



Report No.: AGC00021131105FE08

Page 1 of 44

---

# FCC Test Report

---

Report No.: AGC00021131105FE08

**FCC ID** : 2ABADBONGO

**APPLICATION PURPOSE** : Original Equipment

**PRODUCT DESIGNATION** : BONGO

**BRAND NAME** : N/A

**MODEL NAME** : BONGO-001

**CLIENT** : Otis & Eleanor LLC

**DATE OF ISSUE** : Nov.12, 2013

**STANDARD(S)** : FCC Part 15 Rules

**REPORT VERSION** : V1.0

**Attestation of Global Compliance (Shenzhen) Co., Ltd**

**CAUTION:**

This report shall not be reproduced except in full without the written permission of the test laboratory and shall not be quoted out of context.

**Report Revise Record**

<b>Report Version</b>	<b>Revise Time</b>	<b>Issued Date</b>	<b>Valid Version</b>	<b>Notes</b>
V1.0	/	Nov.12, 2013	Valid	Original Report

## TABLE OF CONTENTS

<b>1. VERIFICATION OF COMPLIANCE.....</b>	<b>5</b>
<b>2. GENERAL INFORMATION .....</b>	<b>6</b>
2.1 PRODUCT DESCRIPTION .....	6
2.2 RELATED SUBMITTAL(S)/GRANT(S).....	6
2.3 TEST METHODOLOGY .....	6
2.4 TEST FACILITY .....	6
2.5 SPECIAL ACCESSORIES.....	6
2.6 EQUIPMENT MODIFICATIONS.....	6
<b>3. SYSTEM TEST CONFIGURATION.....</b>	<b>7</b>
3.1 CONFIGURATION OF TESTED SYSTEM.....	7
3.2 EQUIPMENT USED IN TESTED SYSTEM .....	7
<b>4. SUMMARY OF TEST RESULTS.....</b>	<b>8</b>
<b>5. DESCRIPTION OF TEST MODES.....</b>	<b>8</b>
<b>6. ANTENNA REQUIREMENT.....</b>	<b>9</b>
6.1. STANDARD APPLICABLE .....	9
6.2. TEST RESULT .....	9
<b>7. RADIATED EMISSION.....</b>	<b>10</b>
7.1 MEASUREMENT PROCEDURE.....	10
7.2 TEST SETUP.....	11
7.3 LIMITS AND MEASUREMENT RESULT .....	12
7.4 TEST RESULT .....	12
<b>8. BAND EDGE EMISSION.....</b>	<b>25</b>
8.1. MEASUREMENT PROCEDURE .....	25
8.2. TEST SET-UP .....	25
8.3. TEST RESULT .....	26
<b>9. 6DB BANDWIDTH .....</b>	<b>30</b>
9.1. TEST EQUIPMENT LIST AND DETAILS.....	30
9.2. TEST PROCEDURE.....	30
9.3. SUMMARY OF TEST RESULTS/PLOTS .....	30
<b>10. CONDUCTED OUTPUT POWER .....</b>	<b>33</b>
10.1. MEASUREMENT PROCEDURE .....	33
10.2. TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION).....	33
10.3. LIMITS AND MEASUREMENT RESULT .....	34
<b>11. MAXIMUM CONDUCTED OUTPUT POWER SPECTRAL DENSITY .....</b>	<b>36</b>
11.1 MEASUREMENT PROCEDURE .....	36
11.2 TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION).....	36

11.3 MEASUREMENT EQUIPMENT USED.....	36
11.4 LIMITS AND MEASUREMENT RESULT.....	36
<b>APPENDIX A: PHOTOGRAPHS OF TEST SETUP .....</b>	<b>39</b>
<b>APPENDIX B: PHOTOGRAPHS OF EUT .....</b>	<b>40</b>

## 1. VERIFICATION OF COMPLIANCE

<b>Applicant</b>	Otis & Eleanor LLC
<b>Address</b>	1521 Concord Pike 301, Wilmington, DE 19803
<b>Manufacturer</b>	Otis & Eleanor LLC
<b>Address</b>	1521 Concord Pike 301, Wilmington, DE 19803
<b>Product Designation</b>	BONGO
<b>Brand Name</b>	N/A
<b>Test Model</b>	BONGO-001
<b>Date of test</b>	Nov.06~Nov.09, 2013
<b>Deviation</b>	None
<b>Condition of Test Sample</b>	Normal
<b>Report Template</b>	AGCRT-US-BLE/RF (2013-03-01)

### WE HEREBY CERTIFY THAT:

The above equipment was tested by Attestation of Global Compliance (Shenzhen) 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 (2003) and the energy emitted by the sample EUT tested as described in this report is in compliance with requirement of FCC Part 15 Rules requirement.

Prepared By



Water Zuo Nov.12, 2013

Checked By



Forrest Lei Nov.12, 2013

Authorized By



Solger Zhang Nov.12, 2013

## 2.GENERAL INFORMATION

### 2.1 PRODUCT DESCRIPTION

The EUT is designed as a "BONGO". It is designed by way of utilizing the FHSS technology to achieve the system operation.

A major technical description of EUT is described as following

Operation Frequency	2.402 GHz to 2.480GHz
Bluetooth Version	V4.0
Modulation	GFSK
Number of channels	40 Channel(37 Hopping Channel,3 advertising Channel)
Antenna Designation	Integral antenna
Antenna Gain	2.0dBi
Hardware Version	BSK10-8645
Software Version	BSK10-8645
Power Supply	DC3.7V by Built-in Li-ion Battery

Note: BT is not active when charging. And USB port is only for charging.

### 2.2 RELATED SUBMITTAL(S)/GRANT(S)

This submittal(s) (test report) is intended for **FCC ID: 2ABADBONGO** filing to comply with Section 15.247 of the FCC Part 15, Subpart C Rules.

### 2.3 TEST METHODOLOGY

All measurements contained in this report were conducted with ANSI C63.4-2003, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9 kHz to 40 GHz.

The equipment under test (EUT) was configured to measure its highest possible emission level. The test modes were adapted accordingly in reference to the Operating Instructions. The EUT was tested in all three orthogonal planes and the worse case was showed.

### 2.4 TEST FACILITY

All measurement facilities used to collect the measurement data are located at  
Attestation of Global Compliance (Shenzhen) Co, Ltd

2/F., Building 2, No.1-No.4, Chaxi Sanwei Technical Industrial Park, Gushu, Xixiang, Bao'an District, Shenzhen, Guangdong, China.

FCC register No.: 259865

### 2.5 SPECIAL ACCESSORIES

Refer to section 2.2.

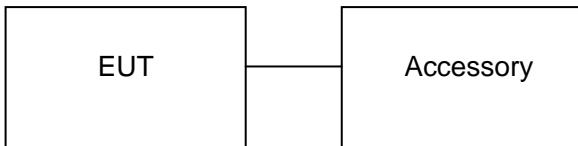
### 2.6 EQUIPMENT MODIFICATIONS

Not available for this EUT intended for grant.

### 3. SYSTEM TEST CONFIGURATION

#### 3.1 CONFIGURATION OF TESTED SYSTEM

**Configuration:** Normal Operating



**Configuration:** Continuous TX



#### 3.2 EQUIPMENT USED IN TESTED SYSTEM

Item	Equipment	Mfr/Brand	Model/Type No.	Remark
1	BONGO	N/A	BONGO-001	EUT
2	Battery	N/A	N/A	Accessory
3	PC	Dell	INSPIRON	A.E
4	Control Board	N/A	T13	A.E

#### 4. SUMMARY OF TEST RESULTS

FCC RULES	DESCRIPTION OF TEST	RESULT
§ 15.203	Antenna Requirement	Compliant
§15.209 §15.247(d)	Radiated Emission	Compliant
§15.247(d)	Band Edges	Compliant
§15.247	6 dB Bandwidth	Compliant
§15.247(b)	Conducted Power	Compliant
§15.247(e)	Maximum Conducted Output Power SPECTRAL Density	Compliant
§15.207	Line Conduction Emission	N/A

Note: N/A means not applicable

#### 5. DESCRIPTION OF TEST MODES

The EUT has been operated in three modulations: GFSK independently.

NO.	TEST MODE DESCRIPTION
1	Low channel TX
2	Middle channel TX
3	High channel TX
4	Normal Operating (BT)

Note:

1. All the test modes can be supply by Built-in full Li-ion battery, only the result of the worst case was recorded in the report if no any records.
2. For Radiated Emission, 3axis were chosen for testing for each applicable mode.

## **6. ANTENNA REQUIREMENT**

### **6.1. STANDARD APPLICABLE**

According to FCC 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 Sections 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 Section 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.

### **6.2. TEST RESULT**

This product has a permanent antenna, fulfill the requirement of this section.

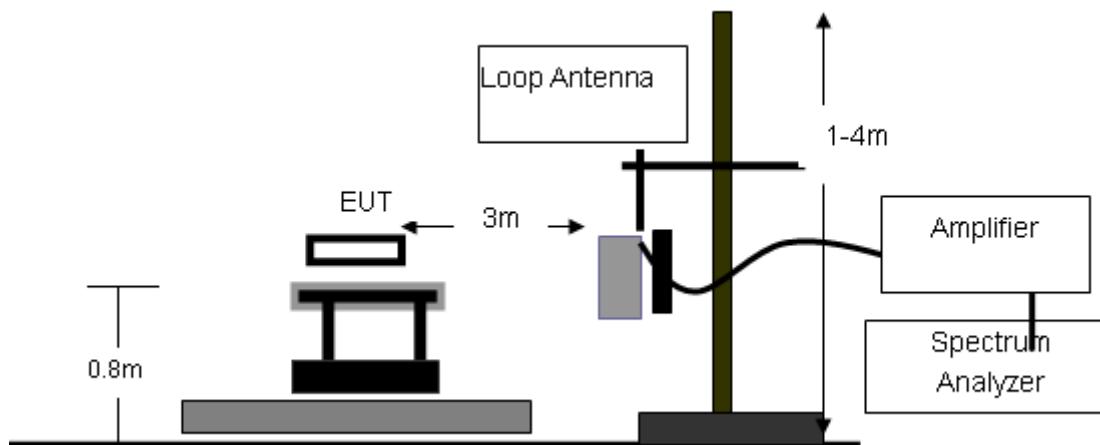
## 7. RADIATED EMISSION

### 7.1 MEASUREMENT PROCEDURE

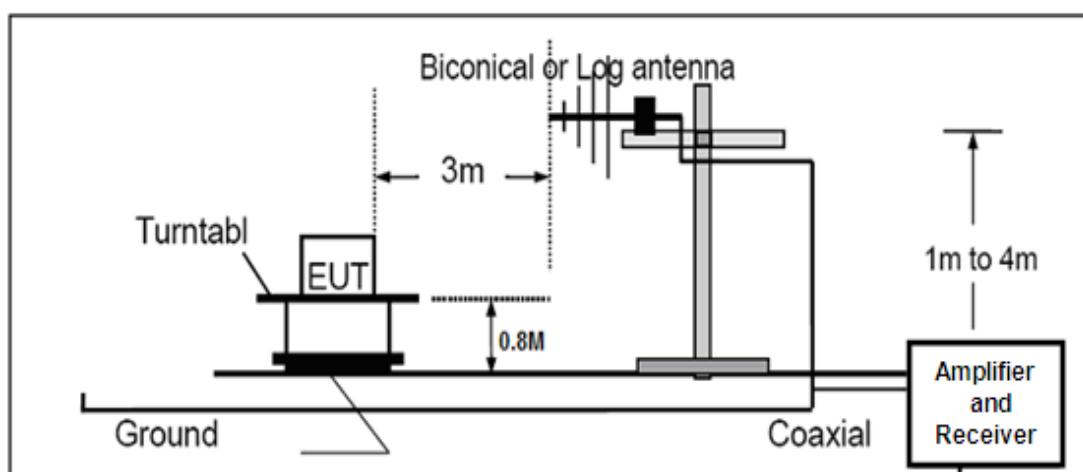
1. Configure the EUT according to ANSI C63.4. The EUT was placed on the top of the turntable 0.8 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turntable.
2. Power on the EUT and all the supporting units. The turntable was rotated by 360 degrees to determine the position of the highest radiation.
3. The height of the broadband receiving antenna was varied between one meter and four meters above ground to find the maximum emissions field strength of both horizontal and vertical polarization.
4. For each suspected emissions, the antenna tower was scan (from 1 M to 4 M) and then the turntable was rotated (from 0 degree to 360 degrees) to find the maximum reading.
5. Set the test-receiver system to Peak or CISPR quasi-peak Detect Function with specified bandwidth under Maximum Hold Mode.
6. For emissions above 1GHz, use 1MHz VBW and RBW for peak reading. Then 1MHz RBW and 10Hz VBW for average reading in spectrum analyzer.
7. When the radiated emissions limits are expressed in terms of the average value of the emissions, and pulsed operation is employed, the measurement field strength shall be determined by averaging over one complete pulse train, including blanking intervals, as long as the pulse train does not exceed 0.1 seconds. As an alternative (provided the transmitter operates for longer than 0.1 seconds) or in cases where the pulse train exceeds 0.1 seconds, the measured field strength shall be determined from the average absolute voltage during a 0.1 second interval during which the field strength is at its maximum values.
8. If the emissions level of the EUT in peak mode was 3 dB lower than the average limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions which do not have 3 dB margin will be repeated one by one using the quasi-peak method for below 1GHz.
9. For testing above 1GHz, the emissions level of the EUT in peak mode was lower than average limit (that means the emissions level in peak mode also complies with the limit in average mode), then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.
10. In case the emission is lower than 30MHz, loop antenna has to be used for measurement and the recorded data should be QP measured by receiver. High - Low scan is not required in this case.

## 7.2 TEST SETUP

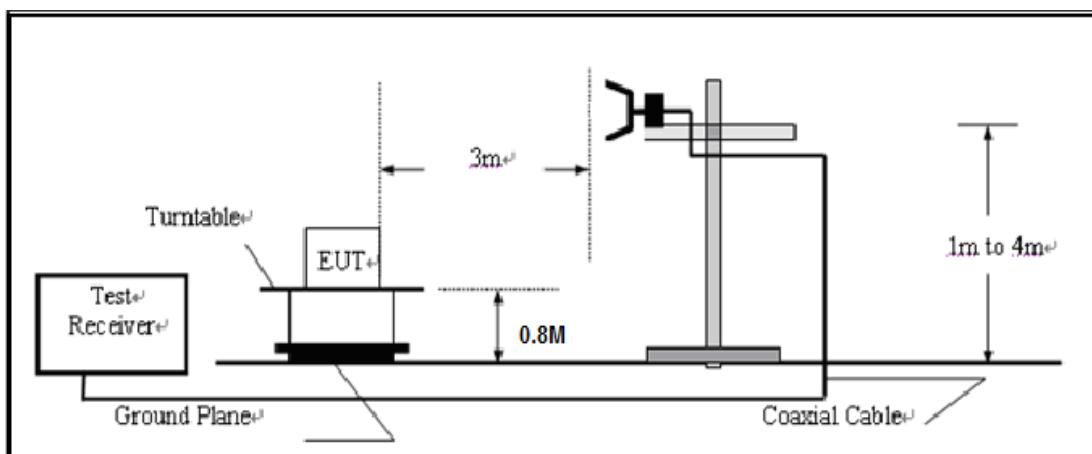
### RADIATED EMISSION TEST SETUP BELOW 30MHz



### RADIATED EMISSION TEST SETUP 30MHz-1000MHz



### RADIATED EMISSION TEST SETUP ABOVE 1000MHz



### 7.3 LIMITS AND MEASUREMENT RESULT

15.209 Limit in the below table has to be followed

Frequencies (MHz)	Field Strength (micorvolts/meter)	Measurement Distance (meters)
0.009~0.490	2400/F(KHz)	300
0.490~1.705	24000/F(KHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
Above 960	500	3

Note: All modes were tested For restricted band radiated emission,  
the test records reported below are the worst result compared to other modes.

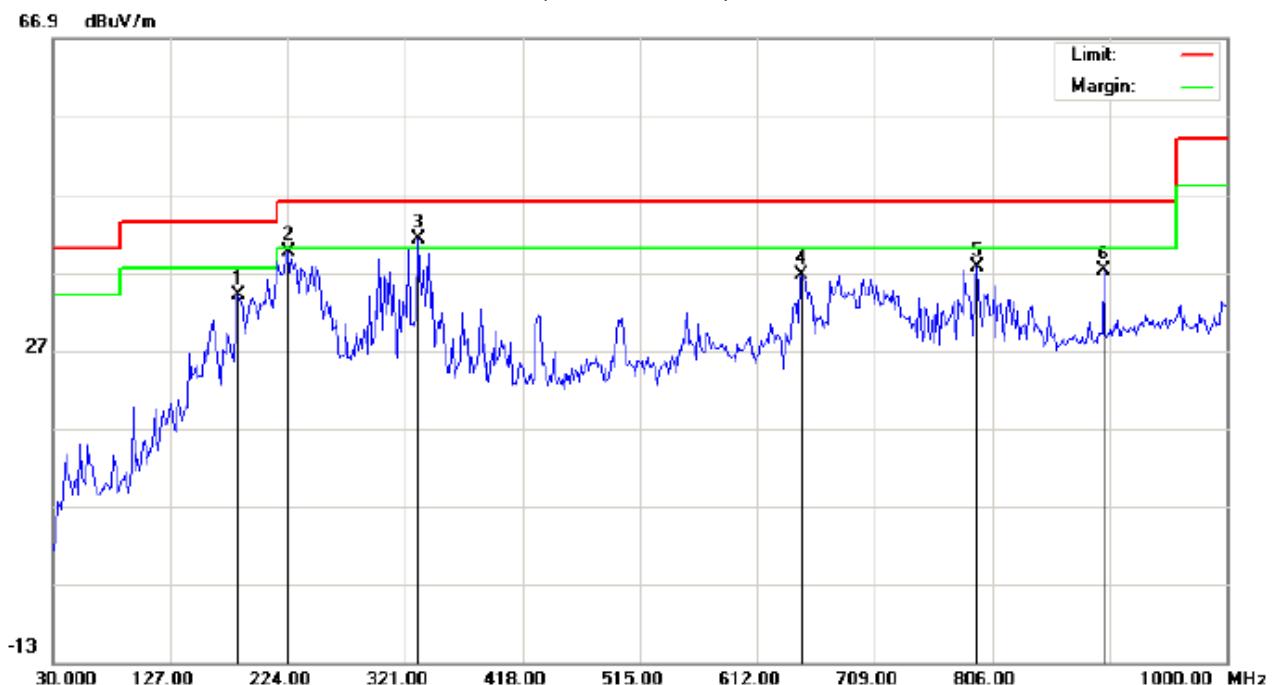
### 7.4 TEST RESULT

#### RADIATED EMISSION BELOW 30MHZ

No emission found between lowest internal used/generated frequencies to 30MHz.

## RADIATED EMISSION BELOW 1GHZ

### RADIATED EMISSION TEST- (30MHZ-1GHZ)-LOW CHANNEL-HORIZONTAL



Site: site #1  
Limit: FCC Class B 3M Radiation  
EUT:BONGO  
M/N:BONGO-001  
Mode: Low Channel TX  
Note:

Polarization: **Horizontal**

Temperature: 26

Power:

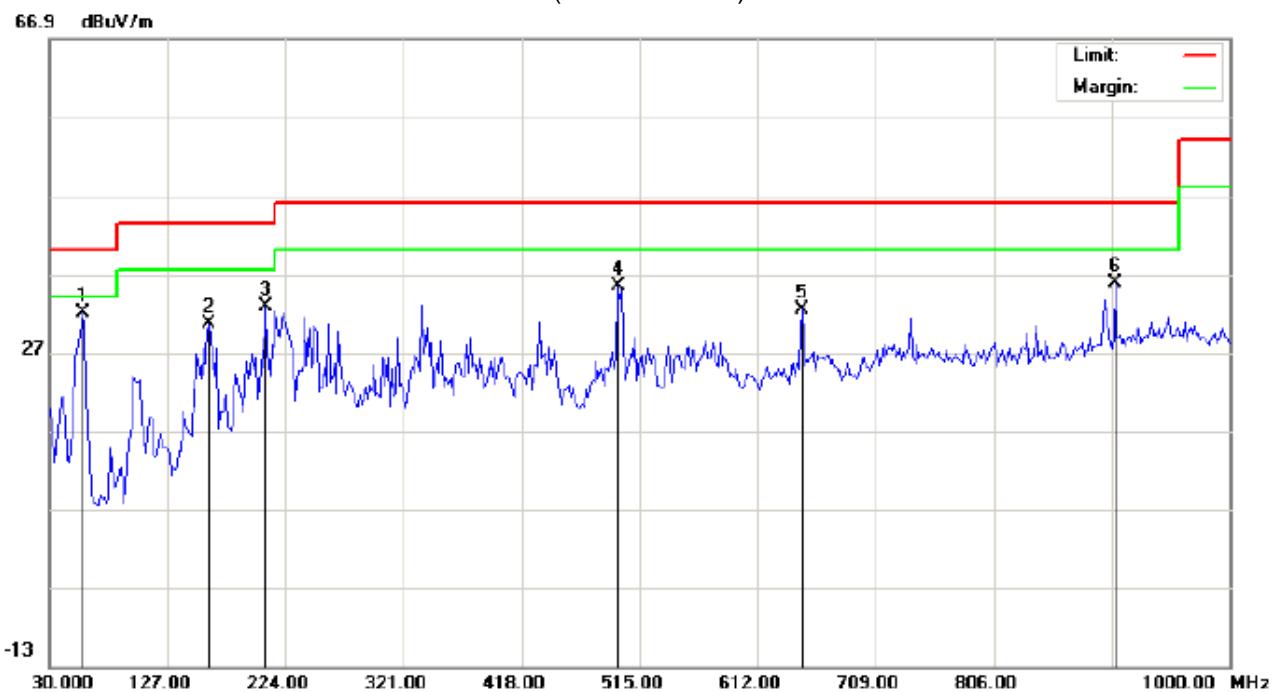
Humidity: 60 %

Distance:

No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna	Table	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		Height	Degree	
1		183.5833	22.83	11.24	34.07	43.50	-9.43	peak			
2		224.0000	26.70	12.91	39.61	46.00	-6.39	peak			
3	*	332.3167	23.61	17.56	41.17	46.00	-4.83	peak			
4		649.1833	12.77	23.85	36.62	46.00	-9.38	peak			
5		793.0667	10.41	27.22	37.63	46.00	-8.37	peak			
6		898.1500	8.71	28.56	37.27	46.00	-8.73	peak			

**RESULT: PASS**

RADIATED EMISSION TEST- (30MHZ-1GHZ)-LOW CHANNEL -VERTICAL



Site: site #1  
 Limit: FCC Class B 3M Radiation  
 EUT:BONGO  
 M/N:BONGO-001  
 Mode: Low Channel TX  
 Note:

Polarization: *Vertical*

Temperature: 26

Power:

Humidity: 60 %

Distance:

No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna	Table	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		Height	Degree	
1	*	57.4833	20.90	11.17	32.07	40.00	-7.93	peak			
2		160.9500	15.55	15.13	30.68	43.50	-12.82	peak			
3		207.8333	20.45	12.30	32.75	43.50	-10.75	peak			
4		497.2167	14.36	21.10	35.46	46.00	-10.54	peak			
5		649.1833	8.62	23.85	32.47	46.00	-13.53	peak			
6		906.2333	7.12	28.78	35.90	46.00	-10.10	peak			

**RESULT: PASS**

**Note:** 1. Factor=Antenna Factor + Cable loss, Margin=Measurement-Limit.

2. The "Factor" value can be calculated automatically by software of measurement system.

RADIATED EMISSION TEST- (30MHZ-1GHZ)-MIDDLE CHANNEL-HORIZONTAL



Site: site #1  
Limit: FCC Class B 3M Radiation  
EUT:BONGO  
M/N:BONGO-001  
Mode: Midddle Channel TX  
Note:

Polarization: *Horizontal*

Temperature: 26

Power:

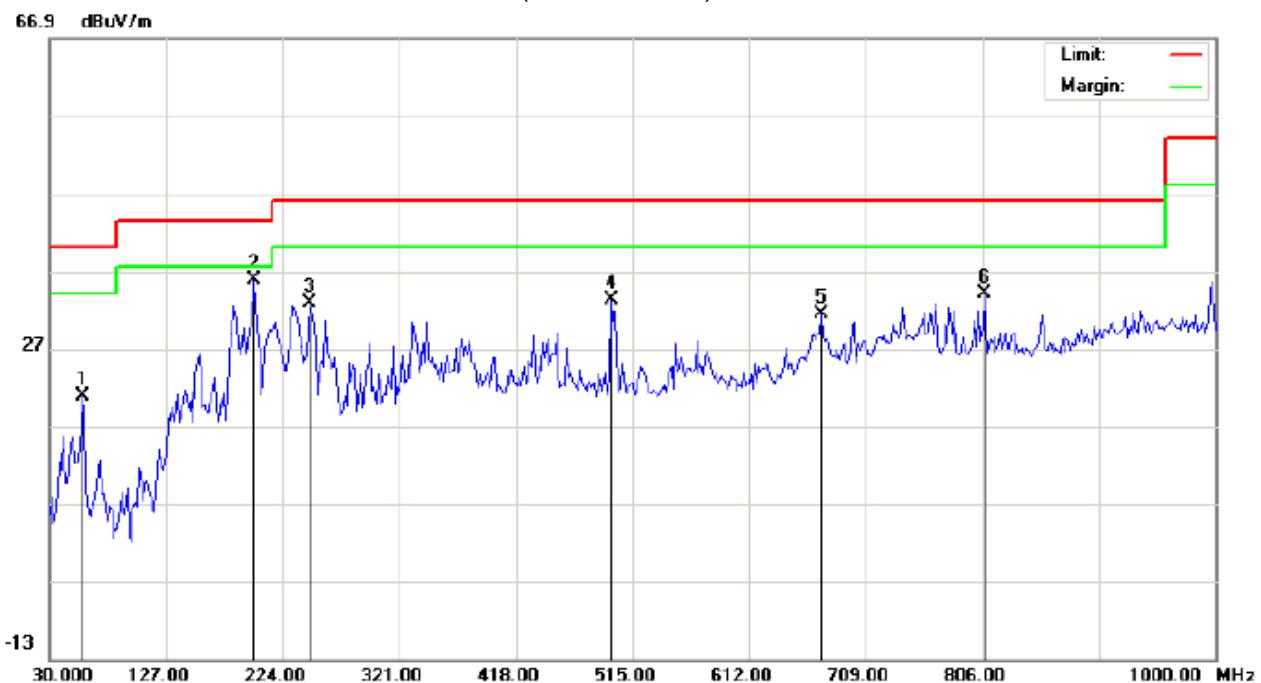
Humidity: 60 %

Distance:

No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna	Table	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		Height	Degree	
1		57.4833	21.26	11.17	32.43	40.00	-7.57	peak			
2	*	159.3333	21.08	15.33	36.41	43.50	-7.09	peak			
3		222.3833	21.86	12.85	34.71	46.00	-11.29	peak			
4		296.7500	18.00	15.31	33.31	46.00	-12.69	peak			
5		497.2167	15.00	21.10	36.10	46.00	-9.90	peak			
6		896.5333	5.31	28.52	33.83	46.00	-12.17	peak			

**RESULT: PASS**

RADIATED EMISSION TEST- (30MHZ-1GHZ)- MIDDLE CHANNEL -VERTICAL



Site: site #1  
 Limit: FCC Class B 3M Radiation  
 EUT:BONGO  
 M/N:BONGO-001  
 Mode: Midddle Channel TX  
 Note:

Polarization: **Vertical**

Temperature: 26

Power:

Humidity: 60 %

Distance:

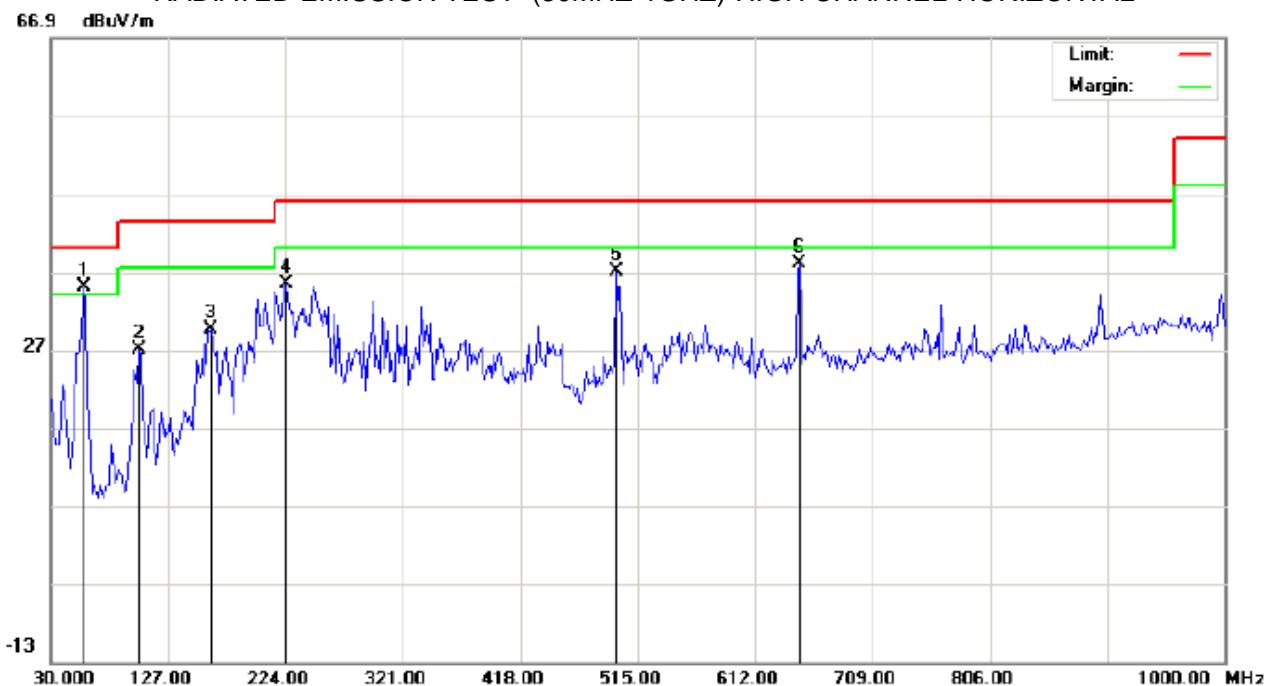
No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1		57.4833	12.55	8.17	20.72	40.00	-19.28	peak			
2	*	199.7500	26.84	9.06	35.90	43.50	-7.60	peak			
3		246.6333	19.22	13.57	32.79	46.00	-13.21	peak			
4		497.2167	12.10	21.10	33.20	46.00	-12.80	peak			
5		671.8167	6.88	24.43	31.31	46.00	-14.69	peak			
6		807.6167	6.76	27.32	34.08	46.00	-11.92	peak			

**RESULT: PASS**

**Note:** 1. Factor=Antenna Factor + Cable loss, Margin=Measurement-Limit.

2. The "Factor" value can be calculated automatically by software of measurement system.

RADIATED EMISSION TEST- (30MHZ-1GHZ)-HIGH CHANNEL-HORIZONTAL



Site: site #1  
 Limit: FCC Class B 3M Radiation  
 EUT:BONGO  
 M/N:BONGO-001  
 Mode: High Channel TX  
 Note:

Polarization: *Horizontal*

Power:

Temperature: 26

Humidity: 60 %

Distance:

No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1	*	57.4833	23.83	11.17	35.00	40.00	-5.00	peak			
2		102.7500	16.38	10.67	27.05	43.50	-16.45	peak			
3		162.5667	14.80	14.78	29.58	43.50	-13.92	peak			
4		224.0000	22.46	12.91	35.37	46.00	-10.63	peak			
5		497.2167	15.98	21.10	37.08	46.00	-8.92	peak			
6		649.1833	14.23	23.85	38.08	46.00	-7.92	peak			

**RESULT: PASS**

RADIATED EMISSION TEST- (30MHZ-1GHZ)-HIGH CHANNEL -VERTICAL



Site: site #1

Polarization: **Vertical**

Temperature: 26

Limit: FCC Class B 3M Radiation

Power:

Humidity: 60 %

EUT:BONGO

Distance:

M/N:BONGO-001

Mode: High Channel TX

Note:

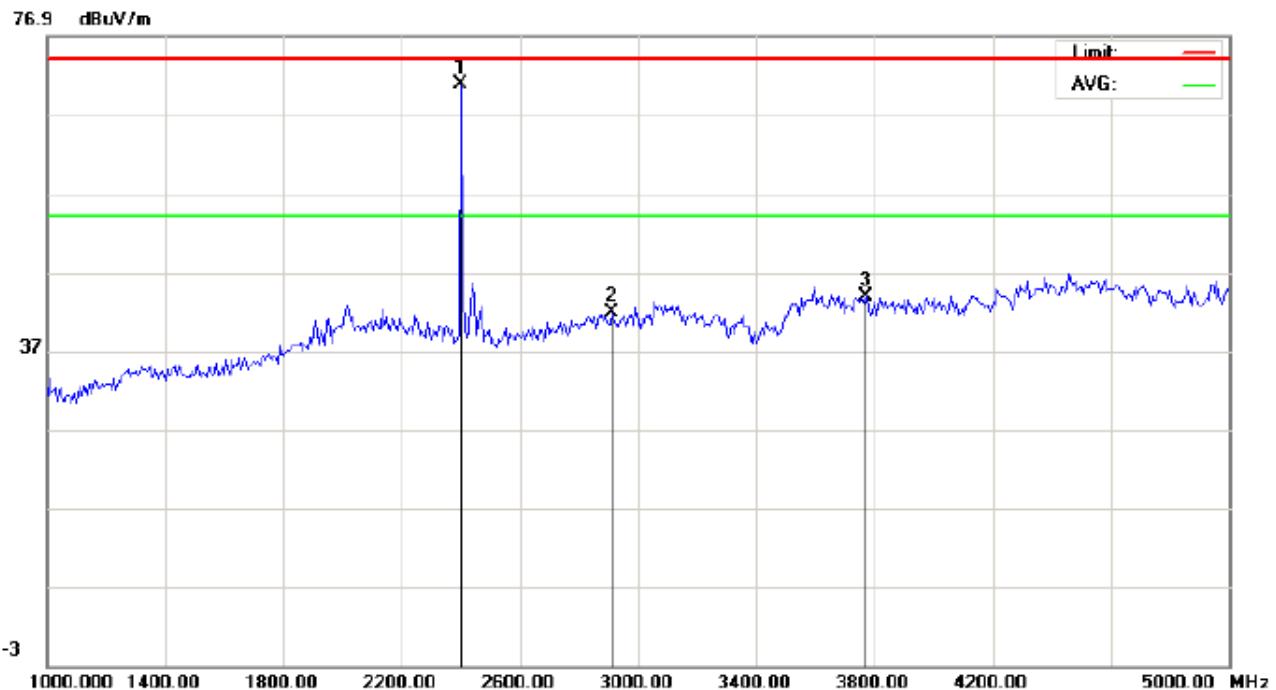
No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna	Table	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		Height	Degree	
1	*	199.7500	26.88	9.06	35.94	43.50	-7.56	peak			
2		232.0833	21.16	12.14	33.30	46.00	-12.70	peak			
3		332.3167	13.95	17.56	31.51	46.00	-14.49	peak			
4		497.2167	10.08	21.10	31.18	46.00	-14.82	peak			
5		751.0333	9.47	26.64	36.11	46.00	-9.89	peak			
6		804.3832	8.74	27.32	36.06	46.00	-9.94	peak			

**RESULT: PASS**

**Note:** 1. Factor=Antenna Factor + Cable loss, Margin=Measurement-Limit.

2. The "Factor" value can be calculated automatically by software of measurement system.

**RADIATED EMISSION ABOVE 1GHZ**  
RADIATED EMISSION TEST- (ABOVE 1GHZ)-LOW CHANNEL-HORIZONTAL

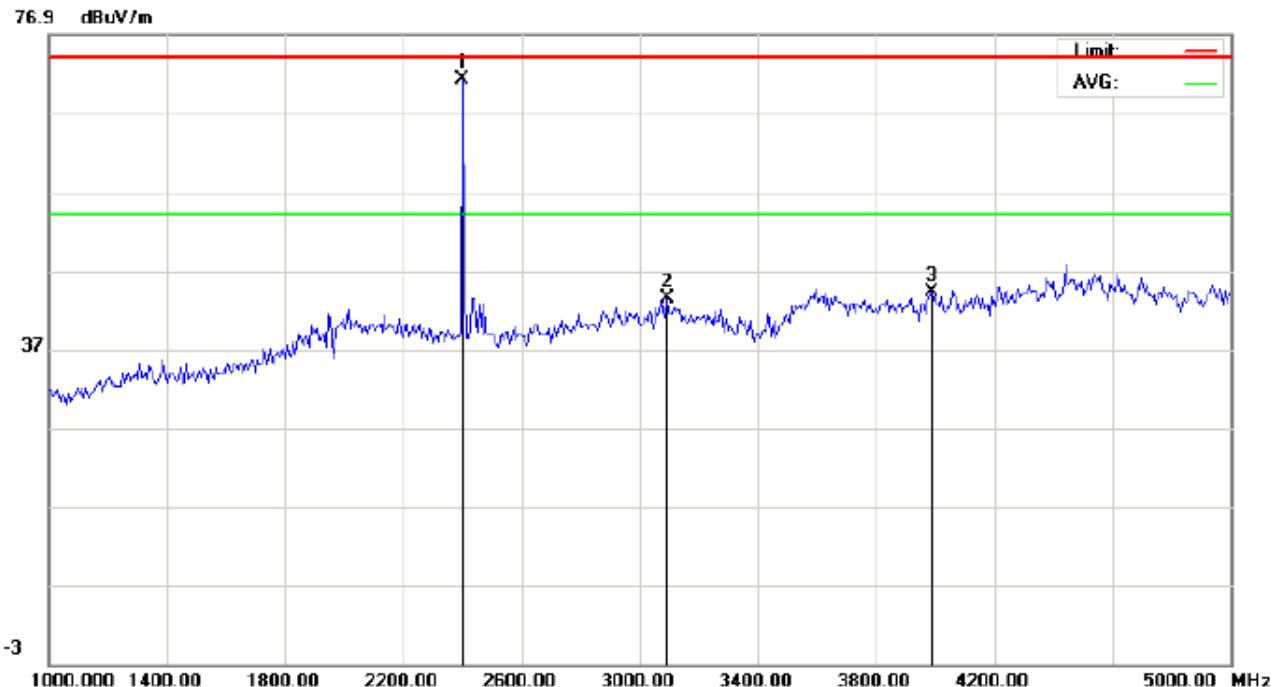


Site: site #1 Polarization: **Horizontal** Temperature: 26  
 Limit: FCC Class B 3M Radiation above 1GHZ(PK) Power: Humidity: 60 %  
 EUT: BONGO Distance:  
 M/N: BONGO-001  
 Mode: low channel TX  
 Note:

No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1	*	2402.000	80.55	-9.68	70.87	74.00	-3.13	peak			
2		2913.333	50.36	-8.57	41.79	74.00	-32.21	peak			
3		3773.333	50.06	-6.21	43.85	74.00	-30.15	peak			

**RESULT: PASS**

## RADIATED EMISSION TEST-(ABOVE 1GHZ)-LOW CHANNEL-VERTICAL



Site: site #1 Polarization: **Vertical** Temperature: 26  
Limit: FCC Class B 3M Radiation above 1GHZ(PK) Power: Humidity: 60 %  
EUT: BONGO Distance:  
M/N: BONGO-001  
Mode: low channel TX  
Note:

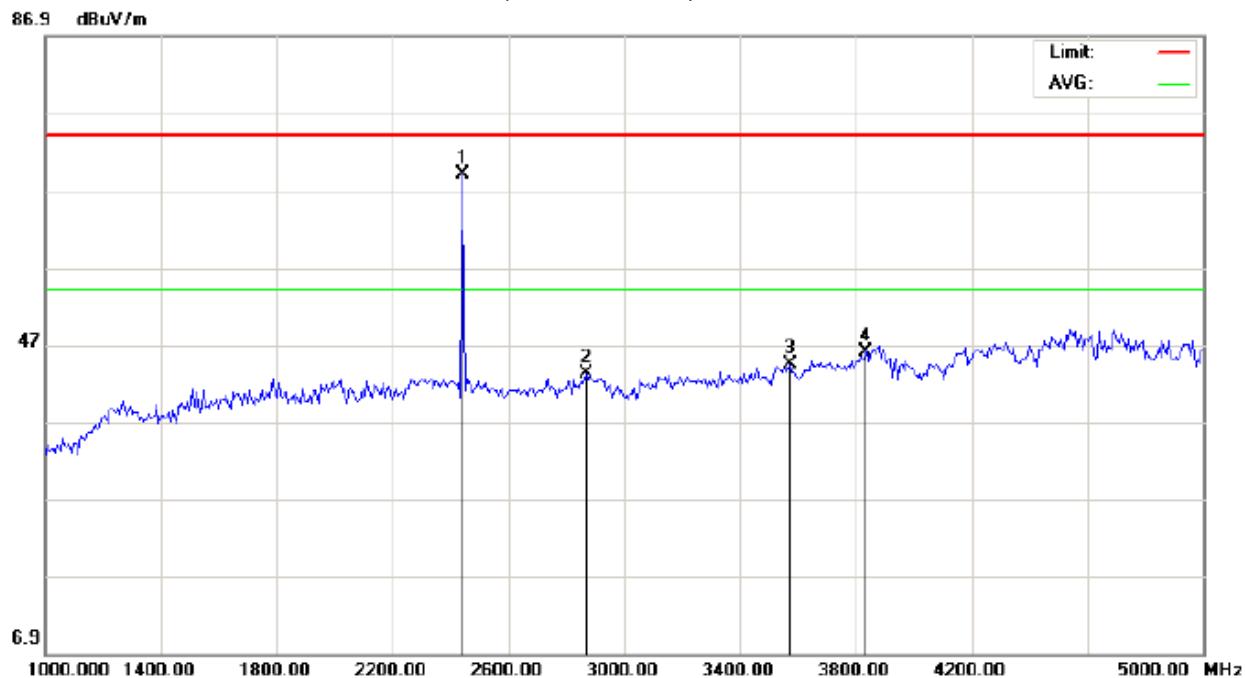
No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1	*	2402.000	80.97	-9.68	71.29	74.00	-2.71	peak			
2		3093.333	51.77	-8.27	43.50	74.00	-30.50	peak			
3		3986.667	49.05	-4.89	44.16	74.00	-29.84	peak			

## RESULT: PASS

**Note:** 1. Factor=Antenna Factor + Cable loss, Margin=Measurement-Limit.

2. The “Factor” value can be calculated automatically by software of measurement system.

## RADIATED EMISSION TEST-(ABOVE 1GHZ)-MIDDLE CHANNEL-HORIZONTAL

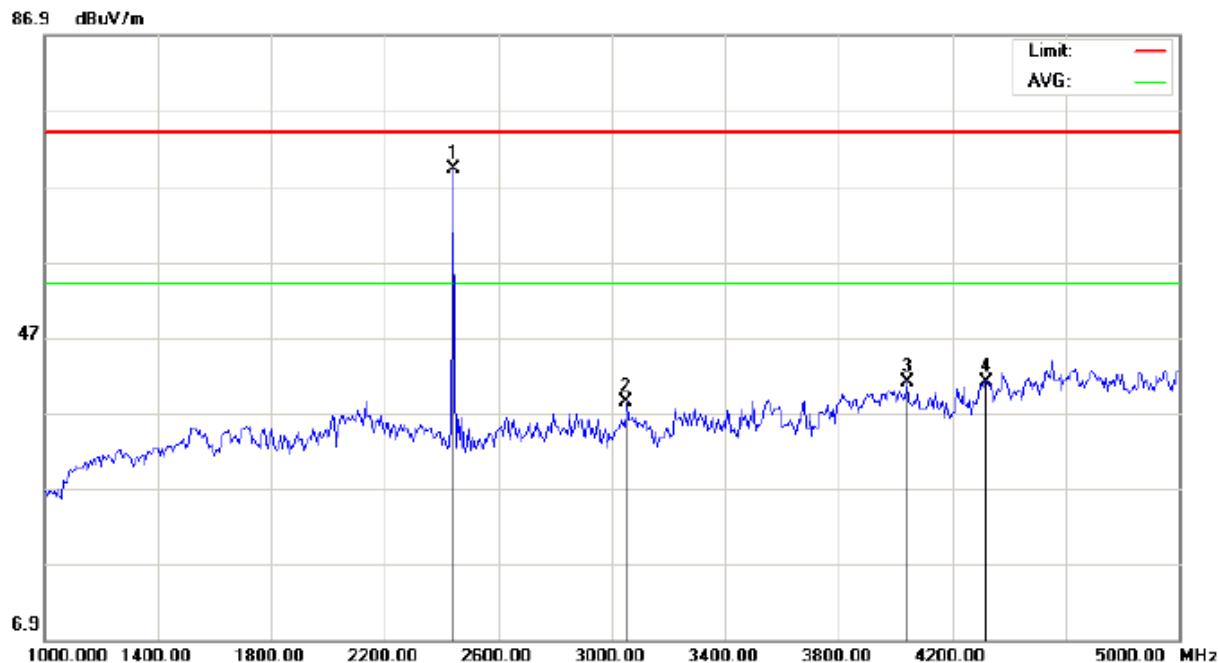


Site: site #1 Polarization: **Horizontal** Temperature: 26  
Limit: FCC Class B 3M Radiation above 1GHZ(PK) Power: Humidity: 60 %  
EUT: BONGO Distance:  
M/N: BONGO-001  
Mode: middle channel TX  
Note:

No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1	*	2440.000	78.70	-9.64	69.06	74.00	-4.94	peak			
2		2866.667	51.85	-8.68	43.17	74.00	-30.83	peak			
3		3573.333	51.91	-7.44	44.47	74.00	-29.53	peak			
4		3833.333	51.93	-5.84	46.09	74.00	-27.91	peak			

## RESULT: PASS

## RADIATED EMISSION TEST-(ABOVE 1GHZ)-MIDDLE CHANNEL-VERTICAL



Site: site #1 Polarization: **Vertical** Temperature: 26  
Limit: FCC Class B 3M Radiation above 1GHZ(PK) Power: Humidity: 60 %  
EUT: BONGO Distance:  
M/N: BONGO-001  
Mode: middle channel TX  
Note:

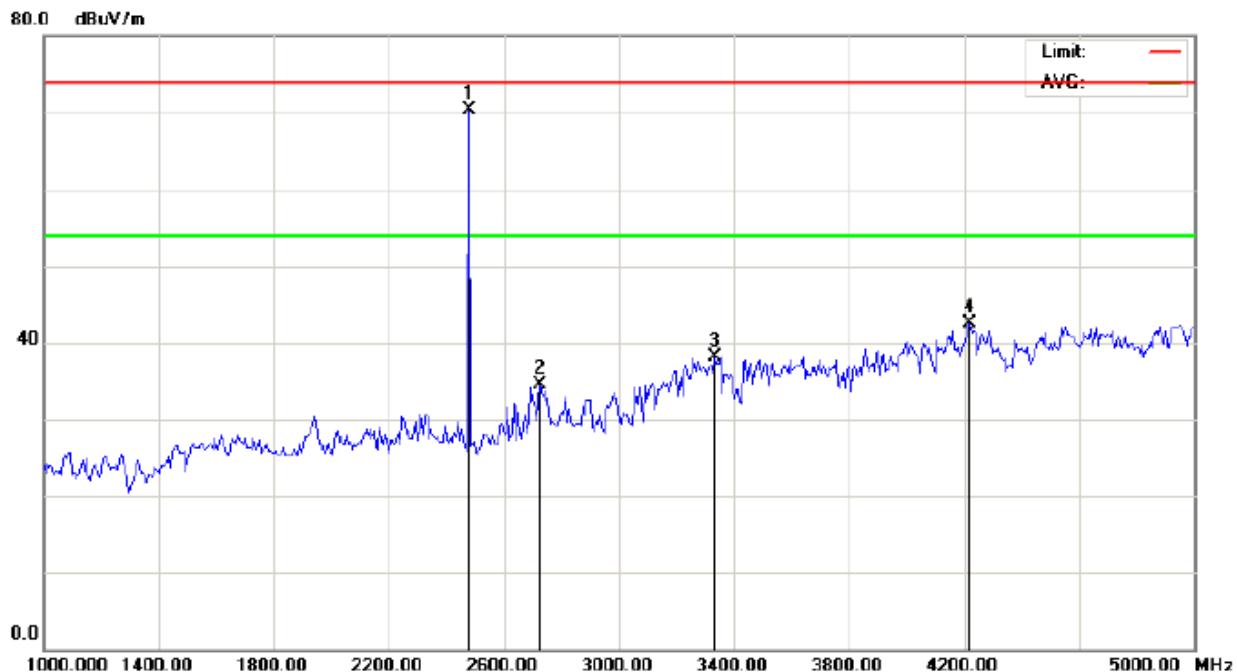
No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1	*	2440.000	78.89	-9.64	69.25	74.00	-4.75	peak			
2		3053.333	46.78	-8.31	38.47	74.00	-35.53	peak			
3		4040.000	45.66	-4.67	40.99	74.00	-33.01	peak			
4		4320.000	44.82	-3.72	41.10	74.00	-32.90	peak			

## RESULT: PASS

**Note:** 1. Factor=Antenna Factor + Cable loss, Margin=Measurement-Limit.

2. The “Factor” value can be calculated automatically by software of measurement system.

## RADIATED EMISSION TEST-(ABOVE 1GHZ)-HIGH CHANNEL-HORIZONTAL

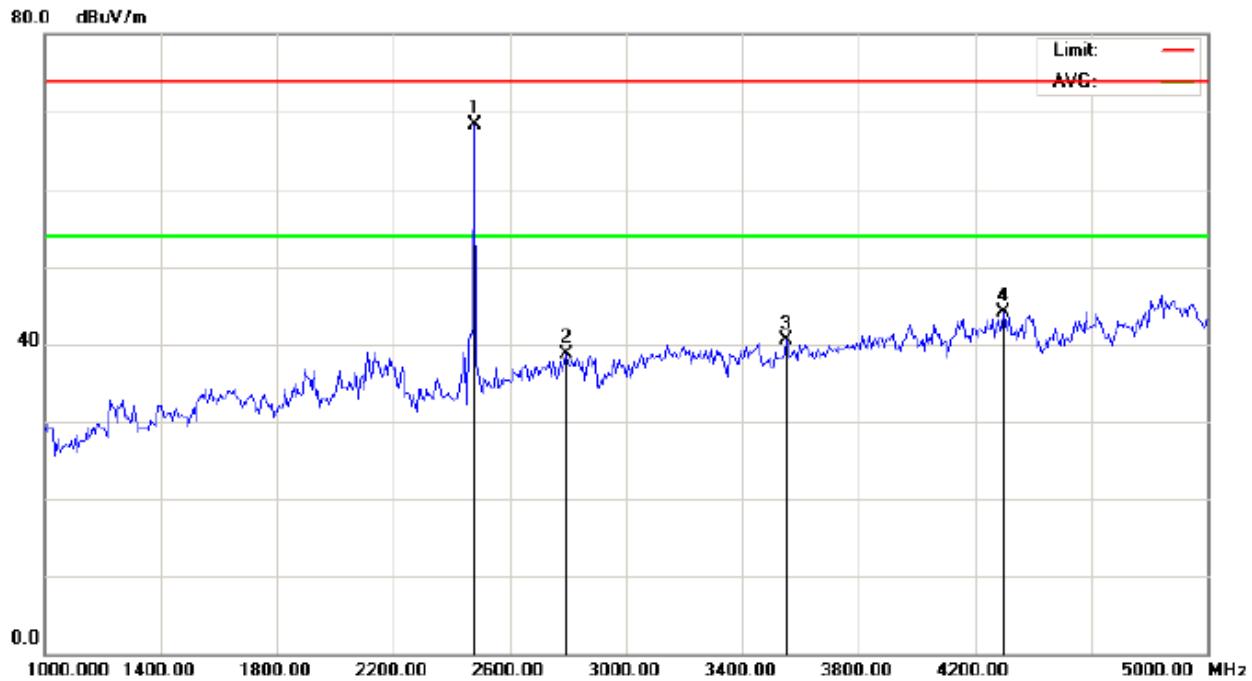


Site: site #1 Polarization: **Horizontal** Temperature: 26  
Limit: FCC Class B 3M Radiation above 1GHZ(PK) Power: Humidity: 60 %  
EUT: BONGO Distance:  
M/N: BONGO-001  
Mode: high channel TX  
Note:

No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1	*	2480.000	79.85	-9.59	70.26	74.00	-3.74	peak			
2		2726.667	43.51	-9.02	34.49	74.00	-39.51	peak			
3		3333.333	46.20	-8.05	38.15	74.00	-35.85	peak			
4		4220.000	46.58	-4.06	42.52	74.00	-31.48	peak			

## RESULT: PASS

## RADIATED EMISSION TEST-(ABOVE 1GHZ)-HIGH CHANNEL-VERTICAL



Site: site #1 Polarization: **Vertical** Temperature: 26  
Limit: FCC Class B 3M Radiation above 1GHZ(PK) Power: Humidity: 60 %  
EUT: BONGO Distance:  
M/N: BONGO-001  
Mode: high channel TX  
Note:

No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1	*	2480.000	77.94	-9.59	68.35	74.00	-5.65	peak			
2		2793.333	47.52	-8.86	38.66	74.00	-35.34	peak			
3		3553.333	48.12	-7.56	40.56	74.00	-33.44	peak			
4		4300.000	47.87	-3.79	44.08	74.00	-29.92	peak			

## RESULT: PASS

**Note:** 5~25GHz at least have 20dB margin. No recording in the test report.

Factor=Antenna Factor+ Cable loss-Amplifier gain, Margin=Measurement-Limit.

The “Factor” value can be calculated automatically by software of measurement system.

## **8. BAND EDGE EMISSION**

### **8.1. MEASUREMENT PROCEDURE**

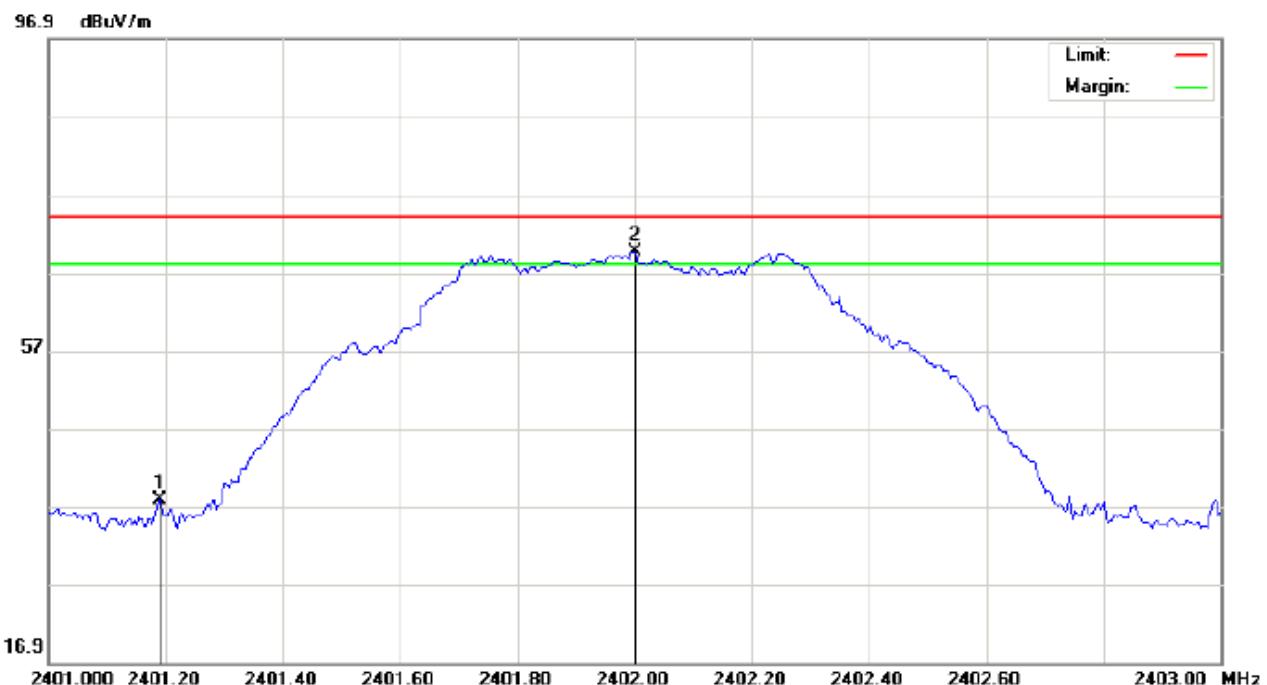
1. Set the EUT Work on the top, the bottom operation frequency individually.
2. Set Span = 2MHz, RBW>=100 KHz, VBW>=3RBW, Center frequency =Operation frequency
3. The band edges was measured and recorded.

### **8.2. TEST SET-UP**

Radiated same as 7.2

### 8.3. TEST RESULT

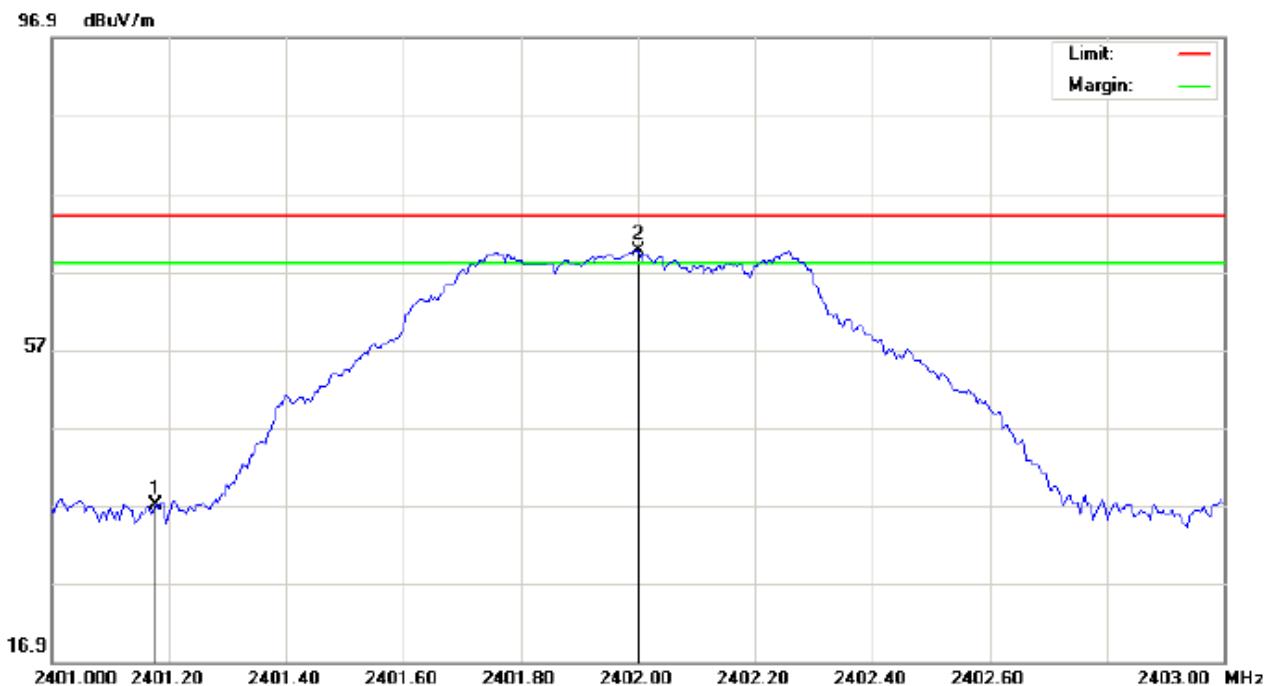
TEST PLOT OF BAND EDGE FOR LOW CHANNEL -Horizontal



Site: site #1 Polarization: *Horizontal* Temperature: 26  
Limit: FCC Class B 3M Radiation above 1GHZ(PK) Power: Humidity: 60 %  
EUT: BONGO Distance: 3m  
M/N:BONGO-001  
Mode: Low channel TX  
Note:

No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1		2401.190	47.58	-9.68	37.90	74.00	-36.10	peak			
2	*	2402.000	79.21	-9.68	69.53	74.00	-4.47	peak			

TEST PLOT OF BAND EDGE FOR LOW CHANNEL - Vertical

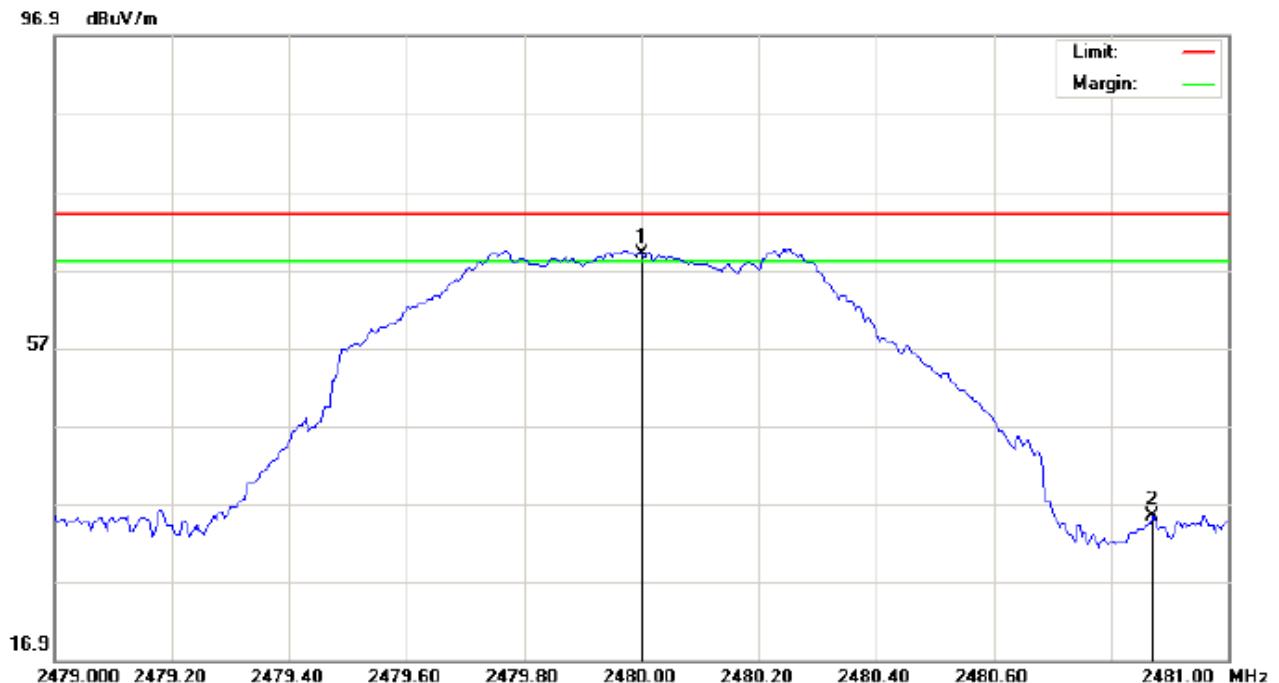


Site: site #1 Polarization: **Vertical** Temperature: 26  
Limit: FCC Class B 3M Radiation above 1GHZ(PK) Power: Humidity: 60 %  
EUT:BONGO Distance: 3m  
M/N:BONGO-001  
Mode: Low channel TX  
Note:

No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1		2401.177	46.74	-9.68	37.06	74.00	-36.94	peak			
2	*	2402.000	79.25	-9.68	69.57	74.00	-4.43	peak			

**RESULT: PASS**

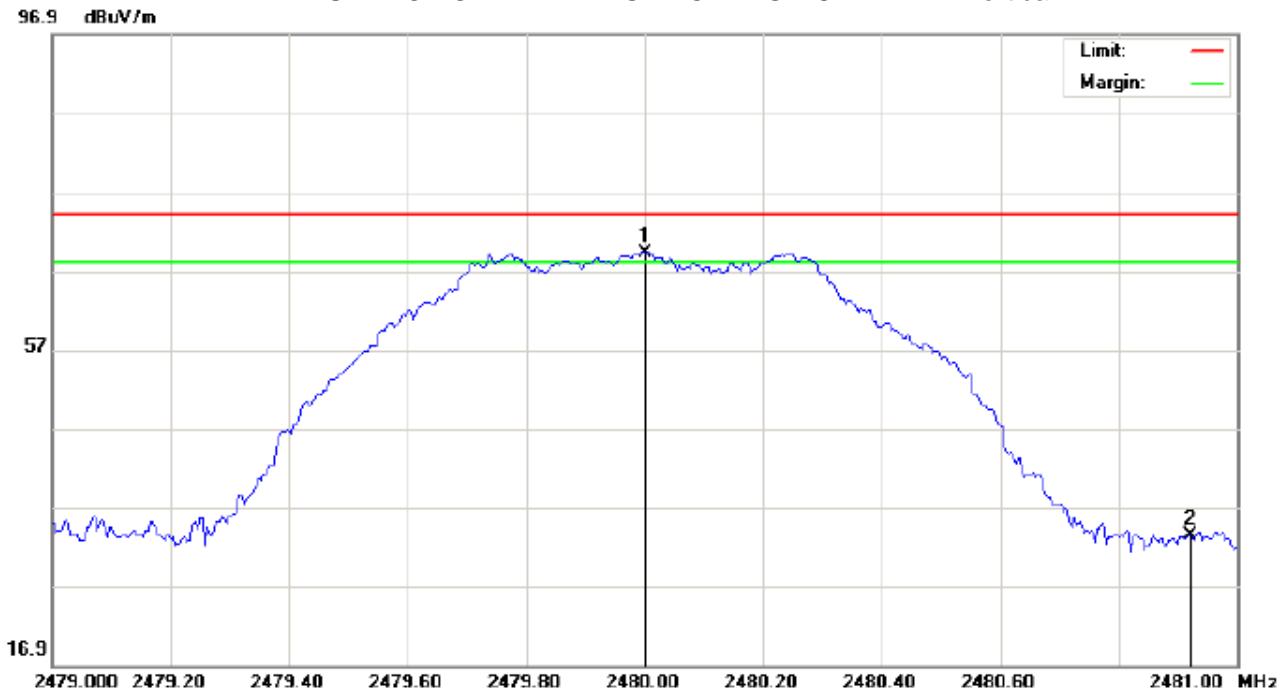
TEST PLOT OF BAND EDGE FOR HIGH CHANNEL –Horizontal



Site: site #1 Polarization: *Horizontal* Temperature: 26  
Limit: FCC Class B 3M Radiation above 1GHZ(PK) Power: Humidity: 60 %  
EUT:BONGO Distance: 3m  
M/N:BONGO-001  
Mode: High channel TX  
Note:

No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1	*	2480.000	78.59	-9.59	69.00	74.00	-5.00	peak			
2		2480.870	44.93	-9.59	35.34	74.00	-38.66	peak			

## TEST PLOT OF BAND EDGE FOR HIGH CHANNEL -Vertical



Site: site #1 Polarization: *Vertical* Temperature: 26  
Limit: FCC Class B 3M Radiation above 1GHZ(PK) Power: Humidity: 60 %  
EUT:BONGO Distance: 3m  
M/N:BONGO-001  
Mode: High channel TX  
Note:

No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1	*	2480.000	78.86	-9.59	69.27	74.00	-4.73	peak			
2		2480.920	42.96	-9.59	33.37	74.00	-40.63	peak			

## RESULT: PASS

Factor=Antenna Factor+ Cable loss-Amplifier gain, Margin=Measurement-Limit.

The “Factor” value can be calculated automatically by software of measurement system.

## 9. 6DB BANDWIDTH

### 9.1. TEST EQUIPMENT LIST AND DETAILS

Equipment	Manufacturer	Model	S/N	Cal. Date	Cal. Due
PSA SERIES SPECTRUM ANALYZER	AGILENT	E4440A	US41421290	07/17/2013	07/16/2014
RECEIVER ANTENNA	ETS	2175	57337	07/17/2013	07/16/2014

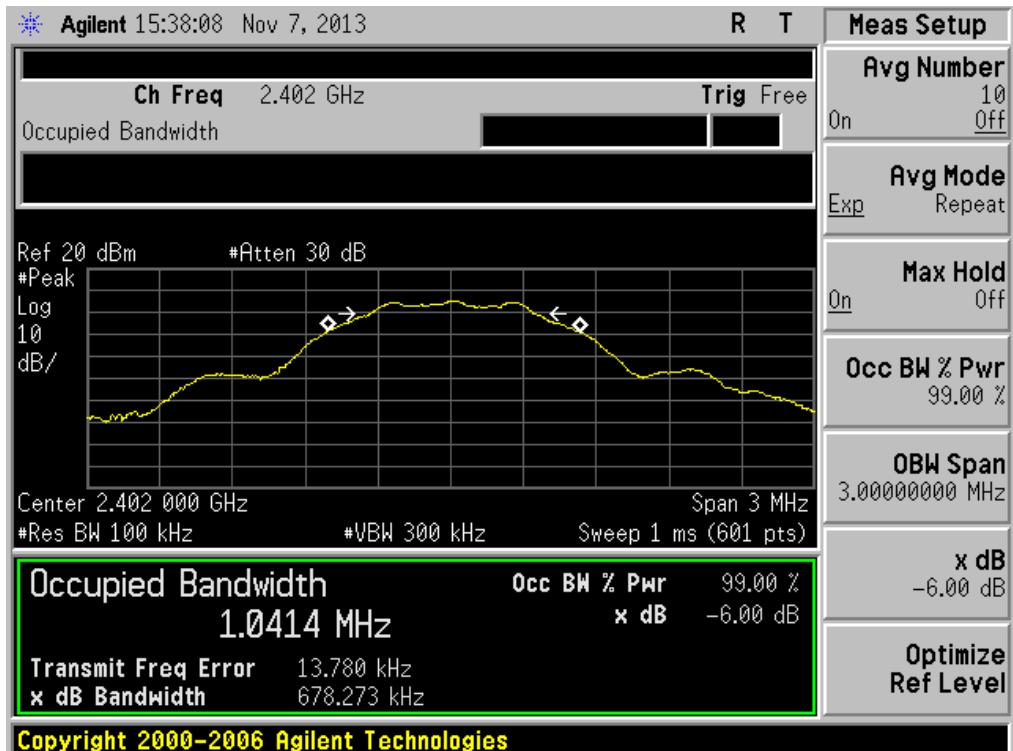
### 9.2. TEST PROCEDURE

1. The EUT was placed on a table which is 0.8m above ground plane.
2. Connect EUT RF output port to the Spectrum Analyzer through an RF attenuator
3. Set the EUT Work on the top, the middle and the bottom operation frequency individually.
3. Set SPA Centre Frequency = Operation Frequency, RBW= 100 KHz, VBW $\geq$ 3\*RBW.
4. Set SPA Trace 1 Max hold, then View.

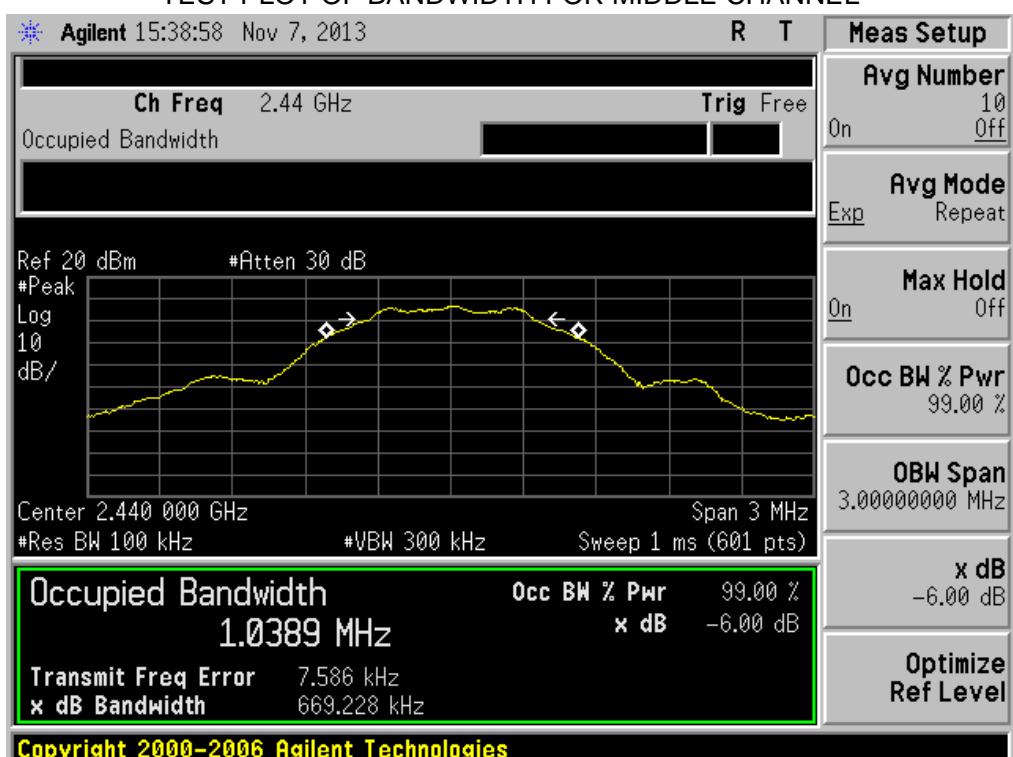
### 9.3. SUMMARY OF TEST RESULTS/PLOTS

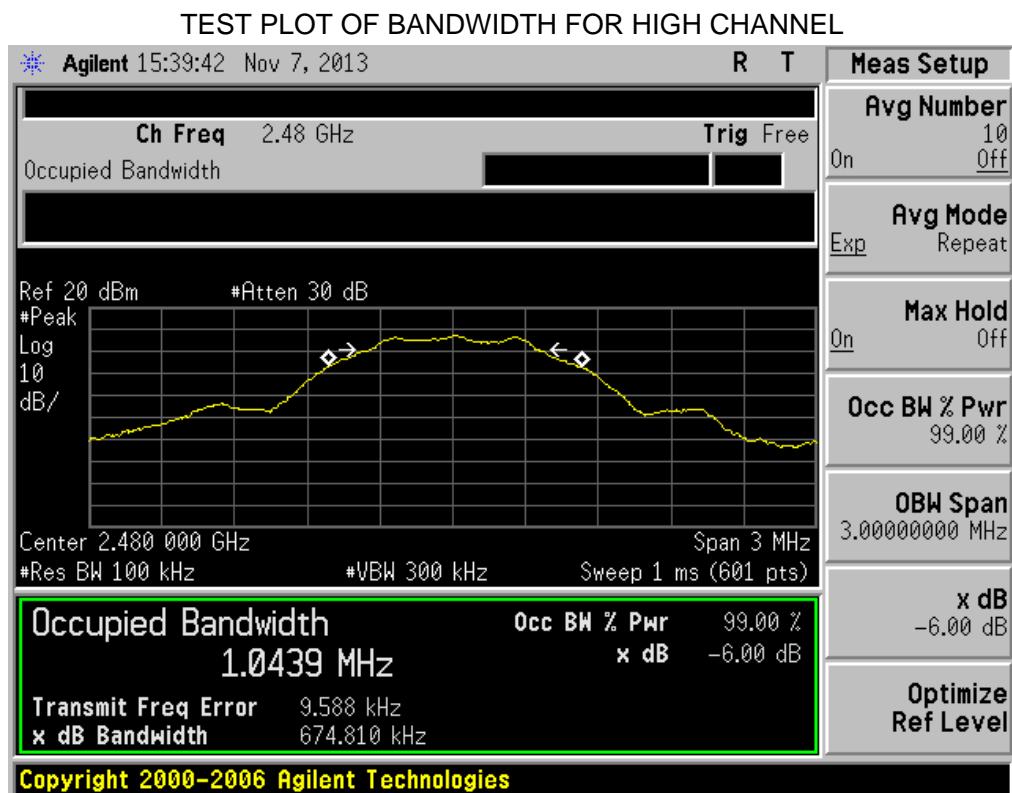
Channel	6dB Bandwidth (KHz)	Minimum Limit (KHz)	Pass/Fail
Low	678.273	500KHz	Pass
Middle	669.228		Pass
High	674.810		Pass

TEST PLOT OF BANDWIDTH FOR LOW CHANNEL



TEST PLOT OF BANDWIDTH FOR MIDDLE CHANNEL





## 10. CONDUCTED OUTPUT POWER

### 10.1. MEASUREMENT PROCEDURE

For peak power test:

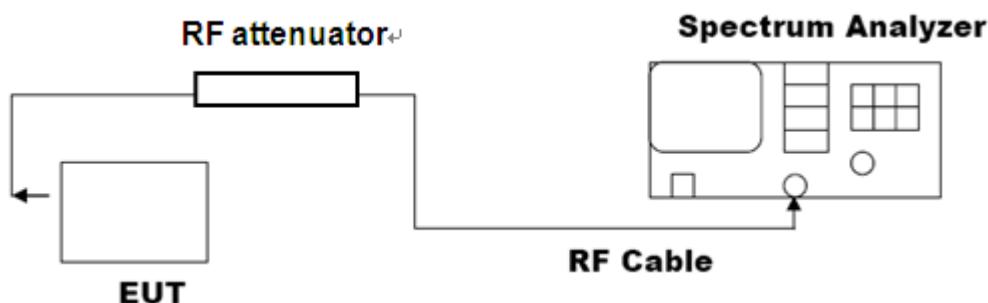
1. The EUT was placed on a turn table which is 0.8m above ground plane.
2. Connect EUT RF output port to the Spectrum Analyzer through an RF attenuator
3. Set the EUT Work on the top, middle and the bottom operation frequency individually.
4. Use the following spectrum analyzer settings:
  - Set the RBW = 1 MHz
  - Set the VBW  $\geq$  3 RBW
  - Set the span  $\geq$  1.5 x DTS bandwidth
  - Detector = peak
  - Sweep time = auto couple
  - Trace mode = max hold
5. Allow the trace to stabilize. Use the instrument's band/channel power measurement function with the band limits set equal to the DTS bandwidth edges.
6. Record the result form the Spectrum Analyzer.

For average power test:

1. The EUT was placed on a table which is 0.8m above ground plane.
2. Connect EUT RF output port to power probe through an RF attenuator.
3. Connect the power probe to the PC.
4. Set the EUT Work on the top, the middle and the bottom operation frequency individually.
5. Record the maximum power from the software.
6. The maximum peak power shall be less 1W (30dBm).

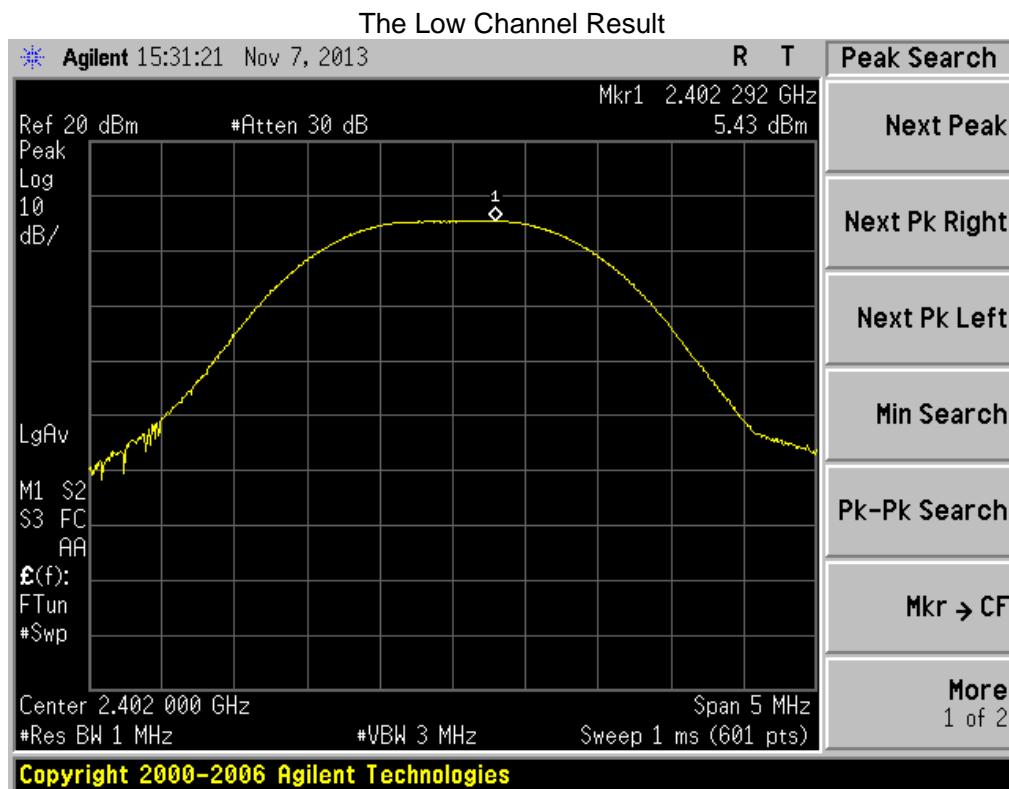
**Note:** The EUT was tested according to KDB 558074 for compliance to FCC 47CFR 15.247 requirements

### 10.2. TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION)

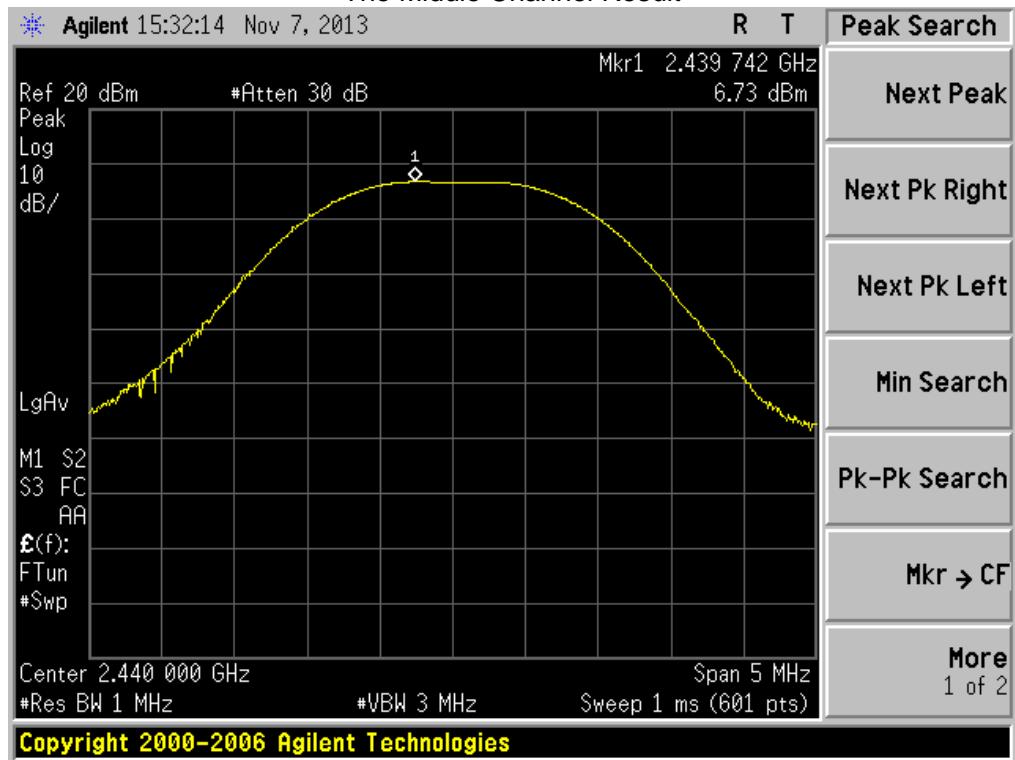


### 10.3. LIMITS AND MEASUREMENT RESULT

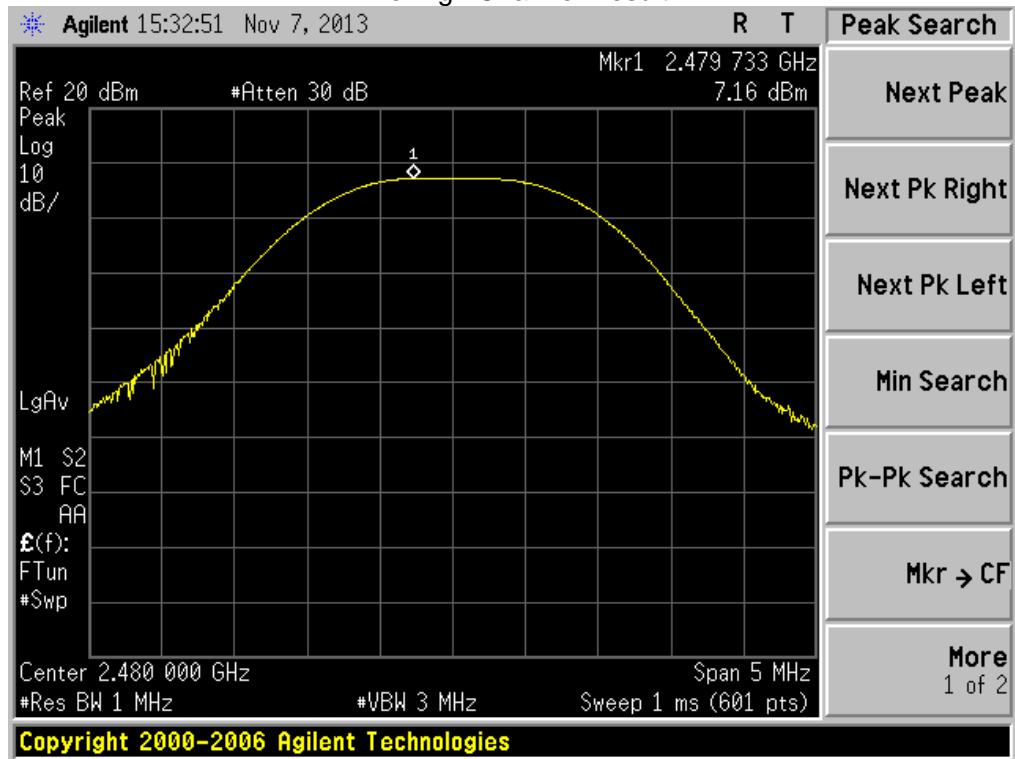
Channel	Average Power (dBm)	Peak Power (dBm)	Applicable Limits (dBm)	Pass/Fail
Low Channel	3.58	5.43	30	Pass
Middle Channel	4.84	6.73	30	Pass
High Channel	5.25	7.16	30	Pass



The Middle Channel Result



The High Channel Result



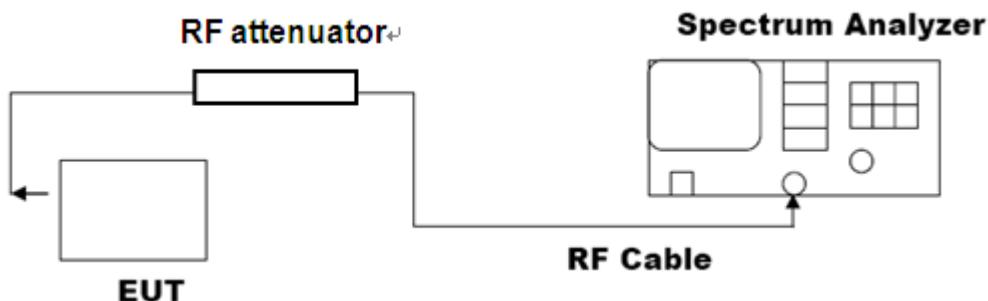
## 11. MAXIMUM CONDUCTED OUTPUT POWER SPECTRAL DENSITY

### 11.1 MEASUREMENT PROCEDURE

- (1). The EUT was placed on a turn table which is 0.8m above ground plane.
- (2). Connect EUT RF output port to the Spectrum Analyzer through an RF attenuator
- (3). Set the EUT Work on the top, the middle and the bottom operation frequency individually.
- (4). Set the span to 1.5times the DTS bandwidth, RBW:  $3\text{kHz} \leq \text{RBW} \leq 100\text{kHz}$ ,  $\text{VBW} = 3 \times \text{RBW}$
- (5). Set SPA Trace 1 Max hold, then View.

**Note:** The EUT was tested according to KDB 558074 for compliance to FCC 47CFR 15.247 requirements.

### 11.2 TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION)



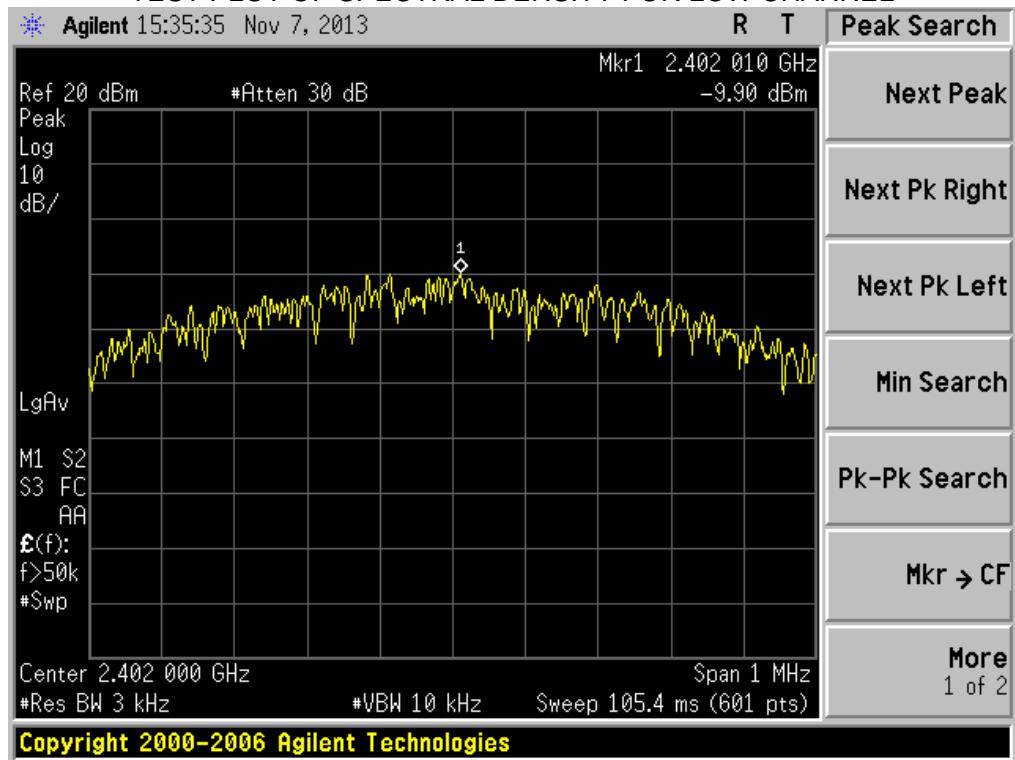
### 11.3 MEASUREMENT EQUIPMENT USED

Equipment	Manufacturer	Model	S/N	Cal. Date	Cal. Due
PSA SERIES SPECTRUM ANALYZER	AGILENT	E4440A	US41421290	07/17/2013	07/16/2014
RECEIVER ANTENNA	ETS	2175	57337	07/17/2013	07/16/2014

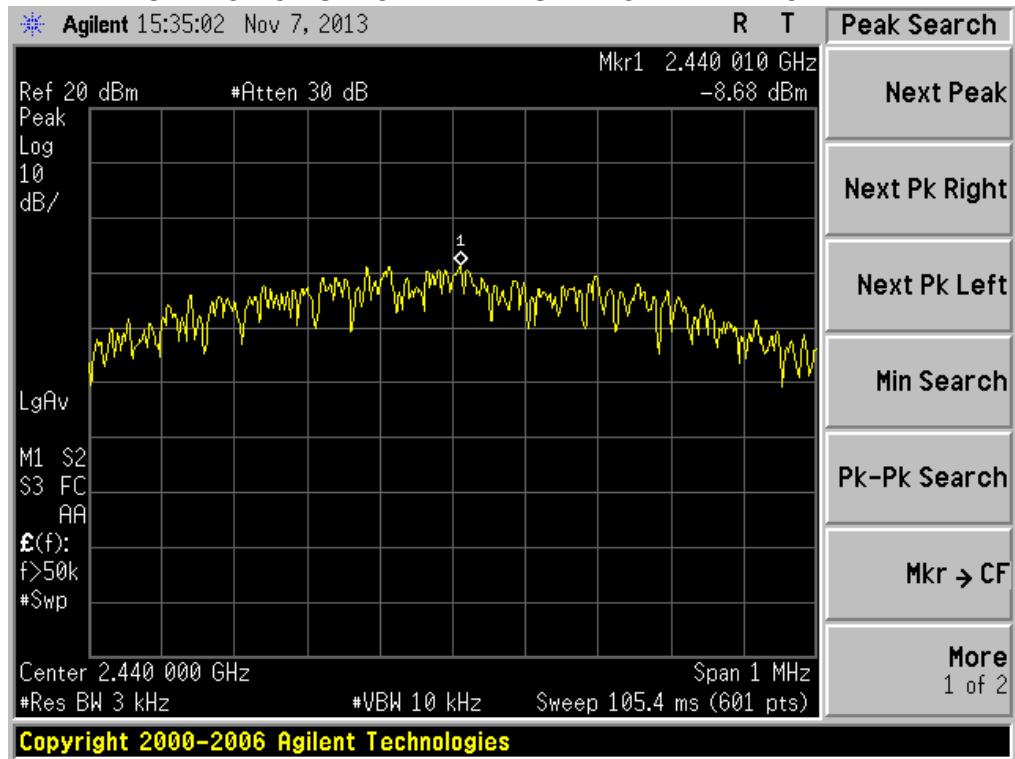
### 11.4 LIMITS AND MEASUREMENT RESULT

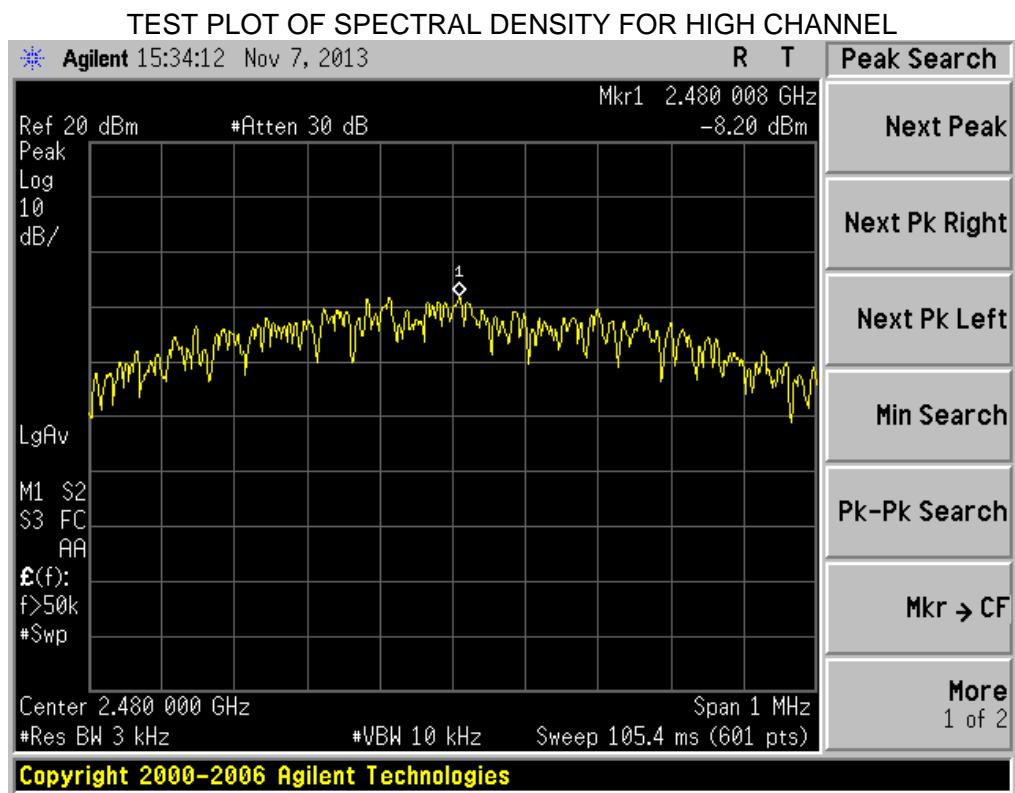
Channel No.	PSD (dBm)	Limit (dBm)	Result
Low Channel	-9.9	8	Pass
Middle Channel	-8.68	8	Pass
High Channel	-8.2	8	Pass

TEST PLOT OF SPECTRAL DENSITY FOR LOW CHANNEL

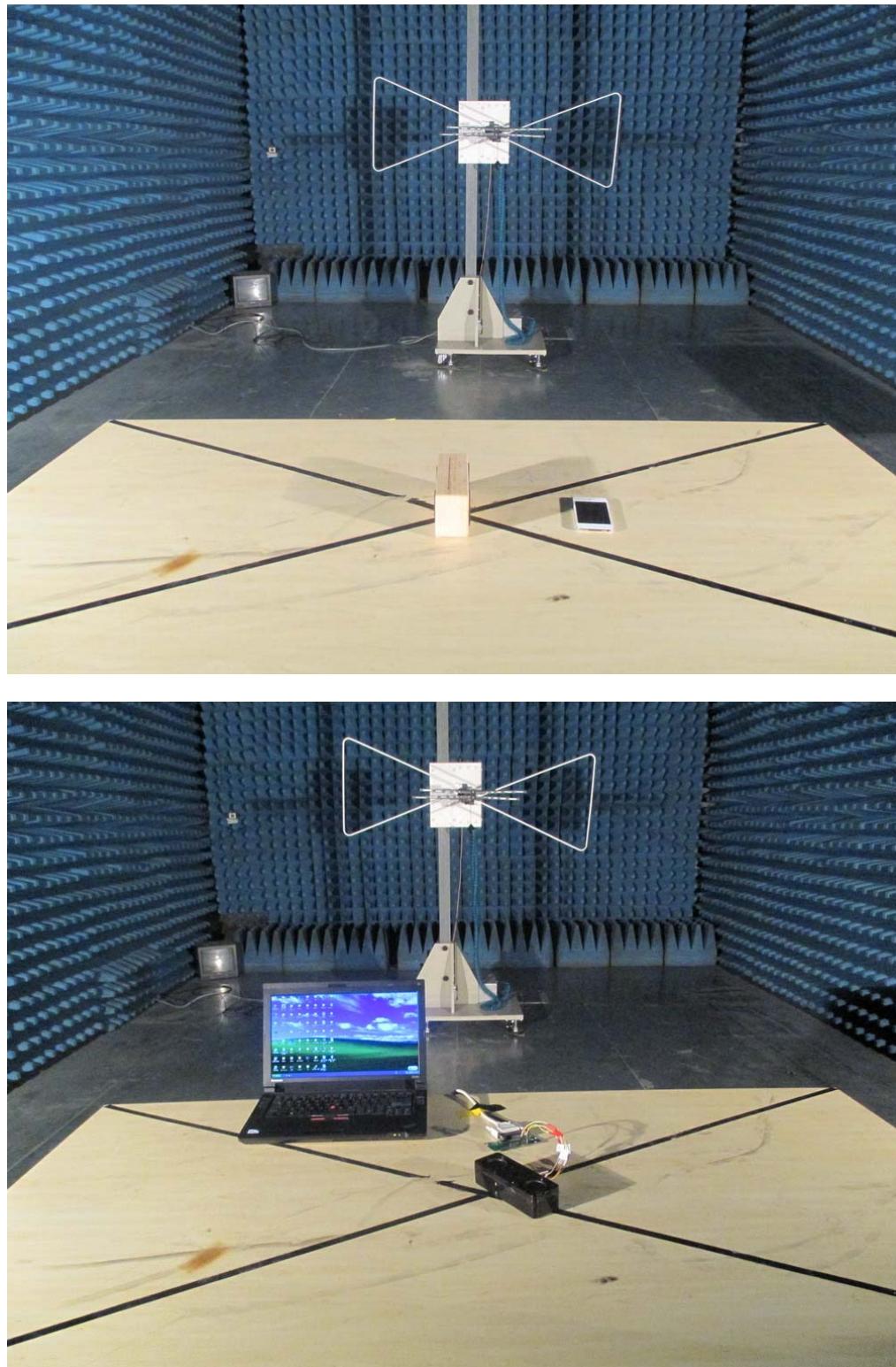


TEST PLOT OF SPECTRAL DENSITY FOR MIDDLE CHANNEL





**APPENDIX A: PHOTOGRAPHS OF TEST SETUP**  
**FCC RADIATED EMISSION TEST SETUP**



## APPENDIX B: PHOTOGRAPHS OF EUT

TOP VIEW OF EUT



BOTTOM VIEW OF EUT



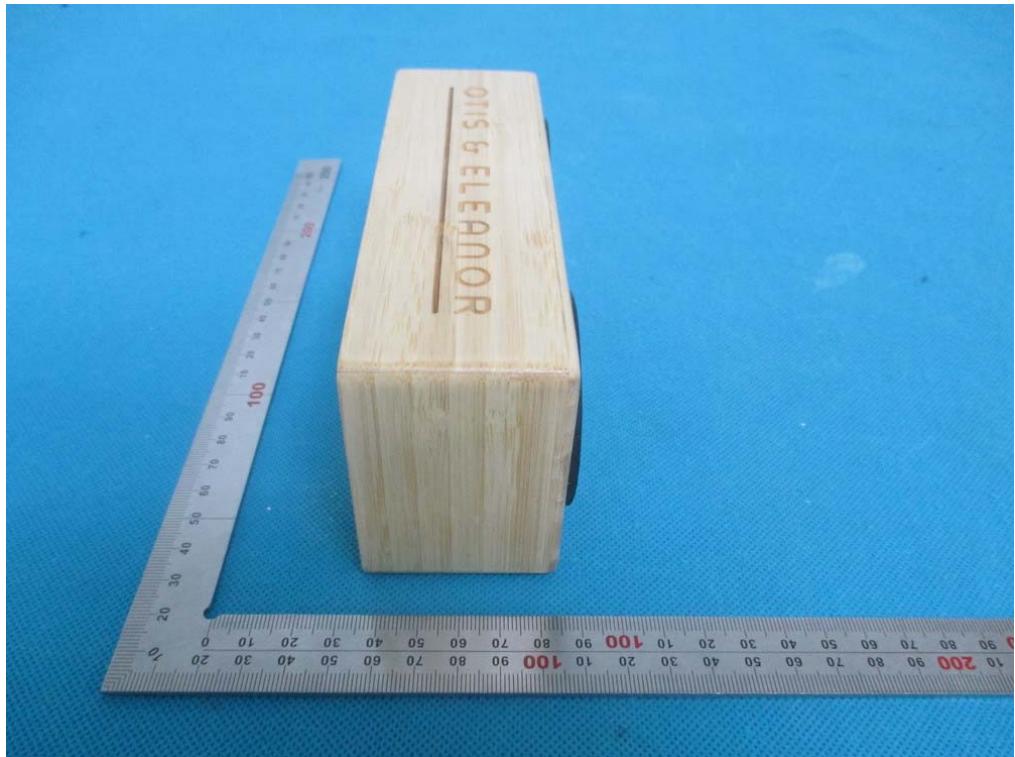
FRONT VIEW OF EUT



BACK VIEW OF EUT



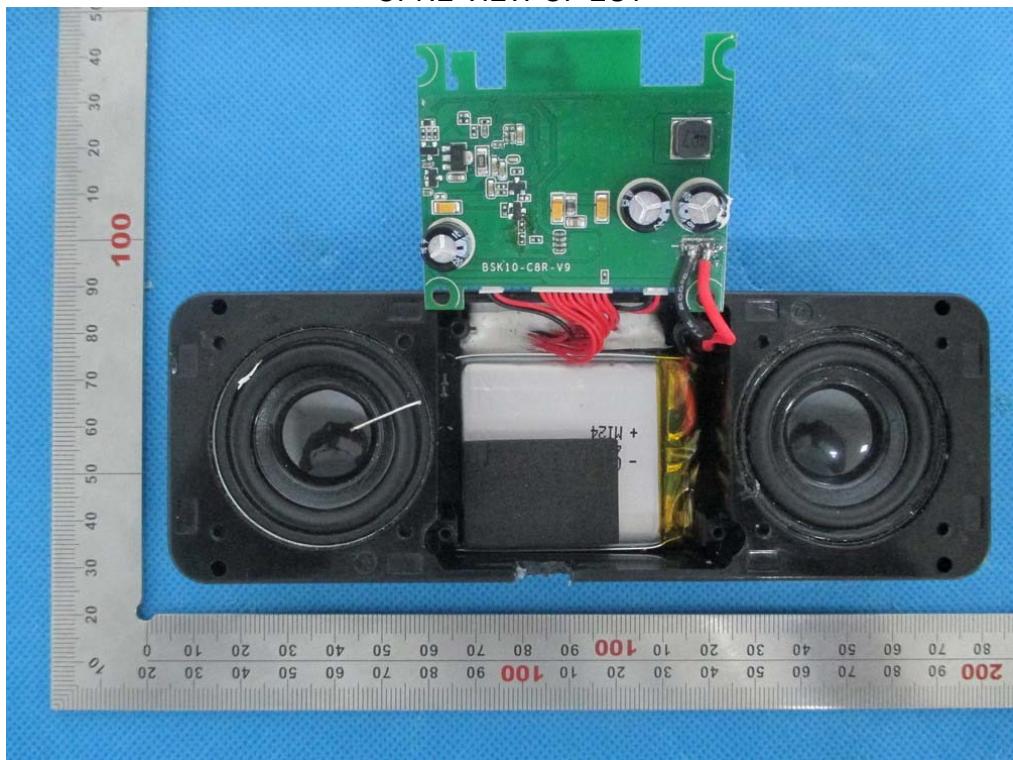
LEFT VIEW OF EUT



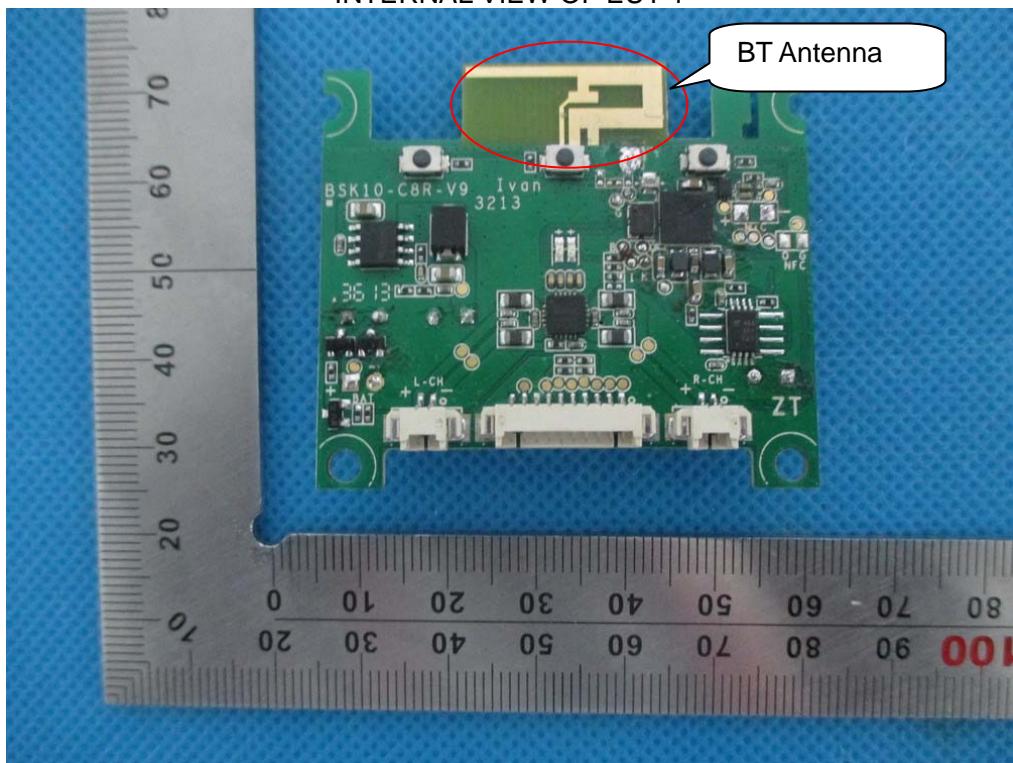
RIGHT VIEW OF EUT



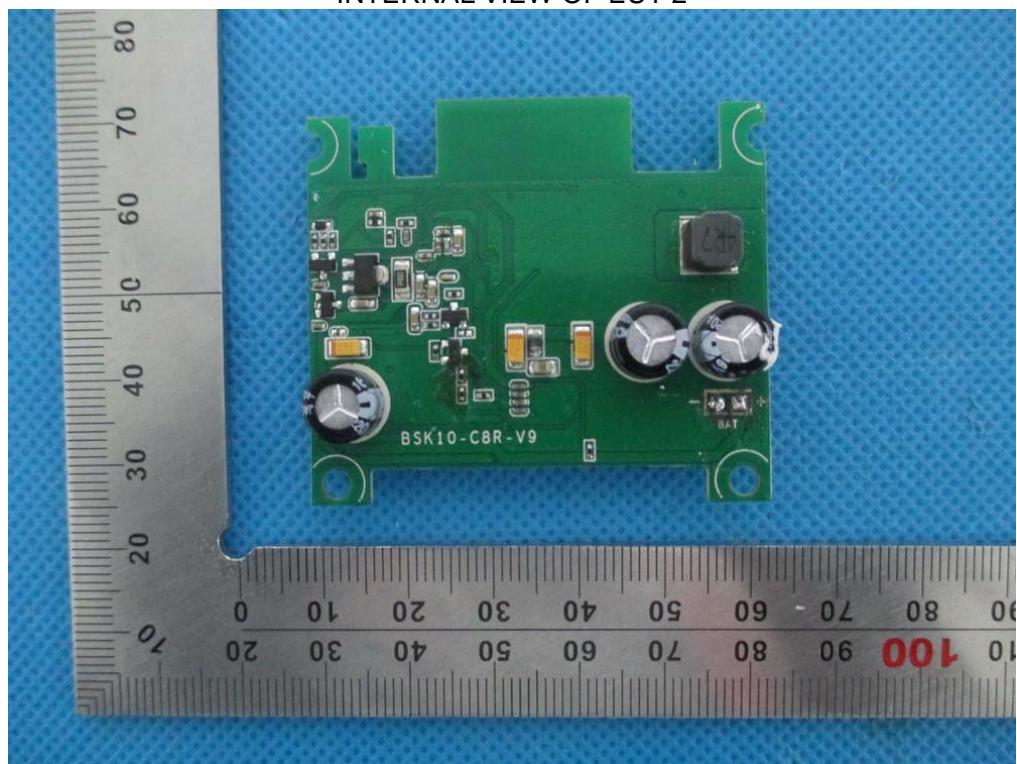
OPEN VIEW OF EUT



INTERNAL VIEW OF EUT-1



INTERNAL VIEW OF EUT-2



----END OF REPORT----