

FCC TEST REPORT  
for  
Shenzhen Loyal Electronics Co., Ltd.  
Dongle  
Model No.: G801E, G802E, G806, G807E

Prepared for : Shenzhen Loyal Electronics Co., Ltd.  
Address : 8F, Bldg. A, Huayuan Technology Park, Fenghuang Industrial  
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Date of Report : Dec. 17, 2011

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APPENDIX I (Photos of EUT) (3 Pages)

## TEST REPORT

Applicant : Shenzhen Loyal Electronics Co., Ltd.  
 Manufacturer : Shenzhen Loyal Electronics Co., Ltd.  
 EUT : Dongle  
 Model No. : G801E, G802E, G806, G807E  
 Serial No. : N.A.  
 Rating : 5.0V $\overline{=}$ , 50mA  
 Trade Mark : N.A.

## Measurement Procedure Used:

FCC Part15 Subpart C, Paragraph 15.207, 15.249 & 15.209

The device described above is tested by Anbotek 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 Anbotek 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 Anbotek Compliance Laboratory Limited

Date of Test : Dec. 14~16, 2011

*Andy chen*

Prepared by : (Engineer / Andy Chen)

*Coco Xiang*

Reviewer : (Project Manager / Coco Xiang)

*Henry Yang*

Approved & Authorized Signer : (Manager / Henry Yang)

## 1. GENERAL INFORMATION

### 1.1. Description of Device (EUT)

EUT	: Dongle
Model Number	: G801E, G802E, G806, G807E (Note: All Models are the same except the model number & colour of appliances, so we prepare “G801E” for EMC test only.)
Test Power Supply	: AC 120V, 60Hz for PC System
Frequency	: 2410~2473MHz
Channels	: 2410~2473MHz (A total of 64 channels with channel spacing of 1MHz. Under normal working condition, choose 20 channels of 64 randomly)
Antenna Specification	: Printed Antenna: 1dBi
Applicant Address	: Shenzhen Loyal Electronics Co., Ltd. : 8F, Bldg. A, Huayuan Technology Park, Fenghuang Industrial Zone, Fuyong, Bao’an, Shenzhen, China
Manufacturer Address	: Shenzhen Loyal Electronics Co., Ltd. : 8F, Bldg. A, Huayuan Technology Park, Fenghuang Industrial Zone, Fuyong, Bao’an, Shenzhen, China
Date of receiver	: Dec. 14, 2011
Date of Test	: Dec. 14~16, 2011

## 1.2.Auxiliary Equipment Used during Test

PC	: Manufacturer: DELL M/N: OPTIPLEX 380 S/N: 1J63X2X CE , FCC: DOC
MONITOR	: Manufacturer: DELL M/N: E170Sc S/N: CN-00V539-64180-055-0UPS CE , FCC: DOC
Keyboard	: Manufacturer: DELL M/N: M-UARDEL7 S/N: N/A CE , FCC: DOC Cable: 1m, 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
USB Cable	: Non-Shielded, 0.5m

### 1.3. Description of Test Facility

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

**CNAS - LAB Code: L3503**

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**

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, August 20, 2010.

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

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, August 30, 2010.

**Test Location**

All Emissions tests were performed at  
Anbotek Compliance Laboratory Limited. at 1/F, 1 /Building, SEC Industrial Park,  
No. 4 Qianhai Road, Nanshan District, Shenzhen, 518054, China

### 1.4. Measurement Uncertainty

Radiation Uncertainty : Ur = 4.3dB

Conduction Uncertainty : Uc = 3.4dB

## 2. MEASURING DEVICE AND TEST EQUIPMENT

Equipment	Manufacturer	Model #	Serial #	Data of Cal.	Due Data
EMI Test Receiver	Rohde & Schwarz	ESCI	100119	Mar.03, 2011	Mar.02, 2012
EMI Test Receiver	Rohde & Schwarz	ESIB26	100249	Sep.22, 2011	Sep.21, 2012
EMI Test Software	SHURPLE	ESK1	N/A	N/A	N/A
Spectrum Analyzer	Agilent	E7405A	MY45114970	Jun.21, 2011	Jun.20, 2012
Signal Generator	Rohde & Schwarz	SMR27	100124	Jul.06, 2011	Jul.05, 2012
Signal Generator	Rohde & Schwarz	SML03	102319	Aug.01, 2011	Aug.01, 2012
AC Power Source	Sepcial power system	YF650	N/A	N/A	N/A
Absorbing Clamp	Rohde & Schwarz	MDS21	100218	Apr.30, 2011	Apr.29, 2012
Power Meter	Rohde & Schwarz	NRVD	101287	Jul.19, 2011	Jul.18, 2012
Coaxial Cable	N/A	N/A	N/A	May.31, 2011	May.30, 2012
Coaxial Cable	N/A	N/A	N/A	May.31, 2011	May.30, 2012
Coaxial Cable	N/A	N/A	N/A	May.31, 2011	May.30, 2012
Universal radio Communication tester	Rohde & Schwarz	CMU200	101724	Sep.08, 2011	Sep.07, 2012
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	N/A	N/A	N/A
BiConilog Antenna	ETS-LINDGREN	3142C	00042670	Mar.03, 2011	Mar.02, 2012
BiConilog Antenna	ETS-LINDGREN	3142C	00042673	Mar.03, 2011	Mar.02, 2012
Double-ridged Waveguide horn	ETS-LINDGREN	3117	00035926	Dec.30, 2010	Dec.29, 2011
Double-ridged Waveguide horn	ETS-LINDGREN	3117	00041545	Dec.30, 2010	Dec.29, 2011
Pre-amplifier	CD	PAM0203	804203	Jun.21, 2011	Jun.20, 2012
RF Switch	CD	RSU-M3	706543	Jun.21, 2011	Jun.20, 2012
Thermo-/Hygrometer	N/A	TH01	N/A	May.03, 2011	May.02, 2012
Shielding Room	Zhong Yu Electronic	N/A	N/A	N/A	N/A
3m Semi-Anechoic Chamber	Zhong Yu Electronic	N/A	N/A	Apr.28, 2011	Apr.27, 2012

### 3. Test Procedure

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

**RADIATION INTERFERENCE:** The test procedure used was ANSI STANDARD C63.4-2009 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

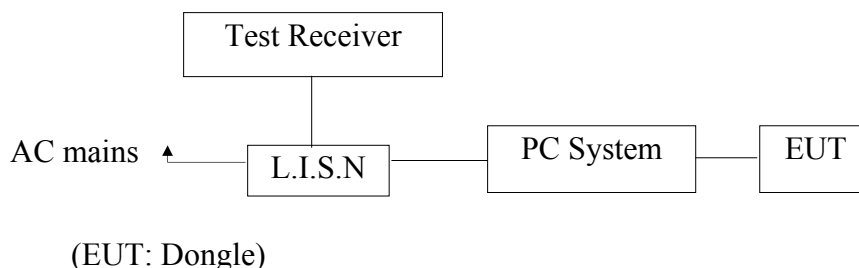
**ANSI STANDARD C63.4-2009 10.1.7 MEASUREMENT PROCEDURES:** The EUT was placed on a table 80 cm high and with dimensions of 1m by 1.5m. The EUT was placed in the center of the table (1.5m side). The table used for radiated measurements is capable of continuous rotation. When an emission was found, the 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.



## 4. Conducted Limits

### 4.1. Block Diagram of Test Setup

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



### 4.2. 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.

### 4.3. 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.

EUT : Dongle  
 Model Number : G801E  
 Applicant : Shenzhen Loyal Electronics Co., Ltd.

### 4.4. Operating Condition of EUT

- 4.4.1. Setup the EUT and simulator as shown as Section 4.1.  
 4.4.2. Turn on the power of all equipment.  
 4.4.3. Let the EUT work in test mode (ON) and measure it.

#### 4.5. 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 C63.4-2003 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 4.6.

#### 4.6. Power Line Conducted Emission Measurement Results

**PASS.**

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

Please refer the following pages.

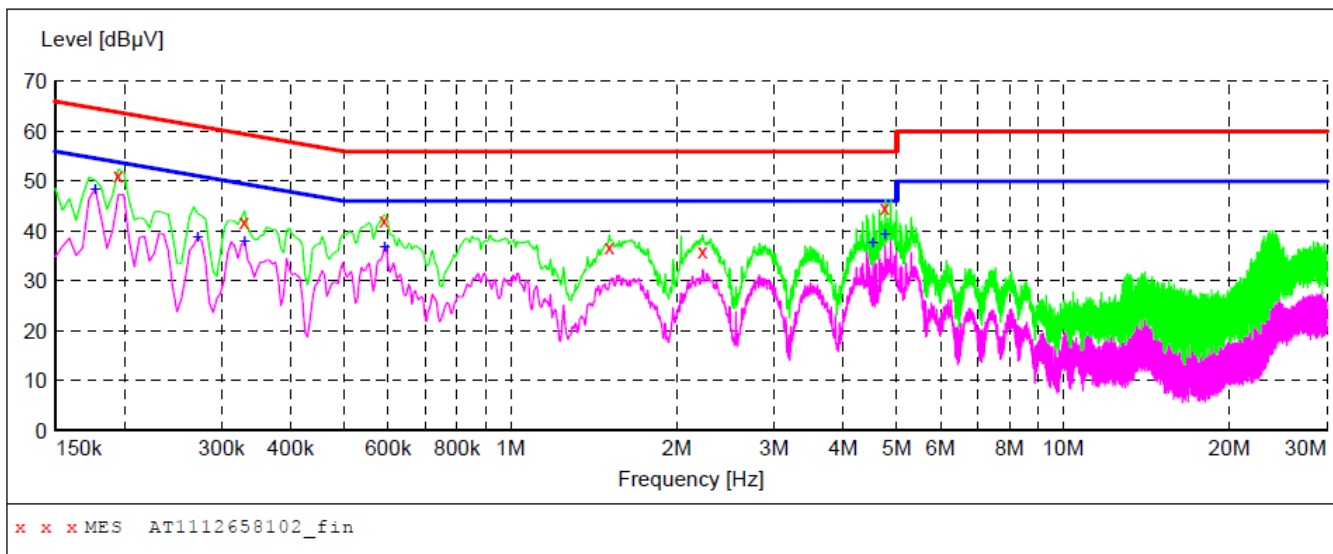
FCC ID: Z5XG801ERX

**CONDUCTED EMISSION TEST DATA**

EUT: Dongle M/N: G801E  
 Operating Condition: ON  
 Test Site: 1# Shielded Room  
 Operator: Andy Chen  
 Test Specification: AC 120V/60Hz for PC  
 Comment: Live Line  
 Tem:25°C Hum:50%

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

Short Description: 150K-30M Disturbance Voltages



**MEASUREMENT RESULT: "AT1112658102\_fin"**

12/15/2011 9:05AM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.195000	51.10	10.1	64	12.7	QP	L1	GND
0.330000	41.80	10.1	60	17.7	QP	L1	GND
0.591000	42.20	10.1	56	13.8	QP	L1	GND
1.508500	36.70	10.3	56	19.3	QP	L1	GND
2.228500	36.10	10.3	56	19.9	QP	L1	GND
4.762000	44.60	10.5	56	11.4	QP	L1	GND

**MEASUREMENT RESULT: "AT1112658102\_fin2"**

12/15/2011 9:05AM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.177000	48.40	10.1	55	6.2	AV	L1	GND
0.271500	38.90	10.1	51	12.2	AV	L1	GND
0.330000	37.80	10.1	50	11.7	AV	L1	GND
0.591000	36.80	10.1	46	9.2	AV	L1	GND
4.528000	37.70	10.5	46	8.3	AV	L1	GND
4.762000	39.30	10.5	46	6.7	AV	L1	GND

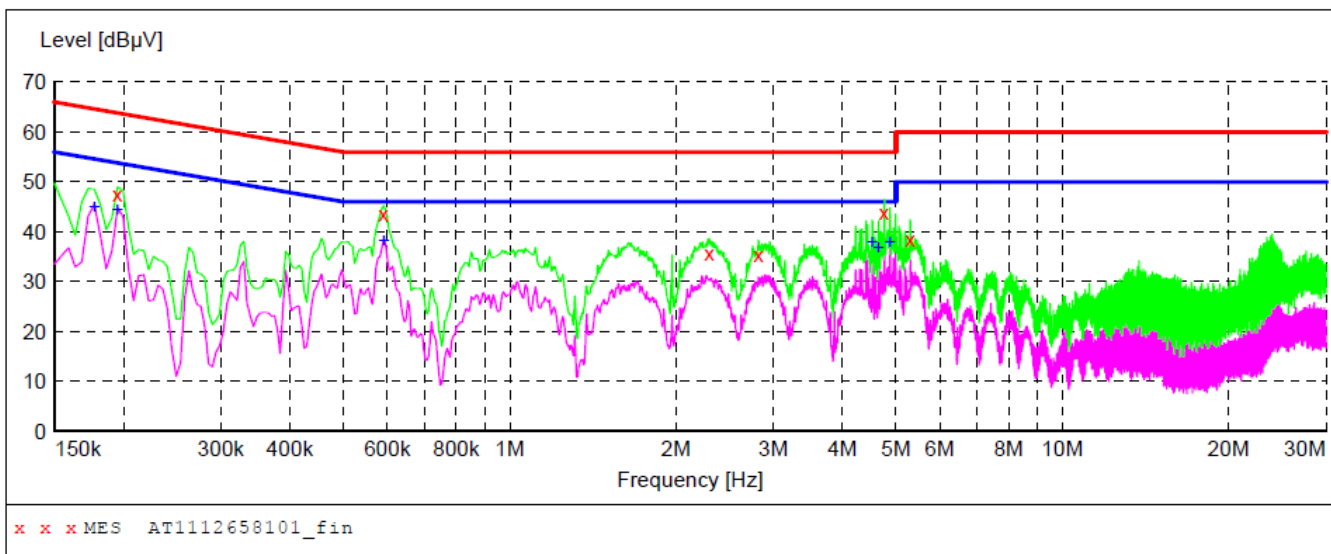
FCC ID: Z5XG801ERX

**CONDUCTED EMISSION TEST DATA**

EUT: Dongle M/N: G801E  
 Operating Condition: ON  
 Test Site: 1# Shielded Room  
 Operator: Andy Chen  
 Test Specification: AC 120V/60Hz for PC  
 Comment: Neutral Line  
 Tem:25°C Hum:50%

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

Short Description: 150K-30M Disturbance Voltages



**MEASUREMENT RESULT: "AT1112658101\_fin"**

12/15/2011 9:02AM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.195000	47.50	10.1	64	16.3	QP	N	GND
0.591000	43.70	10.1	56	12.3	QP	N	GND
2.296000	35.60	10.3	56	20.4	QP	N	GND
2.818000	35.30	10.4	56	20.7	QP	N	GND
4.762000	43.80	10.5	56	12.2	QP	N	GND
5.302000	38.40	10.5	60	21.6	QP	N	GND

**MEASUREMENT RESULT: "AT1112658101\_fin2"**

12/15/2011 9:02AM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.177000	45.00	10.1	55	9.6	AV	N	GND
0.195000	44.40	10.1	54	9.4	AV	N	GND
0.591000	38.30	10.1	46	7.7	AV	N	GND
4.528000	37.80	10.5	46	8.2	AV	N	GND
4.645000	36.90	10.5	46	9.1	AV	N	GND
4.874500	37.90	10.5	46	8.1	AV	N	GND

## 5. Radiation Interference

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

FIELD STRENGTH of Fundamental: 902-928 MHZ 2.4-2.4835 GHz 94 dB $\mu$ V/m @3m	FIELD STRENGTH of Harmonics  54 dB $\mu$ V/m @3m	S15.209 30 - 88 MHz 88 - 216 MHz 216 - 960 MHz ABOVE 960 MHz	40 dBuV/m @3M 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.

### 5.2 Test Procedure

The EUT is placed on a turn table which is 0.8 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 test results are listed in Section 5.3.

### 5.3 Test Results

PASS.

Please refer the following pages.

FCC ID: Z5XG801ERX

**Data:**

Horizontal CH Low(2410MHz)								
Frequency	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit	Over Limit	Remark
MHz	dB	dB/m	dB	dB $\mu$ V	dB $\mu$ V/m	dB $\mu$ V/m	dB	
674.74	1.60	15.59	35.16	50.79	32.82	46.00	-13.18	QP
843.02	1.61	11.50	35.56	47.07	24.62	46.00	-21.38	QP
2410.00	2.20	31.23	35.29	83.26	81.40	114.0	-32.60	Peak
2410.00	2.20	31.23	35.29	80.49	78.63	94.0	-15.37	AV
4820.10	2.62	35.10	34.73	36.42	39.41	74.0	-34.59	Peak
4820.10	2.62	35.10	34.73	33.54	36.53	54.0	-17.47	AV
7230.00	3.09	36.18	35.16	36.46	40.57	74.0	-33.43	Peak
7230.00	3.09	36.18	35.16	33.24	37.35	54.0	-16.65	AV
9640.00	---	---	---	---	---	---	---	---
12050.00	---	---	---	---	---	---	---	---
14460.00	---	---	---	---	---	---	---	---
16870.00	---	---	---	---	---	---	---	---
19280.00	---	---	---	---	---	---	---	---
21690.00	---	---	---	---	---	---	---	---
24100.00	---	---	---	---	---	---	---	---

CH Middle(2442MHz)								
Frequency	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit	Over Limit	Remark
MHz	dB	dB/m	dB	dB $\mu$ V	dB $\mu$ V/m	dB $\mu$ V/m	dB	
445.90	1.60	13.25	22.61	47.76	40.0	46.00	-6.0	QP
2431.01	2.19	31.23	35.85	85.74	83.31	114.0	-30.69	Peak
2442.01	2.21	31.24	35.88	83.23	80.80	94.0	-13.20	AV
4884.10	2.64	35.11	34.73	38.28	41.30	74.0	-32.70	Peak
4884.10	2.64	35.11	34.73	35.48	38.50	54.0	-15.5	AV
7326.15	3.10	36.20	35.18	34.50	38.62	74.0	-35.38	Peak
7326.15	3.10	36.20	35.18	31.49	35.61	54.0	-18.39	AV
9768.05	---	---	---	---	---	---	---	---
12210.00	---	---	---	---	---	---	---	---
14652.00	---	---	---	---	---	---	---	---
17094.00	---	---	---	---	---	---	---	---
19536.00	---	---	---	---	---	---	---	---
21978.00	---	---	---	---	---	---	---	---
24420.00	---	---	---	---	---	---	---	---

FCC ID: Z5XG801ERX

CH High(2473MHz)								
Frequency	Cable	Ant	Preamp	Read	Level	Limit	Over	Remark
MHz	Loss	Factor	Factor	Level	dB $\mu$ V/m	dB $\mu$ V/m	Limit	
	dB	dB/m	dB	dB $\mu$ V			dB	
410.17	1.58	13.27	23.14	47.98	39.69	46.00	-6.31	QP
2461.00	2.19	31.29	35.56	85.65	83.57	114.0	-30.43	Peak
2473.00	2.20	31.31	35.58	82.84	80.77	94.0	-13.23	AV
4946.10	2.67	35.05	34.80	37.31	40.23	74.0	-33.77	Peak
4946.10	2.67	35.05	34.80	34.37	37.29	54.0	-16.71	AV
7419.06	3.12	36.20	35.20	34.37	38.49	74.0	-35.51	Peak
7419.06	3.12	36.20	35.20	31.53	35.65	54.0	-18.35	AV
9892.00	---	---	---	---	---	---	---	---
12365.00	---	---	---	---	---	---	---	---
14838.00	---	---	---	---	---	---	---	---
17311.00	---	---	---	---	---	---	---	---
19784.00	---	---	---	---	---	---	---	---
22257.00	---	---	---	---	---	---	---	---
24730.00	---	---	---	---	---	---	---	---

Vertical CH Low(2410MHz)								
Frequency	Cable	Ant	Preamp	Read	Level	Limit	Over	Remark
MHz	Loss	Factor	Factor	Level	dB $\mu$ V/m	dB $\mu$ V/m	Limit	
	dB	dB/m	dB	dB $\mu$ V			dB	
111.65	1.53	12.41	41.38	48.20	20.76	46.00	-25.24	QP
2400.02	2.19	31.23	35.76	84.79	82.45	114.0	-31.55	Peak
2410.02	2.20	31.24	35.78	82.32	79.98	94.0	-14.02	AV
4820.10	2.66	35.10	34.77	38.70	41.69	74.0	-32.31	Peak
4820.10	2.66	35.10	34.77	35.97	38.96	54.0	-15.04	AV
7230.93	3.12	36.19	35.16	34.49	38.64	74.0	-35.36	Peak
7230.93	3.12	36.19	35.16	31.99	36.14	54.0	-17.86	AV
9640.00	---	---	---	---	---	---	---	---
12050.00	---	---	---	---	---	---	---	---
14460.00	---	---	---	---	---	---	---	---
16870.00	---	---	---	---	---	---	---	---
19280.00	---	---	---	---	---	---	---	---
21690.00	---	---	---	---	---	---	---	---
24100.00	---	---	---	---	---	---	---	---

FCC ID: Z5XG801ERX

CH Middle(2442MHz)								
Frequency	Cable	Ant	Preamp	Read	Level	Limit	Over	Remark
MHz	Loss	Factor	Factor	Level	dBμV/m	dBμV/m	Limit	
	dB	dB/m	dB	dBμV			dB	
403.17	1.60	13.28	41.39	52.54	26.03	43.5	-17.47	QP
2431.01	2.19	31.22	35.88	81.85	79.38	114.0	-34.62	Peak
2442.01	2.20	31.25	35.91	79.84	77.38	94.0	-16.62	AV
4884.12	2.61	35.10	34.73	36.70	39.68	74.0	-34.32	Peak
4884.12	2.61	35.10	34.73	33.74	36.72	54.0	-17.28	AV
7326.25	3.15	36.18	35.17	33.77	37.93	74.0	-36.07	Peak
7326.25	3.15	36.18	35.17	30.90	35.06	54.0	-18.94	AV
9768.00	---	---	---	---	---	---	---	---
12210.00	---	---	---	---	---	---	---	---
14652.00	---	---	---	---	---	---	---	---
17094.00	---	---	---	---	---	---	---	---
19943.00	---	---	---	---	---	---	---	---
22792.00	---	---	---	---	---	---	---	---
24420.00	---	---	---	---	---	---	---	---

CH High(2473MHz)								
Frequency	Cable	Ant	Preamp	Read	Level	Limit	Over	Remark
MHz	Loss	Factor	Factor	Level	dBμV/m	dBμV/m	Limit	
	dB	dB/m	dB	dBμV			dB	
110.38	1.53	12.34	41.40	57.46	29.93	43.5	-13.57	QP
2461.00	2.21	31.34	35.98	84.24	81.81	114.0	-32.19	Peak
2473.00	2.23	31.35	36.00	81.29	78.87	94.0	-15.13	AV
4946.05	2.66	35.06	34.79	35.06	37.99	74.0	-36.01	Peak
4946.05	2.66	35.06	34.79	32.34	35.27	54.0	-18.73	AV
7419.24	3.11	36.20	35.16	35.81	39.96	74.0	-34.04	Peak
7419.24	3.11	36.20	35.16	32.68	36.83	54.0	-17.17	AV
9892.00	---	---	---	---	---	---	---	---
12365.00	---	---	---	---	---	---	---	---
14838.00	---	---	---	---	---	---	---	---
17311.00	---	---	---	---	---	---	---	---
19784.00	---	---	---	---	---	---	---	---
22257.00	---	---	---	---	---	---	---	---
24730.00	---	---	---	---	---	---	---	---

**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.**



## 6. Occupied Bandwidth

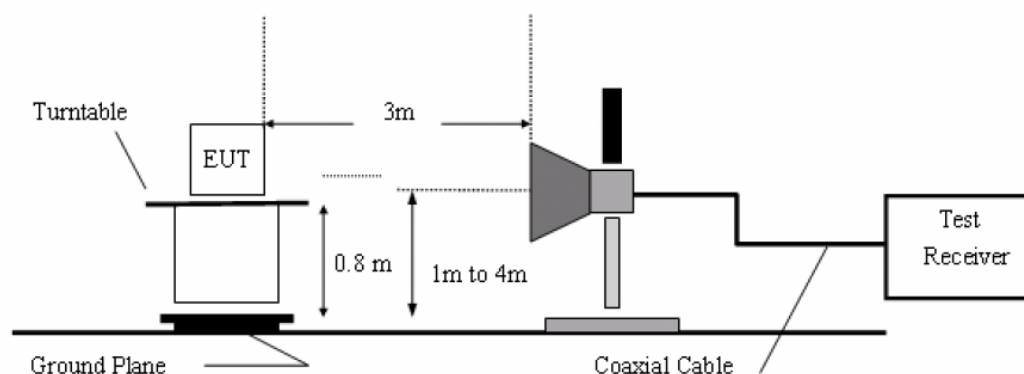
### 6.1. Requirements (15.249):

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.

### 6.2. Test Procedure

The EUT is placed on a turn table which is 0.8 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.

### 6.3. Test Configuration:



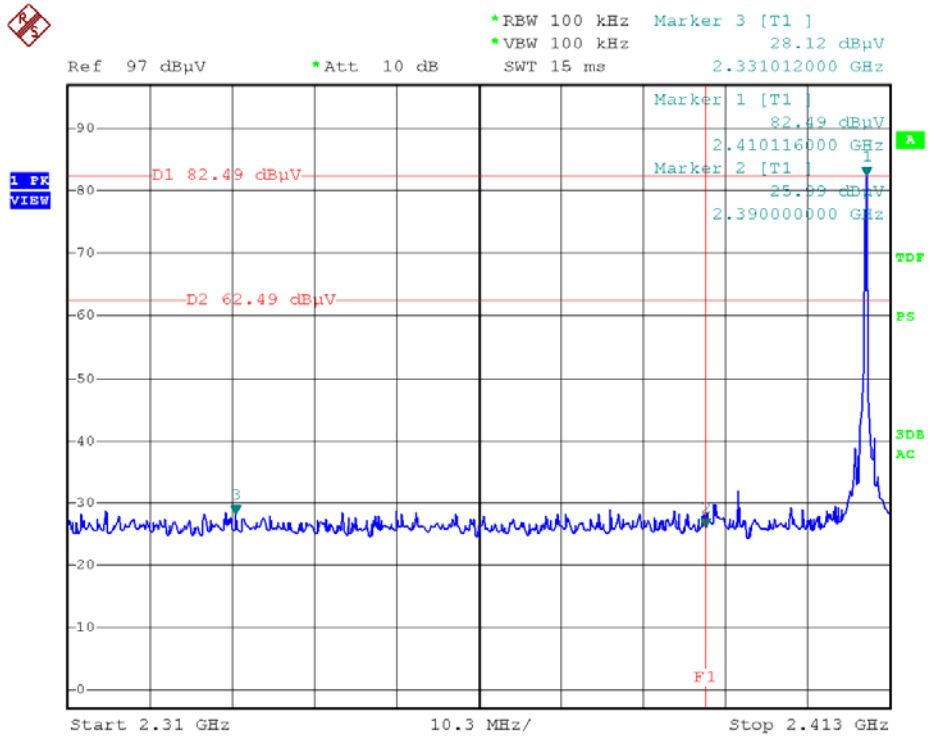
### 6.4. Test Results

Pass.

Please refer the following plot.

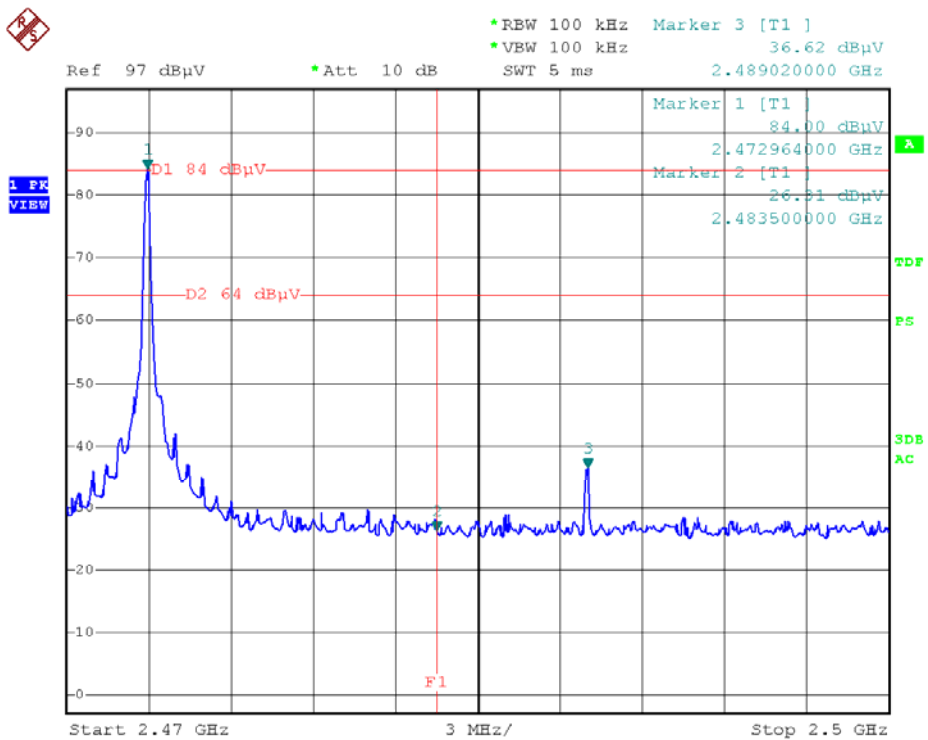
(Note: Marker 2 means the highest value in 2.31GHz~2.39GHz or 2.4835~2.5GHz)

FCC ID: Z5XG801ERX



Bandedges-L-1

Date: 16.DEC.2011 12:07:52



Bandedges-H-1

Date: 16.DEC.2011 11:56:42