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FCC RADIO TEST REPORT

Applicant's company	**Broadcom Corporation**
Applicant Address	190 Mathilda Place Sunnyvale CA 94086 U.S.A.
FCC ID	**QDS-BRCM1085**
Manufacturer's company	**Broadcom Corporation**
Manufacturer Address	190 Mathilda Place Sunnyvale CA 94086 U.S.A.

Product Name	Broadcom 802.11a/b/g/n/ac WLAN + Bluetooth PCI-E NGFF 2230 Card
Brand Name	Broadcom
Model No.	BCM94356Z
Part No.	BCM94356Z, BCM94356ZAE
Test Rule	47 CFR FCC Part 15 Subpart C § 15.247
Test Freq. Range	2400 ~ 2483.5MHz
Received Date	Jul. 31, 2014
Final Test Date	Dec. 30, 2014
Submission Type	Class II Change

Statement

Test result included in this report is for the IEEE 802.11n and IEEE 802.11b/g of the product.

The test result in this report refers exclusively to the presented test model / sample.

Without written approval of SPORTON International Inc., the test report shall not be reproduced except in full.

The measurements and test results shown in this test report were made in accordance with the procedures and found in compliance with the limit given in **ANSI C63.10-2013**, **47 CFR FCC Part 15 Subpart C**, **KDB 558074 D01 v03r02** and **KDB 662911 D01 v02r01**.

The test equipment used to perform the test is calibrated and traceable to NML/ROC.

Testing Laboratory
1190

Table of Contents

History of This Test Report

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR473142-03	Rev. 01	Initial issue of report	Jan. 07, 2015

Certificate No.: CB10312266

1. CERTIFICATE OF COMPLIANCE

Product Name	:	**Broadcom 802.11a/b/g/n/ac WLAN + Bluetooth PCI-E NGFF 2230 Card**
Brand Name	:	**Broadcom**
Model No.	:	**BCM94356Z**
Part No.	:	**BCM94356Z, BCM94356ZAE**
Applicant	:	**Broadcom Corporation**
Test Rule Part(s)	:	**47 CFR FCC Part 15 Subpart C § 15.247**

Sporton International as requested by the applicant to evaluate the EMC performance of the product sample received on Jul. 31, 2014 would like to declare that the tested sample has been evaluated and found to be in compliance with the tested rule parts. The data recorded as well as the test configuration specified is true and accurate for showing the sample's EMC nature.

Sam Chen
SPORTON INTERNATIONAL INC.

2. SUMMARY OF THE TEST RESULT

Applied Standard: 47 CFR FCC Part 15 Subpart C				
Part	**Rule Section**	**Description of Test**	**Result**	**Under Limit**
4.1	15.247(b)(3)	Maximum Conducted Output Power	Complies	15.69 dB
4.2	15.247(e)	Power Spectral Density	Complies	14.31 dB
4.3	15.247(a)(2)	6dB Spectrum Bandwidth	Complies	-
4.4	15.247(d)	Radiated Emissions	Complies	18.06 dB
4.5	15.247(d)	Band Edge Emissions	Complies	0.06 dB
4.6	15.203	Antenna Requirements	Complies	-

3. GENERAL INFORMATION

3.1. Product Details

IEEE 802.11n

Items	Description
Product Type	WLAN (2TX, 2RX)
Radio Type	Intentional Transceiver
Power Type	From host system
Modulation	see the below table for IEEE 802.11n
Data Modulation	OFDM (BPSK / QPSK / 16QAM / 64QAM)
Data Rate (Mbps)	see the below table for IEEE 802.11n
Frequency Range	2400 ~ 2483.5MHz
Channel Number	13 for 20MHz bandwidth ; 9 for 40MHz bandwidth
Channel Band Width (99%)	MCS0 (HT20): 17.52 MHz ; MCS0 (HT40): 36.48 MHz
Maximum Conducted Output Power	MCS0 (HT20): 13.38 dBm ; MCS0 (HT40): 13.04 dBm
Carrier Frequencies	Please refer to section 3.4
Antenna	Please refer to section 3.3

IEEE 802.11b/g

Items	Description
Product Type	WLAN (2TX, 2RX)
Radio Type	Intentional Transceiver
Power Type	From host system
Modulation	DSSS for IEEE 802.11b ; OFDM for IEEE 802.11g
Data Modulation	DSSS (BPSK / QPSK / CCK) ; OFDM (BPSK / QPSK / 16QAM / 64QAM)
Data Rate (Mbps)	DSSS (1/ 2/ 5.5/11) ; OFDM (6/9/12/18/24/36/48/54)
Frequency Range	2400 ~ 2483.5MHz
Channel Number	13
Channel Band Width (99%)	11b: 11.52 MHz ; 11g: 16.64 MHz
Maximum Conducted Output Power	11b: 14.16 dBm ; 11g: 14.31 dBm
Carrier Frequencies	Please refer to section 3.4
Antenna	Please refer to section 3.3

Items	Description	
Beamforming Function	☒ With beamforming	☐ Without beamforming
STBC Function	☒ With STBC	☐ Without STBC

Note: 1. The EUT has beamforming function for 802.11n/ac in 5GHz band 1~4.

2. The EUT has STBC function for 802.11n/ac in 5GHz band 1~4.

3. The MIMO transmission mode is correlated.

Antenna and Band width

Antenna	Two (TX)	
Band width Mode	20 MHz	40 MHz
IEEE 802.11b	V	X
IEEE 802.11g	V	X
IEEE 802.11n	V	V

IEEE 11n Spec.

Protocol	Number of Transmit Chains (NTX)	Data Rate / MCS
802.11n (HT20)	2	MCS 0-15
802.11n (HT40)	2	MCS 0-15
Note 1: IEEE Std. 802.11n modulation consists of HT20 and HT40 (HT: High Throughput). Then EUT support HT20 and HT40. Note 2: Modulation modes consist of below configuration: HT20/HT40: IEEE 802.11n		

3.2. Accessories

N/A

3.3. Table for Filed Antenna

Set	Ant.	Brand	Part No.	Antenna Type	Connector	Gain (dBi)				
						2.4G/ BT	5G B1	5G B2	5G B3	5G B4
1	1	MAG.LAYERS	PCA-4077-25GC1-A1-RT	WLAN/BT antenna	I-PEX A13	3.33	5.85	5.85	6.21	6.21
	2	MAG.LAYERS	PCA-4077-25GC1-A1-RT	WLAN/BT antenna	I-PEX A13	3.33	5.85	5.85	6.21	6.21

Note: The EUT has one set of antenna, and each set contains two antennas.

Chain 1: Connect to Ant. 1, Chain 2: Connect to Ant. 2.

For 2.4 GHz WLAN function (2TX/2RX):

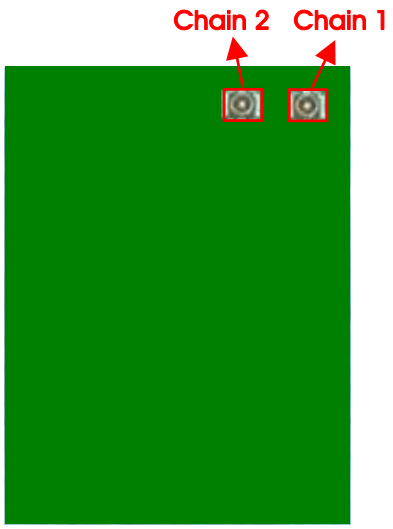
Chain 1 and Chain 2 could transmit/receive simultaneously.

For Bluetooth function (1TX/1RX):

Only Chain 1 could transmit/receive simultaneously.

For 5 GHz WLAN function (2TX/2RX):

Chain 1 and Chain 2 could transmit/receive simultaneously.



3.4. Table for Carrier Frequencies

There are two bandwidth systems.

For 20MHz bandwidth systems, use Channel 1~Channel 13.

For 40MHz bandwidth systems, use Channel 3~Channel 11.

Frequency Band	Channel No.	Frequency	Channel No.	Frequency
2400~2483.5MHz	1	2412 MHz	8	2447 MHz
	2	2417 MHz	9	2452 MHz
	3	2422 MHz	10	2457 MHz
	4	2427 MHz	11	2462 MHz
	5	2432 MHz	12	2467 MHz
	6	2437 MHz	13	2472 MHz
	7	2442 MHz	-	-

3.5. Table for Test Modes

Preliminary tests were performed in different data rate to find the worst radiated emission. The data rate shown in the table below is the worst-case rate with respect to the specific test item. Investigation has been done on all the possible configurations for searching the worst cases. The following table is a list of the test modes shown in this test report.

Test Items	Mode	Data Rate	Channel	Chain
Maximum Conducted Output Power	802.11n HT20	MCS0	13	1+2
	802.11n HT40	MCS0	11	1+2
	11b/BPSK	1 Mbps	13	1+2
	11g/BPSK	6 Mbps	13	1+2
Power Spectral Density	802.11n HT20	MCS0	13	1+2
	802.11n HT40	MCS0	11	1+2
	11b/BPSK	1 Mbps	13	1+2
	11g/BPSK	6 Mbps	13	1+2
6dB Spectrum Bandwidth	802.11n HT20	MCS0	13	1+2
	802.11n HT40	MCS0	11	1+2
	11b/BPSK	1 Mbps	13	1+2
	11g/BPSK	6 Mbps	13	1+2
Radiated Emissions 1GHz~10th Harmonic	802.11n HT20	MCS0	13	1+2
	802.11n HT40	MCS0	11	1+2
	11b/BPSK	1 Mbps	13	1+2
	11g/BPSK	6 Mbps	13	1+2
Band Edge Emissions	802.11n HT20	MCS0	13	1+2
	802.11n HT40	MCS0	11	1+2
	11b/BPSK	1 Mbps	13	1+2
	11g/BPSK	6 Mbps	13	1+2

The following test modes were performed for all tests:

For Radiated Emissions above 1GHz test:

Radiated Emissions above 1GHz test was perform at its 3-axis (X-axis, Y-axis and Z-axis). X-axis was the worst case, so it's recorded in this test report.

3.6. Table for Testing Locations

Test Site Location				
Address:	No.8, Lane 724, Bo-ai St., Jhubei City, Hsinchu County 302, Taiwan, R.O.C.			
TEL:	886-3-656-9065			
FAX:	886-3-656-9085			
Test Site No.	**Site Category**	**Location**	**FCC Reg. No.**	**IC File No.**
03CH01-CB	SAC	Hsin Chu	262045	IC 4086D
CO01-CB	Conduction	Hsin Chu	262045	IC 4086D
TH01-CB	OVEN Room	Hsin Chu	-	-

Open Area Test Site (OATS); Semi Anechoic Chamber (SAC).

3.7. Table for Multiple Listing

The EUT has two part numbers which are identical to each other in all aspects except for the following table:

Model No.	Part No.	Description
BCM94356Z	BCM94356Z	The base pin between these two models is different.
	BCM94356ZAE	

From the above models, part number: BCM94356Z was selected as representative model for the test and its data was recorded in this report.

3.8. Table for Class II Change

This product is an extension of original one reported under Sporton project number: FR473142

Below is the table for the change of the product with respect to the original one.

Modifications	Performance Checking
1. Adding channel 13 for 20MHz bandwidth systems use. 2. Adding channel 11 for 40MHz bandwidth systems use.	1. Maximum Conducted Output Power. 2. Power Spectral Density. 3. 6dB Spectrum Bandwidth. 4. Radiated Emissions 1GHz~10th Harmonic. 5. Band Edge Emissions.

Note: 1. For Radiated Out of Band Emission Reference Level are based on original test report.

2. Maximum Permissible Exposure: adding channel 13 (20MHz bandwidth) and channel 11 (40MHz bandwidth) of 2.4GHz WLAN Band, others are based on original test report (please refer to Report No.: FA473142-03).

3.9. Table for Supporting Units

For Test Site No: TH01-CB

Support Unit	Brand	Model	FCC ID
NB	DELL	E6430	DoC
Test fixture	Broadcom	BCM9NGFF2EC_1	N/A

For Test Site No: 03CH01-CB

Support Unit	Brand	Model	FCC ID
NB	DELL	E4300	RSE-TG233
Test fixture	Broadcom	BCM9NGFF2EC_1	N/A

3.10. Table for Parameters of Test Software Setting

During testing, Channel and Power Controlling Software provided by the customer was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output power expected by the customer and is going to be fixed on the firmware of the final end product.

Power Parameters of IEEE 802.11n

Test Software Version	Manual Tool version: 2.0.2.1
Frequency	2472 MHz
MCS0 HT20	45
Frequency	2462 MHz
MCS0 HT40	45

Power Parameters of IEEE 802.11b/g

Test Software Version	Manual Tool version: 2.0.2.1
Frequency	2472 MHz
IEEE 802.11b	46
IEEE 802.11g	48

3.11. EUT Operation during Test

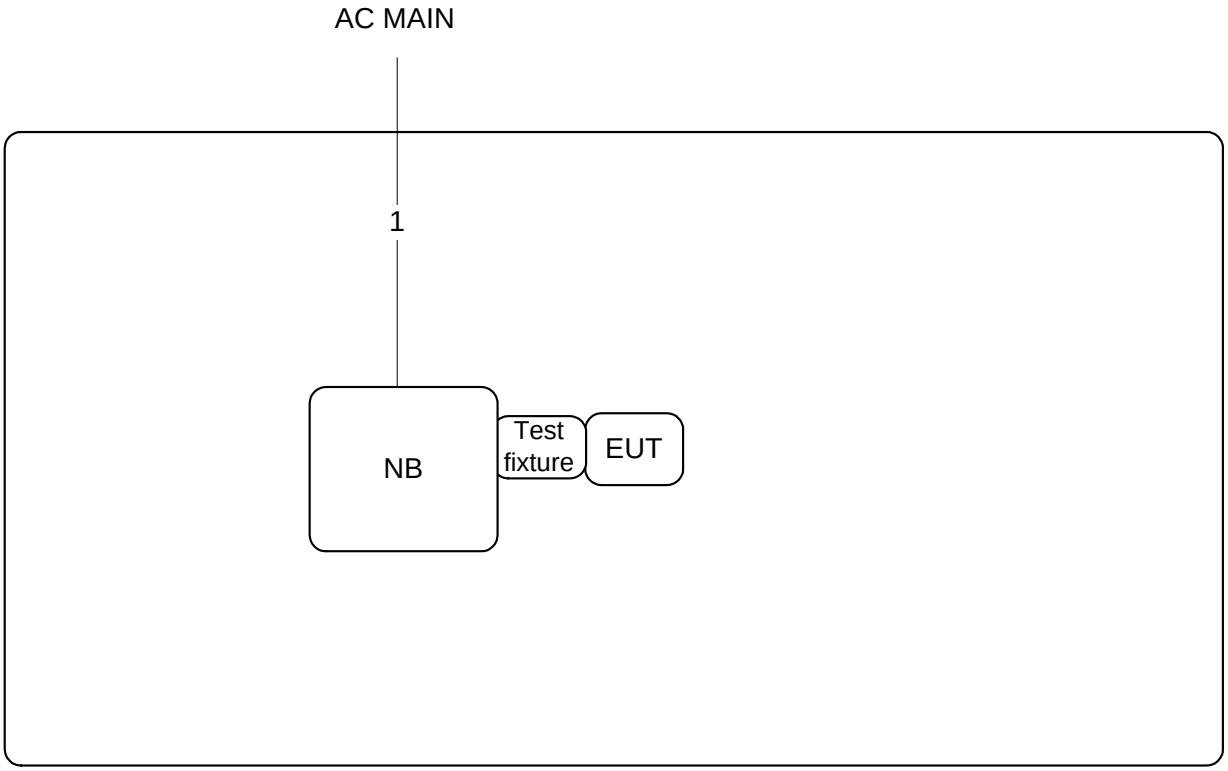
The EUT was programmed to be in continuously transmitting mode.

3.12. Duty Cycle

Mode	On Time (ms)	On+Off Time (ms)	Duty Cycle (%)	Duty Factor (dB)	1/T Minimum VBW (kHz)
802.11n MCS0 HT20	12.44	13.04	95.40	0.20	0.08
802.11n MCS0 HT40	2.06	2.16	95.37	0.21	0.49
802.11b	1.92	2.01	95.52	0.20	0.52
802.11g	0.93	1.03	90.29	0.44	1.08

3.13. Test Configurations

3.13.1. Radiation Emissions Test Configuration



Item	Connection	Shielded	Length
1	Power cable	No	1.8m

4. TEST RESULT

4.1. Maximum Conducted Output Power Measurement

4.1.1. Limit

For systems using digital modulation in the 2400-2483.5MHz, the limit for 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.

4.1.2. Measuring Instruments and Setting

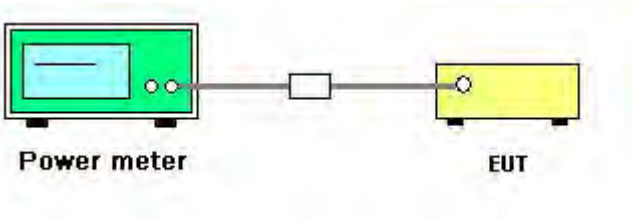
Please refer to section 5 of equipments list in this report. The following table is the setting of the power meter.

Power Meter Parameter	Setting
Bandwidth	50MHz bandwidth is greater than the EUT emission bandwidth
Detector	Average

4.1.3. Test Procedures

1. Test procedures refer KDB 558074 D01 v03r02 section 9.2.3.2 Measurement using a power meter (PM).
2. Multiple antenna systems was performed in accordance with KDB 662911 D01 v02r01 Emissions Testing of Transmitters with Multiple Outputs in the Same Band.
3. This procedure provides an alternative for determining the RMS output power using a broadband RF average power meter with a thermocouple detector.

4.1.4. Test Setup Layout



4.1.5. Test Deviation

There is no deviation with the original standard.

4.1.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

4.1.7. Test Result of Maximum Conducted Output Power

Temperature	20°C	Humidity	52%
Test Engineer	James Chou	Configurations	IEEE 802.11n
Test Date	Dec. 24, 2014		

Configuration IEEE 802.11n MCS0 HT20

Channel	Frequency	Conducted Power (dBm)			Max. Limit (dBm)	Result
		Chain 1	Chain 2	Total		
13	2472 MHz	10.74	9.97	13.38	30.00	Complies

Configuration IEEE 802.11n MCS0 HT40

Channel	Frequency	Conducted Power (dBm)			Max. Limit (dBm)	Result
		Chain 1	Chain 2	Total		
11	2462 MHz	10.51	9.48	13.04	30.00	Complies

Temperature	20°C	Humidity	52%
Test Engineer	James Chou	Configurations	IEEE 802.11b/g
Test Date	Dec. 24, 2014		

Configuration IEEE 802.11b

Channel	Frequency	Conducted Power (dBm)			Max. Limit (dBm)	Result
		Chain 1	Chain 2	Total		
13	2472 MHz	11.46	10.81	14.16	30.00	Complies

Configuration IEEE 802.11g

Channel	Frequency	Conducted Power (dBm)			Max. Limit (dBm)	Result
		Chain 1	Chain 2	Total		
13	2472 MHz	11.44	11.16	14.31	30.00	Complies

4.2. Power Spectral Density Measurement

4.2.1. Limit

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.

4.2.2. Measuring Instruments and Setting

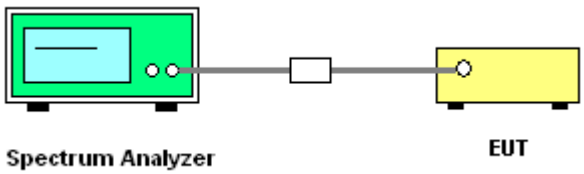
Please refer to section 5 of equipments list in this report. The following table is the setting of the spectrum analyzer.

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	Set the span to 1.5 times the DTS channel bandwidth.
RBW	3 kHz ≤ RBW ≤ 100kHz
VBW	≥ 3 x RBW
Detector	Peak
Trace	Max Hold
Sweep Time	Auto couple

4.2.3. Test Procedures

1. Test was performed in accordance with KDB 558074 D01 v03r02 for Performing Compliance Measurements on Digital Transmission Systems (DTS) - section 10.2 Method PKPSD (peak PSD) and KDB 662911 D01 v02r01 section In-Band Power Spectral Density (PSD) Measurements option (b) Measure and sum spectral maximal across the outputs.
2. Use this procedure when the maximum conducted output power in the fundamental emission is used to demonstrate compliance. The EUT must be configured to transmit continuously at full power over the measurement duration.
3. Ensure that the number of measurement points in the sweep ≥ 2 x span/RBW (use of a greater number of measurement points than this minimum requirement is recommended).
4. Use the peak marker function to determine the maximum level in any 3 kHz band segment within the fundamental EBW.
5. The resulting PSD level must be ≤ 8 dBm.

4.2.4. Test Setup Layout



4.2.5. Test Deviation

There is no deviation with the original standard.

4.2.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

4.2.7. Test Result of Power Spectral Density

Temperature	20°C	Humidity	52%
Test Engineer	James Chou	Configurations	IEEE 802.11n

Configuration IEEE 802.11n MCS0 HT20

Channel	Frequency	Power Density (dBm/3kHz)			Power Density Limit (dBm/3kHz)	Result
		Chain 1	Chain 2	Total		
13	2472 MHz	-13.87	-14.38	-11.11	7.66	Complies

Note: Directional gain= $10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right]$ =6.34dBi>6dBi, so limit=8 – (6.34 – 6)=7.66dBm/3kHz.

Configuration IEEE 802.11n MCS0 HT40

Channel	Frequency	Power Density (dBm/3kHz)			Power Density Limit (dBm/3kHz)	Result
		Chain 1	Chain 2	Total		
11	2462 MHz	-15.98	-17.90	-13.82	7.66	Complies

Note: Directional gain= $10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right]$ =6.34dBi>6dBi, so limit=8 – (6.34 – 6)=7.66dBm/3kHz.

Temperature	20°C	Humidity	52%
Test Engineer	James Chou	Configurations	IEEE 802.11b/g

Configuration IEEE 802.11b

Channel	Frequency	Power Density (dBm/3kHz)			Power Density Limit (dBm/3kHz)	Result
		Chain 1	Chain 2	Total		
13	2472 MHz	-8.42	-11.40	-6.65	7.66	Complies

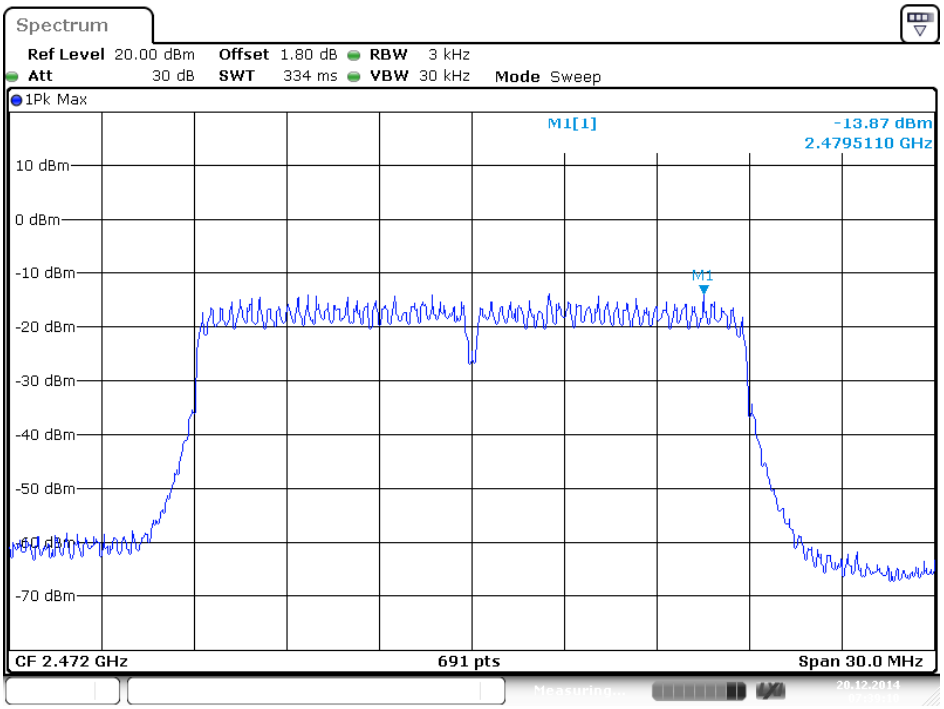
Note: Directional gain= $10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{jk} \right\}^2}{N_{ANT}} \right]$ =6.34dBi>6dBi, so limit=8 – (6.34 – 6)=7.66dBm/3kHz.

Configuration IEEE 802.11g

Channel	Frequency	Power Density (dBm/3kHz)			Power Density Limit (dBm/3kHz)	Result
		Chain 1	Chain 2	Total		
13	2472 MHz	-12.89	-12.93	-9.90	7.66	Complies

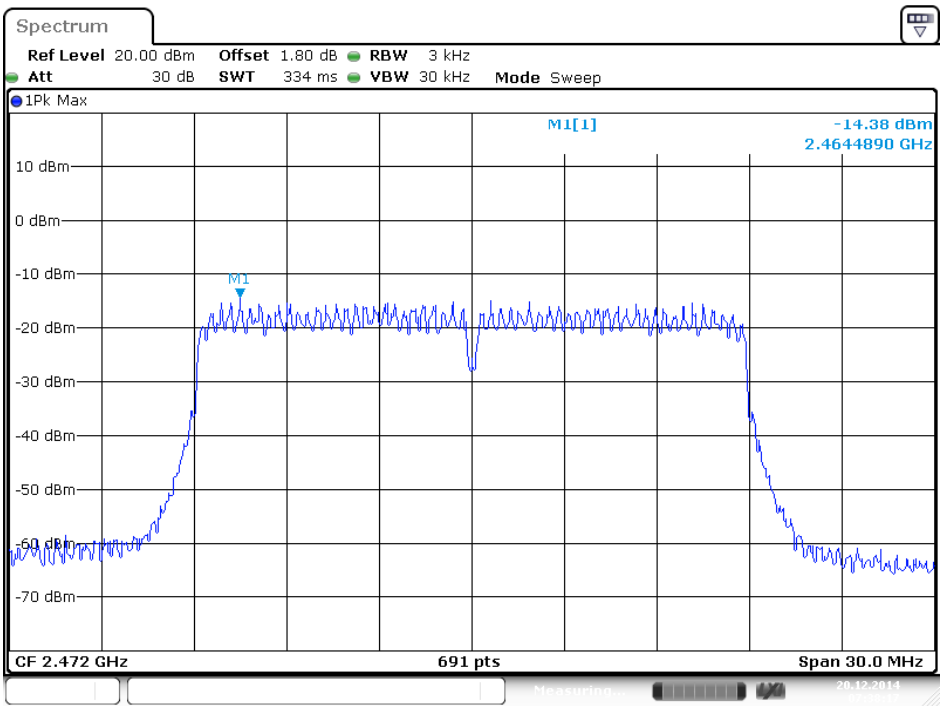
Note: Directional gain= $10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{jk} \right\}^2}{N_{ANT}} \right]$ =6.34dBi>6dBi, so limit=8 – (6.34 – 6)=7.66dBm/3kHz.

Power Density Plot on Configuration IEEE 802.11n MCS0 HT20 / 2472 MHz / Chain 1



Date: 20.DEC.2014 07:39:11

Power Density Plot on Configuration IEEE 802.11n MCS0 HT20 / 2472 MHz / Chain 2



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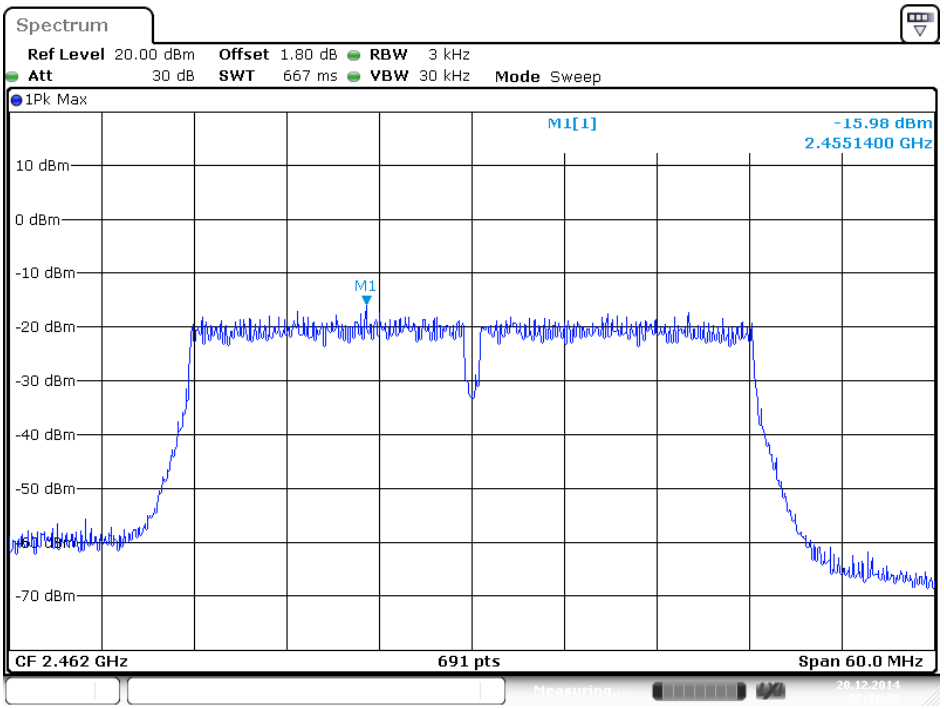
Power Density Plot on Configuration IEEE 802.11n MCS0 HT40 / 2462 MHz / Chain 1



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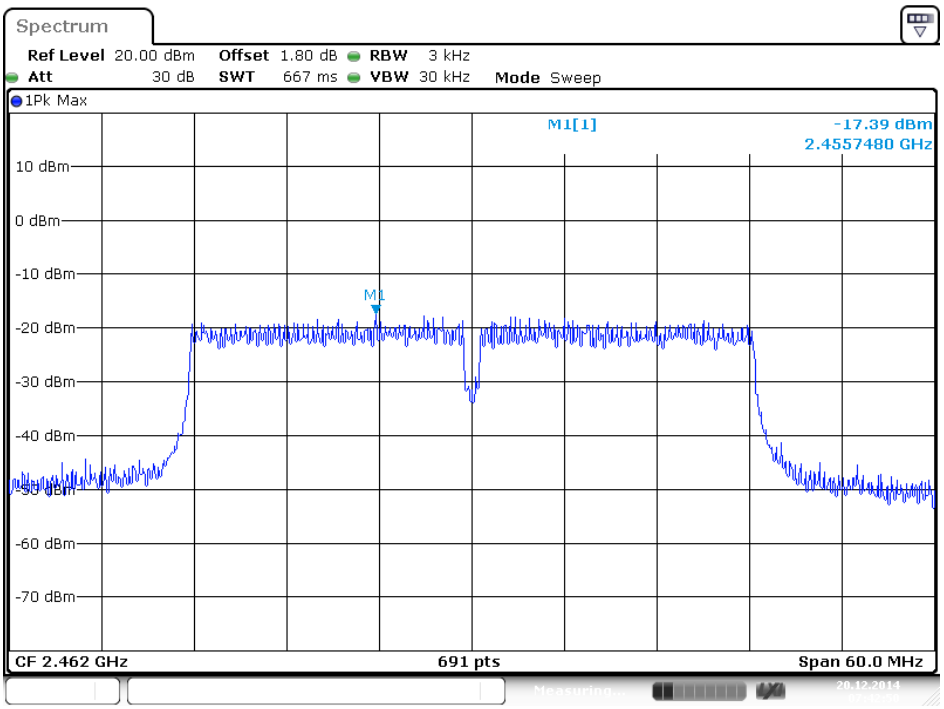
Power Density Plot on Configuration IEEE 802.11n MCS0 HT40 / 2462 MHz / Chain 2



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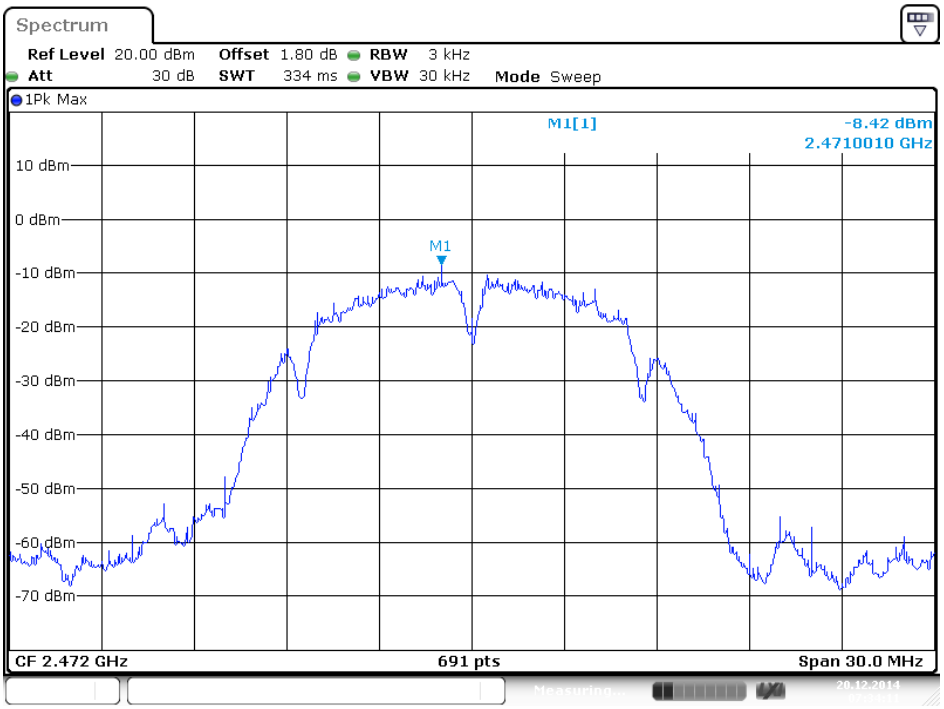
Power Density Plot on Configuration IEEE 802.11b / 2472 MHz / Chain 1



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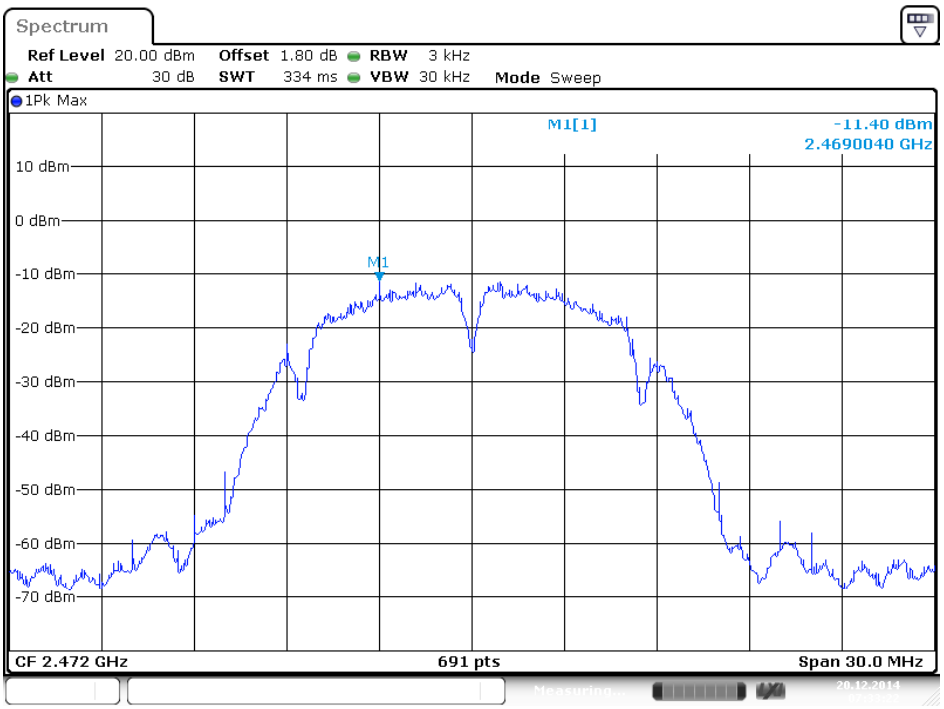
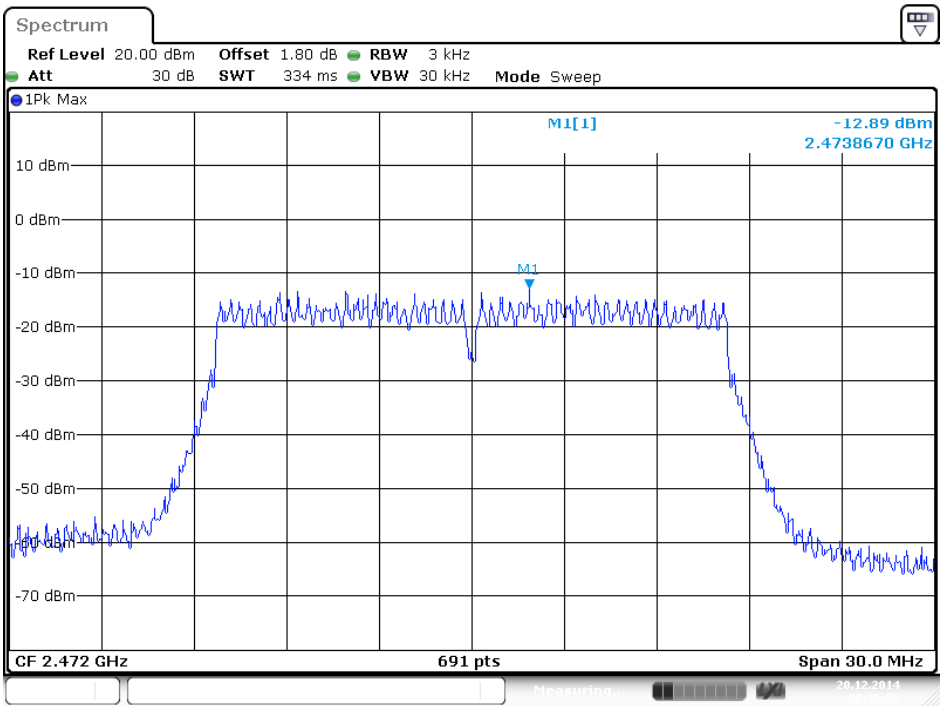
Power Density Plot on Configuration IEEE 802.11b / 2472 MHz / Chain 2



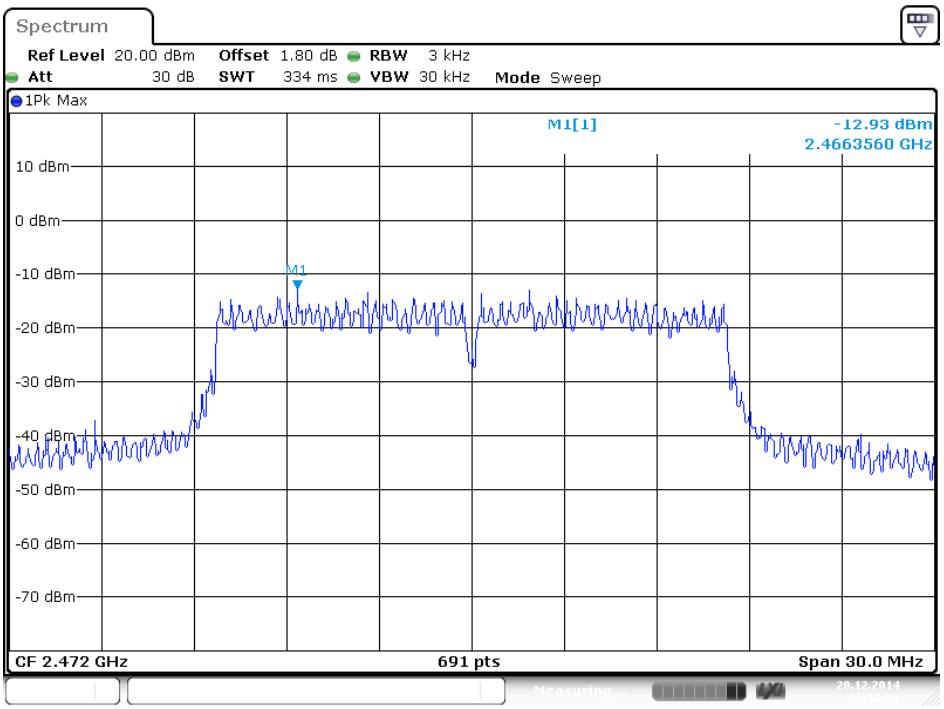
Date: 20.DEC.2014 07:33:21

Power Density Plot on Configuration IEEE 802.11g / 2472 MHz / Chain 1



Date: 20.DEC.2014 07:35:56

Power Density Plot on Configuration IEEE 802.11g / 2472 MHz / Chain 2



Date: 20.DEC.2014 07:36:41

4.3. 6dB Spectrum Bandwidth Measurement

4.3.1. Limit

For digital modulation systems, the minimum 6 dB bandwidth shall be at least 500 kHz.

4.3.2. Measuring Instruments and Setting

Please refer to section 5 of equipments list in this report. The following table is the setting of the Spectrum Analyzer.

Spectrum Parameters	Setting
Attenuation	Auto
Span Frequency	> 6dB Bandwidth
RBW	100kHz
VBW	≥ 3 x RBW
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

4.3.3. Test Procedures

1. The transmitter was conducted to the spectrum analyzer in peak hold mode.
2. Test was performed in accordance with KDB 558074 D01 v03r02 for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247 section 8.0 DTS 6-dB signal bandwidth option 1.
3. Multiple antenna system was performed in accordance with KDB 662911 D01 v02r01 Emissions Testing of Transmitters with Multiple Outputs in the Same Band.
4. Measurement perform conducted of each port.
5. Measured the spectrum width with power higher than 6dB below carrier.

4.3.4. Test Setup Layout

This test setup layout is the same as that shown in section 4.2.4.

4.3.5. Test Deviation

There is no deviation with the original standard.

4.3.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

4.3.7. Test Result of 6dB Spectrum Bandwidth

Temperature	20°C	Humidity	52%
Test Engineer	James Chou	Configurations	IEEE 802.11n

Configuration IEEE 802.11n MCS0 HT20

Channel	Frequency	6dB Bandwidth (MHz)		99% Occupied Bandwidth (MHz)		Min. Limit (kHz)	Test Result
		Chain 1	Chain 2	Chain 1	Chain 2		
13	2472 MHz	17.12	17.12	17.52	17.44	500	Complies

Configuration IEEE 802.11n MCS0 HT40

Channel	Frequency	6dB Bandwidth (MHz)		99% Occupied Bandwidth (MHz)		Min. Limit (kHz)	Test Result
		Chain 1	Chain 2	Chain 1	Chain 2		
11	2462 MHz	36.32	36.32	36.48	36.32	500	Complies

Temperature	20°C	Humidity	52%
Test Engineer	James Chou	Configurations	IEEE 802.11b/g

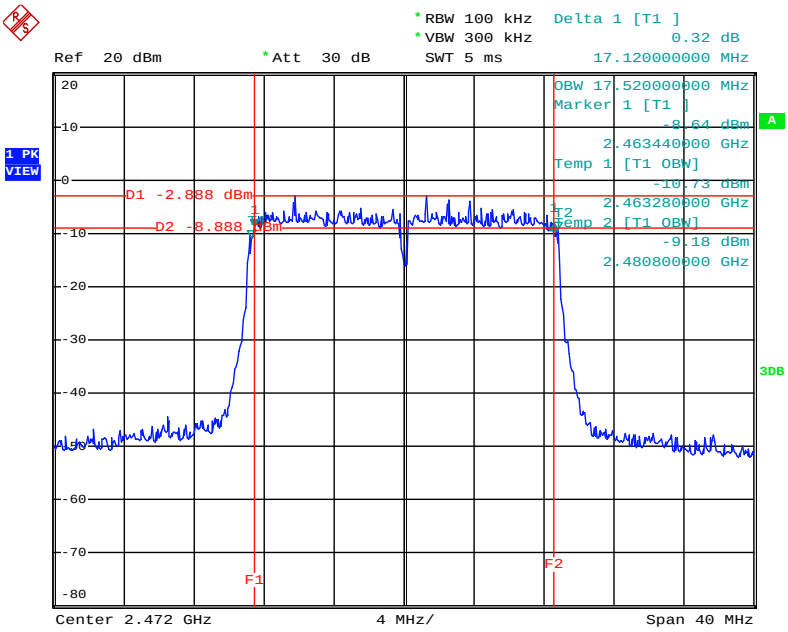
Configuration IEEE 802.11b

Channel	Frequency	6dB Bandwidth (MHz)		99% Occupied Bandwidth (MHz)		Min. Limit (kHz)	Test Result
		Chain 1	Chain 2	Chain 1	Chain 2		
13	2472 MHz	8.56	8.08	11.52	11.44	500	Complies

Configuration IEEE 802.11g

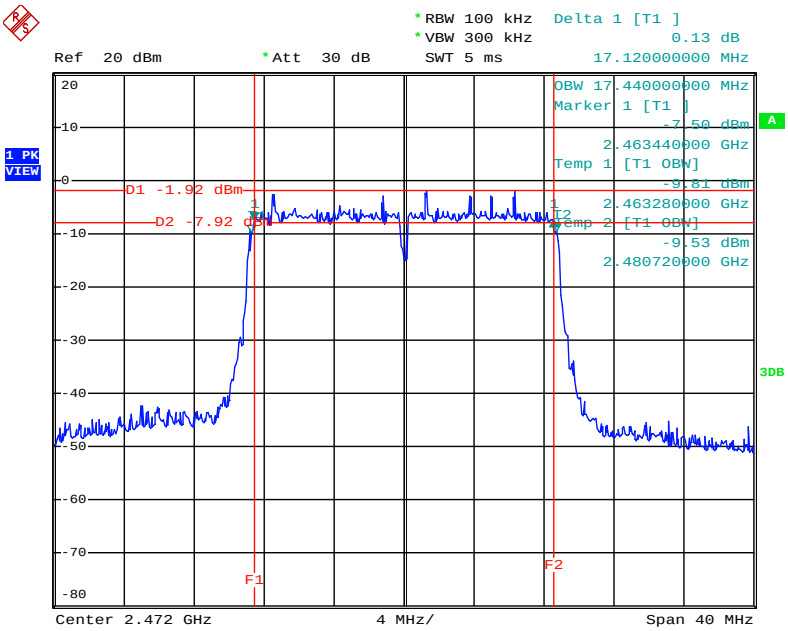
Channel	Frequency	6dB Bandwidth (MHz)		99% Occupied Bandwidth (MHz)		Min. Limit (kHz)	Test Result
		Chain 1	Chain 2	Chain 1	Chain 2		
13	2472 MHz	16.40	16.32	16.64	16.48	500	Complies

6 dB Bandwidth Plot on Configuration IEEE 802.11n MCS0 HT20 / 2472 MHz / Chain 1



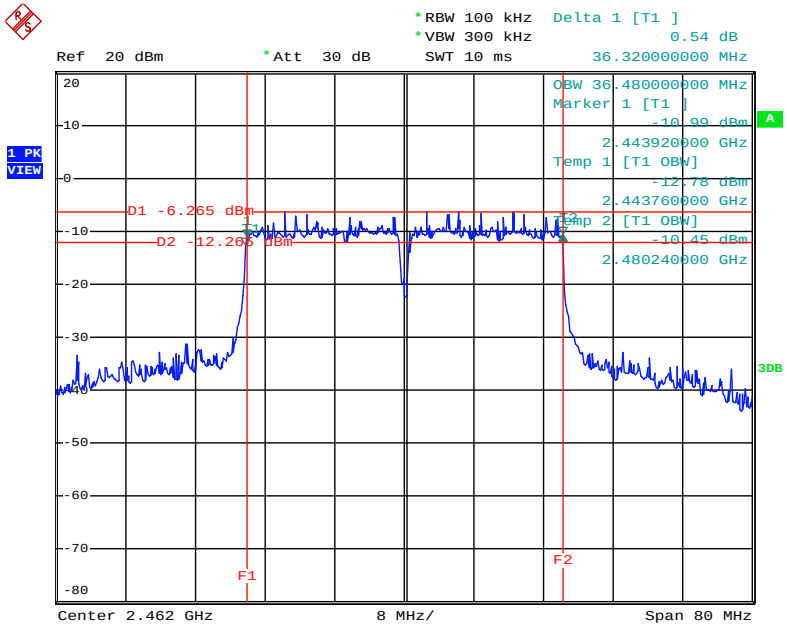
Date: 20.DEC.2014 10:18:34

6 dB Bandwidth Plot on Configuration IEEE 802.11n MCS0 HT20 / 2472 MHz / Chain 2



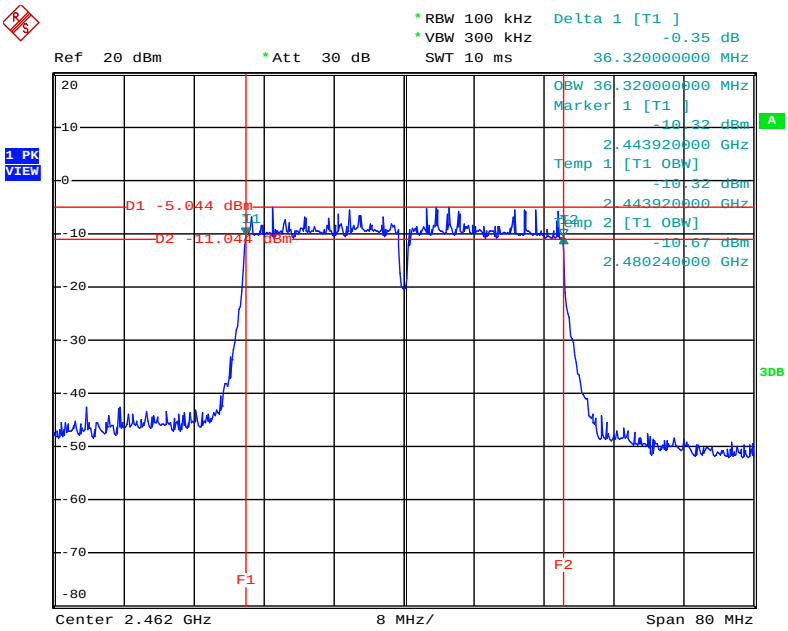
Date: 20.DEC.2014 10:19:22

6 dB Bandwidth Plot on Configuration IEEE 802.11n MCS0 HT40 / 2462 MHz / Chain 1



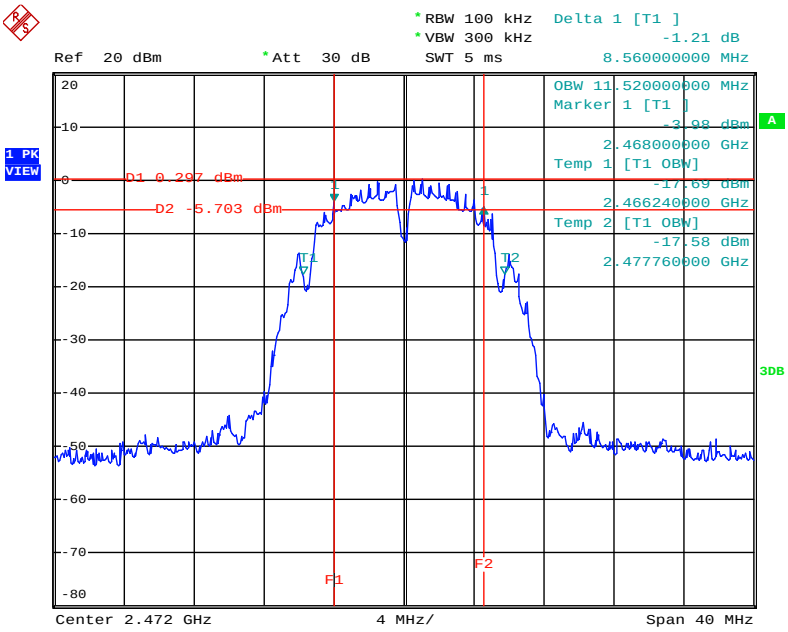
Date: 20.DEC.2014 10:22:01

6 dB Bandwidth Plot on Configuration IEEE 802.11n MCS0 HT40 / 2462 MHz / Chain 2



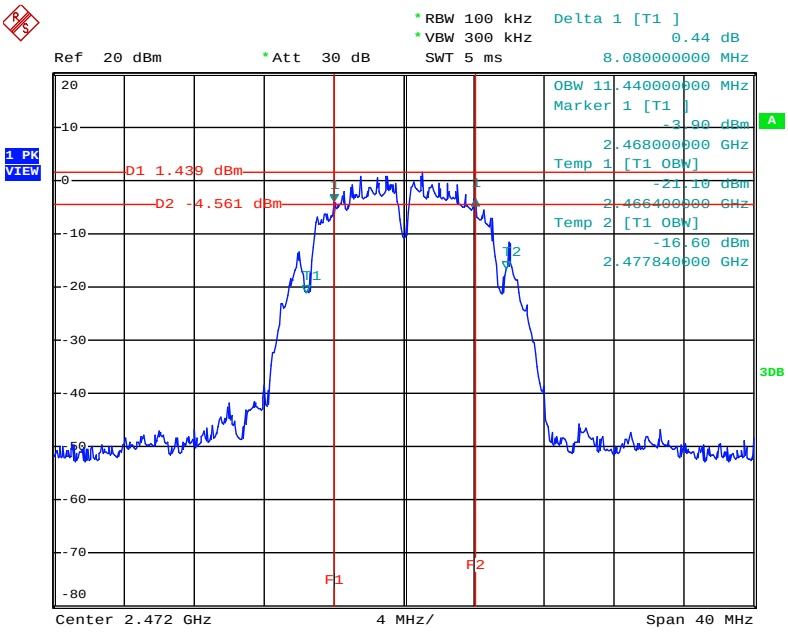
Date: 20.DEC.2014 10:21:24

6 dB Bandwidth Plot on Configuration IEEE 802.11b / 2472 MHz / Chain 1



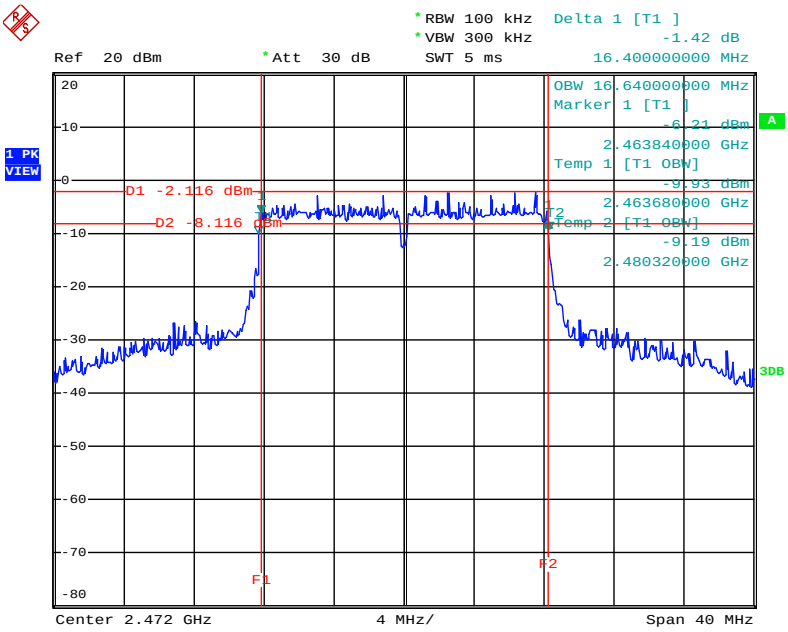
Date: 20.DEC.2014 10:11:00

6 dB Bandwidth Plot on Configuration IEEE 802.11b / 2472 MHz / Chain 2



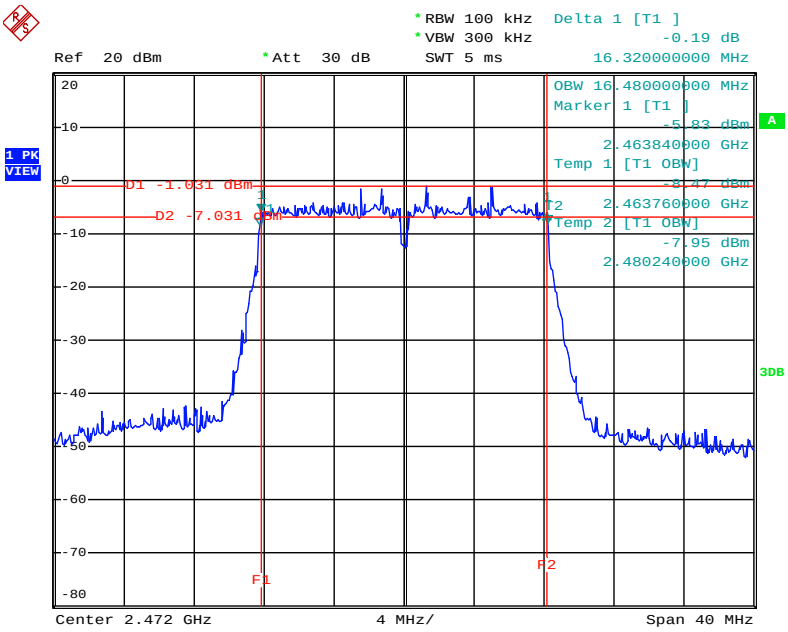
Date: 20.DEC.2014 10:12:52

6 dB Bandwidth Plot on Configuration IEEE 802.11g / 2472 MHz / Chain 1



Date: 20.DEC.2014 10:16:27

6 dB Bandwidth Plot on Configuration IEEE 802.11g / 2472 MHz / Chain 2



Date: 20.DEC.2014 10:15:25

4.4. Radiated Emissions Measurement

4.4.1. Limit

30dBc 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 (micorvolts/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

4.4.2. Measuring Instruments and Setting

Please refer to section 5 of equipments list in this report. The following table is the setting of spectrum analyzer and receiver.

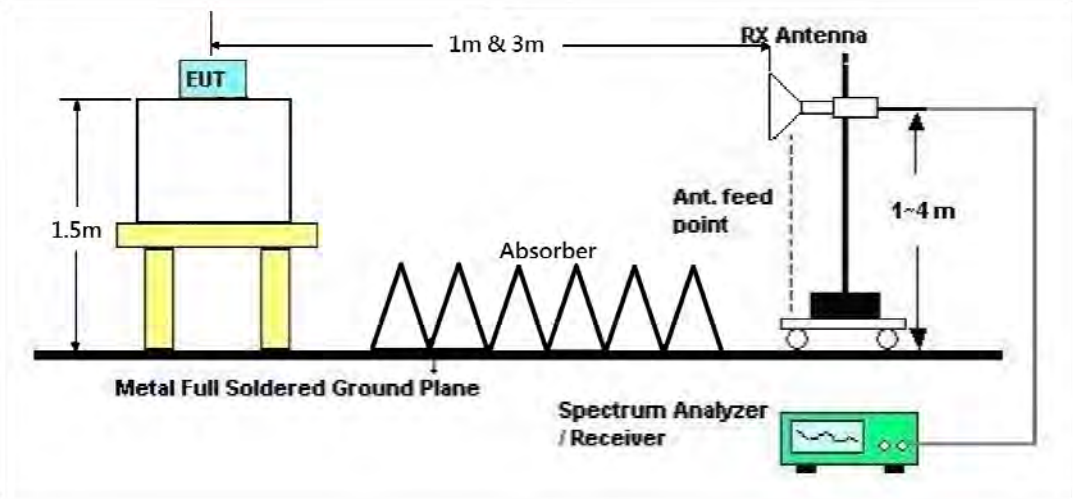
Spectrum Parameter	Setting
Attenuation	Auto
Start Frequency	1000 MHz
Stop Frequency	10th carrier harmonic
RBW / VBW (Emission in restricted band)	1MHz / 3MHz for Peak, 1MHz / 1/T for Average
RBW / VBW (Emission in non-restricted band)	100kHz / 300kHz for peak

Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RBW 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RBW 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RBW 120kHz for QP

4.4.3. Test Procedures

1. Configure the EUT according to ANSI C63.10. The EUT was placed on the top of the turntable 1.5 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turntable.
2. Power on the EUT and all the supporting units. The turntable was rotated by 360 degrees to determine the position of the highest radiation.
3. The height of the broadband receiving antenna was varied between one meter and four meters above ground to find the maximum emissions field strength of both horizontal and vertical polarization.
4. For each suspected emissions, the antenna tower was scan (from 1 m to 4 m) and then the turntable was rotated (from 0 degree to 360 degrees) to find the maximum reading.
5. Set the test-receiver system to Peak or CISPR quasi-peak Detect Function with specified bandwidth under Maximum Hold Mode.
6. For emissions above 1GHz, use 1MHz VBW and 3MHz RBW for peak reading. Then 1MHz RBW and 1/T VBW for average reading in spectrum analyzer.
7. If the emissions level of the EUT in peak mode was 3 dB lower than the average limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions which do not have 3 dB margin will be repeated one by one using the quasi-peak method for below 1GHz.
8. For testing above 1GHz, the emissions level of the EUT in peak mode was lower than average limit (that means the emissions level in peak mode also complies with the limit in average mode), then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.
9. In case the emission is lower than 30MHz, loop antenna has to be used for measurement and the recorded data should be QP measured by receiver. High – Low scan is not required in this case.

4.4.4. Test Setup Layout



4.4.5. Test Deviation

There is no deviation with the original standard.

4.4.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

4.4.7. Results for Radiated Emissions (1GHz~10th Harmonic)

Temperature	23°C	Humidity	61%
Test Engineer	James Chou	Configurations	IEEE 802.11n MCS0 HT20 CH 13 / Chain 1 + Chain 2
Test Date	Dec. 13, 2014		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Antenna Factor	Pol/Phase	T/Pos	A/Pos	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	4943.78	31.36	54.00	-22.64	27.92	5.80	33.66	31.30	HORIZONTAL	212	130	Average
2	4943.80	44.48	74.00	-29.52	41.04	5.80	33.66	31.30	HORIZONTAL	212	130	Peak

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Antenna Factor	Pol/Phase	T/Pos	A/Pos	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	4943.28	44.50	74.00	-29.50	41.06	5.80	33.66	31.30	VERTICAL	114	129	Peak
2	4943.77	31.48	54.00	-22.52	28.04	5.80	33.66	31.30	VERTICAL	114	129	Average

Temperature	23°C	Humidity	61%
Test Engineer	James Chou	Configurations	EEE 802.11n MCS0 HT40 CH 11 / Chain 1 + Chain 2
Test Date	Dec. 13, 2014		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Antenna Factor	Pol/Phase	T/Pos	A/Pos	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	4923.74	44.95	74.00	-29.05	41.56	5.79	33.67	31.27	HORIZONTAL	250	104	Peak
2	4924.30	31.86	54.00	-22.14	28.47	5.79	33.67	31.27	HORIZONTAL	250	104	Average

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Antenna Factor	Pol/Phase	T/Pos	A/Pos	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	4923.95	32.01	54.00	-21.99	28.61	5.79	33.67	31.28	VERTICAL	0	100	Average
2	4924.39	45.72	74.00	-28.28	42.32	5.79	33.67	31.28	VERTICAL	0	100	Peak

Temperature	23°C	Humidity	61%
Test Engineer	James Chou	Configurations	IEEE 802.11b CH 13 / Chain 1 + Chain 2
Test Date	Dec. 13, 2014		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Antenna Factor	Pol/Phase	T/Pos	A/Pos	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	4943.93	44.23	74.00	-29.77	40.79	5.80	33.66	31.30	HORIZONTAL	290	154	Peak
2	4944.04	31.64	54.00	-22.36	28.20	5.80	33.66	31.30	HORIZONTAL	290	154	Average

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Antenna Factor	Pol/Phase	T/Pos	A/Pos	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	4943.92	35.94	54.00	-18.06	32.50	5.80	33.66	31.30	VERTICAL	233	188	Average
2	4944.10	45.57	74.00	-28.43	42.13	5.80	33.66	31.30	VERTICAL	233	188	Peak

Temperature	23°C	Humidity	61%
Test Engineer	James Chou	Configurations	IEEE 802.11g CH 13 / Chain 1 + Chain 2
Test Date	Dec. 13, 2014		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Antenna Factor	Pol/Phase	T/Pos	A/Pos	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	4943.11	31.46	54.00	-22.54	28.02	5.80	33.66	31.30	HORIZONTAL	198	118	Average
2	4943.93	44.58	74.00	-29.42	41.14	5.80	33.66	31.30	HORIZONTAL	198	118	Peak

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Antenna Factor	Pol/Phase	T/Pos	A/Pos	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	4944.37	31.54	54.00	-22.46	28.10	5.80	33.66	31.30	VERTICAL	161	121	Average
2	4944.86	44.44	74.00	-29.56	41.00	5.80	33.66	31.30	VERTICAL	161	121	Peak

Note:

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

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

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

4.5. Emissions Measurement

4.5.1. Limit

30dBc 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 (micorvolts/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

4.5.2. Measuring Instruments and Setting

Please refer to section 5 of equipments list in this report. The following table is the setting of the spectrum analyzer.

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	100 MHz
RBW / VBW (Emission in restricted band)	1MHz / 3MHz for Peak, 1MHz / 1/T for Average
RBW / VBW (30dBc in any 100 kHz bandwidth emission)	100 kHz / 300 kHz for Peak

4.5.3. Test Procedures

For Radiated band edges Measurement:

1. The test procedure is the same as section 4.4.3, only the freqeuncy range investigated is limited to 100MHz around band edges.

For Radiated Out of Band Emission Measurement:

1. Test was performed in accordance with KDB 558074 D01 v03r02 for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247 section 10.1 Unwanted Emissions into Non-Restricted Frequency Bands Measurement Procedure.
2. The radiated emission test is performed on each TX port of operating mode without summing or adding 10log (N) since the limit is relative emission limit.
   Only worst data of each operating mode is presented.

4.5.4. Test Setup Layout

For Radiated band edges Measurement:

This test setup layout is the same as that shown in section 4.4.4.

For Radiated Out of Band Emission Measurement:

This test setup layout is the same as that shown in section 4.4.4.

4.5.5. Test Deviation

There is no deviation with the original standard.

4.5.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

4.5.7. Test Result of Band Edge and Fundamental Emissions

Temperature	23°C	Humidity	61%
Test Engineer	James Chou	Configurations	IEEE 802.11n MCS0 HT20 CH 13 / Chain 1 + Chain 2
Test Date	Dec. 13, 2014		

Channel 13

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Antenna Factor	Pol/Phase	T/Pos	A/Pos	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	2464.80	105.78			74.51	4.05	0.00	27.22	VERTICAL	262	184	Peak
2	2479.60	96.55			65.23	4.07	0.00	27.25	VERTICAL	262	184	Average
3	2484.10	53.94	54.00	-0.06	22.60	4.07	0.00	27.27	VERTICAL	262	184	Average
4	2484.10	67.28	74.00	-6.72	35.94	4.07	0.00	27.27	VERTICAL	262	184	Peak

Item 1, 2 are the fundamental frequency at 2472 MHz.

Note: Both antenna polarizations have been tested and only the worst case was recorded in test report.

Temperature	23°C	Humidity	61%
Test Engineer	James Chou	Configurations	IEEE 802.11n MCS0 HT40 CH 11 / Chain 1 + Chain 2
Test Date	Dec. 13, 2014		

Channel 11

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Antenna Factor	Pol/Phase	T/Pos	A/Pos	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	2459.60	93.70			62.45	4.05	0.00	27.20	VERTICAL	266	189	Average
2	2467.20	103.32			72.05	4.05	0.00	27.22	VERTICAL	266	189	Peak
3	2483.50	53.64	54.00	-0.36	22.30	4.07	0.00	27.27	VERTICAL	266	189	Average
4	2483.50	68.74	74.00	-5.26	37.40	4.07	0.00	27.27	VERTICAL	266	189	Peak

Item 1, 2 are the fundamental frequency at 2462 MHz.

Note: Both antenna polarizations have been tested and only the worst case was recorded in test report.

Temperature	23°C	Humidity	61%
Test Engineer	James Chou	Configurations	IEEE 802.11b CH 13 / Chain 1 + Chain 2
Test Date	Dec. 13, 2014		

Channel 13

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Antenna Factor	Pol/Phase	T/Pos	A/Pos	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	2471.20	104.38			73.08	4.07	0.00	27.23	VERTICAL	263	194	Average
2	2473.00	108.31			77.01	4.07	0.00	27.23	VERTICAL	263	194	Peak
3	2485.70	53.92	54.00	-0.08	22.57	4.08	0.00	27.27	VERTICAL	263	194	Average
4	2486.50	63.25	74.00	-10.75	31.90	4.08	0.00	27.27	VERTICAL	263	194	Peak

Item 1, 2 are the fundamental frequency at 2472 MHz.

Note: Both antenna polarizations have been tested and only the worst case was recorded in test report.

Temperature	23°C	Humidity	61%
Test Engineer	James Chou	Configurations	IEEE 802.11g CH 13 / Chain 1 + Chain 2
Test Date	Dec. 13, 2014		

Channel 13

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Antenna Factor	Pol/Phase	T/Pos	A/Pos	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	2468.20	106.44			75.16	4.05	0.00	27.23	VERTICAL	84	198	Peak
2	2473.00	96.65			65.35	4.07	0.00	27.23	VERTICAL	84	198	Average
3	2483.50	53.87	54.00	-0.13	22.53	4.07	0.00	27.27	VERTICAL	84	198	Average
4	2484.10	67.45	74.00	-6.55	36.11	4.07	0.00	27.27	VERTICAL	84	198	Peak

Item 1, 2 are the fundamental frequency at 2472 MHz.

Note: Both antenna polarizations have been tested and only the worst case was recorded in test report.

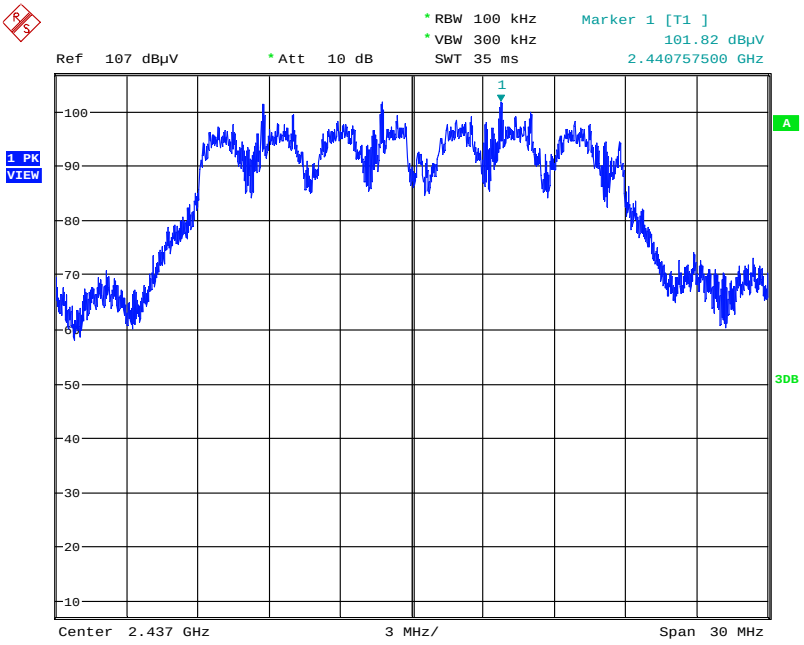
Note:

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

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

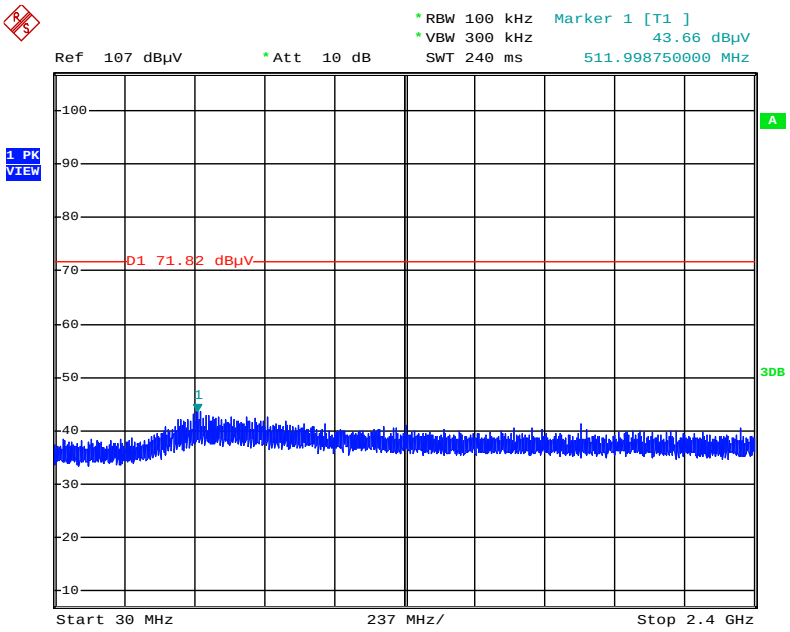
For Emission not in Restricted Band

Plot on Configuration IEEE 802.11n MCS0 HT20 / Reference Level (Horizontal)



Date: 14.SEP.2014 11:20:20

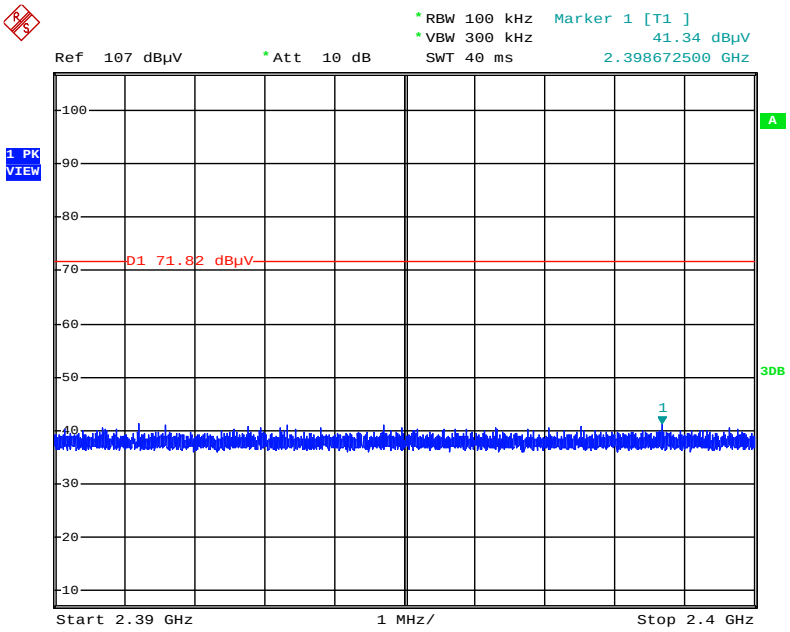
Plot on Configuration IEEE 802.11n MCS0 HT20 / CH 13 / 30MHz~2400MHz (down 30dBc) (Horizontal)



Date: 13.DEC.2014 13:29:53

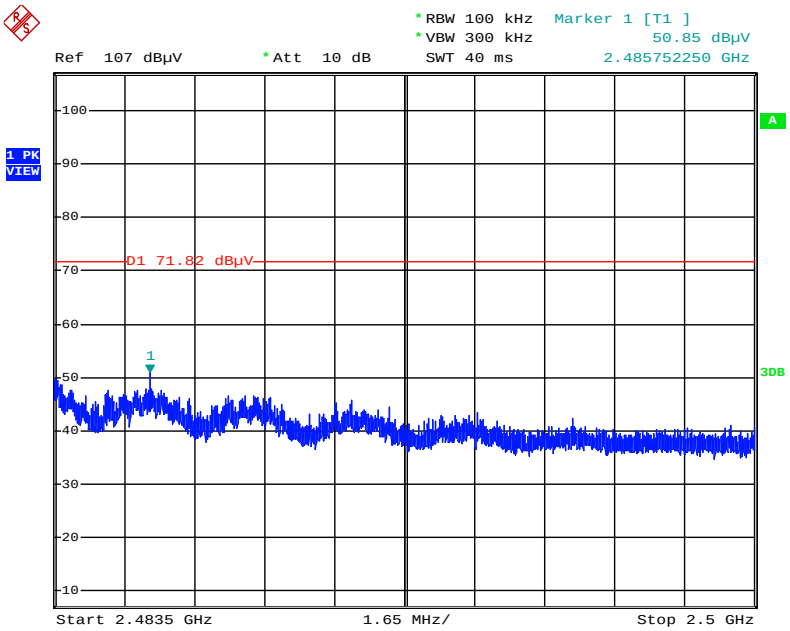
Note: Only the worse polarization (Horizontal) is tested and recorded in test report.

Plot on Configuration IEEE 802.11n MCS0 HT20 / CH 13 / 2390MHz~2400MHz (down 30dBc) (Horizontal)



Date: 30.DEC.2014 12:23:59

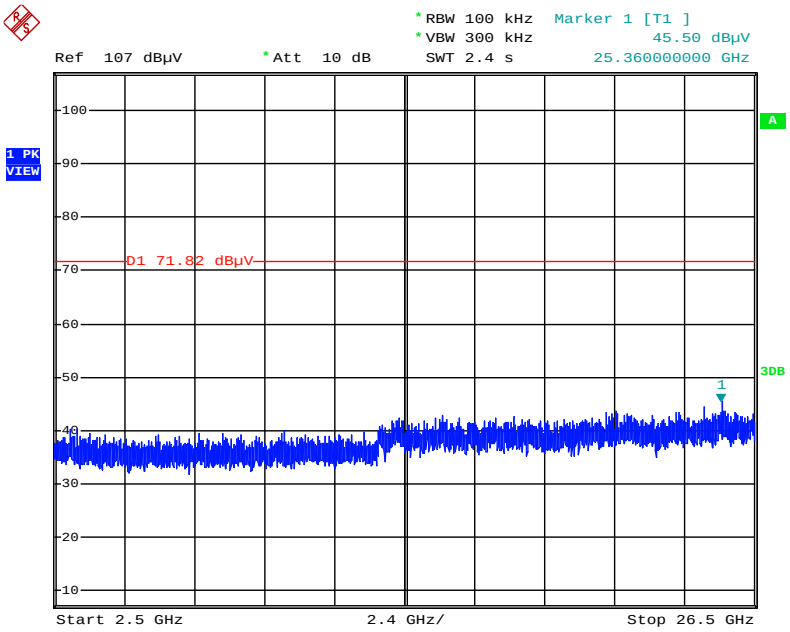
Plot on Configuration IEEE 802.11n MCS0 HT20 / CH 13 / 2483.5MHz~2500MHz (down 30dBc) (Horizontal)



Date: 30.DEC.2014 12:22:23

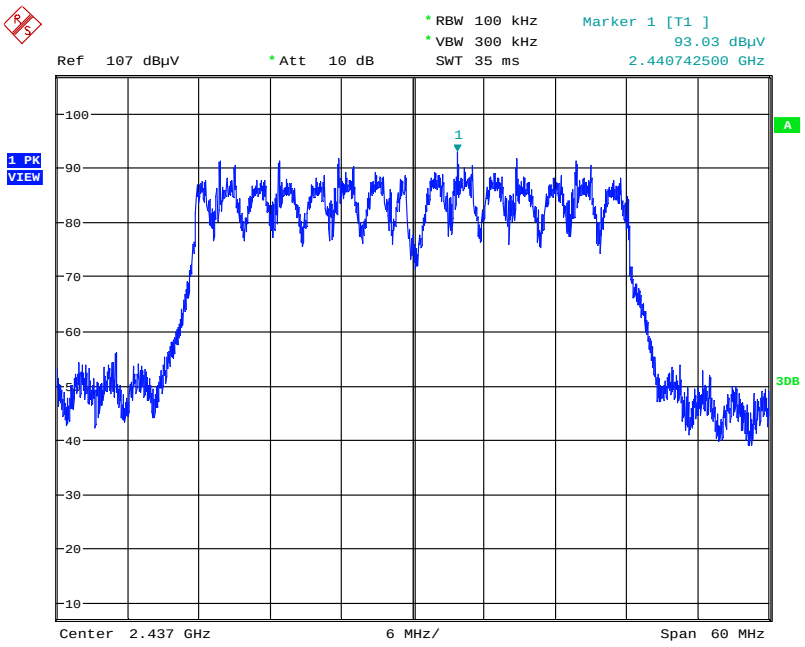
Note: Only the worse polarization (Horizontal) is tested and recorded in test report.

Plot on Configuration IEEE 802.11n MCS0 HT20 / CH 13 / 2500MHz~26500MHz (down 30dBc) (Horizontal)



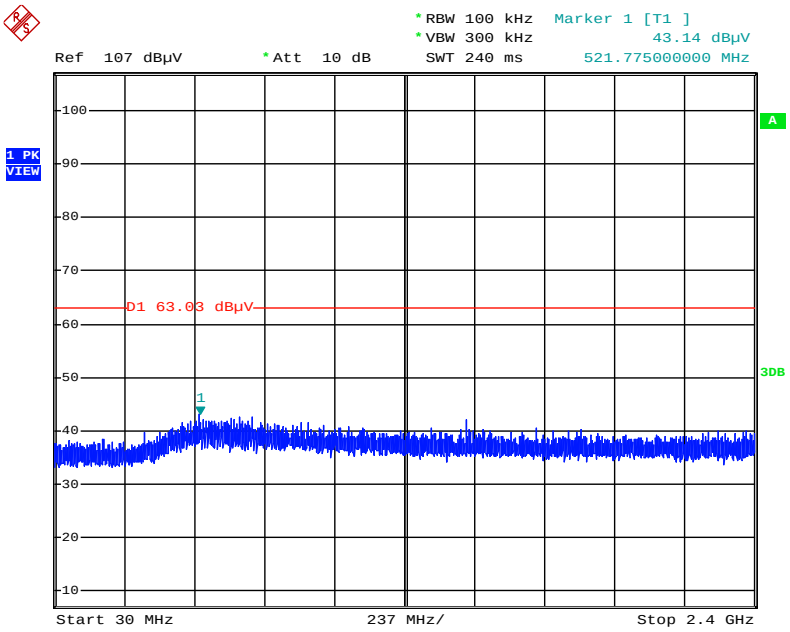
Note: Only the worse polarization (Horizontal) is tested and recorded in test report.

Plot on Configuration IEEE 802.11n MCS0 HT40 / Reference Level (Horizontal)



Date: 14.SEP.2014 11:24:11

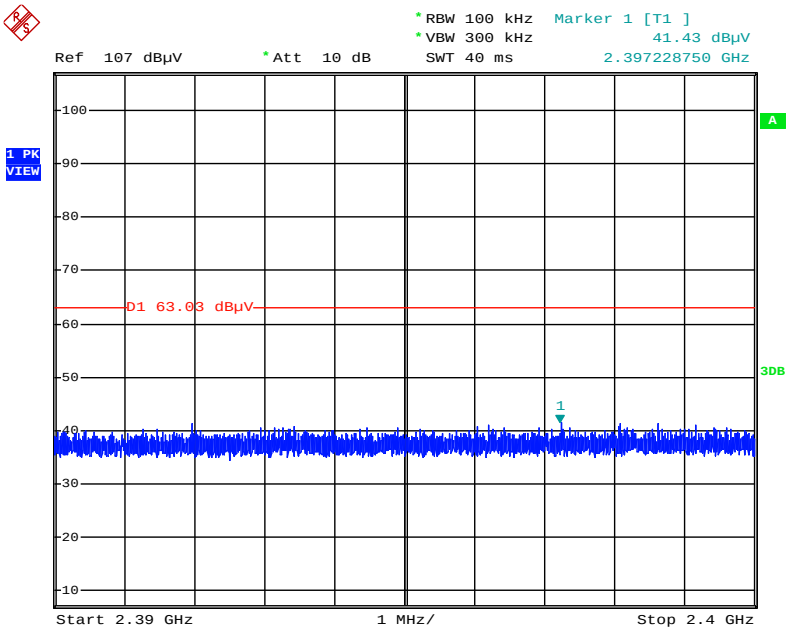
Plot on Configuration IEEE 802.11n MCS0 HT40 / CH 11 / 30MHz~2400MHz (down 30dBc) (Horizontal)



Date: 13.DEC.2014 13:32:27

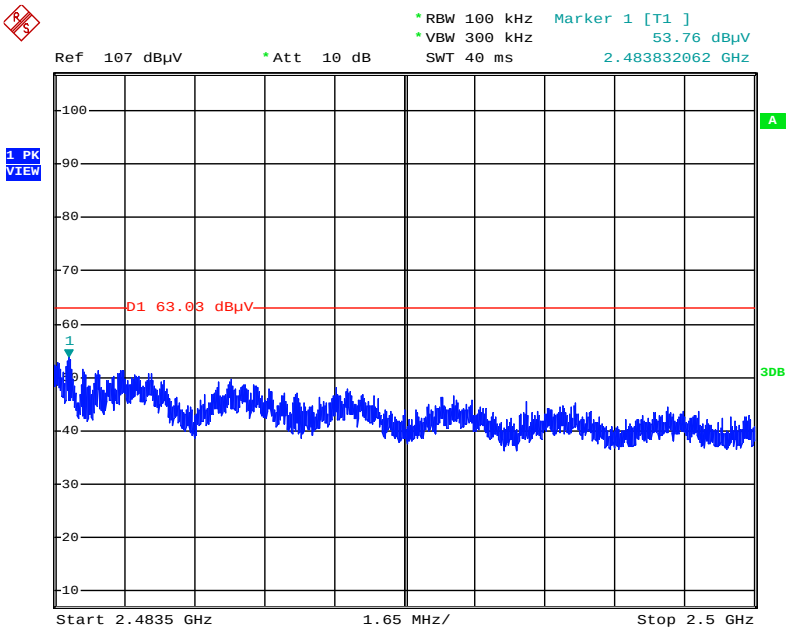
Note: Only the worse polarization (Horizontal) is tested and recorded in test report.

Plot on Configuration IEEE 802.11n MCS0 HT40 / CH 11 / 2390MHz~2400MHz (down 30dBc) (Horizontal)



Date: 30.DEC.2014 12:08:34

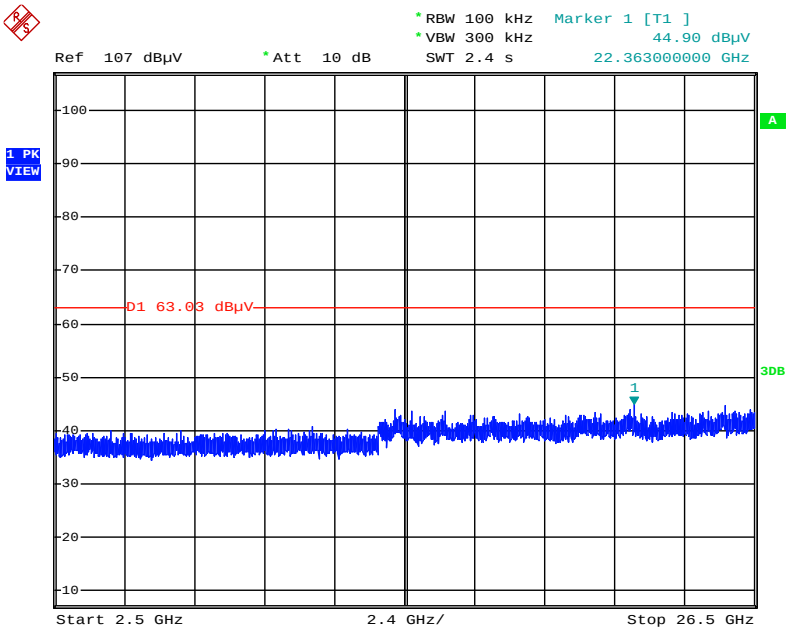
Plot on Configuration IEEE 802.11n MCS0 HT40 / CH 11 / 2483.5MHz~2500MHz (down 30dBc) (Horizontal)



Date: 30.DEC.2014 12:09:18

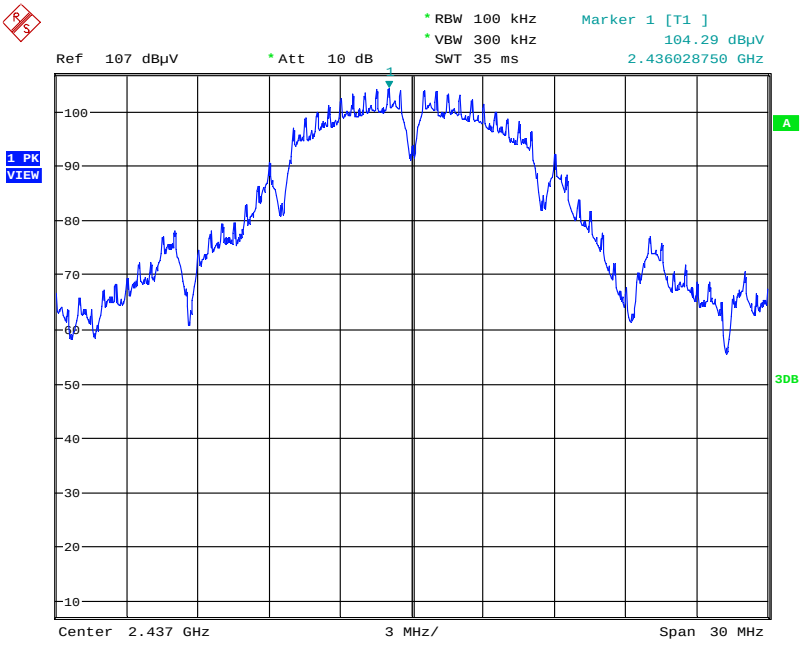
Note: Only the worse polarization (Horizontal) is tested and recorded in test report.

Plot on Configuration IEEE 802.11n MCS0 HT40 / CH 11 / 2500MHz~26500MHz (down 30dBc) (Horizontal)



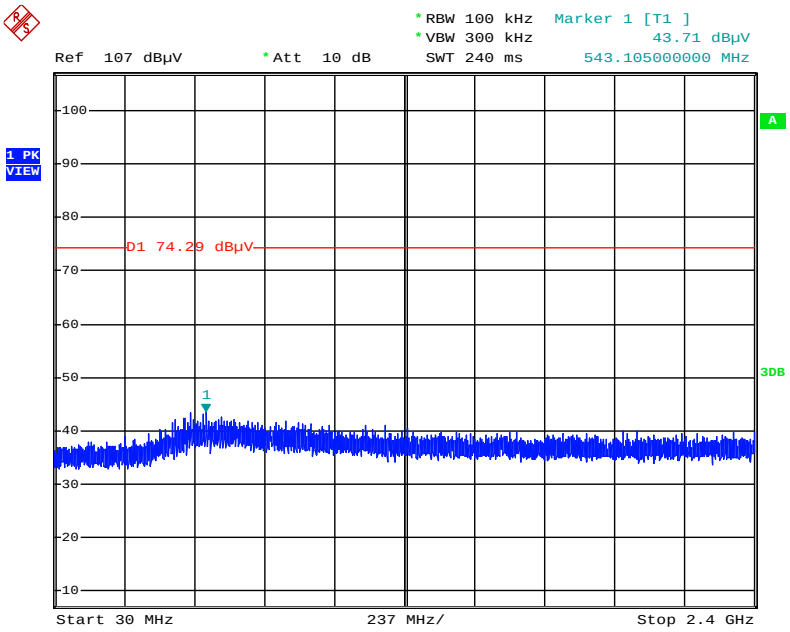
Note: Only the worse polarization (Horizontal) is tested and recorded in test report.

Plot on Configuration IEEE 802.11b / Reference Level (Horizontal)



Date: 14.SEP.2014 11:07:39

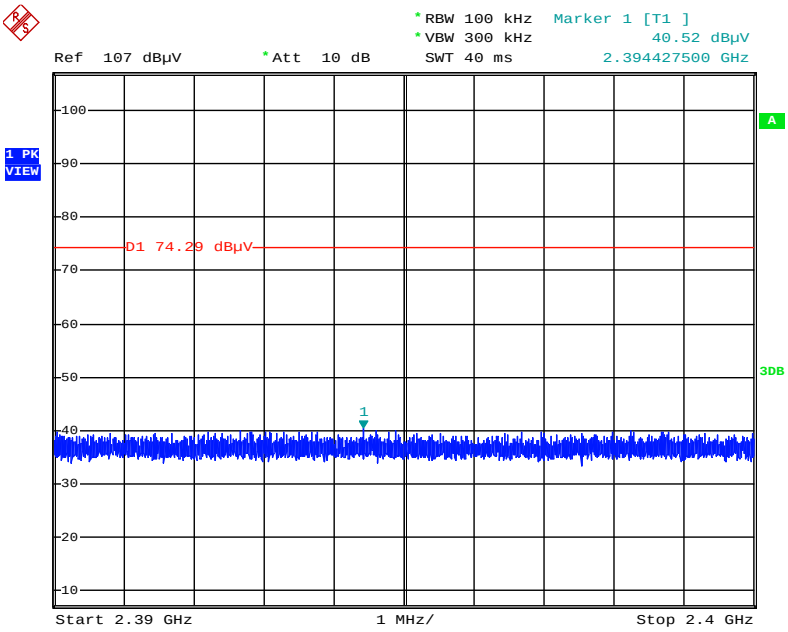
Plot on Configuration IEEE 802.11b / CH 13 / 30MHz~2400MHz (down 30dBc) (Horizontal)



Date: 13.DEC.2014 13:24:16

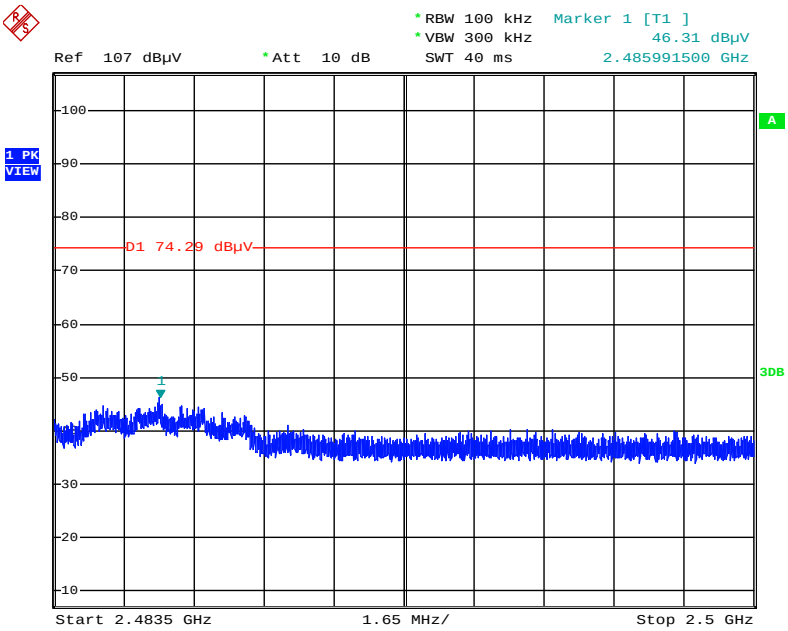
Note: Only the worse polarization (Horizontal) is tested and recorded in test report.

Plot on Configuration IEEE 802.11b / CH 13 / 2390MHz~2400MHz (down 30dBc) (Horizontal)



Date: 30.DEC.2014 12:33:08

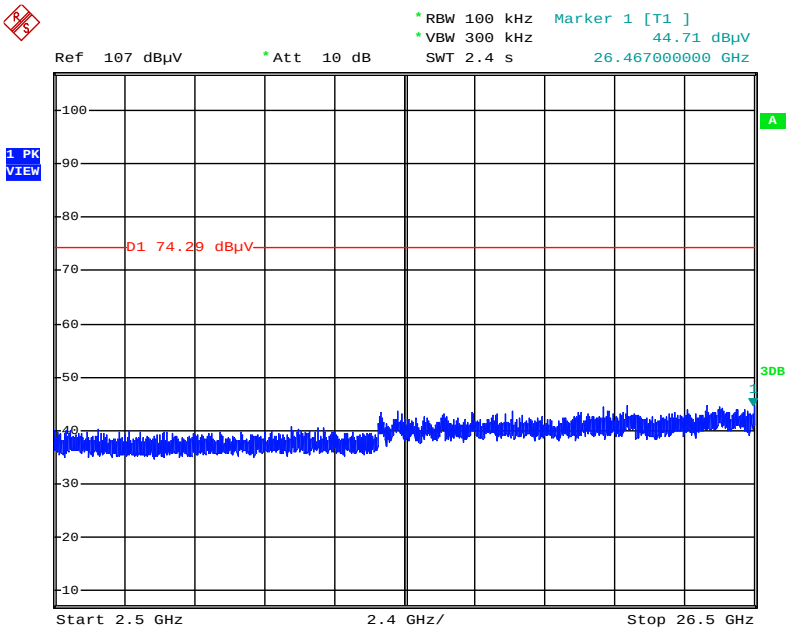
Plot on Configuration IEEE 802.11b / CH 13 / 2483.5MHz~2500MHz (down 30dBc) (Horizontal)



Date: 30.DEC.2014 12:32:18

Note: Only the worse polarization (Horizontal) is tested and recorded in test report.

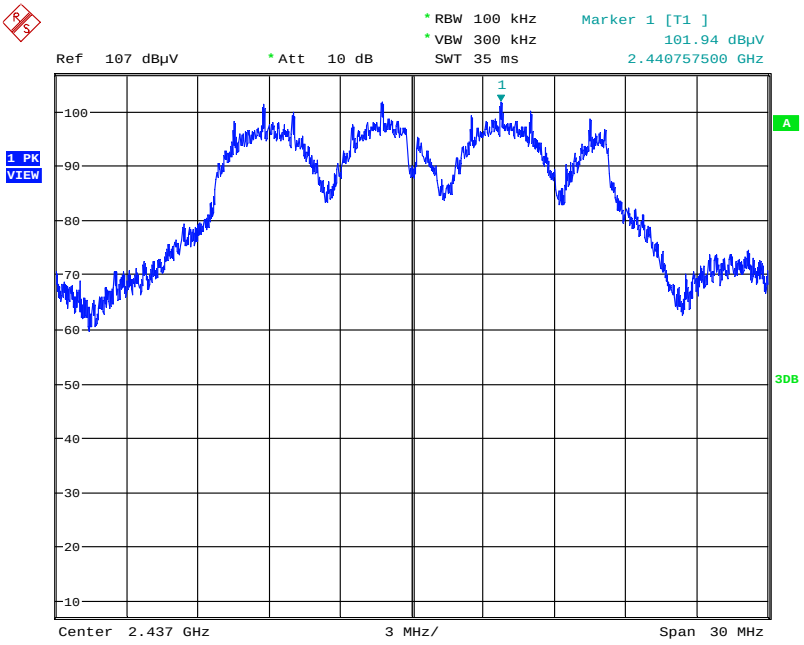
Plot on Configuration IEEE 802.11b / CH 13 / 2500MHz~26500MHz (down 30dBc) (Horizontal)



Date: 13.DEC.2014 13:25:07

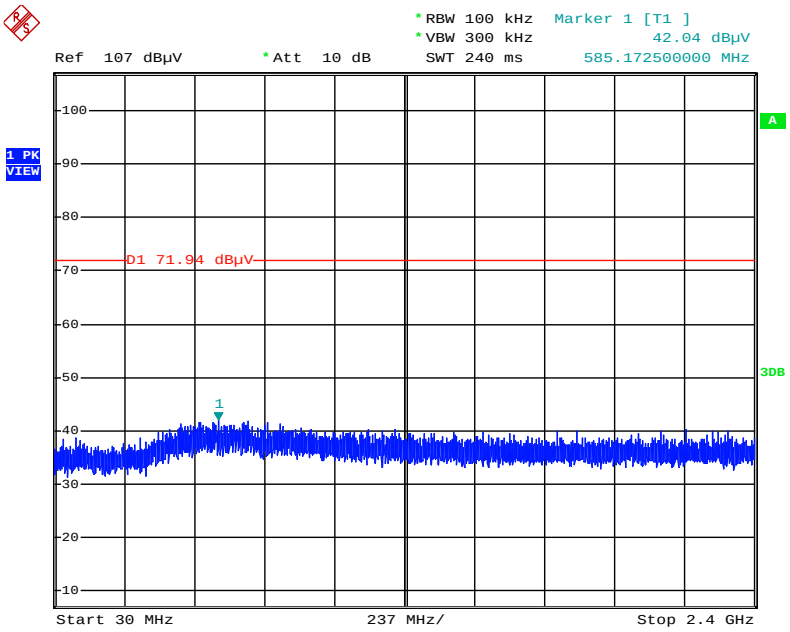
Note: Only the worse polarization (Horizontal) is tested and recorded in test report.

Plot on Configuration IEEE 802.11g / Reference Level (Horizontal)



Date: 14.SEP.2014 11:16:00

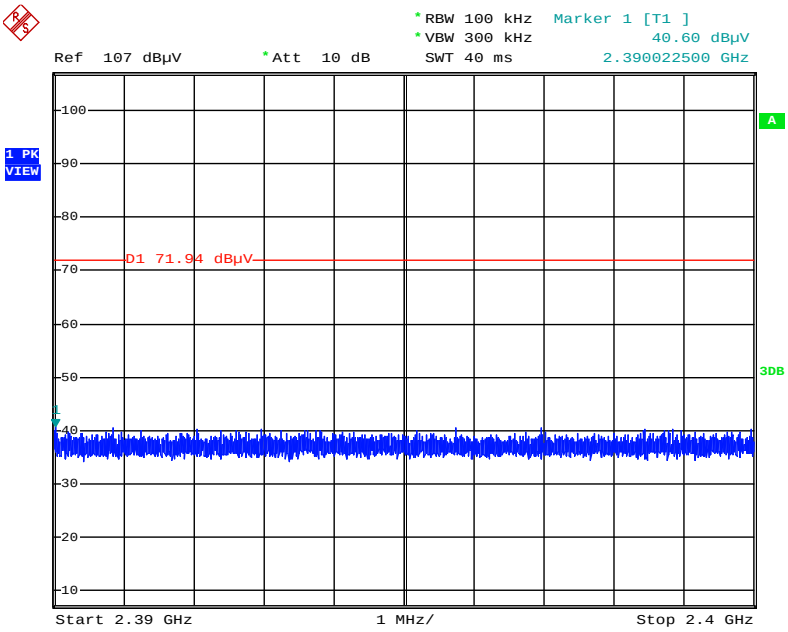
Plot on Configuration IEEE 802.11g / CH 13 / 30MHz~2400MHz (down 30dBc) (Horizontal)



Date: 13.DEC.2014 13:28:04

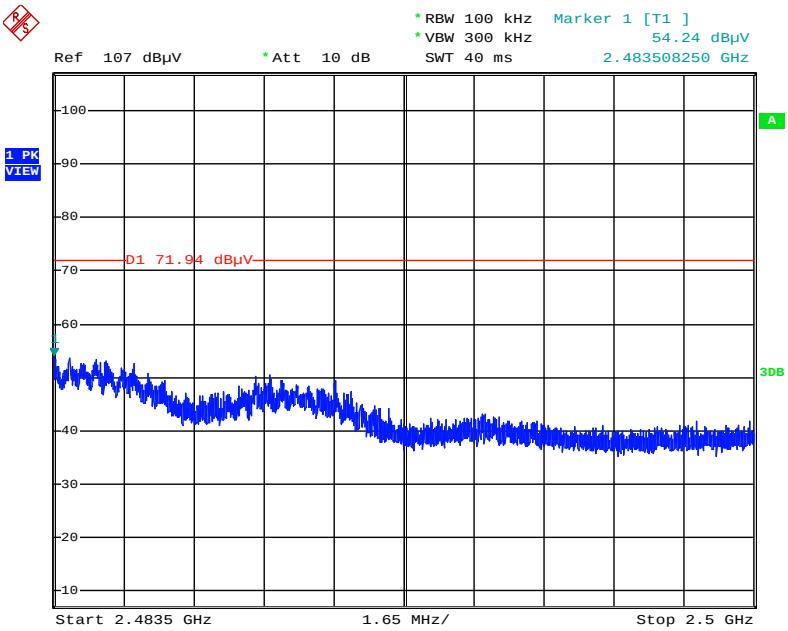
Note: Only the worse polarization (Horizontal) is tested and recorded in test report.

Plot on Configuration IEEE 802.11g / CH 13 / 2390MHz~2400MHz (down 30dBc) (Horizontal)



Date: 30.DEC.2014 12:38:01

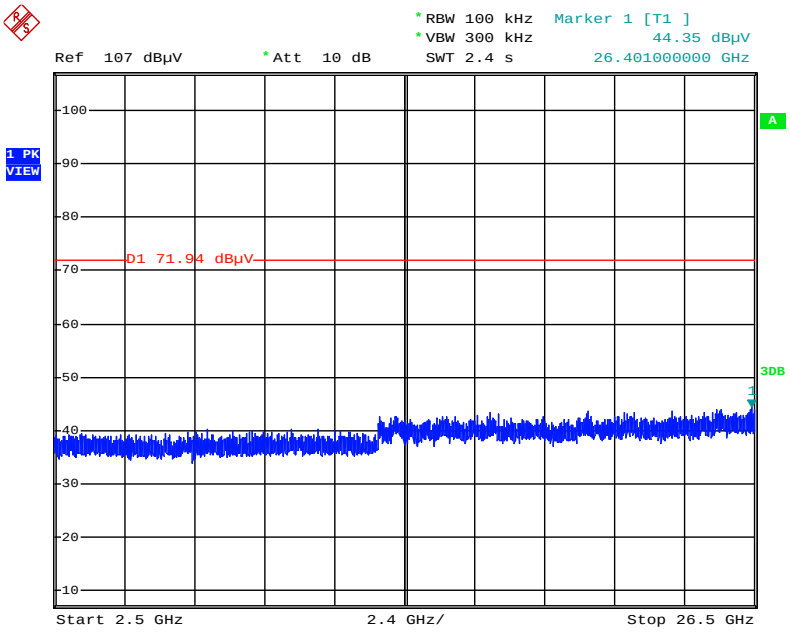
Plot on Configuration IEEE 802.11g / CH 13 / 2483.5MHz~2500MHz (down 30dBc) (Horizontal)



Date: 30.DEC.2014 12:38:33

Note: Only the worse polarization (Horizontal) is tested and recorded in test report.

Plot on Configuration IEEE 802.11g / CH 13 / 2500MHz~26500MHz (down 30dBc) (Horizontal)



Date: 13.DEC.2014 13:27:36

Note: Only the worse polarization (Horizontal) is tested and recorded in test report.

4.6. Antenna Requirements

4.6.1. Limit

Except for special regulations, the Low-power Radio-frequency Devices must not be equipped with any jacket for installing an antenna with extension cable. 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 the user can replace a broken antenna, but the use of a standard antenna jack or electrical connector is prohibited. Further, this requirement does not apply to intentional radiators that must be professionally installed.

4.6.2. Antenna Connector Construction

Please refer to section 3.3 in this test report; antenna connector complied with the requirements.

5. LIST OF MEASURING EQUIPMENTS

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
Signal analyzer	R&S	FSV40	100979	9kHz~40GHz	Dec.12, 2014	Conducted (TH01-CB)
RF Cable-high	Woken	High Cable-7	-	1 GHz – 26.5 GHz	Nov. 15, 2014	Conducted (TH01-CB)
RF Cable-high	Woken	High Cable-8	-	1 GHz – 26.5 GHz	Nov. 15, 2014	Conducted (TH01-CB)
RF Cable-high	Woken	High Cable-9	-	1 GHz – 26.5 GHz	Nov. 15, 2014	Conducted (TH01-CB)
RF Cable-high	Woken	High Cable-10	-	1 GHz – 26.5 GHz	Nov. 15, 2014	Conducted (TH01-CB)
RF Cable-high	Woken	High Cable-11	-	1 GHz – 26.5 GHz	Nov. 15, 2014	Conducted (TH01-CB)
Power Sensor	Anritsu	MA2411B	1126203	300MHz~40GHz	Oct. 06, 2014	Conducted (TH01-CB)
Power Meter	Anritsu	ML2495A	1210004	300MHz~40GHz	Oct. 06, 2014	Conducted (TH01-CB)
BILOG ANTENNA	Schaffner	CBL6112D	22021	20MHz ~ 2GHz	May 26, 2014	Radiation (03CH01-CB)
Horn Antenna	EMCO	3115	00075790	750MHz~18GHz	Nov. 01, 2013	Radiation (03CH01-CB)
Horn Antenna	EMCO	3115	00075790	750MHz~18GHz	Oct. 28, 2014	Radiation (03CH01-CB)
Horn Antenna	Schwarzbeck	BBHA 9170	9170-507	15GHz ~ 40GHz	Feb. 13, 2014	Radiation (03CH01-CB)
Pre-Amplifier	Agilent	8447D	2944A10991	0.1MHz ~ 1.3GHz	Nov. 12, 2013	Radiation (03CH01-CB)
Pre-Amplifier	Agilent	8447D	2944A10991	0.1MHz ~ 1.3GHz	Nov. 15, 2014	Radiation (03CH01-CB)
Pre-Amplifier	Agilent	8449B	3008A02310	1GHz ~ 26.5GHz	Dec. 16, 2013	Radiation (03CH01-CB)
Pre-Amplifier	Agilent	8449B	3008A02009	1GHz ~ 26.5GHz	Dec. 17, 2014	Radiation (03CH01-CB)
Pre-Amplifier	WM	TF-130N-R1	923365	26GHz ~ 40GHz	Oct. 23, 2013	Radiation (03CH01-CB)
Pre-Amplifier	WM	TF-130N-R1	923365	26GHz ~ 40GHz	Nov. 25, 2014	Radiation (03CH01-CB)
Spectrum analyzer	R&S	FSP40	100019	9kHz~40GHz	Dec. 02, 2013	Radiation (03CH01-CB)
Spectrum Analyzer	R&S	FSP40	100080	9kHz ~ 40GHz	Oct. 15, 2014	Radiation (03CH01-CB)
EMI Test Receiver	Agilent	N9038A	MY52260123	9kHz ~ 8GHz	Dec. 12, 2013	Radiation (03CH01-CB)
EMI Test Receiver	R&S	ESR26	101289	9kHz~26GHz	Aug. 22, 2014	Radiation (03CH01-CB)
Turn Table	INN CO	CO 2000	N/A	0 ~ 360 degree	N.C.R.	Radiation (03CH01-CB)
Antenna Mast	INN CO	CO2000	N/A	1 m - 4 m	N.C.R.	Radiation (03CH01-CB)
RF Cable-low	Woken	Low Cable-1	N/A	30 MHz - 1 GHz	Nov. 17, 2013	Radiation (03CH01-CB)
RF Cable-low	Woken	Low Cable-1	N/A	30 MHz - 1 GHz	Nov. 15, 2014	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-1	N/A	1 GHz – 26.5 GHz	Nov. 17, 2013	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-1	N/A	1 GHz – 26.5 GHz	Nov. 15, 2014	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-2	N/A	1 GHz – 26.5 GHz	Nov. 17, 2013	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-2	N/A	1 GHz – 26.5 GHz	Nov. 15, 2014	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-3	N/A	1 GHz - 40 GHz	Nov. 17, 2013	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-3	N/A	1 GHz - 40 GHz	Nov. 15, 2014	Radiation (03CH01-CB)

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
RF Cable-high	Woken	High Cable-4	N/A	1 GHz - 40 GHz	Nov. 17, 2013	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-4	N/A	1 GHz - 40 GHz	Nov. 15, 2014	Radiation (03CH01-CB)

Note: Calibration Interval of instruments listed above is one year.
N.C.R. means Non-Calibration required.

6. MEASUREMENT UNCERTAINTY

Test Items	Uncertainty	Remark
Radiated Emission (1GHz ~ 18GHz)	3.7 dB	Confidence levels of 95%
Radiated Emission (18GHz ~ 40GHz)	3.5 dB	Confidence levels of 95%
Conducted Emission	1.7 dB	Confidence levels of 95%