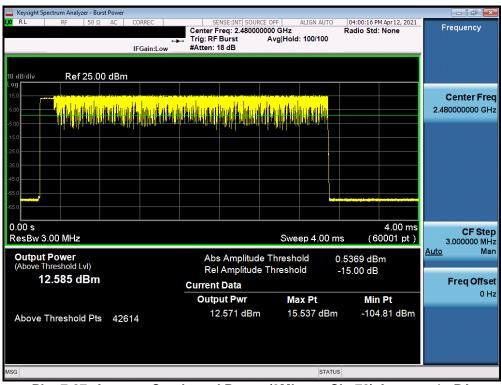


Keysight Spectrum Analyzer - Burst Power		
IXI RL RF 50 Ω AC CORREC	SENSE:INT SOURCE OFF ALIGN AUTO	03:59:46 PM Apr12, 2021 Radio Std: None Frequency
← IFGain:Low	Trig: RF Burst Avg Hold: 100/100 #Atten: 18 dB	
10 dB/div Ref 25.00 dBm		
		Center Freq
5.00	in the data cat and an otable index citized are de the data cat and an	2.441000000 GHz
-15.0		
-35.0		
-45.0		
-55.0		
-65.0		
0.00 s		4.00 ms CF Step
ResBw 3.00 MHz	Sweep 4.00	ms (60001 pt) 3.000000 MHz
Output Power (Above Threshold Lvl)	Abs Amplitude Threshold	1.848 dBm
13.827 dBm	Rel Amplitude Threshold	-15.00 dB Freq Offset
	Current Data Output Pwr Max Pt	Min Pt
	13.864 dBm 16.848 dBr	
Above Threshold Pts 42580		
MSG	STAT	rus

Plot 7-86. Average Conducted Power (3Mbps - Ch. 39) Antenna 1 ePA



Plot 7-87. Average Conducted Power (3Mbps – Ch. 78) Antenna 1 ePA

FCC ID: A3LSMF926B	PCTEST Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 50 of 05
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Keysight Spectrum Analyzer - Burst Power K K K K K K K K K K K K K K K K K K	SENSE:INT SOURCE OFF ALIGN AUT	08:18:37 AM Mar 29, 2021							
	Center Freq: 2.40200000 GHz Trig: RF Burst Avg Hold:>100/100	Radio Std: None	Frequency						
NFE Gain:Low									
10 dB/div Ref 25.00 dBm									
			Center Freq						
	an ha thalt a gu an talan an aile, an an amban an an an air an talan an talan an talan an talan an talan an ta		2.402000000 GHz						
	n terrational and the state of								
-15.0									
-35.0									
-45.0									
-55.0									
-65.0									
0.00 s		4.00 ms	CF Step						
ResBw 3.00 MHz	Sweep 4.00	· · · · · · · · · · · · · · · · · · ·	3.000000 MHz						
Output Power	Abs Amplitude Threshold	0.5135 dBm	<u>Auto</u> Man						
(Above Threshold Lvl) 12.646 dBm	Rel Amplitude Threshold Current Data	-15.00 dB	Erog Offect						
12.040 (12)		Freq Offset 0 Hz							
	Output Pwr Max Pt 12.642 dBm 15.513 dB	Min Pt m -105.39 dBm							
Above Threshold Pts 42637	12.642 dBm 15.513 dB	m -105.39 dBm							
MSG	SG STATUS								
			4 'DA						

Plot 7-88. Average Conducted Power (3Mbps - Ch. 0) Antenna 1 iPA



Plot 7-89. Average Conducted Power (3Mbps – Ch. 39) Antenna 1 iPA

FCC ID: A3LSMF926B	PCTEST Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Dage 60 of 05
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Even Keysight Spectrum Analyzer - Burst Power		
KX RL RF 50 Ω AC CORREC NFE IFGain:Low	SENSE:INT SOURCE OFF ALIGN AUTO Center Freq: 2.480000000 GHz Trig: RF Burst Avg Hold:>100/100 #Atten: 14 dB Avg Avg	08:19:15 AM Mar29, 2021 Radio Std: None Frequency
10 dB/div Ref 25.00 dBm		
	dala contra di social di canda da contra	2.48000000 GH
-150		
-550		
-65.0		4.00 ms
ResBw 3.00 MHz	Sweep 4.00 n	
Output Power (Above Threshold Lvi) 11.329 dBm		0.8574 dBm -15.00 dB Freq Offso
Above Threshold Pts 42638	Output Pwr Max Pt 11.339 dBm 14.143 dBm	Min Pt 0 ⊢ n -106.64 dBm
MSG	STATU	

Plot 7-90. Average Conducted Power (3Mbps - Ch. 78) Antenna 1 iPA

FCC ID: A3LSMF926B	Proud to be part of (e) element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Daga 61 of 05
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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.



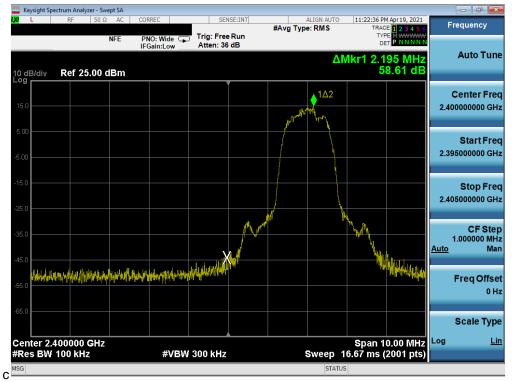
Figure 7-3. Test Instrument & Measurement Setup

Test Notes

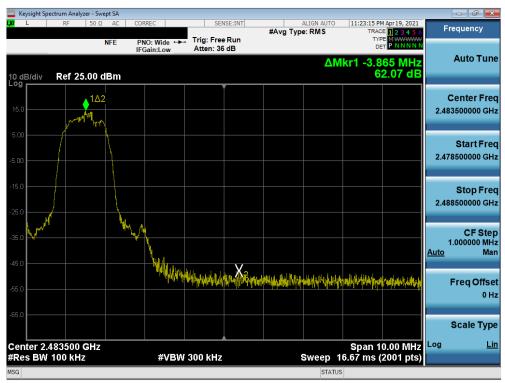
Out of band conducted spurious emissions at the band edge were investigated for all data rates in hopping and non-hopping modes. The worst case emissions were found with the EUT transmitting at 3 Mbps. Band edge emissions were also investigated with the EUT transmitting in all data rates. Plots of the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

FCC ID: A3LSMF926B	PCTEST Proud to be part of (® element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 62 of 05
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Plot 7-91. Band Edge Plot (Bluetooth with Hopping Disabled, 3 Mbps - Ch. 0) Antenna 0



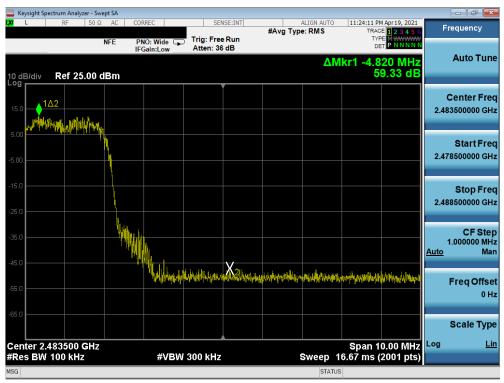
Plot 7-92. Band Edge Plot (Bluetooth with Hopping Disabled, 3 Mbps - Ch. 78) Antenna 0

FCC ID: A3LSMF926B	Proud to be part of (e) element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
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Keysight Spect	trum Analyzer - Swept SA							
LXI L	RF 50 Ω AC	CORREC	SENSE:	#Av	g Type: RMS		123456	Frequency
10 dB/div Log	NFE Ref 25.00 dBm	PNO: Wide G	Trig: Free Ro Atten: 36 dE		Δ	DET	^P NNNNN 85 MHz 0.49 dB	Auto Tune
15.0					1Δ2		HULW	Center Freq 2.400000000 GHz
-5.00								Start Freq 2.395000000 GHz
-15.0								Stop Freq 2.405000000 GHz
-35.0			X					CF Step 1.000000 MHz <u>Auto</u> Man
-55.0	selflowed from a device of the works	halaadd daarof yn arlana	nalmatina (pitan)	Nuh It. It.				Freq Offset 0 Hz
-65.0 Center 2.40 #Res BW 1		#VBW	300 kHz		Sween_1	Span 10 6.67 ms (2	200 IVII 12	Scale Type Log <u>Lin</u>
MSG		, v 2 v 4	0.00		STATUS		, (a)	

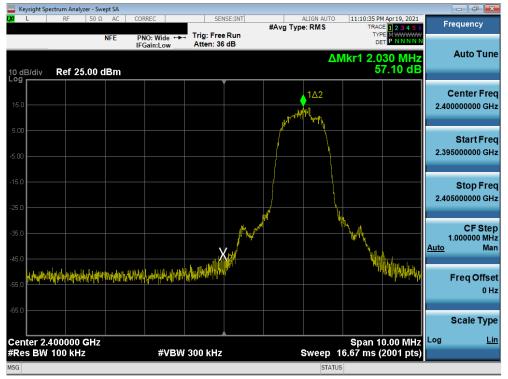




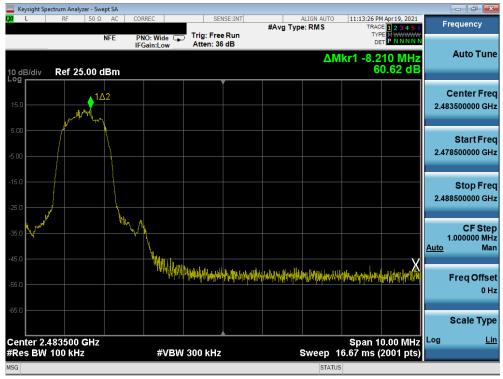
Plot 7-94. Band Edge Plot (Bluetooth with Hopping Enabled, 3 Mbps) Antenna 0

FCC ID: A3LSMF926B	Proud to be part of (6) element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Daga 64 at 05
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Plot 7-95. Band Edge Plot (Bluetooth with Hopping Disabled, 3 Mbps - Ch. 0) Antenna 1



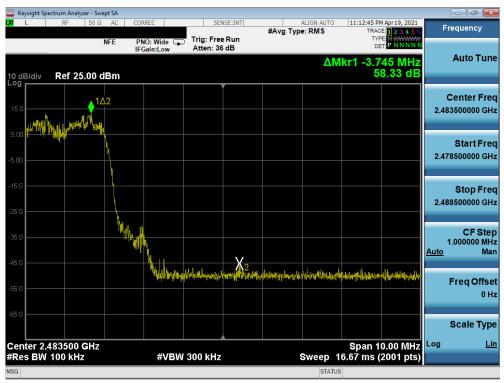
Plot 7-96. Band Edge Plot (Bluetooth with Hopping Disabled, 3 Mbps - Ch. 78) Antenna 1

FCC ID: A3LSMF926B	PCTEST*	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
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🔤 Keysight Sp	ectrum Analyzer - S										
LXI L	RF 50	Ω AC	CORREC		ISE:INT	#Avg Typ	ALIGN AUTO e: RMS	TRAC	Apr 19, 2021	Fre	quency
10 dB/div Log	Ref 25.00	NFE dBm	PNO: Wide	Trig: Free Atten: 36			Δ	DE //kr1 6.9	35 MHz 1.15 dB	,	Auto Tune
15.0							Millionalite	1	↓1∆2		enter Freq 000000 GHz
-5.00											Start Freq 000000 GHz
-15.0											Stop Freq 000000 GHz
-35.0					jiw [#]	Ψ				1.0 <u>Auto</u>	CF Step 000000 MHz Man
-55.0	pellunajinashi julua	p.la.o.	und desette Alender og er	nyudhillahai						F	req Offset 0 Hz
	400000 GH2	2						Span 1	0.00 MHz	S Log	cale Type <u>Lin</u>
#Res BW	100 kHz		#VBV	/ 300 kHz				6.67 ms (2001 pts)		
MSG							STATUS	5			

Plot 7-97. Band Edge Plot (Bluetooth with Hopping Enabled, 3 Mbps) Antenna 1



Plot 7-98. Band Edge Plot (Bluetooth with Hopping Enabled, 3 Mbps) Antenna 1

FCC ID: A3LSMF926B	Proud to be part of (6) element	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

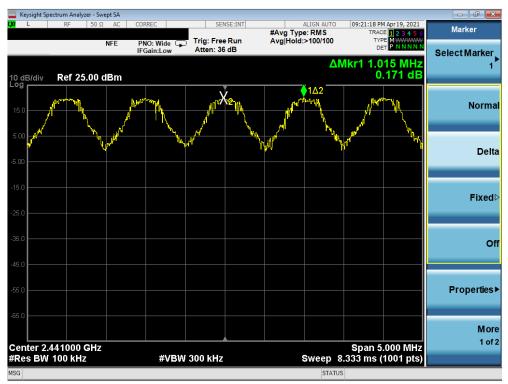
The EUT complies with the minimum channel separation requirement when it is operating in 1x/EDR mode using 79 channels and when operating in AFH mode using 20 channels.

FCC ID: A3LSMF926B	Proved to be part of (6) element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
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Frequency [MHz]	Data Rate [Mbps]	Mod.	Power Scheme	Channel No.	Min. Channel Separation [MHz]
2402	1.0	GFSK	ePA	0	0.576
2441	1.0	GFSK	ePA	39	0.624
2480	1.0	GFSK	ePA	78	0.620
2402	2.0	π/4-DQPSK	ePA	0	0.902
2441	41 2.0 π/4-DQPSK		ePA	39	0.895
2480	2.0	π/4-DQPSK	ePA	78	0.902
2402	3.0	8DPSK	ePA	0	0.888
2441	3.0	8DPSK	ePA	39	0.831
2480	3.0	8DPSK	ePA	78	0.876

Table 7-6. Minimum Channel Separation



Plot 7-99. Channel Spacing Plot (Bluetooth)

FCC ID: A3LSMF926B	PCTEST Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager	
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7.6 Time of Occupancy §15.247 (a.1.iii); RSS-247 [5.1(4)]

Test Overview and Limit

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

Test Procedure Used

ANSI C63.10-2013 - Section 7.8.4

Test Settings

- 1. Span = zero span, centered on a hopping channel
- 2. RBW \leq channel spacing and >> 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.



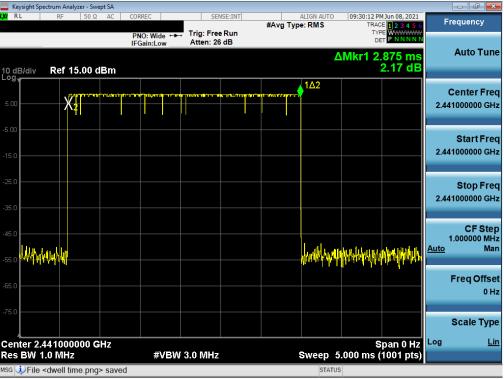
Figure 7-5. Test Instrument & Measurement Setup

Test Notes

None

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Plot 7-100. Time of Occupancy Plot (Bluetooth)

Bluetooth Time of Occupancy Calculation

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

- o 400ms x 79 hopping channels = 31.6 sec (Time of Occupancy Limit)
- Worst case BT has 266.67 hops/second (for 1x/EDR modes with DH5 operation)
- o 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 2.875 ms/channel = 306.68 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)
- o 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 2.875 ms/channel = 153.35 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

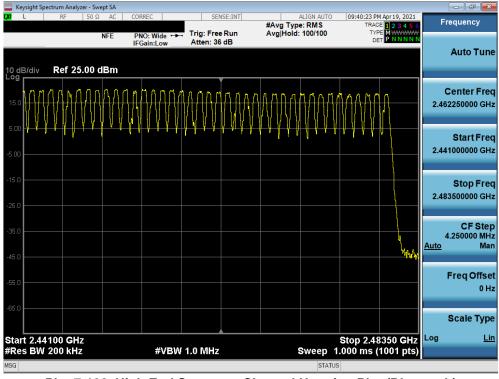
The frequency spectrum was broken up into two sub-ranges to clearly show all of the hopping frequencies. In AFH mode, this device operates using 20 channels so the requirement for minimum number of hopping channels is satisfied.

FCC ID: A3LSMF926B	PCTEST Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
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🔤 Keysight Sp	ectrum Analyzer - S								
L <mark>XI</mark> L	RF 50	Ω AC	CORREC	SEN	ISE:INT	#Avg Typ	ALIGN AUTO	09:39:35 PM Apr 19, 2021 TRACE 1 2 3 4 5	Frequency
		NFE	PNO: Wide ++ IFGain:Low	Trig: Free Atten: 36		Avg Hold		TYPE MWWWW DET PNNNN	Auto Tune
10 dB/div Log	Ref 25.00	dBm							Auto Tune
15.0									Center Freq 2.420500000 GHz
-5.00			• • • • • • • • • • • • • • • • • • •						Start Freq 2.400000000 GHz
-15.0									Stop Freq 2.441000000 GHz
-35.0 N									CF Step 4.100000 MHz <u>Auto</u> Man
-55.0									Freq Offset 0 Hz
Start 2.40	000 GHz							Stop 2.44100 GHz	Scale Type
#Res BW			#VBW	1.0 MHz				1.000 ms (1001 pts	
MSG							STATU	S	

Plot 7-101. Low End Spectrum Channel Hopping Plot (Bluetooth)



Plot 7-102. High End Spectrum Channel Hopping Plot (Bluetooth)

FCC ID: A3LSMF926B	Proud to be part of (6) element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
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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

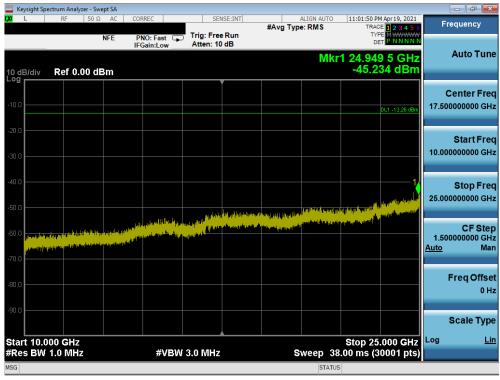
Out-of-band conducted spurious emissions were investigated for all data rates and the worst case emissions were found with the EUT transmitting at N/AMbps. The display line shown in the following plots is the limit at 20dB below the fundamental emission level measured in a 100kHz bandwidth. However, 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: A3LSMF926B	PCTEST Proud to be part of (6) element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
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🚾 Keysight Sp	ectrum Analyzer - Sv										
<mark>,ΧΙ</mark> L	RF 50 9		PNO: Fast	Trig: Free		#Avg Type	ERMS	TR/ T	PM Apr 19, 2021 ACE 1 2 3 4 5 6 YPE M WWWW	Freque	ncy
10 dB/div Log	Ref 25.00		FGain:Low	Atten: 36	dB		N)7 6 GHz 570 dBm	Aut	o Tune
15.0										Cent 5.015000	er Freq 000 GHz
-5.00									DL1 -12.69 dBm		Irt Freq 000 MHz
-15.0										Sto 10.000000	op Freq 000 GHz
-35.0	al part of the set of the set of the set	per program (all programs)	an fallana alamana	ta persona de contra de la contra En contra contra de la contra de l	ang ng sang ng sang ng sang ng sang sang	n - Chapter yn Harter yn yn Arder yn A Mae'r farfar yn Arder	e paparaliser () na na n	anan lagan tan talah sa	la sina a ana sina si	0 997.000 <u>Auto</u>	F Step 000 MHz Man
-45.0										Frec	Offset 0 Hz
-65.0 Start 30 M								Stop 1	0.000 GHz	Sca Log	le Type <u>Lin</u>
#Res BW	1.0 MHz		#VBW	3.0 MHz		S		18.00 ms (30001 pts)		
ISG							STA	105			

Plot 7-103. Conducted Spurious Plot (Bluetooth, 1Mbps – Ch. 0) Antenna 0

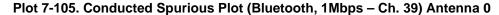


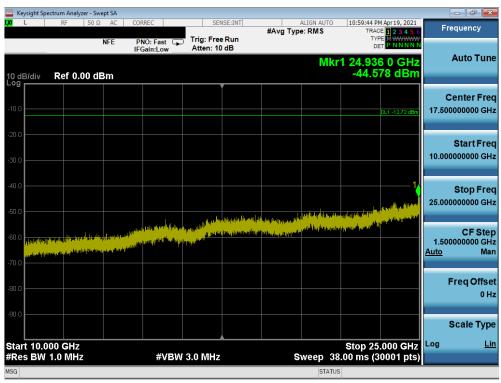
Plot 7-104. Conducted Spurious Plot (Bluetooth, 1Mbps - Ch. 0) Antenna 0

FCC ID: A3LSMF926B	PCTEST Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
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	ectrum Analyzer - S									
X <mark>I</mark> L	RF 50	Ω AC	CORREC			#Avg Typ	ALIGN AUTO e: RMS	TRAC	Apr 19, 2021 E 1 2 3 4 5 6 E M WWWW	Trace/Detector
		NFE	PNO: Fast G	Atten: 36			MI	ort 6.393		Select Trace
10 dB/div	Ref 25.00	dBm						-33.5	12 dBm	1
										Clear Write
15.0										
5.00										Trace Average
-5.00										Trace Average
15.0									DL1 -12.72 dBm	
-25.0										Max Hold
35.0						∮ ¹				
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-55.0										View Blank View
-65.0										
										More 1 of 3
Start 30 M #Res BW			#VBW	/ 3.0 MHz		S	weep <u>18</u>	Stop 10. 3.00 ms <u>(</u> 3	.000 GHz 0001 pts)	
ISG							STATUS	5		



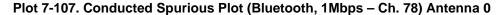


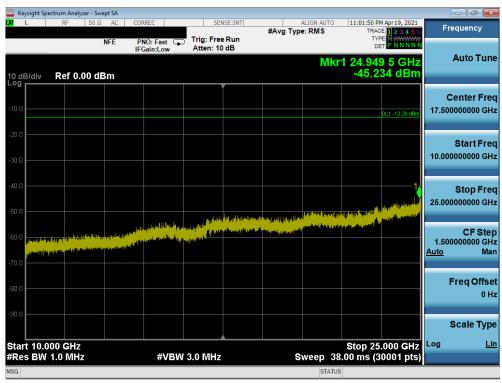
Plot 7-106. Conducted Spurious Plot (Bluetooth, 1Mbps – Ch. 39) Antenna 0

FCC ID: A3LSMF926B	PCTEST Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager	
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Keysight Spectrum Analyze										
L RF		PNO: Fast	Trig: Free		#Avg Type	ALIGN AUTO e: RMS	TRAC TYP	Apr 19, 2021 E 1 2 3 4 5 6 E M WWWWW	Freq	uency
10 dB/div Ref 25.	IF	Gain:Low	Atten: 36	dB		Μ	kr1 6.812	2 3 GHz 27 dBm	A	uto Tune
15.0										nter Freq 00000 GHz
-5.00										tart Freq 00000 MHz
-15.0								DL1 -13,26 dBm		top Freq 00000 GHz
-35.0	ligg for a state of the state o	in the state of th	t oggi blegger beregt fo 11. gans an det state fo	en lanen kenek	t minutepoper t minutepoper	a na ann an than a' thair Thurst a' the search of the	Parta Jay Sanca Jay Manga Jawa Kang Kasara	f ergenstet sek sek med f	997.00 <u>Auto</u>	CF Step 00000 MHz Man
-45.0									Fr	eq Offset 0 Hz
-65.0									Sc	ale Type
Start 30 MHz #Res BW 1.0 MHz		#VBW	3.0 MHz		s	weep 1	Stop 10. 8.00 ms (3	000 GHz 0001 pts)	209	
MSG						STATU				





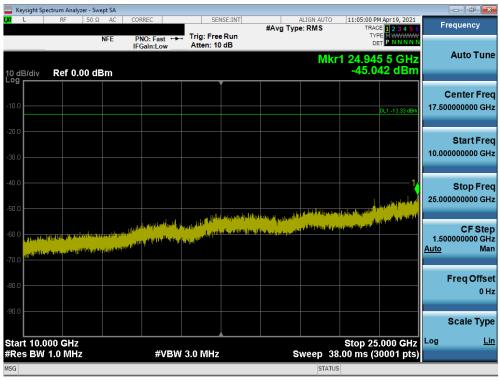
Plot 7-108. Conducted Spurious Plot (Bluetooth, 1Mbps – Ch. 78) Antenna 0

FCC ID: A3LSMF926B	PCTEST Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager	
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										×
LXI L RF 5	Ω AC	CORREC	_	SE:INT	#Avg Typ	ALIGN AUTO B:RMS	TRA	M Apr 19, 2021 CE 1 2 3 4 5 6 PE M WWWWW	Frequenc	;y
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10 dB/div Ref 25.0	0 dBm					N	/kr1 6.33 -34.1	3 7 GHz 35 dBm	Auto	rune
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15.0									5.01500000	0 GHz
5.00									Start	Freq
-5.00									30.00000	MHz
-15.0								DL1 -13.33 dBm	Stop	Frea
-25.0									10.00000000	
					♦ ¹				CF	Step
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-55.0									FreqO	offset 0 Hz
-65.0										
									Scale	Туре
Start 30 MHz #Res BW 1.0 MHz		#VBV	/ 3.0 MHz		S	weep	Stop 10 (18.00 ms)		Log	<u>Lin</u>
MSG						STA				

Plot 7-109. Conducted Spurious Plot (Bluetooth, 1Mbps - Ch. 0) Antenna 1

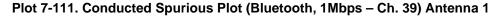


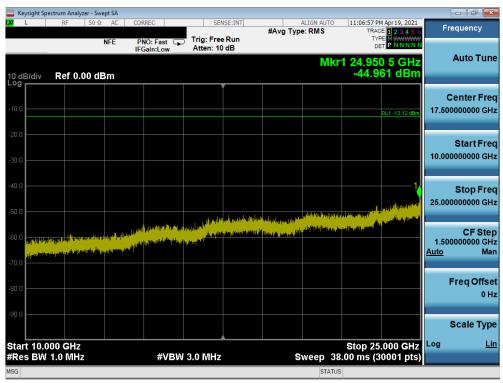
Plot 7-110. Conducted Spurious Plot (Bluetooth, 1Mbps - Ch. 0) Antenna 1

FCC ID: A3LSMF926B	PCTEST Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager	
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🔤 Keysight:	Spectrum Analyzer - S										×
LXI L	RF 50	Ω AC	CORREC		ISE:INT	#Avg Typ	ALIGN AUTO e: RMS	TRAC	Apr 19, 2021	Frequency	
		NFE	PNO: Fast ↔ IFGain:Low	Trig: Free Atten: 36				TYP			
							Μ	kr1 7.03	2 GHz	Auto Tu	ıne
10 dB/div Log	Ref 25.00	dBm						-34.1	16 dBm		
Ĭ										Center F	req
15.0										5.015000000	GHz
5.00											
5.00										Start Fi	
-5.00										30.000000 N	/Hz
									DL1 -13.12 dBm		
-15.0										Stop Fi 10.000000000	
-25.0										10.000000000	HZ
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at dation	Party and a party of the									Freq Off	set
-55.0) Hz
-65.0											
										Scale Ty	/pe
Start 30	MHz							Stop 10	.000 GHz	Log	<u>Lin</u>
	V 1.0 MHz		#VBV	/ 3.0 MHz		s	weep 1	8.00 ms (3			
MSG							STAT	US			



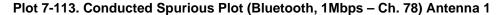


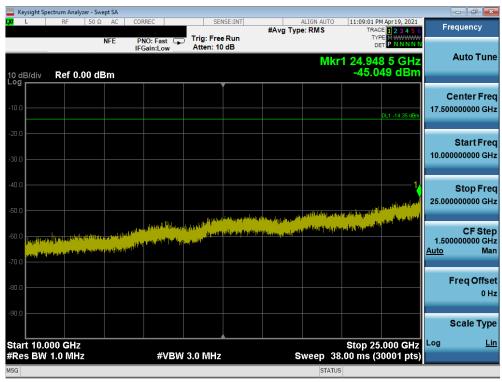
Plot 7-112. Conducted Spurious Plot (Bluetooth, 1Mbps – Ch. 39) Antenna 1

FCC ID: A3LSMF926B	PCTEST Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:	Dogo 70 of 05	
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	ectrum Analyzer - S										
LXI L	RF 50	Ω AC	CORREC	- · -		#Avg Typ	ALIGN AUTO e: RMS	TRAC	Apr19, 2021 E 1 2 3 4 5 6 E M WWWWW	Frequ	ency
10 dB/div	Ref 25.00	NFE) dBm	PNO: Fast IFGain:Low	Atten: 36			M	DE kr1 3.14		Au	to Tune
15.0											ter Freq 0000 GHz
-5.00											art Freq 0000 MHz
-15.0									DL1 -14.35 dBm	St 10.000000	op Freq 0000 GHz
-35.0	ار المراجع الم المسلح المراجع ا	teres a construction of the	Halipping Provide Antonia (1997) Antonia (1997) Antonia (1997) Antonia (1997) Antonia (1997)	tegyddagaeddylff Dagaellagaeddylff	a _n gan sin fèlene manangan délah	a statististististististististi	e i la fanji sereni s	an a	lay layon daga ken Kalan daga ken		CF Step 0000 MHz Man
-55.0	and the second sec									Fre	q Offset 0 Hz
-65.0 Start 30 M	ЛН7							Stop 10	000 GHz	Sca Log	ile Type <u>Lin</u>
#Res BW			#VBW	/ 3.0 MHz		s	weep 1	8.00 ms (3	0001 pts)		
MSG							STAT	US			





Plot 7-114. Conducted Spurious Plot (Bluetooth, 1Mbps – Ch. 78) Antenna 1

FCC ID: A3LSMF926B	PCTEST Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
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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 7-7 per Section 15.209 and RSS-Gen (8.9).

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

Table 7-7. 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 7-8 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 7-8. RBW as a Function of Frequency						

Test Setup

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

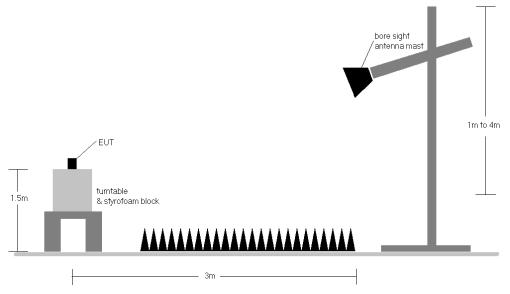


Figure 7-8. Radiated Test Setup >1GHz

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 7-7.
- 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 can operate in both open and closed case position configurations. Both configurations were tested, with open position being the worst case and all testing results are shown open position.

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

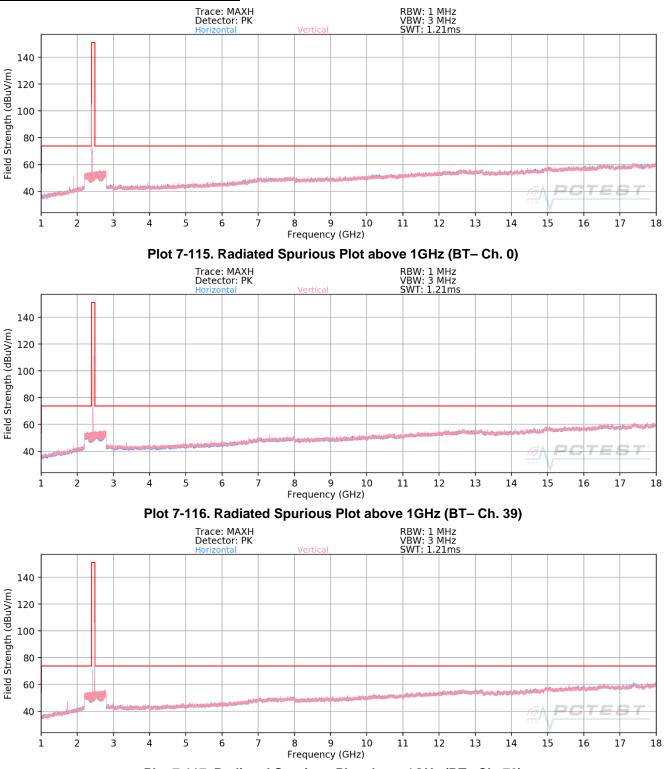
Duty Cycle Correction Factor Calculation

- 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
- 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]





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

Worst Case Mode:	Bluetooth
Worst Case Data Rate:	1 Mbps
Measurement Distance:	3 Meters
Operating Frequency:	2402MHz
Channel:	0

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Duty Cycle Correction [dB]	Strength	Limit [dBµV/m]	Margin [dB]
4804.00	Avg	Н	-	-	-72.35	3.24	0.00	37.89	53.98	-16.09
4804.00	Peak	Н	-	-	-71.05	3.24	0.00	39.19	73.98	-34.79
12010.00	Avg	Н	-	-	-83.09	14.94	0.00	38.85	53.98	-15.13
12010.00	Peak	Н	-	-	-73.83	14.94	0.00	48.11	73.98	-25.87

Table 7-9. Radiated Measurements

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	-	-	-80.37	3.65	0.00	30.28	53.98	-23.70
4882.00	Peak	Н	-	-	-71.38	3.65	0.00	39.27	73.98	-34.71
12205.00	Peak	Н	-	-	-75.42	13.67	0.00	45.25	73.98	-28.73

Table 7-10. Radiated Measurements

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

Bluetooth
1 Mbps
3 Meters
2480MHz
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	-	-	-81.23	4.40	0.00	30.17	53.98	-23.81
4960.00	Peak	Н	-	-	-71.69	4.40	0.00	39.71	73.98	-34.27
7440.00	Avg	Н	-	-	-80.98	8.90	0.00	34.92	53.98	-19.06
7440.00	Peak	Н	-	-	-72.73	8.90	0.00	43.17	73.98	-30.81
12400.00	Avg	Н	-	-	-82.07	13.41	0.00	38.34	53.98	-15.64
12400.00	Peak	Н	-	-	-74.20	13.41	0.00	46.21	73.98	-27.77

Table 7-11. Radiated Measurements

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

Bluetooth	
1 Mbps	
3 Meters	
2480MHz	
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	-	-	-81.72	4.40	0.00	29.68	53.98	-24.30
4960.00	Peak	Н	-	-	-73.30	4.40	0.00	38.10	73.98	-35.88
7440.00	Avg	Н	-	-	-83.36	8.90	0.00	32.54	53.98	-21.44
7440.00	Peak	Н	-	-	-74.75	8.90	0.00	41.15	73.98	-32.83
12400.00	Avg	Н	-	-	-85.38	13.41	0.00	35.03	53.98	-18.95
12400.00	Peak	Н	-	-	-76.92	13.41	0.00	43.49	73.98	-30.49

Table 7-12. Radiated Measurements with WCP

FCC ID: A3LSMF926B	PCTEST*	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
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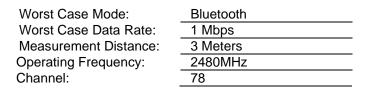


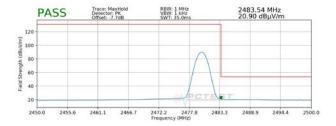
7.10 Radiated Restricted Band Edge Measurements §15.205 §15.209 §15.247 (d); RSS-Gen [8.9]

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

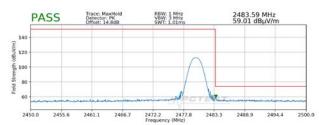
The amplitude offset shown in the following plots for average measurements was calculated using the formula:

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

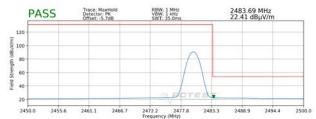




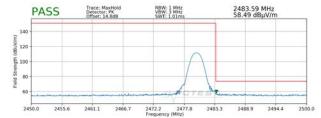
Plot 7-118. Radiated Restricted Upper Band Edge Measurement (Average)



Plot 7-119. Radiated Restricted Upper Band Edge Measurement (Peak)



Plot 7-120. Radiated Restricted Upper Band Edge Measurement with WCP (Average)



Plot 7-121. Radiated Restricted Upper Band Edge Measurement with WCP (Peak)

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7.11 Radiated Spurious Emissions Measurements – Below 1GHz §15.209; RSS-Gen [8.9]

Test Overview and Limit

All out of band radiated spurious emissions are measured with a spectrum analyzer connected to a receive antenna while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies. All data rates and modes were investigated for radiated spurious emissions. Only the radiated emissions of the configuration that produced the worst case emissions are reported in this section.

All out of band emissions appearing in a restricted band as specified in Section 15.205 of the Title 47 CFR and Table 6 of RSS-Gen (8.10) must not exceed the limits shown in Table 7-13 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 7-13. Radiated Limits

Test Procedures Used

ANSI C63.10-2013

Test Settings

Quasi-Peak Field Strength Measurements

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

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Test Setup

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

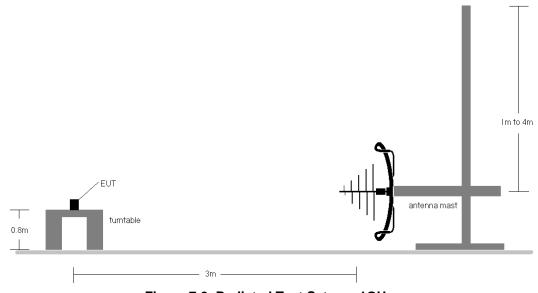


Figure 7-9. Radiated Test Setup < 1GHz

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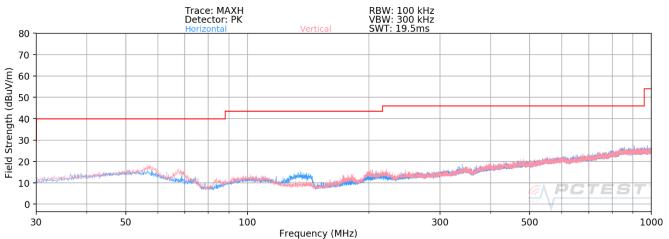
Test Notes

- 1. All emissions lying in restricted bands specified in §15.205 and RSS-Gen (8.10) are below the limit shown in Table 7-13.
- 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]



Plot 7-122. Radiated Spurious Plot below 1GHz

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]
68.87	Quasi-Peak	V	-	-	-74.38	-17.90	14.72	40.00	-25.28
108.82	Quasi-Peak	V	-	-	-74.50	-16.33	16.17	43.52	-27.35
208.31	Quasi-Peak	V	-	-	-74.09	-16.29	16.62	43.52	-26.90
266.66	Quasi-Peak	V	-	-	-76.46	-14.43	16.11	46.02	-29.91
382.57	Quasi-Peak	Н	-	-	-75.98	-11.43	19.59	46.02	-26.43
674.59	Quasi-Peak	V	-	-	-76.78	-6.22	24.00	46.02	-22.03

Table 7-14. Radiated Spurious Emissions Below 1GHz

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7.12 Line Conducted Measurement Data §15.207; RSS-Gen [8.8]

Test Overview and Limit

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

All conducted emissions must not exceed the limits shown in the table below, per Section 15.207 and RSS-Gen (8.8).

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

Table 7-15. Conducted Limits

*Decreases with the logarithm of the frequency.

Test Procedures Used

ANSI C63.10-2013, Section 6.2

Test Settings

Quasi-Peak Field Strength Measurements

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

Average Field Strength Measurements

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

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Test Setup

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

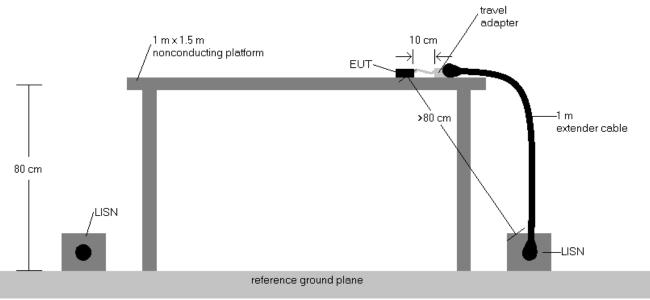


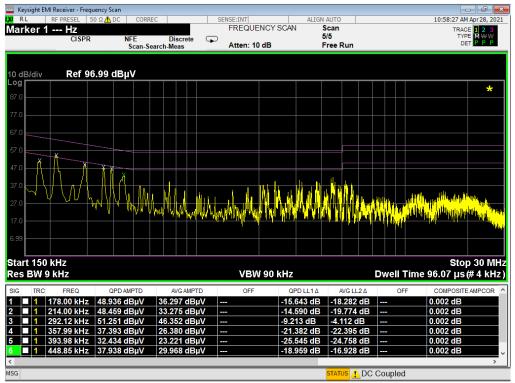
Figure 7-10. Test Instrument & Measurement Setup

Test Notes

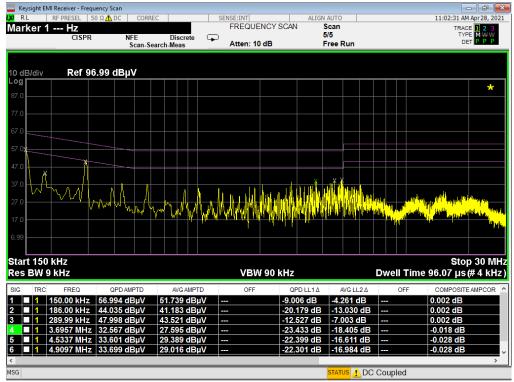
- 1. All modes of operation were investigated and the worst-case emissions are reported using mid channel. The emissions found were not affected by the choice of channel used during testing.
- 2. The limit for an intentional radiator from 150kHz to 30MHz are specified in 15.207 and RSS-Gen (8.8).
- 3. Corr. (dB) = Cable loss (dB) + LISN insertion factor (dB)
- 4. QP/AV Level (dB 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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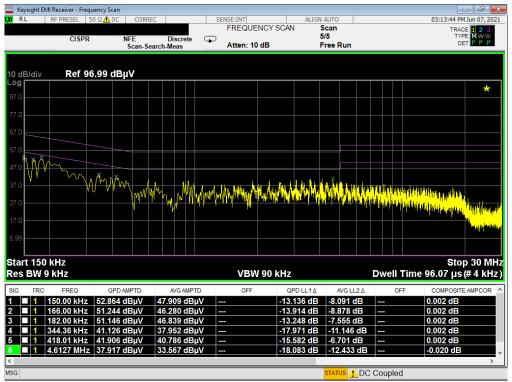
Plot 7-123. Line-Conducted Test Plot (L1)



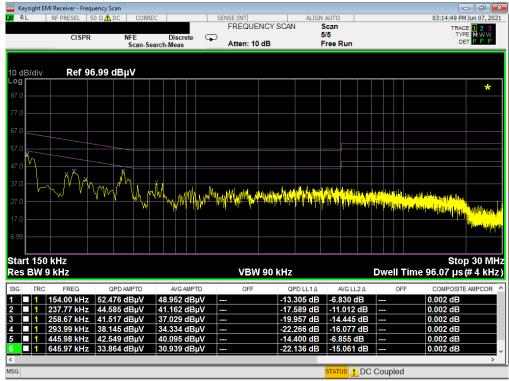
Plot 7-124. Line-Conducted Test Plot (N)

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Plot 7-54. Line-Conducted Test Plot (N) with WCP

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8.0 CONCLUSION

The data collected relate only to the item(s) tested and show that the **Samsung Portable Handset FCC ID: A3LSMF926B** is in compliance with Part 15 Subpart C (15.247) of the FCC Rules.

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