

**ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT  
INTENTIONAL RADIATOR CERTIFICATION TO  
FCC PART 15 SUBPART C REQUIREMENT**

*OF*

**Wireless light Speaker System**

**MODEL No.: L-2017, AB-S10**

**FCC ID: ZOWL-2017**

**REPORT NO: ES110630176F**

**ISSUE DATE: June 23, 2011**

*Prepared for*

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## VERIFICATION OF COMPLIANCE


Applicant:	SHENZHEN 3NOD ELECTRONICS CO. , LTD 3NOD High-tech Park 15#, Zhongfu Road, Tangxiayong Village Industrial Zone. Songgang Town, Baoan District, Shenzhen, Guangdong, China
Manufacturer:	SHENZHEN 3NOD ELECTRONICS CO. , LTD 3NOD High-tech Park 15#, Zhongfu Road, Tangxiayong Village Industrial Zone. Songgang Town, Baoan District, Shenzhen, Guangdong, China
Product Description:	Wireless light Speaker System
Model Number:	L-2017, AB-S10 (Note: Both of the modes are the same, except their model number and trademark are different. We take L-2017 to test.)
File Number:	ES110630176F
Date of Test:	July 20, 2011 to July 22, 2011


### We hereby certify that:


The above equipment was tested by SHENZHEN EMTEK CO., LTD. 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 conducted and radiated emission limits of FCC Rules Part 15.247.

The test results of this report relate only to the tested sample identified in this report.

Date of Test : July 20, 2011 to July 22, 2011

Prepared by :   
(Engineer)

Reviewer :   
(Quality Manager)

Approve & Authorized Signer :   
(Manager)

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## **1. General Information**

### **1.1 Product Description**

A major technical descriptions of EUT is described as following:

- A). Operation Frequency: 2412MHz, 2438MHz, 2464MHz
- B). Modulation: CCK
- C). Number of Channel: 3
- D). Conducted Power: -0.22dBm(2412MHz), -0.15dBm(2438MHz),  
-0.24dBm(2464MHz)
- E) Antenna Gain: 1.5dBi
- F). Antenna Type: PCB Antenna
- G). Power Supply: AC 100-240V
- H). Adapter: Model: Y12FE-075-1500U  
Input: AC 100-240V, 50/60Hz, 0.35A  
Output: DC 7.5V, 1.5A

Note:

1. This device is Wireless light Speaker System have 2.4GHz transceiver function.
2. Test of channel was included the lowest middle and highest frequency to perform the test, then record on this report.

### **1.2 Related Submittal(s) / Grant(s)**

This submittal(s) (test report) is intended for FCC ID: ZOWL-2017 filing to comply with Section 15.247 of the FCC Part 15, Subpart C Rules. The composite system (receiver) is compliance with Subpart B is authorized under a VOC procedure.

### **1.3 Test Methodology**

Both conducted and radiated testing were performed according to the procedures in ANSI C63.4 (2009). Radiated testing was performed at an antenna to EUT distance 3 meters.

### **1.4 Special Accessories**

Not available for this EUT intended for grant.

### **1.5 Equipment Modifications**

Not available for this EUT intended for grant.

## 1.6 Test Facility

Site Description  
EMC Lab.

: Accredited by CNAS, 2010.10.29  
The certificate is valid until 2013.10.28  
The Laboratory has been assessed and proved to be in compliance  
with CNAS/CL01: 2006(identical to ISO/IEC17025: 2005)  
The Certificate Registration Number is L2291

Accredited by TUV Rheinland Shenzhen 2010.5.25  
The Laboratory has been assessed according to the requirements  
ISO/IEC 17025

Accredited by FCC, October 28, 2010  
The Certificate Registration Number is 406365.

Accredited by Industry Canada, March 05, 2010  
The Certificate Registration Number is 46405-4480.

Name of Firm  
Site Location

: SHENZHEN EMTEK CO., LTD.  
: Bldg 69, Majialong Industry Zone,  
Nanshan District, Shenzhen, Guangdong, China

## 2. System Test Configuration

### 2.1 EUT Configuration

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner which intends to maximize its emission characteristics in a continuous normal application.

### 2.2 EUT Exercise

The Transmitter was operated in the normal operating mode. the Tx frequency was fixed which was for the purpose of the measurements.

### 2.3 Test Procedure

#### 2.3.1 Conducted Emissions

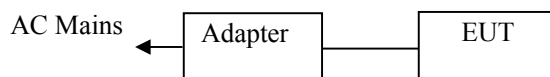
The EUT is a placed on as turn table which is 0.8 m above ground plane. According to the requirements in Section 13.1.4.1 of ANSI C63.4-2009 Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30 MHz using CISPR Quasi-Peak and average detector mode.

#### 2.3.2 Radiated Emissions

The EUT is a placed on as turn table which is 0.8 m above ground plane. The turn table shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. 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 13.1.4.1 of ANSI C63.4-2009.

### 2.4 Configuration of Tested System

**Fig. 2-1 Configuration of Tested System**



**Table 2-1 Equipment Used in Tested System**

Item	Equipment	Mfr/Brand	Model/Type No.	FCC ID	Series No.	Note
1.	Wireless light Speaker System	N/A	L-2015	ZOWL-2017	N/A	EUT
2	Adapter	N/A	Y12FE-075-1500U	N/A	N/A	

**Note:**

- (1) Unless otherwise denoted as EUT in 『Remark』 column, device(s) used in tested system is a support equipment.



### 3. Description of Test Modes

The Transmitter of EUT is Wireless light Speaker System .

- 1.For first channel : 2412MHz
- 2.For second channel : 2438MHz
- 3.For third channel: 2464MHz

#### **EUT operating conditions:**

The EUT exercise program used during conducted testing was designed to exercise the EUT in a manner similar to typical use, The exercise sequence is listed as below:

1. Setup the EUT and simulators as shown on 2.4.
2. Turn on the power of all equipments.
3. The EUT Ping with the Wireless Speaker W/Lighting
4. Repeat the above steps.

#### 4. Summary of Test Results

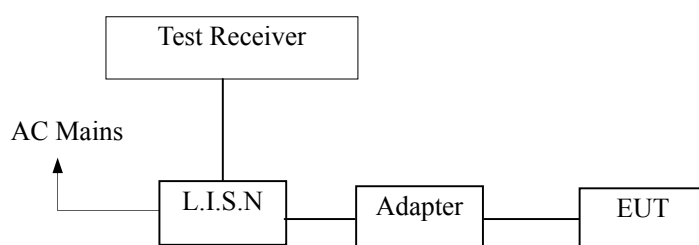
<b>FCC Rules</b>	<b>Description Of Test</b>	<b>Result</b>
§15.247(a)(2)	6dB bandwidth	Compliant
§15.247(b)(3)	Max Peak output Power test	Compliant
§15.247(e)	Power density	Compliant
§15.247(d)	Band edge test	Compliant
§15.207	AC Power Conducted Emission	Compliant
§15.247(d), §15.209	Radiated Emission	Compliant
§15.203	Antenna Port Emission	Compliant
§15.109	Antenna Application	Compliant

## 5. Conducted Emissions Test

### 5.1 Measurement Procedure

1. The EUT was placed on a table which is 0.8m above ground plane.
2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
3. Repeat above procedures until all frequency measured were complete.

### 5.2 Test SET-UP (Block Diagram of Configuration)



### 5.3 Measurement Equipment Used

Conducted Emission Test Site					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Test Receiver	Rohde & Schwarz	ESCS30	828985/018	05/29/2011	05/29/2012
L.I.S.N.	Schwarzbeck	NNLK8129	8129203	05/29/2011	05/29/2012
50Ω Coaxial Switch	Anritsu	MP59B	M20531	N/A	N/A
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100006	05/29/2011	05/29/2012
Voltage Probe	Rohde & Schwarz	TK9416	N/A	05/29/2011	05/29/2012
I.S.N	Rohde & Schwarz	ENY22	1109.9508.02	05/29/2011	05/29/2012

### 5.4 Conducted Emission Limit

Conducted Emission Frequency(MHz)	Quasi-peak	Average
0.15-0.5	66-56	56-46
0.5-5.0	56	46
5.0-30.0	60	50

- Note:**
1. The lower limit shall apply at the transition frequencies
  2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.

## 5.5 Measurement Result

Date of Test:	June 21, 2011	Temperature:	22
Frequency Detector:	0.15~30MHz	Humidity:	50%
Test Result:	PASS	Test Mode:	TX Mode

Test Line	Frequency MHz	Emission Level QP dB(μV)	Emission Level AV dB(μV)	Limits QP dB(μV)	Limits AV dB(μV)	Over QP dB(μV)	Over AV dB(μV)
Neutral	0.15	48.45	28.77	66.00	56.00	-17.55	-27.23
	0.30	43.69	25.76	60.24	50.24	-16.55	-24.48
	0.50	41.23	27.18	56.00	46.00	-14.77	-18.82
	0.79	40.73	19.35	56.00	46.00	-15.27	-26.65
	1.71	42.35	19.05	56.00	46.00	-13.65	-26.95
	18.58	39.22	24.05	60.00	50.00	-20.78	-25.95
Line	0.15	46.38	31.05	66.00	56.00	-19.62	-24.95
	0.30	42.82	23.29	60.24	50.24	-17.42	-26.95
	0.75	39.46	20.14	56.00	46.00	-16.54	-25.86
	1.54	36.85	18.11	56.00	46.00	-19.15	-27.89
	9.88	32.24	22.04	60.00	50.00	-27.76	-27.96
	18.23	37.85	22.36	60.00	50.00	-22.15	-27.64

## 5.6 Conducted Measurement Photo



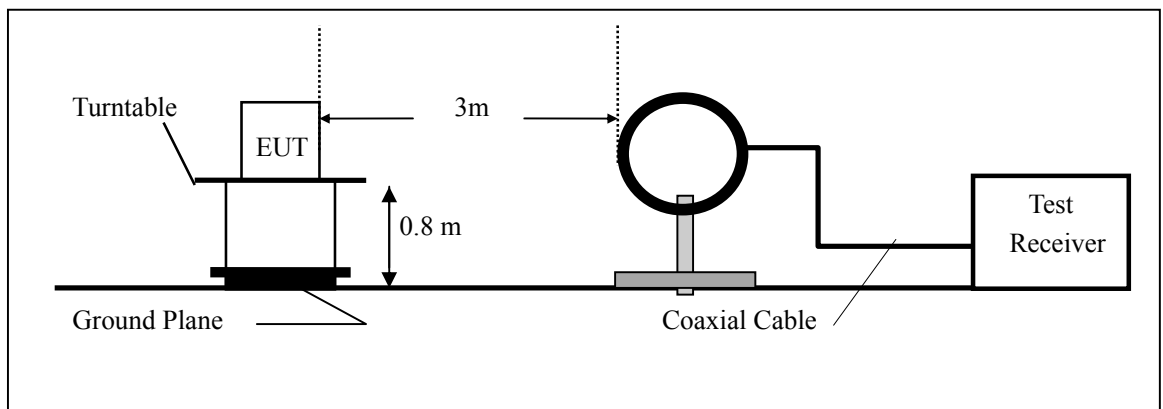
## 6. Radiated Emission Test

### 6.1 Measurement Procedure

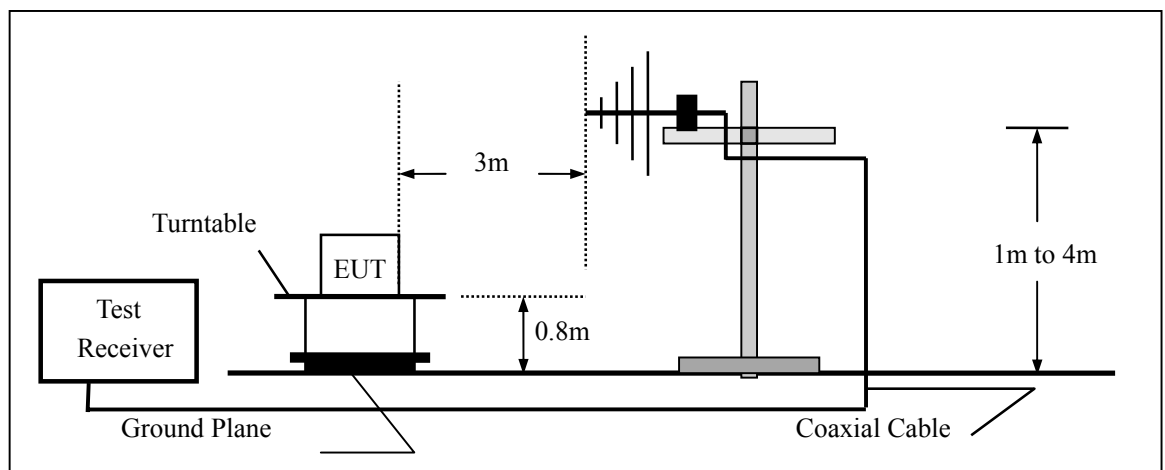
1. The EUT was placed on a turn table which is 0.8m above ground plane.
2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
3. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
4. Repeat above procedures until all frequency measured were complete.

### 6.2 Test SET-UP (Block Diagram of Configuration)

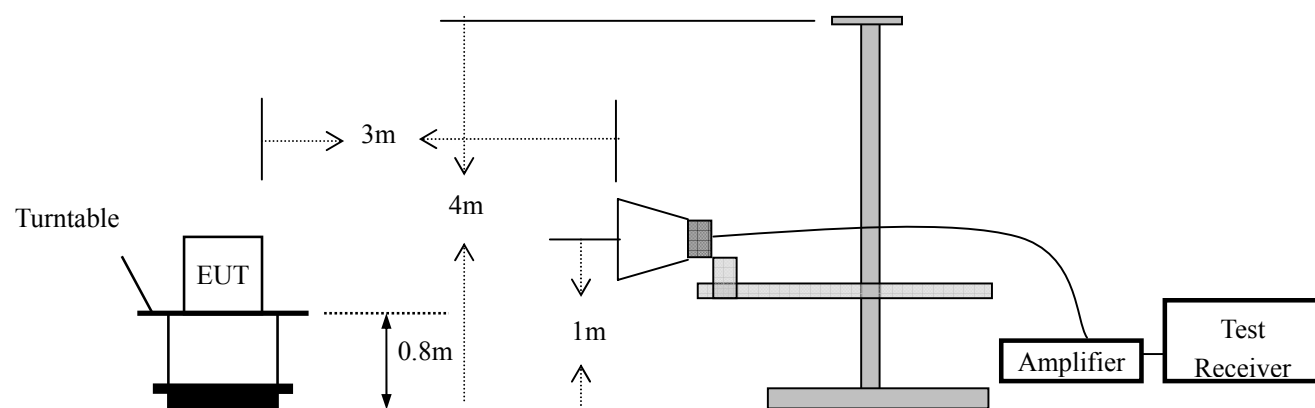
(A) Radiated Emission Test Set-Up, Frequency Below 30MHz



(B) Radiated Emission Test Set-Up, Frequency Below 1000MHz



(C) Radiated Emission Test Set-Up, Frequency above 1000MHz



### 6.3 Measurement Equipment Used

EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
EMI Test Receiver	Rohde & Schwarz	ESU	1302.6005.26	May 29, 2011	05/29/2012
Pre-Amplifier	HP	8447D	2944A07999	May 29, 2011	05/29/2012
Bilog Antenna	Schwarzbeck	VULB9163	142	May 29, 2011	05/29/2012
Loop Antenna	ARA	PLA-1030/B	1029	May 29, 2011	05/29/2012
Horn Antenna	Schwarzbeck	BBHA 9170	BBHA9170399	May 29, 2011	05/29/2012
Horn Antenna	Schwarzbeck	BBHA 9120	D143	May 29, 2011	05/29/2012
Cable	Schwarzbeck	AK9513	ACRX1	May 29, 2011	05/29/2012
Cable	Rosenberger	N/A	FP2RX2	May 29, 2011	05/29/2012
Cable	Schwarzbeck	AK9513	CRPX1	May 29, 2011	05/29/2012
Cable	Schwarzbeck	AK9513	CRRX2	May 29, 2011	05/29/2012

### 6.4 Radiated Emission Limit

#### FCC Class B Limit at 3m:

Frequency MHz	Distance Meter	Field Strength uV/m	Field Strength dBuV/m
30~88	3	100	40.0
88~216	3	150	43.5
216~960	3	200	46.0
960~1000	3	500	54.0
Above 1000	3	74(Peak), 54(AVG)	

Note: The frequencies above 1000MHz, as measured using instrumentation with a peak detector function was corresponding to 20dB above maximum permitted average limit.

## 6.5 Measurement Result

Operation Mode: TX (2412MHz)      Test Date : June 21, 2011  
Frequency Range: 30~1000MHz      Temperature : 28  
Test Result: PASS      Humidity : 65 %  
Measured Distance: 3m      Test By: WOLF

Freq. (MHz)	Ant.Pol. H/V	Emission Level (dBuV)	Limit 3m (dBuV/m)	Over (dB)	Note
43.99	V	28.79	40.00	-11.21	QP
51.76	V	33.30	40.00	-6.70	QP
59.53	V	28.71	40.00	-11.29	QP
98.39	V	26.04	43.50	-17.46	QP
109.27	V	26.38	43.50	-17.12	QP
132.59	V	28.99	43.50	-14.51	QP
54.87	H	25.06	40.00	-14.94	QP
418.62	H	31.44	46.00	-14.56	QP
466.81	H	33.96	46.00	-12.04	QP
603.60	H	29.85	46.00	-16.15	QP
676.66	H	31.25	46.00	-14.75	QP
751.28	H	31.93	46.00	-14.07	QP

- Note:**
- (1) All Readings are Peak Value.
  - (2) Emission Level= Reading Level+Probe Factor +Cable Loss.
  - (3) The average measurement was not performed when the peak measured data under the limit of average detection.
  - (4) EUT lying on the table position is the worst case result in the report.



Operation Mode: TX (2438MHz)      Test Date : June 21, 2011  
Frequency Range: 30~1000MHz      Temperature : 28  
Test Result: PASS      Humidity : 65 %  
Measured Distance: 3m      Test By: WOLF

Freq. (MHz)	Ant.Pol. H/V	Emission Level (dBuV)	Limit 3m (dBuV/m)	Over (dB)	Note
46.04	V	29.49	40.00	-10.51	QP
53.08	V	25.40	40.00	-14.60	QP
63.10	V	22.62	40.00	-17.38	QP
94.39	V	30.82	43.50	-12.68	QP
106.31	V	27.44	43.50	-16.06	QP
131.54	V	29.01	43.50	-14.49	QP
56.13	H	24.19	40.00	-15.81	QP
415.68	H	34.63	46.00	-11.37	QP
469.21	H	29.73	46.00	-16.27	QP
602.53	H	26.93	46.00	-19.07	QP
672.69	H	31.00	46.00	-15.00	QP
748.24	H	28.53	46.00	-17.47	QP

- Note:**
- (1) All Readings are Peak Value.
  - (2) Emission Level= Reading Level+Probe Factor +Cable Loss.
  - (3) The average measurement was not performed when the peak measured data under the limit of average detection.
  - (4) EUT lying on the table position is the worst case result in the report.

Operation Mode:	TX (2464MHz)	Test Date :	June 21, 2011
Frequency Range:	30~1000MHz	Temperature :	28
Test Result:	PASS	Humidity :	65 %
Measured Distance:	3m	Test By:	WOLF

Freq. (MHz)	Ant.Pol. H/V	Emission Level (dBuV)	Limit 3m (dBuV/m)	Over (dB)	Note
45.11	V	28.92	40.00	-11.08	QP
50.69	V	24.72	40.00	-15.28	QP
58.28	V	21.78	40.00	-18.22	QP
100.40	V	29.77	43.50	-13.73	QP
109.22	V	23.15	43.50	-20.35	QP
132.57	V	25.57	43.50	-17.93	QP
51.44	H	22.06	40.00	-17.94	QP
419.83	H	34.88	46.00	-11.12	QP
463.18	H	26.62	46.00	-19.38	QP
606.84	H	29.92	46.00	-16.08	QP
678.08	H	28.95	46.00	-17.05	QP
774.33	H	28.64	46.00	-17.36	QP

- Note:**
- (1) All Readings are Peak Value.
  - (2) Emission Level= Reading Level+Probe Factor +Cable Loss.
  - (3) The average measurement was not performed when the peak measured data under the limit of average detection.
  - (4) EUT lying on the table position is the worst case result in the report.

Operation Mode:	TX (2412MHz)	Test Date :	June 21, 2011
Frequency Range:	Above 1GHz	Temperature :	28
Test Result:	PASS	Humidity :	65 %
Measured Distance:	3m	Test By:	WOLF

Freq. (MHz)	Ant.Pol. H/V	Emission Level(dBuV)		Limit 3m(dBuV/m)		Over(dB)	
		PK	AV	PK	AV	PK	AV
2389.42	V	56.5	40.51	74	54	-17.5	-13.49
7238.78	V	59.97	46.71	74	54	-14.03	-7.29
9881.41	V	55.31	42.5	74	54	-18.69	-11.5
--	V	--	--	--	--	--	--
--	V	--	--	--	--	--	--
--	V	--	--	--	--	--	--
2389.42	H	57.92	47.22	74	54	-16.08	-6.78
7238.78	H	55.6	42.68	74	54	-18.4	-11.32
9636.21	H	61.67	46.03	74	54	-12.33	-7.97
--	H	--	--	--	--	--	--
--	H	--	--	--	--	--	--
--	H	--	--	--	--	--	--

**All emissions not reported were more than 20dB below the specified limit or in the noise floor.**

- Note:**
- (1) All Readings are Peak Value and AV.
  - (2) Emission Level= Reading Level+Probe Factor +Cable Loss.
  - (3) Data of measurement within this frequency range shown "--" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
  - (4) EUT lying on the table position is the worst case result in the report.

Operation Mode: TX (2438MHz)      Test Date : June 21, 2011  
Frequency Range: Above 1GHz      Temperature : 28  
Test Result: PASS      Humidity : 65 %  
Measured Distance: 3m      Test By: WOLF

Freq. (MHz)	Ant.Pol. H/V	Emission Level(dBuV)		Limit 3m(dBuV/m)		Over(dB)	
		PK	AV	PK	AV	PK	AV
2409.42	V	54.7	39.31	74	54	-19.3	-14.69
7249.13	V	62.42	47.38	74	54	-11.58	-6.62
9860.26	V	58.54	44.3	74	54	-15.46	-9.7
--	V	--	--	--	--	--	--
--	V	--	--	--	--	--	--
--	V	--	--	--	--	--	--
2400.09	H	61.42	48.08	74	54	-12.58	-5.92
7254.46	H	56.38	40.03	74	54	-17.62	-13.97
9624.98	H	62.9	46.27	74	54	-11.1	-7.73
--	H	--	--	--	--	--	--
--	H	--	--	--	--	--	--
--	H	--	--	--	--	--	--

**All emissions not reported were more than 20dB below the specified limit or in the noise floor.**

- Note:**
- (1) All Readings are Peak Value and AV.
  - (2) Emission Level= Reading Level+Probe Factor +Cable Loss.
  - (3) Data of measurement within this frequency range shown "--" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
  - (4) EUT lying on the table position is the worst case result in the report.

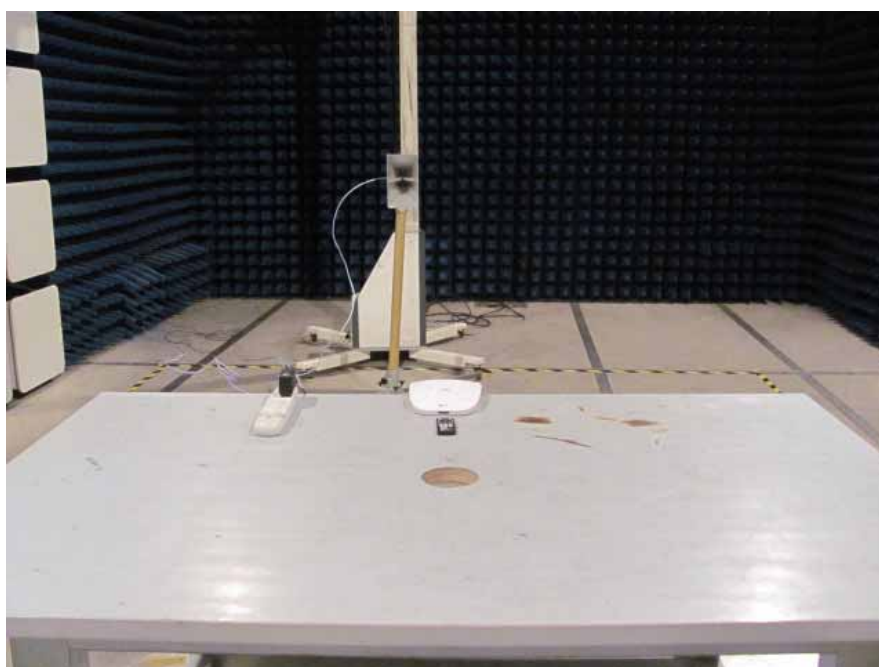
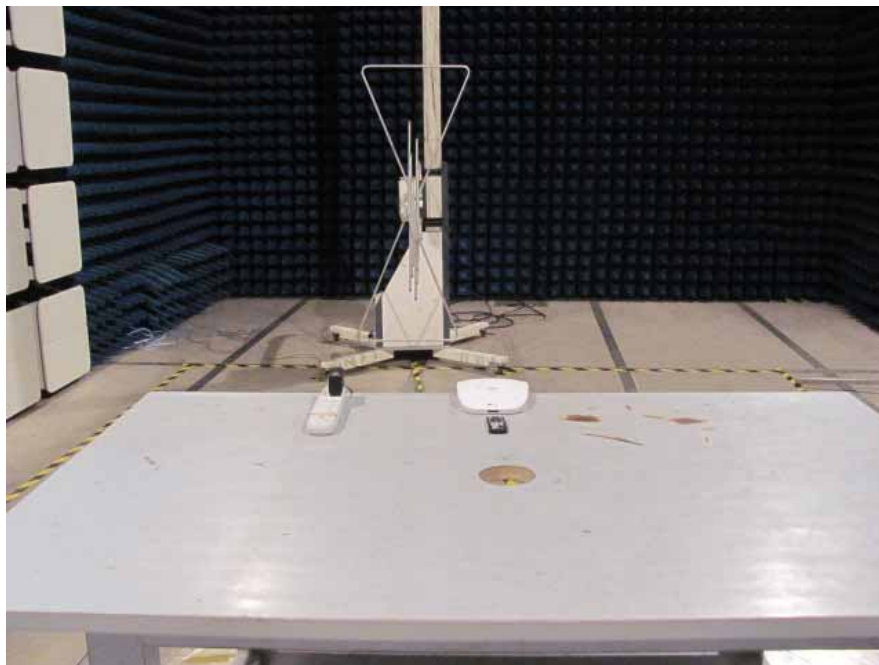
Operation Mode: TX (2464MHz)      Test Date : June 21, 2011  
Frequency Range: Above 1GHz      Temperature : 28  
Test Result: PASS      Humidity : 65 %  
Measured Distance: 3m      Test By: WOLF

Freq. (MHz)	Ant.Pol. H/V	Emission Level(dBuV)		Limit 3m(dBuV/m)		Over(dB)	
		PK	AV	PK	AV	PK	AV
2403.07	V	55	38.11	74	54	-19	-15.89
7247.78	V	59.52	44.81	74	54	-14.48	-9.19
9870.07	V	57.65	43.06	74	54	-16.35	-10.94
--	V	--	--	--	--	--	--
--	V	--	--	--	--	--	--
--	V	--	--	--	--	--	--
2403.67	H	62.48	48.68	74	54	-11.52	-5.32
7249.56	H	57.94	43.26	74	54	-16.06	-10.74
9614.87	H	58.64	44.05	74	54	-15.36	-9.95
--	H	--	--	--	--	--	--
--	H	--	--	--	--	--	--
--	H	--	--	--	--	--	--

**No others harmonics emissions are higher than 20dB below the limits of 47 CFR Part 15.247.**

- Note:**
- (1) All Readings are Peak Value and AV.
  - (2) Emission Level= Reading Level+Probe Factor +Cable Loss.
  - (3) Data of measurement within this frequency range shown "--" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
  - (4) EUT lying on the table position is the worst case result in the report.

## Radiated Measurement Photos

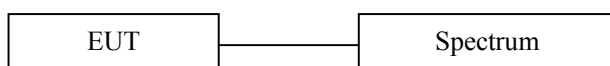


## 7. Occupied Bandwidth Test

### 7.1 Measurement Procedure

The EUT was operating in transmitting mode and could be controlled its channel. Printed out the test result from the spectrum by hard copy function.

### 7.2 Test SET-UP (Block Diagram of Configuration)



### 7.3 Measurement Equipment Used

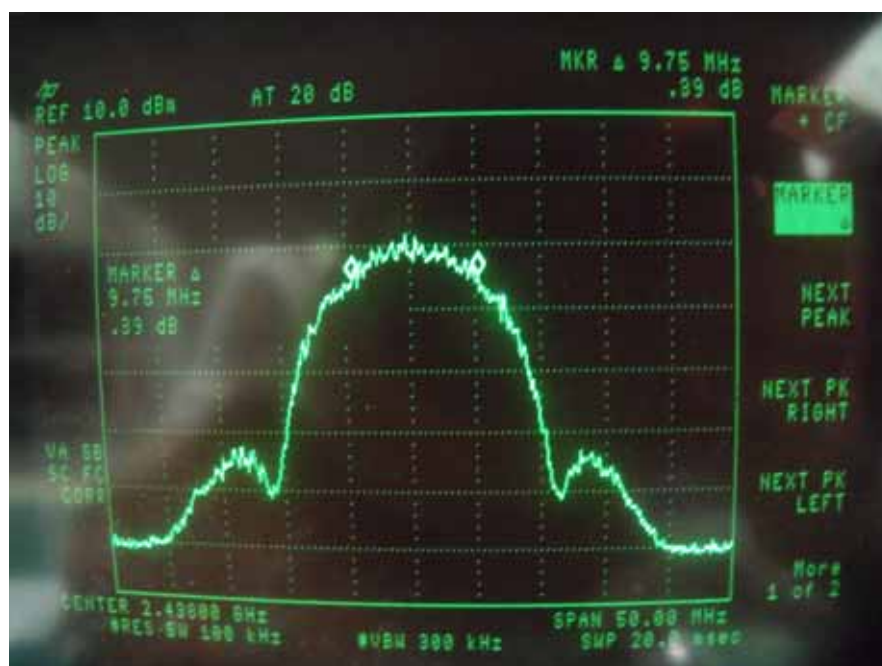
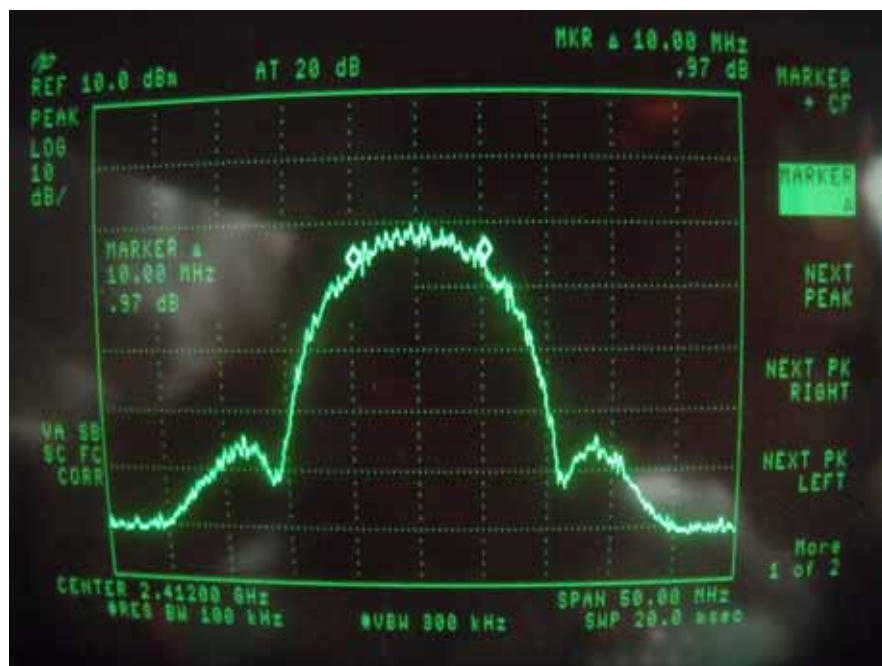
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Spectrum Analyzer	HP	8594E	88156318	05/29/2011	05/29/2012

### 7.4 Measurement Results

6 Bandwidth Test Data Chart:  
Refer to attached data chart.

Spectrum Detector:	PK	Test Date :	June 21, 2011
Test By:	Andy	Temperature :	28
Test Result:	PASS	Humidity :	65 %
Operation Mode:	TX		

Channel number	Channel frequency (MHz)	Measurement level (MHz)	Required Limit (kHz)
1	2412	10.00	>500
2	2438	9.75	>500
3	2464	9.25	>500





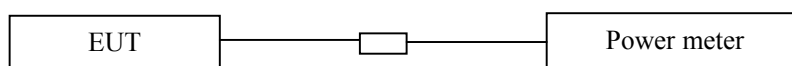


## 8. Maximum Peak Output Power Test

### 8.1 Measurement Procedure

- The Transmitter output (antenna port) was connected to the power meter.
- Turn on the EUT and power meter and then record the peak power value.
- Repeat above procedures on all channels needed to be tested.

### 8.2 Test SET-UP (Block Diagram of Configuration)



### 8.3 Measurement Equipment Used

EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Power meter	Boonton	4232A	29001	05/29/2011	05/29/2012
Power sensor	Boonton	51011-EMC	31184	05/29/2011	05/29/2012

### 8.4 Peak Power output limit

The maximum peak power shall be less 1Watt.

### 8.5 Measurement Results

Spectrum Detector: PK                      Test Date : June 21, 2011  
Test By: Andy                      Temperature : 28  
Test Result: PASS                      Humidity : 65 %  
Operation Mode: TX

Channel number	Channel Frequency(MHz)	Peak Power output(dBm)	Peak Power Limit(W)	Pass/Fail
1	2412.00	-0.22	1W(30dBm)	PASS
2	2438.00	-0.15	1W(30dBm)	PASS
3	2464.00	-0.24	1W(30dBm)	PASS

## 9. Band Edge Test

### 9.1 Measurement Procedure

1. The EUT could be controlled its channel. Printed out test result from the spectrum by hard copy function.
2. The EUT was placed on a turn table which is 0.8m above ground plane.
3. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
4. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
5. Repeat above procedures until all frequency measured were complete.

### 9.2 Test SET-UP (Block Diagram of Configuration)

As 6.2 Test set up (B) and (C)

### 9.3 Measurement Equipment Used

Same as 6.3 Radiated Emission Measurement.

### 9.4 Measurement Results

Spectrum Detector: PK/AV      Test Date : June 21, 2011  
Test By: Andy      Temperature : 28  
Test channel: 2412MHz      Humidity : 65 %

Frequency (MHz)	Polarity	Level (dBuV/m)		Limited (dBuV/m)	
		PK	AV	PK	AV
2395.89	H	45.52	37.23	74	54
2394.56	V	44.56	38.34	74	54

Spectrum Detector: PK/AV      Test Date : June 21, 2011  
Test By: Andy      Temperature : 28  
Test channel: 2464MHz      Humidity : 65 %

Frequency (MHz)	Polarity	Level (dBuV/m)		Limited (dBuV/m)	
		PK	AV	PK	AV
2484.54	H	55.54	46.56	74	54
2483.75	V	55.98	35.90	74	54

## 10. Power Density

### 10.1 Test Equipment

EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Spectrum Analyzer	HP	8594E	88156318	05/29/2011	05/29/2012

### 10.2 Measuring Instruments and Setting

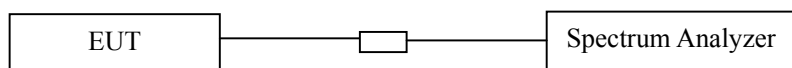
The following table is the setting of spectrum analyzer.

Spectrum analyzer	Setting
Attenuation	Auto
Span Frequency	300kHz
RB	3kHz
VB	10kHz
Detector	Peak
Trace	Max hold
Sweep Time	100s

### 10.3 Test Procedures

- The transmitter output (antenna port) was connected to the spectrum analyzer.
- Set RBW of spectrum analyzer to 3 kHz and VBW to 10 kHz, Set Detector to Peak, Trace to Max Hold.
- Mark the frequency with maximum peak power as the center of the display of the spectrum.
- Set the span to 300 kHz and the sweep time to 100s and record the maximum peak value.

### 10.4 Block Diagram of Test Setup



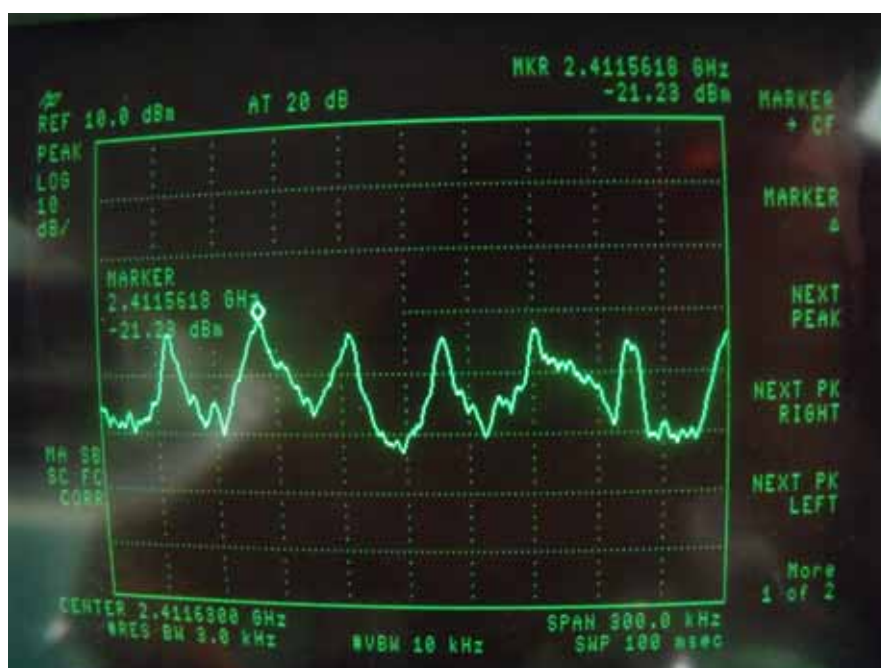
### 10.5 Limit

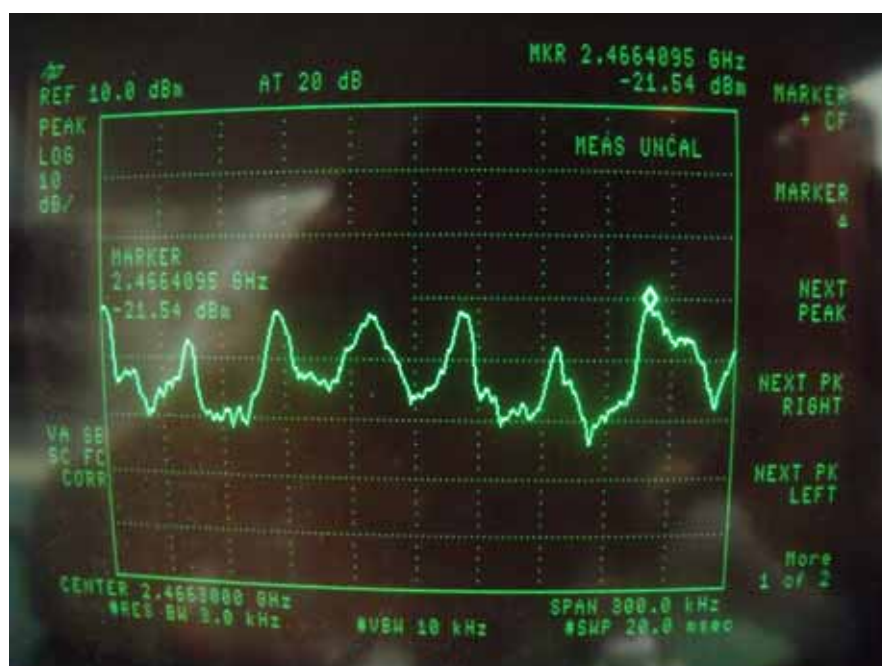
The transmitted power density averaged over any 1 second interval shall not be greater +8dBm in any 3 kHz bandwidth.

## 10.6 Test Result

Spectrum Detector:	PK	Test Date :	June 21, 2011
Test By:	Andy	Temperature :	28
Test Result:	PASS	Humidity :	65 %
Operation Mode:	TX		

Frequency (MHz)	Measurement Level (dBm)	Required Limit (dBm)	Result
2411.56	-21.23	<8dBm	PASS
2437.56	-17.24	<8dBm	PASS
2466.40	-21.54	<8dBm	PASS





## 11. Antenna Port Emission

### 11.1 Test Equipment

EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
EMI Test Receiver	Rohde & Schwarz	ESU	1302.6005.26	05/29/2011	05/29/2012

### 11.2 Measuring Instruments and Setting

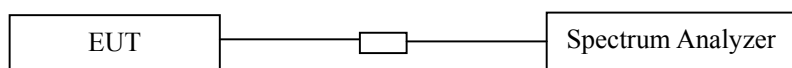
The following table is the setting of spectrum analyzer.

Spectrum analyzer	Setting
Attenuation	Auto
RB	100kHz
VB	300kHz
Detector	Peak
Trace	Max hold

### 11.3 Test Procedures

The conducted spurious emissions were measured conducted using a spectrum analyzer at low, mid, and high channels, The limit was determined by attenuation 20dB of the RF peak power output.

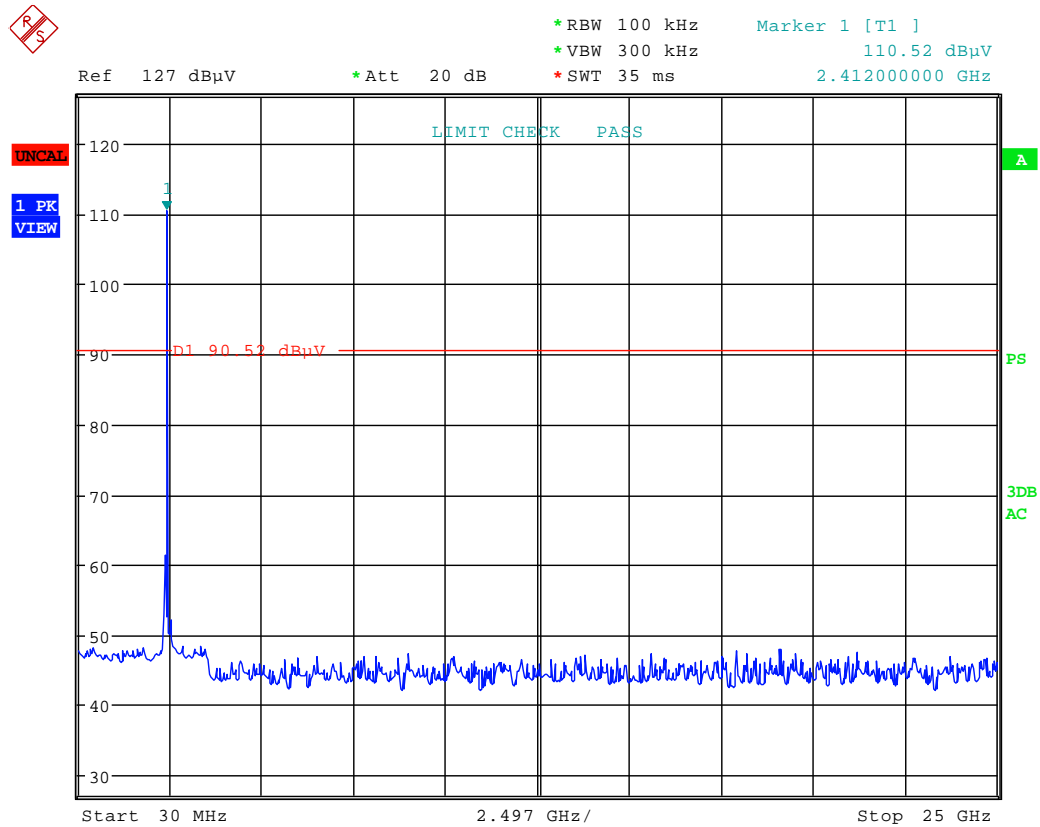
### 11.4 Block Diagram of Test setup



### 11.5 Test Result

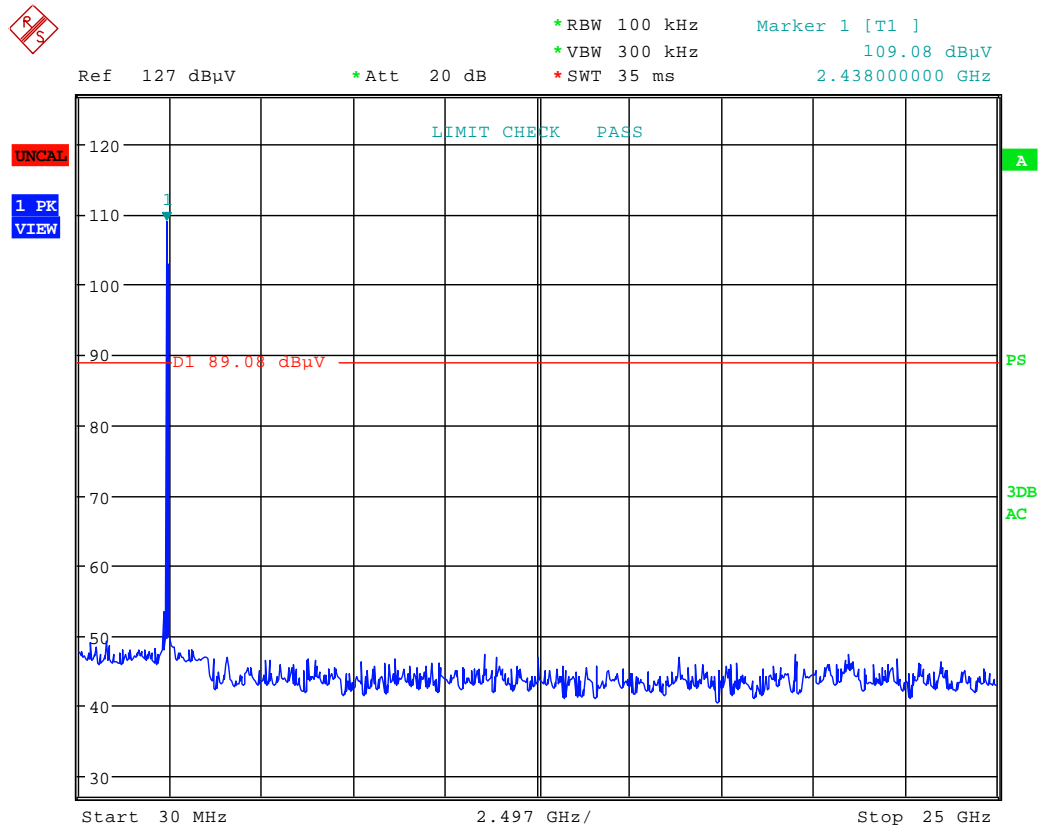
**PASS.**

TX: 2412MHz

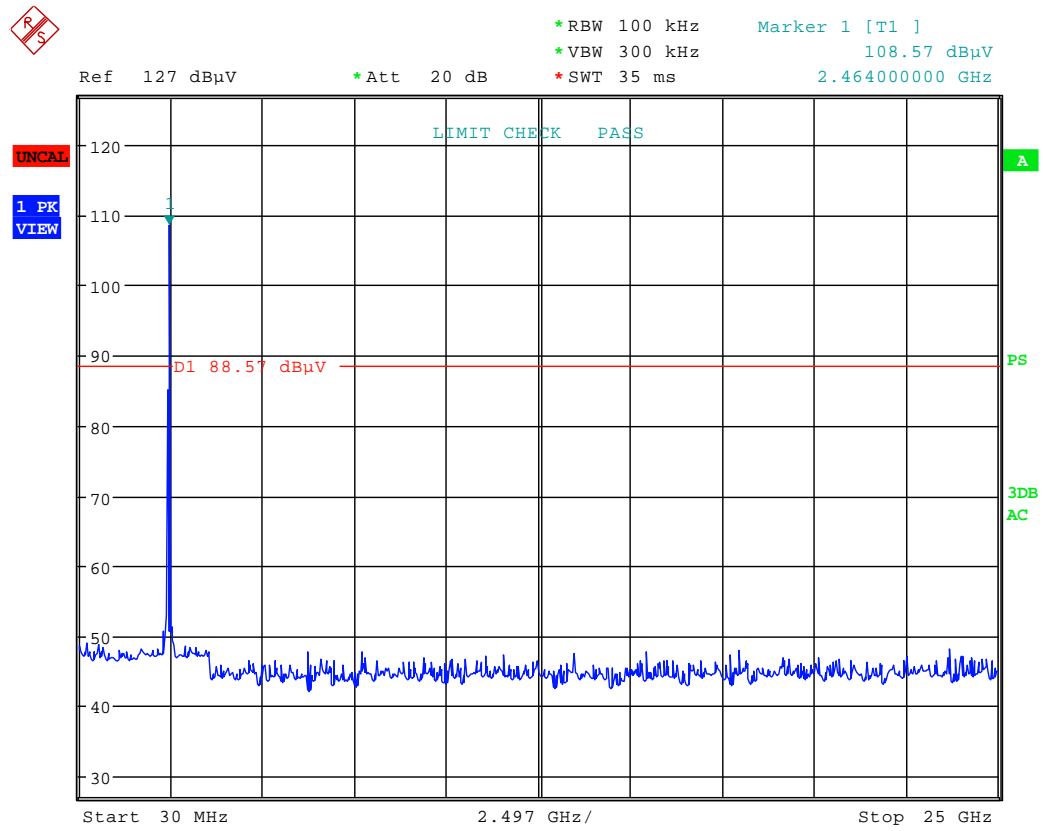




TX: 2438MHz



TX: 2464MHz



## **12. Antenna Application**

### **12.1 Antenna Requirement**

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.

### **12.2 Result**

The EUT'S antenna is PCB Antenna. The antenna's gain is 1.5dBi and meets the requirement.