

APPLICATION FOR CERTIFICATION

On Behalf of
JCE Autonet Ltd.
Car Radio Head Unit
Model No.: W7
FCC ID: 2AB4WW7
Brand: AUTONET

Prepared for : JCE Autonet Ltd.
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TEST REPORT CERTIFICATION

Applicant : JCE Autonet Ltd.
Manufacturer : Dongguan Skyvision Electronics Co., Ltd
EUT Description : Car Radio Head Unit
FCC ID : 2AB4WW7
(A) Model No. : W7
(B) Serial No. : N/A
(C) Brand : AUTONET
(D) Power Supply : DC 12V
(E) Test Voltage : DC 12V (Via DC Power Supply)

Measurement Procedure Used:

FCC Rules and Regulations Part 15 Subpart C, Oct. 2013
(FCC CFR 47 Part 15C, §15.205, §15.207, §15.209 and §15.247)
AND ANSI C63.4:2003

The device described above was tested by AUDIX Technology Corporation to determine the maximum emission levels emanating from the device. The maximum emission levels were compared to the FCC Part 15 subpart C limits.

The measurement results are contained in this test report and AUDIX Technology Corporation is assumed full responsibility for the accuracy and completeness of these measurements. Also, this report shows that the EUT to be technically compliant with the requirements of FCC standards.

This report applies to above tested sample only. This report shall not be reproduced in part without written approval of AUDIX Technology Corporation.

Date of Test: 2014. 03. 17 ~ 19

Date of Report: 2014. 03. 20

Producer: 
(Tina Huang/Administrator)

Signatory: 
(Ben Cheng/Manager)

1. DESCRIPTION OF REVISION HISTORY

Edition No.	Date of Rev.	Revision Summary	Report No.
0	2014. 03. 20	Original Report	EM-F140166

2. GENERAL INFORMATION

2.1. Description of Device (EUT)

Product	Car Radio Head Unit
Model Number	W7
Serial Number	N/A
Brand Name	AUTONET
Applicant	JCE Autonet Ltd. 2-1, Lane 542, Jung Shiau Road, LinKuo, New Taipei City 244, Taiwan
Manufacturer	Dongguan Skyvision Electronics Co., Ltd No.8, Lehe St. Liangtouwe Industrial District, Qinxi Town, Dongguan City, Guandong Province, P.R.China
FCC ID	2AB4WW7
Fundamental Range	802.11b/g: 2412MHz ~ 2462MHz 802.11n-HT20: 2412MHz ~ 2462MHz 802.11n-HT40: 2422MHz ~ 2452MHz BT: 2402MHz ~ 2480MHz
Frequency Channel	802.11b/g: 11 channels 802.11n-HT20: 2.4GHz: 11 channels 802.11n-HT40: 2.4GHz: 7 channels BT: 79 channels
Radio Technology	802.11b: DSSS Modulation (DBPSK/DQPSK/CCK) 802.11g: OFDM Modulation (BPSK/QPSK/16QAM/64QAM) 802.11n: OFDM Modulation (SISO) (BPSK/QPSK/16QAM/64QAM) BT: FHSS (GFSK)
Data Transfer Rate	802.11b: 1/2/5.5/11Mbps 802.11g: 6/9/12/18/24/36/48/54Mbps 802.11n: up to 150Mbps BT: 1Mbps
Antenna Type	WLAN: PCB Antenna+ RF Cable, 1.32dBi(Peak)
	BT: PCB Antenna, 1.98dBi(Peak)
Date of Receipt of Sample	2014. 02. 11
Date of Test	2014. 03. 17 ~ 19
Note: This EUT has 802.11b/g/n-HT20/HT40 and BT function. See below for related test reports based on radio functionality. 1. The BT function has been test in other report of EM-F140165. 2. The 802.11b/g/n-HT20/HT40 function has been test in this report of EM-F140166.	

2.2. Data Rate Relative to Average Output Power

802.11b			
Channel	Modulation	Date Rate (Mbps)	Power (dBm)
1	BPSK	1	16.38
1	BPSK	2	16.37
1	QPSK	5.5	16.37
1	QPSK	11	16.32

802.11g			
Channel	Modulation	Date Rate (Mbps)	Power (dBm)
1	BPSK	6	12.94
1	BPSK	9	12.91
1	QPSK	12	12.90
1	QPSK	18	12.91
1	16-QAM	24	12.88
1	16-QAM	36	12.88
1	64-QAM	48	12.89
1	64-QAM	54	12.87

802.11n-HT20				802.11n-HT40			
Channel	Modulation	Date Rate (Mbps)	Power (dBm)	Channel	Modulation	Date Rate (Mbps)	Power (dBm)
1	BPSK	6.5	12.94	3	BPSK	6.5	11.22
1	QPSK	13	12.91	3	QPSK	13	11.21
1	QPSK	19.5	12.90	3	QPSK	19.5	11.18
1	16-QAM	26	12.91	3	16-QAM	26	11.18
1	16-QAM	39	12.88	3	16-QAM	39	11.15
1	64-QAM	52	12.88	3	64-QAM	52	11.14
1	64-QAM	58.6	12.89	3	64-QAM	58.6	11.13
1	64-QAM	65	12.87	3	64-QAM	65	11.13

2.3. Test Configuration for Each Test Item

Test Item	802.11b	802.11g	802.11n-HT20	802.11n-HT40
	Data Rate for Test (Mbps)			
6db Bandwidth	1	6	6.5	6.5
Maximum Peak Output Power	1	6	6.5	6.5
Emission Limitations	1	6	6.5	6.5
Band Edges	1	6	6.5	6.5
Power Spectral Density	1	6	6.5	6.5

2.4. Tested Supporting System Details

2.4.1. Support Peripheral Unit

No.	Product	Brand	Model No.	Serial No.	FCC ID
1.	DC Power Supply	TOP WARD	3303A	N/A	N/A

2.4.2. Cable Lists

No.	Cable Description Of The Above Support Units
1.	DC Power Cable*2: Non-Shielded, Detachable, 1.6m

2.5. Description of Test Facility

Name of Firm : **AUDIX Technology Corporation**
 EMC Department
 No. 53-11, Dingfu, Linkou Dist.,
 New Taipei City 244, Taiwan

Test Site : **Semi-Anechoic Chamber**
 (Semi-AC) No. 53-11, Dingfu, Linkou Dist.,
 New Taipei City 244, Taiwan

May 11, 2012 Renewal on
 Federal Communication Commission
 Registration Number: 90993

NVLAP Lab. Code : 200077-0

TAF Accreditation No : 1724

2.6. Measurement Uncertainty

Test Item	Frequency Range	Uncertainty (dB)
Radiation Test (Distance: 3m)	30MHz~300MHz	± 2.91dB
	300MHz~1000MHz	± 2.74dB
	Above 1GHz	± 5.02dB

Remark : Uncertainty = $ku_c(y)$

Test Item	Uncertainty
6dB Bandwidth	± 0.05kHz
Maximum peak output power	± 0.33dBm
Emission Limitations	± 0.13dB
Band edges	± 0.13dB
Power spectral density	± 0.13dB

3. CONDUCTED EMISSION MEASUREMENT

【The EUT only employs DC power for operation, no conductive emission limits are required according to FCC Part 15 Section §15.207】

4. RADIATED EMISSION MEASUREMENT

4.1. Test Equipment

The following test equipment was used during the radiated emission measurement:

4.1.1. For Frequency Range 30MHz~1000MHz (at Semi-Anechoic Chamber)

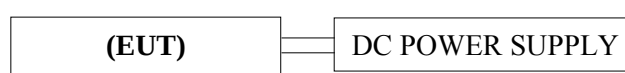
Item	Type	Manufacturer	Model No.	Serial No.	Cal. Due Date
1	Spectrum Analyzer	Agilent	N9030A-544	US51350140	2014. 07. 29
2	Test Receiver	R & S	ESCS30	100338	2014. 06. 30
3	Amplifier	HP	8447D	2944A06305	2015. 02. 17
4	Bilog Antenna	CHASE	CBL6112D	33821	2014. 08. 07

4.1.2. For Frequency Above 1GHz (at Semi-Anechoic Chamber)

Item	Type	Manufacturer	Model No.	Serial No.	Cal. Due Date
1	Spectrum Analyzer	Agilent	N9030A-544	US51350140	2014. 07. 29
2	Test Receiver	R & S	ESCS30	100338	2014. 06. 30
3	Amplifier	Agilent	8449B	3008A02676	2015. 02. 20
4	2.4GHz Notch Filter	K&L	7NSL10-2441.5 E130.5-00	1	2014. 06. 12
5	3G High Pass Filter	Microwave Circuits	H3G018G1	484796	2014. 06. 12
6	Horn Antenna	EMCO	3115	9609-4927	2014. 06. 16
7	Horn Antenna	EMCO	3116	2653	2014. 10. 10

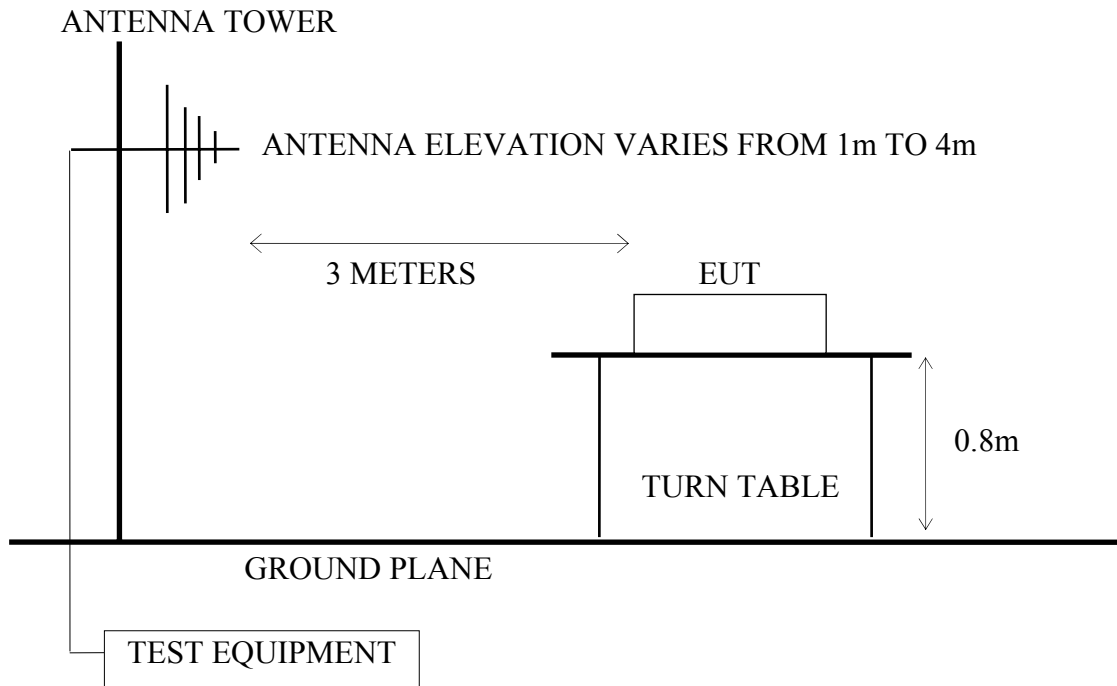
4.2. Test Setup

4.2.1. Block Diagram of connection between EUT and simulators

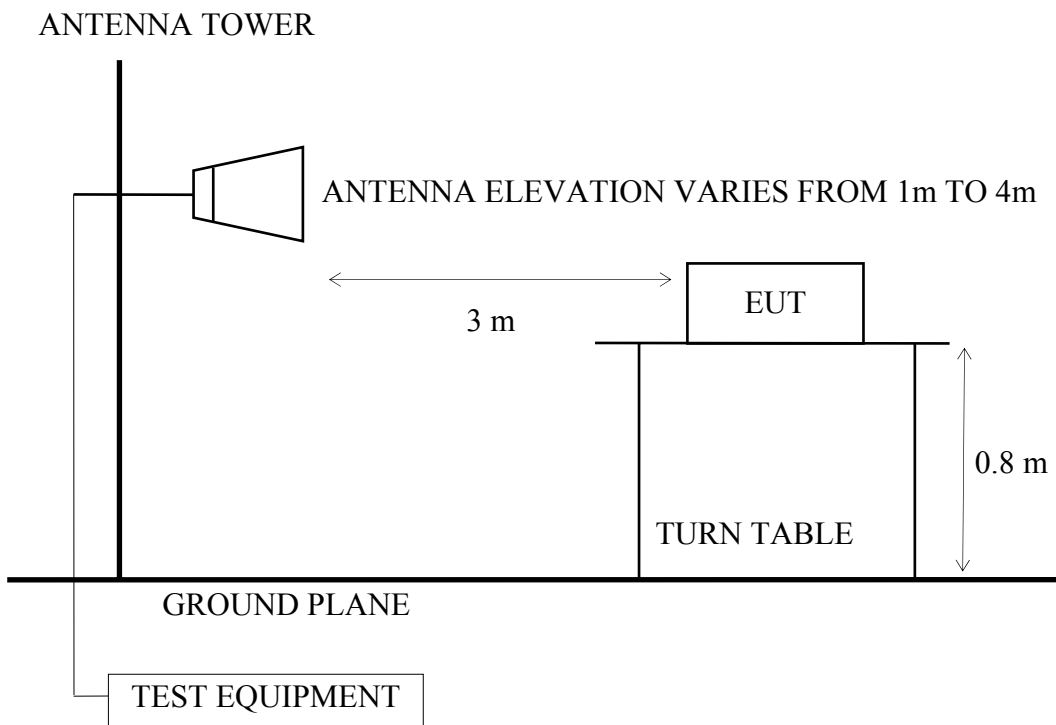


EUT: Car Radio Head Unit

4.2.2. Semi-Anechoic Chamber (3m) Setup Diagram for 30-1000MHz



4.2.3. Semi-Anechoic Chamber (3m) Setup Diagram for above 1GHz



4.3. Radiated Emission Limits (§15.209, RSS-210 §2.7/Table 2)

FREQUENCY MHz	DISTANCE Meters	FIELD STRENGTHS LIMITS	
		$\mu\text{V/m}$	$\text{dB}\mu\text{V/m}$
30 ~ 88	3	100	40.0
88 ~ 216	3	150	43.5
216 ~ 960	3	200	46.0
Above 960	3	500	54.0
Above 1000	3	74.0 $\text{dB}\mu\text{V/m}$ (Peak) 54.0 $\text{dB}\mu\text{V/m}$ (Average)	

Remark : (1) Emission level ($\text{dB}\mu\text{V/m}$) = $20 \log$ Emission level ($\mu\text{V/m}$)

(2) The tighter limit applies at the edge between two frequency bands.

(3) Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.

(4) The limits in this table are based on CFR 47 Part 15.205(a)(b) and Part 15.209 (a).

(5) The over 1GHz limit, FCC limit is used based on CFR 47 Part 15.35(b) and Part 15.205(b) & Part 15.209(e) and Part 15.207(c).

4.4. Operating Condition of EUT

4.4.1. Set up the EUT (Car Radio Head Unit) as shown on 4.2.

4.4.2. To turn on the power of all equipment.

4.4.3. The EUT supports 802.11b/g/n-HT20/n-HT40 modes, we performed pre-scan high, middle, low channels for each mode for spurious emission and listed the worst channel of each mode in test report.

4.4.4. The worst channel of each mode as following:

Mode	Type	Channel	Frequency
1	802.11b	CH 6	2437MHz
2	802.11g	CH 6	2437MHz
3	802.11n-HT20	CH 6	2437MHz
4	802.11n-HT40	CH 6	2437MHz

4.5. Test Procedure

The EUT and its simulators were placed on a turn table which was 0.8 meter above the ground. The turn table rotated 360 degrees to determine the position of the maximum emission level. EUT was set 3 meters away from the receiving antenna which was mounted on an antenna tower. The antenna moved up and down between 1 to 4 meters to find out the maximum emission level. Broadband antenna such as calibrated biconical and log-periodical antenna or horn antenna were used as a receiving antenna. Both horizontal and vertical polarization of the antenna were set on measurement. In order to find the maximum emission, all of the interface cables were manipulated according to ANSI C63.4-2003 regulation.

The bandwidth of the R&S Test Receiver was set at 120kHz. (For 30MHz to 1000MHz)

The resolution bandwidth and video bandwidth of test spectrum analyzer is 1MHz for peak detection (PK) at frequency above 1GHz.

The resolution bandwidth of test spectrum analyzer is 1MHz and the video bandwidth is 10Hz for average detection (AV) at frequency above 1GHz.

The frequency range from 30MHz to 25GHz (Up to 10th harmonics from fundamental frequency) was checked. 30MHz to 1000MHz was measured with Quasi-Peak detector.

Pursuant to ANSI C63.4 8.3.1.2, when peak value complies with the average limit, we didn't perform measurement in average detector.

4.6. Test Results

PASSED.

(All emissions not reported for there is no emission be found.)

For Frequency Range 30MHz~1000MHz:

The EUT with following test modes was performed during this section testing and all the test results are listed in section 4.6.1.

EUT: Car Radio Head Unit

M/N: W7

Test Date: 2014. 03. 19 Temperature: 24 Humidity: 48%

Mode	Type	Channel	Frequency	Test Mode	Reference Test Data No.	
					Horizontal	Vertical
1	802.11b	CH 6	2437MHz	Transmit	# 6	# 9
2	802.11g	CH 6	2437MHz		# 7	# 2
3	802.11n-HT20	CH 6	2437MHz		# 8	# 3
4	802.11n-HT40	CH 6	2437MHz		# 9	# 4

* Above all final readings were measured with Peak detector.

For Frequency above 1GHz:

The EUT with following test modes was performed during this section testing and all the test results are listed in section 4.6.2.

Test Date: 2014. 03. 19 Temperature: 24 Humidity: 48%

Mode	Type	Channel	Frequency	Test Mode	Reference Test Data No.	
					Horizontal	Vertical
1	802.11b	CH 6	2437MHz	Transmit	# 7	# 2

Remark : The emissions (up to 25GHz) not reported for there is no emission be found.

For Restricted Bands:

The EUT was tested in restricted bands and all the test results are listed in section 4.6.3. (The restricted bands defined in part 15.205(a))

Mode	Type	Channel	Frequency	Test Mode	Reference Test Data No.	
					Horizontal	Vertical
1	802.11b	CH 6	2412MHz	Transmit	# 3, # 4	# 1, # 2
2		CH 11	2462MHz		# 7, # 8	# 5, # 6
3	802.11g	CH 6	2412MHz		# 3, # 4	# 1, # 2
4		CH 11	2462MHz		# 7, # 8	# 5, # 6
5	802.11n-HT20	CH 6	2412MHz		# 3, # 4	# 1, # 2
6		CH 11	2462MHz		# 7, # 8	# 5, # 6
7	802.11n-HT40	CH 6	2412MHz		# 3, # 4	# 1, # 2
8		CH 11	2462MHz		# 7, # 8	# 5, # 6

4.6.1. For 30-1000MHz Frequency Range Measurement Results

802.11b , Transmit, Frequency: 2437MHz

Site no. : Audix NO.1 Chamber Data no. : 6
 Dis. / Ant. : 3m CBL6112D 33821 Ant. pol. : HORIZONTAL
 Limit : 30M-1G
 Env. / Ins. : 24°C / 48% N9030A(140) Engineer : Johnny_Hsueh
 EUT : W7
 Power Rating : DC 12V
 Test Mode : Tx2437MHz(802.11B)

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dB μ V)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Remark
1	31.94	18.68	1.10	12.66	32.44	40.00	7.56	Peak
2	127.97	12.24	2.40	22.09	36.73	43.50	6.77	Peak
3	580.96	18.81	6.30	2.12	27.23	46.00	18.77	Peak

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

Site no. : Audix NO.1 Chamber Data no. : 1
 Dis. / Ant. : 3m CBL6112D 33821 Ant. pol. : VERTICAL
 Limit : 30M-1G
 Env. / Ins. : 24°C / 48% N9030A(140) Engineer : Johnny_Hsueh
 EUT : W7
 Power Rating : DC 12V
 Test Mode : Tx2437MHz(802.11B)

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dB μ V)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Remark
1	40.67	13.54	1.30	24.55	39.39	40.00	0.61	Peak
2	148.34	11.29	2.60	21.95	35.84	43.50	7.66	Peak
3	587.75	18.88	6.30	3.67	28.85	46.00	17.15	Peak

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

802.11g , Transmit, Frequency: 2437MHz

Site no. : Audix NO.1 Chamber Data no. : 7
 Dis. / Ant. : 3m CBL6112D 33821 Ant. pol. : HORIZONTAL
 Limit : 30M-1G
 Env. / Ins. : 24°C / 48% N9030A(140) Engineer : Johnny_Hsueh
 EUT : W7
 Power Rating : DC 12V
 Test Mode : Tx2437MHz(802.11G)

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dB μ V)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Remark
1	35.82	16.42	1.20	14.43	32.05	40.00	7.95	Peak
2	145.43	11.43	2.59	17.01	31.03	43.50	12.47	Peak
3	580.96	18.81	6.30	1.12	26.23	46.00	19.77	Peak

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

Site no. : Audix NO.1 Chamber Data no. : 2
 Dis. / Ant. : 3m CBL6112D 33821 Ant. pol. : VERTICAL
 Limit : 30M-1G
 Env. / Ins. : 24°C / 48% N9030A(140) Engineer : Johnny_Hsueh
 EUT : W7
 Power Rating : DC 12V
 Test Mode : Tx2437MHz(802.11G)

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dB μ V)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Remark
1	31.94	18.68	1.10	19.55	39.33	40.00	0.67	Peak
2	147.37	11.34	2.58	19.30	33.22	43.50	10.28	Peak
3	580.96	18.81	6.30	2.08	27.19	46.00	18.81	Peak

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

802.11n-HT20 , Transmit, Frequency: 2437MHz

Site no. : Audix NO.1 Chamber Data no. : 8
 Dis. / Ant. : 3m CBL6112D 33821 Ant. pol. : HORIZONTAL
 Limit : 30M-1G
 Env. / Ins. : 24°C / 48% N9030A(140) Engineer : Johnny_Hsueh
 EUT : W7
 Power Rating : DC 12V
 Test Mode : Tx2437MHz(802.11N20)

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dB μ V)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Remark
1	35.82	16.42	1.20	18.06	35.68	40.00	4.32	Peak
2	128.94	12.22	2.40	21.08	35.70	43.50	7.80	Peak
3	580.96	18.81	6.30	3.34	28.45	46.00	17.55	Peak

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

Site no. : Audix NO.1 Chamber Data no. : 3
 Dis. / Ant. : 3m CBL6112D 33821 Ant. pol. : VERTICAL
 Limit : 30M-1G
 Env. / Ins. : 24°C / 48% N9030A(140) Engineer : Johnny_Hsueh
 EUT : W7
 Power Rating : DC 12V
 Test Mode : Tx2437MHz(802.11N20)

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dB μ V)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Remark
1	45.52	10.97	1.40	24.38	36.75	40.00	3.25	Peak
2	151.25	11.13	2.60	16.38	30.11	43.50	13.39	Peak
3	580.96	18.81	6.30	1.75	26.86	46.00	19.14	Peak

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

802.11n-HT40 , Transmit, Frequency: 2437MHz

Site no. : Audix NO.1 Chamber Data no. : 9
 Dis. / Ant. : 3m CBL6112D 33821 Ant. pol. : HORIZONTAL
 Limit : 30M-1G
 Env. / Ins. : 24°C / 48% N9030A(140) Engineer : Johnny_Hsueh
 EUT : W7
 Power Rating : DC 12V
 Test Mode : Tx2437MHz(802.11N40)

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dB μ V)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Remark
1	34.85	17.00	1.20	18.06	36.26	40.00	3.74	Peak
2	128.94	12.22	2.40	21.51	36.13	43.50	7.37	Peak
3	580.96	18.81	6.30	3.02	28.13	46.00	17.87	Peak

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

Site no. : Audix NO.1 Chamber Data no. : 4
 Dis. / Ant. : 3m CBL6112D 33821 Ant. pol. : VERTICAL
 Limit : 30M-1G
 Env. / Ins. : 24°C / 48% N9030A(140) Engineer : Johnny_Hsueh
 EUT : W7
 Power Rating : DC 12V
 Test Mode : Tx2437MHz(802.11N40)

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dB μ V)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Remark
1	39.70	14.10	1.20	22.83	38.13	40.00	1.87	Peak
2	149.31	11.25	2.60	20.76	34.61	43.50	8.89	Peak
3	580.96	18.81	6.30	2.84	27.95	46.00	18.05	Peak

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

4.6.2. For above 1GHz Frequency Range Measurement Results

802.11b , Transmit, Frequency: 2437MHz

Site no. : Audix NO.1 Chamber Data no. : 7
 Dis. / Ant. : 3m 3115(4927) Ant. pol. : HORIZONTAL
 Limit : ABOVE 1GHZ(AV)
 Env. / Ins. : 24°C / 48% N9030A(140) Engineer : Johnny_Hsueh
 EUT : W7
 Power Rating : DC 12V
 Test Mode : Tx2437MHz(802.11B)

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dB μ V)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Remark
1	4875.00	33.18	9.15	10.21	52.54	54.00	1.46	Peak

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

Site no. : Audix NO.1 Chamber Data no. : 2
 Dis. / Ant. : 3m 3115(4927) Ant. pol. : VERTICAL
 Limit : ABOVE 1GHZ(AV)
 Env. / Ins. : 24°C / 48% N9030A(140) Engineer : Johnny_Hsueh
 EUT : W7
 Power Rating : DC 12V
 Test Mode : Tx2437MHz(802.11B)

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dB μ V)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Remark
1	4875.00	33.18	9.15	8.59	50.92	54.00	3.08	Peak

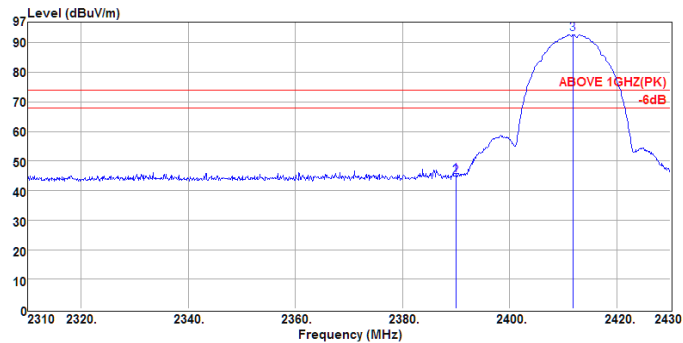
Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading
 2. The emission levels that are 20dB below the official limit are not reported.

4.6.3. Restricted Bands Measurement Results

Date of Test : 2014. 03. 19 Temperature: 24

EUT: Car Radio Head Unit Humidity: 48%

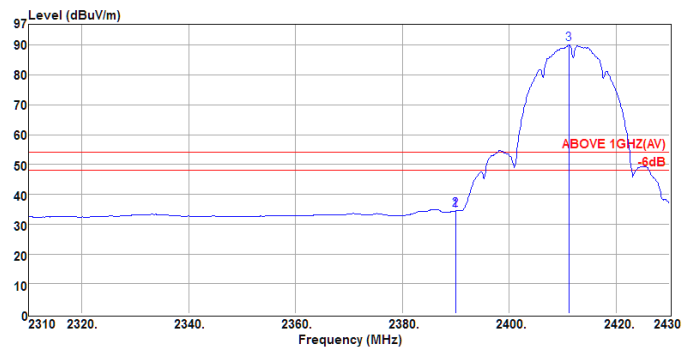
Test Mode: 802.11b , Transmit, Channel: 01, Frequency: 2412MHz



Site no. : Audix NO.1 Chamber Data no. : 3
 Dis. / Ant. : 3m 3115(4927) Ant. pol. : HORIZONTAL
 Limit : ABOVE 1GHZ(PK)
 Env. / Ins. : 24°C / 48% N9030A(140) Engineer : Johnny_Hsueh
 EUT : W7
 Power Rating : DC 12V
 Test Mode : Tx2412MHz(802.11B)

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dB μ V)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Remark
1	2389.92	28.47	6.34	10.43	45.24	74.00	28.76	Peak
2	2390.04	28.47	6.34	9.93	44.74	74.00	29.26	Peak
3	2411.88	28.51	6.36	58.17	93.04	74.00	-19.04	Peak

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



Site no. : Audix NO.1 Chamber Data no. : 4
 Dis. / Ant. : 3m 3115(4927) Ant. pol. : HORIZONTAL
 Limit : ABOVE 1GHZ(AV)
 Env. / Ins. : 24°C / 48% N9030A(140) Engineer : Johnny_Hsueh
 EUT : W7
 Power Rating : DC 12V
 Test Mode : Tx2412MHz(802.11B)

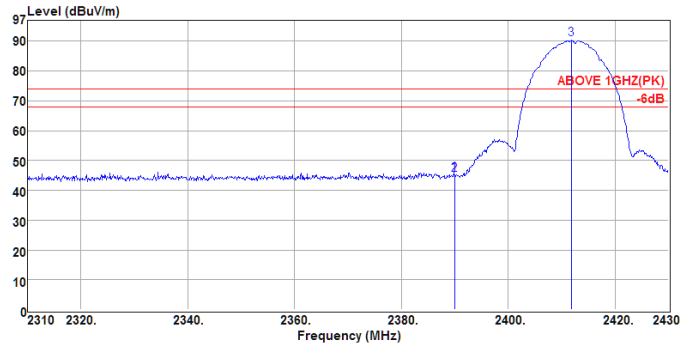
	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dB μ V)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Remark
1	2389.92	28.47	6.34	-0.15	34.86	54.00	19.34	Average
2	2390.04	28.47	6.34	-0.10	34.71	54.00	19.29	Average
3	2411.18	28.51	6.36	55.53	90.40	54.00	-36.40	Average

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

Date of Test : 2014. 03. 19 Temperature: 24

EUT: Car Radio Head Unit Humidity: 48%

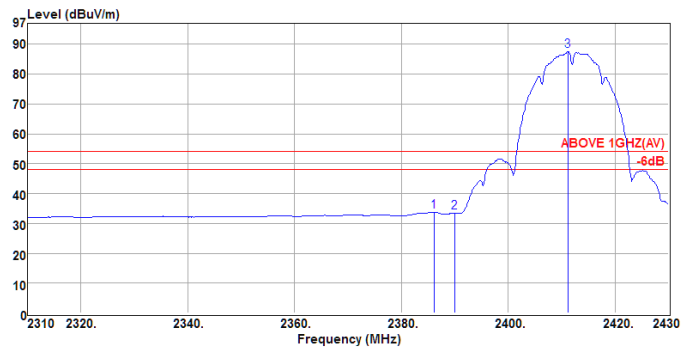
Test Mode: 802.11b , Transmit, Channel: 01, Frequency: 2412MHz



Site no. : Audix NO.1 Chamber Data no. : 1
 Dis. / Ant. : 3m 3115(4927) Ant. pol. : VERTICAL
 Limit : ABOVE 1GHZ(PK)
 Env. / Ins. : 24°C / 48% N9030A(140) Engineer : Johnny_Hsueh
 EUT : W7
 Power Rating : DC 12V
 Test Mode : Tx2412MHz(802.11B)

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dB μ V)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Remark
1	2389.92	28.47	6.34	10.71	45.52	74.00	28.48	Peak
2	2390.04	28.47	6.34	10.33	45.14	74.00	28.86	Peak
3	2411.88	28.51	6.36	55.73	90.80	74.00	-16.80	Peak

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



Site no. : Audix NO.1 Chamber Data no. : 2
 Dis. / Ant. : 3m 3115(4927) Ant. pol. : VERTICAL
 Limit : ABOVE 1GHZ(AV)
 Env. / Ins. : 24°C / 48% N9030A(140) Engineer : Johnny_Hsueh
 EUT : W7
 Power Rating : DC 12V
 Test Mode : Tx2412MHz(802.11B)

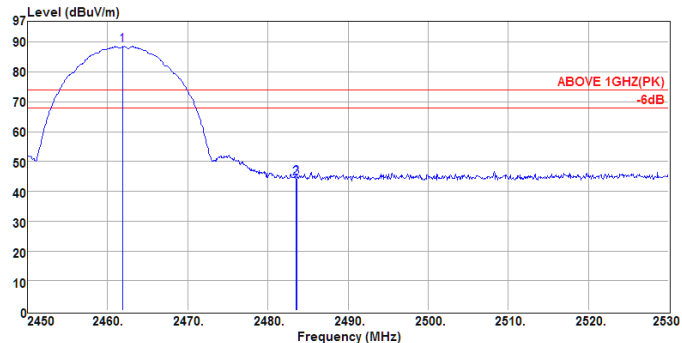
	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dB μ V)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Remark
1	2388.08	28.47	6.33	-0.79	34.01	54.00	19.99	Average
2	2390.04	28.47	6.34	-1.05	33.78	54.00	20.24	Average
3	2411.16	28.51	6.36	52.98	87.83	54.00	-33.83	Average

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

Date of Test : 2014. 03. 19 Temperature: 24

EUT: Car Radio Head Unit Humidity: 48%

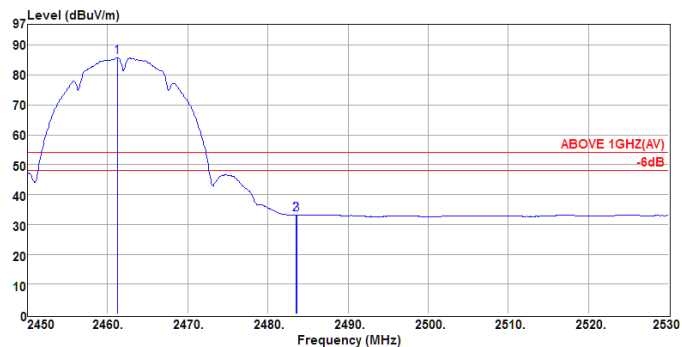
Test Mode: 802.11b , Transmit, Channel: 11, Frequency: 2462MHz



Site no. : Audix NO.1 Chamber Data no. : 7
 Dis. / Ant. : 3m 3115(4927) Ant. pol. : HORIZONTAL
 Limit : ABOVE 1GHZ(PK)
 Env. / Ins. : 24°C / 48% N9030A(140) Engineer : Johnny_Hsueh
 EUT : W7
 Power Rating : DC 12V
 Test Mode : Tx2462MHz(802.11B)

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dB μ V)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Remark
1	2461.84	28.62	6.42	53.86	88.90	74.00	-14.90	Peak
2	2483.52	28.66	6.45	9.33	44.44	74.00	29.56	Peak
3	2483.60	28.66	6.45	9.57	44.68	74.00	29.32	Peak

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



Site no. : Audix NO.1 Chamber Data no. : 8
 Dis. / Ant. : 3m 3115(4927) Ant. pol. : HORIZONTAL
 Limit : ABOVE 1GHZ(AV)
 Env. / Ins. : 24°C / 48% N9030A(140) Engineer : Johnny_Hsueh
 EUT : W7
 Power Rating : DC 12V
 Test Mode : Tx2462MHz(802.11B)

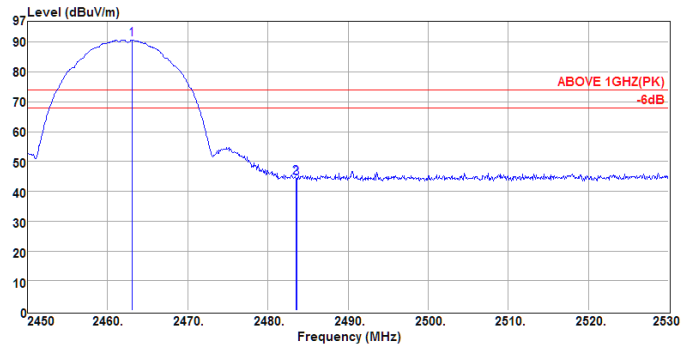
	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dB μ V)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Remark
1	2461.20	28.62	6.42	51.13	86.17	54.00	-32.17	Average
2	2483.52	28.66	6.45	-1.71	33.40	54.00	20.60	Average
3	2483.60	28.66	6.45	-1.72	33.39	54.00	20.61	Average

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

Date of Test : 2014. 03. 19 Temperature: 24

EUT: Car Radio Head Unit Humidity: 48%

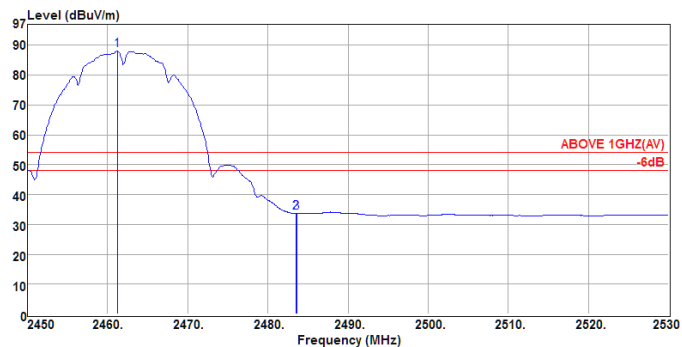
Test Mode: 802.11b , Transmit, Channel: 11, Frequency: 2462MHz



Site no. : Audix NO.1 Chamber Data no. : 5
 Dis. / Ant. : 3m 3115(4927) Ant. pol. : VERTICAL
 Limit : ABOVE 1GHZ(PK)
 Env. / Ins. : 24°C / 48% N9030A(140) Engineer : Johnny_Hsueh
 EUT : W7
 Power Rating : DC 12V
 Test Mode : Tx2462MHz(802.11B)

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dB μ V)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Remark
1	2463.04	28.62	6.42	56.01	91.05	74.00	-17.05	Peak
2	2483.52	28.66	6.45	9.56	44.87	74.00	29.33	Peak
3	2483.60	28.66	6.45	9.19	44.30	74.00	29.70	Peak

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



Site no. : Audix NO.1 Chamber Data no. : 6
 Dis. / Ant. : 3m 3115(4927) Ant. pol. : VERTICAL
 Limit : ABOVE 1GHZ(AV)
 Env. / Ins. : 24°C / 48% N9030A(140) Engineer : Johnny_Hsueh
 EUT : W7
 Power Rating : DC 12V
 Test Mode : Tx2462MHz(802.11B)

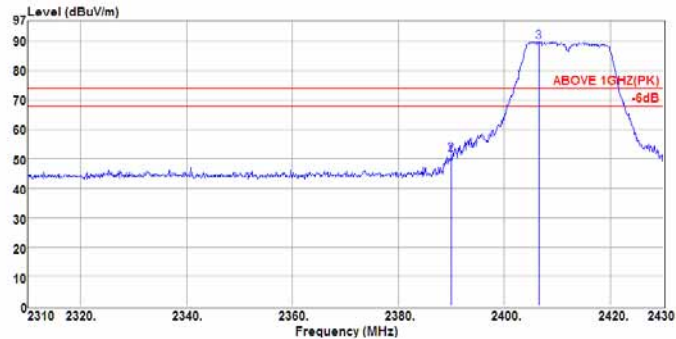
	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dB μ V)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Remark
1	2461.20	28.62	6.42	53.23	88.27	54.00	-34.27	Average
2	2483.52	28.66	6.45	-1.19	33.92	54.00	20.08	Average
3	2483.60	28.66	6.45	-1.18	33.93	54.00	20.07	Average

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

Date of Test : 2014. 03. 19 Temperature: 24

EUT: Car Radio Head Unit Humidity: 48%

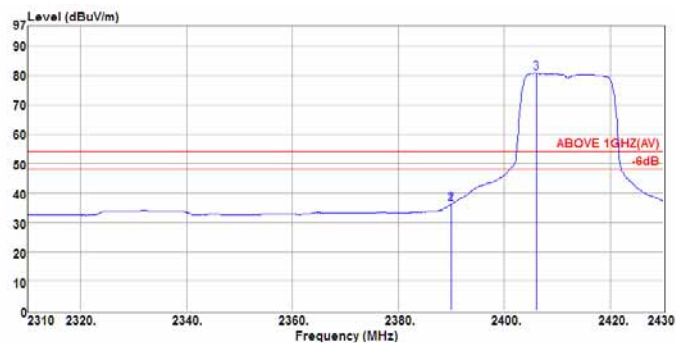
Test Mode: 802.11g , Transmit, Channel: 01, Frequency: 2412MHz



Site no. : Audix NO.1 Chamber Data no. : 3
 Dis. / Ant. : 3m 3115(4927) Ant. pol. : HORIZONTAL
 Limit : ABOVE 1GHZ(PK)
 Env. / Ins. : 24°C / 48% N9030A(140) Engineer : Johnny_Hsueh
 EUT : W7
 Power Rating : DC 12V
 Test Mode : Tx2412MHz(802.11G)

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dB μ V)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Remark
1	2389.92	28.47	6.34	16.12	50.93	74.00	23.07	Peak
2	2390.04	28.47	6.34	16.84	51.65	74.00	22.35	Peak
3	2408.60	28.51	6.36	55.09	89.98	74.00	-15.98	Peak

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



Site no. : Audix NO.1 Chamber Data no. : 4
 Dis. / Ant. : 3m 3115(4927) Ant. pol. : HORIZONTAL
 Limit : ABOVE 1GHZ(AV)
 Env. / Ins. : 24°C / 48% N9030A(140) Engineer : Johnny_Hsueh
 EUT : W7
 Power Rating : DC 12V
 Test Mode : Tx2412MHz(802.11G)

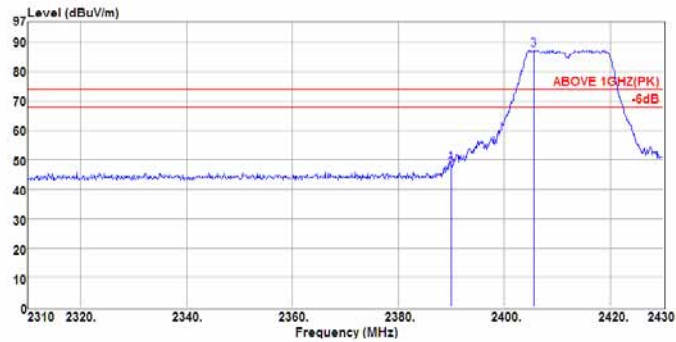
	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dB μ V)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Remark
1	2389.92	28.47	6.34	1.24	36.05	54.00	17.95	Average
2	2390.04	28.47	6.34	1.40	36.21	54.00	17.79	Average
3	2408.12	28.51	6.36	45.93	80.80	54.00	-26.80	Average

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

Date of Test : 2014. 03. 19 Temperature: 24

EUT: Car Radio Head Unit Humidity: 48%

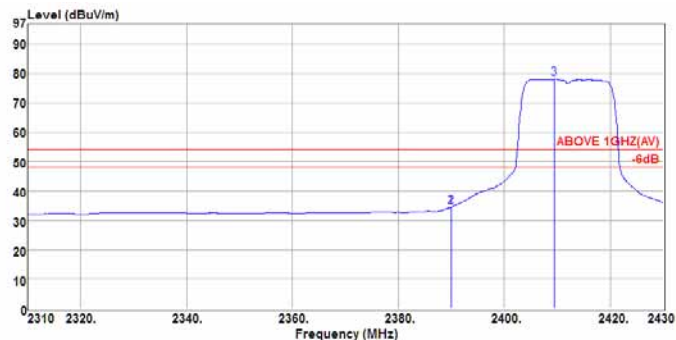
Test Mode: 802.11g , Transmit, Channel: 01, Frequency: 2412MHz



Site no. : Audix NO.1 Chamber Data no. : 1
 Dis. / Ant. : 3m 3115(4827) Ant. pol. : VERTICAL
 Limit : ABOVE 1GHZ(PK)
 Env. / Ins. : 24°C / 48% N8030A(140) Engineer : Johnny_Hsueh
 EUT : W7
 Power Rating : DC 12V
 Test Mode : Tx2412MHz(802.11G)

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dB μ V)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Remark
1	2389.92	28.47	8.34	14.09	48.90	74.00	25.10	Peak
2	2390.04	28.47	8.34	12.23	47.04	74.00	26.96	Peak
3	2405.84	28.51	8.36	52.62	87.49	74.00	-13.49	Peak

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



Site no. : Audix NO.1 Chamber Data no. : 2
 Dis. / Ant. : 3m 3115(4827) Ant. pol. : VERTICAL
 Limit : ABOVE 1GHZ(AV)
 Env. / Ins. : 24°C / 48% N8030A(140) Engineer : Johnny_Hsueh
 EUT : W7
 Power Rating : DC 12V
 Test Mode : Tx2412MHz(802.11G)

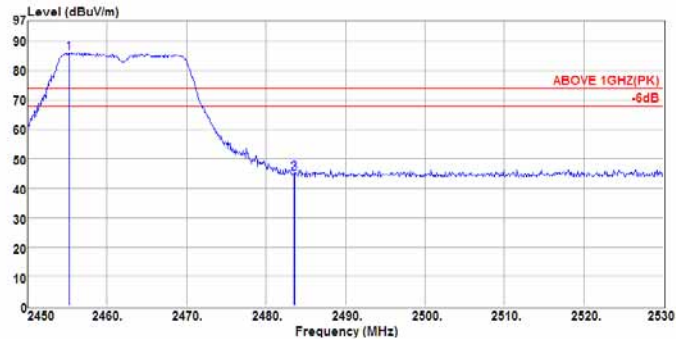
	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dB μ V)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Remark
1	2389.92	28.47	8.34	-0.37	34.44	54.00	19.56	Average
2	2390.04	28.47	8.34	-0.30	34.51	54.00	19.49	Average
3	2409.48	28.51	8.36	43.32	78.19	54.00	-24.19	Average

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

Date of Test : 2014. 03. 19 Temperature: 24

EUT: Car Radio Head Unit Humidity: 48%

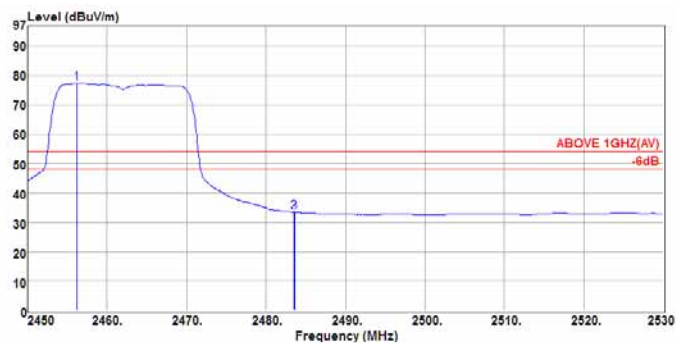
Test Mode: 802.11g , Transmit, Channel: 11, Frequency: 2462MHz



Site no. : Audix NO.1 Chamber Data no. : 7
 Dis. / Ant. : 3m 3115(4927) Ant. pol. : HORIZONTAL
 Limit : ABOVE 1GHZ(PK) -6dB
 Env. / Ins. : 24°C / 48% N9030A(140) Engineer : Johnny_Hsueh
 EUT : W7
 Power Rating : DC 12V
 Test Mode : Tx2462MHz(802.11G)

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dB μ V)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Remark
1	2455.20	28.82	6.42	51.06	86.10	74.00	-12.10	Peak
2	2483.52	28.86	6.45	9.88	44.89	74.00	29.01	Peak
3	2483.60	28.86	6.45	10.18	45.27	74.00	28.73	Peak

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



Site no. : Audix NO.1 Chamber Data no. : 8
 Dis. / Ant. : 3m 3115(4927) Ant. pol. : HORIZONTAL
 Limit : ABOVE 1GHZ(AV)
 Env. / Ins. : 24°C / 48% N9030A(140) Engineer : Johnny_Hsueh
 EUT : W7
 Power Rating : DC 12V
 Test Mode : Tx2462MHz(802.11G)

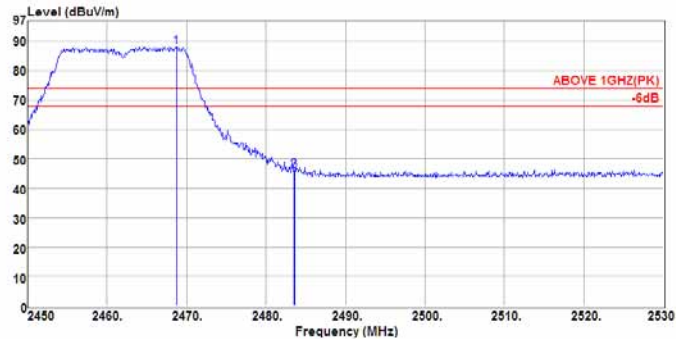
	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dB μ V)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Remark
1	2455.18	28.82	6.42	42.32	77.36	54.00	-23.36	Average
2	2483.52	28.86	6.45	-1.68	33.43	54.00	20.57	Average
3	2483.60	28.86	6.45	-1.69	33.42	54.00	20.58	Average

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

Date of Test : 2014. 03. 19 Temperature: 24

EUT: Car Radio Head Unit Humidity: 48%

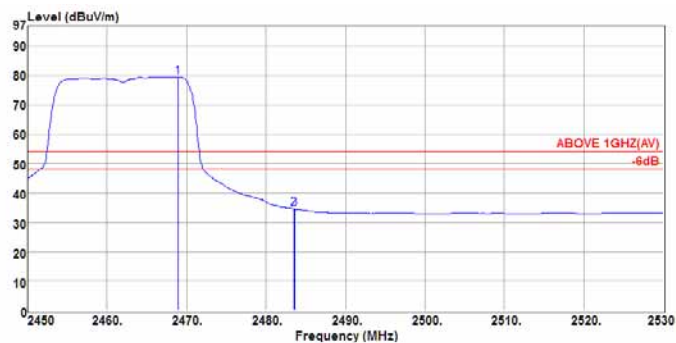
Test Mode: 802.11g , Transmit, Channel: 11, Frequency: 2462MHz



Site no. : Audix NO.1 Chamber Data no. : 5
 Dis. / Ant. : 3m 3115(4927) Ant. pol. : VERTICAL
 Limit : ABOVE 1GHZ(PK)
 Env. / Ins. : 24°C / 48% N9030A(140) Engineer : Johnny_Hsueh
 EUT : W7
 Power Rating : DC 12V
 Test Mode : Tx2462MHz(802.11G)

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dB μ V)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Remark
1	2468.72	28.82	6.43	53.14	88.19	74.00	-14.19	Peak
2	2483.52	28.86	6.45	10.61	45.72	74.00	28.28	Peak
3	2483.60	28.86	6.45	11.05	46.18	74.00	27.84	Peak

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



Site no. : Audix NO.1 Chamber Data no. : 6
 Dis. / Ant. : 3m 3115(4927) Ant. pol. : VERTICAL
 Limit : ABOVE 1GHZ(AV)
 Env. / Ins. : 24°C / 48% N9030A(140) Engineer : Johnny_Hsueh
 EUT : W7
 Power Rating : DC 12V
 Test Mode : Tx2462MHz(802.11G)

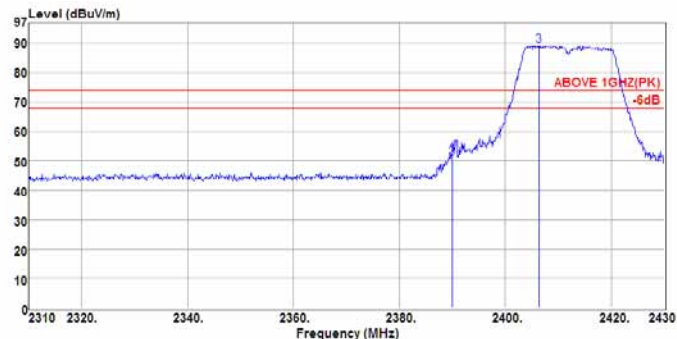
	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dB μ V)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Remark
1	2468.98	28.82	6.43	44.42	79.47	54.00	-25.47	Average
2	2483.52	28.86	6.45	-0.61	34.50	54.00	19.50	Average
3	2483.60	28.86	6.45	-0.66	34.45	54.00	19.55	Average

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

Date of Test : 2014. 03. 19 Temperature: 24

EUT: Car Radio Head Unit Humidity: 48%

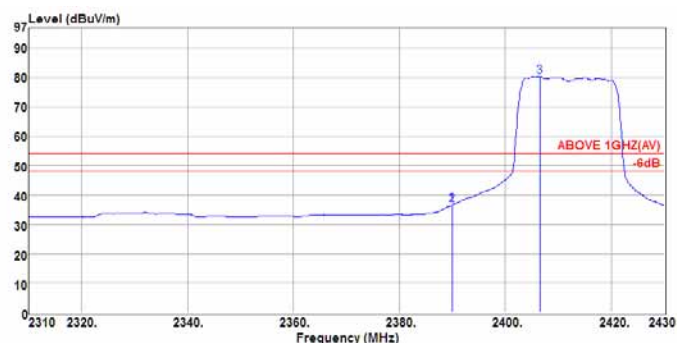
Test Mode: 802.11n-HT20 , Transmit, Channel: 01, Frequency: 2412MHz



Site no. : Audix NO.1 Chamber Data no. : 3
 Dis. / Ant. : 3m 3115(4927) Ant. pol. : HORIZONTAL
 Limit : ABOVE 1GHZ(PK)
 Env. / Ins. : 24°C / 48% N9030A(140) Engineer : Johnny_Hsueh
 EUT : W7
 Power Rating : DC 12V
 Test Mode : Tx2412MHz(802.11N20)

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dB μ V)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Remark
1	2389.92	28.47	6.34	17.18	51.99	74.00	22.01	Peak
2	2390.04	28.47	6.34	16.03	50.84	74.00	23.16	Peak
3	2406.38	28.51	6.36	54.45	89.32	74.00	-15.32	Peak

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



Site no. : Audix NO.1 Chamber Data no. : 4
 Dis. / Ant. : 3m 3115(4927) Ant. pol. : HORIZONTAL
 Limit : ABOVE 1GHZ(AV)
 Env. / Ins. : 24°C / 48% N9030A(140) Engineer : Johnny_Hsueh
 EUT : W7
 Power Rating : DC 12V
 Test Mode : Tx2412MHz(802.11N20)

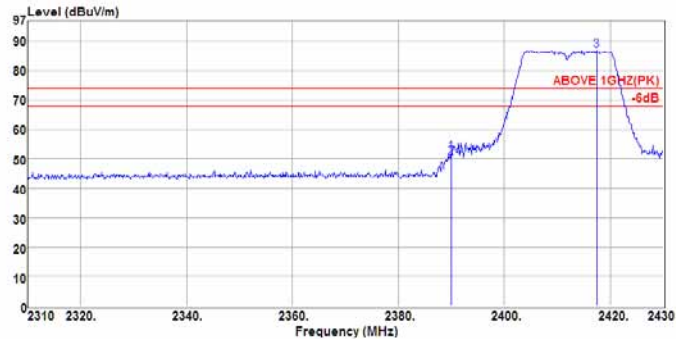
	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dB μ V)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Remark
1	2389.92	28.47	6.34	1.69	36.50	54.00	17.50	Average
2	2390.04	28.47	6.34	1.82	36.63	54.00	17.37	Average
3	2406.48	28.51	6.36	45.44	80.31	54.00	-26.31	Average

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

Date of Test : 2014. 03. 19 Temperature: 24

EUT: Car Radio Head Unit Humidity: 48%

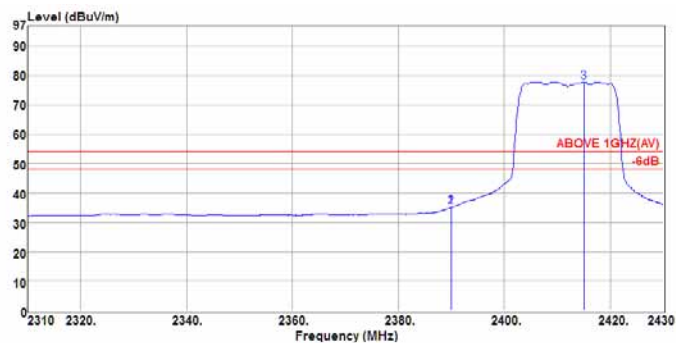
Test Mode: 802.11n-HT20 , Transmit, Channel: 01, Frequency: 2412MHz



Site no. : Audix NO.1 Chamber Data no. : 1
 Dis. / Ant. : 3m 3115(4927) Ant. pol. : VERTICAL
 Limit : ABOVE 1GHZ(PK)
 Env. / Ins. : 24°C / 48% N8030A(140) Engineer : Johnny_Hsueh
 EUT : W7
 Power Rating : DC 12V
 Test Mode : Tx2412MHz(802.11N20)

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dB μ V)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Remark
1	2389.92	28.47	6.34	17.33	52.14	74.00	21.86	Peak
2	2390.04	28.47	6.34	15.48	50.29	74.00	23.71	Peak
3	2417.40	28.51	6.37	52.09	86.97	74.00	-12.97	Peak

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



Site no. : Audix NO.1 Chamber Data no. : 2
 Dis. / Ant. : 3m 3115(4927) Ant. pol. : VERTICAL
 Limit : ABOVE 1GHZ(AV)
 Env. / Ins. : 24°C / 48% N8030A(140) Engineer : Johnny_Hsueh
 EUT : W7
 Power Rating : DC 12V
 Test Mode : Tx2412MHz(802.11N20)

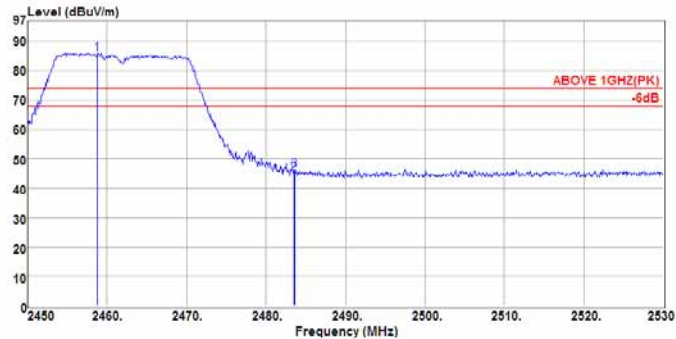
	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dB μ V)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Remark
1	2389.92	28.47	6.34	0.18	34.99	54.00	19.01	Average
2	2390.04	28.47	6.34	0.25	35.06	54.00	18.94	Average
3	2415.12	28.51	6.36	42.97	77.84	54.00	-23.84	Average

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

Date of Test : 2014. 03. 19 Temperature: 24

EUT: Car Radio Head Unit Humidity: 48%

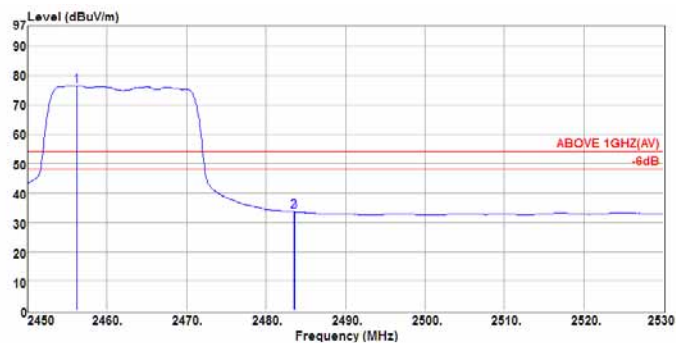
Test Mode: 802.11n-HT20 , Transmit, Channel: 11, Frequency: 2462MHz



Site no. : Audix NO.1 Chamber Data no. : 7
 Dis. / Ant. : 3m 3115(4927) Ant. pol. : HORIZONTAL
 Limit : ABOVE 1GHZ(PK)
 Env. / Ins. : 24°C / 48% N9030A(140) Engineer : Johnny_Hsueh
 EUT : W7
 Power Rating : DC 12V
 Test Mode : Tx2462MHz(802.11N20)

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dB μ V)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Remark
1	2458.80	28.82	6.42	50.84	85.88	74.00	-11.88	Peak
2	2483.52	28.86	6.45	9.78	44.89	74.00	29.11	Peak
3	2483.60	28.86	6.45	10.98	46.09	74.00	27.91	Peak

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



Site no. : Audix NO.1 Chamber Data no. : 8
 Dis. / Ant. : 3m 3115(4927) Ant. pol. : HORIZONTAL
 Limit : ABOVE 1GHZ(AV)
 Env. / Ins. : 24°C / 48% N9030A(140) Engineer : Johnny_Hsueh
 EUT : W7
 Power Rating : DC 12V
 Test Mode : Tx2462MHz(802.11N20)

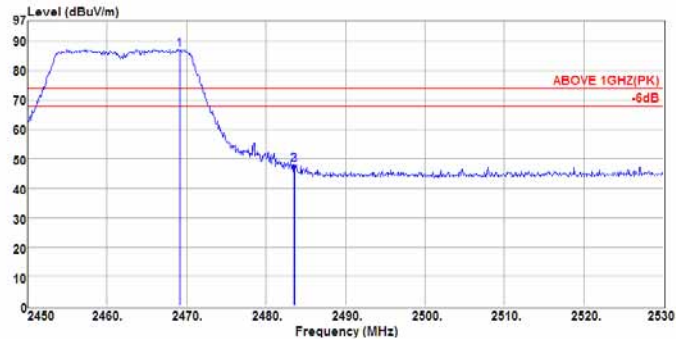
	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dB μ V)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Remark
1	2458.24	28.82	6.42	41.67	76.71	54.00	-22.71	Average
2	2483.52	28.86	6.45	-1.54	33.57	54.00	20.43	Average
3	2483.60	28.86	6.45	-1.54	33.57	54.00	20.43	Average

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

Date of Test : 2014. 03. 19 Temperature: 24

EUT: Car Radio Head Unit Humidity: 48%

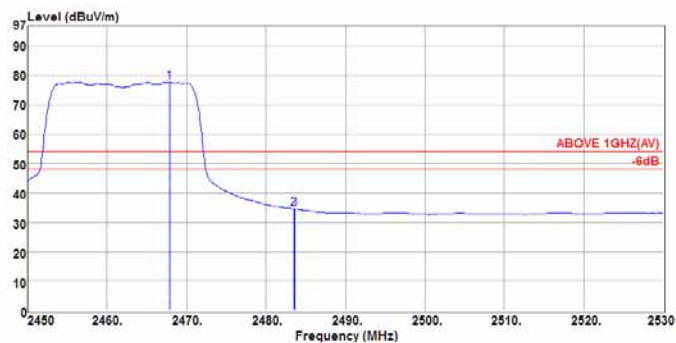
Test Mode: 802.11n-HT20 , Transmit, Channel: 11, Frequency: 2462MHz



Site no. : Audix NO.1 Chamber Data no. : 5
 Dis. / Ant. : 3m 3115(4927) Ant. pol. : VERTICAL
 Limit : ABOVE 1GHZ(PK)
 Env. / Ins. : 24°C / 48% N9030A(140) Engineer : Johnny_Hsueh
 EUT : W7
 Power Rating : DC 12V
 Test Mode : Tx2462MHz(802.11N20)

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dB μ V)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Remark
1	2469.20	28.82	6.43	52.24	87.29	74.00	-13.29	Peak
2	2483.52	28.86	6.45	12.94	48.05	74.00	25.85	Peak
3	2483.60	28.86	6.45	12.80	47.91	74.00	26.09	Peak

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



Site no. : Audix NO.1 Chamber Data no. : 6
 Dis. / Ant. : 3m 3115(4927) Ant. pol. : VERTICAL
 Limit : ABOVE 1GHZ(AV)
 Env. / Ins. : 24°C / 48% N9030A(140) Engineer : Johnny_Hsueh
 EUT : W7
 Power Rating : DC 12V
 Test Mode : Tx2462MHz(802.11N20)

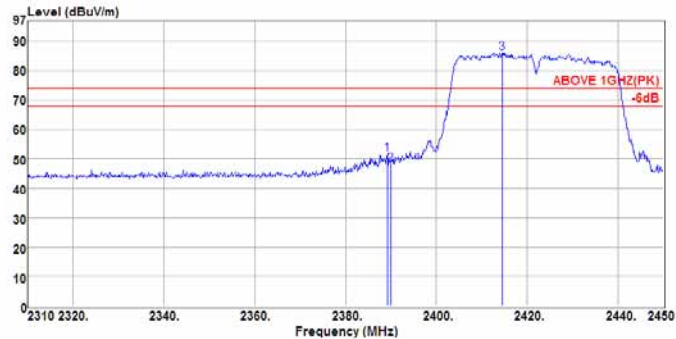
	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dB μ V)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Remark
1	2467.84	28.82	6.43	42.69	77.74	54.00	-23.74	Average
2	2483.52	28.86	6.45	-0.56	34.55	54.00	19.45	Average
3	2483.60	28.86	6.45	-0.57	34.54	54.00	19.46	Average

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

Date of Test : 2014. 03. 19 Temperature: 24

EUT: Car Radio Head Unit Humidity: 48%

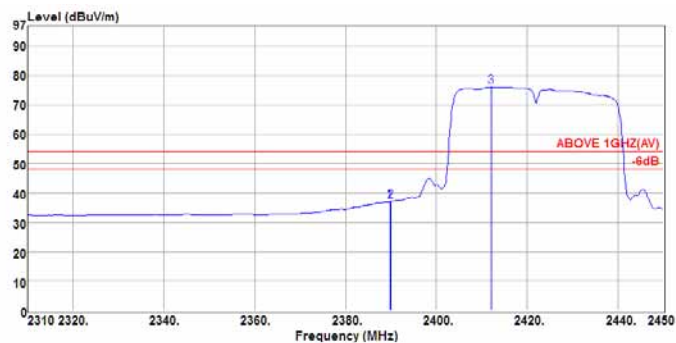
Test Mode: 802.11n-HT40 , Transmit, Channel: 3, Frequency: 2422MHz



Site no. : Audix NO.1 Chamber Data no. : 3
 Dis. / Ant. : 3m 3115(4927) Ant. pol. : HORIZONTAL
 Limit : ABOVE 1GHZ(PK)
 Env. / Ins. : 24°C / 48% N9030A(140) Engineer : Johnny_Hsueh
 EUT : W7
 Power Rating : DC 12V
 Test Mode : Tx2422MHz(802.11N40)

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dB μ V)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Remark
1	2389.24	28.47	6.34	16.72	51.53	74.00	22.47	Peak
2	2389.84	28.47	6.34	13.20	48.01	74.00	25.99	Peak
3	2414.58	28.51	6.36	51.31	86.18	74.00	-12.18	Peak

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



Site no. : Audix NO.1 Chamber Data no. : 4
 Dis. / Ant. : 3m 3115(4927) Ant. pol. : HORIZONTAL
 Limit : ABOVE 1GHZ(AV)
 Env. / Ins. : 24°C / 48% N9030A(140) Engineer : Johnny_Hsueh
 EUT : W7
 Power Rating : DC 12V
 Test Mode : Tx2422MHz(802.11N40)

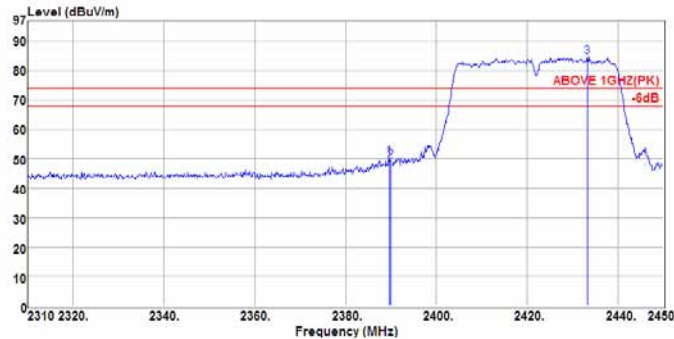
	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dB μ V)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Remark
1	2389.80	28.47	6.34	2.20	37.01	54.00	16.99	Average
2	2389.84	28.47	6.34	2.25	37.06	54.00	16.94	Average
3	2412.08	28.51	6.36	41.28	76.15	54.00	-22.15	Average

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

Date of Test : 2014. 03. 19 Temperature: 24

EUT: Car Radio Head Unit Humidity: 48%

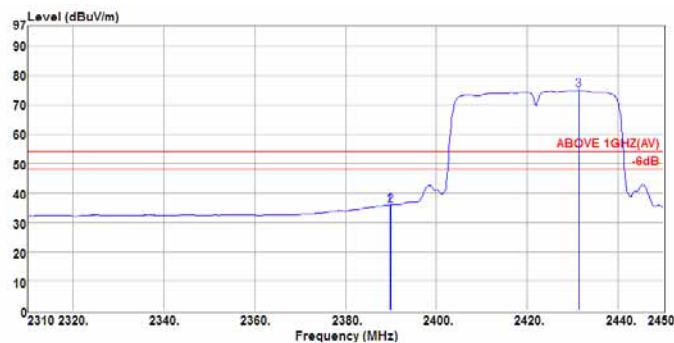
Test Mode: 802.11n-HT40 , Transmit, Channel: 3, Frequency: 2422MHz



Site no. : Audix NO.1 Chamber Data no. : 1
 Dis. / Ant. : 3m 3115(4927) Ant. pol. : VERTICAL
 Limit : ABOVE 1GHZ(PK)
 Env. / Ins. : 24°C / 48% N9030A(140) Engineer : Johnny_Hsueh
 EUT : W7
 Power Rating : DC 12V
 Test Mode : Tx2422MHz(802.11N40)

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dB μ V)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Remark
1	2389.08	28.47	6.34	15.53	50.34	74.00	23.66	Peak
2	2389.84	28.47	6.34	14.48	49.29	74.00	24.71	Peak
3	2433.34	28.55	6.39	49.65	84.58	74.00	-10.59	Peak

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



Site no. : Audix NO.1 Chamber Data no. : 2
 Dis. / Ant. : 3m 3115(4927) Ant. pol. : VERTICAL
 Limit : ABOVE 1GHZ(AV)
 Env. / Ins. : 24°C / 48% N9030A(140) Engineer : Johnny_Hsueh
 EUT : W7
 Power Rating : DC 12V
 Test Mode : Tx2422MHz(802.11N40)

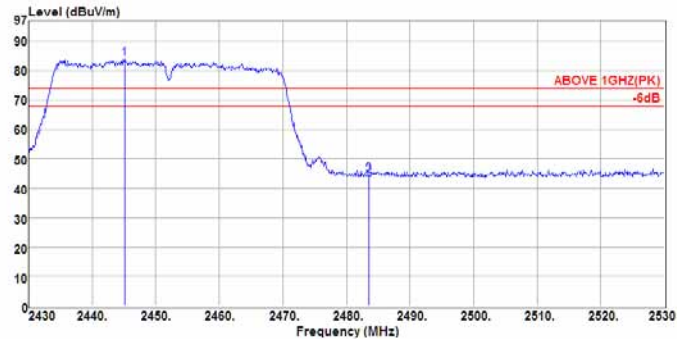
	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dB μ V)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Remark
1	2389.80	28.47	6.34	0.99	35.80	54.00	18.20	Average
2	2389.84	28.47	6.34	1.02	35.83	54.00	18.17	Average
3	2431.38	28.55	6.39	40.06	75.00	54.00	-21.00	Average

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

Date of Test : 2014. 03. 19 Temperature: 24

EUT: Car Radio Head Unit Humidity: 48%

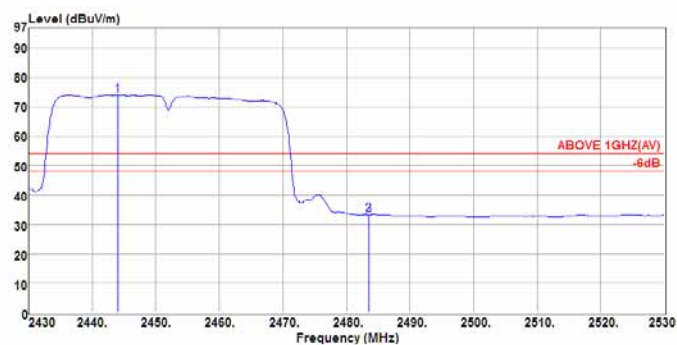
Test Mode: 802.11n-HT40 , Transmit, Channel: 9, Frequency: 2452MHz



Site no. : Audix NO.1 Chamber Data no. : 7
 Dis. / Ant. : 3m 3115(4927) Ant. pol. : HORIZONTAL
 Limit : ABOVE 1GHZ(PK)
 Env. / Ins. : 24°C / 48% N9030A(140) Engineer : Johnny_Hsueh
 EUT : W7
 Power Rating : DC 12V
 Test Mode : Tx2452MHz(802.11N40)

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dB μ V)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Remark
1	2445.10	28.59	6.40	49.05	84.04	74.00	-10.04	Peak
2	2483.50	28.86	6.45	9.01	44.12	74.00	29.88	Peak
3	2483.60	28.86	6.45	9.40	44.51	74.00	29.49	Peak

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



Site no. : Audix NO.1 Chamber Data no. : 8
 Dis. / Ant. : 3m 3115(4927) Ant. pol. : HORIZONTAL
 Limit : ABOVE 1GHZ(AV)
 Env. / Ins. : 24°C / 48% N9030A(140) Engineer : Johnny_Hsueh
 EUT : W7
 Power Rating : DC 12V
 Test Mode : Tx2452MHz(802.11N40)

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dB μ V)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Remark
1	2444.10	28.59	6.40	38.99	73.98	54.00	-19.98	Average
2	2483.50	28.86	6.45	-1.90	33.21	54.00	20.79	Average
3	2483.60	28.86	6.45	-1.86	33.25	54.00	20.75	Average

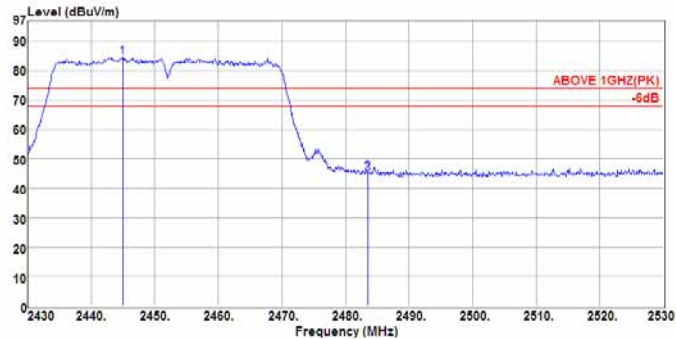
Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading
 2. The emission levels that are 20dB below the official limit are not reported.

Date of Test : 2014. 03. 19 Temperature: 24

EUT: Car Radio Head Unit Humidity: 48%

Test Mode: 802.11n-HT40 , Transmit, Channel: 9, Frequency: 2452MHz

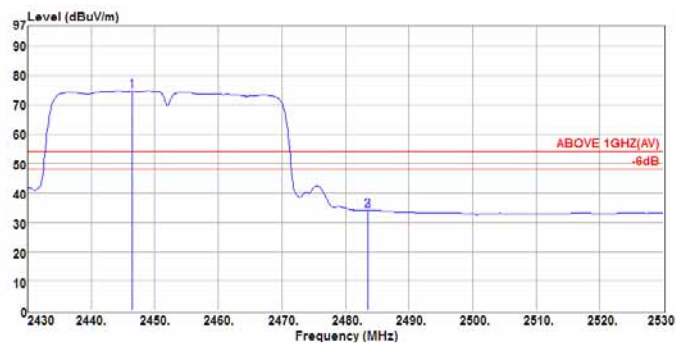
10



Site no. : Audix NO.1 Chamber Data no. : 5
 Dis. / Ant. : 3m 3115(4927) Ant. pol. : VERTICAL
 Limit : ABOVE 1GHZ(PK)
 Env. / Ins. : 24°C / 48% N8030A(140) Engineer : Johnny_Hsueh
 EUT : W7
 Power Rating : DC 12V
 Test Mode : Tx2452MHz(802.11N40)

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dB μ V)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Remark
1	2445.00	28.59	6.40	49.52	84.51	74.00	-10.51	Peak
2	2483.50	28.86	6.45	10.18	45.29	74.00	28.71	Peak
3	2483.60	28.86	6.45	9.52	44.63	74.00	29.37	Peak

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



Site no. : Audix NO.1 Chamber Data no. : 8
 Dis. / Ant. : 3m 3115(4927) Ant. pol. : VERTICAL
 Limit : ABOVE 1GHZ(AV)
 Env. / Ins. : 24°C / 48% N8030A(140) Engineer : Johnny_Hsueh
 EUT : W7
 Power Rating : DC 12V
 Test Mode : Tx2452MHz(802.11N40)

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dB μ V)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Remark
1	2448.40	28.59	6.41	39.80	74.80	54.00	-20.80	Average
2	2483.50	28.86	6.45	-1.13	33.98	54.00	20.02	Average
3	2483.60	28.86	6.45	-1.12	33.99	54.00	20.01	Average

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

5. 6dB BANDWIDTH MEASUREMENT

5.1. Test Equipment

The following test equipment was used during the Emission Bandwidth measurement:

Item	Type	Manufacturer	Model No.	Serial No.	Cal. Due Date
1	Spectrum Analyzer	Agilent	N9030A-544	US51350140	2014. 07. 29

5.2. Block Diagram of Test Setup



EUT: Car Radio Head Unit

5.3. Specification Limits [§15.247(a)(2)]

The minimum 6dB bandwidth shall be at least 500kHz.

5.4. Operating Condition of EUT

The test program “RTK WiFi Tool” was used to enable the EUT to transmit data at different channel frequency individually.

5.5. Test Procedure

The transmitter output was connected to the spectrum analyzer. The bandwidth of the fundamental frequency was measure by spectrum analyzer with 1.5% EBW, $VBW \geq 3 \times RBW$. The 6dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 6dB.

The measurement guideline was according to KDB 558074 D01 DTS Meas Guidance is v03r02.

5.6. Test Results

PASSED. All the test results are attached in next pages.

5.6.1. WLAN Function

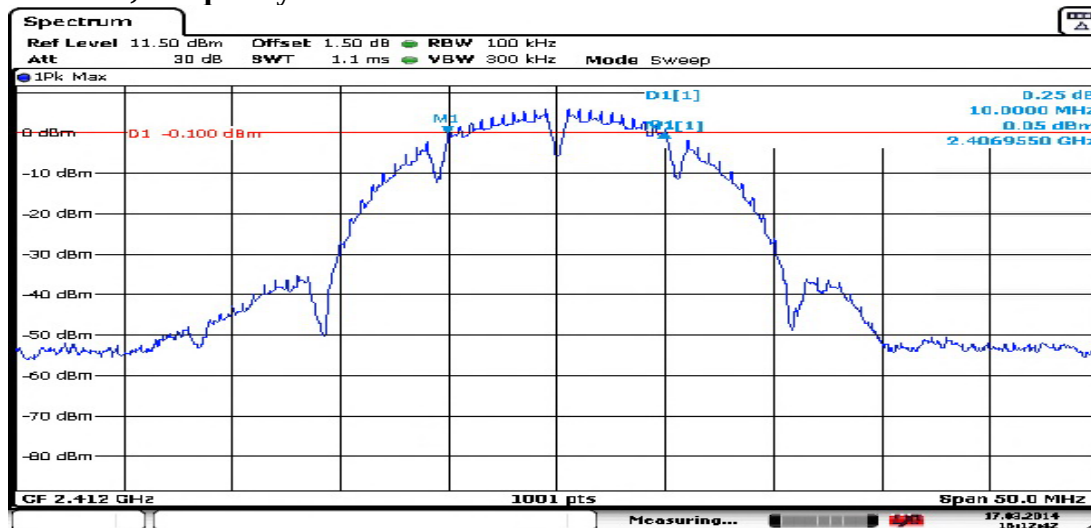
Test Date: 2014. 03. 17 Temperature: 22

Humidity: 50%

Mode	Type of Network	Channel	Frequency	6dB Bandwidth
1	802.11b	CH 1	2412MHz	10.00 MHz
2		CH 6	2437MHz	10.00 MHz
3		CH 11	2462MHz	10.00 MHz
4	802.11g	CH 1	2412MHz	16.60 MHz
5		CH 6	2437MHz	16.60 MHz
6		CH 11	2462MHz	16.60 MHz
7	802.11n-HT20	CH 1	2412MHz	17.80 MHz
8		CH 6	2437MHz	17.80 MHz
9		CH 11	2462MHz	17.80 MHz
10	802.11n-HT40	CH 3	2422MHz	36.40 MHz
11		CH 6	2437MHz	36.40 MHz
12		CH 9	2452MHz	36.40 MHz

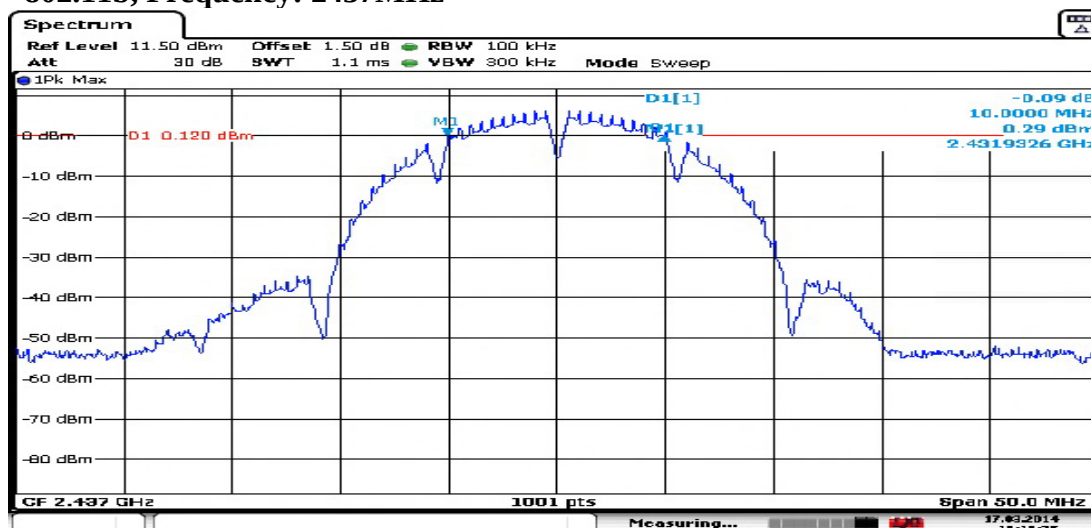
[Limit: least 500kHz]

802.11b, Frequency: 2412MHz



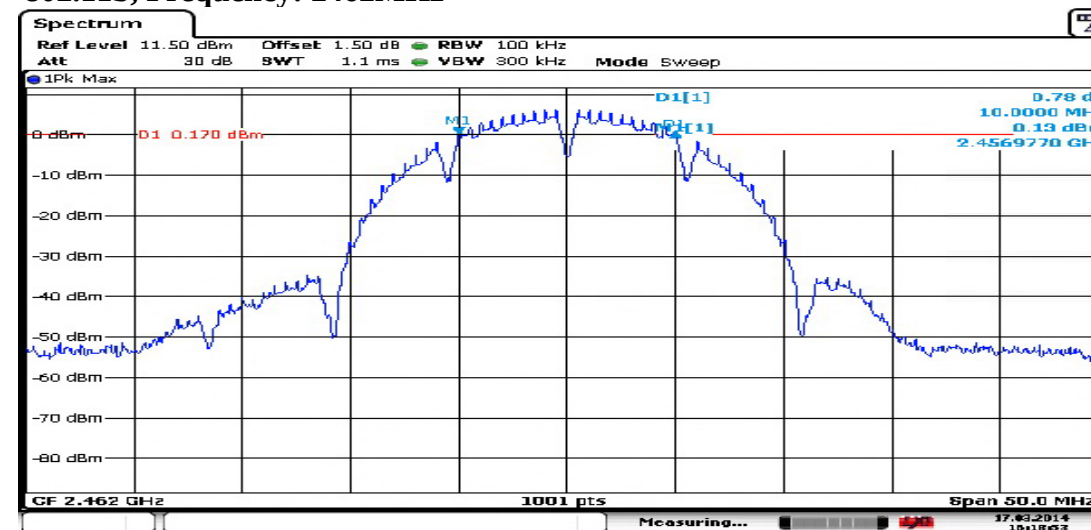
Date: 17.MAR.2014 16:12:42

802.11b, Frequency: 2437MHz



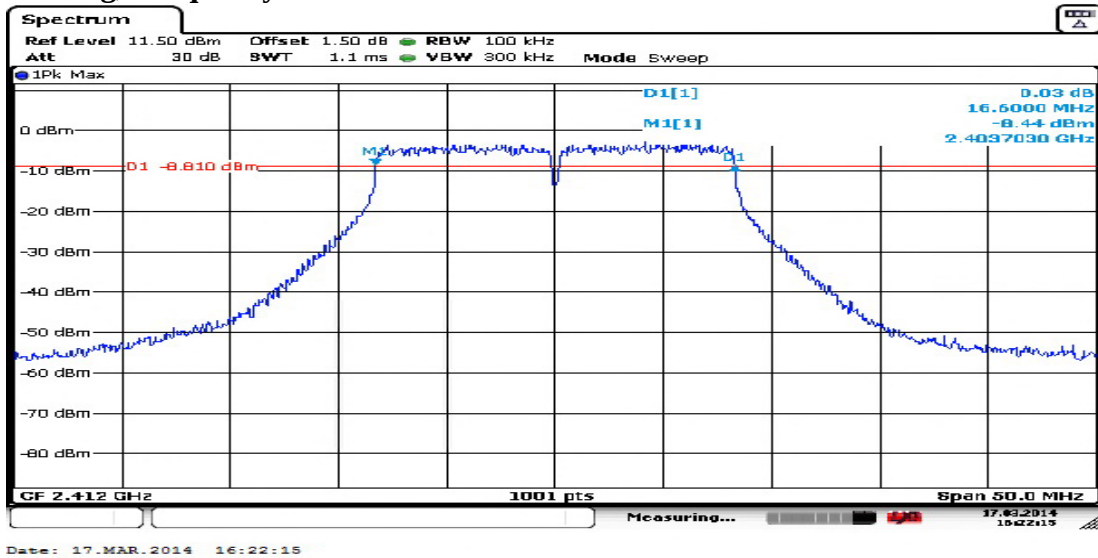
Date: 17.MAR.2014 16:16:26

802.11b, Frequency: 2462MHz

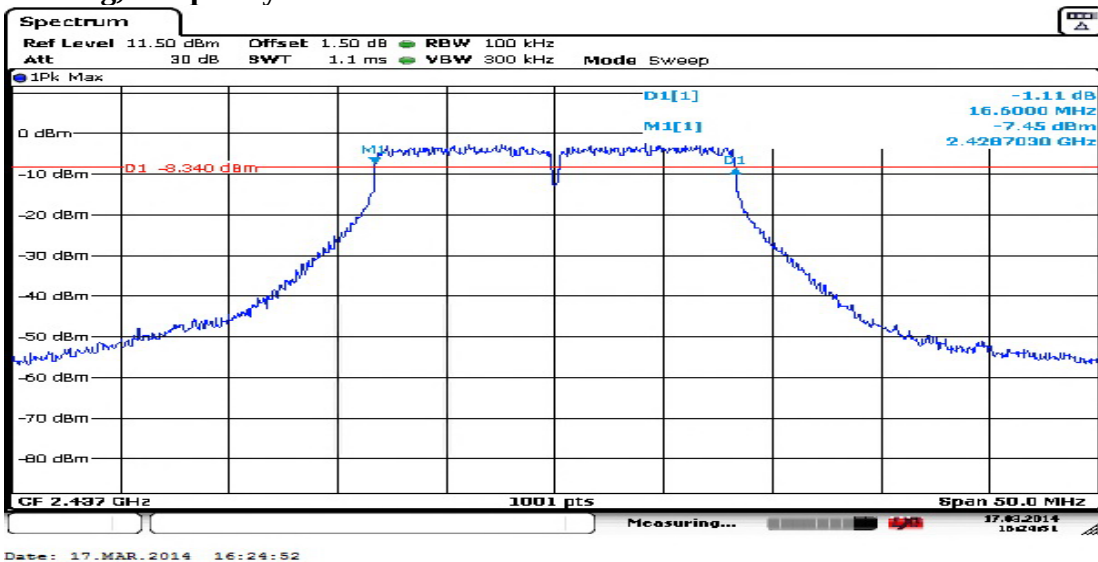


Date: 17.MAR.2014 16:18:53

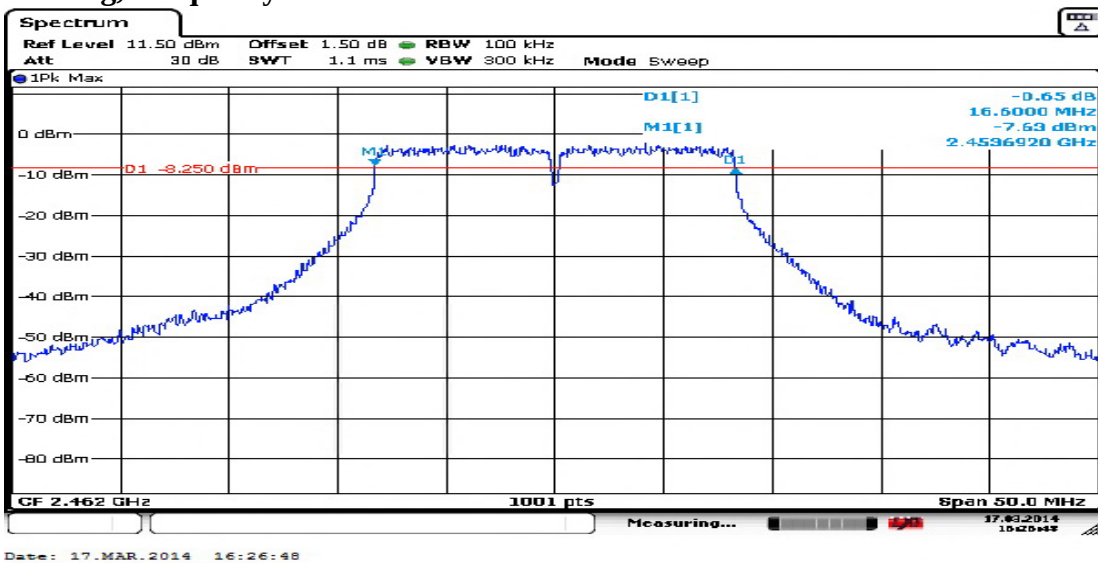
802.11g, Frequency: 2412MHz



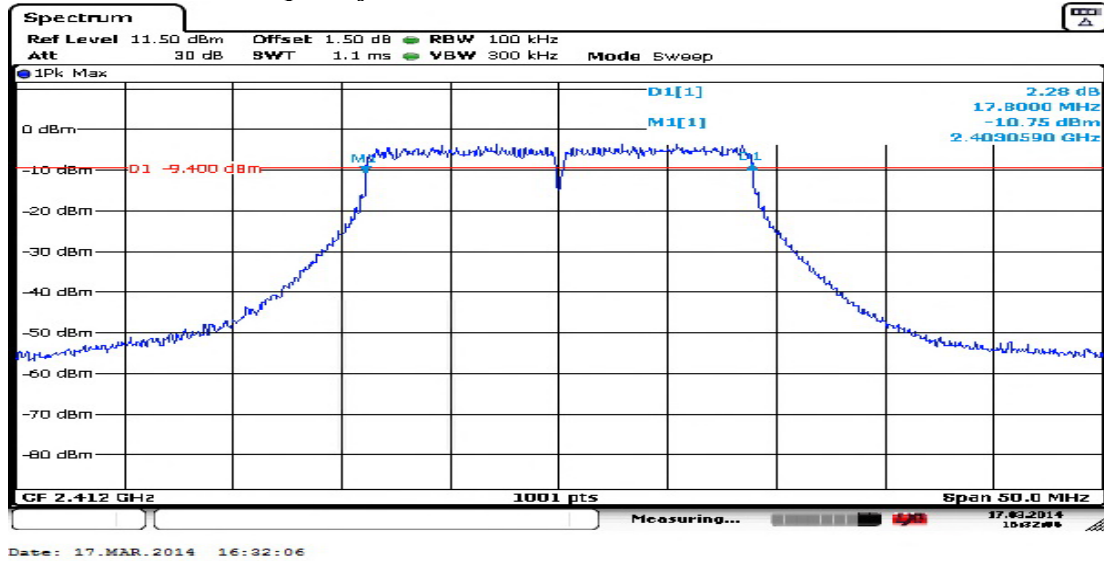
802.11g, Frequency: 2437MHz



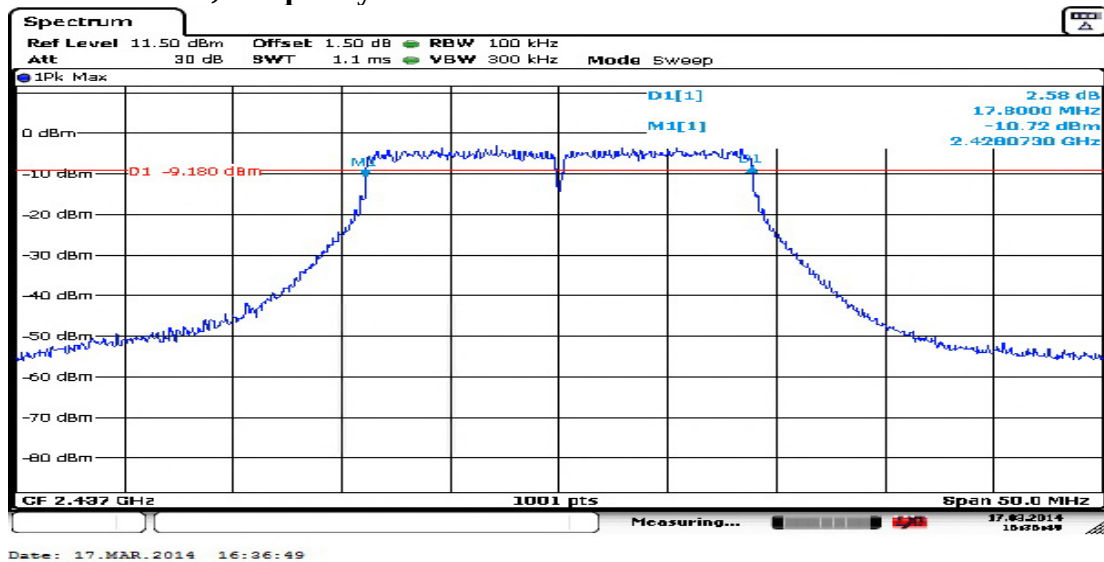
802.11g, Frequency: 2462MHz



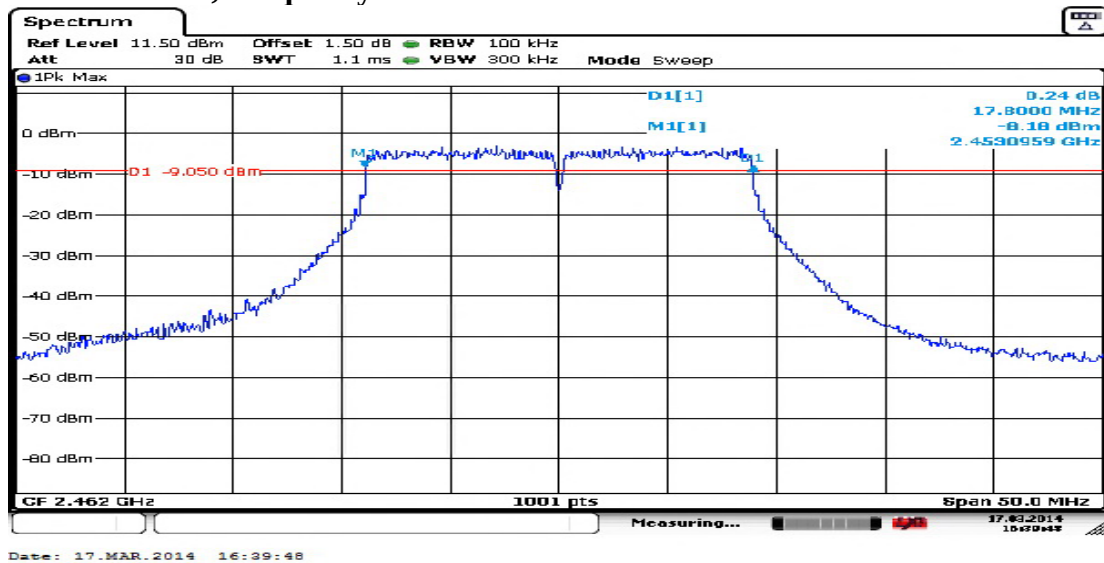
802.11n-HT20, Frequency: 2412MHz



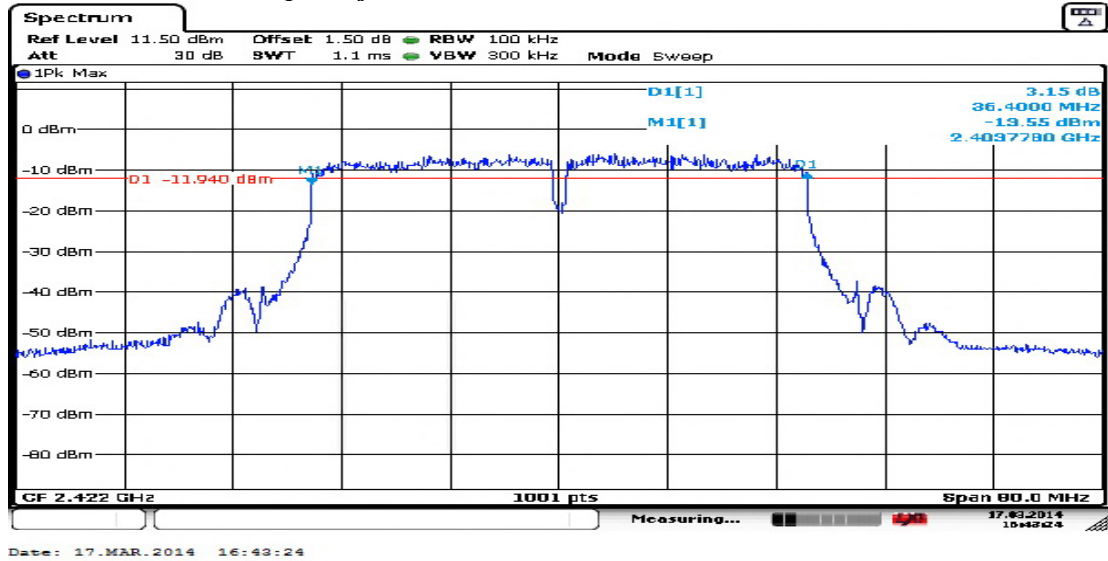
802.11n-HT20, Frequency: 2437MHz



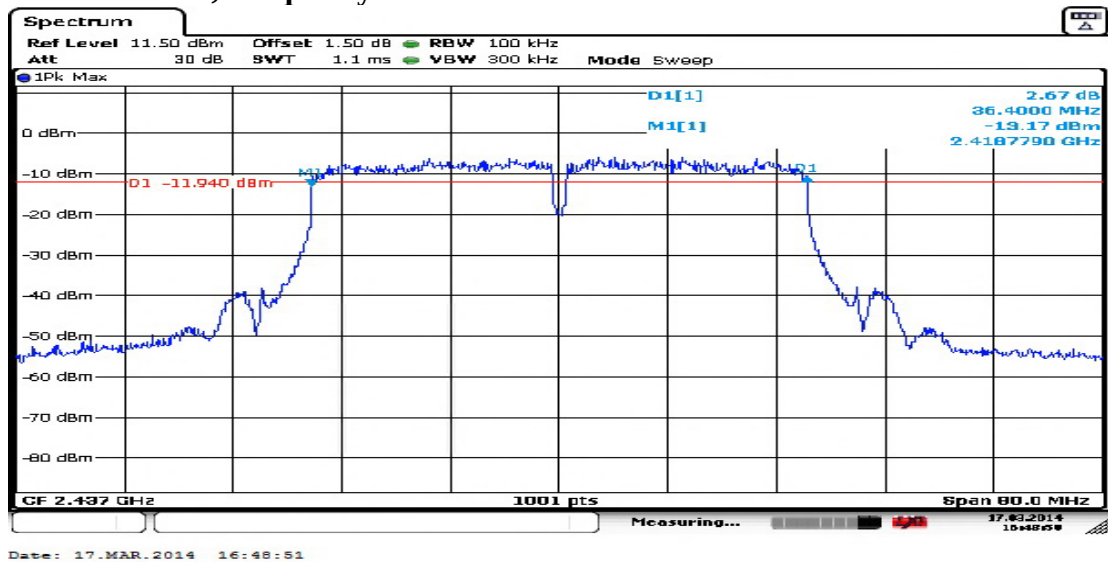
802.11n-HT20, Frequency: 2462MHz



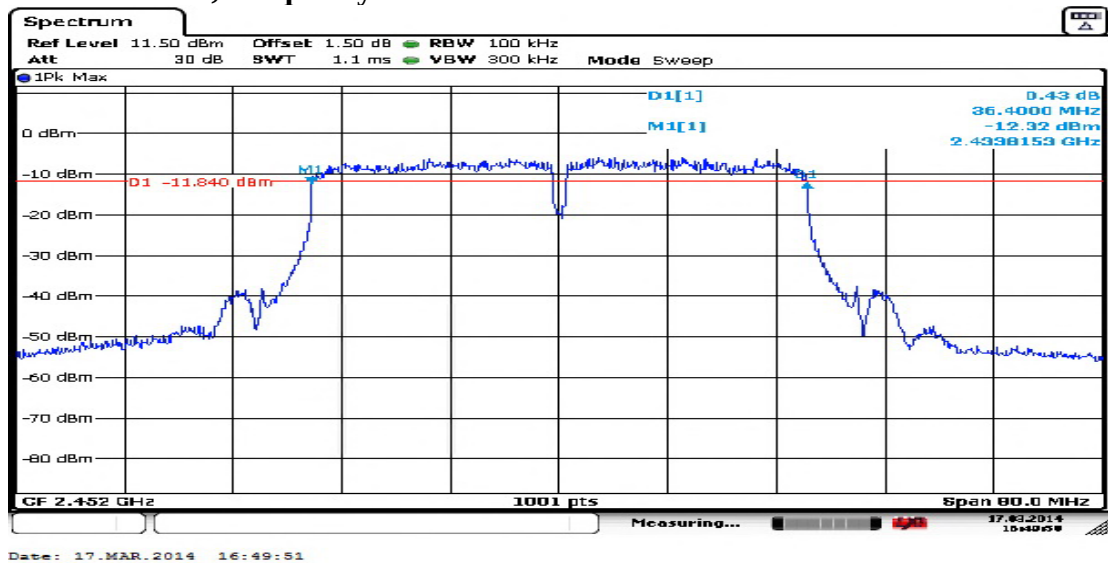
802.11n-HT40, Frequency: 2422MHz



802.11n-HT40, Frequency: 2437MHz



802.11n-HT40, Frequency: 2452MHz



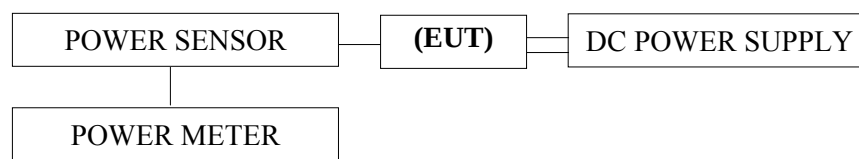
6. MAXIMUM PEAK OUTPUT POWER MEASUREMENT

6.1. Test Equipment

The following test equipment was used during the maximum peak output power measurement:

Item	Type	Manufacturer	Model No.	Serial No.	Cal. Due Date
1.	Power Meter	Antrisu	ML2495A	1145008	2014. 10. 22
2.	Power Sensor	Antrisu	MA2411B	1126096	2014. 10. 22

6.2. Block Diagram of Test Setup



EUT: Car Radio Head Unit

6.3. Specification Limits [§15.247(b)-(3)]

The Limits of maximum Peak Output Power for digital modulation in 2400-2483.5MHz is: 1Watt. (30dBm)

6.4. Operating Condition of EUT

The test program “RTK WiFi Tool” was used to enable the EUT to transmit data at different channel frequency individually.

6.5. Test Procedure

The transmitter output was connected to the power sensor and record the reading of power meter.

The measurement guideline was according to KDB 558074 D01 DTS Meas Guidance is v03r02.

6.6. Test Results

PASSED. All the test results are listed below.

6.6.1. WLAN Function

Test Date: 2014. 03. 17 Temperature: 22 Humidity: 50%

Test Mode	Channel	Frequency (MHz)	Output Power(dBm)	
			Peak	Average
802.11b	CH 1	2412	19.12	16.38
	CH 6	2437	19.16	16.44
	CH 11	2462	19.01	16.29
802.11g	CH 1	2412	22.66	12.94
	CH 6	2437	22.83	13.28
	CH 11	2462	22.37	13.26
802.11n-HT20	CH 1	2412	21.48	12.19
	CH 6	2437	21.57	12.51
	CH 11	2462	21.42	12.56
802.11n-HT40	CH 3	2422	20.63	11.22
	CH 6	2437	20.71	11.37
	CH 9	2452	20.59	11.47

[Limit: 1Watt. (30dBm)]

7. EMISSION LIMITATIONS MEASUREMENT

Pursuant to KDB 558074 D01 DTS Meas Guidance is v03r02 that emission levels below limits specified in 15.209 would not be required.

8. BAND EDGES MEASUREMENT

8.1. Test Equipment

The following test equipment was used during the band edges measurement:

Item	Type	Manufacturer	Model No.	Serial No.	Cal. Due Date
1	Spectrum Analyzer	Agilent	N9030A-544	US51350140	2014. 07. 29

8.2. Block Diagram of Test Setup

The same as section.5.2.

8.3. Specification Limits [§15.247(c)]

The highest level should be at least 20 dB below reference level as measured in section 8.6.

8.4. Operating Condition of EUT

The test program “RTK WiFi Tool” was used to enable the EUT to transmit data at different channel frequency individually.

8.5. Test Procedure

The transmitter output was connected to the spectrum analyzer. Set both RBW=100 kHz and VBW to 300kHz with suitable frequency span including 100kHz bandwidth from band edge.

The measurement guideline was according to KDB 558074 D01 DTS Meas Guidance is v03r02.

8.6. Test Results

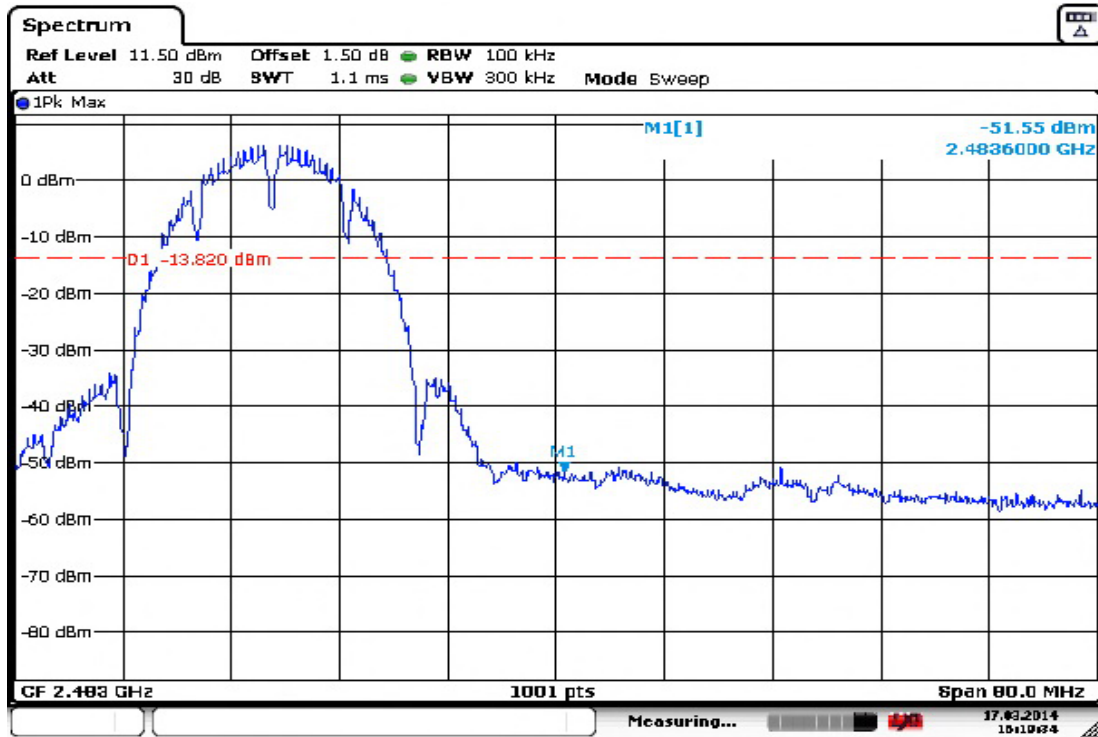
PASSED. All the test results are attached in next pages.

8.6.1. WLAN Function

Test Date: 2014. 03. 17 Temperature: 22 Humidity: 50%

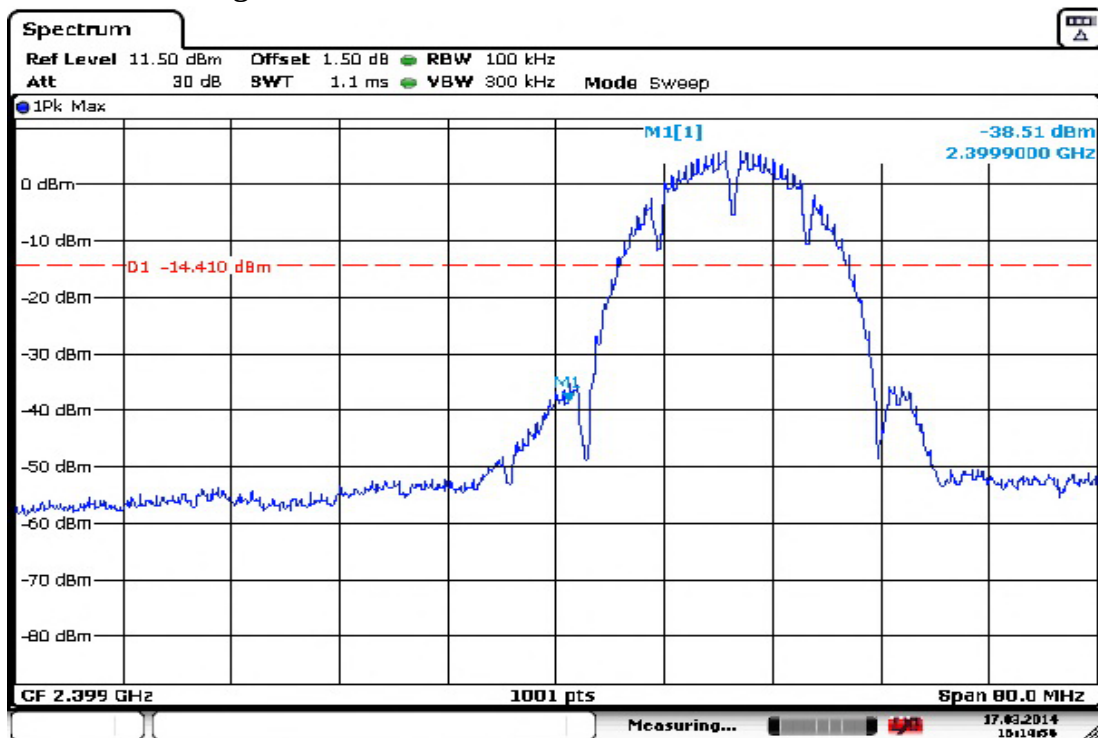
802.11b

Upper Band edge



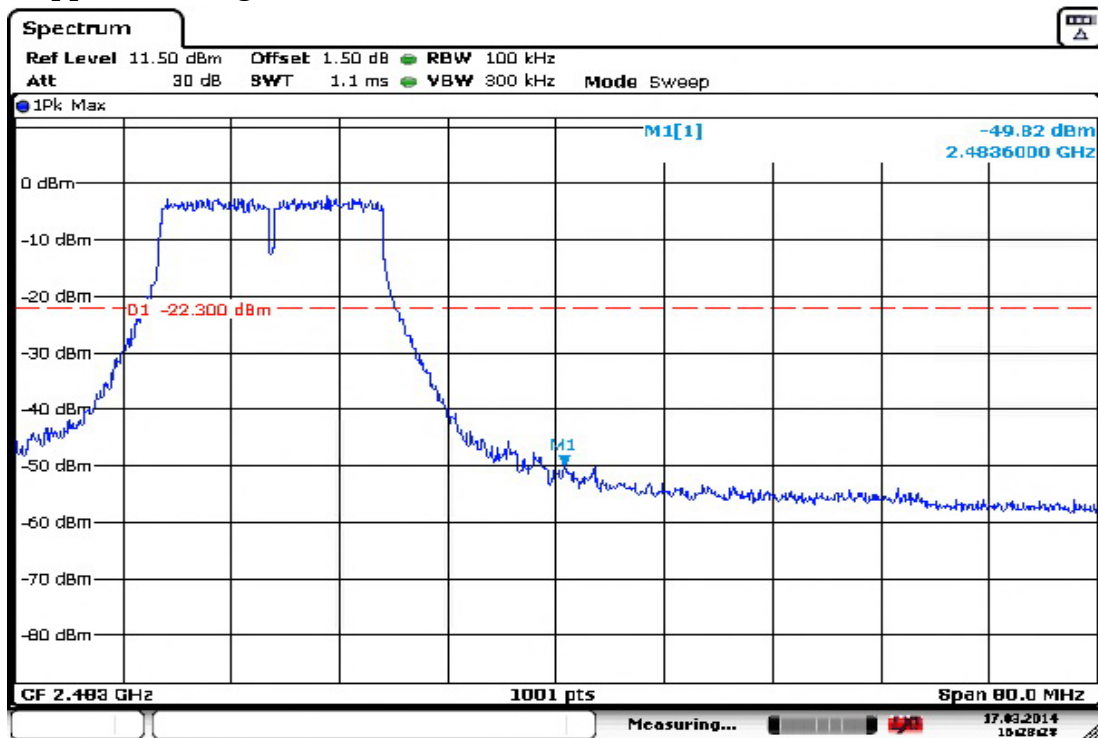
Date: 17.MAR.2014 16:19:34

Below Band edge



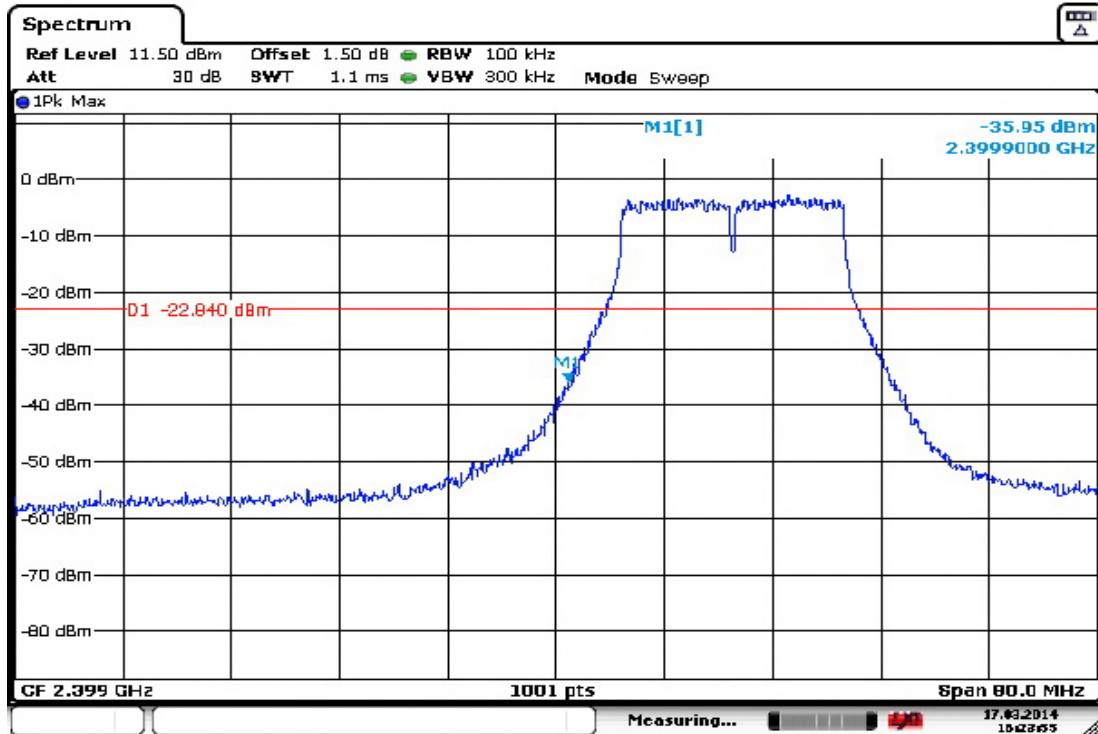
Date: 17.MAR.2014 16:14:57

802.11g Upper Band edge



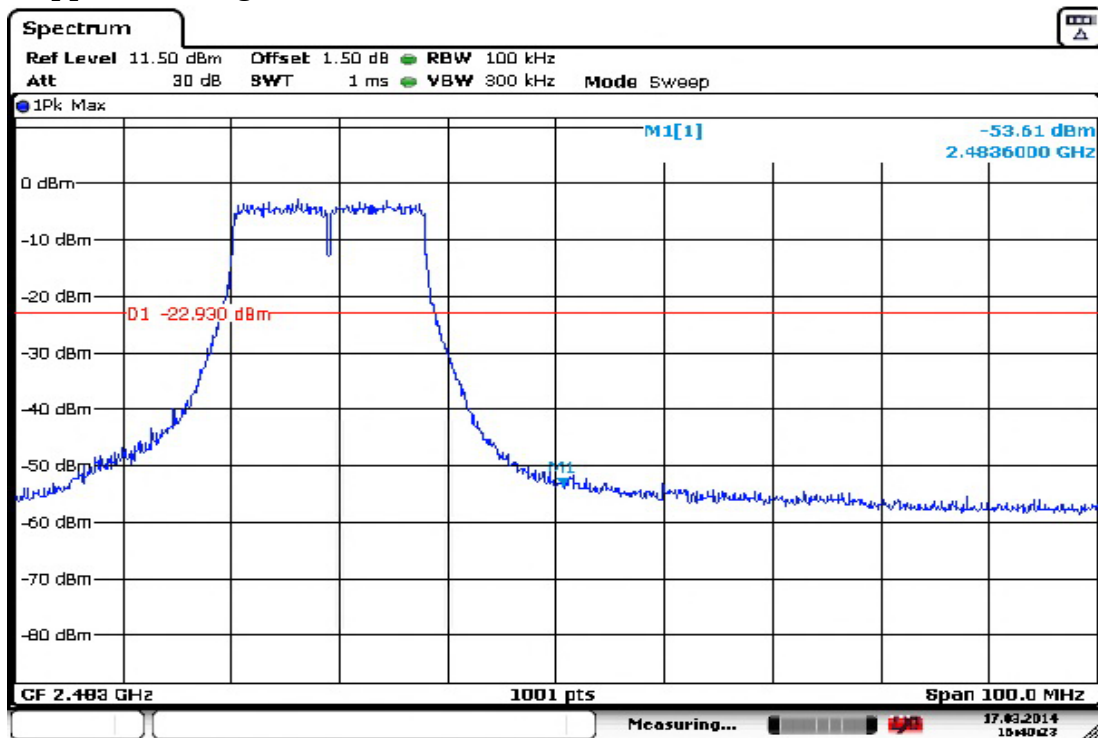
Date: 17.MAR.2014 16:28:29

Below Band edge



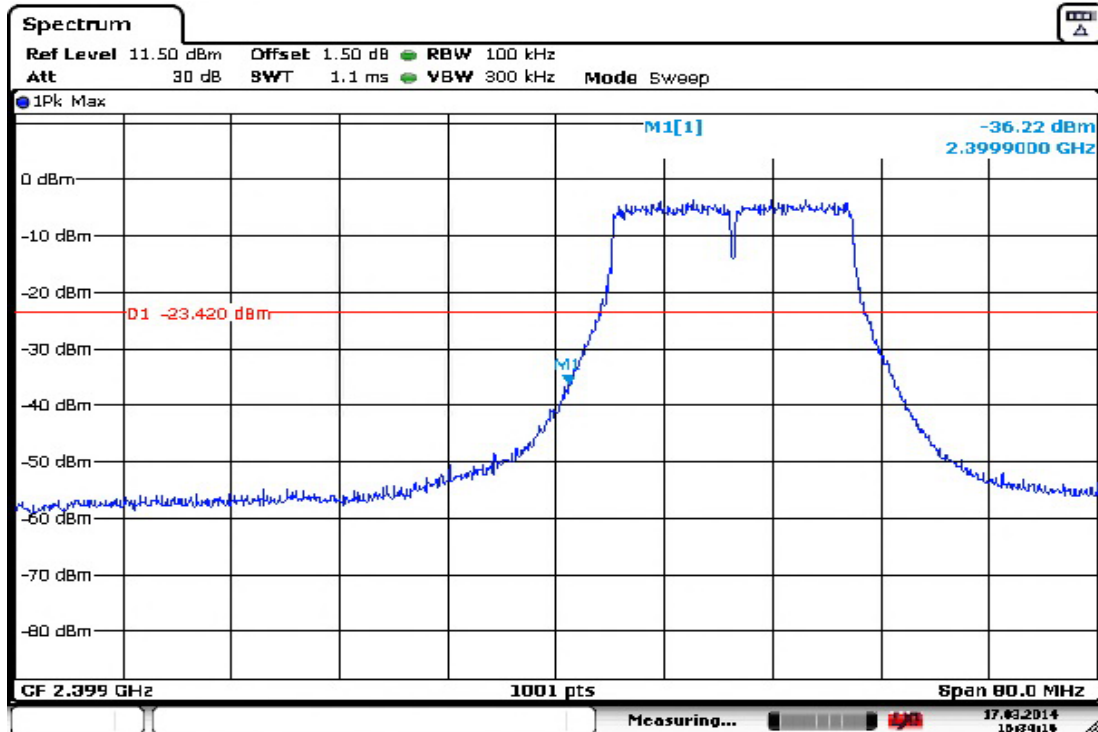
Date: 17.MAR.2014 16:23:56

802.11n-HT20 Upper Band edge



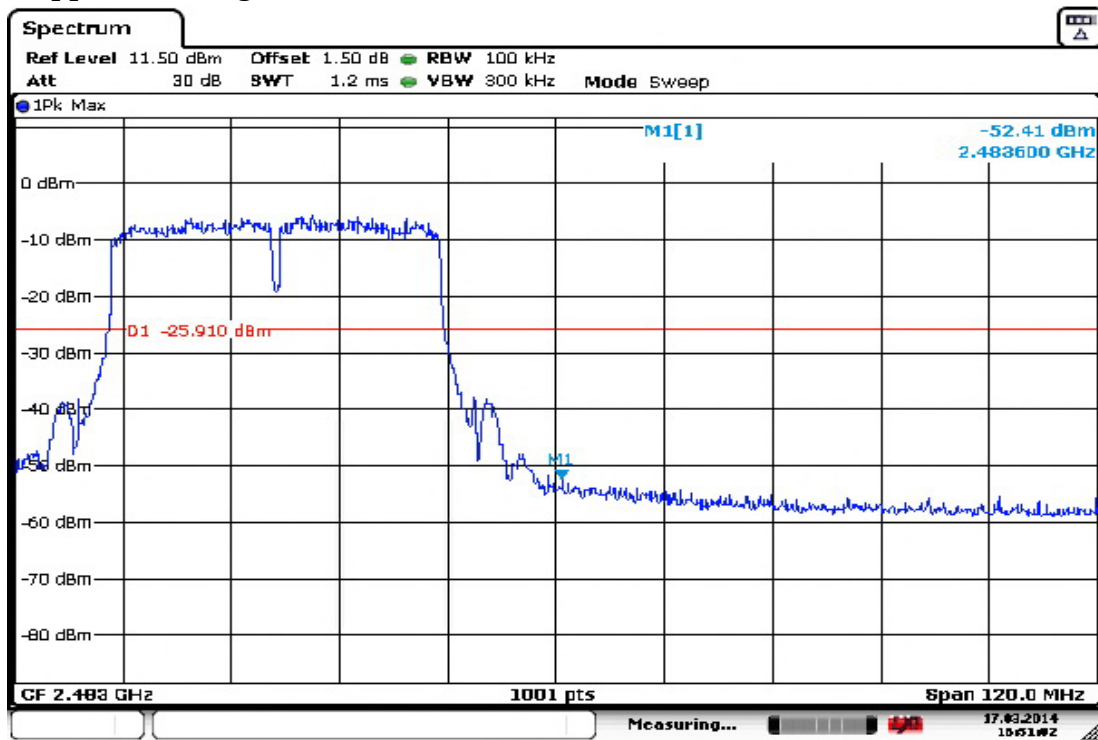
Date: 17.MAR.2014 16:40:23

Below Band edge



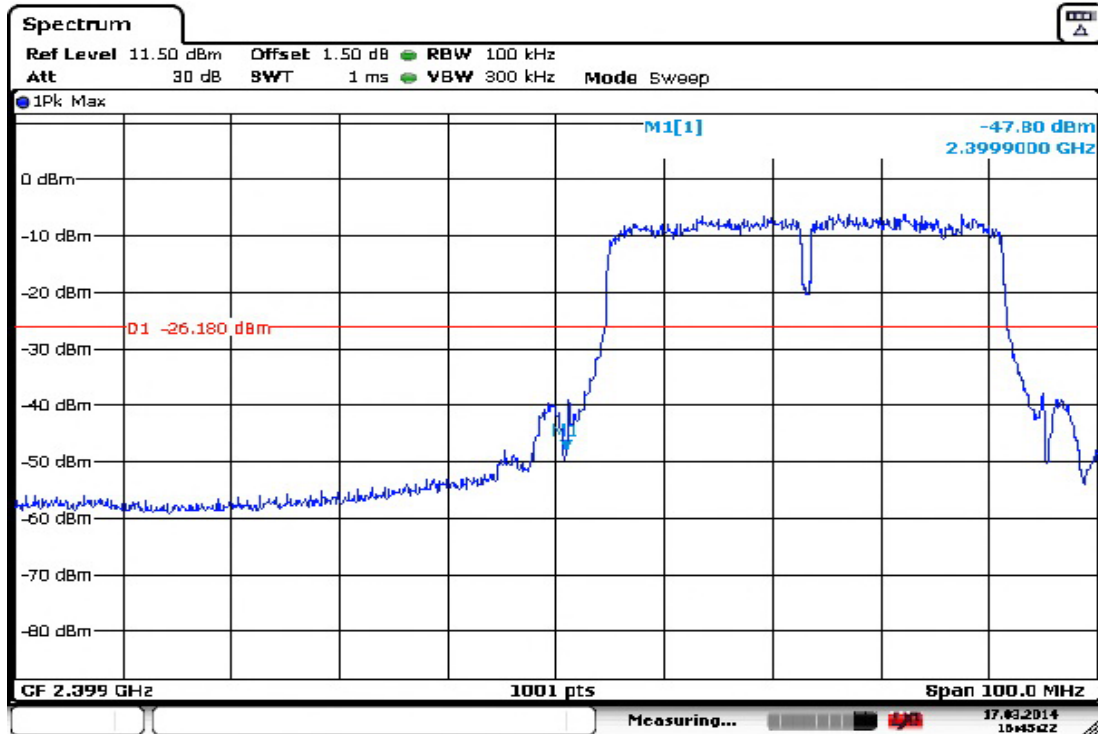
Date: 17.MAR.2014 16:34:16

DTS 802.11n-HT40 Upper Band edge



Date: 17.MAR.2014 16:51:03

Below Band edge



Date: 17.MAR.2014 16:45:23

9. POWER SPECTRAL DENSITY MEASUREMENT

9.1. Test Equipment

The following test equipment was used during the power spectral density measurement:

Item	Type	Manufacturer	Model No.	Serial No.	Cal. Due Date
1	Spectrum Analyzer	Agilent	N9030A-544	US51350140	2014. 07. 29

9.2. Block Diagram of Test Setup

The same as section.5.2.

9.3. Specification Limits [§15.247(d)]

The peak power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8dBm in any 3kHz band.

9.4. Operating Condition of EUT

The test program “RTK WiFi Tool” was used to enable the EUT to transmit data at different channel frequency individually.

9.5. Test Procedure

The transmitter output was connected to the spectrum analyzer. The bandwidth of the fundamental frequency was measured with the spectrum analyzer using 100kHz RBW and ≥ 300 kHz VBW, set sweep time = Auto.

The measurement guideline was according to KDB 558074 D01 DTS Meas Guidance is v03r02.

9.6. Test Results

PASSED. All the test results are attached in next pages.

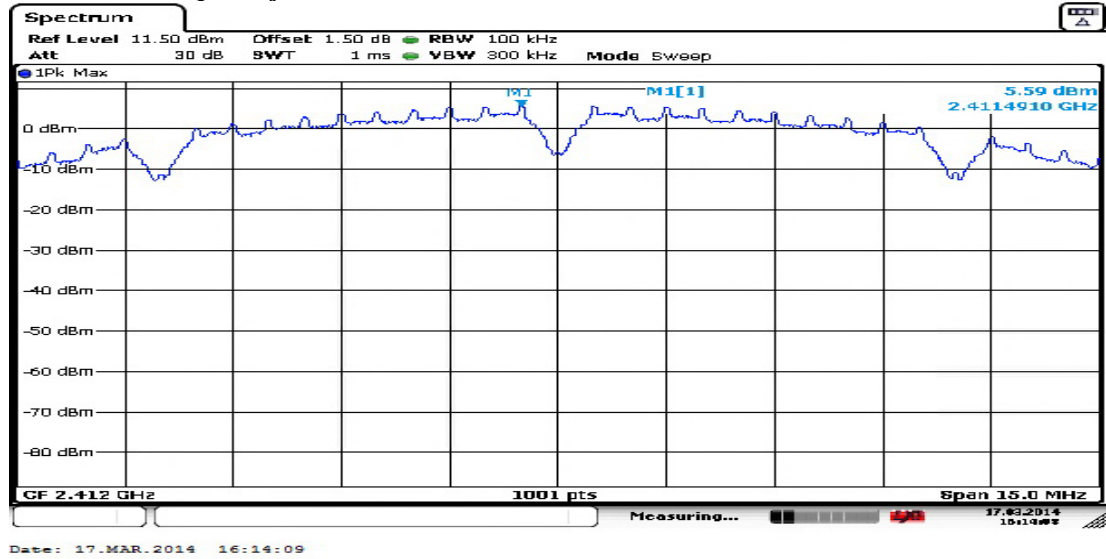
9.6.1. WLAN Function

Test Date: 2014. 03. 17 Temperature: 22 Humidity: 50%

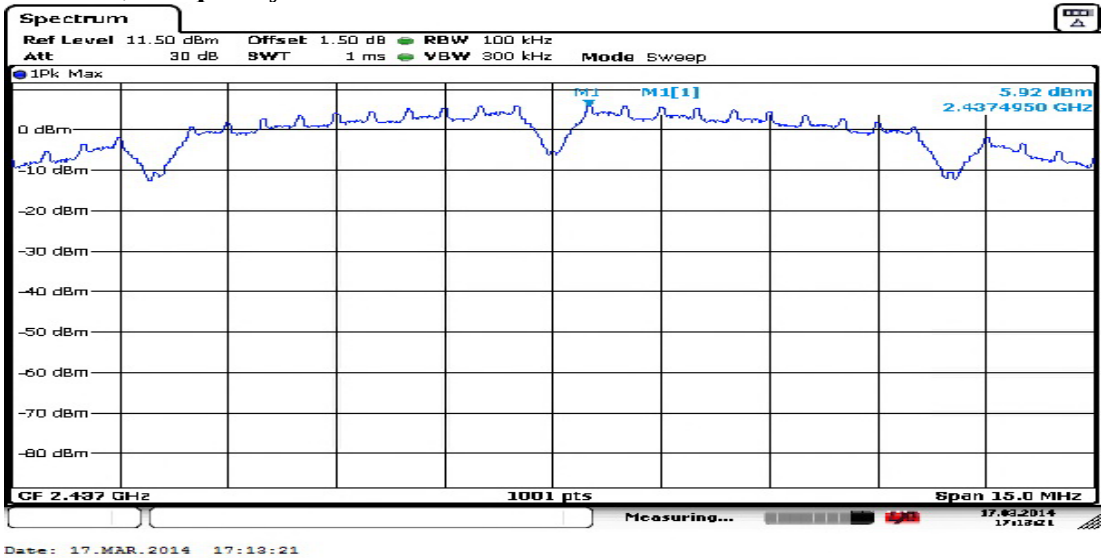
Mode	Type of Network	Channel	Frequency	Power Spectral Density
1	802.11b	CH 1	2412MHz	5.59 dBm
2		CH 6	2437MHz	5.92 dBm
3		CH 11	2462MHz	6.18 dBm
4	802.11g	CH 1	2412MHz	-2.84 dBm
5		CH 6	2437MHz	-2.42 dBm
6		CH 11	2462MHz	-2.30 dBm
7	802.11n-HT20	CH 1	2412MHz	-3.42 dBm
8		CH 6	2437MHz	-3.31 dBm
9		CH 11	2462MHz	-2.93 dBm
10	802.11n-HT40	CH 3	2422MHz	-6.12 dBm
11		CH 6	2437MHz	-6.03 dBm
12		CH 9	2452MHz	-5.91 dBm

[Limit: 8dBm]

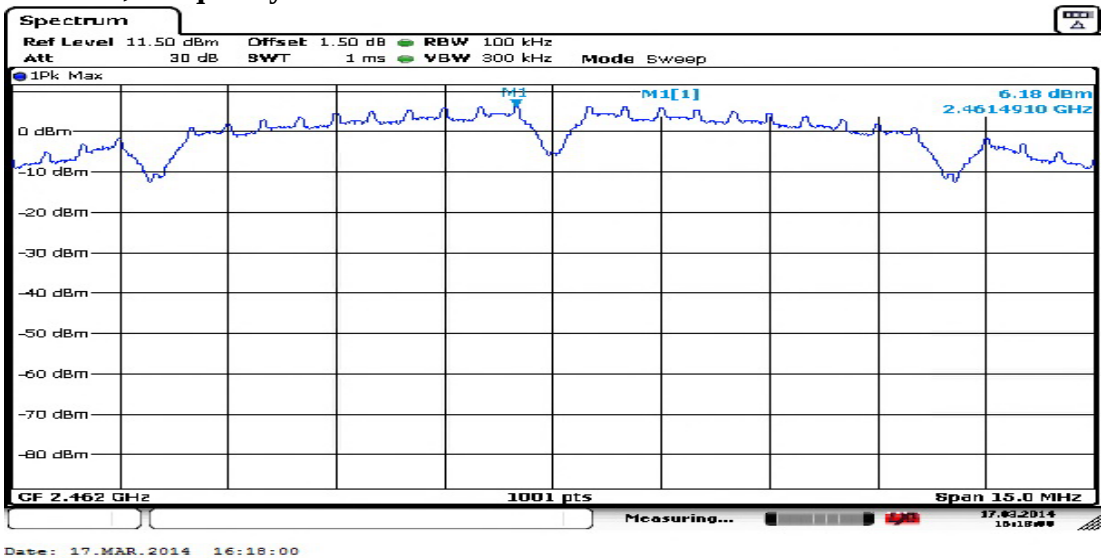
802.11b , Frequency: 2412MHz



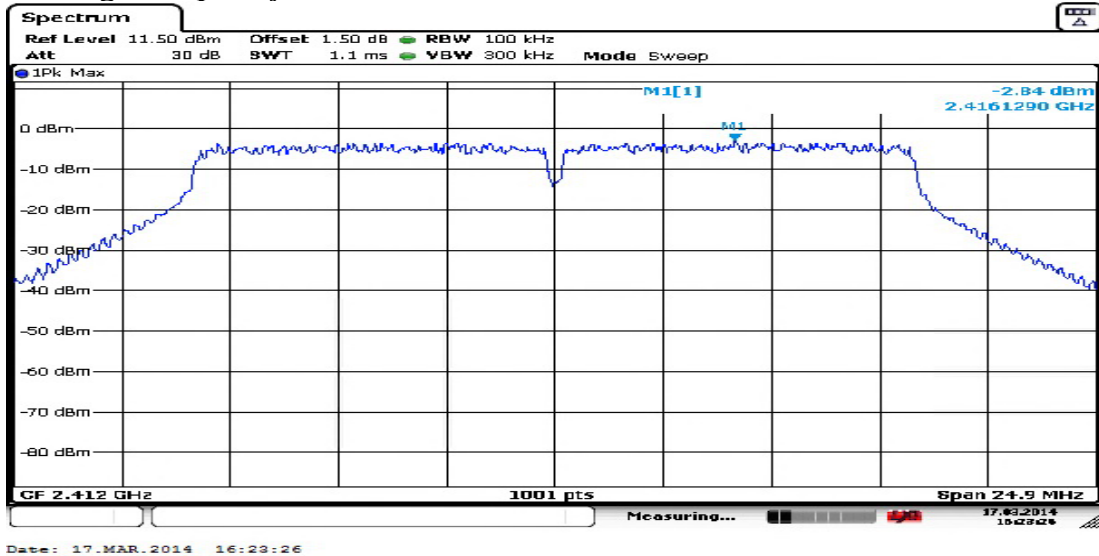
802.11b , Frequency: 2437MHz



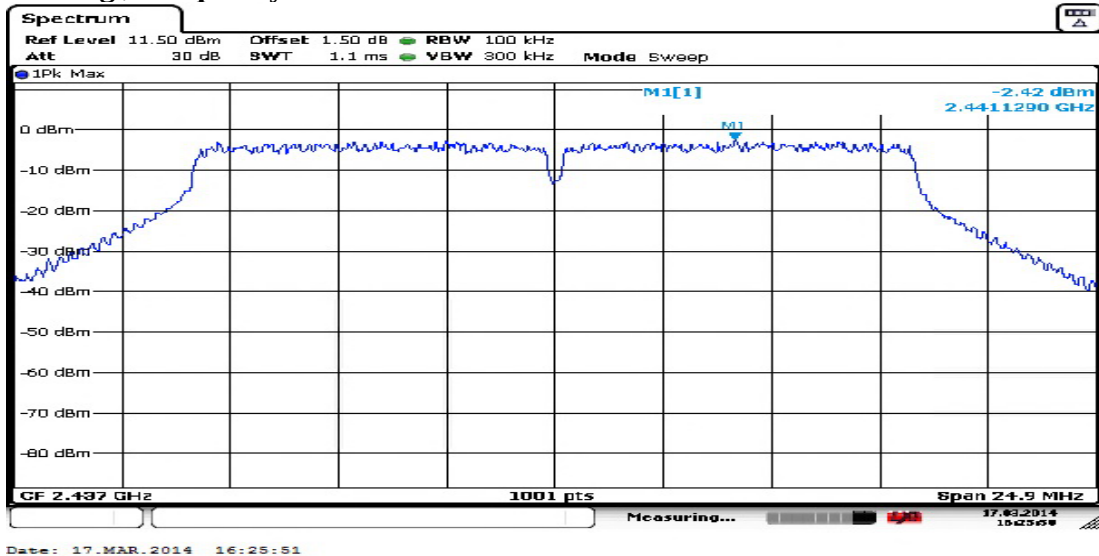
802.11b , Frequency: 2462MHz



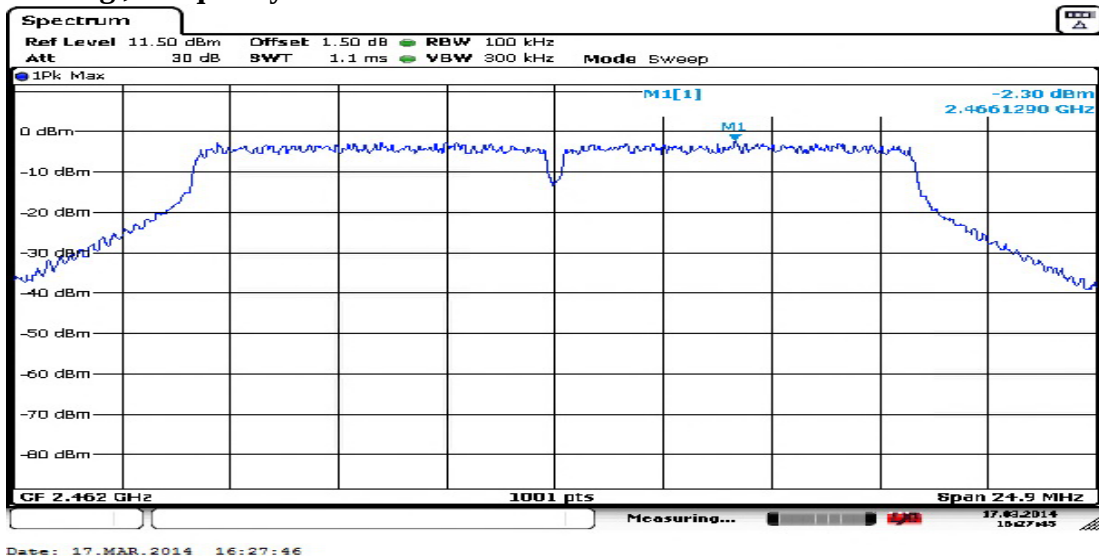
802.11g , Frequency: 2412MHz



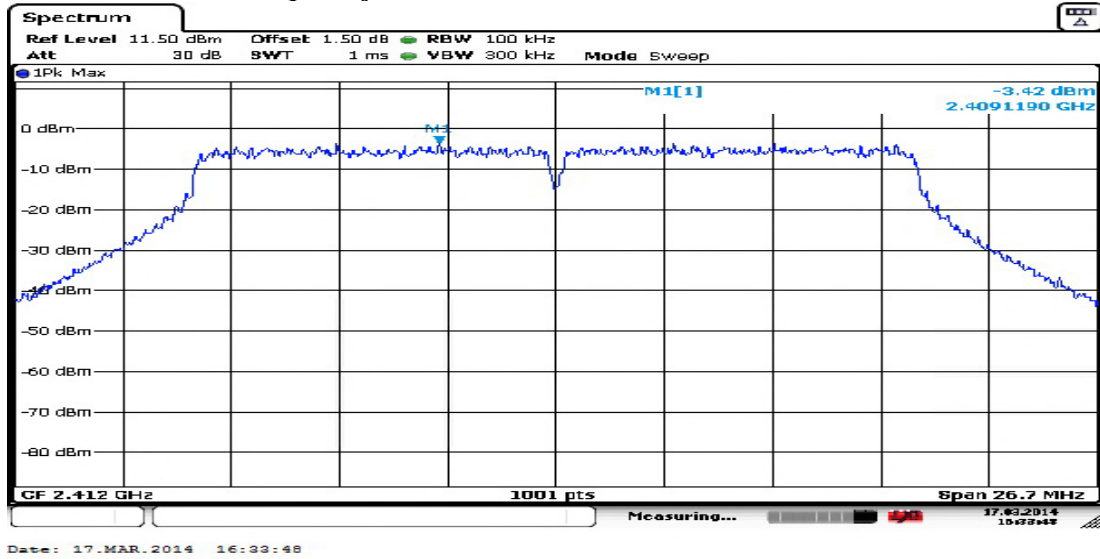
802.11g , Frequency: 2437MHz



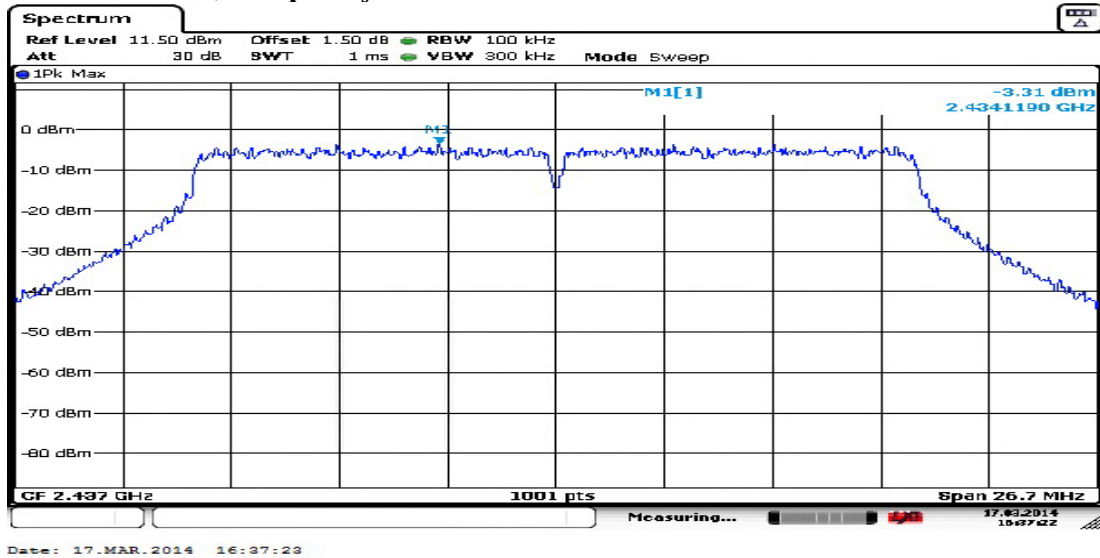
802.11g , Frequency: 2462MHz



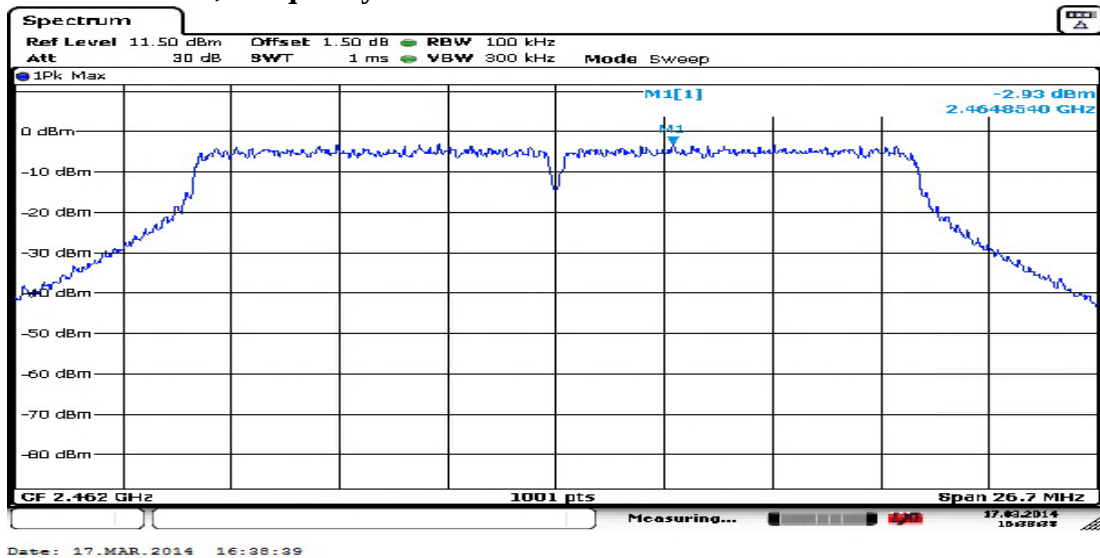
802.11n-HT20 , Frequency: 2412MHz



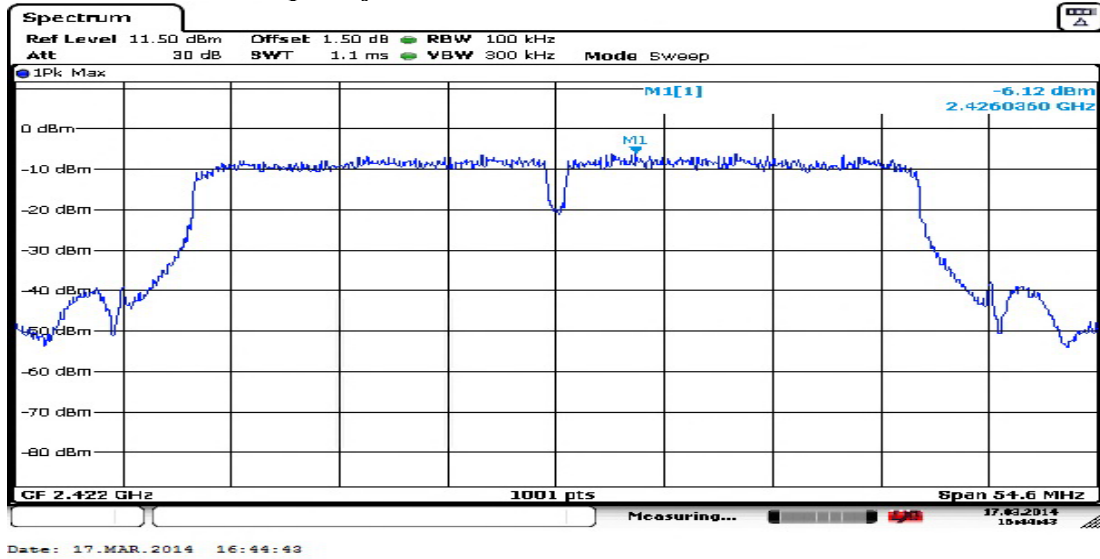
802.11n-HT20 , Frequency: 2437MHz



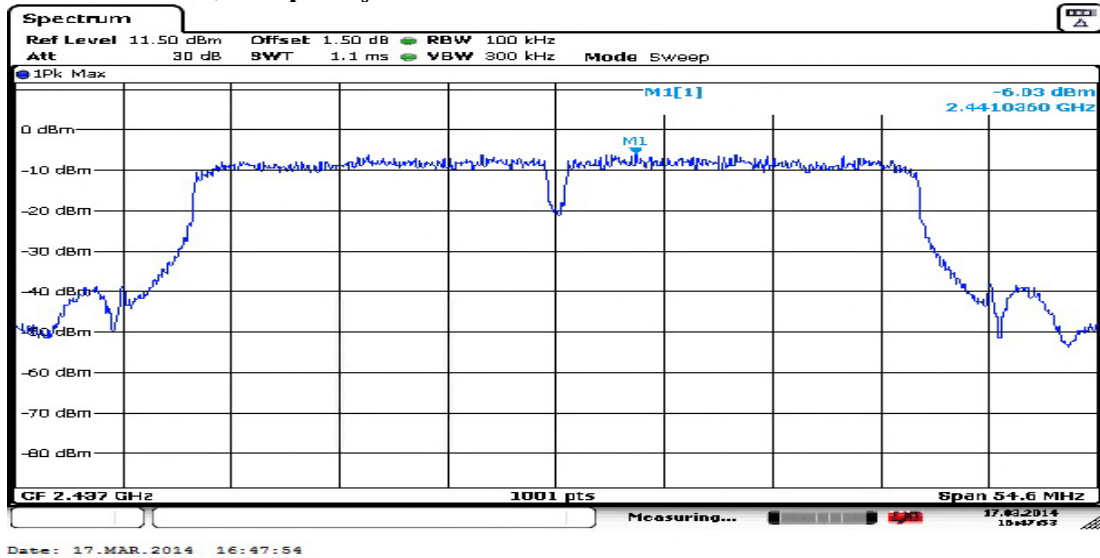
802.11n-HT20 , Frequency: 2462MHz



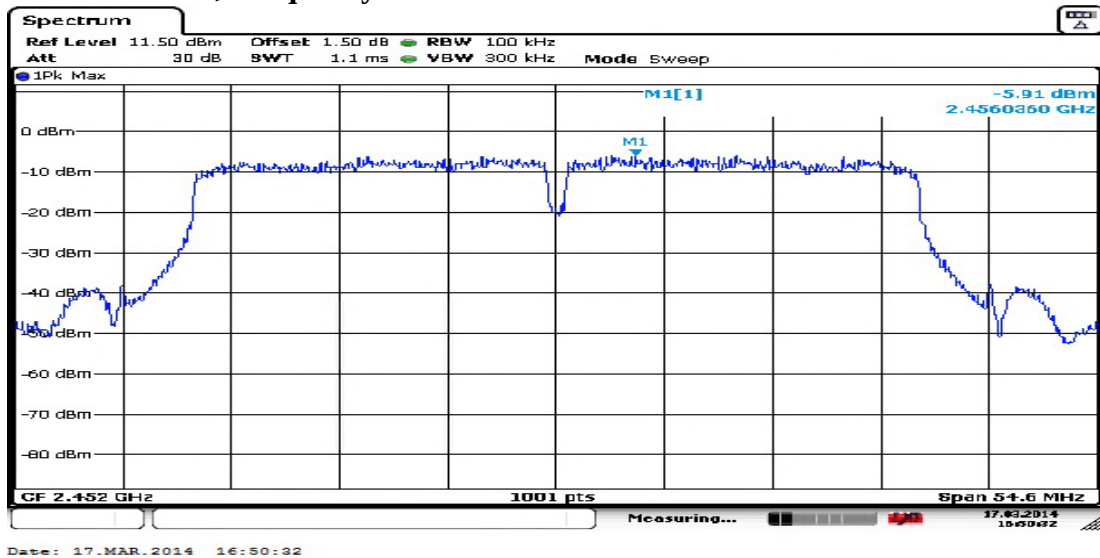
802.11n-HT40 , Frequency: 2422MHz



802.11n-HT40 , Frequency: 2437MHz



802.11n-HT40 , Frequency: 2452MHz



10.DEVIATION TO TEST SPECIFICATIONS

【NONE】

11.PHOTOGRAPHS

11.1.Photos of Radiated Measurement at Semi-Anechoic Chamber

11.1.1.Frequency Range 30MHz~1GHz



11.1.2.Frequency Range Above 1GHz



11.2.Photo of Section RF Conducted Measurement

