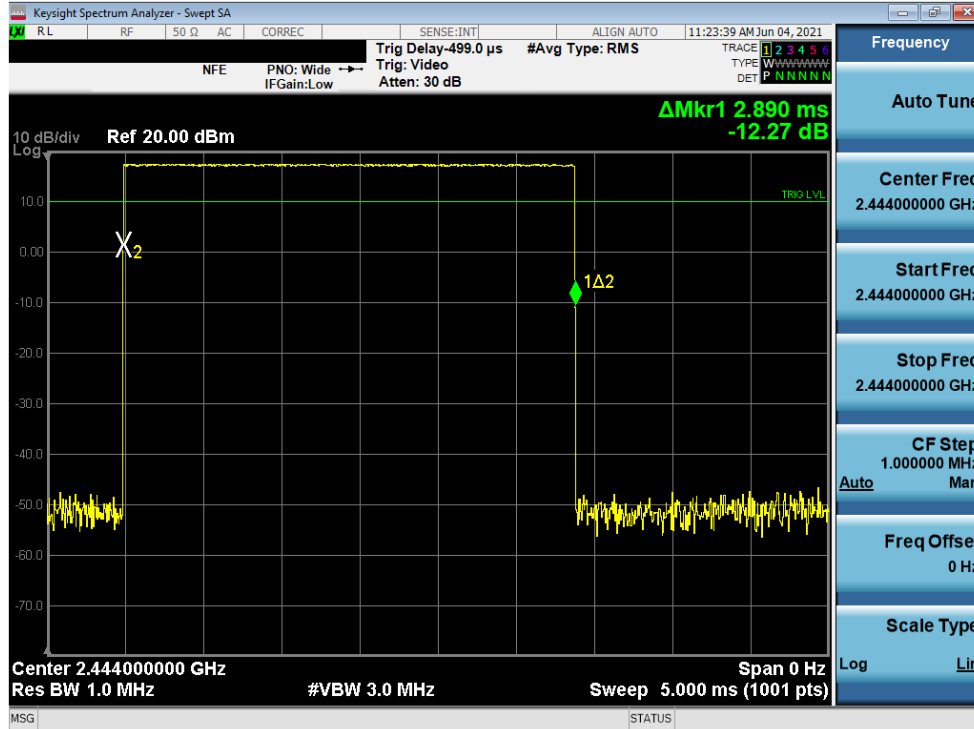
Typically, Bluetooth 1x/EDR mode has a channel hopping rate of 1600 hops/s. Since 1x/EDR modes use 5 transmit and 1 receive slot, for a total of 6 slots, the Bluetooth transmitter is actually hopping at a rate of $1600 / 6 = 266.67$ hops/s/slot

- 400ms x 79 hopping channels = 31.6 sec (Time of Occupancy Limit)
- Worst case BT has 266.67 hops/second (for 1x/EDR modes with DH5 operation)
- $266.67 \text{ hops/second} / 79 \text{ channels} = 3.38 \text{ hops/second}$ (# of hops/second on one channel)
- $3.38 \text{ hops/second/channel} \times 31.6 \text{ seconds} = 106.67 \text{ hops}$ (# hops over a 31.6 second period)
- $106.67 \text{ hops} \times 2.885 \text{ ms/channel} = 307.74 \text{ ms}$ (worst case dwell time for one channel in 1x/EDR modes)

With AFH, the number of channels is reduced to a minimum of 20 channels and the channel hopping rate is reduced by 50% to 800 hops/s. AFH mode also uses 6 total slots so the Bluetooth transmitter hops at a rate of $800 / 6 = 133.3$ hops/s/slot

- 400ms x 20 hopping channels = 8 sec (Time of Occupancy Limit)
- Worst case BT has 133.3 hops/second/slot (for AFH mode with DH5 operation)
- $133.3 \text{ hops/s} / 20 \text{ channels} = 6.67 \text{ hops/second}$ (# of hops/second on one channel)
- $6.67 \text{ hops/s} / \text{channel} \times 8 \text{ seconds} = 53.34 \text{ hops}$ (# hops over a 8 second period)
- $53.34 \text{ hops} \times 2.885 \text{ ms/channel} = 153.89 \text{ ms}$ (worst case dwell time for one channel in AFH mode)

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Plot 7-132. Time of Occupancy Plot (Bluetooth, iPA) – ANT1

Bluetooth Time of Occupancy Calculation

Typically, Bluetooth 1x/EDR mode has a channel hopping rate of 1600 hops/s. Since 1x/EDR modes use 5 transmit and 1 receive slot, for a total of 6 slots, the Bluetooth transmitter is actually hopping at a rate of $1600 / 6 = 266.67$ hops/s/slot

- o 400ms x 79 hopping channels = 31.6 sec (Time of Occupancy Limit)
- o Worst case BT has 266.67 hops/second (for 1x/EDR modes with DH5 operation)
- o $266.67 \text{ hops/second} / 79 \text{ channels} = 3.38 \text{ hops/second}$ (# of hops/second on one channel)
- o $3.38 \text{ hops/second/channel} \times 31.6 \text{ seconds} = 106.67 \text{ hops}$ (# hops over a 31.6 second period)
- o $106.67 \text{ hops} \times 2.890 \text{ ms/channel} = 308.28 \text{ ms}$ (worst case dwell time for one channel in 1x/EDR modes)

With AFH, the number of channels is reduced to a minimum of 20 channels and the channel hopping rate is reduced by 50% to 800 hops/s. AFH mode also uses 6 total slots so the Bluetooth transmitter hops at a rate of $800 / 6 = 133.3$ hops/s/slot

- o 400ms x 20 hopping channels = 8 sec (Time of Occupancy Limit)
- o Worst case BT has 133.3 hops/second/slot (for AFH mode with DH5 operation)
- o $133.3 \text{ hops/s} / 20 \text{ channels} = 6.67 \text{ hops/second}$ (# of hops/second on one channel)
- o $6.67 \text{ hops/s} / \text{channel} \times 8 \text{ seconds} = 53.34 \text{ hops}$ (# hops over a 8 second period)
- o $53.34 \text{ hops} \times 2.890 \text{ ms/channel} = 154.15 \text{ ms}$ (worst case dwell time for one channel in AFH mode)

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7.7 Number of Hopping Channels

§15.247 (a.1.iii); RSS-247 [5.1(4)]

Test Overview and Limit

Measurement is made while EUT is operating in hopping mode. ***This frequency hopping system must employ a minimum of 15 hopping channels.***

Test Procedure Used

ANSI C63.10-2013 – Section 7.8.3

Test Settings

1. Span = frequency of band of operation (divided into two plots)
2. RBW < 30% of channel spacing or 20dB bandwidth, whichever is smaller.
3. VBW ≥ RBW
4. Sweep = auto
5. Detector = peak
6. Trace mode = max hold
7. Trace was allowed to stabilize

Test Setup

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

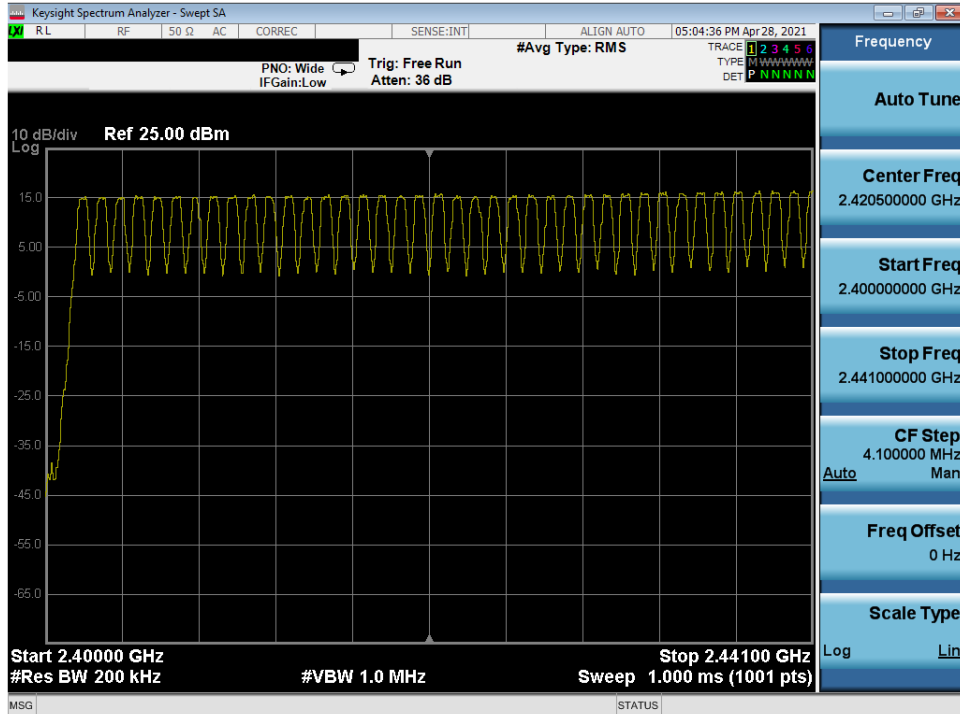


Figure 7-6. Test Instrument & Measurement Setup

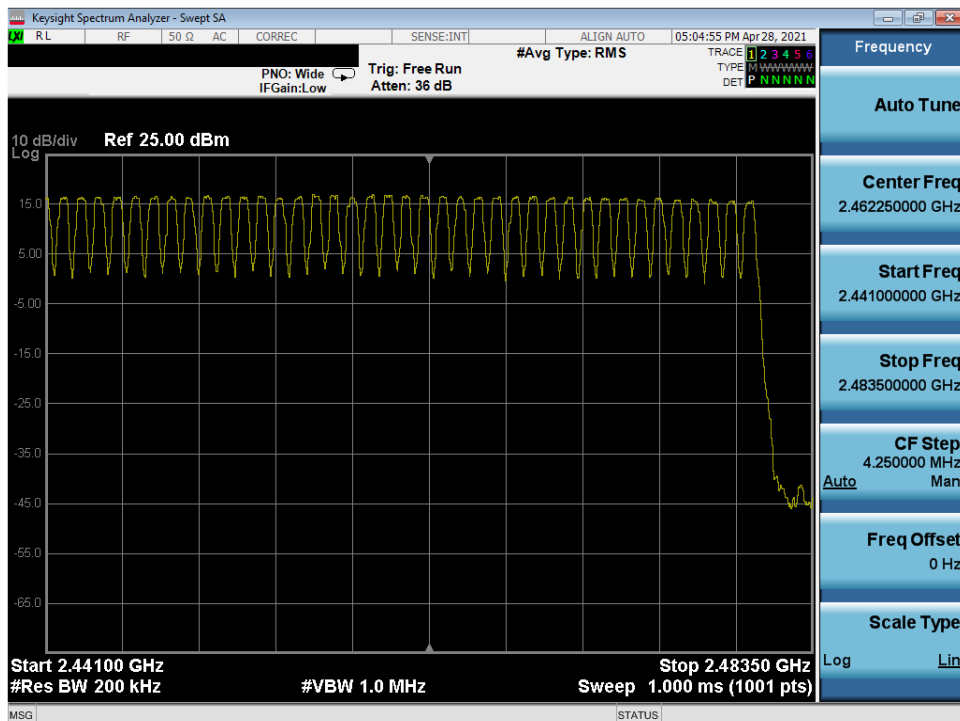
Test Notes

The frequency spectrum was broken up into two sub-ranges to clearly show all of the hopping frequencies. In AFH mode, this device operates using 20 channels so the requirement for minimum number of hopping channels is satisfied.

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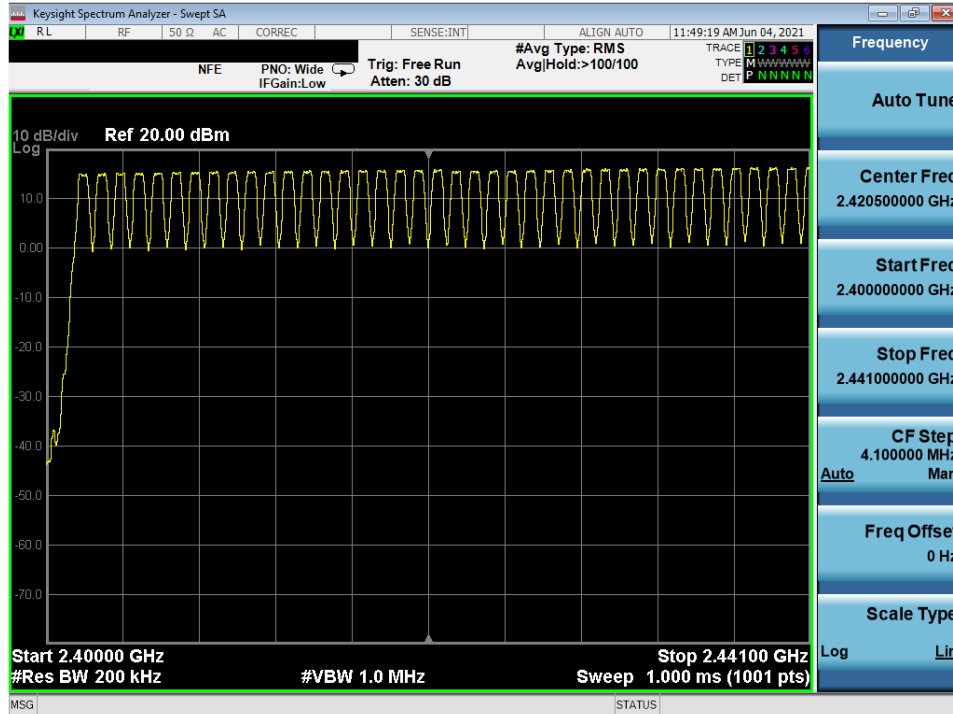


Plot 7-133. Low End Spectrum Channel Hopping Plot (Bluetooth, ePA) – ANTO

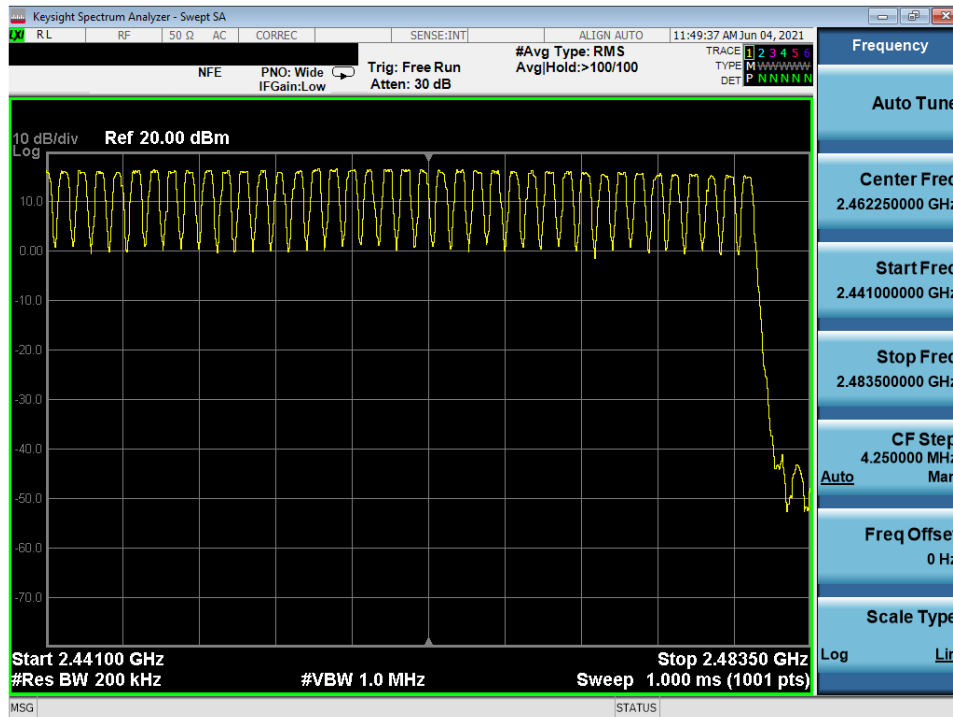


Plot 7-134. High End Spectrum Channel Hopping Plot (Bluetooth, ePA) – ANTO

FCC ID: A3LSMF711U1	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
Test Report S/N: 1M2107290086-14.A3L	Test Dates: 04/16/2021 - 04/29/2021	EUT Type: Portable Handset		Page 94 of 139

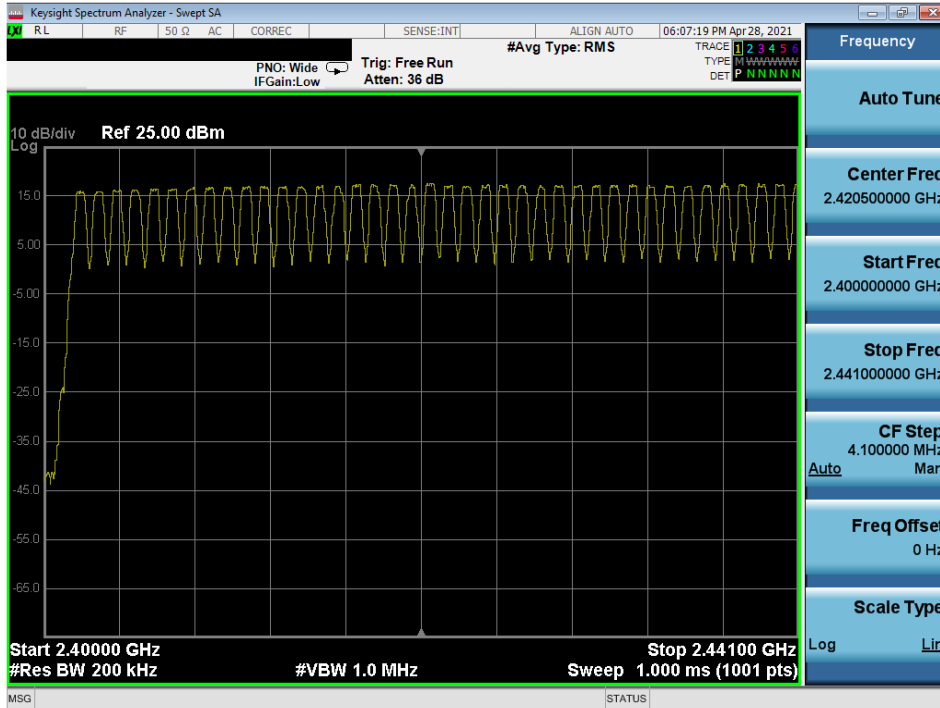


Plot 7-135. Low End Spectrum Channel Hopping Plot (Bluetooth, iPA) – ANT0

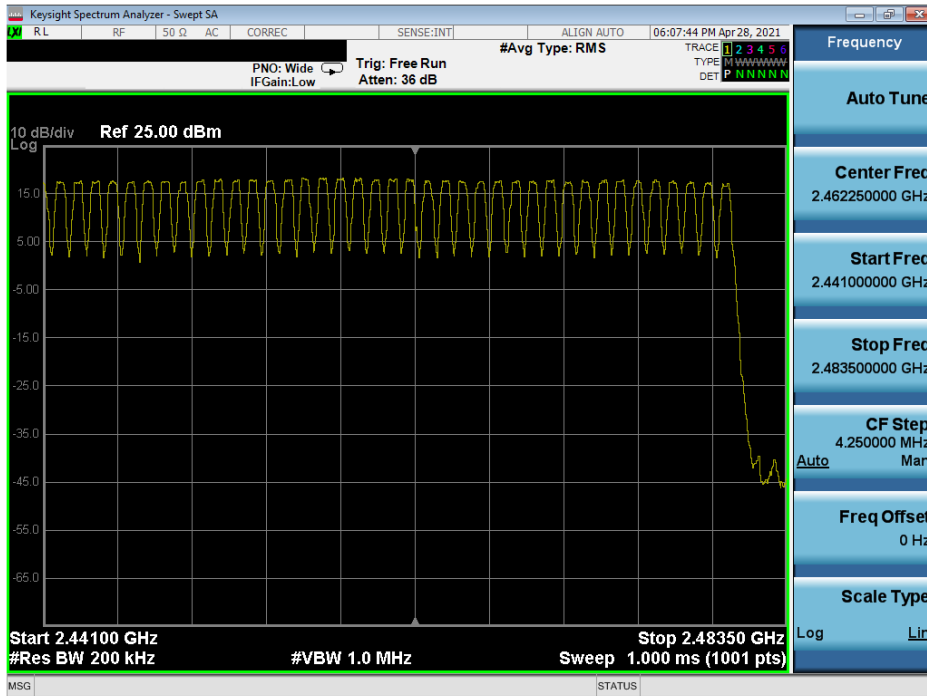


Plot 7-136. High End Spectrum Channel Hopping Plot (Bluetooth, iPA) – ANT0

FCC ID: A3LSMF711U1		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2107290086-14.A3L	Test Dates: 04/16/2021 - 04/29/2021	EUT Type: Portable Handset		Page 95 of 139

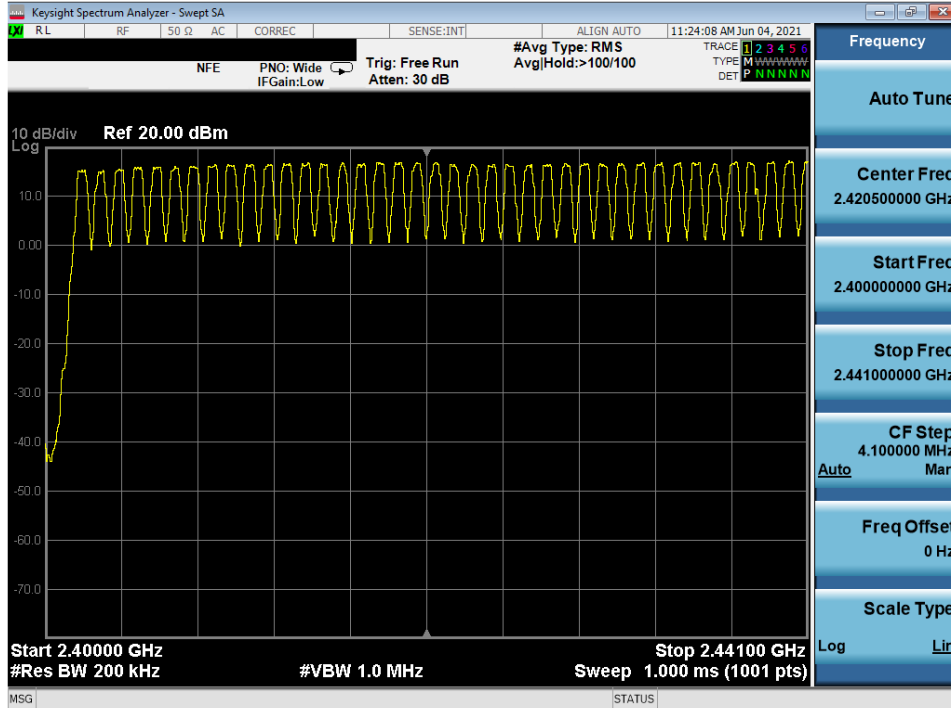


Plot 7-137. Low End Spectrum Channel Hopping Plot (Bluetooth, ePA) – ANT1

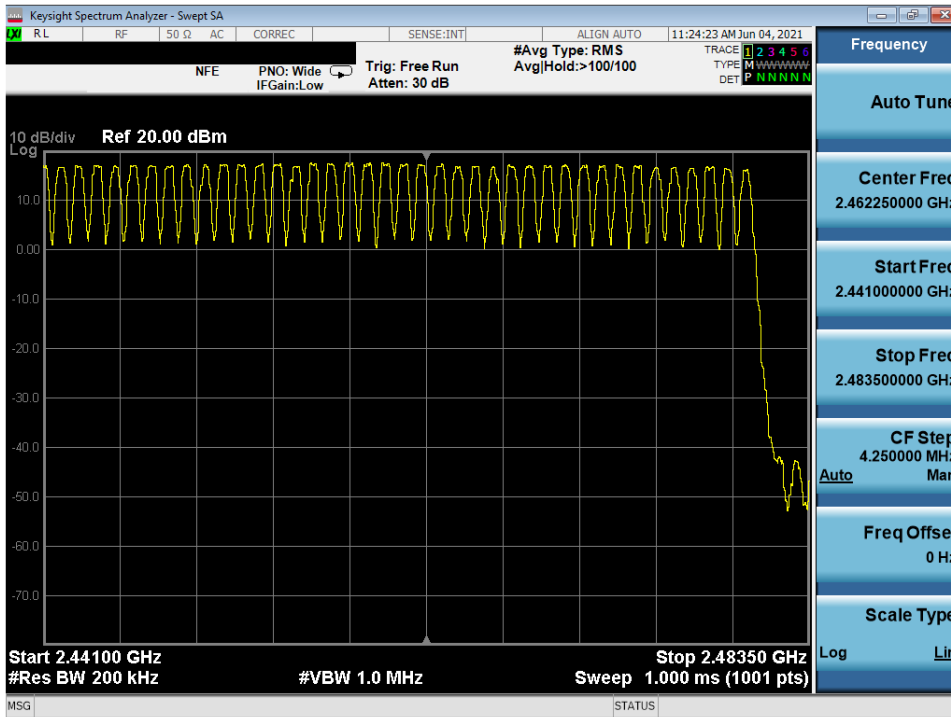


Plot 7-138. High End Spectrum Channel Hopping Plot (Bluetooth, ePA) – ANT1

FCC ID: A3LSMF711U1		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
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Plot 7-139. Low End Spectrum Channel Hopping Plot (Bluetooth, iPA) – ANT1



Plot 7-140. High End Spectrum Channel Hopping Plot (Bluetooth, iPA) – ANT1

FCC ID: A3LSMF711U1		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2107290086-14.A3L	Test Dates: 04/16/2021 - 04/29/2021	EUT Type: Portable Handset		Page 97 of 139

7.8 Conducted Spurious Emissions

§15.247 (d); RSS-247 [5.5]

Test Overview and Limit

Conducted out-of-band spurious emissions were investigated from 30MHz up to 25GHz to include the 10th harmonic of the fundamental transmit frequency. **The maximum permissible out-of-band emission level is 20 dBc.**

Test Procedure Used

ANSI C63.10-2013 – Section 7.8.8

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* (See note below)
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.

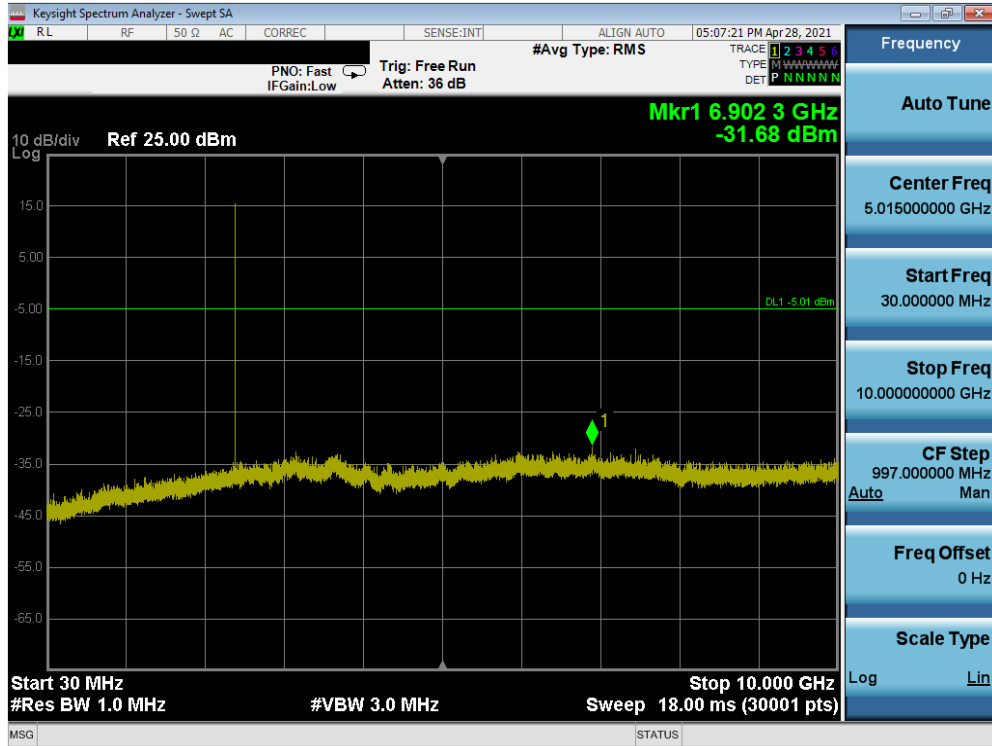


Figure 7-7. Test Instrument & Measurement Setup

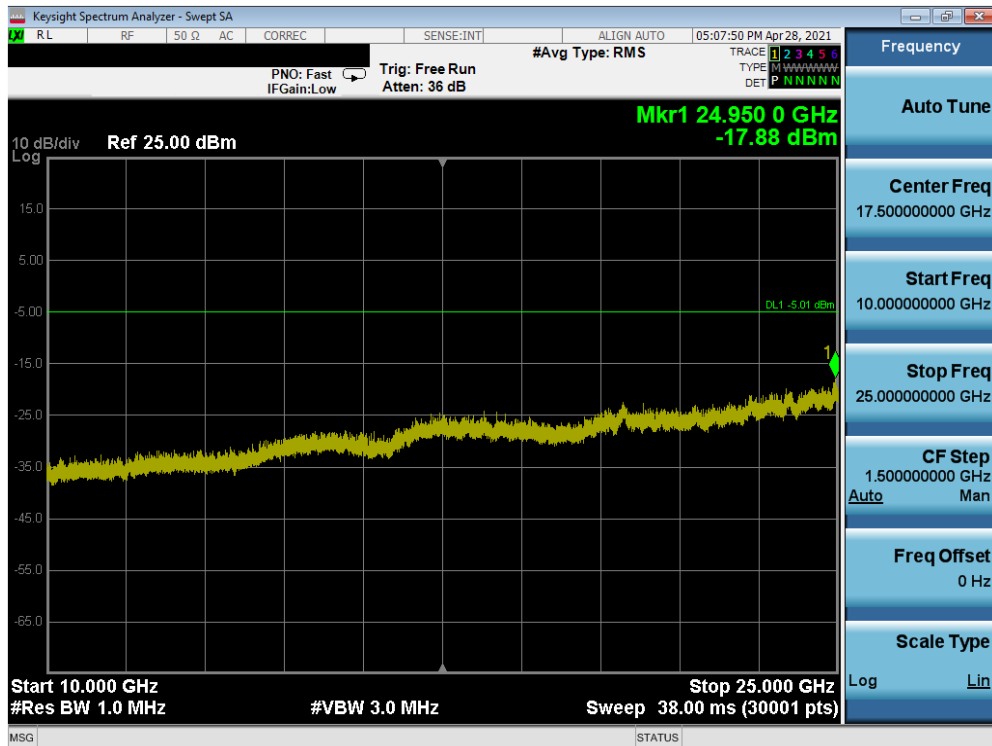
Test Notes

1. Out-of-band conducted spurious emissions were investigated for all data rates and the worst case emissions were found with the EUT transmitting at 1Mbps. The display line shown in the following plots is the limit at 20dB below the fundamental emission level measured in a 100kHz bandwidth. However, the traces in the following plots are measured with a 1MHz RBW to reduce test time, so the display line may not necessarily appear to be 20dB below the level of the fundamental in a 1MHz bandwidth.

FCC ID: A3LSMF711U1		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2107290086-14.A3L	Test Dates: 04/16/2021 - 04/29/2021	EUT Type: Portable Handset		Page 98 of 139

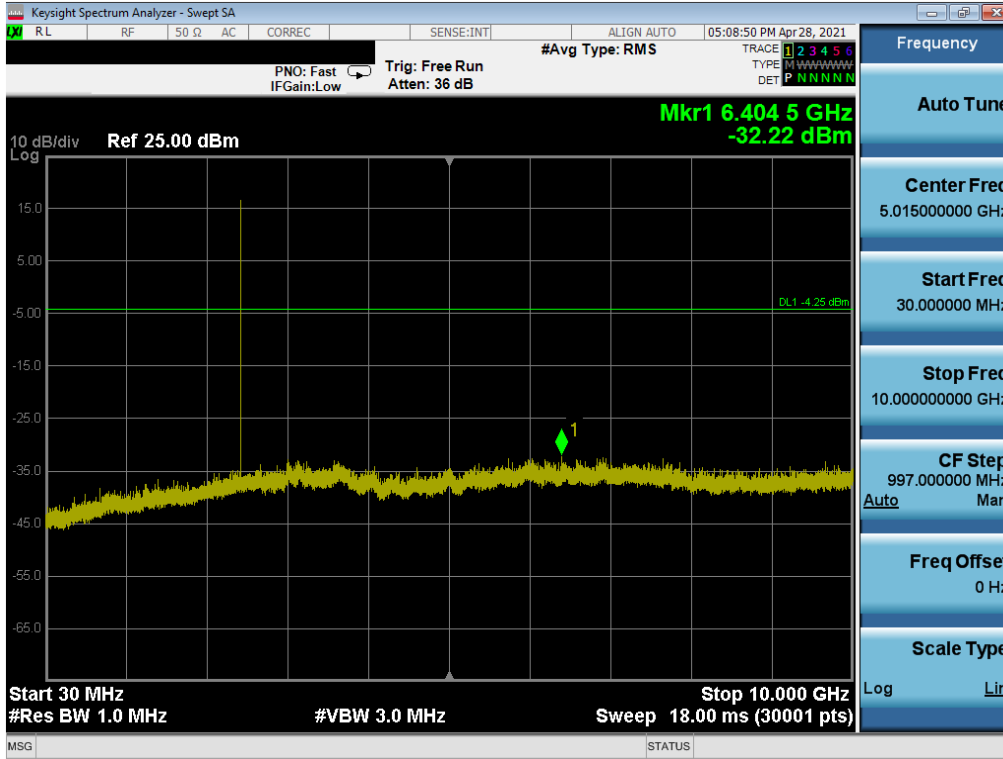


Plot 7-141. Conducted Spurious Plot (Bluetooth, 1Mbps – Ch. 0, ePA) – ANT0

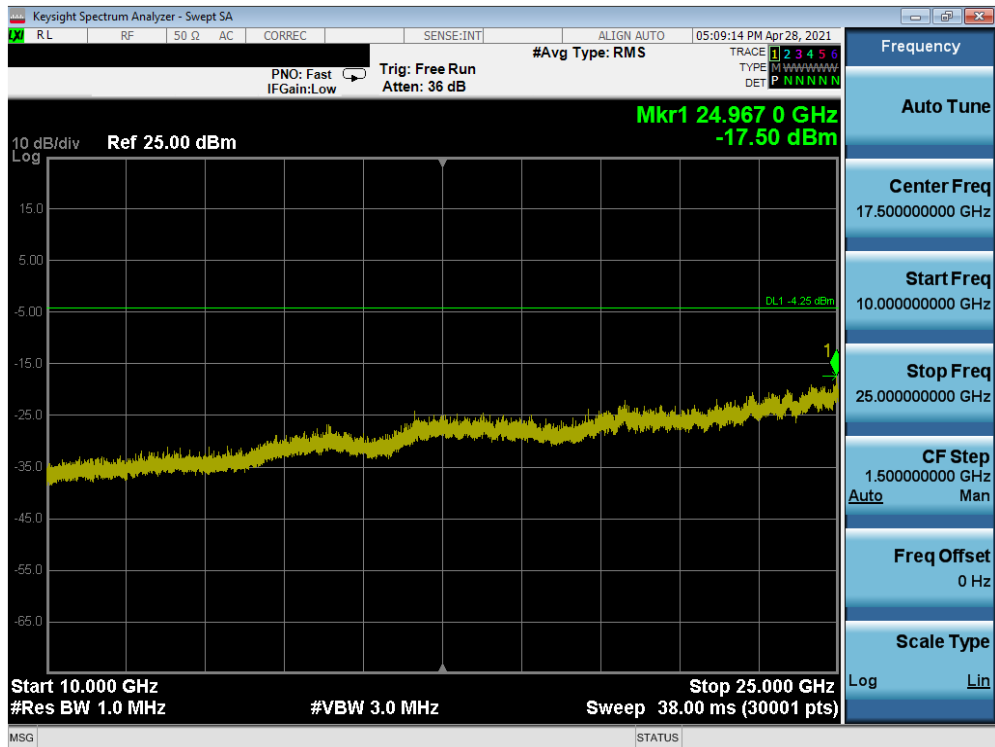


Plot 7-142. Conducted Spurious Plot (Bluetooth, 1Mbps – Ch. 0, ePA) – ANT0

FCC ID: A3LSMF711U1	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
Test Report S/N: 1M2107290086-14.A3L	Test Dates: 04/16/2021 - 04/29/2021	EUT Type: Portable Handset		Page 99 of 139

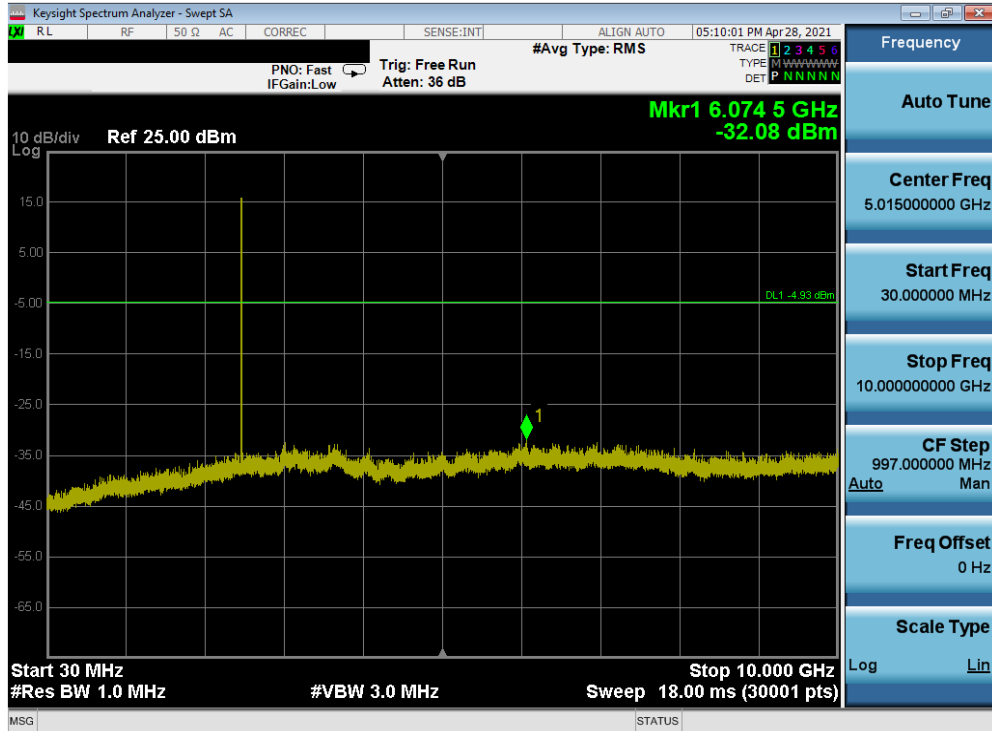


Plot 7-143. Conducted Spurious Plot (Bluetooth, 1Mbps – Ch. 39, ePA) – ANTO

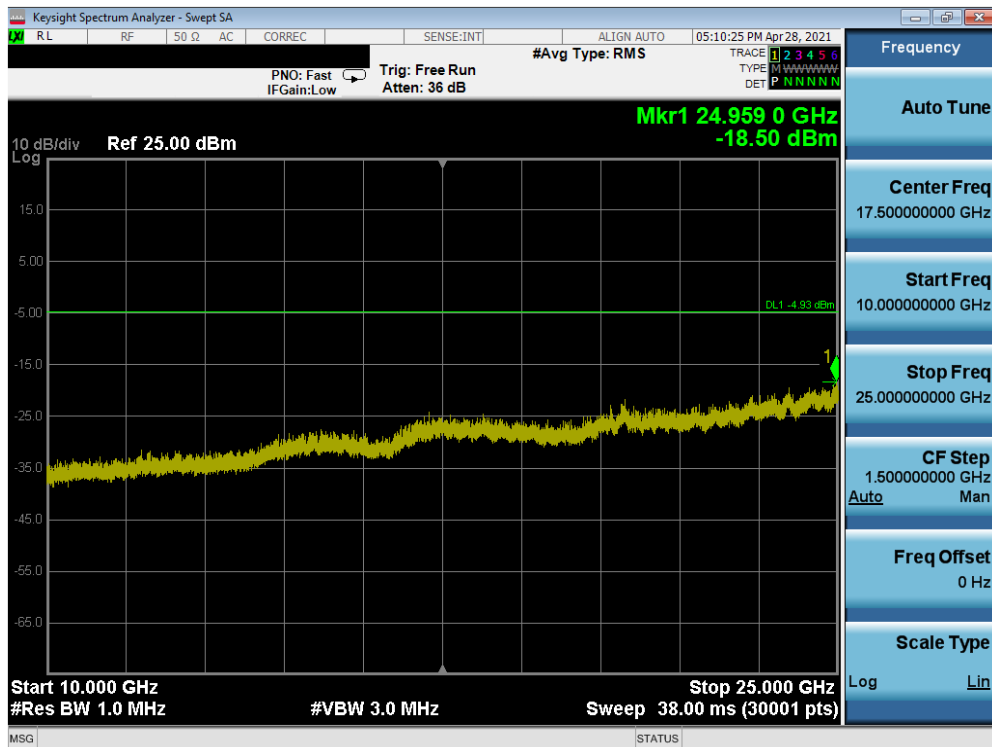


Plot 7-144. Conducted Spurious Plot (Bluetooth, 1Mbps – Ch. 39, ePA) – ANTO

FCC ID: A3LSMF711U1		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2107290086-14.A3L	Test Dates: 04/16/2021 - 04/29/2021	EUT Type: Portable Handset		Page 100 of 139

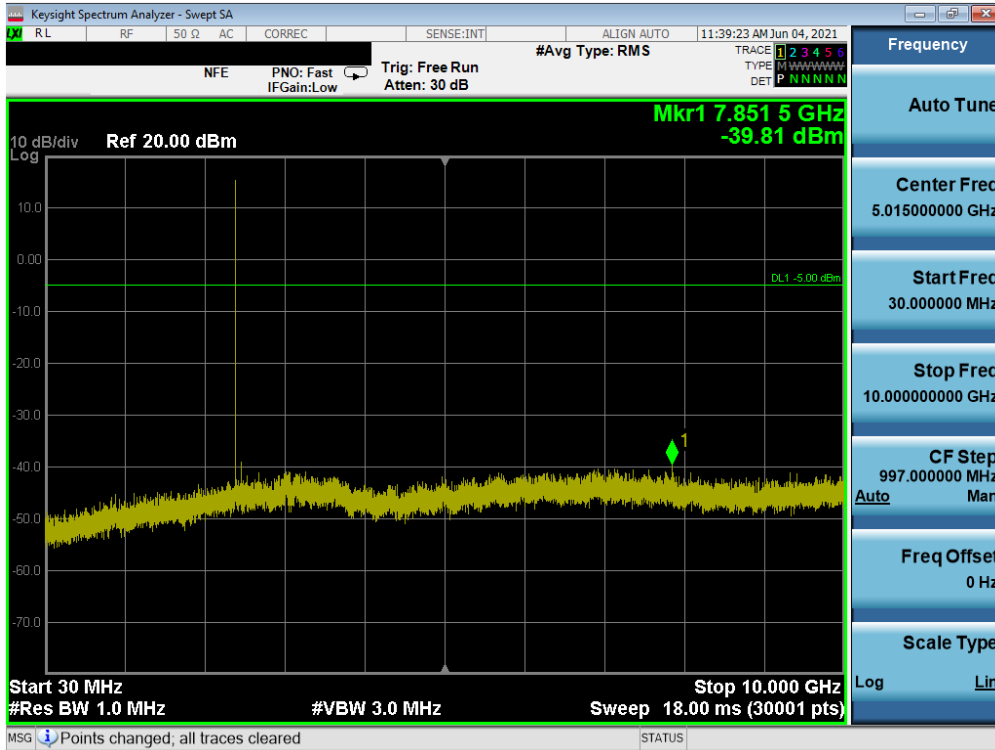


Plot 7-145. Conducted Spurious Plot (Bluetooth, 1Mbps – Ch. 78, ePA) – ANTO

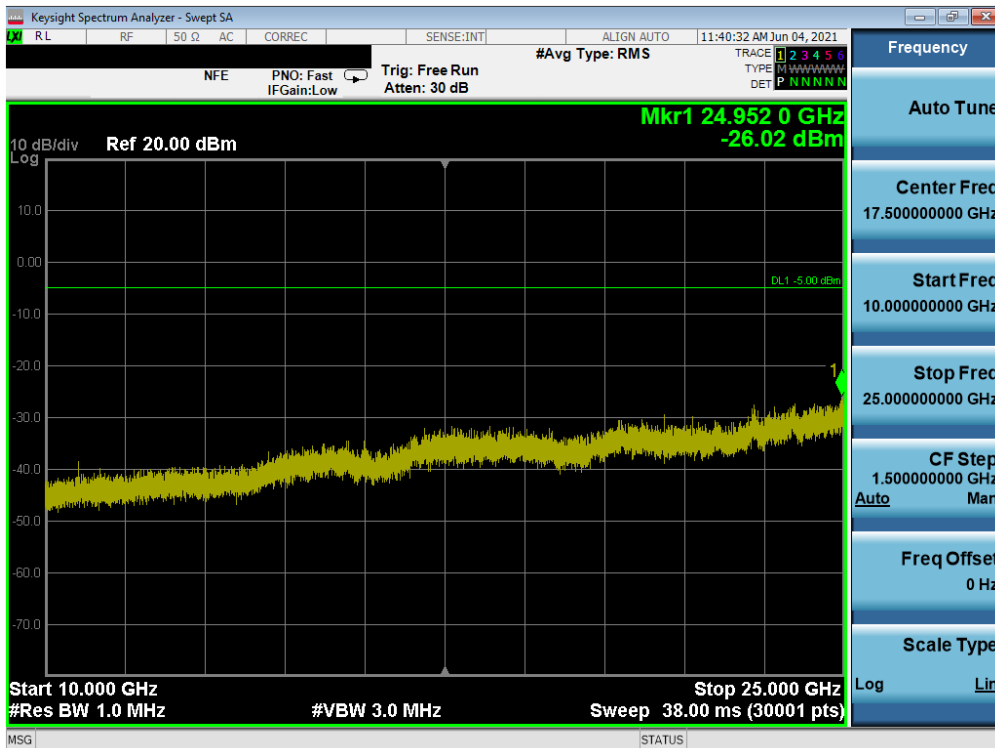


Plot 7-146. Conducted Spurious Plot (Bluetooth, 1Mbps – Ch. 78, ePA) – ANTO

FCC ID: A3LSMF711U1	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
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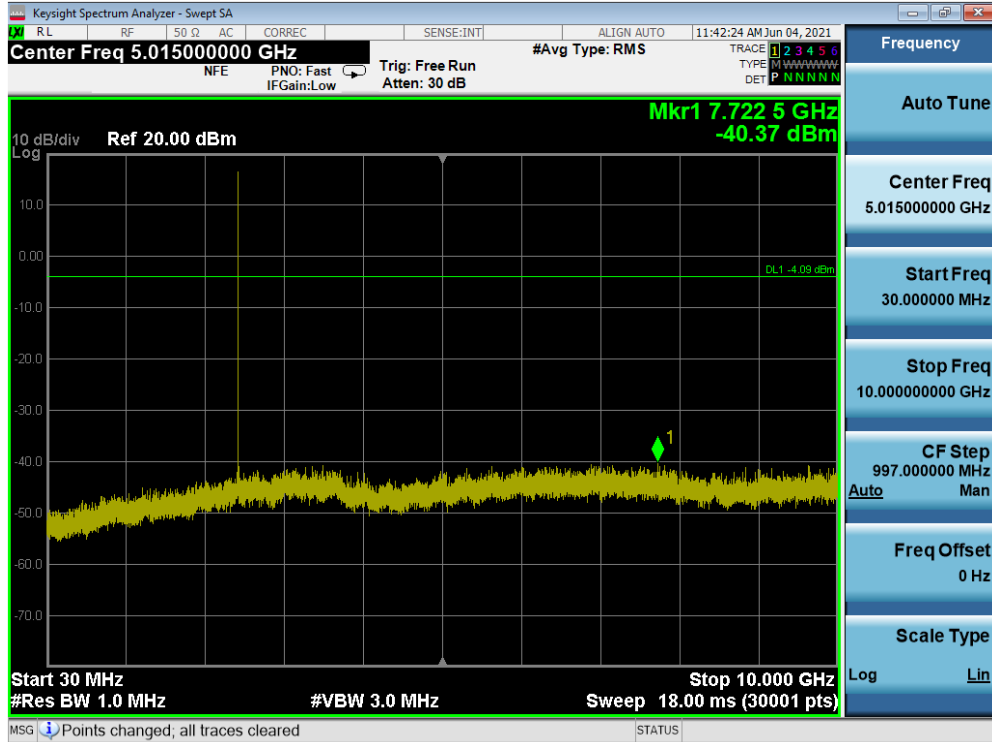


Plot 7-147. Conducted Spurious Plot (Bluetooth, 1Mbps – Ch. 0, iPA) – ANT0

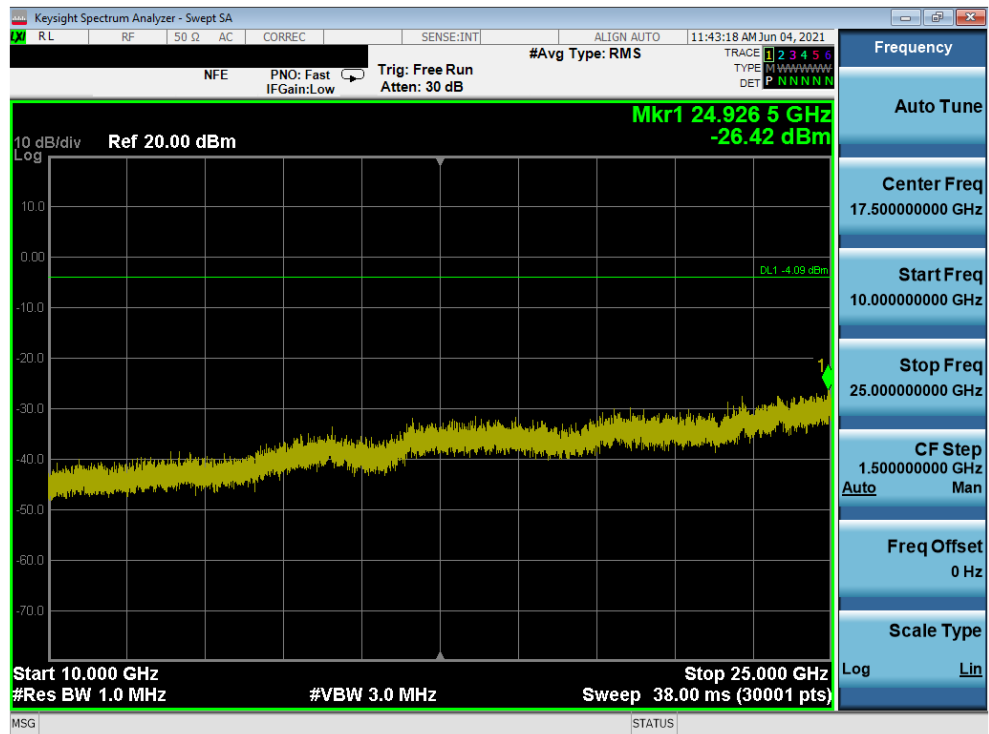


Plot 7-148. Conducted Spurious Plot (Bluetooth, 1Mbps – Ch. 0, iPA) – ANT0

FCC ID: A3LSMF711U1	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2107290086-14.A3L	Test Dates: 04/16/2021 - 04/29/2021	EUT Type: Portable Handset		Page 102 of 139

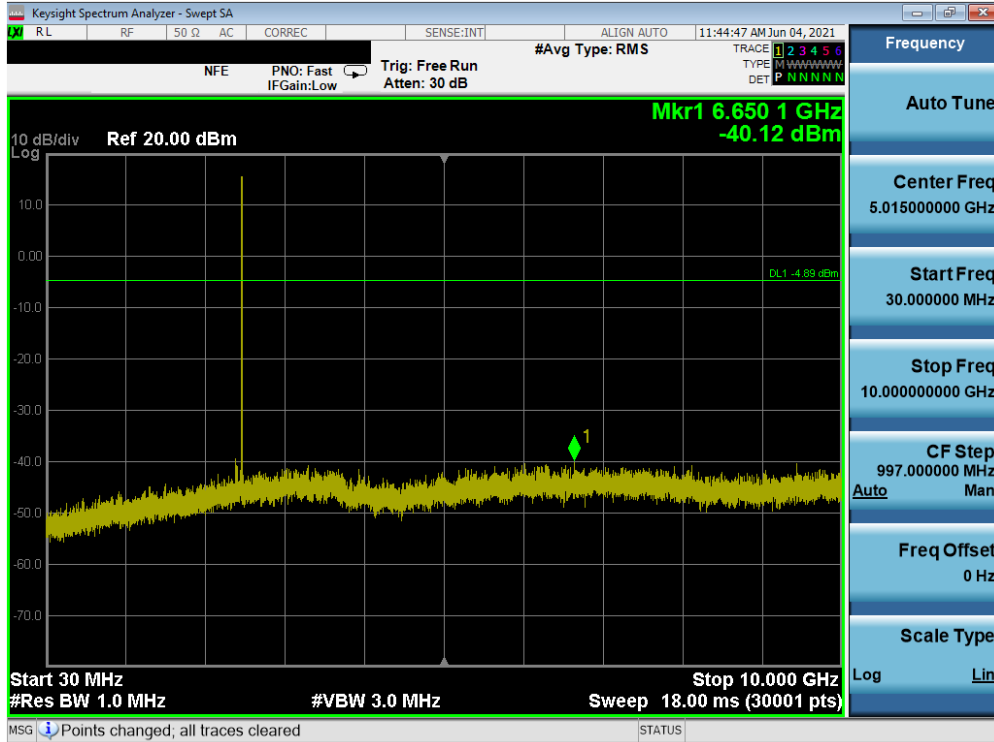


Plot 7-149. Conducted Spurious Plot (Bluetooth, 1Mbps – Ch. 39, iPA) – ANTO

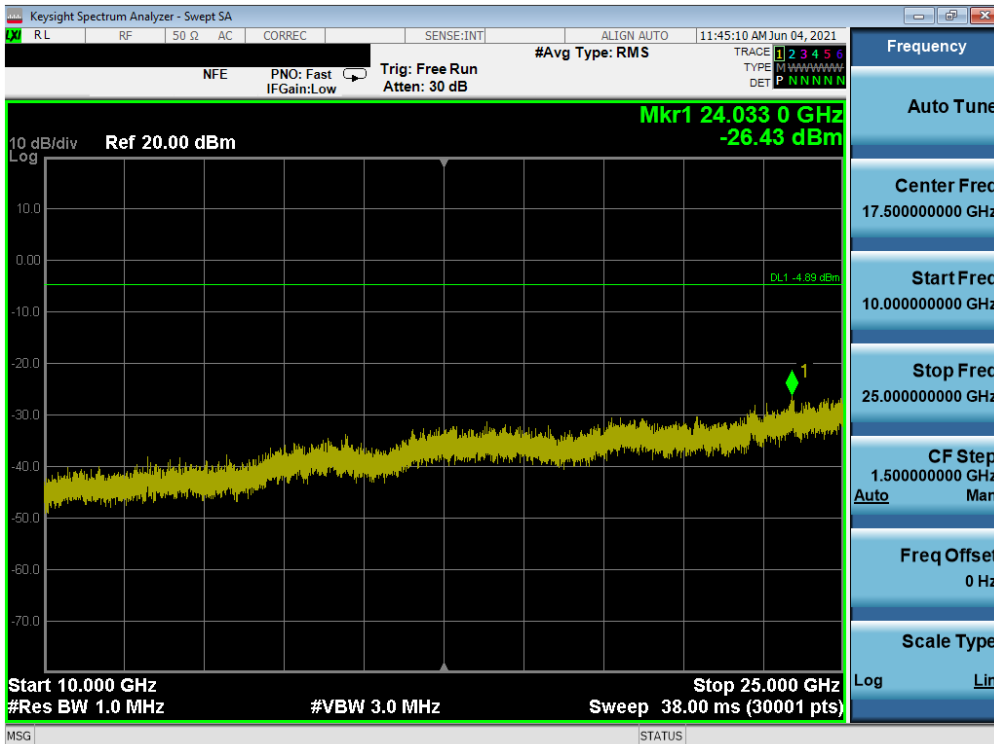


Plot 7-150. Conducted Spurious Plot (Bluetooth, 1Mbps – Ch. 39, iPA) – ANTO

FCC ID: A3LSMF711U1	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
Test Report S/N: 1M2107290086-14.A3L	Test Dates: 04/16/2021 - 04/29/2021	EUT Type: Portable Handset		Page 103 of 139

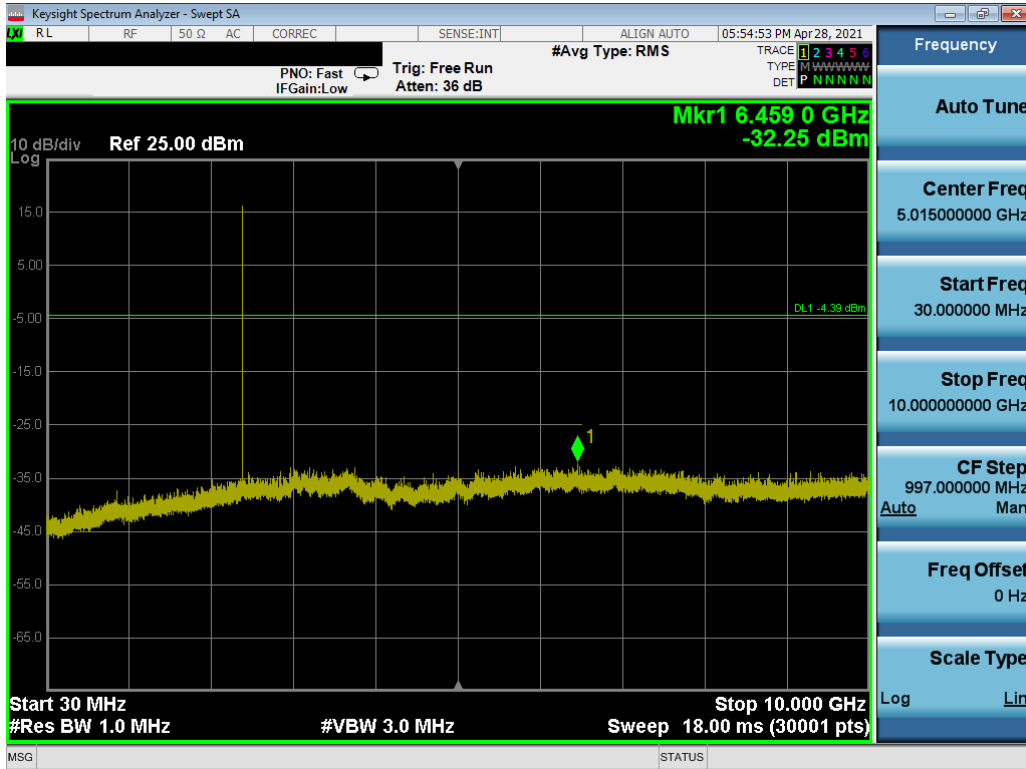


Plot 7-151. Conducted Spurious Plot (Bluetooth, 1Mbps – Ch. 78, iPA) – ANT0



Plot 7-152. Conducted Spurious Plot (Bluetooth, 1Mbps – Ch. 78, iPA) – ANT0

FCC ID: A3LSMF711U1	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
Test Report S/N: 1M2107290086-14.A3L	Test Dates: 04/16/2021 - 04/29/2021	EUT Type: Portable Handset		Page 104 of 139

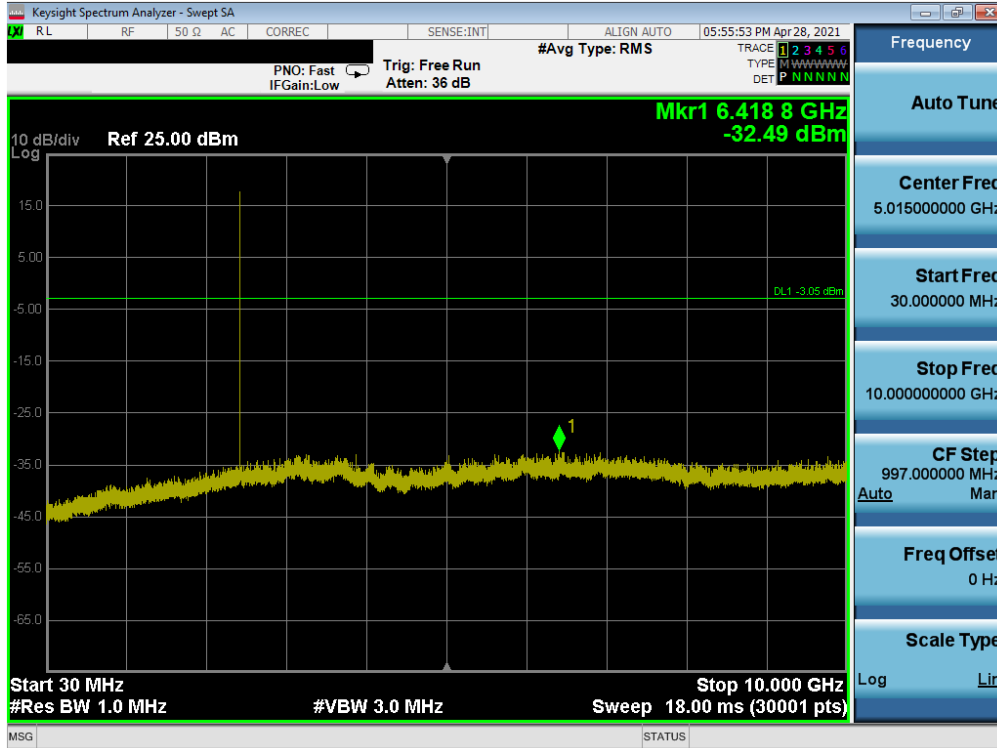


Plot 7-153. Conducted Spurious Plot (Bluetooth, 1Mbps – Ch. 0, ePA) – ANT1

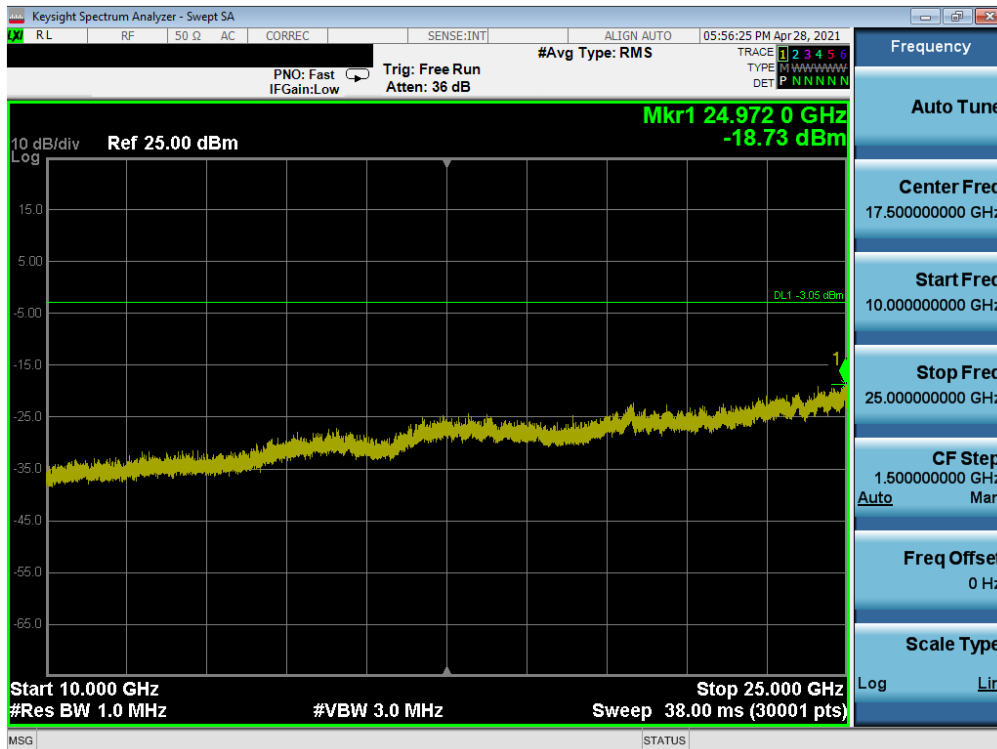


Plot 7-154. Conducted Spurious Plot (Bluetooth, 1Mbps – Ch. 0, ePA) – ANT1

FCC ID: A3LSMF711U1	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
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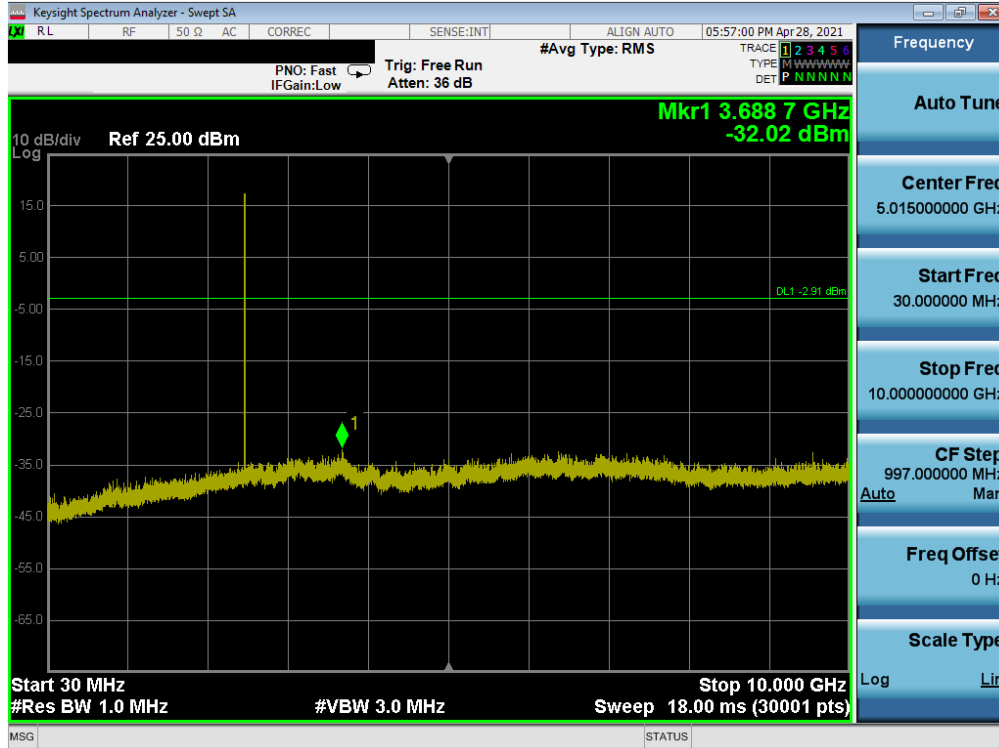


Plot 7-155. Conducted Spurious Plot (Bluetooth, 1Mbps – Ch. 39, ePA) – ANT1

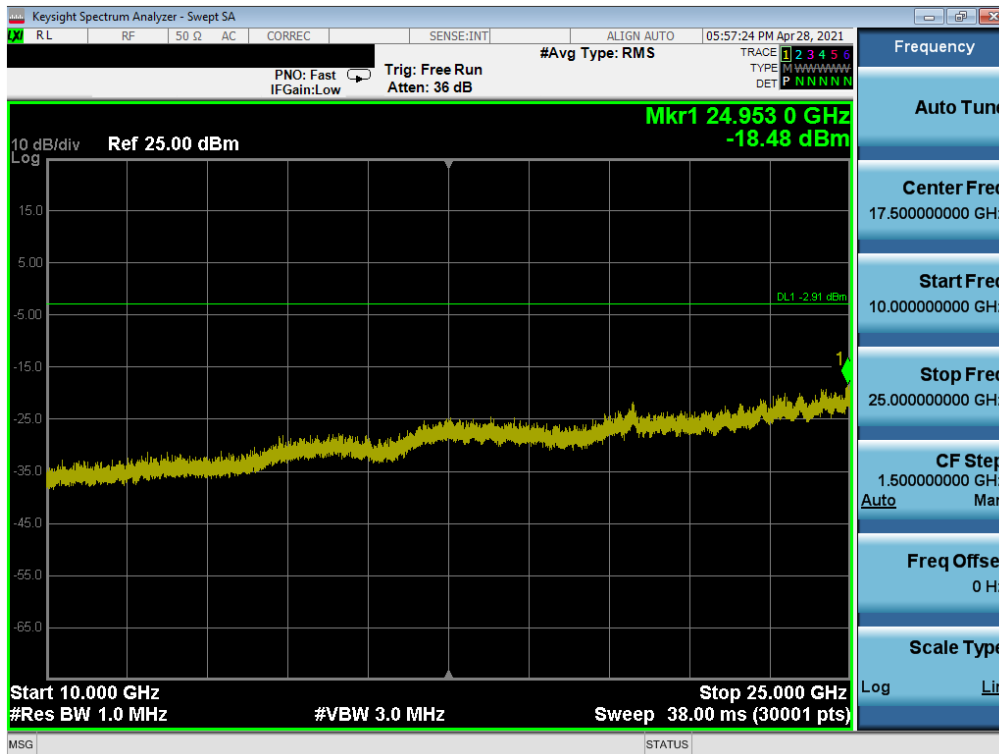


Plot 7-156. Conducted Spurious Plot (Bluetooth, 1Mbps – Ch. 39, ePA) – ANT1

FCC ID: A3LSMF711U1	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
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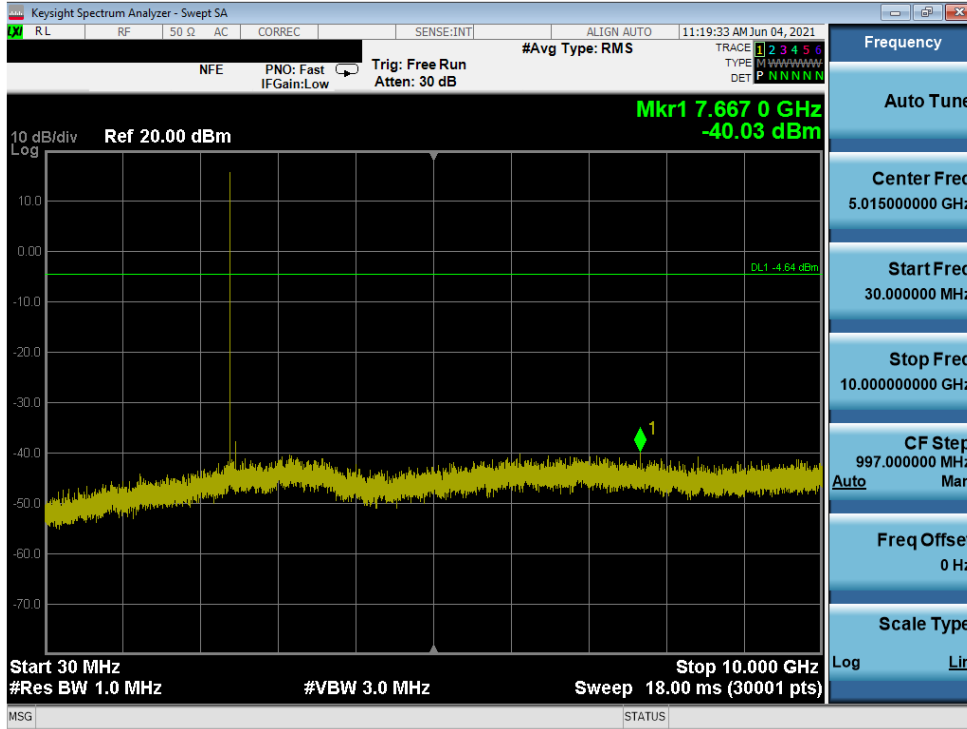


Plot 7-157. Conducted Spurious Plot (Bluetooth, 1Mbps – Ch. 78, ePA) – ANT1

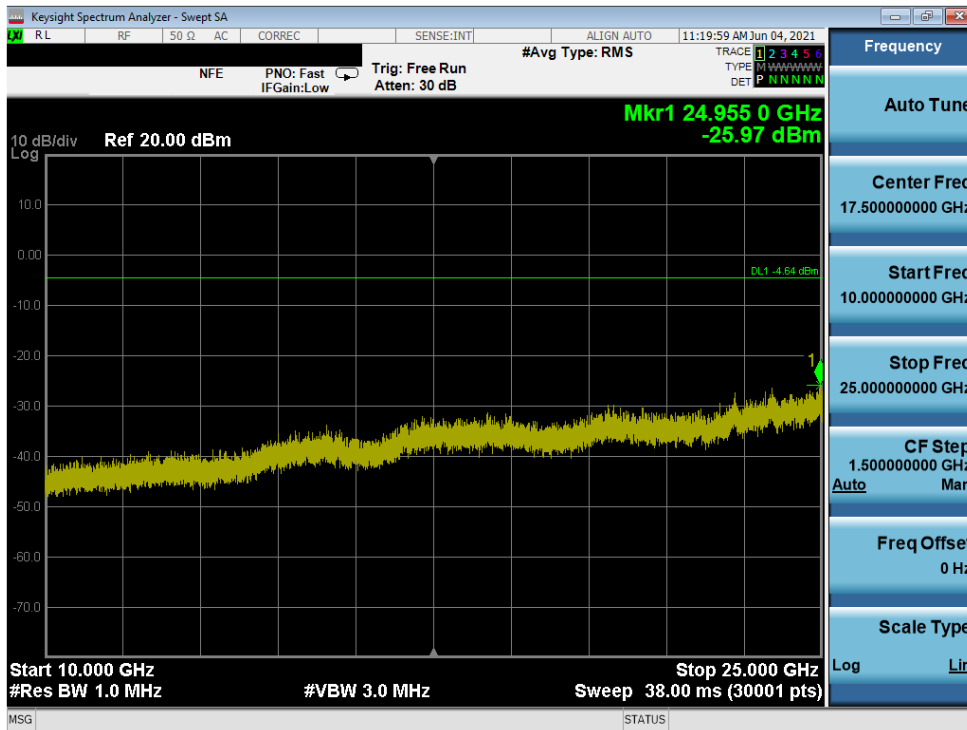


Plot 7-158. Conducted Spurious Plot (Bluetooth, 1Mbps – Ch. 78, ePA) – ANT1

FCC ID: A3LSMF711U1	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2107290086-14.A3L	Test Dates: 04/16/2021 - 04/29/2021	EUT Type: Portable Handset		Page 107 of 139

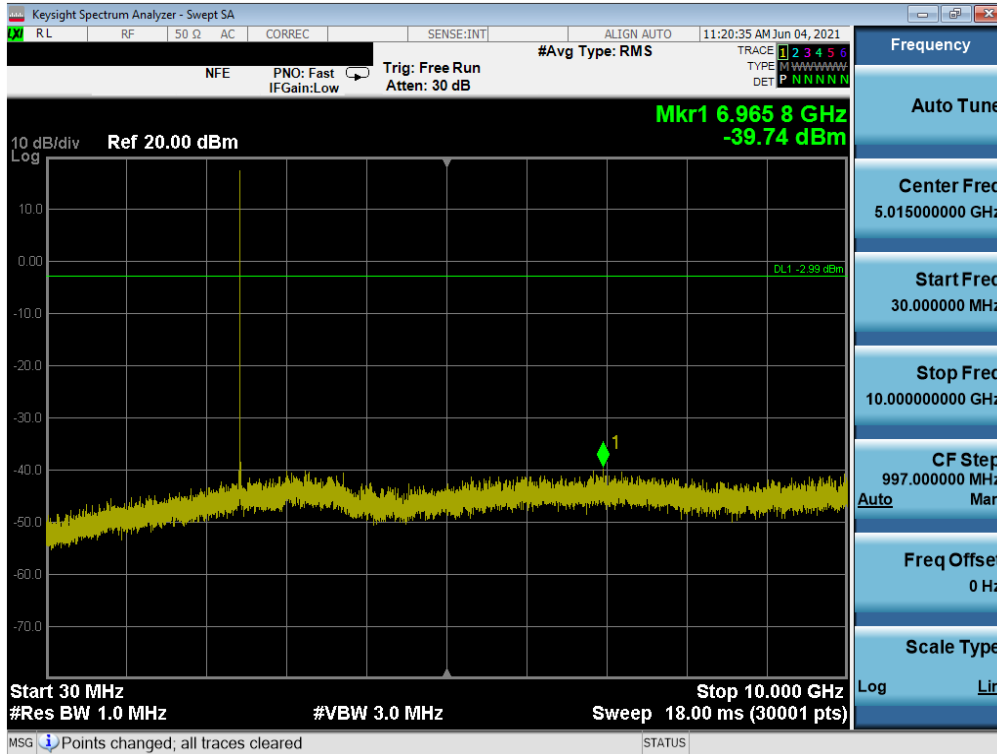


Plot 7-159. Conducted Spurious Plot (Bluetooth, 1Mbps – Ch. 0, iPA) – ANT1

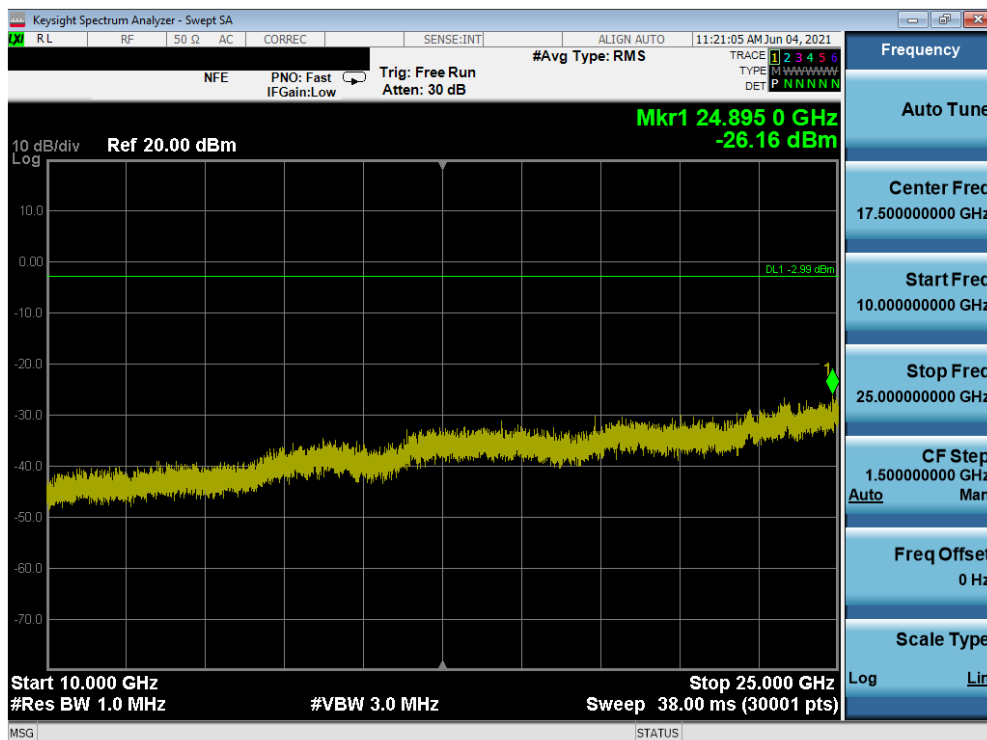


Plot 7-160. Conducted Spurious Plot (Bluetooth, 1Mbps – Ch. 0, iPA) – ANT1

FCC ID: A3LSMF711U1	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2107290086-14.A3L	Test Dates: 04/16/2021 - 04/29/2021	EUT Type: Portable Handset		Page 108 of 139

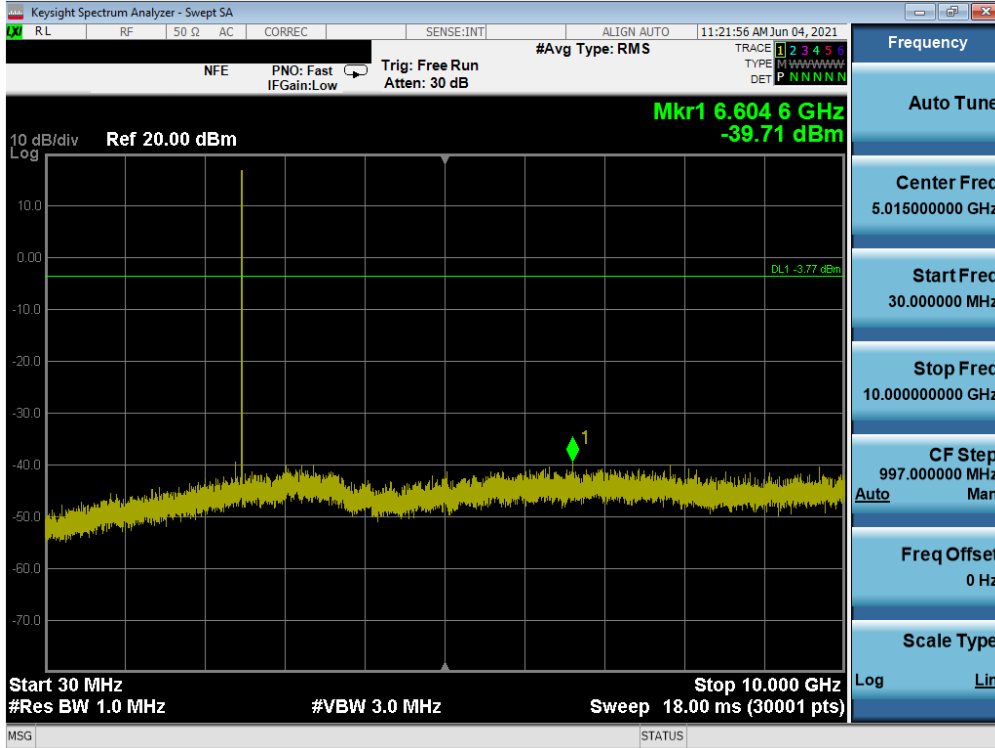


Plot 7-161. Conducted Spurious Plot (Bluetooth, 1Mbps – Ch. 39, iPA) – ANT1

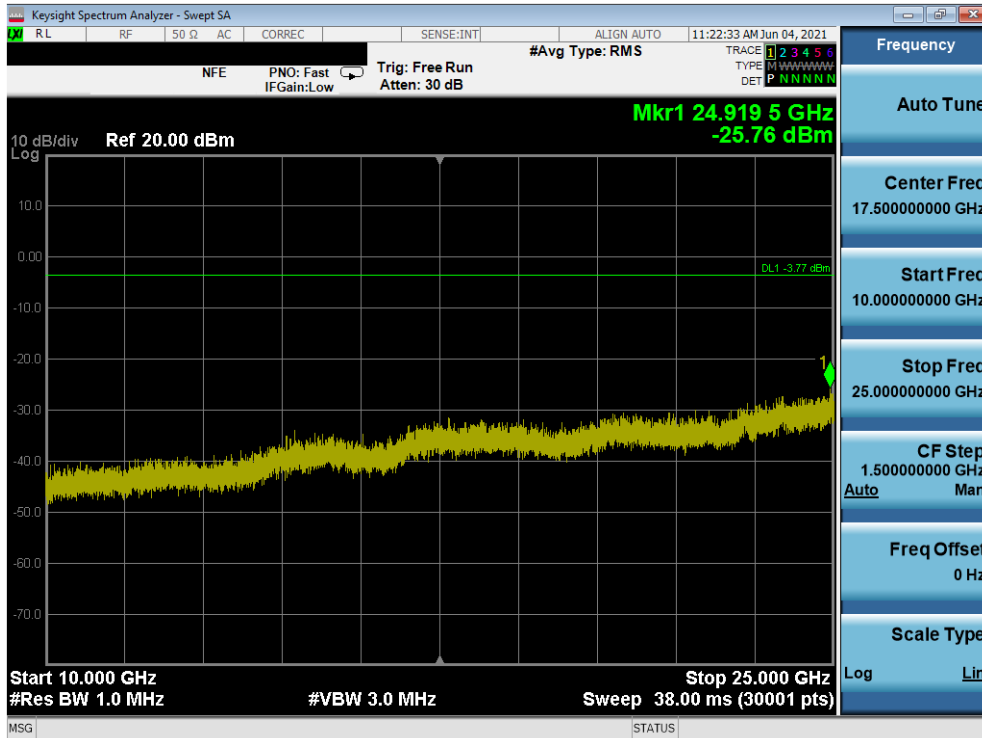


Plot 7-162. Conducted Spurious Plot (Bluetooth, 1Mbps – Ch. 39, iPA) – ANT1

FCC ID: A3LSMF711U1		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
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Plot 7-163. Conducted Spurious Plot (Bluetooth, 1Mbps – Ch. 78, iPA) – ANT1



Plot 7-164. Conducted Spurious Plot (Bluetooth, 1Mbps – Ch. 78, iPA) – ANT1

FCC ID: A3LSMF711U1		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2107290086-14.A3L	Test Dates: 04/16/2021 - 04/29/2021	EUT Type: Portable Handset		Page 110 of 139

7.9 Radiated Spurious Emission Measurements – Above 1GHz

§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 7-10 per Section 15.209 and RSS-Gen (8.9).

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

Table 7-8. Radiated Limits

Test Procedure Used

ANSI C63.10-2013 – Section 6.6.4.3

Test Settings

Average Field Strength Measurements per Section 4.1.4.2.3 of ANSI C63.10-2013

1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. RBW = 1MHz
3. VBW = 1kHz $\geq 1/\tau$ Hz, where τ = pulse width in seconds
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 stabilize

Peak Field Strength Measurements per Section 4.1.4.2.2 of ANSI C63.10-2013

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 7-11 below
3. VBW = 3MHz
4. Detector = peak
5. Sweep time = auto couple
6. Trace mode = max hold
7. Trace was allowed to stabilize

FCC ID: A3LSMF711U1		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
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Frequency	RBW
9 – 150kHz	200 – 300Hz
0.15 – 30MHz	9 – 10kHz
30 – 1000MHz	100 – 120kHz
> 1000MHz	1MHz

Table 7-9. RBW as a Function of Frequency

Test Setup

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

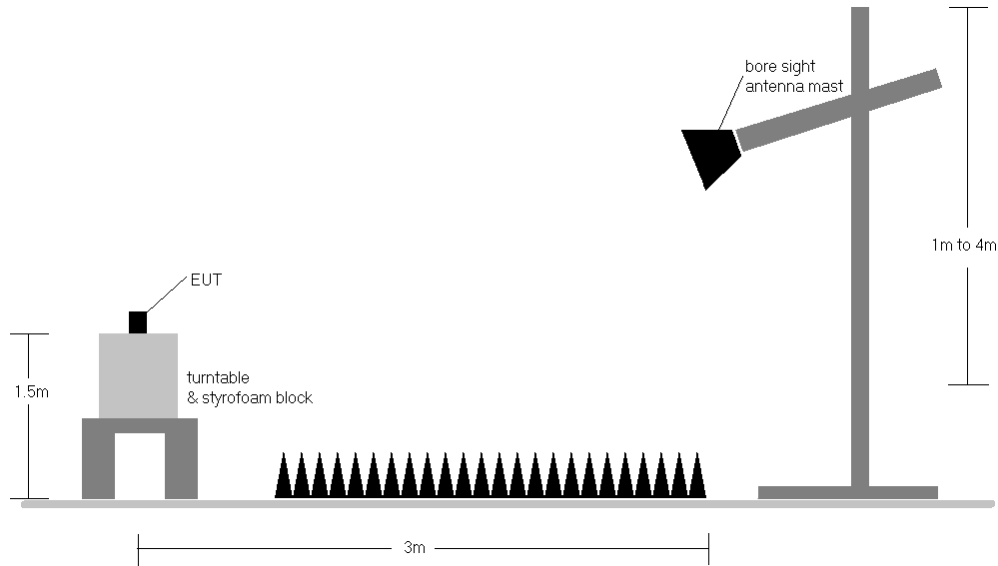


Figure 7-8. Radiated Test Setup >1GHz

Test Notes

1. All emissions lying in restricted bands specified in §15.205 and Section 8.10 of RSS-Gen are below the limit shown in Table 7-10.
2. No significant radiated emissions were found in the 2310 - 2390MHz restricted band.
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 and the worst-case emissions are reported.
6. The duty cycle correction factor was not applied to noise floor measurements.
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.

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Sample Calculation

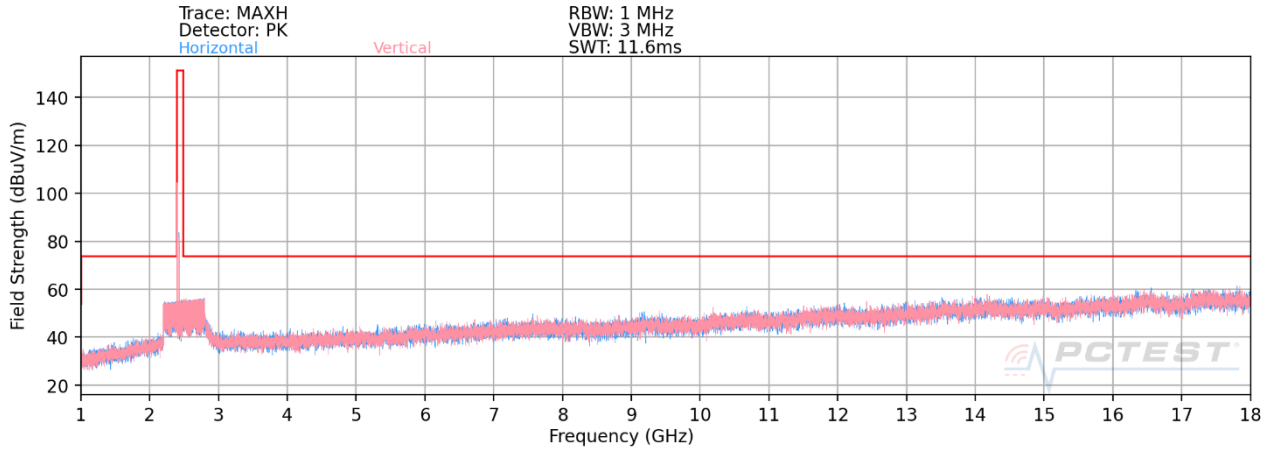
- Field Strength Level $_{[dB\mu V/m]} = \text{Analyzer Level }_{[dBm]} + 107 + \text{AFCL }_{[dB/m]} + \text{Duty Cycle Correction }_{[dB]}$
- $\text{AFCL }_{[dB/m]} = \text{Antenna Factor }_{[dB/m]} + \text{Cable Loss }_{[dB]}$
- $\text{Margin }_{[dB]} = \text{Field Strength Level }_{[dB\mu V/m]} - \text{Limit }_{[dB\mu V/m]}$

Duty Cycle Correction Factor Calculation

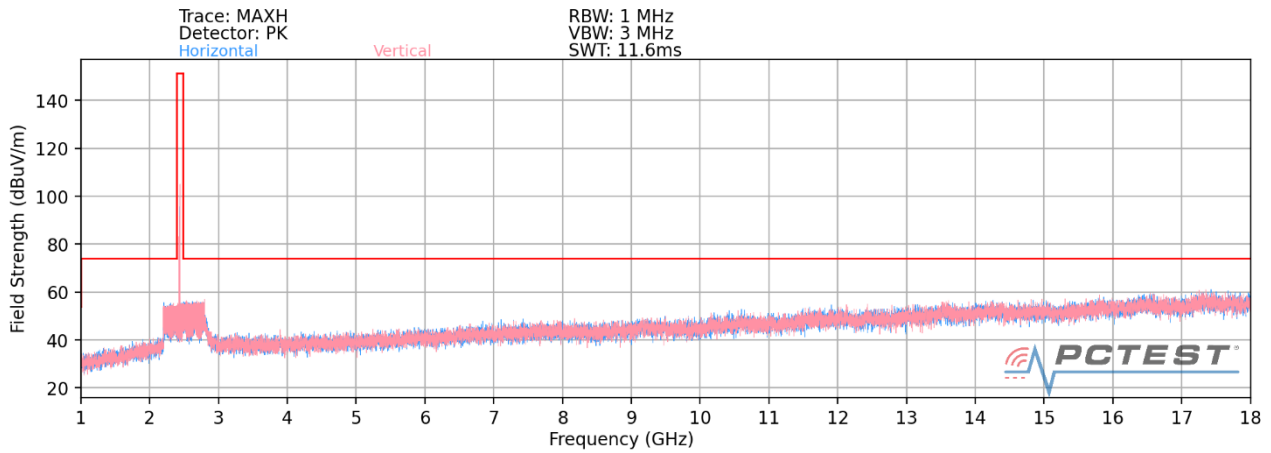
- Channel hop rate = 800 hops/second (AFH Mode)
- Adjusted channel hop rate for DH5 mode = 133.33 hops/second
- Time per channel hop = $1 / 133.33 \text{ hops/second} = 7.50 \text{ ms}$
- Time to cycle through all channels = $7.50 \times 20 \text{ channels} = 150 \text{ ms}$
- Number of times transmitter hits on one channel = $100 \text{ ms} / 150 \text{ ms} = 1 \text{ time(s)}$
- Worst case dwell time = 7.5 ms
- Duty cycle correction factor = $20\log_{10}(7.5\text{ms}/100\text{ms}) = -22.5 \text{ dB}$

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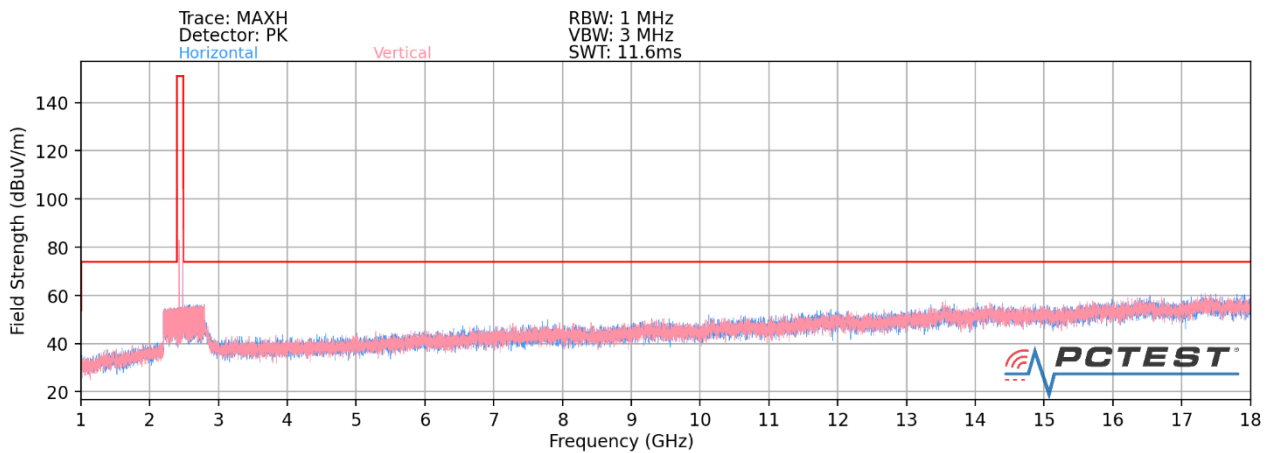
Radiated Spurious Emission Measurements
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Plot 7-165. Radiated Spurious Plot above 1GHz (BT- Ch. 0) – OPEN

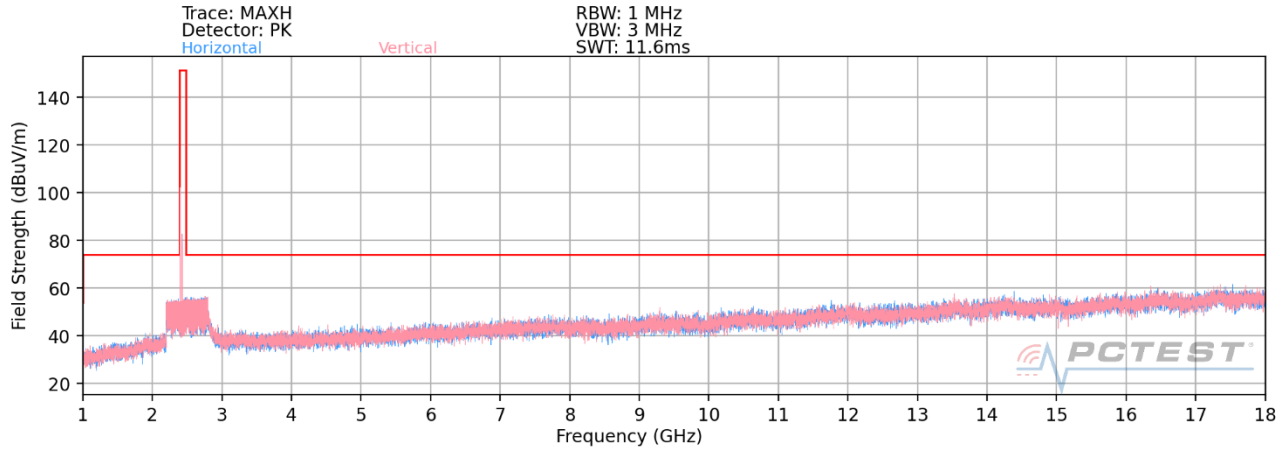


Plot 7-166. Radiated Spurious Plot above 1GHz (BT- Ch. 39) – OPEN

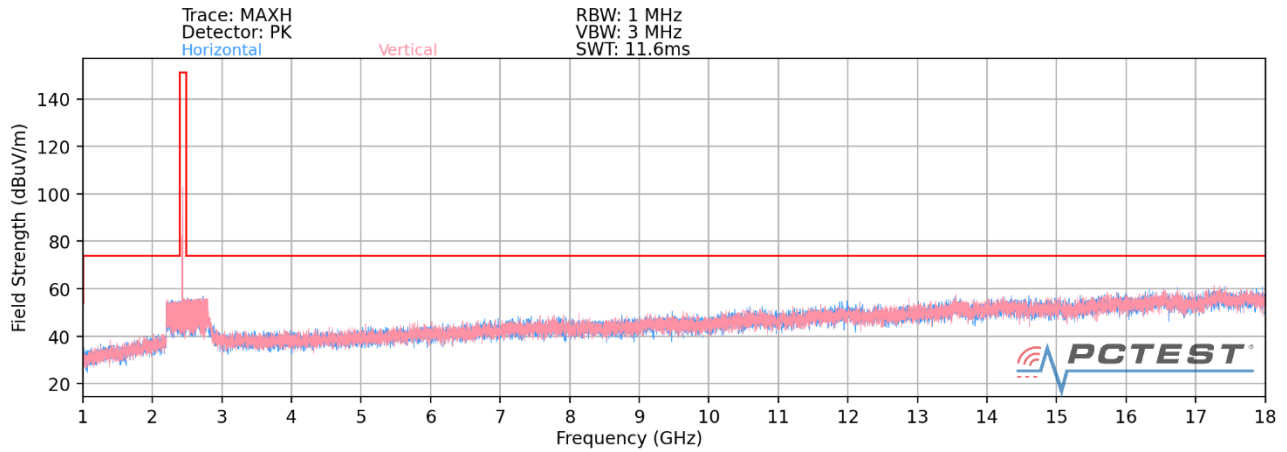


Plot 7-167. Radiated Spurious Plot above 1GHz (BT- Ch. 78) – OPEN

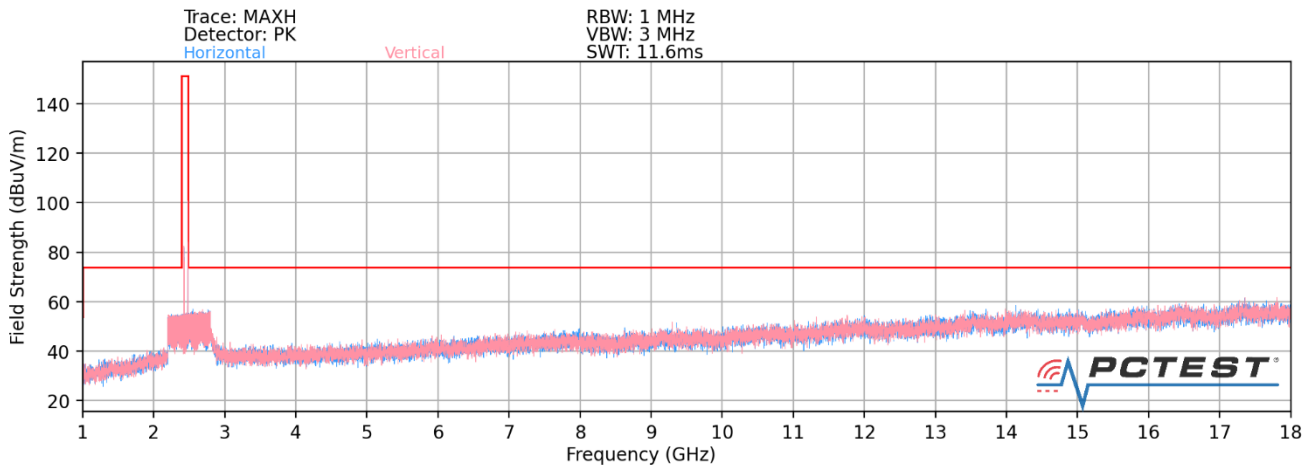
FCC ID: A3LSMF711U1	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
Test Report S/N: 1M2107290086-14.A3L	Test Dates: 04/16/2021 - 04/29/2021	EUT Type: Portable Handset		Page 114 of 139



Plot 7-168. Radiated Spurious Plot above 1GHz (BT- Ch. 0) – CLOSED

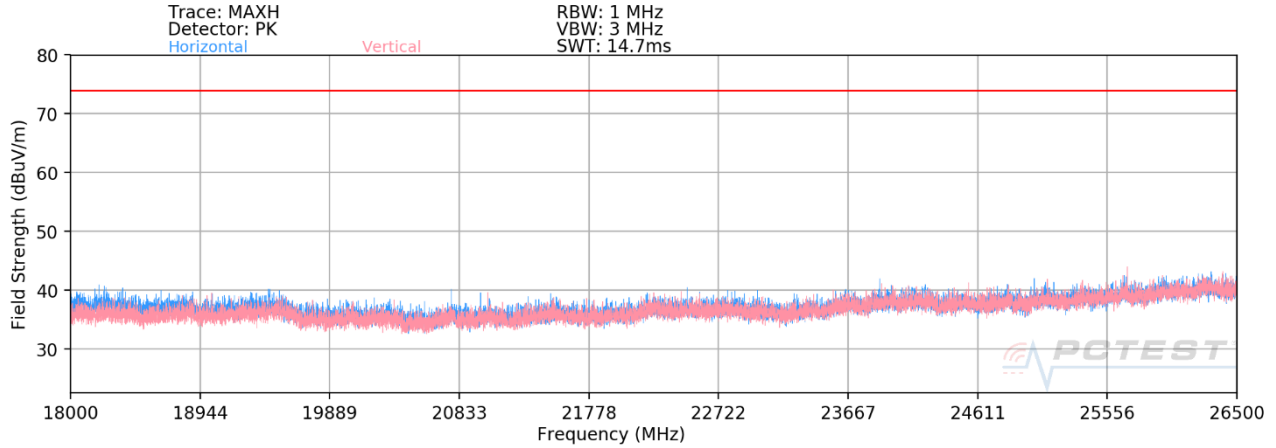


Plot 7-169. Radiated Spurious Plot above 1GHz (BT- Ch. 39) – CLOSED

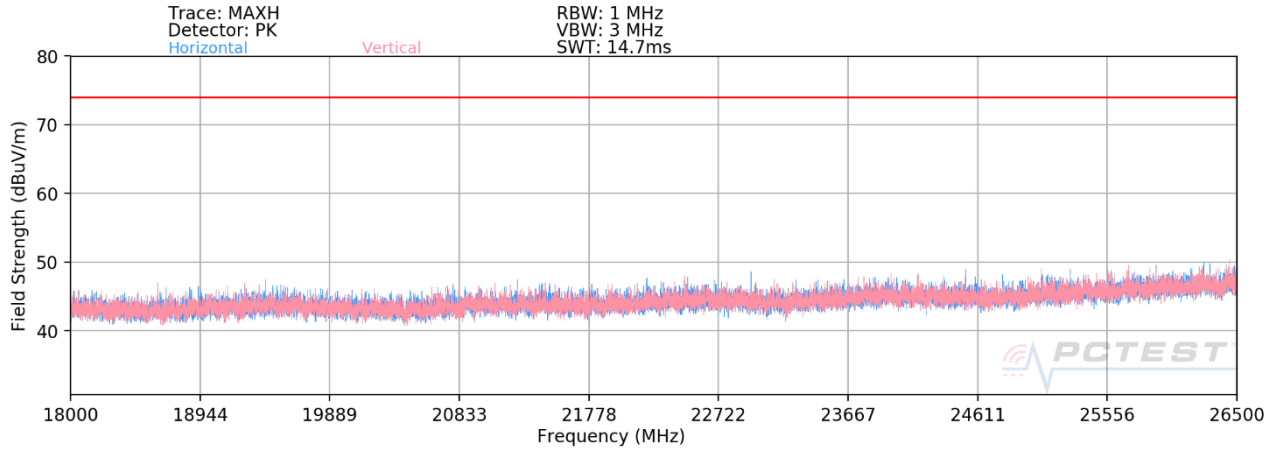


Plot 7-170. Radiated Spurious Plot above 1GHz (BT- Ch. 78) – CLOSED

FCC ID: A3LSMF711U1	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
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Plot 7-171. Radiated Spurious Plot above 18GHz – OPEN



Plot 7-172. Radiated Spurious Plot above 18GHz – CLOSED

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Radiated Spurious Emission Measurements

§15.205 §15.209 §15.247 (d); RSS-Gen [8.9]

Worst Case Mode: Bluetooth
 Worst Case Data Rate: 1 Mbps
 Measurement Distance: 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	V	-	-	-80.89	9.56	35.67	53.98	-18.31
4804.00	Peak	V	-	-	-69.18	9.56	47.38	73.98	-26.60
12010.00	Avg	V	-	-	-83.71	24.11	47.40	53.98	-6.58
12010.00	Peak	V	-	-	-72.67	24.11	58.44	73.98	-15.54

Table 7-10. Radiated Measurements – ANT0, ePA, CLOSED

FCC ID: A3LSMF711U1		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
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Radiated Spurious Emission Measurements
§15.205 §15.209 §15.247 (d); RSS-Gen [8.9]

Worst Case Mode: Bluetooth
 Worst Case Data Rate: 1 Mbps
 Measurement Distance: 3 Meters
 Operating Frequency: 2441MHz
 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]
4882.00	Avg	V	-	-	-80.90	9.47	35.57	53.98	-18.41
4882.00	Peak	V	-	-	-69.49	9.47	46.98	73.98	-27.00
7323.00	Avg	V	-	-	-82.53	15.67	40.14	53.98	-13.84
7323.00	Peak	V	-	-	-71.48	15.67	51.19	73.98	-22.79
12205.00	Avg	V	-	-	-84.29	23.55	46.26	53.98	-7.72
12205.00	Peak	V	-	-	-73.75	23.55	56.80	73.98	-17.18

Table 7-11. Radiated Measurements– ANT0, ePA, CLOSED

FCC ID: A3LSMF711U1		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
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Radiated Spurious Emission Measurements
§15.205 §15.209 §15.247 (d); RSS-Gen [8.9]

Worst Case Mode: Bluetooth
 Worst Case Data Rate: 1 Mbps
 Measurement Distance: 3 Meters
 Operating Frequency: 2480MHz
 Channel: 78

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	V	-	-	-81.01	9.87	35.86	53.98	-18.12
4960.00	Peak	V	-	-	-69.78	9.87	47.09	73.98	-26.89
7440.00	Avg	V	-	-	-82.69	16.09	40.40	53.98	-13.58
7440.00	Peak	V	-	-	-71.55	16.09	51.54	73.98	-22.44
12400.00	Avg	V	-	-	-84.19	23.86	46.67	53.98	-7.31
12400.00	Peak	V	-	-	-73.12	23.86	57.74	73.98	-16.24

Table 7-12. Radiated Measurements – ANT0, ePA, CLOSED

FCC ID: A3LSMF711U1		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2107290086-14.A3L	Test Dates: 04/16/2021 - 04/29/2021	EUT Type: Portable Handset		Page 119 of 139

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

Worst Case Mode: Bluetooth
 Worst Case Data Rate: 1 Mbps
 Measurement Distance: 3 Meters
 Operating Frequency: 2441MHz
 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]
4882.00	Avg	V	-	-	-83.52	9.47	32.95	53.98	-21.03
4882.00	Peak	V	-	-	-69.64	9.47	46.83	73.98	-27.15
7323.00	Avg	V	-	-	-85.37	15.67	37.30	53.98	-16.68
7323.00	Peak	V	-	-	-70.96	15.67	51.71	73.98	-22.27
12205.00	Avg	V	-	-	-86.66	23.55	43.89	53.98	-10.09
12205.00	Peak	V	-	-	-72.61	23.55	57.94	73.98	-16.04

Table 7-13. Radiated Measurements with WCP – ANT0, ePA

FCC ID: A3LSMF711U1		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
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Radiated Spurious Emission Measurements

§15.205 §15.209 §15.247 (d); RSS-Gen [8.9]

Worst Case Mode: Bluetooth
 Worst Case Data Rate: 1 Mbps
 Measurement Distance: 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	V	-	-	-78.80	6.43	34.63	53.98	-19.35
4804.00	Peak	V	-	-	-67.21	6.43	46.22	73.98	-27.76
12010.00	Avg	V	-	-	-82.17	18.38	43.21	53.98	-10.77
12010.00	Peak	V	-	-	-69.79	18.38	55.59	73.98	-18.39

Table 7-14. Radiated Measurements – ANT0, iPA, CLOSED

Radiated Spurious Emission Measurements

§15.205 §15.209 §15.247 (d); RSS-Gen [8.9]

Worst Case Mode: Bluetooth
 Worst Case Data Rate: 1 Mbps
 Measurement Distance: 3 Meters
 Operating Frequency: 2441MHz
 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]
4882.00	Avg	V	-	-	-78.45	6.88	35.43	53.98	-18.55
4882.00	Peak	V	-	-	-67.61	6.88	46.27	73.98	-27.71
7323.00	Avg	V	-	-	-80.14	12.84	39.70	53.98	-14.28
7323.00	Peak	V	-	-	-68.63	12.84	51.21	73.98	-22.77
12205.00	Avg	V	-	-	-81.87	18.62	43.75	53.98	-10.23
12205.00	Peak	V	-	-	-70.18	18.62	55.44	73.98	-18.54

Table 7-15. Radiated Measurements– ANT0, iPA, CLOSED

FCC ID: A3LSMF711U1		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
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Radiated Spurious Emission Measurements

§15.205 §15.209 §15.247 (d); RSS-Gen [8.9]

Worst Case Mode: Bluetooth
 Worst Case Data Rate: 1 Mbps
 Measurement Distance: 3 Meters
 Operating Frequency: 2480MHz
 Channel: 78

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	V	-	-	-79.54	6.66	34.12	53.98	-19.86
4960.00	Peak	V	-	-	-64.87	6.66	48.79	73.98	-25.19
7440.00	Avg	V	-	-	-81.12	13.08	38.96	53.98	-15.02
7440.00	Peak	V	-	-	-69.45	13.08	50.63	73.98	-23.35
12400.00	Avg	V	-	-	-81.71	18.77	44.06	53.98	-9.92
12400.00	Peak	V	-	-	-70.29	18.77	55.48	73.98	-18.50

Table 7-16. Radiated Measurements – ANT0, iPA, CLOSED

Worst Case Mode: Bluetooth
 Worst Case Data Rate: 1 Mbps
 Measurement Distance: 3 Meters
 Operating Frequency: 2480MHz
 Channel: 78

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	V	104	90	-79.01	9.87	37.86	53.98	-16.12
4960.00	Peak	V	104	90	-68.43	9.87	48.44	73.98	-25.54
7440.00	Avg	V	-	-	-81.97	16.09	41.12	53.98	-12.86
7440.00	Peak	V	-	-	-72.16	16.09	50.93	73.98	-23.05
12400.00	Avg	V	-	-	-84.16	23.86	46.70	53.98	-7.28
12400.00	Peak	V	-	-	-73.45	23.86	57.41	73.98	-16.57

Table 7-17. Radiated Measurements with WCP – ANT0, iPA

FCC ID: A3LSMF711U1	 PCTEST [®] Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
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Radiated Spurious Emission Measurements

§15.205 §15.209 §15.247 (d); RSS-Gen [8.9]

Worst Case Mode: Bluetooth
 Worst Case Data Rate: 1 Mbps
 Measurement Distance: 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	-	-	-80.91	9.56	35.83	53.98	-18.15
4804.00	Peak	H	-	-	-69.22	9.56	48.09	73.98	-25.89
12010.00	Avg	H	-	-	-83.65	24.11	47.25	53.98	-6.73
12010.00	Peak	H	-	-	-71.59	24.11	59.52	73.98	-14.46

Table 7-18. Radiated Measurements – ANT1, ePA, CLOSED

FCC ID: A3LSMF711U1		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
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Radiated Spurious Emission Measurements
§15.205 §15.209 §15.247 (d); RSS-Gen [8.9]

Worst Case Mode: Bluetooth
 Worst Case Data Rate: 1 Mbps
 Measurement Distance: 3 Meters
 Operating Frequency: 2441MHz
 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]
4882.00	Avg	H	-	-	-81.02	9.47	35.55	53.98	-18.43
4882.00	Peak	H	-	-	-69.58	9.47	47.76	73.98	-26.22
7323.00	Avg	H	-	-	-82.56	15.67	40.07	53.98	-13.91
7323.00	Peak	H	-	-	-71.43	15.67	51.30	73.98	-22.68
12205.00	Avg	H	-	-	-84.32	23.55	46.42	53.98	-7.56
12205.00	Peak	H	-	-	-73.79	23.55	57.70	73.98	-16.28

Table 7-19. Radiated Measurements – ANT1, ePA, CLOSED

FCC ID: A3LSMF711U1		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
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Radiated Spurious Emission Measurements
§15.205 §15.209 §15.247 (d); RSS-Gen [8.9]

Worst Case Mode: Bluetooth
 Worst Case Data Rate: 1 Mbps
 Measurement Distance: 3 Meters
 Operating Frequency: 2480MHz
 Channel: 78

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	-	-	-81.13	9.87	35.85	53.98	-18.13
4960.00	Peak	H	-	-	-69.88	9.87	46.74	73.98	-27.24
7440.00	Avg	H	-	-	-82.73	16.09	40.23	53.98	-13.75
7440.00	Peak	H	-	-	-71.59	16.09	51.67	73.98	-22.31
12400.00	Avg	H	-	-	-84.21	23.86	46.59	53.98	-7.39
12400.00	Peak	H	-	-	-73.19	23.86	57.75	73.98	-16.23

Table 7-20. Radiated Measurements – ANT1, ePA, CLOSED

FCC ID: A3LSMF711U1		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
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Radiated Spurious Emission Measurements
§15.205 §15.209 §15.247 (d); RSS-Gen [8.9]

Worst Case Mode: Bluetooth
 Worst Case Data Rate: 1 Mbps
 Measurement Distance: 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	-	-	-78.89	9.56	37.67	53.98	-16.31
4804.00	Peak	H	-	-	-67.05	9.56	49.51	73.98	-24.47
12010.00	Avg	H	-	-	-82.00	24.11	49.11	53.98	-4.87
12010.00	Peak	H	-	-	-69.98	24.11	61.13	73.98	-12.85

Table 7-21. Radiated Measurements – ANT1, iPA, CLOSED

FCC ID: A3LSMF711U1		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
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Radiated Spurious Emission Measurements

§15.205 §15.209 §15.247 (d); RSS-Gen [8.9]

Worst Case Mode: Bluetooth
 Worst Case Data Rate: 1 Mbps
 Measurement Distance: 3 Meters
 Operating Frequency: 2441MHz
 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]
4882.00	Avg	H	-	-	-78.89	9.47	37.58	53.98	-16.40
4882.00	Peak	H	-	-	-67.75	9.47	48.72	73.98	-25.26
7323.00	Avg	H	-	-	-80.24	15.67	42.43	53.98	-11.55
7323.00	Peak	H	-	-	-69.22	15.67	53.45	73.98	-20.53
12205.00	Avg	H	-	-	-81.62	23.55	48.93	53.98	-5.05
12205.00	Peak	H	-	-	-70.29	23.55	60.26	73.98	-13.72

Table 7-22. Radiated Measurements – ANT1, iPA, CLOSED

FCC ID: A3LSMF711U1		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
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Radiated Spurious Emission Measurements
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Worst Case Mode: Bluetooth
 Worst Case Data Rate: 1 Mbps
 Measurement Distance: 3 Meters
 Operating Frequency: 2480MHz
 Channel: 78

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	-	-	-79.11	9.87	37.76	53.98	-16.22
4960.00	Peak	H	-	-	-67.49	9.87	49.38	73.98	-24.60
7440.00	Avg	H	-	-	-80.36	16.09	42.73	53.98	-11.25
7440.00	Peak	H	-	-	-69.23	16.09	53.86	73.98	-20.12
12400.00	Avg	H	-	-	-81.87	23.86	48.99	53.98	-4.99
12400.00	Peak	H	-	-	-70.48	23.86	60.38	73.98	-13.60

Table 7-23. Radiated Measurements – ANT1, iPA, CLOSED

FCC ID: A3LSMF711U1		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
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7.10 Radiated Restricted Band Edge Measurements

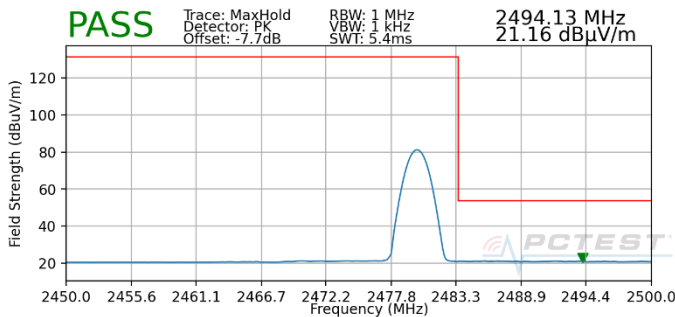
§15.205 §15.209 §15.247 (d); RSS-Gen [8.9]

The radiated restricted band edge measurements are measured with an EMI test receiver connected to the receive antenna while the EUT is transmitting. Two different amplitude offsets were used depending on whether peak or average measurements were measured. The average measurements use a duty cycle correction factor (DCCF).

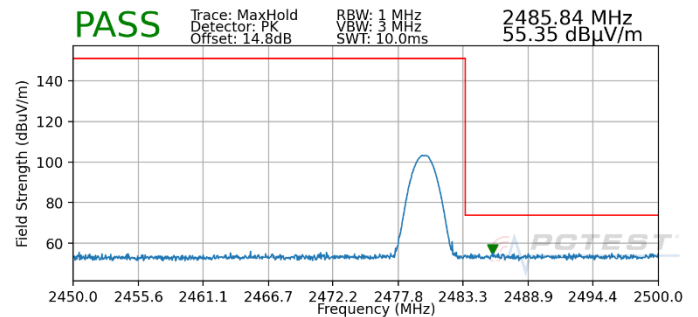
The amplitude offset shown in the following plots for average measurements was calculated using the formula:

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

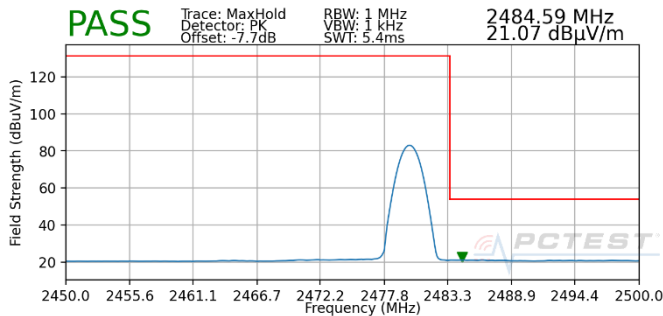
Worst Case Mode:	Bluetooth
Worst Case Data Rate:	1 Mbps
Measurement Distance:	3 Meters
Operating Frequency:	2480MHz
Channel:	78



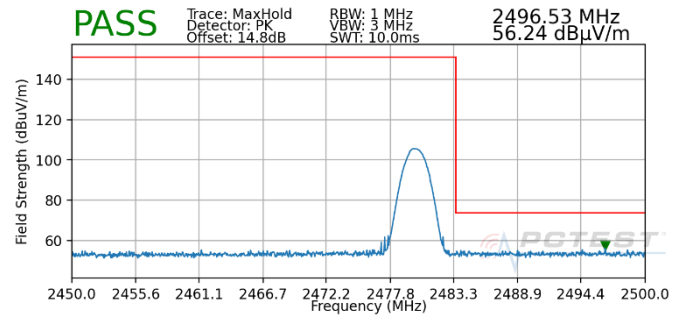
Plot 7-173. Radiated Restricted Upper Band Edge Measurement (Average) – ANT0



Plot 7-175. Radiated Restricted Upper Band Edge Measurement (Peak) – ANT0

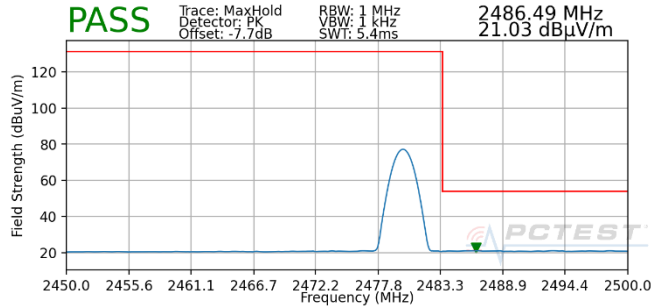


Plot 7-174. Radiated Restricted Upper Band Edge Measurement (Average) – ANT1

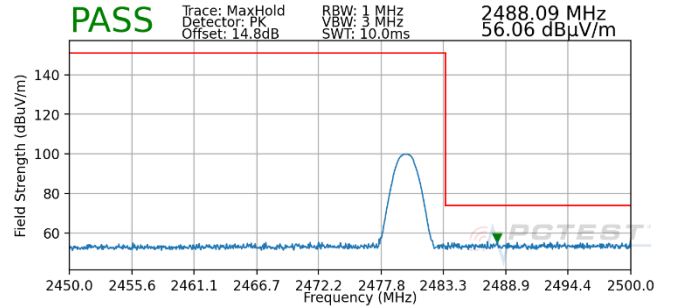


Plot 7-176. Radiated Restricted Upper Band Edge Measurement (Peak) – ANT1

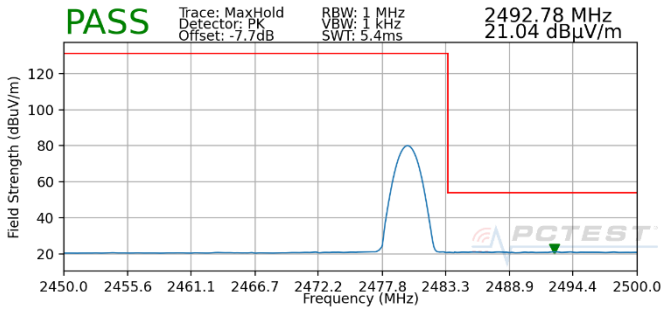
FCC ID: A3LSMF711U1		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
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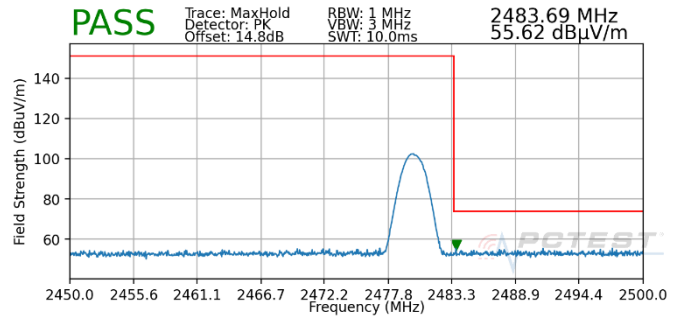
Plot 7-177. Radiated Restricted Upper Band Edge Measurement with WCP (Average) – ANT0



Plot 7-179. Radiated Restricted Upper Band Edge Measurement with WCP (Peak) – ANT0



Plot 7-178. Radiated Restricted Upper Band Edge Measurement with WCP (Average) – ANT1



Plot 7-180. Radiated Restricted Upper Band Edge Measurement with WCP (Peak) – ANT1

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7.11 Radiated Spurious Emissions Measurements – Below 1GHz

§15.209; 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 its maximum duty cycle, at maximum power, and at the appropriate frequencies. All data rates and modes were investigated for radiated spurious emissions. 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 7-40 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 7-24. Radiated Limits

Test Procedures Used

ANSI C63.10-2013

Test Settings

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

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Test Setup

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

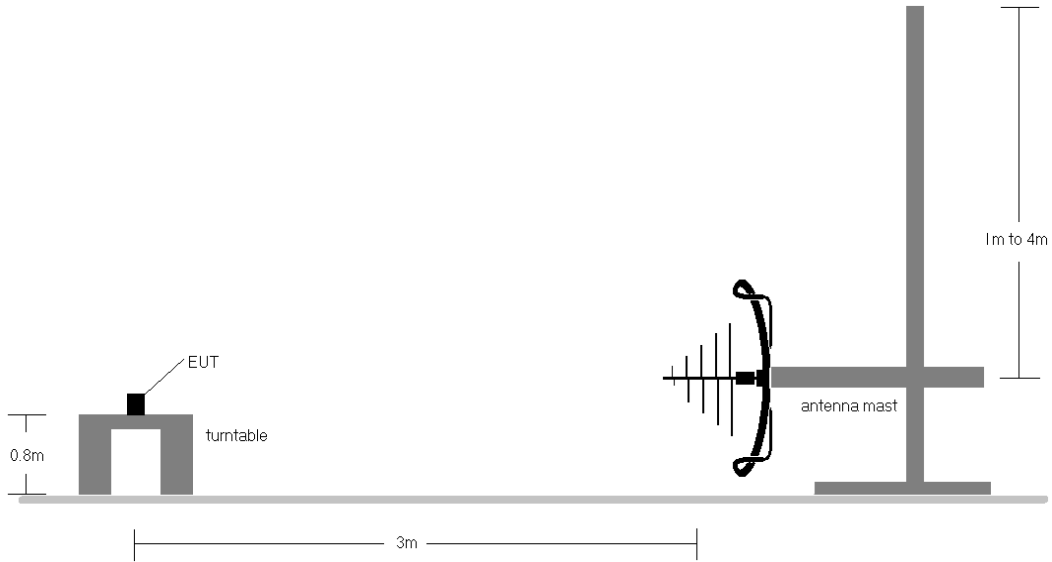


Figure 7-9. Radiated Test Setup < 1GHz

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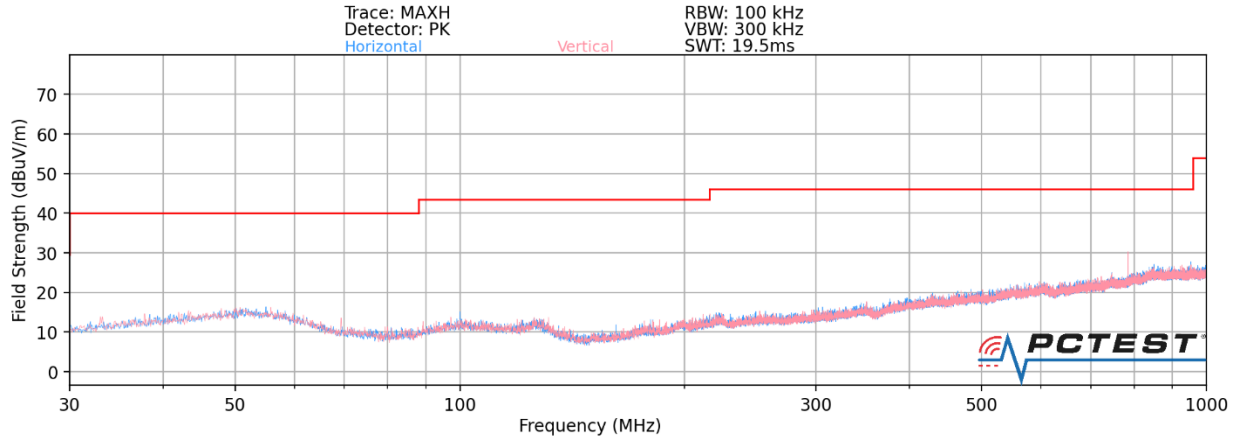
Test Notes

1. All emissions lying in restricted bands specified in §15.205 and RSS-Gen (8.10) are below the limit shown in Table 7-40.
2. The broadband receive antenna is manipulated through vertical and horizontal polarizations during the tests. The EUT is manipulated through three orthogonal planes.
3. This unit was tested with its standard battery.
4. The spectrum is investigated using a peak detector and final measurements are recorded using CISPR quasi peak detector. The worst-case emissions are reported however emissions whose levels were not within 20dB of the respective limits were not reported.
5. Emissions were measured at a 3 meter test distance.
6. Emissions are investigated while operating on the center channel of the mode, band, and modulation that produced the worst case results during the transmitter spurious emissions testing.
7. No spurious emissions were detected within 20dB of the limit below 30MHz.
8. The results recorded using the broadband antenna is 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.
9. The wide spectrum spurious emissions plots shown on the following pages are used only for the purpose of emission identification. There were no emissions detected in the 30MHz – 1GHz frequency range, as shown in the subsequent plots.

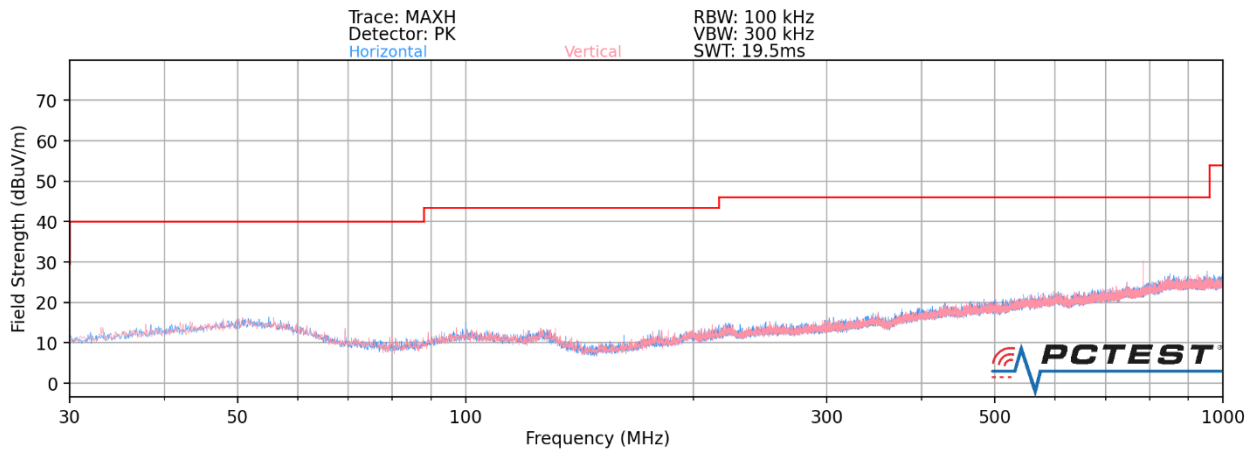
FCC ID: A3LSMF711U1		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
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Radiated Spurious Emissions Measurements (Below 1GHz)

§15.209; RSS-Gen [8.9]



Plot 7-181. Radiated Spurious Plot below 1GHz – OPEN



Plot 7-182. Radiated Spurious Plot below 1GHz – CLOSED

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]
52.00	Quasi-Peak	V	-	-	-82.41	-13.61	10.98	40.00	-29.02
101.00	Quasi-Peak	V	-	-	-83.41	-16.10	7.49	43.52	-36.03
134.00	Quasi-Peak	V	-	-	-81.38	-19.32	6.30	43.52	-37.22
217.00	Quasi-Peak	V	-	-	-81.21	-15.85	9.94	46.02	-36.08
608.00	Quasi-Peak	V	-	-	-82.11	-6.92	17.97	46.02	-28.05
789.00	Quasi-Peak	V	-	-	-82.03	-16.84	8.13	46.02	-37.90

Table 7-25. Radiated Spurious Emissions Below 1GHz

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7.12 Line Conducted Measurement 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 (dB μ V)	
	Quasi-peak	Average
0.15 – 0.5	66 to 56*	56 to 46*
0.5 – 5	56	46
5 – 30	60	50

Table 7-26. 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.

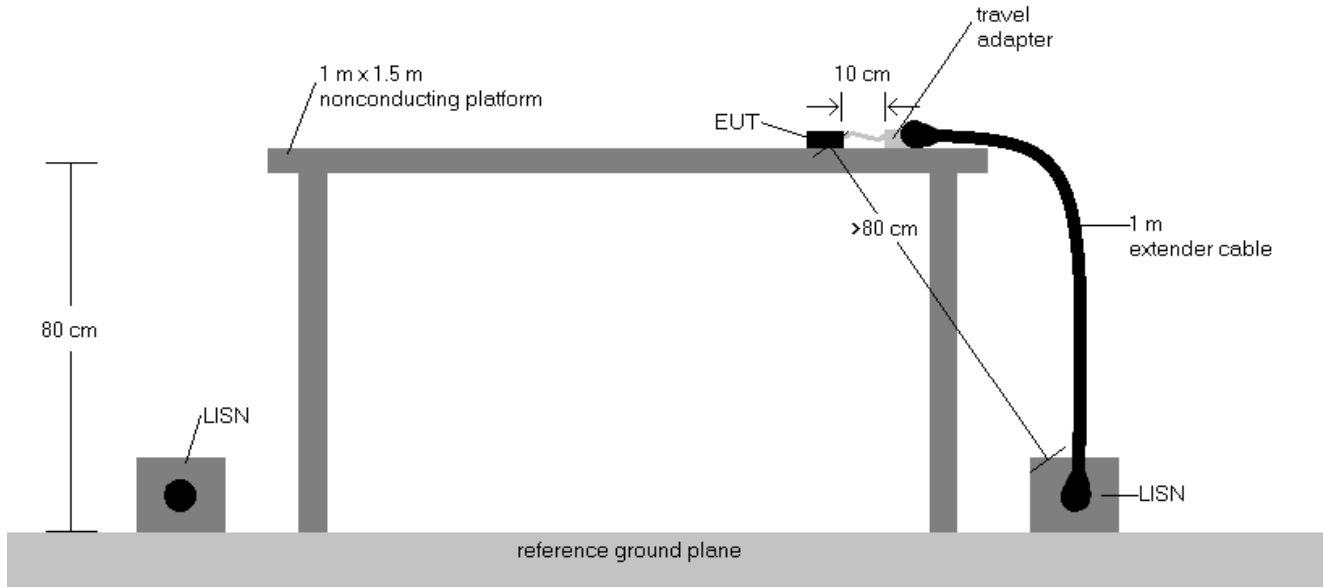
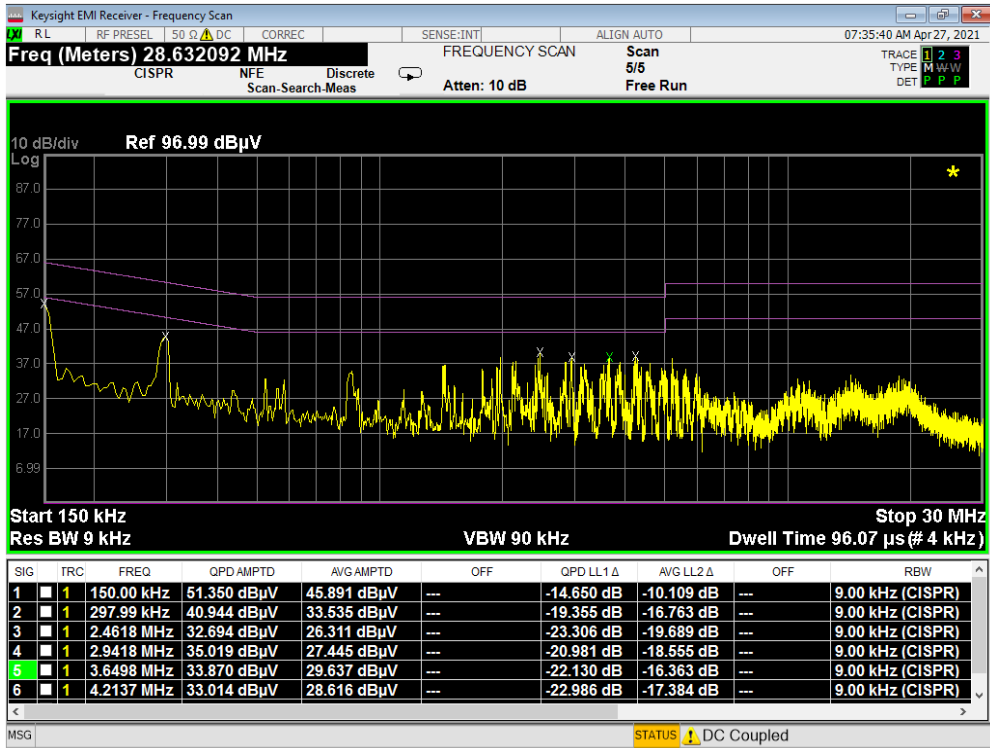


Figure 7-10. Test Instrument & Measurement Setup

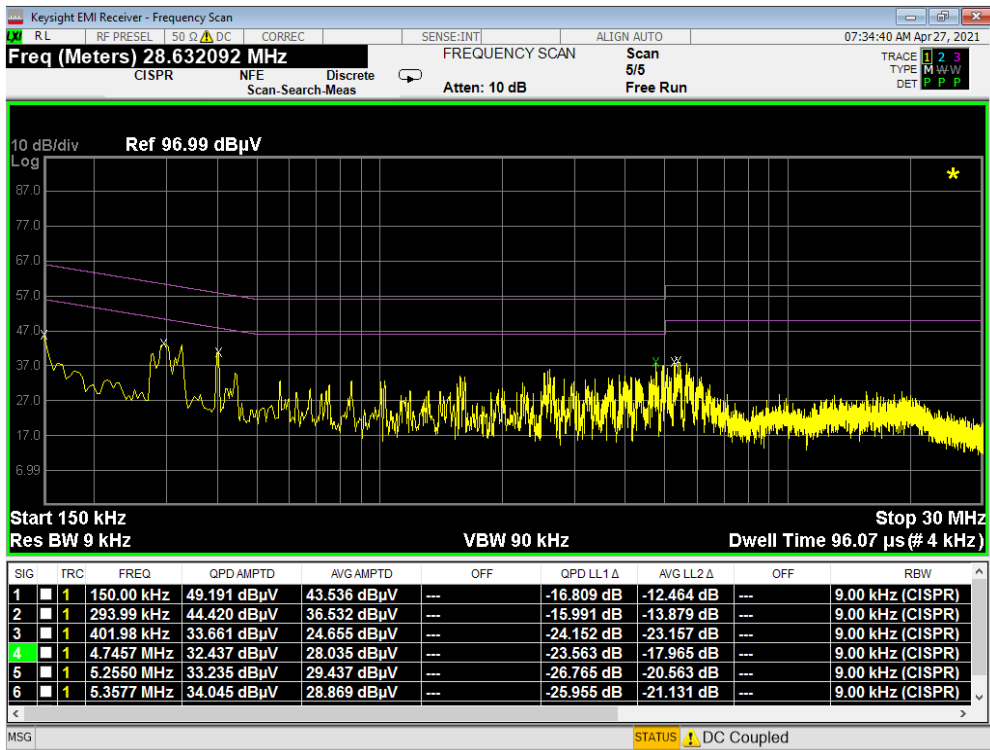
Test Notes

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 15.207 and RSS-Gen (8.8).
3. $Corr. (dB) = Cable\ loss (dB) + LISN\ insertion\ factor (dB)$
4. $QP/AV\ Level (dB\mu V) = QP/AV\ Analyzer/Receiver\ Level (dB\mu V) + Corr. (dB)$
5. $Margin (dB) = QP/AV\ Limit (dB\mu V) - QP/AV\ Level (dB\mu V)$
6. Traces shown in plot are made using a peak detector.
7. Deviations to the Specifications: None.

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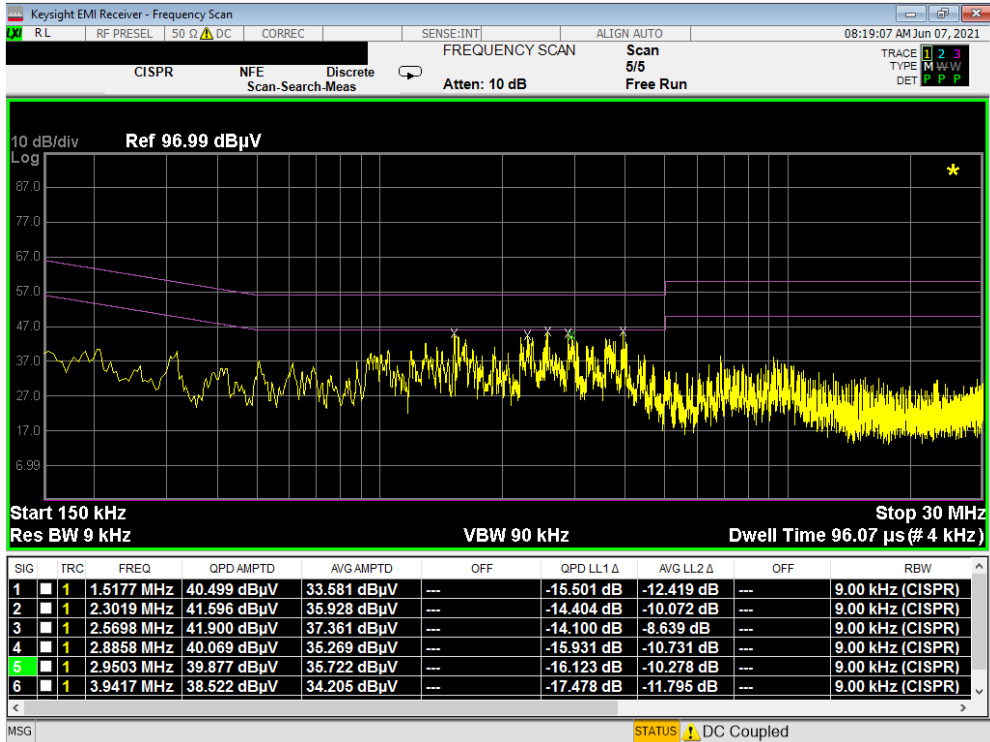


Plot 7-183. Line-Conducted Test Plot (L1)

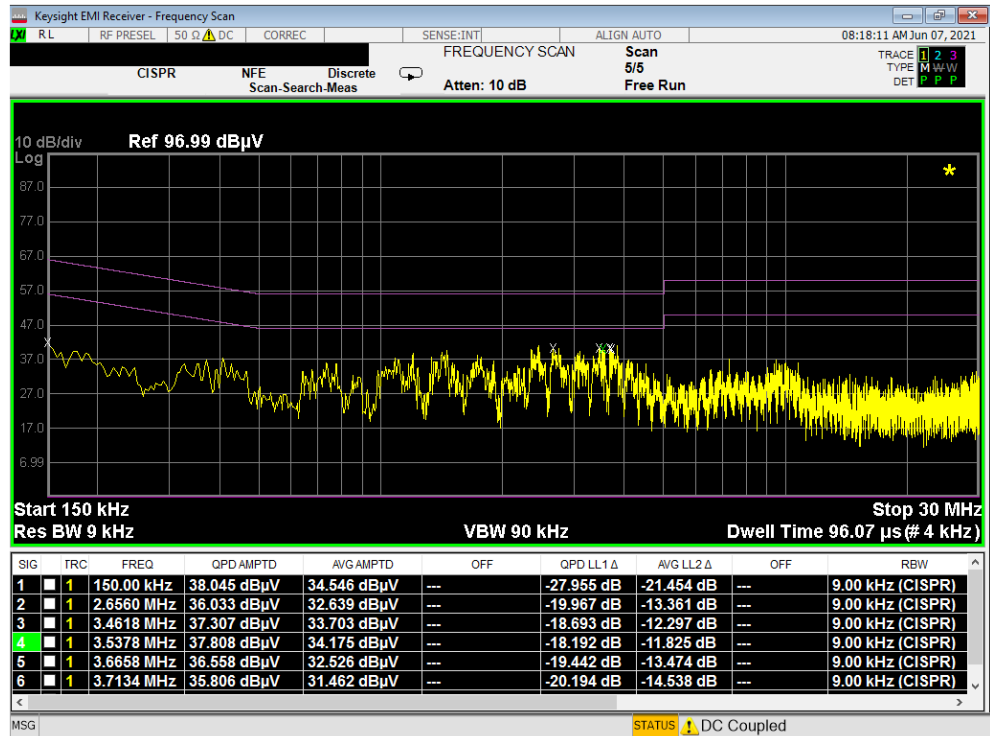


Plot 7-184. Line-Conducted Test Plot (N)

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Plot 7-185. Line-Conducted Test Plot with WCP (L1)



Plot 7-186. Line-Conducted Test Plot with WCP (N)

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CONCLUSION

The data collected relate only to the item(s) tested and show that the **Samsung Portable Handset FCC ID: A3LSMF711U1** is in compliance with Part 15 Subpart C (15.247) of the FCC Rules.

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