FCC TEST REPORT

For

EZLO INC.

Home Automation Gateway

Test Model: EZ0001-1

Prepared for	:	EZLO INC.
Address	:	1255 Broad St, Clifton, NJ 07013, United States

Prepared by	:	Shenzhen LCS Compliance Testing Laboratory Ltd.
Address	:	1/F., Xingyuan Industrial Park, Tongda Road, Bao'an Avenue,
		Bao'an District, Shenzhen, Guangdong, China
Tel	:	(+86)755-82591330
Fax	:	(+86)755-82591332
Web	:	www.LCS-cert.com
Mail	:	webmaster@LCS-cert.com

Date of receipt of test sample	:	May 03, 2016
Number of tested samples	:	1
Sample number	:	Prototype
Date of Test	:	May 03, 2016~ June 01, 2016
Date of Report	:	June 01, 2016

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FCC ID:2AIYW-EZ0001-1

Report No.: LCS1605312799E

	FCC TEST REPORT	
	FCC CFR 47 PART 15 C(15.247): 2015	
Report Reference No	: LCS1605312799E	
Date of Issue	: June 01, 2016	
Testing Laboratory Name	: Shenzhen LCS Compliance Testing	g Laboratory Ltd.
Address	: 1/F., Xingyuan Industrial Park, Tong Bao'an District, Shenzhen, Guangdon	
Testing Location/ Procedure	: Full application of Harmonised stand Partial application of Harmonised sta Other standard testing method □	
Applicant's Name	: EZLO INC.	
Address	: 1255 Broad St, Clifton, NJ 07013, U	nited States
Test Specification		
Standard	: FCC CFR 47 PART 15 C(15.247): 20	015 / ANSI C63.10: 2013
Test Report Form No	: LCSEMC-1.0	
TRF Originator	: Shenzhen LCS Compliance Testing I	Laboratory Ltd.
Master TRF	: Dated 2011-03	
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Test Item Description	: Home Automation Gateway	
Trade Mark	: eZLO Gateway	
Test Model	: EZ0001-1	
Ratings	: DC 5V,2A by adapter	
	Adapter input :100-240VAC,50/60Hz	z,0.4A
	Adapter output :5VDC,2A	

Calvin Weng

Calvin Weng/ Administrators

Gavin Liang/ Manager

Glin Lu/ Technique principal

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FCC -- TEST REPORT

Test Report No. : LCS1605312799E

June 01, 2016

Date of issue

Test Model	: EZ0001-1
EUT	: Home Automation Gateway
Applicant	: EZLO INC.
Address	: 1255 Broad St, Clifton, NJ 07013, United States
Telephone	: /
Fax	: /
Manufacturer	: EZLO INC.
Address	: 1255 Broad St, Clifton, NJ 07013, United States
Telephone	: /
Fax	: /
Factory	: EZLO INC.
Address	: 1255 Broad St, Clifton, NJ 07013, United States
Telephone	: /
Fax	: /

Test Result Positive

The test report merely corresponds to the test sample.

It is not permitted to copy extracts of these test result without the written permission of the test laboratory.

Revision History

Revision	Issue Date	Revisions	Revised By
00	2016-06-01	Initial Issue	Gavin Liang

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FCC ID:2AIYW-EZ0001-1 Report No.: LCS1605312799E

1. GENERAL INFORMATION

1.1. Description of Device (EUT)

EUT	: Home Automation Gateway
Test Model	: EZ0001-1
Power Supply	DC 5V,2A by adapter Adapter input :100-240VAC,50/60Hz,0.4A Adapter output :5VDC,2A
Hardware Version	: N/A
Software Version	: N/A
Bluetooth	:
Frequency Range	: 2.402-2.480GHz
Channel Number	: 40 channels for Bluetooth V4.0 (DTS)
Channel Spacing	: 2MHz for Bluetooth V4.0 (DTS)
Modulation Type	: GFSK for Bluetooth V4.0 (DTS)
Bluetooth Version	: V4.0
Antenna Description	: Ceramic Antenna, 0dBi(Max.)
WIFI(2.4GHz Band)	:
Operating Frequency	: 2412-2462MHz
Channel Spacing	: 5MHz
Channel Number	: 13 Channel for 20MHz bandwidth(2412~2462MHz)
	9 channels for 40MHz bandwidth(2422~2452MHz)
Modulation Type	: 802.11b: DSSS; 802.11g/n: OFDM
Antenna Description	: External Antenna, 2 dBi(Max.)
Zigbee(2.4G Band)	:
Frequency Range	: 2405-2480MHz,(Channel Number: 16, Channel Frequency=2405+5(K-1), K=1, 2, 316)
Channel Spacing	: 5MHz
Channel Number	: 16
Modulation Type	: O-QPSK
Antenna Description	: PCB Antenna, 0 dBi(Max.)

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1.2. Support Equipment List

Manufacturer	Description	Model	Serial Number	Certificate
Ktec Power	AC/DC	KSAS0120500	/	VOC
Supply Co.,Ltd	ADAPTER	200HU	/	VOC

1.3. External I/O

I/O Port Description	Quantity	Cable
USB Port	2	N/A
RJ45 Port	1	N/A

1.4. Description of Test Facility

CNAS Registration Number. is L4595.

FCC Registration Number. is 899208.

Industry Canada Registration Number. is 9642A-1.

VCCI Registration Number. is C-4260 and R-3804.

ESMD Registration Number. is ARCB0108.

UL Registration Number. is 100571-492.

TUV SUD Registration Number. is SCN1081.

TUV RH Registration Number. is UA 50296516-001

There is one 3m semi-anechoic chamber and one line conducted labs for final test. The Test Sites meet the requirements in documents ANSI C63.4: 2014, CISPR 22/EN 55022 and CISPR16-1-4 SVSWR requirements.

FCC ID:2AIYW-EZ0001-1 Report No.: LC

Report No.: LCS1605312799E

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Cal Date	Due Date
EMC Receiver	R&S	ESCS 30	100174	9kHz – 2.75GHz	June 18,2015	June 17,2016
Signal analyzer	Agilent	E4448A(External mixers to 40GHz)	US44300469	9kHz~40GHz	July 16,2015	July 15,2016
LISN	MESS Tec	NNB-2/16Z	99079	9KHz-30MHz	June 18,2015	June 17,2016
LISN (Support Unit)	EMCO	3819/2NM	9703-1839	9KHz-30MHz	June 18,2015	June 17,2010
RF Cable-CON	UTIFLEX	3102-26886-4	CB049	9KHz-30MHz	June 18,2015	June 17,201
ISN	SCHAFFNER	ISN ST08	21653	9KHz-30MHz	June 18,2015	June 17,2016
3m Semi Anechoic Chamber	SIDT FRANKONIA	SAC-3M	03CH03-HY	30M-1GHz 3m	June 18,2015	June 17,2016
Amplifier	SCHAFFNER	COA9231A	18667	9kHz-2GHzz	June 18,2015	June 17,201
Amplifier	Agilent	8449B	3008A02120	1GHz-26.5GHz	July 16,2015	July 15,201
Amplifier	MITEQ	AMF-6F-260400	9121372	26.5GHz-40GHz	July 16,2015	July 15,201
Spectrum Analyzer	Agilent	E4407B	MY41440292	9k-26.5GHz	July 16,2015	July 15,201
MAX Signal Analyzer	Agilent	N9020A	MY50510140	20Hz~26.5GHz	Oct. 27, 2015	Oct. 26, 201
Loop Antenna	R&S	HFH2-Z2	860004/001	9k-30MHz	June 18,2015	June 17,201
By-log Antenna	SCHWARZBECK	VULB9163	9163-470	30MHz-1GHz	June 10,2015	June 09,201
Horn Antenna	EMCO	3115	6741	1GHz-18GHz	June 10,2015	June 09,201
Horn Antenna	SCHWARZBECK	BBHA9170	BBHA9170154	15GHz-40GHz	June 10,2015	June 09,201
RF Cable-R03m	Jye Bao	RG142	CB021	30MHz-1GHz	June 18,2015	June 17,201
RF Cable-HIGH	SUHNER	SUCOFLEX 106	03CH03-HY	1GHz-40GHz	June 18,2015	June 17,201
Spectrum Meter	R&S	FSP 30	100023	9kHz-30GHz	July 16,2015	July 15,201
Power Meter	R&S	NRVS	100444	DC-40GHz	June 18,2015	June 17,201
Power Sensor	R&S	NRV-Z51	100458	DC-30GHz	June 18,2015	June 17,201
Power Sensor	R&S	NRV-Z32	10057	30MHz-6GHz	June 18,2015	June 17,201
RF CABLE-1m	JYE Bao	RG142	CB034-1m	20MHz-7GHz	June 18,2015	June 17,201
RF CABLE-2m	JYE Bao	RG142	CB035-2m	20MHz-1GHz	June 18,2015	June 17,201

1.5. List Of Measuring Equipments

Note: All equipment through GRGT EST calibration

1.6. Statement of The Measurement Uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. To CISPR 16-4 "Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC Measurements" and is documented in the LCS quality system acc. To DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

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1.7. Measurement Uncertainty

Test Item		Frequency Range	Uncertainty	Note
		9KHz~30MHz	3.10dB	(1)
	:	30MHz~200MHz	2.96dB	(1)
Radiation Uncertainty		200MHz~1000MHz	3.10dB	(1)
		1GHz~26.5GHz	3.80dB	(1)
		26.5GHz~40GHz	3.90dB	(1)
Conduction Uncertainty	:	150kHz~30MHz	1.63dB	(1)
Power disturbance	:	30MHz~300MHz	1.60dB	(1)

(1). This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

1.8. Description Of Test Modes

The EUT has been tested under operating condition.

For pre-testing, when performed power line conducted emission measurement, the input Voltage/Frequency AC 120V/60Hz and AC 240V/60Hz were used. Only recorded the worst case in this report.

The EUT was set to transmit at 100% duty cycle. This test was performed with EUT in X, Y, Z position and the worse case was found when EUT in Y position.

Worst-case mode and channel used for 150kHz-30 MHz power line conducted emissions was determined to be 802.11b mode(TX-Middle Channel).

Worst-case mode and channel used for 9kHz-1000 MHz radiated emissions was determined to be 802.11b mode(TX-Middle Channel).

Worst-Case data rates were utilized from preliminary testing of the Chipset, worst-case data rates used during the testing are as follows: BLE 4.0: 1Mbps, GFSK 802.11b Mode: 1 Mbps, DSSS. 802.11g Mode: 6 Mbps, OFDM. 802.11n Mode HT20: MCS0, OFDM. 802.11n Mode HT40: MCS0, OFDM.

***Note: Using a temporary antenna connector for the EUT when conducted measurements are performed.

DLL 4.0				
Frequency Band	Channel No.	Frequency(MHz)	Channel No.	Frequency(MHz)
	1	2402	21	2442
2402~2480MHz	2	2404		
	3	2406		
			38	2476
			39	2478
	20	2440	40	2480

Channel List & Frequency BLE 4.0

802.11b/g/n(HT20)

Frequency Band	Channel No.	Frequency(MHz)	Channel No.	Frequency(MHz)
	1	2412	7	2442
	2	2417	8	2447
	3	2422	9	2452
2412~2462MHz	4	2427	10	2457
	5	2432	11	2462
	6	2437		

802.11n(HT40)

Frequency Band	Channel No.	Frequency(MHz)	Channel No.	Frequency(MHz)
	1		7	2442
	2		8	2447
2422~2452MHz	3	2422	9	2452
2422~2432MITIZ	4	2427	10	
	5	2432	11	
	6	2437		

2. TEST METHODOLOGY

All measurements contained in this report were conducted with ANSI C63.10: 2013, American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices.

The radiated testing was performed at an antenna-to-EUT distance of 3 meters. All radiated and conducted emissions measurement was performed at Shenzhen LCS Compliance Testing Laboratory Ltd..

2.1. 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.

2.2. EUT Exercise

The EUT was operated in the engineering mode to fix the TX frequency that was for the purpose of the measurements.

According to FCC's request, Test Procedure KDB558074 D01 DTS Meas Guidance v03r05 is required to be used for this kind of FCC 15.247 digital modulation device.

According to its specifications, the EUT must comply with the requirements of the Section 15.203, 15.205, 15.207, 15.209 and 15.247 under the FCC Rules Part 15 Subpart C.

2.3. General Test Procedures

2.3.1 Conducted Emissions

According to the requirements in Section 6.2 of ANSI C63.10: 2013, AC power-line conducted emissions shall be measured in the frequency range between 0.15 MHz and 30MHz using Quasi-peak and average detector modes.

2.3.2 Radiated Emissions

The EUT is placed on a turn table and the turntable shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna, which varied from 1m to 4m 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 maximum emissions, exploratory radiated emission measurements were made according to the requirements in Section 6.3 of ANSI C63.10: 2013

3. SYSTEM TEST CONFIGURATION

3.1. Justification

The system was configured for testing in a continuous transmit condition.

3.2. EUT Exercise Software

N/A

3.3. Special Accessories

N/A

3.4. Block Diagram/Schematics

Please refer to the related document

3.5. Equipment Modifications

Shenzhen LCS Compliance Testing Laboratory Ltd. has not done any modification on the EUT.

3.6. Test Setup

Please refer to the test setup photo.

4. SUMMARY OF TEST RESULTS

Applied Standard: FCC Part 15 Subpart C						
FCC Rules	FCC Rules Description of Test					
§15.247(b)(3)	Maximum Conducted Output Power	Compliant				
§15.247(e)	Power Spectral Density	Compliant				
§15.247(a)(2)	6dB Bandwidth	Compliant				
§15.209, §15.247(d)	Radiated and Conducted Spurious Emissions	Compliant				
§15.205	\$15.205 Emissions at Restricted Band					
§15.207(a)	\$15.207(a) Line Conducted Emissions Compliant					
§15.203 Antenna Requirements Compliant						
Note: This is a DTS test r	eport for Home Automation Gateway (EZ0001-	1)				

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5. TEST RESULT

5.1. Maximum Conducted Output Power Measurement

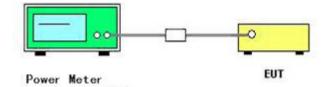
5.1.1. Standard Applicable

According to § 15.247(b)(3), For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850MHz bands: 1 Watt.

5.1.2. Test Procedures

The transmitter output (antenna port) was connected to the power meter.

5.1.3. Test Setup Layout



5.1.4. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

Temperature	25°C	Humidity	60%
Test Engineer	Chaz	Configurations	BLE 4.0; 802.11b/g/n

5.1.5.	Test	Result	of Ma	aximum	Conducted	Output Power
--------	------	--------	-------	--------	-----------	---------------------

Mode	Channel	Frequency (MHz)	Conducted Power (dBm, Peak)	Max. Limit (dBm)	Result
	1	2402	-3.55	30	Complies
BLE 4.0	20	2440	-2.16	30	Complies
	40	2480	-4.86	30	Complies
	1	2412	12.53	30	Complies
802.11b	6	2437	12.87	30	Complies
	11	2462	12.07	30	Complies
	1	2412	11.27	30	Complies
802.11g	6	2437	11.91	30	Complies
	11	2462	11.31	30	Complies
000.44	1	2412	11.25	30	Complies
802.11n HT20	6	2437	11.99	30	Complies
11120	11	2462	11.15	30	Complies
	3	2422	11.67	30	Complies
802.11n HT40	6	2437	11.42	30	Complies
11140	9	2452	11.03	30	Complies

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5.2. Power Spectral Density Measurement

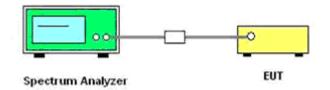
5.2.1. Standard Applicable

According to §15.247(e): For digitally modulated systems, 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.

5.2.2. Test Procedures

- 1) The transmitter was connected directly to a Spectrum Analyzer through a directional couple.
- 2) The power was monitored at the coupler port with a Spectrum Analyzer. The power level was set to the maximum level.
- 3) Set the RBW = 3 kHz.
- 4) Set the VBW \ge 3*RBW
- 5) Set the span to 1.5 times the DTS channel bandwidth.
- 6) Detector = peak.
- 7) Sweep time = auto couple.
- 8) Trace mode = max hold.
- 9) Allow trace to fully stabilize.
- 10) Use the peak marker function to determine the maximum power level in any 3 kHz band segment within the fundamental EBW.

5.2.3. Test Setup Layout



5.2.4. EUT Operation during Test

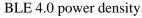
The EUT was programmed to be in continuously transmitting mode.

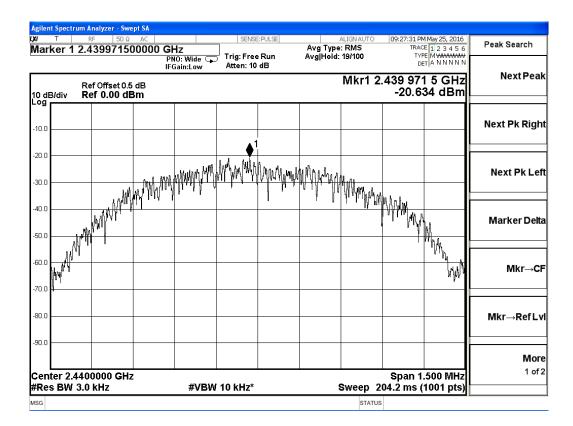
Temperatu	re		25°C	Humidity 6		60%	
Test Engine	ngineer		Chaz	Configurations		BLE 4.0; 802.11b/g/	
Mode	Cha	innel	Frequency (MHz)	Power Density (dBm/3KHz)		. Limit /3KHz)	Result
		1	2402	-21.941		8	Complies
BLE 4.0	2	20	2440	-20.634		8	Complies
	4	0	2480	-19.882		8	Complies
		1	2412	-13.386		8	Complies
802.11b	802.11b 6 11		2437	-14.761		8	Complies
			2462	-14.661		8	Complies
		1	2412	-19.117		8	Complies
802.11g	6		2437	-20.208		8	Complies
	1	1	2462	-20.882		8	Complies
		1	2412	-19.866		8	Complies
802.11n HT20	6		2437	-21.218		8	Complies
_	11		2462	-21.342		8	Complies
		3	2422	-21.247		8	Complies
802.11n HT40		6	2437	-21.893		8	Complies
		9	2452	-22.573		8	Complies

Note: The measured power density (dBm) has the offset with cable loss already.

FCC ID:2AIYW-EZ0001-1 Report No.: 1

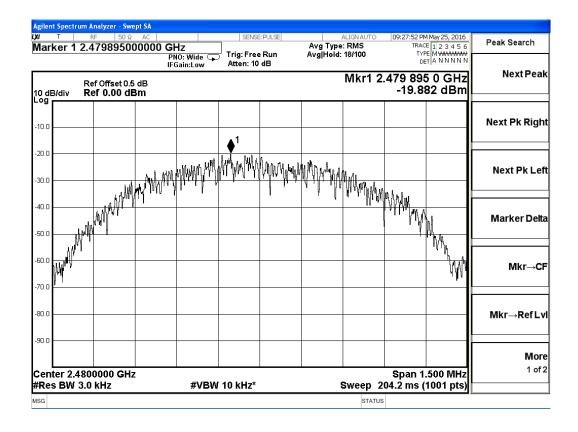
trum Analyzer - Swept SA UTO 09:27:10 PM May 25, 2016 TRACE 1 2 3 4 5 6 TYPE MWWWWW DET A N N N N N SENSE:PULSE Avg Type: RMS Avg|Hold: 39/100 Peak Search Marker 1 2.401971500000 GHz Trig: Free Run Atten: 10 dB PNO: Wide 😱 IFGain:Low Next Peak Mkr1 2.401 971 5 GHz Ref Offset 0.5 dB Ref 0.00 dBm -21.941 dBm 10 dB/div Log Next Pk Right -10.0 -20.0 Next Pk Left -30.0 -40.0 Marker Delta -50.0 -60.0 Mkr→CF γ .70 r -80.0 Mkr→RefLvl -90.0 More 1 of 2 Center 2.4020000 GHz Span 1.500 MHz #Res BW 3.0 kHz #VBW 10 kHz* Sweep 204.2 ms (1001 pts) MSG STATUS



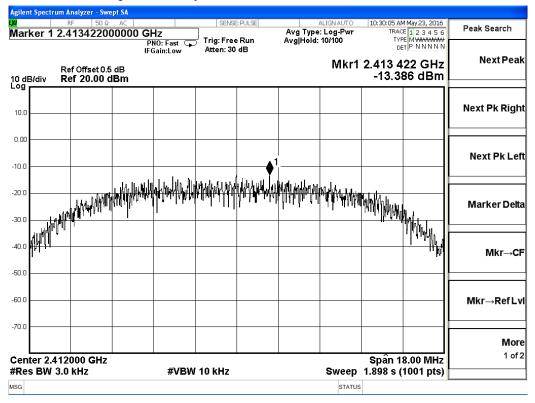


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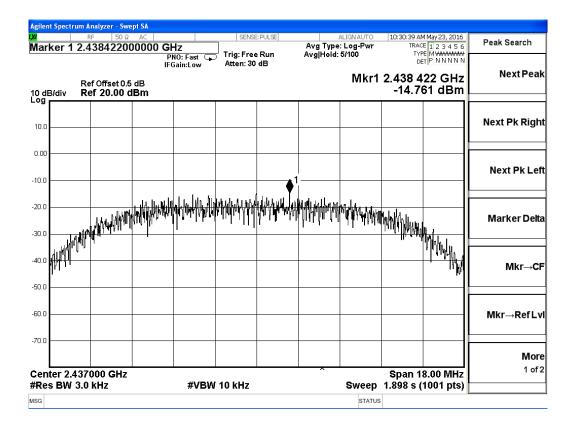


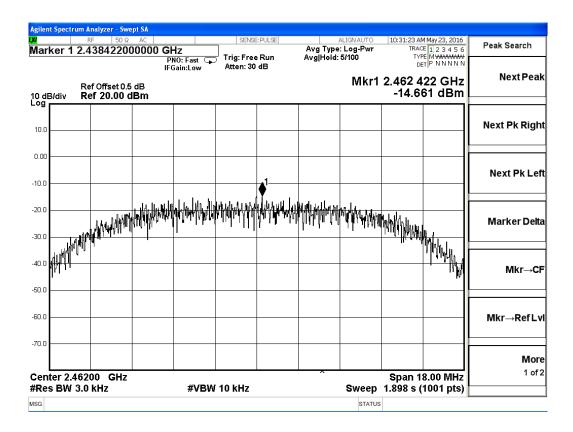
802.11b power density



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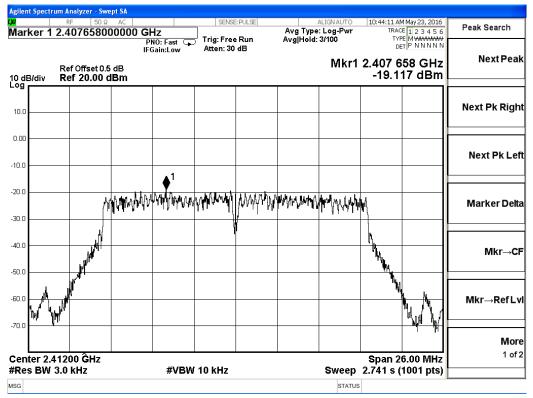
FCC ID:2AIYW-EZ0001-1 Report No.: LCS1605312799E



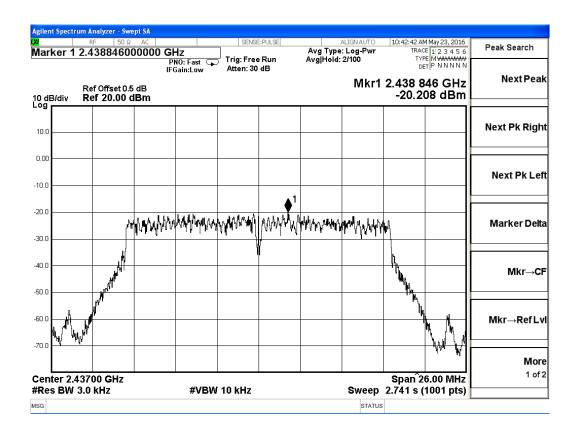


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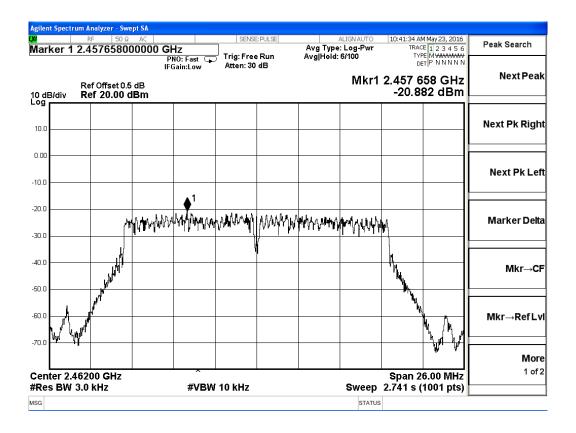


802.11g power density

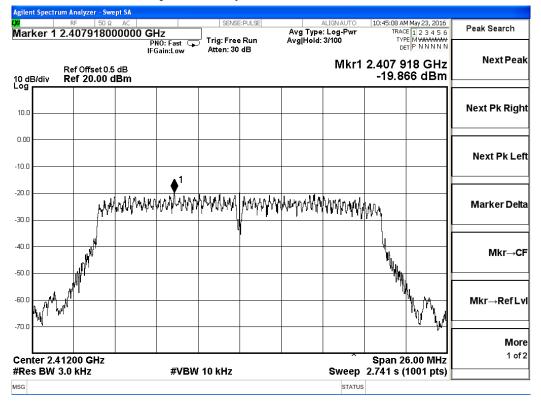


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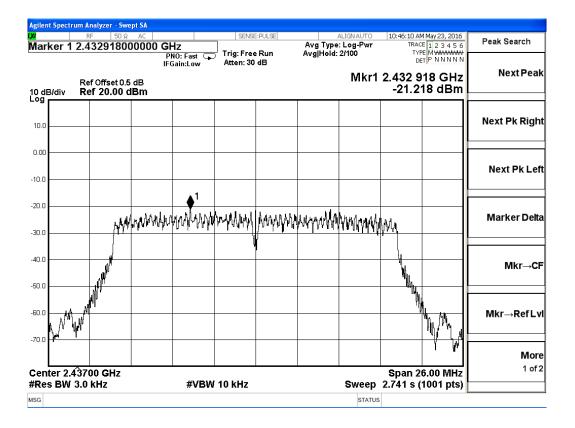


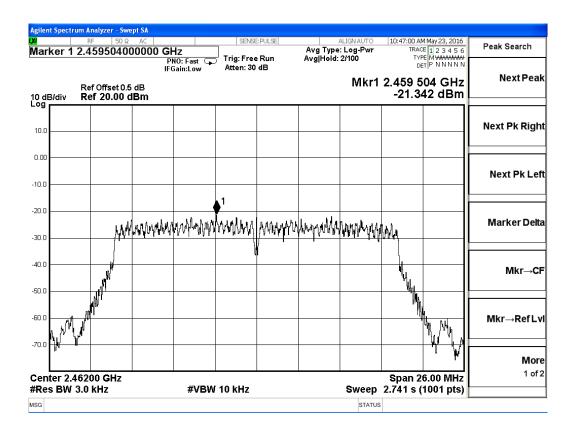
802.11n HT20 power density



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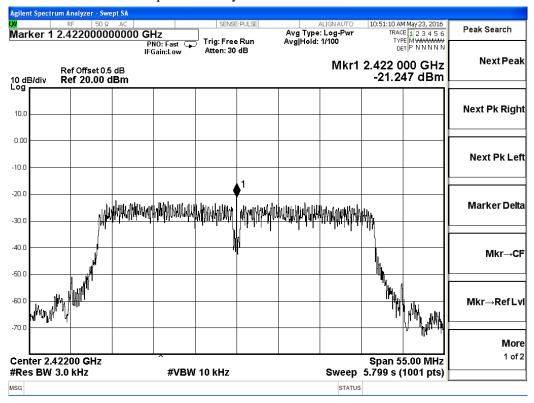
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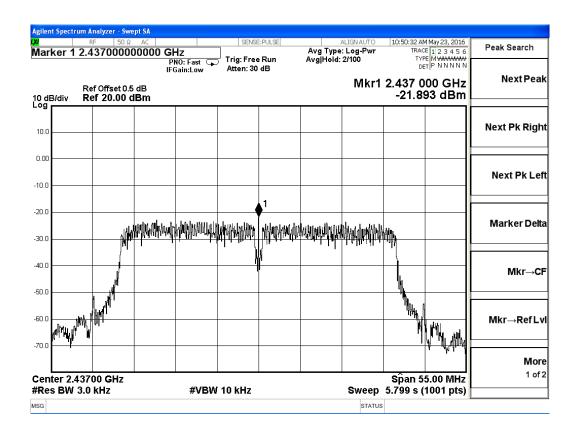


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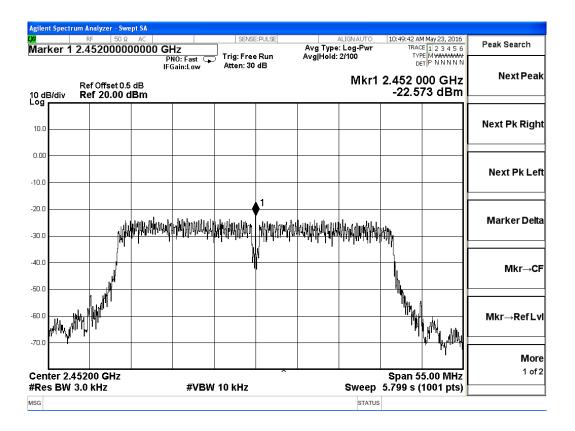


802.11n HT40 power density



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5.3. 6 dB Spectrum Bandwidth Measurement

5.3.1. Standard Applicable

According to \$15.247(a)(2): Systems using digital modulation techniques may operate in the 902-928 MHz, 2400-2483.5MHz, and 5725-5850 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.

5.3.2. Instruments Setting

The following table is the setting of the Spectrum Analyzer.

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	> RBW
Detector	Peak
Trace	Max Hold
Sweep Time	100ms

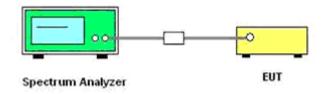
5.3.3. Test Procedures

1) The transmitter output (antenna port) was connected to the spectrum analyser in peak hold mode.

2) The resolution bandwidth and the video bandwidth were set according to KDB558074 D01 DTS Meas. Guidance v03r05.

3) Measured the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6dB relative to the maximum level measured in the fundamental emission.

5.3.4. Test Setup Layout



5.3.5. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

Temperature	25°C	Humidity	60%
Test Engineer	Chaz	Configurations	BLE4.0; 802.11b/g/n

Mode	Channel	Frequency	6dB Bandwidth (MHz)	Min. Limit (kHz)	Result
	1	2402	0.69	500	Complies
BLE 4.0	20	2440	0.69	500	Complies
	40	2480	0.69	500	Complies
	1	2412	11.54	500	Complies
802.11b	6	2437	11.30	500	Complies
	11	2462	11.31	500	Complies
	1	2412	16.49	500	Complies
802.11g	6	2437	16.48	500	Complies
	11	2462	16.49	500	Complies
002.44 *	1	2412	17.67	500	Complies
802.11n	6	2437	17.65	500	Complies
HT20	11	2462	17.66	500	Complies
902.11	3	2422	36.43	500	Complies
802.11n HT40	6	2437	36.42	500	Complies
11140	9	2452	36.44	500	Complies

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FCC ID:2AIYW-EZ0001-1

Agilent Spectrum Analyzer - Occupied BW SENSE:PULSE Center Freq: 2.402000000 GHz Trig: Free Run Avg|Hol #Atten: 10 dB 09:23:41 PM May 25, 2016 Radio Std: None ALIGN AUTO 50 Ω Trace/Detector x dB -6.00 dB Avg|Hold:>10/10 Ð Radio Device: BTS #IFGain:Low 10 dB/div Ref 0.00 dBm Log -10.0 **Clear Write** -20.0 30.0 -40.0 Average -50.0 -60.0 -70.0 -80.0 Max Hold -90.C Center 2.402 GHz #Res BW 100 kHz Span 3 MHz #VBW 300 kHz Sweep 1 ms Min Hold **Occupied Bandwidth Total Power** 1.56 dBm 1.0280 MHz Detector Peak▶ Transmit Freq Error -3.213 kHz **OBW Power** 99.00 % Auto Man x dB Bandwidth 695.6 kHz x dB -6.00 dB MSG STATUS

BLE 4.0 channel, 6dB bandwidth

T RF 50Ω AC		ENSE:PULSE	ALIGN AUTO	09:24:10 P Radio Std	M May 25, 2016	Trace	e/Detector
enter Freq 2.440000000	Trig: F	r Freq: 2.440000000 GHz Free Run Avg Ho n: 10 dB	: bld:>10/10	Radio Sta Radio Dev			
dB/div Ref 0.00 dBm							
			<u>_</u>			c	Clear Wr
			\				
					^		Avera
1.0					w water		
.0							Max H
enter 2.44 GHz Res BW 100 kHz	#	VBW 300 kHz			an 3 MHz ep 1 ms		Min H
Occupied Bandwidtl	า	Total Power	2.5	5 dBm			
1.0	0283 MHz						Deteo Pea
Transmit Freq Error	-2.691 kHz	OBW Power	99	9.00 %		Auto	<u>N</u>
x dB Bandwidth	688.8 kHz	x dB	-6.	00 dB			
			STATU	_			

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FCC ID:2AIYW-EZ0001-1 Report No.: LCS1605312799E

lent Spectrum Analyzer - Occupied BW 09:24:52 PM May 25, 2016 Radio Std: None SENSE:PULSE Center Freq: 2.480000000 GHz Trig: Free Run Avg|Hol-#Atten: 10 dB 50 Ω ALIGN AUTO Trace/Detector x dB -6.00 dB Avg|Hold:>10/10 Ģ Radio Device: BTS #IFGain:Low 10 dB/div Ref 0.00 dBm Log -10.0 **Clear Write** 20.0 30.0 40.0 Average 50.0 -60 r 70.0 80.0 Max Hold 90.0 Center 2.48 GHz #Res BW 100 kHz Span 3 MHz #VBW 300 kHz Sweep 1 ms Min Hold **Occupied Bandwidth Total Power** 3.64 dBm 1.0291 MHz Detector Peak▶ -3.632 kHz **Transmit Freq Error OBW Power** 99.00 % Auto Man x dB Bandwidth 692.8 kHz x dB -6.00 dB MSG STATUS

802.11b channel, 6dB bandwidth

	ectrum Analyzer - Occ											
w/ xdB-6	RF 50 Ω	AC			E:PULSE req: 2.41200		ALIGN A	UTO	10:15:17 A	M May 23, 2016	Trac	e/Detector
x ub -0			Ģ	Trig: Fre #Atten: 3	e Run	Avg Hold	>10/10)				
		#11	Gain:Low	#Atten: 3	UdB				Radio Dev	Aice: BTS		
10 dB/di Log	v Ref 20.0	0 dBm	-		1	1	1					
10.0												
0.00					๛๚๛๛๛	Ma 4- ~						Clear Write
-10.0		m					m					
-20.0		and the second						w.				
-30.0									North Contraction of the second secon			Average
-40.0	and the second s								han harrow			5
-50.0	www.white								***\	m and a second		
-60.0												
-70.0												Max Hold
	2.412 GHz									n 30 MHz		
#Res B	W 100 kHz			#VE	3W 300 k	Hz			Sweep	2.933 ms		Min Hold
000	upied Band	width			Total P	ower		18.6	dBm			
				1-								
		14.8	361 MI	٦Z								Detector Peak▶
Tran	nsmit Freq Err	or	-45.812	κHz	OBW P	ower		99	.00 %		Auto	Man
x dB	Bandwidth		11.54 N	٩Hz	x dB			-6.0	00 dB			
MSG								STATUS	i		L	
									1			

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Agilent Spe	ectrum Analyzer - Oco											
(XI Center	RF 50 Ω Freq 2.43700		lz Gain:Low ∽				ALIGN AU		10:15:40 A Radio Std Radio Dev		Trac	e/Detector
10 dB/div	v Ref 20.0		Gain:Low	#Atten: 0					Naulo Der			
Log 10.0 0.00			- Comment	ᢑᡡᡁᡘᡟᡊᡙᠬᡔᡘᡁ	ᠬ᠕ᠬᠬᢦ᠊ᠰᢦ	man and a second						Clear Write
-10.0		por company				y y	www.vv	N.	^			Average
-40.0 -50.0	Marinehandriv								موالىسلىلىر مى	rfly-bayedtyry		Max Hold
-70.0	2.437 GHz									n 30 MHz		
	W 100 kHz upied Band	width		#VI	BW 300 k Total P		1		Sweep dBm	2.933 ms		Min Hold
		14.8	855 MH	Ηz								Detector Peak▶
	smit Freq Eri	ror	-50.589		OBW P	ower			00 %		Auto	Man
x dB	Bandwidth		11.30 №	IHz	x dB			-6.0	0 dB			
MSG							ST	TATUS				

dB -6.00 dB	50 Ω	AC		Cente	ENSE:PULSE		ALIGN AU	F	10:16:37 A Radio Std	M May 23, 2016 : None	Trac	e/Detector
		1	¥IFGain:Lov		Free Run n: 30 dB	Avg Hol-	d:>10/10		Radio Dev	vice: BTS		
dB/div Re	ef 20.00	dBm					;					
1.0												Clear Wri
0			m	y you warnen	ᠬ᠕ᡅ᠂᠕ᡘ	more	Mar N					
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	a fund								hy.			Avera
mont	Ard all a								WWW	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~		
												Max Ho
nter 2.462 G es BW 100 k				#	≠VBW 300	kHz		ş		n 30 MHz 2.933 ms		Min Ho
Occupied	Bandv	vidth			Total	Power		16.2 c	dBm			
		14.	.873 I	MHz								Detect
Fransmit Fr	eq Erro	or	-47.4 ⁻	12 kHz	OBW	Power		99.0	00 %		Auto	Pea <u>M</u>
x dB Bandw	ridth		11.3	1 MHz	x dB			-6.00) dB			
							s	TATUS				

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FCC ID:2AIYW-EZ0001-1

ctrum Analyzer - Occupied BW 10:19:39 AM May 23, 2016 Radio Std: None ALIGN AUTO 50 Ω SENSE:PULSE Center Freq: 2.412000000 GHz Trig: Free Run Avg|Hol #Atten: 30 dB Meas Setup x dB -6.00 dB Avg|Hold:>10/10 Ð Radio Device: BTS Avg/Hold Num #IFGain:Low 10 Off On 10 dB/div Ref 20.00 dBm Log 10.0 Avg Mode 0.00 E<u>xp</u> Repeat many many my my many many 10.0 mm -20.0 -30.0 -4N N Λ_{m} _ممرر -50.0 **OBW** Power -60.0 99.00 % 70.0 Span 30 MHz Sweep 2.933 ms Center 2.412 GHz #Res BW 100 kHz #VBW 300 kHz 14.3 dBm **Occupied Bandwidth Total Power** 16.408 MHz x dB -6.00 dB -12.449 kHz **Transmit Freq Error OBW Power** 99.00 % x dB Bandwidth 16.49 MHz x dB -6.00 dB More 1 of 2 MSG STATUS

802.11g channel, 6dB bandwidth

Clear Clear Clear Clear Clear Ave Clear Ave Clear Max enter 2.437 GHz Res BW 100 kHz #VBW 300 kHz Sweep 2.933 ms Occupied Bandwidth 16.400 MHz Det	RF 50 Q AC enter Freq 2.437000000	Trig	sense:PULSE ter Freq: 2.437000000 G : Free Run Avg i en: 30 dB	ALIGN AUTO Hz Hold:>10/10	10:18:08 A Radio Std: Radio Dev		Trac	e/Detector
Clear Clear Clear Clear Clear Clear Clear Ave Max enter 2.437 GHz Res BW 100 kHz Transmit Freq Error -12.703 kHz Clear Clear Clear Ave Ave Ave Ave Ave Ave Ave Ave	og	n						
Ave Ave Ave Ave Ave Ave Ave Ave	.00	and the second second	m and an	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~			C	Clear Wri
Max Max Max Max Max Span 30 MHz Res BW 100 kHz #VBW 300 kHz Sweep 2.933 ms Min Cccupied Bandwidth Total Power 16.400 MHz Transmit Freq Error -12.703 kHz OBW Power 99.00 %					WWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWW			Avera
Res BW 100 kHz #VBW 300 kHz Sweep 2.933 ms Occupied Bandwidth Total Power 12.9 dBm 16.400 MHz Transmit Freq Error -12.703 kHz OBW Power 99.00 %	1.0					the second se		Max Ho
16.400 MHz Det Transmit Freq Error -12.703 kHz OBW Power 99.00 %					Sweep			Min Ho
Transmit Freq Error -12.703 kHz OBW Power 99.00 %	•		Total Power	12.9	∂dBm			Detec
x dB Bandwidth 16.48 MHz x dB -6.00 dB			OBW Power	99	9.00 %		Auto	Pea <u>N</u>
	x dB Bandwidth	16.48 MHz	x dB	-6.	00 dB			
STATUS								

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Agilent Spectrum Analyzer - Occupied BW			
X RF 50 Ω AC x dB -6.00 dB	SENSE:PULSE Center Freq: 2.462000000 GHz Trig: Free Run Avg Hold:	ALIGN AUTO 10:16:55 AM May 23, 2016 Radio Std: None >10/10	Trace/Detector
#IFGain:Low	#Atten: 30 dB	Radio Device: BTS	
10 dB/div Ref 20.00 dBm			
10.0			
0.00			Clear Write
-10.0	an many when a proposed		
-20.0			Average
-30.0			Average
-50.0 monthing the second		VI HINGON	
-60.0			Max Hold
-70.0			
Center 2.462 GHz #Res BW 100 kHz	#VBW_300 kHz	Span 30 MHz Sweep 2.933 ms	
		•	Min Hold
Occupied Bandwidth	Total Power	12.5 dBm	
16.408 MI	ΗZ		Detector Peak▶
Transmit Freq Error -10.264	kHz OBW Power	99.00 %	Auto <u>Man</u>
x dB Bandwidth 16.49 N	/Hz x dB	-6.00 dB	
MSG		STATUS	

802.11n HT20 channel, 6dB bandwidth

		nalyzer - Occ										
<mark>IXI</mark> X d D	-6.00 d	F 50 Ω	AC			E:PULSE req: 2.41200		ALIGN AUTO	10:20:04 A Radio Std:	M May 23, 2016	Trac	e/Detector
хив	-0.00 u	D		Ģ	🚽 Trig: Free	e Run	Avg Hold	>10/10				
			#IF0	Gain:Low	#Atten: 3	0 dB			Radio Dev	ice: BTS		
10 dB/	div	Ref 20.00) dBm									
Log 10.0												
0.00												Clear Write
			+ + - 0/1 + 1	ᡅ᠋ᢣ᠈ᢣᡆᡔᡐᡘᡙᠵ	~~~^^	a						
-10.0						1						
-20.0		ſ							h			
-30.0		کم کی							- The			Average
-40.0		ng p ^{ro}							- '\ \ \ \ \			
-50.0 🗠	raw ^{rac} y ^r	Ŷ							<u> </u>	Long m	<u> </u>	
-60.0												Max Hold
-70.0												Maxilola
ĻĻ												
	er 2.412 BW 10				#\/E	300 k	U -		Spa	n 30 MHz 2.933 ms		
#Res	DW IU				#VC	544 300 M	.пz		Sweep	2.955 1115		Min Hold
00	cupie	d Band	width			Total P	ower	14.2	2 dBm			
		a Bana		34 MI	1-							
			17.5	54 111	72							Detector Peak▶
Tra	ansmit	Freq Err	or	-24.634	кНz	OBW P	ower	99	9.00 %		Auto	Man
xc	IB Band	dwidth		17.67 N	٩Hz	x dB		-6.	00 dB			
MSG								STATUS	\$			
								GIAIO	~			

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	nt Spect			cupied BW									
w xd	B -6.0	RF 00 dB	50 Ω	AC			E:PULSE req: 2.43700 e Run			10:21:24 A Radio Std	M May 23, 2016 : None	Trac	e/Detector
				#IF	Gain:Low	#Atten: 3		Arginola.	- 10/10	Radio Dev	vice: BTS		
	dB/div	R	ef 20.0	0 dBm									
Log 10.0													
0.00												· ·	Clear Write
-10.0)			hanne	man	mmy	mm	han	n mover			<u> </u>	
-20.0			,	1			vr.			1			
-30.0										land the second			Average
-40.0		~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	م مرکز							- N. C	~		
-50.0 -60.0		· 🗤									Vin		
-70.0													Max Hold
			<u></u>										
		2.437 C				#VE	300 k	Hz			n 30 MHz 2.933 ms		Min Hold
	Dccu	pied	Band	width			Total P	ower	13.3	3 dBm			
				17.5	530 MI	Ηz							Detector
ר	Frans	mit Fr	eq Err	or	-26.719	кНz	OBW P	ower	99	9.00 %		Auto	Peak► <u>Man</u>
>	dB B	Bandv	vidth		17.65 N	1Hz	x dB		-6.	00 dB			
MSG									STATUS	S		Ľ.	

Agilent Spectrum XI Center Fred	RF 50 Ω	AC 00000 GH	İZ Gain:Low				ALIGNAUTO	10:21:49 A Radio Std Radio Dev		Trac	e/Detector
10 dB/div	Ref 20.0	0 _. dBm									
Log 10.0 0.00			لەك يە مەت مەت مەت مەت مەت مەت مەت مەت مەت مە	~~~^~^~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~			monto				Clear Write
-20.0 -30.0 -40.0								1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1			Average
-50.0 76-10,000-10-10,000 -60.0									why war		Max Hold
Center 2.46 #Res BW 10				#VE	3W 300 k	Hz			n 30 MHz 2.933 ms		Min Hold
Occupie	ed Band		31 MI	Ηz	Total P	ower	12.4	l dBm			Detector Peak▶
Transmit x dB Bar	Freq Err ndwidth	or	-26.526 17.66 N		OBW P x dB	ower		9.00 % 00 dB		Auto	Man
MSG							STATU	5			

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CdB - 5.00 dB Center Pred: 2.4220000 GB2 Radio Std: None #IFGain:Low #IFGain:Low Avg Hold>10/10 #Atten: 30 dB Radio Device: BTS 10 dB/div Ref 20.00 dBm Cleat 10 dB/div Ref 20.00 dBm Cleat 10 dB/div Ref 20.00 dBm Cleat 10 dB/div Ref 20.00 dBm Radio Device: BTS 10 dB/div Ref 20.00 dBm Ref 20.00 dBm 10 dB/div Ref 20.00 dBm Ref 20.00 dBm 10 dB/div Ref 20.00 dBm Ref 20.00 dBm 10 dB/div Total Power 14.0 dBm 11 dBm 25 000 MU L Ref 20.00 MU L		50Ω AC			PULSE		ALIGN AUTO		M May 23, 2016	Trac	e/Detector
Log 100 100 100 100 100 100 100 10	dB -6.00 dB	#	IFGain:Low	Trig: Free	Run		:>10/10			Trac	erDelector
100 Image: Clear of the second seco) dB/div Ref 2	0.00 dBm									
00 <	0.0										Clear Wr
A A A A A A A A A A A A A A A A A A A		1 www.www.	๛๛ๅ๛๚๛๚๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛	www.arman	man	๛๚๚๛๚๛๛๛๛	^{IA} WWWWWWWWW				
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Auto Auto	D.O Wayner May Angel							- North Com	h when and		
enter 2.422 GHz Res BW 100 kHz #VBW 300 kHz Span 60 MHz Sweep 5.8 ms M Occupied Bandwidth Total Power 14.0 dBm 35.989 MHz D Transmit Freq Error -62.459 kHz OBW Power 99.00 %	0.0	-							C. Alleren		Max H
Res BW 100 kHz #VBW 300 kHz Sweep 5.8 ms Occupied Bandwidth Total Power 14.0 dBm 35.989 MHz D Transmit Freq Error -62.459 kHz OBW Power 99.00 %								Spa	n 60 MHz		
Coordination Data Statistics 35.989 MHz D Transmit Freq Error -62.459 kHz OBW Power 99.00 %				#VB	W 300 k	Hz					Min H
Transmit Freq Error -62.459 kHz OBW Power 99.00 %	Occupied Ba	ndwidth			Total P	ower	14.0	dBm			
		35.	989 MH	z							Deteo Pe
x dB Bandwidth 36.43 MHz x dB -6.00 dB	Transmit Freq	Error	-62.459 kl	Hz	OBW P	ower	99	.00 %		Auto	-e
	x dB Bandwidtl	h	36.43 MI	Ηz	x dB		-6.	00 dB			
G STATUS											

802.11n HT40 channel, 6dB bandwidth

RF 50 Ω AC		ENSE:PULSE	ALIGN AUTO		M May 23, 2016	T	/Detecto
nter Freq 2.43700000	Trig: F	r Freq: 2.437000000 GHz Free Run Avg Hol n: 30 dB	d:>10/10	Radio Std Radio Dev		Trace	Detecto
dB/div Ref 20.00 dBn				Radio Der	ite. B15		
0						· ~	lear W
0						Ŭ	
0	www.howhand	my murris man	Marin Marin				
0 **		- W		<u> </u>			
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0					I. M. K. W. W.		
0							Max H
enter 2.437 GHz Span 60 MHz					n 60 MHz		
Res BW 100 kHz		#VBW 300 kHz			p 5.8 ms		Min H
Occupied Bandwidt	h	Total Power	13.2	dBm			
•	5.992 MHz						
3							Deteo
Transmit Freq Error	-66.427 kHz	OBW Power	99	.00 %		Auto	
x dB Bandwidth	36.42 MHz	x dB	-6	00 dB			
	00.42 00.12	A GB	-0.				

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Agiler	it Spectri	ım Analyzer - Oc										
<mark>IXI</mark> V dE	3 -6.0	RF 50Ω DAB	AC			E:PULSE reg: 2.45200		ALIGNAUTO	10:24:58 A Radio Std	M May 23, 2016 None	Trac	e/Detector
x ui	5-0.0				🚽 Trig: Fre	e Run	Avg Hold	:>10/10				
	#IFGain:Low #Atten: 30 dB Radio Device: BTS						rice: BTS					
10 d Log	B/div	Ref 20.0	0 dBm	1		1						
10.0												
0.00											'	Clear Write
-10.0			A. Martin Martin	www.www	- Thursdon (1)-wyly)	manana		ኯኯኯኯኯኯ			<u> </u>	
-20.0						₽			<u> </u>			
-30.0		/	/						\			Average
-40.0		- Alamara							Mr. A			_
-50.0	mayor	work America							l ~~V~	Marth whom		
-60.0												Max Hold
-70.0												Μάλ Πυία
Ι.									_			
		452 GHz 100 kHz			#\/E	300 k	U -7			n 60 MHz p 5.8 ms		
#RC	5 044				# * 6	DAA DOOK	пг		owee	h 2.0 III2		Min Hold
l c	ccur	ied Band	lwidth			Total P	ower	13.6	i dBm			
	36.000 MHz							Detector				
			00.0		12							Peak ►
T	ransn	nit Freq Eri	ror	-70.782	kHz	OBW P	ower	99	0.00 %		Auto	Man
x	x dB Bandwidth		36.44 MHz		x dB		-6.00 dB					
MSG								STATUS	5		L	

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5.4. Radiated Emissions Measurement

5.4.1. Standard Applicable

According to §15.247 (d): 20dBc in any 100 kHz bandwidth outside the operating frequency band. In case the emission fall within the restricted band specified on 15.205(a), then the 15.209(a) limit in the table below has to be followed.

Frequencies(MHz)	Field Strength(microvolts/meter)	Measurement Distance(meters)
0.009~0.490	2400/F(KHz)	300
0.490~1.705	24000/F(KHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
Above 960	500	3

5.4.2. Instruments Setting

The following table is the setting of spectrum analyzer and receiver.

Spectrum Parameter	Setting
Attenuation	Auto
Start Frequency	1000 MHz
Stop Frequency	10th carrier harmonic
RB / VB (Emission in restricted band)	1MHz / 1MHz for Peak, 1 MHz / 10Hz for Average
RB / VB (Emission in non-restricted band)	1MHz / 1MHz for Peak, 1 MHz / 10Hz for Average

Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RB 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RB 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RB 100kHz for QP

5.4.3. Test Procedures

1) Sequence of testing 9 kHz to 30 MHz

Setup:

--- The equipment was set up to simulate a typical usage like described in the user manual or described by manufacturer.

--- If the EUT is a tabletop system, a rotatable table with 0.8 m height is used.

--- If the EUT is a floor standing device, it is placed on the ground.

--- Auxiliary equipment and cables were positioned to simulate normal operation conditions.

--- The AC power port of the EUT (if available) is connected to a power outlet below the turntable.

--- The measurement distance is 3 meter.

--- The EUT was set into operation.

Premeasurement:

--- The turntable rotates from 0 $^{\circ}$ to 315 $^{\circ}$ using 45 $^{\circ}$ steps.

--- The antenna height is 0.8 meter.

--- At each turntable position the analyzer sweeps with peak detection to find the maximum of all emissions

Final measurement:

--- Identified emissions during the premeasurement the software maximizes by rotating the turntable position (0 ° to 360 °) and by rotating the elevation axes (0 ° to 360 °).

--- The final measurement will be done in the position (turntable and elevation) causing the highest emissions with QPK detector.

--- The final levels, frequency, measuring time, bandwidth, turntable position, correction factor, margin to the limit and limit will be recorded. Also a plot with the graph of the premeasurement and the limit will be stored.

2) Sequence of testing 30 MHz to 1 GHz

Setup:

--- The equipment was set up to simulate a typical usage like described in the user manual or described by manufacturer.

--- If the EUT is a tabletop system, a table with 0.8 m height is used, which is placed on the ground plane.

--- If the EUT is a floor standing device, it is placed on the ground plane with insulation between both.

--- Auxiliary equipment and cables were positioned to simulate normal operation conditions

--- The AC power port of the EUT (if available) is connected to a power outlet below the turntable.

- --- The measurement distance is 3 meter.
- --- The EUT was set into operation.

Premeasurement:

- --- The turntable rotates from 0 ° to 315 ° using 45 ° steps.
- --- The antenna is polarized vertical and horizontal.
- --- The antenna height changes from 1 to 3 meter.

--- At each turntable position, antenna polarization and height the analyzer sweeps three times in peak to find the maximum of all emissions.

Final measurement:

--- The final measurement will be performed with minimum the six highest peaks.

--- According to the maximum antenna and turntable positions of premeasurement the software maximize the peaks by changing turntable position (± 45 °) and antenna movement between 1 and 4 meter.

--- The final measurement will be done with QP detector with an EMI receiver.

--- The final levels, frequency, measuring time, bandwidth, antenna height, antenna polarization, turntable angle, correction factor, margin to the limit and limit will be recorded. Also a plot with the graph of the premeasurement with marked maximum final measurements and the limit will be stored.

3) Sequence of testing 1 GHz to 18 GHz

Setup:

--- The equipment was set up to simulate a typical usage like described in the user manual or described by manufacturer.

--- If the EUT is a tabletop system, a rotatable table with 1.5 m height is used.

--- If the EUT is a floor standing device, it is placed on the ground plane with insulation between both.

--- Auxiliary equipment and cables were positioned to simulate normal operation conditions

--- The AC power port of the EUT (if available) is connected to a power outlet below the turntable.

--- The measurement distance is 3 meter.

--- The EUT was set into operation.

Premeasurement:

--- The turntable rotates from 0 ° to 315 ° using 45 ° steps.

--- The antenna is polarized vertical and horizontal.

--- The antenna height scan range is 1 meter to 2.5 meter.

--- At each turntable position and antenna polarization the analyzer sweeps with peak detection to find the maximum of all emissions.

Final measurement:

--- The final measurement will be performed with minimum the six highest peaks.

--- According to the maximum antenna and turntable positions of premeasurement the software maximize the peaks by changing turntable position (± 45 °) and antenna movement between 1 and 4 meter. This procedure is repeated for both antenna polarizations.

--- The final measurement will be done in the position (turntable, EUT-table and antenna polarization) causing the highest emissions with Peak and Average detector.

--- The final levels, frequency, measuring time, bandwidth, turntable position, EUT-table position, antenna polarization, correction factor, margin to the limit and limit will be recorded. Also a plot with the graph of the premeasurement with marked maximum final measurements and the limit will be stored.

4) Sequence of testing above 18 GHz

Setup:

--- The equipment was set up to simulate a typical usage like described in the user manual or described by manufacturer.

--- If the EUT is a tabletop system, a rotatable table with 1.5 m height is used.

--- If the EUT is a floor standing device, it is placed on the ground plane with insulation between both.

--- Auxiliary equipment and cables were positioned to simulate normal operation conditions

--- The AC power port of the EUT (if available) is connected to a power outlet below the turntable.

--- The measurement distance is 1 meter.

--- The EUT was set into operation.

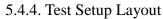
Premeasurement:

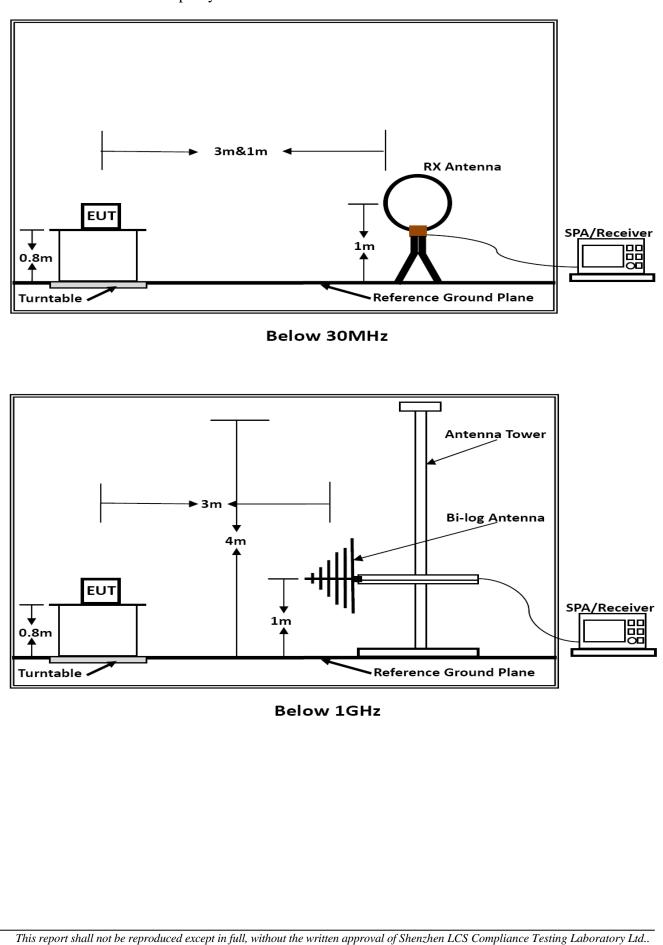
--- The antenna is moved spherical over the EUT in different polarisations of the antenna.

Final measurement:

--- The final measurement will be performed at the position and antenna orientation for all detected emissions that were found during the premeasurements with Peak and Average detector.

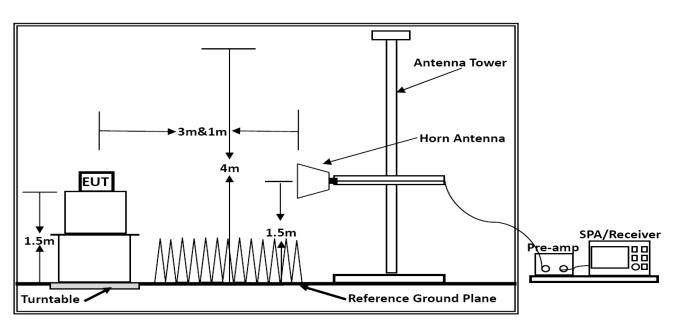
--- The final levels, frequency, measuring time, bandwidth, correction factor, margin to the limit and limit will be recorded. Also a plot with the graph of the premeasurement and the limit will be stored.





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Above 1GHz

5.4.5. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

Temperature	25°C	Humidity	60%
Test Engineer	Chaz	Configurations	BLE 4.0; 802.11b/g/n

Freq.	Level	Over Limit	Over Limit	Remark
(MHz)	(dBuV)	(dB)	(dBuV)	
-	-	-	-	See Note

Note:

The radiated emissions from 9kHz to 30MHz are at least 20dB below the official limit and no need to report.

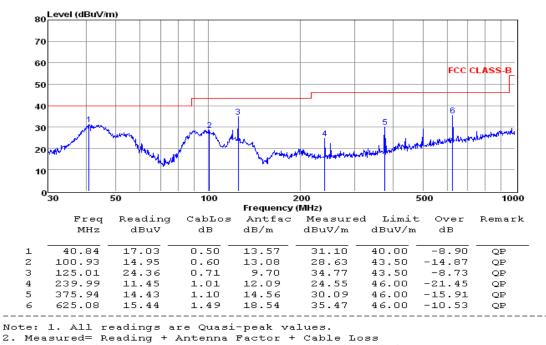
Distance extrapolation factor = 40 log (specific distance / test distance) (dB);

Limit line = specific limits (dBuV) + distance extrapolation factor.

5.4.7. Results of Radiated Emissions (30MHz~1GHz)
--	-------------

Temperature	25°C	Humidity	60%	
Test Engineer	Chaz	Configurations	802.11b(Middle Channel)	

Horizontal:



3. The emission that ate 20db blow the offficial limit are not reported

Vertical:

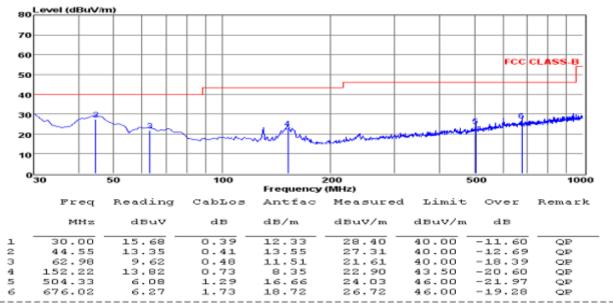
80 70 60 -B 50 40 30 20 10 0 30 1000 50 100 200 500 Frequency (MHz) CabLos Freq Reading Antfac Measured Limit Over Remark MHz dBuV dB dB/m dBuV/m dBuV/m dB 43.81 3.79 0.41 13.56 17.76 40.00 -22.24 1 QP 2 54.83 5.25 0.46 0.71 13.03 18.74 40.00 43.50 -21.26 OP з 125.01 8.21 9.70 18.62 -24.88 OP 250.30 4 8.58 1.02 12.07 21.67 46.00 -24.33 QP 5 375.94 15.29 1.10 14.56 30.95 46.00 -15.05 QP б 625.08 17.37 1.49 18.54 37.40 46.00 -8.60 OP

Note: 1. All readings are Quasi-peak values. 2. Measured= Reading + Antenna Factor + Cable Loss 3. The emission that ate 20db blow the offficial limit are not reported

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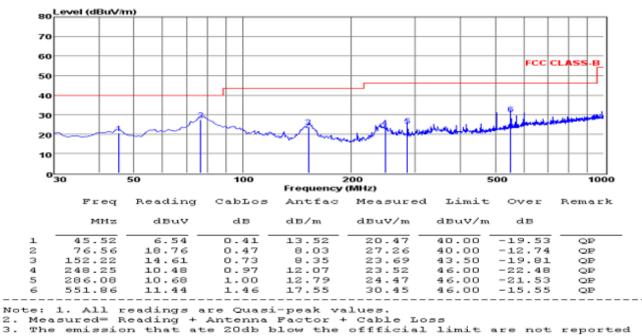
Temperature	Temperature 25°C		60%	
Test Engineer	Chaz	Configurations	BLE (Middle Channel)	

Horizontal:



te: 1. All readings are Quasi-peak values. Measured= Reading + Antenna Factor + Cable Loss The emission that ate 20db blow the offficial limit are not reported Note: 2. з.

Vertical:



з.

***Note:

Pre-scan all mode and recorded the worst case results in this report (802.11b (Middle Channel) &BLE(Middle channel)).

Emission level (dBuV/m) = $20 \log Emission level (uV/m)$.

Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level.

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5.4.8. Results for Radiated Emissions (Above 1GHz)

Note: Only recorded the worst test result.

BLE 4.0

TX-Low Channel

Freq. MHz	Reading Level dBuV	Ant. Fac. dB/m	Pre. Fac. dB	Cab. Loss dB	Measured dBuV/m	Limit dBuV/m	Margin dB	Remark	Pol.
4804.06	44.37	33.06	35.04	3.94	46.33	74	-27.67	Peak	Horizontal
4804.03	35.72	33.06	35.04	3.94	37.68	54	-17.26	Average	Horizontal
4804.06	45.34	33.06	35.04	3.94	47.30	74	-25.94	Peak	Vertical
4804.03	36.53	33.06	35.04	3.94	38.49	54	-15.35	Average	Vertical

TX-Middle Channel

Freq. MHz	Reading Level dBuV	Ant. Fac. dB/m	Pre. Fac. dB	Cab. Loss dB	Measured dBuV/m	Limit dBuV/m	Margin dB	Remark	Pol.
4880.07	43.99	33.16	35.15	3.96	45.42	74	-28.58	Peak	Horizontal
4880.10	34.46	33.16	35.15	3.96	35.82	54	-18.18	Average	Horizontal
4880.07	45.51	33.16	35.15	3.96	47.34	74	-26.66	Peak	Vertical
4880.10	35.72	33.16	35.15	3.96	37.43	54	-16.57	Average	Vertical

Freq. MHz	Reading Level dBuV	Ant. Fac. dB/m	Pre. Fac. dB	Cab. Loss dB	Measured dBuV/m	Limit dBuV/m	Margin dB	Remark	Pol.
4960.04	44.77	33.26	35.14	3.98	46.87	74	-27.13	Peak	Horizontal
4960.06	34.91	33.26	35.14	3.98	37.01	54	-16.99	Average	Horizontal
4960.04	44.55	33.26	35.14	3.98	46.65	74	-27.35	Peak	Vertical
4960.06	37.45	33.26	35.14	3.98	39.55	54	-14.45	Average	Vertical

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FCC ID:2AIYW-EZ0001-1 Report No.: LCS1605312799E

802.11b

TX-Low Channel

Freq. MHz	Reading dBuv	Ant. Fac. dB/m	Pre. Fac. dB	Cab. Loss dB	Measured dBuv/m	Limit dBuv/m	Margin dB	Remark	Pol.
4824.11	48.61	33.06	35.04	3.94	50.57	74	-23.43	Peak	Horizontal
4824.13	38.95	33.06	35.04	3.94	40.91	54	-13.09	Average	Horizontal
4824.11	50.84	33.06	35.04	3.94	52.80	74	-21.20	Peak	Vertical
4824.13	42.81	33.06	35.04	3.94	42.77	54	-9.23	Average	Vertical

TX-Middle Channel

Freq. MHz	Reading dBuv	Ant. Fac. dB/m	Pre. Fac. dB	Cab. Loss dB	Measured dBuv/m	Limit dBuv/m	Margin dB	Remark	Pol.
4874.14	48.88	33.16	35.15	3.96	50.98	74	-23.02	Peak	Horizontal
4874.17	39.23	33.16	35.15	3.96	41.20	54	-12.80	Average	Horizontal
4874.14	50.78	33.16	35.15	3.96	52.75	74	-21.25	Peak	Vertical
4874.17	41.92	33.16	35.15	3.96	43.89	54	-10.11	Average	Vertical

Freq. MHz	Reading dBuv	Ant. Fac. dB/m	Pre. Fac. dB	Cab. Loss dB	Measured dBuv/m	Limit dBuv/m	Margin dB	Remark	Pol.
4924.17	48.84	33.26	35.14	3.98	50.94	74	-23.06	Peak	Horizontal
4924.20	38.34	33.26	35.14	3.98	40.44	54	-13.56	Average	Horizontal
4924.17	50.66	33.26	35.14	3.98	52.76	74	-21.24	Peak	Vertical
4924.20	42.11	33.26	35.14	3.98	44.21	54	-9.79	Average	Vertical

802.11g

TX-Low Channel

Freq. MHz	Reading dBuv	Ant. Fac. dB/m	Pre. Fac. dB	Cab. Loss dB	Measured dBuv/m	Limit dBuv/m	Margin dB	Remark	Pol.
4824.21	48.24	33.06	35.04	3.94	50.20	74	-23.80	Peak	Horizontal
4824.24	39.15	33.06	35.04	3.94	41.11	54	-12.89	Average	Horizontal
4824.24	49.22	33.06	35.04	3.94	51.18	74	-22.82	Peak	Vertical
4824.24	40.51	33.06	35.04	3.94	42.47	54	-11.53	Average	Vertical

TX-Middle Channel

Freq. MHz	Reading dBuv	Ant. Fac. dB/m	Pre. Fac. dB	Cab. Loss dB	Measured dBuv/m	Limit dBuv/m	Margin dB	Remark	Pol.
4874.17	47.11	33.16	35.15	3.96	49.08	74	-24.92	Peak	Horizontal
4874.20	38.15	33.16	35.15	3.96	40.12	54	-13.88	Average	Horizontal
4874.17	49.08	33.16	35.15	3.96	51.05	74	-22.95	Peak	Vertical
4874.20	38.34	33.16	35.15	3.96	40.31	54	-13.69	Average	Vertical

Freq. MHz	Reading dBuv	Ant. Fac. dB/m	Pre. Fac. dB	Cab. Loss dB	Measured dBuv/m	Limit dBuv/m	Margin dB	Remark	Pol.
4924.21	47.55	33.26	35.14	3.98	49.65	74	-24.35	Peak	Horizontal
4924.23	37.64	33.26	35.14	3.98	39.74	54	-14.26	Average	Horizontal
4924.21	48.68	33.26	35.14	3.98	50.78	74	-23.22	Peak	Vertical
4924.23	39.13	33.26	35.14	3.98	41.23	54	-12.77	Average	Vertical

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802.11n HT20

TX-Low Channel

Freq. MHz	Reading dBuv	Ant. Fac. dB/m	Pre. Fac. dB	Cab. Loss dB	Measured dBuv/m	Limit dBuv/m	Margin dB	Remark	Pol.
4824.15	49.44	33.06	35.04	3.94	51.40	74	-22.80	Peak	Horizontal
4824.17	39.75	33.06	35.04	3.94	41.71	54	-12.29	Average	Horizontal
4824.15	50.33	33.06	35.04	3.94	52.29	74	-21.71	Peak	Vertical
4824.17	40.52	33.06	35.04	3.94	42.48	54	-11.52	Average	Vertical

TX-Middle Channel

Freq. MHz	Reading dBuv	Ant. Fac. dB/m	Pre. Fac. dB	Cab. Loss dB	Measured dBuv/m	Limit dBuv/m	Margin dB	Remark	Pol.
4874.13	41.31	33.16	35.15	3.96	47.28	74	-26.72	Peak	Horizontal
4874.16	36.52	33.16	35.15	3.96	38.49	54	-15.51	Average	Horizontal
4874.13	48.27	33.16	35.15	3.96	50.24	74	-23.76	Peak	Vertical
4874.16	39.27	33.16	35.15	3.96	41.24	54	-12.76	Average	Vertical

Freq. MHz	Reading dBuv	Ant. Fac. dB/m	Pre. Fac. dB	Cab. Loss dB	Measured dBuv/m	Limit dBuv/m	Margin dB	Remark	Pol.
4924.14	48.11	33.26	35.14	3.98	50.21	74	-23.79	Peak	Horizontal
4924.17	38.43	33.26	35.14	3.98	40.53	54	-13.57	Average	Horizontal
4924.14	49.35	33.26	35.14	3.98	51.45	74	-22.55	Peak	Vertical
4924.17	39.82	33.26	35.14	3.98	41.92	54	-12.08	Average	Vertical

SHENZHEN LCS COMPLIANCE TESTING LABORATORY LTD.

FCC ID:2AIYW-EZ0001-1 Report No.: LCS1605312799E

802.11n HT40

TX-Low	Channel
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Freq. MHz	Reading dBuv	Ant. Fac. dB/m	Pre. Fac. dB	Cab. Loss dB	Measured dBuv/m	Limit dBuv/m	Margin dB	Remark	Pol.
4844.12	47.59	33.06	35.04	3.94	49.55	74	-24.45	Peak	Horizontal
4844.15	37.27	33.06	35.04	3.94	39.23	54	-14.77	Average	Horizontal
4844.12	49.04	33.06	35.04	3.94	51.00	74	-23.00	Peak	Vertical
4844.15	39.01	33.06	35.04	3.94	40.97	54	-13.03	Average	Vertical

TX-Middle Channel

Freq. MHz	Reading dBuv	Ant. Fac. dB/m	Pre. Fac. dB	Cab. Loss dB	Measured dBuv/m	Limit dBuv/m	Margin dB	Remark	Pol.
4874.11	48.12	33.16	35.15	3.96	50.09	74	-23.91	Peak	Horizontal
4874.14	38.78	33.16	35.15	3.96	40.75	54	-13.25	Average	Horizontal
4874.11	48.17	33.16	35.15	3.96	50.14	74	-23.86	Peak	Vertical
4874.14	39.93	33.16	35.15	3.96	41.90	54	-12.10	Average	Vertical

TX-High Channel

Freq. MHz	Reading dBuv	Ant. Fac. dB/m	Pre. Fac. dB	Cab. Loss dB	Measured dBuv/m	Limit dBuv/m	Margin dB	Remark	Pol.
4904.11	46.66	33.26	35.14	3.98	48.76	74	-25.24	Peak	Horizontal
4904.13	36.92	33.26	35.14	3.98	39.02	54	-14.98	Average	Horizontal
4904.11	47.50	33.26	35.14	3.98	49.60	74	-24.40	Peak	Vertical
4904.13	38.17	33.26	35.14	3.98	40.27	54	-13.73	Average	Vertical

Notes:

- 1. Measuring frequencies from 9k~10th harmonic or 26.5GHz (which is less), No emission found between lowest internal used/generated frequency to 30MHz.
- 2. Radiated emissions measured in frequency range from 30MHz~10th harmonic or 26.5GHz (which is less) were made with an instrument using Peak detector mode.
- 3. The radiated emissions from 18GHz to 25GHz are at least 20dB below the official limit and no need to report.

5.4.9. Results of Band Edges Test (Radiated)

Note: Only recorded the worst test result.

BLE 4.0

TX-Low Channel

Freq. MHz	Reading Level dBuV	Ant. Fac. dB/m	Pre. Fac. dB	Cab. Loss dB	Measured dBuV/m	Limit dBuV/m	Margin dB	Remark	Pol.
2377.65	43.77	32.89	35.16	3.51	45.01	74	-28.99	Peak	Horizontal
2377.63	34.91	32.90	35.16	3.51	36.16	54	-17.84	Average	Horizontal
2390.00	45.77	32.92	35.16	3.54	47.07	74	-26.93	Peak	Horizontal
2390.00	36.75	32.92	35.16	3.54	38.05	54	-15.95	Average	Horizontal
2400.00	51.59	32.92	35.16	3.54	52.89	74	-21.11	Peak	Horizontal
2400.00	41.87	32.92	35.16	3.54	43.17	54	-10.83	Average	Horizontal
2377.65	43.86	32.89	35.16	3.51	45.10	74	-28.90	Peak	Vertical
2377.63	34.61	32.90	35.16	3.51	35.86	54	-18.14	Average	Vertical
2390.00	45.92	32.92	35.16	3.54	47.22	74	-26.78	Peak	Vertical
2390.00	36.25	32.92	35.16	3.54	37.55	54	-16.45	Average	Vertical
2400.00	51.40	32.92	35.16	3.54	52.70	74	-21.30	Peak	Vertical
2400.00	43.15	32.92	35.16	3.54	44.45	54	-9.55	Average	Vertical

	TX-High (Channel							
Freq. MHz	Reading Level dBuV	Ant. Fac. dB/m	Pre. Fac. dB	Cab. Loss dB	Measured dBuV/m	Limit dBuV/m	Margin dB	Remark	Pol.
2483.50	45.82	33.06	35.18	3.60	47.30	74	-26.70	Peak	Horizontal
2483.50	36.38	33.08	35.18	3.60	37.88	54	-16.12	Average	Horizontal
2487.43	42.90	33.08	35.18	3.62	44.42	74	-29.58	Peak	Horizontal
2487.46	33.31	33.08	35.18	3.62	34.83	54	-19.17	Average	Horizontal
2483.50	46.95	33.06	35.18	3.60	48.43	74	-25.57	Peak	Vertical
2483.53	37.50	33.08	35.18	3.60	39.00	54	-15.00	Average	Vertical
2487.43	44.52	33.08	35.18	3.62	46.04	74	-27.96	Peak	Vertical
2487.46	35.11	33.08	35.18	3.62	36.63	54	-17.37	Average	Vertical

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802.11b

Freq. Rea	ading A	Ant	TX-Low Channel												
MHz di		Ant. Fac. dB/m	Pre. Fac. dB	Cab. Loss dB	Measured dBuv/m	Limit dBuv/m	Margin dB	Remark	Pol.						
2376.17 44	4.63 32	32.89	35.16	3.51	45.87	74	-28.13	Peak	Horizontal						
2376.20 35	5.10 32	32.90	35.16	3.51	36.35	54	-17.65	Average	Horizontal						
2390.00 47	7.97 3	32.92	35.16	3.54	49.27	74	-24.73	Peak	Horizontal						
2390.00 37	7.48 32	32.92	35.16	3.54	38.78	54	-15.22	Average	Horizontal						
2400.00 54	4.11 32	32.92	35.16	3.54	55.41	74	-18.59	Peak	Horizontal						
2400.00 43	3.63 3	32.92	35.16	3.54	44.93	54	-9.07	Average	Horizontal						
2376.17 45	5.53 32	32.89	35.16	3.51	46.77	74	-27.23	Peak	Vertical						
2376.20 35	5.98 32	32.90	35.16	3.51	37.23	54	-16.77	Average	Vertical						
2390.00 48	8.04 32	32.92	35.16	3.54	49.34	74	-24.66	Peak	Vertical						
2390.00 38	8.02 32	32.92	35.16	3.54	39.32	54	-14.68	Average	Vertical						
2400.00 56	6.05 32	32.92	35.16	3.54	57.35	74	-16.65	Peak	Vertical						
2400.00 45	5.73 3	32.92	35.16	3.54	47.03	54	-6.97	Average	Vertical						

TX-High Channel

Freq. MHz	Reading dBuv	Ant. Fac. dB/m	Pre. Fac. dB	Cab. Loss dB	Measured dBuv/m	Limit dBuv/m	Margin dB	Remark	Pol.
2483.50	47.37	33.06	35.18	3.60	48.85	74	-25.15	Peak	Horizontal
2483.50	36.49	33.08	35.18	3.60	37.99	54	-16.01	Average	Horizontal
2486.47	45.26	33.08	35.18	3.62	46.78	74	-27.22	Peak	Horizontal
2486.50	34.50	33.08	35.18	3.62	36.02	54	-17.98	Average	Horizontal
2483.50	48.92	33.06	35.18	3.60	50.40	74	-23.60	Peak	Vertical
2483.50	37.63	33.08	35.18	3.60	39.13	54	-14.87	Average	Vertical
2486.47	46.27	33.08	35.18	3.62	47.79	74	-26.21	Peak	Vertical
2486.50	36.85	33.08	35.18	3.62	38.37	54	-15.63	Average	Vertical

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802.11g

ТХ	TX-Low Channel													
Freq. MHz	Reading dBuv	Ant. Fac. dB/m	Pre. Fac. dB	Cab. Loss dB	Measured dBuv/m	Limit dBuv/m	Margin dB	Remark	Pol.					
2377.34	45.14	32.89	35.16	3.51	46.38	74	-27.62	Peak	Horizontal					
2377.37	34.56	32.90	35.16	3.51	35.81	54	-18.19	Average	Horizontal					
2390.00	48.69	32.92	35.16	3.54	49.99	74	-24.01	Peak	Horizontal					
2390.00	38.21	32.92	35.16	3.54	39.51	54	-14.49	Average	Horizontal					
2400.00	52.52	32.92	35.16	3.54	53.82	74	-20.18	Peak	Horizontal					
2400.00	41.87	32.92	35.16	3.54	43.17	54	-10.83	Average	Horizontal					
2377.34	46.54	32.89	35.16	3.51	47.78	74	-26.22	Peak	Vertical					
2377.37	36.19	32.90	35.16	3.51	37.44	54	-16.56	Average	Vertical					
2390.00	50.06	32.92	35.16	3.54	51.36	74	-22.64	Peak	Vertical					
2390.00	38.24	32.92	35.16	3.54	39.54	54	-14.46	Average	Vertical					
2400.00	54.18	32.92	35.16	3.54	55.48	74	-18.52	Peak	Vertical					
2400.00	43.79	32.92	35.16	3.54	45.09	54	-8.91	Average	Vertical					

TX-High Channel

Free		Ant.	Pre.	Cab.	Magazirad	1 :	Monatio		
Freq. MHz	Reading dBuv	Fac. dB/m	Fac. dB	Loss dB	Measured dBuv/m	Limit dBuv/m	Margin dB	Remark	Pol.
2483.50	45.94	33.06	35.18	3.60	47.42	74	-26.58	Peak	Horizontal
2483.50	34.84	33.08	35.18	3.60	36.34	54	-17.66	Average	Horizontal
2487.44	47.95	33.08	35.18	3.62	49.47	74	-24.53	Peak	Horizontal
2487.47	35.46	33.08	35.18	3.62	36.98	54	-17.02	Average	Horizontal
2483.50	46.24	33.06	35.18	3.60	47.72	74	-26.28	Peak	Vertical
2483.50	36.01	33.08	35.18	3.60	37.51	54	-16.49	Average	Vertical
2487.44	48.30	33.08	35.18	3.62	49.82	74	-24.18	Peak	Vertical
2487.47	37.31	33.08	35.18	3.62	38.83	54	-15.17	Average	Vertical

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ТХ	K-Low Cha	nnel				TX-Low Channel													
Freq. MHz	Reading dBuv	Ant. Fac. dB/m	Pre. Fac. dB	Cab. Loss dB	Measured dBuv/m	Limit dBuv/m	Margin dB	Remark	Pol.										
2377.61	47.14	32.89	35.16	3.51	48.38	74	-25.62	Peak	Horizontal										
2377.63	35.55	32.9	35.16	3.51	36.80	54	-17.20	Average	Horizontal										
2390.00	49.12	32.92	35.16	3.54	50.42	74	-23.58	Peak	Horizontal										
2390.00	37.89	32.92	35.16	3.54	39.19	54	-14.81	Average	Horizontal										
2400.00	55.27	32.92	35.16	3.54	56.57	74	-17.43	Peak	Horizontal										
2400.00	45.16	32.92	35.16	3.54	46.46	54	-7.54	Average	Horizontal										
2377.61	47.67	32.89	35.16	3.51	48.91	74	-25.09	Peak	Vertical										
2377.63	36.71	32.9	35.16	3.51	37.96	54	-16.04	Average	Vertical										
2390.00	49.50	32.92	35.16	3.54	50.80	74	-23.20	Peak	Vertical										
2390.00	39.21	32.92	35.16	3.54	40.51	54	-13.49	Average	Vertical										
2400.00	56.83	32.92	35.16	3.54	58.13	74	-15.87	Peak	Vertical										
2400.00	45.76	32.92	35.16	3.54	47.06	54	-6.94	Average	Vertical										

802.11n(HT20)

TX-High Channel

Freq. MHz	Reading dBuv	Ant. Fac. dB/m	Pre. Fac. dB	Cab. Loss dB	Measured dBuv/m	Limit dBuv/m	Margin dB	Remark	Pol.
2483.50	44.91	33.06	35.18	3.60	46.39	74	-27.61	Peak	Horizontal
2483.50	35.65	33.08	35.18	3.60	37.15	54	-16.85	Average	Horizontal
2488.17	47.37	33.08	35.18	3.62	48.89	74	-25.11	Peak	Horizontal
2488.20	36.06	33.08	35.18	3.62	37.58	54	-16.42	Average	Horizontal
2483.50	42.62	33.06	35.18	3.60	44.10	74	-29.90	Peak	Vertical
2483.50	36.09	33.08	35.18	3.60	37.59	54	-16.41	Average	Vertical
2488.17	47.29	33.08	35.18	3.62	48.81	74	-25.19	Peak	Vertical
2488.20	36.85	33.08	35.18	3.62	38.37	54	-15.63	Average	Vertical

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ТХ	TX-Low Channel													
Freq. MHz	Reading dBuv	Ant. Fac. dB/m	Pre. Fac. dB	Cab. Loss dB	Measured dBuv/m	Limit dBuv/m	Margin dB	Remark	Pol.					
2378.37	48.67	32.89	35.16	3.51	49.91	74	-24.09	Peak	Horizontal					
2378.40	37.78	32.90	35.16	3.51	39.03	54	-14.97	Average	Horizontal					
2390.00	50.61	32.92	35.16	3.54	51.91	74	-22.09	Peak	Horizontal					
2390.00	39.58	32.92	35.16	3.54	40.88	54	-13.12	Average	Horizontal					
2400.00	51.60	32.92	35.16	3.54	52.90	74	-21.10	Peak	Horizontal					
2400.00	41.70	32.92	35.16	3.54	43.00	54	-11.00	Average	Horizontal					
2378.37	49.44	32.89	35.16	3.51	50.68	74	-23.32	Peak	Vertical					
2378.40	39.85	32.90	35.16	3.51	41.10	54	-12.90	Average	Vertical					
2390.00	51.38	32.92	35.16	3.54	52.68	74	-21.32	Peak	Vertical					
2390.00	40.85	32.92	35.16	3.54	42.15	54	-11.85	Average	Vertical					
2400.00	53.54	32.92	35.16	3.54	54.84	74	-19.16	Peak	Vertical					
2400.00	44.58	32.92	35.16	3.54	45.88	54	-8.12	Average	Vertical					

802.11n(HT40)

TX-High Channel

Freq. MHz	Reading dBuv	Ant. Fac. dB/m	Pre. Fac. dB	Cab. Loss dB	Measured dBuv/m	Limit dBuv/m	Margin dB	Remark	Pol.
2483.50	48.15	33.06	35.18	3.60	49.63	74	-24.37	Peak	Horizontal
2483.50	38.26	33.08	35.18	3.60	39.76	54	-14.24	Average	Horizontal
2487.71	49.51	33.08	35.18	3.62	51.03	74	-22.97	Peak	Horizontal
2487.74	39.02	33.08	35.18	3.62	40.54	54	-13.46	Average	Horizontal
2483.50	48.88	33.06	35.18	3.60	50.36	74	-23.64	Peak	Vertical
2483.50	38.87	33.08	35.18	3.60	40.37	54	-13.63	Average	Vertical
2487.71	49.55	33.08	35.18	3.62	51.07	74	-22.93	Peak	Vertical
2487.74	39.81	33.08	35.18	3.62	41.33	54	-12.67	Average	Vertical

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5.5. Conducted Spurious Emissions and Band Edges Test

5.5.1. Standard Applicable

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in \$15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in \$15.205(a), must also comply with the radiated emission limits specified in \$15.209(a) (see \$15.205(c)).

5.5.2. Instruments Setting

The following table is the setting of the spectrum analyzer.

Spectrum Parameter	Setting
Detector	Peak
Attenuation	Auto
RB / VB (Emission in restricted band)	100KHz/300KHz
RB / VB (Emission in non-restricted band)	100KHz/300KHz

5.5.3. Test Procedures

The transmitter output is connected to a spectrum analyzer. The resolution bandwidth is set to 100 kHz. The video bandwidth is set to 300 kHz

The spectrum from 9kHz to 26.5GHz is investigated with the transmitter set to the lowest, middle, and highest channels.

5.5.4. Test Setup Layout

This test setup layout is the same as that shown in section 5.3.4.

5.5.5. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

5.5.6. Test Results of Conducted Spurious Emissions

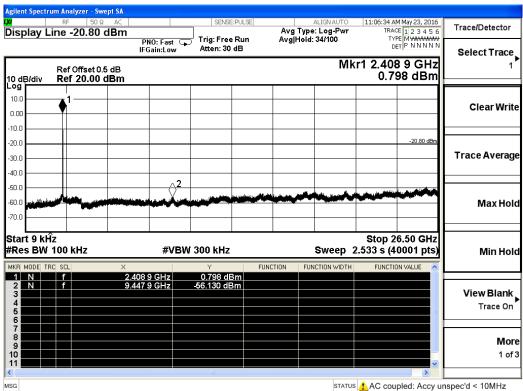
BLE	4.0								
Agilent Spect	rum Analyzer -	Swept SA							
uxu ⊤ Display I	RF 5			SENSE:P	Av	ALIGNAUTO g Type: RMS Hold: 20/100	TRA	M May 25, 2016 CE 1 2 3 4 5 6 PE M WWWWWW	Trace/Detector
		F	PNO: Fast 🔾 Gain:Low	☐ Trig: Free F Atten: 10 d		IIFI010: 20/100			Select Trace
10 dB/div	Ref Offsel Ref 0.00					Mk		2 2 GHz 02 dBm	1
-10.0	▲ ¹								
-20.0									Clear Write
-30.0	_		-					-99.00 dDm	
-40.0									Trace Average
-60.0									g
-70.0			$ \rangle^2$						
-80.0	and the second second					m			Max Hold
Start 9 kl #Res BW			#\/B\/	V 300 kHz*		Sween		6.50 GHz 0001 pts)	Min Hold
MKR MODE T		×	#¥U¥	Y JOO KIIZ	FUNCTION		· ·		
1 N 2 N 3 4 5 6	f		2 GHz 2 GHz	-13.002 dBn -74.132 dBn					View Blank Trace On
7 8 9 10 11									Mor 1 of 3
MSG						STATUS	AC cou		spec'd < 10MHz

Trace/Detecto	23456	09:32:51 PM N TRACE	ALIGNAUTO Type: RMS		SENSE:PULS			rf 50 e -29.48	⊤ Iav Lin	isn
Select Trac		TYPE DET	old: 6/100	Avg	Trig: Free Rur Atten: 10 dB	l0: Fast 🕞 ain:Low	PN	0 20.40		J
		r1 2.440 -9.47	Mk					Ref Offset Ref 0.00) dB
								≬ 1		og 0.0
Clear Wr										0.0
	-29.48 dBm									0.0
										0.0
Trace Avera										0.0
										0.0
							2			0.0
Max Ho	-		أدرما فندار روار ومرقا أتساكن				1 . Y			0.0
										0.0
		Stop 26.							9 kHz	L tərt
Min Ho		.272 s (400	Sweep 3		300 kHz*	#VBV		00 kHz	BW 10	
	ALUE	FUNCTION	FUNCTION WIDTH	FUNCTION	Y		×	SCL	ODE TRC	KR M
					-9.475 dBm -79.928 dBm		2.440 (7.320 (f	N N	
View Blan					-73.320 UBIII	9912	7.520 (3
Trace O	=									4
										6
										8 9
Mo										
M o 1 o										0

FCC ID:2AIYW-EZ0001-1 Report No.: LCS1605312799E

gilent Spectrum Analyzer - Swept SA							
¢/ T RF 50 Ω AC		SENSE:PULS	Avg	ALIGNAUTO Type: RMS	TRAC	4 May 25, 2016 E 1 2 3 4 5 6	Trace/Detector
Ref Offset 0.5 dB 10 dB/div Ref 0.00 dBm	PNO: Fast 🖵 IFGain:Low	∫ Trig: Free Rur Atten: 10 dB	n Avgit	101d: 12/100 Mk	r1 2.47§	TANNNN 7 GHz 68 dBm	Select Trace
-00 1 -20.0						-30.97 dBm	Clear Write
-40.0							Trace Average
-70.0 -80.0 -90.0	2 						Max Hole
Start 9 kHz #Res BW 100 kHz MKR MODE TRC SCL X		300 kHz*	FUNCTION	Sweep :	3.272 s (4	6.50 GHz 0001 pts)	Min Hold
	.479 7 GHz .439 9 GHz	-10.968 dBm -79.823 dBm					View Blank Trace On
7 8 9 9 9 10 10 10 10 10 10 10 10 10 10 10 10 10							Mor 1 of 3
ISG				STATUS	AC cou	pled: Accy ur	spec'd < 10MHz

802.11b



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Agilent Spectr	um Analyzer - Sw	rept SA								
w Display L	RF 50 Ω .ine -21.86	dBm		1	::PULSE	Avg Type	ALIGNAUTO	TRAC	M May 23, 2016 2E 1 2 3 4 5 6 PE M WWWWWW	Trace/Detector
10 dB/div	Ref Offset 0. Ref 20.00	IFGair 5 dB	:Fast 😱 n:Low	Trig: Free Atten: 30		Avg Hold		r1 2.43	6 7 GHz 62 dBm	Select Trace
10.0 0.00	1 1									Clear Write
-20.0 -30.0 -40.0									-21.86 dBm	Trace Average
-50.0 -60.0 -70.0			2							Max Hold
Start 9 kH #Res BW	100 kHz	×		300 kHz	FUNC	TION FU	Sweep 2	2.533 s (4	6.50 GHz 0001 pts)	Min Hold
1 N 2 N 3 4 5 6	f f	2.436 7 0 9.463 2 0		-1.862 dE -55.962 dE						View Blank Trace On
7 8 9 10 11									•	More 1 of 3
MSG							STATUS	AC cou	pled: Accy ur	nspec'd < 10MHz

	33 AM May 23, 2016	11,00,01	ALIGN AUTO		PULSE	CENC			RF 50	nt Spectr
Trace/Detector	TRACE 1 2 3 4 5 6		: Log-Pwr	Avg Tvp	PULSE	SENSE	Hz		2.4638456	ker 1
Select Trace	DET P N N N N N		14/100	Avg Hold		Trig: Free Atten: 30	PNO: Fast 😱 FGain:Low		2.4000400	
1	463 8 GHz 6.096 dBm		Mk						Ref Offset 0 Ref 20.00	B/div
Clear Writ									 ▲1	
									-	
Trace Averag	-23.10 dBm									
							^2			
Max Hol										
Min Hol	p 26.50 GHz s (40001 pts)		Sweep 2			, 300 kHz	#VBW		z 100 kHz	L rt9kH sBW
	NCTION VALUE	FUNC	CTION WIDTH	TION FL	3m	Y -3.096 dB	38 GHz	× 2.46	SCL	MODE TF
View Blank Trace On					Sm 	-56.695 dE	4 7 GHz	9.53	f	N
Mor 1 of										
	>									

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802.11g

Agilent Spect L <mark>XI</mark>	RF	50 Ω	AC		SE	NSE:PULSE		ALIGNAUTO		M May 23, 2016	Trace/Detector
Display	Line -2	26.10 c	IBm PI	NO: Fast		ree Run		Type: Log-Pwr Hold: 8/100	TY	CE 1 2 3 4 5 6 PE M WWWWW ET P N N N N N	Trace/Delector
			IFC	Gain:Low	Atten:	30 dB		MI	_	8 9 GHz	Select Trace
10 dB/div		ffset 0.5 2 0.00 d						IVIT		98 dBm	1
Log 10.0											
0.00	∮ 1-										Clear Write
-10.0	_ -						_				
-20.0										-26.10 dBm	
-30.0											Trace Average
-40.0					2						
-60.0			والمرواح والمراجع والمراجع والمراجع	L.X	الم الم						Max Hold
-70.0				10000 - 100 - 100							
Start 9 k	Hz ^								Stop 2	6.50 GHz	
#Res BW		Hz		#VE	300 kH	lz		Sweep		0001 pts)	Min Hold
MKR MODE	TRC SCL		×	9 GHz	Y -6.098		NCTION	FUNCTION WIDTH	FUNCTI	ON VALUE	
2 N	f		9.468		-56.016	dBm					View Blank
4											Trace On
6											
8											More
10										~	1 of 3
<					Ш						
MSG								STATU	s 🚺 AC cou	pled: Accy u	nspec'd < 10MHz

	AM May 23, 2016	11:11:56 A	ALIGN AUTO		SENSE:PUL		50 Ω AC	RF	
Trace/Detecto	CE 123456 PE MWWWWW DET P N N N N N	TY	ype: Log-Pwr old: 8/100		Trig: Free Ru Atten: 30 dB	PNO: Fast C	80 dBm	Line -26.	play
Select Hat	5 4 GHz '95 dBm		Mk				et 0.5 dB .00 dBm		dB/div
Clear Wi								1	
)
Trace Avera	-26.80 dBm								
				و به هم رسال والتقاوين	مغمر وبلم وواطلون خطريا وي ور	2 2))
Max H									
Min H	26.50 GHz 10001 pts)		Sweep 2		300 kHz	#VBI		λHz № 100 kHz	Int 9 ĥ es BM
Min H		.533 s (4	Sweep 2	FUNCTION	Y		×		es BW
Min He View Blan Trace C	10001 pts)	.533 s (4	•	FUNCTION		#VB) 135 4 GHz 123 9 GHz	× 2.4	N 100 kHz	MODE

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Agile	nt Spectru		- Swept SA								
<mark>الا</mark> Dis	play Li		50 Ω AC		- · -	E:PULSE		ALIGNAUTO e: Log-Pwr	TRA	M May 23, 2016 CE 1 2 3 4 5 6 PE M WWWWWW	Trace/Detector
				PNO: Fast IFGain:Low			Avg Hold		D		Select Trace
	lŖ/div	Ref Offs Ref 20.	et 0.5 dB . 00 dBm					IVIP		47 dBm	1
Log 10.0											
0.00		_ _1									Clear Write
-10.0	·	— —									
-20.0										-27.95 dBm	
-30.0											Trace Average
-40.0 -50.0					2						
-60.0			COLUMN THE REAL OF			المالي ويتحدث الم					Max Hold
-70.0											maxitora
Sta	rt 9 kHz	,						<u> </u>	Stop 2	6.50 GHz	
		IOO kHz		#VI	BW 300 kHz	2		Sweep 3	2.533 s (4	0001 pts)	Min Hold
MKR 1	MODE TRO	SCL f	×	463 8 GHz	۲ -7.947 d		CTION FU	NCTION WIDTH	FUNCTI	ON VALUE	
2	N	f		463 8 GHZ 524 8 GHz	-7.947 d -56.893 d						View Blank
4											Trace On
6											
8											More
10 11										~	1 of 3
<					Ш					>	
MSG								STATUS	S 🦺 AC cou	pled: Accy u	nspec'd < 10MHz

802.11n HT20

					05105		Swept SA Ο Ω AC	u <mark>m Analyzer</mark> - RF 5	t Spectri
Trace/Detecto	M May 23, 2016 E 1 2 3 4 5 6 E M WWWWW	TRAC	ALIGNAUTO : Log-Pwr 7/100	Run	SENSE: Trig: Free	PNO: Fast		ine -26.2	olay L
Select Trac	D 2 GHz		Mk	dB	Atten: 30 o	IFGain:Low			
	65 dBm							Ref Offse Ref 20.0	B/div
Clear Wr								_ ≜ 1	
								- i	
	-26.27 dBm								
Trace Avera									
Max H				 والم الأدر ومتقدم الا	الم المعالمين الم	الفرار الأر يعرونان والماسية	يعلم حماهم استعراض		
IVIAX FI									Constant of the
Min He	6.50 GHz 0001 pts)	ا2 Stop 533 s	Sweep 2		300 kHz	#VBV		z 100 kHz	t9kH sBW
	IN VALUE	-	CTION WIDTH	FUN	Y		×	C SCL	MODE TR
				m	-6.265 dB -51.723 dB	0 2 GHz 08 1 GHz	2.4	f	N N
View Blan									
Trace O	=								
M									
10	~								
	~								

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Agilent Spectr	um Analyzer - Sw	rept SA							
<mark>x</mark> Display L	RF 50 Ω	dBm		E:PULSE	Avg Type	ALIGNAUTO	TRAC	M May 23, 2016 E 1 2 3 4 5 6 E M WWWWWW	Trace/Detector
10 dB/div	Ref Offset 0.				Avg Hold		r1 2.43	5 4 GHz 92 dBm	Select Trace
10.0 0.00 -10.0	1								Clear Write
-10.0								-27.59 dBm	Trace Average
-50.0 -60.0		2							Max Hold
Start 9 kH #Res BW	100 kHz	# *	VBW 300 kHz	FUNC	TION FU	Sweep 2	2.533 s (4	6.50 GHz 0001 pts)	Min Hole
1 N 2 N 3 4 5 5	f f	2.435 4 GHz 7.920 9 GHz							View Blank Trace On
7 8 9 10 11									Mor 1 of 3
MSG						STATUS	AC cou	pled: Accv ur	nspec'd < 10MHz

Agilent Spectr	um Analyzer - S									
<mark>x</mark> Displav L	RF 50	Ω AC B dBm			:PULSE		ALIGNAUTO e: Log-Pwr	TRA	M May 23, 2016 CE 1 2 3 4 5 6	Trace/Detector
		F	PNO: Fast (Gain:Low	Trig: Free Atten: 30		Avg Hold	: 7/100	TY D	PE MWWWWW ET P N N N N N	Select Trace
10 dB/div	Ref Offset (Ref 20.00						Mk		7 9 GHz 25 dBm	1
10.0										Clear Write
-10.0	1									
-20.0									-28.63 dBm	Trace Average
-30.0										Trace Average
-50.0			2 ²	unte un un articultita	والمتحدث والمحد والمحد والمحد والمحد والمحاد			المعرية والمعرية		
-60.0 -70.0					and the second					Max Hold
L Start 9 k⊦ #Res BW			#VB	W 300 kHz		~	Sweep 2	Stop 2 2.533 s (4	6.50 GHz 0001 pts)	Min Hold
MKR MODE TR	RC SCL	× 2.457	9 GHz	۲ -8.625 dE	FUNC	TION FU	NCTION WIDTH	FUNCTI	DN VALUE	
2 N 3 4 5 6	f		37 GHz	-56.812 dE						View Blank Trace On
7 8 9 9 10 11										Mor 1 of 3
MSG				Ш			STATUS	AC cou	pled: Accy ur	nspec'd < 10MHz

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802.11n HT40

Agilent Spectr	um Analyzer - S									
ม Display L	RF 50	B dBm			PULSE		ALIGNAUTO e: Log-Pwr	TRA	M May 23, 2016 CE 1 2 3 4 5 6 PE M WWWWWW	Trace/Detector
		PNO): Fast	Trig: Free Atten: 30		Avg Hold		D	ET P N N N N N	Select Trace
10 dB/div	Ref Offset (Ref 20.00						Mł		0 1 GHz 25 dBm	1
Log 10.0										
0.00	- _ 1									Clear Write
-10.0										
-30.0									-30.63 dBm	Trace Average
-40.0										
-50.0		والمراجع والمتعاط والمتعالم والمراجع		والانتقار ومعارك ومرار	and a second	Lange and		وي المراجع وي المراجع br>محمد محمد المراجع المراج		Max Hold
-70.0			and a start of the							Max Hold
L Start 9 k⊦									6.50 GHz	
#Res BW			#VBV	N 300 kHz			-		0001 pts)	Min Hold
MKR MODE TR	f	× 2.430 1		Y -10.625 dE	3m	CTION FU	INCTION WIDTH	FUNCTI	DN VALUE	
2 N 3 4	f	9.491 6	GHZ	-56.900 dE	3m					View Blank
5										Trace On
7 8										More
9 10 11										1 of 3
<				ш					>	nspec'd < 10MHz

	um Analyzer - S			SENSE:	PULSE	ALIGN AUTO	11:16:23 A	4 May 23, 2016	
play L	ine -30.68				Av	g Type: Log-Pwr	TRAC	E123456	Trace/Detecto
			PNO: Fast IFGain:Low	Trig: Free Atten: 30 o		g Hold: 7/100		PEMWWWWWW TPNNNNN	Select Trac
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es BW	100 kHz		#VB	W 300 kHz		Sweep 3	2.533 s (4	0001 pts)	Min H
MODE TR	RC SCL	×	34 7 GHz	۲ -10.679 dBı	FUNCTION	FUNCTION WIDTH	FUNCTIO	IN VALUE	
	f		20 1 GHz	-57.296 dBi	n				View Bla
N									Trace
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SHENZHEN LCS COMPLIANCE TESTING LABORATORY LTD. FCC ID:2AIYW-EZ0001-1 Report No.: LCS1605312799E

Agilent Spectr	um Analyzer - Sw								
Marker 1	RF 50 G	2 AC 72450 GHz		PULSE	Avg Type	ALIGNAUTO : Log-Pwr	TRAC	M May 23, 2016 E 1 2 3 4 5 6	View/Display
		PNO: Fas IFGain:Lo			Avg Hold:	9/100	TYI Di		
10 dB/div	Ref Offset 0. Ref 20.00					Mk		6 7 GHz 74 dBm	Display►
Log 10.0									
0.00	 1								
-10.0									
-20.0									
-30.0								-30.57 dBm	
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MKR MODE TF	RC SCL	×	Y 40.574 JD	FUNC	TION FUN	ICTION WIDTH	FUNCTIO	IN VALUE	
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3 4									
5									
8									
9									
11 <			TH I					>	
MSG						STATUS	AC cou	pled: Accy u	nspec'd < 10MHz

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5.5.7. Test Results of Band Edges Test

BLE 4.0

Display Line -27.49 dBm PNO: Fast Trig: Free Run Avg Type: RMS Trace/Detector PNO: Fast Trig: Free Run Avg Type: RMS Trace/Detector 0 dB/div Ref 00ffset 0.5 dB Mkr1 2.401 932 GHz 1 10 dB/div Ref 0.00 dBm -7.491 dBm -7.491 dBm -0.0 -0.0 -0.0 -0.0 -0.0 -0.0 -0.0 -0.0 -0.0 -0.0 -0.0 -0.0 -0.0 -0.0 -7.491 dBm -0.0 -0.0 -0.0 -0.0 -0.0 -0.0 -0.0 -0.0 -0.0 -0.0 -0.0 -0.0 -0.0 -0.0 -0.0 -0.0 -0.0 -0.0 -0.0 -0.0 -0.0 -0.0 -0.0 -0.0 -0.0 -0.0 -0.0 -0.0 -0.0 -0.0 -0.0 -0.0 -0.0 -0.0 -0.0 -0.0 -0.0 -0.0 -0.0 -0.0 -0.0 -0.0 -0.0 -0.0 -0.0 -0.0 -0.0	Agilen	it Spect	trum A	nalyzer - Sw	ept SA											
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Start 2.31000 GHz #VBW 300 kHz* Stop 2.40400 GHz #Res BW 100 kHz #VBW 300 kHz* Sweep 11.60 ms (1001 pts) 1 N f 2.401 932 GHz -7.491 dBm 2 N f 2.400 000 GHz -89.057 dBm 3 N f 2.390 000 GHz -78.477 dBm 6 -78.477 dBm -78.477 dBm -77.491 dBm 9 - - - 11 - - - - 10 - - - - - 11 - - - - - - 11 - - - - - -		*****	,/Hayadiral/	All Handstone Martin	~~~~	all monore	e falling any		ana, tayo wa	17 1 7201_1400.0407	Table of the state of the					Max Hold
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3 N f 2.390 000 GHz -78.477 dBm View Blank 4 -78.477 dBm -78.477 dBm Trace On 6 - - - - 6 - - - - - 8 - - - - - - 9 - - - - - - - 10 - - - - - - 1 of 3 11 - - - - - - - -	1	Ν	f		2.401 9	32 GHz										
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NextPe	80 GHz 74 dBm		Mkr1						Offset 0.5 f 0.00 dE		dB/di
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802.11b

								alyzer - Sw		lent S
D:53:16 AM May 23, 2016 TRACE 1 2 3 4 5 6 TYPE MWWWWW	TRAC	ALIGNAUTO Fype: Log-Pwr Iold:>100/100		E:PULSE	SENSE		AC 00000 G		r 1 2.4	arke
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— <u> </u>										0.0
p 2.42200 GHz									2.31000	
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	200 GHz 100 kHz		#VBV	V 300 kHz			Sweep 4.	Stop 2.50 600 ms (*		Min H
R MODE TF	f	× 2.458 86		∨ -1.507 dBr	FUNC	TION FUI	NCTION WIDTH	FUNCTIO	N VALUE	
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802.11g

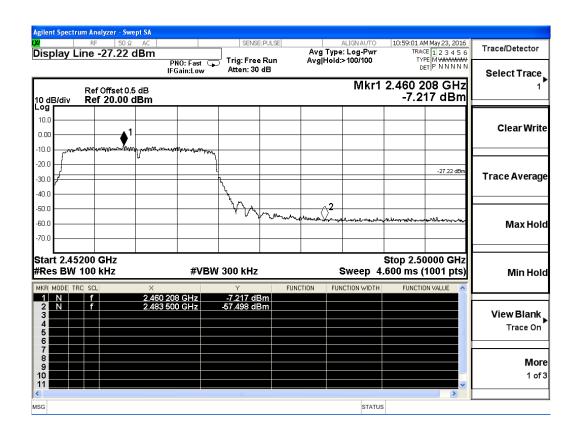
gilent Spectrum Analyzer - Swept SA RF 50 Ω AC		SENSE:PULSE		ALIGN AUTO	10:54:04 AM May 23, 2016	
isplay Line -24.86 dBm	PNO: Fast 🕞			e: Log-Pwr d:>100/100	TRACE 1 2 3 4 5 6 TYPE MWWWW DET P N N N N N	Trace/Detector
Ref Offset 0.5 dB 0 dB/div Ref 20.00 dBm	II Gam.cow			Mkr	1 2.412 93 GHz -4.858 dBm	Select Trace
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					-24.86 dBm	Trace Averaç
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art 2.31000 GHz Res BW 100 kHz	#VBW	7 300 kHz	FUNCTION FL		Stop 2.42200 GHz 0.73 ms (1001 pts)	Min Ho
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							zer - Swent SA	ectrum Analyze
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Select Trace	.462 944 GHz -6.754 dBm				Atten: 30	IFGain:Low	fset 0.5 dB	
Clear Write	-6.734 dBm						20.00 dBm	iv Ref 20
Trace Average	-26.76 dBm					nante production	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	
Max Hold	milludinghergented	were the month of the second	man	- Marthan	L.			
Min Hold	op 2.50000 GHz 00 ms (1001 pts)				/ 300 kHz	#VBW		2.45200 GH 3W 100 kH
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	>	STATUS						

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802.11n HT20

	t Spectru	m Analyzer									
<mark>₩</mark> Disp	olay Li	^{RF} ne -25.	50 Ω AC 27 dBm			E:PULSE		ALIGNAUTO ype: Log-Pwr old:>100/100	TRA	M May 23, 2016 E 1 2 3 4 5 6 PE M WWWWWW	Trace/Detector
				PNO: Fast IFGain:Low	Atten: 30		Avgini		D	ET P N N N N N	Select Trace
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Log 10.0											
0.00										1	Clear Write
-10.0 -20.0									~**********	and the state of t	
-30.0										-25.27 dBm	Trace Average
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-50.0 -60.0			man marken	Allen Competitions	was wind	hilling and the	marchar	Chung and a start of the start			Max Hold
-70.0											Max Hold
Star	L)00 GHz							Stop 2.42	2200 GHz	
		100 kHz		#VE	3W 300 kHz			Sweep 1			Min Hold
1	MODE TRO	f		10 13 GHz	ې -5.266 d	Bm	NCTION	FUNCTION WIDTH	FUNCTI	ON VALUE	
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802.11n HT40

	AM May 23, 2016	10/56/22 4	ALIGNAUTO			SENSE:			Analyzer - Sv RF 50 §	it Spectrun	Agilent X/
Trace/Detector	ACE 1 2 3 4 5 6	TRA	: Log-Pwr	Avg Type Avg Hold:		Trig: Free		dBm	e -28.58	olay Lir	
Select Trace	DET P N N N N N	D	- 100/100	Avginoid.		Atten: 30	NO: Fast 🕞 Gain:Low				
1	l 38 GHz 584 dBm		Mkr						tef Offset 0 tef 20.00		10 dE
Clear Write											L og 10.0
	State Strate		1-								0.00
	-28.58 dBm										20.0
Trace Average	-28.58 dBm										-30.0
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Min Hole	14200 GHz (1001 pts)			:		300 kHz	#VBW			t 2.310 s BW 1	
			CTION WIDTH			ץ -8.584 dB		× 2.411 3	GCL f	MODE TRC	MKR N
View Blank					m	-37.386 dB -48.948 dB	0 GHz	2.411 3	f f	N N	
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Mor 1 of											9 10
	<u>×</u>					00					11
			STATUS								SG

lgilent Spectrum Analyzer - S	wept SA					
	Ω AC	SENSE:PULS	Avg Type	ALIGNAUTO e: Log-Pwr	11:04:12 AM May 23, 2016 TRACE 1 2 3 4 5 6 TYPE MWWWWW	Trace/Detector
	PNO: Fast IFGain:Low				DET P N N N N N	Select Trace
Ref Offset 0 10 dB/div Ref 20.00				Mkr1 2	2.441 384 GHz -9.261 dBm	1
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70.0					top 2.50000 GHz	
Res BW 100 kHz	#V	BW 300 kHz			i33 ms (1001 pts)	Min Hold
1 N f 2 N f 3 4 5 6	2.441 384 GHz 2.483 500 GHz	-9.261 dBm -53.448 dBm				View Blank Trace On
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< science and scie				STATUS		

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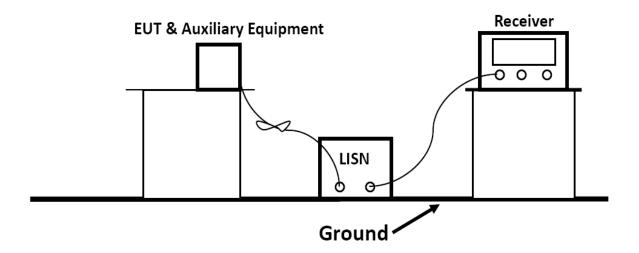
5.6. Power line conducted emissions

5.6.1 Standard Applicable

According to §15.207 (a): For an intentional radiator which is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed 250 microvolts (The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz). The limits at specific frequency range is listed as follows:

Frequency Range	Limits (dBµV)				
(MHz)	Quasi-peak	Average			
0.15 to 0.50	66 to 56	56 to 46			
0.50 to 5	56	46			
5 to 30	60	50			

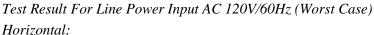
5.6.2 Block Diagram of Test Setup

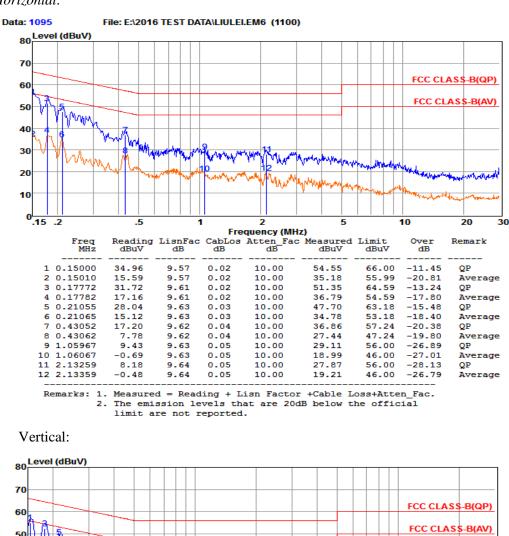


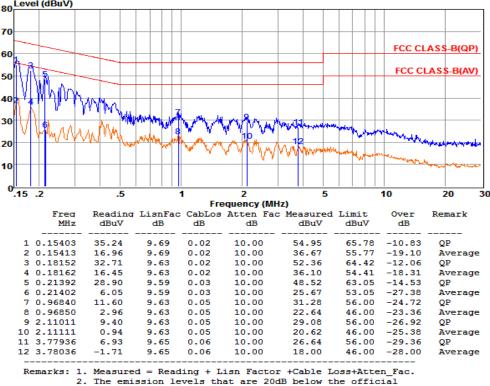
5.6.3 Test Results

PASS.

The test data please refer to following page.







limit are not reported.

***Note: Pre-scan all mode and recorded the worst case results in this report (802.11b (TX-Middle Channel)).

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5.7. Antenna Requirements

5.7.1. Standard Applicable

According to antenna requirement of §15.203.

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall 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 manufacturer may design the unit so that a broken antenna can be re-placed by the user, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of Sections 15.211, 15.213, 15.217, 15.219, or 15.221. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with Section 15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this Part are not exceeded.

And according to \$15.247(4)(1), system operating in the 2400-2483.5MHz bands that are used exclusively for fixed, point-to-point operations may employ transmitting antennas with directional gain greater than 6dBi provided the maximum peak output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6dBi.

5.7.2. Antenna Connector Construction

The antenna used for BLE transmitting is permanently attached and no consideration of replacement. While the antenna for Wi-Fi is an external antenna, please see EUT photo for details.

The BLE uses a ceramic antenna, and the maximum antenna gain is 0dBi, the Wi-Fi antenna is a external antenna, the maximum antenna gain is 2dBi.

5.7.3. Results: Compliance.

Measurement

The antenna gain of the complete system is calculated by the difference of radiated power in EIRP and the conducted power of the module.

Conducted power refer ANSI C63.10:2013 Output power test procedure for DTS devices.

Radiated power refers to ANSI C63.10:2013 Radiated emissions tests.

Measurement parameters

Measurement parameter							
Detector:	Peak						
Sweep Time:	Auto						
Resolution bandwidth:	3MHz						
Video bandwidth:	3MHz						
Trace-Mode:	Max hold						

Limits

FCC	IC							
Antenna Gain								
6 dBi								

BLE

T _{nom}	V _{nom}	Lowest Channel 2402 MHz	Middle Channel 2440 MHz	Highest Channel 2480 MHz
Measu	power [dBm] ired with nodulation	-3.55	-2.16	-4.86
Measu	oower [dBm] ired with nodulation	-3.98	-2.73	-5.12
Gain [dBi]	Calculated	-0.43	-0.57	-0.26
М	easurement unce	ertainty	\pm 1.6 dB (cond.)) / ± 3.8 dB (rad.)

Wi-Fi

T _{nom}	V _{nom}	Lowest Channel 2412 MHz	Middle Channel 2437 MHz	Highest Channel 2462 MHz
Conducted power [dBm] Measured with DSSS modulation		12.53	12.87	12.07
Radiated power [dBm] Measured with DSSS modulation		14.12	14.61	13.83
Gain [dBi] Calculated		1.59	1.74	1.76
Measurement uncertainty			\pm 1.6 dB (cond.) / ± 3.8 dB (rad.)	

Result: -/-

-----THE END OF REPORT------

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