TEST REPORT

DT&C Co. 1td

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1. Report	t No: DRTFCC1906-019)7
2. Custor	ner	
• Nam	e : LG Electronics USA, Ir	пс.
• Addr	ess : 1000 Sylvan Ave. Er	nglewood Cliffs, New Jersey, United States 07632
3. Use of	Report : FCC Original Gr	ant
4. Produc	t Name / Model Name : M	lobile Phone / LM-X320EMW
FCC II	D : ZNFX320EMW	
5. Test M	ethod Used : KDB558074	D01v05r02, ANSI C63.10-2013
Test S	pecification : FCC Part 15	Subpart C.247
6. Date o	f Test : 2019.05.09 ~ 2019	9.05.14
7. Testing	g Environment : See appe	nded test report.
8. Test R	esult : Refer to the attache	ed test result.
Affirmation		Reviewed by Name : Geunki Son (Signature)
The tes	Name : JaeHyeok Bang st results presented in this te	est report are limited only to the sample supplied by applicant and
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		2019.06.04.
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Test Report Version

Test Report No.	Date	Description
DRTFCC1906-0197	Jun. 04, 2019	Initial issue

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1. EUT DESCRIPTION

FCC Equipment Class	Digital Transmission System(DTS)
Product	Mobile Phone
Model Name	LM-X320EMW
Add Model Name	NA
Power Supply	DC 3.85 V
Frequency Range	• 802.11b/g/n : 2412 MHz ~ 2472 MHz
Max. RF Output Power	2.4GHz Band • 802.11b : 19.54 dBm • 802.11g : 21.56 dBm • 802.11n (HT20) : 21.26 dBm
Modulation Type	• 802.11b: CCK, DSSS • 802.11g/n: OFDM
Antenna Specification	Antenna type: PIFA Antenna gain: -0.07 dBi

2. INFORMATION ABOUT TESTING

2.1 Test mode

Test mode	Worst case data rate	Tested Frequency(MHz)				
802.11b	11 Mbps	2412	2437	2462	2472	
802.11g	9 Mbps	2412	2437	2462	2472	
802.11n	MCS 0	2412	2437	2462	2472	

Note 1: The worst case data rate is determined as above test mode according to the power measurements. Note 2: The power measurement results for all modes and data rate were reported.

2.2 Auxiliary equipment

Equipment	Model No.	Serial No.	Manufacturer	Note	
-	-	-	-	-	
-			-	-	

2.3 Tested environment

Temperature	: 20 ~ 25 °C
Relative humidity content	: 35 ~ 45 %
Details of power supply	: DC 3.85 V

2.4 EMI suppression Device(s) / Modifications

EMI suppression device(s) added and/or modifications made during testing \rightarrow None

2.5 Measurement Uncertainty

The measurement uncertainties shown below were calculated in accordance with requirements of ANSI C63.4-2014 and ANSI C63.10-2013. All measurement uncertainty values are shown with a coverage factor of k = 2 to indicate a 95 % level of confidence.

Test items	Measurement uncertainty
Transmitter Output Power	0.7 dB (The confidence level is about 95 %, $k = 2$)
Conducted spurious emission	1.0 dB (The confidence level is about 95 %, $k = 2$)
AC conducted emission	2.4 dB (The confidence level is about 95 %, k=2)
Radiated spurious emission (1 GHz Below)	5.1 dB (The confidence level is about 95 %, $k = 2$)
Radiated spurious emission (1 GHz ~ 18 GHz)	5.4 dB (The confidence level is about 95 %, $k = 2$)
Radiated spurious emission (18 GHz Above)	5.3 dB (The confidence level is about 95 %, k = 2)

3. SUMMARY OF TESTS

FCC Part Section(s)	Parameter	Limit	Test Condition	Status Note 1			
15.247(a)	6 dB Bandwidth	> 500 kHz		С			
15.247(b)	Transmitter Output Power	< 1 Watt		С			
15.247(d)	Out of Band Emissions / Band Edge	20 dBc in any 100 kHz BW	Conducted	С			
15.247(e)	Transmitter Power Spectral Density	< 8 dBm/3 kHz		С			
-	RSS-Gen [6.6]	Occupied Bandwidth (99 %)		NA			
15.247(d) 15.205 15.209	General Field Strength Limits (Restricted Bands and Radiated Emission Limits)	FCC 15.209 limits	Radiated	C Note 3			
15.207	AC Line Conducted Emissions	FCC 15.207 limits	AC Line Conducted	С			
15.203	15.203 Antenna Requirements		-	С			
Note 1: C=Comply NC=Not Comply NT=Not Tested NA=Not Applicable							

Note 1: C=Comply NC=Not Comply NT=Not Tested NA=Not Applicable

Note 2: For radiated emission tests below 30 MHz were performed on semi-anechoic chamber which is correlated with OATS. Note 3: This test item was performed in each axis and the worst case data was reported.



4. TEST METHODOLOGY

The measurement procedures described in the ANSI C63.10-2013 and the guidance provided in KDB558074 D01v05r02 were used in measurement of the EUT.

The EUT was tested per the guidance of KDB558074 D01v05r02. And ANSI C63.10-2013 was used to reference appropriate EUT setup and maximizing procedures of radiated spurious emission and AC line conducted emission testing.

4.1 EUT configuration

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner that intends to maximize its emission characteristics in a continuous normal application.

4.2 EUT exercise

The EUT was operated in the test mode to fix the Tx frequency that was for the purpose of the measurements. According to its specifications, the EUT must comply with the requirements of the Section 15.207, 15.209 and 15.247 under the FCC Rules Part 15 Subpart C.

4.3 General test procedures

Conducted Emissions

The power-line conducted emission test procedure is not described on the KDB558074 D01v05r02.

So this test was fulfilled with the requirements in Section 6.2 of ANSI C63.10-2013.

The EUT is placed on the wooden table, which is 0.8 m above ground plane and the conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30 MHz using CISPR Quasi-peak and Average detector

Radiated Emissions

Basically the radiated tests were performed with KDB558074 D01v05r02. But some requirements and procedures like test site requirements, EUT setup and maximizing procedure were fulfilled with the requirements in Section 5 and 6 of the ANSI C63.10-2013.

The EUT is placed on a non-conductive table. For emission measurements at or below 1 GHz, the table height is 80 cm. For emission measurements above 1 GHz, the table height is 1.5 m. The turntable shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3 m away from the receiving antenna, which varied from 1 m to 4 m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the highest emission, the relative positions of the EUT were rotated through three orthogonal axes.

4.4 Description of test modes

The EUT has been tested with all modes of operating conditions to determine the worst case emission characteristics. A test program is used to control the EUT for staying in continuous transmitting mode.



5. INSTRUMENT CALIBRATION

The measuring equipment, which was utilized in performing the tests documented herein, has been calibrated in accordance with the manufacturer's recommendations for utilizing calibration equipment, which is traceable to recognized national standards.

6. FACILITIES AND ACCREDITATIONS

6.1 Facilities

DT&C Co., Ltd.

The 3 m test site and conducted measurement facility used to collect the radiated data are located at the 42, Yurim-ro, 154beon-gil, Cheoin-gu, Yongin-si, Gyeonggi-do, Korea 17042. The test site complies with the requirements of § 2.948 according to ANSI C63.4-2014.

- FCC MRA Accredited Test Firm No. : KR0034

www.dtnc.net	www.dtnc.net							
Telephone	:	+ 82-31-321-2664						
FAX	:	+ 82-31-321-1664						

6.2 Equipment

Radiated emissions are measured with one or more of the following types of linearly polarized antennas: tuned dipole, bi-conical, log periodic, bi-log, and/or ridged waveguide, loop, horn. Spectrum analyzers with pre-selectors and peak, quasi-peak detectors are used to perform radiated measurements.

Conducted emissions are measured with Line Impedance Stabilization Networks and EMI Test Receivers. Calibrated wideband preamplifiers, coaxial cables, and coaxial attenuators are also used for making measurements.

All receiving equipment conforms to CISPR Publication 16-1, "Radio Interference Measuring Apparatus and Measurement Methods."

7. ANTENNA REQUIREMENTS

7.1 According to FCC 47 CFR §15.203

An intentional radiator antenna shall be designed to ensure that no antenna other than that furnished by the responsible party can be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section.

The antenna is attached on the device by means of unique coupling method (Spring Tension). Therefore this E.U.T Complies with the requirement of §15.203

8. TEST RESULT

8.1 6dB bandwidth

Test Requirements and limit, §15.247(a)

The bandwidth at 6 dB down from the highest in-band spectral density is measured with a spectrum analyzer connected to the receive antenna while the EUT is operating in transmission mode at the appropriate frequencies.

The minimum permissible 6 dB bandwidth is 500 kHz.

Test Configuration:

Refer to the APPENDIX I.

Test Procedure:

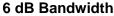
- KDB558074 D01v05r02 Section 8.2
- ANSI C63.10-2013 Section 11.8.2
- 1. Set resolution bandwidth (RBW) = 100 kHz.
- 2. Set the video bandwidth (VBW) \ge 3 x RBW.
- (RBW : 100 kHz / VBW : 300 kHz)
- 3. Detector = **Peak**.
- 4. Trace mode = **Max hold**.
- 5. Sweep = Auto couple.
- 6. Allow the trace to stabilize.
- 7. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

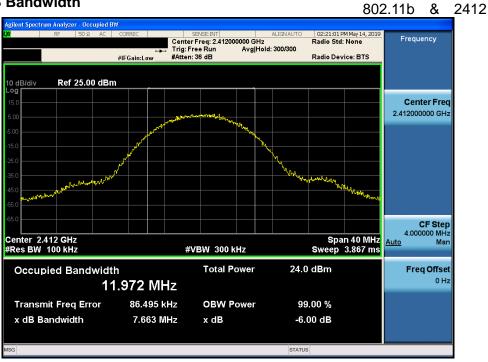
Test Mode	Frequency	Test Results[MHz]		
	2412	7.66		
802.11b	2437	7.76		
002.110	2462	7.37		
	2472	7.29		
	2412	15.72		
802.11g	2437	16.14		
002.11g	2462	16.06		
	2472	15.95		
	2412	15.98		
802.11n	2437	16.70		
ov2.110	2462	16.59		
	2472	16.11		

Test Results: Comply



RESULT PLOTS





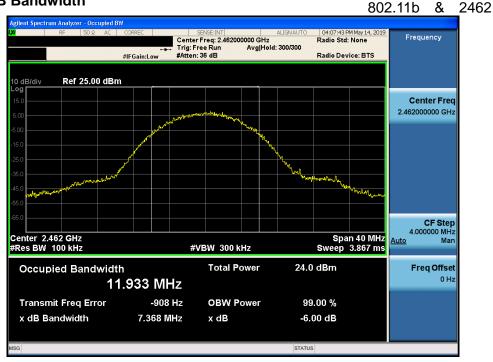
6 dB Bandwidth

802.11b & 2437



Dt&C

6 dB Bandwidth

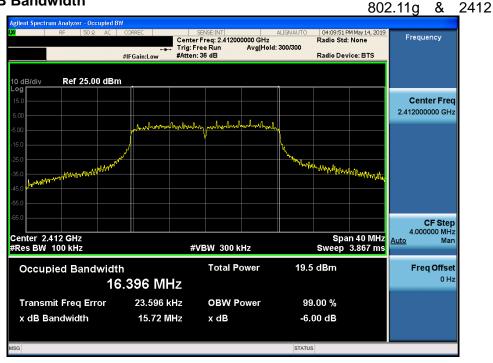


6 dB Bandwidth



802.11b & 2472

6 dB Bandwidth

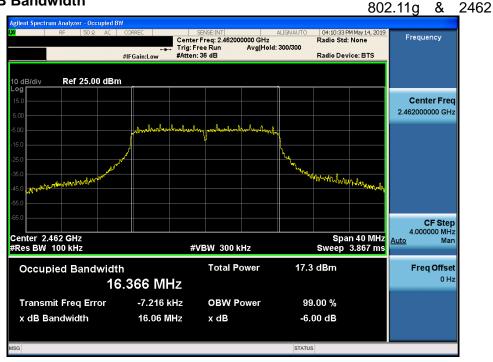


6 dB Bandwidth



802.11g & 2437

6 dB Bandwidth



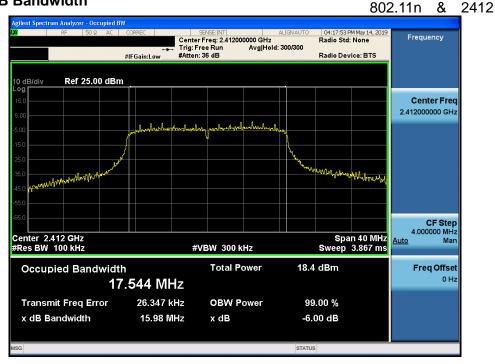
6 dB Bandwidth



802.11g & 2472

Dt&C

6 dB Bandwidth



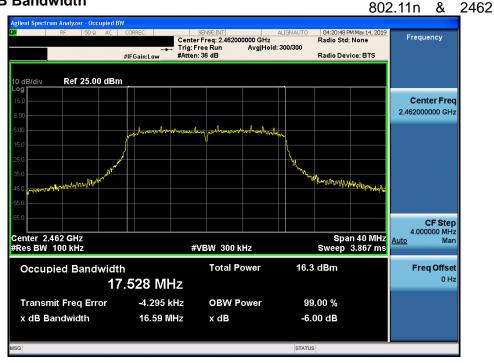
6 dB Bandwidth



802.11n & 2437

Dt&C

6 dB Bandwidth



6 dB Bandwidth



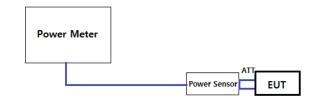
802.11n & 2472

8.2 Maximum peak conducted output power

Test Requirements and limit, §15.247(b)

The maximum permissible conducted output power is 1 Watt.

Test Configuration



Test Procedure

- KDB558074 D01v05r02 Section 8.3.1.3
- ANSI C63.10-2013 Section 11.9.1.3

PKPM1 Peak power meter method

- 1. The maximum conducted output powers were measured using a broadband peak RF power meter which has greater video bandwidth than DUT's DTS bandwidth and utilize a fast-responding diode detector.
- KDB558074 D01v05r02 Section 8.3.2.3
- ANSI C63.10-2013 Section 11.9.2.3.2

Method AVGPM-G

 The average conducted output powers were measured using a wideband gated RF power meter provided that the gate parameters are adjusted such that the power is measured only when the EUT is transmitting at its maximum power control level. Since this measurement is made only during the ON time of the transmitter, no duty cycle correction is required.



Test Results: Comply

Freq. (MHz)			Maxim	um Peak Co	onducted Ou	Itput Power	(dBm) for <u>80</u>	02.11b	
	Det.				Data Rat	e [Mbps]			
		1	2	5.5	11	-	-	-	-
2412	PK	19.31	19.35	19.43	19.44	-	-	-	-
2412	AV	16.42	16.39	16.52	16.50	-	-	-	-
2437	PK	19.49	19.45	19.48	19.53	-	-	-	-
2437	AV	16.49	16.45	16.56	16.52	-	-	-	-
2462	PK	19.42	19.39	19.28	19.54	-	-	-	-
2402	AV	16.52	16.47	16.76	16.55	-	-	-	-
2472	PK	1.63	1.70	1.65	1.90	-	-	-	-
2412	AV	-1.47	-1.55	-1.48	-1.43	-	-	-	-

From		Maximum Peak Conducted Output Power (dBm) for <u>802.11g</u>												
Freq. (MHz)	Det.				Data Rat	e [Mbps]								
		6	9	12	18	24	36	48	54					
2412	PK	20.20	21.36	19.93	19.38	19.13	19.76	19.59	19.19					
2412	AV	13.46	13.65	13.46	12.51	12.54	12.59	12.57	12.59					
0407	PK	20.40	21.56	20.38	19.74	19.48	19.81	19.40	19.10					
2437	AV	13.81	13.77	13.73	12.79	12.60	12.69	12.67	12.63					
2462	PK	19.68	20.05	19.44	18.59	19.05	18.07	18.17	18.60					
2402	AV	11.69	11.64	11.66	10.75	10.60	10.81	10.73	10.71					
2472	PK	5.48	6.33	5.85	6.27	6.26	5.58	6.02	6.27					
2472	AV	-3.35	-3.26	-3.70	-3.66	-3.21	-3.15	-3.47	-3.20					



F ree a		Maximum Peak Conducted Output Power (dBm) for 802.11n(HT20)												
Freq. (MHz)	Det.				Data Ra	te [MCS]								
		0	1	2	3	4	5	6	7					
2442	PK	20.78	20.69	20.33	19.62	19.97	20.25	19.95	19.67					
2412	AV	12.49	12.44	12.46	11.56	11.50	11.52	11.69	11.65					
2427	PK	21.26	21.19	21.20	19.95	20.40	20.46	20.29	20.61					
2437	AV	12.62	12.65	12.64	11.76	11.84	11.73	11.75	11.69					
2462	PK	19.80	19.74	19.29	18.05	18.34	17.66	18.14	17.79					
2402	AV	10.67	10.77	10.64	9.47	9.35	9.33	9.39	9.49					
2472	PK	6.05	5.28	5.21	5.87	6.00	5.64	5.75	5.49					
2472	AV	-3.44	-3.42	-3.39	-3.41	-3.45	-3.47	-3.33	-3.37					



8.3 Maximum power spectral density

Test requirements and limit, §15.247(e)

The power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

Test Configuration:

Refer to the APPENDIX I.

Test Procedure

- KDB558074 D01v05r02 Section 8.4
- ANSI C63.10-2013 Section 11.10.2

Method PKPSD (peak PSD)

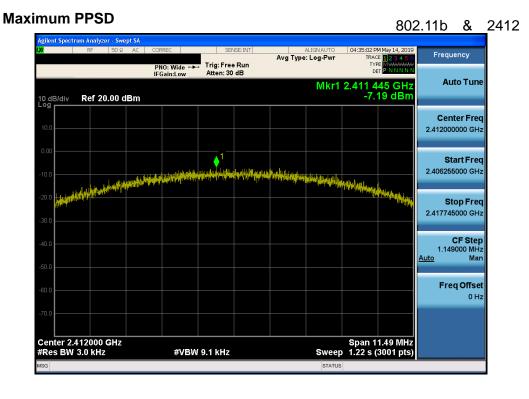
- 1. Set analyzer center frequency to DTS channel center frequency.
- 2. Set the span to 1.5 times the DTS bandwidth.
- 3. Set the RBW to : $3 \text{ kHz} \leq \text{RBW} \leq 100 \text{ kHz}$
- 4. Set the VBW \ge 3 x RBW
- 5. Detector = Peak
- 6. Sweep time = **Auto couple**
- 7. Trace mode = **Max hold.**
- 8. Allow trace to fully stabilize.
- 9. Use the **peak marker function** to determine the maximum amplitude level within the RBW.

10. If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

Test Results: Comply

Test Mode	Frequency	RBW	PKPSD [dBm]
	2412	3 kHz	-7.19
802.11b	2437	3 kHz	-6.72
802.110	2462	3 kHz	-5.97
	2472	3 kHz	-24.65
	2412	3 kHz	-12.07
902 11 4	2437	3 kHz	-11.22
802.11g	2462	3 kHz	-12.98
	2472	3 kHz	-28.44
	2412	3 kHz	-12.54
802.11n	2437	3 kHz	-12.73
002.111	2462	3 kHz	-14.46
	2472	3 kHz	-29.21

RESULT PLOTS



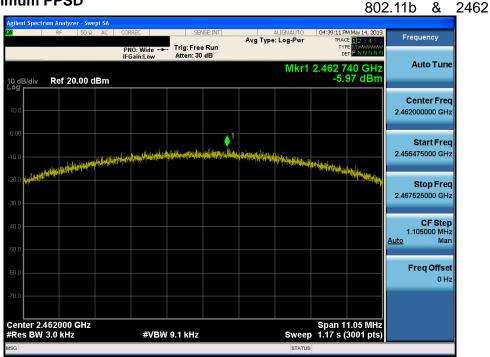
Maximum PPSD

802.11b & 2437



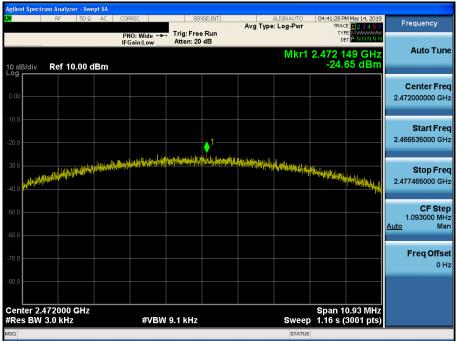
Dt&C

Maximum PPSD

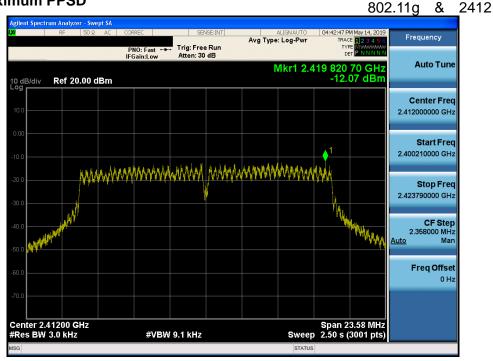


Maximum PPSD

802.11b & 2472

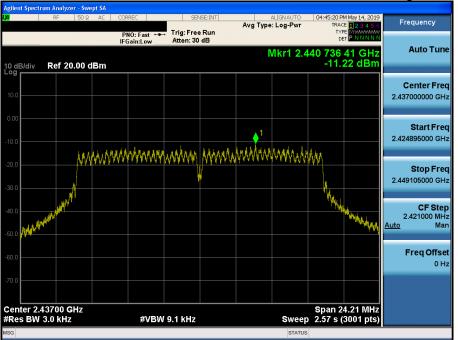


Maximum PPSD

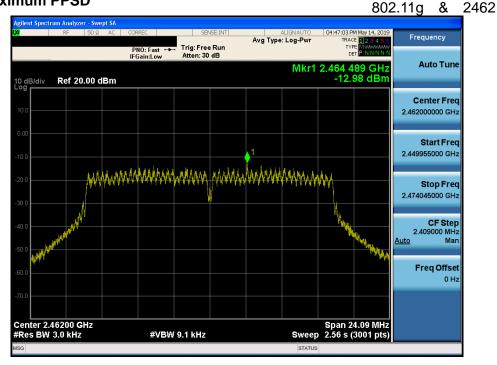


Maximum PPSD

802.11g & 2437

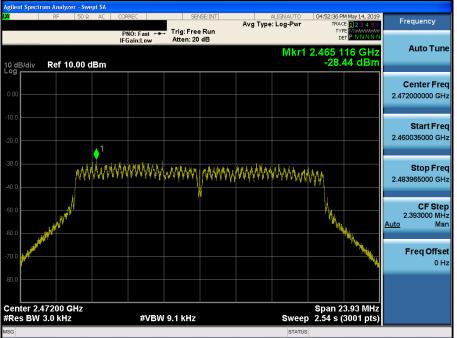


Maximum PPSD



Maximum PPSD

802.11g & 2472

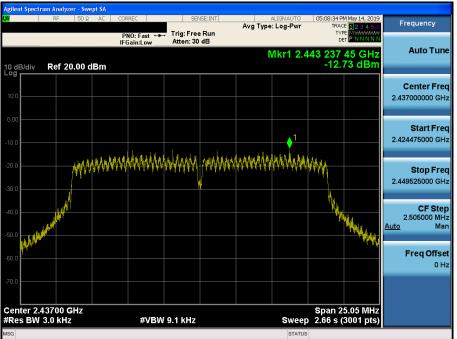


Maximum PPSD



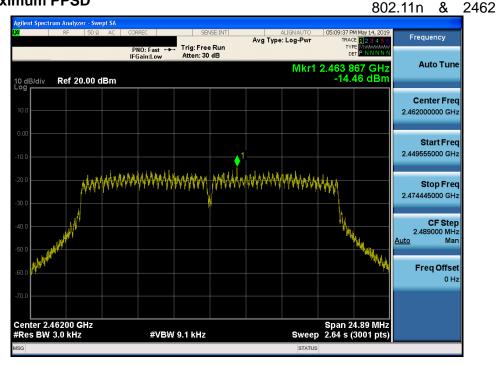
Maximum PPSD

802.11n & 2437



Dt&C

Maximum PPSD



Maximum PPSD

802.11n & 2472





8.4 Out of band emissions at the band edge / conducted spurious emissions

Test requirements and limit, §15.247(d)

§15.247(d) specifies that in any 100 kHz bandwidth outside of the authorized frequency band, the power shall be attenuated according to the following conditions:

If the peak output power procedure is used to measure the fundamental emission power to demonstrate compliance to **15.247(b)(3)** requirements, then the peak conducted output power measured within any 100 kHz outside the authorized frequency band shall be attenuated **by at least 20 dB** relative to the maximum measured in-band peak PSD level.

If the average output power procedure is used to measure the fundamental emission power to demonstrate compliance to **15.247(b)(3)** requirements, then the power in any 100 kHz outside of the authorized frequency band shall be attenuated by at least 30 dB relative to the maximum measured in band average PSD level. In either case, attenuation to levels below the general emission limits specified in §15.209(a) is not required.

Test Configuration:

Refer to the APPENDIX I.

Test Procedure

- KDB558074 D01v05r02 Section 8.5
- ANSI C63.10-2013 Section 11.11

- Reference level measurement

1. Set instrument center frequency to DTS channel center frequency.

- 2. Set the span to \geq 1.5 times the DTS bandwidth.
- 3. Set the $\overrightarrow{RBW} = 100 \text{ kHz}$.
- 4. Set the VBW \geq 3 x RBW.
- 5. Detector = Peak.
- 6. Sweep time = Auto couple.
- 7. Trace mode = Max hold.
- 8. Allow trace to fully stabilize.
- 9. Use the peak marker function to determine the maximum PSD level.

- Emission level measurement

- 1. Set the center frequency and span to encompass frequency range to be measured.
- 2. Set the RBW = 100 kHz. (Actual 1 MHz , See below note)
- 3. Set the VBW ≥ 3 x RBW. (Actual 3 MHz, See below note)
- 4. Detector = **Peak**.
- 5. Ensure that the number of measurement points \geq Span / RBW.
- 6. Sweep time = **Auto couple.**
- 7. Trace mode = **Max hold.**
- 8. Allow the trace to stabilize. (this may take some time, depending on the extent of the span)
- 9. Use the peak marker function to determine the maximum amplitude level.

Note : The conducted spurious emission was tested with below settings. Frequency range: 9 kHz ~ 30 MHz RBW = 100 kHz, VBW = 300 kHz, SWEEP TIME = AUTO, DETECTOR = PEAK, TRACE = MAX HOLD, SWEEP POINT : 40001

Frequency range: 30 MHz ~ 10 GHz, 10 GHz ~25 GHz

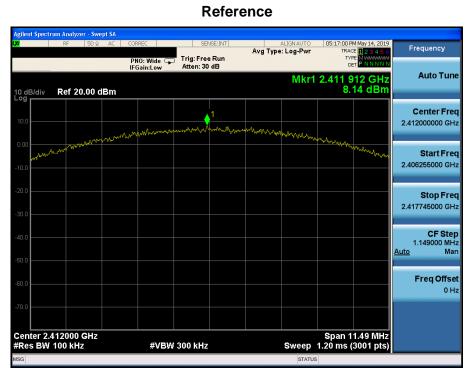
RBW = 1 MHz, VBW = 3 MHz, SWEEP TIME = AUTO, DETECTOR = PEAK, TRACE = MAX HOLD, SWEEP POINT : 40001

LIMIT LINE = 20 dB below of the reference level of above measurement procedure Step 2. (RBW = 100 kHz, VBW = 300 kHz)

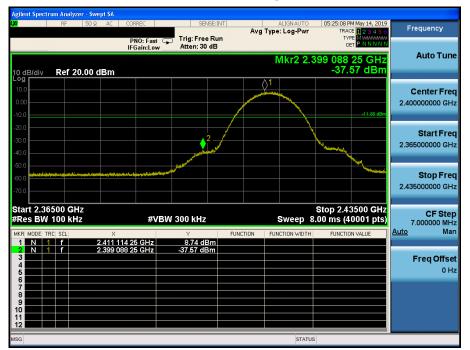
If the emission level with above setting was close to the limit (ie, less than 3 dB margin) then zoom scan is required using RBW = 100 kHz, VBW = 300 kHz, SPAN = 100 MHz and BINS = 2001 to get accurate emission level within 100 kHz BW.

RESULT PLOTS

802.11b & 2412



Low Band-edge

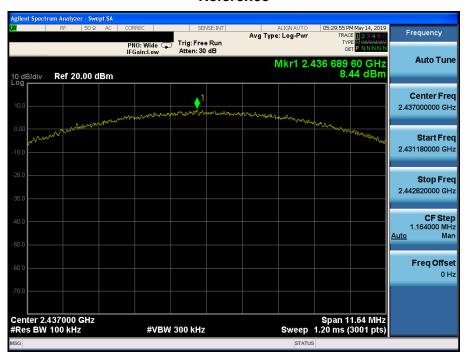


	t Spec			yzer - S														
L <mark>XI</mark>			RF	50	Ω Å	DC	CORRE	c	S	ENSE:IN	Т	Ava		ALIGNAUTO		41 PM May 14, 2019 IRACE 1 2 3 4 5 6		Frequency
							PNO: IFGai	Fast G	Trig: Fr		ı							
	_	_	_		_		IFGal	n:Low_	Attent					ML	r2 A 6	77 1 MHz		Auto Tune
10 di	Ridio	D	lef '	20.00) dE	tm								IVIP		9.19 dBm		
Log				20.00														
10.0																		Center Freq
0.00																		15.004500 MHz
-10.0			+													-11.86 dBm		
-20.0																		Start Freq
-30.0																		9.000 kHz
-40.0	1																	
-50.0	Y			_ ĕ ²														Stop Freq
-60.0	AN AN	in the	en førs	renalitan	diyy of	Hillin ia	***	under the first state of the st	alle in the shear the	hilliph	ilynifi ar y	e fijet de state	in view	atter where we have		delibre meaning in the		30.000000 MHz
-70.0																		
	t 9 k														Sto	o 30.00 MHz		CF Step
#Re	s B₩	/ 10	0 k	Hz				#VB۱	W 300 kH	z				Sweep 5	i.33 ms	(40001 pts)		2.999100 MHz
	MODE	TRC 9	SCL			×	07.0		Y		FUNC	TION	FUN	CTION WIDTH	FUN	CTION VALUE	<u>Aut</u>	<u>:o</u> Man
1 2	N N	1	r f			4.6	287.2 77 1 N	(HZ 1HZ	-53.86 c -59.19 c	iBm iBm								
3								_										Freq Offset
5																		0 Hz
7																		
8																		
10 11																		
12																		
MSG														STATU	DC 🚺	Coupled		
		-	-		-								-				-	

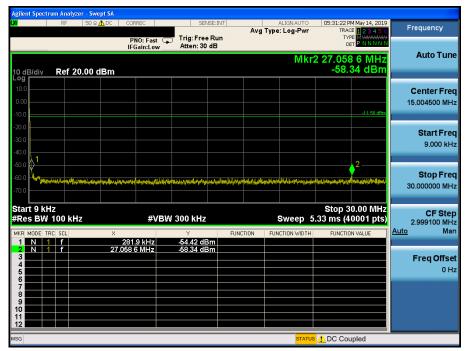
Agilent Spectr											
LXI	RF	50Ω AC	CORREC		SEN	ISE:INT	Ava T	ALIGN AUTO ype: Log-Pwr		M May 14, 2019	Frequency
			PNO: Fa IFGain:L	ast 😱 .ow	Trig: Free Atten: 30				۲۷ D 3 9.478		Auto Tune
10 dB/div Log	Ref 20.0	00 dBm	1						-41.	37 dBm	
10.0 0.00 -10.0										-11.86 dBm	Center Freq 5.015000000 GHz
-20.0										3	Start Freq
-40.0 -50.0						and the state of the state		2 ²		<u> </u>	30.000000 MHz
-60.0 -70.0											Stop Freq 10.000000000 GHz
Start 30 N #Res BW	1.0 MHz		#	¢VBW	3.0 MHz		ICTION	Sweep 1	8.7 ms (4	.000 GHz 0001 pts)	CF Step 997.000000 MHz Auto Man
1 N 1 2 N 1 3 N 1	f	7.5	412 83 GH 508 50 GH 478 07 GH	z	¥ 14.51 dE -40.39 d⊟ -41.37 d⊟	sm Im	ICTION	FUNCTION WIDTH	FUNCTIO	IN VALUE	Freq Offset
4 5 6 7											0 Hz
8 9 10 11											
12 MSG								STATUS	3		



802.11b & 2437



Reference



	- Swept SA 50 Ω AC	CORREC	SENSE	INT	ALIGN AUTO	05:34:30 PM May 14, 2019	
Tu	30 x AC	PNO: Fast (IFGain:Low		un	Avg Type: Log-Pwr	TRACE 123456 TYPE MWWWWW DET P NNNNN	Frequency
dB/div Ref 20.	00 dBm				Mkr	3 5.664 79 GHz -40.26 dBm	Auto Tun
29 0.00 .00	¥1						Center Fre 5.015000000 G⊦
D.0		 2 ²		3	and the product of the second s		Start Fre 30.000000 M⊦
D.0							Stop Fre 10.00000000 GF
tart 30 MHz Res BW 1.0 MHz	×	#VB	W 3.0 MHz	FUNCTI		Stop 10.000 GHz 8.7 ms (40001 pts)	CF Ste 997.000000 MH Auto Ma
1 N 1 f 2 N 1 f 3 N 1 f 4	2.4 3.2	37 01 GHz 20 90 GHz 64 79 GHz	14.36 dBm -40.18 dBm -40.26 dBm				Freq Offso 0 F
6 7 8 9 9 0 1							
2							

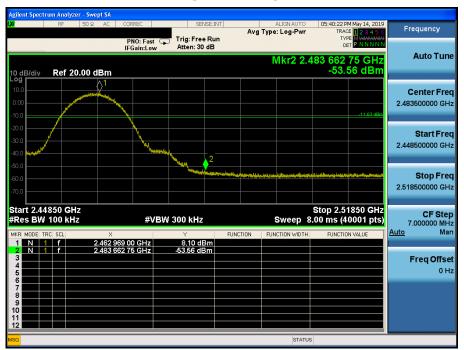
Agilent Spectrur								
L <mark>XI</mark>	RF 50 Ω	AC COF	IREC	SENS		ALIGNAUTO g Type: Log-Pwr	05:35:54 PM May 14, 2019 TRACE 2 3 4 5 (Frequency
			NO: Fast 🕞 Gain:Low	Trig: Free F Atten: 30 d				Auto Tuno
10 dB/div	Ref 20.00	dBm				Mkr3 ′	16.910 875 GHz -33.21 dBm	
10.0 0.00								Center Freq 17.50000000 GHz
-10.0							-11.56.dBm	17.50000000 GH2
-20.0 -30.0				3				Start Freq 10.00000000 GHz
-40.0 -50.0	ST() of a later of transfer							
-60.0								Stop Freq 25.00000000 GHz
Start 10.00 #Res BW 1			#VBW	3.0 MHz		Sweep 4	Stop 25.000 GHz 0.0 ms (40001 pts	
MKR MODE TRC		×		Y OB OD UD	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	<u>Auto</u> Man
1 N 1 2 N 1 3 N 1	f f f	24.858 629 20.892 629 16.910 879	5 GHz	-26.88 dBr -28.40 dBr -33.21 dBr	n			Freq Offset
4 5 6								0 Hz
7 8 9								
10 11 12								
MSG						STATUS	3	

802.11b & 2462



Reference

High Band-edge

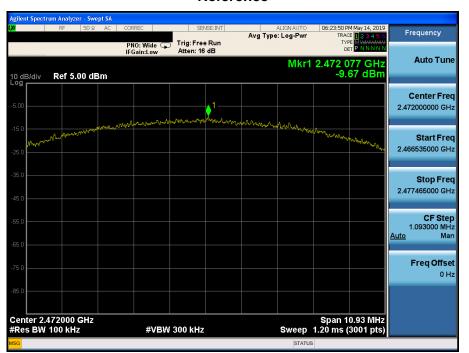


Agilent	t Specti																
L) XI		R	F	50 \$	2 🧥 D(: 0	DRREC		SEN	JSE:INT	Ava		ALIGN AUTO		CE 123456	Freq	uency
							PNO: Fas Gain:Lo		Trig: Free Atten: 30			.,,		TY	PE MWWWWW ET P N N N N N		uto Tune
10 dE	3/div	Re	ef 2	0.00	dBr	n							Mkr		6 8 MHz 85 dBm	A	
Log 10.0 0.00 -10.0															-11.63.dBm		nter Freq 04500 MHz
-20.0 -30.0 -40.0																	tart Freq 9.000 kHz
-50.0 -60.0 -70.0	V ¹	AND THE		(hdwyth	st) i f frain	an the second	in finite states	lation	ling that the state of the stat	2- mhrellen/174/mi	lever the state of	heldhu	findef#systembolishe	etyriyilari oʻyby havisiga	nania, katuratiki		top Freq 00000 MHz
#Res	t 9 kH S BW	100		z		×	#1	vBW	300 kHz	510	NCTION		Sweep 5	.33 ms (4	80.00 MHz 10001 pts)	2.99 Auto	CF Step 99100 MHz Man
1 2 3 4 5	N 1 N 1					28	2.7 kHz 8 MHz		-53.60 dE -58.85 dE	3m	NCTION	FON		FUNCTI	JN VALUE		e q Offset 0 Hz
6 7 9 10 11																	
MSG													STATUS	DC Co	upled		

	um Analyzer - Sv						
LXI	RF 50 S	Ω AC CO	DRREC	SENSE:IN	ALIGNAUTO e: Log-Pwr	05:41:42 PM May 14 TRACE 2 3	
			PNO: Fast 🕞 -Gain:Low	Trig: Free Run Atten: 30 dB		TYPE MWW DET P NN 4 1.398 38 G	Auto Tune
10 dB/div Log 10.0	Ref 20.00	dBm 1				-44.04 di	Center Freq
-10.0 -20.0 -30.0						-41.6	
-40.0 -50.0	4			a traj tradicio di Tita Deservis	2		
-60.0							Stop Freq 10.000000000 GHz
Start 30 N #Res BW	1.0 MHz	×		/ 3.0 MHz	Sweep 1	Stop 10.000 0 8.7 ms (40001 FUNCTION VALUE	pts) CF Step 997.000000 MHz Auto Man
1 N 1 2 N 1 3 N 1 4 N 1 5 6	f f f f	6.893 9.400	68 GHz 85 GHz 06 GHz 38 GHz	14.32 dBm -41.04 dBm -41.40 dBm -44.04 dBm			Freq Offset 0 Hz
7 8 9 10 11							
12 MSG					STATUS	8	

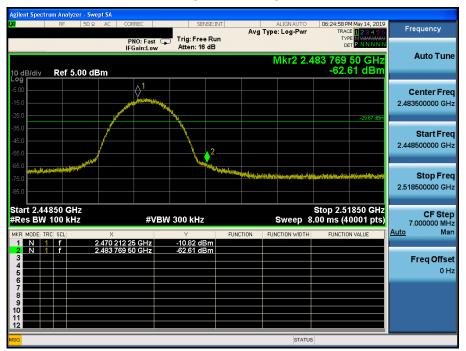
RF 5	DΩ AC	CORREC	SENSE:II		ALIGN AUTO	05:42:46 PM May 14, 2019	Frequency
		PNO: Fast G	Trig: Free Ru Atten: 30 dB		j Type: Log-Pwr	TRACE 123456 TYPE MWWWWWW DET PINNNNN	Frequency
IB/div Ref 20.0	0 dBm	II Gain.cow			Mkr4 1	9.093 750 GHz -32.77 dBm	Auto Tun
						-11.63 dBm	Center Fre 17.500000000 G⊦
				4			Start Fre 10.000000000 G⊦
							Stop Fre 25.000000000 GH
es BW 1.0 MHz	×	#VBI	N 3.0 MHz	FUNCTION	Sweep 4	Stop 25.000 GHz 0.0 ms (40001 pts) FUNCTION VALUE	CF Ste 1.50000000 GF <u>Auto</u> Ma
N 1 f N 1 f N 1 f N 1 f	21.476 21.019	500 GHz 125 GHz 750 GHz 750 GHz	-27.59 dBm -28.92 dBm -28.97 dBm -32.77 dBm				Freq Offs 0 F

802.11b & 2472



Reference

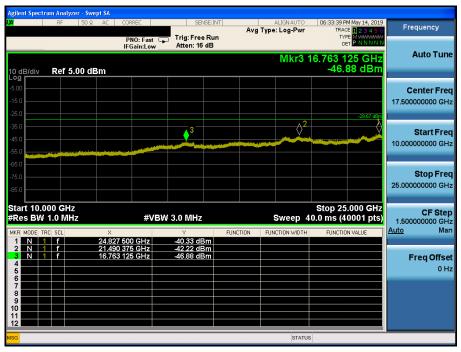
High Band-edge



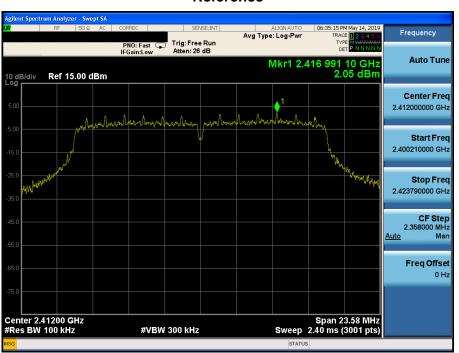
RF 50 ຊ 🧘 D	C CORREC	SENSE:INT	ALIGNAUTO Avg Type: Log-Pwr	06:25:28 PM May 14, 2019 TRACE 1 2 3 4 5 6	Frequency
	PNO: Fast G	Trig: Free Run Atten: 16 dB	Avg Type. Log-Fwi	TYPE MWWWWWW DET P N N N N N	
0 dB/div Ref 5.00 dBm			Mkr	2 26.880 9 MHz -73.16 dBm	Auto Tune
• g 5.00 15.0					Center Free 15.004500 MH
45.0				-29.67 dBm	Start Free 9.000 kH
36.0 75.0 36.0	nni (an	ารูสมัตรีหลุกรับสูมิสุริทร์ และสูงสุริตรูสุริตรูสุริตรูสุริตรูสุริตรูสุริตรูสุริตรูสุริตรูสุริตรูสุริตรูสุริตรู	น _{ากเส} ร์ได้สระมหุรไปทำเวลาไป ได้เรื่องไหนไหน	2-	Stop Fre 30.000000 MH
itart 9 kHz Res BW 100 kHz	#VBV	V 300 kHz	Sweep 5	Stop 30.00 MHz 5.33 ms (40001 pts)	CF Ste 2.999100 MH
1 N 1 f	× 281.9 kHz 26.880 9 MHz	Y F -68.18 dBm -73.16 dBm	UNCTION FUNCTION WIDTH	FUNCTION VALUE	<u>Auto</u> Ma
3 4 4 5 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6		-73.10 0.011			Freq Offse 0 H
7 8 9 9 9 10 10 10 10 10 10 10 10 10 10 10 10 10					
11					

Agilent Spectrum Analyzer - Swept SA					
LXU RF 50Ω AC	CORREC	SENSE:INT	ALIGN AUTO Avg Type: Log-Pwr	06:26:31 PM May 14, 2019 TRACE 1 2 3 4 5 6	Frequency
	PNO: Fast 🖵 IFGain:Low	Trig: Free Run Atten: 16 dB		TYPE MWWWW DET P NNNNN 4 5.556 62 GHz	Auto Tune
10 dB/div Ref 5.00 dBm	1			-55.02 dBm	
-5.00					Center Freq
-15.0				-29.67 dBm	5.015000000 GHz
-35.0					Start Freq
55.0	Manager Par di Atoma	4 		- Setting - Long - Advanced - In	30.00000 MHz
-65.0					Oton Enge
-75.0					Stop Freq 10.000000000 GHz
Start 30 MHz #Res BW 1.0 MHz	#VBW	3.0 MHz	Sweep 1	Stop 10.000 GHz 8.7 ms (40001 pts)	CF Step 997.000000 MHz
MKR MODE TRC SCL X	71 90 GHz	Y FUN -4.11 dBm	CTION FUNCTION WIDTH	FUNCTION VALUE	<u>Auto</u> Man
2 N 1 f 7.1 3 N 1 f 7.6	14 68 GHz 84 22 GHz 56 62 GHz	-54.67 dBm -55.00 dBm -55.02 dBm			Freq Offset
					0 Hz
7 8					
9					
11 12					
MSG			STATUS	3	





802.11g & 2412



Reference

Low Band-edge



RF	50 Ω 🛕 DC 🔋 CORREC	SENSE:INT	ALIGN AUTO	07:16:34 PM May 14, 2019	Frequency			
	PNO: Fa IFGain:L	st 🕞 Trig: Free Run ow Atten: 26 dB	Avg Type: Log-Pwr	TRACE 1 2 3 4 5 6 TYPE MWWWWW DET P NNNNN	Auto Tune			
d5/div Ref 15.00 dBm -62.91 dBm								
9 00 00 .0				-17.95 dDm	Center Fre 15.004500 MH			
.0 .0 λ1					Start Fre 9.000 kH			
	yalih mayong kana kana ana ana ang ma		usa lankaraa kanka lankarin la	ม้านสูงที่หลุ่มๆในประสุของและไรที่ประไม่ได้เป็นที่ได้หลางๆ	Stop Fre 30.000000 M⊦			
art 9 kHz tes BW 100 kHz R MODE TRC SCL	#	VBW 300 kHz		Stop 30.00 MHz .33 ms (40001 pts)	CF Ste 2.999100 MH Auto Ma			
N 1 f	281.9 kH 11.856 2 MH:	z -58.65 dBm	UNCTION FUNCTION WIDTH	PONCTION VALUE	Freq Offse			

	um Analyzer - Swep										
LXI	RF 50 Ω	AC CORRE	ic	SENSE:I		ALIGNAUTO g Type: Log-Pwr	07:17:37 PM May 14, 201 TRACE 1 2 3 4 5				
		PNO IFGai	:Fast 🖵 in:Low	Trig: Free Ru Atten: 26 dB							
10 dB/div											
5.00								Center Freq			
-5.00								5.015000000 GHz			
-15.0							-17:95 dDn				
-25.0					. 2		3	Start Freq			
-45.0		The second s			Ŷ [_]	and a state of the		30.000000 MHz			
-55.0		and the second			أنائمه فالكافيد			Stop Freq			
-65.0								10.000000000 GHz			
Start 30 N #Res BW			#VBW	3.0 MHz		Sweep 1	Stop 10.000 GHz 18.7 ms (40001 pts	997.000000 MHz			
MKR MODE TF		× 2.415 57 0	201-	∀ 9.68 dBm	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	<u>Auto</u> Man			
2 N 1 3 N 1	f	<u>5.926 76 0</u> 9.425 23 0	GHz	-45.29 dBm -46.42 dBm							
4 5		9.425 23 (JHZ	-46.42 aBm				Freq Offset 0 Hz			
6								0112			
7 8											
9 10											
11 12											
MSG						STATU	S				