

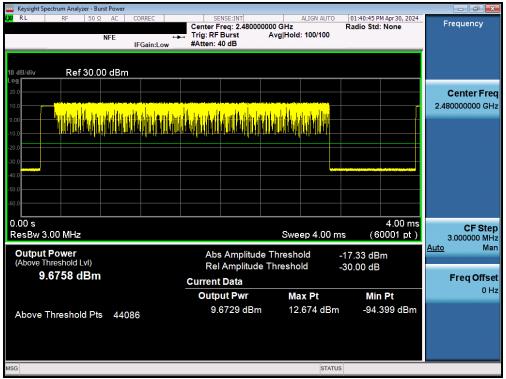
Plot 7-106. Average Conducted Power (3Mbps - Ch. 0) - Dual Ant 2



Plot 7-107. Average Conducted Power (3Mbps – Ch. 39) – Dual Ant 2

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Plot 7-108. Average Conducted Power (3Mbps - Ch. 78) - Dual Ant 2

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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.



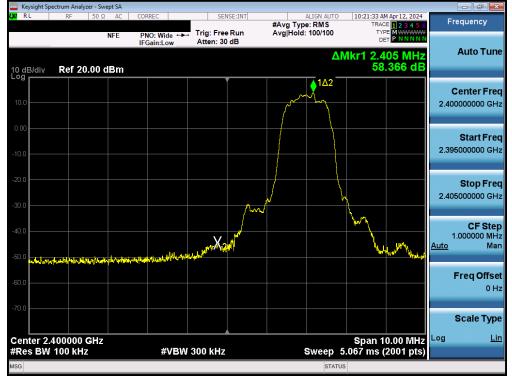
Figure 7-3. Test Instrument & Measurement Setup

Test Notes

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.

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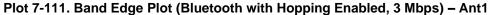


Plot 7-110. Band Edge Plot (Bluetooth with Hopping Disabled, 3 Mbps - Ch. 78) - Ant1

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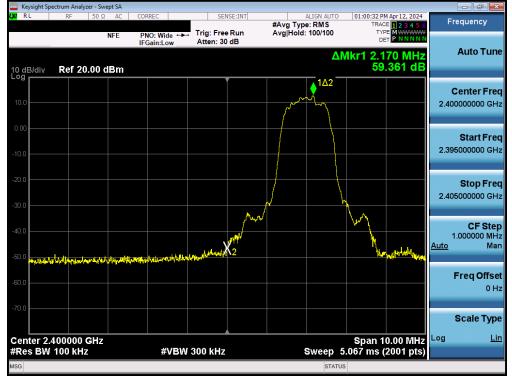




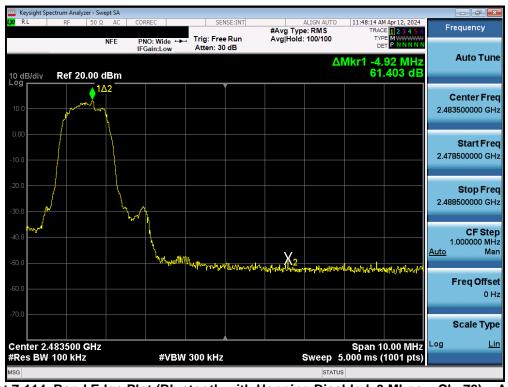
Plot 7-112. Band Edge Plot (Bluetooth with Hopping Enabled, 3 Mbps) – Ant1

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Plot 7-113. Band Edge Plot (Bluetooth with Hopping Disabled, 3 Mbps - Ch. 0) - Ant2

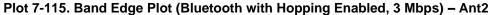


Plot 7-114. Band Edge Plot (Bluetooth with Hopping Disabled, 3 Mbps - Ch. 78) - Ant2

FCC ID: A3LNP940XMA	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
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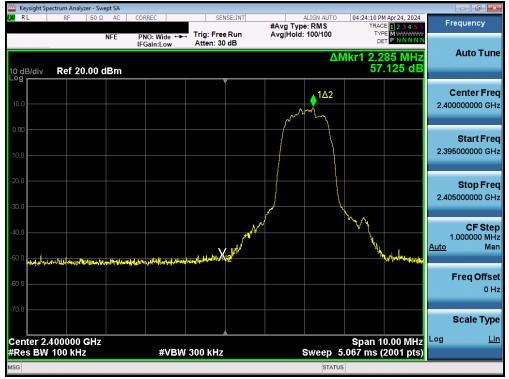




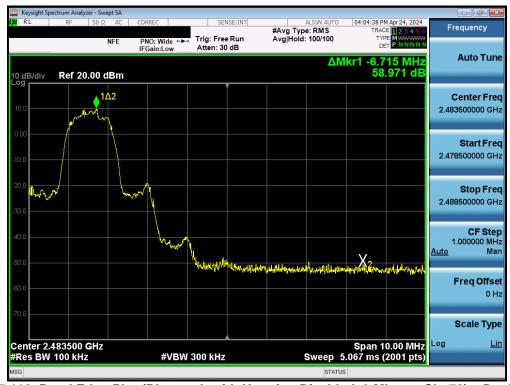
Plot 7-116. Band Edge Plot (Bluetooth with Hopping Enabled, 3 Mbps) – Ant2

FCC ID: A3LNP940XMA	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
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Plot 7-117. Band Edge Plot (Bluetooth with Hopping Disabled, 3 Mbps - Ch. 0) - Dual Ant1



Plot 7-118. Band Edge Plot (Bluetooth with Hopping Disabled, 3 Mbps – Ch. 78) – Dual Ant1

FCC ID: A3LNP940XMA	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
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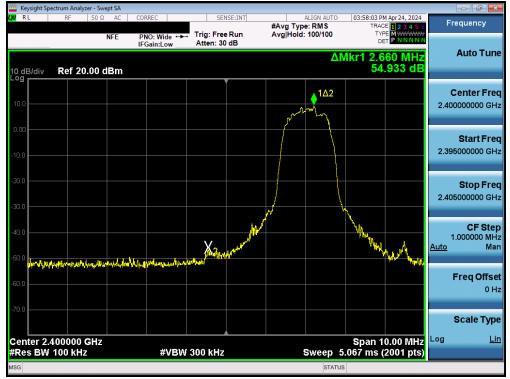




Plot 7-120. Band Edge Plot (Bluetooth with Hopping Enabled, 3 Mbps) – Dual Ant1

FCC ID: A3LNP940XMA	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
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Plot 7-121. Band Edge Plot (Bluetooth with Hopping Disabled, 3 Mbps - Ch. 0) - Dual Ant2



Plot 7-122. Band Edge Plot (Bluetooth with Hopping Disabled, 3 Mbps – Ch. 78) – Dual Ant2

FCC ID: A3LNP940XMA	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
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Plot 7-124. Band Edge Plot (Bluetooth with Hopping Enabled, 3 Mbps) – Dual Ant2

FCC ID: A3LNP940XMA	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
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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 ≥ 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

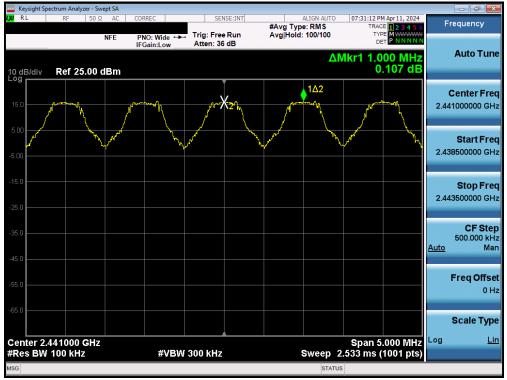
The EUT complies with the minimum channel separation requirement when it is operating in 1x/EDR mode using 79 channels and when operating in AFH mode using 20 channels.

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Frequency [MHz]	Data Rate [Mbps]	Mod.	Channel No.	Min. Channel Separation [MHz]
2402	1.0	GFSK	0	0.629
2441	1.0	GFSK	39	0.630
2480	1.0	GFSK	78	0.631
2402	2.0	π/4-DQPSK	0	0.891
2441	2.0	π/4-DQPSK	39	0.892
2480	2.0	π/4-DQPSK	78	0.892
2402	3.0	8DPSK	0	0.871
2441	3.0	8DPSK	39	0.870
2480	3.0	8DPSK	78	0.869

 Table 7-9. Minimum Channel Separation – Ant1



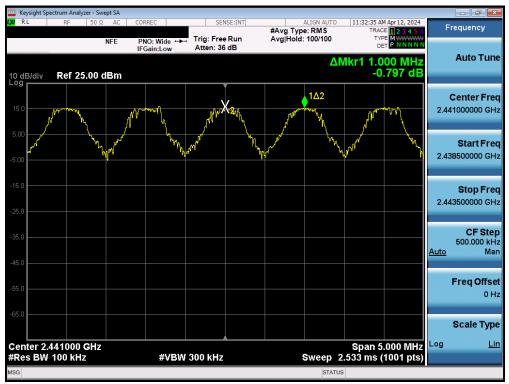
Plot 7-125. Channel Spacing Plot (Bluetooth) – Ant1

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Frequency [MHz]	Data Rate [Mbps]	Mod.	Channel No.	Min. Channel Separation [MHz]
2402	1.0	GFSK	0	0.630
2441	1.0	GFSK	39	0.630
2480	1.0	GFSK	78	0.630
2402	2.0	π/4-DQPSK	0	0.892
2441	2.0	π/4-DQPSK	39	0.891
2480	2.0	π/4-DQPSK	78	0.890
2402	3.0	8DPSK	0	0.871
2441	3.0	8DPSK	39	0.872
2480	3.0	8DPSK	78	0.869

 Table 7-10. Minimum Channel Separation – Ant2



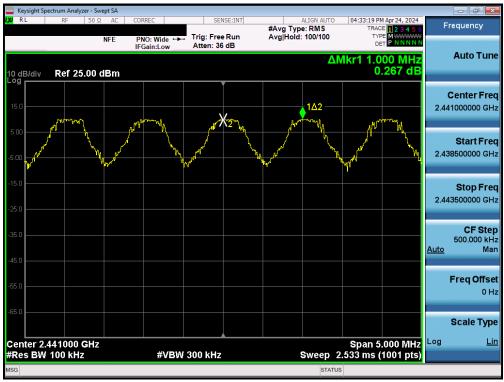
Plot 7-126. Channel Spacing Plot (Bluetooth) – Ant2

FCC ID: A3LNP940XMA	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
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Frequency [MHz]	Data Rate [Mbps]	Mod.	Channel No.	Min. Channel Separation [MHz]
2402	1.0	GFSK	0	0.630
2441	1.0	GFSK	39	0.630
2480	1.0	GFSK	78	0.630
2402	2.0	π/4-DQPSK	0	0.881
2441	2.0	π/4-DQPSK	39	0.881
2480	2.0	π/4-DQPSK	78	0.881
2402	3.0	8DPSK	0	0.868
2441	3.0	8DPSK	39	0.867
2480	3.0	8DPSK	78	0.868

 Table 7-11. Minimum Channel Separation – Dual Ant1



Plot 7-127. Channel Spacing Plot (Bluetooth) – Dual Ant1

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Frequency [MHz]	Data Rate [Mbps]	Mod.	Channel No.	Min. Channel Separation [MHz]
2402	1.0	GFSK	0	0.631
2441	1.0	GFSK	39	0.630
2480	1.0	GFSK	78	0.630
2402	2.0	π/4-DQPSK	0	0.882
2441	2.0	π/4-DQPSK	39	0.881
2480	2.0	π/4-DQPSK	78	0.881
2402	3.0	8DPSK	0	0.869
2441	3.0	8DPSK	39	0.869
2480	3.0	8DPSK	78	0.882

 Table 7-12. Minimum Channel Separation – Dual Ant2



Plot 7-128. Channel Spacing Plot (Bluetooth) – Dual Ant2

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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 >> 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.



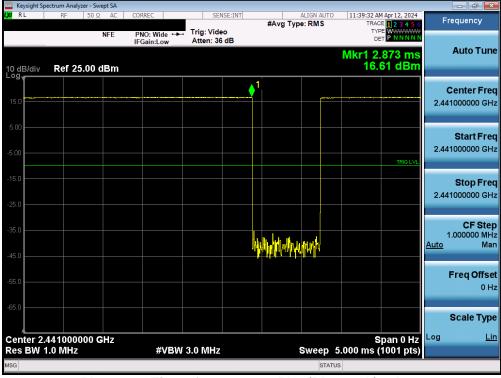
Figure 7-5. Test Instrument & Measurement Setup

Test Notes

None

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Plot 7-129. Time of Occupancy Plot (Bluetooth) – Ant1

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

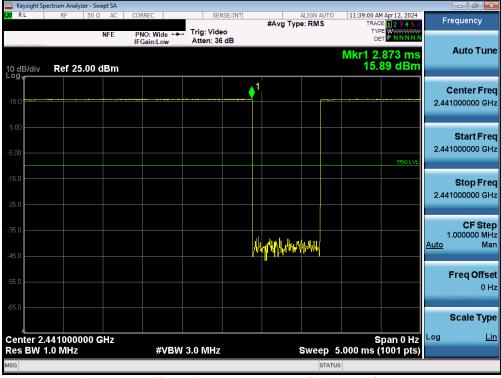
- 400ms x 79 hopping channels = 31.6 sec (Time of Occupancy Limit)
- Worst case BT has 266.67 hops/second (for 1x/EDR modes with DH5 operation)
- 266.67 hops/second / 79 channels = 3.38 hops/second (# of hops/second on one channel)
- 3.38 hops/second/channel x 31.6 seconds = 106.67 hops (# hops over a 31.6 second period)
- 106.67 hops x 2.873 ms/channel = 306.46 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 hops/s / 20 channels = 6.67 hops/second (# of hops/second on one channel)
- o 6.67 hops/s / channel x 8 seconds = 53.34 hops (# hops over a 8 second period)
- o 53.34 hops x 2.873 ms/channel = 153.25 ms (worst case dwell time for one channel in AFH mode)

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Plot 7-130. Time of Occupancy Plot (Bluetooth) – Ant2

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

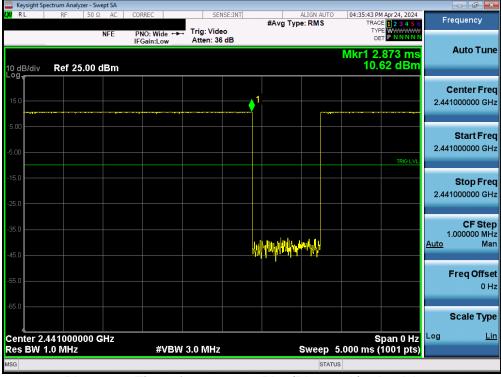
- 400ms x 79 hopping channels = 31.6 sec (Time of Occupancy Limit)
- Worst case BT has 266.67 hops/second (for 1x/EDR modes with DH5 operation)
- 266.67 hops/second / 79 channels = 3.38 hops/second (# of hops/second on one channel)
- 3.38 hops/second/channel x 31.6 seconds = 106.67 hops (# hops over a 31.6 second period)
- 106.67 hops x 2.873 ms/channel = 306.46 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)
- o Worst case BT has 133.3 hops/second/slot (for AFH mode with DH5 operation)
- 133.3 hops/s / 20 channels = 6.67 hops/second (# of hops/second on one channel)
- o 6.67 hops/s / channel x 8 seconds = 53.34 hops (# hops over a 8 second period)
- o 53.34 hops x 2.873 ms/channel = 153.25 ms (worst case dwell time for one channel in AFH mode)

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Plot 7-131. Time of Occupancy Plot (Bluetooth) – Dual Ant1

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

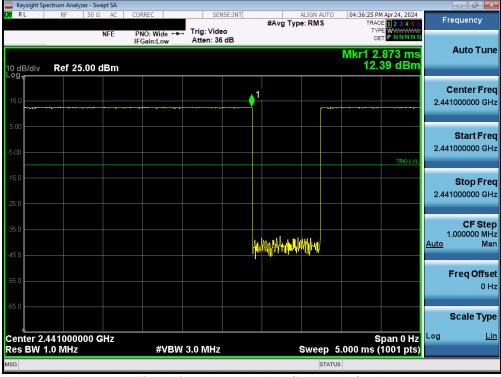
- 400ms x 79 hopping channels = 31.6 sec (Time of Occupancy Limit)
- Worst case BT has 266.67 hops/second (for 1x/EDR modes with DH5 operation)
- 266.67 hops/second / 79 channels = 3.38 hops/second (# of hops/second on one channel)
- 3.38 hops/second/channel x 31.6 seconds = 106.67 hops (# hops over a 31.6 second period)
- 106.67 hops x 2.873 ms/channel = 306.46 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 hops/s / 20 channels = 6.67 hops/second (# of hops/second on one channel)
- o 6.67 hops/s / channel x 8 seconds = 53.34 hops (# hops over a 8 second period)
- 53.34 hops x 2.873 ms/channel = 153.25 ms (worst case dwell time for one channel in AFH mode)

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Plot 7-132. Time of Occupancy Plot (Bluetooth) – Dual Ant2

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 hops/second / 79 channels = 3.38 hops/second (# of hops/second on one channel)
- 3.38 hops/second/channel x 31.6 seconds = 106.67 hops (# hops over a 31.6 second period)
- 106.67 hops x 2.873 ms/channel = 306.46 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 hops/s / 20 channels = 6.67 hops/second (# of hops/second on one channel)
- o 6.67 hops/s / channel x 8 seconds = 53.34 hops (# hops over a 8 second period)
- 53.34 hops x 2.873 ms/channel = 153.25 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.



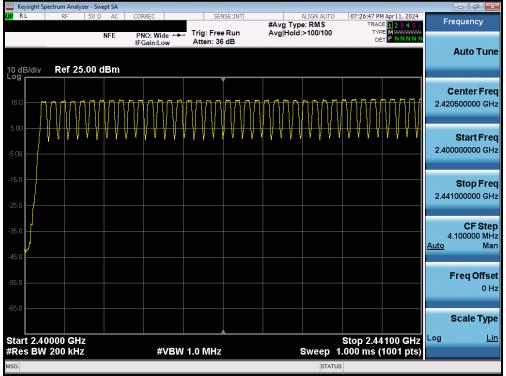
Figure 7-6. Test Instrument & Measurement Setup

Test Notes

The frequency spectrum was broken up into two sub-ranges to clearly show all 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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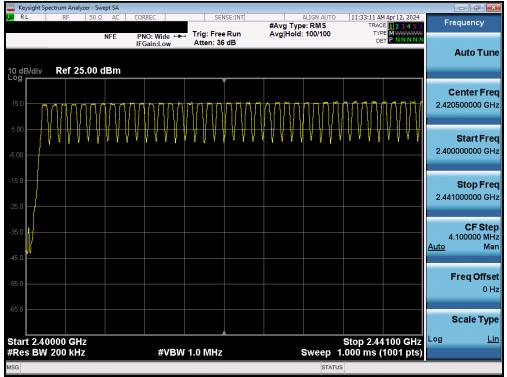
Plot 7-133. Low End Spectrum Channel Hopping Plot (Bluetooth) - Ant1



Plot 7-134. High End Spectrum Channel Hopping Plot (Bluetooth) – Ant1

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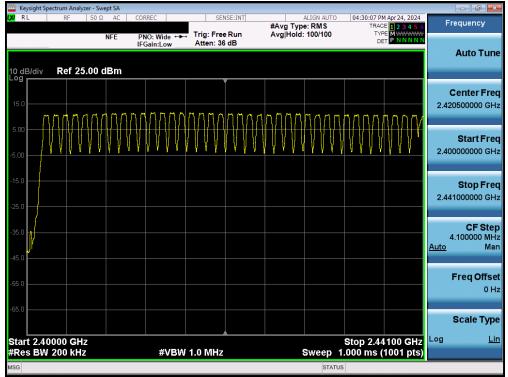
Plot 7-135. Low End Spectrum Channel Hopping Plot (Bluetooth) – Ant2



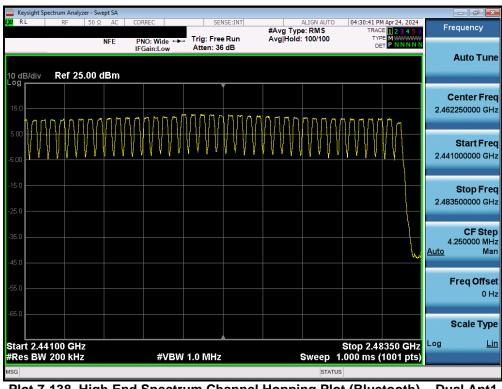
Plot 7-136. High End Spectrum Channel Hopping Plot (Bluetooth) – Ant2

FCC ID: A3LNP940XMA		MEASUREMENT REPORT (CERTIFICATION)			
Test Report S/N:	Test Dates:	EUT Type:	Dage 04 of 129		
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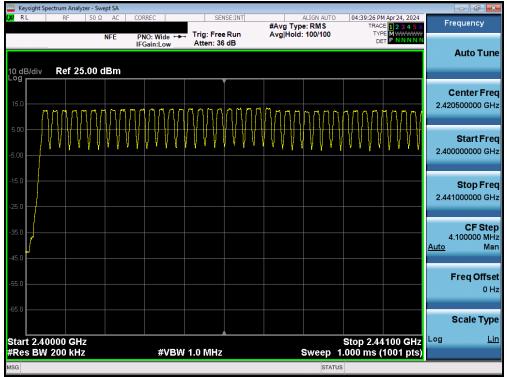
Plot 7-137. Low End Spectrum Channel Hopping Plot (Bluetooth) – Dual Ant1



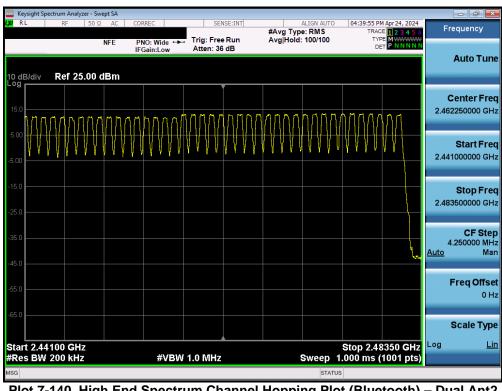
Plot 7-138. High End Spectrum Channel Hopping Plot (Bluetooth) – Dual Ant1

FCC ID: A3LNP940XMA		MEASUREMENT REPORT (CERTIFICATION)			
Test Report S/N:	Test Dates:	EUT Type:	Dage OF of 129		
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Plot 7-139. Low End Spectrum Channel Hopping Plot (Bluetooth) – Dual Ant2



Plot 7-140. High End Spectrum Channel Hopping Plot (Bluetooth) – Dual Ant2

FCC ID: A3LNP940XMA		MEASUREMENT REPORT (CERTIFICATION)			
Test Report S/N:	Test Dates:	EUT Type:	Dage 00 of 120		
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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

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: A3LNP940XMA		MEASUREMENT REPORT (CERTIFICATION)			
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	pectrum Analyzer - Swep										
L <mark>XI</mark> RL	RF 50 Ω	AC COI	RREC	SEN	ISE:INT	#Avg Typ	ALIGN AUTO		Apr 12, 2024	Frequ	Jency
	N		NO: Fast 🖵 Gain:Low	Trig: Free Atten: 30				TYF De		Aı	uto Tune
10 dB/div	Ref 20.00 di	3m						(r1 3.714 -33.	77 dBm		
10.0											n ter Freq 10000 GHz
-10.0									DL1 -3.46 dBm		tart Freq 0000 MHz
-20.0			1.								top Freq 0000 GHz
-40.0				النابية ا لي تأمينا				a <mark>definido e de la compositiva de la d</mark>	lingti Milli su partas		CF Step 0000 MHz Man
-60.0										Fre	e q Offset 0 Hz
-70.0											ale Type
	MHz / 1.0 MHz		#VBW	3.0 MHz		\$.00 ms (3	.000 GHz 0001 pts)	Log	Lin
MSG							STATUS	3			

Plot 7-141. Conducted Spurious Plot (Bluetooth, 1Mbps - Ch. 0) - Ant1



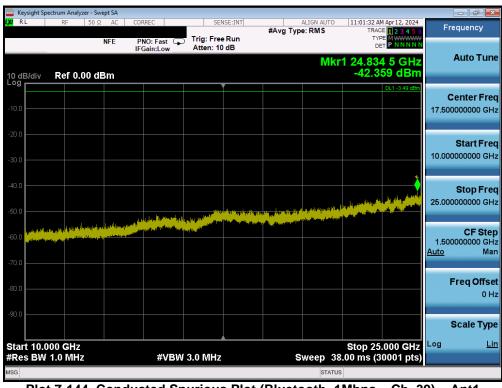
Plot 7-142. Conducted Spurious Plot (Bluetooth, 1Mbps - Ch. 0) - Ant1

FCC ID: A3LNP940XMA		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:	Page 98 of 138	
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	ectrum Analyzer - Swe									
X/RL	RF 50 Ω	AC (CORREC		ISE:INT	#Avg Typ	ALIGN AUTO e: RMS	TRAC	Apr 12, 2024	Frequency
10 dB/div	Ref 20.00 d		PNO: Fast 🕞	Trig: Free Atten: 30			Mk	DE	3 4 GHz 52 dBm	Auto Tune
10.0										Center Freq 5.015000000 GHz
-10.0									DL1 -3.49 dBm	Start Freq 30.000000 MHz
-20.0			1-							Stop Freq 10.000000000 GHz
-40.0	generation (a start (SSER)) prised, part	arpi (s. 164) 				e nya Aliga Lagramya e dal Gun Mata mangatana dal	a para da la parte da tenta Para da tenta	er Hernen auferna Aber er sterne sterne	engentrupender Handeleenenter	CF Step 997.000000 MH₂ <u>Auto</u> Man
-60.0										Freq Offset 0 Hz
-70.0										Scale Type
Start 30 N #Res BW			#VBW	3.0 MHz		s	weep 18	Stop 10 .00 ms (3	.000 GHz 0001 pts)	Log <u>Lin</u>
MSG							STATUS			

Plot 7-143. Conducted Spurious Plot (Bluetooth, 1Mbps - Ch. 39) - Ant1



Plot 7-144. Conducted Spurious Plot (Bluetooth, 1Mbps - Ch. 39) - Ant1

FCC ID: A3LNP940XMA		MEASUREMENT REPORT (CERTIFICATION)			
Test Report S/N:	Test Dates:	EUT Type:	Dawa 00 af 400		
1M2403190019-03.A3L	3/26/2024 - 04/30/2024	Portable Computing Device	Page 99 of 138		
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	ectrum Analyzer - Swe	pt SA									×
XV RL	RF 50 Ω	AC O	ORREC	SEN	ISE:INT	#Avg Typ	ALIGN AUTO		M Apr 12, 2024	Frequency	
	I	NFE I	PNO: Fast 🕞 FGain:Low	Trig: Free Atten: 30				TYF De	0 5 GHz 63 dBm	Auto Tu	ne
10 dB/div Log	Ref 20.00 d	Bm		,				-34.	63 dBm		
10.0										Center Fr 5.015000000 G	
-10.0									DL1 -1.94 dBm	Start Fr 30.000000 M	
-20.0			1 -							Stop Fr 10.000000000 G	
	personal personal discontraction	Uprakata an Andreas Alan an Andreas			den a a a a a a a a a a a a a a a a a a a	kan kapan kapan kabu Derim kan kabu kabu an k	(Newslop & Cyrintyng) Second Million (Media)	a d ^{hal} ang	n selfen gen steren steren Steren steren	CF Sto 997.000000 M <u>Auto</u> M	
-50.0										Freq Offs 0	sel Hz
-70.0										Scale Ty	ре
Start 30 N #Res BW			#VBW	3.0 MHz		s	weep <u>18</u>	Stop 10 .00 ms <u>(</u> 3	.000 GHz 0001 pts)	Log <u>l</u>	Lir
MSG							STATUS				

Plot 7-145. Conducted Spurious Plot (Bluetooth, 1Mbps - Ch. 78) - Ant1



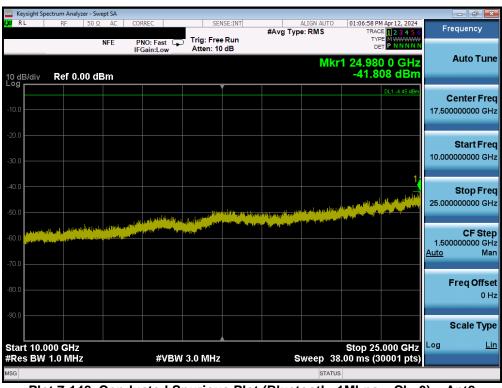
Plot 7-146. Conducted Spurious Plot (Bluetooth, 1Mbps - Ch. 78) - Ant1

FCC ID: A3LNP940XMA		MEASUREMENT REPORT (CERTIFICATION)					
Test Report S/N:	Test Dates:	EUT Type:	Dage 100 of 120				
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	ectrum Analyzer - Sw										
LXI RL	RF 50 Ω	2 AC	CORREC	SEI	SE:INT	#Avg Typ	ALIGN AUTO		M Apr 12, 2024	Free	quency
		NFE	PNO: Fast ++ IFGain:Low	Trig: Free Atten: 30				TYF De			uto Tune
10 dB/div Log	Ref 20.00	dBm				1		-34.	4 6 GHz 02 dBm		
10.0											e nter Freq 000000 GHz
-10.0									DL1 -4.45 dBm		Start Freq 00000 MHz
-20.0			1								Stop Freq 000000 GHz
-40.0	alaran da III da aran da Arab								tergy President Const Constant Constant	997.0 <u>Auto</u>	CF Step 00000 MHz Man
-60.0										Fi	r eq Offset 0 Hz
-70.0										S	cale Type
Start 30 N #Res BW			#VBW	3.0 MHz		s	weep 18	Stop 10 .00 ms (3	.000 GHz 0001 pts)	Log	<u>Lin</u>
MSG							STATUS	5			

Plot 7-147. Conducted Spurious Plot (Bluetooth, 1Mbps - Ch. 0) - Ant2



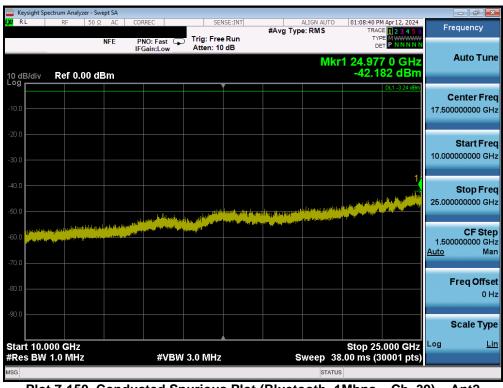
Plot 7-148. Conducted Spurious Plot (Bluetooth, 1Mbps – Ch. 0) – Ant2

FCC ID: A3LNP940XMA		MEASUREMENT REPORT (CERTIFICATION)					
Test Report S/N:	Test Dates:	EUT Type:	Dogo 101 of 129				
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	ectrum Analyzer - Sv									- F -
L <mark>XI</mark> RL	RF 50 Ω	2 AC	CORREC	SEN	ISE:INT	#Avg Typ	ALIGN AUTO e: RMS		Apr 12, 2024	Frequency
10 dB/div	Ref 20.00	NFE dBm	PNO: Fast IFGain:Low	Trig: Free Atten: 30			M	□E r1 3.67 0	6 0 GHz 7 dBm	Auto Tun
10.0										Center Free 5.015000000 GH
-10.0									DL1 -3.24 dBm	Start Free 30.000000 MH
-20.0			1							Stop Free 10.000000000 GH
-40.0					ten konstandar Marina atarika	nya din Lynka yn de Brand I. Y na din hegen da ac de Brand h	a a da ferrer di la parte de la casa ny seconda da di la casa	an ^{fal} a da far far far far far sen 1 ^{dill} era - Januar Andrea (da barret	ian ya Mali Karati Afrika Manazarta	CF Step 997.000000 MH <u>Auto</u> Mar
-60.0										Freq Offse 0 H
-70.0										Scale Type
Start 30 M #Res BW			#VBW	3.0 MHz		9	weep 18	Stop 10 .00 ms (3	.000 GHz 0001 pts)	Log <u>Li</u> i
MSG							STATUS			

Plot 7-149. Conducted Spurious Plot (Bluetooth, 1Mbps - Ch. 39) - Ant2



Plot 7-150. Conducted Spurious Plot (Bluetooth, 1Mbps - Ch. 39) - Ant2

FCC ID: A3LNP940XMA		MEASUREMENT REPORT (CERTIFICATION)					
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	trum Analyzer - Swept S									
LXI RL	RF 50 Ω /	AC COR	REC	SEN	ISE:INT	#Avg Typ	ALIGN AUTO		Apr 12, 2024	Frequency
	NF		IO: Fast 🖵 ain:Low	Trig: Free Atten: 30	Run dB			TYP DE		Auto Tui
10 dB/div Log	Ref 20.00 dB	m						-35.	1 1 GHz 53 dBm	
10.0										Center Fre 5.015000000 GI
-10.0									DL1 -3.99 dBm	Start Fro 30.000000 Mi
-20.0										Stop Fro 10.000000000 GI
-30.0							1 populpilustyj	ipiling states and the		CF Ste 997.000000 MI
-50.0 -50.0	ander, end Beenrichenberg (Auto Mi Freq Offs
-60.0										01
Start 30 M								Stop 10	000 9112	Scale Typ Log <u>L</u>
#Res BW 1	I.O MHŻ		#VBW	3.0 MHz		S	STATUS		0001 pts)	

Plot 7-151. Conducted Spurious Plot (Bluetooth, 1Mbps - Ch. 78) - Ant2



Plot 7-152. Conducted Spurious Plot (Bluetooth, 1Mbps - Ch. 78) - Ant2

FCC ID: A3LNP940XMA		MEASUREMENT REPORT (CERTIFICATION)					
Test Report S/N:	Test Dates:	EUT Type:	Dega 102 of 129				
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	ectrum Analyzer										
X/RL	RF 5	50Ω AC	CORREC	SEI	ISE:INT	#Avg Typ	ALIGN AUTO e: RMS		M Apr 24, 2024	Frequ	uency
		NFE	PNO: Fast ++ IFGain:Low	Trig: Free Atten: 30				TYF DE		0.	uto Tune
10 dB/div Log	Ref 20.0	0 dBm			_		Mk	(r1 3.66) -35.	2 4 GHz 43 dBm	A	ito i une
10.0											nter Freq
10.0										5.01500	0000 GHz
0.00											tart Freq
-10.0									DL1 -9.36 dBm	30.00	0000 MHz
-20.0											top Freq
-30.0			1-							10.00000	0000 GHz
-40.0			And a state of the	The state of the s	Wood Star	and the second second		L. Physical Spectrum	and the state of t		CF Step
-50.0	and the second secon		land the second from	Terroris and the second				and the birt is store to	a da na subición de la constante de la constant	Auto	Man
										Fre	eq Offset
-60.0											0 Hz
-70.0										Sc	ale Type
Start 30 M								Stop 10	.000 GHz	Log	Lin
#Res BW	1.0 MHz		#VBW	3.0 MHz		S			0001 pts)		
ISG							STATUS				

Plot 7-153. Conducted Spurious Plot (Bluetooth, 1Mbps - Ch. 0) - Dual Ant1



Plot 7-154. Conducted Spurious Plot (Bluetooth, 1Mbps - Ch. 0) - Dual Ant1

FCC ID: A3LNP940XMA		MEASUREMENT REPORT (CERTIFICATION)					
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	ectrum Analyzer											
LXI RL	RF 5	50Ω AC	COR	REC	SE	NSE:INT	#Avg Typ	ALIGN AUTO e: RMS		M Apr 24, 2024	Frequen	су
10 dB/div	Ref 20.0	NFE	PN IFG	lO: Fast G ain:Low	Trig: Fre Atten: 30				۲۲ ۱kr1 3.65		Auto	Tune
10.0											Cente 5.01500000	
-10.0										DL1 -8.11 dBm	Star 30.00000	t Freq 00 MHz
-20.0				1							Stop 10.00000000	o Freq 00 GHz
-40.0	nya mini aka sa ka s									n <mark>daga sekang panakanan sekanan sekan Sekanan sekanan sekanan</mark>	CF 997.00000 <u>Auto</u>	Step 00 MHz Man
-60.0											Freq	Offset 0 Hz
-70.0											Scale	e Type Lin
Start 30 N #Res BW				#VBV	/ 3.0 MHz		s	weep 1	Stop 10 18.00 ms (3	.000 GHz 00001 pts)	LUg	
MSG								STAT				



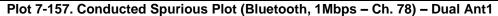


Plot 7-156. Conducted Spurious Plot (Bluetooth, 1Mbps - Ch. 39) - Dual Ant1

FCC ID: A3LNP940XMA		MEASUREMENT REPORT (CERTIFICATION)					
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	ctrum Analyzer - Swept SA							
LXU RL	RF 50 Ω AC	CORREC	SENSE:		ALIGN AUTO		Apr 24, 2024	Frequency
10 dB/div	NFE Ref 20.00 dBm	PNO: Fast 😱 IFGain:Low) Trig: Free Ru Atten: 30 dB	un 🗸		TYP DE		Auto Tune
10.0								Center Freq 5.015000000 GHz
-10.0							DL1 -8.46 dBm	Start Freq 30.000000 MHz
-20.0		1-						Stop Freq 10.000000000 GHz
-40.0				e kongere kritelikke Ålegerekte. Megerekende peskinketeret	linen in on the sould be		ng pantiling kan saya ang panting panganang	CF Step 997.000000 MHz <u>Auto</u> Man
-60.0								Freq Offset 0 Hz
-70.0								Scale Type
Start 30 M #Res BW		#VBW	3.0 MHz		Sweep 1	Stop 10. 3.00 ms (3	.000 GHz 0001 pts)	
MSG					STATU	_		





Plot 7-158. Conducted Spurious Plot (Bluetooth, 1Mbps - Ch. 78) - Dual Ant1

FCC ID: A3LNP940XMA	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
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	ectrum Analyzer -										- 6 -
LXI RL	RF 50	Ω AC	COR	REC		SENSE:INT	#Avg Ty	ALIGN AUTO		M Apr 24, 2024	Frequency
		NFE		łO:Fast ↔ Sain:Low		: Free Run en: 30 dB			TYI Di		Auto Tune
10 dB/div Log	Ref 20.00) dBm				•			-35.	35 dBm	
10.0											Center Freq 5.015000000 GHz
0.00											
										DL1 -8.53 dBm	Start Freq 30.000000 MHz
-10.0											
-20.0											Stop Freq 10.00000000 GHz
-30.0				•	1						10.00000000 GHz
-40.0	and provided in the state of th	MARK STRUCT	i di Mangarit		ardi ^a ngan sagi		ng and said and said Said and said		ad the discover		CF Step 997.000000 MHz
-50.0		and Constant	4 W T T T								<u>Auto</u> Man
-60.0											Freq Offset
											0 Hz
-70.0											Scale Type
Start 30 M #Res BW				#\/R	W 3.0 M			Sween 19	Stop 10	.000 GHz 0001 pts)	Log <u>Lin</u>
MSG	1.0 10112			#vD	W 3.0 P			sweep ra		ooon pisj	

Plot 7-159. Conducted Spurious Plot (Bluetooth, 1Mbps - Ch. 0) - Dual Ant2

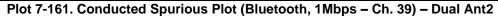


Plot 7-160. Conducted Spurious Plot (Bluetooth, 1Mbps – Ch. 0) – Dual Ant2

FCC ID: A3LNP940XMA		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
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	ectrum Analyzer - S										_	
LXI RL	RF 50	Ω AC	CORF	EC	SE	NSE:INT	#Avg Typ	ALIGN AUTO e: RMS		M Apr 24, 2024	Frequ	ency
		NFE		0:Fast ↔ ain:Low	Atten: 3				TY D		Au	to Tune
10 dB/div Log	Ref 20.00	dBm						W	lkr1 3.64 -35.	8 1 GHZ 48 dBm		
												ter Freq
10.0											5.015000	0000 GHz
0.00										DL1 -8.55 dBm		art Freq
-10.0											30.000	0000 MHz
-20.0												op Freq
-30.0				1-							10.00000	0000 GHz
-40.0			angedo 1	Annual Costs		dug kun kun kun ku		eensella ja	Terrer Mary Mary Agendration	and Anthone of the		CF Step
.50,0	and Constant and a state		فالترجور للرياب	tana ang ang ang ang ang ang ang ang ang	the state of the state	A STREET	realling all months falls	and a second state of the	Mitter Militer Militare and	a tana tang sa	997.000 <u>Auto</u>	000 MHz Man
-30,0											Ero	q Offset
-60.0											FIC	0 Hz
-70.0												
												ale Type
Start 30 N #Res BW				#VBM	/ 3.0 MHz		s	weep	Stop 10 8.00 ms (3	0.000 GHz 00001 pts)	Log	Lin
MSG								STAT				

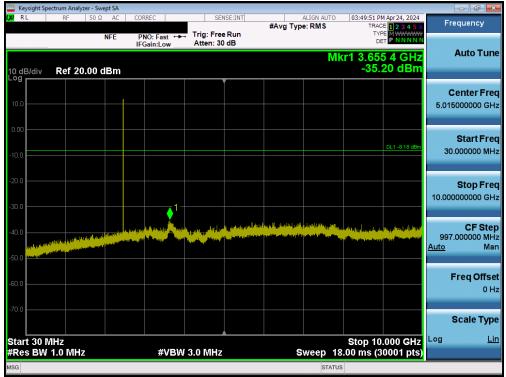


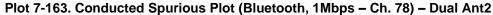


Plot 7-162. Conducted Spurious Plot (Bluetooth, 1Mbps – Ch. 39) – Dual Ant2

FCC ID: A3LNP940XMA		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
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Plot 7-164. Conducted Spurious Plot (Bluetooth, 1Mbps - Ch. 78) - Dual Ant2

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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 below per Section 15.209 and RSS-Gen (8.9).

Frequency	Field Strength [µV/m]	Measured Distance [Meters]
Above 960.0 MHz	500	3

Table 7-13. 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 \ge 1/ τ 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 7-14 below
- 3. VBW = 3MHz
- 4. Detector = peak
- 5. Sweep time = auto couple
- 6. Trace mode = max hold
- 7. Trace was allowed to stabilize

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

Table 7-14. RBW as a Function of Frequency

Test Setup

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

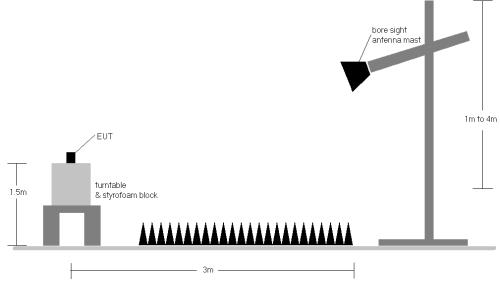


Figure 7-8. Radiated Test Setup >1GHz

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 §15.209.
- 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 is used to denote a noise floor measurement.

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Sample Calculation

- ο Field Strength Level [dBµV/m] = Analyzer Level [dBm] + 107 + AFCL [dB/m] + Duty Cycle Correction [dB]
- AFCL [dB/m] = Antenna Factor [dB/m] + Cable Loss [dB]
- $\circ \quad Margin_{[dB]} = Field Strength Level_{[dB\mu V/m]} Limit_{[dB\mu V/m]}$

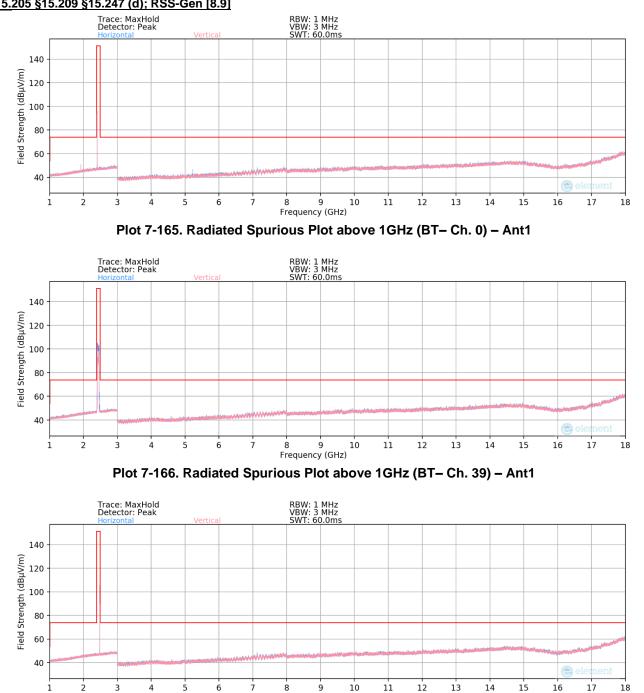
Duty Cycle Correction Factor Calculation

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

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Radiated Spurious Emission Measurements – Ant1 §15.205 §15.209 §15.247 (d); RSS-Gen [8.9]



Plot 7-167. Radiated Spurious Plot above 1GHz (BT- Ch. 78) - Ant1

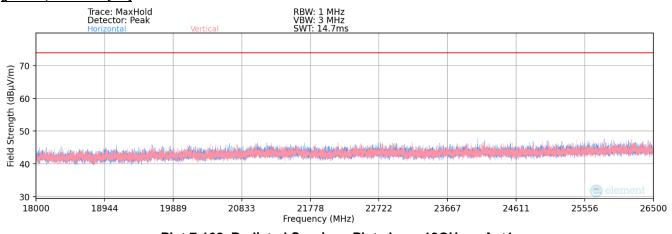
Frequency (GHz)

FCC ID: A3LNP940XMA		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
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Radiated Spurious Emissions Measurements (Above 18GHz) – Ant1

<u>§15.209; RSS-Gen [8.9]</u>



Plot 7-168. Radiated Spurious Plot above 18GHz - Ant1

FCC ID: A3LNP940XMA		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Dage 114 of 120
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Radiated Spurious Emission Measurements – Ant1 §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]	Duty Cycle Correction [dB]	Strength	Limit [dBµV/m]	Margin [dB]
4804.00	Avg	н	-	-	-76.88	0.13	0.00	30.25	53.98	-23.73
4804.00	Peak	н	-	-	-64.13	0.13	0.00	43.00	73.98	-30.98
12010.00	Avg	н	-	-	-81.38	12.88	0.00	38.50	53.98	-15.48
12010.00	Peak	Н	-	-	-69.25	12.88	0.00	50.63	73.98	-23.35

Table 7-15. Radiated Measurements – Ant1

Worst Case Mode: Worst Case Data Rate: Measurement Distance: Operating Frequency: Channel:

Bluetooth
1 Mbps
3 Meters
2441MHz
39

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Duty Cycle Correction [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
4882.00	Avg	н	-	-	-76.36	0.34	0.00	30.98	53.98	-23.00
4882.00	Peak	Н	-	-	-64.40	0.34	0.00	42.94	73.98	-31.04
7323.00	Avg	Н	-	-	-77.65	6.00	0.00	35.35	53.98	-18.63
7323.00	Peak	н	-	-	-65.64	6.00	0.00	47.36	73.98	-26.62
12205.00	Avg	н	-	-	-80.31	12.77	0.00	39.46	53.98	-14.52
12205.00	Peak	Н	-	-	-68.43	12.77	0.00	51.34	73.98	-22.64

Table 7-16. Radiated Measurements – Ant1

FCC ID: A3LNP940XMA		MEASUREMENT REPORT (CERTIFICATION)					
Test Report S/N:	Test Dates:	EUT Type:	Dage 115 of 120				
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Worst Case Mode:	Bluetooth
Worst Case Data Rate:	1 Mbps
Measurement Distance:	3 Meters
Operating Frequency:	_2480MHz
Channel:	78

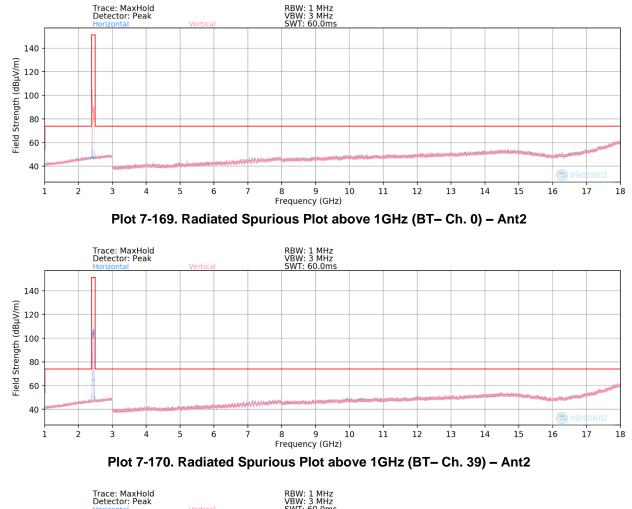
Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Duty Cycle Correction [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
4960.00	Avg	н	-	-	-76.24	1.41	0.00	32.17	53.98	-21.81
4960.00	Peak	н	-	-	-64.35	1.41	0.00	44.06	73.98	-29.92
7440.00	Avg	н	-	-	-76.89	6.20	0.00	36.31	53.98	-17.67
7440.00	Peak	н	-	-	-65.12	6.20	0.00	48.08	73.98	-25.90
12400.00	Avg	Н	-	-	-80.38	13.37	0.00	39.99	53.98	-13.99
12400.00	Peak	Н	-	-	-68.19	13.37	0.00	52.18	73.98	-21.80

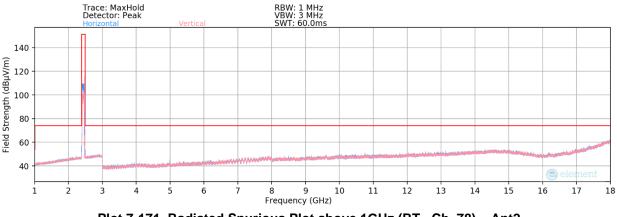
Table 7-17. Radiated Measurements – Ant1

FCC ID: A3LNP940XMA		MEASUREMENT REPORT (CERTIFICATION)					
Test Report S/N:	Test Dates:	EUT Type:	Dogo 110 of 129				
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Radiated Spurious Emission Measurements – Ant2 §15.205 §15.209 §15.247 (d); RSS-Gen [8.9]





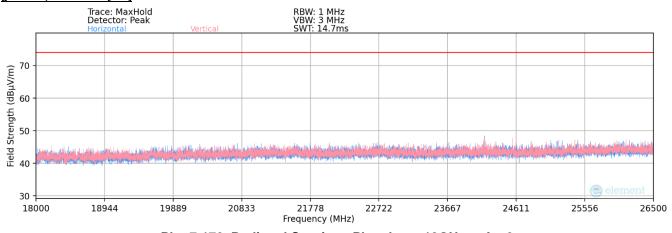


FCC ID: A3LNP940XMA		MEASUREMENT REPORT (CERTIFICATION)					
Test Report S/N:	Test Dates:	EUT Type:	Dege 117 of 120				
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Radiated Spurious Emissions Measurements (Above 18GHz) – Ant2

<u>§15.209; RSS-Gen [8.9]</u>



Plot 7-172. Radiated Spurious Plot above 18GHz – Ant2

FCC ID: A3LNP940XMA		Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:	Dega 110 of 120
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Radiated Spurious Emission Measurements – Ant2 §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]	Duty Cycle Correction [dB]	Strength	Limit [dBµV/m]	Margin [dB]
4804.00	Avg	н	-	-	-76.58	0.13	0.00	30.55	53.98	-23.43
4804.00	Peak	н	-	-	-64.41	0.13	0.00	42.72	73.98	-31.26
12010.00	Avg	н	-	-	-81.45	12.88	0.00	38.43	53.98	-15.55
12010.00	Peak	Н	-	-	-70.12	12.88	0.00	49.76	73.98	-24.22

Table 7-14. Radiated Measurements – Ant2

Worst Case Mode: Worst Case Data Rate: Measurement Distance: Operating Frequency: Channel:

Bluetooth
1 Mbps
3 Meters
2441MHz
39

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Duty Cycle Correction [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
4882.00	Avg	н	-	-	-76.28	0.34	0.00	31.06	53.98	-22.92
4882.00	Peak	Н	-	-	-64.81	0.34	0.00	42.53	73.98	-31.45
7323.00	Avg	Н	-	-	-77.28	6.00	0.00	35.72	53.98	-18.26
7323.00	Peak	н	-	-	-65.74	6.00	0.00	47.26	73.98	-26.72
12205.00	Avg	н	-	-	-80.32	12.77	0.00	39.45	53.98	-14.53
12205.00	Peak	Н	-	-	-69.41	12.77	0.00	50.36	73.98	-23.62

Table 7-15. Radiated Measurements – Ant2

FCC ID: A3LNP940XMA		Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:	Dage 110 of 120
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Worst Case Mode:BluetoothWorst Case Data Rate:1 MbpsMeasurement Distance:3 MetersOperating Frequency:2480MHzChannel:78

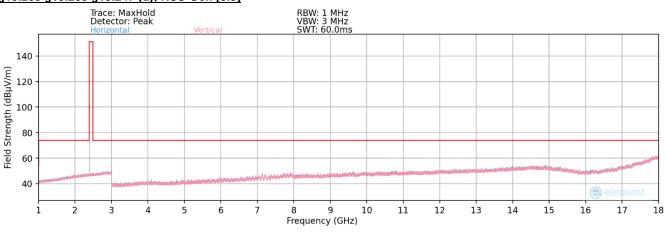
Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Duty Cycle Correction [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
4960.00	Avg	н	-	-	-76.04	1.41	0.00	32.37	53.98	-21.61
4960.00	Peak	н	-	-	-63.69	1.41	0.00	44.72	73.98	-29.26
7440.00	Avg	н	-	-	-77.18	6.20	0.00	36.02	53.98	-17.96
7440.00	Peak	н	-	-	-65.63	6.20	0.00	47.57	73.98	-26.41
12400.00	Avg	н	-	-	-80.49	13.37	0.00	39.88	53.98	-14.10
12400.00	Peak	Н	-	-	-69.73	13.37	0.00	50.64	73.98	-23.34

Table 7-16. Radiated Measurements – Ant2

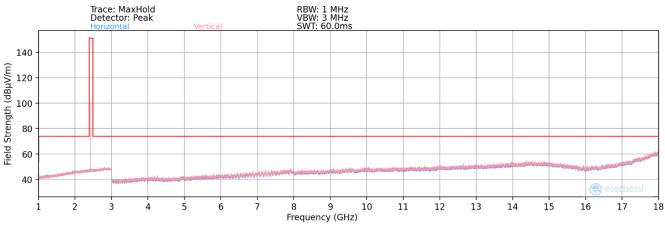
FCC ID: A3LNP940XMA		MEASUREMENT REPORT (CERTIFICATION)							
Test Report S/N:	Test Dates:	EUT Type:	Degs 100 of 100						
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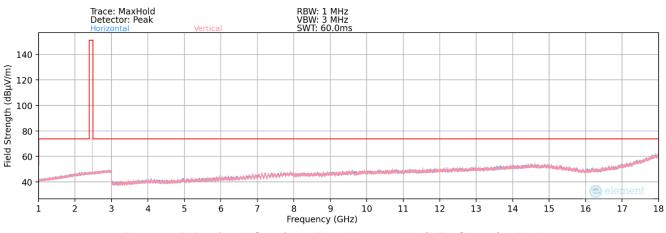
Radiated Spurious Emission Measurements – Dual §15.205 §15.209 §15.247 (d); RSS-Gen [8.9]









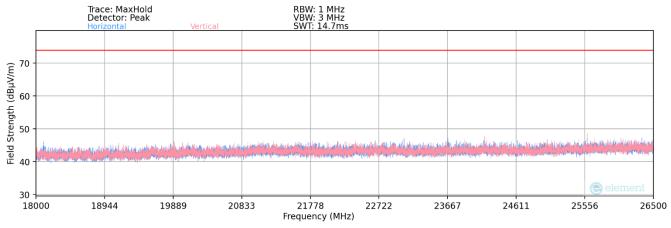


Plot 7-175. Radiated Spurious Plot above 1GHz (BT- Ch. 78) - Dual

FCC ID: A3LNP940XMA		Approved by: Technical Manager	
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Radiated Spurious Emissions Measurements (Above 18GHz) – Dual §15.209; RSS-Gen [8.9]



Plot 7-176. Radiated Spurious Plot above 18GHz – Dual

FCC ID: A3LNP940XMA		Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:	Dage 100 of 100
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Radiated Spurious Emission Measurements – Dual §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]	Duty Cycle Correction [dB]	Dist. Corr. Factor [dB]	Field Strength [dBµV/m]	Limit [dBµ V/m]	Margin [dB]
4804.00	Avg	н	-	-	-76.93	0.13	0.00	0.00	30.20	53.98	-23.78
4804.00	Peak	н	-	-	-66.81	0.13	0.00	0.00	40.32	73.98	-33.66
12010.00	Avg	н	-	-	-81.45	12.88	0.00	0.00	38.43	53.98	-15.55
12010.00	Peak	н	-	-	-70.26	12.88	0.00	0.00	49.62	73.98	-24.36

Table 7-17. Radiated Measurements – Dual

Worst Case Mode: Worst Case Data Rate: Measurement Distance: Operating Frequency: Channel:

Bluetooth	
1 Mbps	
3 Meters	
2441MHz	
39	

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Duty Cycle Correction [dB]	Dist. Corr. Factor [dB]	Field Strength [dBµV/m]	Limit [dBµ V/m]	Margin [dB]
4882.00	Avg	Н	-	-	-76.54	0.34	0.00	0.00	30.80	53.98	-23.18
4882.00	Peak	Н	-	-	-66.83	0.34	0.00	0.00	40.51	73.98	-33.47
7323.00	Avg	Н	-	-	-78.20	6.00	0.00	0.00	34.80	53.98	-19.18
7323.00	Peak	Н	-	-	-69.71	6.00	0.00	0.00	43.29	73.98	-30.69
12205.00	Avg	Н	-	-	-80.95	12.77	0.00	0.00	38.82	53.98	-15.16
12205.00	Peak	Н	-	-	-70.44	12.77	0.00	0.00	49.33	73.98	-24.65

Table 7-18. Radiated Measurements – Dual

FCC ID: A3LNP940XMA		Approved by: Technical Manager	
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Worst Case Mode:BluetoothWorst Case Data Rate:1 MbpsMeasurement Distance:3 MetersOperating Frequency:2480MHzChannel:78

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Duty Cycle Correction [dB]	Dist. Corr. Factor [dB]	Field Strength [dBµV/m]	Limit [dBµ V/m]	Margin [dB]
4960.00	Avg	Н	-	-	-76.04	1.41	0.00	0.00	32.37	53.98	-21.61
4960.00	Peak	Н	-	-	-63.69	1.41	0.00	0.00	44.72	73.98	-29.26
7440.00	Avg	н	-	-	-77.18	6.20	0.00	0.00	36.02	53.98	-17.96
7440.00	Peak	н	-	-	-65.63	6.20	0.00	0.00	47.57	73.98	-26.41
12400.00	Avg	н	-	-	-80.49	13.37	0.00	0.00	39.88	53.98	-14.10
12400.00	Peak	н	-	-	-69.73	13.37	0.00	0.00	50.64	73.98	-23.34

Table 7-19. Radiated Measurements – Dual

FCC ID: A3LNP940XMA		MEASUREMENT REPORT (CERTIFICATION)	
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7.10 Radiated Restricted Band Edge Measurements

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

Test Overview and Limit

All out of band radiated emissions at the band edge are measured with a spectrum analyzer connected to a receive antenna while the EUT is operating at maximum power, at the appropriate frequencies, and with hopping disabled. 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 below per Section 15.209 and RSS-Gen (8.9).

Frequency	Field Strength [μV/m]	Measured Distance [Meters]	
Above 960.0 MHz	500	3	

Table	7-18.	Radiated	Limits
-------	-------	----------	--------

Test Procedure Used

ANSI C63.10-2013 – Section 6.10.5.2

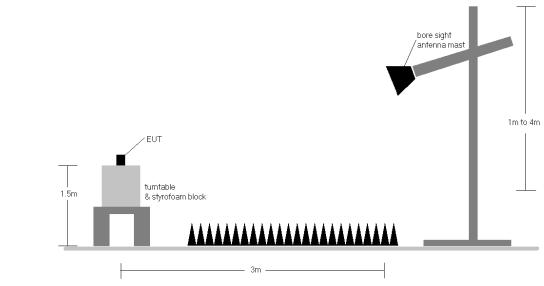
Test Settings

- 1. Span is set large enough to capture the peak level of the emission operating on the channel closest to the band edge
- 2. Reference level offset is set with the appropriate corrections for the frequencies shown in the plots
- 3. Reference level is set to provide the appropriate amount of "head room" above the signal as specified in ANSI C63.10-2013 Section 4.1.5.2
- 4. Attenuation is set to a low enough level to maintain enough dynamic range between the noise floor and the radiated limit
- 5. Sweep time = Auto coupled
- 6. RBW = 1MHz
- 7. VBW = 3 x RBW for peak measurements and 1kHz for RMS measurements
- 8. Detector = RMS and peak
- 9. Trace = Max Hold
- 10. Trace was allowed to stabilize

FCC ID: A3LNP940XMA	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
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Test Setup



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

Figure 7-9. 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 limits shown in §15.209.
- 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. 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:

Offset (dB) = (Antenna Factor + Cable Loss + Attenuator) – Preamplifier Gain + DCCF

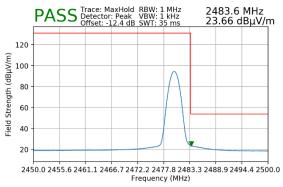
7. The "-" shown in the following RSE tables is used to denote a noise floor measurement.

FCC ID: A3LNP940XMA		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Dama 400 at 400
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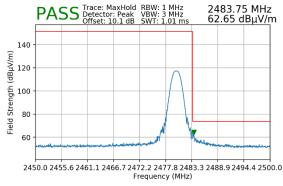


Worst Case Mode: Worst Case Data Rate: Measurement Distance: Operating Frequency: Channel:

Bluetooth
1 Mbps
3 Meters
2480MHz
78

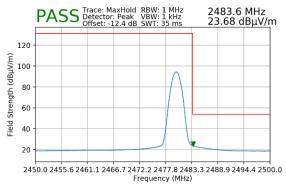


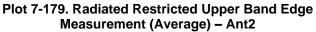
Plot 7-177. Radiated Restricted Upper Band Edge Measurement (Average) – Ant1

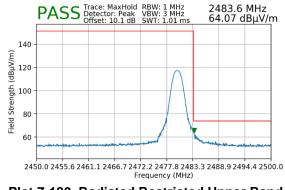




Bluetooth
1 Mbps
3 Meters
2480MHz
78





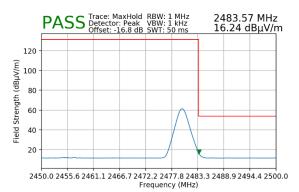


Plot 7-180. Radiated Restricted Upper Band Edge Measurement (Peak) – Ant2

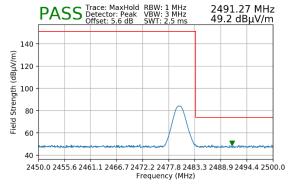
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Worst Case Mode:	Bluetooth
Worst Case Data Rate:	3 Mbps
Measurement Distance:	3 Meters
Operating Frequency:	2480MHz
Channel:	78



Plot 7-181. Radiated Restricted Upper Band Edge Measurement (Average) - Dual



Plot 7-182. Radiated Restricted Upper Band Edge Measurement (Peak) - Dual

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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 must not exceed the limits shown below per Section 15.209 and RSS-Gen (8.9).

Frequency	Field Strength [µV/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 7-19. 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.

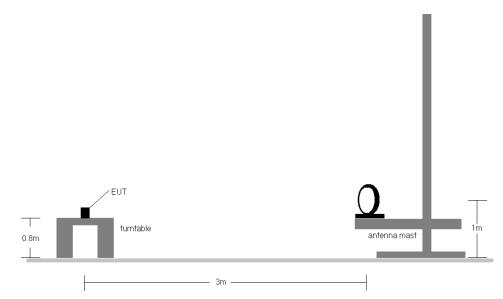
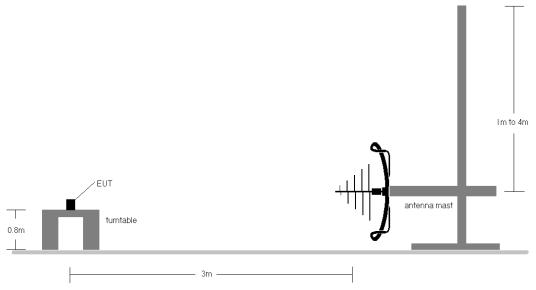
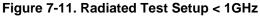


Figure 7-10. Radiated Test Setup < 30Mhz





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Test Notes

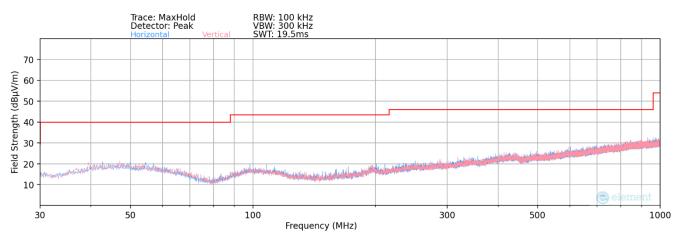
- 1. All emissions lying in restricted bands specified in §15.205 and RSS-Gen (8.10) are below the limits shown in §15.209.
- 2. The broadband receive antenna is manipulated through vertical and horizontal polarizations during the tests. The EUT is manipulated through three orthogonal planes.
- 3. This 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.
- 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.

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Radiated Spurious Emissions Measurements (Below 1GHz)

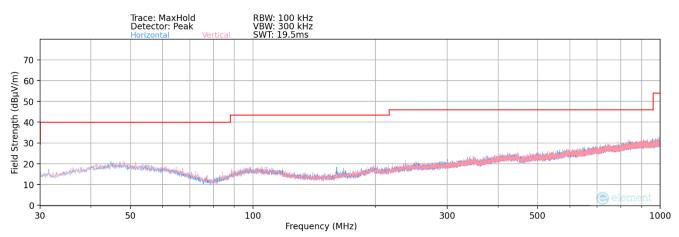
§15.209; RSS-Gen [8.9]





Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	Limit [dBµ V/m]	Margin [dB]
960.63	Quasi-Peak	Н	-	-	-112.70	30.69	24.99	53.98	-28.99

Table 7-20. Radiated Spurious Emissions Below 1GHz – Ant1



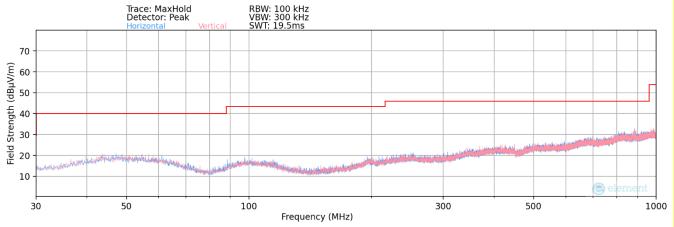


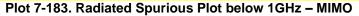
Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	Limit [dBµ V/m]	Margin [dB]
984.01	Quasi-Peak	Н	-	-	-112.20	30.99	25.79	53.98	-28.19

Table 7-21. Radiated Spurious Emissions Below 1GHz – Ant2

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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]
325.00	Quasi-Peak	Н	-	-	-95.23	21.49	33.26	46.02	-12.76

Plot 7-184. Radiated Spurious Emissions Below 1GHz – MIMO

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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 (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.

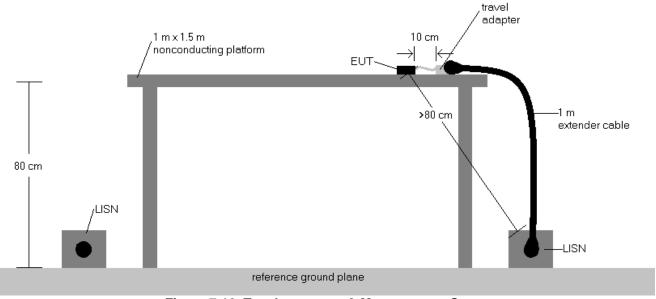


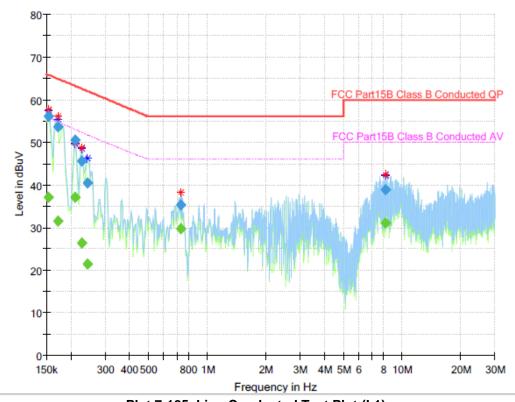
Figure 7-12. Test Instrument & Measurement Setup

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 μ V) = QP/AV Analyzer/Receiver Level (dB μ V) + Corr. (dB)
- 5. Margin (dB) = QP/AV Limit (dB μ V) QP/AV Level (dB μ V)
- 6. Traces shown in plot are made using a peak detector.
- 7. Deviations to the Specifications: None.

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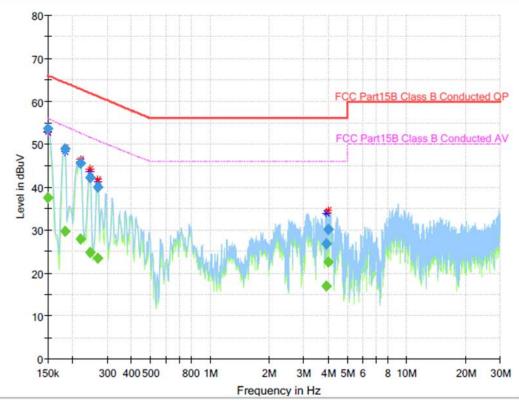
Plot 7-185. Line-Conducted Test Plot (L1)

Frequency (MHz)	QuasiPeak (dBuV)	Average (dBuV)	Limit (dBuV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.152985		37.19	55.82	18.63	1000.0	9.000	L1	9.8
0.152985	56.14		65.84	9.70	1000.0	9.000	L1	9.8
0.170895		31.57	54.82	23.25	1000.0	9.000	L1	10.0
0.170895	53.60		64.92	11.31	1000.0	9.000	L1	10.0
0.209700		36.99	53.02	16.03	1000.0	9.000	L1	9.8
0.209700	50.43		63.22	12.78	1000.0	9.000	L1	9.8
0.227610		26.31	52.31	26.00	1000.0	9.000	L1	9.8
0.227610	45.60		62.54	16.94	1000.0	9.000	L1	9.8
0.242535		21.55	51.77	30.23	1000.0	9.000	L1	9.7
0.242535	40.46		62.01	21.55	1000.0	9.000	L1	9.7
0.735060		29.62	46.00	16.38	1000.0	9.000	L1	9.9
0.735060	35.41		56.00	20.59	1000.0	9.000	L1	9.9
8.218455		31.15	50.00	18.85	1000.0	9.000	L1	10.1
8.218455	38.86		60.00	21.14	1000.0	9.000	L1	10.1

Table 7-24. Line-Conducted Test Table(L1)

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

Frequency (MHz)	QuasiPeak (dBuV)	Average (dBuV)	Limit (dBuV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.150000		37.59	56.00	18.41	1000.0	9.000	N	9.8
0.150000	53.71		66.00	12.29	1000.0	9.000	N	9.8
0.182835		29.79	54.22	24.42	1000.0	9.000	N	10.0
0.182835	48.93		64.36	15.42	1000.0	9.000	N	10.0
0.218655		27.86	52.66	24.80	1000.0	9.000	N	9.8
0.218655	45.50		62.87	17.37	1000.0	9.000	N	9.8
0.245520		24.86	51.67	26.80	1000.0	9.000	N	9.7
0.245520	42.25		61.91	19.66	1000.0	9.000	N	9.7
0.269400		23.48	50.89	27.42	1000.0	9.000	N	9.7
0.269400	39.93		61.14	21.21	1000.0	9.000	N	9.7
3.899160		16.94	46.00	29.06	1000.0	9.000	N	9.9
3.899160	26.88		56.00	29.12	1000.0	9.000	N	9.9
4.018560		22.53	46.00	23.47	1000.0	9.000	N	9.9
4.018560	30.27		56.00	25.73	1000.0	9.000	N	9.9

Table 7-25. Line-Conducted Test Table(N)

FCC ID: A3LNP940XMA	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager	
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8.0 CONCLUSION

The data collected relate only to the item(s) tested and show that the **Samsung Portable Computing Device FCC ID: A3LNP940XMA** is in compliance with Part 15 Subpart C (15.247) of the FCC Rules.

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