

# EMC TEST REPORT

For

Internal Radio

Model Number: Pico Wi-Fi

FCC ID: BZAPICOWI-FI

Report Number : WT078001991

Test Laboratory : Shenzhen Academy of Metrology and  
Quality Inspection EMC Laboratory  
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## TEST REPORT DECLARATION

Applicant : Hip Shing Electronics Limited  
Address : Unit 1-3, 20FL, New Treasure Centre, No. 10, Ng Fong St., San Po Kong KLN, HK  
Manufacturer : Dongguan Zhi Cheng Electronic Products Co., Ltd  
Address : China Dongguanshi, Tangxia Ping San 188 Ind Zone  
EUT Description : Internal Radio  
Model Number : Pico Wi-Fi  
FCC ID Number : BZAPICOWI-FI


Test Standards:

### FCC Part 15 15.247

The EUT described above is tested by Shenzhen Academy of Metrology and Quality Inspection EMC Laboratory to determine the maximum emissions from the EUT. Shenzhen Academy of Metrology and Quality Inspection EMC Laboratory is assumed full responsibility for the accuracy of the test results. 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 (2003) and the energy emitted by the sample EUT tested as described in this report is in compliance with conducted and radiated emission limits of FCC Rules Part 15.247.

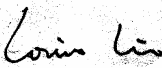
The test report is valid for above tested sample only and shall not be reproduced in part without written approval of the laboratory.

Tested by:

  
\_\_\_\_\_  
(Dewelly Yang)

Date: \_\_\_\_\_

Checked by:

  
\_\_\_\_\_  
(Louis Lin)

Date: \_\_\_\_\_

Approved by:

  
\_\_\_\_\_  
(Peter Lin)

Date: \_\_\_\_\_

## 1. TEST RESULTS SUMMARY

Table 1 Test Results Summary

Test Items	FCC Rules	Test Results
Conducted Disturbance	15.207	Pass
Radiated disturbance	15.247 d	Pass
Spectrum Bandwidth of a Direct Sequence Spread Spectrum System	15.247(a)(2)	Pass
Maximum Peak Output Power	15.247(b)	Pass
Power Spectral Density	15.247(e)	Pass
Band Edge Measurement	15.247(d)	Pass
Antenna Requirement	15.203	Pass

## 2. GENERAL INFORMATION

### 2.1. Report information

- 2.1.1. This report is not a certificate of quality; it only applies to the sample of the specific product/equipment given at the time of its testing. The results are not used to indicate or imply that they are application to the similar items. In addition, such results must not be used to indicate or imply that SMQ approves recommends or endorses the manufacture, supplier or use of such product/equipment, or that SMQ in any way guarantees the later performance of the product/equipment.
- 2.1.2. The sample/s mentioned in this report is/are supplied by Applicant, SMQ therefore assumes no responsibility for the accuracy of information on the brand name, model number, origin of manufacture or any information supplied.
- 2.1.3. Additional copies of the report are available to the Applicant at an additional fee. No third part can obtain a copy of this report through SMQ, unless the applicant has authorized SMQ in writing to do so.

### 2.2. Laboratory Accreditation and Relationship to Customer

The testing report were performed by the Shenzhen Academy of Metrology and quality Inspection EMC Laboratory (Guangdong EMC compliance testing center), in their facilities located at Bldg. of Metrology & Quality Inspection, Longzhu Road, Nanshan District, Shenzhen, Guangdong, China. At the time of testing, Laboratory is accredited by the following organizations:

China National Accreditation Committee for Laboratories (**CNAL**) accredits the Laboratory for conformance to FCC standards, EMC international standards and EN standards. The Registration Number is L0579.

The Laboratory is listed in the United States of American Federal Communications Commission (**FCC**), and the registration number are **97379**(open area test site) and **274801**(semi anechoic chamber).

The Laboratory is listed in Voluntary Control Council for Interference by Information Technology Equipment (**VCCI**), and the registration number are **R-1974**(open area test site) , **R-1966**(semi anechoic chamber), **C-2117**(mains ports conducted interference measurement) and **T-180**(telecommunication ports conducted interference measurement).

The Laboratory is registered to perform emission tests with Industry Canada (**IC**), and the registration number is **IC4174**.

**TUV Rhineland** accredits the Laboratory for conformance to IEC and EN standards, the registration number is **E2024086Z02**.

Measurement Uncertainty

### 2.3. Measurement Uncertainty

Conducted Disturbance : 9kHz~30MHz 3.5dB

Radiated Disturbance: 30MHz~1000MHz 4.5dB  
1GHz~18GHz 4.6dB

## 3. PRODUCT DESCRIPTION

### 3.1. EUT Description

Description : Internal Radio

Manufacturer : Dongguan Zhi Cheng Electronic Products Co., Ltd

Model Number : Pico Wi-Fi

Input : DC12V

Input Power : Adapter:  
M/N:KSS15-120-1200  
Input:AC100-240V 50-60Hz 500mA  
Output:DC12V 1200mA

Operate Frequency : IEEE802.11 b/g 2412~2462MHz( 11channel)

Antenna Designation : Non-User Replaceable (Fixed)

Table 2 \_ The working Frequency List

Channel	Frequency	Channel	Frequency
1	2412 MHz	7	2442 MHz
2	2417 MHz	8	2447 MHz
3	2422 MHz	9	2452 MHz
4	2427 MHz	10	2457 MHz
5	2432 MHz	11	2462 MHz
6	2437 MHz		

### 3.2. Related Submittal(s) / Grant (s)

This submittal(s) (test report) is intended for FCC ID: BZAPICOWI-FI filing to comply with Section 15.247 of the FCC Part 15, Subpart C Rules.

### 3.3. Block Diagram of EUT Configuration

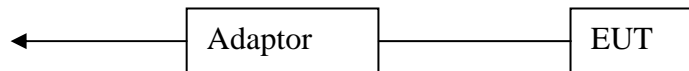


Figure 1 EUT setup 1

### 3.4. Operating Condition of EUT

Mode 1: ch1(IEEE802.11 54Mbps)  
Mode2: ch6(IEEE802.11 54Mbps)  
Mode3: ch11(IEEE802.11 54Mbps)

### 3.5. Special Accessories

Not available for this EUT intended for grant.

### 3.6. Equipment Modifications

Not available for this EUT intended for grant.

### 3.7. Support Equipment List

Table 3 Support Equipment List

Name	Model No	S/N	Manufacturer	Used “√”
Notebook	2672	99-1N31N	IBM	✓

### 3.8. Test Conditions

Date of test: Aug.10-20.15,2007  
Date of EUT Receive: Aug.8,2007  
Temperature: 24-26 °C  
Relative Humidity: 45-53%



#### 4. TEST EQUIPMENT USED

Table 4 Test Equipment

No.	Equipment	Manufacturer	Model No.	Last Cal.	Cal. Interval
SB2603	EMI Test Receiver	Rohde & Schwarz	ESCS30	Jan.25, 2007	1 Year
SB3321	AMN	Rohde & Schwarz	ESH2-Z5	Jan.25, 2007	1 Year
SB2604	AMN	Rohde & Schwarz	ESH3-Z5	Jan.25, 2007	1 Year
SB3436	EMI Test Receiver	Rohde & Schwarz	ESI26	Jan.25, 2007	1 Year
SB3440	Bilog Antenna	Chase	CBL6112B	Jan.25, 2007	1 Year
SB3435	Horn Antenna	Rohde & Schwarz	HF906	Jan.25, 2007	1 Year
SB3435/01	Amplifier(1-18 GHz)	Rohde & Schwarz	---	Jan.25, 2007	1 Year
SB3435/02	Amplifier(18-40 GHz)	Rohde & Schwarz	---	May.05, 2007	1 Year
SB3435/03	Horn Antenna	Rohde & Schwarz	AT4560	May.05, 2007	1 Year
SB3450/01	3m Semi-anechoic chamber	Albatross Projects	9X6X6	Jan.25, 2007	1 Year

## 5. CONDUCTED DISTURBANCE TEST

### 5.1. Test Standard and Limit

#### 5.1.1. Test Standard

FCC Part 15 15.207

#### 5.1.2. Test Limit

Table 5 Conducted Disturbance Test Limit (Class B)

Frequency	Maximum RF Line Voltage (dB $\mu$ V)	
	Quasi-peak Level	Average Level
150kHz~500kHz	66 ~ 56 *	56 ~ 46 *
500kHz~5MHz	56	46
5MHz~30MHz	60	50

- Decreasing linearly with logarithm of the frequency
- The lower limit shall apply at the transition frequency.

### 5.2. Test Procedure

The EUT is put on a table of non-conducting material that is 80cm high. The vertical conducting wall of shielding is located 40cm to the rear of the EUT. The power line of the EUT is connected to the AC mains through a Artificial Mains Network (A.M.N.). A EMI test receiver (R&S Test Receiver ESCS30) is used to test the emissions form both sides of AC line. According to the requirements in Section 7 and 13 of ANSI C63.4-2003. Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using CISPR Quasi-Peak and average detector mode.

The bandwidth of EMI test receiver is set at 9kHz.

### 5.3. Test Arrangement

The arrangement of the equipment is installed to meet the standards and operating in a manner, which tends to maximize its emission characteristics in a normal application. The detailed information refers to test picture.

### 5.4. Test Data

The emissions don't show in below are too low against the limits. Refer to the test curves .  
Working mode: Ch1 (the worst case)

Table 6 Conducted Disturbance Test Data

Model: Pico Wi-Fi							
Mode: 1							
Line							
Frequency (MHz)	Correction Factor (dB)	Quasi-Peak			Average		
		Reading (dB $\mu$ V)	Emission Level (dB $\mu$ V)	Limits (dB $\mu$ V)	Reading (dB $\mu$ V)	Emission Level (dB $\mu$ V)	Limits (dB $\mu$ V)
0.186	10.0	41.2	51.2	64.2	28.6	38.6	54.2
0.250	10.0	34.4	44.4	61.7	24.0	34.0	51.7

- REMARKS:** 1. Emission level(dBuV)=Read Value(dBuV) + Correction Factor(dB)  
 2. Correction Factor(dB) =LISN Factor (dB) + Cable Factor (dB)+Limiter Factor(dB)  
 3. The other emission levels were very low against the limit.

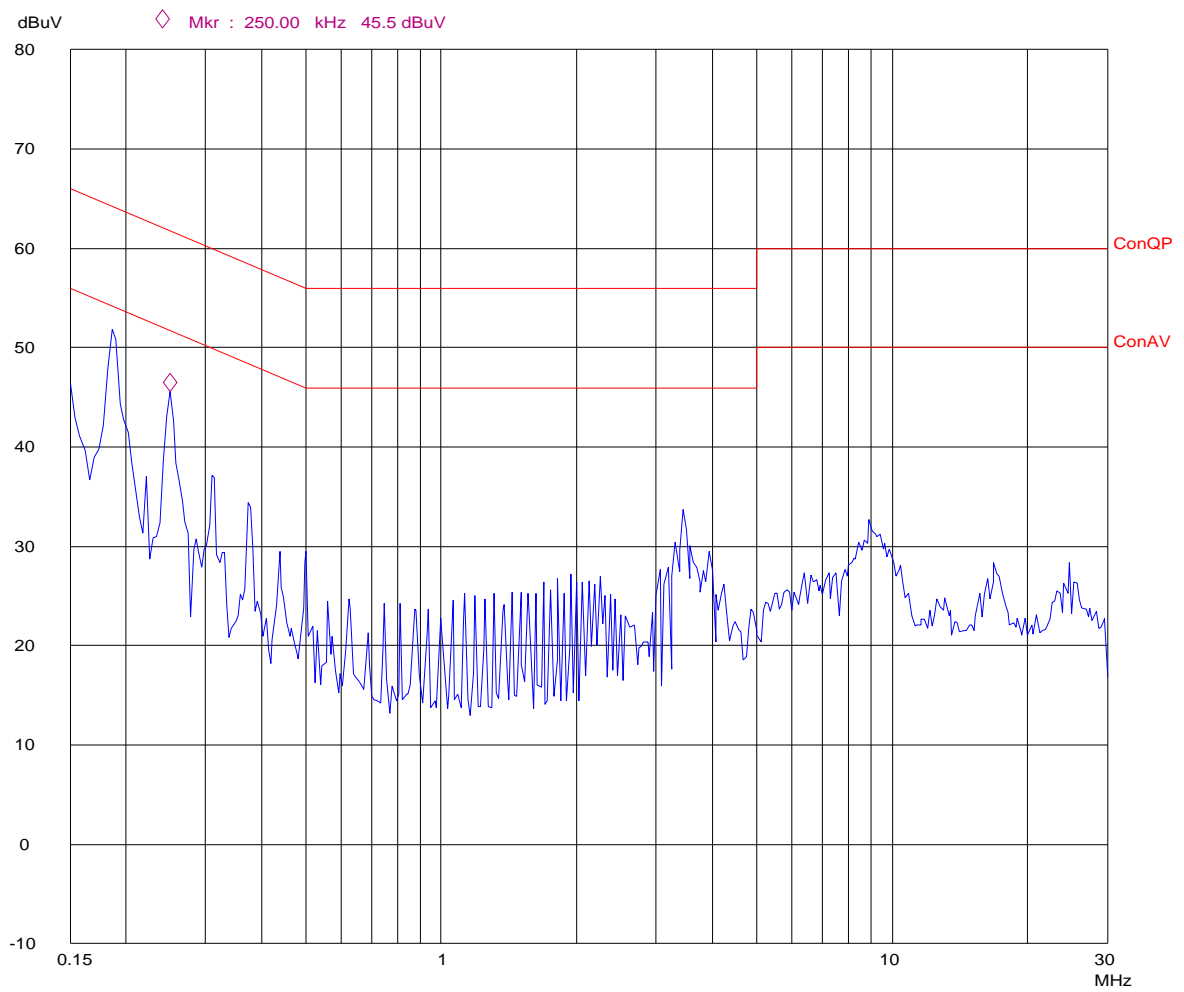
Table 7 Conducted Disturbance Test Data

Model: Pico Wi-Fi							
Mode: 1							
Neutral							
Frequency (MHz)	Correction Factor (dB)	Quasi-Peak			Average		
		Reading (dB $\mu$ V)	Emission Level (dB $\mu$ V)	Limits (dB $\mu$ V)	Reading (dB $\mu$ V)	Emission Level (dB $\mu$ V)	Limits (dB $\mu$ V)
0.186	10.0	41.3	51.3	64.2	28.4	38.4	54.2
0.250	10.0	34.5	44.5	61.7	23.8	33.8	51.7

- REMARKS:** 1. Emission level(dBuV)=Read Value(dBuV) + Correction Factor(dB)  
 2. Correction Factor(dB) =LISN Factor (dB) + Cable Factor (dB)+Limiter Factor(dB)  
 3. The other emission levels were very low against the limit.

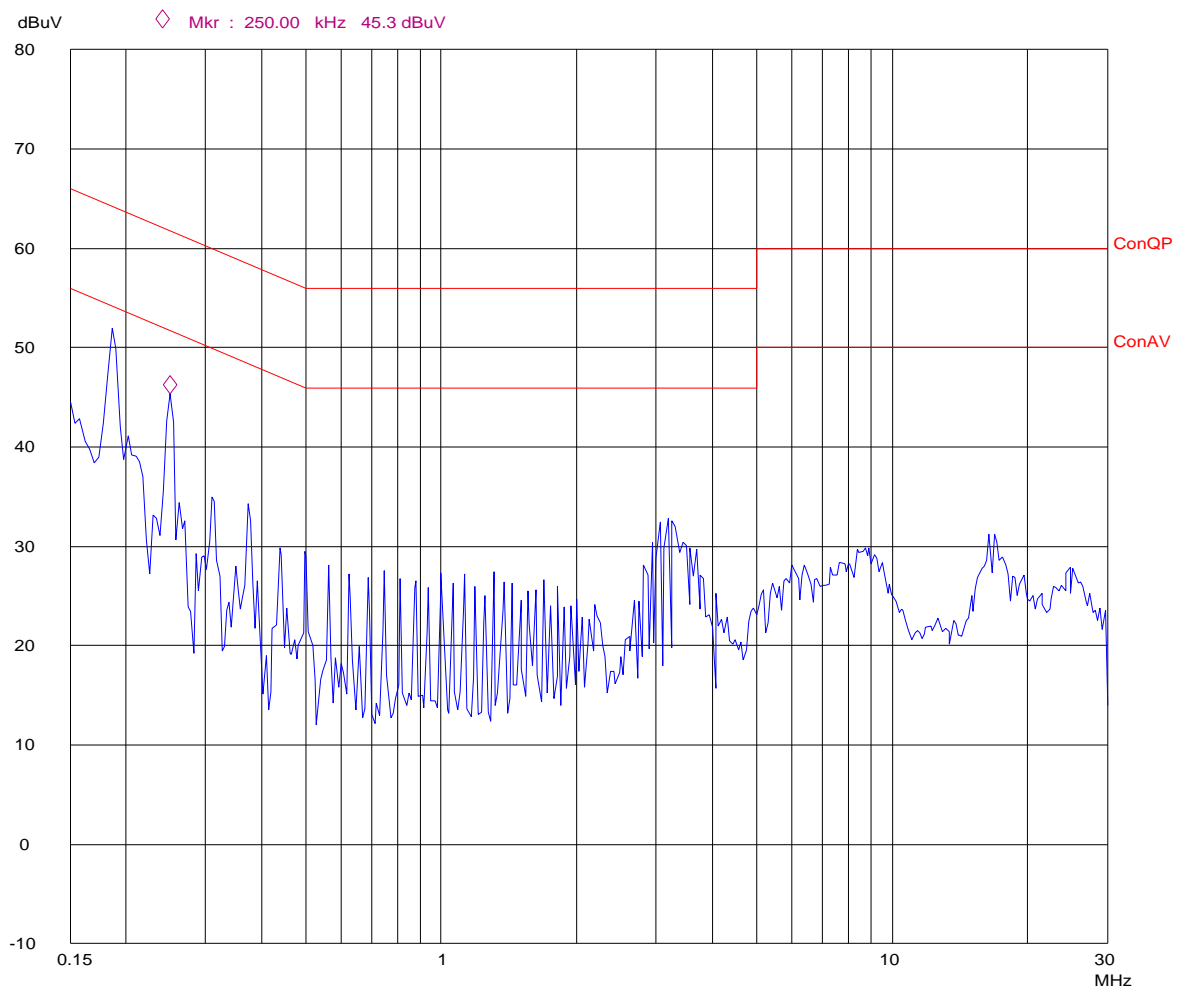
# Conducted Disturbance

EUT: M/N:Pico Wi-Fi  
Op Cond: CH1  
Test Spec: N  
Comment: AC 120V/60Hz



# Conducted Disturbance

EUT: M/N:Pico Wi-Fi  
Op Cond: CH1  
Test Spec: L  
Comment: AC 120V/60Hz



## 6. RADIATED DISTURBANCE TEST

### 6.1. Test Standard and Limit

#### 6.1.1. Test Standard

FCC Part 15 15.247 d

#### 6.1.2. Test Limit

Table 8 Radiated Disturbance Test Limit

FREQUENCY MHz	FIELD STRENGTHS LIMITS ( $\mu\text{V/m}$ )	FIELD STRENGTHS LIMITS dB ( $\mu\text{V/m}$ )
Fundamental	50000	94.0
Harmonics	500	54.0
30 ~ 88	100	40.0
88 ~ 216	150	43.5
216 ~ 960	200	46.0
960 ~	500	54.0

\* The lower limit shall apply at the transition frequency.

\* The test distance is 3m.

### 6.2. Test Procedure

The EUT is placed on a turntable, which is 0.8 meter above ground. The turntable can rotate 360 degrees to determine the position of the maximum emission level. EUT is set 3 meters away from the receiving antenna, which is mounted on an antenna tower. The antenna can move up and down between 1 to 4 meters to find out the maximum emission level. Broadband antenna is used as a receiving antenna. Both horizontal and vertical polarization of the antenna is set on test. In order to find out the max. emission, the relative positions of this hand-held transmitter(EUT) was rotated through three orthogonal axes according to the requirements in Section 8 and 13 of ANSI C63.4-2003.

The frequency spectrum from 30 MHz to 1 GHz was investigated. All readings from 30 MHz to 1 GHz are quasi-peak values with a resolution bandwidth of 120 kHz. All readings are above 1 GHz, AV values with a resolution bandwidth of 1 MHz.

Measurements were made at 3 meters

### 6.3. Test Arrangement

The arrangement of the equipment is installed to meet the standards and operating in a manner, which tends to maximize its emission characteristics in a normal application. The detailed information refers to test picture.

## 6.4. Test Data

Emissions don't show below are too low against the limits, the test curves are shown in the APPENDIX I

- Note: 1. Emission level(dBuV/m)=Reading Value(dBuV) + Correction Factor(dB/m)+ Antenna Factor (dB/m)  
 2. Correction Factor(dB/m) = Cable Factor (dB)+Amplifier Factor(dB)  
 3. The other emission levels were very low against the limit.

Table 9 General Radiated Emission Data

Model number: PICO Wi-Fi Test Mode: ch 1							
Frequency (MHz)	Polarization	Reading Value (dB $\mu$ V)	Cable Loss (dB)	Antenna Factor (dB/m)	Emission Level dB ( $\mu$ V/m)	Limits dB ( $\mu$ V/m)	Detector
49.148	V	28.2	1.2	8.52	38.5	40.0	QP
61.434	V	31.1	1.4	5.93	38.4	40.0	QP
71.985	V	28.1	1.4	7.53	37.0	40.0	QP
122.885	V	27.9	1.9	12.75	42.5	43.5	QP
147.454	V	28.7	2.1	11.34	42.1	43.5	QP
172.032	H	21.4	2.2	10.34	33.9	43.5	QP
2414.987	V	76.0	-32.2	28.5	79.7	----	Fundamental AV
2414.231	H	83.2	-32.2	28.5	86.9	----	Fundamental AV
4827.901	H	35.0	-31.0	33.3	32.7	74.0	Peak
4827.901	H	30.7	-31.0	33.3	28.4	54.0	AV
7244.156	H	35.1	-28.3	36.4	27.0	74.0	Peak
7244.156	H	30.8	-28.3	36.4	22.7	54.0	AV

Table 10 General Radiated Emission Data

Model number: PICO Wi-Fi Test Mode: ch 6							
Frequency (MHz)	Polarization	Reading Value (dB $\mu$ V)	Cable Loss (dB)	Antenna Factor (dB/m)	Emission Level dB ( $\mu$ V/m)	Limits dB ( $\mu$ V/m)	Detector
49.138	V	28.4	1.2	8.52	38.1	40.0	QP
61.434	V	30.9	1.4	5.93	38.2	40.0	QP
71.985	V	28.1	1.4	7.53	37.0	40.0	QP
122.885	V	27.9	1.9	12.75	42.5	43.5	QP
147.454	V	28.6	2.1	11.34	42.0	43.5	QP
147.464	H	20.5	2.1	11.34	33.9	43.5	QP
2438.560	V	77.6	-32.2	28.5	81.5	----	Fundamental AV
2438.560	H	80.4	-32.2	28.5	84.1	----	Fundamental AV
4877.911	H	35.0	-31.0	33.3	32.7	74.0	Peak
4877.911	H	30.8	-31.0	33.3	28.5	54.0	AV
7314.150	H	35.4	-28.3	36.4	27.3	74.0	Peak
7314.150	H	30.4	-28.3	36.4	22.3	54.0	AV



Table 11 General Radiated Emission Data

Model number: PICO Wi-Fi Test Mode: ch 11							
Frequency (MHz)	Polarization	Reading Value (dB $\mu$ V)	Cable Loss (dB)	Antenna Factor (dB/m)	Emission Level dB ( $\mu$ V/m)	Limits dB ( $\mu$ V/m)	Detector
49.148	V	28.3	1.2	8.52	38.0	40.0	QP
61.433	V	31.1	1.4	5.93	38.4	40.0	QP
71.985	V	28.1	1.4	7.53	37.0	40.0	QP
122.855	V	27.5	1.9	12.75	42.1	43.5	QP
147.464	V	28.5	2.1	11.34	41.9	43.5	QP
172.032	H	21.0	2.2	10.34	33.5	43.5	QP
2462.861	V	73.2	-32.2	28.5	69.5	----	Fundamental AV
2462.861	H	76.0	-32.2	28.5	72.3	----	Fundamental AV
4926.901	H	35.2	-31.0	33.3	32.9	74.0	Peak
4926.901	H	30.7	-31.0	33.3	28.4	54.0	AV
7388.186	H	35.3	-28.3	36.4	27.2	74.0	Peak
7388.186	H	30.8	-28.3	36.4	22.7	54.0	AV

Table 12 **Restricted Band Radiated Emission Data**

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
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	2655 - 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	
12.51975 -	240 - 285	3345.8 - 3358	
12.52025	322 - 335.4	3600 - 4400	
12.57675 -			
12.57725			
13.36 - 13.41			

All the emission of the above band were less than the limit 20dB.

## 7. 6DB BANDWIDTH MEASUREMENT

### 7.1. LIMITS OF 6dB BANDWIDTH MEASUREMENT

The minimum of 6dB Bandwidth Measurement is 0.5 MHz.

### 7.2. TEST PROCEDURE

The transmitter output was connected to the spectrum analyzer through an attenuator. The bandwidth of the fundamental frequency was measured by spectrum analyzer with 100kHz RBW and 100kHz VBW. The 6dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 6dB.

### 7.3. TEST SETUP



### 7.4. EUT OPERATING CONDITIONS

Mode1  
Mode 2  
Mode 3

### 7.5. Test Data

Table 13 Test Data

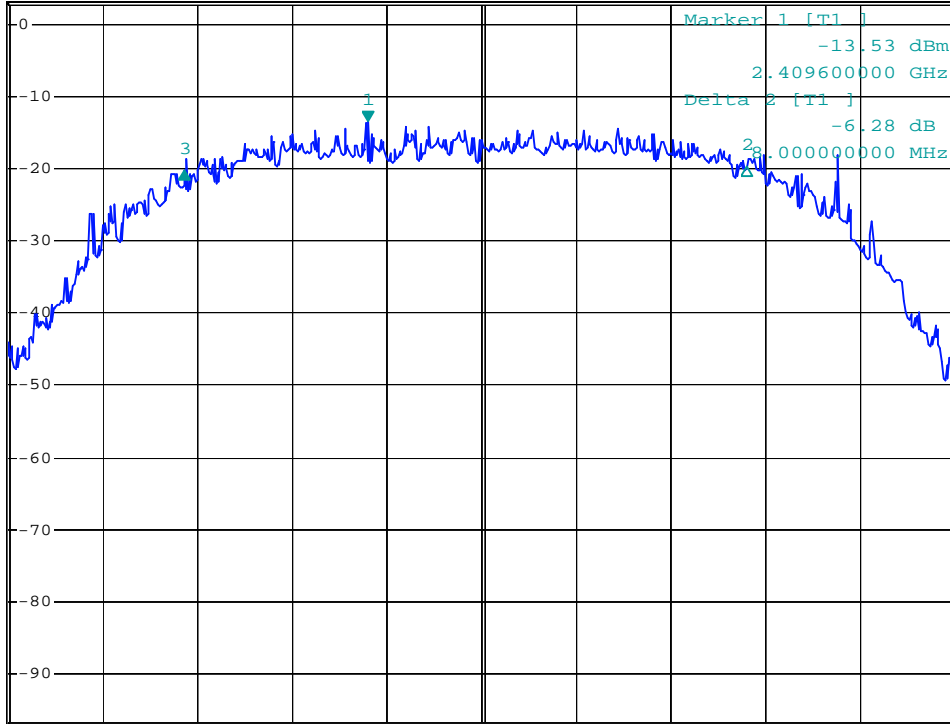
CHANNEL	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	results
Ch1	11.8	0.5	Pass
Ch6	12.7	0.5	Pass
Ch11	12.8	0.5	Pass

# Ch1 2412MHz



\*RBW 100 kHz Delta 3 [T1 ]  
\*VBW 100 kHz -6.68 dB  
Ref 3 dBm Att 40 dB SWT 5 ms -3.880000000 MHz

1 PK  
VIEW



Center 2.412 GHz 2 MHz/ Span 20 MHz

UB-8H

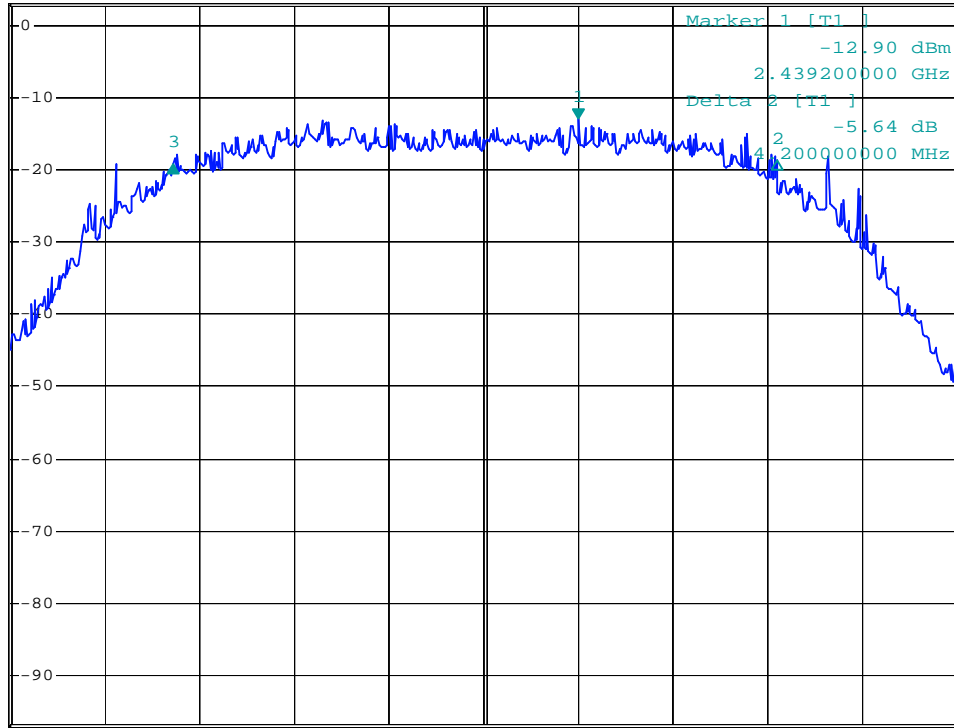
Date: 3.AUG.2007 17:24:57

# Ch 6 (2438MHz)



\*RBW 100 kHz Delta 3 [T1 ]  
\*VBW 100 kHz -6.21 dB  
Ref 3 dBm Att 40 dB SWT 5 ms -8.560000000 MHz

1 PK  
VIEW



Center 2.4372 GHz 2 MHz/ Span 20 MHz

UB-8H

Date: 3.AUG.2007 17:04:44

# Ch11 (2462MHz)

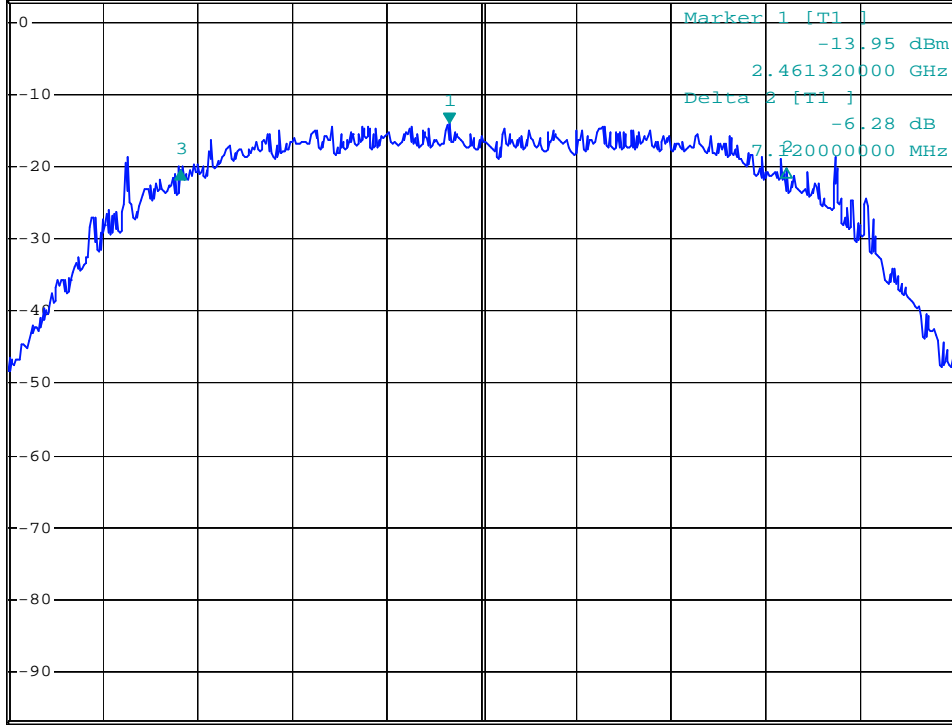


\*RBW 100 kHz Delta 3 [T1 ]  
\*VBW 100 kHz -6.65 dB  
\*SWT 5 ms -5.68000000 MHz

Ref 3 dBm

Att 40 dB

1 PK  
VIEW



Center 2.462 GHz

2 MHz/

Span 20 MHz

UB-8H

Date: 3.AUG.2007 17:42:54

## 8. MAXIMUM PEAK OUTPUT POWER

### 8.1. LIMITS OF MAXIMUM PEAK OUTPUT POWER MEASUREMENT

The Maximum Peak Output Power Measurement is 30dBm.

### 8.2. TEST PROCEDURES

1. A detector was used on the output port of the EUT. An oscilloscope was used to read the response of the detector.
2. Replaced the EUT by the signal generator. The center frequency of the S.G was adjusted to the center frequency of the measured channel.
3. Adjusted the power to have the same reading on oscilloscope. Record the power level.

### 8.3. TEST SETUP



### 8.4. EUT OPERATING CONDITIONS

Same as Item 4.3.6

### 8.5. Test Data

Table 14 Test Data

CHANNEL	Peak Power Output (dBm)	LIMIT (dBm)	results
Ch1	-3.0	30dBm	Pass
Ch6	-2.8	30dBm	Pass
Ch11	-3.1	30dBm	Pass

## 9. POWER SPECTRAL DENSITY MEASUREMENT

### 9.1. LIMITS OF POWER SPECTRAL DENSITY MEASUREMENT

The Maximum of Power Spectral Density Measurement is 8dBm.

### 9.2. TEST PROCEDURE

The transmitter output was connected to the spectrum analyzer through an attenuator, the bandwidth of the fundamental frequency was measured with the spectrum analyzer using 1kHz RBW and 1kHz VBW, set sweep time = span/1kHz. The power spectral density was measured and recorded. The sweep time is allowed to be longer than span/1kHz for a full response of the mixer in the spectrum analyzer.

### 9.3. 4.5.5 TEST SETUP



### 9.4. 4.5.6 EUT OPERATING CONDITION

Mode1  
Mode 2  
Mode 3

### 9.5. Test Data

Table 15 Test Data

CHANNEL	RF POWER LEVEL IN 3kHz BW (dBm)	MAXIMUM LIMIT (dBm)	results
Ch1	-30.4	8	Pass
Ch6	-30.3	8	Pass
Ch11	-26.5	8	Pass



# Ch1

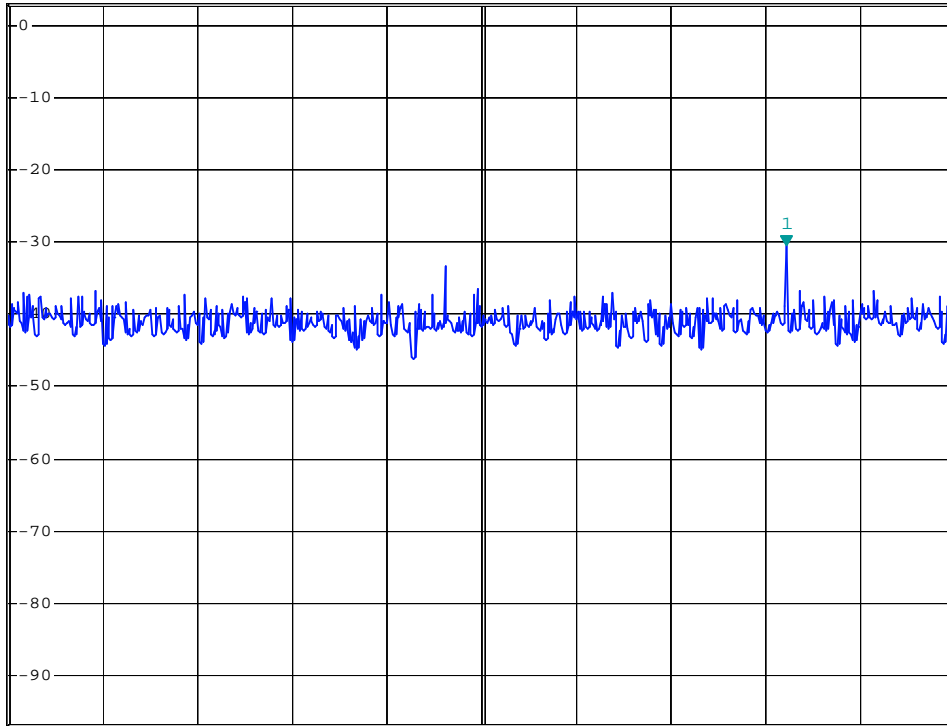


\*RBW 1 kHz      Marker 1 [T1 ]  
\*VBW 1 kHz      -30.48 dBm  
\*SWT 680 s      2.412644000 GHz

Ref 3 dBm

Att 40 dB

1 PK  
MAXH



Center 2.412 GHz

200 kHz/

Span 2 MHz

UB-8H

Date: 3.AUG.2007 17:38:02

Ch6

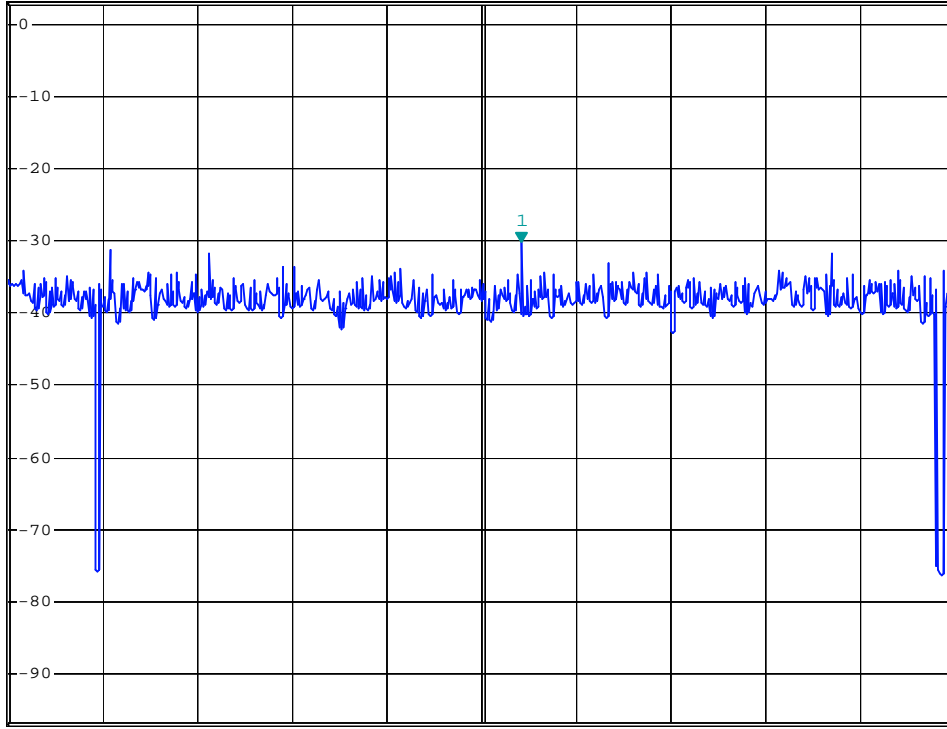


\*RBW 1 kHz    Marker 1 [T1 ]  
\*VBW 1 kHz    -30.31 dBm  
\*SWT 680 s    2.437284000 GHz

Ref 3 dBm

Att 40 dB

1 PK  
MAXH



Center 2.4372 GHz

200 kHz/

Span 2 MHz

UB-8H

Date: 3.AUG.2007 17:20:34

# Ch11

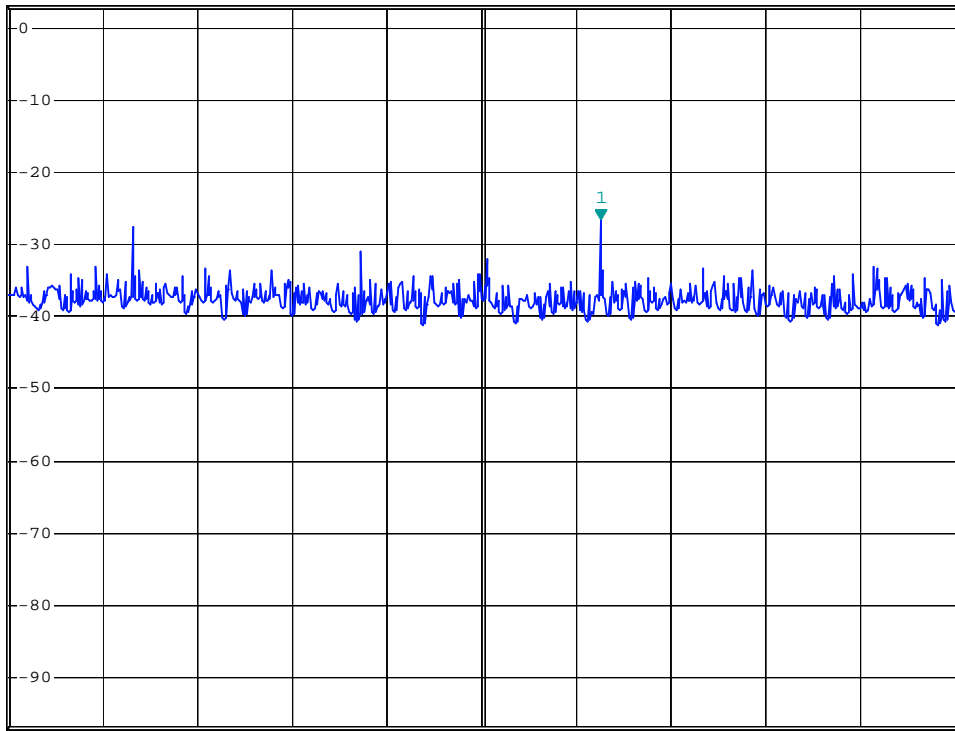


\*RBW 1 kHz      Marker 1 [T1 ]  
\*VBW 1 kHz      -26.51 dBm  
\*SWT 680 s      2.462252000 GHz

Ref 3 dBm

Att 40 dB

1 PK  
VIEW



Center 2.462 GHz

200 kHz/

Span 2 MHz

UB-8H

Date: 3.AUG.2007 18:04:27

## **10. BAND EDGES MEASUREMENT**

### **10.1.LIMITS OF BAND EDGES MEASUREMENT**

Below -20dB of the highest emission level of operating band (in 100kHz Resolution Bandwidth).

### **10.2.TEST PROCEDURE**

The transmitter output was connected to the spectrum analyzer via a low lose cable. Set both RBW and VBW of spectrum analyzer to 100kHz with suitable frequency span including 100 MHz bandwidth from band edge. The band edges was measured and recorded.

The spectrum plots (Peak RBW=VBW=100kHz) are attached on the following pages.

### **10.3.EUT OPERATING CONDITION**

Mode1

Mode 3

### **10.4.TEST RESULTS**

The spectrum plots are attached on the following 3 images. It shows compliance with the requirement in part 15.247(d).

NOTE 1: The band edge emission plot of on page 29 ch1 shows 31.3dBc. The emission of carrier strength list in the test result of channel 1 is 79.5dBuV/m (AV), so the maximum field strength in restrict band is  $79.5-31.3=48.2$ dBuV/m which is under 54dBuV/m limit.

The band edge emission plot of on page 30 ch11 shows 31.1dBc. The emission of carrier strength list in the test result of channel 1 is 72.3dBuV/m (AV), so the maximum field strength in restrict band is  $72.3-31.1=41.2$ dBuV/m which is under 54dBuV/m limit.

# Ch1



\*RBW 100 kHz    Marker 1 [T1 ]  
\*VBW 100 kHz                    -16.14 dBm  
SWT 10 ms                        2.410600000 GHz

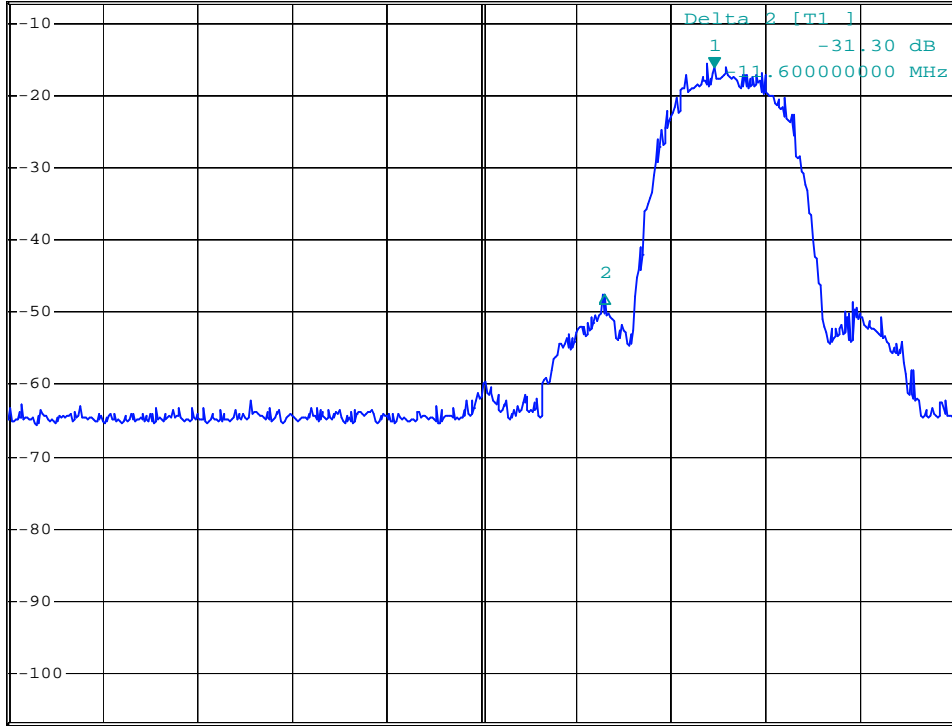
Ref -7 dBm

Att 30 dB

SWT 10 ms

2.410600000 GHz

1 PK  
MAXH



Center 2.386 GHz

10 MHz/

Span 100 MHz

UB-8H

Date: 7.AUG.2007 18:37:24

# Ch11



\*RBW 100 kHz Delta 3 [T1 ]  
\*VBW 100 kHz -32.43 dB  
SWT 10 ms -15.00000000 MHz

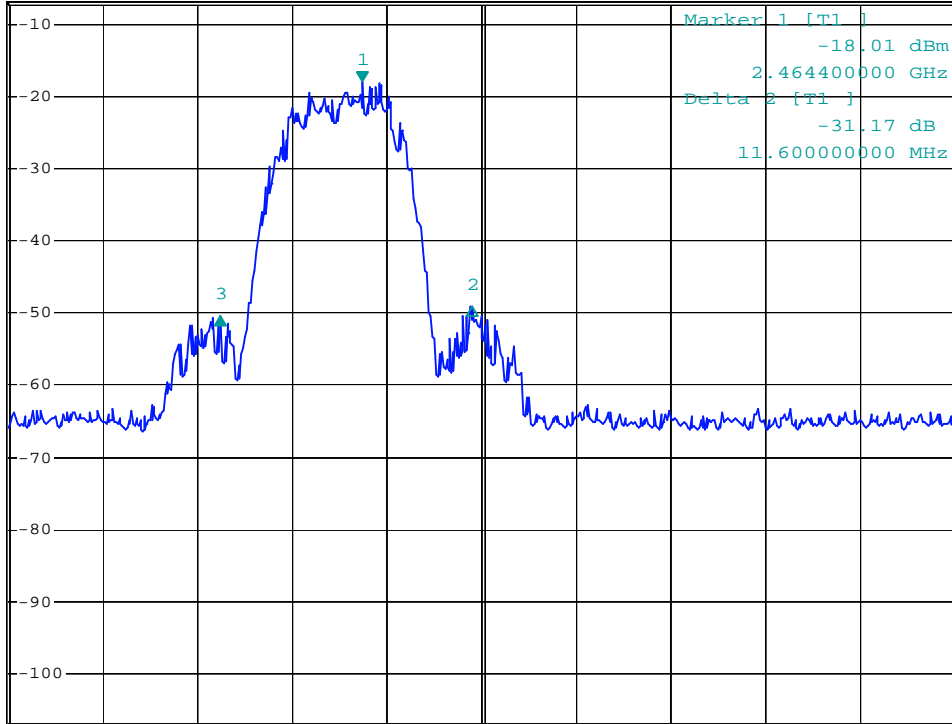
Ref -7 dBm

Att 30 dB

SWT 10 ms

-15.00000000 MHz

1 PK  
VIEW



Center 2.477 GHz

10 MHz/

Span 100 MHz

UB-8H

Date: 7.AUG.2007 18:49:46

## 11. ANTENNA REQUIREMENT

### 11.1. STANDARD APPLICABLE

For intentional device, according to FCC 47 CFR Section 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. And according to FCC 47 CFR Section 15.247 (b), if transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

### 11.2. ANTENNA CONNECTED CONSTRUCTION

The antenna used in this product is Chip antenna without connector. The maximum Gain of the antenna is 3.0dBi.

## 12. MPE CALCULATION

Maximum Power output: 2437MHz: 0.524mW (-2.8dBm)

Max Antenna gain,: 3.0 dBi

One-half power: -5.8dBm

Maximum EIRP from transmit antenna is  $-5.8 + 3.0 = -2.8$  dBm EIRP

To determine the overall exposure at 20 cm from the EUT.

The field strength contribution from each antenna is calculated using the equation

$E, \text{ V/m} = (30 * \text{EIRP, watts})^{0.5} / \text{separation distance}$

Maximum EIRP from transmit antenna is -2.8 dBm EIRP = 0.524mW EIRP

$S, \text{ mW/cm}^2 = E/3770$  , E in V/m

Total exposure at 20cm: 0.000033 mW.cm<sup>2</sup>

FCC Limit: 1.0 mW/cm<sup>2</sup>

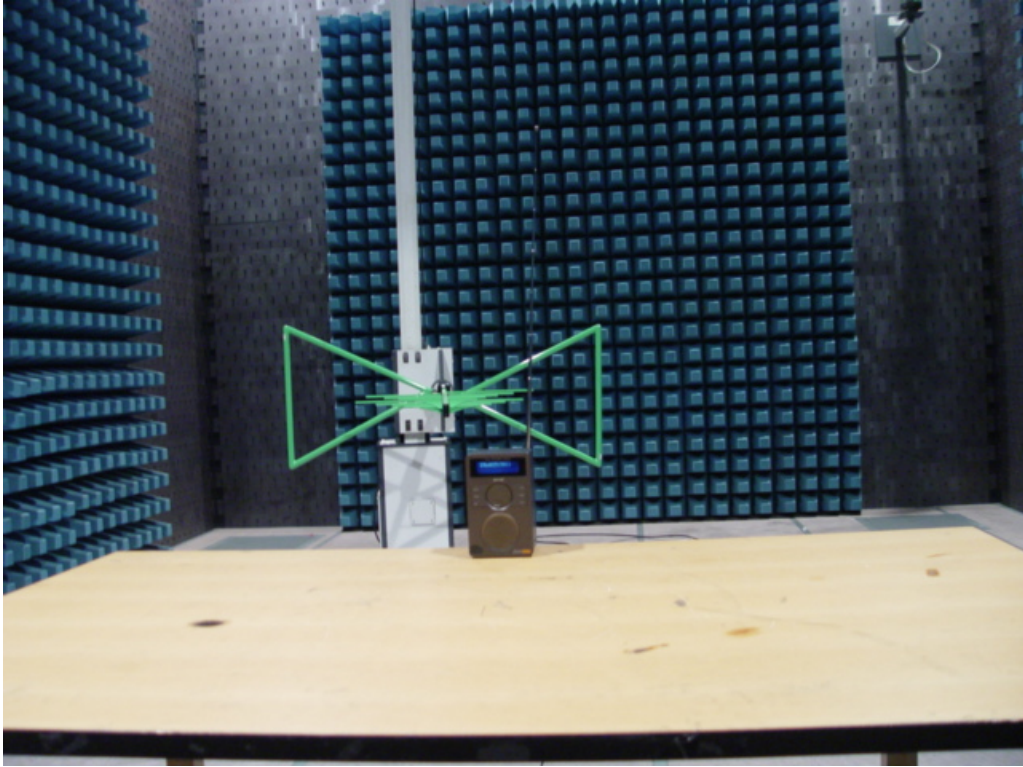
**APPENDIX I TEST PHOTO**



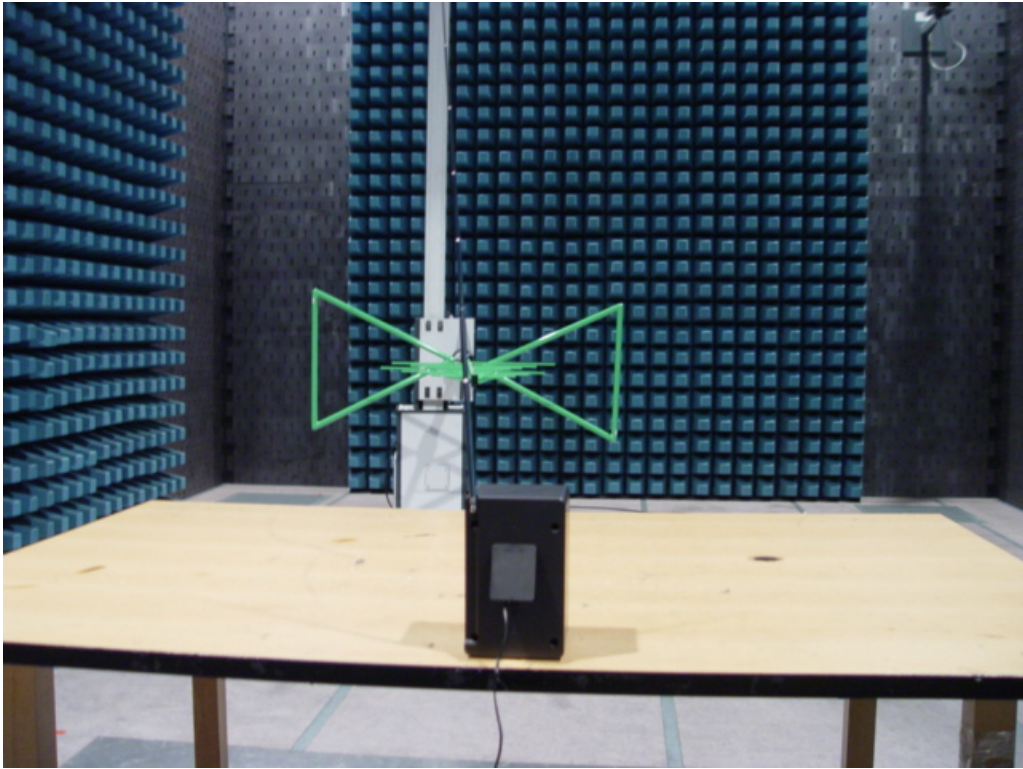
**Photo 1 Conducted Emission Test**



**Photo 2 Radaited Emission Test**



**Photo 3 Radaited Emission Test**

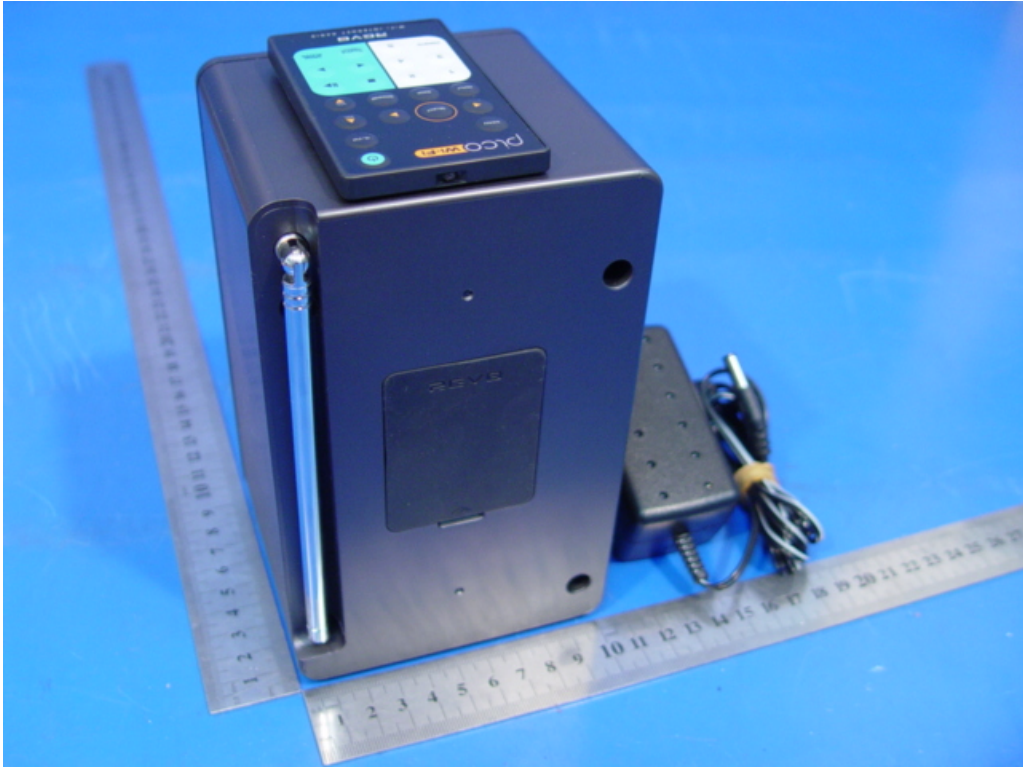


**APPENDIX II EUT PHOTO**

**Photo 1 Appearance of EUT**



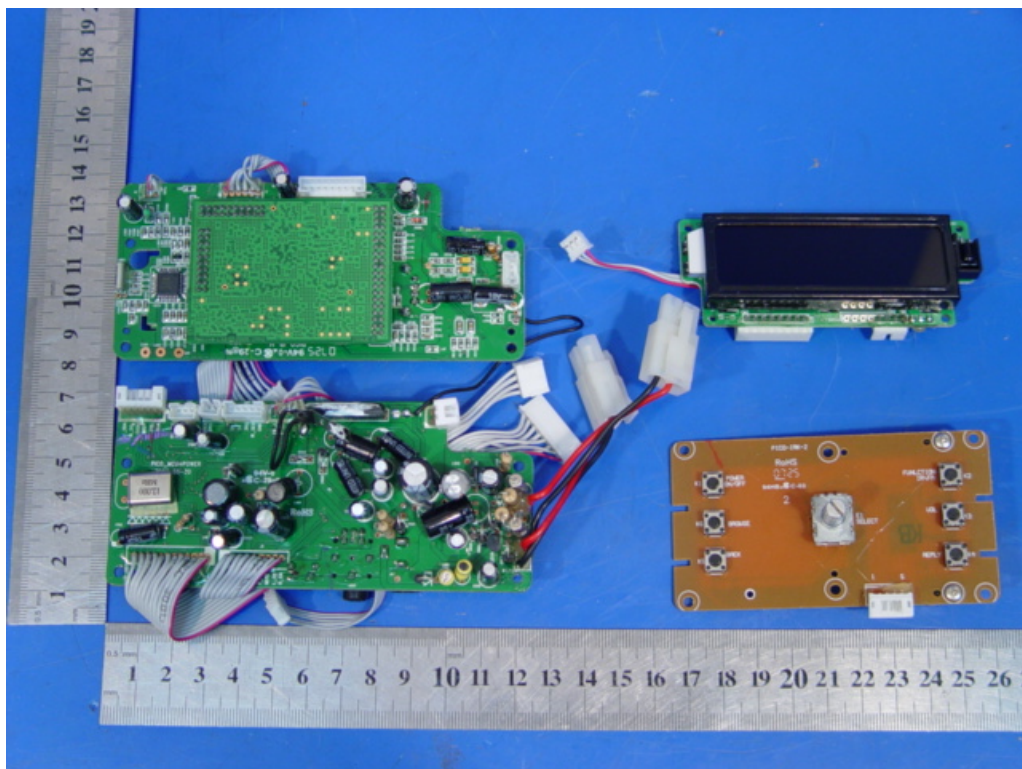
**Photo 2 Appearance of EUT**



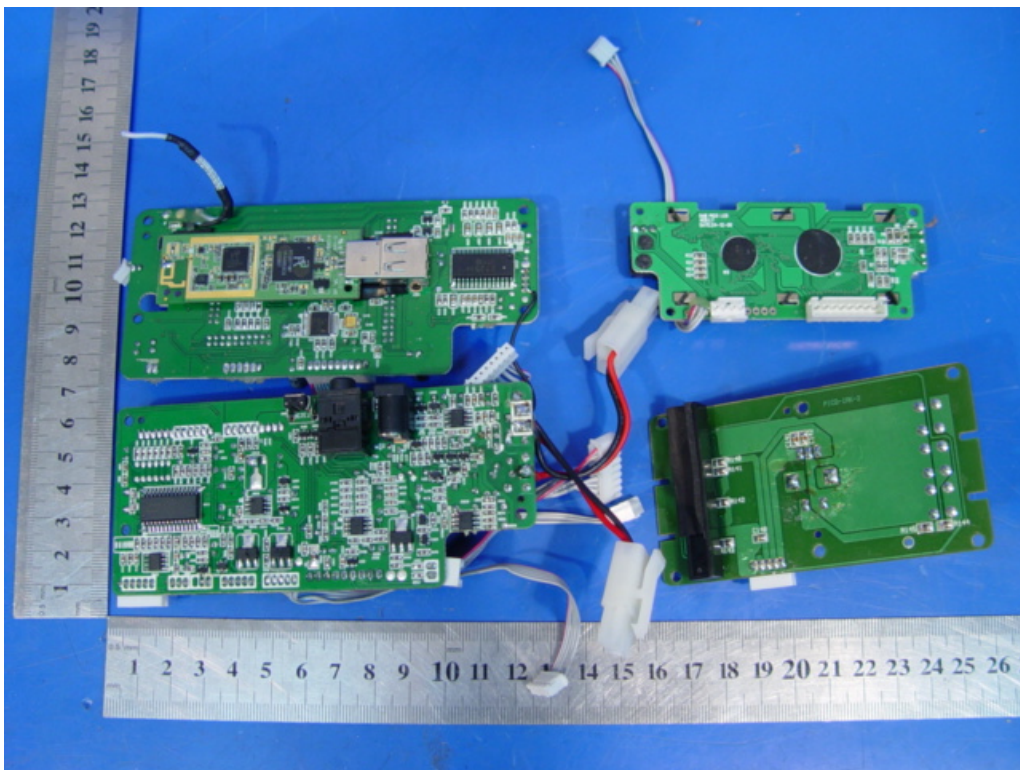
**Photo 3 Inside of EUT**



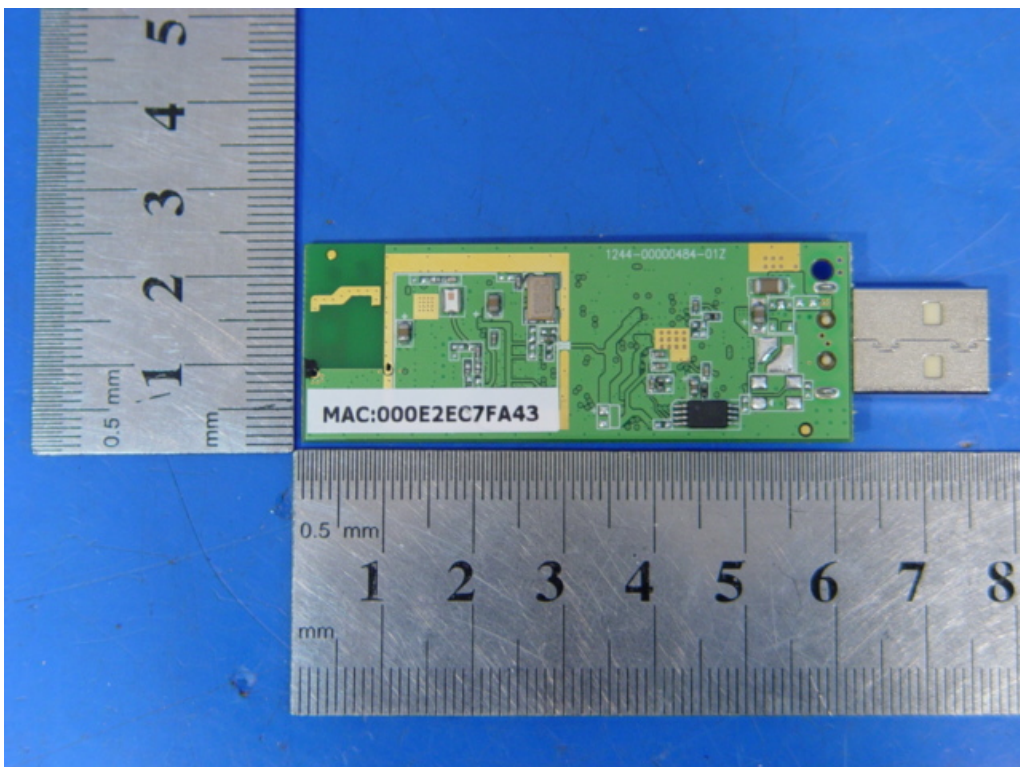
**Photo 4 Inside of EUT**



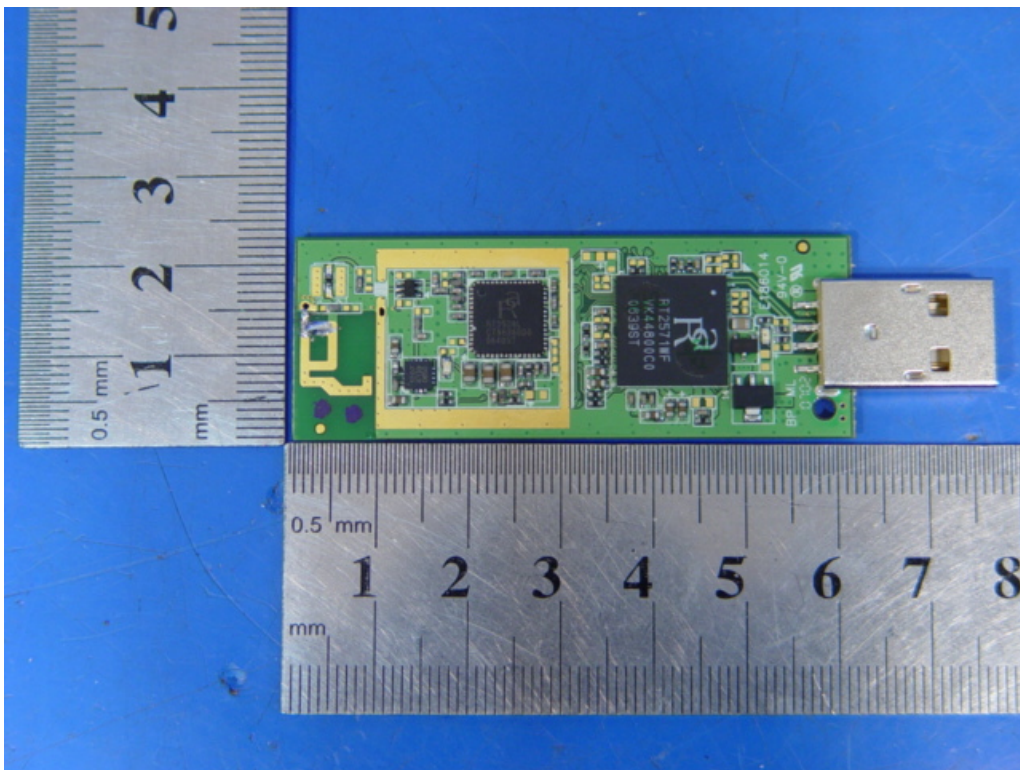
**Photo 5 Inside of EUT**



**Photo 6 Inside of EUT**



**Photo 7 Inside of EUT**



**Photo 8 Adaptor**

