

FCC TEST REPORT  
for  
Risecomm Microelectronics (Shenzhen) Co., Ltd.

A/C Manager  
Model No.: KTJK-M02J

Prepared for : Risecomm Microelectronics (Shenzhen) Co., Ltd.  
Address : Skyworth Bldg. C501, Hi-Tech Industrial Park, Nanshan District,  
Shenzhen, China

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Report Number : R011505470I  
Date of Test : Jul. 01~ 28, 2015  
Date of Report : Jul. 28, 2015

## TABLE OF CONTENTS

Description

Page

Test Report

<b>1. GENERAL INFORMATION.....</b>	<b>4</b>
1.1. Description of Device (EUT).....	4
1.2. Auxiliary Equipment Used during Test.....	5
1.3. Description of Test Facility.....	6
1.4. Measurement Uncertainty.....	6
<b>2. TEST PROCEDURE.....</b>	<b>7</b>
<b>3. CONDUCTED LIMITS.....</b>	<b>8</b>
3.1. Block Diagram of Test Setup.....	8
3.2. Power Line Conducted Emission Measurement Limits (15.207).....	8
3.3. Configuration of EUT on Measurement.....	8
3.4. Operating Condition of EUT.....	8
3.5. Test Procedure.....	9
3.6. Test equipment.....	9
3.7. Power Line Conducted Emission Measurement Results.....	9
<b>4. RADIATION INTERFERENCE.....</b>	<b>12</b>
4.1. Requirements (15.249, 15.209):.....	12
4.2. Test Procedure.....	12
4.3. Test Results.....	12
<b>5. BANDEDGE.....</b>	<b>18</b>
5.1. Requirements (15.249):.....	18
5.2. Test Procedure.....	18
5.3. Test Configuration:.....	18
5.4. Test Results.....	19
<b>6. OCCUPIED BANDWIDTH.....</b>	<b>28</b>
6.1. Requirements :.....	28
6.2. Test SET-UP.....	28
6.3 Test Equipment.....	28
6.4. Test Results.....	28
<b>7. ANTENNA APPLICATION.....</b>	<b>31</b>
7.1. Antenna requirement.....	31
7.2. Result.....	31
<b>8. PHOTOGRAPH.....</b>	<b>32</b>
8.1. Photo of Power Line Conducted Emission Measurement.....	32
8.2 Photo of Radiation Emission Test.....	33

## TEST REPORT

Applicant : Risecomm Microelectronics (Shenzhen) Co., Ltd.  
Manufacturer : Risecomm Microelectronics (Shenzhen) Co., Ltd.  
EUT : A/C Manager  
Model No. : KTJK-M02J  
Serial No. : N.A.  
Trade Mark : N.A.  
Rating : AC 100-240V, 50/60Hz, 16A Max.

Measurement Procedure Used:

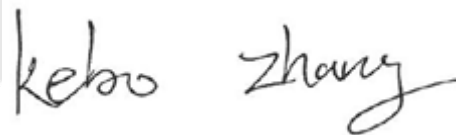
FCC Part15 Subpart C, Paragraph 15.207, 15.249 & 15.209

The device described above is tested by Shenzhen Anbotech Compliance Laboratory Limited to determine the maximum emission levels emanating from the device and the severe levels of the device can endure and its performance criterion. The measurement results are contained in this test report and Shenzhen Anbotech Compliance Laboratory Limited is assumed full of responsibility for the accuracy and completeness of these measurements. Also, this report shows that the EUT (Equipment Under Test) is technically compliant with the FCC Part 15 Subpart C requirements.

This report applies to above tested sample only and shall not be reproduced in part without written approval of Shenzhen Anbotech Compliance Laboratory Limited.

Date of Test : Jul. 01~ 28, 2015

Prepared by :



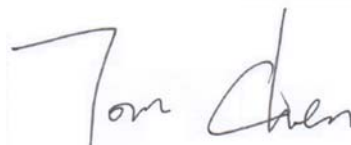
(Tested Engineer / Kebo Zhang)

Reviewer :



(Project Manager / Amy Ding)

Approved & Authorized Signer :



(Manager / Tom Chen)

## 1. GENERAL INFORMATION

### 1.1. Description of Device (EUT)

EUT : A/C Manager

Model Number : KTJK-M02J

Test Power Supply : AC 120V/60Hz

Frequency : 2408-2474MHz

Channel Space 1MHz

No. of Channels : 67

Antenna Specification : PCB Antenna:0 dBi

Applicant : Risecomm Microelectronics (Shenzhen) Co., Ltd.  
Address : Skyworth Bldg. C501, Hi-Tech Industrial Park, Nanshan District, Shenzhen, China

Manufacturer : Risecomm Microelectronics (Shenzhen) Co., Ltd.  
Address : Skyworth Bldg. C501, Hi-Tech Industrial Park, Nanshan District, Shenzhen, China

Factory : Risecomm Microelectronics (Shenzhen) Co., Ltd.  
Address : Skyworth Bldg. C501, Hi-Tech Industrial Park, Nanshan District, Shenzhen, China

Date of receipt : Jul. 01, 2015

Date of Test : Jul. 01~ 28, 2015

## 1.2. Auxiliary Equipment Used during Test

PC	: Manufacturer: DELL M/N: Optiplex 3020 MT S/N: CN-079V51-70163-4AD-089K-A00 Input Rating: AC 100-240V, 50-60Hz 5.4A CE , FCC DOC, CCC
MONITOR	: Manufacturer: DELL M/N: UZ2215Hf S/N: CN-035VN6-72872-45A-A3AB Input Rating: AC 100-240V, 50-60Hz, 1.5A Output Rating: DC 19.5V, 4.62A TUV-GS FCC CE KCC VCCI
MOUSE	: Manufacturer: DELL M/N: MS111-T S/N: CN-0KW2YH-71616-488-1CBJ Input Rating: DC 5V,0.1A Cable: 1.8m, unshielded CE FCC VCCI KCC TUV-GS
KEYBOARD	: Manufacturer: DELL M/N: SK-8120 S/N: CN-0DJ365-71616-49J-0MVR-A00 Input Rating: DC 5V,0.05A CE FCC VCCI KCC TUV-GS Cable: 1.8m, unshielded
Printer	: Manufacturer: Brother M/N: MFC-3360C S/N: N/A CE, FCC:DOC
Power Line	: Non-Shielded, 1.5m
VGA Cable	: Non-Shielded, 1.5m
Smart Router	: ZNLY-201

### 1.3. Description of Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

**CNAS - LAB Code: L3503**

Shenzhen Anbotek Compliance Laboratory Limited., Laboratory has been assessed and in compliance with CNAS/CL01: 2006 accreditation criteria for testing laboratories (identical to ISO/IEC 17025:2005 General Requirements) for the Competence of Testing Laboratories.

**FCC-Registration No.: 752021**

Shenzhen Anbotek Compliance Laboratory Limited, EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration 752021, July 10, 2013.

**IC-Registration No.: 8058A-1**

Shenzhen Anbotek Compliance Laboratory Limited., EMC Laboratory has been registered and fully described in a report filed with the (IC) Industry Canada. The acceptance letter from the IC is maintained in our files. Registration 8058A-1, February 22, 2013.

**Test Location**

All Emissions tests were performed at  
Shenzhen Anbotek Compliance Laboratory Limited. at 1/F., Building 1, SEC Industrial Park, No.0409 Qianhai Road, Nanshan District, Shenzhen, Guangdong, China

### 1.4. Measurement Uncertainty

Radiation Uncertainty	:	Ur = 4.1 dB (Horizontal) Ur = 4.3 dB (Vertical)
Conduction Uncertainty	:	Uc = 3.4dB

## 2. Test Procedure

**GENERAL:** This report shall NOT be reproduced except in full without the written approval of Shenzhen Anbotek Compliance Laboratory Limited. The EUT was transmitting a test signal during the testing.

**RADIATION INTERFERENCE:** The test procedure used was ANSI STANDARD C63.10-2013 using a spectrum analyzer with a pre-selector. The analyzer was calibrated in dB above a microvolt at the output of the antenna. The resolution bandwidth was 100KHz and the video bandwidth was 300KHz up to 1.0GHz and 1.0MHz with a video BW of 3.0MHz above 1.0GHz. The ambient temperature of the EUT was 74.3oF with a humidity of 69%.

**FORMULA OF CONVERSION FACTORS:** The Field Strength at 3m was established by adding the meter reading of the spectrum analyzer (which is set to read in units of dBuV) to the antenna correction factor supplied by the antenna manufacturer. The antenna correction factors are stated in terms of dB. The gain of the Preselector was accounted for in the Spectrum Analyzer Meter Reading.

**Example:**

Freq (MHz) METER READING + ACF = FS  
20 dBuV + 10.36 dB = 30.36 dBuV/m @ 3m

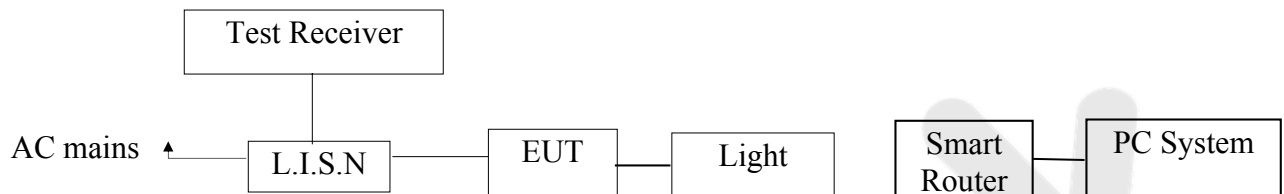
**ANSI STANDARD C63.10-2013 10.1.7 MEASUREMENT PROCEDURES:** The EUT was placed on a table 80 cm high and with dimensions of 1m by 1.5m. The EUT was placed in the center of the table (1.5m side). The table used for radiated measurements is capable of continuous rotation.

When an emission was found, the table was rotated to produce the maximum signal strength. At this point, the antenna was raised and lowered from 1m to 4m. The antenna was placed in both the horizontal and vertical planes.

### 3. Conducted Limits

#### 3.1. Block Diagram of Test Setup

##### 3.1.1. Block diagram of connection between the EUT and simulators



#### 3.2. Power Line Conducted Emission Measurement Limits (15.207)

Frequency MHz	Limits dB(μV)	
	Quasi-peak Level	Average Level
0.15 ~ 0.50	66 ~ 56*	56 ~ 46*
0.50 ~ 5.00	56	46
5.00 ~ 30.00	60	50

- Notes: 1. \*Decreasing linearly with logarithm of frequency.  
2. The lower limit shall apply at the transition frequencies.

#### 3.3. Configuration of EUT on Measurement

The following equipments are installed on Power Line Conducted Emission Measurement to meet the commission requirement and operating regulations in a manner which tends to maximize its emission characteristics in a normal application.

#### 3.4. Operating Condition of EUT

- 3.4.1. Setup the EUT and simulator as shown as Section 3.1.
- 3.4.2. Turn on the power of all equipment.
- 3.4.3. Let the EUT work in test mode (On) and measure it.



### 3.5. Test Procedure

The EUT system is connected to the power mains through a line impedance stabilization network (L.I.S.N.). This provides a 50ohm coupling impedance for the EUT system. Please refer the block diagram of the test setup and photographs. Both sides of AC line are checked to find out the maximum conducted emission. In order to find the maximum emission levels, the relative positions of equipment and all of the interface cables shall be changed according to FCC ANSI C63.10-2013 on Conducted Emission Measurement.

The bandwidth of test receiver (ESCI) set at 9KHz.

The frequency range from 150KHz to 30MHz is checked.

The test results are reported on Section 3.6.

### 3.6. Test equipment

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Two-Line V-network	Rohde & Schwarz	ENV216	100055	Apr. 17, 2015	1 Year
2.	EMI Test Receiver	Rohde & Schwarz	ESCI	100627	Apr. 17, 2015	1 Year
3.	RF Switching Unit	Compliance Direction	RSU-M2	38303	Apr. 17, 2015	1 Year

### 3.7. Power Line Conducted Emission Measurement Results

**PASS.**

The frequency range from 150KHz to 30 MHz is investigated.

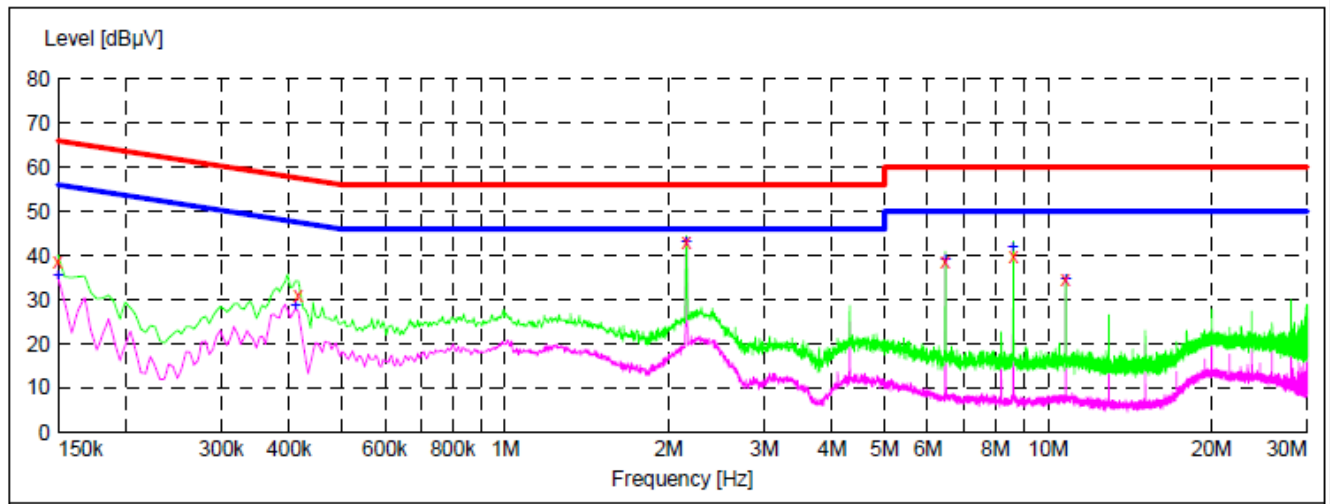
Please refer the following pages.

## CONDUCTED EMISSION TEST DATA

Test Site: 1# Shielded Room  
Operating Condition: ON  
Test Specification: AC 120V/60Hz  
Comment: Live Line  
Tem:25℃ Hum:50%

### SCAN TABLE: "Voltage (150K~30M) FIN"

Short Description: 150K-30M Disturbance Voltages



Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.150000	38.80	20.1	66	27.2	QP	L1	GND
0.415500	31.20	20.1	58	26.3	QP	L1	GND
2.156500	43.20	20.3	56	12.8	QP	L1	GND
6.467500	38.50	20.5	60	21.5	QP	L1	GND
8.623000	40.00	20.6	60	20.0	QP	L1	GND
10.774000	34.70	20.6	60	25.3	QP	L1	GND

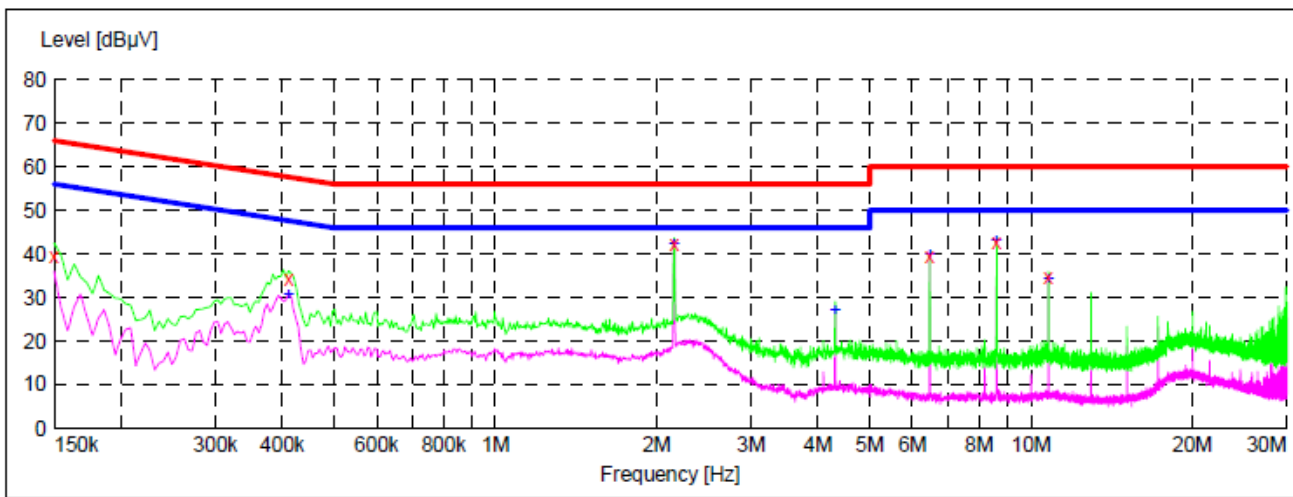
Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.150000	35.40	20.1	56	20.6	AV	L1	GND
0.411000	28.90	20.1	48	18.7	AV	L1	GND
2.156500	43.00	20.3	46	3.0	AV	L1	GND
6.467500	38.90	20.5	50	11.1	AV	L1	GND
8.618500	41.80	20.6	50	8.2	AV	L1	GND
10.774000	34.70	20.6	50	15.3	AV	L1	GND

## CONDUCTED EMISSION TEST DATA

Test Site: 1# Shielded Room  
Operating Condition: ON  
Test Specification: AC 120V/60Hz  
Comment: Neutral Line  
Tem:25°C Hum:50%

### SCAN TABLE: "Voltage(150K~30M) FIN"

Short Description: 150K-30M Disturbance Voltages



Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.150000	39.50	20.1	66	26.5	QP	N	GND
0.411000	34.10	20.1	58	23.5	QP	N	GND
2.156500	42.40	20.3	56	13.6	QP	N	GND
6.463000	39.40	20.5	60	20.6	QP	N	GND
8.618500	42.80	20.6	60	17.2	QP	N	GND
10.774000	34.60	20.6	60	25.4	QP	N	GND

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.411000	30.70	20.1	48	16.9	AV	N	GND
2.156500	42.20	20.3	46	3.8	AV	N	GND
4.307500	27.20	20.5	46	18.8	AV	N	GND
6.463000	39.70	20.5	50	10.3	AV	N	GND
8.618500	42.90	20.6	50	7.1	AV	N	GND
10.774000	34.10	20.6	50	15.9	AV	N	GND

## 4. Radiation Interference

### 4.1. Requirements (15.249, 15.209):

FIELD STRENGTH of Fundamental: @3M 902-928 MHz 2.4-2.4835 GHz 94 dBμV/m @3m	FIELD STRENGTH of Harmonics    54 dBμV/m @3m	S15.209 30 - 88 MHz  88 - 216 MHz 216 - 960 MHz ABOVE 960 MHz	40 dBuV/m  43.5 46 54dBuV/m
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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 the lesser attenuation.

### 4.2. Test Procedure

For below 1GHz, the EUT is placed on a turn table which is 0.8 meter high above the ground. For above 1GHz, the EUT is placed on a turn table which is 1.5 meter high above the ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level. The EUT is set 3 meters away from the receiving antenna which is mounted on a antenna tower. The antenna can be moved up and down from 1 to 4 meters to find out the maximum emission level. Both horizontal and vertical polarization of the antenna are set on test.

All readings from 30MHz to 1GHz are quasi-peak values with a resolution bandwidth of 120kHz. All reading are above 1GHz, peak & average values with a resolution bandwidth of 1MHz. The EUT is tested in 9\*6\*6 Chamber. The device is evaluated in xyz orientation. The test results are listed in Section 4.3.

#### Test Equipment

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Spectrum Analysis	Agilent	E4407B	US39390582	Apr. 17, 2015	1 Year
2.	Preamplifier	Instruments corporation	EMC011830	980100	Apr. 17, 2015	1 Year
3.	EMI Test Receiver	Rohde & Schwarz	ESPI	101604	Apr. 17, 2015	1 Year
4.	Double Ridged Horn Antenna	Instruments corporation	GTH-0118	351600	Apr. 20, 2015	1 Year
5.	Bilog Broadband Antenna	Schwarzbeck	VULB9163	VULB 9163-289	Apr. 20, 2015	1 Year
6.	Pre-amplifier	SONOMA	310N	186860	Apr. 17, 2015	1 Year
7.	EMI Test Software EZ-EMC	SHURPLE	N/A	N/A	N/A	N/A

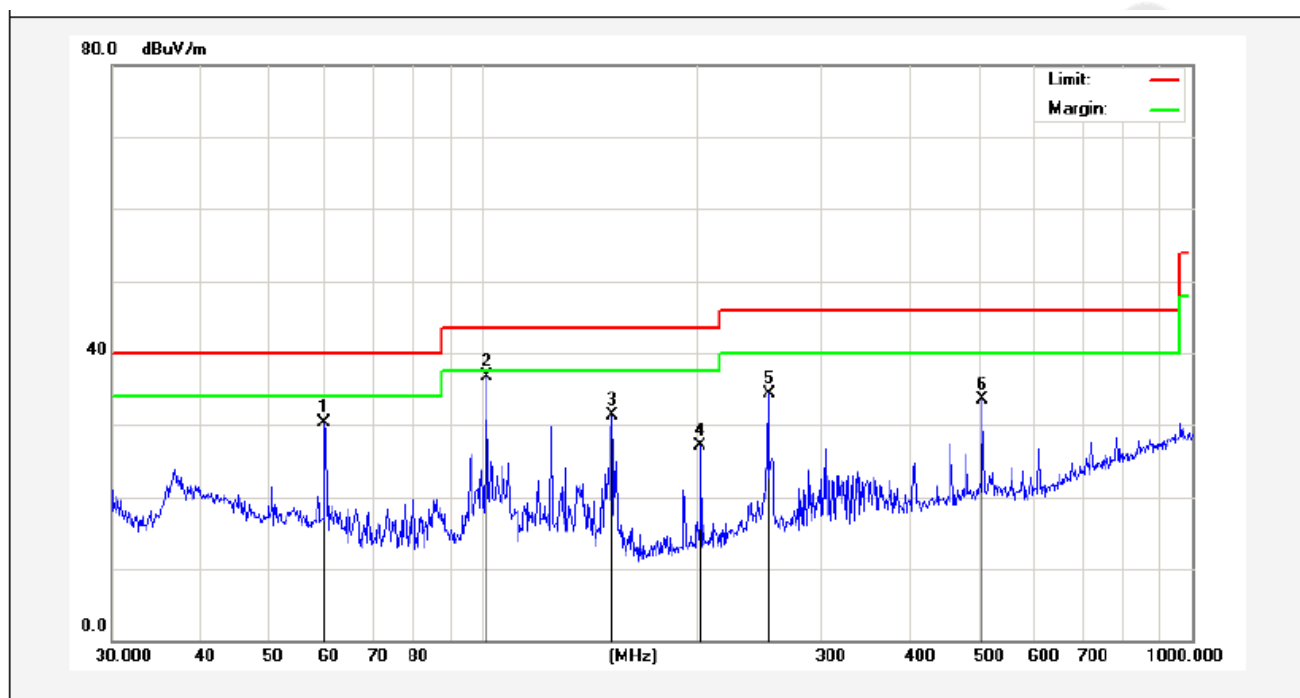
### 4.3. Test Results

PASS.

Please refer the following pages. Only the worst case (x orientation).

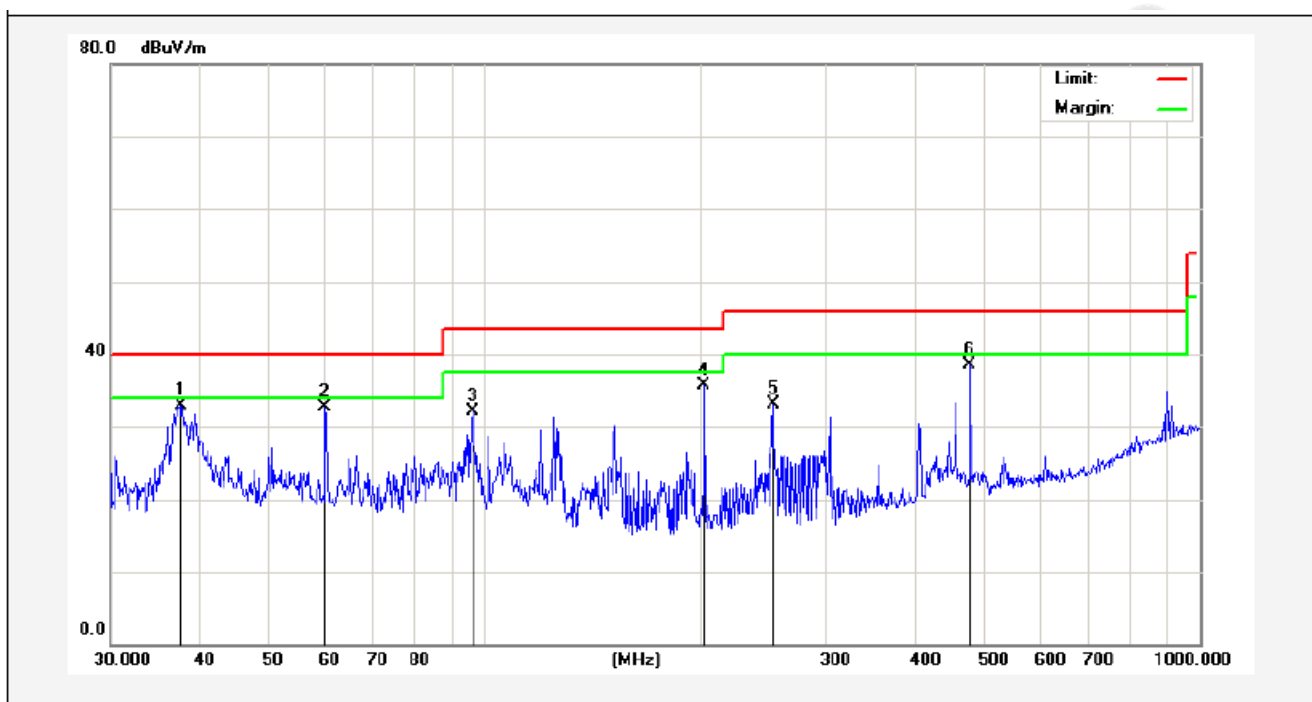
**Below 1GHz:**

Job No.:	0115054701	Polarziation:	Horizontal
Standard:	(RE)FCC PART15 C _3m	Power Source:	AC 120V/60Hz
Test item:	Radiation Test	Temp.(C)/Hum.(%RH):	24.3( C)/55%RH
Mode:	ON	Distance:	3m
Note:	30-1000MHz		



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/)	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	59.8588	45.78	-15.38	30.40	40.00	-9.60	peak			
2	101.2885	54.37	-17.75	36.62	43.50	-6.88	peak			
3	152.1297	51.53	-20.24	31.29	43.50	-12.21	peak			
4	202.8104	44.91	-17.77	27.14	43.50	-16.36	peak			
5	252.9482	50.00	-15.67	34.33	46.00	-11.67	peak			
6	506.4791	44.54	-10.97	33.57	46.00	-12.43	peak			

Job No.: 011505470I Polarization: Vertical  
Standard: (RE)FCC PART15 C \_3m Power Source: AC 120V/60Hz  
Test item: Radiation Test Temp.(C)/Hum.(%RH): 24.3( C)/55%RH  
Mode: ON Distance: 3m  
Note: 30-1000MHz



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	37.5478	45.22	-12.30	32.92	40.00	-7.08	peak			
2	59.8588	48.18	-15.38	32.80	40.00	-7.20	peak			
3	96.0986	48.08	-15.97	32.11	43.50	-11.39	peak			
4	202.8103	51.43	-15.77	35.66	43.50	-7.84	peak			
5	252.9482	47.04	-14.03	33.01	46.00	-12.99	peak			
6	477.1693	50.05	-11.62	38.43	46.00	-7.57	peak			

**Above 1 GHz:**

Horizontal CH Low (2408MHz)								
Frequency MHz	Cable Loss dB	Ant Factor dB/m	Preamp Factor dB	Read Level dBμV	Level dBμV/m	Limit dBμV/m	Over Limit dB	Remark
2408.000	2.17	31.21	35.30	86.94	85.02	114.0	-28.98	Peak
2408.000	2.17	31.21	35.30	73.19	71.27	94.0	-22.73	AV
4816.000	2.56	34.01	34.71	47.59	49.45	74.0	-24.55	Peak
4816.000	2.56	34.01	34.71	32.66	34.52	54.0	-19.48	AV
7224.000	2.98	36.16	35.15	43.57	47.56	74.0	-26.44	Peak
7224.000	2.98	36.16	35.15	29.15	33.14	54.0	-20.86	AV
9632.000	---	---	---	---	---	---	---	---
9632.000	---	---	---	---	---	---	---	---
12040.000	---	---	---	---	---	---	---	---
12040.000	---	---	---	---	---	---	---	---
---	---	---	---	---	---	---	---	---

Vertical CH Low (2408MHz)								
Frequency MHz	Cable Loss dB	Ant Factor dB/m	Preamp Factor dB	Read Level dBμV	Level dBμV/m	Limit dBμV/m	Over Limit dB	Remark
2408.000	2.17	31.21	35.30	87.88	85.96	114.0	-28.04	Peak
2408.000	2.17	31.21	35.30	76.29	74.37	94.0	-19.63	AV
4816.000	2.56	34.01	34.71	49.87	51.73	74.0	-22.27	Peak
4816.000	2.56	34.01	34.71	31.33	33.19	54.0	-20.81	AV
7224.000	2.98	36.16	35.15	42.08	46.07	74.0	-27.93	Peak
7224.000	2.98	36.16	35.15	32.66	36.65	54.0	-17.35	AV
9632.000	---	---	---	---	---	---	---	---
9632.000	---	---	---	---	---	---	---	---
12040.000	---	---	---	---	---	---	---	---
12040.000	---	---	---	---	---	---	---	---
---	---	---	---	---	---	---	---	---

Horizontal CH Middle (2441MHz)								
Frequency MHz	Cable Loss dB	Ant Factor dB/m	Preamp Factor dB	Read Level dBμV	Level dBμV/m	Limit dBμV/m	Over Limit dB	Remark
2441.000	2.19	31.22	34.60	89.94	88.75	114.0	-25.25	Peak
2441.000	2.19	31.22	34.60	75.22	74.03	94.0	-19.97	AV
4882.000	2.57	35.00	34.58	43.15	46.14	74.0	-27.86	Peak
4882.000	2.57	35.00	34.58	32.04	35.03	54.0	-18.97	AV
7323.000	3.00	36.17	35.14	47.66	51.69	74.0	-22.31	Peak
7323.000	3.00	36.17	35.14	32.29	36.32	54.0	-17.68	AV
9764.000	---	---	---	---	---	---	---	---
9764.000	---	---	---	---	---	---	---	---
12205.000	---	---	---	---	---	---	---	---
12205.000	---	---	---	---	---	---	---	---
---								

Vertical CH Middle (2441MHz)								
Frequency MHz	Cable Loss dB	Ant Factor dB/m	Preamp Factor dB	Read Level dBμV	Level dBμV/m	Limit dBμV/m	Over Limit dB	Remark
2441.000	2.19	31.22	34.60	89.09	87.90	114.0	-26.10	Peak
2441.000	2.19	31.22	34.60	77.47	76.28	94.0	-17.72	AV
4882.000	2.57	35.00	34.58	45.29	48.28	74.0	-25.72	Peak
4882.000	2.57	35.00	34.58	32.38	35.37	54.0	-18.63	AV
7323.000	3.00	36.17	35.14	46.64	50.67	74.0	-23.33	Peak
7323.000	3.00	36.17	35.14	33.27	37.30	54.0	-16.70	AV
9764.000	---	---	---	---	---	---	---	---
9764.000	---	---	---	---	---	---	---	---
12205.000	---	---	---	---	---	---	---	---
12205.000	---	---	---	---	---	---	---	---
---								



Horizontal CH High (2474MHz)								
Frequency MHz	Cable Loss dB	Ant Factor dB/m	Preamp Factor dB	Read Level dBμV	Level dBμV/m	Limit dBμV/m	Over Limit dB	Remark
2474.000	2.20	31.65	36.00	90.19	88.04	114.0	-25.96	Peak
2474.000	2.20	31.65	36.00	77.87	75.72	94.0	-18.28	AV
4948.000	2.58	35.06	34.79	52.55	55.40	74.0	-18.60	Peak
4948.000	2.58	35.06	34.79	34.61	37.46	54.0	-16.54	AV
7422.000	3.02	36.19	34.90	43.57	47.88	74.0	-26.12	Peak
7422.000	3.02	36.20	35.20	34.64	38.66	54.0	-15.34	AV
9896.000	---	---	---	---	---	---	---	---
9896.000	---	---	---	---	---	---	---	---
12370.000	---	---	---	---	---	---	---	---
12370.000	---	---	---	---	---	---	---	---
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Vertical CH High (2474MHz)								
Frequency MHz	Cable Loss dB	Ant Factor dB/m	Preamp Factor dB	Read Level dBμV	Level dBμV/m	Limit dBμV/m	Over Limit dB	Remark
2474.000	2.20	31.65	36.00	92.84	90.69	114.0	-23.31	Peak
2474.000	2.20	31.65	36.00	78.06	75.91	94.0	-18.09	AV
4948.000	2.58	35.06	34.79	48.22	51.07	74.0	-22.93	Peak
4948.000	2.58	35.06	34.79	31.76	34.61	54.0	-19.39	AV
7422.000	3.02	36.19	34.90	49.69	54.00	74.0	-20.00	Peak
7422.000	3.02	36.20	35.20	36.11	40.13	54.0	-13.87	AV
9896.000	---	---	---	---	---	---	---	---
9896.000	---	---	---	---	---	---	---	---
12370.000	---	---	---	---	---	---	---	---
12370.000	---	---	---	---	---	---	---	---
---	---	---	---	---	---	---	---	---

**NOTE: “ --- ” 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. The results of different modulations are the same.**

## 5. Bandedge

### 5.1. Requirements (15.249):

The field strength of any emissions appearing outside the band edges and up to 10 kHz above and below the band edges shall be attenuated at least 50 dB below the level of the carrier or to the general limits of 15.249.

### 5.2. Test Procedure

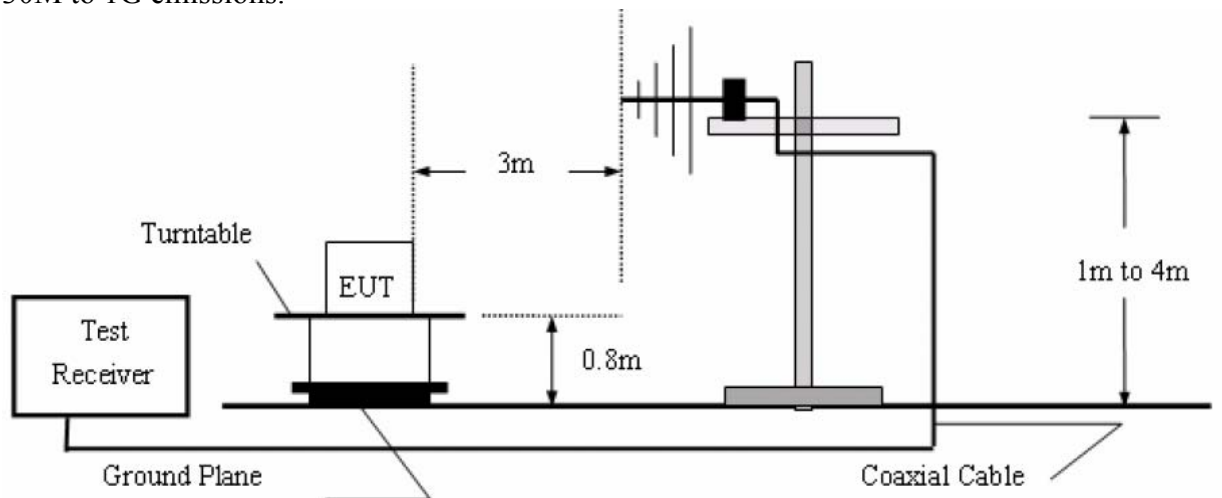
The EUT is placed on a turn table which is 1.5 meter high above the ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level. The EUT is set 3 meters away from the receiving antenna which is mounted on a antenna tower. The antenna can be moved up and down from 1 to 4 meters to find out the maximum emission level. Both horizontal and vertical polarization of the antenna are set on test. The device is evaluated in xyz orientation.

#### Test Equipment

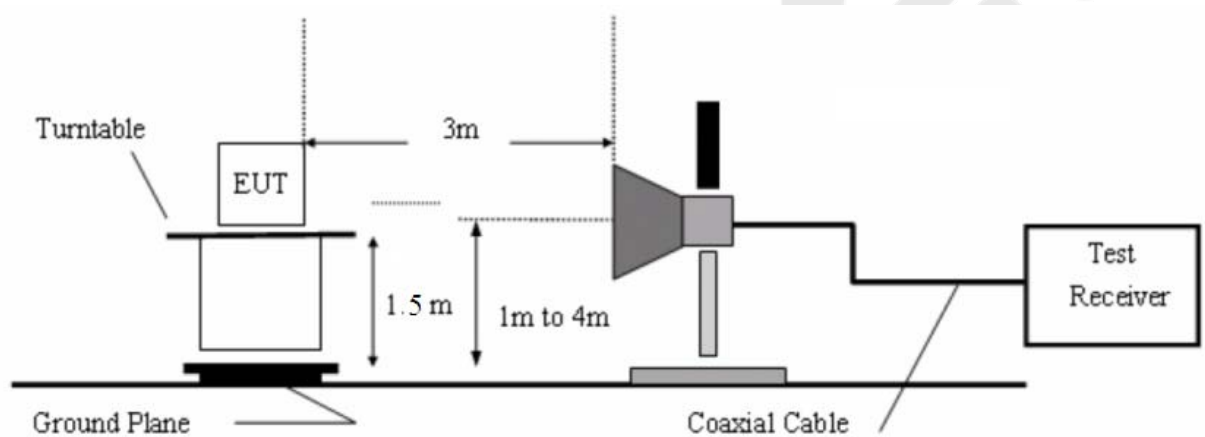
Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Spectrum Analysis	Agilent	E4407B	US39390582	Apr. 17, 2015	1 Year
2.	Preamplifier	Instruments corporation	EMC011830	980100	Apr. 17, 2015	1 Year
3.	EMI Test Receiver	Rohde & Schwarz	ESPI	101604	Apr. 17, 2015	1 Year
4.	Double Ridged Horn Antenna	Instruments corporation	GTH-0118	351600	Apr. 20, 2015	1 Year
5.	Bilog Broadband Antenna	Schwarzbeck	VULB9163	VULB 9163-289	Apr. 20, 2015	1 Year
6.	Pre-amplifier	SONOMA	310N	186860	Apr. 17, 2015	1 Year
7.	EMI Test Software EZ-EMC	SHURPLE	N/A	N/A	N/A	N/A

### 5.3. Test Configuration:

30M to 1G emissions:



1G to 40G emissions:

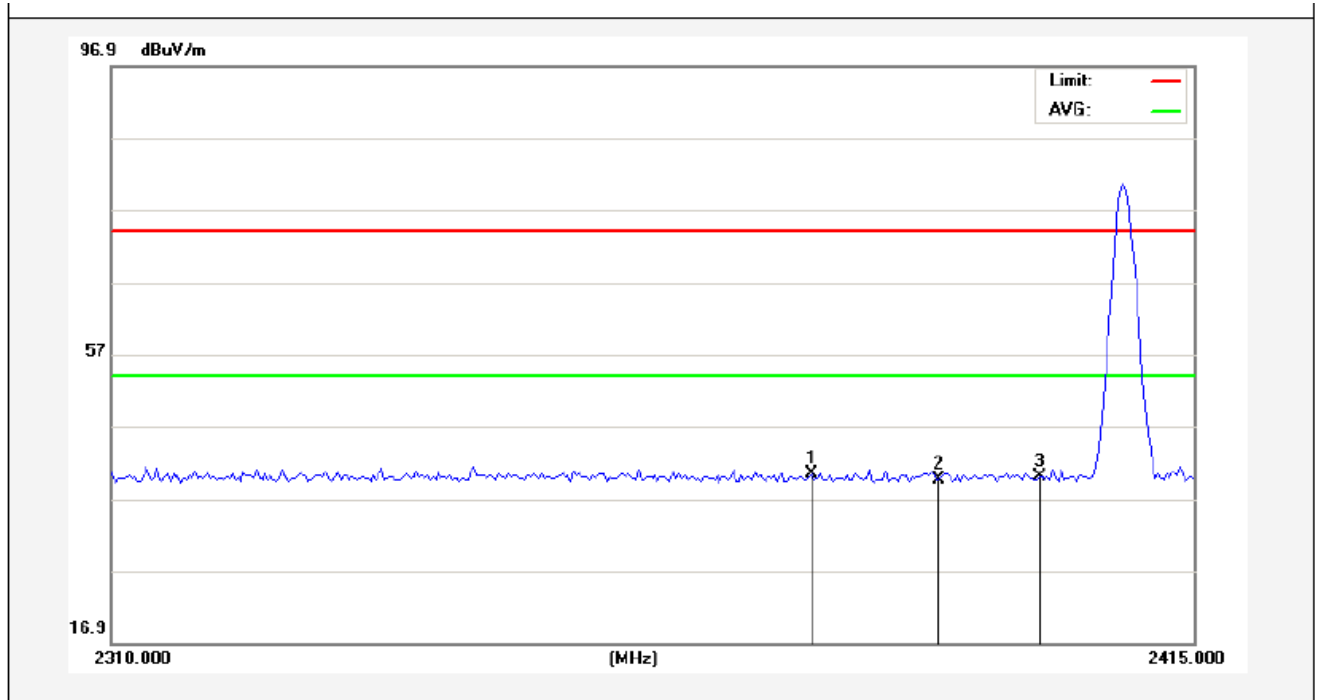


#### 5.4. Test Results

Pass.

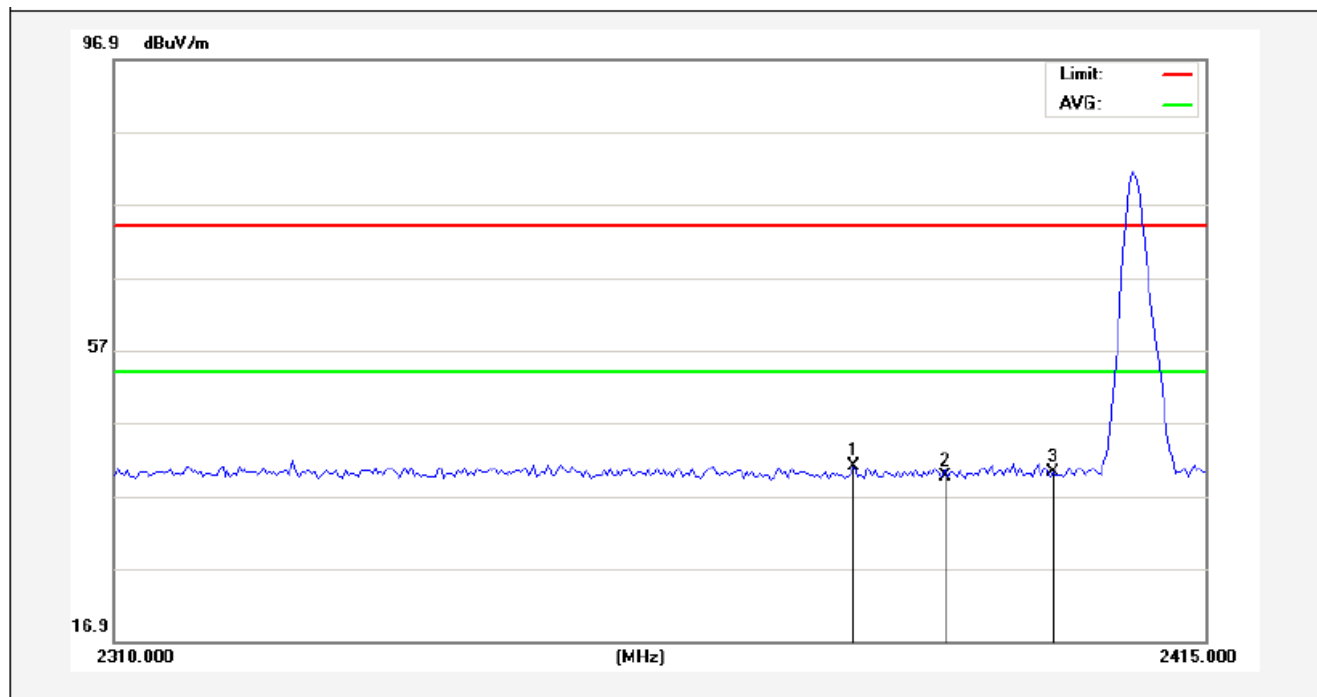
Please refer the following plot. Only the worst case (x orientation).

Job No.:	011505470I	Polarization:	Horizontal
Standard:	(RE)FCC PART15 C _3m	Power Source:	AC 120V/60Hz
Test item:	Radiation Test	Temp.(C)/Hum.(%RH):	24.3( C)/55%RH
Note:	PEAK	Distance:	3m



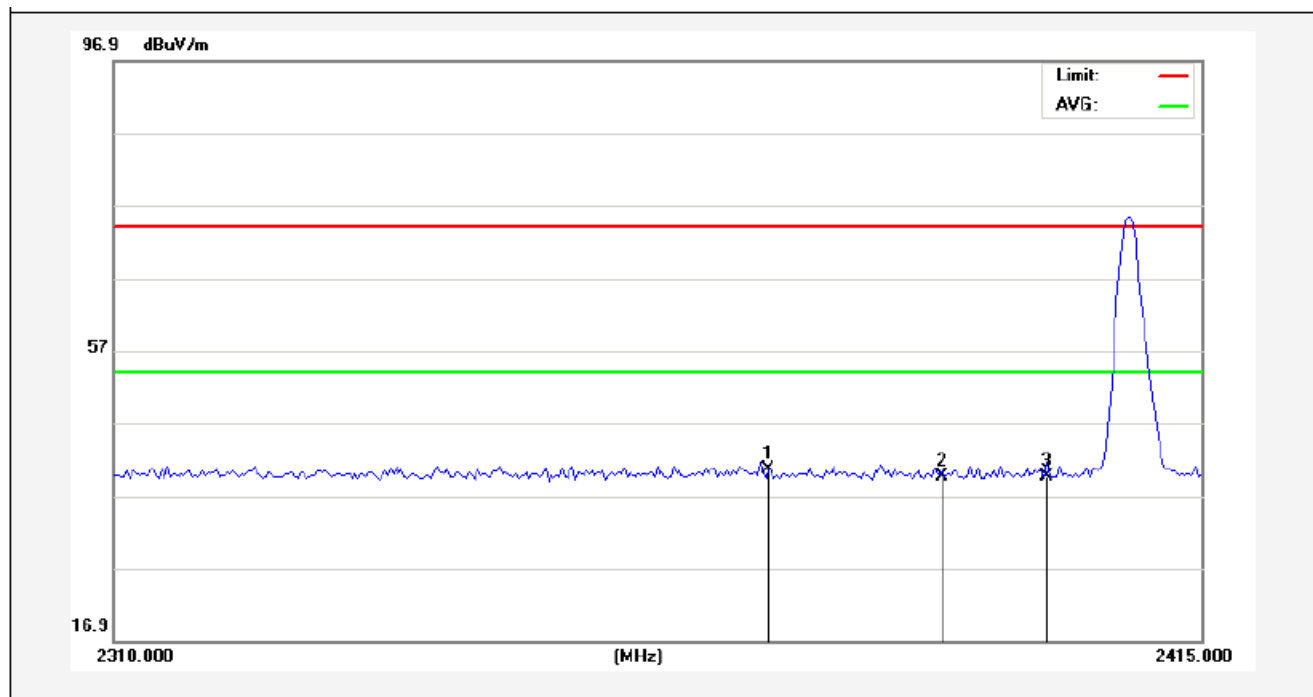
No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/)	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	2377.463	42.87	-2.54	40.33	74.00	-33.67	peak			
2	2390.000	42.20	-2.51	39.69	74.00	-34.31	peak			
3	2400.000	42.45	-2.49	39.96	74.00	-34.04	peak			

Job No.:	011505470I	Polarization:	Vertical
Standard:	(RE)FCC PART15 C _3m	Power Source:	AC 120V/60Hz
Test item:	Radiation Test	Temp.(C)/Hum.(%RH):	24.3( C)/55%RH
Note:	PEAK	Distance:	3m



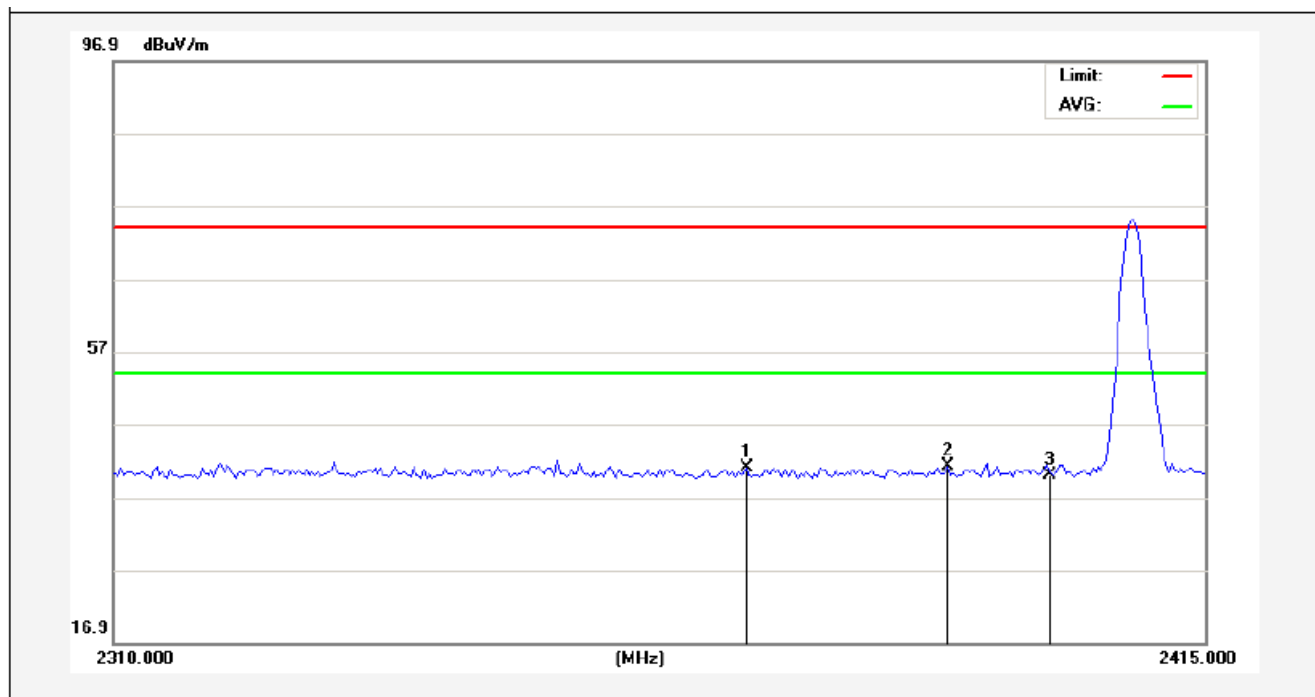
No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/)	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	2380.875	43.54	-2.53	41.01	74.00	-32.99	peak			
2	2390.000	42.04	-2.51	39.53	74.00	-34.47	peak			
3	2400.000	42.74	-2.49	40.25	74.00	-33.75	peak			

Job No.:	011505470I	Polarization:	Horizontal
Standard:	(RE)FCC PART15 C _3m	Power Source:	AC 120V/60Hz
Test item:	Radiation Test	Temp.(C)/Hum.(%RH):	24.3( C)/55%RH
Note:	AV	Distance:	3m



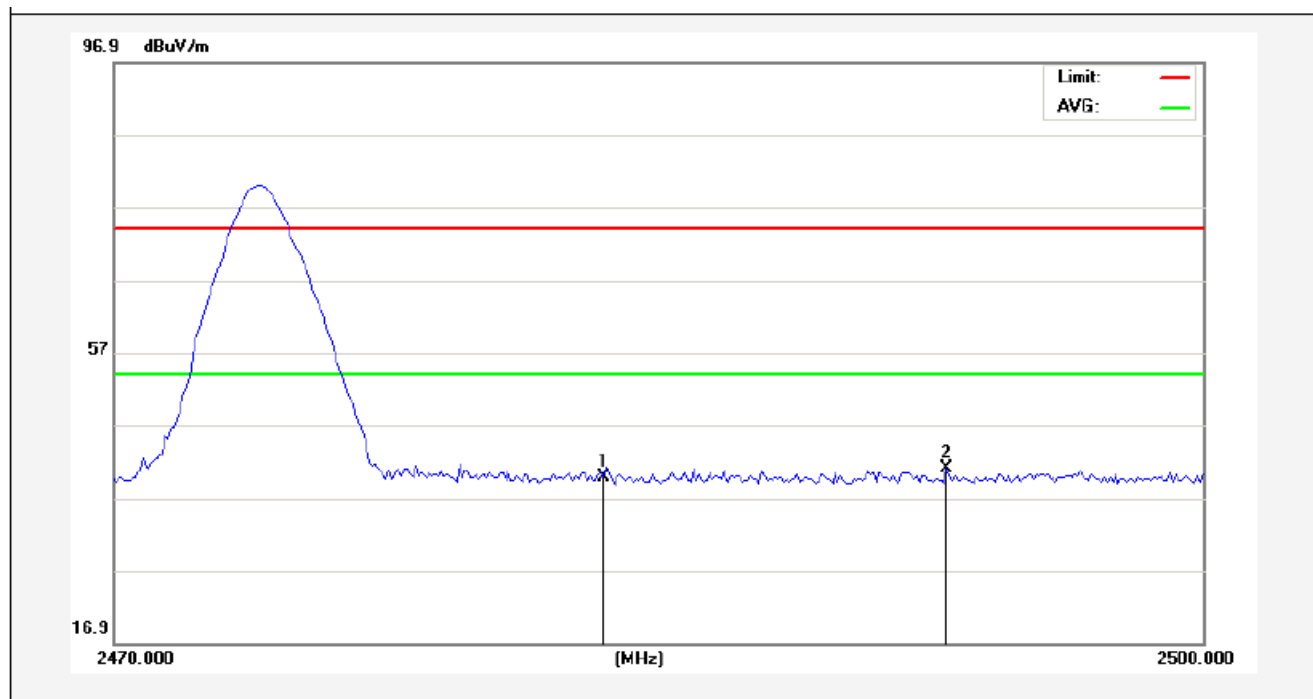
No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/)	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	2372.738	43.22	-2.55	40.67	54.00	-13.33	AVG			
2	2390.000	42.10	-2.51	39.59	54.00	-14.41	AVG			
3	2400.000	42.04	-2.49	39.55	54.00	-14.45	AVG			

<b>Job No.:</b>	<b>011505470I</b>	<b>Polarization:</b>	<b>Vertical</b>
<b>Standard:</b>	<b>(RE)FCC PART15 C _3m</b>	<b>Power Source:</b>	<b>AC 120V/60Hz</b>
<b>Test item:</b>	<b>Radiation Test</b>	<b>Temp.(C)/Hum.(%RH):</b>	<b>24.3( C)/55%RH</b>
<b>Note:</b>	<b>AV</b>	<b>Distance:</b>	<b>3m</b>



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/)	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	2370.375	43.59	-2.56	41.03	54.00	-12.97	AVG			
2	2390.000	43.78	-2.51	41.27	54.00	-12.73	AVG			
3	2400.000	42.49	-2.49	40.00	54.00	-14.00	AVG			

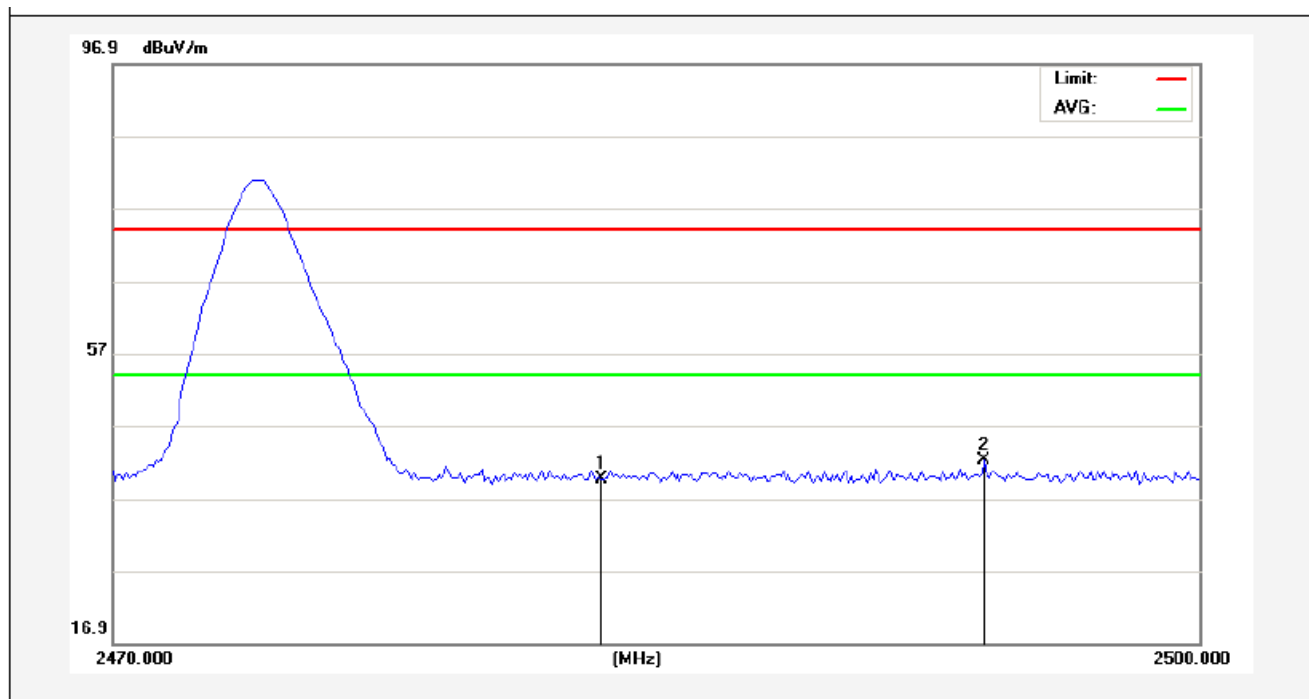
Job No.:	011505470I	Polarization:	Horizontal
Standard:	(RE)FCC PART15 C _3m	Power Source:	AC 120V/60Hz
Test item:	Radiation Test	Temp.(C)/Hum.(%RH):	24.3( C)/55%RH
Note:	PEAK	Distance:	3m



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/)	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	2483.500	42.12	-2.31	39.81	74.00	-34.19	peak			
2	2492.950	43.25	-2.29	40.96	74.00	-33.04	peak			

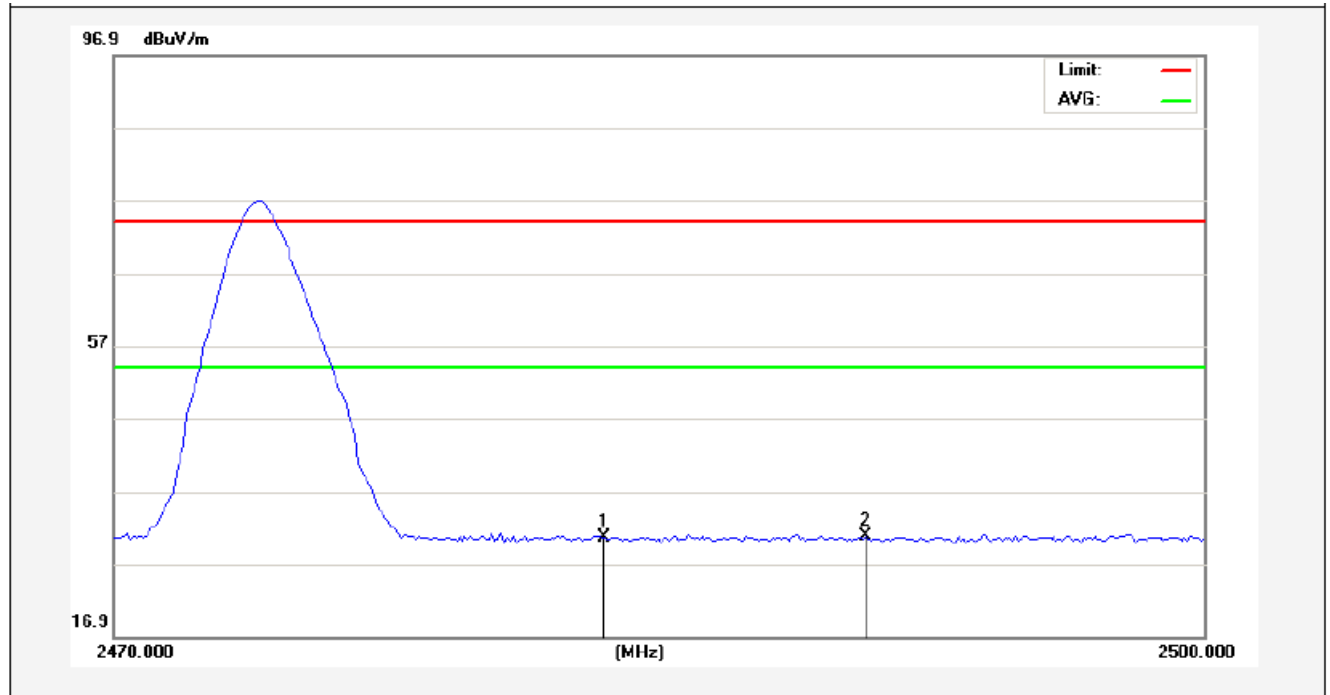


Job No.:	011505470I	Polarization:	Vertical
Standard:	(RE)FCC PART15 C _3m	Power Source:	AC 120V/60Hz
Test item:	Radiation Test	Temp.(C)/Hum.(%RH):	24.3( C)/55%RH
Note:	PEAK	Distance:	3m



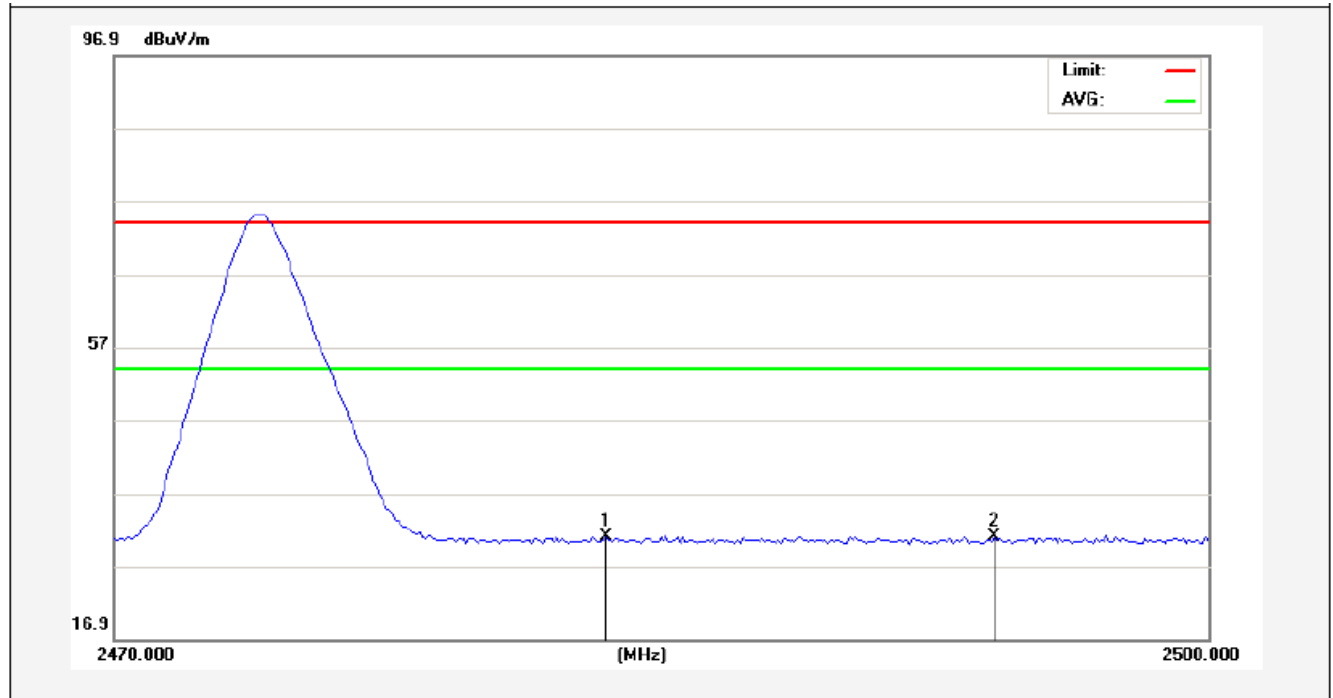
No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/)	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	2483.500	41.87	-2.31	39.56	74.00	-34.44	peak			
2	2494.075	44.50	-2.28	42.22	74.00	-31.78	peak			

<b>Job No.:</b>	<b>011505470I</b>	<b>Polarization:</b>	<b>Horizontal</b>
<b>Standard:</b>	<b>(RE)FCC PART15 C _3m</b>	<b>Power Source:</b>	<b>AC 120V/60Hz</b>
<b>Test item:</b>	<b>Radiation Test</b>	<b>Temp.(C)/Hum.(%RH):</b>	<b>24.3( C)/55%RH</b>
<b>Note:</b>	<b>AV</b>	<b>Distance:</b>	<b>3m</b>



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/)	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	2483.500	32.95	-2.31	30.64	54.00	-23.36	AVG			
2	2490.700	33.14	-2.29	30.85	54.00	-23.15	AVG			

<b>Job No.:</b>	<b>011505470I</b>	<b>Polarization:</b>	<b>Vertical</b>
<b>Standard:</b>	<b>(RE)FCC PART15 C _3m</b>	<b>Power Source:</b>	<b>AC 120V/60Hz</b>
<b>Test item:</b>	<b>Radiation Test</b>	<b>Temp.(C)/Hum.(%RH):</b>	<b>24.3( C)/55%RH</b>
<b>Note:</b>	<b>AV</b>	<b>Distance:</b>	<b>3m</b>



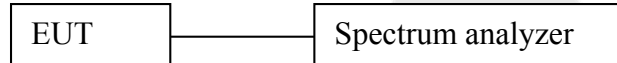
No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/)	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	2483.500	33.27	-2.31	30.96	54.00	-23.04	AVG			
2	2494.150	33.36	-2.28	31.08	54.00	-22.92	AVG			

## 6. Occupied Bandwidth

### 6.1. Requirements :

According to 15.215 (c), intentional radiators operating under the alternative provisions to the general emission limits, as contained in §§15.217 through 15.257 and in Subpart E of this part, must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated. The requirement to contain the designated bandwidth of the emission within the specified frequency band includes the effects from frequency sweeping, frequency hopping and other modulation techniques that may be employed as well as the frequency stability of the transmitter over expected variations in temperature and supply voltage. If a frequency stability is not specified in the regulations, it is recommended that the fundamental emission be kept within at least the central 80% of the permitted band in order to minimize the possibility of out-of-band operation.

### 6.2. Test SET-UP



### 6.3 Test Equipment

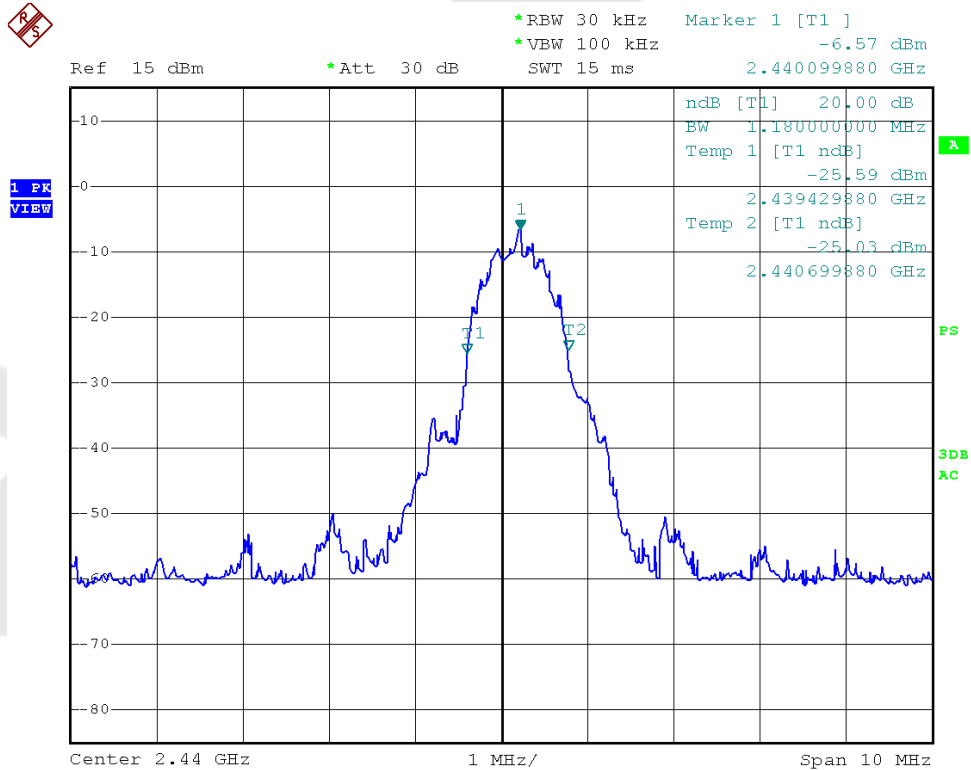
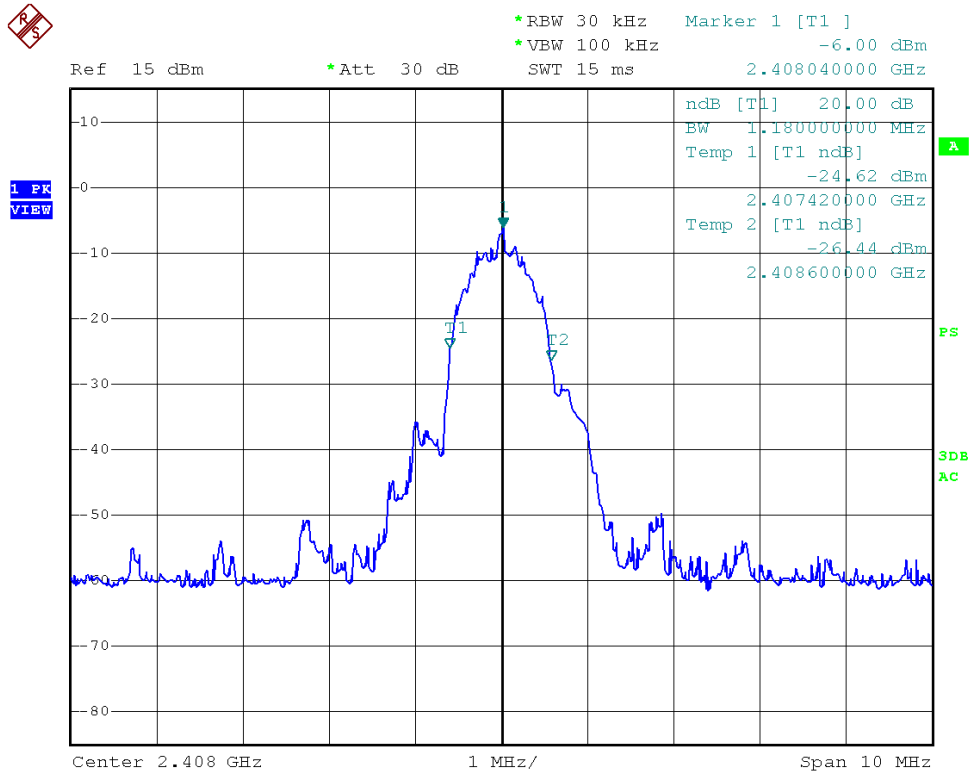
Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Spectrum Analysis	Agilent	E4407B	US39390582	Apr. 17, 2015	1 Year
2.	Preamplifier	Instruments corporation	EMC011830	980100	Apr. 17, 2015	1 Year
3.	EMI Test Receiver	Rohde & Schwarz	ESPI	101604	Apr. 17, 2015	1 Year
4.	Double Ridged Horn Antenna	Instruments corporation	GTH-0118	351600	Apr. 20, 2015	1 Year
5.	Bilog Broadband Antenna	Schwarzbeck	VULB9163	VULB 9163-289	Apr. 20, 2015	1 Year
6.	Pre-amplifier	SONOMA	310N	186860	Apr. 17, 2015	1 Year
7.	EMI Test Software EZ-EMC	SHURPLE	N/A	N/A	N/A	N/A

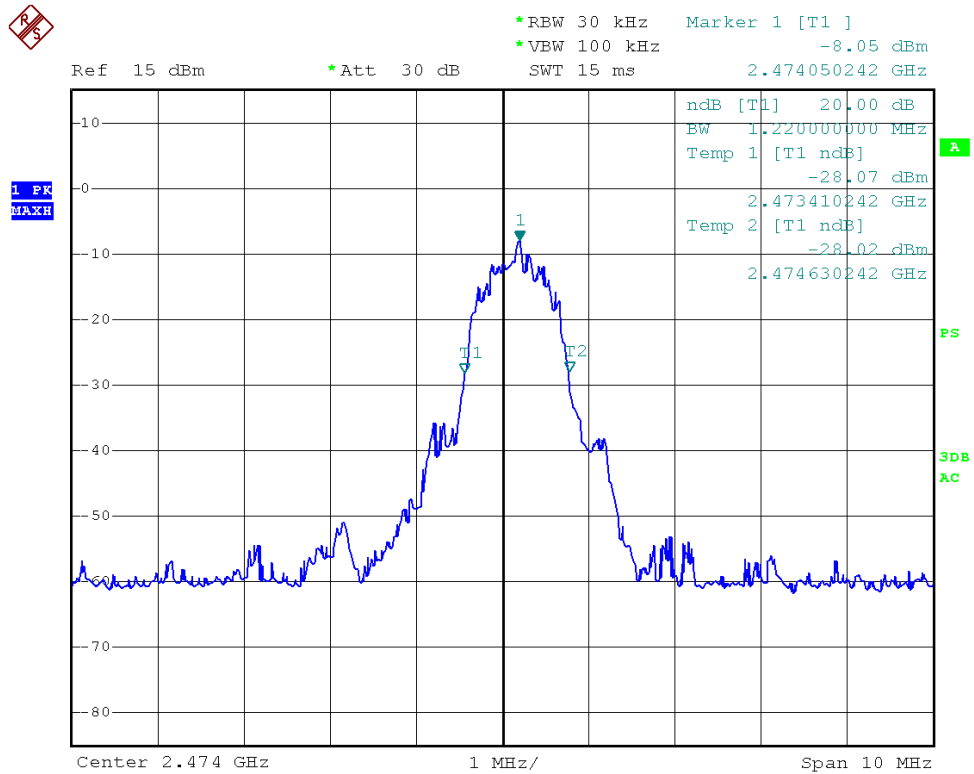
### 6.4. Test Results

Pass.

Please refer the following plot.

20dB Down:





## 7. ANTENNA APPLICATION

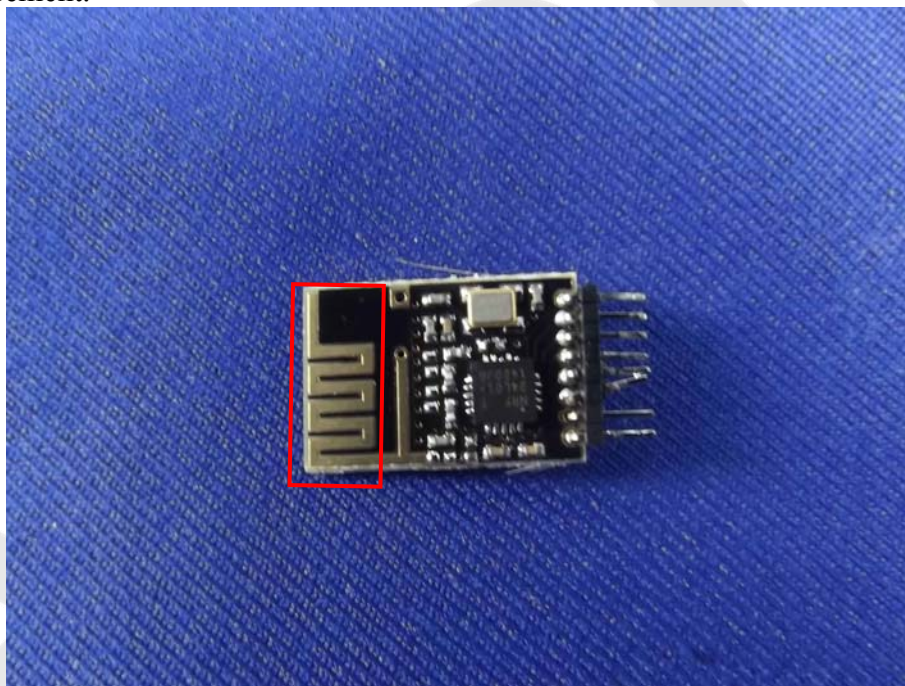
### 7.1. Antenna requirement

The EUT'S antenna is met the requirement of FCC part 15C 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. 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.

### 7.2. Result

The EUT's antenna used a PCB antenna which is permanently attached, The antenna's gain is 0dBi and meets the requirement.



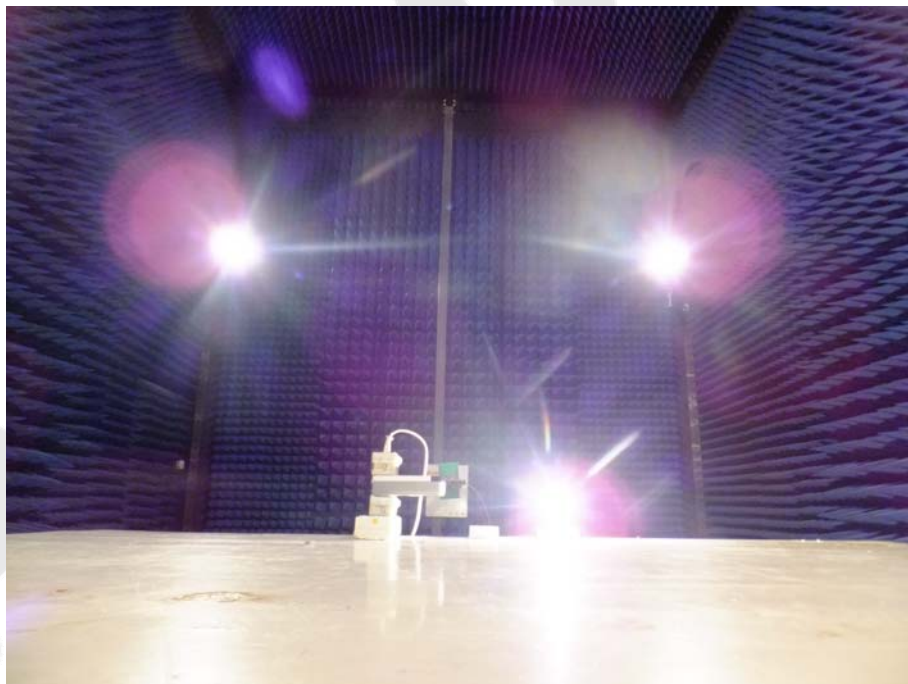
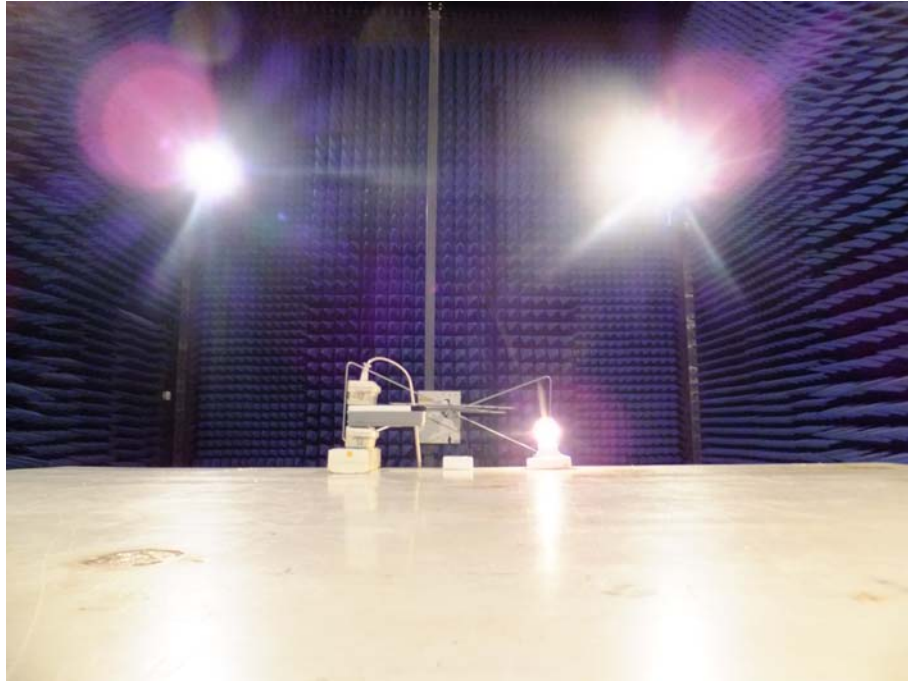
## 8. PHOTOGRAPH

### 8.1. Photo of Power Line Conducted Emission Measurement





## 8.2 Photo of Radiation Emission Test



## APPENDIX I (External Photos)

Figure 1

The EUT-Overall View



Figure 2

The EUT-Top View



Figure 3  
The EUT-Bottom View



Figure 4  
The EUT-Front View





Figure 5  
The EUT-Back View



Figure 6  
The EUT-Right View



Figure 7  
The EUT-Left View



## APPENDIX II (Internal Photos)

Figure 8  
The EUT-Inside View



Figure 9  
PCB of the EUT-Front View





Figure 10  
PCB of the EUT-Back View

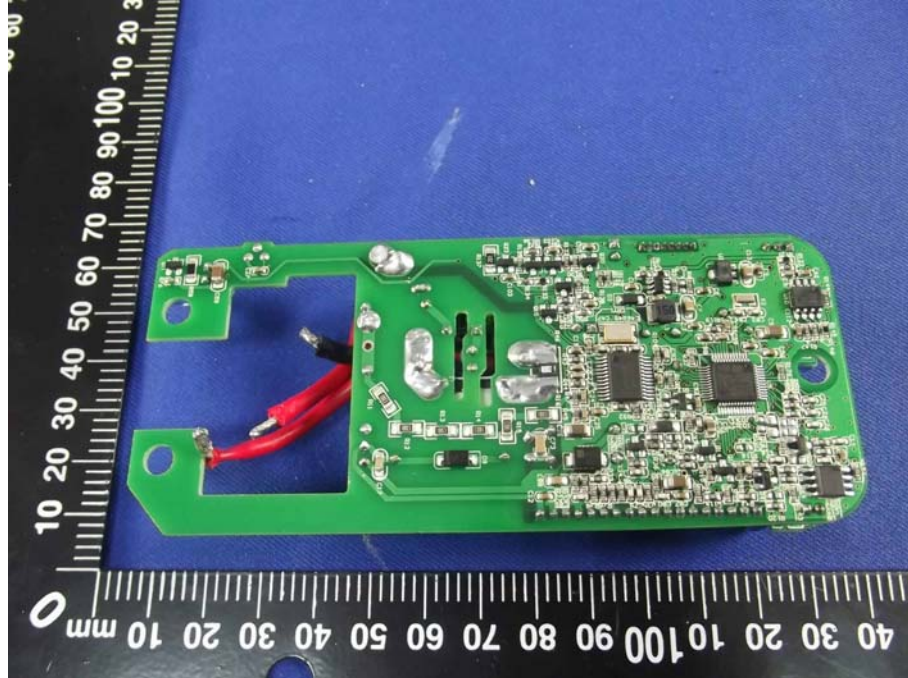


Figure 11  
PCB of the EUT-Front View

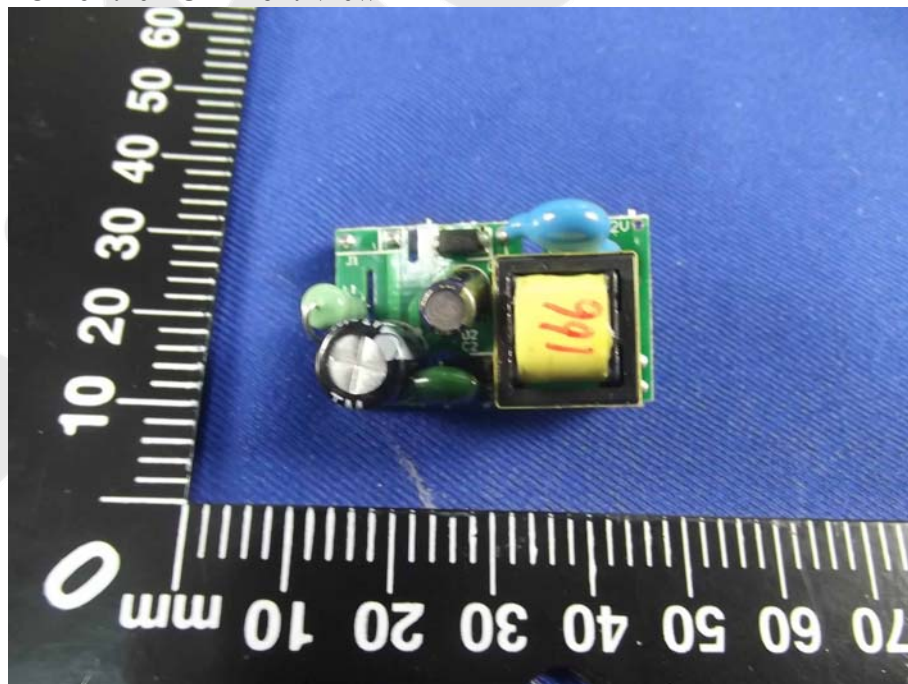


Figure 12  
PCB of the EUT-Back View

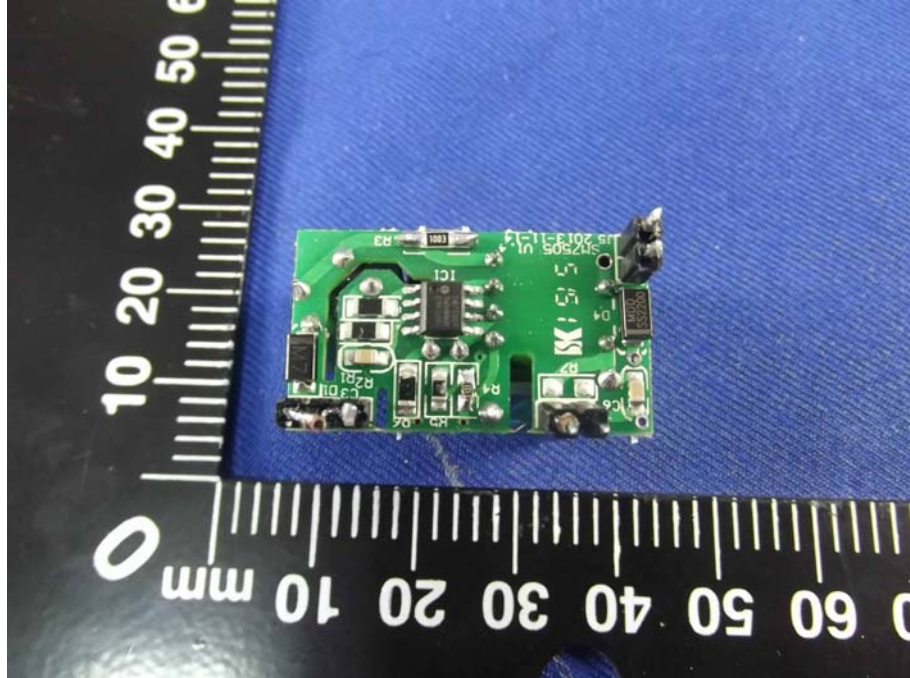


Figure 13  
PCB of the EUT-Front View

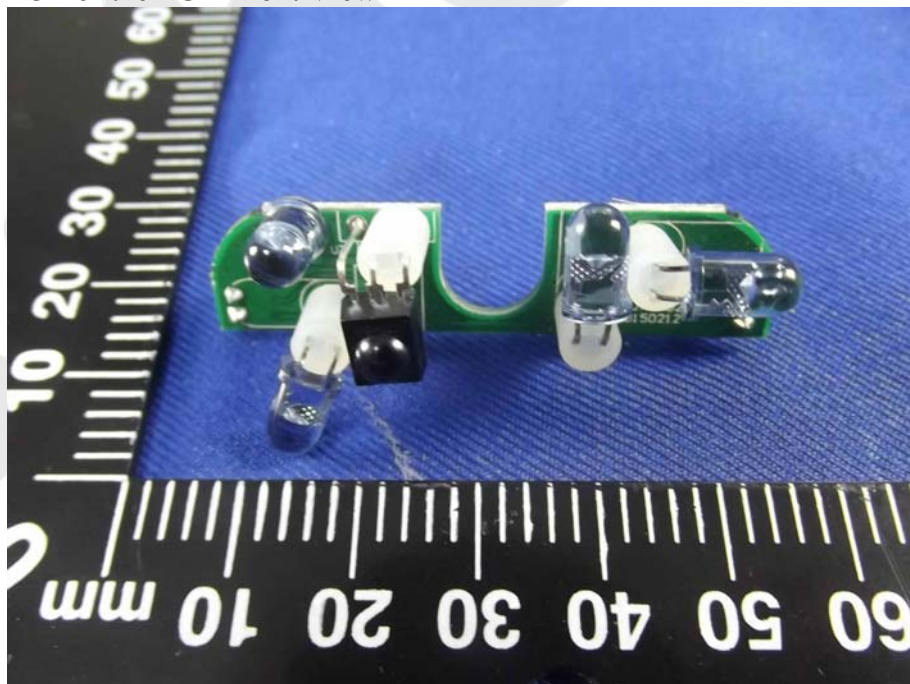




Figure 14  
PCB of the EUT-Back View

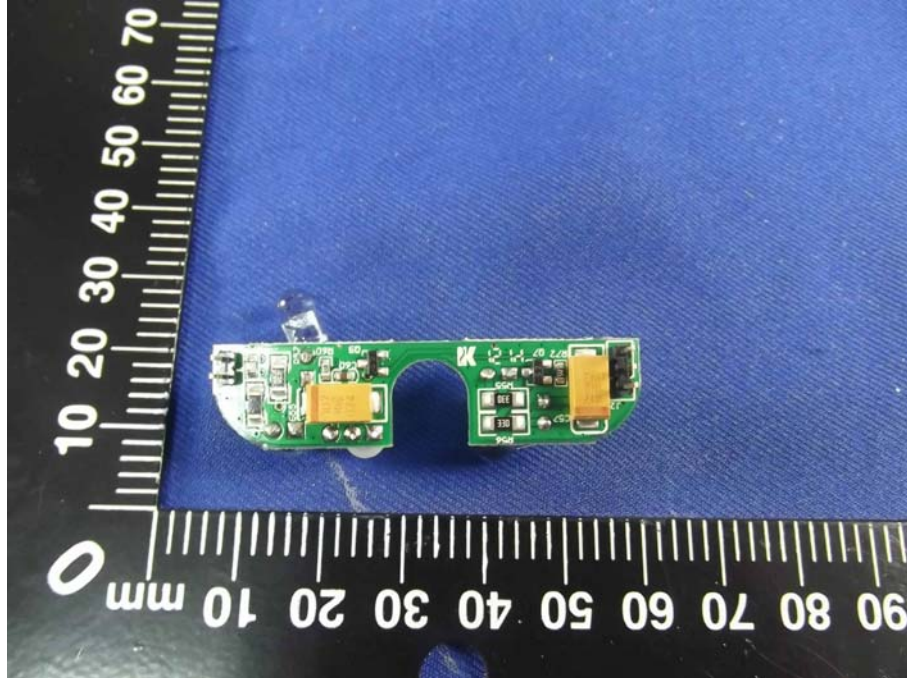


Figure 15  
PCB of the EUT-Front View

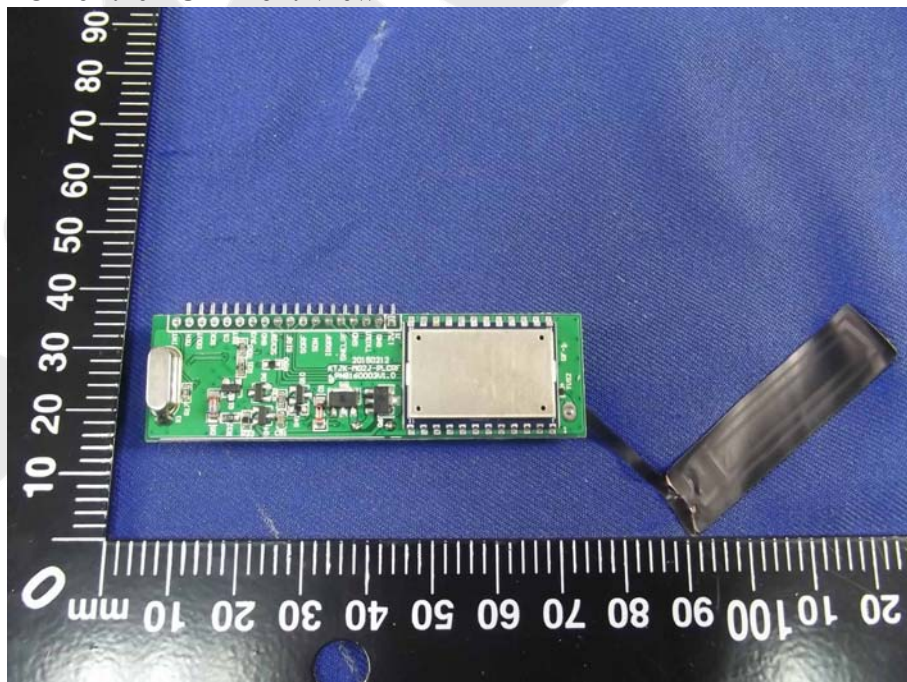


Figure 16  
PCB of the EUT-Back View

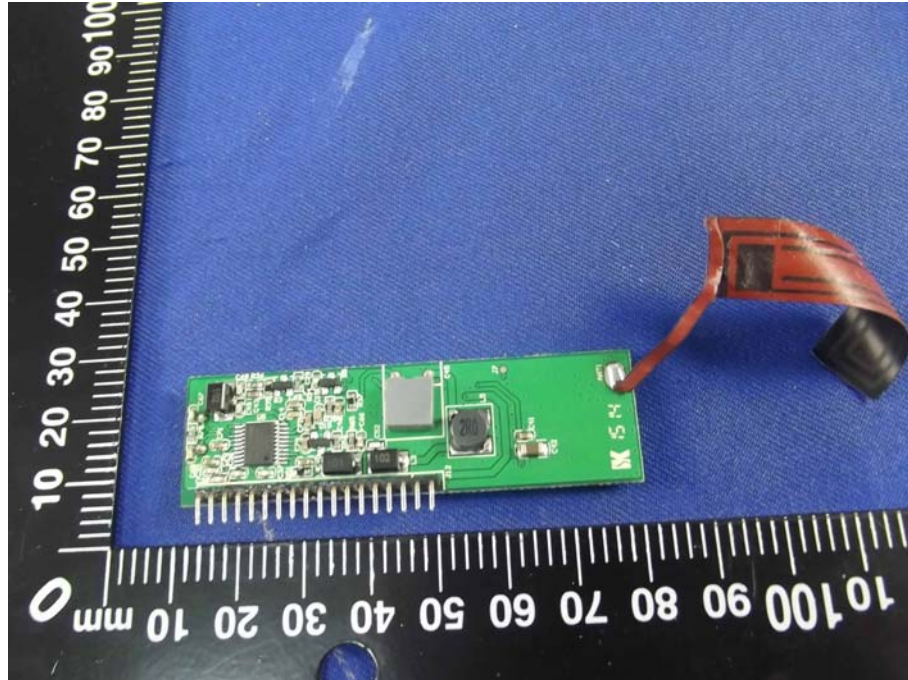


Figure 17  
PCB of the EUT-Front View (433.92MHz Module)

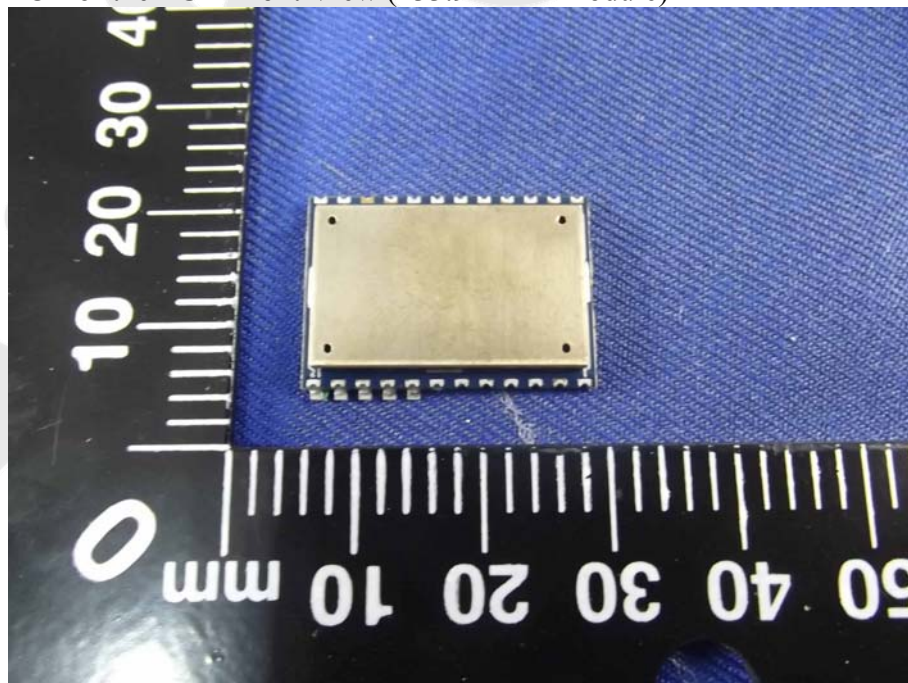




Figure 18  
PCB of the EUT-Back View (433.92MHz Module)

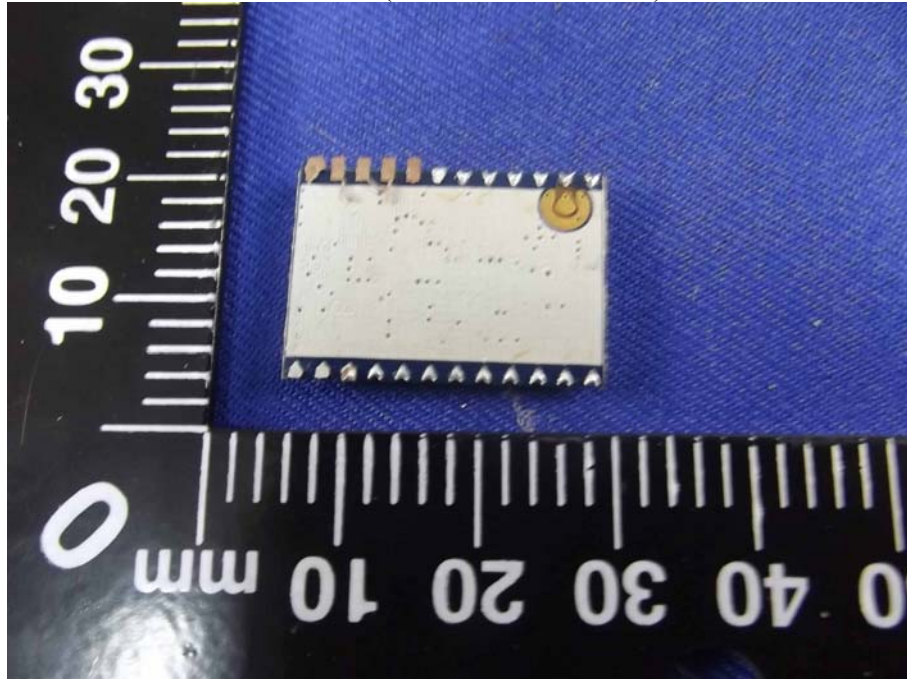


Figure 19  
PCB of the EUT-Front View (433.92MHz Module)

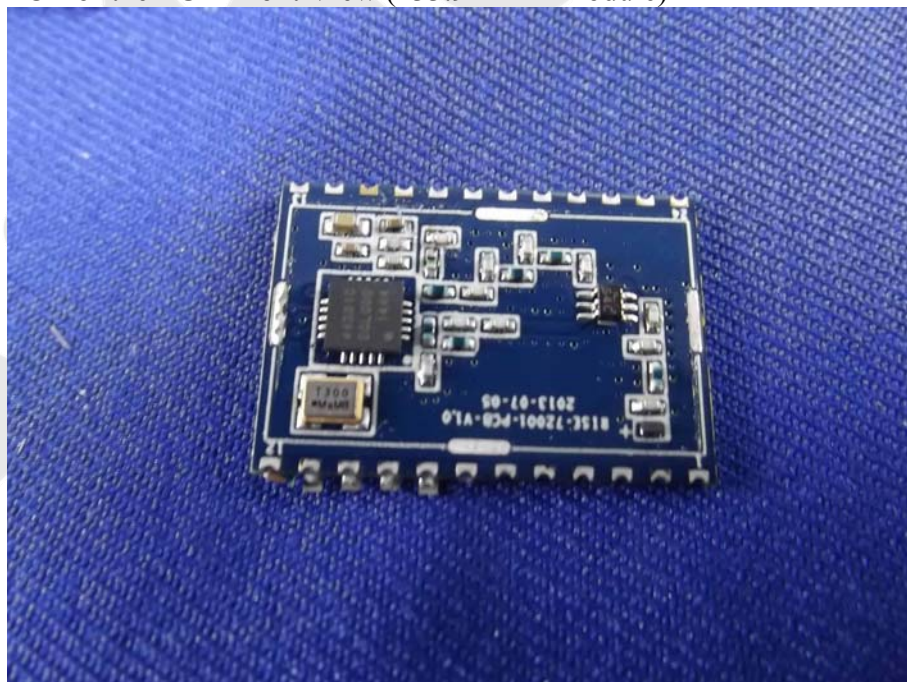


Figure 20  
PCB of the EUT-Back View (433.92MHz Module)

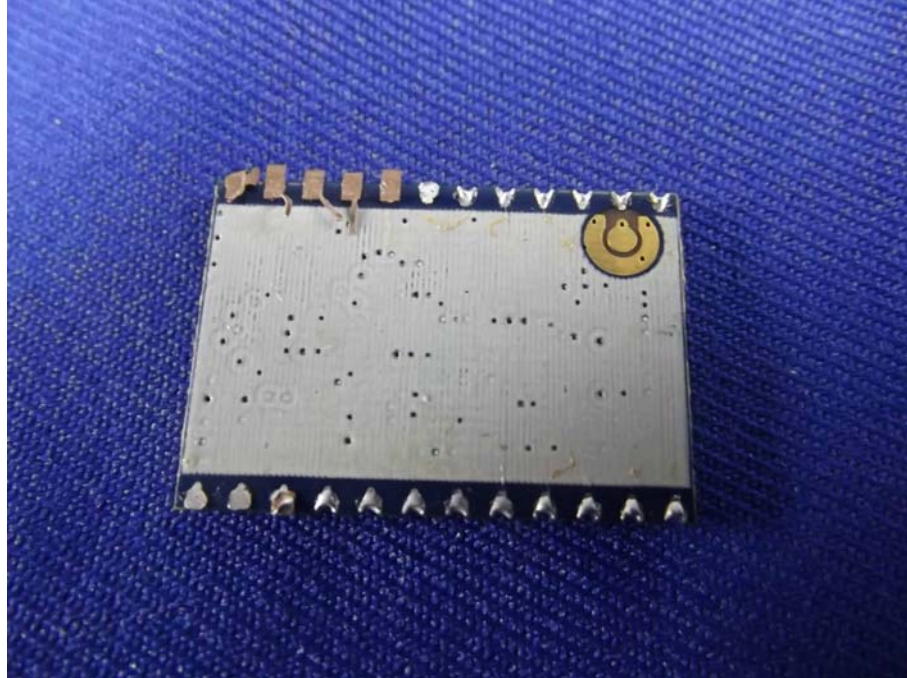


Figure 21  
PCB of the EUT-Front View (2.4GHz Module)

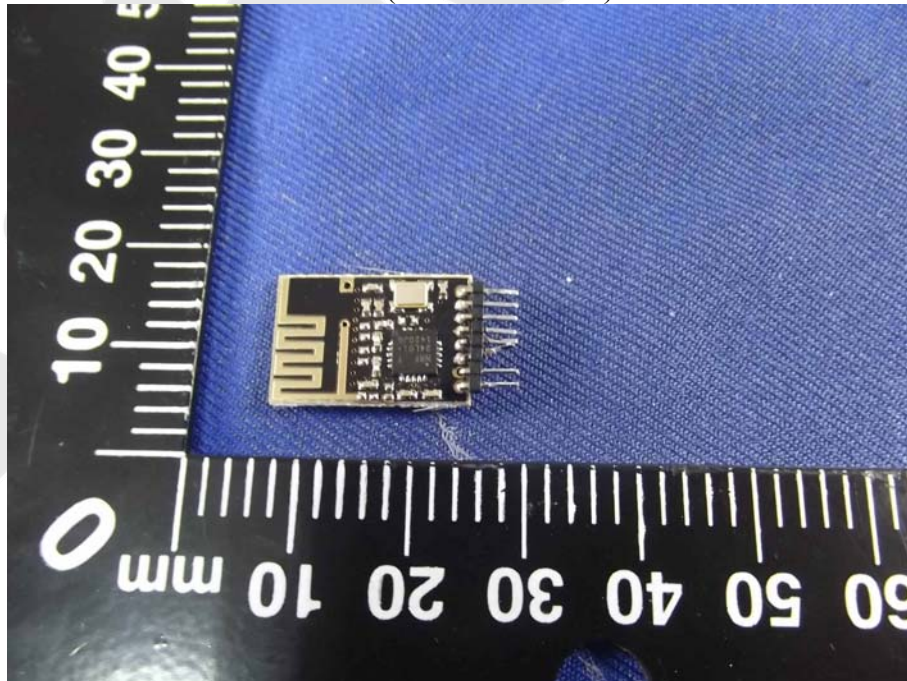




Figure 22  
PCB of the EUT-Back View (2.4GHz Module)

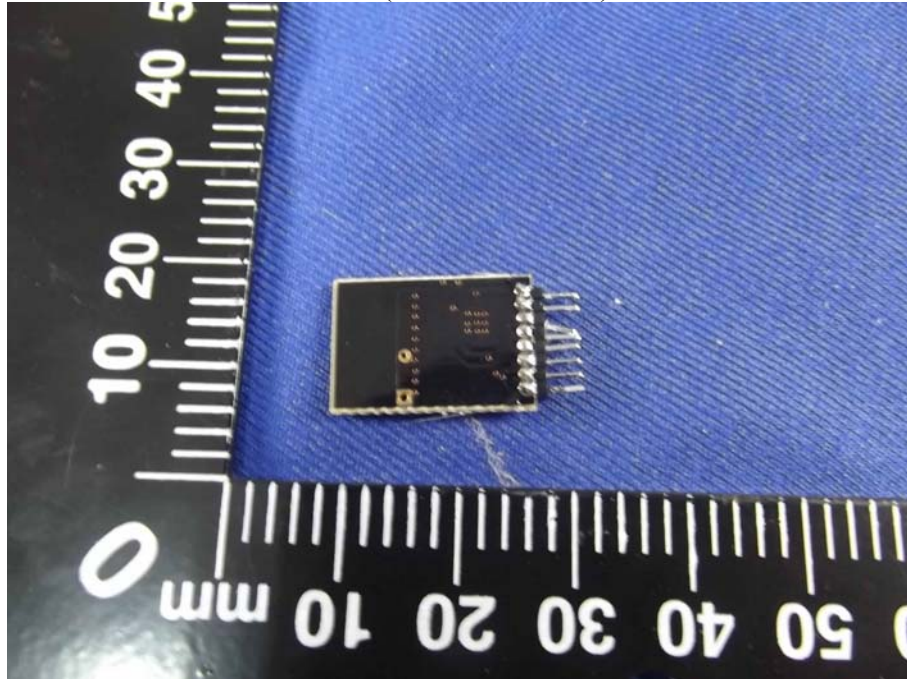


Figure 23  
PCB of the EUT-Front View (2.4GHz Module)

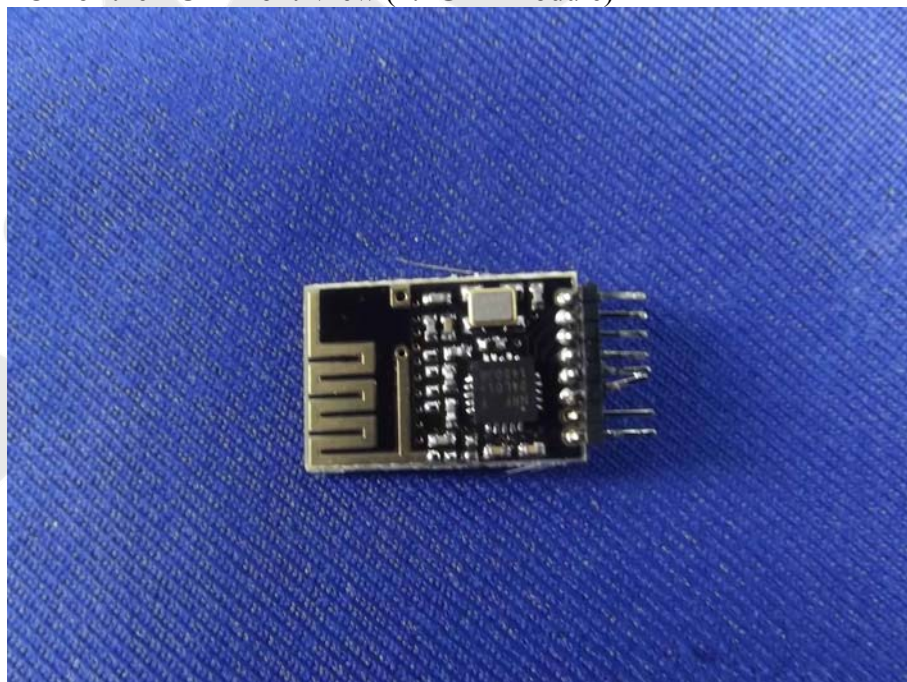


Figure 24  
PCB of the EUT-Back View (2.4GHz Module)

