FCC TEST REPORT

For

VISUAL LAND INC.

11.6 inch TABLET

Model No.: ME-11E

Additional Model No.: ME-10E, ME-13E, ME-10SE

Prepared for	:	VISUAL LAND INC.
Address	:	17785 Center Court Dr. Suite 670, Cerritos, CA 90703, USA

Prepared by	:	Shenzhen LCS Compliance Testing Laboratory Ltd.
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Date of receipt of test sample	:	December 01, 2015
Number of tested samples	:	1
Serial number	:	Prototype
Date of Test	:	December 01, 2015 – December 10, 2015
Date of Report	:	December 10, 2015

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FCC TEST REPORT
FCC CFR 47 PART 15 C(15.247): 2014

Report Reference No.	**:**	**LCS1512100946E**
Date of Issue	:	December 10, 2015
Testing Laboratory Name.....	**:**	**Shenzhen LCS Compliance Testing Laboratory Ltd.**
Address	:	1/F., Xingyuan Industrial Park, Tongda Road, Bao'an Avenue, Bao'an District, Shenzhen, Guangdong, China
Testing Location/ Procedure.....	:	Full application of Harmonised standards ■ Partial application of Harmonised standards ☐ Other standard testing method ☐
Applicant's Name.....	**:**	**VISUAL LAND INC.**
Address	:	17785 Center Court Dr. Suite 670, Cerritos, CA 90703, USA
Test Specification		
Standard	:	FCC CFR 47 PART 15 C(15.247): 2014
Test Report Form No.....	**:**	LCSEMC-1.0
TRF Originator	:	Shenzhen LCS Compliance Testing Laboratory Ltd.
Master TRF	:	Dated 2011-03

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Test Item Description.	**:**	**11.6 inch TABLET**
Trade Mark	:	VISUAL LAND
Model/ Type reference.....	:	ME-11E
Ratings	:	DC 3.7V by battery
Result	:	**Positive**

Compiled by:	**Supervised by:**	**Approved by:**
Jacky Li	Glin Lu	Gavin Liang
Jacky Li/ File administrators	Glin Lu/ Technique principal	Gavin Liang/ Manager

FCC -- TEST REPORT

Test Report No. : LCS1512100946E	December 10, 2015 Date of issue

Type / Model.....	: ME-11E
EUT.....	: 11.6 inch TABLET
Applicant.....	**: VISUAL LAND INC.**
Address.....	: 17785 Center Court Dr. Suite 670, Cerritos, CA 90703, USA
Telephone.....	: 562-860-2600
Fax.....	: 562-860-2607
Manufacturer.....	**: VISUAL LAND INC.**
Address.....	: 17785 Center Court Dr. Suite 670, Cerritos, CA 90703, USA
Telephone.....	: 562-860-2600
Fax.....	: 562-860-2607
Factory.....	**: VISUAL LAND INC.**
Address.....	: 17785 Center Court Dr. Suite 670, Cerritos, CA 90703, USA
Telephone.....	: 562-860-2600
Fax.....	: 562-860-2607

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.

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1. GENERAL INFORMATION

1.1. Description of Device (EUT)

EUT : 11.6 inch TABLET

Model Number : ME-11E

Power Supply : DC 3.7V by battery

Frequency Range : 2412.00-2462.00MHz for 802.11b/g/n
2402.00-2480.00MHz for BT V4.0

Channel Spacing : 5MHz for 802.11b/g/n
2MHz for BT V4.0

Channel Number : 11 Channels for 20MHz Bandwidth
40 Channels for BT V4.0

Modulation Technology : IEEE 802.11b: DSSS(CCK,DQPSK,DBPSK)
IEEE 802.11g: OFDM(64QAM, 16QAM, QPSK, BPSK)
IEEE 802.11n: OFDM (64QAM, 16QAM,QPSK,BPSK)
BT V4.0: GFSK

Data Rates : IEEE 802.11b: 1-11Mbps
IEEE 802.11g: 6-54Mbps
IEEE 802.11n: MCS0-MCS15
BT V4.0: 1Mbps

Antenna Type And Gain : Integral antenna, 0.1 dBi

1.2. Host System Configuration List and Details

Manufacturer	Description	Model	Serial Number	Certificate
--	CLASS 2 POWER SUPPLY	SW-050250	--	VOC

1.3. External I/O Cable

I/O Port Description	Quantity	Cable
USB	2	Shielded, 0.8m
TF Card	1	N/A
Earphone	1	N/A

1.4. Description of Test Facility

Site Description EMC Lab.	:	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

1.5. 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.

1.6. Measurement Uncertainty

Test Item		Frequency Range	Uncertainty	Note
Radiation Uncertainty	:	9KHz~30MHz	±3.10dB	(1)
		30MHz~200MHz	±2.96dB	(1)
		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.

1.7. Description Of Test Modes

The EUT has been tested under operating condition.

This test was performed with EUT in X, Y, Z position and the worse case was found when EUT in X position.

Worst-case mode and channel used for 150kHz-30 MHz power line conducted emissions was the mode and channel with the highest output power, that was determined to be 802.11b mode(Low Channel).

Worst-case mode and channel used for 9kHz-1000 MHz radiated emissions was the mode and channel with the highest output power, that was determined to be 802.11b mode(Low Channel).

Worst-Case data rates were utilized from preliminary testing of the Chipset, worst-case data rates used during the testing are as follows:
802.11b Mode : 1 Mbps, DSSS.
802.11g Mode : 6 Mbps, OFDM.
802.11n Mode HT20:.MCS0, OFDM.
802.11n Mode HT20:.MCS15, OFDM.
BT V4.0 : 1 Mbps, GFSK.

Note: The EUT was programmed to be in continuously transmitting mode and the transmit duty cycle is not less than 98%.

Channel List & Frequency
802.11b/g/n(HT20)

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

802.11n(HT40)

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

BT V4.0

Mode of Operations	Frequency Range (MHz)	Data Rate (Mbps)
GFSK	2402	1
	2440	1
	2480	1
For Conducted Emission		
Test Mode	TX Mode(Continuously)	
For Radiated Emission		
Test Mode	TX Mode(Continuously)	

2. TEST METHODOLOGY

All measurements contained in this report were conducted with ANSI C63.10-2013, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9 kHz to 40 GHz.

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 v03r02 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

The EUT is placed on the turntable, which is 0.8 m above ground plane. According to the requirements in Section 6.2.1 of ANSI C63.10-2013 Conducted emissions from the EUT 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, which is 0.8 m above ground plane. 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	**Description of Test**	**Result**
§15.247(b)	Maximum Conducted Output Power	Compliant
§15.247(e)	Power Spectral Density	Compliant
§15.247(a)(2)	6dB Bandwidth	Compliant
§15.247(a)	Occupied Bandwidth	Compliant
§15.209, §15.247(d)	Radiated and Conducted Spurious Emissions	Compliant
§15.205	Emissions at Restricted Band	Compliant
§15.207(a)	Conducted Emissions	Compliant
§15.203	Antenna Requirements	Compliant

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5. TEST RESULT

5.1. Maximum Conducted Output Power Measurement

5.1.1. Standard Applicable

According to §15.247(b): For systems using digital modulation in the 2400-2483.5 MHz and 5725-5850 MHz band, the limit for maximum peak conducted output power is 30dBm. The limited has to be reduced by the amount in dB that the gain of the antenna exceed 6dBi. In case of point-to-point operation, the limit has to be reduced by 1dB for every 3dB that the directional gain of the antenna exceeds 6dBi.

Systems operating in the 5725-5850 MHz band that are used exclusively for fixed, point-to-point operations may employ transmitting antennas with directional gain greater than 6dBi without any corresponding reduction in transmitter peak output power.

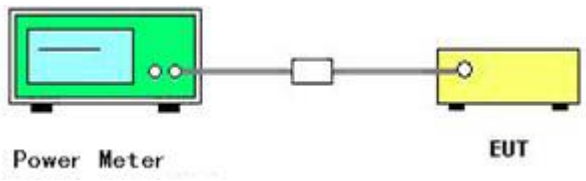
5.1.2. Measuring Instruments and Setting

Please refer to section 6 of equipments list in this report. The following table is the setting of the power meter.

5.1.3. Test Procedures

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

5.1.4. Test Setup Layout



5.1.5. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

5.1.6. Test Result of Maximum Conducted Output Power

Temperature	25°C	Humidty	60%
Test Engineer	Jacky	Configurations	802.11b/g/n/BT V4.0

802.11b

Channel	Frequency (MHz)	Conducted Peak Power (dBm)	Conducted AVG Power (dBm)	Max. Limit (dBm)	Result
1	2412	10.25	8.25	30	Complies
6	2437	10.54	8.54	30	Complies
11	2462	11.19	9.19	30	Complies

802.11g

Channel	Frequency (MHz)	Conducted Peak Power (dBm)	Conducted AVG Power (dBm)	Max. Limit (dBm)	Result
1	2412	13.97	7.12	30	Complies
6	2437	14.15	7.34	30	Complies
11	2462	14.22	7.86	30	Complies

802.11n HT20

Channel	Frequency (MHz)	Conducted Peak Power (dBm)	Conducted AVG Power (dBm)	Max. Limit (dBm)	Result
1	2412	13.53	6.53	30	Complies
6	2437	14.09	7.09	30	Complies
11	2462	14.31	7.31	30	Complies

802.11n HT40

Channel	Frequency (MHz)	Conducted Peak Power (dBm)	Conducted AVG Power (dBm)	Max. Limit (dBm)	Result
3	2422	14.40	7.40	30	Complies
6	2437	14.37	7.37	30	Complies
9	2452	14.74	7.74	30	Complies

BT V4.0

Channel	Frequency (MHz)	Conducted Peak Power (dBm)	Conducted AVG Power (dBm)	Max. Limit (dBm)	Result
1	2402	2.63	0.65	30	Complies
20	2440	2.25	0.38	30	Complies
40	2480	2.86	0.71	30	Complies

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.

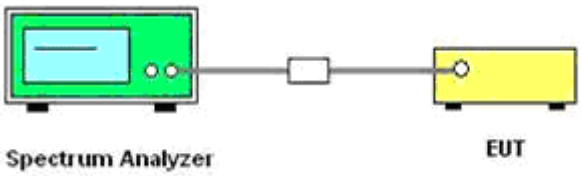
5.2.2. Measuring Instruments and Setting

Please refer to section 6 of equipments list in this report. The following table is the setting of Spectrum Analyzer.

5.2.3. 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 ≥ 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.

5.2.4. Test Setup Layout



5.2.5. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

5.2.6. Test Result of Power Spectral Density

Temperature	25℃	Humidity	60%
Test Engineer	Jakcy	Configurations	802.11b/g/n/BT V4.0

802.11b

Channel	Frequency (MHz)	Power *Density* (dBm/3KHz)	Max. Limit (dBm/3KHz)	Result
1	2412	-31.231	8	Complies
6	2437	-30.774	8	Complies
11	2462	-30.419	8	Complies

802.11g

Channel	Frequency (MHz)	Power *Density* (dBm/3KHz)	Max. Limit (dBm/3KHz)	Result
1	2412	-28.325	8	Complies
6	2437	-27.936	8	Complies
11	2462	-27.648	8	Complies

802.11n HT20

Channel	Frequency (MHz)	Power *Density* (dBm/3KHz)	Max. Limit (dBm/3KHz)	Result
1	2412	-28.545	8	Complies
6	2437	-28.242	8	Complies
11	2462	-28.069	8	Complies

802.11n HT40

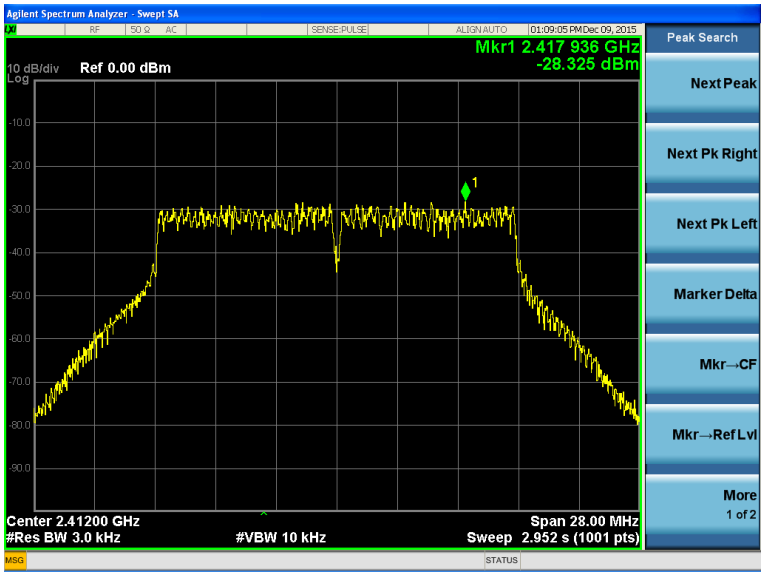
Channel	Frequency (MHz)	Power *Density* (dBm/3KHz)	Max. Limit (dBm/3KHz)	Result
3	2422	-29.918	8	Complies
6	2437	-29.490	8	Complies
8	2452	-29.943	8	Complies

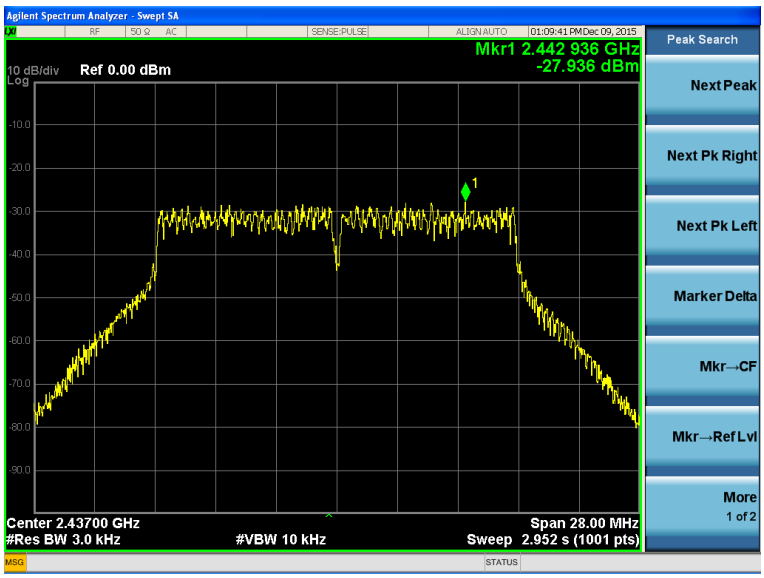
BT V4.0

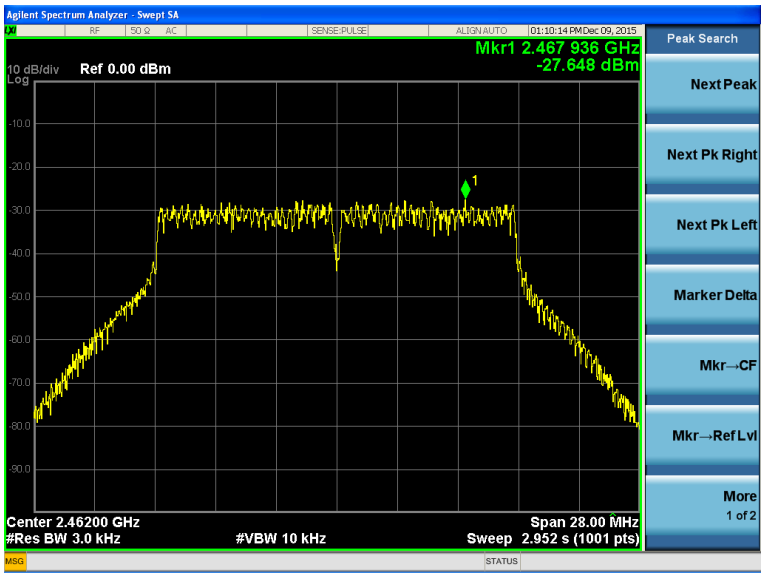
Channel	Frequency (MHz)	Power *Density* (dBm/3KHz)	Max. Limit (dBm/3KHz)	Result
1	2402	-17.121	8	Complies
20	2440	-16.933	8	Complies
40	2480	-17.276	8	Complies

802.11b power density

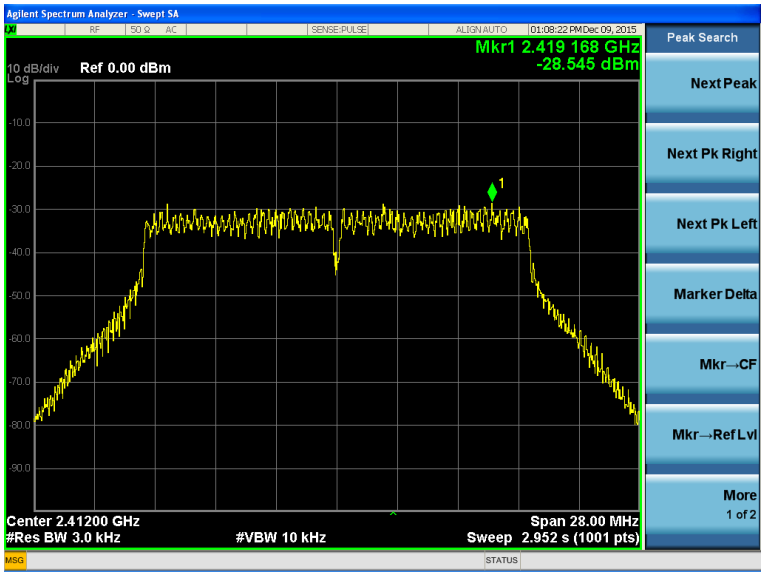
802.11g power density

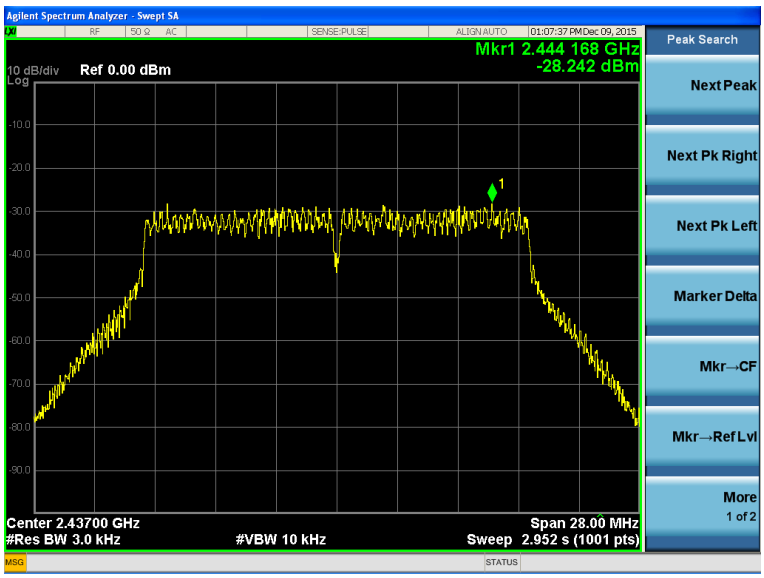


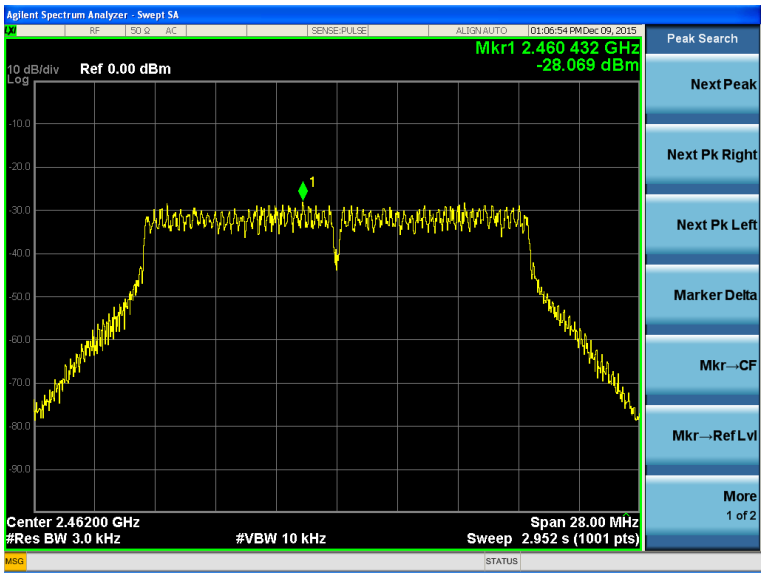




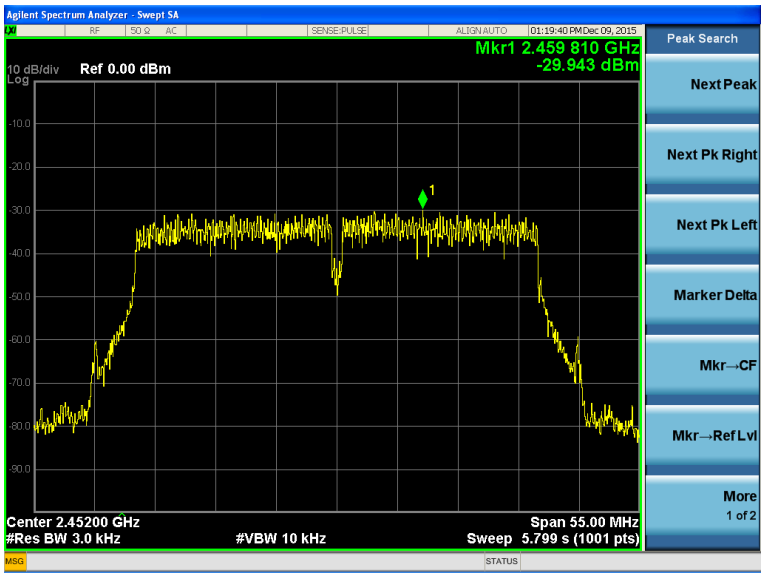
802.11n HT20 power density



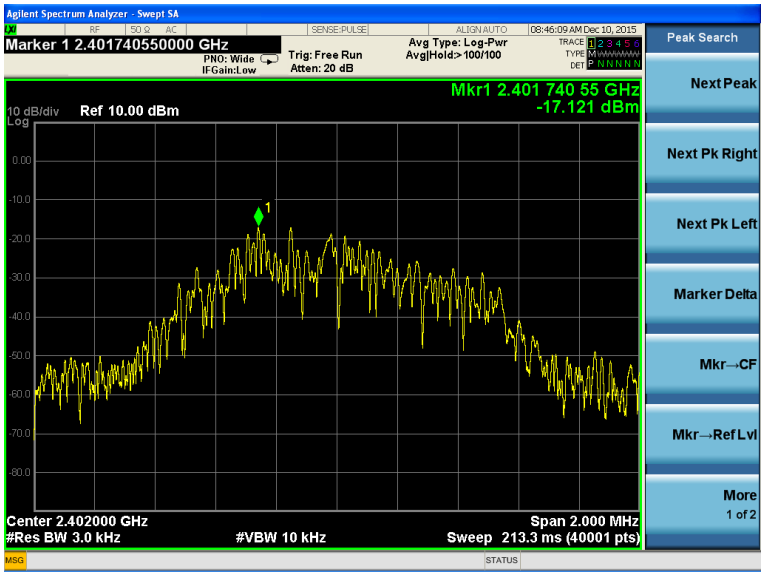


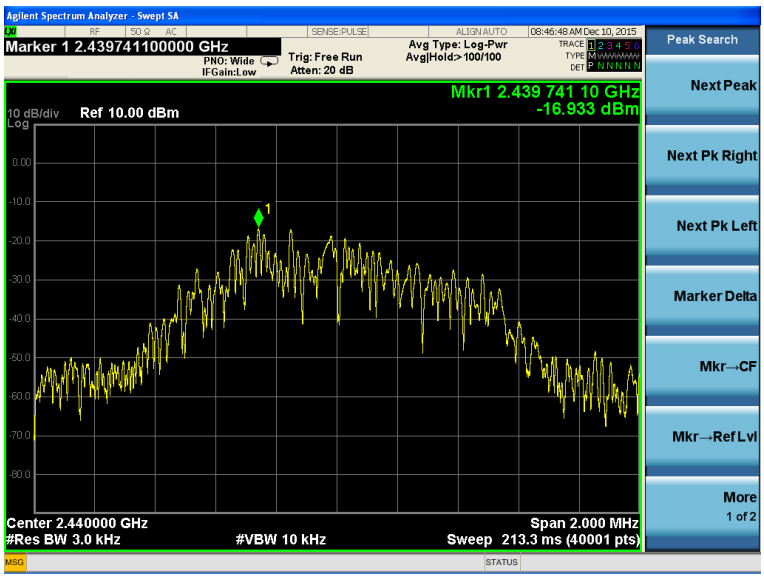


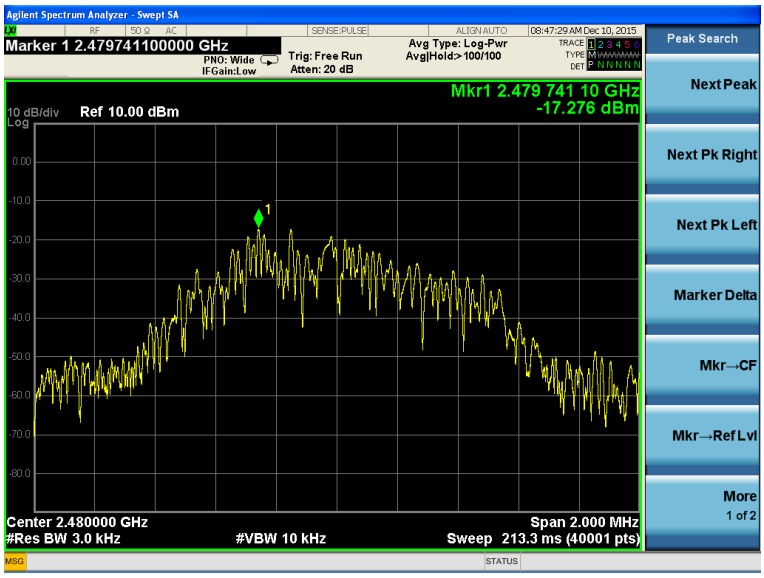
802.11n HT40 power density



BT V4.0 power density







5.3. 6 dB Spectrum Bandwidth Measurement

5.3.1. Standard Applicable

According to §15.247(a)(2): For digital modulation systems, the minimum 6 dB bandwidth shall be at least 500 kHz.

5.3.2. Measuring Instruments and Setting

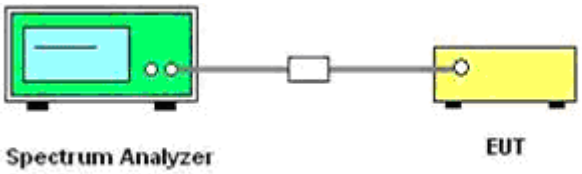
Please refer to section 6 of equipments list in this report. The following table is the setting of the Spectrum Analyzer.

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.
3. Measured the spectrum width with power higher than 6dB below carrier.

5.3.4. Test Setup Layout



5.3.5. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

5.3.6. Test Result of 6dB Spectrum Bandwidth

Temperature	25˚C	Humidity	60%
Test Engineer	Jacky	Configurations	802.11b/g/n/BT V4.0

802.11b

Channel	Frequency	6dB Bandwidth (MHz)	Min. Limit (kHz)	Result
1	2412	10.22	500	Complies
6	2437	10.56	500	Complies
11	2462	10.29	500	Complies

802.11g

Channel	Frequency	6dB Bandwidth (MHz)	Min. Limit (kHz)	Result
1	2412	16.44	500	Complies
6	2437	16.52	500	Complies
11	2462	16.47	500	Complies

802.11n HT20

Channel	Frequency	6dB Bandwidth (MHz)	Min. Limit (kHz)	Result
1	2412	17.73	500	Complies
6	2437	17.63	500	Complies
11	2462	17.70	500	Complies

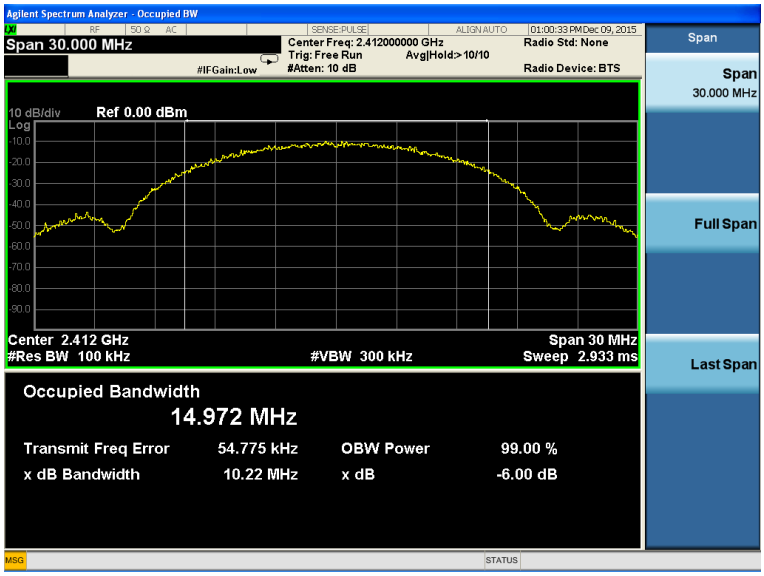
802.11n HT40

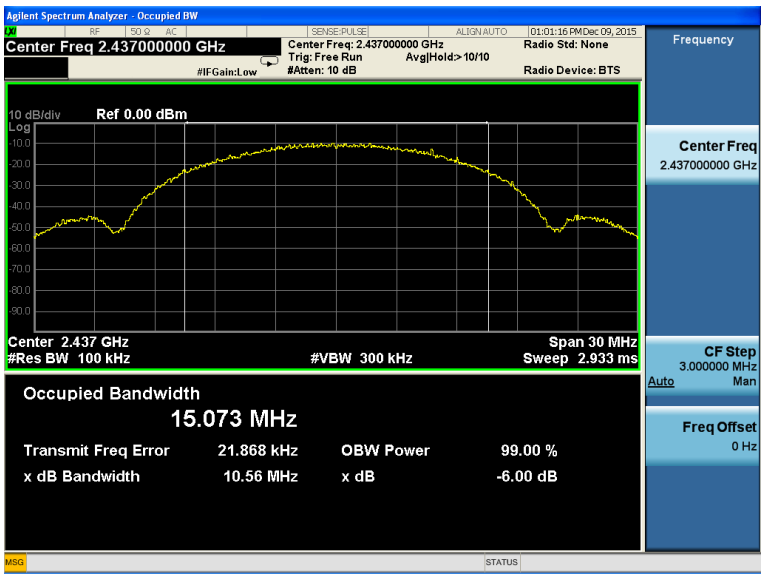
Channel	Frequency	6dB Bandwidth (MHz)	Min. Limit (kHz)	Result
3	2422	35.84	500	Complies
6	2437	35.27	500	Complies
9	2452	35.88	500	Complies

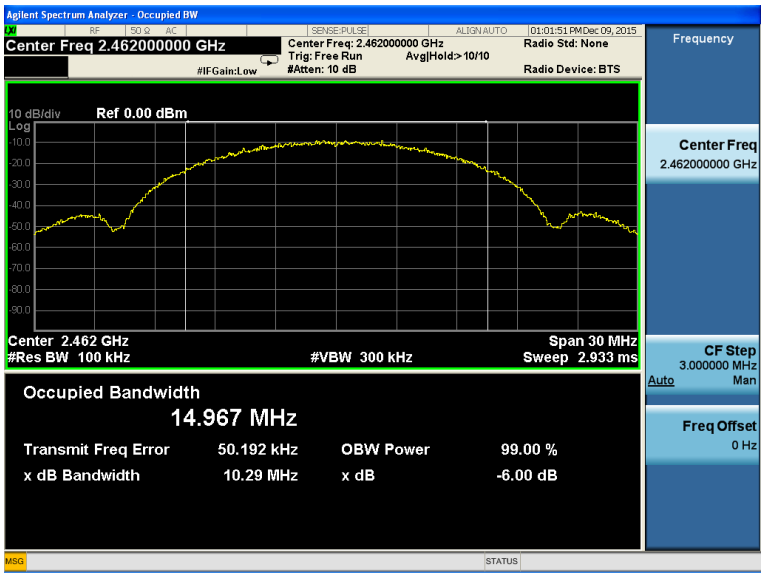
BT V4.0

Channel	Frequency	6dB Bandwidth (kHz)	Min. Limit (kHz)	Result
1	2402	532.40	500	Complies
20	2440	533.40	500	Complies
40	2480	531.00	500	Complies

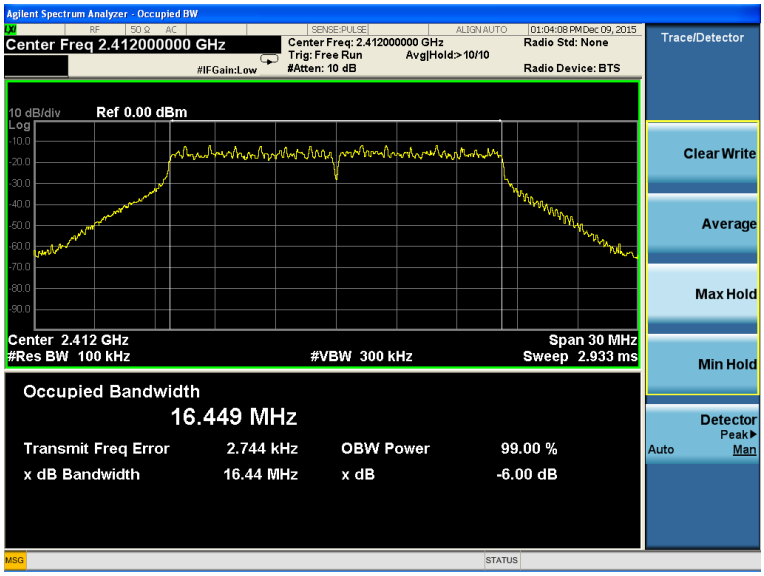
802.11b channel, 6dB bandwidth

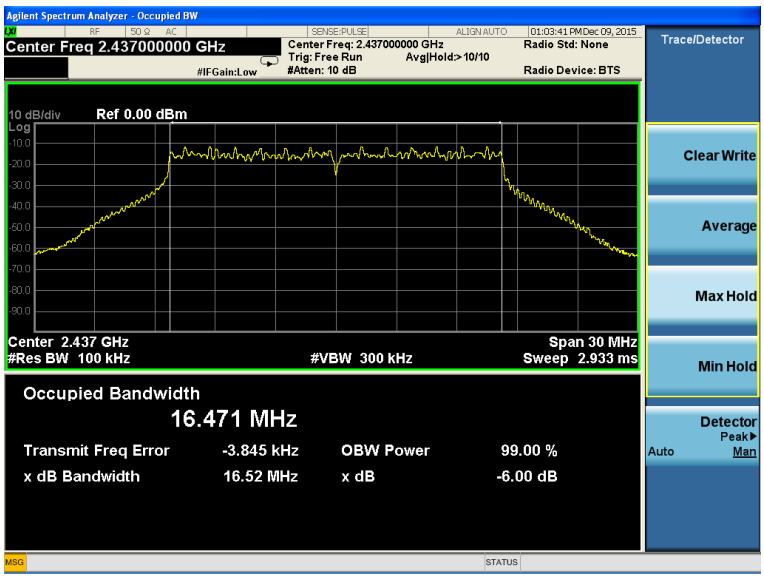


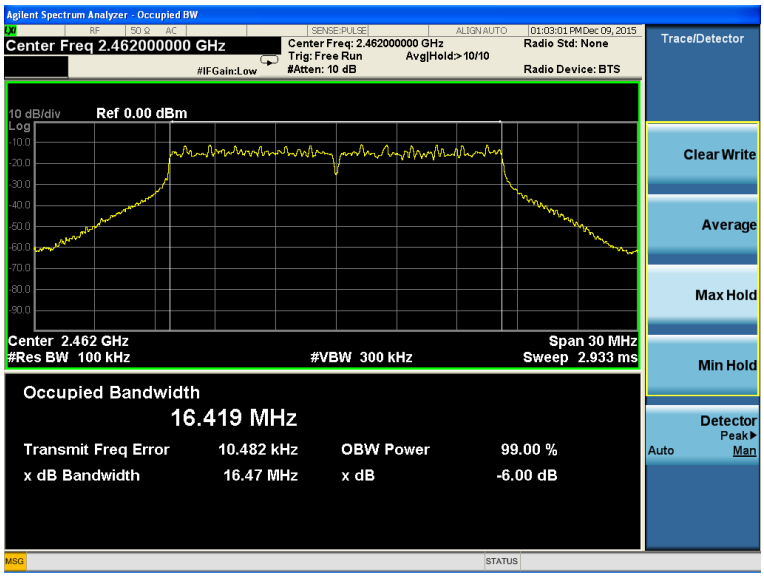




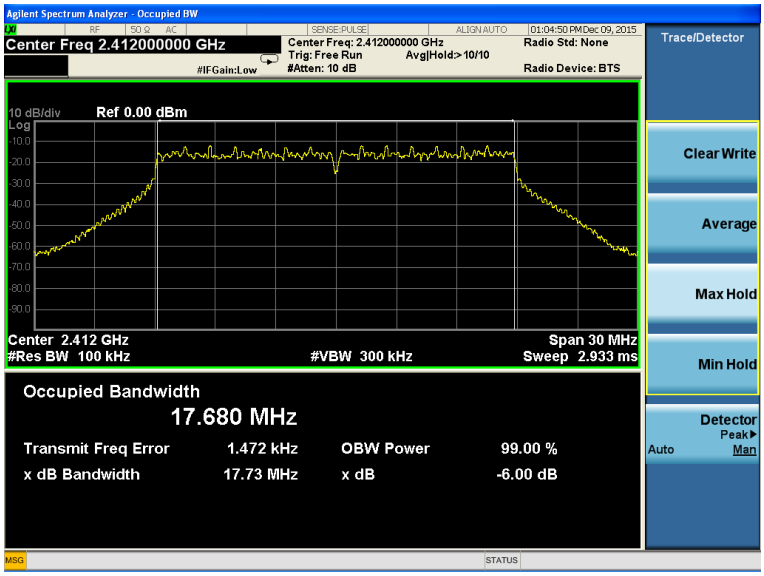
802.11g channel, 6dB bandwidth

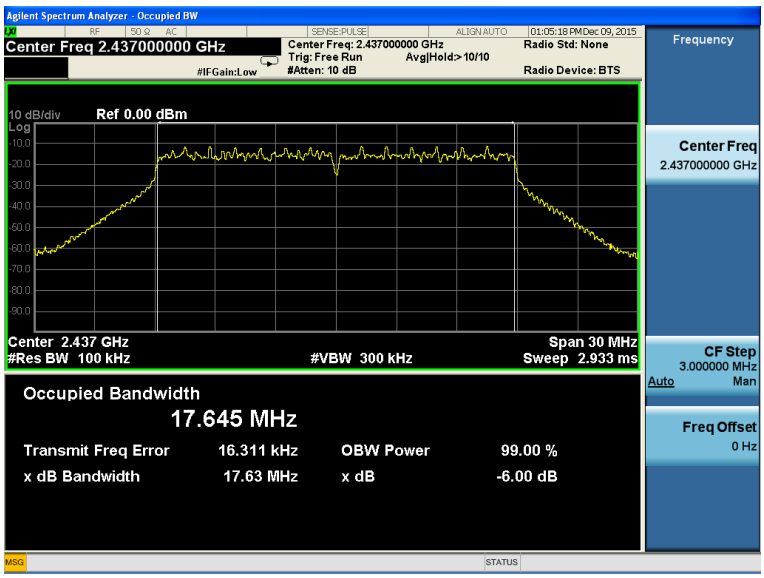


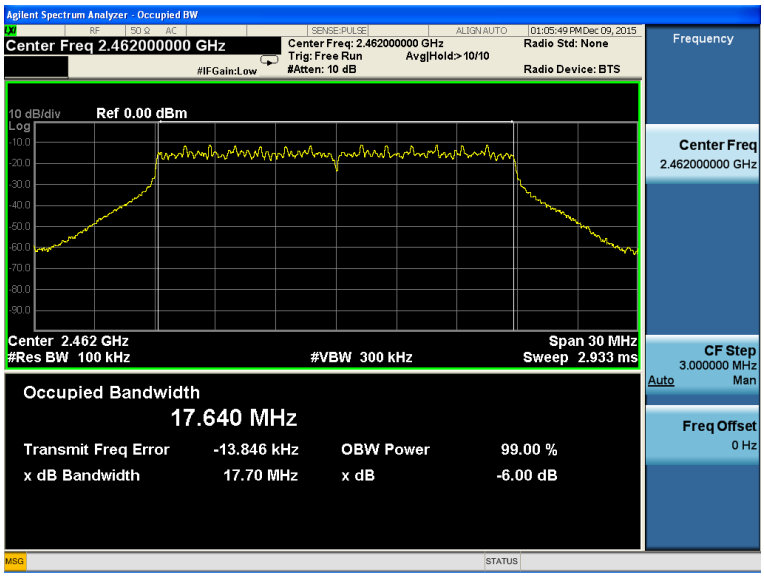




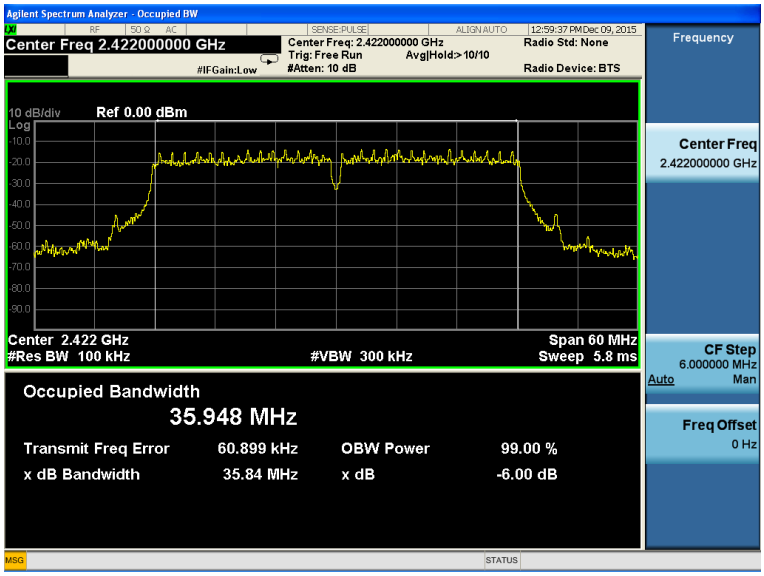
802.11n HT20 channel, 6dB bandwidth

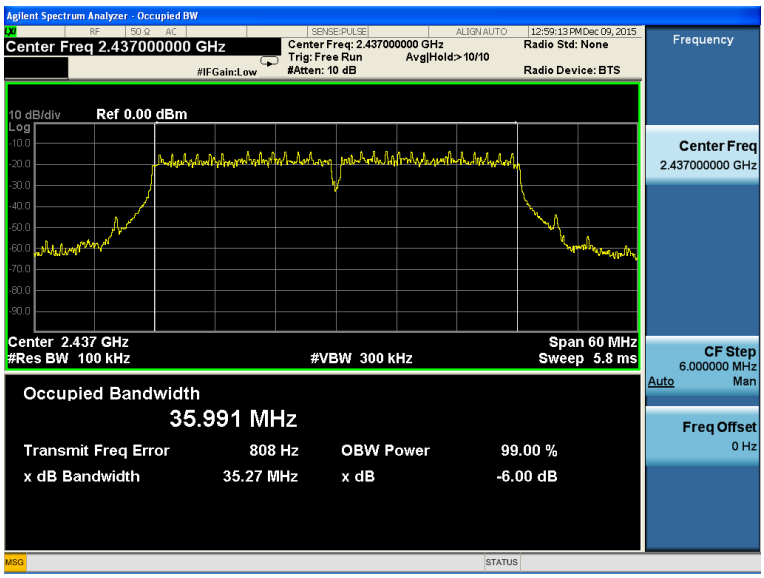


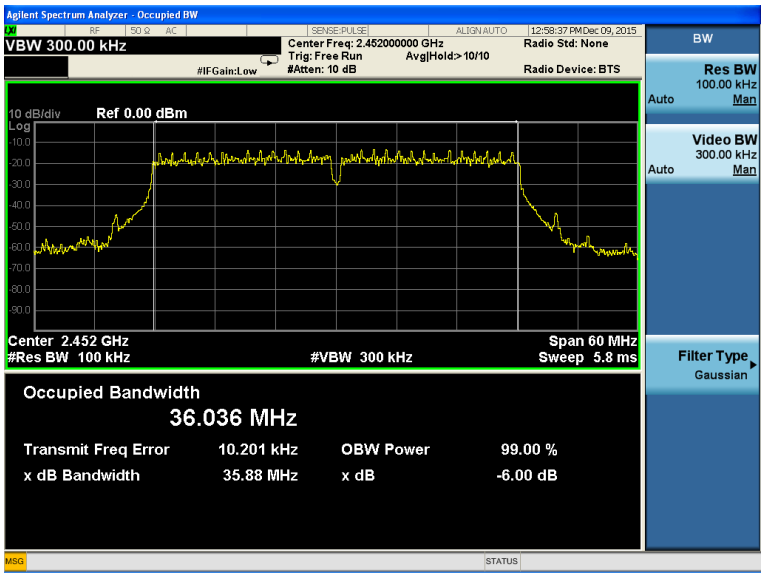




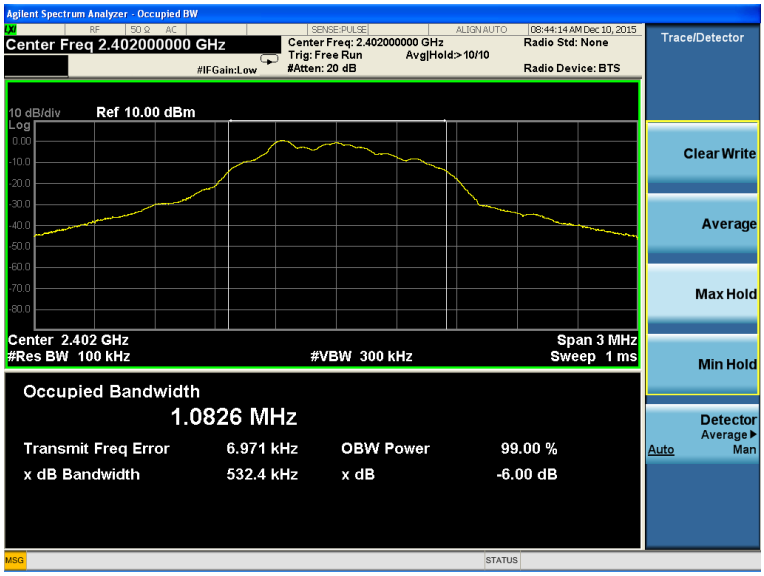
802.11n HT40 channel, 6dB bandwidth

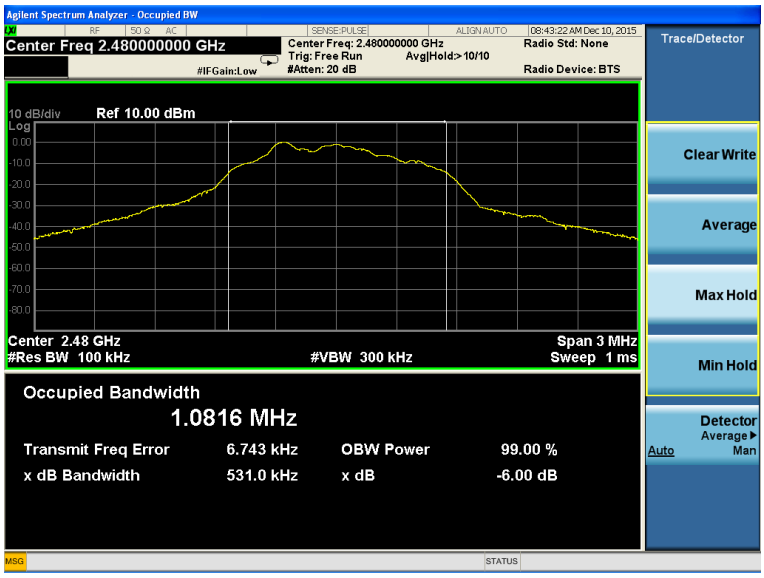






BT V4.0, 6dB bandwidth





5.4. Occupied Bandwidth

5.4.1. Standard Applicable

According to §15.247(a): Operation under the provisions of this section is limited to frequency hopping and digitally modulated intentional radiators that comply with the following provisions:

For systems using digital modulation techniques, the EUT may operate in the 902-928 MHz, 2400-2483.5 MHz and 5725-5850 MHz bands. The minimum 6dB bandwidth shall be at least 500 kHz.

5.4.2. Measuring Instruments and Setting

Please refer to section 6 of equipments list in this report. The following table is the setting of the Spectrum Analyzer.

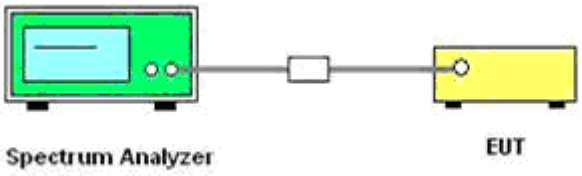
Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	> RBW
RBW	1% to 3% of the band
VBW	3 times the RBW
Detector	Peak
Trace	Max Hold
Sweep Time	100ms

5

5.4.3. Test Procedures

The transmitter output is connected to the spectrum analyzer. The RBW is set to 1% to 3% of the bandwidth. The VBW is set to 3 times the RBW. The sweep time is coupled. The spectrum analyzer internal bandwidth measurement function is utilized.

5.4.4. Test Setup Layout



5.4.5. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

5.4.6. Test Result of 99% Occupied Bandwidth.

Temperature	25℃	Humidity	60%
Test Engineer	Jacky	Configurations	802.11b/g/n/BT V4.0

802.11b

Channel	Frequency (MHz)	99% OBW (MHz)
1	2412	14.972
6	2437	15.073
11	2462	14.967

802.11g

Channel	Frequency (MHz)	99% OBW (MHz)
1	2412	16.449
6	2437	16.471
11	2462	16.419

802.11n HT20

Channel	Frequency (MHz)	99% OBW (MHz)
1	2412	17.680
6	2437	17.645
11	2462	17.640

802.11n HT40

Channel	Frequency (MHz)	99% OBW (MHz)
3	2422	35.948
6	2437	35.991
9	2452	36.036

BT V4.0

Channel	Frequency (MHz)	99% OBW (MHz)
1	2402	1.0826
20	2440	1.0828
40	2480	1.0816

Test plots: Please refer to clause 5.3.6

5.5. Radiated Emissions Measurement

5.5.1. 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

5.5.2. Measuring Instruments and Setting

Please refer to section 6 of equipments list in this report. 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

5.5.3. 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° to 315° using 45° steps.

--- The antenna height is 1.5 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 12.75 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 is 1.5 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 found antenna polarisation and turntable position of the premeasurement the software maximizes the peaks by rotating the turntable position (0° to 360°). This measurement is repeated for different EUT-table positions (0° to 150° in 30°-steps). This procedure is repeated for both antenna polarisations.

--- The final measurement will be done in the position (turntable, EUT-table and antenna polarization) causing the highest emissions with Peak and RMS 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 12.75 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.

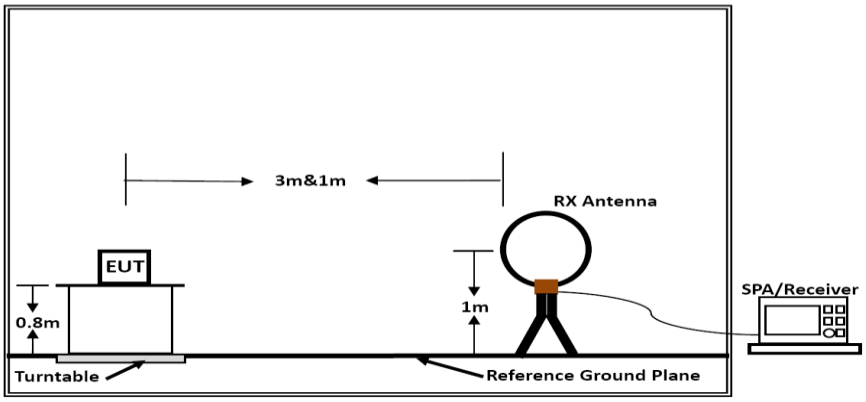
Final measurement:

--- 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 RMS detector.

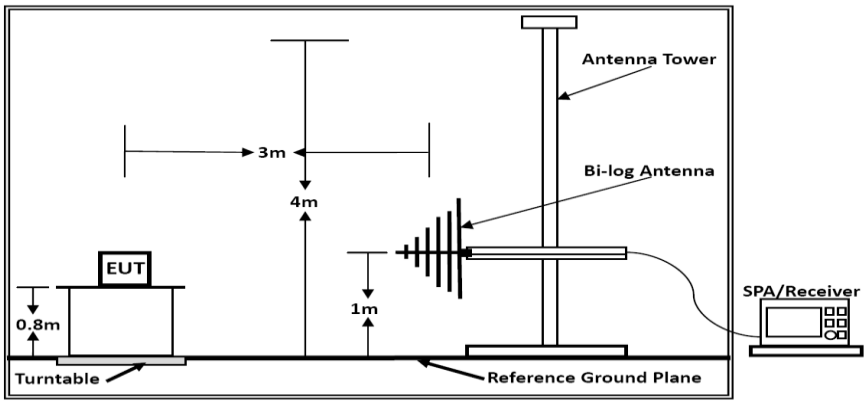
--- The final levels, frequency, measuring time, bandwidth, correction factor, margin to the limit and limit will be recorded. Also a plot with the graph of the premeasurement and the limit will be stored.

5.5.4. Test Setup Layout

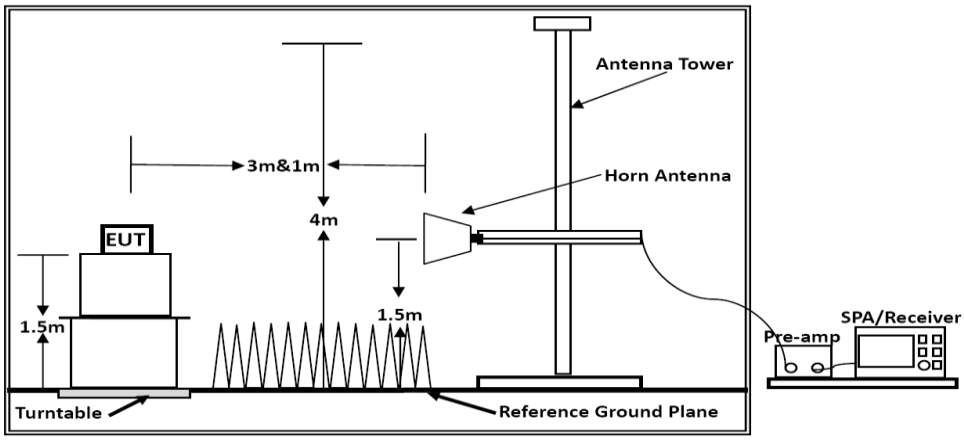
For radiated emissions below 30MHz



Below 30MHz



Below 1GHz



Above 1GHz

Above 10 GHz shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade form 3m to 1.5m.

Distance extrapolation factor = 20 log (specific distanc [3m] / test distance [1.5m]) (dB);

Limit line = specific limits (dBuV) + distance extrapolation factor [6 dB].

5.5.5. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

5.5.6. Results of Radiated Emissions (9kHz~30MHz)

Temperature	25℃	Humidty	60%
Test Engineer	Jacky	Configurations	802.11b/g/n/BT V4.0

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

Note:

The amplitude of spurious emissions which are attenuated by more than 20 dB below the permissible value has no need to be reported.

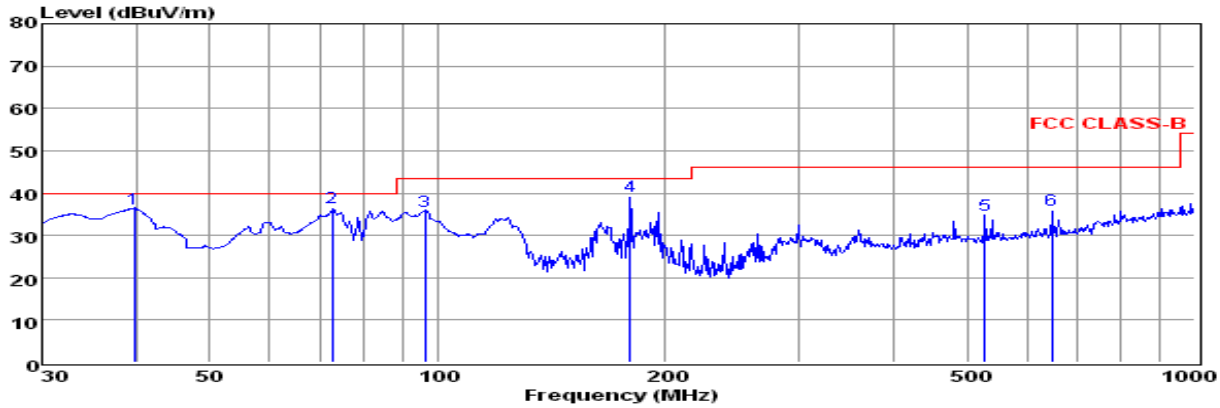
Distance extrapolation factor = 40 log (specific distance / test distance) (dB);

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

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

Temperature	25℃	Humidty	60%
Test Engineer	Jacky	Configurations	802.11b (Low CH)

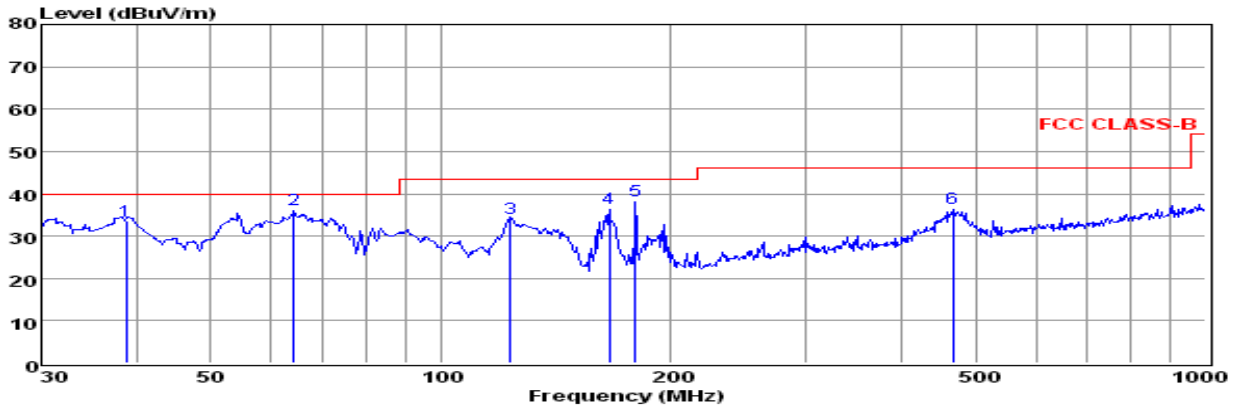
Test result for 802.11b (Low Channel)



Env./Ins: 24℃/56%
pol: HORIZONTAL

	Freq MHz	Reading dBuV	CabLos dB	Antfac dB/m	Measured dBuV/m	Limit dBuV/m	Over dB	Remark
1	39.71	22.27	0.38	13.51	36.16	40.00	-3.84	QP
2	72.59	27.74	0.55	8.21	36.50	40.00	-3.50	QP
3	96.10	22.29	0.58	12.91	35.78	43.50	-7.72	QP
4	179.39	28.82	0.89	9.64	39.35	43.50	-4.15	QP
5	528.25	16.20	1.46	17.11	34.77	46.00	-11.23	QP
6	647.39	15.96	1.54	18.62	36.12	46.00	-9.88	QP

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



Env./Ins: 24℃/56%
pol: VERTICAL

	Freq	Reading	CabLos	Antfac	Measured	Limit	Over	Remark
	MHz	dBuV	dB	dB/m	dBuV/m	dBuV/m	dB	
1	38.75	20.08	0.38	13.26	33.72	40.00	-6.28	QP
2	64.21	24.77	0.52	11.02	36.31	40.00	-3.69	QP
3	123.27	23.47	0.70	9.97	34.14	43.50	-9.36	QP
4	166.07	26.90	0.77	8.85	36.52	43.50	-6.98	QP
5	179.39	27.78	0.89	9.64	38.31	43.50	-5.19	QP
6	467.24	19.64	1.31	15.76	36.71	46.00	-9.29	QP

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

Note:

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

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

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

5.5.8. Results for Radiated Emissions (Above 1GHz)

802.11b

Channel 1

Freq. MHz	Reading dBuv	Ant. Fac. dB/m	Pre. Fac. dB	Cab. Loss dB	Measured dBuv/m	Limit dBuv/m	Margin dB	Remark	Pol.
4824.00	59.50	33.06	35.04	3.94	61.46	74	-12.54	Peak	Horizontal
4824.00	44.86	33.06	35.04	3.94	46.82	54	-7.18	Average	Horizontal
4824.00	56.41	33.06	35.04	3.94	58.37	74	-15.63	Peak	Vertical
4824.00	41.06	33.06	35.04	3.94	43.02	54	-10.98	Average	Vertical

Channel 6

Freq. MHz	Reading dBuv	Ant. Fac. dB/m	Pre. Fac. dB	Cab. Loss dB	Measured dBuv/m	Limit dBuv/m	Margin dB	Remark	Pol.
4874.00	59.70	33.16	35.15	3.96	61.67	74	-12.33	Peak	Horizontal
4874.00	43.32	33.16	35.15	3.96	45.29	54	-8.71	Average	Horizontal
4874.00	56.57	33.16	35.15	3.96	58.54	74	-15.46	Peak	Vertical
4874.00	41.16	33.16	35.15	3.96	43.13	54	-10.87	Average	Vertical

Channel 11

Freq. MHz	Reading dBuv	Ant. Fac. dB/m	Pre. Fac. dB	Cab. Loss dB	Measured dBuv/m	Limit dBuv/m	Margin dB	Remark	Pol.
4924.00	59.43	33.26	35.14	3.98	61.53	74	-12.47	Peak	Horizontal
4924.00	43.64	33.26	35.14	3.98	45.74	54	-8.26	Average	Horizontal
4924.00	55.96	33.26	35.14	3.98	58.06	74	-15.94	Peak	Vertical
4924.00	39.94	33.26	35.14	3.98	42.04	54	-11.96	Average	Vertical

802.11g

Channel 1

Freq. MHz	Reading dBuv	Ant. Fac. dB/m	Pre. Fac. dB	Cab. Loss dB	Measured dBuv/m	Limit dBuv/m	Margin dB	Remark	Pol.
4824.00	57.01	33.06	35.04	3.94	58.97	74	-15.03	Peak	Horizontal
4824.00	42.05	33.06	35.04	3.94	44.01	54	-9.99	Average	Horizontal
4824.00	53.90	33.06	35.04	3.94	55.86	74	-18.14	Peak	Vertical
4824.00	39.27	33.06	35.04	3.94	41.23	54	-12.77	Average	Vertical

Channel 6

Freq. MHz	Reading dBuv	Ant. Fac. dB/m	Pre. Fac. dB	Cab. Loss dB	Measured dBuv/m	Limit dBuv/m	Margin dB	Remark	Pol.
4874.00	57.04	33.16	35.15	3.96	59.01	74	-14.99	Peak	Horizontal
4874.00	42.44	33.16	35.15	3.96	44.41	54	-9.59	Average	Horizontal
4874.00	54.48	33.16	35.15	3.96	56.45	74	-17.55	Peak	Vertical
4874.00	39.09	33.16	35.15	3.96	41.06	54	-12.94	Average	Vertical

Channel 11

Freq. MHz	Reading dBuv	Ant. Fac. dB/m	Pre. Fac. dB	Cab. Loss dB	Measured dBuv/m	Limit dBuv/m	Margin dB	Remark	Pol.
4924.00	57.34	33.26	35.14	3.98	59.44	74	-14.56	Peak	Horizontal
4924.00	42.16	33.26	35.14	3.98	44.26	54	-9.74	Average	Horizontal
4924.00	53.33	33.26	35.14	3.98	55.43	74	-18.57	Peak	Vertical
4924.00	38.93	33.26	35.14	3.98	41.03	54	-12.97	Average	Vertical

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802.11n HT20

Channel 1

Freq. MHz	Reading dBuv	Ant. Fac. dB/m	Pre. Fac. dB	Cab. Loss dB	Measured dBuv/m	Limit dBuv/m	Margin dB	Remark	Pol.
4824.00	57.07	33.06	35.04	3.94	59.03	74	-14.97	Peak	Horizontal
4824.00	42.45	33.06	35.04	3.94	44.41	54	-9.59	Average	Horizontal
4824.00	54.79	33.06	35.04	3.94	56.75	74	-17.25	Peak	Vertical
4824.00	39.43	33.06	35.04	3.94	41.39	54	-12.61	Average	Vertical

Channel 6

Freq. MHz	Reading dBuv	Ant. Fac. dB/m	Pre. Fac. dB	Cab. Loss dB	Measured dBuv/m	Limit dBuv/m	Margin dB	Remark	Pol.
4874.00	57.05	33.16	35.15	3.96	59.02	74	-14.98	Peak	Horizontal
4874.00	41.48	33.16	35.15	3.96	43.45	54	-10.55	Average	Horizontal
4874.00	54.20	33.16	35.15	3.96	56.17	74	-17.83	Peak	Vertical
4874.00	39.26	33.16	35.15	3.96	41.23	54	-12.77	Average	Vertical

Channel 11

Freq. MHz	Reading dBuv	Ant. Fac. dB/m	Pre. Fac. dB	Cab. Loss dB	Measured dBuv/m	Limit dBuv/m	Margin dB	Remark	Pol.
4924.00	57.33	33.26	35.14	3.98	59.43	74	-14.57	Peak	Horizontal
4924.00	42.67	33.26	35.14	3.98	44.77	54	-9.23	Average	Horizontal
4924.00	54.18	33.26	35.14	3.98	56.28	74	-17.72	Peak	Vertical
4924.00	39.02	33.26	35.14	3.98	41.12	54	-12.88	Average	Vertical

802.11n HT40

Channel 3

Freq. MHz	Reading dBuv	Ant. Fac. dB/m	Pre. Fac. dB	Cab. Loss dB	Measured dBuv/m	Limit dBuv/m	Margin dB	Remark	Pol.
4824.00	55.81	33.06	35.04	3.94	57.77	74	-16.23	Peak	Horizontal
4824.00	40.86	33.06	35.04	3.94	42.82	54	-11.18	Average	Horizontal
4824.00	53.45	33.06	35.04	3.94	55.41	74	-18.59	Peak	Vertical
4824.00	38.07	33.06	35.04	3.94	40.03	54	-13.97	Average	Vertical

Channel 6

Freq. MHz	Reading dBuv	Ant. Fac. dB/m	Pre. Fac. dB	Cab. Loss dB	Measured dBuv/m	Limit dBuv/m	Margin dB	Remark	Pol.
4874.00	54.57	33.16	35.15	3.96	56.54	74	-17.46	Peak	Horizontal
4874.00	40.05	33.16	35.15	3.96	42.02	54	-11.98	Average	Horizontal
4874.00	53.44	33.16	35.15	3.96	55.41	74	-18.59	Peak	Vertical
4874.00	38.06	33.16	35.15	3.96	40.03	54	-13.97	Average	Vertical

Channel 9

Freq. MHz	Reading dBuv	Ant. Fac. dB/m	Pre. Fac. dB	Cab. Loss dB	Measured dBuv/m	Limit dBuv/m	Margin dB	Remark	Pol.
4924.00	55.51	33.26	35.14	3.98	57.61	74	-16.39	Peak	Horizontal
4924.00	39.97	33.26	35.14	3.98	42.07	54	-11.93	Average	Horizontal
4924.00	53.31	33.26	35.14	3.98	55.41	74	-18.59	Peak	Vertical
4924.00	37.93	33.26	35.14	3.98	40.03	54	-13.97	Average	Vertical

BT V4.0

Channel 1

Freq. MHz	Reading dBuv	Ant. Fac. dB/m	Pre. Fac. dB	Cab. Loss dB	Measured dBuv/m	Limit dBuv/m	Margin dB	Remark	Pol.
4804.00	49.78	33.06	35.04	3.94	51.74	74	-22.26	Peak	Horizontal
4804.00	35.93	33.06	35.04	3.94	37.89	54	-16.11	Average	Horizontal
4804.00	49.29	33.06	35.04	3.94	51.25	74	-22.75	Peak	Vertical
4804.00	34.17	33.06	35.04	3.94	36.13	54	-17.87	Average	Vertical

Channel 20

Freq. MHz	Reading dBuv	Ant. Fac. dB/m	Pre. Fac. dB	Cab. Loss dB	Measured dBuv/m	Limit dBuv/m	Margin dB	Remark	Pol.
4880.00	50.09	33.16	35.15	3.96	52.06	74	-21.94	Peak	Horizontal
4880.00	35.44	33.16	35.15	3.96	37.41	54	-16.59	Average	Horizontal
4880.00	49.90	33.16	35.15	3.96	51.87	74	-22.13	Peak	Vertical
4880.00	34.09	33.16	35.15	3.96	36.06	54	-17.94	Average	Vertical

Channel 40

Freq. MHz	Reading dBuv	Ant. Fac. dB/m	Pre. Fac. dB	Cab. Loss dB	Measured dBuv/m	Limit dBuv/m	Margin dB	Remark	Pol.
4960.00	49.01	33.26	35.14	3.98	51.11	74	-22.89	Peak	Horizontal
4960.00	34.35	33.26	35.14	3.98	36.45	54	-17.55	Average	Horizontal
4960.00	49.68	33.26	35.14	3.98	51.78	74	-22.22	Peak	Vertical
4960.00	34.26	33.26	35.14	3.98	36.36	54	-17.64	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 9k~10th harmonic or 40GHz (which is less) were made with an instrument using Peak detector mode.*
3. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*

5.5.9. Results of Band Edges Test (Radiated)

802.11b

Tx-2412

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.
2390.00	49.47	32.89	35.16	3.51	50.71	74	-23.29	Peak	Horizontal
2390.00	33.85	32.89	35.16	3.51	35.09	54	-18.91	Average	Horizontal
2400.00	56.92	32.92	35.16	3.54	58.22	74	-15.78	Peak	Horizontal
2400.00	44.48	32.92	35.16	3.54	45.78	54	-8.22	Average	Horizontal
2390.00	49.12	32.89	35.16	3.51	50.36	74	-23.64	Peak	Vertical
2390.00	33.87	32.89	35.16	3.51	35.11	54	-18.89	Average	Vertical
2400.00	55.74	32.92	35.16	3.54	57.04	74	-16.96	Peak	Vertical
2400.00	42.50	32.92	35.16	3.54	43.80	54	-10.20	Average	Vertical

Tx-2462

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	49.39	33.06	35.18	3.60	50.87	74	-23.13	Peak	Horizontal
2483.50	33.58	33.06	35.18	3.60	35.06	54	-18.94	Average	Horizontal
2483.50	48.63	33.06	35.18	3.60	50.11	74	-23.89	Peak	Vertical
2483.50	34.22	33.06	35.18	3.60	35.70	54	-18.30	Average	Vertical

802.11g

Tx-2412

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.
2390.00	50.28	32.89	35.16	3.51	51.52	74	-22.48	Peak	Horizontal
2390.00	35.90	32.89	35.16	3.51	37.14	54	-16.86	Average	Horizontal
2400.00	58.36	32.92	35.16	3.54	59.66	74	-14.34	Peak	Horizontal
2400.00	45.49	32.92	35.16	3.54	46.79	54	-7.21	Average	Horizontal
2390.00	49.93	32.89	35.16	3.51	51.17	74	-22.83	Peak	Vertical
2390.00	36.02	32.89	35.16	3.51	37.26	54	-16.74	Average	Vertical
2400.00	56.11	32.92	35.16	3.54	57.41	74	-16.59	Peak	Vertical
2400.00	41.78	32.92	35.16	3.54	43.08	54	-10.92	Average	Vertical

Tx-2462

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	49.61	33.06	35.18	3.60	51.09	74	-22.91	Peak	Horizontal
2483.50	35.39	33.06	35.18	3.60	36.87	54	-17.13	Average	Horizontal
2483.50	50.26	33.06	35.18	3.60	51.74	74	-22.26	Peak	Vertical
2483.50	34.54	33.06	35.18	3.60	36.02	54	-17.98	Average	Vertical

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802.11n(HT20)

Tx-2412

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.
2390.00	49.89	32.89	35.16	3.51	51.13	74	-22.87	Peak	Horizontal
2390.00	35.84	32.89	35.16	3.51	37.08	54	-16.92	Average	Horizontal
2400.00	57.86	32.92	35.16	3.54	59.16	74	-14.84	Peak	Horizontal
2400.00	45.14	32.92	35.16	3.54	46.44	54	-7.56	Average	Horizontal
2390.00	50.54	32.89	35.16	3.51	51.78	74	-22.22	Peak	Vertical
2390.00	36.12	32.89	35.16	3.51	37.36	54	-16.64	Average	Vertical
2400.00	56.41	32.92	35.16	3.54	57.71	74	-16.29	Peak	Vertical
2400.00	41.72	32.92	35.16	3.54	43.02	54	-10.98	Average	Vertical

Tx-2462

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	49.86	33.06	35.18	3.60	51.34	74	-22.66	Peak	Horizontal
2483.50	35.93	33.06	35.18	3.60	37.41	54	-16.59	Average	Horizontal
2483.50	49.76	33.06	35.18	3.60	51.24	74	-22.76	Peak	Vertical
2483.50	34.54	33.06	35.18	3.60	36.02	54	-17.98	Average	Vertical

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802.11n(HT40)

Tx-2422

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.
2390.00	50.17	32.89	35.16	3.51	51.41	74	-22.59	Peak	Horizontal
2390.00	35.99	32.89	35.16	3.51	37.23	54	-16.77	Average	Horizontal
2400.00	59.01	32.92	35.16	3.54	60.31	74	-13.69	Peak	Horizontal
2400.00	44.86	32.92	35.16	3.54	46.16	54	-7.84	Average	Horizontal
2390.00	50.34	32.89	35.16	3.51	51.58	74	-22.42	Peak	Vertical
2390.00	35.93	32.89	35.16	3.51	37.17	54	-16.83	Average	Vertical
2400.00	57.14	32.92	35.16	3.54	58.44	74	-15.56	Peak	Vertical
2400.00	43.72	32.92	35.16	3.54	45.02	54	-8.98	Average	Vertical

Tx-2452

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	50.39	33.06	35.18	3.60	51.87	74	-22.13	Peak	Horizontal
2483.50	35.08	33.06	35.18	3.60	36.56	54	-17.44	Average	Horizontal
2483.50	48.75	33.06	35.18	3.60	50.23	74	-23.77	Peak	Vertical
2483.50	33.93	33.06	35.18	3.60	35.41	54	-18.59	Average	Vertical

BT V4.0

Tx-2402

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.
2390.00	48.97	32.89	35.16	3.51	50.21	74	-23.79	Peak	Horizontal
2390.00	33.81	32.89	35.16	3.51	35.05	54	-18.95	Average	Horizontal
2400.00	54.11	32.92	35.16	3.54	55.41	74	-18.59	Peak	Horizontal
2400.00	41.48	32.92	35.16	3.54	42.78	54	-11.22	Average	Horizontal
2390.00	48.81	32.89	35.16	3.51	50.05	74	-23.95	Peak	Vertical
2390.00	33.99	32.89	35.16	3.51	35.23	54	-18.77	Average	Vertical
2400.00	52.83	32.92	35.16	3.54	54.13	74	-19.87	Peak	Vertical
2400.00	38.72	32.92	35.16	3.54	40.02	54	-13.98	Average	Vertical

Tx-2480

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	48.58	33.06	35.18	3.60	50.06	74	-23.94	Peak	Horizontal
2483.50	34.74	33.06	35.18	3.60	36.22	54	-17.78	Average	Horizontal
2483.50	49.27	33.06	35.18	3.60	50.75	74	-23.25	Peak	Vertical
2483.50	33.53	33.06	35.18	3.60	35.01	54	-18.99	Average	Vertical

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5.6. Conducted Spurious Emissions and Band Edges Test

5.6.1. Standard Applicable

According to §15.247 (d): 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. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)).

5.6.2. Measuring Instruments and Setting

Please refer to section 6 of equipments list in this report. 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

5.6.3. 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 100 kHz

The spectrum from 9kHz to 40GHz is investigated with the transmitter set to the lowest, middle, and highest channels.

5.6.4. Test Setup Layout

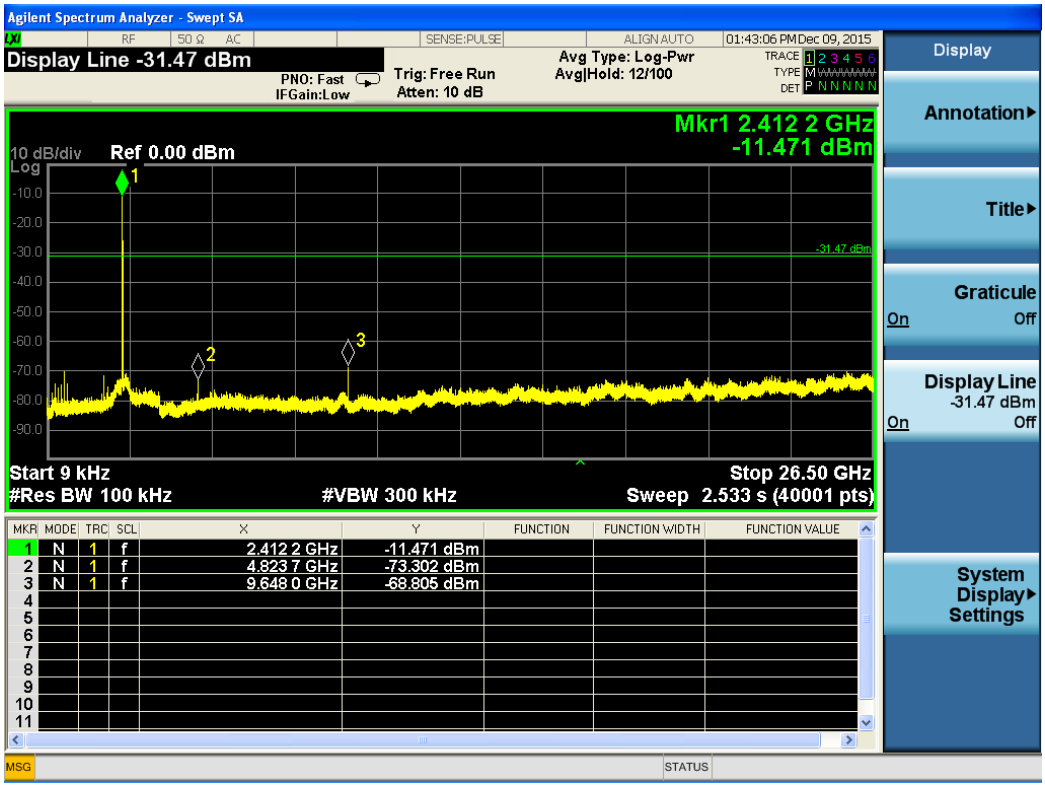
This test setup layout is the same as that shown in section 5.4.4.

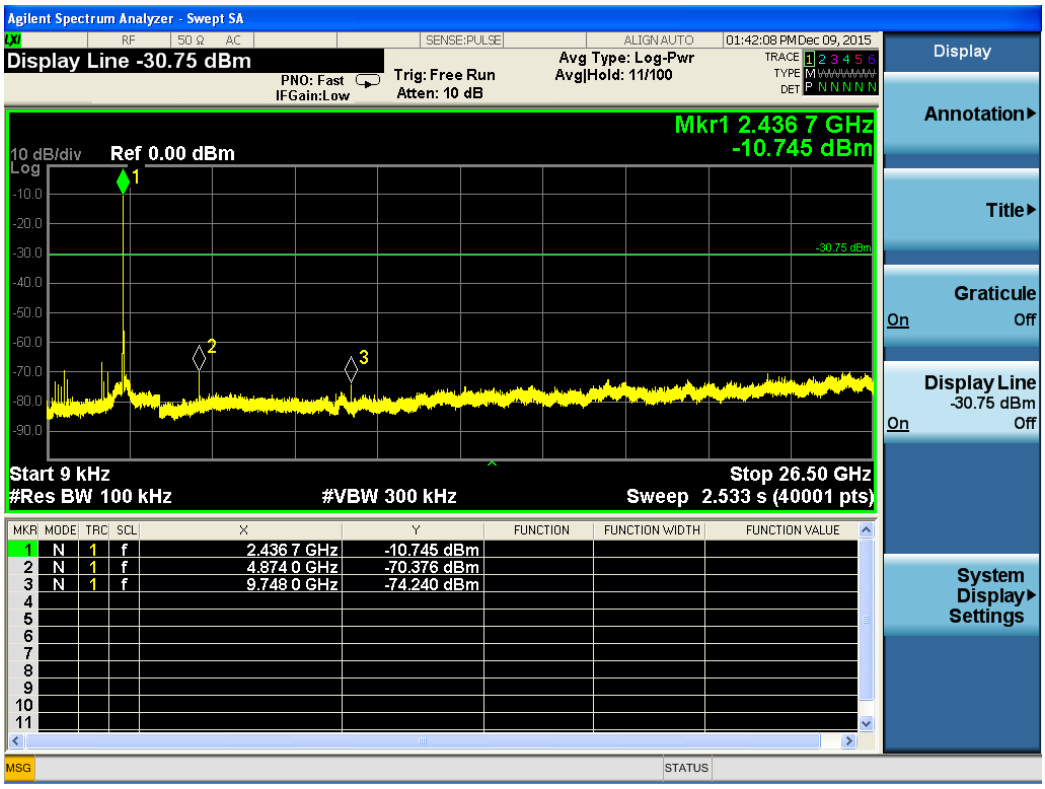
5.6.5. EUT Operation during Test

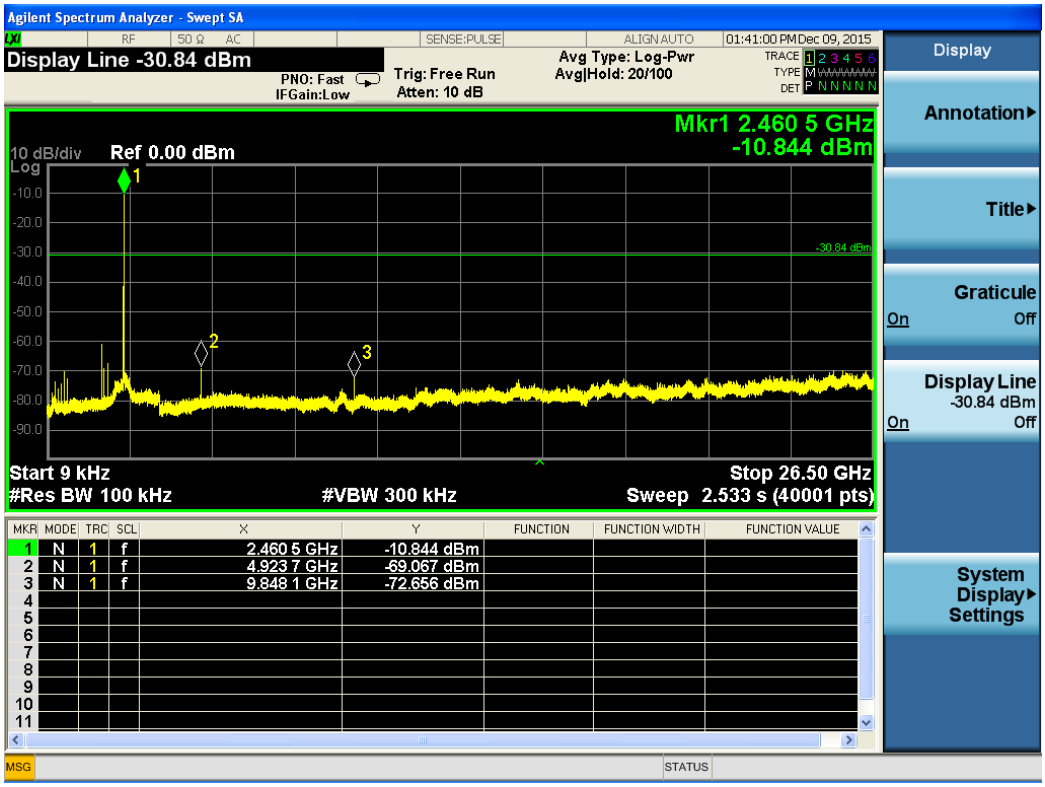
The EUT was programmed to be in continuously transmitting mode.

5.6.6. Test Results of Conducted Spurious Emissions

802.11b



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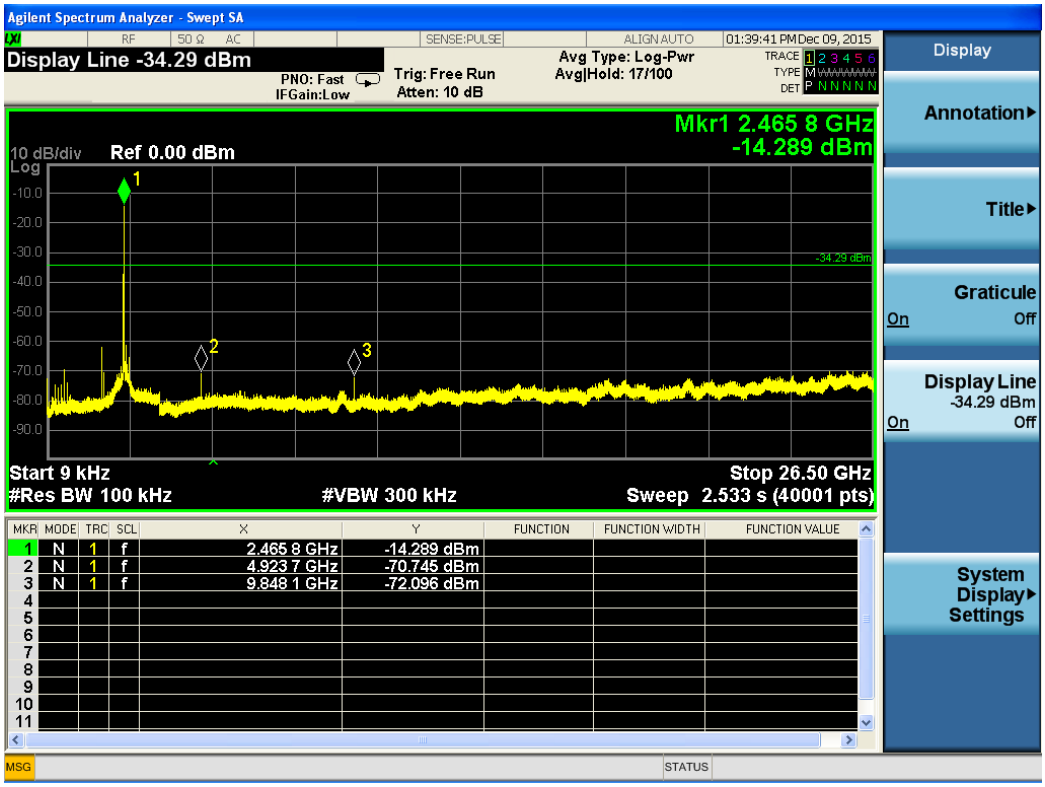
Display Line -30.84 dBm
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 10 dB
Avg Type: Log-Pwr
Avg|Hold: 20/100
01:41:00 PM Dec 09, 2015
Mkr1 2.460 5 GHz
-10.844 dBm
10 dB/div
Ref 0.00 dBm
Start 9 kHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 26.50 GHz
Sweep 2.533 s (40001 pts)
1 N 1 f 2.460 5 GHz -10.844 dBm
2 N 1 f 4.923 7 GHz -69.067 dBm
3 N 1 f 9.848 1 GHz -72.656 dBm
Display
Annotation
Title
Graticule
Display Line
-30.84 dBm
System Display Settings

802.11g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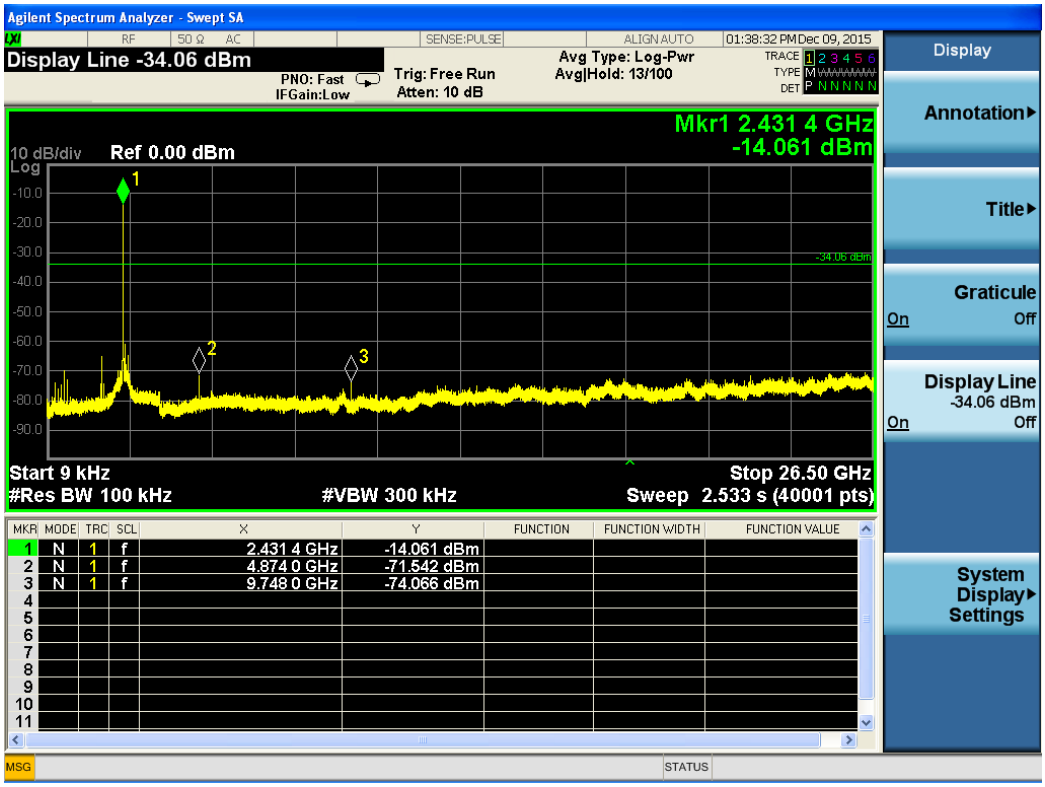
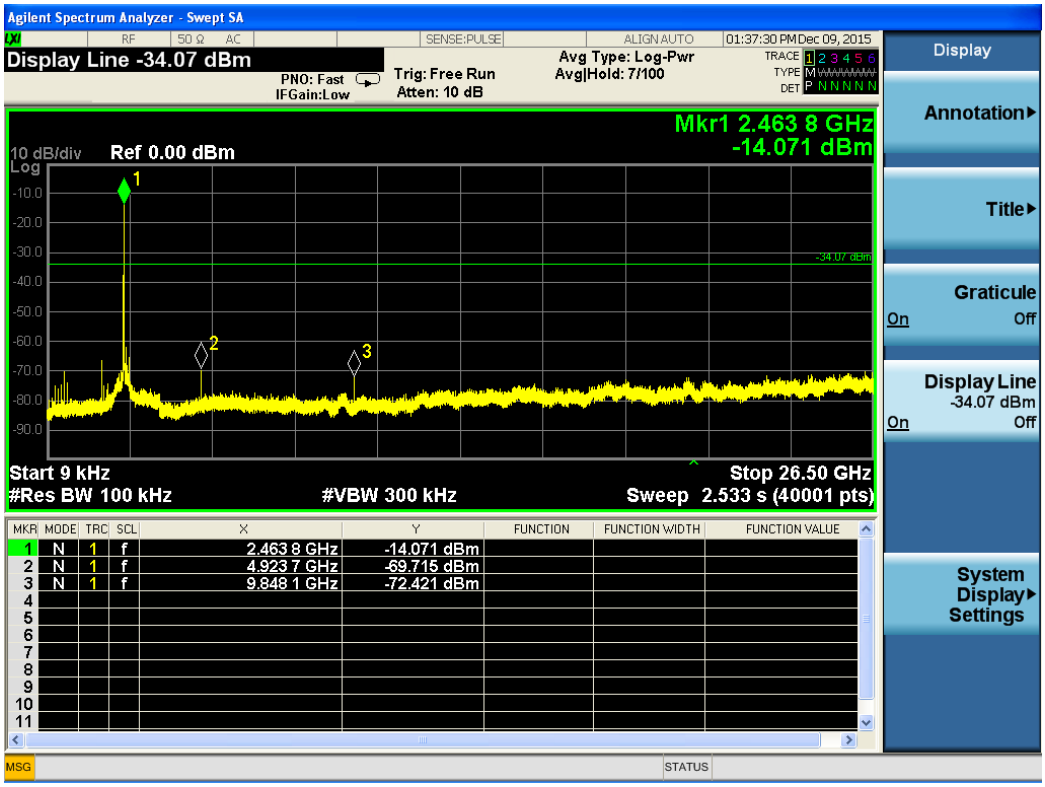
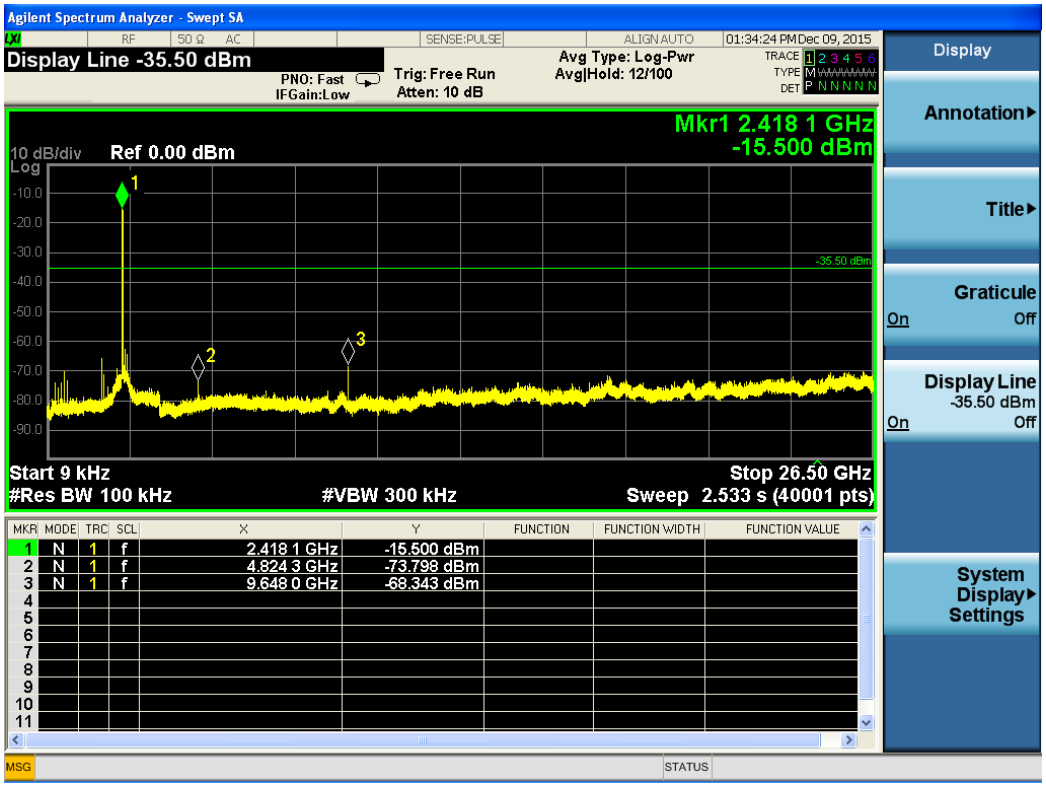
Display Line -34.29 dBm
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 10 dB
Avg Type: Log-Pwr
Avg|Hold: 17/100
01:39:41 PM Dec 09, 2015
Mkr1 2.465 8 GHz
-14.289 dBm
10 dB/div
Ref 0.00 dBm
Start 9 kHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 26.50 GHz
Sweep 2.533 s (40001 pts)
1 N 1 f 2.465 8 GHz -14.289 dBm
2 N 1 f 4.923 7 GHz -70.745 dBm
3 N 1 f 9.848 1 GHz -72.096 dBm
Display
Annotation
Title
Graticule
Display Line
-34.29 dBm
System Display Settings


Agilent Spectrum Analyzer - Swept SA
Display Line -34.06 dBm
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 10 dB
Avg Type: Log-Pwr
Avg|Hold: 13/100
01:38:32 PM Dec 09, 2015
Mkr1 2.431 4 GHz
-14.061 dBm
10 dB/div
Ref 0.00 dBm
Start 9 kHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 26.50 GHz
Sweep 2.533 s (40001 pts)
1 N 1 f 2.431 4 GHz -14.061 dBm
2 N 1 f 4.874 0 GHz -71.542 dBm
3 N 1 f 9.748 0 GHz -74.066 dBm
Display
Annotation
Title
Graticule
Display Line
-34.06 dBm
System Display Settings


Agilent Spectrum Analyzer - Swept SA
Display Line -34.07 dBm
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 10 dB
Avg Type: Log-Pwr
Avg|Hold: 7/100
01:37:30 PM Dec 09, 2015
Mkr1 2.463 8 GHz
-14.071 dBm
10 dB/div
Ref 0.00 dBm
Start 9 kHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 26.50 GHz
Sweep 2.533 s (40001 pts)
1 N 1 f 2.463 8 GHz -14.071 dBm
2 N 1 f 4.923 7 GHz -69.715 dBm
3 N 1 f 9.848 1 GHz -72.421 dBm
Display
Annotation
Title
Graticule
Display Line
-34.07 dBm
System Display Settings

802.11n HT20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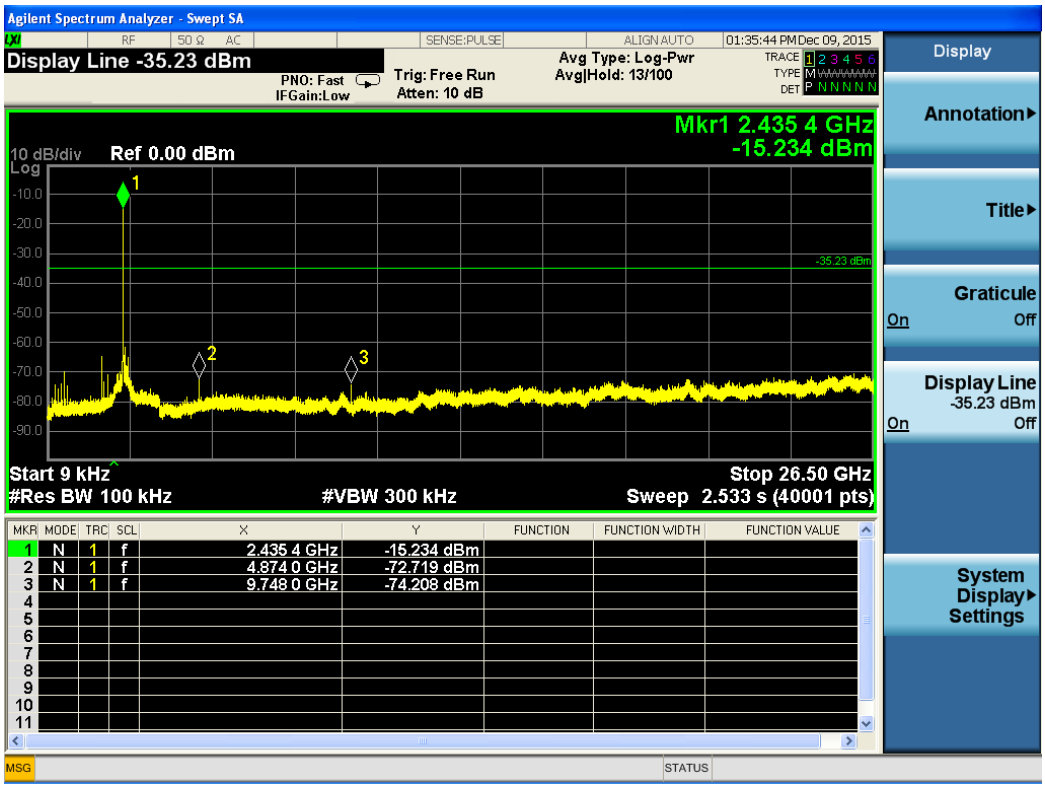
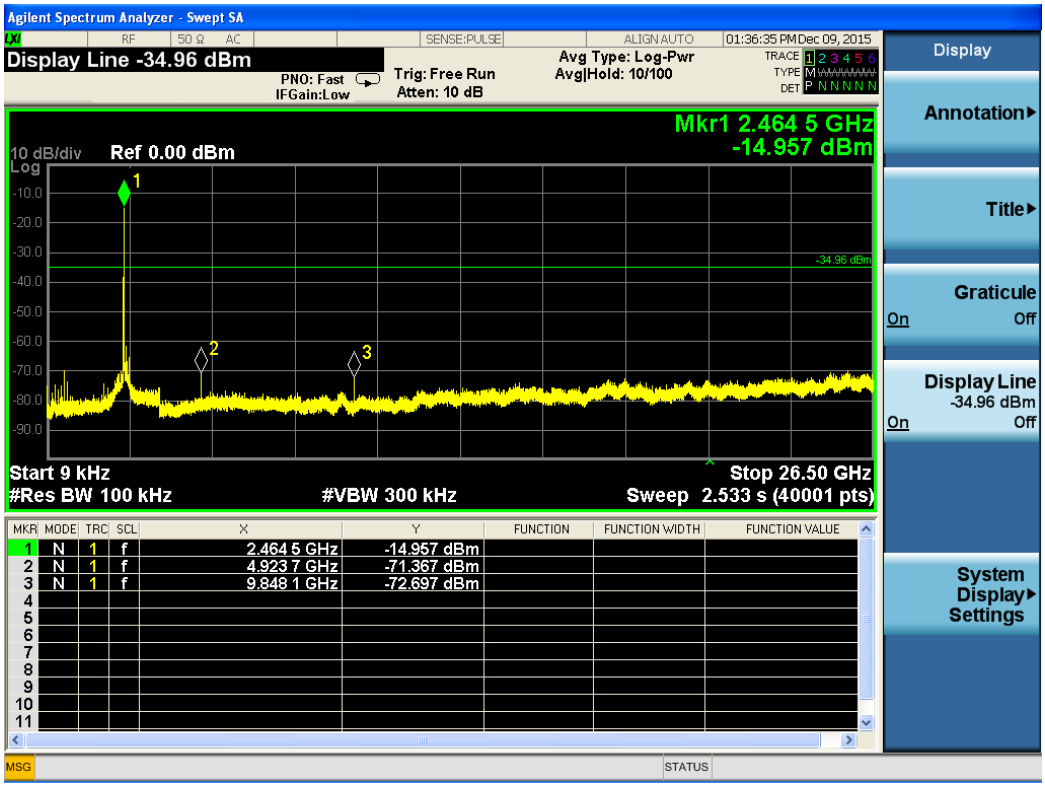
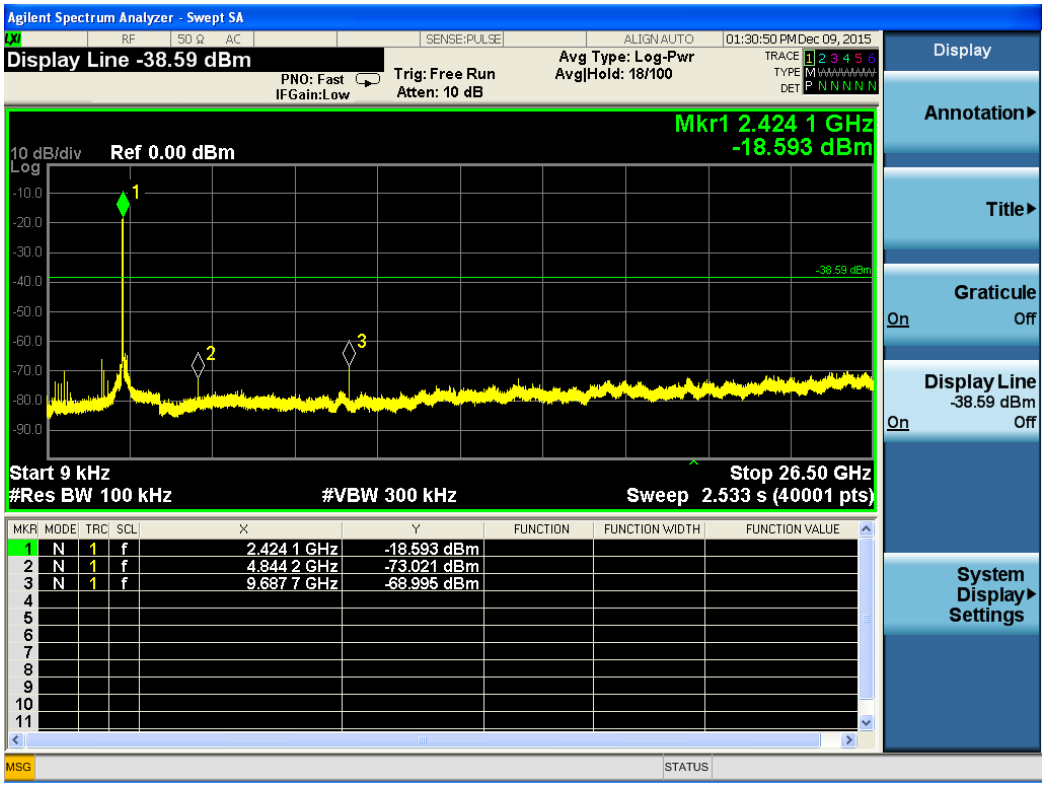
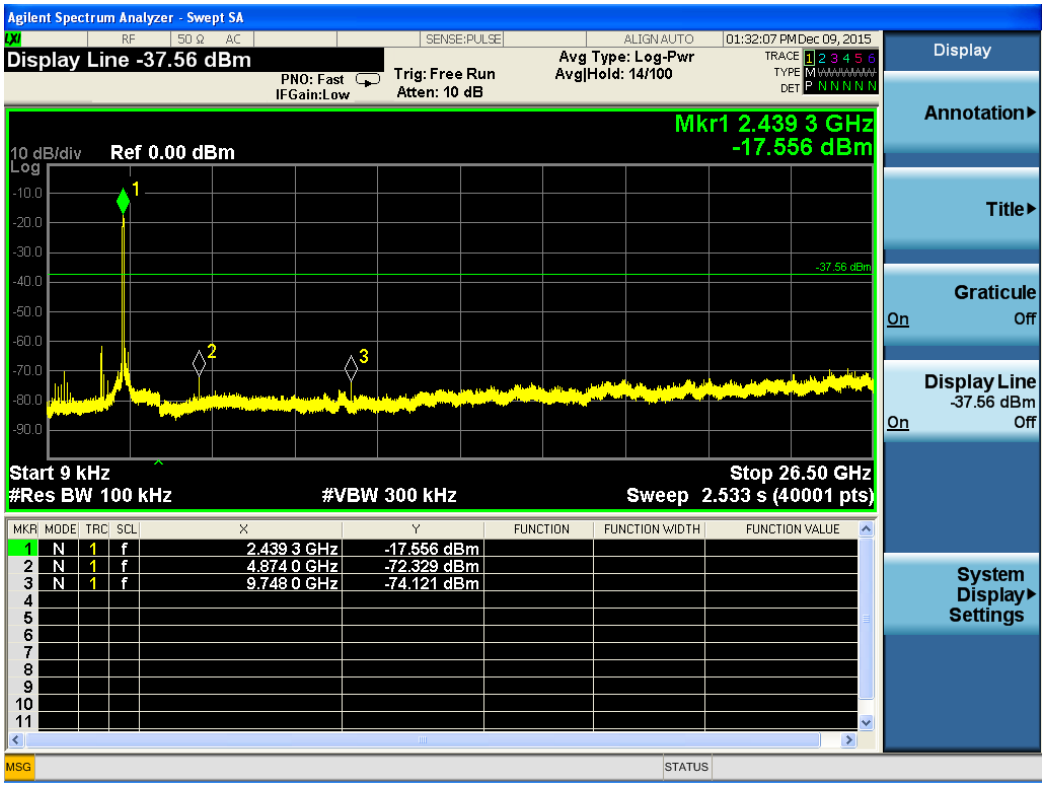
Display Line -35.50 dBm
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 10 dB
Avg Type: Log-Pwr
Avg|Hold: 12/100
01:34:24 PM Dec 09, 2015
Mkr1 2.418 1 GHz
-15.500 dBm
10 dB/div
Ref 0.00 dBm
Start 9 kHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 26.50 GHz
Sweep 2.533 s (40001 pts)
1 N 1 f 2.418 1 GHz -15.500 dBm
2 N 1 f 4.824 3 GHz -73.798 dBm
3 N 1 f 9.648 0 GHz -68.343 dBm
Display
Annotation
Title
Graticule
Display Line
-35.50 dBm
System Display Settings

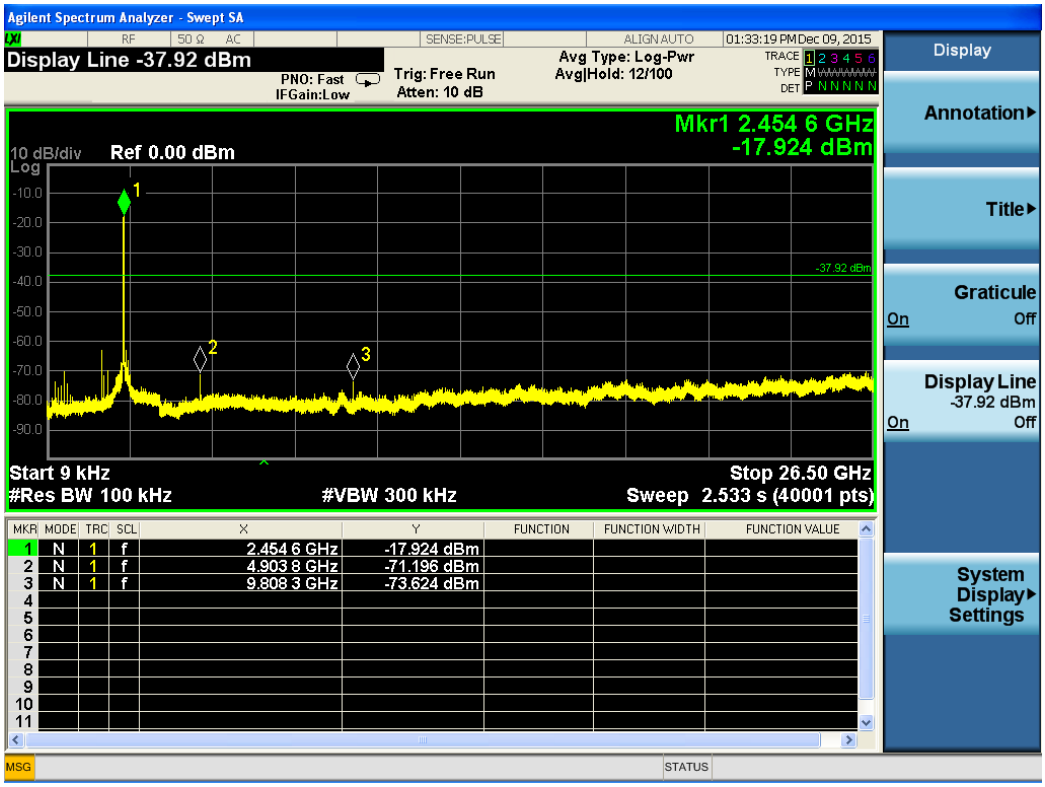

Agilent Spectrum Analyzer - Swept SA
Display Line -35.23 dBm
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 10 dB
Avg Type: Log-Pwr
Avg|Hold: 13/100
01:35:44 PM Dec 09, 2015
Mkr1 2.435 4 GHz
-15.234 dBm
10 dB/div
Ref 0.00 dBm
Start 9 kHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 26.50 GHz
Sweep 2.533 s (40001 pts)
1 N 1 f 2.435 4 GHz -15.234 dBm
2 N 1 f 4.874 0 GHz -72.719 dBm
3 N 1 f 9.748 0 GHz -74.208 dBm
Display
Annotation
Title
Graticule
Display Line
-35.23 dBm
System Display Settings


Agilent Spectrum Analyzer - Swept SA
Display Line -34.96 dBm
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 10 dB
Avg Type: Log-Pwr
Avg|Hold: 10/100
01:36:35 PM Dec 09, 2015
Mkr1 2.464 5 GHz
-14.957 dBm
10 dB/div
Ref 0.00 dBm
Start 9 kHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 26.50 GHz
Sweep 2.533 s (40001 pts)
1 N 1 f 2.464 5 GHz -14.957 dBm
2 N 1 f 4.923 7 GHz -71.367 dBm
3 N 1 f 9.848 1 GHz -72.697 dBm
Display
Annotation
Title
Graticule
Display Line
-34.96 dBm
System Display Settings

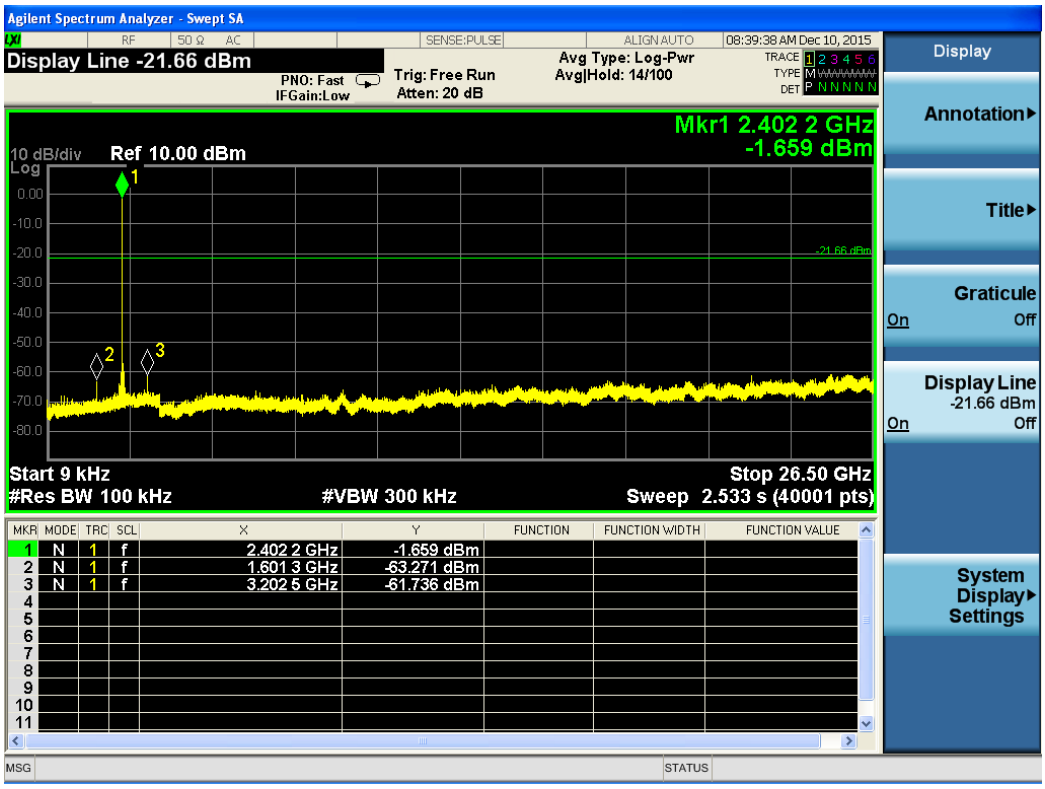
802.11n HT40

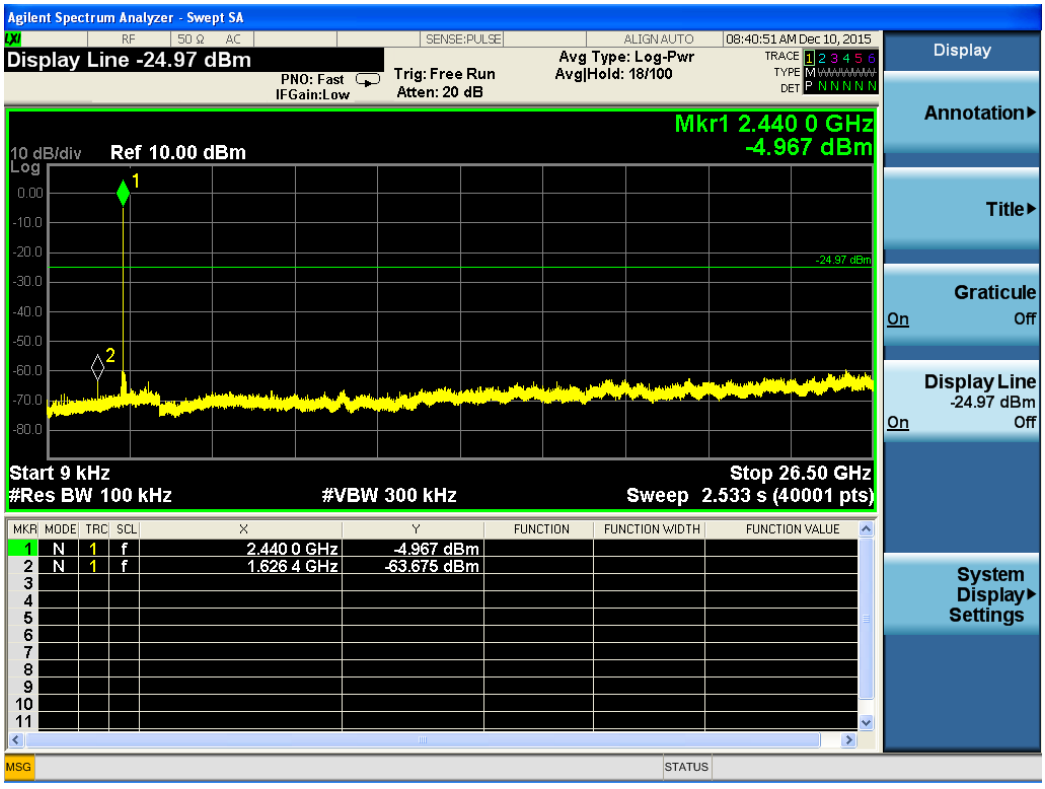

Agilent Spectrum Analyzer - Swept SA
Display Line -38.59 dBm
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 10 dB
Avg Type: Log-Pwr
Avg|Hold: 18/100
01:30:50 PM Dec 09, 2015
Mkr1 2.424 1 GHz
-18.593 dBm
10 dB/div
Ref 0.00 dBm
Start 9 kHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 26.50 GHz
Sweep 2.533 s (40001 pts)
1 N 1 f 2.424 1 GHz -18.593 dBm
2 N 1 f 4.844 2 GHz -73.021 dBm
3 N 1 f 9.687 7 GHz -68.995 dBm
Display
Annotation
Title
Graticule
Display Line
-38.59 dBm
System Display Settings

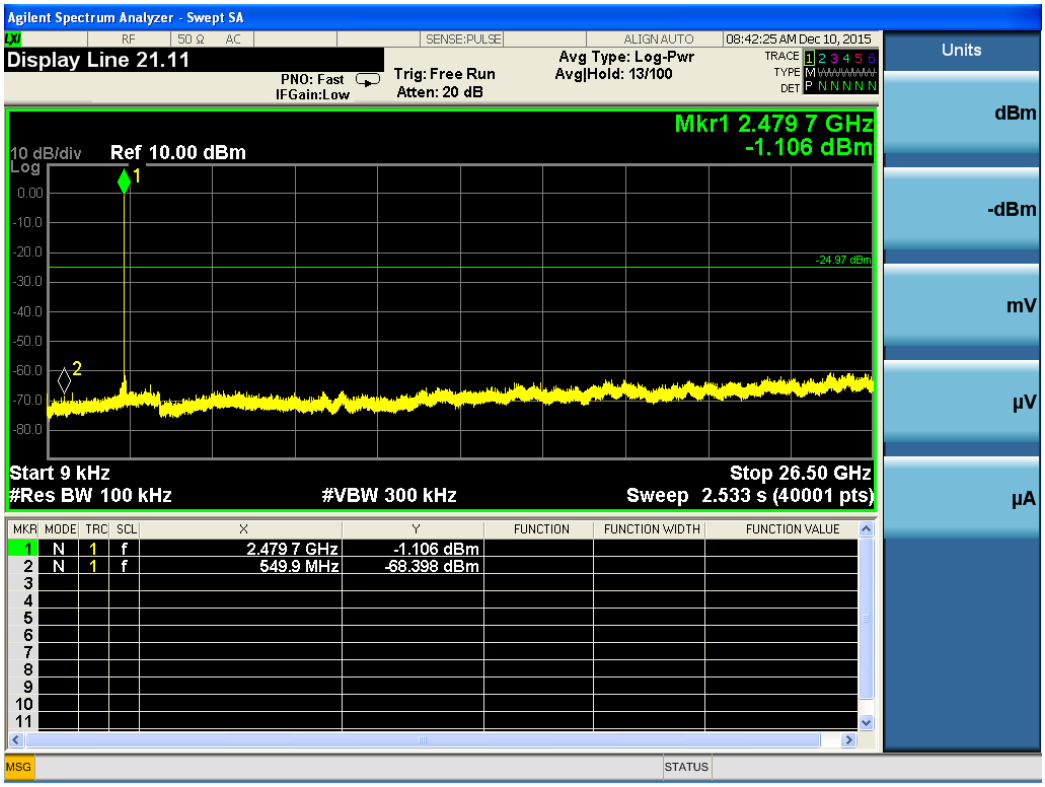

Agilent Spectrum Analyzer - Swept SA
Display Line -37.56 dBm
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 10 dB
Avg Type: Log-Pwr
Avg|Hold: 14/100
01:32:07 PM Dec 09, 2015
Mkr1 2.439 3 GHz
-17.556 dBm
10 dB/div
Ref 0.00 dBm
Log
-37.56 dBm
Start 9 kHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 26.50 GHz
Sweep 2.533 s (40001 pts)
1 N 1 f 2.439 3 GHz -17.556 dBm
2 N 1 f 4.874 0 GHz -72.329 dBm
3 N 1 f 9.748 0 GHz -74.121 dBm
Display
Annotation
Title
Graticule
On Off
Display Line
-37.56 dBm
On Off
System Display Settings


Agilent Spectrum Analyzer - Swept SA
Display Line -37.92 dBm
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 10 dB
Avg Type: Log-Pwr
Avg|Hold: 12/100
01:33:19 PM Dec 09, 2015
Mkr1 2.454 6 GHz
-17.924 dBm
10 dB/div
Ref 0.00 dBm
Log
-37.92 dBm
Start 9 kHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 26.50 GHz
Sweep 2.533 s (40001 pts)
1 N 1 f 2.454 6 GHz -17.924 dBm
2 N 1 f 4.903 8 GHz -71.196 dBm
3 N 1 f 9.808 3 GHz -73.624 dBm
Display
Annotation
Title
Graticule
On Off
Display Line
-37.92 dBm
On Off
System Display Settings

BT V4.0

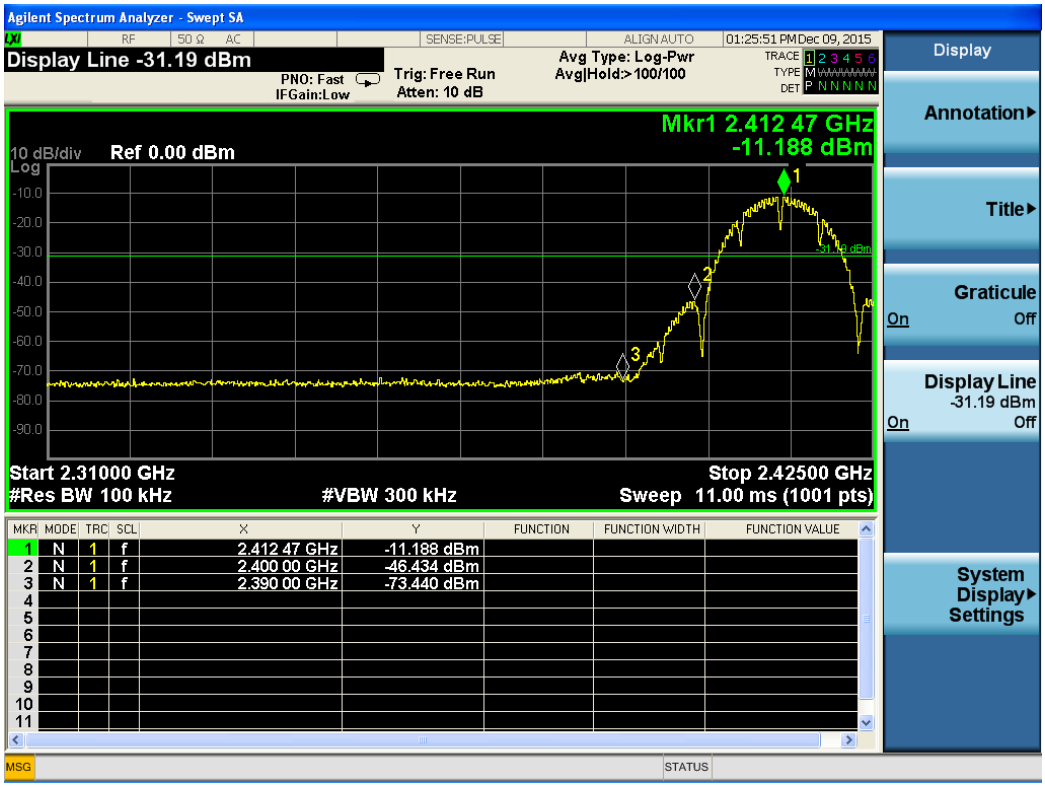

Agilent Spectrum Analyzer - Swept SA
Display Line -21.66 dBm
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold: 14/100
08:39:38 AM Dec 10, 2015
Mkr1 2.402 2 GHz
-1.659 dBm
10 dB/div
Ref 10.00 dBm
Start 9 kHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 26.50 GHz
Sweep 2.533 s (40001 pts)
1 N 1 f 2.402 2 GHz -1.659 dBm
2 N 1 f 1.601 3 GHz -63.271 dBm
3 N 1 f 3.202 5 GHz -61.736 dBm
Display
Annotation
Title
Graticule
Display Line
-21.66 dBm
System Display Settings


Agilent Spectrum Analyzer - Swept SA
Display Line -24.97 dBm
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold: 18/100
08:40:51 AM Dec 10, 2015
Mkr1 2.440 0 GHz
-4.967 dBm
10 dB/div
Ref 10.00 dBm
Start 9 kHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 26.50 GHz
Sweep 2.533 s (40001 pts)
1 N 1 f 2.440 0 GHz -4.967 dBm
2 N 1 f 1.626 4 GHz -63.675 dBm
Display
Annotation
Title
Graticule
Display Line
-24.97 dBm
System Display Settings

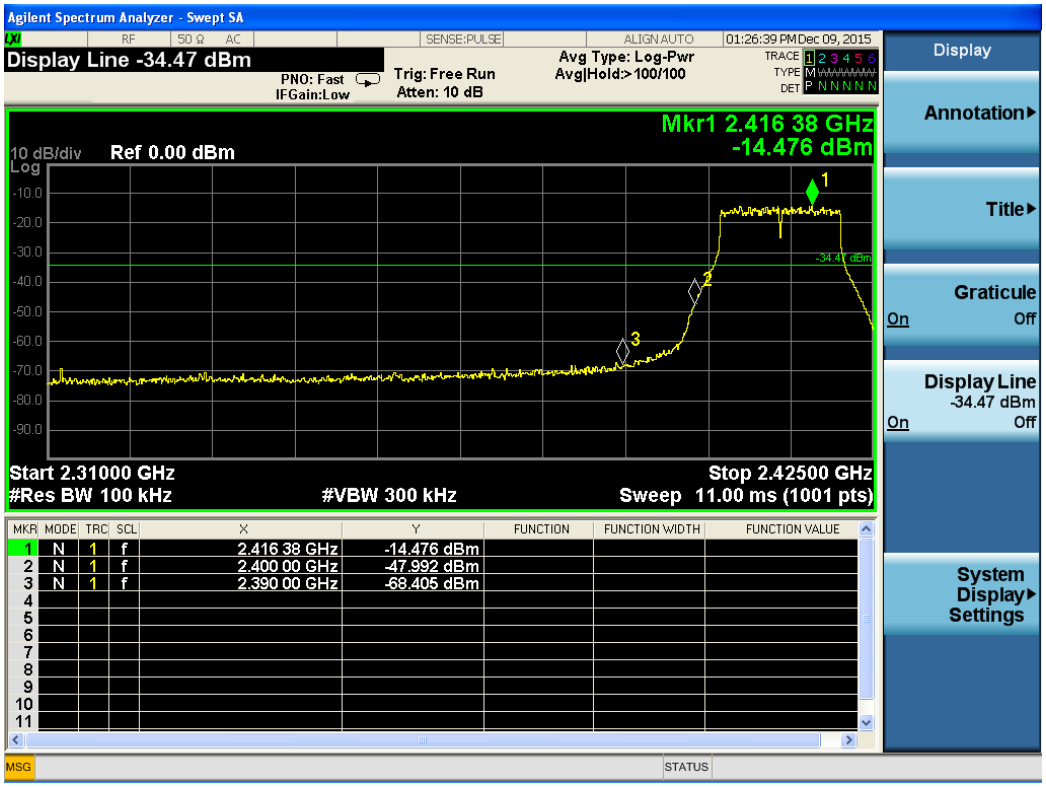

Agilent Spectrum Analyzer - Swept SA
Display Line 21.11
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold: 13/100
08:42:25 AM Dec 10, 2015
Units
dBm
-dBm
mV
µV
µA
Mkr1 2.479 7 GHz
-1.106 dBm
10 dB/div
Ref 10.00 dBm
Log
-24.97 dBm
Start 9 kHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 26.50 GHz
Sweep 2.533 s (40001 pts)
MKR MODE TRC SCL X Y FUNCTION FUNCTION WIDTH FUNCTION VALUE
1 N 1 f 2.479 7 GHz -1.106 dBm
2 N 1 f 549.9 MHz -68.398 dBm
MSG
STATUS

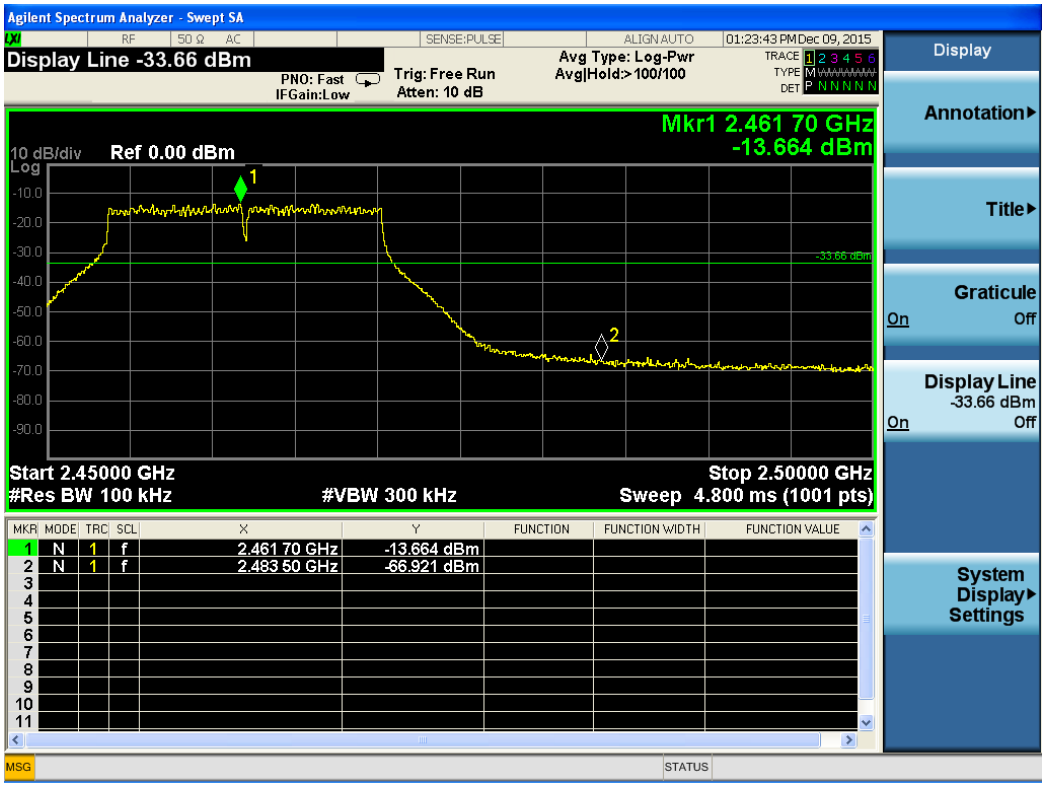
5.6.7. Test Results of Band Edges Test

802.11b

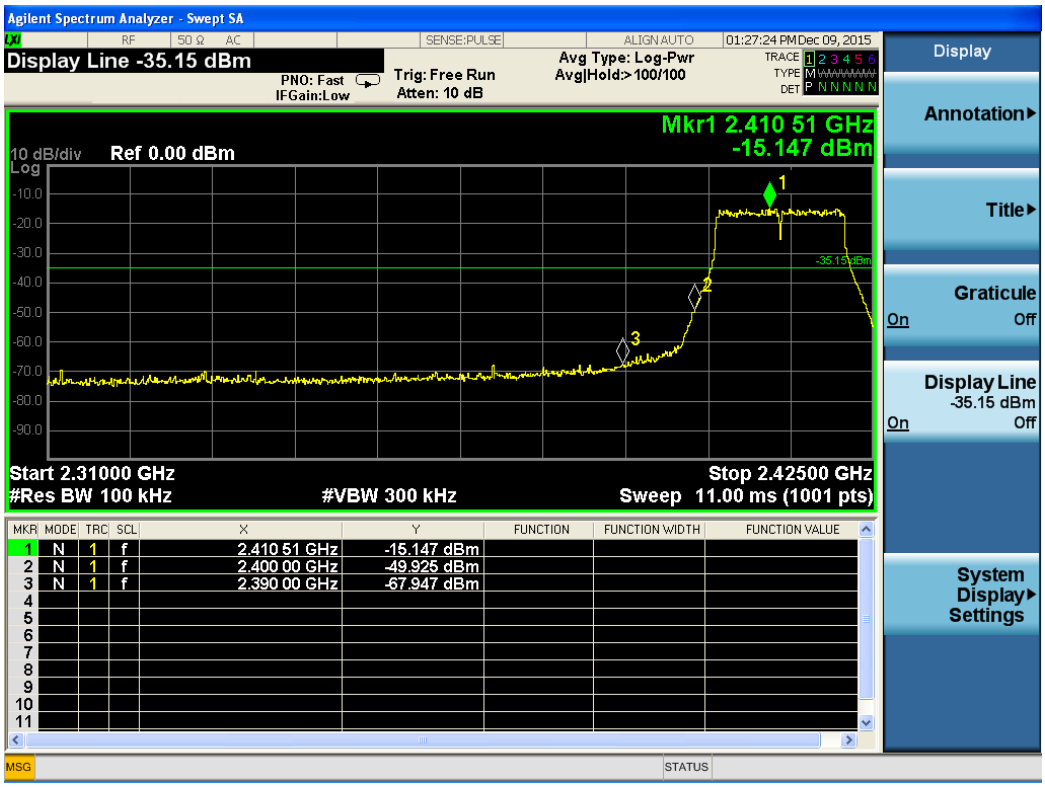


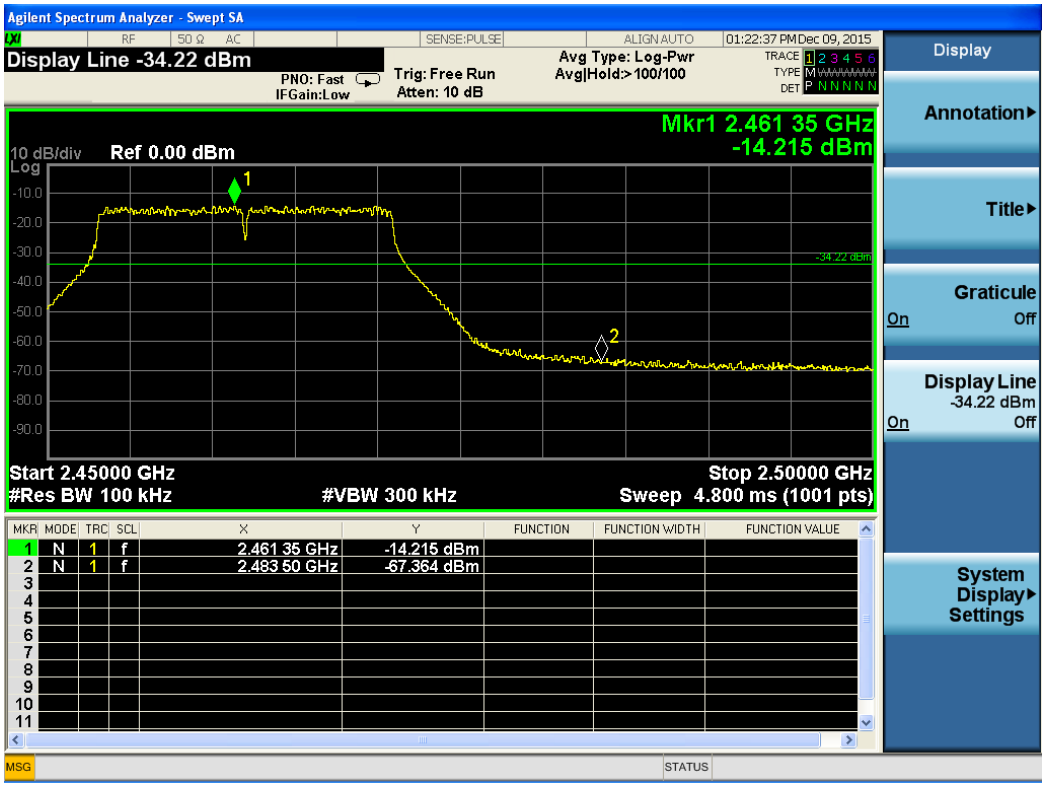
802.11g


Agilent Spectrum Analyzer - Swept SA
Display Line -34.47 dBm
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 10 dB
Avg Type: Log-Pwr
Avg|Hold:>100/100
01:26:39 PM Dec 09, 2015
Mkr1 2.416 38 GHz
-14.476 dBm
10 dB/div Ref 0.00 dBm
Start 2.31000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 2.42500 GHz
Sweep 11.00 ms (1001 pts)
MKR MODE TRC SCL X Y FUNCTION FUNCTION WIDTH FUNCTION VALUE
1 N 1 f 2.416 38 GHz -14.476 dBm
2 N 1 f 2.400 00 GHz -47.992 dBm
3 N 1 f 2.390 00 GHz -68.405 dBm
Display
Annotation
Title
Graticule
On Off
Display Line
-34.47 dBm
On Off
System Display Settings
MSG
STATUS

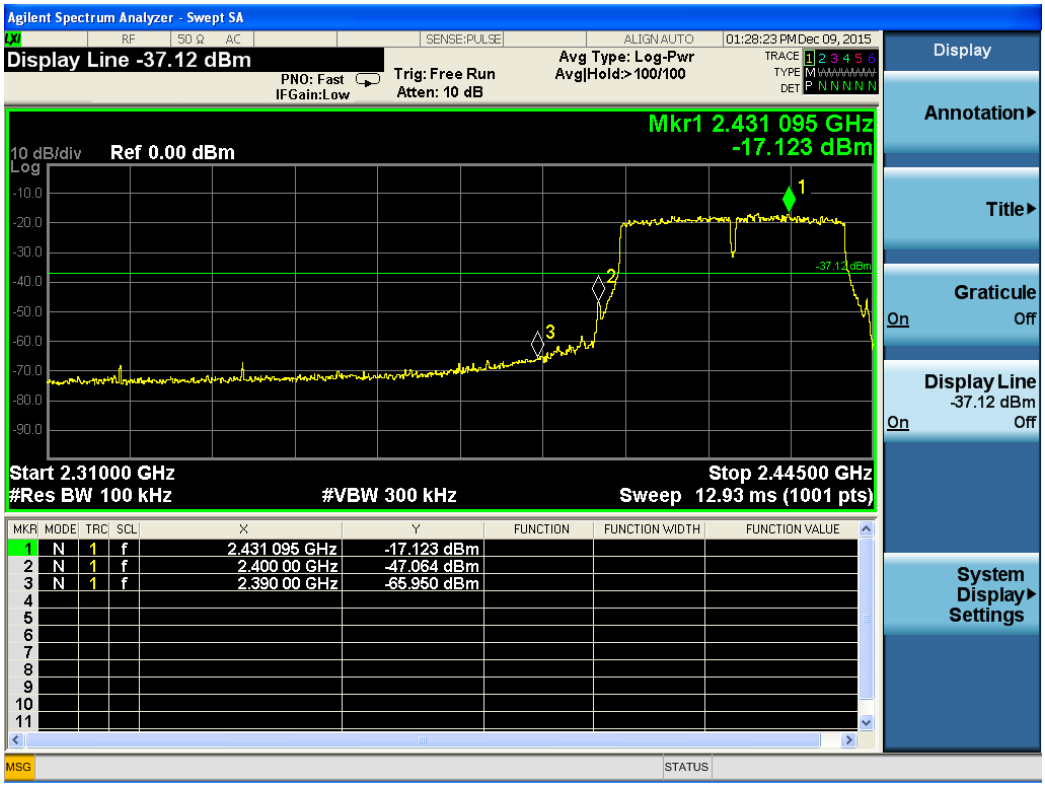

Agilent Spectrum Analyzer - Swept SA
Display Line -33.66 dBm
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 10 dB
Avg Type: Log-Pwr
Avg|Hold:>100/100
01:23:43 PM Dec 09, 2015
Mkr1 2.461 70 GHz
-13.664 dBm
10 dB/div Ref 0.00 dBm
Start 2.45000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 2.50000 GHz
Sweep 4.800 ms (1001 pts)
MKR MODE TRC SCL X Y FUNCTION FUNCTION WIDTH FUNCTION VALUE
1 N 1 f 2.461 70 GHz -13.664 dBm
2 N 1 f 2.483 50 GHz -66.921 dBm
Display
Annotation
Title
Graticule
On Off
Display Line
-33.66 dBm
On Off
System Display Settings
MSG
STATUS

802.11n HT20


Agilent Spectrum Analyzer - Swept SA
Display Line -35.15 dBm
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 10 dB
Avg Type: Log-Pwr
Avg|Hold:>100/100
01:27:24 PM Dec 09, 2015
Mkr1 2.410 51 GHz
-15.147 dBm
10 dB/div
Ref 0.00 dBm
Start 2.31000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 2.42500 GHz
Sweep 11.00 ms (1001 pts)
1 N 1 f 2.410 51 GHz -15.147 dBm
2 N 1 f 2.400 00 GHz -49.925 dBm
3 N 1 f 2.390 00 GHz -67.947 dBm
Display
Annotation
Title
Graticule
Display Line
System Display Settings

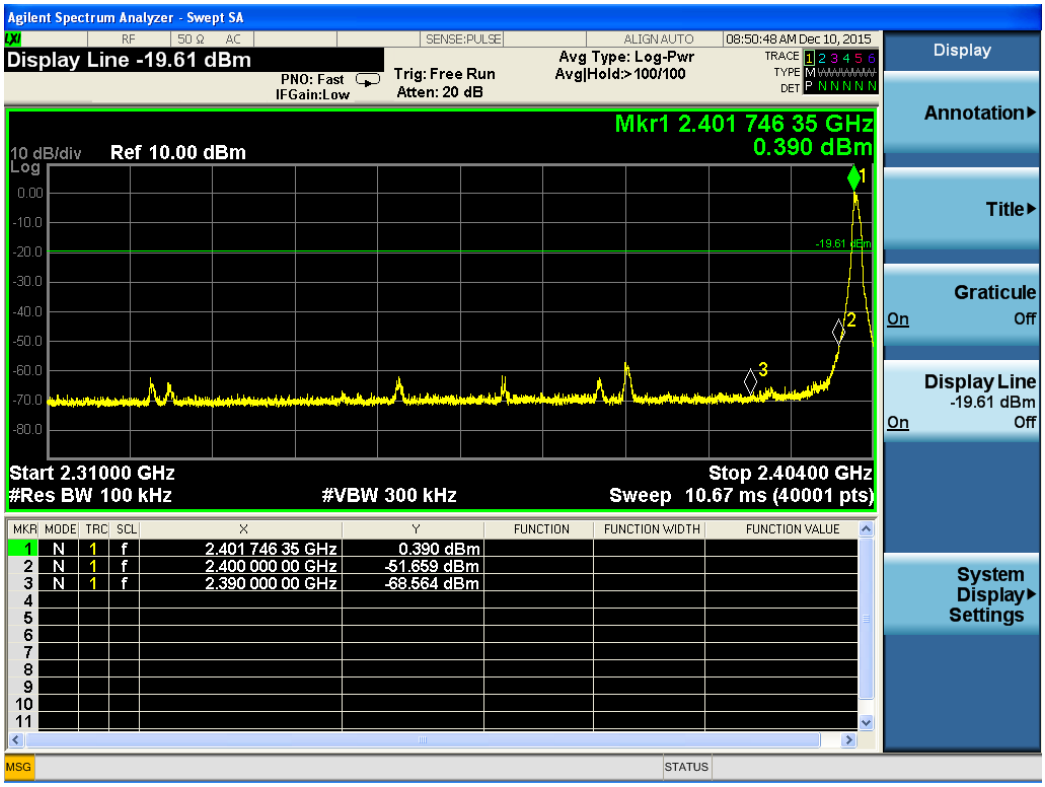

Agilent Spectrum Analyzer - Swept SA
Display Line -34.22 dBm
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 10 dB
Avg Type: Log-Pwr
Avg|Hold:>100/100
01:22:37 PM Dec 09, 2015
Mkr1 2.461 35 GHz
-14.215 dBm
10 dB/div
Ref 0.00 dBm
Start 2.45000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 2.50000 GHz
Sweep 4.800 ms (1001 pts)
1 N 1 f 2.461 35 GHz -14.215 dBm
2 N 1 f 2.483 50 GHz -67.364 dBm
Display
Annotation
Title
Graticule
Display Line
System Display Settings

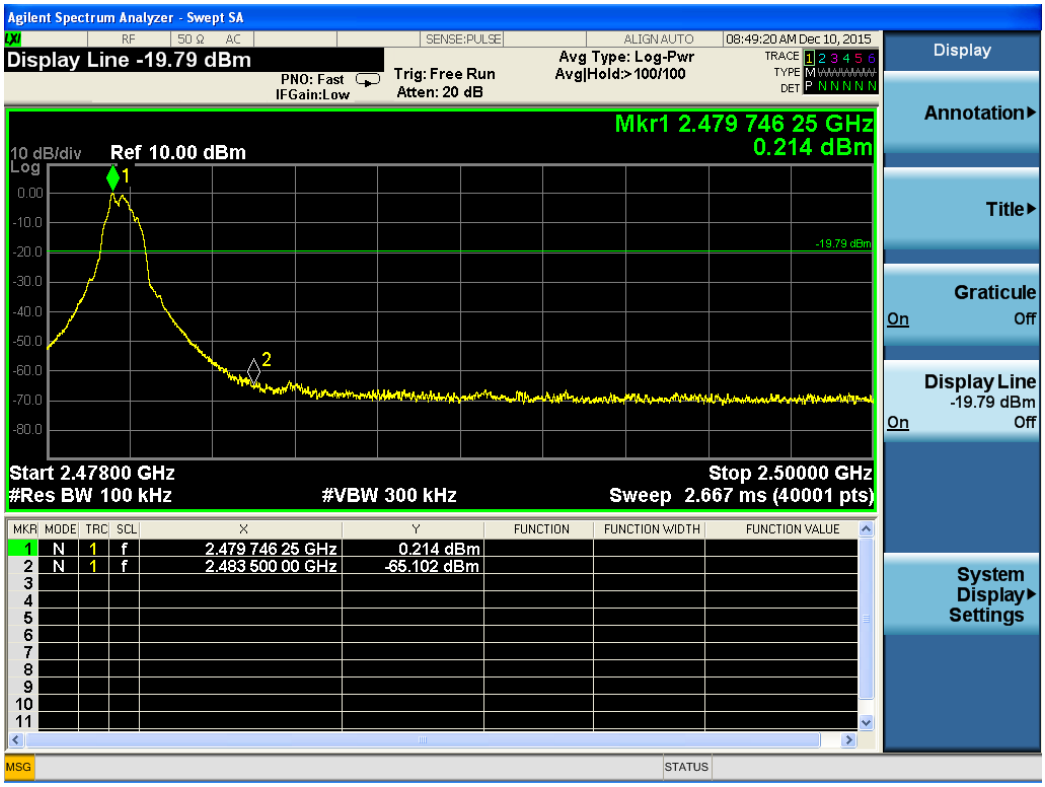
802.11n HT40


Agilent Spectrum Analyzer - Swept SA
Display Line -37.12 dBm
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 10 dB
Avg Type: Log-Pwr
Avg|Hold:>100/100
01:28:23 PM Dec 09, 2015
Mkr1 2.431 095 GHz
-17.123 dBm
10 dB/div Ref 0.00 dBm
Start 2.31000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 2.44500 GHz
Sweep 12.93 ms (1001 pts)
1 N 1 f 2.431 095 GHz -17.123 dBm
2 N 1 f 2.400 00 GHz -47.064 dBm
3 N 1 f 2.390 00 GHz -65.950 dBm
Display
Annotation
Title
Graticule
Display Line
System Display Settings

Agilent Spectrum Analyzer - Swept SA
Display Line -36.68 dBm
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 10 dB
Avg Type: Log-Pwr
Avg|Hold:>100/100
01:21:16 PM Dec 09, 2015
Mkr2 2.483 50 GHz
-64.460 dBm
10 dB/div Ref 0.00 dBm
Start 2.43000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 2.50000 GHz
Sweep 6.733 ms (1001 pts)
1 N 1 f 2.454 78 GHz -16.680 dBm
2 N 1 f 2.483 50 GHz -64.460 dBm
Display
Annotation
Title
Graticule
Display Line
System Display Settings

BT V4.0


Agilent Spectrum Analyzer - Swept SA
Display Line -19.61 dBm
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold:>100/100
08:50:48 AM Dec 10, 2015
Mkr1 2.401 746 35 GHz
0.390 dBm
10 dB/div
Ref 10.00 dBm
Start 2.31000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 2.40400 GHz
Sweep 10.67 ms (40001 pts)
1 N 1 f 2.401 746 35 GHz 0.390 dBm
2 N 1 f 2.400 000 00 GHz -51.659 dBm
3 N 1 f 2.390 000 00 GHz -68.564 dBm
Display
Annotation
Title
Graticule
Display Line
System Display Settings


Agilent Spectrum Analyzer - Swept SA
Display Line -19.79 dBm
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold:>100/100
08:49:20 AM Dec 10, 2015
Mkr1 2.479 746 25 GHz
0.214 dBm
10 dB/div
Ref 10.00 dBm
Start 2.47800 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 2.50000 GHz
Sweep 2.667 ms (40001 pts)
1 N 1 f 2.479 746 25 GHz 0.214 dBm
2 N 1 f 2.483 500 00 GHz -65.102 dBm
Display
Annotation
Title
Graticule
Display Line
System Display Settings

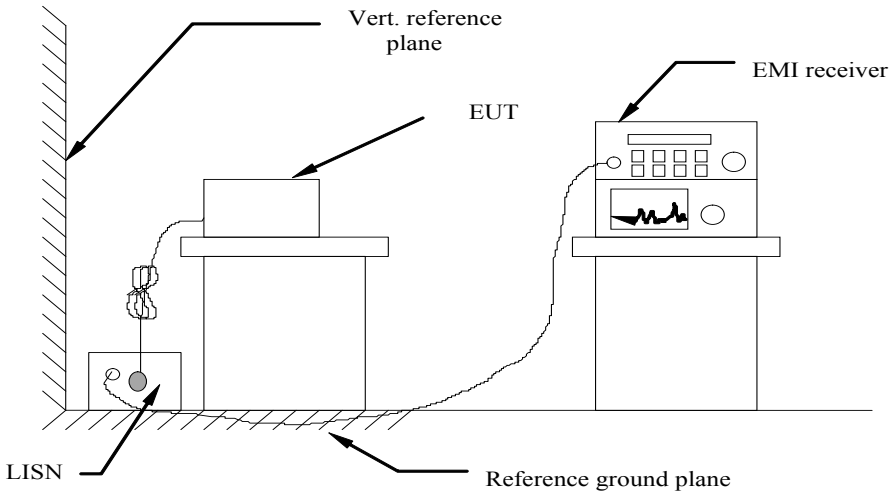
5.7. Power line conducted emissions

5.7.1 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 (MHz)	Limits (dBμV)	
	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

5.7.2 Block Diagram of Test Setup

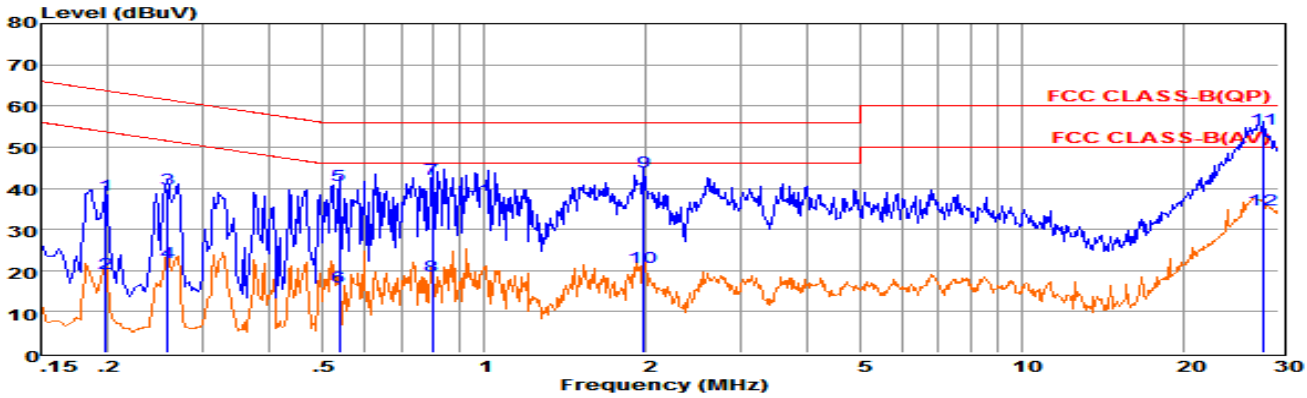


5.7.3 Test Results

PASS.

The test data please refer to following page.

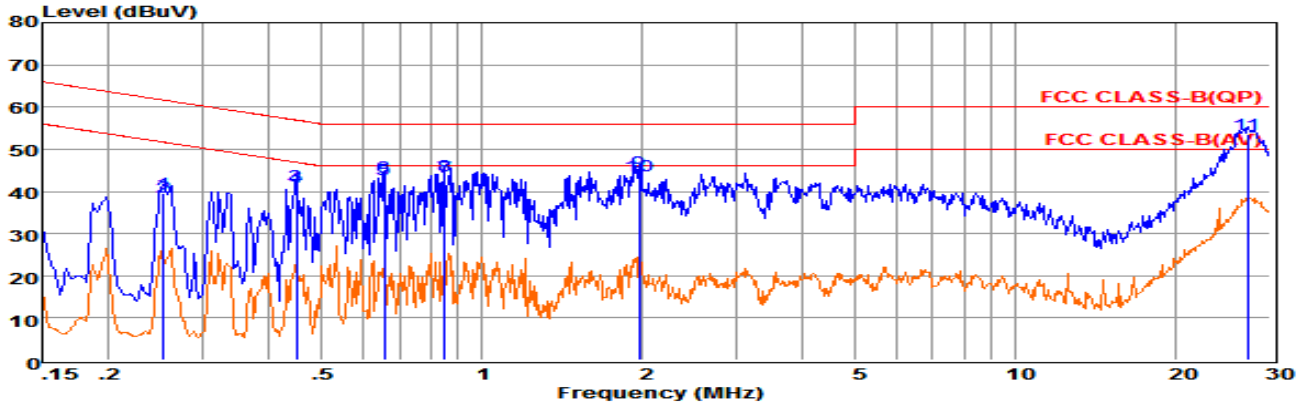
Test result for 802.11b(AC 120V)



Env. Ins: 24*/56%
Power Rating: AC 120V/60Hz
Pol: NEUTRAL

	Freq MHz	Reading dBpW	LisnFac dB	CabLos dB	Measured dBpW	Limit dBpW	Over dB	Remark
1	0.20	18.82	9.59	0.02	38.43	63.71	-25.28	QP
2	0.20	-0.31	9.59	0.02	19.30	53.71	-34.41	Average
3	0.26	20.19	9.60	0.03	39.82	61.51	-21.69	QP
4	0.26	2.32	9.60	0.03	21.95	51.51	-29.56	Average
5	0.54	21.04	9.62	0.04	40.70	56.00	-15.30	QP
6	0.54	-3.46	9.62	0.04	16.20	46.00	-29.80	Average
7	0.80	22.53	9.63	0.04	42.20	56.00	-13.80	QP
8	0.80	-0.89	9.63	0.04	18.78	46.00	-27.22	Average
9	1.98	24.25	9.63	0.05	43.93	56.00	-12.07	QP
10	1.98	1.05	9.63	0.05	20.73	46.00	-25.27	Average
11	28.15	34.38	9.84	0.14	54.36	60.00	-5.64	QP
12	28.15	14.69	9.84	0.14	34.67	50.00	-15.33	Average

Remarks: 1. Measured = Reading + Lisn Factor +Cable Loss.
2. The emission levels that are 20dB below the official limit are not reported.

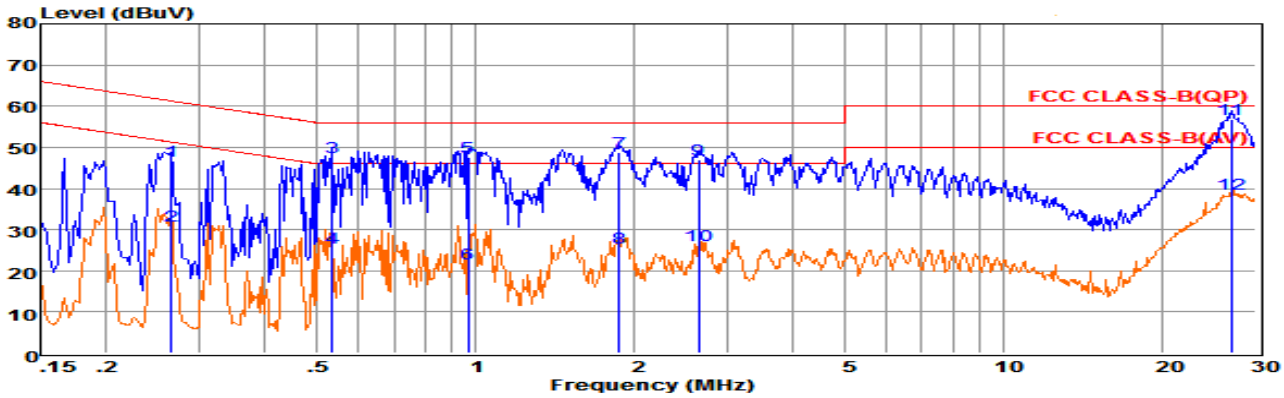


Env. Ins: 24*/56%
Power Rating: AC 120V/60Hz
Pol: LINE

	Freq MHz	Reading dBpW	LisnFac dB	CabLos dB	Measured dBpW	Limit dBpW	Over dB	Remark
1	0.25	19.91	9.63	0.03	39.57	61.64	-22.07	QP
2	0.25	19.02	9.63	0.03	38.68	51.64	-12.96	Average
3	0.45	21.63	9.62	0.04	41.29	56.89	-15.60	QP
4	0.45	21.47	9.62	0.04	41.13	46.89	-5.76	Average
5	0.66	23.17	9.64	0.04	42.85	56.00	-13.15	QP
6	0.66	23.66	9.64	0.04	43.34	46.00	-2.66	Average
7	0.85	23.86	9.63	0.04	43.53	56.00	-12.47	QP
8	0.85	24.01	9.63	0.04	43.68	46.00	-2.32	Average
9	1.97	24.78	9.64	0.05	44.47	56.00	-11.53	QP
10	1.97	24.08	9.64	0.05	43.77	46.00	-2.23	Average
11	27.27	33.62	9.71	0.13	53.46	60.00	-6.54	QP

Remarks: 1. Measured = Reading + Lisn Factor +Cable Loss.
2. The emission levels that are 20dB below the official limit are not reported.

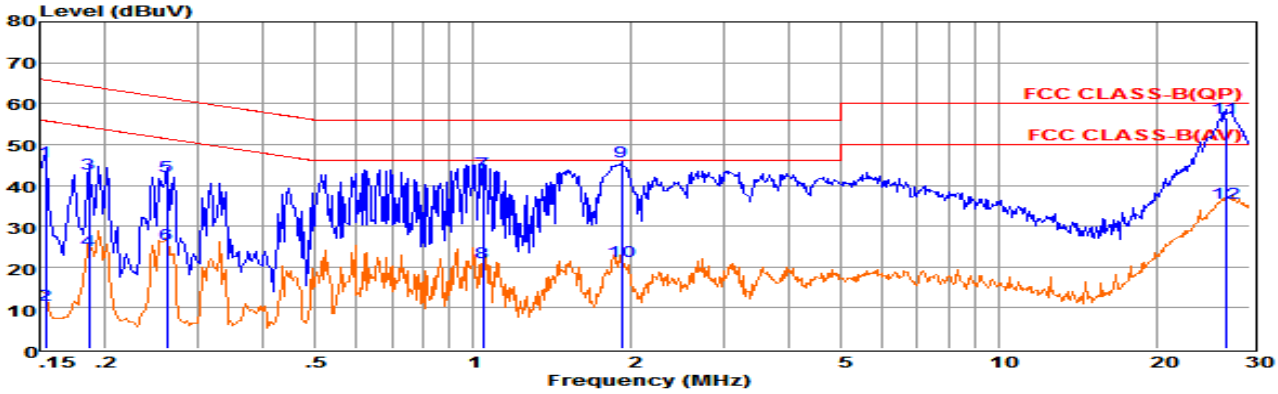
Test result for 802.11b(AC 240V)



Env. Ins: 24*/56%
Power Rating: AC 240V/60Hz
Pol: NEUTRAL

	Freq MHz	Reading dBpW	LisnFac dB	CabLos dB	Measured dBpW	Limit dBpW	Over dB	Remark
1	0.27	27.11	9.60	0.03	46.74	61.25	-14.51	QP
2	0.27	11.35	9.60	0.03	30.98	51.24	-20.26	Average
3	0.53	28.07	9.62	0.04	47.73	56.00	-8.27	QP
4	0.54	5.93	9.62	0.04	25.59	46.00	-20.41	Average
5	0.97	28.02	9.63	0.05	47.70	56.00	-8.30	QP
6	0.97	2.12	9.63	0.05	21.80	46.00	-24.20	Average
7	1.87	29.08	9.63	0.05	48.76	56.00	-7.24	QP
8	1.87	5.81	9.63	0.05	25.49	46.00	-20.51	Average
9	2.65	27.36	9.64	0.05	47.05	56.00	-8.95	QP
10	2.65	6.44	9.64	0.05	26.13	46.00	-19.87	Average
11	26.98	36.84	9.83	0.13	56.80	60.00	-3.20	QP
12	26.98	18.67	9.83	0.13	38.63	50.00	-11.37	Average

Remarks: 1. Measured = Reading + Lisn Factor +Cable Loss.
2. The emission levels that are 20dB below the official limit are not reported.



Env. Ins: 24*/56%
Power Rating: AC 240V/60Hz
Pol: LINE

	Freq MHz	Reading dBpW	LisnFac dB	CabLos dB	Measured dBpW	Limit dBpW	Over dB	Remark
1	0.15	26.19	9.58	0.02	45.79	65.78	-19.99	QP
2	0.15	-9.00	9.58	0.02	10.60	55.77	-45.17	Average
3	0.19	23.28	9.62	0.02	42.92	64.20	-21.28	QP
4	0.19	4.54	9.62	0.02	24.18	54.19	-30.01	Average
5	0.26	22.70	9.63	0.03	42.36	61.38	-19.02	QP
6	0.26	5.93	9.63	0.03	25.59	51.38	-25.79	Average
7	1.04	23.55	9.63	0.05	43.23	56.00	-12.77	QP
8	1.04	1.46	9.63	0.05	21.14	46.00	-24.86	Average
9	1.92	26.10	9.64	0.05	45.79	56.00	-10.21	QP
10	1.92	1.84	9.64	0.05	21.53	46.00	-24.47	Average
11	26.98	36.64	9.71	0.13	56.48	60.00	-3.52	QP
12	26.98	15.95	9.71	0.13	35.79	50.00	-14.21	Average

Remarks: 1. Measured = Reading + Lisn Factor +Cable Loss.
2. The emission levels that are 20dB below the official limit are not reported.

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

5.8. Antenna Requirements

5.8.1 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.

5.8.2 Antenna Connected Construction

5.8.2.1. Standard Applicable

According to § 15.203 & RSS-Gen, 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.

5.8.2.2. Antenna Connector Construction

The directional gains of antenna used for transmitting is 3.0dBi, and the antenna is connect to PCB board and no consideration of replacement. Please see EUT photo for details.

5.8.2.3. Results: Compliance.

Measurement parameters:

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

Note: The antenna gain of the complete system is calculated by the difference of radiated power in EIRP and the conducted power of the module. For normal WLAN devices, the DSSS mode is used.

Limits:

FCC	IC
Antenna Gain	
6dBi	

Tnom	Vnom	Lowest channel 2412 MHz	Middle channel 2437 MHz	Highest channel 2462 MHz
Conducted power [dBm] Measured with DSSS modulation		3.54	3.40	3.77
Radiated power [dBm] Measured with DSSS modulation		3.46	3.28	3.73
Gain [dBi] Calculated		-0.08	-0.12	-0.04
Measurement uncertainty			± 1.5 dB (cond.) / ± 3 dB (rad.)	

Result: -/-

6. LIST OF MEASURING EQUIPMENTS

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
Signal analyzer	Agilent	N9020A	MY50510140	9kHz~26.5GHz	October 27, 2014	October 26, 2015
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, 2016
RF Cable-CON	UTIFLEX	3102-26886-4	CB049	9KHz-30MHz	June 18, 2015	June 17, 2016
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, 2016
Amplifier	Agilent	8449B	3008A02120	1GHz-26.5GHz	July 16, 2015	July 15, 2016
Amplifier	MITEQ	AMF-6F-260400	9121372	26.5GHz-40GHz	July 16, 2015	July 15, 2016
Loop Antenna	R&S	HFH2-Z2	860004/001	9k-30MHz	June 18, 2015	June 17, 2016
By-log Antenna	SCHWARZBECK	VULB9163	9163-470	30MHz-1GHz	June 10, 2015	June 09, 2016
Horn Antenna	EMCO	3115	6741	1GHz-18GHz	June 10, 2015	June 09, 2016
Horn Antenna	SCHWARZBECK	BBHA9170	BBHA9170154	15GHz-40GHz	June 10, 2015	June 09, 2016
RF Cable-R03m	Jye Bao	RG142	CB021	30MHz-1GHz	June 18, 2015	June 17, 2016
RF Cable-HIGH	SUHNER	SUCOFLEX 106	03CH03-HY	1GHz-40GHz	June 18, 2015	June 17, 2016
Spectrum Meter	R&S	FSP 30	100023	9kHz-30GHz	July 16, 2015	July 15, 2016
Power Meter	R&S	NRVS	100444	DC-40GHz	June 18, 2015	June 17, 2016
Power Sensor	R&S	NRV-Z51	100458	DC-30GHz	June 18, 2015	June 17, 2016
Power Sensor	R&S	NRV-Z32	10057	30MHz-6GHz	June 18, 2015	June 17, 2016
AC Power Source	HPC	HPA-500E	HPA-9100024	AC 0~300V	June 18, 2015	June 17, 2016
DC power Soure	GW	GPC-6030D	C671845	DC 1V-60V	June 18, 2015	June 17, 2016
Temp. and Humidigy	Giant Force	GTH-225-20-S	MAB0103-00	N/A	June 18, 2015	June 17, 2016
RF CABLE-1m	JYE Bao	RG142	CB034-1m	20MHz-7GHz	June 18, 2015	June 17, 2016
RF CABLE-2m	JYE Bao	RG142	CB)35-2m	20MHz-1GHz	June 18, 2015	June 17, 2016
Vector signal Generator	R&S	SMU200A	102098	100kHz~6GHz	June 18, 2015	June 17, 2016
Signal Generator	R&S	SMR40	10016	10MHz~40GHz	July 16, 2015	July 15, 2016
Note: All equipment through GRGT EST calibration						

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