

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.

2-1, Lane 542, Jung Shiau Road, LinKuo,
New Taipei City 244, Taiwan

Prepared by : AUDIX Technology Corporation

EMC Department

No. 53-11, Dingfu, Linkou Dist.,
New Taipei City 244, Taiwan

Tel : (02) 2609-9301, 2609-2133

Fax: (02) 2609-9303

File Number : C1M1402133

Report Number : EM-F140165

Date of Test : 2014. 03. 14 ~ 19

Date of Report : 2014. 03. 20

TABLE OF CONTENTS

Description	Page
TEST REPORT CERTIFICATION	4
1. DESCRIPTION OF VERSION	5
2. GENERAL INFORMATION	6
2.1. Description of Device (EUT).....	6
2.2. Tested Supporting System Details	7
2.3. Description of Test Facility	7
2.4. Measurement Uncertainty	8
3. CONDUCTED EMISSION MEASUREMENT.....	9
4. RADIATED EMISSION MEASUREMENT	10
4.1. Test Equipment.....	10
4.2. Test Setup	10
4.3. Radiated Emission Limits (§15.209)	12
4.4. Operating Condition of EUT	12
4.5. Test Procedure	13
4.6. Radiated Emission Measurement Results	14
5. 20dB BANDWIDTH MEASUREMENT	25
5.1. Test Equipment.....	25
5.2. Block Diagram of Test Setup.....	25
5.3. Specification Limits (§15.247(a)(1))	26
5.4. Operating Condition of EUT	26
5.5. Test Procedure	26
5.6. Test Results.....	27
6. CARRIER FREQUENCY SEPARATION MEASUREMENT	29
6.1. Test Equipment.....	29
6.2. Block Diagram of Test Setup.....	29
6.3. Specification Limits (§15.247(a)(1))	29
6.4. Operating Condition of EUT	29
6.5. Test Procedure	29
6.6. Test Results.....	30
7. TIME OF OCCUPANCY MEASUREMENT	33
7.1. Test Equipment.....	33
7.2. Block Diagram of Test Setup.....	33
7.3. Specification Limits (§15.247(a)(1)(iii))	33
7.4. Operating Condition of EUT	33
7.5. Test Procedure	33
7.6. Test Results.....	34
8. NUMBER OF HOPPING CHANNELS MEASUREMENT	38
8.1. Test Equipment.....	38
8.2. Block Diagram of Test Setup.....	38
8.3. Specification Limits (§15.247(a)(1)(iii))	38
8.4. Operating Condition of EUT	38
8.5. Test Procedure	38
8.6. Test Results.....	39
9. MAXIMUM PEAK OUTPUT POWER MEASUREMENT	40
9.1. Test Equipment.....	40
9.2. Block Diagram of Test Setup.....	40
9.3. Specification Limits (§15.247(b)-(1)).....	40

9.4. Operating Condition of EUT 40

9.5. Test Procedure 40

9.6. Test Results..... 41

10. EMISSION LIMITATIONS MEASUREMENT.....44

11. BAND EDGES MEASUREMENT.....45

12. DEVIATION TO TEST SPECIFICATIONS46

13. PHOTOGRAPHS47

13.1. Photos of Radiated Measurement at Semi-Anechoic Chamber..... 47

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
AND ANSI C63.4/2003

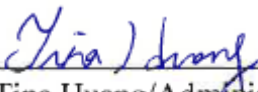
(FCC CFR 47 Part 15C, §15.207 and §15.209 and §15.247)

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 FCC official limits.

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. 14 ~ 19 Date of Report : 2014. 03. 20

Producer : 
 (Tina Huang/Administrator)

Signatory : 
 (Ben Cheng/Manager)

1. DESCRIPTION OF VERSION

Edition No.	Date of Rev.	Revision Summary	Report No.
0	2014. 03. 20	Original Report	EM-F140165

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. 14 ~ 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 802.11b/g/n-HT20/HT40 function has been test in other report of EM-F140166. 2. The BT function has been test in this report of EM-F140165.	

2.2. Tested Supporting System Details

2.2.1. Support Peripheral Unit

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

2.2.2. Cable Lists

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

2.3. Description of Test Facility

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

Test Location & Facility (AC) : **Semi-Anechoic Chamber**
 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

2.4. Measurement Uncertainty

Test Item	Frequency Range	Uncertainty (dB)
Radiation Test (Distance: 3m)	30MHz~300MHz	±2.91dB
	300MHz~1000MHz	±2.94dB
	Above 1GHz	± 5.02dB

Remark : Uncertainty = $k u_c(y)$

Test Item	Uncertainty
20dB Bandwidth	± 0.2kHz
Carrier Frequency Separation	± 0.2kHz
Time Of Occupancy	± 0.03sec
Maximum peak Output power	± 0.52dBm
Emission Limitations	± 0.13dB
Band Edges	± 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)

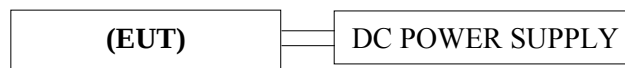
Item	Type	Manufacturer	Model No.	Serial No.	Cal. Due Date
1	Spectrum Analyzer	Agilent	N9030A-544	US51350140	2014. 07. 29
2	Test Receiver	R & S	ESCS30	100338	2014. 06. 30
3	Amplifier	HP	8447D	2944A06305	2015. 02. 17
4	Bilog Antenna	CHASE	CBL6112D	33821	2014. 08. 07

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

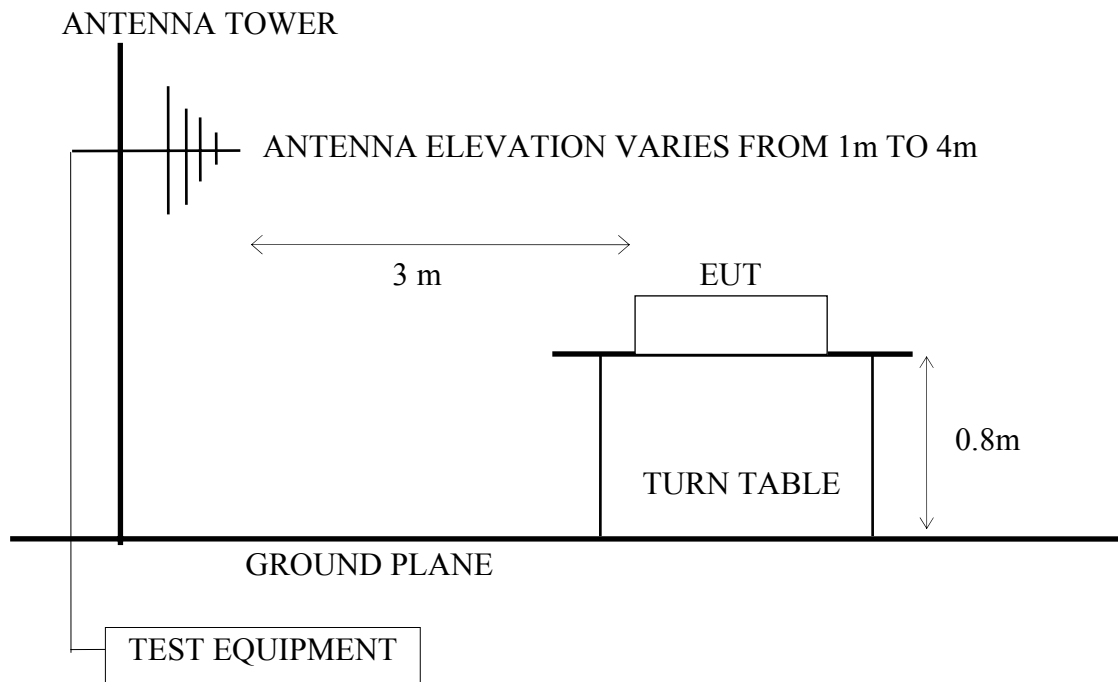
4.2. Test Setup

4.2.1. Block Diagram of connection between EUT and simulators

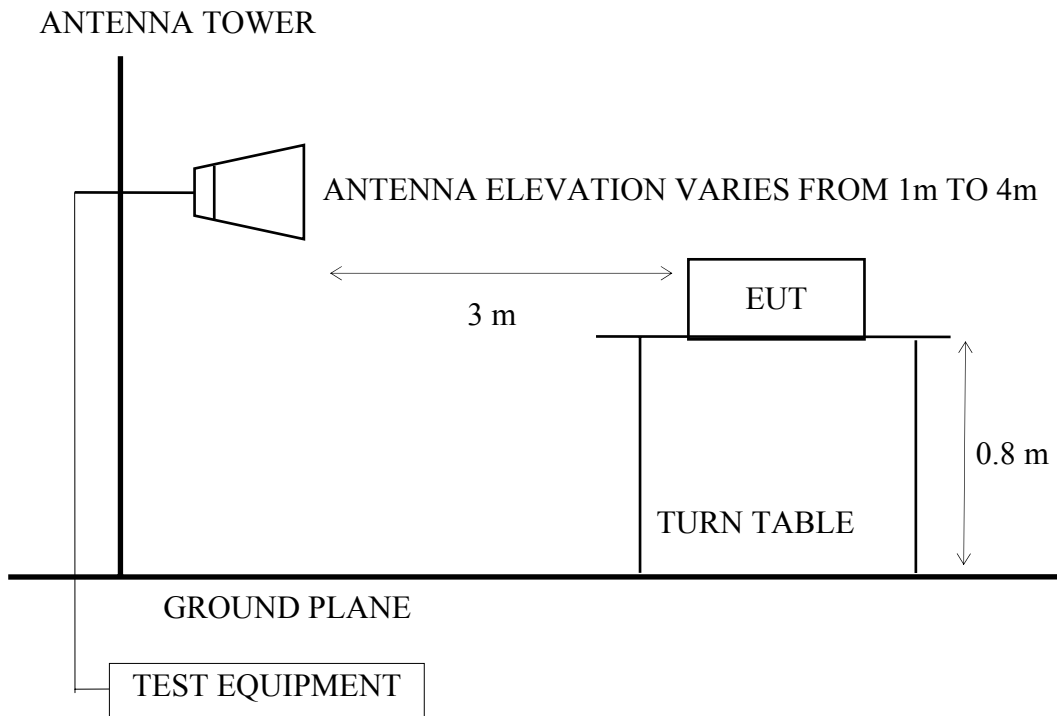


EUT: Car Radio Head Unit

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)

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) via Notebook PC and simulator as shown on 4.2.
- 4.4.2. To turn on the power of all equipment.
- 4.4.3. The EUT set to continuously transmit signals at 2402MHz, 2440MHz and 2480MHz during all test time.

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 bilog 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 ESCS30 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 4.2.2, peak detector is an alternate option for frequency from 30MHz to 1000MHz.

Above 1GHz was measured with peak and average detector. For frequency from 3000Hz o 25000Hz, we checked it in 1 meter distance and with a shorter cable 2 meter instead of original's. There is no signal exist.

4.6. Radiated Emission Measurement 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	GFSK	CH 0	2402MHz	Transmit	# 11	# 7
2	GFSK	CH 39	2441MHz		# 12	# 8
3	GFSK	CH 78	2480MHz		# 13	# 9

* 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	GFSK	CH 0	2402MHz	Transmit	# 10	# 7
2	GFSK	CH 39	2441MHz		# 6	# 3
3	GFSK	CH 78	2480MHz		# 4	# 1

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	GFSK	CH 0	2402MHz	Transmit	# 3, # 4	# 5, # 6
2		CH 78	2480MHz		# 17, # 18	# 19, # 20

4.6.1. For 30-1000MHz Frequency Range Measurement Results

Frequency: 2402MHz

Site no. : Audix NO.1 Chamber
 Dis. / Ant. : 3m CBL6112D 33821
 Limit : 30M-1G
 Env. / Ins. : 24°C / 48% N9030A(140)
 EUT : W7
 Power Rating : DC 12V
 Test Mode : Tx 2402MHz(GFSK)

Data no. : 11
 Ant. pol. : HORIZONTAL
 Engineer : Johnny_Hsueh

	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	145.43	11.43	2.59	17.01	31.03	43.50	12.47	Peak
2	222.06	10.80	3.30	12.89	26.99	46.00	19.01	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
 Dis. / Ant. : 3m CBL6112D 33821
 Limit : 30M-1G
 Env. / Ins. : 24°C / 48% N9030A(140)
 EUT : W7
 Power Rating : DC 12V
 Test Mode : Tx 2402MHz(GFSK)

Data no. : 7
 Ant. pol. : VERTICAL
 Engineer : Johnny_Hsueh

	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	78.50	7.29	1.80	29.08	38.17	40.00	1.83	Peak
2	148.34	11.29	2.60	20.95	34.84	43.50	8.66	Peak
3	580.96	18.81	6.30	2.48	27.59	46.00	18.41	Peak

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

Frequency: 2441MHz

Site no. : Audix NO.1 Chamber
 Dis. / Ant. : 3m CBL6112D 33821
 Limit : 30M-1G
 Env. / Ins. : 24°C / 48% N9030A(140)
 EUT : W7
 Power Rating : DC 12V
 Test Mode : Tx 2441MHz(GFSK)

Data no. : 12
 Ant. pol. : HORIZONTAL
 Engineer : Johnny_Hsueh

	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	128.94	12.22	2.40	21.08	35.70	43.50	7.80	Peak
2	221.09	10.75	3.30	15.78	29.83	46.00	16.17	Peak
3	580.96	18.81	6.30	2.34	27.45	46.00	18.55	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
 Dis. / Ant. : 3m CBL6112D 33821
 Limit : 30M-1G
 Env. / Ins. : 24°C / 48% N9030A(140)
 EUT : W7
 Power Rating : DC 12V
 Test Mode : Tx 2441MHz(GFSK)

Data no. : 8
 Ant. pol. : VERTICAL
 Engineer : Johnny_Hsueh

	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	54.25	8.38	1.50	22.37	32.25	40.00	7.75	Peak
2	148.34	11.29	2.60	18.70	32.59	43.50	10.91	Peak
3	580.96	18.81	6.30	1.08	26.19	46.00	19.81	Peak

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

Frequency: 2480MHz

Site no. : Audix NO.1 Chamber Data no. : 13
 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 : Tx 2480MHz(GFSK)

	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	147.37	11.34	2.58	16.81	30.73	43.50	12.77	Peak
2	222.06	10.80	3.30	13.85	27.95	46.00	18.05	Peak
3	580.96	18.81	6.30	2.02	27.13	46.00	18.87	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. : 9
 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 : Tx 2480MHz(GFSK)

	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	53.28	8.61	1.50	22.96	33.07	40.00	6.93	Peak
2	148.34	11.29	2.60	17.43	31.32	43.50	12.18	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.

4.6.2. For above 1GHz Frequency Range Measurement Results

Frequency: 2402MHz

Site no. : Audix NO.1 Chamber Data no. : 10
 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 : Tx 2402MHz(GFSK)

	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	1602.00	26.08	6.14	15.77	47.99	54.00	6.01	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. : 7
 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 : Tx 2402MHz(GFSK)

	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	1602.00	26.08	6.14	14.72	46.94	54.00	7.06	Peak

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

Frequency: 2441MHz

Site no. : Audix NO.1 Chamber
 Dis. / Ant. : 3m 3115(4927)
 Limit : ABOVE 1GHZ(AV)
 Env. / Ins. : 24°C / 48% N9030A(140)
 EUT : W7
 Power Rating : DC 12V
 Test Mode : Tx 2441MHz(GFSK)

Data no. : 6
 Ant. pol. : HORIZONTAL
 Engineer : Johnny_Hsueh

	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	1628.00	26.21	6.36	15.61	48.18	54.00	5.82	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
 Dis. / Ant. : 3m 3115(4927)
 Limit : ABOVE 1GHZ(AV)
 Env. / Ins. : 24°C / 48% N9030A(140)
 EUT : W7
 Power Rating : DC 12V
 Test Mode : Tx 2441MHz(GFSK)

Data no. : 3
 Ant. pol. : VERTICAL
 Engineer : Johnny_Hsueh

	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	1628.00	26.21	6.36	14.30	46.87	54.00	7.13	Peak

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

Frequency: 2480MHz

Site no. : Audix NO.1 Chamber
 Dis. / Ant. : 3m 3115(4927)
 Limit : ABOVE 1GHZ(AV)
 Env. / Ins. : 24°C / 48% N9030A(140)
 EUT : W7
 Power Rating : DC 12V
 Test Mode : Tx 2480MHz(GFSK)

Data no. : 4
 Ant. pol. : HORIZONTAL
 Engineer : Johnny_Hsueh

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Emission Reading (dB μ V)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Remark
1	1654.00	26.27	6.52	16.96	49.75	54.00	4.25	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
 Dis. / Ant. : 3m 3115(4927)
 Limit : ABOVE 1GHZ(AV)
 Env. / Ins. : 24°C / 48% N9030A(140)
 EUT : W7
 Power Rating : DC 12V
 Test Mode : Tx 2480MHz(GFSK)

Data no. : 1
 Ant. pol. : VERTICAL
 Engineer : Johnny_Hsueh

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Emission Reading (dB μ V)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Remark
1	1654.00	26.27	6.52	14.05	46.84	54.00	7.16	Peak

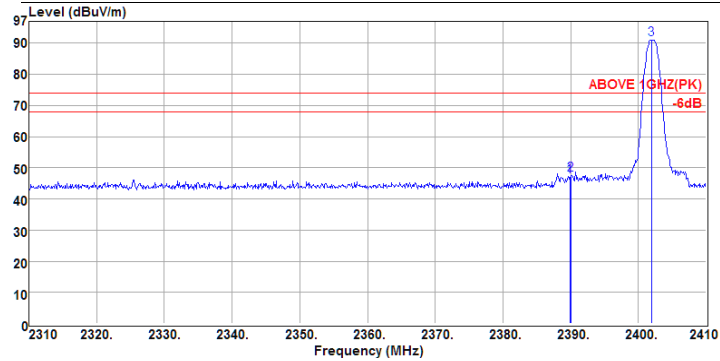
Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading
 2. The emission levels that are 20dB below the official limit are not reported.

4.6.3. Restricted Bands Measurement Results

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

EUT : Car Radio Head Unit Humidity : 48%

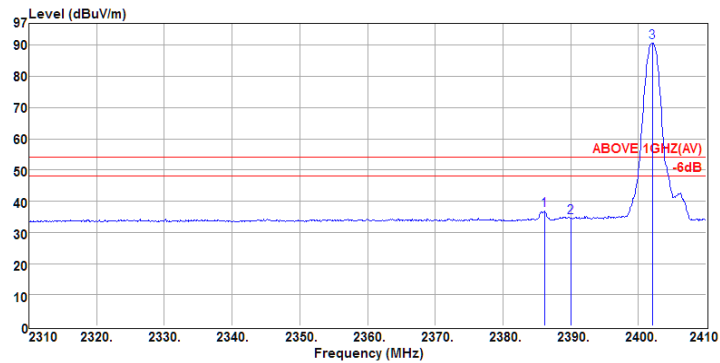
Test Mode : Frequency: 2402MHz



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 : Tx 2402MHz(GFSK)

	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	2389.90	28.47	6.34	12.37	47.18	74.00	26.82	Peak
2	2390.00	28.47	6.34	12.95	47.76	74.00	26.24	Peak
3	2401.90	28.47	6.36	56.55	91.38	74.00	-17.38	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 : Tx 2402MHz(GFSK)

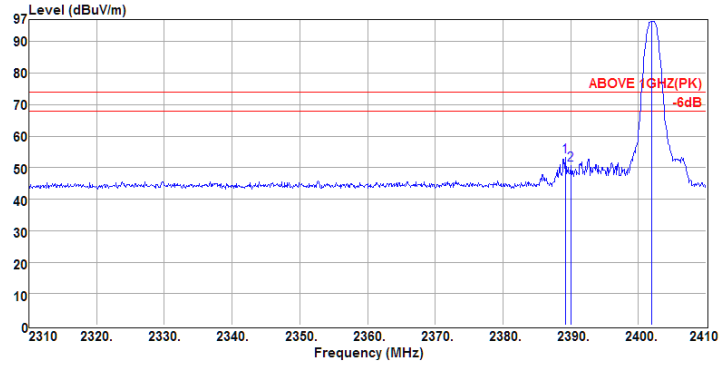
	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dB μ V)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Remark
1	2386.20	28.47	6.33	2.31	37.11	54.00	16.89	Average
2	2390.00	28.47	6.34	0.00	34.81	54.00	19.19	Average
3	2402.10	28.47	6.36	56.27	91.10	54.00	-37.10	Average

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%

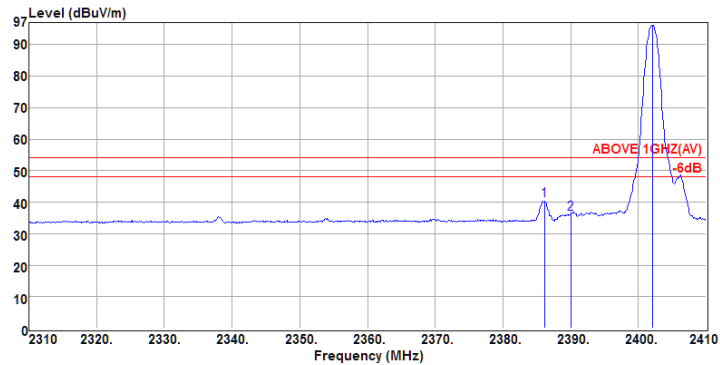
Test Mode : Frequency: 2402MHz



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 : Tx 2402MHz(GFSK)

	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	2389.20	28.47	6.34	18.72	53.53	74.00	20.47	Peak
2	2390.00	28.47	6.34	18.27	51.08	74.00	22.92	Peak
3	2401.90	28.47	6.36	61.96	96.79	74.00	-22.79	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 : Tx 2402MHz(GFSK)

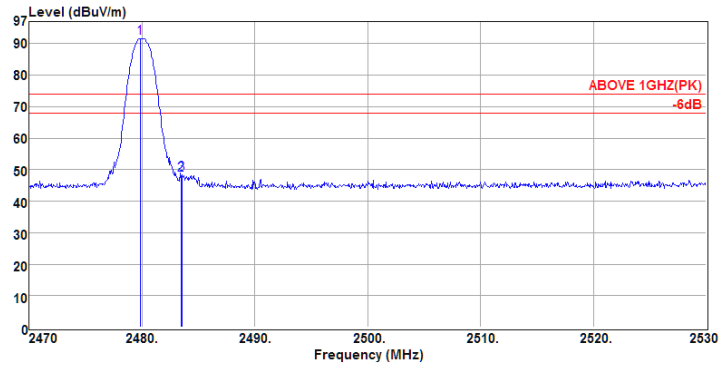
	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dB μ V)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Remark
1	2389.20	28.47	6.33	5.78	40.58	54.00	13.42	Average
2	2390.00	28.47	6.34	1.54	36.35	54.00	17.65	Average
3	2402.10	28.47	6.36	61.66	96.49	54.00	-42.49	Average

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%

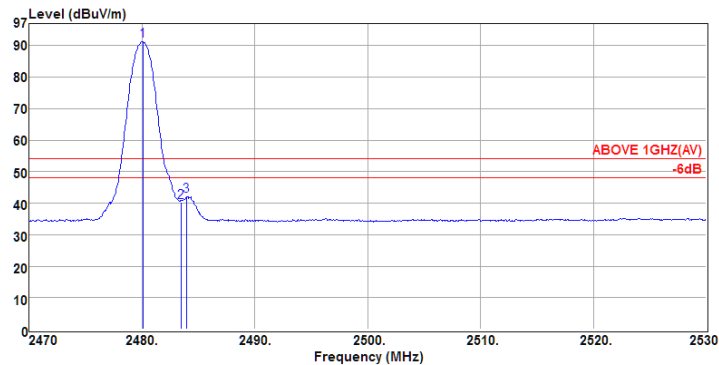
Test Mode : Frequency: 2480MHz



Site no. : Audix N0.1 Chamber Data no. : 17
 Dis. / Ant. : 3m 3115(4927) Ant. pol. : HORIZONTAL
 Limit : ABOVE 1GHZ(PK)
 Env. / Ins. : 24°C / 48% N8030A(140) Engineer : Johnny_Hsueh
 EUT : W7
 Power Rating : DC 12V
 Test Mode : Tx 2480MHz(GFSK)

	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	2479.84	28.66	6.44	56.74	91.84	74.00	-17.84	Peak
2	2483.50	28.66	6.45	13.31	48.42	74.00	25.58	Peak
3	2483.56	28.66	6.45	13.66	48.77	74.00	25.23	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 N0.1 Chamber Data no. : 18
 Dis. / Ant. : 3m 3115(4927) Ant. pol. : HORIZONTAL
 Limit : ABOVE 1GHZ(AV)
 Env. / Ins. : 24°C / 48% N8030A(140) Engineer : Johnny_Hsueh
 EUT : W7
 Power Rating : DC 12V
 Test Mode : Tx 2480MHz(GFSK)

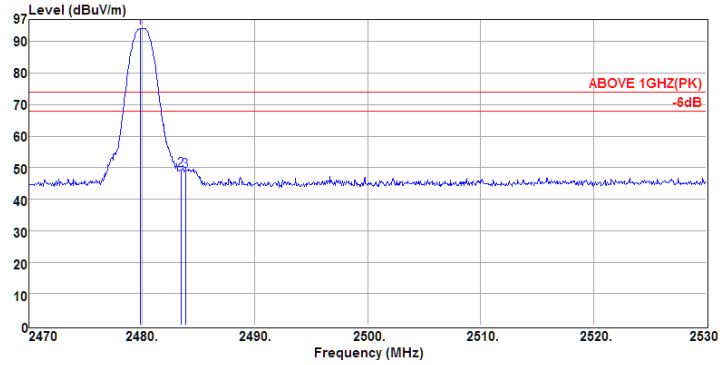
	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dB μ V)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Remark
1	2480.08	28.66	6.44	56.41	91.51	54.00	-37.51	Average
2	2483.50	28.66	6.45	5.18	40.29	54.00	13.71	Average
3	2483.98	28.66	6.45	7.21	42.32	54.00	11.68	Average

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%

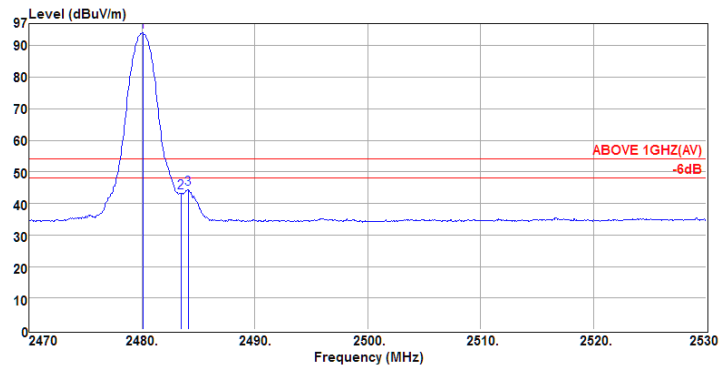
Test Mode : Frequency: 2480MHz



Site no. : Audix NO.1 Chamber Data no. : 19
 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 : Tx 2480MHz(GFSK)

	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	2479.84	28.66	6.44	59.40	94.50	74.00	-20.50	Peak
2	2483.50	28.66	6.45	14.03	49.14	74.00	24.86	Peak
3	2483.86	28.66	6.45	13.91	49.02	74.00	24.98	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. : 20
 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 : Tx 2480MHz(GFSK)

	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	2480.08	28.66	6.44	59.22	94.32	54.00	-40.32	Average
2	2483.50	28.66	6.45	8.28	43.39	54.00	10.61	Average
3	2484.16	28.66	6.45	9.46	44.57	54.00	9.43	Average

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

5. 20dB BANDWIDTH MEASUREMENT

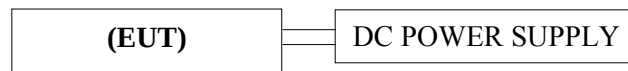
5.1. Test Equipment

The following test equipment was used during the 20dB bandwidth measurement:

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

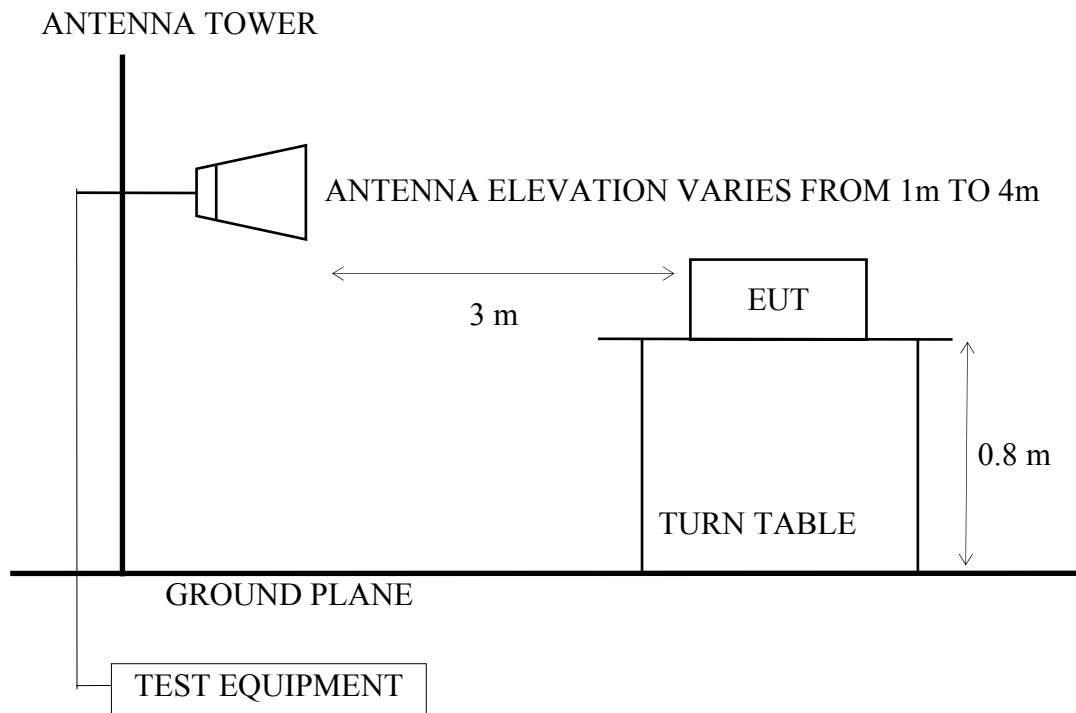
5.2. Block Diagram of Test Setup

5.2.1. Block Diagram of connection between EUT and simulators



EUT: Car Radio Head Unit

5.2.2. Semi-Anechoic Chamber (3m) Setup Diagram



5.3. Specification Limits (§15.247(a)(1))

Alternatively, frequency hopping systems operating in the 2400-2483.5MHz band may have hopping channel carrier frequencies that are separated by 25kHz or two-thirds of the 20dB bandwidth of the hopping channel, whichever is greater.

5.4. Operating Condition of EUT

5.4.1. Set up the EUT and simulator as shown on 5.2.

5.4.2. To turn on the power of all equipment.

5.4.3. The EUT (Car Radio Head Unit) was controlled and set as continuous transmitting via Bluetooth test set during testing.

5.5. Test Procedure

The transmitter output was connected to the spectrum analyzer. The RBW of the fundamental frequency was measure by spectrum analyzer 1% of the 20dB bandwidth and the setting equal to RBW and VBW is equal to RBW. The 20dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 20dB.

The measurement guideline was according to FCC Public Notice DA 00-705.

5.6. Test Results

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

EUT: Car Radio Head Unit

M/N: W7

Test Date : 2014. 03. 14 Temperature : 24

Humidity : 48%

Type of Modulation: GFSK

No.	Channel	Test Frequency	Test Frequency	2/3 (20dB Bandwidth)
1.	CH0	2402MHz	0.860 MHz	0.573 MHz
2.	CH39	2441MHz	0.885 MHz	0.590 MHz
3.	CH78	2480MHz	0.890 MHz	0.593 MHz

The maximum two-thirds of the 20dB bandwidth shall be at maximum 0.593kHz.

Figure 1: GFSK, Channel 0, Frequency: 2402MHz



Figure 2: GFSK, Channel 39, Frequency: 2441MHz



Figure 3: GFSK, Channel 78, Frequency: 2480MHz



6. CARRIER FREQUENCY SEPARATION MEASUREMENT

6.1. Test Equipment

The following test equipment was used during the carrier frequency separation measurement:

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

6.2. Block Diagram of Test Setup

The same as section. 5.2.

6.3. Specification Limits (§15.247(a)(1))

Alternatively, frequency hopping systems operating in the 2400-2483.5MHz band may have hopping channel carrier frequencies that are separated by 25kHz or two-thirds of the 20dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output no greater than 125mW.

6.4. Operating Condition of EUT

Same as 20dB bandwidth measurement which was listed in section 5.4.

6.5. Test Procedure

The transmitter output was connected to the spectrum analyzer. The channel separation was measure by spectrum analyzer with RBW equal to 1% of the span. The video bandwidth not to be smaller than resolution bandwidth, the peak was mark on adjacent bandwidth, the between of peak is carrier frequency separation. The measurement guideline was according to FCC Public Notice DA 00-705.

6.6. Test Results

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

EUT: Car Radio Head Unit

M/N: W7

Test Date : 2014. 03. 14 Temperature : 24 Humidity : 48%

Type of Modulation: GFSK

1. 2402MHz adjacent channel of carrier frequency separation: 1.000MHz.
2. 2441MHz adjacent channel of right carrier frequency separation: 1.000MHz.
3. 2441MHz adjacent channel of left carrier frequency separation: 1.000MHz.
4. 2480MHz adjacent channel of carrier frequency separation: 1.000MHz.

[Above values have met the requirement as specified in section 4.3: frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater.]

Figure 1: GFSK, 2402MHz adjacent channel of carrier frequency separation



Figure 2: GFSK, 2441MHz adjacent channel of right carrier frequency separation

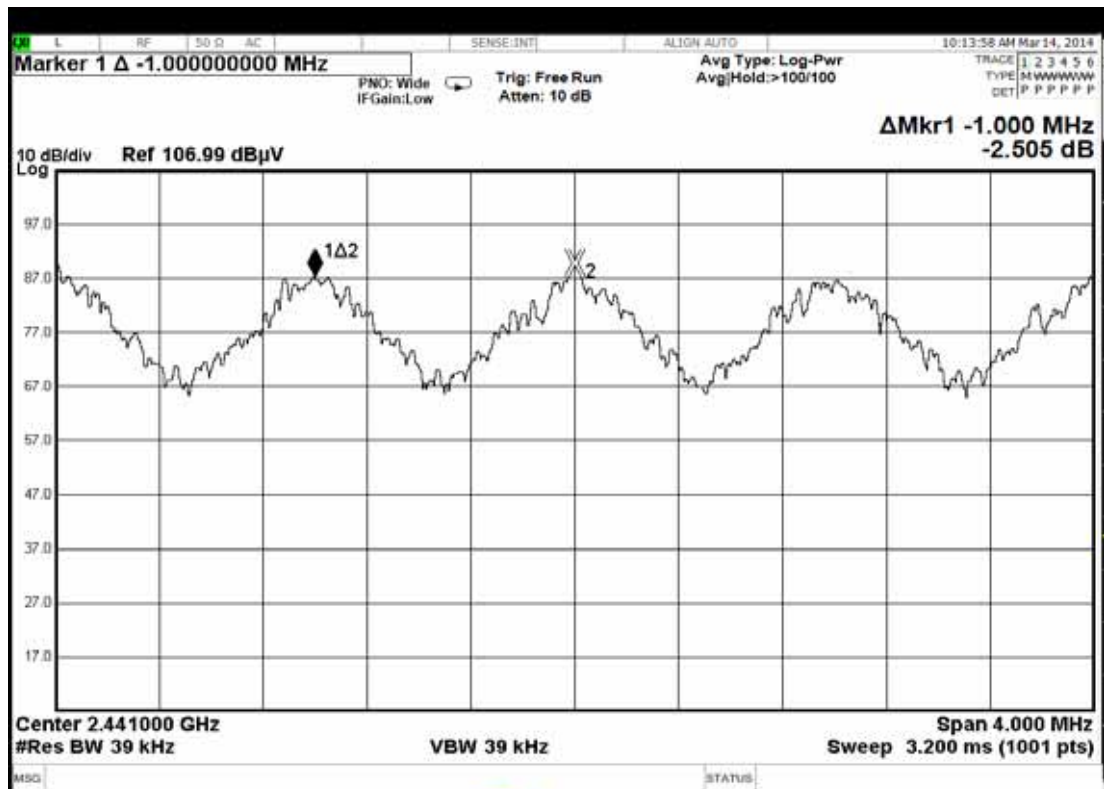


Figure 3: GFSK, 2441MHz adjacent channel of left carrier frequency separation



Figure 4: GFSK, 2480MHz adjacent channel of carrier frequency separation



7. TIME OF OCCUPANCY MEASUREMENT

7.1. Test Equipment

The following test equipment was used during the time of occupancy measurement:

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

7.2. Block Diagram of Test Setup

The same as section. 5.2.

7.3. Specification Limits (§15.247(a)(1)(iii))

Frequency hopping systems in the 2400-2483.5MHz shall use at least 15 non-overlapping channels. The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by number of hopping channels employed.

7.4. Operating Condition of EUT

Same as 20dB bandwidth measurement which was listed in section 5.4.

7.5. Test Procedure

The transmitter output was connected to the spectrum analyzer. The bandwidth of the fundamental frequency was measure by spectrum analyzer with 1MHz RBW and 1MHz VBW. $VBW \geq RBW$; Span=zero span.

Centred on a hopping channel sweep=as necessary to capture the entire dwell time per hopping channel ; Detector function=peak ; Trace=Max hold

The measurement guideline was according to FCC Public Notice DA 00-705.

7.6. Test Results

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

EUT: Car Radio Head Unit

M/N: W7

Test Date : 2014. 03. 14 Temperature : 24 Humidity : 48%

Type of Modulation : GFSK, Test Frequency : 2441MHz

Duty cycle: 79channels*0.4 seconds = 31.6 seconds

DH1 : For each 5 seconds of 50 channels appearance, the longest time of occupancy for each of 31.6 seconds is:

$$50 \text{ channels} * 31.6 \text{ seconds} / 5 * 0.420\text{ms} = 132.720\text{ms} (<400\text{ms})$$

DH3 : For each 5 seconds of 25 channels appearance, the longest time of occupancy for each of 31.6 seconds is:

$$25 \text{ channels} * 31.6 \text{ seconds} / 5 * 1.660\text{ms} = 262.280\text{ms} (<400\text{ms})$$

DH5 : For each 5 seconds of 17 channels appearance, the longest time of occupancy for each of 31.6 seconds is:

$$17 \text{ channels} * 31.6 \text{ seconds} / 5 * 2.920\text{ms} = 313.720\text{ms} (<400\text{ms})$$

Figure 4: GFSK, 2441MHz, DH1

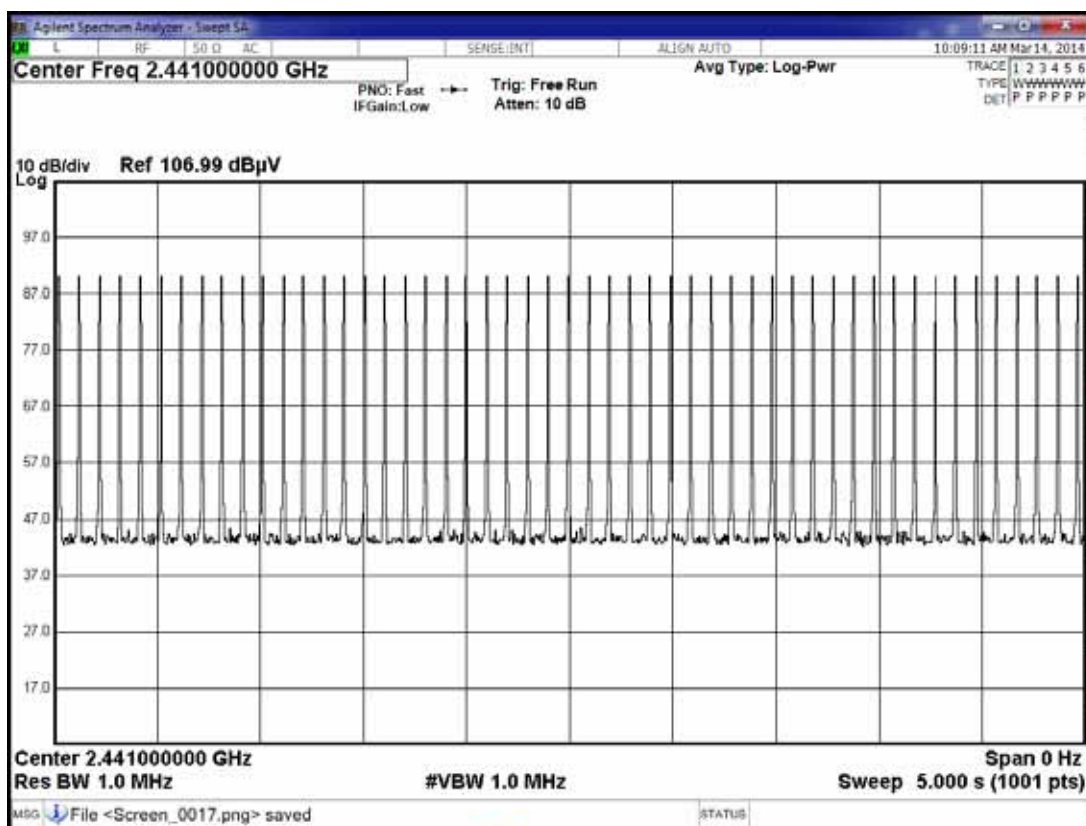
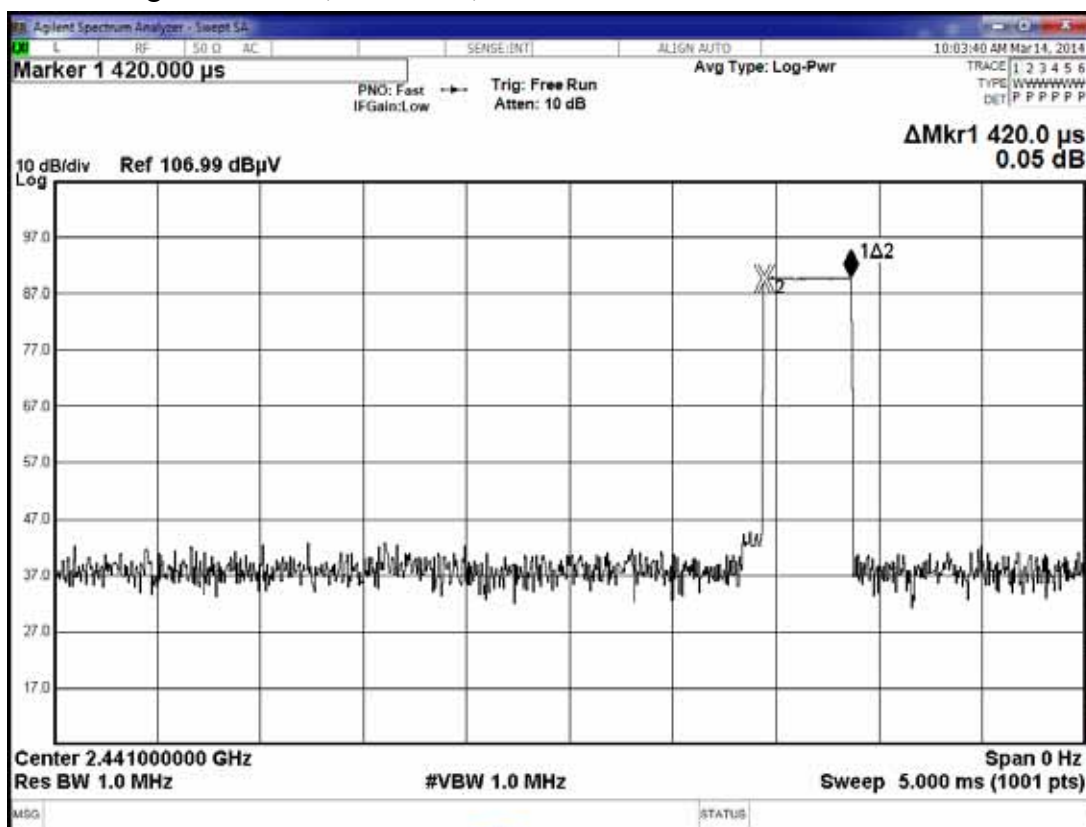


Figure 5: GFSK, 2441MHz, DH3

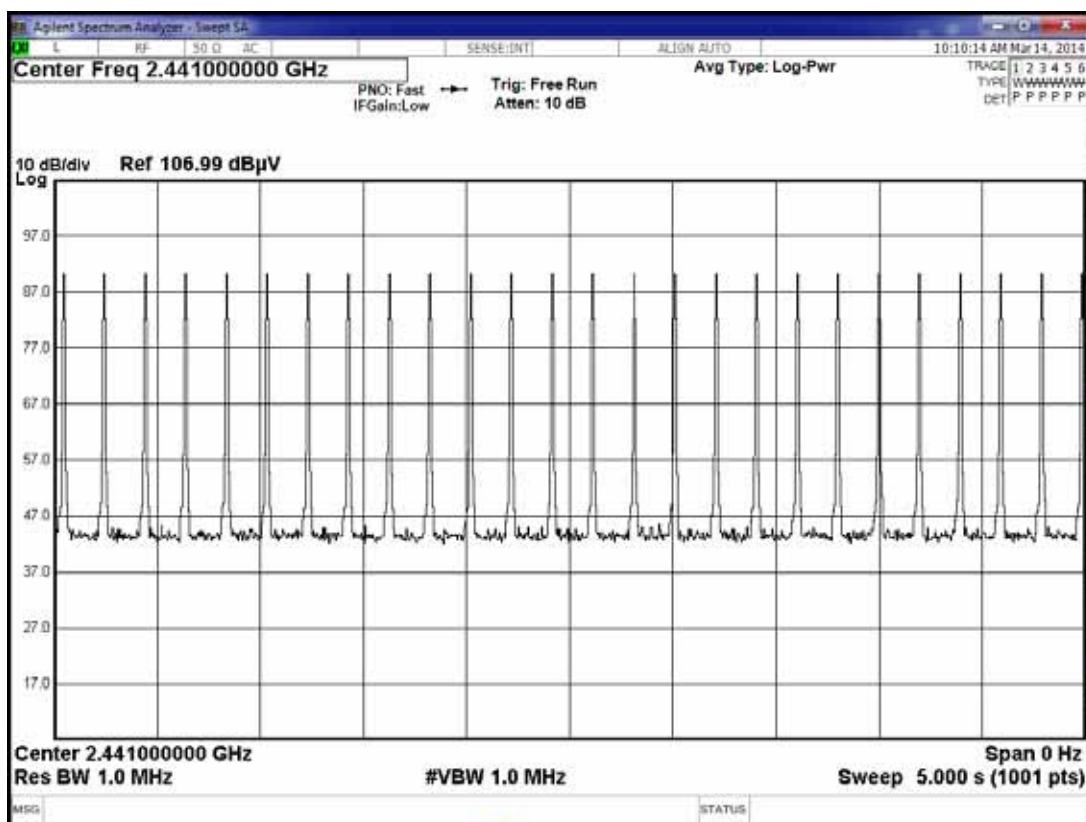
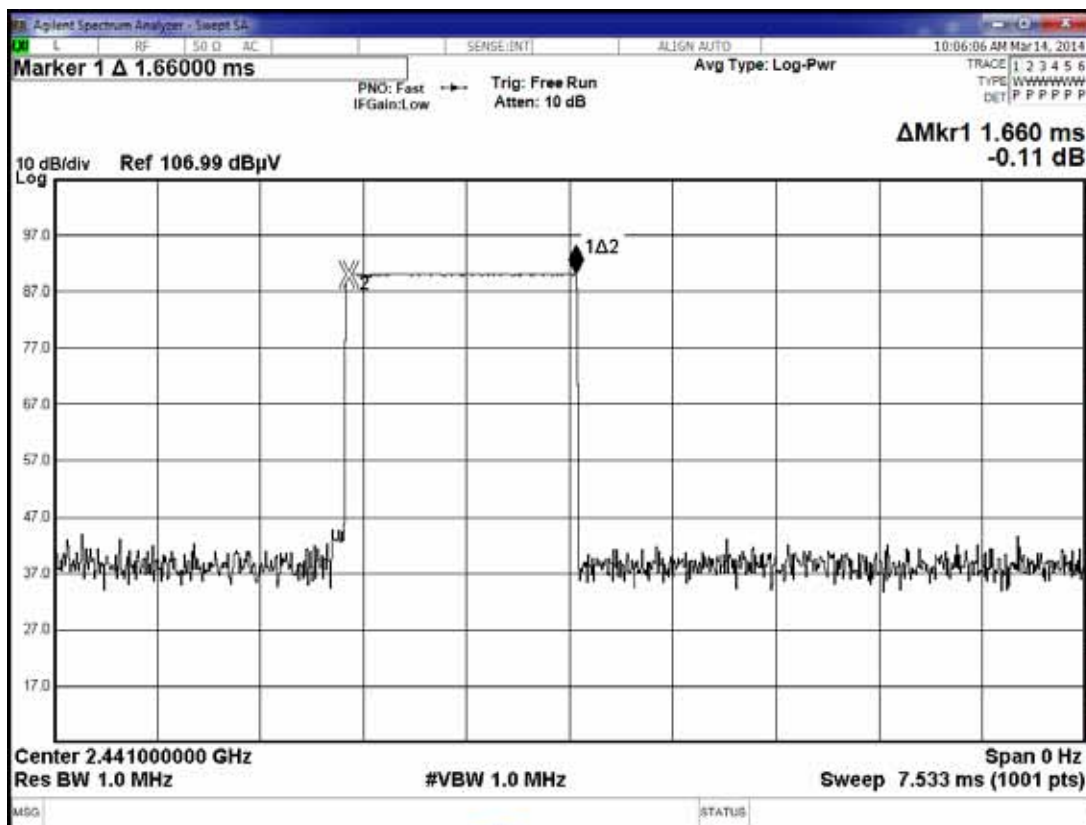
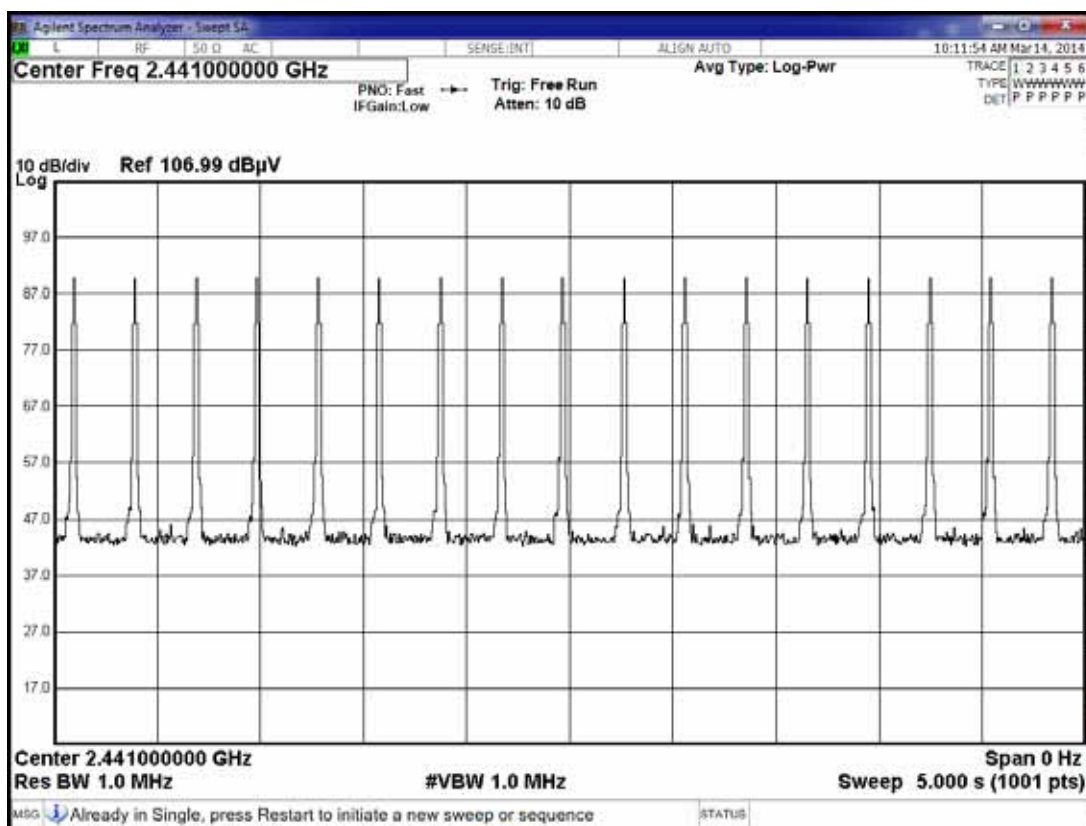
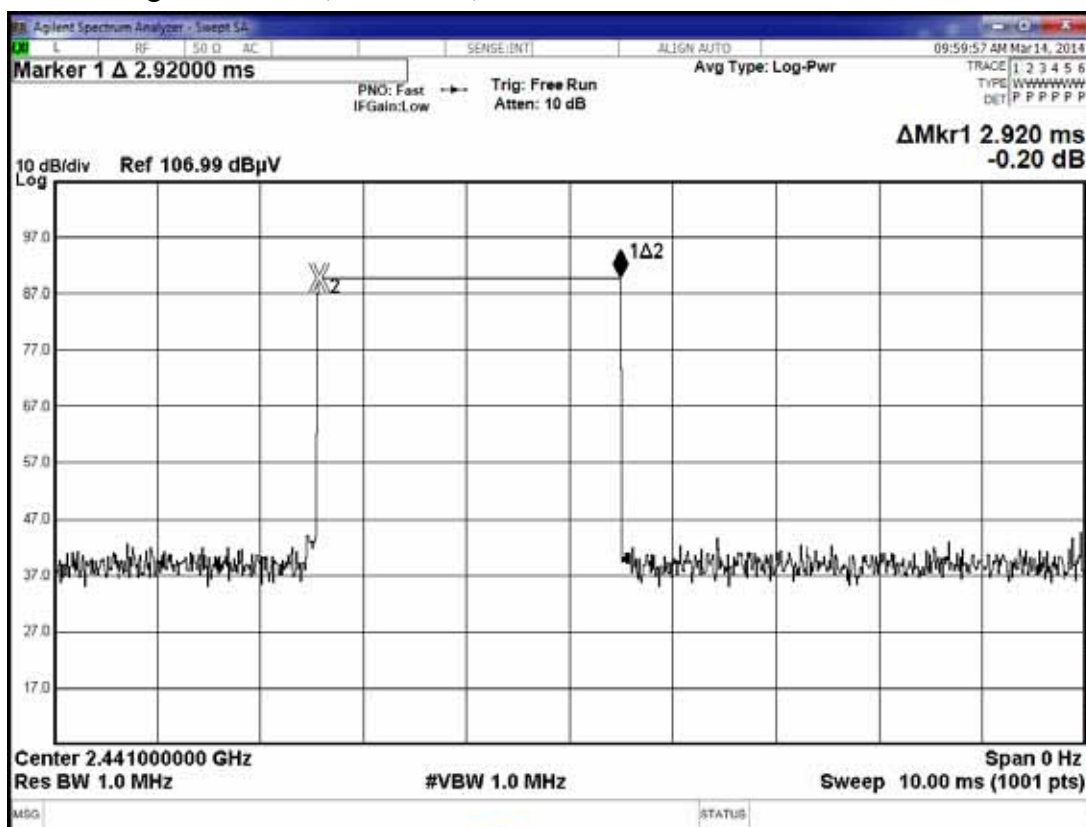


Figure 6: GFSK, 2441MHz, DH5



8. NUMBER OF HOPPING CHANNELS MEASUREMENT

8.1. Test Equipment

The following test equipment was used during the number of hopping channels measurement:

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

8.2. Block Diagram of Test Setup

The same as section. 5.2.

8.3. Specification Limits (§15.247(a)(1)(iii))

Frequency hopping systems which use fewer than 20 hopping frequencies may employ intelligent hopping techniques to avoid interference to other transmissions. Frequency hopping systems may avoid or suppress transmissions on a particular hopping frequency provided that a minimum of 15 non-overlapping channels.

8.4. Operating Condition of EUT

Same as 20dB bandwidth measurement which was listed in section 5.4.

8.5. Test Procedure

The transmitter output was connected to the spectrum analyzer. The bandwidth of the fundamental frequency was measure by spectrum analyzer with 100kHz RBW and 100kHz VBW. Sweep=Auto ; Detector function=peak ; Trace=Max hold
The measurement guideline was according to FCC Public Notice DA 00-705.

8.6. Test Results

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

EUT: Car Radio Head Unit

M/N: W7

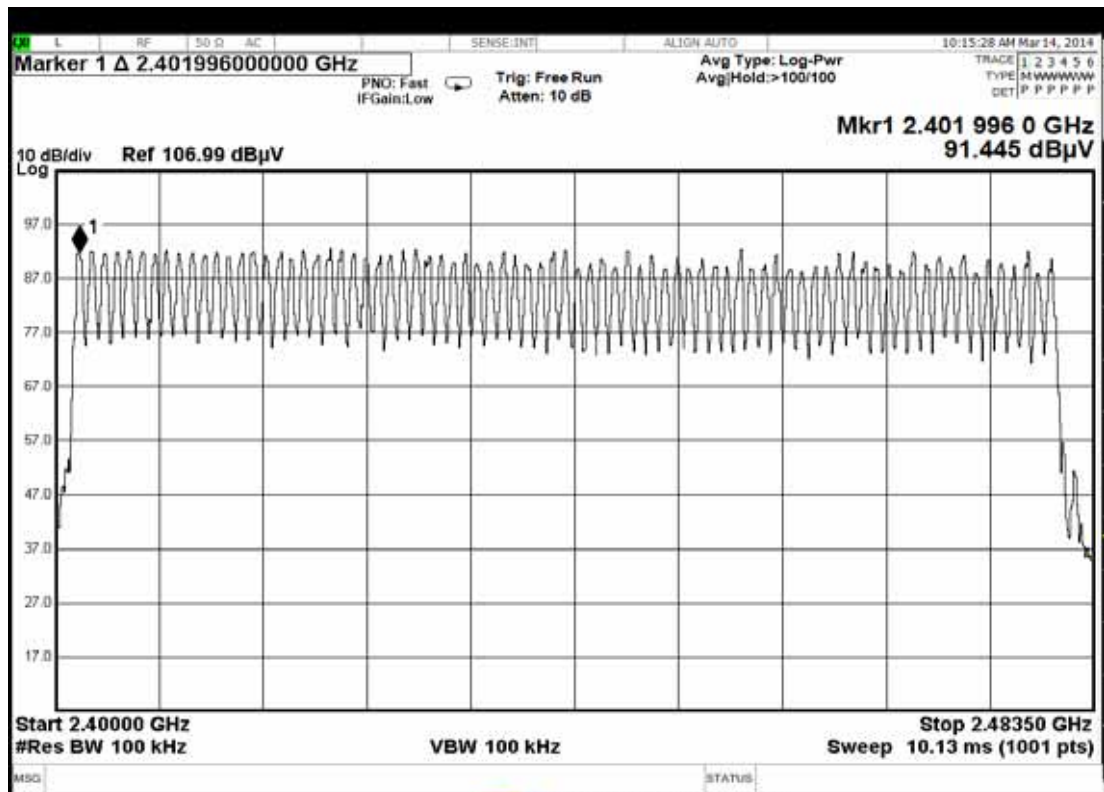
Test Date : 2014. 03. 14 Temperature : 24

Humidity : 48%

Type of Modulation: GFSK

The number hopping channel is 79.

Figure: GFSK



9. MAXIMUM PEAK OUTPUT POWER MEASUREMENT

9.1. Test Equipment

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

9.2. Block Diagram of Test Setup

The same as section. 4.2.

9.3. Specification Limits (§15.247(b)-(1))

The Limits of maximum Peak Output Power for frequency hopping systems in 2400-2483.5MHz is: 0.125Watt. (21dBm)

9.4. Operating Condition of EUT

Same as 20dB bandwidth measurement which was listed in section 5.4.

9.5. Test Procedure

The setup of output power testing is as below:

Span can encompass the waveform

RBW>EBW

VBW RBW

Sweep=1.5MHz

The measurement guideline was according to FCC Public Notice DA 00-705.

9.6. Test Results

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

EUT: Car Radio Head Unit

M/N: W7

Test Date : 2014. 03. 14 Temperature : 24

Humidity : 48%

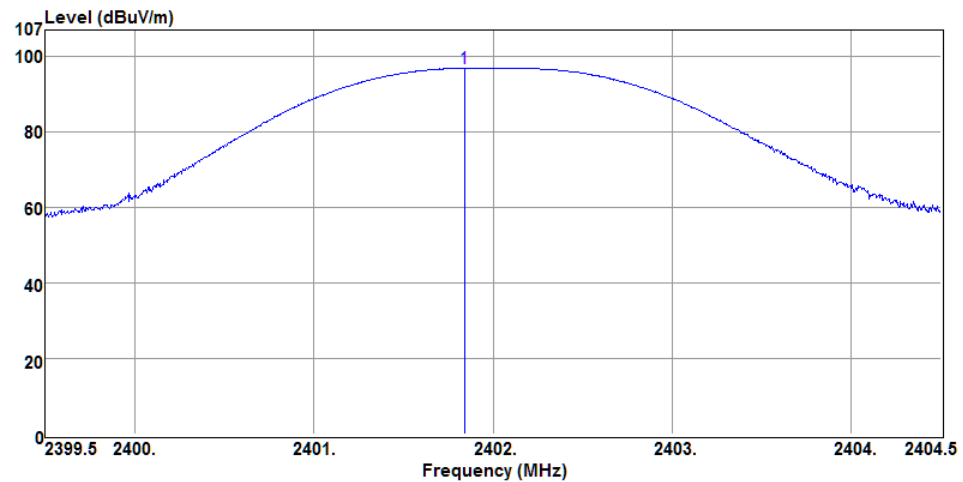
Type of Modulation: GFSK



AUDIX Technology Corporation
 EMC Department
 No.53-11, Dingfu, Linkou Dist., New Taipei City,
 Taiwan R.O.C. Post Code:24443
 Tel:+886-2-26092133 Fax:+886-2-26099303
 Email:ttemc@ttemc.com.

Data: 1

File: D:\share DOC\johnny-e3\C1M1402133-W7\TX2402.EM6 (12)



Site no. : Audix NO.1 Chamber Data no. : 1
 Dis. / Ant. : 3m 3115(4927) Ant. pol. : VERTICAL
 Limit :
 Env. / Ins. : 24°C / 48% N9030A(140) Engineer : Johnny_Hsueh
 EUT : W7
 Power Rating : DC 12V
 Test Mode : Tx 2402MHz(GFSK)

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dB μV)	Emission Level (dB μV/m)	Limits (dB μV/m)	Margin (dB)	Remark
1	2401.84	28.47	6.35	62.04	96.86			Peak

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

Channel	Test Frequency	Emission Level (dBμv/m)	E (V/m)	EIRP (dBm)	Peak Output Power (dBm)
0	2402MHz	96.86	0.070	1.63	-0.52

Pursuant to KDB412172 D01,

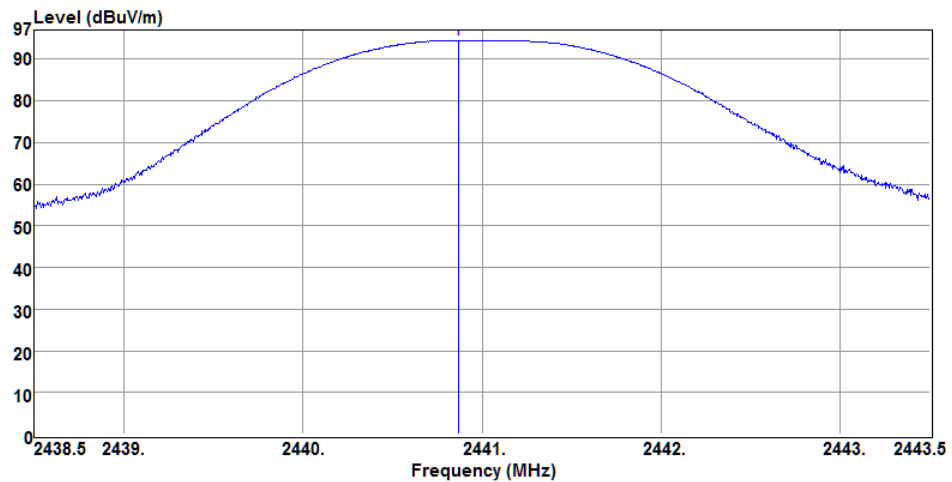
ERP (peak output power) = $(E \times d)^2 / 30 - 2.15$

Where d= distance in meter and E=electric field strength in V/m.



AUDIX Technology Corporation
 EMC Department
 No.53-11, Dingfu, Linkou Dist., New Taipei City,
 Taiwan R.O.C. Post Code:24443
 Tel:+886-2-26092133 Fax:+886-2-26099303
 Email:ttmc@ttmc.com.

Data: 2 File: D:\share DOC\johnny-e3\IC1M1402133-W7\TX2441.EM6 (8)



Site no. : Audix NO.1 Chamber Data no. : 2
 Dis. / Ant. : 3m 3115(4927) Ant. pol. : VERTICAL
 Limit :
 Env. / Ins. : 24°C / 48% N9030A(140) Engineer : Johnny_Hsueh
 EUT : W7
 Power Rating : DC 12V
 Test Mode : Tx 2441MHz(GFSK)

	Freq. (MHz)	Ant. Cable 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	2440.87	28.59	6.40	59.79	94.78			Peak

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

Channel	Test Frequency	Emission Level (dB μ v/m)	E (V/m)	EIRP (dBm)	Peak Output Power (dBm)
39	2441MHz	94.49	0.053	-0.74	-3.25

Pursuant to KDB412172 D01,

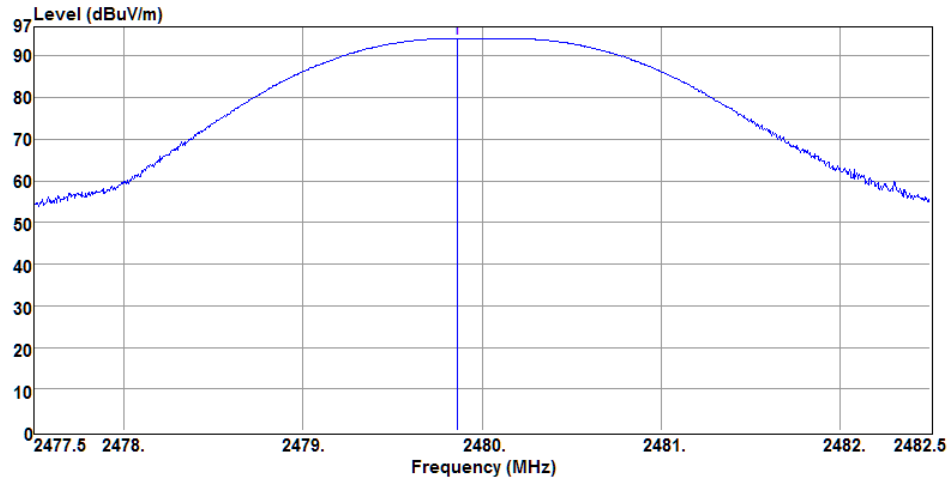
ERP (peak output power) = $(E \times d)^2 / 30 - 2.15$

Where d= distance in meter and E=electric field strength in V/m.



AUDIX Technology Corporation
 EMC Department
 No.53-11, Dingfu, Linkou Dist., New Taipei City,
 Taiwan R.O.C. Post Code:24443
 Tel:+886-2-26092133 Fax:+886-2-26099303
 Email:ttemc@ttemc.com.

Data: 15 File: D:\share DOC\johnny-e3\C1M1402133-W7\TX2480.EM6 (20)



Site no. : Audix NO.1 Chamber Data no. : 15
 Dis. / Ant. : 3m 3115(4927) Ant. pol. : VERTICAL
 Limit :
 Env. / Ins. : 24°C / 48% N9030A(140) Engineer : Johnny_Hsueh
 EUT : W7
 Power Rating : DC 12V
 Test Mode : Tx 2480MHz(GFSK)

		Ant. Cable		Emission				
	Freq. (MHz)	Factor (dB/m)	Loss (dB)	Reading (dB μ V)	Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Remark
1	2479.87	28.66	6.44	59.14	94.24			Peak

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

Channel	Test Frequency	Emission Level (dB μ V/m)	E (V/m)	EIRP (dBm)	Peak Output Power (dBm)
79	2480MHz	94.24	0.052	-0.91	-3.06

Pursuant to KDB412172 D01,

ERP (peak output power) = $(E \times d)^2 / 30 - 2.15$

Where d= distance in meter and E=electric field strength in V/m.

10.EMISSION LIMITATIONS MEASUREMENT

Emission level is below limits specified in 15.209 thus conducted emission is not need.

11.BAND EDGES MEASUREMENT

Emission level is below limits specified in 15.209 thus conducted emission is not need.

12.DEVIATION TO TEST SPECIFICATIONS

【NONE】

13. PHOTOGRAPHS

13.1. Photos of Radiated Measurement at Semi-Anechoic Chamber

13.1.1. Frequency Range 30MHz~1GHz



13.1.2. Frequency Range Above 1GHz



