



Plot 7-232. Band Edge Plot (Bluetooth with Hopping Enabled, iPA, 3 Mbps - Ch.78) - ANTO (Q)



Plot 7-233. Band Edge Plot (Bluetooth with Hopping Disabled, ePA, 3 Mbps - Ch. 0) - ANT1 (N)

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- Ke	ysight Spectrum An	alyzer - Swep	ot SA									
l ,XI R	L RF	50 Ω	AC COF	RREC	SEN	ISE:INT	#Avg Typ	ALIGN AUTO e: RMS	07:37:07 P TRAC	M Apr 28, 2021	F	requency
10 dI	3/div Ref 2	25.00 di	Pr IF0 Bm	NO: Wide ↔ Gain:Low_	Atten: 36	dB		Δ	⊡ Mkr1 -7 61	20 MHz .660 dB		Auto Tune
15.0	Real Provide State	1∆2 ^^1∆4									2.48	Center Freq 33500000 GHz
5.00 -5.00											2.47	Start Freq 78500000 GHz
-15.0 -25.0	Aver alter the second sec		- Umgl								2.48	Stop Freq 88500000 GHz
-35.0 -45.0				h h h h					v		<u>Auto</u>	CF Step 1.000000 MHz Man
-55.0				" ¶U/hv/\\	փու <mark>հ</mark> երիկերոր	Homen	npanintAlm.a.	ml awnan hody	np~}Hennp#AA2	นุแหลามให้สาวหลายที่ไข		Freq Offset 0 Hz
-65.U											1.00	Scale Type
Cen #Re:	ter 2.48350 s BW 100 kl	0 GHz Hz		#VBW	300 kHz			Sweep 5	Span 1 5.000 ms	0.00 MHz (1001 pts)	Log	Lin
MSG								STATU	S			

Plot 7-234. Band Edge Plot (Bluetooth with Hopping Disabled, ePA, 3 Mbps – Ch. 78) – ANT1 (N)



Plot 7-235. Band Edge Plot (Bluetooth with Hopping Enabled, ePA, 3 Mbps - Ch.0) - ANT1 (N)

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Plot 7-236. Band Edge Plot (Bluetooth with Hopping Enabled, ePA, 3 Mbps – Ch.78) – ANT1 (N)



Plot 7-237. Band Edge Plot (Bluetooth with Hopping Disabled, iPA, 3 Mbps - Ch. 0) - ANT1 (N)

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Plot 7-238. Band Edge Plot (Bluetooth with Hopping Disabled, iPA, 3 Mbps – Ch. 78) – ANT1 (N)



Plot 7-239. Band Edge Plot (Bluetooth with Hopping Enabled, iPA, 3 Mbps - Ch.0) - ANT1 (N)

FCC ID: A3LSMF711B	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
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Plot 7-240. Band Edge Plot (Bluetooth with Hopping Enabled, iPA, 3 Mbps – Ch.78) – ANT1 (N)



Plot 7-241. Band Edge Plot (Bluetooth with Hopping Disabled, ePA, 3 Mbps – Ch. 0) – ANT1 (Q)

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Plot 7-242. Band Edge Plot (Bluetooth with Hopping Disabled, ePA, 3 Mbps – Ch. 78) – ANT1 (Q)



Plot 7-243. Band Edge Plot (Bluetooth with Hopping Enabled, ePA, 3 Mbps - Ch.0) - ANT1 (Q)

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IXI RE 50Ω AC	CORREC SEN	#Avg Type	ALIGN AUTO 05:52:11 P e: RMS TRAC	M Apr 28, 2021 DE 1 2 3 4 5 6	Frequency
	PNO: Wide + Trig: Free IFGain:Low Atten: 36	e Run i dB	TY D		Auto Tune
10 dB/div Ref 25.00 dBm			58	.203 dB	
15.0					Center Freq 2.483500000 GHz
5.00					Start Freq 2.478500000 GHz
-15.0					Stop Freq 2.488500000 GHz
-35.0					CF Step 1.000000 MHz <u>Auto</u> Man
-45.0	an iel holyniaan fol out of for the second s	in the hoursel Michaeller	an mithanna an dùr dha an dhan an dhanna dhan an dh	h-shearh-ilh-hibe	Freq Offset 0 Hz
-65.0					Scale Type
Center 2.483500 GHz #Res BW 100 kHz	#VBW 300 kHz		Span 1 Sweep 5.000 ms	0.00 MHz (1001 pts)	Log <u>Lin</u>

Plot 7-244. Band Edge Plot (Bluetooth with Hopping Enabled, ePA, 3 Mbps - Ch.78) - ANT1 (Q)



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Plot 7-246. Band Edge Plot (Bluetooth with Hopping Disabled, iPA, 3 Mbps - Ch. 78) - ANT1 (Q)



Plot 7-247. Band Edge Plot (Bluetooth with Hopping Enabled, iPA, 3 Mbps - Ch.0) - ANT1 (Q)

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Plot 7-248. Band Edge Plot (Bluetooth with Hopping Enabled, iPA, 3 Mbps - Ch.78) - ANT1 (Q)

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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

- 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.
- 2. 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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Frequency [MHz]	Data Rate [Mbps]	Mod.	Power Scheme	Channel No.	Min. Channel Separation [MHz] (N)	Min. Channel Separation [MHz] (Q)
2402	1.0	GFSK	ePA	0	0.570	0.614
2441	1.0	GFSK	ePA	39	0.608	0.622
2480	1.0	GFSK	ePA	78	0.608	0.624
2402	1.0	GFSK	iPA	0	0.615	0.617
2441	1.0	GFSK	iPA	39	0.610	0.622
2480	1.0	GFSK	iPA	78	0.624	0.626
2402	2.0	π/4-DQPSK	ePA	0	0.888	0.876
2441	2.0	π/4-DQPSK	ePA	39	0.882	0.895
2480	2.0	π/4-DQPSK	ePA	78	0.894	0.902
2402	2.0	π/4-DQPSK	iPA	0	0.866	0.902
2441	2.0	π/4-DQPSK	iPA	39	0.900	0.854
2480	2.0	π/4-DQPSK	iPA	78	0.852	0.905
2402	3.0	8DPSK	ePA	0	0.884	0.901
2441	3.0	8DPSK	ePA	39	0.867	0.798
2480	3.0	8DPSK	ePA	78	0.895	0.861
2402	3.0	8DPSK	iPA	0	0.874	0.840
2441	3.0	8DPSK	iPA	39	0.840	0.879
2480	3.0	8DPSK	iPA	78	0.887	0.866

Table 7-8. Minimum Channel Separation – ANT0

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Plot 7-249. Channel Spacing Plot (Bluetooth, ePA) - ANT0 (N)



Plot 7-250. Channel Spacing Plot (Bluetooth, iPA) - ANTO (N)

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Plot 7-251. Channel Spacing Plot (Bluetooth, ePA) - ANT0 (Q)



Plot 7-252. Channel Spacing Plot (Bluetooth, iPA) – ANT0 (Q)

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Frequency [MHz]	Data Rate [Mbps]	Mod.	Power Scheme	Channel No.	Min. Channel Separation [MHz] (N)	Min. Channel Separation [MHz] (Q)
2402	1.0	GFSK	ePA	0	0.614	0.617
2441	1.0	GFSK	ePA	39	0.622	0.622
2480	1.0	GFSK	ePA	78	0.624	0.626
2402	1.0	GFSK	iPA	0	0.618	0.619
2441	1.0	GFSK	iPA	39	0.624	0.631
2480	1.0	GFSK	iPA	78	0.619	0.635
2402	2.0	π/4-DQPSK	ePA	0	0.876	0.902
2441	2.0	π/4-DQPSK	ePA	39	0.895	0.854
2480	2.0	π/4-DQPSK	ePA	78	0.902	0.905
2402	2.0	π/4-DQPSK	iPA	0	0.917	0.863
2441	2.0	π/4-DQPSK	iPA	39	0.843	0.833
2480	2.0	π/4-DQPSK	iPA	78	0.880	0.874
2402	3.0	8DPSK	ePA	0	0.901	0.840
2441	3.0	8DPSK	ePA	39	0.798	0.879
2480	3.0	8DPSK	ePA	78	0.861	0.866
2402	3.0	8DPSK	iPA	0	0.875	0.842
2441	3.0	8DPSK	iPA	39	0.873	0.883
2480	3.0	8DPSK	iPA	78	0.828	0.865

Table 7-9. Minimum Channel Separation – ANT1

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Plot 7-253. Channel Spacing Plot (Bluetooth, ePA) - ANT1 (N)



Plot 7-254. Channel Spacing Plot (Bluetooth, iPA) – ANT1 (N)

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Plot 7-255. Channel Spacing Plot (Bluetooth, ePA) – ANT1 (Q)



Plot 7-256. Channel Spacing Plot (Bluetooth, iPA) – ANT1 (Q)

FCC ID: A3LSMF711B	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 >> 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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K RL RF 50 Ω AC CORREC SENSE:INT ALIGN AUTO 07:08:25 PA Trig Delay-752.3 μs #Avg Type: RMS TRAC Trig Delay-752.3 μs #Avg Type: RMS TRAC	Frequency
PNO: Wide → Thg. Video IFGain:Low Atten: 36 dB DE Atten: 36 dB AMKr1 2. -4	893 ms 6.47 dB
	Center Freq 2.441000000 GHz
-5.00	Start Freq 2.441000000 GHz
-15.0 -25.0 1Δ2	Stop Freq 2.441000000 GHz
-35.0 -45.0 ATHIN HIM AND	CF Step 1.00000 MHz <u>Auto</u> Man
-55.0	Freq Offset 0 Hz
	Scale Type
Center 2.441000000 GHz S Res BW 1.0 MHz #VBW 3.0 MHz Sweep 7.533 ms (pan 0 Hz ^{Log} <u>Lin</u> 1001 pts)
MSG STATUS	

Plot 7-257. Time of Occupancy Plot (Bluetooth, ePA) – ANT0 (N)

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 2.893 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

- 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)
- 6.67 hops/s / channel x 8 seconds = 53.34 hops (# hops over a 8 second period)
- 53.34 hops x 2.893 ms/channel = 154.31 ms (worst case dwell time for one channel in AFH mode)

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Plot 7-258. Time of Occupancy Plot (Bluetooth, ePA) – ANT0 (Q)

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 2.893 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

- 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)
- 6.67 hops/s / channel x 8 seconds = 53.34 hops (# hops over a 8 second period)
- 53.34 hops x 2.893 ms/channel = 154.31 ms (worst case dwell time for one channel in AFH mode)

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Plot 7-259. Time of Occupancy Plot (Bluetooth, iPA) – ANT0 (N)

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 2.892 ms/channel = 308.49 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)
- 6.67 hops/s / channel x 8 seconds = 53.34 hops (# hops over a 8 second period)
- o 53.34 hops x 2.892 ms/channel = 154.26 ms (worst case dwell time for one channel in AFH mode)

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Plot 7-260. Time of Occupancy Plot (Bluetooth, iPA) - ANT0 (Q)

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 2.890 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

- 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)
- 6.67 hops/s / channel x 8 seconds = 53.34 hops (# hops over a 8 second period)
- 53.34 hops x 2.890 ms/channel = 154.15 ms (worst case dwell time for one channel in AFH mode)

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Plot 7-261. Time of Occupancy Plot (Bluetooth, ePA) – ANT1 (N)

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 2.893 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

- 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)
- 6.67 hops/s / channel x 8 seconds = 53.34 hops (# hops over a 8 second period)
- 53.34 hops x 2.893 ms/channel = 154.31 ms (worst case dwell time for one channel in AFH mode)

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🔤 Keysight Sp	ectrum Ana	ilyzer - Swep	ot SA										
L <mark>XI</mark> RL	RF	50 Ω	AC	CORREC]	SEI	vse:int y-499.0 µs	#Avg Typ	ALIGN AUTO e: RMS	06:06:33 PI TRAC	M Apr 28, 2021 E <mark>1 2 3 4 5 6</mark>	Fre	equency
10 dB/div	Ref 2	25.00 dl	Bm	PNO: Wide IFGain:Lov	e +++ V	Atten: 36	eo 6 dB			ΔMkr1 2 -2	.885 ms 7.77 dB		Auto Tune
15.0	X ₂										TRIG LVL	C 2.441	e nter Freq 000000 GHz
-5.00						•1∆2						2.441	Start Freq 0000000 GHz
-15.0												2.441	Stop Freq 0000000 GHz
-35.0 -45.0	¢					W	upik harak har	n <mark>ylestale</mark> ntly	Whytyd wyr	and label and a	uter with the	1. <u>Auto</u>	CF Step 000000 MHz Man
-55.0												F	F req Offset 0 Hz
												5	Scale Type
Center 2.	441000 1.0 MH	0000 GI	Hz	#\	(B)4(3	0 MHz			Sweep	S	pan 0 Hz	Log	Lin
MSG	NO IVITI				DW 3.				STAT		reo i pisj		
									UIAI				

Plot 7-262. Time of Occupancy Plot (Bluetooth, ePA) - ANT1 (Q)

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 2.885 ms/channel = 307.74 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)
- 6.67 hops/s / channel x 8 seconds = 53.34 hops (# hops over a 8 second period)
- o 53.34 hops x 2.885 ms/channel = 153.89 ms (worst case dwell time for one channel in AFH mode)

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Plot 7-263. Time of Occupancy Plot (Bluetooth, iPA) – ANT1 (N)

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 2.886 ms/channel = 307.85 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)
- 6.67 hops/s / channel x 8 seconds = 53.34 hops (# hops over a 8 second period)
- o 53.34 hops x 2.886 ms/channel = 153.94 ms (worst case dwell time for one channel in AFH mode)

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Keysight Spectrum Analyzer - Swept SA				
LXI RL RF 50Ω AC	CORREC SENSE:II Trig Delay-49	ALIGN AUT ALIGN AUT ALIGN AUT ALIGN AUT ALIGN AUT	0 11:23:39 AM Jun 04, 2021 TRACE 1 2 3 4 5 6	Frequency
NFE	PNO: Wide Atten: 30 dB		DET P NNNNN	
10 dB/div Ref 20.00 dBm			∆Mkr1 2.890 ms -12.27 dB	Auto Tune
10.0			TRIG LVL	Center Freq 2.444000000 GHz
0.00 X2		1Δ2		Start Freq 2.444000000 GHz
-20.0				Stop Freq 2.444000000 GHz
-30.0				CF Step 1.000000 MHz <u>Auto</u> Man
-50.0 / / / / / / / / -60.0		Wapatanay	erenangerenden en forderen forderen. An der einen er einen	Freq Offset 0 Hz
-70.0				Scale Type
Center 2.444000000 GHz			Span 0 Hz	Log <u>Lin</u>
Res BW 1.0 MHz	#VBW 3.0 MHz	Sweep	5.000 ms (1001 pts)	
MSG		STA	TUS	

Plot 7-264. Time of Occupancy Plot (Bluetooth, iPA) - ANT1 (Q)

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 2.890 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

- 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)
- 6.67 hops/s / channel x 8 seconds = 53.34 hops (# hops over a 8 second period)
- 53.34 hops x 2.890 ms/channel = 154.15 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 7-265. Low End Spectrum Channel Hopping Plot (Bluetooth, ePA) – ANT0 (N)



Plot 7-266. High End Spectrum Channel Hopping Plot (Bluetooth, ePA) – ANT0 (N)

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🔤 Key	sight Spe	ctrum Ani	alyzer - Sw	vept SA																	
L <mark>XI</mark> RL	-	RF	50 S	2 AC	COR	REC			SE	NSE:I	NT				ALIGN	AUTO	0	5:03:21 P	M Jun 04, 2021		Amplitude
Ref	Leve	20.0	0 dBr	n			_	Tri	a: Fre	e Pu			#A\	g Typ	be: RI	VIS 1/100		TRAI TY	DE 1 2 3 4 5 6		Ampinado
				NFE	IFG	io: wid Sain:Lo	e 🕞 w	At	ten: 3	0 dB				III. IOIG				D			Pefl evel
																				i l	
10.15		D-6 (-ID																	20.00 dBm
10 dE Log	sidiv	Ref 2	20.00	aвт						_		_									
	~				. n m	A b	~ M			Ĭ.	-1 / 1		~ ~		~ /	1 ~ ~		m M			Attonuation
40.0	- 11		INN		WW	AA	ΗA	Ш		VΗ	W	11		HA	111	WH.		1114	IHWAN		
10.0			111	\mathbb{N}	$\{I,I\}$. 41	111	J {	łł	ΥU	11 \/	U	ļ	Дſ	l U		U H	MIT	1 V V IA)		[30 dB]
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0.00	*	_ _ _r	Ύι¥	- ¥ - ¥	<u>, ,</u>	Y Į	- (4 1	*	Υ	1	Y	<u> </u>	1 - 1	ι ř	1	• • •			Coole/Div
																					Scale/Div
-10.0																					10 dB
-20.0																					O colo Tranc
																					Scale Type
20.0	1																			<u>Log</u>	Lin
-30.0												T									
	Ń																				
-40.0	J•																				Presel Center
-50.0																					
-60.0																					Presel Adjust
00.0																					0 Hz
70.0																					
-70.0																					
																					More
Star	1240	000 G	H7														Ste	n 24	4100 GHz		1 of 2
#Res	BW	200 ki	z			#	/BW	1.0	MHz						Swe	eep	1.00	0 ms	(1001 pts)		
MEC																STATI	IC				
MSG																STATU	15				

Plot 7-267. Low End Spectrum Channel Hopping Plot (Bluetooth, iPA) - ANTO (N)



Plot 7-268. High End Spectrum Channel Hopping Plot (Bluetooth, iPA) – ANT0 (N)

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Plot 7-269. Low End Spectrum Channel Hopping Plot (Bluetooth, ePA) – ANT0 (Q)



Plot 7-270. High End Spectrum Channel Hopping Plot (Bluetooth, ePA) – ANT0 (Q)

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Plot 7-271. Low End Spectrum Channel Hopping Plot (Bluetooth, iPA) - ANT0 (Q)



Plot 7-272. High End Spectrum Channel Hopping Plot (Bluetooth, iPA) – ANT0 (Q)

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🔤 Keysight !	Spectrum Analyzer -	Swept SA								e e 💌
LXI RL	RF 50	Ω AC	CORREC	SEN	SE:INT		ALIGN AUTO	08:00:06 PM	1 Apr 28, 2021	Fraguanay
					_	#Avg Typ	e:RMS	TRAC	E 1 2 3 4 5 6	Frequency
			PNO: Wide 😱	Trig: Free	Run			TYP		
			IFGain:Low	Atten: 36	dB					. .
										Auto Tune
	B-6.05.04									
10 dB/div	Ref 25.00) dBm								
Log										
										Center Freq
15.0	ო	m m m n	<u></u>	MMMA	$\Lambda \Lambda \Lambda \Lambda$	MANN	nnnn	NANA	<u>nnan</u>	2 420500000 GHz
	NHM	HUUU	444411V4	JUN IN	H H H H H H H H H H	1111111	1111111	14444	111111	2.42000000000112
	' 17 17 17 17 17	11 H N N		} [] }} [] }	1 11 11 11 1	1444	1111111	א נו גו א	U H U U	
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	YYYY	ΥΥΥΥ	YYYYY	7 Y Y Y I	(ידיא	יץיץי	γτγγ	YYYY	Start Freq
										2 40000000 GHz
-5.00										2.40000000000112
45.0										
-15.0										Stop Freq
										2 441000000 CH7
25.0										2.441000000 GHz
-23.0										
-35.0										CF Step
Ń										4.100000 MHz
۲.										<u>Auto</u> Man
-45.0										
										Freg Offset
-55.0										0 Ц-7
										0 112
05.0										
-65.0										
										Scale Type
Start 2.4	0000 GHz							Stop 2,44	100 GHz	Log <u>Lin</u>
#Res B¥	V 200 kHz		#VBW	1.0 MHz			Sweep_1	.000 ms (1001 pts)	
MSG							STATUS	3		

Plot 7-273. Low End Spectrum Channel Hopping Plot (Bluetooth, ePA) – ANT1 (N)



Plot 7-274. High End Spectrum Channel Hopping Plot (Bluetooth, ePA) – ANT1 (N)

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Plot 7-275. Low End Spectrum Channel Hopping Plot (Bluetooth, iPA) – ANT1 (N)



Plot 7-276. High End Spectrum Channel Hopping Plot (Bluetooth, iPA) – ANT1 (N)

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Plot 7-277. Low End Spectrum Channel Hopping Plot (Bluetooth, ePA) – ANT1 (Q)



Plot 7-278. High End Spectrum Channel Hopping Plot (Bluetooth, ePA) – ANT1 (Q)

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Plot 7-279. Low End Spectrum Channel Hopping Plot (Bluetooth, iPA) – ANT1 (Q)



Plot 7-280. High End Spectrum Channel Hopping Plot (Bluetooth, iPA) – ANT1 (Q)

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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

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.

2. 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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Keysight Spectrum Analyzer - Swept SA					
LX/RL RF 50Ω AC	CORREC	SENSE:INT	ALIGN AUTO	06:54:05 PM Apr 28, 2021	Fraguanay
		#A1	/g Type: RMS	TRACE 1 2 3 4 5 6	Frequency
	PNO: Fast 🖵 Trig: I	Free Run		DET P NNNN	
	IFGain:Low Atten	: 36 dB		021	
			Mk	r1 6.918 6 GHz	Auto Tune
				-31 24 dBm	
Log Rei 25.00 dBin					
209					
					Center Freq
15.0					5.015000000 GHz
5.00					
					Start Freq
F 00				DL1 -4.89 dBm	30.000000 MHz
-5.00					
-15.0					
10.0					Stop Freq
					10.000000000 GHz
-25.0			1		
			\'		
			e de la cal		CE Sten
-35.0	The second s	a participation of the second second period	attes de la constant de la constant de la constant en la constant en la constant en la constant en la constant e	an gi dha galan an bi da a talah sa ta pi da sa	
	and a second	Statistics and and the second states of the second	and the second se	المشاهدة وسليك ومناو والمتلك	Auto Man
PROPERTY OF THE OWNER WATER OF THE OWNER OF THE OWNER OF THE OWNER OWNER OF THE OWNER					<u>Auto</u> Marr
-45.0					
					Energy Office of
-55.0					Frequiset
00.0					0 Hz
-65.0					
					Scale Type
Otort 20 Milla				Step 10 000 CHz	Loa Lin
	10 (DW) 0 0 0 0			Stop 10.000 GHZ	
#Res BW 1.0 MHz	#VBM 3.0 M	HZ	Sweep 18.	.00 ms (30001 pts)	
MSG			STATUS		

Plot 7-281. Conducted Spurious Plot (Bluetooth, 1Mbps - Ch. 0, ePA) - ANTO (N)



Plot 7-282. Conducted Spurious Plot (Bluetooth, 1Mbps - Ch. 0, ePA) - ANTO (N)

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Keysight Spectrum Analyzer - Swept SA				
LXI RL RF 50 Ω AC CORREC	SENSE:INT	ALIGN AUTO	06:55:41 PM Apr 28, 2021	Frequency
	T · D	#Avg Type: RMS	TRACE 1 2 3 4 5 6	Frequency
PNO: Fast	Trig: Free Run		DET P NNNN	
IFGain:Low	Atten: 36 dB			
		Mk	r1 6.239 6 GHz	Auto Tune
10 dB/div Ref 25.00 dBm			-31.85 dBm	
Log				
				Contor From
				CenterFreq
15.0				5.015000000 GHz
500				
				Start Freg
			DL1 -4.37 dBm	30 000000 MH-
-5.00				30.000000 WHZ
15.0				
-15.0				Stop Freq
				10.000000000 GHz
-25.0		\vdash		
		 		
		يباينه والمتحم والمتحد المحالمة والمح		CF Step
-35.0	The second s	The state of the design of the set of the se	an and a start of the second start of the	997.000000 MHz
	and the strength of the strength os strength of the strength os strength of the strength os strength o		A STATE OF THE REAL PROPERTY O	<u>Auto</u> Man
-45.0				
				Freg Offset
-55.0				0 Hz
				0112
65 D				
-03.0				Scole Trme
				Scale Type
				Log Lip
Start 30 MHz			Stop 10.000 GHz	
#Res BW 1.0 MHz #VI	BW 3.0 MHz	Sweep 18	.00 ms (30001 pts)	
MSG		STATUS		

Plot 7-283. Conducted Spurious Plot (Bluetooth, 1Mbps - Ch. 39, ePA) - ANTO (N)



Plot 7-284. Conducted Spurious Plot (Bluetooth, 1Mbps – Ch. 39, ePA) – ANTO (N)

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Plot 7-285. Conducted Spurious Plot (Bluetooth, 1Mbps - Ch. 78, ePA) - ANTO (N)



Plot 7-286. Conducted Spurious Plot (Bluetooth, 1Mbps – Ch. 78, ePA) – ANTO (N)

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🔤 Ke	ysight Spec	trum Ana	lyzer - Swe	ept SA										
L <mark>XI</mark> R	L	RF	50 Ω	AC	COR	REC	SEI	NSE:INT	#Ava Tvp	ALIGN AUTO e: RMS	04:56:03 P	M Jun 04, 2021	F	requency
				NFE	PN IFG	IO: Fast 🕞 Jain:Low	Trig: Free Atten: 26	e Run 6 dB			TY D			
10 di Loa	3/div	Ref 1	5.00 d	IBm						N	lkr1 4.80 -37.	4 3 GHz 51 dBm		Auto Tune
5.00													5.01	Center Freq 5000000 GHz
-5.00												DL1 -4.69 dBm		Start Fred
-15.0													3	0.000000 MHz
-25.0													10.00	Stop Freq
-35.0							•						10.00	00000000
-45.0		terre filester	a balance fo		attanı Attanı	an ing Pangang Pangang Pangang Pangang Pangang Pangang Pangang	ll _{enne} lle _{nen se} fert and	n fin ferensen at ferter Naar faktere statistische	a a da fa da	n an	anda harafan yang dalaman ^{Anda} harafan yang dalaman	r (terfeterer og skaler I de sjeleterer og skaler	99 <u>Auto</u>	CF Step 7.000000 MHz Man
-55.0	iline du mini													Freq Offset
-75.0														UHZ
														Scale Type
Star #Re	t 30 M s BW 1	Hz .0 MF	Iz			#VBW	3.0 MHz		s	weep 1	Stop 10 18.00 ms (3	.000 GHz 0001 pts)	Log	<u>Lin</u>
MSG										STAT	US			





Plot 7-288. Conducted Spurious Plot (Bluetooth, 1Mbps - Ch. 0, iPA) - ANTO (N)

FCC ID: A3LSMF711B	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
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🔤 Keysigl	ht Spectrur	n Analyzer -	Swept SA									
LXI RL		RF 5	0Ω AC	CORRE	C	SEN	ISE:INT	#Avg Tup	ALIGN AUT	0 04:57:11	PM Jun 04, 2021	Frequency
			NEE	PNO	Fast	Trig: Free	Run	#Avg iyp	e. RIVIS	т	YPE MWWWWW	
				IFGai	in:Low	Atten: 26	dB				DET PNNNNN	
										Mkr1 4.8	81 7 GHz	Auto Tune
10 dB/d	iv R	ef 15.0	0 dBm							-39	.30 dBm	
												Ocentes Eres
5.00												Center Freq
3.00												5.015000000 GHZ
5.00											DL1 -4.35 dBm	
-5.00												Start Freq
15.0												30.000000 MHz
10.0												
25.0												
-20.0												Stop Freq
25.0							1					10.00000000 GHz
-33.0						•						
45.0								1 10 1	u., 1	_		CF Step
-40.0		يتغريق وال	Durit Miller	1977 (Barriston) Barris	and a state of the	A CONTRACTOR OF	A subset of a s	adalar a sa dina dina ang	n in allena on in	and the second	Al het prochaineler	997.000000 MHz
-55 D	that the second second	in a state of the st	stantal <mark>A</mark> aratab	hikun (h) - H	angang (ang	فيحدد المرارين والأمرين	a in the addition of the	The subscription of the second s	ana jana, naj	المعتقم أحظم بالشر	and the first factor of the set	<u>Auto</u> Man
400	al and a second s	(1										
-65.0												Freq Offset
00.0												0 Hz
-75.0												
10.0												Scale Type
Start 3	0 MHz									Stop 1	0.000 GHz	Log <u>Lin</u>
#Res E	3W 1.0	₩Hz			#VBW	3.0 MHz		s	weep	18.00 ms i	(30001 pts)	
MSG									STA	TUS		

Plot 7-289. Conducted Spurious Plot (Bluetooth, 1Mbps - Ch. 39, iPA) - ANTO (N)



Plot 7-290. Conducted Spurious Plot (Bluetooth, 1Mbps - Ch. 39, iPA) - ANTO (N)

FCC ID: A3LSMF711B	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
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Plot 7-291. Conducted Spurious Plot (Bluetooth, 1Mbps - Ch. 78, iPA) - ANTO (N)



Plot 7-292. Conducted Spurious Plot (Bluetooth, 1Mbps – Ch. 78, iPA) – ANTO (N)

FCC ID: A3LSMF711B	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
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🔤 Kej	ysight Spec	trum An	alyzer - Swe	pt SA										
L <mark>XI</mark> R	L	RF	<u>50 Ω</u>	AC	CORREC		SEN	NSE:INT		ALIGN AUT	0 05:07:21 F	M Apr 28, 2021	Ere	
									#Avg Typ	e:RMS	TRA	CE 1 2 3 4 5 6	Fre	quency
					PNO: Fas	st 🖵 Tri	ig: Free	Run			יד			
_					IFGain:Lo	w At	tten: 36	6 dB						
										N	/kr1 6.90	2 3 GHz		Auto Tune
40.0		Dof 4	05 00 d	Dina							-31	68 dBm		_
Loa	3/019	Rei	20.00 u	ыш										
3								Ť						
													С	enter Freq
15.0													5.015	000000 GHz
														_
5.00														
														StartFreq
-5.00												DL1 -5.01 dBm	30.	000000 MHz
0.00														
-15.0														Stop Fred
														StopFreq
													10.000	000000 GHz
-25.0										1				
									🔶					
-35.0					1	- 1 L			and a state of the state of the	طريرالأ ليطعان	Catal Anna anna anna anna anna anna anna an	and the second second		CF Step
-55.6		1.4	والتو فأورين	for the second second	a a constantinitiana a s	A sub-	din tutu.	and the second secon	الألدية الدروالد والمسال	يتأريب محافظتهم	an a	and the second	997.	000000 MHz
	L. Lothell	finalisti a		No.			Contraction of the local data				and the strength		<u>Auto</u>	Man
-45.0	and an international													
													F	req Offset
-55.0														0 Hz
														0112
65.0														
-00.0														
														scale Type
													1.00	Lin
Star	t 30 M	ΤZ									Stop 10	0.000 GHz	Log	
#Re	s BW 1	.0 M	Hz		#	VBW 3.0	MHz		S	weep	18.00 ms (30001 pts)		
MSG										STA	TUS			





Plot 7-294. Conducted Spurious Plot (Bluetooth, 1Mbps - Ch. 0, ePA) - ANTO (Q)

FCC ID: A3LSMF711B	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
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Plot 7-295. Conducted Spurious Plot (Bluetooth, 1Mbps - Ch. 39, ePA) - ANTO (Q)



Plot 7-296. Conducted Spurious Plot (Bluetooth, 1Mbps - Ch. 39, ePA) - ANTO (Q)

FCC ID: A3LSMF711B	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
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🔤 Keysight Spe	ctrum Analyze	r - Swept SA										
LXI RL	RF	50 Ω AC	CORREC		SENSE:	INT	4	ALIGN AUT	0 05:10:01	PM Apr 28, 2021	En	aduancy
				- ·			#Avg Type	e:RMS	TRA	CE 1 2 3 4 5 6	FI	equency
			PNO: Fas	st 🖵 🛄	g: Free Ru	in				PER NNNNN		
			IFGain:Lo	w Al	ten. 36 dB							
								N	/lkr1 6.07	'4 5 GHz		Auto Tune
10 dBidiy	Ref 25	00 dBm							-32	.08 dBm		
Log	1101 201											
											-	optor From
15.0											, L	enter Freq
15.0											5.01	5000000 GHz
5.00												
												Start Freq
										DI 4 4 92 dBm	30	000000 MH-
-5.00										DET 14.00 dom	50	.000000 1411 12
.15.0												
-13.0												Stop Freq
											10.000	0000000 GHz
-25.0												
						\	, l					
				14.			أناط وروران الألور ومطو	وروبالد الشرو				CF Step
-35.0		ato interesting in the		Court Adda of	क्रा गर्म के जा		وأقلب ويصارف ويتد		a an	and the state of the	997	.000000 MHz
	particular and a second	And and the second s		and the states	in the second second				and the second states		Auto	Man
-45.0	and a state of the second											
											I	req Offset
-55.0												0 Hz
												0112
-65.0												
-03.0												
												Scale Type
											Log	Lin
start 30 lv	IHZ								Stop 1	U.UUU GHZ	209	<u></u>
#Res BW	1.0 MHz		#	VBW 3.0	MHZ		S	weep	18.00 ms (30001 pts)		
MSG								STA	TUS			

Plot 7-297. Conducted Spurious Plot (Bluetooth, 1Mbps - Ch. 78, ePA) - ANTO (Q)



Plot 7-298. Conducted Spurious Plot (Bluetooth, 1Mbps - Ch. 78, ePA) - ANTO (Q)

FCC ID: A3LSMF711B	Prouce to be part of element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
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🔤 Keys	ight Spectrur	n Analyzer - S	Swept SA										
LXU RL		RF 50	Ω AC	CORF	REC	SEI	NSE:INT	#Avg Typ	ALIGN AUT e: RMS	0 11:39:23 / TRA	M Jun 04, 2021 CE 1 2 3 4 5 6	F	requency
10 dB.	/div R	ef 20.00	NFE dBm	PN IFG	O: Fast ain:Low	Atten: 30	e Run) dB		ſ	Mkr1 7.85 -39	1 5 GHz 81 dBm		Auto Tune
10.0												(5.01	Center Freq 5000000 GHz
-10.0											DL1 -5.00 dBm	31	Start Freq 0.000000 MHz
-20.0 -												10.00	Stop Freq 0000000 GHz
-40.0 -	er ferferte fille fill	un juokod ja juga su	all and a		F Bengersonger Bengesseller, ge	ing part and part of the last	la godine fa se fo ^{nde} nom De selectore de la companya de la co	a Martin Martin Andres Ing	n far ferste som	A Mary Obligation of the second secon	(). State (). State ().	997 <u>Auto</u>	CF Step 7.000000 MHz Man
-60.0	(Dist Hills and Life												Freq Offset 0 Hz
-70.0	00 841											Log	Scale Type
start #Res	30 WHZ BW 1.0	MHz			#VBW	3.0 MHz		s	weep	Stop 10	30001 pts)	Log	<u> </u>
MSG 🤙	Points cl	nanged; a	II trace	s cleare	d				STA	TUS			

Plot 7-299. Conducted Spurious Plot (Bluetooth, 1Mbps - Ch. 0, iPA) - ANTO (Q)



Plot 7-300. Conducted Spurious Plot (Bluetooth, 1Mbps - Ch. 0, iPA) - ANTO (Q)

FCC ID: A3LSMF711B	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
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🔤 Keysight Spectrum Analyzer - Sv	vept SA									
XI RF 50 ⊆ Center Freq 5 0150	2 AC CO	RREC 7	SEN	ISE:INT	#Avg Type	ALIGN AUTO e: RMS	11:42:24 AM	MJun 04, 2021	Fi	requency
	NFE P	NO: Fast 😱 Gain:Low	Trig: Free Atten: 30	Run dB						Auto Tune
10 dB/div Ref 20.00	dBm			/	1	IVI	-40.	37 dBm		
10.0									5.01	Center Freq
0.00									0.01	
0.00								DL1 -4.09 dBm		Start Freq
-10.0									30	0.000000 MHz
-20.0										Stop Freq
-30.0									10.00	0000000 GHz
10.0						•				CF Step
	PERSONAL PROPERTY		and here we also	Andreastan Andreastan	n paga se ta ta ta ta ta sa	All have get the state	¹⁹ Mersey Mendedal	haller begang have filler	997 <u>Auto</u>	7.000000 MHz Man
-50.0 man little and land land			اللغر وسلافل ويحم النوح	יו יי ק				с. р. р. с. ст .		
-60.0										Freq Offset
70.0										UHZ
-70.0										Scale Type
Start 30 MHz							Stop 10	.000 GHz	Log	Lin
WRES BW 1.0 WHZ	traces clea	#VBW :	3.0 MHz		S	STATI	8.00 ms (3 s	0001 pts)		

Plot 7-301. Conducted Spurious Plot (Bluetooth, 1Mbps - Ch. 39, iPA) - ANTO (Q)



Plot 7-302. Conducted Spurious Plot (Bluetooth, 1Mbps - Ch. 39, iPA) - ANTO (Q)

FCC ID: A3LSMF711B	Prouce to be part of element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
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Keysight Spectrum	n Analyzer - Sw	ept SA										
L <mark>XI</mark> RL P	F 50 Ω	AC	CORREC		SENSE	:INT		ALIGN AUT	0 11:44:47	AM Jun 04, 2021	F	requency
				T			#Avg Typ	e:RMS	TR4		F	requeitcy
		NFE	PNO: Fast		g: Free R ten: 30 d	R B				ET P NNNN		
			IFGain:Lov	<u> </u>	uen. 00 u	0		_				
									Mkr1 6.65	0 1 GHz		Auto Tune
10 dB/div Re	ef 20.00 d	lBm							-40	.12 dBm		
					Y							
		1										Center Freq
10.0											5.01	5000000 GHz
											0.01	
0.00										DI 1 1 20 dBm		Start From
										DET -4103 GBM		StartFrey
-10.0											3	0.000000 MHz
20.0												
-20.0												Stop Freq
											10.00	00000000 GHz
-30.0												
							1					
40.0							•					CF Step
-40.0			الرجار ألمانا ألري ويلين	ale da la		الأرامة ويرازل	all of the second second	n ⁱⁿ tedarch	hard and the meater of the	ور والارداء ورجم بدراري	99	7.000000 MHz
	and the lot of	Abortania - Ta	دامليانيانيانيانير د يې	als, ordered	India de las sec	أأشيب الأخدر برغير	والمتحدار والمتقاطرون	Ali ini ina di hu	aller and a second second	يتعاطره وعلقات بالتعار	<u>Auto</u>	Man
-50.0 and all and a second				والمحالين والأكتار والك	, Lythe, dill had	a di u				W. 10,		
Detailure and detailed												
-60.0												Freq Offset
00.0												0 Hz
-70.0												
												Scale Type
Start 30 MHz									Stop 1	0.000 GHz	Log	Lin
#Res BW 1.0	MHz		#\	/BW 3.0	MHz		S	weep	18.00 ms (30001 pts)		
MSG Depints ch	anged all	traces	cleared					STA	TUS			

Plot 7-303. Conducted Spurious Plot (Bluetooth, 1Mbps - Ch. 78, iPA) - ANTO (Q)



Plot 7-304. Conducted Spurious Plot (Bluetooth, 1Mbps - Ch. 78, iPA) - ANTO (Q)

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🔤 Keysight	Spectrum An	alyzer - Swep	ot SA								
LXI RL	RF	50 Ω	AC CO	ORREC	S	ENSE:INT		ALIGN AUTO	07:45:41 P	M Apr 28, 2021	Frequency
					Taiau Ea	D	#Avg Typ	e:RMS	TRAC		riequency
				PNO: Fast (Atten: 3	BedB			D	PNNNN	
_				-Galli.LOW	744611. 4			_			Auto Tune
								IV	Kr1 6.39	0 2 GHZ	riaco i ano
10 dB/div	Ref	25.00 d	Bm						-32.	18 dBm	
											Center Freq
15.0											5.015000000 GHz
F 00											
5.00											Start From
											Startireq
-5.00										DL1 -4.67 dBm	30.000000 MHZ
15.0											
-13.0											Stop Freq
											10.00000000 GHz
-25.0											
							- I 🔶 '				
-35.0				All and a state	.	والكافر والمراجع والمراجع	الواحورية أجاد والعر	PRINTING STREET	L	and the set of the set	CF Step
	الافتر وروادور	and the states of		-	Contraction of the second s	ومعادياته ومناطلان والم	أأتا والمأد والتعر وأشرأا أقدر	and the second second	and the second secon	and a strength of the set	997.000000 MHz
used ^{an}	and a starting of the	a state of the state of the									<u>Auto</u> Man
-45.0	ister i fill										
											Erog Offect
-55.0											Frequiser
											0 Hz
05.0											
-65.0											Ocolo Trmo
											Scale Type
	DALL_								0 4		Log Lin
start 30	WHZ	_							Stop 10	.000 GHz	
#Res B)	AV 1.0 MI	HZ		#VB	W 3.0 MH	2	s	weep 1	8.00 ms (3	0001 pts)	
MSG								STATI	us		





Plot 7-306. Conducted Spurious Plot (Bluetooth, 1Mbps - Ch. 0, ePA) - ANT1 (N)

FCC ID: A3LSMF711B	Prouce to be part of element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
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Keysight Spectrum	Analyzer - Swept SA	1								
LX/RL R	F 50 Ω AC	CORREC	SEN	ISE:INT	#Ava Tvp	ALIGN AUTO	07:46:47 PI TRAC	4 Apr 28, 2021	Frequenc	cy
10 dB/div Re	f 25.00 dBn	PNO: Fast G	Trig: Free Atten: 36	e Run i dB		M	typ de (r1 7.10 -32.	D 1 GHz 19 dBm	Auto	Tune
15.0									Center 5.01500000	Freq 0 GHz
-5.00								DL1 -3.61 dBm	Start 30.000000	Freq 0 MHz
-15.0									Stop 10.00000000	Freq 0 GHz
-35.0					ty of the table part of the second			d <mark>arrada Narajan Darakanan.</mark> Katalah Sangaran Manada	CF 997.000000 <u>Auto</u>	Step D MHz Man
-45.0									Freq C) ffset 0 Hz
-65.0							Stop 40		Scale	Type Lin
#Res BW 1.0	MHz	#VBV	/ 3.0 MHz		s	weep 18	3.00 ms (3	0001 pts)	9	

Plot 7-307. Conducted Spurious Plot (Bluetooth, 1Mbps - Ch. 39, ePA) - ANT1 (N)



Plot 7-308. Conducted Spurious Plot (Bluetooth, 1Mbps – Ch. 39, ePA) – ANT1 (N)

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🔤 Kej	ysight Spec	trum A	nalyzer - Swe	ept SA									- C	
LX/ R	L	RF	50 Ω	AC	CORREC		SE	NSE:INT		ALIGN AUT	FO 07:48:03 F	M Apr 28, 2021	Erog	
								_	#Avg Typ	e:RMS	TRA	CE 123456	Freq	uency
					PNO:	Fast 🖵	Trig: Fre	e Run						
					IFGair	:Low	Atten: 3	6 dB						
											Mkr1 6.91	2 3 GHz	A	uto i une
10 45	Zaliu	Dof	25.00 6	Bm							-32	45 dBm		
Log	Siaiv	Kei	23.00 0											
								Ť					-	
													Ce	nter Freq
15.0													5.01500	00000 GHz
E 00														
5.00														tart From
												DL1 -2.80 dBm		laitriey
-5.00													30.00	00000 MHz
-15.0													S	top Frea
													40.0000	
25.0													10.00000	0000 GH2
-20.0										1				
									(05.04++
-35.0				(10	treal to the state	A DEAL	. laft ablack	فبالتلاء بالسوين وت	a sultanta pinahi siya	(Job Joseff) (g	Contraction of the second	and a second second second	007.00	CF Step
	I .	ر. الارتيان	المصحفا فالمراجع		and the state	Second Second	and a second second	المستحمسانية والم	and a strength of the other	ويرقعا وبالاقترار	And and a state of the second states	and the second states of the	997.00	DOODO MHZ
	Halashard	-	And a state of the state of the										Auto	Man
-45.0	ALC: ALC: NO.													
													_	
65 O													Fr	eq Offset
-35.0														0 Hz
-65.0														
													Sc	ale Type
Ctar	+ 30 M	47									Stop 4		Log	Lin
etal #De						#\/D\A/	2.0 MIL		-	woon	19 00 me (20001 nto		
#Re	SEW	.U IV	Inz			#VBW	3.0 WH2		5	weep	18.00 ms (-	suuu pisj		
MSC										CT.	ATUS			

Plot 7-309. Conducted Spurious Plot (Bluetooth, 1Mbps - Ch. 78, ePA) - ANT1 (N)



Plot 7-310. Conducted Spurious Plot (Bluetooth, 1Mbps - Ch. 78, ePA) - ANT1 (N)

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🔤 Kej	/sight Spec	trum Ar	nalyzer - Swe	ept SA									
L <mark>XI</mark> RI	L	RF	50 Ω	AC	CORREC		SEN	ISE:INT		ALIGN AUT	TO 06:19:02	2 PM Jun 04, 2021	Frequency
							- · -	_	#Avg Typ	e:RMS	TF	RACE 1 2 3 4 5 6	Frequency
				NFE	PNO: Fas	t 🖵	Atten: 30	dB				DET P NNNN	
					IFGalit:L0	w	Atten. 00	40		_			
											Mkr1 6.2	00 4 GHz	Auto Tulle
<u>10 dE</u>	3/div	Ref	20.00 c	IBm							-39	9.94 dBm	
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10.0													5.015000000 GHz
0.00													
0.00												DL1 -4.10 dBm	Start Fred
													30 000000 MH-
-10.0													30.00000 WHZ
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-50.0	and an Alberta	an far ar f	المريد المريدين	الأفراد المعام	haltes hi	بغايف الألك	أستالتك رحابا			n in lindstatis	the still south wall	li patrici del Chinistica di	
00.0	and a statistical di	فأذله ونامره	diana h										
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MSG										STA	ATUS		

Plot 7-311. Conducted Spurious Plot (Bluetooth, 1Mbps - Ch. 0, iPA) - ANT1 (N)



Plot 7-312. Conducted Spurious Plot (Bluetooth, 1Mbps - Ch. 0, iPA) - ANT1 (N)

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🔤 Keysight Spectrum Analyzer - Sv	vept SA							- 5 💌
Center Freq 5.0150	2 AC COR 00000 GH	REC	SENSE:INT	#Avg Typ	ALIGN AUTO e: RMS	11:42:24 A	MJun 04, 2021	Frequency
10 dB/div Ref 20.00	dBm	IO: Fast 😱 🗍 Gain:Low A	Atten: 30 dB		MI	kr1 7.72 -40.	2 5 GHz 37 dBm	Auto Tune
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-10.0							DL1 -4.09 dBm	Start Freq 30.000000 MHz
-20.0								Stop Freq 10.000000000 GHz
-40.0	pa new york the strength		Sama ang Kitipatèn Jawaka Sing Kangganang Kitipatèn Sing Katalan	and a second	1 Ningeroying Ningeroying	hanna an	Paulie (engany) (milit) at his pairi pairi dala sa	CF Step 997.000000 MHz <u>Auto</u> Man
-60.0								Freq Offset 0 Hz
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Start 30 MHz #Res BW 1.0 MHz	traces clear	#VBW 3.0	0 MHz	S	weep 18	Stop 10 3.00 ms (3	.000 GHz 0001 pts)	

Plot 7-313. Conducted Spurious Plot (Bluetooth, 1Mbps - Ch. 39, iPA) - ANT1 (N)



Plot 7-314. Conducted Spurious Plot (Bluetooth, 1Mbps - Ch. 39, iPA) - ANT1 (N)

FCC ID: A3LSMF711B	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
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🔤 Keysight Spe	ctrum Ana	lyzer - Swept S	A							_	- 6 - X -
LXI RL	RF	50 Ω A	C CORREC		SENSE:INT		ALIGN AUTO	11:44:47 A	M Jun 04, 2021	Erec	nuency
				Taia		#Avg Typ	e:RMS	TRAC		FIE	quency
		NFE	PNO: Fa	st 🖵 Ing Att	en: 30 dB			DI	PNNNN		
			II Galli.E	0w 710						4	Auto Tune
							IV	IKT 0.05			
10 dB/div	Ref 2	0.00 dBr	n					-40.			
- V9											
										Ce	enter Freq
10.0										5.0150	000000 GHz
0.00			_								
									DL1 -4.89 dBm		Start Freq
-10.0										30.0	00000 MHz
10.0											
-20.0											Stop Freq
										10.0000	000000 GHz
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no o Lutha	1 and 1 and	all book and	بالبالعألة إلاريغ لاسترقص	hale the second second	والأفلور الشناء وواوالا ورواور	أأرز تخذار وتحتقتهم أتعر	di printe di pri	ومتالك وشترو فألاقك	ومطاوره والمراجع	Auto	wan
-50.0 ###	فأنقصرا واطعمره	Hall Broker									
The state										FI	rea Offset
-60.0											0 4 7
											0112
-70.0											
										S	cale Type
Start 30 N	1Hz							Stop 10	.000 GHz	Log	Lin
#Res BW	1.0 MH	z	#	VBW 3.01	VIHz	6	weep 1	8.00 ms (3	0001 pts)		
MSG Doin	s chang	ed: all trac	es cleared				STAT	บร			





Plot 7-316. Conducted Spurious Plot (Bluetooth, 1Mbps - Ch. 78, iPA) - ANT1 (N)

FCC ID: A3LSMF711B	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
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Plot 7-317. Conducted Spurious Plot (Bluetooth, 1Mbps - Ch. 0, ePA) - ANT1 (Q)



Plot 7-318. Conducted Spurious Plot (Bluetooth, 1Mbps - Ch. 0, ePA) - ANT1 (Q)

FCC ID: A3LSMF711B	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	ING	Approved by: Technical Manager
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🔤 Kej	ysight Spec	trum An	alyzer - Swe	pt SA									
LXI R	L	RF	50 Ω	AC C	ORREC	SEI	NSE:INT		ALIGN AUT	0 05:55:53 P	M Apr 28, 2021	E.	ogu opov
							_	#Avg Typ	e:RMS	TRA	CE 1 2 3 4 5 6	FI	equency
					PNO: Fast 🔾	Trig: Free	Run			IY D			
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									N	/kr1 6.41	8 8 GHz		Auto Tune
10 di	⊃≀diu	Dof '	25 00 d	Bm						-32	49 dBm		
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5.00													
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45.0													
-15.0													Stop Freq
												10.00	0000000 GHz
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-35.0			. 6	A DESCRIPTION OF TAXABLE PARTY.	A CONTRACTOR OF THE	Contraction of the last	الوالعاليهم والإرجها	and an other states of the sta	and a starting	وفارهتهم بطلب والرجني	ang daga shaka ka	997	
		distant and	af far de de ser en en	AND A DESCRIPTION OF A	and the second line	C. A. Barriel	and the second second	and the second		Stable statistics and statistics	a new sector of the sector of	Auto	
45.0		أطعانه وبالاقاد	a a subsection of the second									<u>/(ato</u>	man
*40.0	No.												
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-55.0													req enser
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													Scale Type
Star	t 30 M	Hz								Stop 10	.000 GHz	Log	Lin
#Re	s BW 1	1.0 M	Hz		#VBV	/ 3.0 MHz		S	weep	18.00 ms (3	10001 pts)		
MSG									STA	105			

Plot 7-319. Conducted Spurious Plot (Bluetooth, 1Mbps - Ch. 39, ePA) - ANT1 (Q)



Plot 7-320. Conducted Spurious Plot (Bluetooth, 1Mbps - Ch. 39, ePA) - ANT1 (Q)

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🔤 Keys	sight Spect	rum Ana	lyzer - Swej	pt SA										
LXI RL		RF	50 Ω	AC	CORREC		SEN	ISE:INT		ALIGN AUT	O 05:57:00 P	M Apr 28, 2021	E.	roquepev
								_	#Avg Typ	e:RMS	TRAC	E 1 2 3 4 5 6	F	requency
					PNO: Fas	st 😱	Trig: Free	Run			IY D			
					IFGain:Lo	w	Atten: 36	dB			b			A
											Mkr1 3.68	8 7 GHz		Auto Tune
10 40	lalin	Dof 9	5 00 A	Bm							-32	02 dBm		
		RCI Z	J.00 u	5111										
5								Í						
														Center Freq
15.0 -													5.01	5000000 GHz
E 00														
5.00														Stort From
												DI 1 -2 91 dBm		StartFreq
-5.00													30	0.000000 MHz
-15.0														Stop Fred
													40.00	otopineq
05.0													10.00	0000000 GHZ
-25.0 -						1								
-35.0 -					a to a bitte in all	pet .		all and a state of the state of	and the second second	and a second	the ball the state of the state	La contraction of the second		CF Step
		ու դես	description.	a de la casa de la cas	-	all and a second	A	المسافية معاليها	in the second second second	ورياليكوا أتتمل	all the sector to be the	الأطالع الخرب وأنبع ومادل	997	7.000000 MHz
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-45.0	and a state of the second s													
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-65.0														
														Scale Type
														could type
Other st	00.041	1-									O tom 40		Log	Lin
Start	30 WI	Z									Stop 10	.000 GHZ	209	201
#Res	BW 1	.U MH	Z		#	ARM:	3.0 MHz		S	weep	18.00 ms (3	10001 pts)		
MSG										STA	TUS			

Plot 7-321. Conducted Spurious Plot (Bluetooth, 1Mbps - Ch. 78, ePA) - ANT1 (Q)



Plot 7-322. Conducted Spurious Plot (Bluetooth, 1Mbps - Ch. 78, ePA) - ANT1 (Q)

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🔤 Ke	ysight Spea	trum Ar	nalyzer - Sw	ept SA											- ¢ 🔀
L <mark>XI</mark> R	L	RF	50 Ω	AC	COR	REC	SEN	NSE:INT	#Avg Typ	ALIGN AUT	ro 11:1	9:33 AM Jun 04, 20	21	Fr	equency
				NFE	PN IFC	IO: Fast 🖵 Gain:Low	Trig: Free Atten: 30	e Run) dB	#AA8 JAb	e. KWI3			AW NN		
10 dE	3/div	Ref	20.00 (dBm							Mkr1 7	.667 0 GI 40.03 dB	lz m		Auto Tune
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-50.0 -60.0	alon albihil	ath calif	t _{el} terterte												Freq Offset 0 Hz
-70.0														Lon	Scale Type
Star #Re:	t 30 M sBW	HZ 1.0 <u>M</u>	Hz			#VBW	3.0 MHz		s	weep	Sto 18.00 <u> n</u>	p 10.000 GI 1s (3000 <u>1 p</u>	ts)	Log	LIN
MSG										STA	ATUS		~		

Plot 7-323. Conducted Spurious Plot (Bluetooth, 1Mbps - Ch. 0, iPA) - ANT1 (Q)



Plot 7-324. Conducted Spurious Plot (Bluetooth, 1Mbps - Ch. 0, iPA) - ANT1 (Q)

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Plot 7-325. Conducted Spurious Plot (Bluetooth, 1Mbps - Ch. 39, iPA) - ANT1 (Q)



Plot 7-326. Conducted Spurious Plot (Bluetooth, 1Mbps - Ch. 39, iPA) - ANT1 (Q)

FCC ID: A3LSMF711B	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
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🔤 Keysight Sp	ectrum Analy	zer - Swept SA									
LXIRL	RF	50 Ω AC	CORREC	SEI	NSE:INT		ALIGN AUT	0 11:21:56 /	AM Jun 04, 2021	Ε.	oguopov
				Talas Fas		#Avg Typ	e:RMS	TRA	CE 1 2 3 4 5 6	FI	equency
		NFE	PNO: Fast	Atten: 30	e Kun) dB				ET P NNNN		
			IFGain:Low	Atten. ot							Auto Tune
							N	NKr1 6.60	4 6 GHZ		Auto Tune
10 dB/div	Ref 20	1.00 dBm						-39	.71 dBm		
					Y						
										0	Center Freq
10.0										5.01	5000000 GHz
0.00									DL1 -3.77 dBm		Start Fred
										20	
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											StopFreq
										10.00	0000000 GHz
-30.0											
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-40.0						a Loath a star Loa	alla a chi n	4 11		007	
		الاطراط والملول والمراجع	Man Autor Constraint	all with part of the	(In the second	and the second second second	ערואי דע איירידי	in a final sector s	din with a second state of the second se	Auto	.000000 Minz Man
-so o a dreading	ALC: NO DECEMBER OF	ألتقعل وتقارب والم	ر بن الطلاط ال اسر سم. اندى	الاستانية، سيري الأقط	للأوراد أأأأوا حماقتي وا	المعاليدين وترافقهم بأ	الدادانين والثلطار	الطفاع ملقت سيطلق أقالك	أنفأ تشعلقته فتراشرهم	Auto	Marr
Ju 10/84	and the state of the second	'''''									
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											Scale Type
Start 30 N	MHz							Stop 10	0.000 GHz	Log	Lin
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								`		_	

Plot 7-327. Conducted Spurious Plot (Bluetooth, 1Mbps - Ch. 78, iPA) - ANT1 (Q)



Plot 7-328. Conducted Spurious Plot (Bluetooth, 1Mbps - Ch. 78, iPA) - ANT1 (Q)

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

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

Table 7-10. 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 7-11 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 7-11. 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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9. This device will be manufactured using two different WIFI chipsets (N and Q) and each chipset supports two configurations: one is with screen open, and one is with screen closed. Both configurations for each chipset are tested, and the worst case radiated emissions data is shown in this report.

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]
- $\circ \quad \text{Margin}_{[dB]} = \text{Field Strength Level}_{[dB\mu V/m]} \text{Limit}_{[dB\mu V/m]}$

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 hops/second = 7.50 ms
- Time to cycle through all channels = 7.50 x 20 channels = 150 ms
- Number of times transmitter hits on one channel = 100 ms / 150 ms = 1 time(s)
- Worst case dwell time = 7.5 ms
- \circ Duty cycle correction factor = 20log₁₀(7.5ms/100ms) = -22.5 dB

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











Plot 7-331. Radiated Spurious Plot above 1GHz (BT- Ch. 78) - OPEN (N)

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Plot 7-334. Radiated Spurious Plot above 1GHz (BT- Ch. 78) -- CLOSED (N)

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













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Plot 7-340. Radiated Spurious Plot above 1GHz (BT- Ch. 78) - CLOSED (Q)

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