

# **FCC TEST REPORT**

**Test report  
On Behalf of  
Shenzhen Sourceway Technology Co., LTD.  
For  
Wireless Presenter  
Model No.: 21946**

**FCC ID: 2AKFF21946P**

**Prepared for :** Shenzhen Sourceway Technology Co., LTD.  
5/F, Tower B, WDL Business Building, No.194 Meilong Road,  
Longhua District, Shenzhen, P.R.China

**Prepared By :** Laboratory of Shenzhen United Testing Technology Co., Ltd  
Room 316-319, Block B, Honghualing Industrial Park of the Fifth Zone, Taoyuan  
Street, Nanshan District, Shenzhen, Guangdong, China

**Date of Test:** March 02, 2017 ~ March 09, 2017

**Date of Report:** March 09, 2017

**Report Number:** UNI1700302051-E

## TEST RESULT CERTIFICATION

**Applicant's name** ..... : Shenzhen Sourceway Technology Co., LTD.

Address ..... : 5/F, Tower B, WDL Business Building, No.194 Meilong Road,  
Longhua District, Shenzhen, P.R.China

**Manufacture's Name** ..... : Dongguan Boyye Industrial Co., LTD.

Address ..... : #36 Shengye Road, North District of Tianmei Park,  
Huangjiang Town, Dongguan, Guangdong, China

### Product description

Trade Mark: Trust

Product name ..... : Wireless Presenter

Model and/or type reference : 21946

**Standards** ..... : FCC Rules and Regulations Part 15 Subpart C Section 15.249  
ANSI C63.10: 2013

This publication may be reproduced in whole or in part for non-commercial purposes as long as the **Laboratory of Shenzhen United Testing Technology Co., Ltd** is acknowledged as copyright owner and source of the material. **Laboratory of Shenzhen United Testing Technology Co., Ltd** takes no responsibility for and will not assume liability for damages resulting from the reader's interpretation of the reproduced material due to its placement and context.

**Date of Test** ..... :

Date (s) of performance of tests ..... : March 09, 2017 ~ March 09, 2017

Date of Issue ..... : March 09, 2017

Test Result ..... : **Pass**

Testing Engineer :



---

(Eric Xie)

Technical Manager :



---

(Dora Qin)

Authorized Signatory :



---

(Kait Chen)

<b>Table of Contents</b>	<b>Page</b>
1 . TEST SUMMARY	4
2 . GENERAL INFORMATION	5
2.1 GENERAL DESCRIPTION OF EUT	5
Operation of EUT during testing	6
2.2 DESCRIPTION OF TEST SETUP	6
2.3 MEASUREMENT INSTRUMENTS LIST	7
3 . CONDUCTED EMISSIONS TEST	8
3.1 Conducted Power Line Emission Limit	8
3.2 Test Setup	8
3.3 Test Procedure	8
3.4 Test Result	8
4 RADIATED EMISSION TEST	9
4.1 Radiation Limit	9
4.2 Test Setup	9
4.3 Test Procedure	10
4.4 Test Result	10
5 BAND EDGE	17
5.1 Limits	17
5.2 Test Procedure	17
5.3 Test Result	17
6 OCCUPIED BANDWIDTH MEASUREMENT	19
6.1 Test Setup	19
6.2 Test Procedure	19
6.3 Measurement Equipment Used	19
6.4 Test Result	19
7 ANTENNA REQUIREMENT	21
8 PHOTOGRAPH OF TEST	22
8.1 Radiated Emission	22

## 1. TEST SUMMARY

### 1.1 TEST PROCEDURES AND RESULTS

DESCRIPTION OF TEST	RESULT
CONDUCTED EMISSIONS TEST	N/A
RADIATED EMISSION TEST	COMPLIANT
BAND EDGE	COMPLIANT
OCCUPIED BANDWIDTH MEASUREMENT	COMPLIANT
ANTENNA REQUIREMENT	COMPLIANT

### 1.2 TEST FACILITY

Test Firm : Dongguan Dongdian Testing Service Co., Ltd  
Certificated by FCC, Registration No.: 270092

Address : No.17 Zongbu road 2, Songshan Lake Sci&Tech Park, DongGuan  
City, Guangdong province, 523808 China

### 1.3 MEASUREMENT UNCERTAINTY

Measurement Uncertainty

Conducted Emission Expanded Uncertainty	= 2.23dB, k=2
Radiated emission expanded uncertainty(9kHz-30MHz)	= 3.08dB, k=2
Radiated emission expanded uncertainty(30MHz-1000MHz)	= 4.42dB, k=2
Radiated emission expanded uncertainty(Above 1GHz)	= 4.06dB, k=2

## 2. GENERAL INFORMATION

### 2.1 GENERAL DESCRIPTION OF EUT

Equipment	Wireless Presenter
Model Name	21946
Serial No	N/A
Model Difference	N/A
FCC ID	2AKFF21946P
Antenna Type	PCB Antenna
Antenna Gain	0 dBi
BT Operation frequency	2408-2474MHz
Number of Channels	34CH
Modulation Type	GFSK
Power Source	N/A
Power Rating	DC 1.5V from battery

## 2.1.1 Carrier Frequency of Channels

Channel List							
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
01	2408	11	2428	21	2448	31	2468
02	2410	12	2430	22	2450	32	2470
03	2412	13	2432	23	2452	33	2472
04	2414	14	2434	24	2454	34	2474
05	2416	15	2436	25	2456	/	/
06	2418	16	2438	26	2458	/	/
07	2420	17	2440	27	2460	/	/
08	2422	18	2442	28	2462	/	/
09	2424	19	2444	29	2464	/	/
10	2426	20	2446	30	2466	/	/

## Operation of EUT during testing

## Operating Mode

The mode is used: **Transmitting mode**

Low Channel: 2408MHz

Middle Channel: 2440MHz

High Channel: 2474MHz

## 2.2 DESCRIPTION OF TEST SETUP

Operation of EUT during Radiation testing:

EUT

## 2.3 MEASUREMENT INSTRUMENTS LIST

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	EMI Receiver	Rohde & Schwarz	ESCI	100627	Feb. 19, 2017	1 Year
2.	LISN	SchwarzBeck	NSLK 8126	8126377	Feb. 19, 2017	1 Year
3.	RF Switching Unit	Compliance Direction	RSU-M2	38303	Feb. 19, 2017	1 Year
4.	EMI Test Software ES-K1	Rohde & Schwarz	N/A	N/A	N/A	N/A
5.	EMI Test Receiver	Rohde & Schwarz	ESCI	100627	Feb. 19, 2017	1 Year
6.	Trilog Broadband Antenna	Schwarzbeck	VULB9163	VULB 9163-289	Feb. 19, 2017	1 Year
7.	Pre-amplifier	Compliance Direction	PAP-0203	22008	Feb. 19, 2017	1 Year
8.	EMI Test Software EZ-EMC	SHURPLE	N/A	N/A	N/A	N/A
9.	EMI Receiver	Rohde & Schwarz	ESCI	100627	Feb. 19, 2017	1 Year
10.	LISN	SchwarzBeck	NSLK 8126	8126377	Feb. 19, 2017	1 Year
11.	RF Switching Unit	Compliance Direction	RSU-M2	38303	Feb. 19, 2017	1 Year
12.	EMI Test Software ES-K1	Rohde & Schwarz	N/A	N/A	N/A	N/A
13.	EMI Receiver	Rohde & Schwarz	ESCI	100627	Feb. 19, 2017	1 Year
14.	EMI Receiver	Rohde & Schwarz	ESCI	100627	Feb. 19, 2017	1 Year
15.	LISN	SchwarzBeck	NSLK 8126	8126377	Feb. 19, 2017	1 Year
16.	RF Switching Unit	Compliance Direction	RSU-M2	38303	Feb. 19, 2017	1 Year
17.	EMI Test Software ES-K1	Rohde & Schwarz	N/A	N/A	N/A	N/A
18.	Power Meter	R&S	NRVD	SEL0069	Feb. 19, 2017	1 Year
19.	Power Sensor	R&S	URV5-Z2	SEL0071	Feb. 19, 2017	1 Year
20.	Power Sensor	R&S	URV5-Z2	SEL0072	Feb. 19, 2017	1 Year
21.	Software EMC32	R&S	EMC32-S	SEL0082	N/A	N/A
22.	Log-periodic Antenna	Amplifier Reasearch	Ai9-480	SEL0073	N/A	N/A
23.	Antenna Tripod	Amplifier Reasearch	TP1000A	SEL0074	N/A	N/A
24.	High Gain Horn Antenna(0.8-5GHz)	Amplifier Reasearch	AT4002A	SEL0075	N/A	N/A
25.	Spectrum analyzer	Agilent	N9020A	MY499110 048	Feb. 19, 2017	1 Year
26.	Spectrum analyzer	Agilent	E4407B	MY461843 26	Feb. 19, 2017	1 Year

### 3. CONDUCTED EMISSIONS TEST

#### 3.1 Conducted Power Line Emission Limit

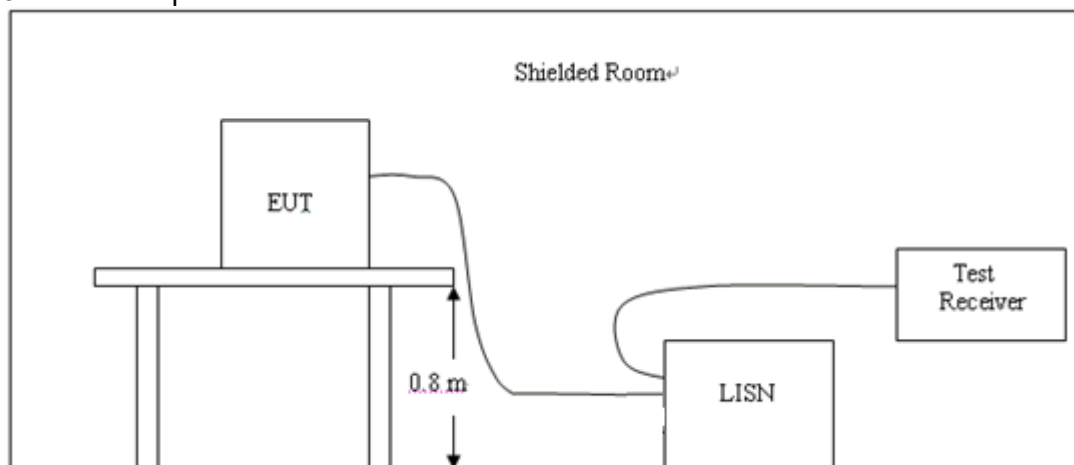
For unintentional device, according to § 15.107(a) Line Conducted Emission Limits is as following

Frequency (MHz)	Maximum RF Line Voltage (dB $\mu$ V)			
	CLASS A		CLASS B	
	Q.P.	Ave.	Q.P.	Ave.
0.15 - 0.50	79	66	66-56*	56-46*
0.50 - 5.00	73	60	56	46
5.00 - 30.0	73	60	60	50

\* Decreasing linearly with the logarithm of the frequency

For intentional device, according to §15.207(a) Line Conducted Emission Limit is same as above table.

#### 3.2 Test Setup



#### 3.3 Test Procedure

- 1, The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. The EUT is a tabletop system, a wooden table with a height of 0.8 meters is used and is placed on the ground plane as per ANSI C63.10.
- 2, Support equipment, if needed, was placed as per ANSI C63.10.
- 3, All I/O cables were positioned to simulate typical actual usage as per ANSI C63.10.
- 4, If a EUT received DC power from the USB Port of Notebook PC, the PC's adapter received AC120V/60Hz power through a Line Impedance Stabilization Network (LISN) which supplied power source and was grounded to the ground plane.
- 5, All support equipments received AC power from a second LISN, if any.
- 6, The EUT test program was started. Emissions were measured on each current carrying line of the EUT using a spectrum Analyzer / Receiver connected to the LISN powering the EUT. The LISN has two monitoring points: Line 1 (Hot Side) and Line 2 (Neutral Side). Two scans were taken: one with Line 1 connected to Analyzer / Receiver and Line 2 connected to a 50 ohm load; the second scan had Line 1 connected to a 50 ohm load and Line 2 connected to the Analyzer / Receiver.
- 7, Analyzer / Receiver scanned from 150 KHz to 30MHz for emissions in each of the test modes.

#### 3.4 Test Result

N/A

EUT power supply by battery, so this test item not applicable.



## 4 RADIATED EMISSION TEST

### 4.1 Radiation Limit

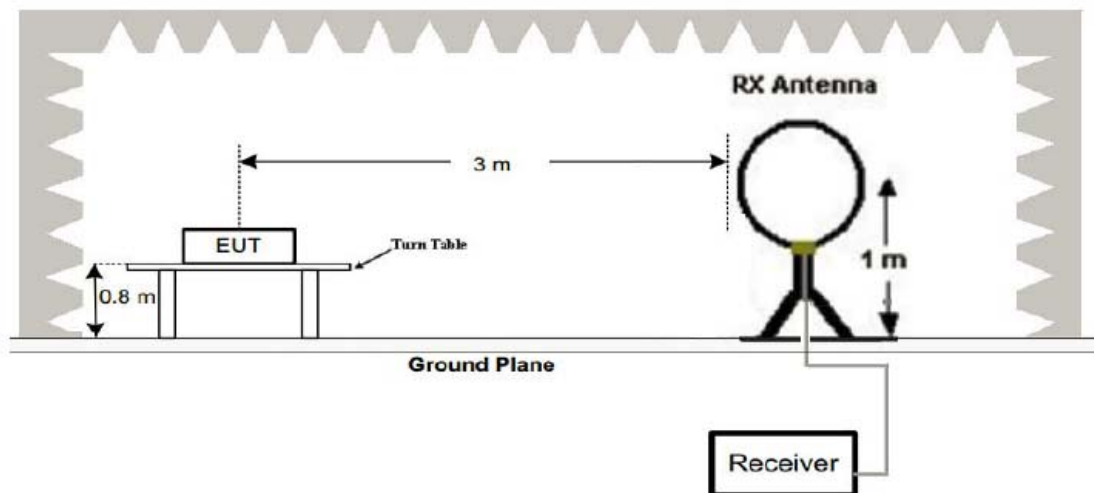
For unintentional device, according to § 15.109(a), except for Class A digital devices, the field strength of radiated emissions from unintentional radiators at a distance of 3 meters shall not exceed the following values:

Frequency (MHz)	Distance (Meters)	Radiated (dB $\mu$ V/m)	Radiated ( $\mu$ V/m)
30-88	3	40	100
88-216	3	43.5	150
216-960	3	46	200
Above 960	3	54	500

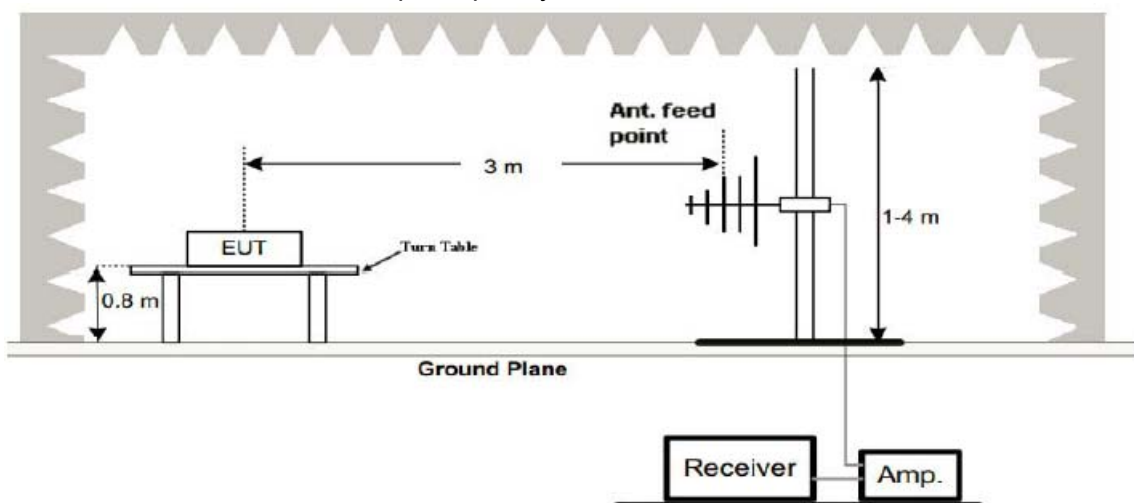
For intentional device, according to § 15.209(a), the general requirement of field strength of radiated emissions from intentional radiators at a distance of 3 meters shall not exceed the above table.

### 4.2 Test Setup

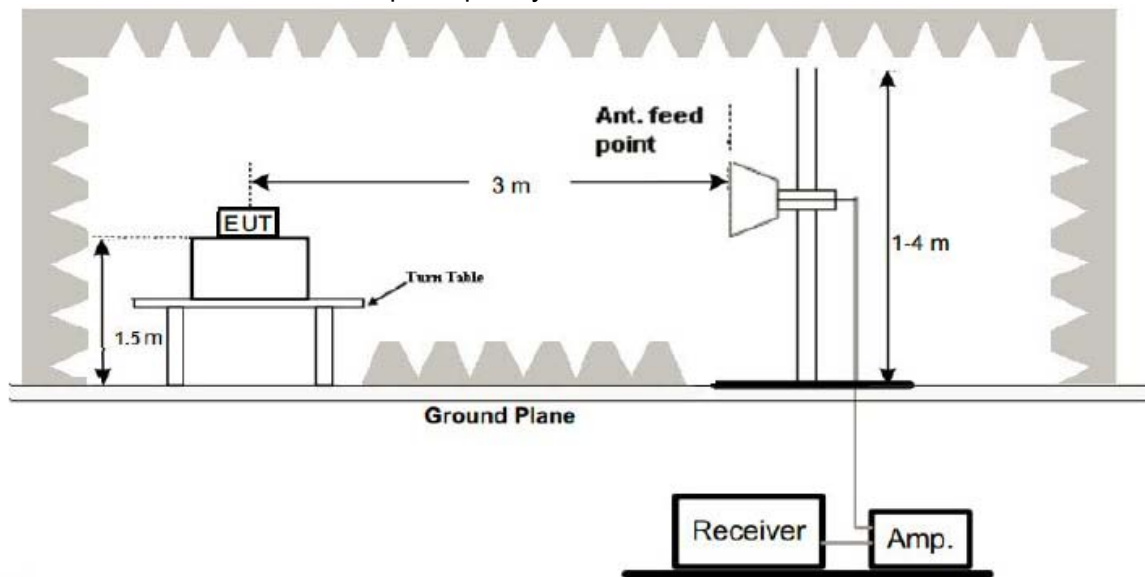
#### (1) Radiated Emission Test-Up Frequency Below 30MHz



#### (2) Radiated Emission Test-Up Frequency 30MHz~1GHz



## (3) Radiated Emission Test-Up Frequency Above 1GHz



## 4.3 Test Procedure

1. Below 1GHz measurement the EUT is placed on turntable which is 0.8m above ground plane. And above 1GHz measurement EUT was placed on low permittivity and low tangent turn table which is 1.5m above ground plane.
2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emissions.
4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
5. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
6. Repeat above procedures until the measurements for all frequencies are complete.
7. The test frequency range from 9KHz to 25GHz per FCC PART 15.33(a).

## Note:

For battery operated equipment, the equipment tests shall be performed using a new battery.

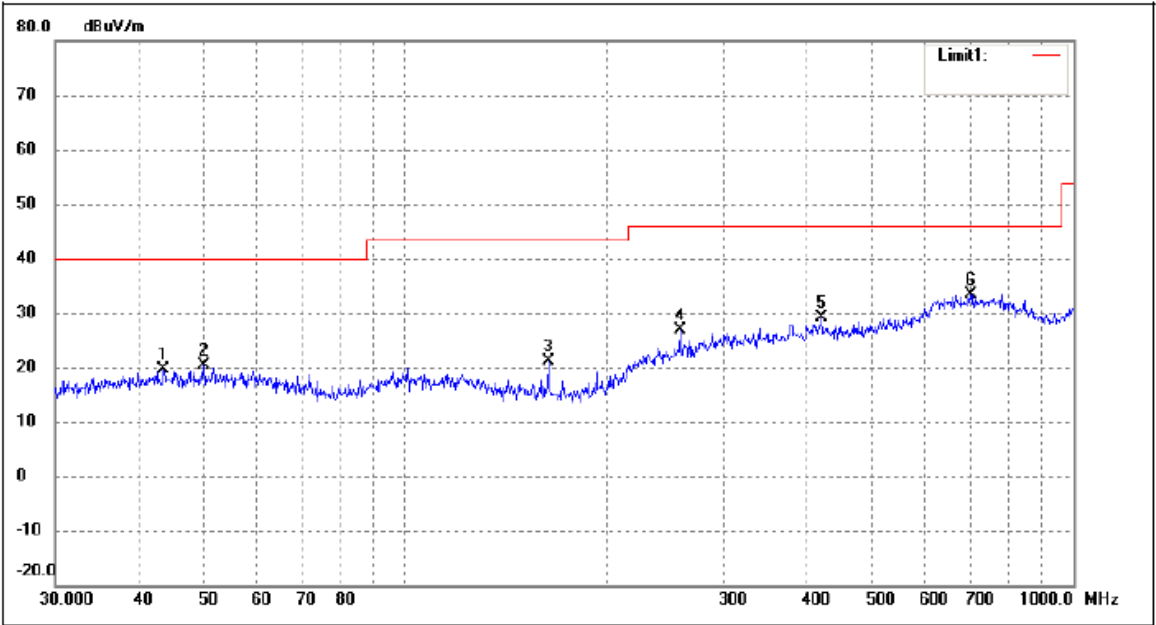
## 4.4 Test Result

## PASS

All the test modes completed for test. The worst case of Radiated Emission is CH 2408; the test data of this mode was reported.

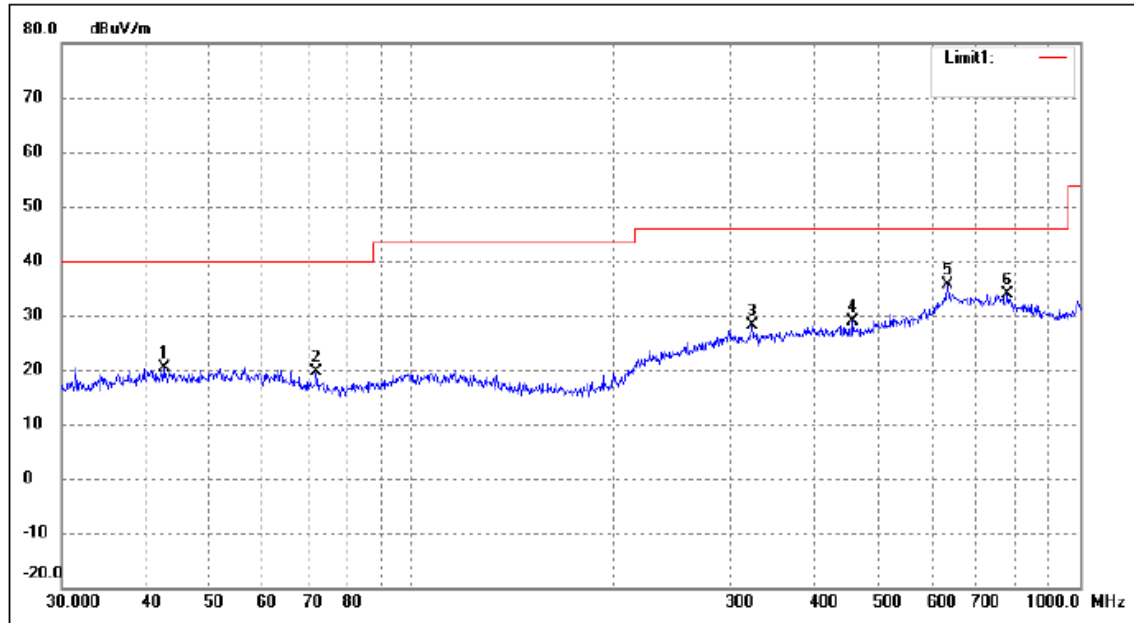
Below 1GHz Test Results:

Antenna polarity: H



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( ° )	(cm)	
1	43.5056	14.66	4.94	19.60	40.00	-20.40	51	100	peak
2	50.0566	15.45	4.98	20.43	40.00	-19.57	76	100	peak
3	163.7549	18.59	2.44	21.03	43.50	-22.47	106	100	peak
4	258.3263	17.34	9.62	26.96	46.00	-19.04	158	100	peak
5	420.5803	17.16	11.90	29.06	46.00	-16.94	193	100	peak
6	701.7609	16.23	17.24	33.47	46.00	-12.53	267	100	peak

Antenna polarity: V



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ( ° )	Height (cm)	Remark
1	42.6000	15.44	4.94	20.38	40.00	-19.62	58	100	peak
2	72.0843	17.09	2.62	19.71	40.00	-20.29	97	100	peak
3	323.3204	16.30	11.84	28.14	46.00	-17.86	126	100	peak
4	457.5073	15.84	12.96	28.80	46.00	-17.20	158	100	peak
5	633.9073	17.83	17.86	35.69	46.00	-10.31	264	100	peak
6	779.6068	17.07	16.80	33.87	46.00	-12.13	310	100	peak

Remark:

(1) Measuring frequencies from 9 KHz to the 1 GHz, Radiated emission test from 9KHz to 30MHz was verified,

and no any emission was found except system noise floor.

(2) \* denotes emission frequency which appearing within the Restricted Bands specified in provision of 15.205, then the general radiated emission limits in 15.209 apply.

(3) The IF bandwidth of EMI Test Receiver between 30MHz to 1GHz was 120KHz, 1 MHz for measuring above 1 GHz, below 30MHz was 10KHz.

## Above 1 GHz Test Results:

CH Low (2408MHz)

Horizontal:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
2408	109.85	-5.84	104.01	114	-9.99	peak
2408	84.67	-5.84	78.83	94	-15.17	AVG
4816	57.31	-3.64	53.67	74	-20.33	peak
4816	45.06	-3.64	41.42	54	-12.58	AVG
7224	55.12	-0.95	54.17	74	-19.83	peak
7224	38.94	-0.95	37.99	54	-16.01	AVG
---	---	---	---	---	---	---
---	---	---	---	---	---	---

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.

Vertical:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
2408	107.88	-5.84	102.04	114	-11.96	peak
2408	82.92	-5.84	77.08	94	-16.92	AVG
4816	56.05	-3.64	52.41	74	-21.59	peak
4816	43.17	-3.64	39.53	54	-14.47	AVG
7224	53.56	-0.95	52.61	74	-21.39	peak
7224	38.74	-0.95	37.79	54	-16.21	AVG
---	---	---	---	---	---	---
---	---	---	---	---	---	---

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.

CH Middle (2440MHz)

Horizontal:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
2440	108.35	-5.71	102.64	114	-11.36	peak
2440	85.62	-5.71	79.91	94	-14.09	AVG
4880	57.13	-3.51	53.62	74	-20.38	peak
4880	45.04	-3.51	41.53	54	-12.47	AVG
7320	54.33	-0.82	53.51	74	-20.49	peak
7320	38.45	-0.82	37.63	54	-16.37	AVG
---	---	---	---	---	---	---
---	---	---	---	---	---	---

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.

Vertical:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
2440	107.69	-5.71	101.98	114	-12.02	peak
2440	82.45	-5.71	76.74	94	-17.26	AVG
4882	55.42	-3.51	51.91	74	-22.09	peak
4882	43.67	-3.51	40.16	54	-13.84	AVG
7323	53.94	-0.82	53.12	74	-20.88	peak
7323	38.72	-0.82	37.9	54	-16.1	AVG
---	---	---	---	---	---	---
---	---	---	---	---	---	---

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.

CH High (2474MHz)

Horizontal:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
2474	107.99	-5.65	102.34	114	-11.66	peak
2474	83.15	-5.65	77.5	94	-16.5	AVG
4948	58.01	-3.43	54.58	74	-19.42	peak
4948	43.44	-3.43	40.01	54	-13.99	AVG
7422	52.81	-0.75	52.06	74	-21.94	peak
7422	37.56	-0.75	36.81	54	-17.19	AVG
---	---	---	---	---	---	---
---	---	---	---	---	---	---

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.

Vertical:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
2474	106.58	-5.65	100.93	114	-13.07	peak
2474	81.26	-5.65	75.61	94	-18.39	AVG
4948	56.67	-3.43	53.24	74	-20.76	peak
4948	41.65	-3.43	38.22	54	-15.78	AVG
7422	52.16	-0.75	51.41	74	-22.59	peak
7422	38.46	-0.75	37.71	54	-16.29	AVG
---	---	---	---	---	---	---
---	---	---	---	---	---	---

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.

**Remark:**

(1) Measuring frequencies from 1 GHz to the 25 GHz.

(2) "F" denotes fundamental frequency; "H" denotes spurious frequency. "E" denotes band edge frequency.

(3) \* denotes emission frequency which appearing within the Restricted Bands specified in provision of 15.205, then the general radiated emission limits in 15.209 apply.

(4) 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.

(5) The IF bandwidth of EMI Test Receiver between 30MHz to 1GHz was 120KHz, 1 MHz for measuring above 1 GHz, below 30MHz was 10KHz.

(6) When the test results of Peak Detected below the limits of Average Detected, the Average Detected is not need completed. For example: Top Channel at Fundamental 73.16dBuV/m(PK Value) <93.98(AV Limit), at harmonic 53.20 dBuV/m(PK Value) <54 dBuV/m(AV Limit), the Average Detected not need to completed.



Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
2310	52.45	-5.81	46.64	74	-27.36	peak
2310	/	-5.81	/	54	/	AVG
2390	55.83	-5.84	49.99	74	-24.01	peak
2390	/	-5.84	/	54	/	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

Operation Mode: TX CH High (2474MHz)

## Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
2483.5	53.66	-5.65	48.01	74	-25.99	peak
2483.5	/	-5.65	/	54	/	AVG
2500	55.27	-5.72	49.55	74	-24.45	peak
2500	/	-5.72	/	54	/	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

Vertical:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
2483.5	51.74	-5.65	46.09	74	-27.91	peak
2483.5	/	-5.65	/	54	/	AVG
2500	53.16	-5.72	47.44	74	-26.56	peak
2500	/	-5.72	/	54	/	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.						
Remark: All the other emissions not reported were too low to read and deemed to comply with FCC limit.						

## 6 OCCUPIED BANDWIDTH MEASUREMENT

### 6.1 Test Setup

Same as Radiated Emission Measurement

### 6.2 Test Procedure

1. The EUT was placed on a turn table which is 0.8m above ground plane.
2. Set EUT as normal operation.
3. Based on FCC Part15 C Section 15.249(a): RBW= 51KHz. VBW= 150 KHz, Span=5MHz.
4. The useful radiated emission from the EUT was detected by the spectrum analyser with peak detector.

### 6.3 Measurement Equipment Used

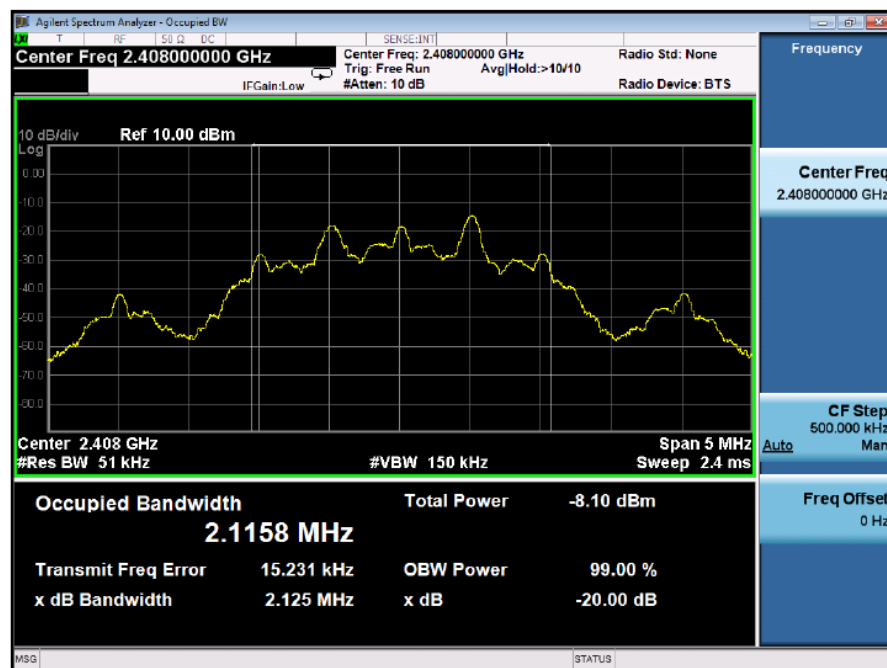
Same as Radiated Emission Measurement

### 6.4 Test Result

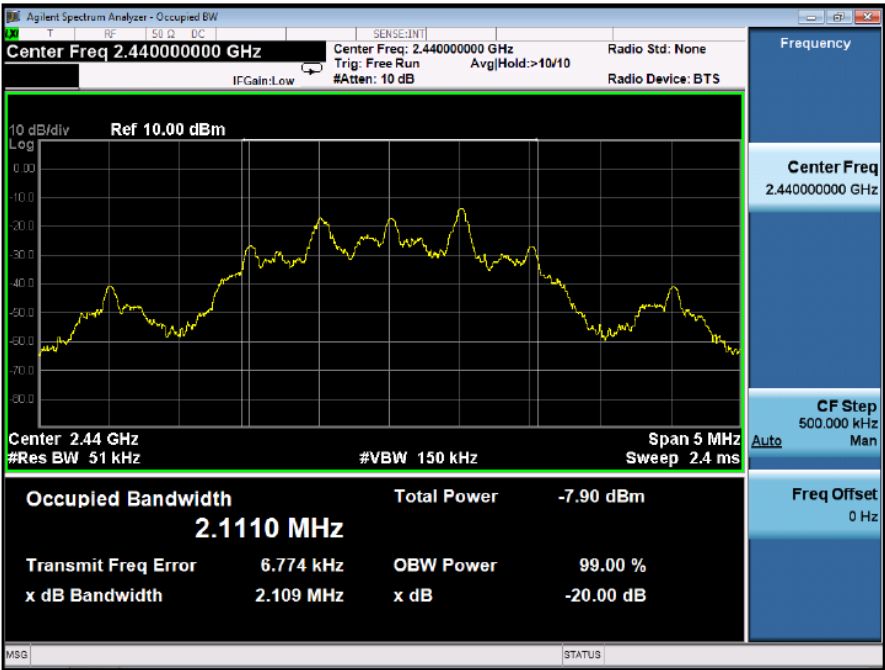
**PASS**

Frequency	20dB Bandwidth (MHz)	Result
2408 MHz	2.125	<b>PASS</b>
2440 MHz	2.109	<b>PASS</b>
2474 MHz	2.122	<b>PASS</b>

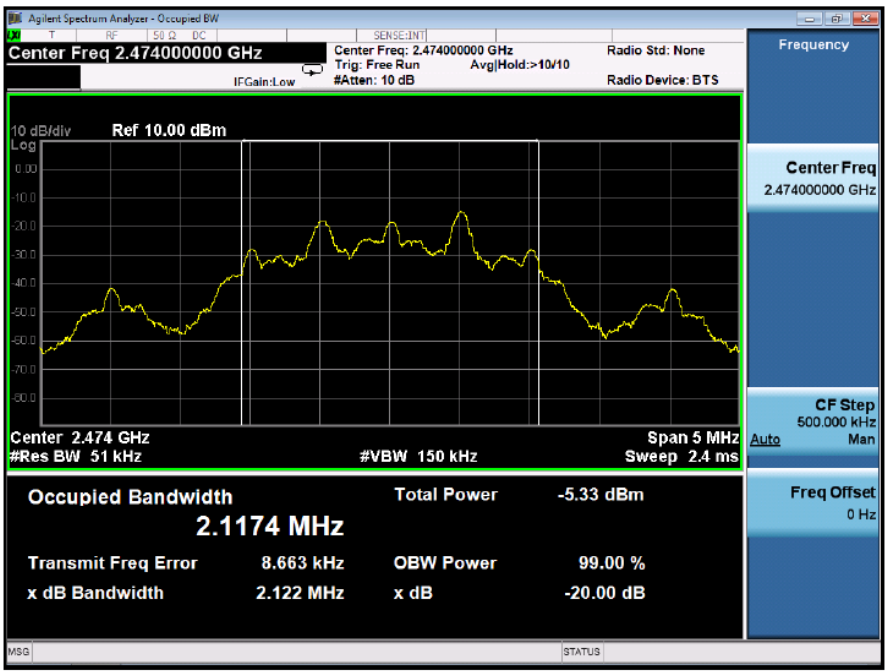
CH: 2408MHz



CH: 2440MHz



CH: 2474MHz



## 7 ANTENNA REQUIREMENT

### 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 15.249, 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.

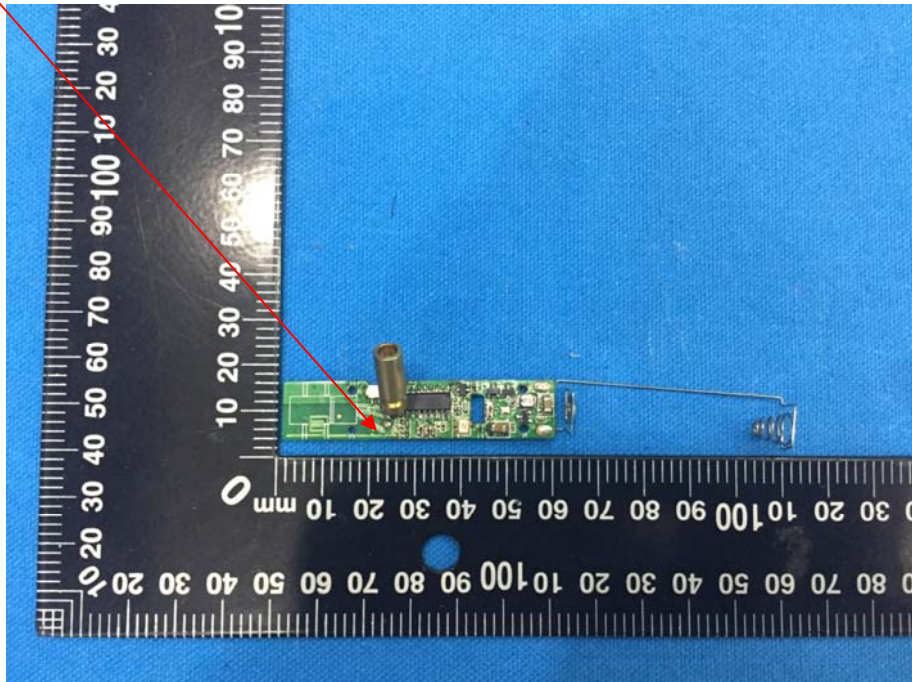
### Refer to statement below for compliance.

The manufacturer may design the unit so that the user can replace a broken antenna, but the use of a standard antenna jack or electrical connector is prohibited. Further, this requirement does not apply to intentional radiators that must be professionally installed.

### Antenna Connected Construction

The antenna used in this product is a PCB Antenna, The directional gains of antenna used for transmitting is 0 dBi.

### ANTENNA



## 8 PHOTOGRAPH OF TEST

### 8.1 Radiated Emission

