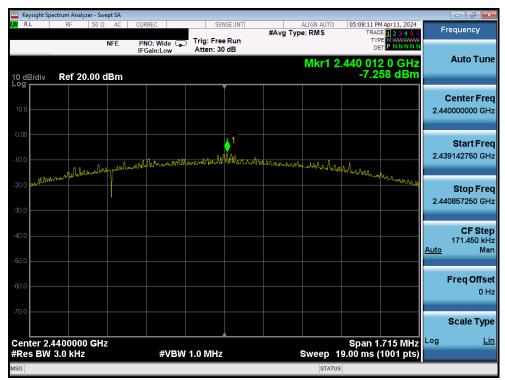


Keysight Spectrum Analyzer - Swept SA				- đ ×
KL RF 50Ω AC	CORREC SENSE:IN	ALIGN AUTO #Avg Type: RMS	05:01:51 PM Apr 11, 2024 TRACE 1 2 3 4 5 6	Frequency
NFE 10 dB/div Ref 20.00 dBm	PNO: Wide Trig: Free Run IFGain:Low Atten: 30 dB	Mkr1 2	2.402 010 3 GHz -7.380 dBm	Auto Tune
10.0				Center Freq 2.402000000 GHz
0.00 -10.0 -20.0 palline and hold a way walk	Marmon miller work Alther	Lin Maleranne Manhalada	mhrlishash mhra a	Start Freq 2.401140500 GHz
-20.0 ml//////				Stop Freq 2.402859500 GHz
-40.0				CF Step 171.900 kHz <u>Auto</u> Man
-60.0				Freq Offset 0 Hz
-70.0				Scale Type
Center 2.4020000 GHz #Res BW 3.0 kHz	#VBW 1.0 MHz	Sweep ′	Span 1.719 MHz 19.00 ms (1001 pts)	
MSG		STATU	s	

Plot 7-88. Power Spectral Density Plot (Bluetooth (LE), 2Mbps - Ch. 0) - Dual Ant2



Plot 7-89. Power Spectral Density Plot (Bluetooth (LE), 2Mbps - Ch. 19) - Dual Ant2

FCC ID: A3LNP940XMA		Approved by: Technical Manager	
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	ectrum Analyzer - Swe										
L <mark>XI</mark> RL	RF 50 Ω	AC	CORREC	SEN	SE:INT	#Avg Type	ALIGN AUTO e: RMS		Apr 11, 2024	Fr	equency
10 dB/div	Ref 20.00 c	NFE	PNO: Wide 🖵 IFGain:Low	Trig: Free Atten: 30			Mkr1 2	TYP DE .480 012			Auto Tune
10.0											Center Freq 0000000 GHz
-10.0	montalabramba	h for the former	withurnamitestit		1 Marianta	W WWWALLIMM	and the for the state of the second	holars halfman	դ _{ւս}	2.47	Start Freq 9139000 GHz
-20.0 m.////***										2.48	Stop Freq 0861000 GHz
-40.0										<u>Auto</u>	CF Step 172.200 kHz Man
-60.0											Freq Offset 0 Hz
-70.0								0	700 841	Log	Scale Type Lin
#Res BW	4800000 GHz 3.0 kHz	2	#VBW	1.0 MHz		ę	Sweep 1	span 1. 9.07 ms ('	722 MHz 1001 pts)	LUg	
MSG							STATUS				

Plot 7-90. Power Spectral Density Plot (Bluetooth (LE), 2Mbps - Ch. 39) - Dual Ant2

FCC ID: A3LNP940XMA		Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:	Dage 69 of 112
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7.5 Conducted Emissions at the Band Edge §15.247(d); RSS-247 [5.5]

Test Overview and Limit

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

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

Test Procedure Used

ANSI C63.10-2013 - Section 11.11.3

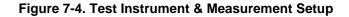
Test Settings

- 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.





Test Notes

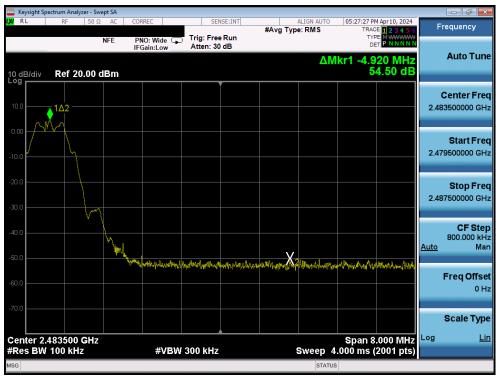
None

FCC ID: A3LNP940XMA		MEASUREMENT REPORT (CERTIFICATION)			
Test Report S/N:	Test Dates:	EUT Type:	Dama (0) (1440)		
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Keysight Spectrum Analyzer -							_			
🗶 RL RF 5	i0 Ω AC CO	RREC	SENSE	#	Avg Type	ERMS	TRAC	Apr 10, 2024	Fi	requency
10 dB/div Ref 20.0	IF	NO: Wide 😱 Gain:Low	Trig: Free R Atten: 30 d			ΔM	DE kr1 4.3	16 MHz 3.99 dB		Auto Tune
10.0						142				Center Freq 0000000 GHz
-10.0					j		5		2.39	Start Freq 6000000 GHz
-20.0					\sim		- Jun		2.40	Stop Freq 4000000 GHz
-40.0	the hard and the second se	upper for the state of the stat	https://hologlogica	when				have when the	<u>Auto</u>	CF Step 800.000 kHz Man
-60.0										Freq Offsel 0 Hz
										Scale Type
Center 2.400000 GH #Res BW 100 kHz	łz	#VBW	300 kHz		ę	Sweep 4.	Span 8 000 ms (1000 IVII 12	Log	Lin
MSG						STATUS				

Plot 7-91. Band Edge Plot (Bluetooth (LE), 125kbps - Ch. 0) - Ant1



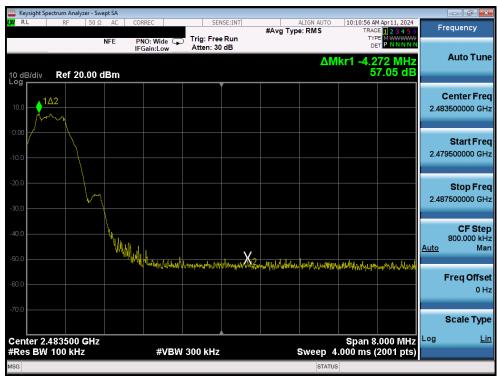
Plot 7-92. Band Edge Plot (Bluetooth (LE), 125kbps - Ch. 39) - Ant1

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Keysight Spectrum Analyzer - Swept					
LXI R.L R.F 50 Ω	AC CORREC	SENSE:INT	#Avg Type: RMS	10:04:36 AM Apr 11, 2024 TRACE 1 2 3 4 5 6	Frequency
10 dB/div Ref 20.00 dE	IFGain:Low	Frig: Free Run Atten: 30 dB	Δι	Mkr1 2.448 MHz 55.17 dB	Auto Tune
10.0			142		Center Freq 2.400000000 GHz
-10.0					Start Freq 2.396000000 GHz
-20.0			\sim		Stop Freq 2.404000000 GHz
-40.0 -50.0	enlite chamalelaneete X	Ruunnhumhu		Mallubla	CF Step 800.000 kHz <u>Auto</u> Man
-60.0					Freq Offset 0 Hz
					Scale Type
Center 2.400000 GHz #Res BW 100 kHz	#VBW 3	00 kHz	Sweep 4	Span 8.000 MHz .000 ms (2001 pts)	Log <u>Lin</u>
MSG			STATU	3	

Plot 7-93. Band Edge Plot (Bluetooth (LE), 500kbps - Ch. 0) - Ant1



Plot 7-94. Band Edge Plot (Bluetooth (LE), 500kbps - Ch. 39) - Ant1

FCC ID: A3LNP940XMA		Approved by: Technical Manager	
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Plot 7-95. Band Edge Plot (Bluetooth (LE), 1Mbps - Ch. 0) - Ant1



Plot 7-96. Band Edge Plot (Bluetooth (LE), 1Mbps - Ch. 39) - Ant1

FCC ID: A3LNP940XMA		Approved by: Technical Manager	
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Plot 7-97. Band Edge Plot (Bluetooth (LE), 2Mbps - Ch. 0) - Ant1



Plot 7-98. Band Edge Plot (Bluetooth (LE), 2Mbps - Ch. 39) - Ant1

FCC ID: A3LNP940XMA		Approved by: Technical Manager	
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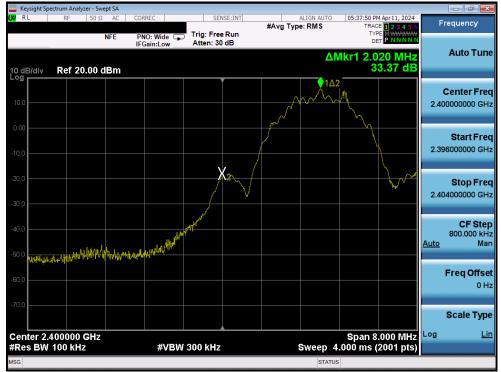
Plot 7-99. Band Edge Plot (Bluetooth (LE), 1Mbps - Ch. 0) - Ant2



Plot 7-100. Band Edge Plot (Bluetooth (LE), 1Mbps - Ch. 39) - Ant2

FCC ID: A3LNP940XMA		Approved by: Technical Manager	
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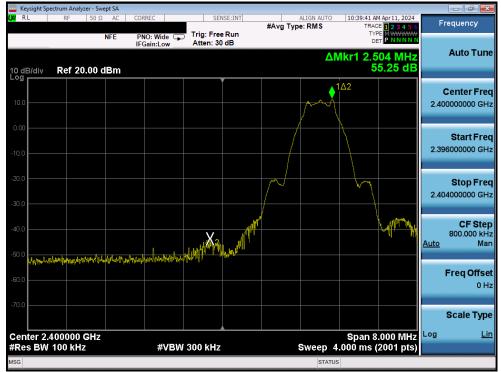
Plot 7-101. Band Edge Plot (Bluetooth (LE), 2Mbps - Ch. 0) - Ant2



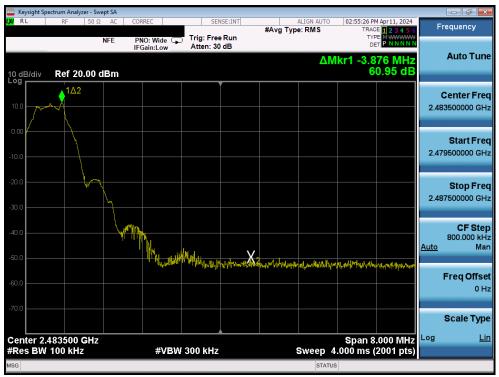
Plot 7-102. Band Edge Plot (Bluetooth (LE), 2Mbps - Ch. 39) - Ant2

FCC ID: A3LNP940XMA		Approved by: Technical Manager	
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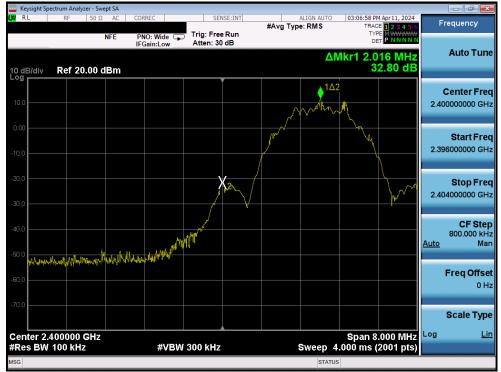
Plot 7-103. Band Edge Plot (Bluetooth (LE), 1Mbps – Ch. 0) – Dual Ant1



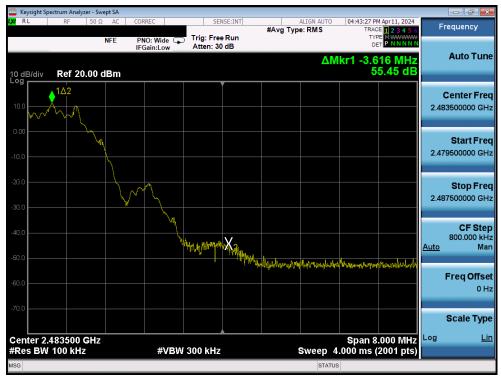
Plot 7-104. Band Edge Plot (Bluetooth (LE), 1Mbps - Ch. 39) - Dual Ant1

FCC ID: A3LNP940XMA		Approved by: Technical Manager	
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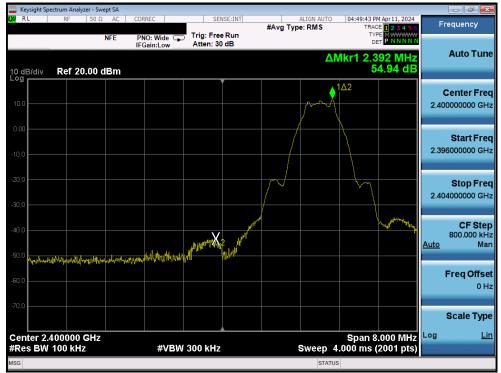
Plot 7-105. Band Edge Plot (Bluetooth (LE), 2Mbps – Ch. 0) – Dual Ant1



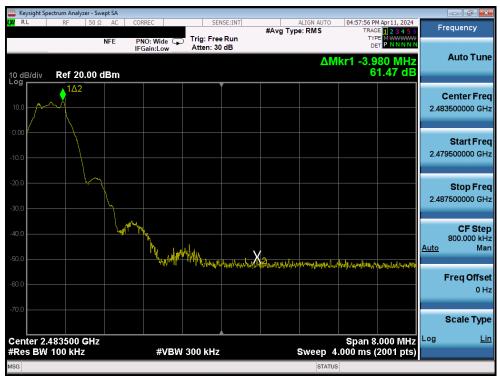
Plot 7-106. Band Edge Plot (Bluetooth (LE), 2Mbps - Ch. 39) - Dual Ant1

FCC ID: A3LNP940XMA		Approved by: Technical Manager	
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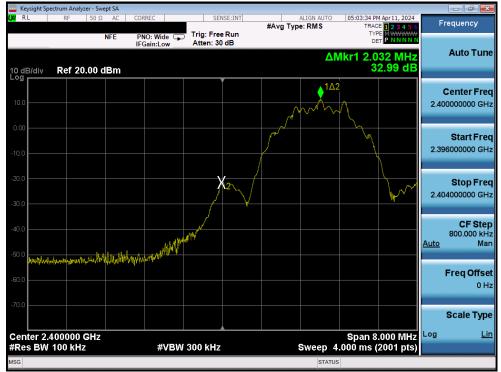
Plot 7-107. Band Edge Plot (Bluetooth (LE), 1Mbps – Ch. 0) – Dual Ant2



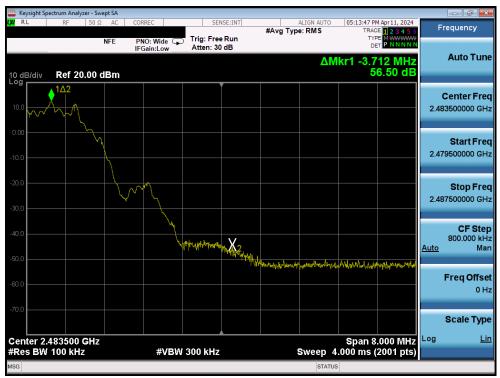
Plot 7-108. Band Edge Plot (Bluetooth (LE), 1Mbps – Ch. 39) – Dual Ant2

FCC ID: A3LNP940XMA	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
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Plot 7-109. Band Edge Plot (Bluetooth (LE), 2Mbps – Ch. 0) – Dual Ant2



Plot 7-110. Band Edge Plot (Bluetooth (LE), 2Mbps – Ch. 39) – Dual Ant2

FCC ID: A3LNP940XMA		Approved by: Technical Manager	
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7.6 Conducted Spurious Emissions §15.247(d); RSS-247 [5.5]

Test Overview and Limit

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

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

Test Procedure Used

ANSI C63.10-2013 – Section 11.11.3 Test Settings

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

Test Setup

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



Figure 7-5. Test Instrument & Measurement Setup

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Test Notes

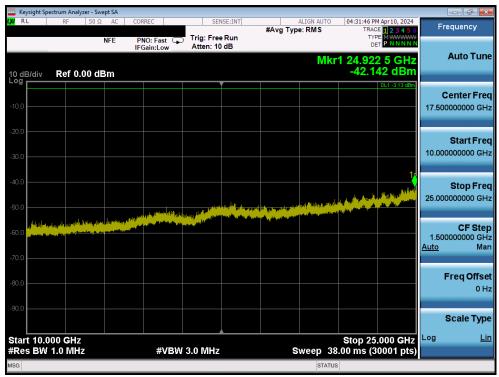
- 1. RBW was set to 1MHz rather than 100kHz in order to increase the measurement speed.
- The display line shown in the following plots denotes the limit at 20dB below the fundamental emission level measured in a 100kHz bandwidth. However, since the traces in the following plots are measured with a 1MHz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

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	ctrum Analyze										- 6 🛃
LXV RL	RF	50 Ω AC NFE	PN	IO: Fast	Trig: Fre		#Avg Typ	ALIGN AUTO e: RMS	TRA	PM Apr 10, 2024 ACE 1 2 3 4 5 6 YPE M WWWWWW DET P N N N N N	Frequency
10 dB/div	Ref 20.	00 dBm		Gain:Low _	Atten: 3	0 dB		M	lkr1 3.64	8 4 GHz .02 dBm	Auto Tun
10.0											Center Fre 5.015000000 GH
•10.00										DL1 -3.13 dBm	Start Fre 30.000000 M⊦
-20.0				1							Stop Fre 10.000000000 G⊢
40.0			a pina ani		i <mark>da ante ante da la dela da ante da la dela dela dela dela dela dela de</mark>		n talast til gild gan i sarling stransforma			lega lanas parte de la secono actor no la secono da la secono di Antorio	CF Ste 997.000000 M⊢ <u>Auto</u> Ma
60.0											Freq Offs 0 F
-70.0 Start 30 M									Stop 1	0.000 GHz	Scale Typ
#Res BW	1.0 MHz			#VB	W 3.0 MHz		8	stat		30001 pts)	

Plot 7-111. Conducted Spurious Plot (Bluetooth (LE), 1Mbps – Ch. 0) – Ant1



Plot 7-112. Conducted Spurious Plot (Bluetooth (LE), 1Mbps – Ch. 0) – Ant1

FCC ID: A3LNP940XMA		Approved by: Technical Manager	
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Keysight Spectrum Analyzer - Sw					- F ×
LXI RL RF 50 Ω	AC CORREC	SENSE:INT	ALIGN AUTO #Avg Type: RMS	04:35:12 PM Apr 10, 2024 TRACE 1 2 3 4 5 6	Frequency
	NFE PNO: Fast IFGain:Low	○ Trig: Free Run Atten: 30 dB	Mk		Auto Tune
10 dB/div Ref 20.00 d	dBm			-34.34 dBm	
10.0					Center Freq 5.015000000 GHz
-10.0				DL1 -2:23 dBm	Start Freq 30.000000 MHz
-20.0					Stop Freq
-30.0	4		لى مەلىرىكى بىلىرىكى		10.000000000 GHz
-40.0				and here proposed to a type of the face of the proposed for a prop	CF Step 997.000000 MHz <u>Auto</u> Man
-60.0					Freq Offset 0 Hz
-70.0					Scale Type
Start 30 MHz #Res BW 1.0 MHz	#VBW	/ 3.0 MHz	Sweep 18	Stop 10.000 GHz .00 ms (30001 pts)	Log <u>Lin</u>
MSG			STATUS		

Plot 7-113. Conducted Spurious Plot (Bluetooth (LE), 1Mbps – Ch. 19) – Ant1



Plot 7-114. Conducted Spurious Plot (Bluetooth (LE), 1Mbps - Ch. 19) - Ant1

FCC ID: A3LNP940XMA		Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:	
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	t Spectrum Analyze									e e e
L <mark>XI</mark> RL	RF	50 Ω AC	CORREC	SEN	NSE:INT	#Avg Typ	ALIGN AUTO e: RMS		M Apr 10, 2024	Frequency
		NFE	PNO: Fast IFGain:Low	Trig: Free Atten: 30		• //		DI		Auto Tun
10 dB/div	• Ref 20.	00 dBm					M	lkr1 6.62 -35.	4 8 GHz 03 dBm	
										Center Fre
10.0										5.015000000 GH
0.00									DL1 1.24 dBm	Start Fre
-10.0										30.000000 MH
-20.0										Oton Era
										Stop Fre 10.000000000 GH
-30.0			. ti.			• ¹	م يول ي			
-40.0	a thing is a factor of the second	deterative and the states	Angene of Africa (a. 1946) Angene of Africa (a. 1946)		and a state of the	an and other distant	r (ni serie a constante L'internet a constante	Hand Mittage Registration Mittage Means Registration	n sent gyner synsystem. Han Hyndrig an gyner yw gyner yw gyner yw gyner gyner gyner gyner gyner gyner gyner gyn	CF Ste 997.000000 MH
-50.0	and the particular of									<u>Auto</u> Ma
-60.0										Freq Offs
										0 H
-70.0										Scale Typ
Start 30								Stop 10	.000 GHz	Log <u>Li</u>
	W 1.0 MHz		#VBW	3.0 MHz		s		8.00 ms (3	0001 pts)	
MSG							STAT	US		

Plot 7-115. Conducted Spurious Plot (Bluetooth (LE), 1Mbps - Ch. 39) - Ant1

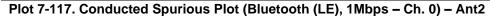


Plot 7-116. Conducted Spurious Plot (Bluetooth (LE), 1Mbps - Ch. 39) - Ant1

FCC ID: A3LNP940XMA		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
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	pectrum Analyz		4									d X
L <mark>XI</mark> RL	RF	50 Ω AC	C COF	RREC		NSE:INT	#Avg Typ	ALIGN AUTO e: RMS	TRA	M Apr 11, 2024	Freque	ency
		NFE	P	NO:Fast 🕞 Gain:Low	Trig: Free Atten: 30				TY D	PE M WWWWW ET P N N N N N		
10 dB/div	Bef 20	.00 dBn		Sumeon				MI	(r1 5.98 -34	7 4 GHz 88 dBm	Au	to Tune
	Kei Zu	.00 051				Ĩ						
10.0												er Fred
10.0											5.015000	000 GHz
0.00												
										DL1 -4.09 dBm		art Freq
-10.0											30.000	000 MHz
-20.0												
-20.0												op Freq
-30.0							1				10.000000	000 GH2
						مى الما م	المربية بمربعان ملا	lastantaris da		a state a		CF Step
-40.0		phone product	lipstics."		Mangashi guli Bash Mila sa saƙasari		and the second second second	(magnitude), stars,	a de la construction de la construc- La construcción de la construcción d	a secondaria considera. Mante da constante conse	997.000	
		And the second se									Auto	Man
-30.0											_	
-60.0											Free	Offset p 0 Hz
												0 112
-70.0											Sca	Іе Туре
Start 30				#\/D\/	V 3.0 MHz				Stop 10).000 GHz 30001 pts)	Log	Lin
#RES BW	V 1.0 MHz			#VBV	v o.u ivinz		5	statu		sooon pis)		
								STATU				





Plot 7-118. Conducted Spurious Plot (Bluetooth (LE), 1Mbps – Ch. 0) – Ant2

FCC ID: A3LNP940XMA		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
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🔤 Keysight Spectrum Analyzer - S									
LXI R.L RF 50	Ω AC CO	RREC	SEN	NSE:INT	#Avg Typ	ALIGN AUTO		M Apr 12, 2024	Frequency
	NFE P IF	NO: Fast 🖵 Gain:Low	Trig: Free Atten: 30				TYI Di		Auto Tune
10 dB/div Ref 20.00	dBm	1					kr1 6.67 -35.	59 dBm	
10.0									Center Freq 5.015000000 GHz
0.00									
0.00								DL1 -2.22 dBm	Start Freq
-10.0									30.000000 MHz
-20.0									Stop Freq
-30.0									10.00000000 GHz
-40.0		A Marine Property and	and the factors in the	Charles Services		ang ang tang tang tang tang tang tang ta	all a the source of the source	, estimated (contract	CF Step 997.000000 MHz
-40.0	and the second	a dalah manangka dalam sa	Name of Contract o			alma and a set	lain silling at a training of	and a set of the set of	<u>Auto</u> Man
-60.0									Freq Offset
									0 Hz
-70.0									Scale 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)	Log <u>Lin</u>
MSG						STATL			

Plot 7-119. Conducted Spurious Plot (Bluetooth (LE), 1Mbps – Ch. 19) – Ant2



Plot 7-120. Conducted Spurious Plot (Bluetooth (LE), 1Mbps - Ch. 19) - Ant2

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		m Analyzer										
L <mark>XI</mark> RL		RF 5	50Ω AC	COF	REC		NSE:INT	#Avg Typ	ALIGN AUTO e: RMS	TRA	M Apr 11, 2024	Frequency
10 dB/d	liv R	ef 20.0	NFE 10 dBm	IF	NO:Fast G Gain:Low	Trig: Fre Atten: 3			M	⊳ kr1 3.68	9 3 GHz 03 dBm	Auto Tune
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-10.0											DL1 -3.25 dBm	Start Freq 30.000000 MHz
-20.0 -					1							Stop Freq 10.000000000 GHz
-40.0	a land the			الي بالمالي الي المركز الم				a da se a popula Parta da secon		tal dama alek darikan Ing the constant ing	a the set of	CF Step 997.000000 MHz <u>Auto</u> Mar
-60.0 —												Freq Offset 0 Hz
-70.0												Scale Type
Start 3 #Res B					#VB۱	N 3.0 MHz		s	weep 1	Stop 10 8.00 ms (3	.000 GHz 30001 pts)	
MSG									STAT	us		

Plot 7-121. Conducted Spurious Plot (Bluetooth (LE), 1Mbps - Ch. 39) - Ant2



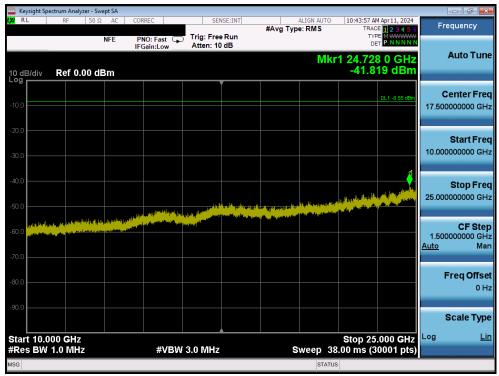
Plot 7-122. Conducted Spurious Plot (Bluetooth (LE), 1Mbps - Ch. 39) - Ant2

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	ght Spectrum												- 6 <mark>- x</mark>
l <mark>xi</mark> rl	R	F 50	Ω AC	COF	REC		SENSE:INT	#Avg Typ	ALIGN AUTO		AM Apr 11, 2024	Free	quency
			NFE	PI	NO:Fast Gain:Low		Free Run : 30 dB			T	YPE M WWWWW DET P NNNN		
				IFV	Jain.Low	711101			M	lkr1 3.65	59 1 GHz	A	luto Tune
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MSG									STAT	US			

Plot 7-123. Conducted Spurious Plot (Bluetooth (LE), 1Mbps - Ch. 0) - Dual Ant1



Plot 7-124. Conducted Spurious Plot (Bluetooth (LE), 1Mbps - Ch. 0) - Dual Ant1

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		n Analyzer - Sw		1						- P	x
L <mark>XI</mark> RL	F	RF 50 Ω		CORREC		#Avg Typ	ALIGN AUTO	TRA	M Apr 11, 2024 CE 1 2 3 4 5 6 PE M WWWW	Frequency	1
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-10.0									DL1 -8.85 dBm	Start F 30.000000	
-20.0							1_			Stop F 10.000000000	
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Plot 7-125. Conducted Spurious Plot (Bluetooth (LE), 1Mbps - Ch. 19) - Dual Ant1



Plot 7-126. Conducted Spurious Plot (Bluetooth (LE), 1Mbps - Ch. 19) - Dual Ant1

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	ight Spectru	ım Analyzer - Sw										- đ ×
L <mark>XI</mark> RL		RF 50 Ω		CORREC		ENSE:INT	#Avg Typ	ALIGN AUTO	TRAC	M Apr 11, 2024	Fre	quency
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0.00 -10.0										DL1 -8.61 dBm		Start Fred 000000 MHz
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-70.0												cale Type
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MSG								STAT				

Plot 7-127. Conducted Spurious Plot (Bluetooth (LE), 1Mbps - Ch. 39) - Dual Ant1



Plot 7-128. Conducted Spurious Plot (Bluetooth (LE), 1Mbps - Ch. 39) - Dual Ant1

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NFE PNO: Fast IFGain:Low Trig: Free Run Atten: 30 dB #Avg Type: RMS Trace IP 23 4 50 Trig: Free Run Atten: 30 dB Auto Tune 0 dB/div Ref 20.00 dBm Image: Ref 20.00 dBm Im				nalyzer - S										_	
Auto Tune Mkr1 3.648 8 GHz -35.05 dBm	l,XI R	L	RF	50 !	Ω AC	c co	RREC		SE	NSE:INT				Fr	equency
og Center Freq 00 Center Freq 000 Cui-324 den 000 Cii-324 den 00					NFE	F	PNO: Fas Gain:Lo	st 🖵 w					DET P NNNN		Auto Tune
100 1	10 dl Log	B/div	Ref	20.00	dBn	า						 -35	5.05 dBm		
0.00 0.01-324 dBm 0.01-324 dBm Start Freq 0.00 0.01-324 dBm 0.01-324 dBm Start Freq 0.00 0.01-324 dBm Start Freq 30.000000 MHz 0.00 0.01-324 dBm Start Freq 30.000000 MHz 0.00 0.01-324 dBm Start Freq 30.000000 GHz 0.00 0.01-324 dBm Start Freq 30.000000 GHz 0.00 0.01-324 dBm Start Freq 30.0000000 GHz 0.00 0.01-324 dBm Start Freq 30.0000000 GHz 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 <td></td>															
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70.0 CHz															Freq Offset
itart 30 MHz Stop 10.000 GHz															0 Hz
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Res BW 1.0 MHz #VBW 3.0 MHz Sweep 18.00 ms (30001 pts)												Stop 1	0.000 GHz		Lin
SG STATUS	#Re ^{MSG}	SBW	1.0 IV	IHZ			#	AB M	-3.0 MHz		s		(30001 pts)		

Plot 7-129. Conducted Spurious Plot (Bluetooth (LE), 1Mbps - Ch. 0) - Dual Ant2



Plot 7-130. Conducted Spurious Plot (Bluetooth (LE), 1Mbps - Ch. 0) - Dual Ant2

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	ht Spectrum													a X
L <mark>XI</mark> RL	F	F 5	ο <u>Ω</u> Α(C CC	RREC			NSE:INT	#Avg Typ	ALIGN AUTO	TRA	M Apr 11, 2024 CE 1 2 3 4 5 6	Frequen	су
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MSG										STA	TUS			

Plot 7-131. Conducted Spurious Plot (Bluetooth (LE), 1Mbps - Ch. 19) - Dual Ant2



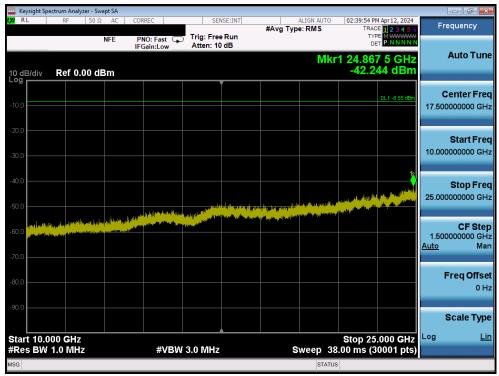
Plot 7-132. Conducted Spurious Plot (Bluetooth (LE), 1Mbps - Ch. 19) - Dual Ant2

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	ht Spectrum A												- đ ×
L <mark>XI</mark> RL	RF			CORREC			NSE:INT	#Avg Typ	ALIGN AUTO	TRA	PM Apr 12, 2024 CE 1 2 3 4 5 6	Fre	quency
10 dB/di	iv Ref	20.00 d	NFE IBM	PNO: IFGain	Fast 🕞	Trig: Fre Atten: 30			N	⊾ kr1 2.47	76 GHz 45 dBm		Auto Tune
10.0			♦ ¹										enter Freq 000000 GHz
-10.0											DL1 -8.55 dBm		Start Freq 000000 MHz
-20.0													Stop Fred 000000 GH:
-40.0								and an Andrew Arten wyra Ar		Non a Processing Const.		997.1 <u>Auto</u>	CF Step 000000 MH: Mar
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-70.0												s	cale Type
Start 3 #Res B	80 MHz 3W 1.0 N	1Hz			#VBW	3.0 MHz		s	weep 1	Stop 1 8.00 ms (0.000 GHz 30001 pts)	Log	Lir
MSG									STAT	US			

Plot 7-133. Conducted Spurious Plot (Bluetooth (LE), 1Mbps - Ch. 39) - Dual Ant2



Plot 7-134. Conducted Spurious Plot (Bluetooth (LE), 1Mbps - Ch. 39) - Dual Ant2

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

Test Overview and Limit

All out of band radiated spurious emissions are measured with a spectrum analyzer connected to a receive antenna while the EUT is operating at maximum power and at the appropriate frequencies. Only the radiated emissions of the configuration that produced the worst case emissions are reported in this section.

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

Frequency	Field Strength [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 7-12. Radiated Limits

Test Procedures Used

ANSI C63.10-2013 – Section 6.6.4.3

Test Settings

Average Field Strength Measurements

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

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Peak Field Strength Measurements

- 1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
- 2. RBW is set depending on measurement frequency, as specified in Table 7-13 below
- 3. VBW = 3MHz
- 4. Detector = peak
- 5. Sweep time = auto couple
- 6. Trace mode = max hold
- 7. Trace was allowed to stabilize

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

Table 7-13. RBW as a Function of Frequency

Test Setup

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

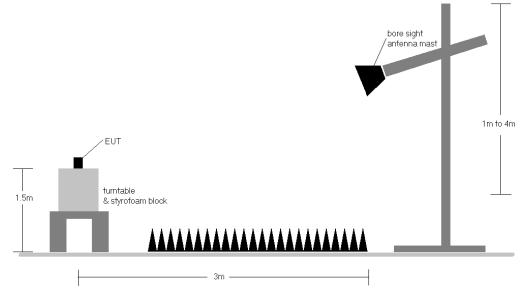


Figure 7-6. Radiated Test Setup >1GHz

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Test Notes

- 1. All radiated spurious emissions levels were measured in a radiated test setup.
- 2. All emissions lying in restricted bands specified in §15.205 and Section 8.10 of RSS-Gen are below the limit shown in Table 7-12.
- 3. The antenna is manipulated through typical positions, polarity and length during the tests. The EUT is manipulated through three orthogonal planes.
- 4. This unit was tested with its standard battery.
- 5. The spectrum is measured from 9kHz to the 10th harmonic of the fundamental frequency of the transmitter using CISPR quasi peak detector below 1GHz. Above 1 GHz, average and peak measurements were taken using linearly polarized horn antennas. The worst-case emissions are reported however emissions whose levels were not within 20dB of the respective limits were not reported.
- 6. Average measurements were recorded using a VBW of 3kHz, per Section 4.1.4.2.3 of ANSI C63.10-2013, since 1/T is equal to just under 3kHz. This method was used because the EUT could not be configured to operate with a duty cycle > 98%. Both average and peak measurements were made using a peak detector
- 7. Emissions below 18GHz were measured at a 3 meter test distance while emissions above 18GHz were measured at a 1 meter test distance with the application of a distance correction factor.
- 8. The "-" shown in the following RSE tables are used to denote a noise floor measurement.
- 9. No Emission was founded above 18GHz.

Sample Calculations

Determining Spurious Emissions Levels

- Field Strength Level [dBμV/m] = Analyzer Level [dBm] + 107 + AFCL [dB/m]
- AFCL [dB/m] = Antenna Factor [dB/m] + Cable Loss [dB]
- Margin [dB] = Field Strength Level $[dB\mu V/m]$ Limit $[dB\mu V/m]$

Radiated Band Edge Measurement Offset

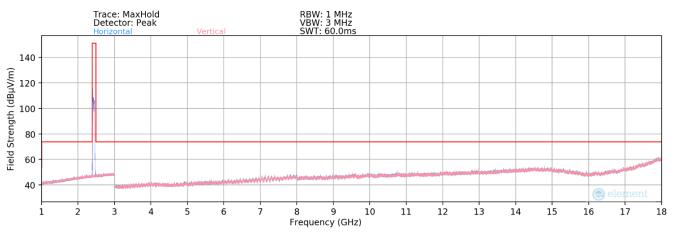
• The amplitude offset shown in the radiated restricted band edge plots in Section 7.8 was calculated using the formula:

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

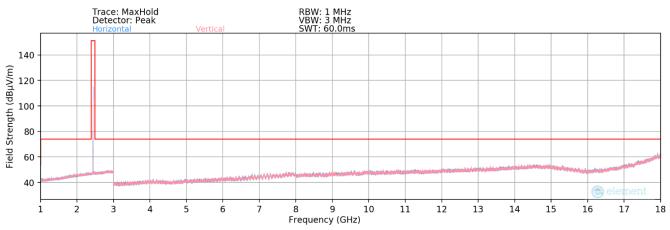
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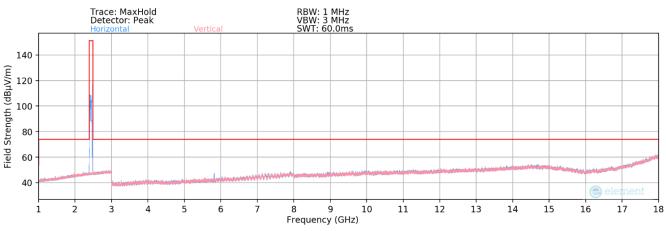
Radiated Spurious Emission Measurements – Ant1 §15.205 §15.209 §15.247(d); RSS-Gen [8.9]













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

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

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
4804.00	Avg	Н	-	-	-76.43	0.13	30.70	53.98	-23.28
4804.00	Peak	н	-	-	-65.16	0.13	41.97	73.98	-32.01
12010.00	Avg	н	-	-	-81.34	12.88	38.54	53.98	-15.44
12010.00	Peak	н	-	-	-69.65	12.88	50.23	73.98	-23.75

 Table 7-14. Radiated Measurements – Ant1

Bluetooth Mode:LEDistance of Measurements:3 MetersOperating Frequency:2440MHzChannel:19

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
4880.00	Avg	Н	-	-	-76.38	0.34	30.96	53.98	-23.02
4880.00	Peak	н	-	-	-64.63	0.34	42.71	73.98	-31.27
7320.00	Avg	н	-	-	-77.41	6.00	35.59	53.98	-18.39
7320.00	Peak	н	-	-	-66.23	6.00	46.77	73.98	-27.21
12200.00	Avg	н	-	-	-80.19	12.77	39.58	53.98	-14.40
12200.00	Peak	н	-	-	-68.60	12.77	51.17	73.98	-22.81

Table 7-15. Radiated Measurements – Ant1

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

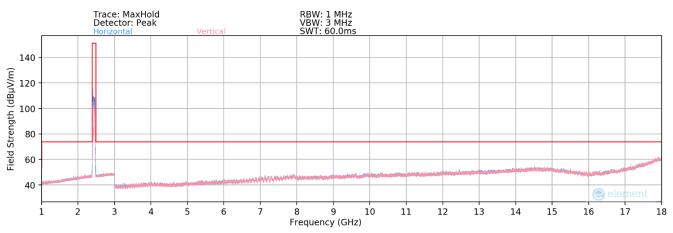
Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
4960.00	Avg	н	-	-	-76.49	1.41	31.92	53.98	-22.06
4960.00	Peak	н	-	-	-64.72	1.41	43.69	73.98	-30.29
7440.00	Avg	н	-	-	-77.48	6.20	35.72	53.98	-18.26
7440.00	Peak	н	-	-	-66.36	6.20	46.84	73.98	-27.14
12400.00	Avg	Н	-	-	-80.89	13.37	39.48	53.98	-14.50
12400.00	Peak	н	-	-	-68.94	13.37	51.43	73.98	-22.55

Table 7-16. Radiated Measurements – Ant1

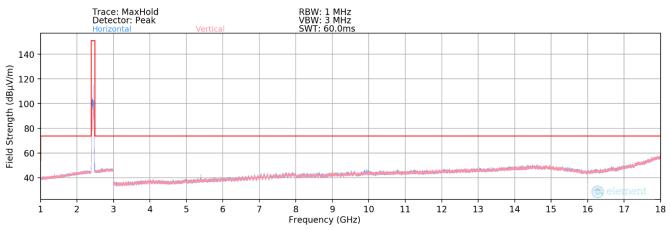
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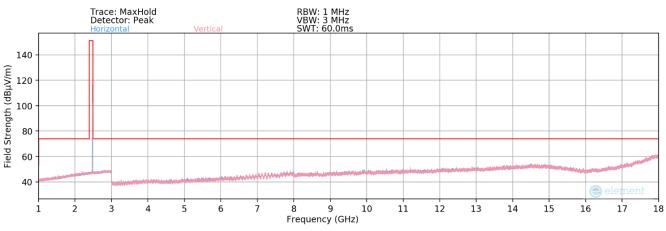
Radiated Spurious Emission Measurements – Ant2 §15.205 §15.209 §15.247(d); RSS-Gen [8.9]













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Radiated Spurious Emission Measurements – Ant2 §15.205 §15.209 §15.247(d); RSS-Gen [8.9]

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

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
4804.00	Avg	н	-	-	-76.65	0.13	30.48	53.98	-23.50
4804.00	Peak	н	-	-	-65.24	0.13	41.89	73.98	-32.09
12010.00	Avg	н	-	-	-80.29	12.88	39.59	53.98	-14.39
12010.00	Peak	н	-	-	-69.35	12.88	50.53	73.98	-23.45

 Table 7-17. Radiated Measurements – Ant2

Bluetooth Mode:LEDistance of Measurements:3 MetersOperating Frequency:2440MHzChannel:19

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
4880.00	Avg	н	-	-	-76.18	0.34	31.16	53.98	-22.82
4880.00	Peak	н	-	-	-64.27	0.34	43.07	73.98	-30.91
7320.00	Avg	н	-	-	-77.38	6.00	35.62	53.98	-18.36
7320.00	Peak	н	-	-	-66.32	6.00	46.68	73.98	-27.30
12200.00	Avg	Н	-	-	-80.23	12.77	39.54	53.98	-14.44
12200.00	Peak	н	-	-	-68.75	12.77	51.02	73.98	-22.96

Table 7-18. Radiated Measurements – Ant2

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

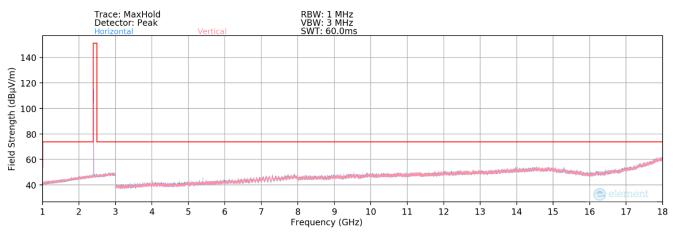
Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
4960.00	Avg	Н	-	-	-76.85	1.41	31.56	53.98	-22.42
4960.00	Peak	н	-	-	-65.74	1.41	42.67	73.98	-31.31
7440.00	Avg	н	-	-	-77.51	6.20	35.69	53.98	-18.29
7440.00	Peak	н	-	-	-66.41	6.20	46.79	73.98	-27.19
12400.00	Avg	Н	-	-	-81.05	13.37	39.32	53.98	-14.66
12400.00	Peak	Н	-	-	-68.68	13.37	51.69	73.98	-22.29

Table 7-19. Radiated Measurements – Ant2

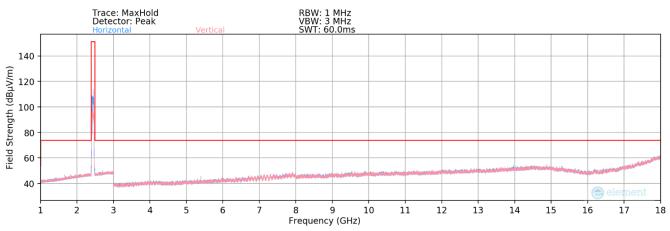
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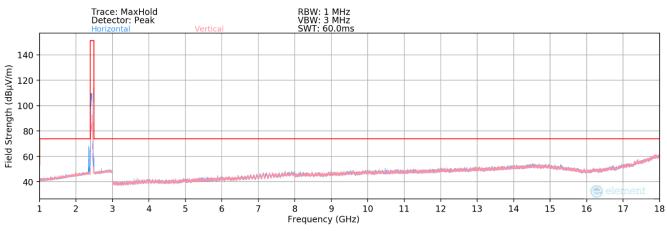
Radiated Spurious Emission Measurements – Dual §15.205 §15.209 §15.247(d); RSS-Gen [8.9]













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

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

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
4804.00	Avg	н	-	-	-76.58	0.13	30.55	53.98	-23.43
4804.00	Peak	н	-	-	-64.79	0.13	42.34	73.98	-31.64
12010.00	Avg	н	-	-	-81.04	12.88	38.84	53.98	-15.14
12010.00	Peak	н	-	-	-70.03	12.88	49.85	73.98	-24.13

Table 7-20. Radiated Measurements – Dual

Bluetooth Mode:LEDistance of Measurements:3 MetersOperating Frequency:2440MHzChannel:19

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
4880.00	Avg	н	-	-	-76.27	0.34	31.07	53.98	-22.91
4880.00	Peak	н	-	-	-64.59	0.34	42.75	73.98	-31.23
7320.00	Avg	н	-	-	-77.41	6.00	35.59	53.98	-18.39
7320.00	Peak	н	-	-	-66.59	6.00	46.41	73.98	-27.57
12200.00	Avg	н	-	-	-80.57	12.77	39.20	53.98	-14.78
12200.00	Peak	н	-	-	-68.94	12.77	50.83	73.98	-23.15

Table 7-21. Radiated Measurements – Dual

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

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
4960.00	Avg	н	-	-	-76.12	1.41	32.29	53.98	-21.69
4960.00	Peak	н	-	-	-65.42	1.41	42.99	73.98	-30.99
7440.00	Avg	н	-	-	-77.68	6.20	35.52	53.98	-18.46
7440.00	Peak	н	-	-	-66.73	6.20	46.47	73.98	-27.51
12400.00	Avg	Н	-	-	-80.98	13.37	39.39	53.98	-14.59
12400.00	Peak	Н	-	-	-68.74	13.37	51.63	73.98	-22.35

Table 7-22. Radiated Measurements – Dual

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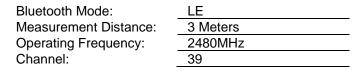


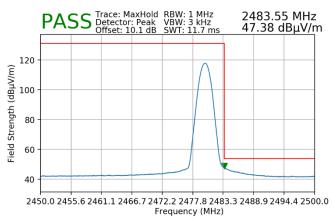
7.8 Radiated Restricted Band Edge Measurements §15.205 §15.209; RSS-Gen [8.9]

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

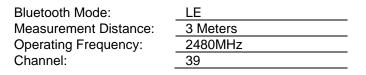
The amplitude offset shown in the following plots for average measurements was calculated using the formula:

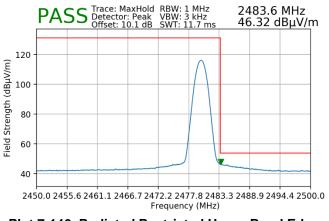
Offset (dB) = (Antenna Factor + Cable Loss + Attenuator) – Preamplifier Gain



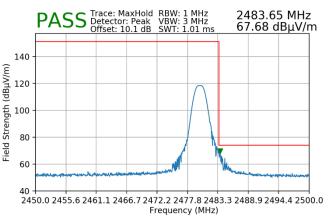




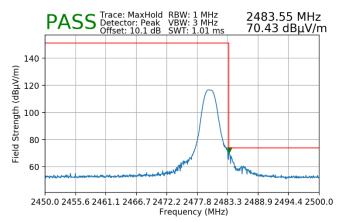


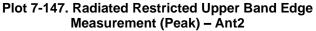






Plot 7-145. Radiated Restricted Lower Band Edge Measurement (Peak) – Ant1

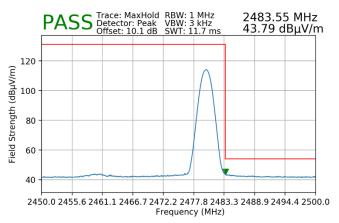




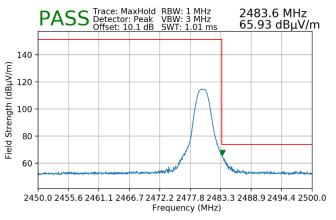
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Bluetooth Mode:	LE
Measurement Distance:	3 Meters
Operating Frequency:	2480MHz
Channel:	39



Plot 7-148. Radiated Restricted Upper Band Edge Measurement (Average) – Dual



Plot 7-149. Radiated Restricted Upper Band Edge Measurement (Peak) – Dual

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

Test Overview and Limit

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

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

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

Table 7-23. Conducted Limits

*Decreases with the logarithm of the frequency.

Test Procedures Used

ANSI C63.10-2013, Section 6.2

Test Settings

Quasi-Peak Field Strength Measurements

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

Average Field Strength Measurements

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

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Test Setup

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

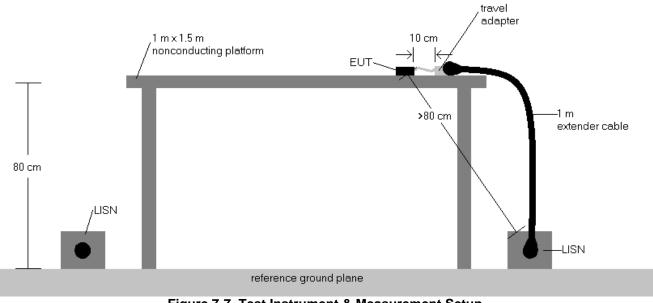


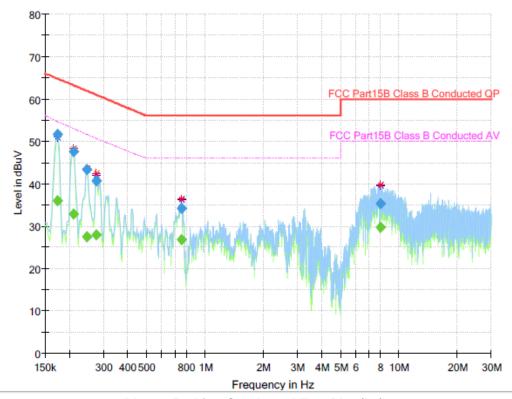
Figure 7-7. Test Instrument & Measurement Setup

Test Notes

- 1. All modes of operation were investigated, and the worst-case emissions are reported using mid channel. The emissions found were not affected by the choice of channel used during testing.
- 2. The limit for an intentional radiator from 150kHz to 30MHz are specified in 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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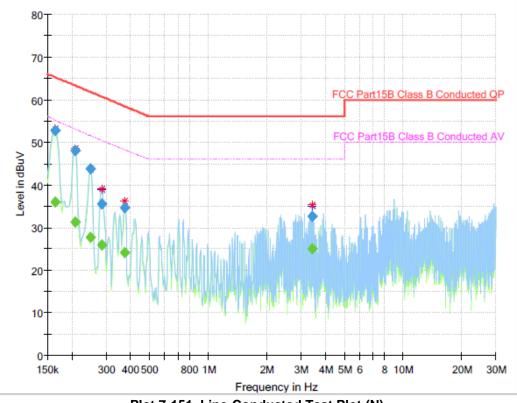
Plot 7-150. Line-Conducted Test Plot (L1)

Frequency (MHz)	QuasiPeak (dBuV)	Average (dBuV)	Limit (dBuV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.173880		35.98	54.67	18.69	1000.0	9.000	L1	10.0
0.173880	51.56		64.77	13.21	1000.0	9.000	L1	10.0
0.209700		32.84	53.02	20.17	1000.0	9.000	L1	9.8
0.209700	47.53		63.22	15.69	1000.0	9.000	L1	9.8
0.245520		27.39	51.67	24.28	1000.0	9.000	L1	9.7
0.245520	43.40		61.91	18.51	1000.0	9.000	L1	9.7
0.275370		27.94	50.71	22.77	1000.0	9.000	L1	9.7
0.275370	40.75		60.95	20.21	1000.0	9.000	L1	9.7
0.758940		26.76	46.00	19.24	1000.0	9.000	L1	9.9
0.758940	34.20		56.00	21.80	1000.0	9.000	L1	9.9
8.030400		29.72	50.00	20.28	1000.0	9.000	L1	10.1
8.030400	35.28		60.00	24.72	1000.0	9.000	L1	10.1

Table 7-24. Line-Conducted Test Table(L1) – Ant1

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Plot 7-151. Line-Conducted Test Plot (N)

Frequency (MHz)	QuasiPeak (dBuV)	Average (dBuV)	Limit (dBuV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.164925		35.92	55.14	19.22	1000.0	9.000	N	9.9
0.164925	52.64		65.21	12.57	1000.0	9.000	N	9.9
0.206715		31.37	53.14	21.77	1000.0	9.000	N	9.9
0.206715	48.03		63.34	15.30	1000.0	9.000	N	9.9
0.248505		27.68	51.57	23.89	1000.0	9.000	N	9.7
0.248505	43.88		61.81	17.92	1000.0	9.000	N	9.7
0.284325		25.95	50.44	24.49	1000.0	9.000	N	9.7
0.284325	35.62		60.69	25.07	1000.0	9.000	N	9.7
0.373875		24.13	48.24	24.11	1000.0	9.000	N	9.8
0.373875	34.72		58.41	23.70	1000.0	9.000	N	9.8
3.415590		24.99	46.00	21.01	1000.0	9.000	N	9.8
3.415590	32.57		56.00	23.43	1000.0	9.000	N	9.8

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

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8.0 CONCLUSION

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

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