



## FCC COMPLIANCE TEST REPORT

Technical Statement of Conformity  
in accordance with 47 CFR Part 15 Subpart C

### The product

<b>Equipment Under Test</b>	:	MobileXfer
<b>Model Number</b>	:	MXF-001
<b>Product Series</b>	:	N/A
<b>Report Number</b>	:	HA140550-RA
<b>Issue Date</b>	:	15-Oct-2014
<b>Test Result</b>	:	Compliance

is produced by

**UNIGRAND LTD**

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**TAF Accreditation No.:** 1163

**FCC Designation No.:** TW1071

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SL2-IS-E-0023, SL2-R1-E-0023,  
SL2-R2-E-0023, SL2-L1-E-0023

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G-696

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# Test Result Certification

<b>Applicant</b>	: UNIGRAND LTD
<b>Address of Applicant</b>	: 7F., No.108-2, Minquan Rd., Xindian Dist., New Taipei City, Taiwan(R.O.C.)
<b>Manufacturer</b>	: UNIGRAND LTD
<b>Address of Manufacturer</b>	: 7F., No.108-2, Minquan Rd., Xindian Dist., New Taipei City, Taiwan(R.O.C.)
<b>Trade Name</b>	: AKAR
<b>Equipment Under Test</b>	: MobileXfer
<b>Model Number</b>	: MXF-001
<b>Product Series</b>	: N/A
<b>FCC ID</b>	: 2AATY140903
<b>Filing Type</b>	: Certification
<b>Sample Received Date</b>	: 15-Aug-2014
<b>Test Standard</b>	:

FCC Part 15 Subpart C §15.247

**Deviations from standard test methods & any other specifications : NONE**

**Remark:**

1. This report details the results of the test carried out on one sample.
2. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.4 (2009) and the energy emitted by the sample EUT tested as described in this report is in compliance with the requirements of FCC Rules Part 15.203, 15.207, 15.209, 15.247.
3. This report applies to the above sample only and shall not be reproduced in part without written approval of HongAn Technology Co., Ltd.

**Documented by:**

2014-10-15

Furby Chin/ ADM. Dept Staff

**Tested by:**

2014-10-14

Ben Chen/ ENG. Dept. Staff

**Approved by:**

Date: 2014-10-15

Adam Yang / Section Manager

## Summary of Test Result

	Test Item	Applicable Standard	Test Result
1	Antenna Requirement	FCC part 15 subpart C §203	Compliance
2	Conducted Emission	FCC part 15 subpart C §207	Compliance
3	Radiated Emission	FCC part 15 subpart C §209	Compliance
4	Minimum 6dB Bandwidth	FCC part 15 subpart C §247(a)(2)	Compliance
5	Maximum Peak Output Power	FCC part 15 subpart C §247(b)(3)	Compliance
6	100kHz Bandwidth of Band Edges	FCC part 15 subpart C §247(d)	Compliance
7	Power Spectral Density	FCC part 15 subpart C §247(e)	Compliance

## 1 General Description

### 1.1 Description of EUT

<b>Equipment Under Test</b>	:	MobileXfer			
<b>Model Number of EUT</b>	:	MXF-001			
<b>Product Series</b>	:	N/A			
<b>Power Supply</b>	:	Input : USB 5 Vdc			
<b>Frequency Range</b>	:	2402~2480 MHz			
<b>Transmit Power</b>	:	-2.25 dBm			
<b>Number of Channels</b>	:	40 Channels			
<b>Carrier Frequency of Each Channel</b>	:	<b>Channel</b>	<b>Frequency</b>	<b>Channel</b>	<b>Frequency</b>
		01	2402	21	2442
		02	2404	22	2444
		03	2406	23	2446
		04	2408	24	2448
		05	2410	25	2450
		06	2412	26	2452
		07	2414	27	2454
		08	2416	28	2456
		09	2418	29	2458
		10	2420	30	2460
		11	2422	31	2462
		12	2424	32	2464
		13	2426	33	2466
		14	2428	34	2468
		15	2430	35	2470
		16	2432	36	2472
		17	2434	37	2474
		18	2436	38	2476
		19	2438	39	2478
		20	2440	40	2480
<b>Antenna Specification</b>	:	PCB Antenna/ Gain: -0.26 dBi			
<b>Modulation Technique</b>	:	GFSK			
<b>Specification</b>	:	<b>Dimensions</b> : 1.8 cm (L) X 1.5 cm (W) X 0.8 cm (H) <b>Weight</b> : 2g <b>Function</b> : The EUT is a BT4.0 low energy dongle. ※For more detail specification, please refer to the User Manual.			

## 1.2 Test Instruments

### Instruments Used for Measurement

Instrument Name	Manufacture Mode	Model Number	Serial Number	Last Cal. Date	Next Cal. Date
LISN	EMCO	3810/2NM	9702-1821	18-AUG-2014	18-AUG-2015
LISN	Rolf Heine Hochfrequenztechnik	NNB-4/32T	00001	04-MAR-2014	04-MAR-2015
EMI Receiver	R&S	ESCI7	100931	17-JUL-2014	17-JUL-2015
Spectrum Analyzer	R&S	FSL6	100323	23-AUG-2014	23-AUG-2015
Spectrum Analyzer	Advantest	R3172	101202158	08-AUG-2014	08-AUG-2015
Preamplifier	Schaffner	CPA9231A	0405	23-AUG-2014	23-AUG-2015
Preamplifier	HD	HD17187	004	26-MAY-2014	26-MAY-2015
Microwave Preamplifier	Com-Power	PAM-840	461269	02-JUL-2014	02-JUL-2015
Bilog Antenna	TESEQ	CBL6111D	25769	25-FEB-2014	25-FEB-2015
Bilog Antenna	TESEQ	CBL6111D	38521	01-JUL-2014	01-JUL-2015
Double-Ridged Waveguide Horn	EMCO	3115	9912-5992	22-MAY-2014	22-MAY-2015
Antenna	Com-Power	AH-840	101042	03-JUL-2014	03-JUL-2015
Temp. & Humidity Chamber	Giant Force	GTH-150-20-SP-AR	MMA0907-012	07-JUL-2014	07-JUL-2015

※ The test equipments used are calibrated and can be traced to National ITRI and International Standards.

### 1.3 Test Methodology

All Tests were performed according to the procedures specified in ANSI C63.4(2009).

### 1.4 Auxiliary Equipments

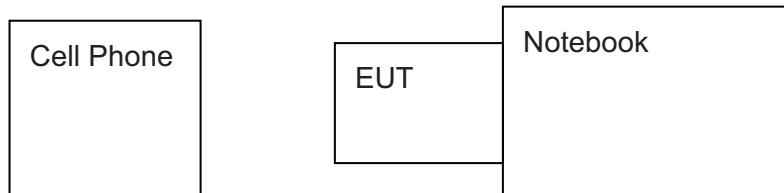
#### 1.3.1. Provided by HongAn Technology Co., Ltd. for Emission Test.

No.	Equipment	Model No.	Serial No.	EMC Approved	Brand	Description	
						Data Cable	Power Cable
A16	Notebook	X551C	N/A	CE Mark, FCC DoC, BSMI ID R31018	ASUS	Adapter to Notebook Unshielded*1.8m	AC to Adapter Unshielded*1.8m
H1	Cell phone	GT-9100	N/A	CE Mark, FCC DoC	SAMAUNG	N/A	N/A

#### 1.3.2. Provided by the Manufacturer

N/A

### 1.5 EUT SETUP



Note: Main Test Sample: MXF-001

### 1.6 Identifying the Final Test Mode

1. Mode 1: TX BT mode CH 01.
2. Mode 2: TX BT mode CH 20.
3. Mode 3: TX BT mode CH 40.

Note:

1. To access into different Bluetooth modes, the EUT is connected to Notebook through USB cable. Notebook executes Bluetooth Test 3 testing program to control the Bluetooth function.
2. All X, Y, Z, 3 axis of EUT have been tested and only the worse case was chosen to be the representative test mode and reported.
3. According to its specifications, the EUT must comply with the requirements of the Section 15.203, 15.207, 15.209 and 15.247 under the FCC Rules Part 15 Subpart C.

Remark:

The EUT could perform scanning function through USB connection.

## 1.7 Condition of Power Supply

DC 5 V

## 1.8 EUT Configuration

1. Setup the EUT as shown in Sec.1.4 Block Diagram.
2. Turn on the power of all equipments.
3. Activate the selected Final Test Mode.

## 1.9 Modification

N/A

## 2 Power line Conducted Emission Measurement

### 2.1 Test Instruments

Refer to Sec. 1.2 Test Instruments.

### 2.2 Test Arrangement and Procedure

1. Please refer to FCC Part 15 Subpart C Section 15.207 for the test requirement.
2. Please refer to FCC KDB 558074 D01 v03r02 for the measurement method.
3. The spectrum analyzer or receiver is set as:

Set the RBW to: 9 kHz

Set the VBW  $\geq 3 \times$  RBW

Detector = QP, Average

### 2.3 Limit

15.207(a) The final test data are shown on the following tables and refer to the following page(s) for the graphs. Except as shown in paragraphs (b) and (c) of this section, for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 kHz to 30 MHz, shall not exceed the limits in the following table, as measured using a 50  $\mu$ H/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the boundary between the frequency ranges.

Frequency (MHz)	Limits (dBuV)	
	Q.P. (Quasi-Peak)	A.V. (Average)
0.15 to 0.50	66 to 56	56 to 46
0.50 to 5.0	56	46
5.0 to 30	60	50

15.247(b) The limit shown in paragraph (a) of this section shall not apply to carrier current systems operating as intentional radiators on frequencies below 30 MHz. In lieu thereof, these carrier current systems shall be subject to the following standards:

- (1) For carrier current system containing their fundamental emission within the frequency band 535-1705 kHz and intended to be received using a standard AM broadcast receiver: no limit on conducted emissions.
- (2) For all other carrier current systems: 1000  $\mu$ V within the frequency band 535-1705 kHz, as measured using a 50  $\mu$ H/50 ohms LISN.
- (3) Carrier current systems operating below 30 MHz are also subject to the radiated emission limits in §15.205, §15.209, §15.221, §15.223, or §15.227, as appropriate.

15.274(c) Measurements to demonstrate compliance with the conducted limits are not required for devices which only employ battery power for operation and which do not operate from the AC power lines or contain provisions for operation while connected to the AC power lines. Devices that include,



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or make provisions for, the use of battery chargers which permit operating while charging, AC adapters or battery eliminators or that connect to the AC power lines indirectly, obtaining their power through another device which is connected to the AC power lines, shall be tested to demonstrate compliance with the conducted limits.

## 2.4 Test Result

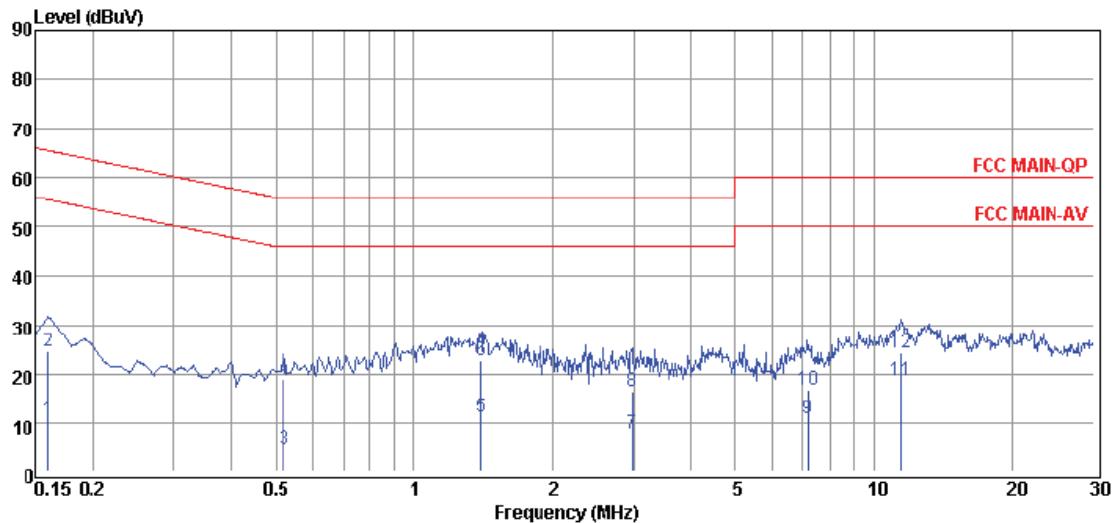
Keeping TX mode

The final test data are shown on the following page(s).

### Power line Conducted Emission Test Data

Temperature : 24°C  
Test Date : 14-Oct-2014

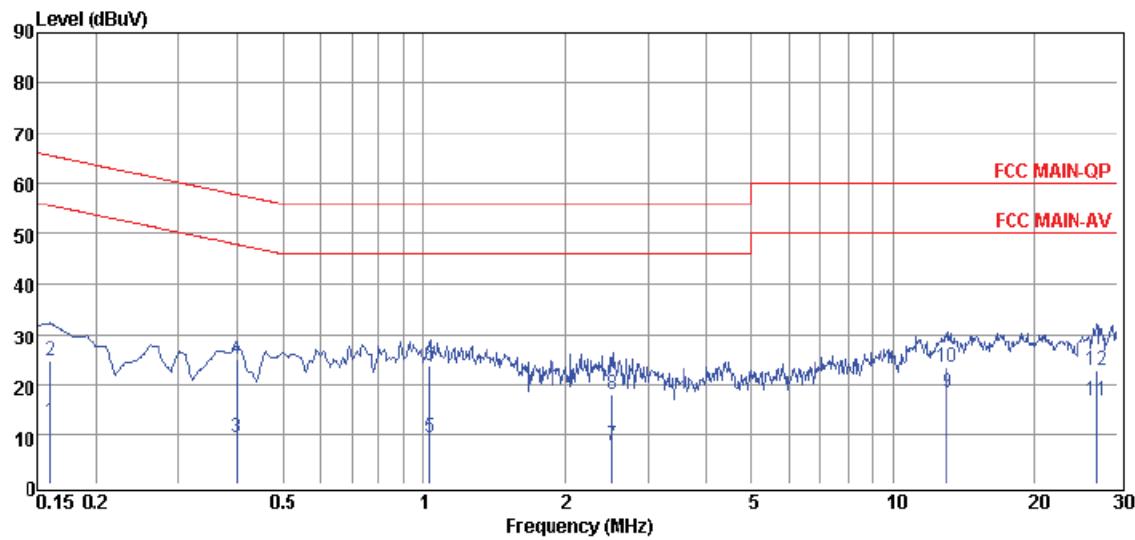
Power Line : Line  
Humidity : 50%  
Test Mode : Keeping TX Mode.



No.	Freq MHz	Reading dB $\mu$ V	C.F dB	Result dB $\mu$ V	Limit dB $\mu$ V	Margin dB	Power Line	Remark
1	0.16	10.30	0.18	10.48	55.46	-44.98	LINE	Average
2	0.16	24.50	0.18	24.68	65.46	-40.78	LINE	QP
3	0.52	4.40	0.18	4.58	46.00	-41.42	LINE	Average
4	0.52	18.90	0.18	19.08	56.00	-36.92	LINE	QP
5	1.40	10.80	0.27	11.07	46.00	-34.93	LINE	Average
6	1.40	22.60	0.27	22.87	56.00	-33.13	LINE	QP
7	2.98	7.29	0.40	7.69	46.00	-38.31	LINE	Average
8	2.98	16.09	0.40	16.49	56.00	-39.51	LINE	QP
9	7.18	10.29	0.66	10.95	50.00	-39.05	LINE	Average
10	7.18	16.29	0.66	16.95	60.00	-43.05	LINE	QP
11	11.38	17.89	0.85	18.74	50.00	-31.26	LINE	Average
12	11.38	23.49	0.85	24.34	60.00	-35.66	LINE	QP

**Power line Conducted Emission Test Data**

Temperature : 24°C  
Power Line : Neutral  
Test Date : 14-Oct-2014  
Humidity : 50%  
Test Mode : Keeping TX Mode.



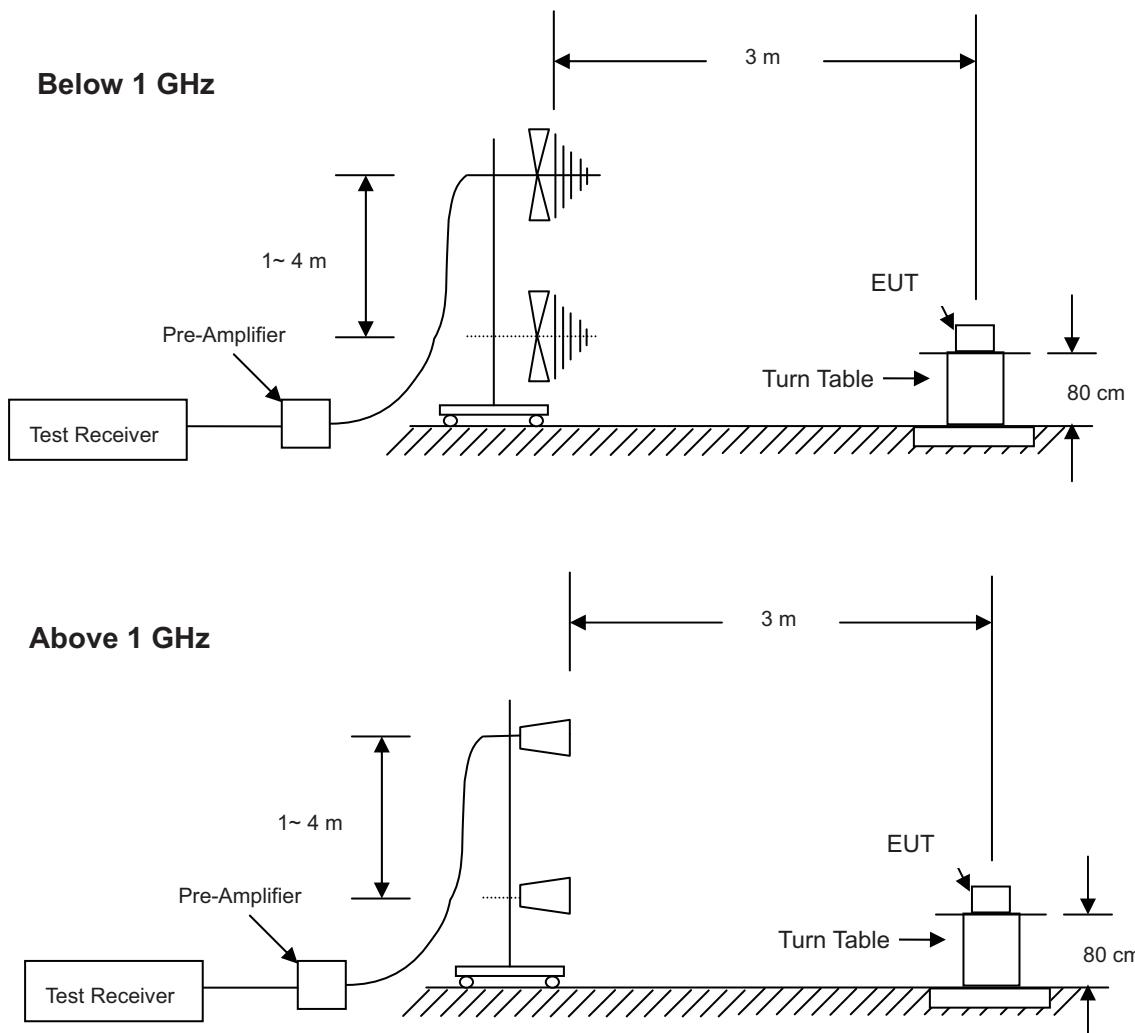
No.	Freq MHz	Reading dB $\mu$ V	C.F dB	Result dB $\mu$ V	Limit dB $\mu$ V	Margin dB	Power Line	Remark
1	0.16	12.50	0.26	12.76	55.46	-42.70	NEUTRAL	Average
2	0.16	24.30	0.26	24.56	65.46	-40.90	NEUTRAL	QP
3	0.40	9.10	0.27	9.37	47.85	-38.48	NEUTRAL	Average
4	0.40	24.50	0.27	24.77	57.85	-33.08	NEUTRAL	QP
5	1.03	9.10	0.33	9.43	46.00	-36.57	NEUTRAL	Average
6	1.03	23.30	0.33	23.63	56.00	-32.37	NEUTRAL	QP
7	2.51	7.19	0.45	7.64	46.00	-38.36	NEUTRAL	Average
8	2.51	17.59	0.45	18.04	56.00	-37.96	NEUTRAL	QP
9	13.05	17.30	0.94	18.24	50.00	-31.76	NEUTRAL	Average
10	13.05	22.30	0.94	23.24	60.00	-36.76	NEUTRAL	QP
11	27.17	14.90	1.79	16.69	50.00	-33.31	NEUTRAL	Average
12	27.17	20.90	1.79	22.69	60.00	-37.31	NEUTRAL	QP

### 3 Radiated Emission Test

#### 3.1 Test Instruments

Refer to Sec. 1.2 Test Instruments.

#### 3.2 Test Arrangement and Procedure



1. Please refer to FCC Part 15 Subpart C Section 15.209 for the test requirement.
2. Please refer to FCC KDB 558074 D01 v03r02 for the measurement method.
3. The spectrum analyzer or receiver is set as:

Below 1000MHz:

QP Detector : RBW = 120 kHz , VBW = 300 kHz

Above 1000MHz:

(1) Peak Detector: RBW = 1 MHz , VBW = 3 MHz for PK value. (for PK value)

(2) RMS Detector : RBW = 1 MHz , VBW = 3 MHz for AV value. (for AV value)

### 3.3 Limit

#### 15.205 Limit of Restricted Band of Operation

(a) Except as shown in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

Frequency Band			
MHz	MHz	MHz	GHz
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
<sup>1</sup> 0.495-0.505	16.69475-16.69525	608-614	5.35-5.46
2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.215-6.218	74.8-75.2	1660-1710	10.6-12.7
6.26775-6.26825	108-121.94	1718.8-1722.2	13.25-13.4
6.31175-6.31225	123-138	2200-2300	14.47-14.5
8.291-8.294	149.9-150.05	2310-2390	15.35-16.2
8.362-8.366	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37625-8.38675	156.7-156.9	2690-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5
12.57675-12.57725	322-335.4	3600-4400	
13.36-13.41			

### 15.209 Limit of Spurious Emission

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

Frequency (MHz)	Field strength (microvolts/ meter)	Measurement distance (meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100**	3
88-216	150**	3
216-960	200**	3
Above 960	500	3

\*\* Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this part, e.g. §§ 15.231 and 15.241.

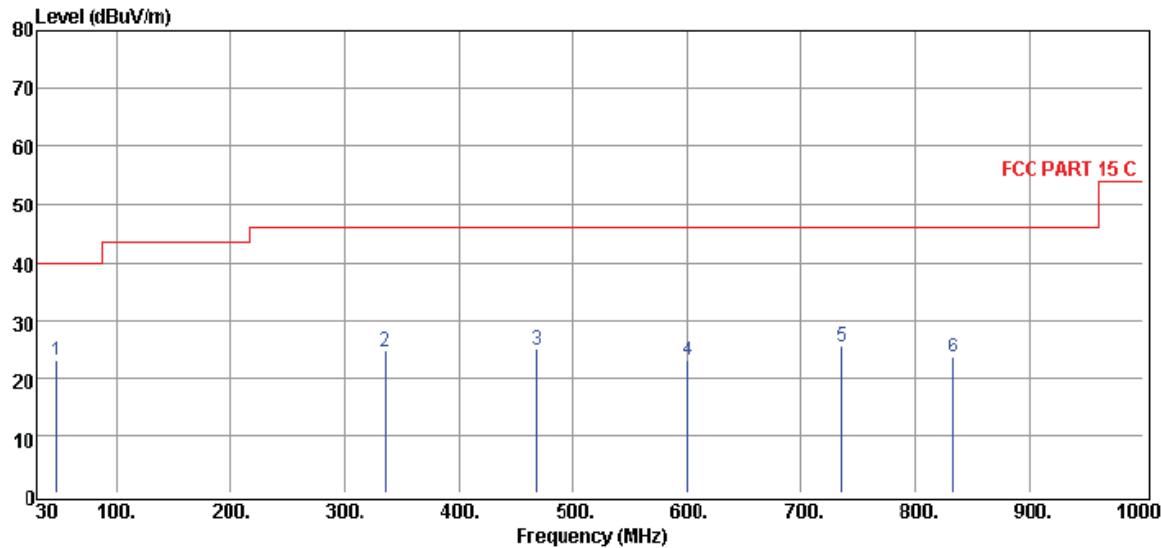
### 3.4 Test Result

#### Compliance

The final test data are shown on the following page(s).

**Radiated Emission Test Data (Below 1 GHz)**

Temperature : 24°C      Polarization : Horizontal  
Test Date : 27-Aug-2014      Humidity : 40%  
Test Mode : Mode 1      Channel : 01



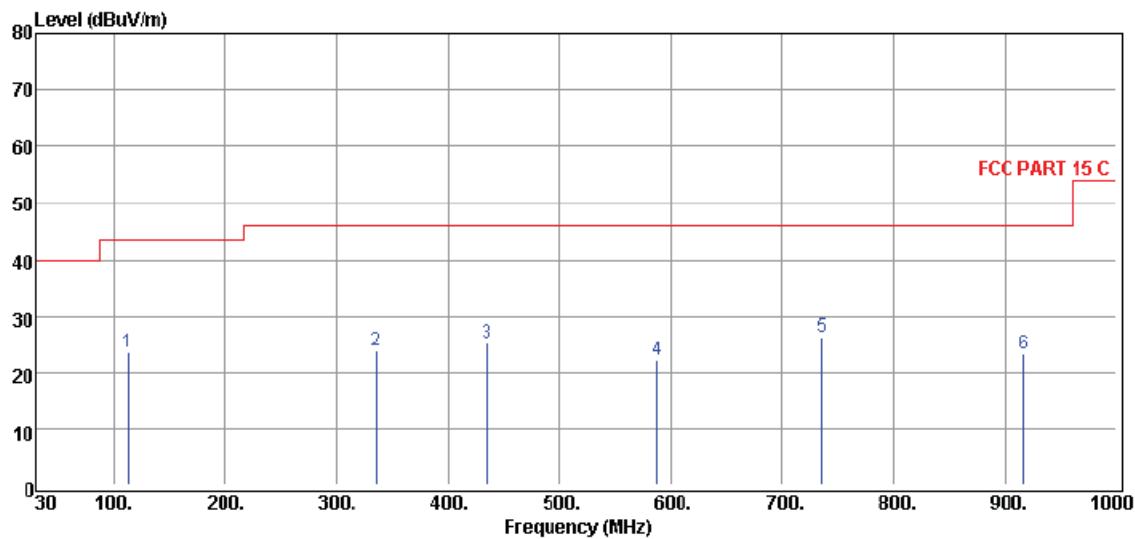
No.	Freq MHz	Reading dB $\mu$ V	C.F dB	Result dB $\mu$ V/m	Limit dB $\mu$ V/m	Margin dB	Antenna Pol.	Remark
1	47.46	42.33	-19.31	23.02	40.00	-16.98	HORIZONTAL	Peak
2	335.55	38.55	-13.82	24.73	46.00	-21.27	HORIZONTAL	Peak
3	468.44	35.25	-10.42	24.83	46.00	-21.17	HORIZONTAL	Peak
4	600.36	31.00	-8.04	22.96	46.00	-23.04	HORIZONTAL	Peak
5	736.16	31.53	-5.99	25.54	46.00	-20.46	HORIZONTAL	Peak
6	833.16	28.33	-4.70	23.63	46.00	-22.37	HORIZONTAL	Peak

Note 1. C.F (Correction Factor) = Antenna factor + Cable loss - Preampl gain °

Note 2. Margin = Result - Limit ; Result = Reading + C.F °

### Radiated Emission Test Data (Below 1 GHz)

Temperature	:	24°C	Polarization	:	Vertical
Test Date	:	27-Aug-2014	Humidity	:	40%
Test Mode	:	Mode 1	Channel	:	01



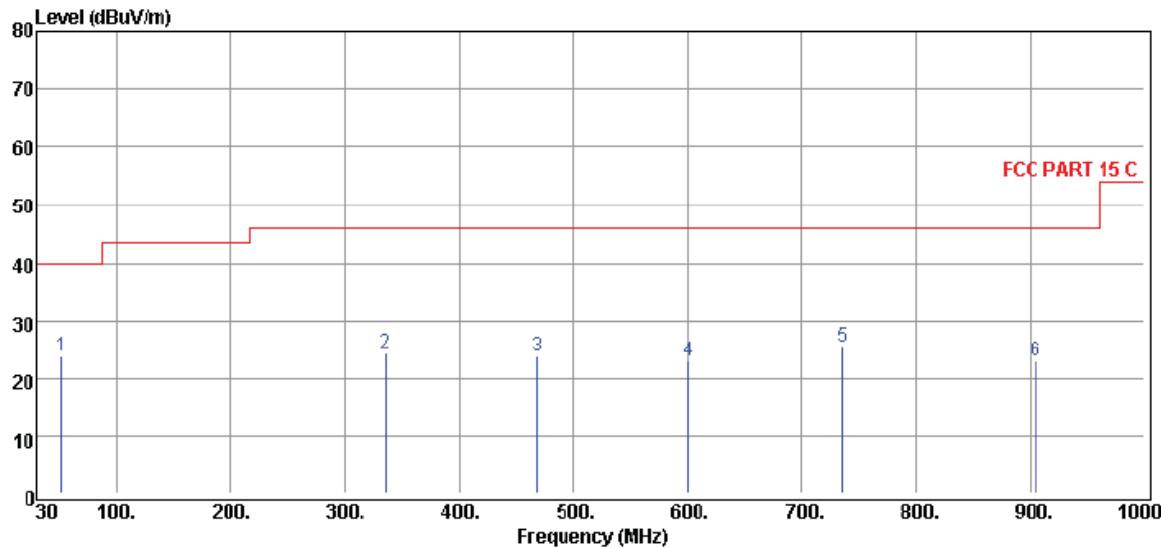
No.	Freq MHz	Reading dB $\mu$ V	C.F dB	Result dB $\mu$ V/m	Limit dB $\mu$ V/m	Margin dB	Antenna Pol.	Remark
1	112.45	40.91	-17.49	23.42	43.50	-20.08	VERTICAL	Peak
2	335.55	37.70	-13.82	23.88	46.00	-22.12	VERTICAL	Peak
3	435.46	36.46	-11.23	25.23	46.00	-20.77	VERTICAL	Peak
4	587.75	30.50	-8.27	22.23	46.00	-23.77	VERTICAL	Peak
5	736.16	32.15	-5.99	26.16	46.00	-19.84	VERTICAL	Peak
6	917.55	26.95	-3.75	23.20	46.00	-22.80	VERTICAL	Peak

Note 1. C.F (Correction Factor) = Antenna factor + Cable loss - Preamp gain .

Note 2. Margin = Result - Limit ; Result = Reading + C.F .

### Radiated Emission Test Data (Below 1 GHz)

Temperature	:	24°C	Polarization	:	Horizontal
Test Date	:	27-Aug-2014	Humidity	:	40%
Test Mode	:	Mode 2	Channel	:	20



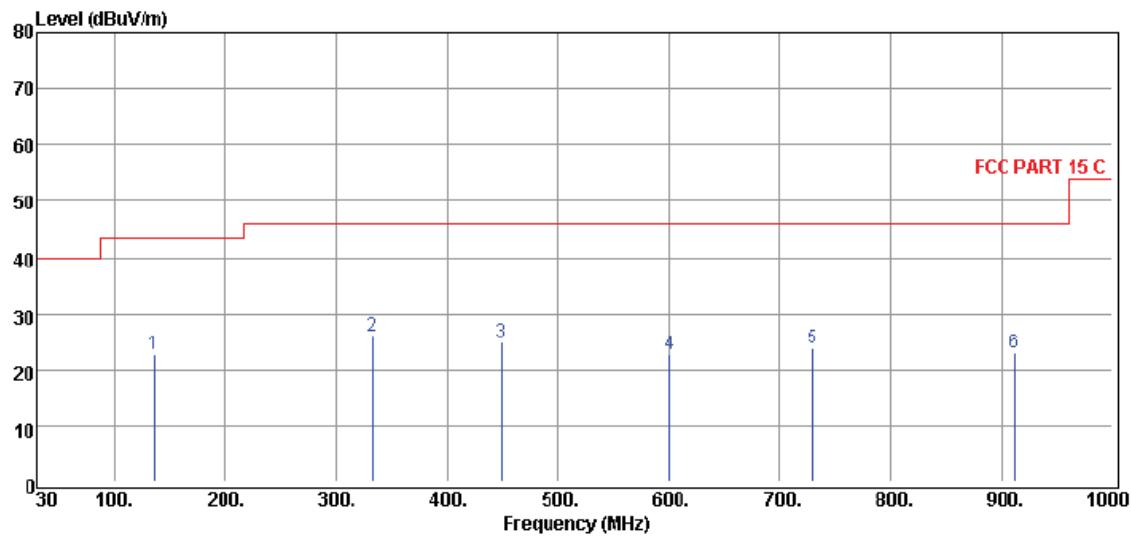
No.	Freq MHz	Reading dB $\mu$ V	C.F dB	Result dB $\mu$ V/m	Limit dB $\mu$ V/m	Margin dB	Antenna Pol.	Remark
1	51.34	44.88	-21.03	23.85	40.00	-16.15	HORIZONTAL	Peak
2	335.55	38.27	-13.82	24.45	46.00	-21.55	HORIZONTAL	Peak
3	468.44	34.14	-10.42	23.72	46.00	-22.28	HORIZONTAL	Peak
4	600.36	30.99	-8.04	22.95	46.00	-23.05	HORIZONTAL	Peak
5	736.16	31.57	-5.99	25.58	46.00	-20.42	HORIZONTAL	Peak
6	904.94	26.97	-4.04	22.93	46.00	-23.07	HORIZONTAL	Peak

Note 1. C.F (Correction Factor) = Antenna factor + Cable loss - Preamp gain ◊

Note 2. Margin = Result - Limit : Result = Reading + C.F ◊

### Radiated Emission Test Data (Below 1 GHz)

Temperature	:	24°C	Polarization	:	Vertical
Test Date	:	27-Aug-2014	Humidity	:	40%
Test Mode	:	Mode 2	Channel	:	20



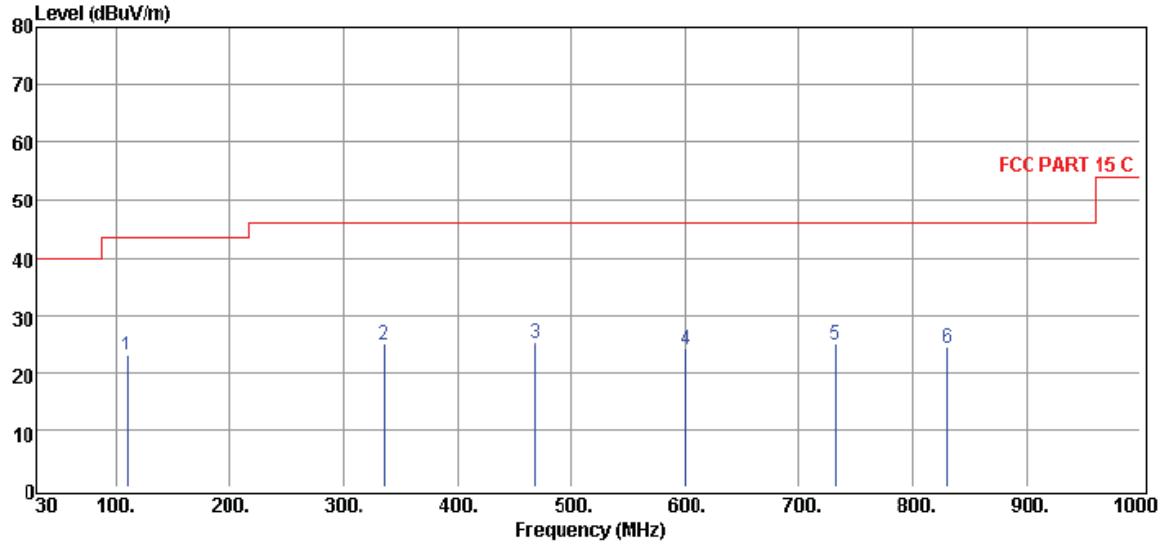
No.	Freq MHz	Reading dBuV	C.F dB	Result dBuV/m	Limit dBuV/m	Margin dB	Antenna Pol.	Remark
1	134.76	39.28	-16.69	22.59	43.50	-20.91	VERTICAL	Peak
2	332.64	40.05	-13.92	26.13	46.00	-19.87	VERTICAL	Peak
3	449.04	35.72	-10.79	24.93	46.00	-21.07	VERTICAL	Peak
4	600.36	30.83	-8.04	22.79	46.00	-23.21	VERTICAL	Peak
5	730.34	29.95	-6.08	23.87	46.00	-22.13	VERTICAL	Peak
6	912.70	26.81	-3.87	22.94	46.00	-23.06	VERTICAL	Peak

Note 1. C.F (Correction Factor) = Antenna factor + Cable loss - Preamp gain .

Note 2. Margin = Result - Limit ; Result = Reading + C.F .

**Radiated Emission Test Data (Below 1 GHz)**

Temperature : 24°C      Polarization : Horizontal  
Test Date : 27-Aug-2014      Humidity : 40%  
Test Mode : Mode 3      Channel : 40



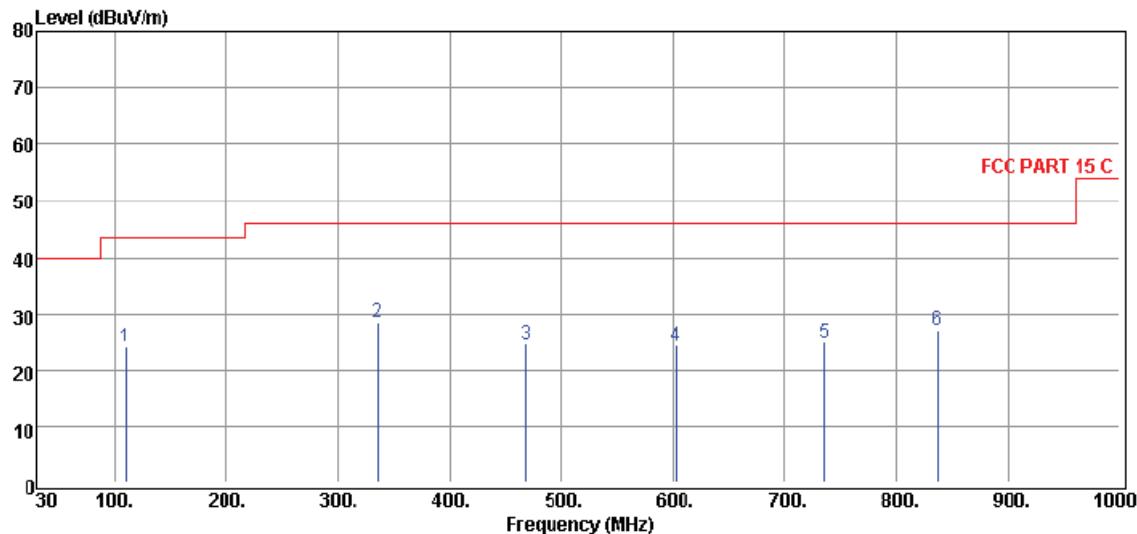
No.	Freq MHz	Reading dB <sub>μ</sub> V	C.F dB	Result dB <sub>μ</sub> V/m	Limit dB <sub>μ</sub> V/m	Margin dB	Antenna Pol.	Remark
1	109.54	40.72	-17.77	22.95	43.50	-20.55	HORIZONTAL	Peak
2	335.55	38.69	-13.82	24.87	46.00	-21.13	HORIZONTAL	Peak
3	468.44	35.73	-10.42	25.31	46.00	-20.69	HORIZONTAL	Peak
4	600.36	32.13	-8.04	24.09	46.00	-21.91	HORIZONTAL	Peak
5	733.25	31.07	-6.03	25.04	46.00	-20.96	HORIZONTAL	Peak
6	830.25	29.12	-4.75	24.37	46.00	-21.63	HORIZONTAL	Peak

Note 1. C.F (Correction Factor) = Antenna factor + Cable loss - Preamp gain .

Note 2. Margin = Result - Limit ; Result = Reading + C.F .

### Radiated Emission Test Data (Below 1 GHz)

Temperature	:	24°C	Polarization	:	Vertical
Test Date	:	27-Aug-2014	Humidity	:	40%
Test Mode	:	Mode 3	Channel	:	40



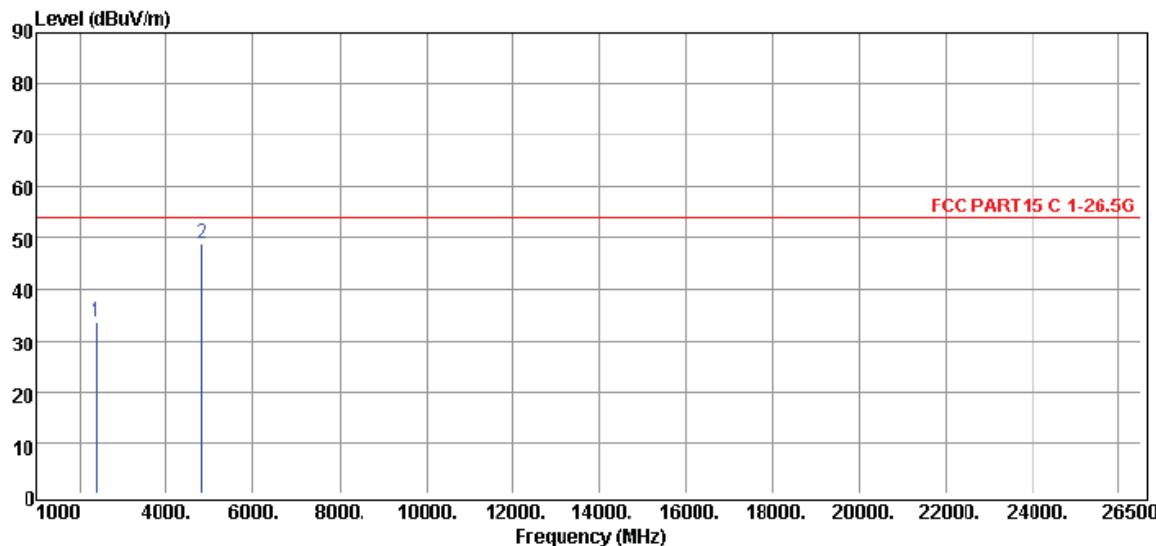
No.	Freq MHz	Reading dB $\mu$ V	C.F dB	Result dB $\mu$ V/m	Limit dB $\mu$ V/m	Margin dB	Antenna Pol.	Remark
1	109.54	41.85	-17.77	24.08	43.50	-19.42	VERTICAL	Peak
2	335.55	42.26	-13.82	28.44	46.00	-17.56	VERTICAL	Peak
3	468.44	34.92	-10.42	24.50	46.00	-21.50	VERTICAL	Peak
4	602.30	32.42	-8.02	24.40	46.00	-21.60	VERTICAL	Peak
5	736.16	30.91	-5.99	24.92	46.00	-21.08	VERTICAL	Peak
6	837.04	31.81	-4.63	27.18	46.00	-18.82	VERTICAL	Peak

Note 1. C.F (Correction Factor) = Antenna factor + Cable loss - Preamp gain .

Note 2. Margin = Result - Limit ; Result = Reading + C.F .

**Radiated Emission Test Data (Above 1 GHz)**

Temperature	:	24°C	Polarization	:	Horizontal
Test Date	:	27-Aug-2014	Humidity	:	40%
Test Mode	:	Mode 1	Channel	:	01

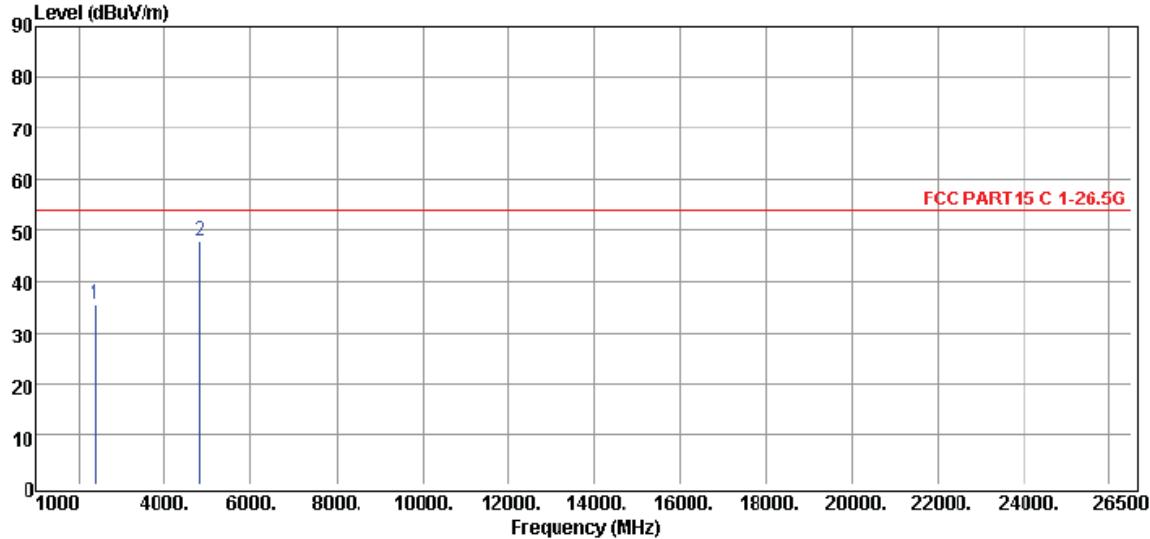


No.	Freq MHz	Reading dB $\mu$ V	C.F dB	Result dB $\mu$ V/m	Limit dB $\mu$ V/m	Margin dB	Antenna Pol.	Remark
1	2390.00	41.44	-7.92	33.52	54.00	-20.48	HORIZONTAL	Peak
2	4810.00	49.91	-0.87	49.04	54.00	-4.96	HORIZONTAL	Peak

Remark : All readings are Peak values. None of the peak value reading exceeds the A.V. limit. Hence, A.V. reading was not measured.

**Radiated Emission Test Data (Above 1 GHz)**

Temperature	:	24°C	Polarization	:	Vertical
Test Date	:	27-Aug-2014	Humidity	:	40%
Test Mode	:	Mode 1	Channel	:	01

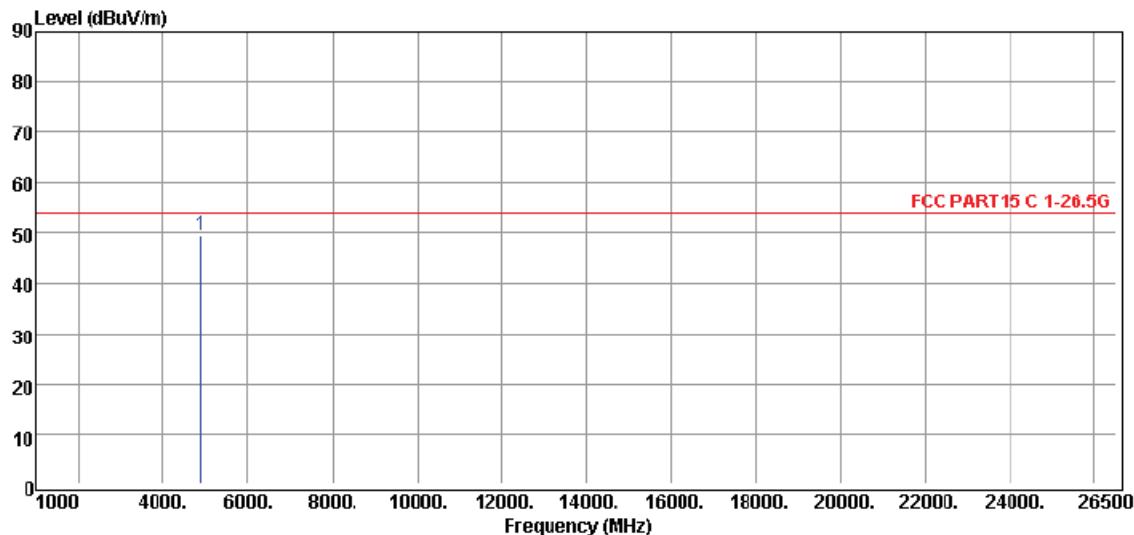


No.	Freq MHz	Reading dB $\mu$ V	C.F dB	Result dB $\mu$ V/m	Limit dB $\mu$ V/m	Margin dB	Antenna Pol.	Remark
1	2390.00	43.29	-7.92	35.37	54.00	-18.63	VERTICAL	Peak
2	4810.00	48.71	-0.87	47.84	54.00	-6.16	VERTICAL	Peak

Remark : All readings are Peak values. None of the peak value reading exceeds the A.V. limit. Hence, A.V. reading was not measured.

**Radiated Emission Test Data (Above 1 GHz)**

Temperature	:	24°C	Polarization	:	Horizontal
Test Date	:	27-Aug-2014	Humidity	:	40%
Test Mode	:	Mode 2	Channel	:	20



No.	Freq MHz	Reading dB $\mu$ V	C.F dB	Result dB $\mu$ V/m	Limit dB $\mu$ V/m	Margin dB	Antenna Pol.	Remark
1	4885.00	50.06	-0.68	49.38	54.00	-4.62	HORIZONTAL	Peak

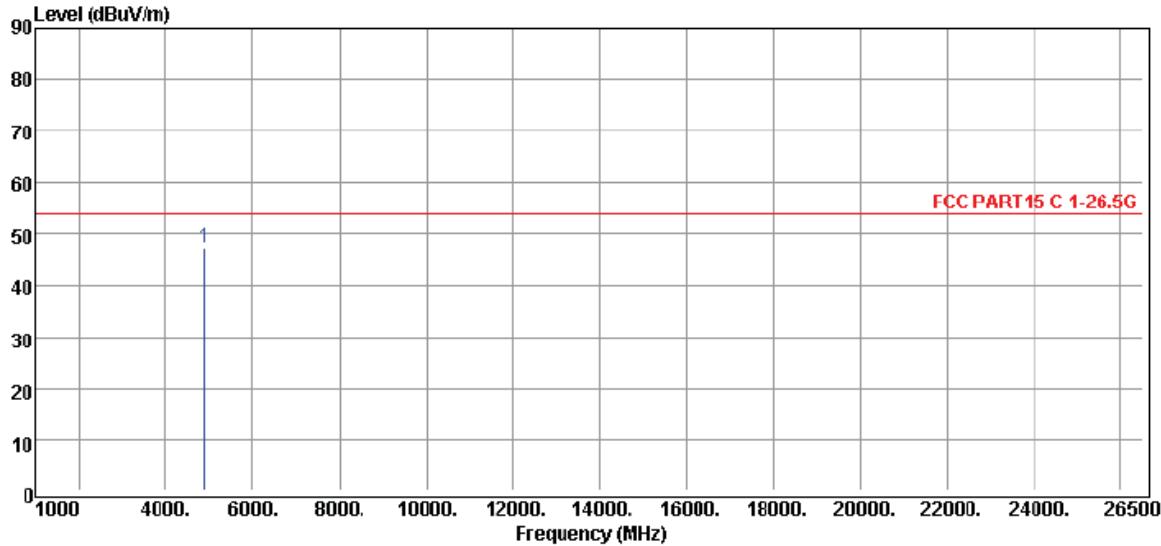
Note 1. C.F (Correction Factor) = Antenna factor + Cable loss - Preamp gain .

Note 2. Margin = Result - Limit ; Result = Reading + C.F .

Remark : All readings are Peak values. None of the peak value reading exceeds the A.V. limit. Hence, A.V. reading was not measured.

## Radiated Emission Test Data (Above 1 GHz)

Temperature	: 24°C	Polarization	: Vertical
Test Date	: 27-Aug-2014	Humidity	: 40%
Test Mode	: Mode 2	Channel	: 20



No.	Freq	Reading	C.F	Result	Limit	Margin	Antenna	Remark
	MHz	dB $\mu$ V	dB	dB $\mu$ V/m	dB $\mu$ V/m	dB	Pol.	Peak
1	4885.00	47.96	-0.68	47.28	54.00	-6.72	VERTICAL	

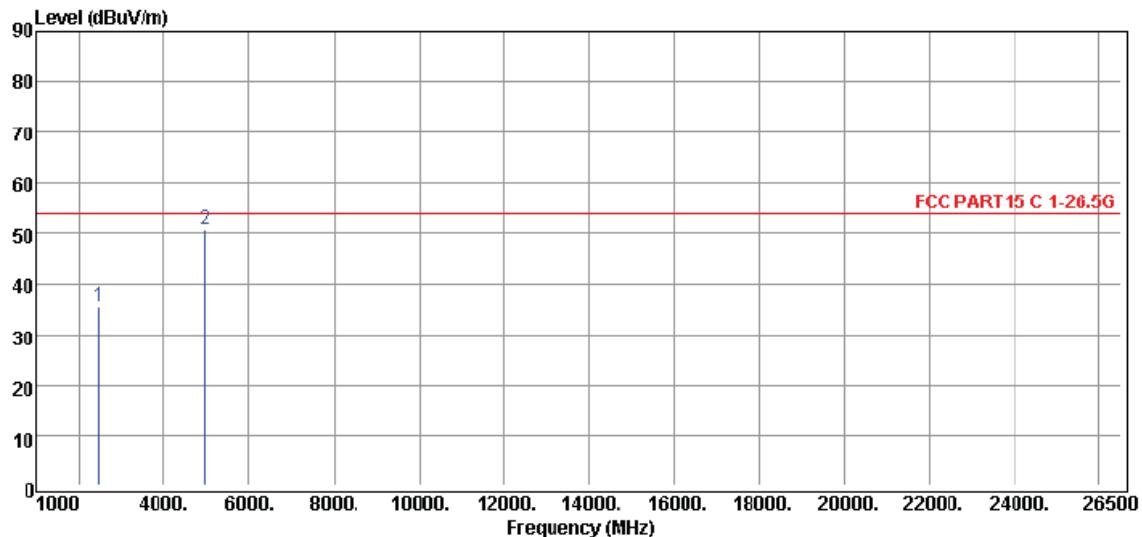
Note 1. C.F (Correction Factor) = Antenna factor + Cable loss - Preamp gain .

Note 2. Margin = Result - Limit ; Result = Reading + C.F .

Remark : All readings are Peak values. None of the peak value reading exceeds the A.V. limit. Hence, A.V. reading was not measured.

**Radiated Emission Test Data (Above 1 GHz)**

Temperature	:	24°C	Polarization	:	Horizontal
Test Date	:	14-Oct-2014	Humidity	:	50%
Test Mode	:	Mode 3	Channel	:	40

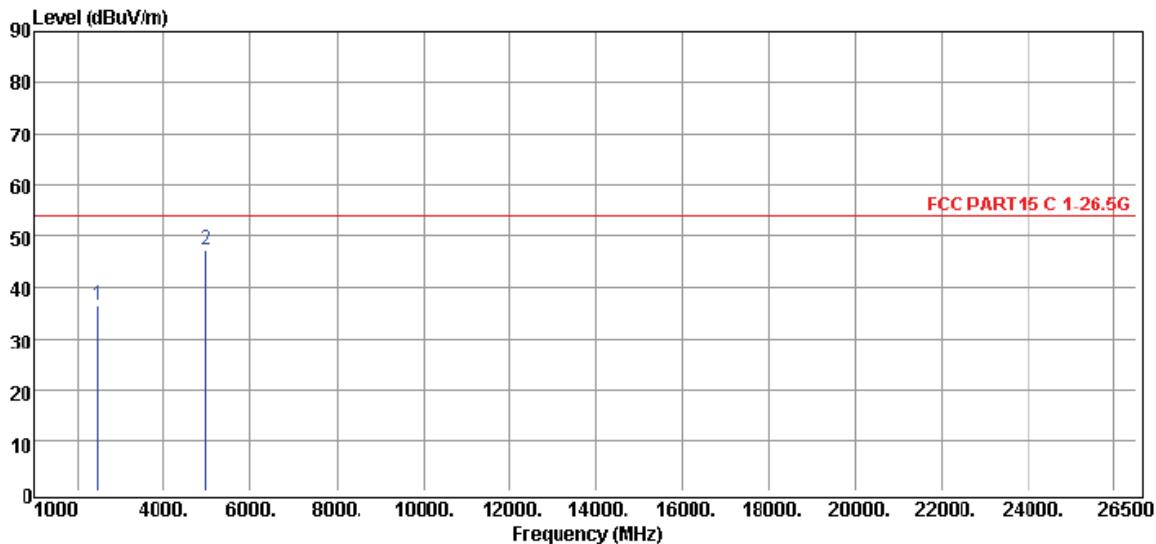


No.	Freq MHz	Reading dB $\mu$ V	C.F dB	Result dB $\mu$ V/m	Limit dB $\mu$ V/m	Margin dB	Antenna Pol.	Remark
1	2483.50	43.18	-7.66	35.52	54.00	-18.48	HORIZONTAL	Peak
2	4965.00	51.20	-0.51	50.69	54.00	-3.31	HORIZONTAL	Peak

Remark : All readings are Peak values. None of the peak value reading exceeds the A.V. limit. Hence, A.V. reading was not measured.

### Radiated Emission Test Data (Above 1 GHz)

Temperature	:	24°C	Polarization	:	Vertical
Test Date	:	14-Oct-2014	Humidity	:	50%
Test Mode	:	Mode 3	Channel	:	40



No.	Freq MHz	Reading dB $\mu$ V	C.F dB	Result dB $\mu$ V/m	Limit dB $\mu$ V/m	Margin dB	Antenna Pol.	Remark
1	2483.50	43.98	-7.66	36.32	54.00	-17.68	VERTICAL	Peak
2	4965.00	47.70	-0.51	47.19	54.00	-6.81	VERTICAL	Peak

Remark : All readings are Peak values. None of the peak value reading exceeds the A.V. limit. Hence, A.V. reading was not measured.

## 4 Minimum 6 dB Bandwidth

### 4.1 Test Instruments

Refer to Sec. 1.2 Test Instruments.

### 4.2 Test Arrangement and Procedure

1. Please refer to FCC Part 15 Subpart C Section 15.247(a)(2) for the test requirement.
2. Please refer to FCC KDB 558074 D01 v03r02 for the measurement method.
3. The spectrum analyzer or receiver is set as:

Set the RBW to: 100 kHz

Set the VBW  $\geq 3 \times$  RBW

Detector = peak

### 4.3 Limit

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

15.247(a) (2) Systems using digital modulation techniques may operate in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.

### 4.4 Test Result

#### Compliance

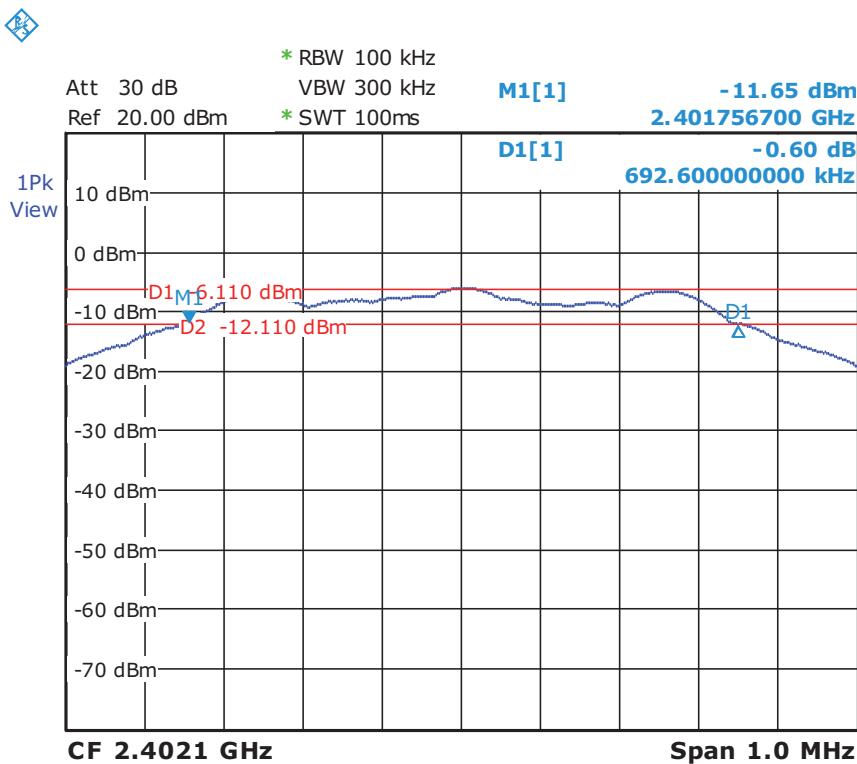
The final test data are shown on the following tables and refer to the following page(s) for the graphs.

Bluetooth			
Channel	Frequency (MHz)	Result (kHz)	Limit (kHz)
Low	2402	692.60	>500
Middle	2440	678.60	>500
High	2480	694.60	>500



Temperature : 24°C  
Test Date : 27-Aug-2014  
Test Mode : Mode1

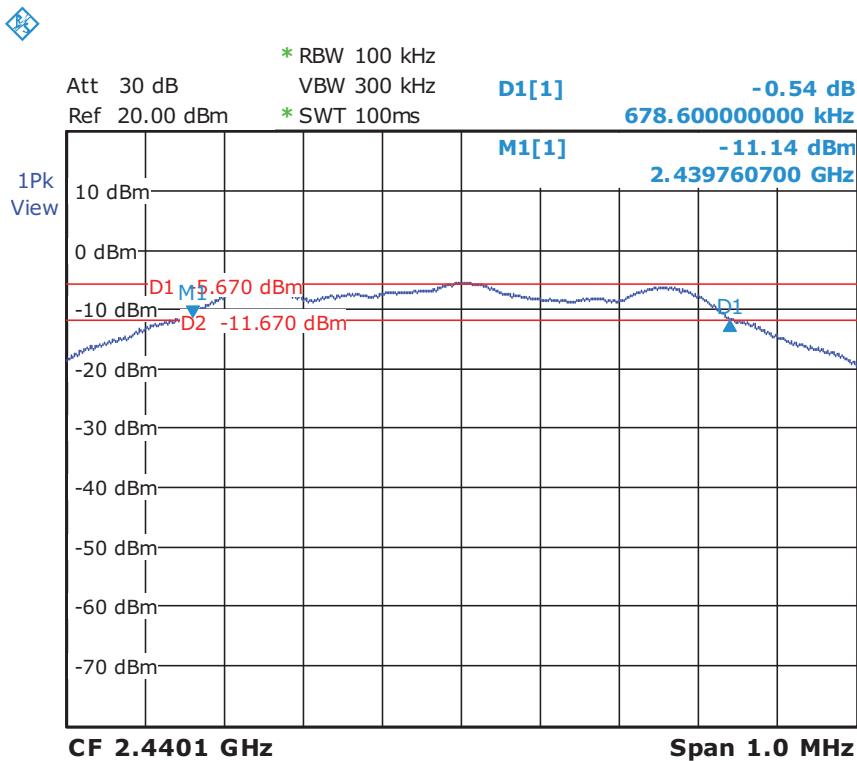
Humidity : 40%  
Tested by : Ben Chen  
Channel : 2402



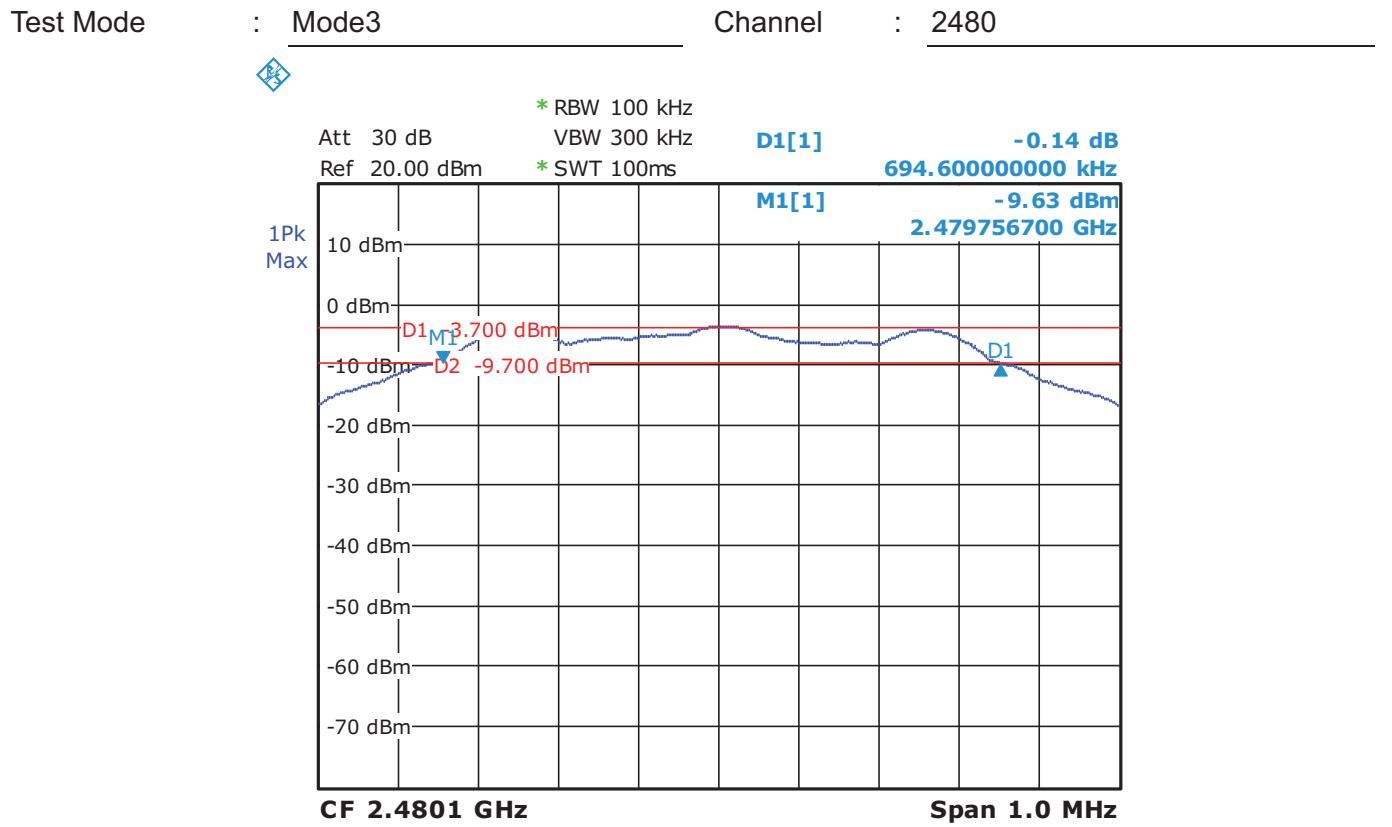
Date: 27.AUG.2014 11:57:48

Test Mode : Mode2

Channel : 2440



Date: 27.AUG.2014 12:00:50



Date: 27.AUG.2014 12:02:26

## 5 Peak Output Power

### 5.1 Test Instruments

Refer to Sec. 1.2 Test Instruments.

### 5.2 Test Arrangement and Procedure

1. Please refer to FCC Part 15 Subpart C Section 15.247(b)(3) for the test requirement.
2. Please refer to FCC KDB 558074 D01 v03r02 for the measurement method.
3. The spectrum analyzer or receiver is set as:

Set the RBW to: 1 MHz

Set the VBW  $\geq 3 \times$  RBW

Detector = peak

### 5.3 Limit

15.247(b) The maximum peak conducted output power of the intentional radiator shall not exceed the following:

15.247(b) (3) For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt. As an alternative to a peak power measurement, compliance with the one Watt limit can be based on a measurement of the maximum conducted output power. Maximum Conducted Output Power is defined as the total transmit power delivered to all antennas and antenna elements averaged across all symbols in the signaling alphabet when the transmitter is operating at its maximum power control level. Power must be summed across all antennas and antenna elements. The average must not include any time intervals during which the transmitter is off or is transmitting at a reduced power level. If multiple modes of operation are possible (e.g., alternative modulation methods), the maximum conducted output power is the highest total transmit power occurring in any mode.

15.247(b) (4) The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

The maximum antenna gain is -0.26 dBi, therefore, the limit is 30 dBm.

### 5.4 Test Result

#### Compliance

The final test data are shown on the following tables and refer to the following page(s) for the graphs.

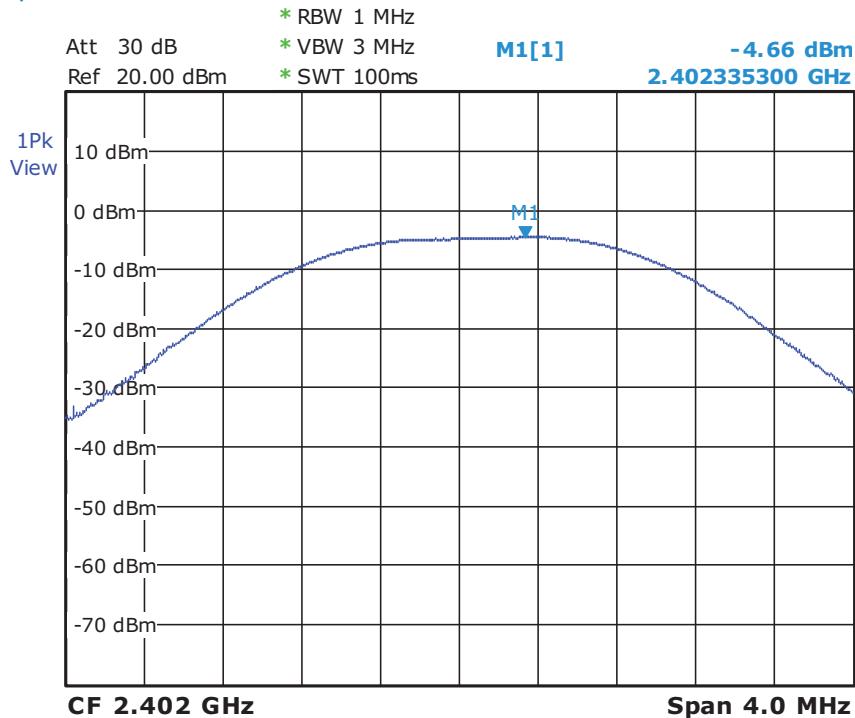


<b>Bluetooth</b>			
<b>Channel</b>	<b>Frequency (MHz)</b>	<b>Result (dBm)</b>	<b>Limit (dBm)</b>
01	2402	-4.66	30
20	2440	-3.85	30
40	2480	-2.25	30



Temperature : 24°C  
Test Date : 24-Sep-2014  
Test Mode : Mode1

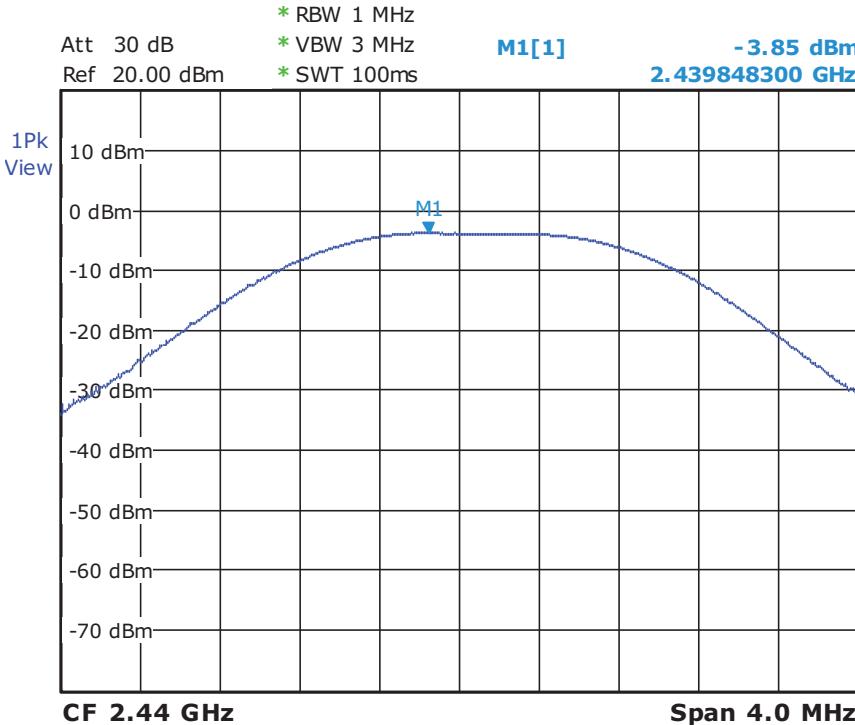
Humidity : 40%  
Tested by : Ben Chen  
Channel : 2402



Date: 24.SEP.2014 14:40:08

Test Mode : Mode2

Channel : 2440



Date: 24.SEP.2014 14:46:45

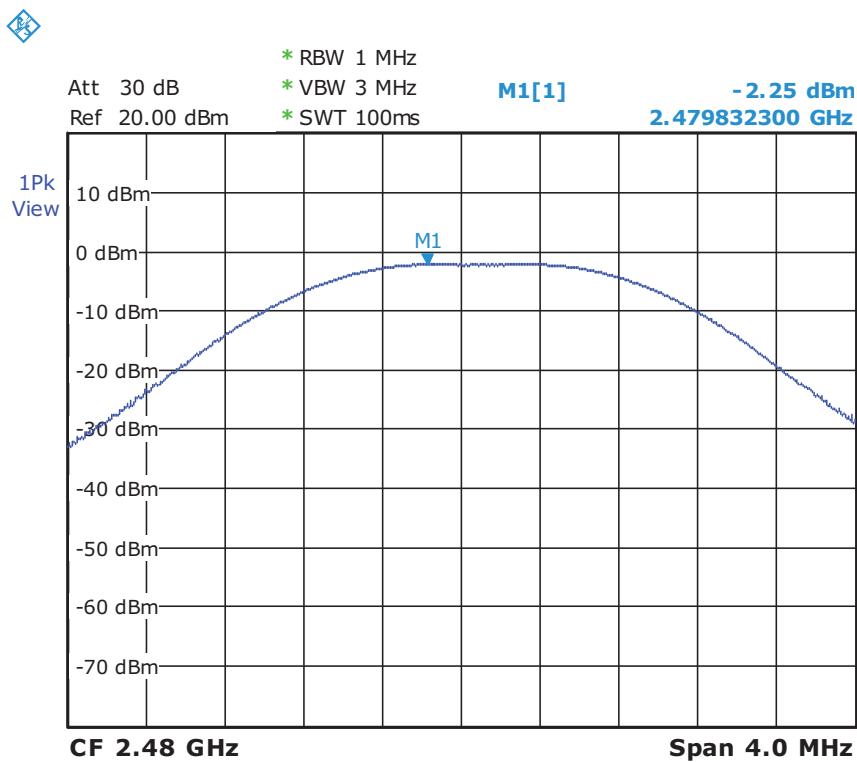


Test Mode

: Mode3

Channel

: 2480



Date: 24.SEP.2014 14:48:07

## 6 Spurious Emissions(Radiated): 100kHz Bandwidth of Band Edges

### 6.1 Test Instruments

Refer to Sec. 1.2 Test Instruments.

### 6.2 Test Arrangement and Procedure

1. Please refer to FCC Part 15 Subpart C Section 15.247(d) for the test requirement.
2. Please refer to FCC KDB 558074 D01 v03r02 for the measurement method.
3. The spectrum analyzer or receiver is set as:

Set the RBW to: 100 kHz

Set the VBW : 300 kHz

Detector = peak

### 6.3 Limit

15.247 (d) In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

### 6.4 Test Result

#### Compliance

The final test data are shown on the following page(s).

**Bluetooth Channel: 01**

Measured Result				Result (dB)	Limit (dB)
Lower Channel (MHz)	Max Peak Power (dBm)	Highest Freq. at Lower Band edge (MHz)	Max Peak Power at Lower Band edge (dBm)		
2402	-5.520	2394.48	-49.86	44.34	20

Remark: Result (dB) = Max Peak Power – Max Peak power at lower band edge. When Result > Limit, it's a pass.

**Bluetooth Channel: 40**

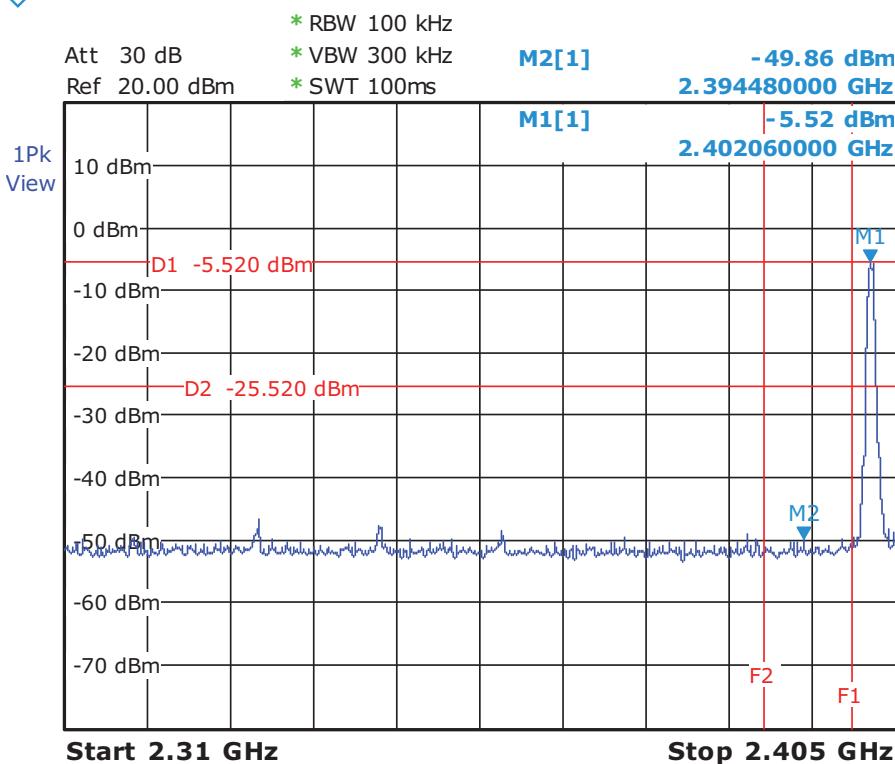
Measured Result				Result (dB)	Limit (dB)
Higher Channel (MHz)	Max Peak Power (dBm)	Highest Freq. at Lower Band edge (MHz)	Max Peak Power at Lower Band edge (dBm)		
2480	-3.72	2489.28	-48.58	44.86	20

Remark: Result (dB) = Max Peak Power – Max Peak power at lower band edge. When Result > Limit, it's a pass.



Temperature : 24°C  
Test Date : 27-Aug-2014  
Test Mode : Mode1

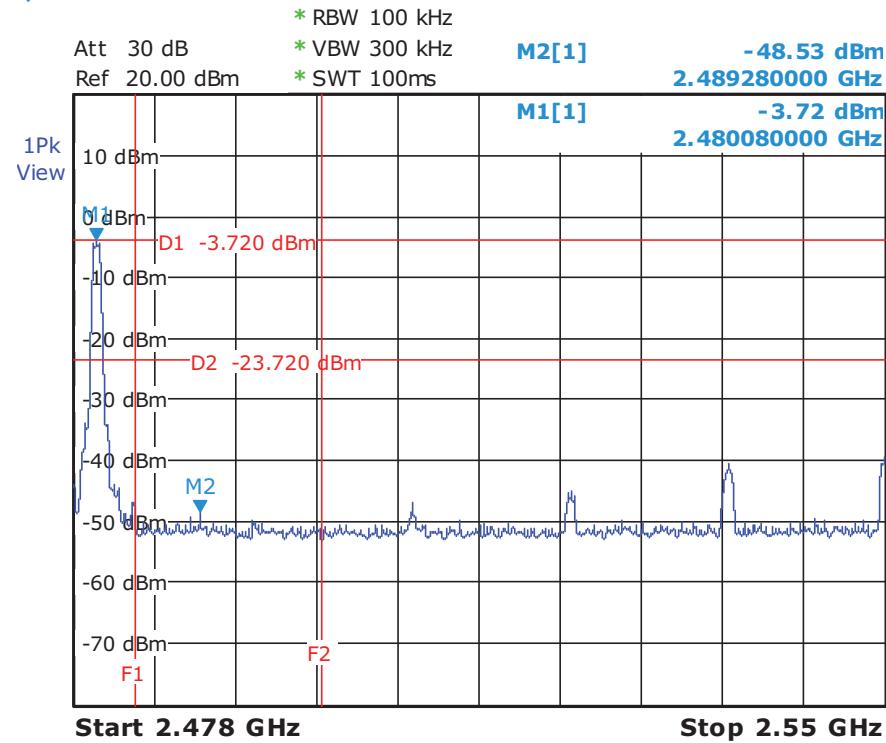
Humidity : 40%  
Tested by : Ben Chen  
Channel : 2402



Date: 27.AUG.2014 12:34:20

Test Mode : Mode3

Channel : 2480



Date: 27.AUG.2014 12:40:12

## 7 Power Spectral Density

### 7.1 Test Instruments

Refer to Sec. 1.2 Test Instruments.

### 7.2 Test Arrangement and Procedure

1. Please refer to FCC Part 15 Subpart C Section 15.247(e) for the test requirement.
2. Please refer to FCC KDB 558074 D01 v03r02 for the measurement method.
3. The spectrum analyzer or receiver is set as:

Set the RBW to: 3 kHz

Set the VBW  $\geq 3 \times$  RBW

Detector = peak

### 7.3 Limit

15.247(e) For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission. This power spectral density shall be determined in accordance with the provisions of paragraph (b) of this section. The same method of determining the conducted output power shall be used to determine the power spectral density.

### 7.4 Test Result

#### Compliance

The final test data are shown on the following tables and refer to the following page(s) for the graphs.

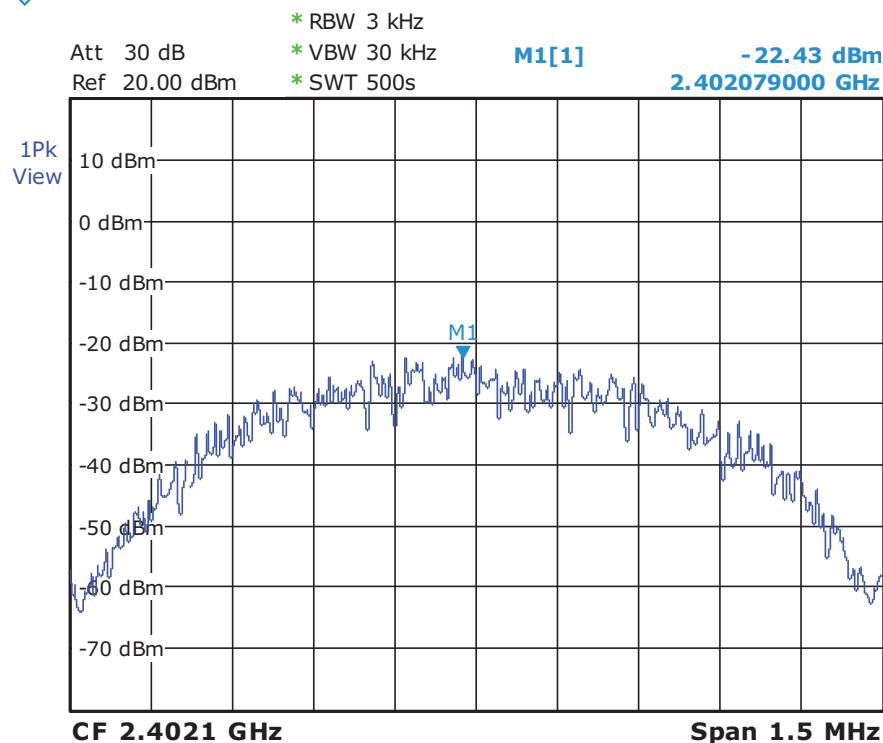
Test Mode : BT

Channel	Frequency(MHz)	Result (dBm)	Limit(dBm)
1	2402	-22.43	8
20	2440	-21.02	8
40	2480	-19.13	8



Temperature : 24°C  
Test Date : 27-Aug-2014  
Test Mode : Mode1

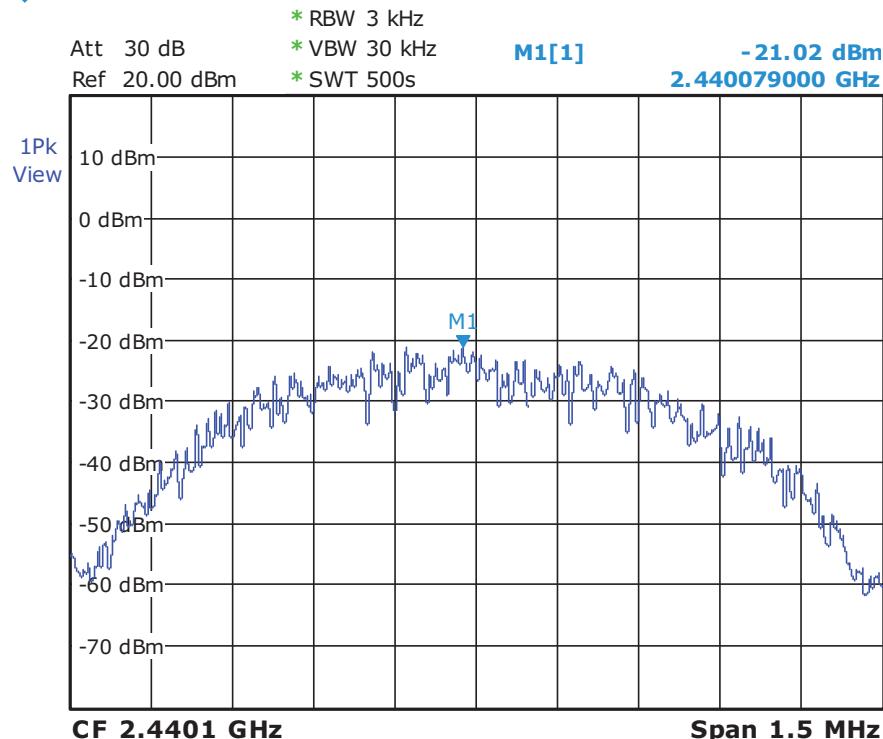
Humidity : 40%  
Tested by : Ben Chen  
Channel : 2402



Date: 27.AUG.2014 12:15:50

Test Mode : Mode2

Channel : 2440



Date: 27.AUG.2014 12:17:49

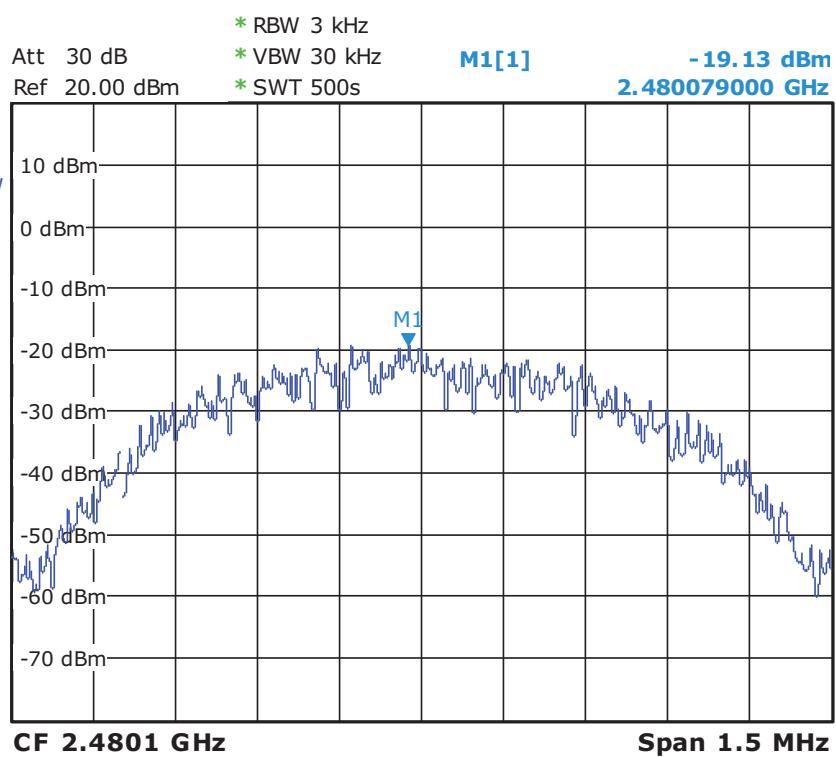


Test Mode

: Mode3

Channel

: 2480



Date: 27.AUG.2014 12:29:11

## 8 Antenna requirement

### 8.1 Limit

15.203 An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of §15.211, §15.213, §15.217, §15.219, or §15.221. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with §15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this part are not exceeded.

### 8.2 Test Result

#### Compliance

The EUT applies a PCB antenna.