FCC TEST REPORT

Product Name:	ANDROID SET TOP BOX
Trade Mark:	LSP.mini, GIEC
Model No.:	LSPs912-G1-1703
Report Number:	170329002RFC-3
Test Standards:	FCC 47 CFR Part 15 Subpart C
FCC ID:	2AF98-LSPMINIS912
Test Result:	PASS
Date of Issue:	May 31, 2017

Prepared for:

LIFE STYLE PANEL PTY LTD
7 7Logistics Place,Larapinta,Queensland,Australia

Prepared by:

Shenzhen UnionTrust Quality and Technology Co., Ltd.
16/F, Block A, Building 6, Baoneng Science and Technology Park,
Qingxiang Road No.1, Longhua New District, Shenzhen, China
TEL: +86-755-2823 0888
FAX: +86-755-2823 0886

Tested by: _____ Kevin Liang, Senior Engineer

Reviewed by: _____ Jim Long, Senior Engineer

Approved by: _____ Billy Li, Technical Director

Date: May 31, 2017

UnionTrust Laboratories * Certified *

Version

Version No.	Date	Description
V1.0	May 31, 2017	Original

CONTENTS

1. GENERAL INFORMATION

1.1 CLIENT INFORMATION

Applicant:	LIFE STYLE PANEL PTY LTD
Address of Applicant:	7 7Logistics Place,Larapinta,Queensland,Australia
Manufacturer:	SHENZHEN GIEC DIGITAL CO., LTD
Address of Manufacturer:	No.1 Building,Factory,No.7 District,Dayang Development Areas,FuYongStreet,Baoan,Shenzhen,Guangdong,China

1.2 EUT INFORMATION

1.2.1 General Description of EUT

Product Name:	ANDROID SET TOP BOX		
Model No.:	LSPs912-G1-1703		
Add. Model No.:	GK-MP1125, GK-MP1129 (see note 1)		
Trade Mark:	GIEC, LSP.mini		
DUT Stage:	Production Unit		
EUT Supports Function:	2.4 GHz ISM Band:	IEEE 802.11b/g/n	
		Bluetooth: V3.0+HS & V4.1 LE	
	5 GHz U-NII Bands:	5 180 MHz to 5 240 MHz	IEEE 802.11a/n/ac
		5 260 MHz to 5 320 MHz	IEEE 802.11a/n/ac
		5 500 MHz to 5 700 MHz	IEEE 802.11a/n/ac
		5 745 MHz to 5 805 MHz	IEEE 802.11a/n/ac
Software Version:	V1.0.1.20161201		
Hardware Version:	RM-MPEG-172G VER1.0-1		
Sample Received Date:	March 30, 2017		
Sample Tested Date:	April 1, 2017 to May 4, 2017		

Note 1: Following are the diffrences of these three models. After evaluation, the differences between these models have no influence for RF test.

Model name	Trade name	Description
GK-MP1125	GIEC	All three models are with the same circuit and PCB layout. Color, silk screen and trademark of these three models are different. Model LSPs912-G1-1703 has no AV interface, and model GK-MP1129 has different shell with that of the other two models.
LSPs912-G1-1703	LSP.mini	
GK-MP1129	GIEC	

1.2.2 Description of Accessories

Adapter	
Trade Mark:	LSP.
Model No.:	TY0500420A1mn
Input:	100-240 V~50/60 Hz 0.8 A
Output:	5.0 V ⎓ 4.2 A
AC Cable:	N/A
DC Cable:	1.50 Meter, Unshielded without ferrite

Cable	
Trade Mark:	N/A
Model No.:	N/A
Description:	HDMI Cable
Cable Type:	Shielded without ferrite
Length:	1.50 Meter

1.3 PRODUCT SPECIFICATION SUBJECTIVE TO THIS STANDARD

Frequency Range:	2412 MHz to 2462 MHz	
Support Standards:	IEEE 802.11b, IEEE 802.11g, IEEE 802.11n-HT20	
Type of Modulation:	IEEE 802.11b: DSSS(CCK, DQPSK, DBPSK) IEEE 802.11g: OFDM(64-QAM, 16-QAM, QPSK, BPSK) IEEE 802.11n-HT20: OFDM(64-QAM, 16-QAM, QPSK, BPSK)	
Data Rate:	IEEE 802.11b: Up to 11 Mbps IEEE 802.11g: Up to 54 Mbps IEEE 802.11n-HT20: Up to MCS15	
Number of Channels:	IEEE 802.11b: 11 IEEE 802.11g: 11 IEEE 802.11n-HT20: 11	
Channel Separation:	5 MHz	
Antenna Type:	Chain 0	Integral Antenna
	Chain 1	Integral Antenna
Antenna Gain:	Chain 0	2 dBi
	Chain 1	2 dBi
Directional gain:	5.01 dBi	
Maximum Peak Power:	SISO_ Chain 0	IEEE 802.11b: 17.39 dBm IEEE 802.11g: 20.60 dBm IEEE 802.11n-HT20: 16.65 dBm
	SISO_ Chain 1	IEEE 802.11b: 17.97 dBm IEEE 802.11g: 21.34 dBm IEEE 802.11n-HT20: 16.79 dBm
	MIMO_ Chain 0+1	IEEE 802.11n-HT20: 19.68 dBm
Normal Test Voltage:	120V~60Hz	

1.4 OTHER INFORMATION

Operation Frequency Each of Channel							
IEEE 802.11b, IEEE 802.11g, IEEE 802.11n-HT20							
Channel	**Frequency**	**Channel**	**Frequency**	**Channel**	**Frequency**	**Channel**	**Frequency**
1	2412 MHz	4	2427 MHz	7	2442 MHz	10	2457 MHz
2	2417 MHz	5	2432 MHz	8	2447 MHz	11	2462 MHz
3	2422 MHz	6	2437 MHz	9	2452 MHz	--	--

1.5 DESCRIPTION OF SUPPORT UNITS

The EUT has been tested with associated equipment below.

1) Support Equipment

Description	Manufacturer	Model No.	Serial Number	Supplied by
LCD monitor	DELL	P2416Db	CN-ONDY73-74261-5C9-OLVS	UnionTrust
--	--	--	--	--

2) Support Cable

Cable No.	Description	Connector	Length	Supplied by
1	Antenna Cable	SMA	0.30 Meter	UnionTrust
--	--	--	--	--

1.6 TEST LOCATION

Shenzhen UnionTrust Quality and Technology Co., Ltd.

Address: 16/F, Block A, Building 6, Baoneng Science and Technology Park, Qingxiang Road No.1, Longhua New District, Shenzhen, China 518109
Telephone: +86 (0) 755 2823 0888
Fax: +86 (0) 755 2823 0886

Tests were sub-contracted.
Compliance Certification Services (Shenzhen) Inc.

Address: No.10-1 Mingkeda Logistics Park, No.18 Huanguan South RD. Guan lan Town, Baoan Distr, Shenzhen, Guangdong, China.
Telephone: +86 (0) 755 28055000 Fax: +86 (0) 755 29055221

1.7 TEST FACILITY

Shenzhen UnionTrust Quality and Technology Co., Ltd.

The test facility is recognized, certified, or accredited by the following organizations:

CNAS-Lab Code: L9069

The measuring equipment utilized to perform the tests documented in this report has been calibrated once a year or in accordance with the manufacturer's recommendations, and is traceable under the ISO/IEC/EN 17025 to international or national standards. Equipment has been calibrated by accredited calibration laboratories.

IC-Registration No.: 21600-1

The 3m Semi-anechoic chamber of Shenzhen UnionTrust Quality and Technology Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 21600-1.

Compliance Certification Services (Shenzhen) Inc.

FCC Registration Number is 441872.

1.8 DEVIATION FROM STANDARDS

None.

1.9 ABNORMALITIES FROM STANDARD CONDITIONS

None.

1.10 OTHER INFORMATION REQUESTED BY THE CUSTOMER

None.

1.11 MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the Product as specified in CISPR 16-4-2. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

No.	Item	Measurement Uncertainty
1	Conducted emission 9KHz-150KHz	±3.2878 dB
2	Conducted emission 150KHz-30MHz	±3.2878 dB
3	Radiated emission 30MHz-200Hz	±3.8928 dB
4	Radiated emission 200MHz-1GHz	±3.8753 dB
5	Radiated emission 1GHz-8GHz	±5.3112 dB
6	Radiated emission Above 8GHz	±5.3493 dB

2. TEST SUMMARY

FCC 47 CFR Part 15 Subpart C Test Cases			
Test Item	**Test Requirement**	**Test Method**	**Result**
Antenna Requirement	FCC 47 CFR Part 15 Subpart C Section 15.203/15.247 (c)	ANSI C63.10-2013	PASS
AC Power Line Conducted Emission	FCC 47 CFR Part 15 Subpart C Section 15.207	ANSI C63.10-2013	PASS*
Conducted Peak Output Power	FCC 47 CFR Part 15 Subpart C Section 15.247 (b)(3)	KDB 558074 D01 v03r05 Section 9.1.2	PASS
6dB Bandwidth	FCC 47 CFR Part 15 Subpart C Section 15.247 (a)(2)	KDB 558074 D01 v03r05 Section 8.1	PASS
Power Spectral Density	FCC 47 CFR Part 15 Subpart C Section 15.247 (e)	KDB 558074 D01 v03r05 Section 10.2	PASS
Conducted Out of Band Emission	FCC 47 CFR Part 15 Subpart C Section 15.247(d)	KDB 558074 D01 v03r05 Section 11	PASS
Radiated Spurious Emissions	FCC 47 CFR Part 15 Subpart C Section 15.205/15.209	KDB 558074 D01 v03r05 Section 12.1	PASS*
Band Edge Measurements (Radiated)	FCC 47 CFR Part 15 Subpart C Section 15.205/15.209	KDB 558074 D01 v03r05 Section 12.1	PASS*

Note:

1) N/A: In this whole report not application.
2) "*": In this whole report "*" means tests were sub-contracted Item.

3. EQUIPMENT LIST

Radiated Emission Test Equipment List 966(1)						
Used	**Equipment**	**Manufacturer**	**Model No.**	**Serial Number**	**Cal. date (mm dd, yyyy)**	**Cal. Due date (mm dd, yyyy)**
☑	Amplifier	HP	8447D	2944A08999	Feb. 12, 2017	Feb. 11, 2018
☑	Antenna	SCHAFFNER	CBL6143	5082	Feb. 12, 2017	Feb. 11, 2018
☑	Turn Table	N/A	N/A	N/A	N.C.R	N.C.R
☑	EMI TEST RECEIVER	ROHDE&SCHWARZ	ESPI	101026	Feb. 12, 2017	Feb. 11, 2018
☑	Temp. / Humidity Meter	Anymetre	JR913	N/A	Feb. 15, 2017	Feb. 14, 2018
☑	Test S/W	FARAD	EZ-EMC/ CCS-03A1			

Radiated Emission Test Equipment List 966(2)						
Used	**Equipment**	**Manufacturer**	**Model No.**	**Serial Number**	**Cal. date (mm dd, yyyy)**	**Cal. Due date (mm dd, yyyy)**
☑	PSA Series Spectrum Analyzer	Agilent	E4446A	US44300399	Feb. 17, 2017	Feb. 16, 2018
☑	High Noise Amplifier	Agilent	8449B	3008A01838	Feb. 11, 2017	Feb. 10, 2018
☑	Horn Antenna	SCHWARZBECK	BBHA9120	D286	Feb. 12, 2017	Feb. 11, 2018
☑	Board-Band Horn Antenna	Schwarzbeck	BBHA 9170	9170-497	Feb. 11, 2017	Feb. 10, 2018
☑	Turn Table	N/A	N/A	N/A	N.C.R	N.C.R
☑	Controller	Sunol Sciences	SC104V	022310-1	N.C.R	N.C.R
☑	Controller	CT	N/A	N/A	N.C.R	N.C.R
☑	Antenna Tower	SUNOL	TLT2	N/A	N.C.R	N.C.R
☑	Temp. / Humidity Meter	Anymetre	JR913	N/A	Feb. 15, 2017	Feb. 14, 2018
☑	Test S/W	FARAD	LZ-RF / CCS-SZ-3A2			

Conducted Emission Test Equipment List						
Used	**Equipment**	**Manufacturer**	**Model No.**	**Serial Number**	**Cal. date (mm dd, yyyy)**	**Cal. Due date (mm dd, yyyy)**
☑	EMI TEST RECEIVER	ROHDE&SCHWARZ	ESCI	100783	Feb. 11, 2017	Feb. 10, 2018
☑	LISN(EUT)	ROHDE&SCHWARZ	ENV216	101543-WX	Feb. 11, 2017	Feb. 10, 2018
☑	LISN	EMCO	3825/2	8901-1459	Feb. 12, 2017	Feb. 11, 2018
☑	Temp. / Humidity Meter	VICTOR	HTC-1	N/A	Feb. 15, 2017	Feb. 14, 2018
☑	Test S/W	FARAD	EZ-EMC/ CCS-3A1-CE			

Conducted RF test Equipment List						
Used	**Equipment**	**Manufacturer**	**Model No.**	**Serial Number**	**Cal. date (mm dd, yyyy)**	**Cal. Due date (mm dd, yyyy)**
☑	EXA Spectrum Analyzer	KEYSIGHT	N9010A	MY51440197	Dec. 22, 2016	Dec. 22, 2017
☑	USB Wideband Power Sensor	KEYSIGHT	U2021XA	MY55430035	Dec. 22, 2016	Dec. 22, 2017
☑	USB Wideband Power Sensor	KEYSIGHT	U2021XA	MY55430023	Dec. 22, 2016	Dec. 22, 2017
☑	Receiver	R&S	ESR7	1316.3003K07 -101181-K3	Dec. 22, 2016	Dec. 22, 2017

4. TEST CONFIGURATION

4.1 ENVIRONMENTAL CONDITIONS FOR TESTING

4.1.1 Normal or Extreme Test Conditions

Environment Parameter	Selected Values During Tests		
Test Condition	Ambient		
	Temperature (°C)	Voltage (V)	Relative Humidity (%)
NT/NV	+15 to +35	120V~60Hz	20 to 75
Remark: 1) NV: Normal Voltage; NT: Normal Temperature			

4.1.2 Record of Normal Environment

Test Item	Temperature (°C)	Relative Humidity (%)	Pressure (Kpa)	Tested by
AC Power Line Conducted Emission	23.6	54	100.2	Tiny You
Conducted Peak Output Power	25.2	62	99.8	Tiny You
6dB Bandwidth	25.2	62	99.8	Tiny You
Power Spectral Density	25.2	62	99.8	Tiny You
Conducted Out of Band Emission	25.2	62	99.8	Tiny You
Radiated Spurious Emissions	23.6	54	100.2	Tiny You
Band Edge Measurements (Radiated)	24.8	59	99.8	Tiny You

4.2 TEST CHANNELS

Mode	Tx/Rx Frequency	Test RF Channel Lists		
		Lowest(L)	Middle(M)	Highest(H)
IEEE 802.11b	2412 MHz to 2462 MHz	Channel 1	Channel 6	Channel 11
		2412 MHz	2437 MHz	2462 MHz
IEEE 802.11g	2412 MHz to 2462 MHz	Channel 1	Channel 6	Channel 11
		2412 MHz	2437 MHz	2462 MHz
IEEE 802.11n-HT20	2412 MHz to 2462 MHz	Channel 1	Channel 6	Channel 11
		2412 MHz	2437 MHz	2462 MHz
IEEE 802.11n-HT40	2422 MHz to 2452 MHz	Channel 3	Channel 6	Channel 9
		2422 MHz	2437 MHz	2452 MHz

4.3 EUT TEST STATUS

Mode	Tx/Rx Function	Description
IEEE 802.11b IEEE 802.11g IEEE 802.11n-HT20	1Tx/1Rx	1. Keep the EUT in continuously transmitting or receiving with modulation test single.
IEEE 802.11n-HT20	2Tx/2Rx	2. Keep the EUT in continuously transmitting or receiving with modulation test single.

4.4 PRE-SCAN

4.4.1 Pre-scan under all rates

Mode and Frequency	Maximum Conducted Average Power (dBm)_Chain 0							
	1		2		5.5		11	
IEEE 802.11b 2437 MHz	**14.23**		14.22		14.05		13.59	
IEEE 802.11g 2437 MHz	6	9	12	18	24	36	48	54
	13.78	13.74	13.66	13.53	12.62	12.42	12.44	12.23
IEEE 802.11n-HT20 2437 MHz	MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
	8.77	8.41	8.12	8.36	7.34	7.17	7.23	6.04
	MCS8	MCS9	MCS10	MCS11	MCS12	MCS13	MCS14	MCS15
	8.57	8.20	7.98	8.26	7.09	6.86	7.01	5.85

4.4.2 Worst-case data rates

Mode	Worst-case data rates
IEEE 802.11b	1 Mbps
IEEE 802.11g	6 Mbps
IEEE 802.11n-HT20	MCS0

4.5 TEST SETUP

4.5.1 For Radiated Emissions test setup

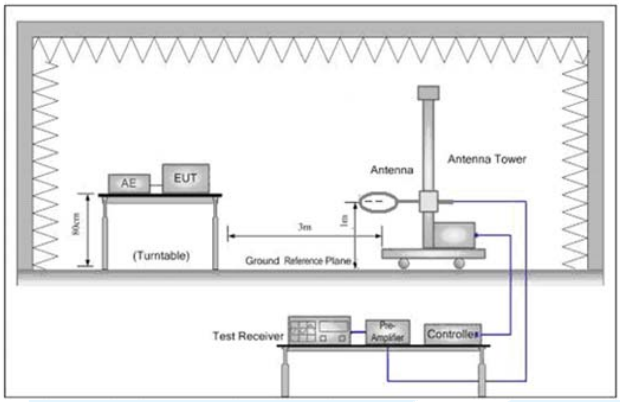


Figure 1. Below 30MHz

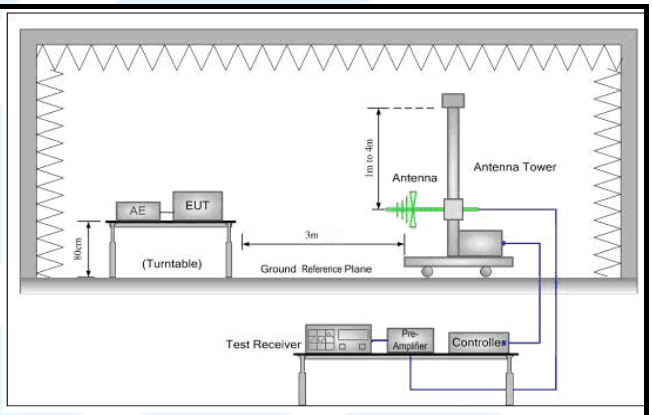


Figure 2. 30MHz to 1GHz

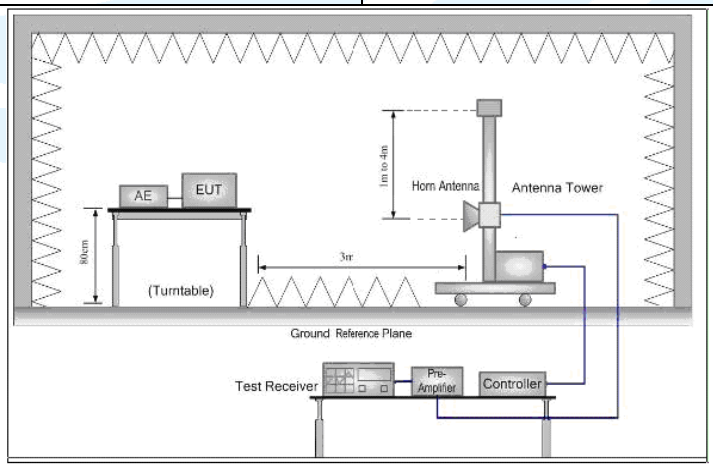
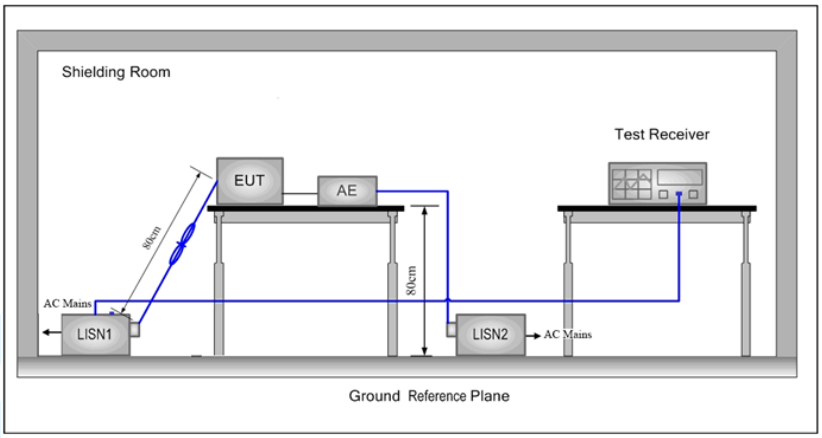


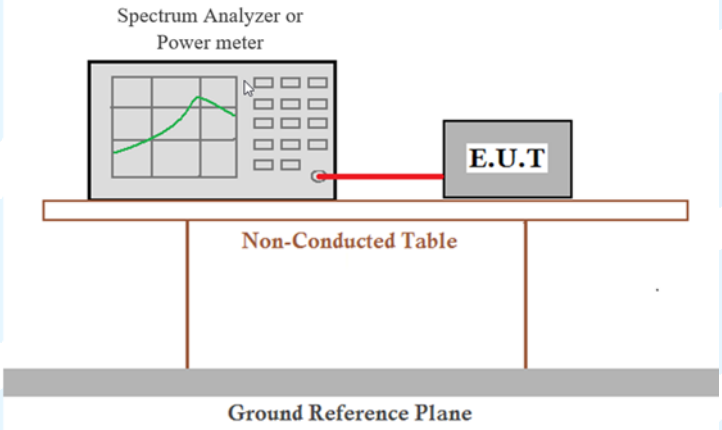
Figure 3. Above 1GHz

4.5.2 For Conducted Emissions test setup

Figure 3. Conducted Emissions setup



4.5.3 For Conducted RF test setup



4.6 SYSTEM TEST CONFIGURATION

For emissions testing, the equipment under test (EUT) setup to transmit continuously to simplify the measurement methodology. Care was taken to ensure proper power supply voltages during testing. During testing, radiated emission were performed with the EUT set to transmit at the channel with highest output power as worst-case scenario. It was powered by a 120V~60Hz. Only the worst case data were recorded in this test report.

The signal is maximized through rotation and placement in the three orthogonal axes. The antenna height and polarization are varied during the search for maximum signal level. The antenna height is varied from 1 to 4 meters. Radiated emissions are taken at three meters unless the signal level is too low for measurement at that distance. If necessary, a pre-amplifier is used and/or the test is conducted at a closer distance. Therefore, all final radiated testing was performed with the EUT in (see table below) orientation.

Frequency	Mode	Antenna Port	Worst-case axis positioning
Above 1GHz	1TX	Chain 0	Z axis
	1TX	Chain 1	Z axis
	2TX	Chain 0+1	Z axis

All readings are extrapolated back to the equivalent three meter reading using inverse scaling with distance. Analyzer resolution is 100 kHz or greater for frequencies below 1000 MHz. The resolution is 1 MHz or greater for frequencies above 1000 MHz. The spurious emissions more than 20 dB below the permissible value are not

reported.

Radiated emission measurement were performed from the lowest radio frequency signal generated in the device which is greater than 9 kHz to the tenth harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower.

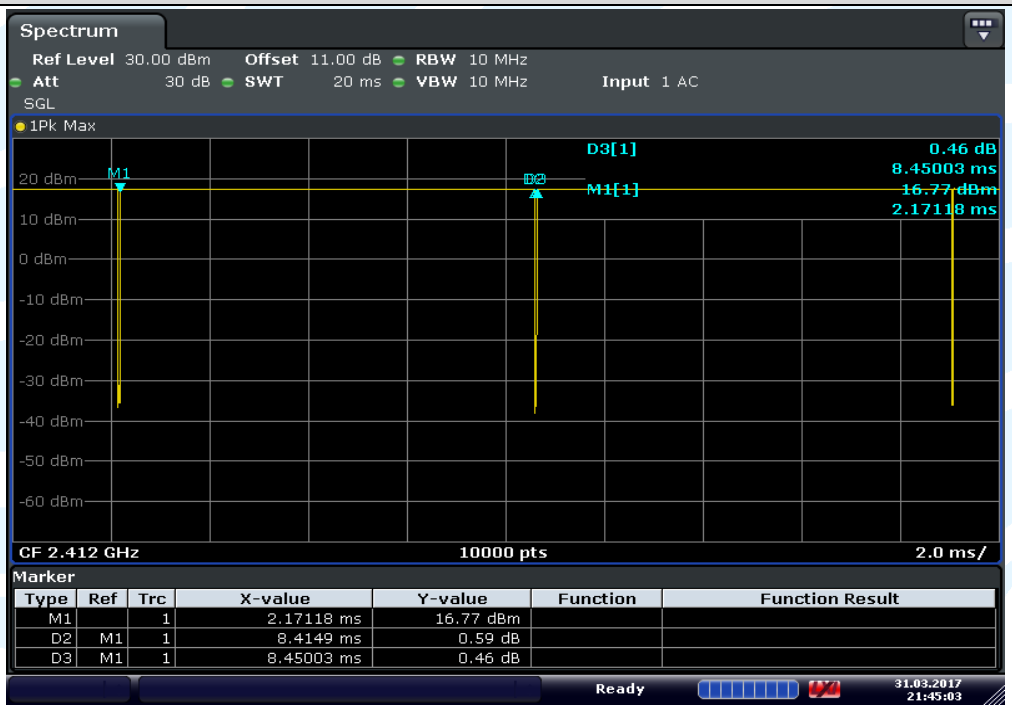
4.7 DUTY CYCLE

Mode	Data rates (Mbps)	On Time (msec)	Period (msec)	Duty Cycle (linear)	Duty Cycle (%)	Duty Cycle Factor (dB)	1/ T Minimum VBW (kHz)	Average Factor (dB)
IEEE 802.11b	1	8.4149	8.45003	1.00	99.58	0.00	0.01	-0.04
IEEE 802.11g	6	1.4	1.43478	0.98	97.58	0.11	0.71	-0.21
IEEE 802.11n-HT20	MCS0	1.30475	1.34783	0.97	96.80	0.14	0.77	-0.28

Remark:
1) Duty cycle= On Time/ Period;
2) Duty Cycle factor = 10 * log(1/ Duty cycle);
3) Average factor = 20 $\log_{10}$ Duty Cycle.

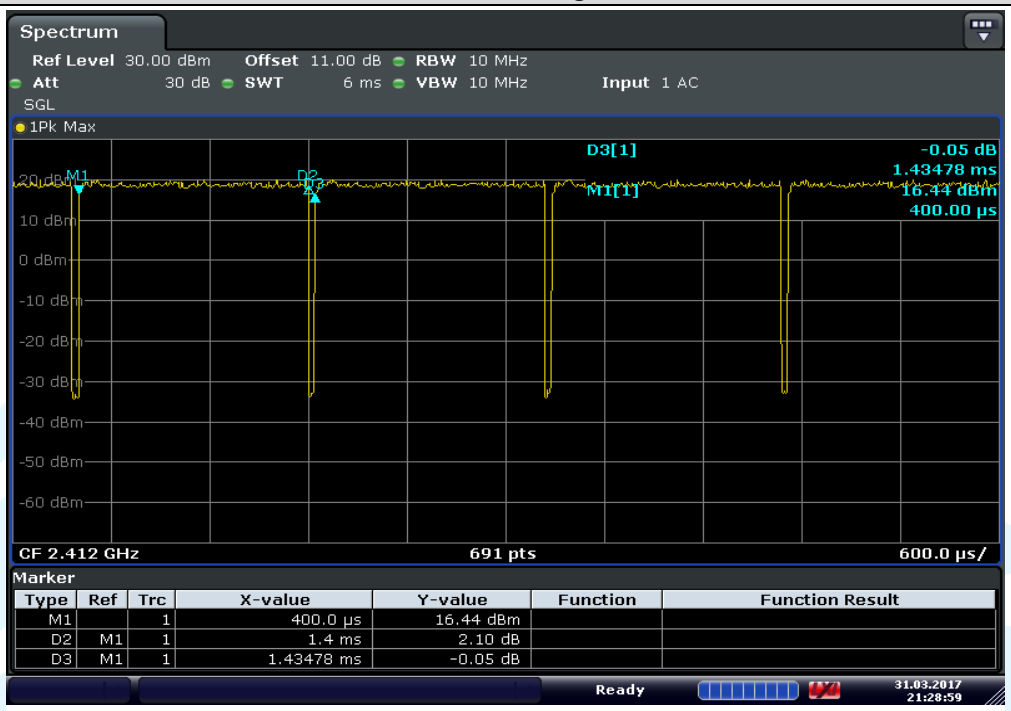
The test plot as follows

IEEE 802.11b



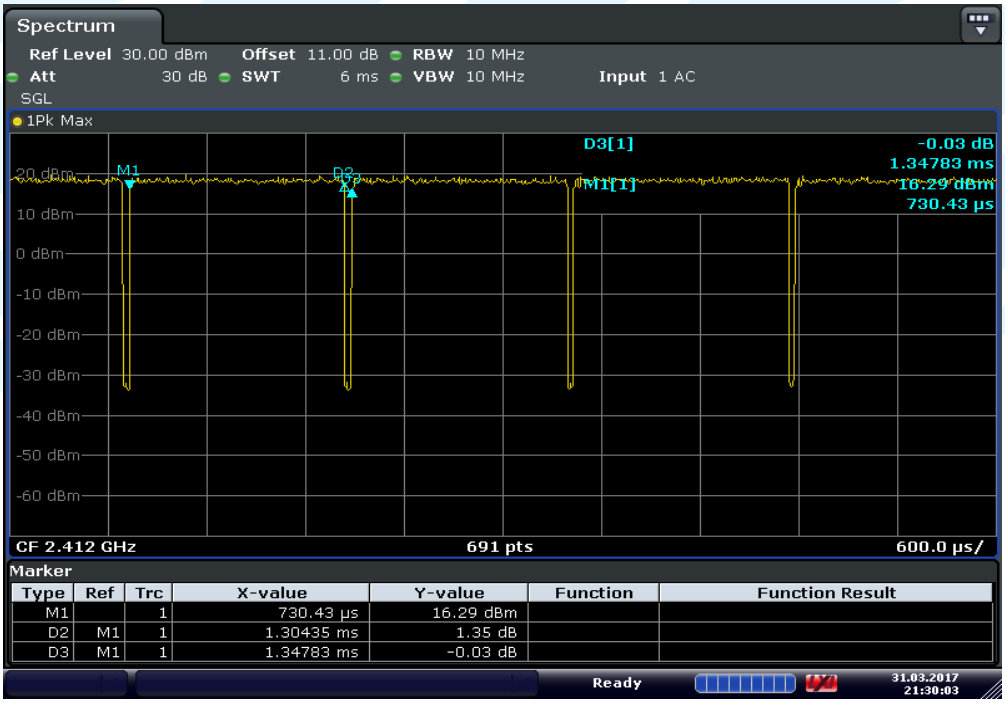
Date: 31.MAR.2017 21:45:03

IEEE 802.11g



Date: 31.MAR.2017 21:28:59

IEEE 802.11n-HT20



Date: 31.MAR.2017 21:30:03

5. RADIO TECHNICAL REQUIREMENTS SPECIFICATION

5.1 REFERENCE DOCUMENTS FOR TESTING

No.	Identity	Document Title
1	FCC 47 CFR Part 2	Frequency allocations and radio treaty matters; general rules and regulations
2	FCC 47 CFR Part 15	Radio Frequency Devices
3	ANSI C63.10-2013	American National Standard for Testing Unlicesed Wireless Devices
4	KDB 558074 D01 DTS Meas Guidance v03r05	Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247
5	KDB 662911 D01 Multiple Transmitter Output v02r01	Emissions Testing of Transmitters with Multiple Outputs in the Same Band

5.2 ANTENNA REQUIREMENT

Standard Requirement
15.203 requirement: 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, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. **15.247(b) (4) requirement:** The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.
EUT Antenna:
Both antenna in the interior of the equipment and no consideration of replacement. The transmit signals are correlated with each other and the antenna gain of both chains is completely consistent, the best case directional gain of the antenna is 5.01 dBi (See section 5.3).

5.3 CONDUCTED PEAK OUTPUT POWER

Test Requirement: FCC 47 CFR Part 15 Subpart C Section15.247 (b)(3)

Test Method: KDB 558074 D01 v03r05, Section 9.1.2

Limit: For systems using digital modulation in the 2400-2483.5 MHz bands: 1 Watt.

Test Procedure:
1. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the power meter.
2. Measure out each test modes' peak or average output power, record the power level.

Note: The cable loss and attenuator loss were offset into measure device as an amplitude offset.

Test Setup: Refer to section 4.4.3 for details.

Instruments Used: Refer to section 3 for details

Test Mode: Transmitter mode

Test Results: Pass

Test Data:

Mode	Channel/ Frequency (MHz)	Maximum Conducted Peak Output Power (dBm)				
		SISO_ Chain 0	SISO_ Chain 1	Total Power MIMO_ Chain 0+1	Limit (dBm)	Pass / Fail
IEEE 802.11b	1(2412)	17.17	17.35	---	30	Pass
	6(2437)	17.39	17.63	---	30	Pass
	11(2462)	17.21	17.97	---	30	Pass
IEEE 802.11g	1(2412)	20.41	20.57	---	30	Pass
	6(2437)	**20.57**	20.97	---	30	Pass
	11(2462)	**20.60**	**21.34**	---	30	Pass
IEEE 802.11n-HT20	1(2412)	15.97	16.24	19.12	30	Pass
	6(2437)	16.65	16.68	**19.68**	30	Pass
	11(2462)	16.24	16.79	19.53	30	Pass

Remark:
1. Power with Duty Factor = Measured Power + Duty Cycle Factor
2. Total (Chain 0+1) = $10*\log[(10^{\text{Chain 0/10}})+(10^{\text{Chain 1/10}})]$
3. Directional gain and the maximum conducted output power limit see table below:

Frequency Band	Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Correlated chains directional gain (dBi)	Peak Power Limit (dBm)
2400 MHz to 2483.5 MHz	2.00	2.00	5.01	30.00
Basic methodology with N_{ANT} transmit antennas, each with the same directional gain G_{ANT} dBi, being driven by N_{ANT} transmitter outputs of equal power. Directional gain is to be computed as follows:				
If *any* transmit signals are *correlated* with each other,				
Directional gain = $G_{ANT} + 10 \log(N_{ANT})$ dBi				

Mode	Channel/ Frequency (MHz)	Maximum Conducted Average Power (dBm)					
		SISO		Duty Cycle Factor (dB)	SISO		MIMO
		Measured Power			Power with Duty Factor		Total Power
		Chain 0	Chain 1		Chain 0	Chain 1	Chain 0+1
IEEE 802.11b	1(2412)	13.98	13.93	0.00	13.98	13.93	--
	6(2437)	14.23	14.14		**14.23**	14.14	--
	11(2462)	14.06	14.32		14.06	**14.32**	--
IEEE 802.11g	1(2412)	13.53	13.48	0.11	13.64	13.59	--
	6(2437)	**13.78**	**13.78**		13.89	13.89	--
	11(2462)	13.85	14.12		13.96	14.23	--
IEEE 802.11n-HT20	1(2412)	8.46	8.72	0.14	8.60	8.86	11.74
	6(2437)	8.77	9.07		8.91	9.21	12.07
	11(2462)	8.68	9.16		8.82	9.30	**12.08**

Remark:
1. Power with Duty Factor = Measured Power + Duty Cycle Factor
2. Total (Chain 0+1) = $10*\log[(10^{\text{Chain 0/10}})+(10^{\text{Chain 1/10}})]$

5.46 DB BANDWIDTH

Test Requirement: FCC 47 CFR Part 15 Subpart C Section 15.247 (a)(2)

Test Method: KDB 558074 D01 v03r05, Section 8.1

Limit: For direct sequence systems, the minimum 6dB bandwidth shall be at least 500kHz

Test Procedure: Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
Use the following spectrum analyzer settings:
a) Set RBW = 100 kHz.
b) Set the video bandwidth (VBW) ≥ 3 x RBW.
c) Detector = Peak.
d) Trace mode = max hold.
e) Sweep = auto couple.
f) Allow the trace to stabilize.
g) Measure 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 6 dB relative to the maximum level measured in the fundamental emission.

Note: The cable loss and attenuator loss were offset into measure device as an amplitude offset.

Test Setup: Refer to section 4.4.3 for details.

Instruments Used: Refer to section 3 for details

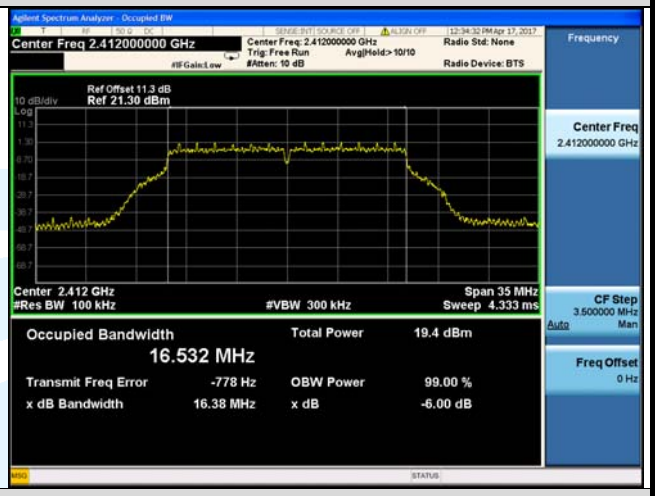
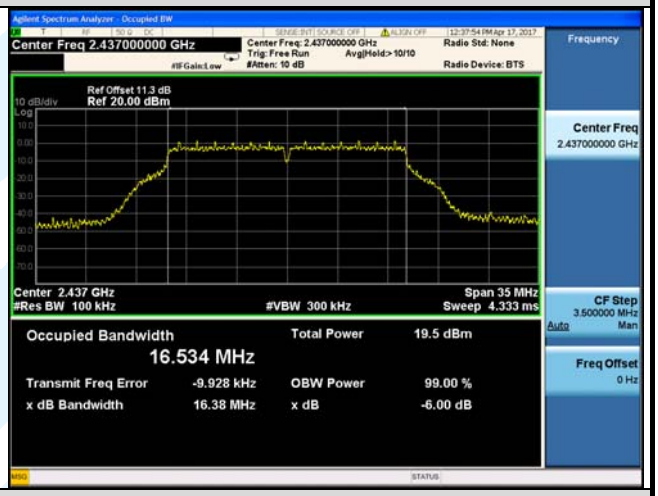
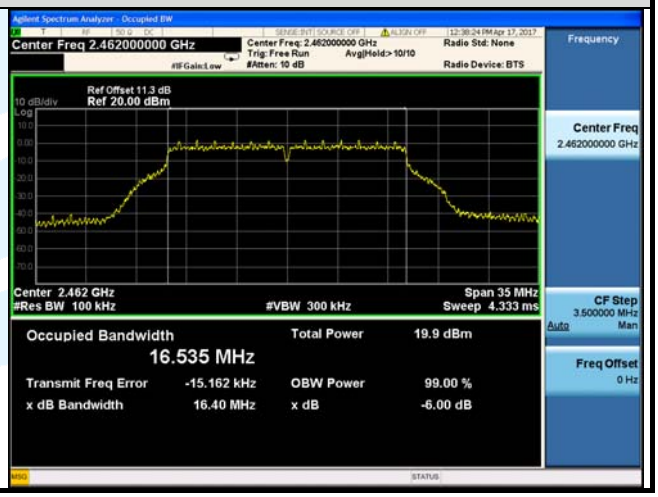
Test Mode: Transmitter mode

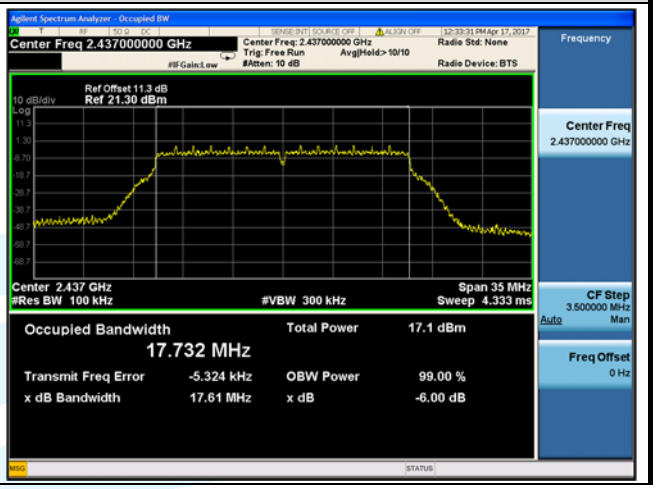
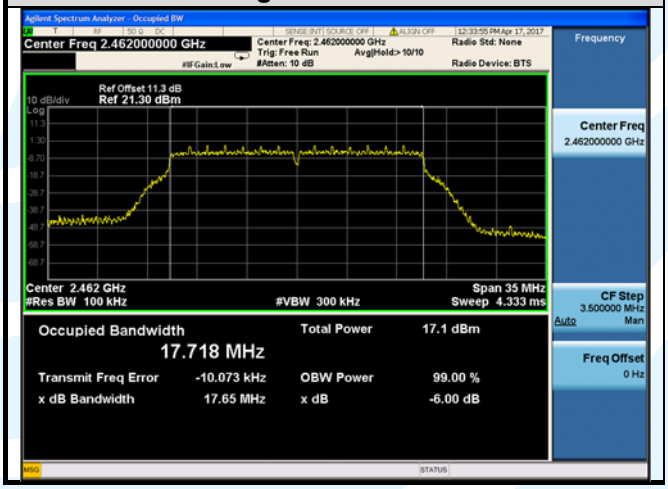
Test Results: Pass

Test Data:

Mode	Channel/ Frequency (MHz)	6 dB Bandwidth (MHz)	99% Bandwidth (MHz)	6 dB Bandwidth Limit	Pass / Fail
The worst case test data: SISO_ Chain 1					
IEEE 802.11b	1(2412)	8.552	11.329	> 500 kHz	Pass
	6(2437)	8.552	11.078	> 500 kHz	Pass
	11(2462)	8.095	11.033	> 500 kHz	Pass
IEEE 802.11g	1(2412)	16.38	16.532	> 500 kHz	Pass
	6(2437)	16.38	16.534	> 500 kHz	Pass
	11(2462)	16.40	16.535	> 500 kHz	Pass
IEEE 802.11n-HT20	1(2412)	17.61	17.747	> 500 kHz	Pass
	6(2437)	17.61	17.732	> 500 kHz	Pass
	11(2462)	17.65	17.718	> 500 kHz	Pass

The test plot as follows:

IEEE 802.11b	IEEE 802.11g
Lowest Channel	
	
Middle Channel	
	
Highest Channel	
	

IEEE 802.11n-HT20	
Lowest Channel	**Middle Channel**
	
Highest Channel	
	

5.5 POWER SPECTRAL DENSITY

Test Requirement: FCC 47 CFR Part 15 Subpart C Section 15.247 (e)

Test Method: KDB 558074 D01 v03r05, Section 10.2

Limit: For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8dBm in any 3kHz band during any time interval of continuous transmission.

Test Procedure: Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.

Use the following spectrum analyzer settings:

a) Set analyzer center frequency to DTS channel center frequency.
b) Set the span to 1.5 times the DTS bandwidth.
c) Set the RBW to: 3 kHz ≤ RBW ≤ 100 kHz.
d) Set the VBW ≥ 3 x RBW.
e) Detector = peak.
f) Sweep time = auto couple.
g) Trace mode = max hold.
h) Allow trace to fully stabilize.
i) Use the peak marker function to determine the maximum amplitude level within the RBW.
j) If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

Note: The cable loss and attenuator loss were offset into measure device as an amplitude offset.

Test Setup: Refer to section 4.4.3 for details.

Instruments Used: Refer to section 3 for details

Test Mode: Transmitter mode

Test Results: Pass

Test Data:

Mode	Channel/ Frequency (MHz)	Power spectral density (dBm)				
		SISO_ Chain 0	SISO_ Chain 1	Total Power MIMO_ Chain 0+1	Limit @3kHz (dBm)	Pass / Fail
IEEE 802.11b	1(2412)	---	-8.876	---	8	Pass
	6(2437)	---	-7.974	---	8	Pass
	11(2462)	---	-8.315	---	8	Pass
IEEE 802.11g	1(2412)	---	-10.694	---	8	Pass
	6(2437)	---	-10.519	---	8	Pass
	11(2462)	---	-10.659	---	8	Pass
IEEE 802.11n-HT20	1(2412)	-13.672	-13.391	**-10.52**	8	Pass
	6(2437)	-14.290	-13.917	-11.09	8	Pass
	11(2462)	-14.502	-13.296	-10.85	8	Pass

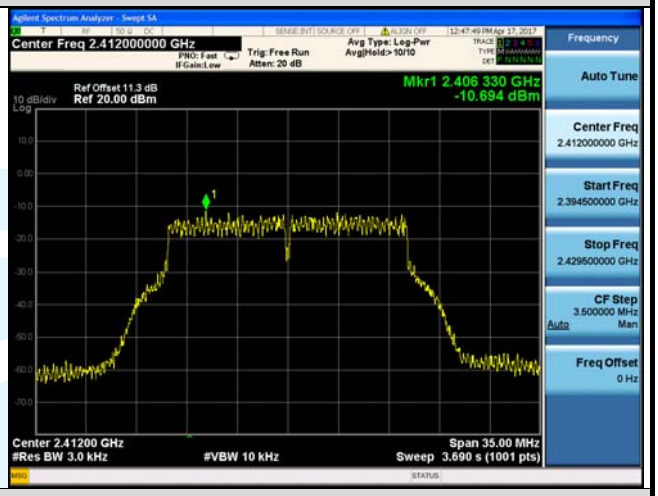
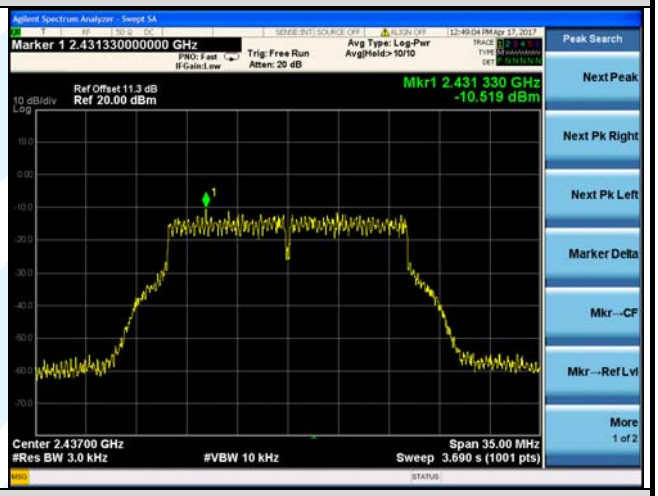
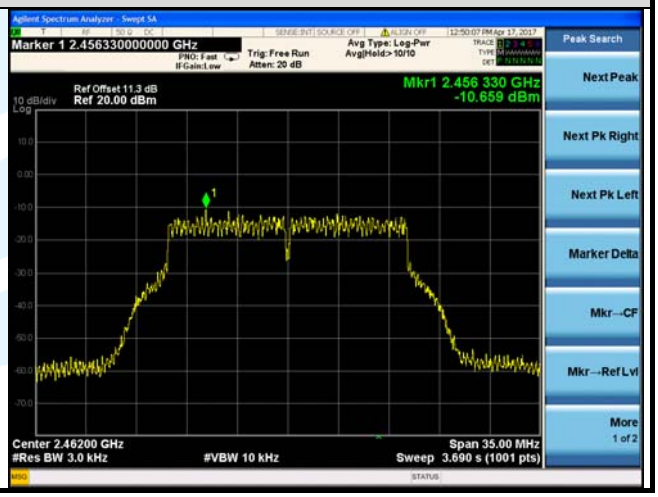
Remark:

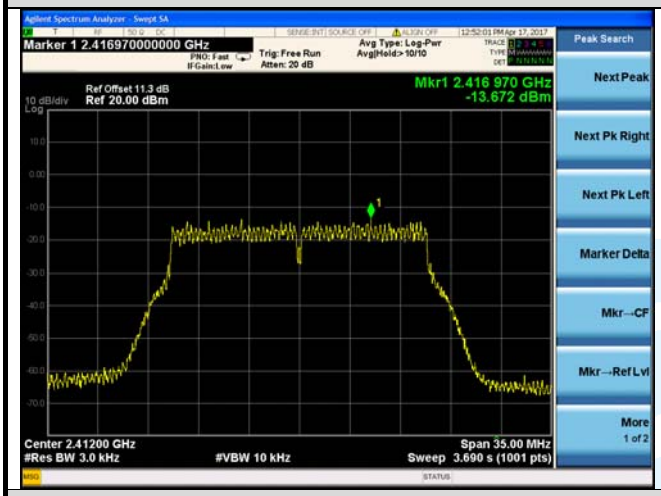
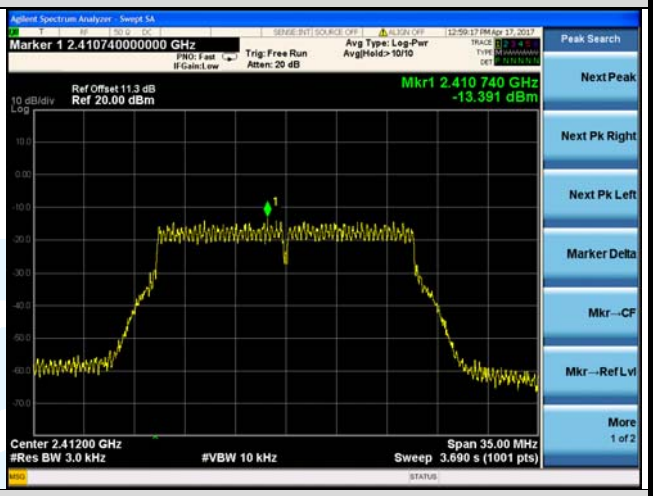
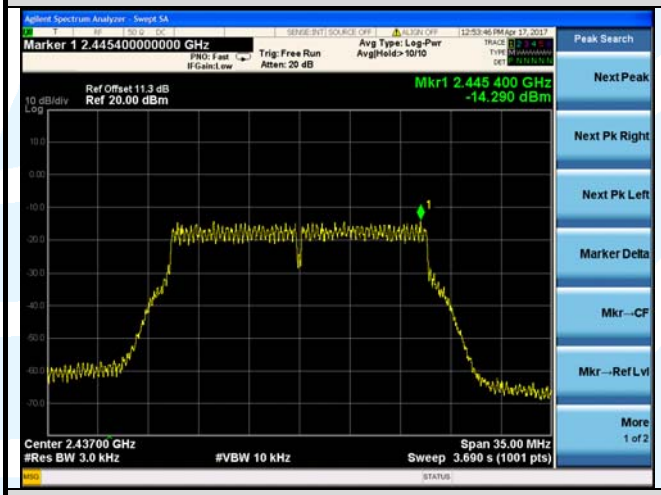
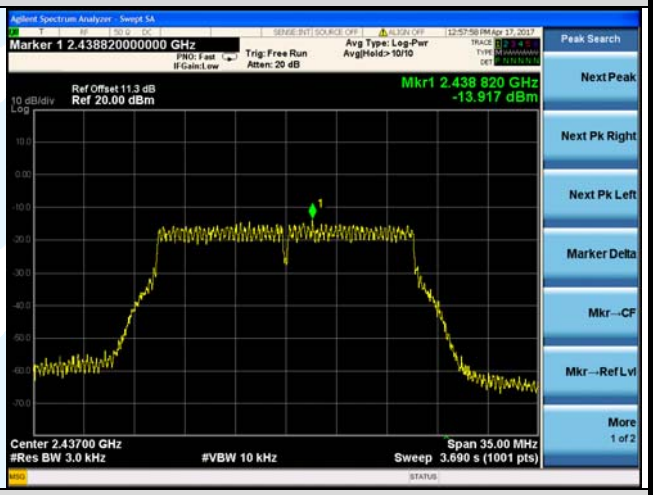
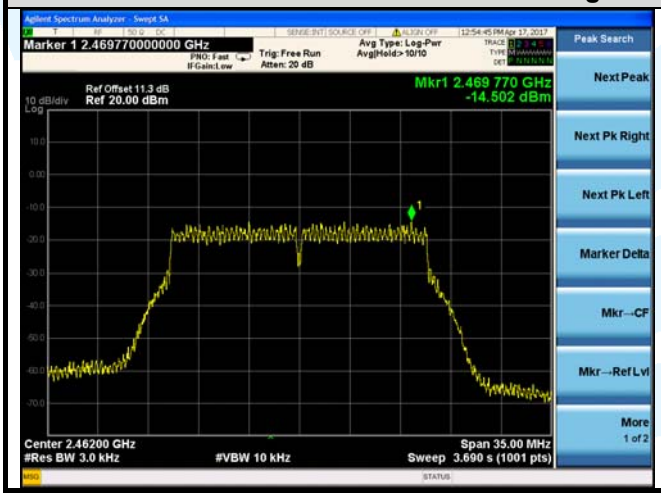
2. Total (Chain 0+1) = $10*\log[(10^{\text{Chain 0}/10})+(10^{\text{Chain 1}/10})]$

3. Directional gain and the maximum conducted power spectral density limit see table below:

Frequency Band	Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Correlated chains directional gain (dBi)	Peak Power Limit (dBm)
2400 MHz to 2483.5 MHz	2.00	2.00	5.01	8.00
Basic methodology with N_{ANT} transmit antennas, each with the same directional gain G_{ANT} dBi, being driven by N_{ANT} transmitter outputs of equal power. Directional gain is to be computed as follows:				
If *any* transmit signals are *correlated* with each other,				
Directional gain = $G_{ANT} + 10 \log(N_{ANT})$ dBi				

The test plot as follows:

IEEE 802.11b	IEEE 802.11g
Lowest Channel	
	
Middle Channel	
	
Highest Channel	
	

IEEE 802.11n-HT20_Chain 0	IEEE 802.11n-HT20_Chain 1
Lowest Channel	
	
Middle Channel	
	
Highest Channel	
	

5.6 CONDUCTED OUT OF BAND EMISSION

Test Requirement: FCC 47 CFR Part 15 Subpart C Section 15.247(d)

Test Method: KDB 558074 D01 v03r05, Section 11

Limit: In any 100kHz bandwidth outside the frequency bands in which the spread spectrum intentional radiator in operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power.

Test Procedure: Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.

Use the following spectrum analyzer settings:

Step 1:Measurement Procedure REF

a) Set instrument center frequency to DTS channel center frequency.
b) Set the span to ≥ 1.5 times the DTS bandwidth.
c) Set the RBW = 100 kHz.
d) Set the VBW ≥ 3 x RBW.
e) Detector = peak.
f) Sweep time = auto couple.
g) Trace mode = max hold.
h) Allow trace to fully stabilize.
i) Use the peak marker function to determine the maximum PSD level.
j) Note that the channel found to contain the maximum PSD level can be used to establish the reference level.

Step 2:Measurement Procedure OOBE

a) Set RBW = 100 kHz.
b) Set VBW ≥ 300 kHz.
c) Detector = peak.
d) Sweep = auto couple.
e) Trace Mode = max hold.
f) Allow trace to fully stabilize.
g) Use the peak marker function to determine the maximum amplitude level.

Note: The cable loss and attenuator loss were offset into measure device as an amplitude offset.

Test Setup: Refer to section 4.4.3 for details.

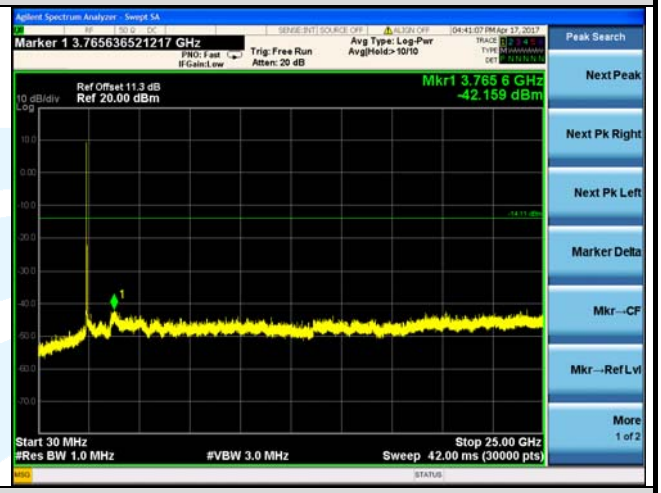
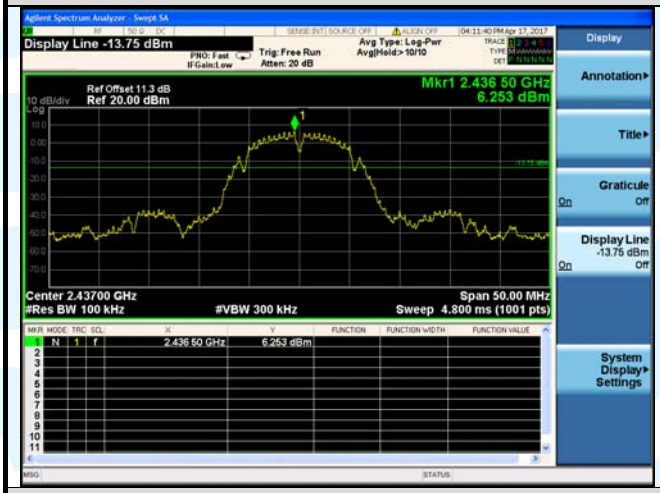
Instruments Used: Refer to section 3 for details

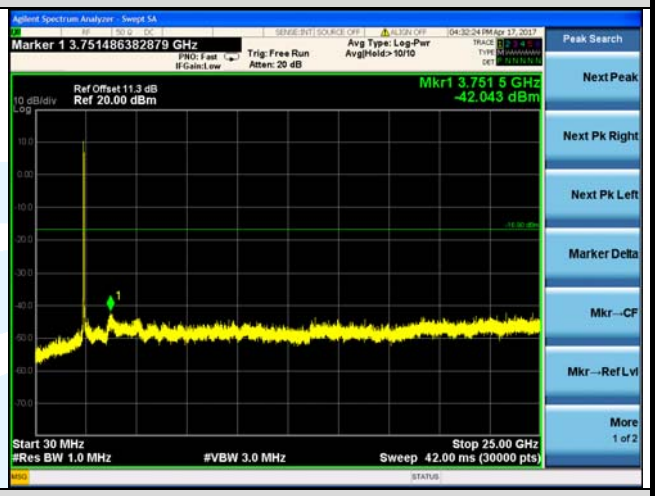
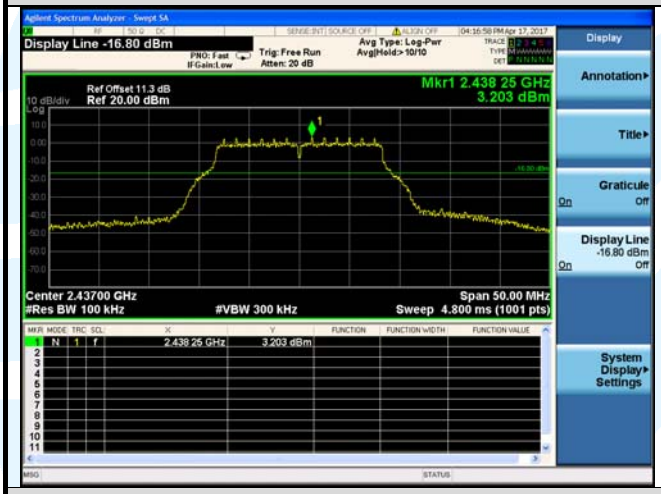
Test Mode: Transmitter mode

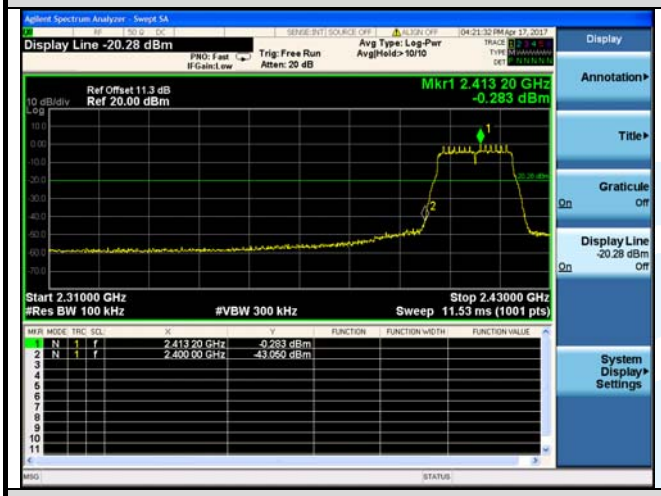
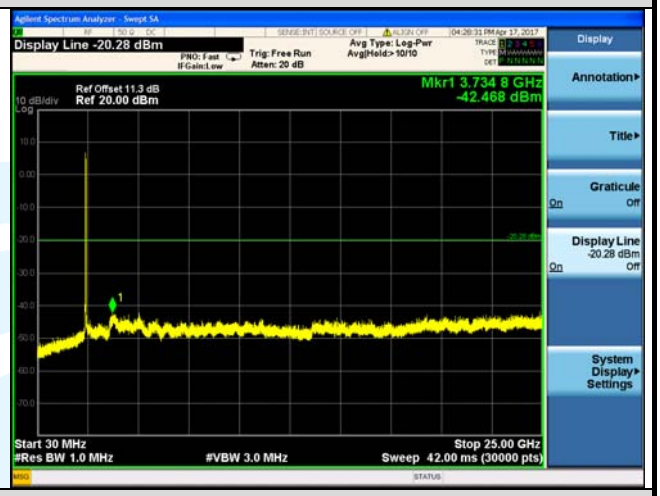
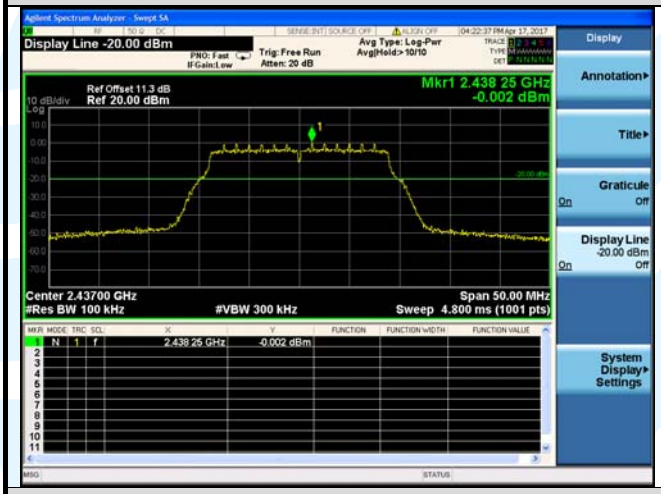
Test Results: Pass

Test Data:

The worst case test plot as follows:

IEEE 802.11b (SISO_ Chain 1)	
In-Band Reference Level	**Out of Band Emission**
Lowest Channel	
	
Middle Channel	
	
Highest Channel	
	

IEEE 802.11g (SISO_ Chain 1)	
In-Band Reference Level	**Out of Band Emission**
Lowest Channel	
	
Middle Channel	
	
Highest Channel	
	

IEEE 802.11n-HT20 (SISO_ Chain 1)	
In-Band Reference Level	**Out of Band Emission**
Lowest Channel	
	
Middle Channel	
	
Highest Channel	
	

5.7 RADIATED SPURIOUS EMISSIONS

Test Requirement: FCC 47 CFR Part 15 Subpart C Section 15.205/15.209

Test Method: KDB 558074 D01 v03r05, Section 12.1

Receiver Setup:

Frequency	Detector	RBW	VBW	Remark
0.009 MHz-0.090 MHz	Peak	10 kHz	30 KHz	Peak
0.009 MHz-0.090 MHz	Average	10 kHz	30 KHz	Average
0.090 MHz-0.110 MHz	Quasi-peak	10 kHz	30 KHz	Quasi-peak
0.110 MHz-0.490 MHz	Peak	10 kHz	30 KHz	Peak
0.110 MHz-0.490 MHz	Average	10 kHz	30 KHz	Average
0.490 MHz -30 MHz	Quasi-peak	10 kHz	30 kHz	Quasi-peak
30 MHz-1 GHz	Quasi-peak	100 kHz	300 KHz	Quasi-peak
Above 1 GHz	Peak	1 MHz	3 MHz	Peak
	Peak	1 MHz	10 Hz or 1/T	Average

Limits:

Spurious Emissions

Frequency	Field strength (microvolt/meter)	Limit (dBμV/m)	Remark	Measurement distance (m)
0.009 MHz-0.490 MHz	2400/F(kHz)	--	--	300
0.490 MHz-1.705 MHz	24000/F(kHz)	--	--	30
1.705 MHz-30 MHz	30	--	--	30
30 MHz-88 MHz	100	40.0	Quasi-peak	3
88 MHz-216 MHz	150	43.5	Quasi-peak	3
216 MHz-960 MHz	200	46.0	Quasi-peak	3
Above 1 GHz	500	54.0	Average	3

Note: 15.35(b), Unless otherwise specified, the limit on peak radio frequency emissions is 20dB above the maximum permitted average emission limit applicable to the equipment under test. This peak limit applies to the total peak emission level radiated by the device.

Remark:

1. The lower limit shall apply at the transition frequencies.
2. Emission level (dBuV/m) = 20 log Emission level (uV/m).
3. For frequencies above 1000 MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20 dB under any condition of modulation.

Test Setup: Refer to section 4.4.1 for details.

Test Procedures:

1. From 30 MHz to 1GHz test procedure as below:

1) The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic camber. The table was rotated 360 degrees to determine the position of the highest radiation.
2) The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
3) The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
4) For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rota table table was turned from 0 degrees to 360 degrees to find the maximum reading.
5) The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
6) If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could

be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

2. Above 1GHz test procedure as below:

1) Different between above is the test site, change from Semi- Anechoic Chamber to fully Anechoic Chamber and change form table 0.8 meter to 1.5 meter(Above 18GHz the distance is 1 meter and table is 1.5 meter).
2) Test the EUT in the lowest channel ,middle channel, the Highest channel
3) The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the Z axis positioning which it is worse case.
4) Repeat above procedures until all frequencies measured was complete.

Equipment Used: Refer to section 3 for details.

Test Result: Pass

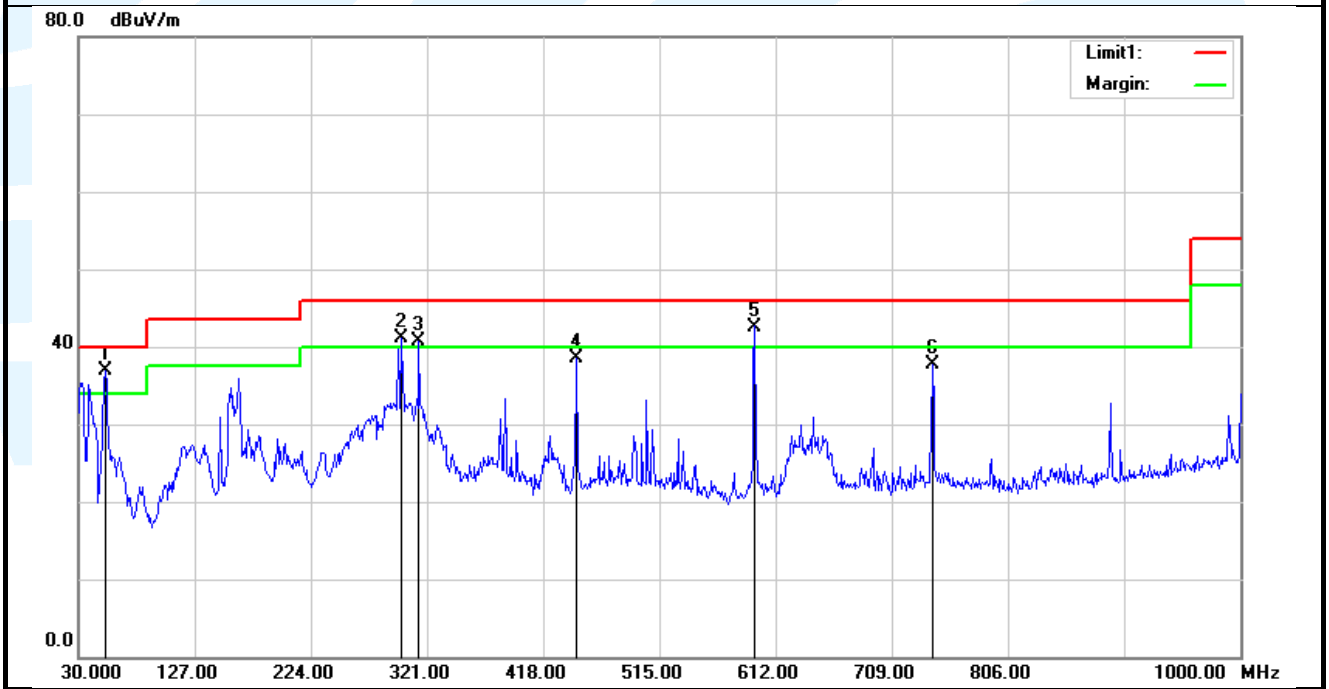
The measurement data as follows:

Radiated Emission Test Data (9 KHz ~ 30 MHz):

The amplitude of spurious emissions attenuated more than 20 dB below the permissible value is not required to be report.

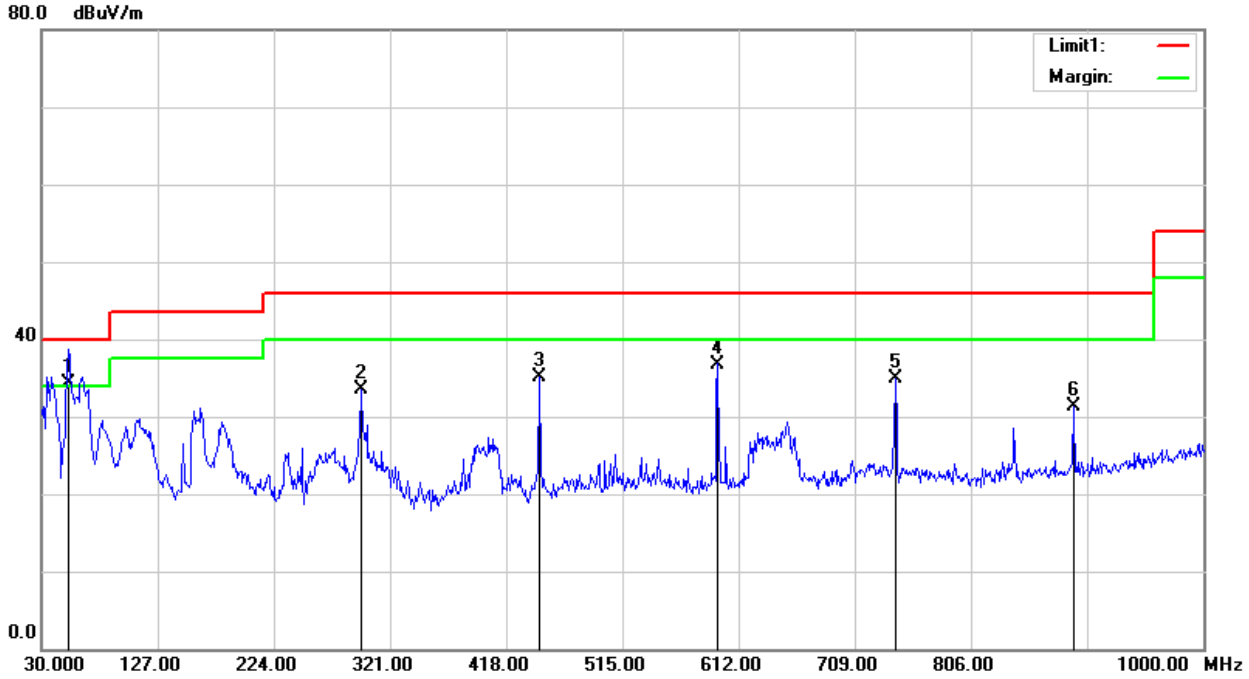
Radiated Emission Test worst Data _ 802.11n-HT20_ Chain 0+1_Middle Channel (30 MHz ~ 1 GHz):

Horizontal



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1*	52.3100	49.36	-12.51	36.85	40.00	-3.15	QP
2!	299.6600	51.05	-10.01	41.04	46.00	-4.96	QP
3!	314.2100	50.58	-9.92	40.66	46.00	-5.34	QP
4	446.1300	47.31	-8.89	38.42	46.00	-7.58	QP
5!	594.5400	48.63	-6.03	42.60	46.00	-3.40	QP
6	742.9500	41.28	-3.56	37.72	46.00	-8.28	QP

Vertical



No.	Frequency (MHz)	Reading (dBuV)	Correction factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1*	52.3100	46.91	-12.51	34.40	40.00	-5.60	QP
2	296.7500	43.55	-9.96	33.59	46.00	-12.41	QP
3	446.1300	44.08	-8.89	35.19	46.00	-10.81	QP
4	594.5400	42.83	-6.03	36.80	46.00	-9.20	QP
5	742.9500	38.52	-3.56	34.96	46.00	-11.04	QP
6	891.3600	33.67	-2.37	31.30	46.00	-14.70	QP

Radiated Emission Test Data (Above 1 GHz Worst Case):

SISO_ Chain 1_IEEE 802.11b_Lowest Channel:

No.	Frequency (MHz)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Polaxis	Remark
1	4824.00	48.66	74.00	-25.34	Peak	Horizontal
2	4824.00	38.37	54.00	-15.63	Average	Horizontal
3	7236.00	47.75	74.00	-26.25	Peak	Horizontal
4	7236.00	39.46	54.00	-14.54	Average	Horizontal
5	4824.00	49.49	74.00	-24.51	Peak	Vertical
6	4824.00	37.58	54.00	-16.42	Average	Vertical
7	7236.00	48.38	74.00	-25.62	Peak	Vertical
8	7236.00	39.53	54.00	-14.47	Average	Vertical

SISO_ Chain 1_IEEE 802.11b_Middle Channel:

No.	Frequency (MHz)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Polaxis	Remark
1	4874.00	48.73	74.00	-25.27	Peak	Horizontal
2	4874.00	38.46	54.00	-15.54	Average	Horizontal
3	7311.00	47.84	74.00	-26.16	Peak	Horizontal
4	7311.00	39.53	54.00	-14.47	Average	Horizontal
5	4874.00	49.37	74.00	-24.63	Peak	Vertical
6	4874.00	37.26	54.00	-16.74	Average	Vertical
7	7311.00	48.41	74.00	-25.59	Peak	Vertical
8	7311.00	39.55	54.00	-14.45	Average	Vertical

SISO_ Chain 1_IEEE 802.11b_Highest Channel:

No.	Frequency (MHz)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Polaxis	Remark
1	4924.00	48.69	74.00	-25.31	Peak	Horizontal
2	4924.00	38.38	54.00	-15.62	Average	Horizontal
3	7386.00	47.56	74.00	-26.44	Peak	Horizontal
4	7386.00	39.35	54.00	-14.65	Average	Horizontal
5	4924.00	48.99	74.00	-25.01	Peak	Vertical
6	4924.00	37.68	54.00	-16.32	Average	Vertical
7	7386.00	48.53	74.00	-25.47	Peak	Vertical
8	7386.00	39.64	54.00	-14.36	Average	Vertical

SISO_ Chain 1_IEEE 802.11g_Lowest Channel:						
No.	Frequency (MHz)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Polaxis	Remark
1	4824.00	47.43	74.00	-26.57	Peak	Horizontal
2	4824.00	37.58	54.00	-16.42	Average	Horizontal
3	7236.00	47.41	74.00	-26.59	Peak	Horizontal
4	7236.00	38.87	54.00	-15.13	Average	Horizontal
5	4824.00	47.19	74.00	-26.81	Peak	Vertical
6	4824.00	37.35	54.00	-16.65	Average	Vertical
7	7236.00	48.27	74.00	-25.73	Peak	Vertical
8	7236.00	39.58	54.00	-14.42	Average	Vertical

SISO_ Chain 1_IEEE 802.11g_Middle Channel:						
No.	Frequency (MHz)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Polaxis	Remark
1	4874.00	48.34	74.00	-25.66	Peak	Horizontal
2	4874.00	37.62	54.00	-16.38	Average	Horizontal
3	7311.00	47.78	74.00	-26.22	Peak	Horizontal
4	7311.00	38.92	54.00	-15.08	Average	Horizontal
5	4874.00	48.23	74.00	-25.77	Peak	Vertical
6	4874.00	37.61	54.00	-16.39	Average	Vertical
7	7311.00	48.52	74.00	-25.48	Peak	Vertical
8	7311.00	39.58	54.00	-14.42	Average	Vertical

SISO_ Chain 1_IEEE 802.11g_Highest Channel:						
No.	Frequency (MHz)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Polaxis	Remark
1	4924.00	48.17	74.00	-25.83	Peak	Horizontal
2	4924.00	37.53	54.00	-16.47	Average	Horizontal
3	7386.00	48.31	74.00	-25.69	Peak	Horizontal
4	7386.00	39.28	54.00	-14.72	Average	Horizontal
5	4924.00	48.34	74.00	-25.66	Peak	Vertical
6	4924.00	37.72	54.00	-16.28	Average	Vertical
7	7386.00	48.39	74.00	-25.61	Peak	Vertical
8	7386.00	39.45	54.00	-14.55	Average	Vertical

MIMO_ Chain 0+1_IEEE 802.11n-HT20_Lowest Channel:

No.	Frequency (MHz)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Polaxis	Remark
1	4824.00	49.42	74.00	-24.58	Peak	Horizontal
2	4824.00	38.31	54.00	-15.69	Average	Horizontal
3	7236.00	48.77	74.00	-25.23	Peak	Horizontal
4	7236.00	39.35	54.00	-14.65	Average	Horizontal
5	4824.00	49.24	74.00	-24.76	Peak	Vertical
6	4824.00	37.83	54.00	-16.17	Average	Vertical
7	7236.00	48.68	74.00	-25.32	Peak	Vertical
8	7236.00	39.62	54.00	-14.38	Average	Vertical

MIMO_ Chain 0+1_IEEE 802.11n-HT20_Middle Channel:

No.	Frequency (MHz)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Polaxis	Remark
1	4874.00	50.14	74.00	-23.86	Peak	Horizontal
2	4874.00	39.46	54.00	-14.54	Average	Horizontal
3	7311.00	49.03	74.00	-24.97	Peak	Horizontal
4	7311.00	39.63	54.00	-14.37	Average	Horizontal
5	4874.00	49.86	74.00	-24.14	Peak	Vertical
6	4874.00	38.42	54.00	-15.58	Average	Vertical
7	7311.00	48.98	74.00	-25.02	Peak	Vertical
8	7311.00	39.85	54.00	-14.15	Average	Vertical

MIMO_ Chain 0+1_IEEE 802.11n-HT20_Highest Channel:

No.	Frequency (MHz)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Polaxis	Remark
1	4924.00	49.39	74.00	-24.61	Peak	Horizontal
2	4924.00	38.26	54.00	-15.74	Average	Horizontal
3	7386.00	48.63	74.00	-25.37	Peak	Horizontal
4	7386.00	39.21	54.00	-14.79	Average	Horizontal
5	4924.00	48.66	74.00	-25.34	Peak	Vertical
6	4924.00	37.68	54.00	-16.32	Average	Vertical
7	7386.00	48.72	74.00	-25.28	Peak	Vertical
8	7386.00	39.63	54.00	-14.37	Average	Vertical

5.8 BAND EDGE MEASUREMENTS (RADIATED)

Test Requirement: FCC 47 CFR Part 15 Subpart C Section 15.205/15.209

Test Method: KDB 558074 D01 v03r05, Section 12.1

Limits:

Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in Section 15.209, whichever is the lesser attenuation.

Frequency	Limit (dBμV/m @3m)	Remark
30 MHz-88 MHz	40.0	Quasi-peak Value
88 MHz-216 MHz	43.5	Quasi-peak Value
216 MHz-960 MHz	46.0	Quasi-peak Value
960 MHz-1 GHz	54.0	Quasi-peak Value
Above 1 GHz	54.0	Average Value
	74.0	Peak Value

Test Setup: Refer to section 4.4.1 for details.

Test Procedures:

Radiated band edge measurements at 2390 MHz and 2483.5 MHz were made with the unit transmitting in the low end of the channel range and the high end closest to the restricted bands respectively. The emissions were made on the 966 Semi-Chamber. Use (resolution bandwidth (RBW) = 1 MHz, video bandwidth (VBW) = 3 MHz for peak levels and RBW = 1 MHz and VBW = 10 Hz or 1/T for average levels).

1. Use radiated spurious emission test procedure described in clause 5.10. The transmitter output (antenna port) was connected to the test receiver.
2. Set the PK and AV limit line.
3. Record the fundamental emission and emissions out of the band-edge.
4. Determine band-edge compliance as required.

Equipment Used: Refer to section 3 for details.

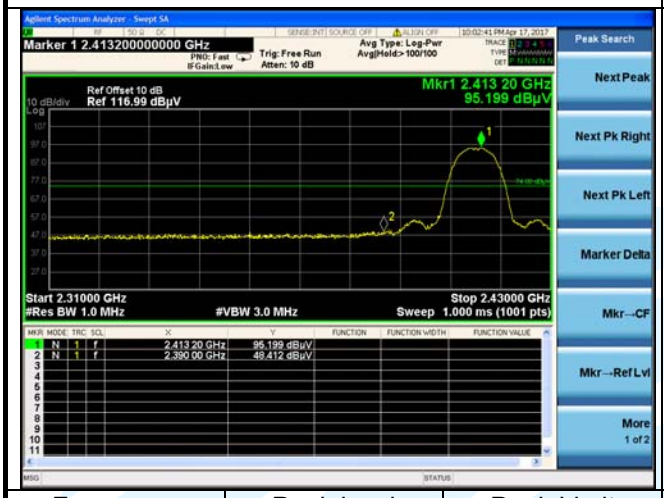
Test Result: Pass

The measurement data as follows:

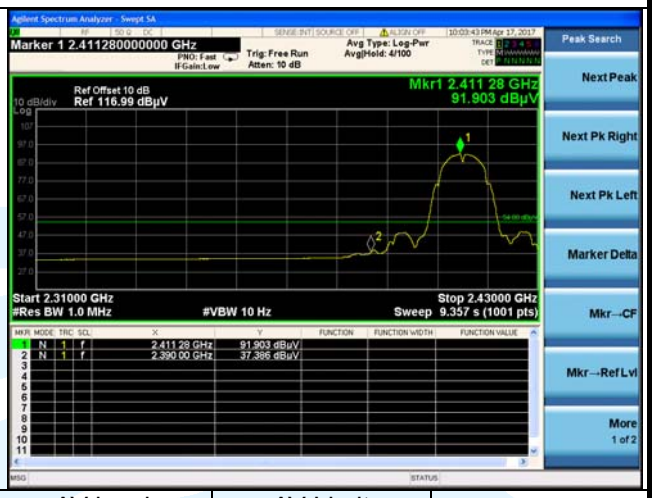
IEEE 802.11b_SISO_Chain 1

Test Channel:	Lowest Channel	Ant. Polar. :	Horizontal

Detector: Peak



Detector: AV



Frequency (MHz)	Peak level (dBuv/m)	Peak Limit (dBuv/m)	AV level (dBuv/m)	AV Limit (dBuv/m)	Conclusion
2390	48.412	74	37.386	54	Pass

Test Channel:	Lowest Channel	Ant. Polar. :	Vertical

Detector: Peak

Detector: AV

Frequency (MHz)	Peak level (dBuv/m)	Peak Limit (dBuv/m)	AV level (dBuv/m)	AV Limit (dBuv/m)	Conclusion
2390	54.266	74	44.538	54	Pass

Test Channel:	Highest Channel	Ant. Polar. :	Horizontal
Detector: Peak		Detector: AV	

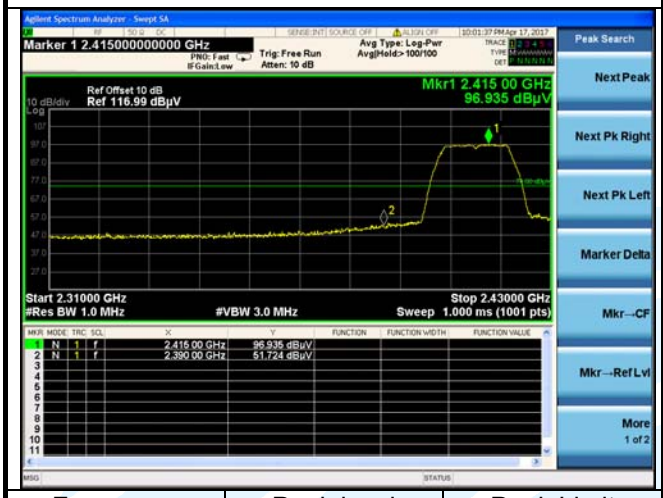
Frequency (MHz)	Peak level (dBuv/m)	Peak Limit (dBuv/m)	AV level (dBuv/m)	AV Limit (dBuv/m)	Conclusion
2390	49.399	74	39.163	54	Pass

Test Channel:	Highest Channel	Ant. Polar. :	Vertical
Detector: Peak		Detector: AV	

Frequency (MHz)	Peak level (dBuv/m)	Peak Limit (dBuv/m)	AV level (dBuv/m)	AV Limit (dBuv/m)	Conclusion
2390	54.759	74	47.259	54	Pass

IEEE 802.11g_SISO_Chain 1

Test Channel:	Lowest Channel	Ant. Polar. :	Horizontal
Detector: Peak		Detector: AV	



Frequency (MHz)	Peak level (dBuv/m)	Peak Limit (dBuv/m)	AV level (dBuv/m)	AV Limit (dBuv/m)	Conclusion
2390	51.724	74	40.441	54	Pass

Test Channel:	Lowest Channel	Ant. Polar. :	Vertical
Detector: Peak		Detector: AV	

Frequency (MHz)	Peak level (dBuv/m)	Peak Limit (dBuv/m)	AV level (dBuv/m)	AV Limit (dBuv/m)	Conclusion
2390	59.132	74	48.106	54	Pass

Test Channel:	Highest Channel	Ant. Polar. :	Horizontal
Detector: Peak		Detector: AV	

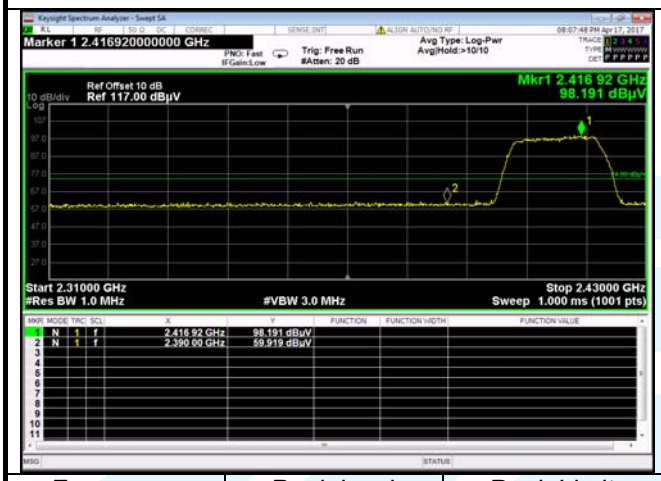
Frequency (MHz)	Peak level (dBuv/m)	Peak Limit (dBuv/m)	AV level (dBuv/m)	AV Limit (dBuv/m)	Conclusion
2390	52.418	74	39.642	54	Pass

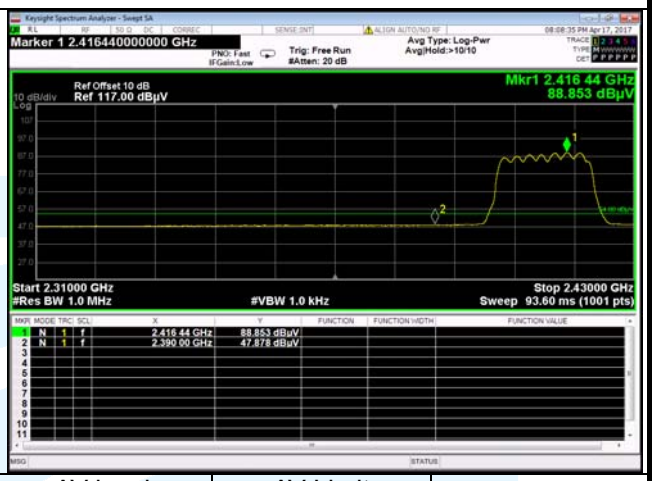
Test Channel:	Highest Channel	Ant. Polar. :	Vertical
Detector: Peak		Detector: AV	

Frequency (MHz)	Peak level (dBuv/m)	Peak Limit (dBuv/m)	AV level (dBuv/m)	AV Limit (dBuv/m)	Conclusion
2390	61.357	74	47.105	54	Pass

IEEE 802.11n-HT20_MIMO_Chain 0+1

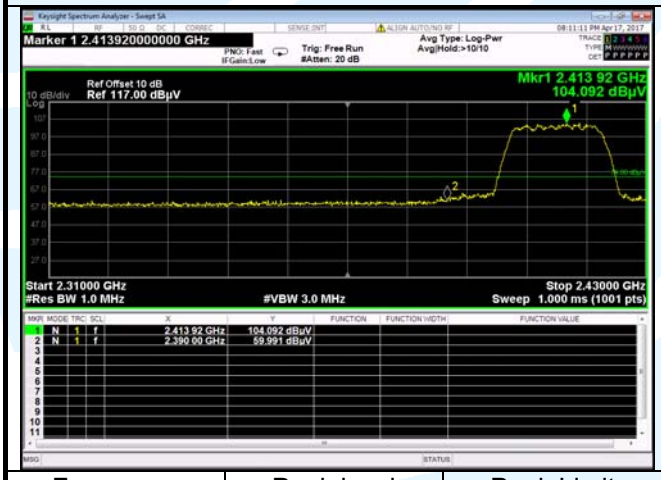
Test Channel:	Lowest Channel	Ant. Polar. :	Horizontal
Detector: Peak		Detector: AV	

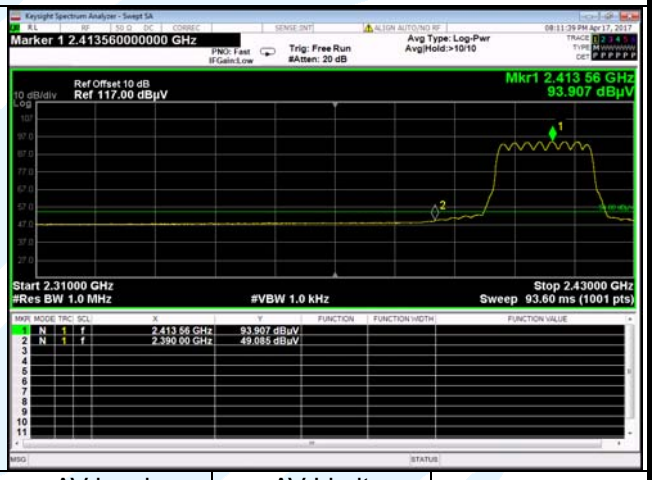




Frequency (MHz)	Peak level (dBuv/m)	Peak Limit (dBuv/m)	AV level (dBuv/m)	AV Limit (dBuv/m)	Conclusion
2390	59.919	74	47.878	54	Pass

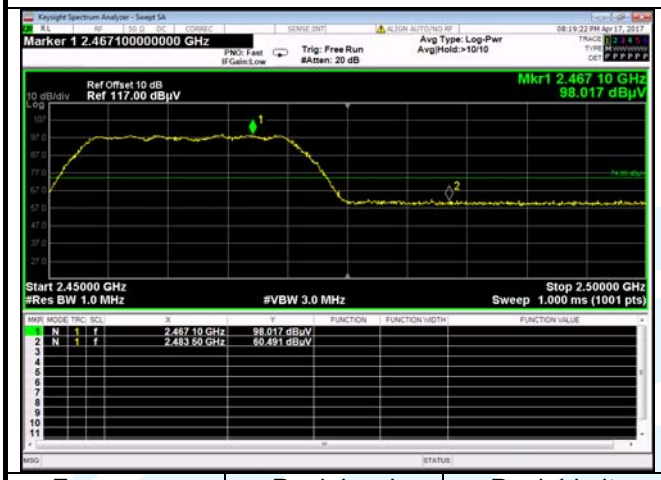
Test Channel:	Lowest Channel	Ant. Polar. :	Vertical
Detector: Peak		Detector: AV	

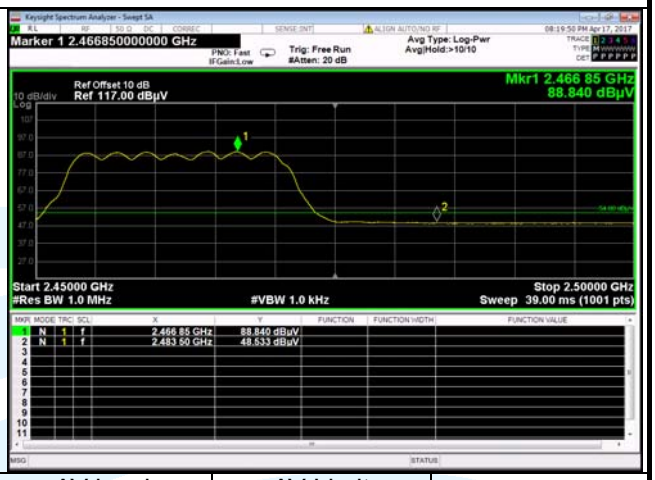




Frequency (MHz)	Peak level (dBuv/m)	Peak Limit (dBuv/m)	AV level (dBuv/m)	AV Limit (dBuv/m)	Conclusion
2390	59.991	74	49.085	54	Pass

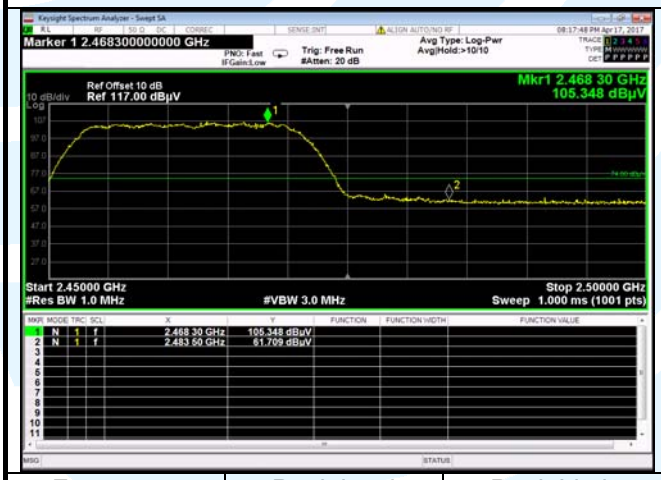
Test Channel:	Highest Channel	Ant. Polar. :	Horizontal
Detector: Peak		Detector: AV	

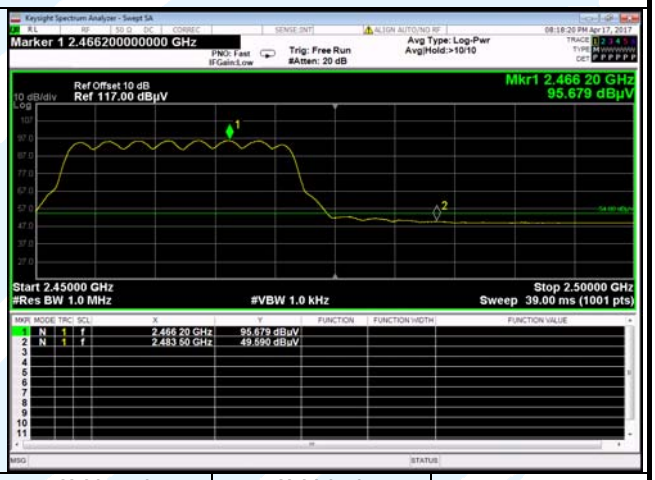




Frequency (MHz)	Peak level (dBuv/m)	Peak Limit (dBuv/m)	AV level (dBuv/m)	AV Limit (dBuv/m)	Conclusion
2390	60.491	74	48.533	54	Pass

Test Channel:	Highest Channel	Ant. Polar. :	Vertical
Detector: Peak		Detector: AV	





Frequency (MHz)	Peak level (dBuv/m)	Peak Limit (dBuv/m)	AV level (dBuv/m)	AV Limit (dBuv/m)	Conclusion
2390	61.709	74	49.590	54	Pass

5.9 CONDUCTED EMISSION

Test Requirement: 47 CFR Part 15C Section 15.207

Test Method: ANSI C63.10-2013

Limits:

Frequency range (MHz)	Limits (dB(μV))	
	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

Remark:

1. The lower limit shall apply at the transition frequencies.
2. The limit decreases linearly with the logarithm of the frequency in the range 0.15 to 0.50 MHz.

Test Setup: Refer to section 4.4.2 for details.

Test Procedures:

Test frequency range :150KHz-30MHz

1) The mains terminal disturbance voltage test was conducted in a shielded room.
2) The EUT was connected to AC power source through a LISN 1 (Line Impedance Stabilization Network) which provides a 50Ω/50μH + 5Ω linear impedance. The power cables of all other units of the EUT were connected to a second LISN 2, which was bonded to the ground reference plane in the same way as the LISN 1 for the unit being measured. A multiple socket outlet strip was used to connect multiple power cables to a single LISN provided the rating of the LISN was not exceeded.
3) The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane,
4) The test was performed with a vertical ground reference plane. The rear of the EUT shall be 0.4 m from the vertical ground reference plane. The vertical ground reference plane was bonded to the horizontal ground reference plane. The LISN 1 was placed 0.8 m from the boundary of the unit under test and bonded to a ground reference plane for LISNs mounted on top of the ground reference plane. This distance was between the closest points of the LISN 1 and the EUT. All other units of the EUT and associated equipment was at least 0.8 m from the LISN 2.
5) In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10 on conducted measurement.

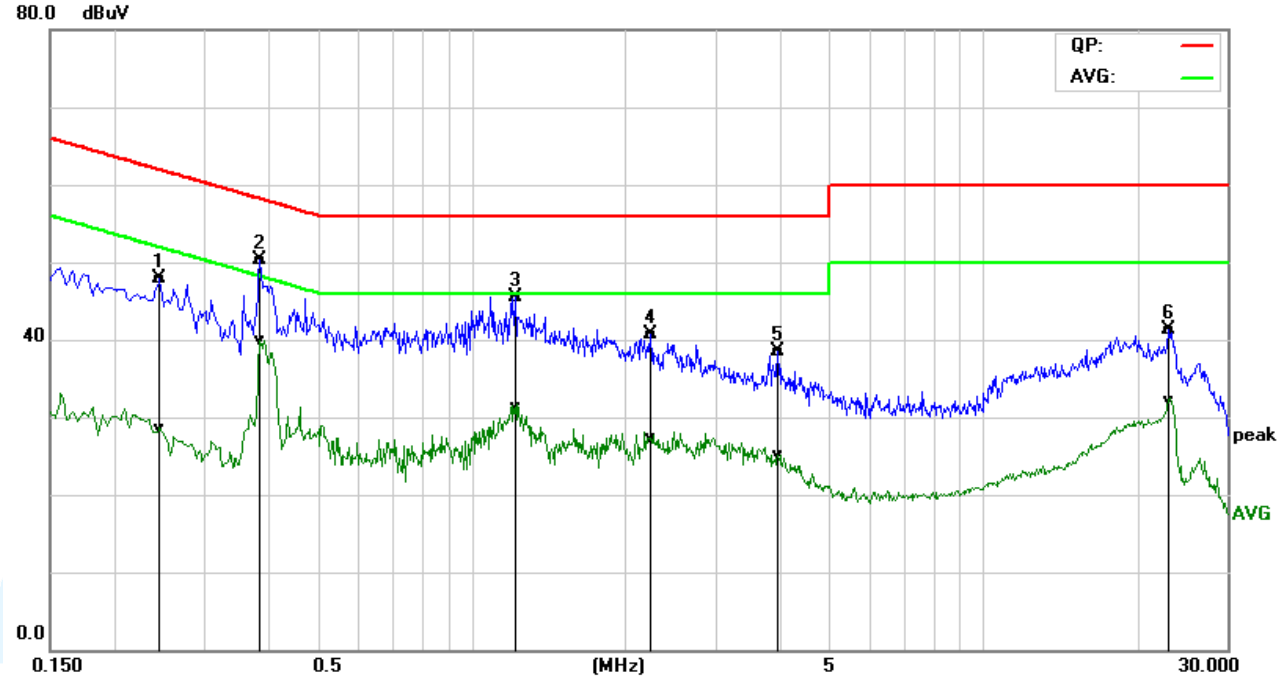
Equipment Used: Refer to section 3 for details.

Test Result: Pass

The measurement data as follows:

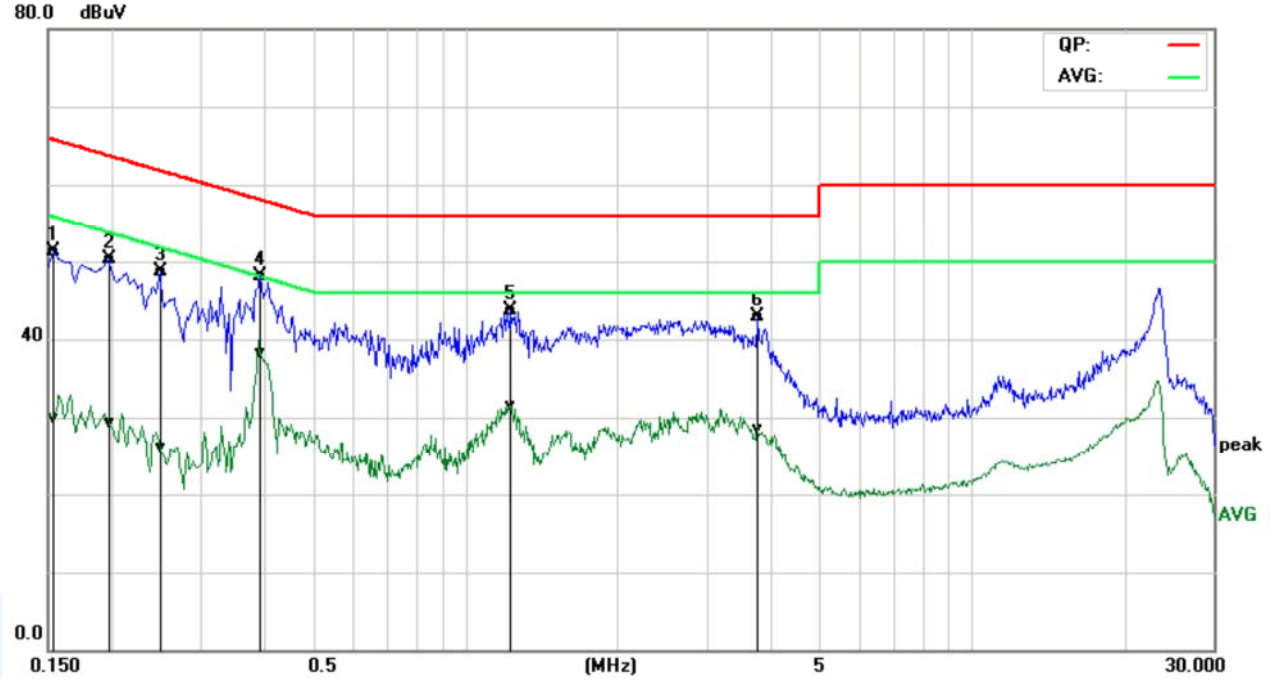
Quasi Peak:

Live Line



No.	Frequency	QuasiPeak reading	Average reading	Correction factor	QuasiPeak result	Average result	QuasiPeak limit	Average limit	QuasiPeak margin	Average margin	Remark
	(MHz)	(dBuV)	(dBuV)	(dB)	(dBuV)	(dBuV)	(dBuV)	(dBuV)	(dB)	(dB)	
1P	0.2460	28.27	8.98	19.62	47.89	28.60	61.89	51.89	-14.00	-23.29	Pass
2*	0.3860	30.82	20.26	19.57	50.39	39.83	58.15	48.15	-7.76	-8.32	Pass
3P	1.2220	25.95	11.66	19.59	45.54	31.25	56.00	46.00	-10.46	-14.75	Pass
4P	2.2380	20.96	7.56	19.72	40.68	27.28	56.00	46.00	-15.32	-18.72	Pass
5P	3.9700	18.73	5.46	19.73	38.46	25.19	56.00	46.00	-17.54	-20.81	Pass
6P	23.1299	20.98	11.74	20.39	41.37	32.13	60.00	50.00	-18.63	-17.87	Pass

Neutral Line



No.	Frequency	QuasiPeak reading	Average reading	Correction factor	QuasiPeak result	Average result	QuasiPeak limit	Average limit	QuasiPeak margin	Average margin	Remark
	(MHz)	(dBuV)	(dBuV)	(dB)	(dBuV)	(dBuV)	(dBuV)	(dBuV)	(dB)	(dB)	
1P	0.1539	31.73	10.32	19.52	51.25	29.84	65.78	55.79	-14.53	-25.95	Pass
2P	0.1980	30.69	9.86	19.54	50.23	29.40	63.69	53.69	-13.46	-24.29	Pass
3P	0.2500	29.26	6.48	19.54	48.80	26.02	61.75	51.76	-12.95	-25.74	Pass
4*	0.3940	28.49	18.70	19.53	48.02	38.23	57.98	47.98	-9.96	-9.75	Pass
5P	1.2340	24.17	11.83	19.59	43.76	31.42	56.00	46.00	-12.24	-14.58	Pass
6P	3.7820	23.13	8.76	19.79	42.92	28.55	56.00	46.00	-13.08	-17.45	Pass

Remark:
1. An initial pre-scan was performed on the Phase and neutral lines with peak detector. Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission were detected.

APPENDIX 1 PHOTOGRAPHS OF TEST SETUP

See test photographs attached in Appendix 1 for the actual connections between Product and support equipment.

APPENDIX 2 PHOTOGRAPHS OF EUT CONSTRUCTIONAL DETAILS

Refer to Appendix 2 for EUT external and internal photographs.

*** End of Report ***