

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

OF

Targus Wireless USB Receiver

MODEL No.: AMP22R, AMP23R

BRAND NAME: Targus

FCC ID: OXM000047

REPORT NO: KAD130131067E

ISSUE DATE: February 18, 2013

Prepared for

**TARGUS GROUP INTERNATIONAL, INC.
1211 North Miller Street, Anaheim, California, 92806, United States**

Prepared by

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VERIFICATION OF COMPLIANCE

Applicant:	TARGUS GROUP INTERNATIONAL, INC. 1211 North Miller Street, Anaheim, California, 92806, United States
Manufacturer	SYSGRATION(SHENZHEN) LTD. Egongling Village, Pinghu Town, Longgang Dist. Shenzhen City, China
Product Description:	Targus Wireless USB Receiver
Brand Name:	Targus
Model Number:	AMP22R, AMP23R (Note: These samples are the same except appearance and model number, so we prepare AMP22R for EMC test.)
File Number:	KAD130131067E
Date of Test:	January 31, 2012 to February 18, 2013

We hereby certify that:

The above equipment was tested by DONGGUAN EMTEK CO., LTD. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.4 (2009) and the energy emitted by the sample EUT tested as described in this report is in compliance with conducted and radiated emission limits of FCC Rules Part 15.249.

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

Approved By



Sam Lv / Q.A. Manager
DONGGUAN EMTEK CO., LTD.

Table of Contents

1. GENERAL INFORMATION	4
1.1 PRODUCT DESCRIPTION.....	4
1.2 RELATED SUBMITTAL(S) / GRANT (S).....	4
1.3 TEST METHODOLOGY	4
1.4 SPECIAL ACCESSORIES.....	5
1.5 EQUIPMENT MODIFICATIONS	5
1.6 TEST FACILITY	5
2. SYSTEM TEST CONFIGURATION.....	6
2.1 EUT CONFIGURATION.....	6
2.2 EUT EXERCISE	6
2.3 TEST PROCEDURE	6
2.4 LIMITATION	7
2.5 CONFIGURATION OF TESTED SYSTEM	8
3. SUMMARY OF TEST RESULTS	9
4. DESCRIPTION OF TEST MODES	9
5. CONDUCTED EMISSIONS TEST	10
5.1 MEASUREMENT PROCEDURE:	10
5.2 TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION).....	10
5.3 MEASUREMENT EQUIPMENT USED:.....	10
5.4 MEASUREMENT RESULT:	10
5.5 CONDUCTED MEASUREMENT PHOTOS:	13
6. RADIATED EMISSION TEST	14
6.1 MEASUREMENT PROCEDURE	14
6.2 TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION).....	15
6.3 MEASUREMENT EQUIPMENT USED:.....	16
6.4 OUT OF BAND RADIATED MEASUREMENT RESULT	17
6.5 RADIATED MEASUREMENT PHOTOS:	21
7. BAND EDGE.....	22
8. ANTENNA APPLICATION	24
8.1 ANTENNA REQUIREMENT	24

1. General Information

1.1 Product Description

The TARGUS GROUP INTERNATIONAL, INC. Model: AMP22R (referred to as the EUT in this report) The EUT is an short range, lower power, Targus Wireless USB Receiver designed as an Input Device. It is designed by way of utilizing the GFSK modulation achieves the system operating.

A major technical descriptions of EUT is described as following:

- A) Operation Frequency: 2412-2472MHz
- B) Modulation: GFSK
- C) Number of Channel: 5
- D) Antenna Designation: Integral
- E) Power Supply: DC 5.0V from host equipment
- F) The channels are as follows:

Channel No.	Frequency
1	2412MHZ
2	2427MHZ
3	2452MHZ
4	2467MHZ
5	2472MHZ

G) The following EUT information was declared by the manufacturer and for more detailed feature description, please refer to the manuaufacturer's specifications or Users Manual.

- 1. The EUT is used as a receiver together with presenter, but it still has the function of transmitting.
- 2. The EUT has several models, which are identical to each other except for the transmitter differences only, as the following:

Brand Name	Model No.	Differentiation
Targus	AMP22R	Sell with Presenter with mouse
	AMP23R	Sell with presenter

1.2 Related Submittal(s) / Grant (s)

This submittal(s) (test report) is intended for FCC ID: OXM000047 filing to comply with Section 15.249 of the FCC Part 15 Subpart C Rules.

1.3 Test Methodology

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

1.4 Special Accessories

Not available for this EUT intended for grant.

1.5 Equipment Modifications

Not available for this EUT intended for grant.

1.6 Test Facility

Site Description

EMC Lab.

: Accredited by FCC, Aug. 18, 2011
The Certificate Registration Number is 247565.

Accredited by Industry Canada, January 13, 2011
The Certificate Number is 9444A.

Name of Firm

Site Location

: DONGGUAN EMTEK CO., LTD.
: No.281, Guantai Road, Nancheng District,
Dongguan, Guangdong, China

2. System Test Configuration

2.1 EUT Configuration

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

2.2 EUT Exercise

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

2.3 Test Procedure

2.3.1 Conducted Emissions

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

2.3.2 Radiated Emissions

The EUT is placed on a turn table which is 0.8 m above ground plane. The turn table shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the max. emission, the relative positions of this hand-held transmitter(EUT) were rotated through three orthogonal axes according to the requirements in Section 13.1.4.1 of ANSI C63.4-2009.

2.4 Limitation

(1) Conducted Emission

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

Note:

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

(2) Radiated Emissions FCC Rule: 15.249(a)

FCC Part 15, Subpart C Section 15.249. The field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

Frequency(MHz)	Filed Strength of Fundamental(at 3m)		Filed Strength of Harmonics(at 3m)	
	PEAK	AVERAGE	PEAK	AVERAGE
902-928	114	94	74.0	54.0
2400-2483.5	114	94	74.0	54.0
5725-5875	114	94	74.0	54.0
24000-24250	128	108	88.0	68.0

Radiated Emissions

FCC Rule: 15.249(d)(e)

FCC Part 15, Subpart C Section 15.209 limit of radiated emission for frequency below 1000GHz. The emissions from an intentional radiator shall not exceed the field strength level specified in the following table:

Frequency (MHz)	Field strength $\mu\text{V/m}$	Distance(m)	Field strength at 3m $\text{dB}\mu\text{V/m}$
30-88	100	3	40
88-216	150	3	43.5
216-960	200	3	46
Above 960	500	3	54

- Remark:
1. Emission level in $\text{dB}\mu\text{V/m}=20 \log (\mu\text{V/m})$
 2. Measurement was performed at an antenna to the closed point of EUT distance of meters.

FCC Part 15, Section 15.35(b) limit of radiated emission for frequency above 1000MHz

Frequency(MHz)	Class A($\text{dB}\mu\text{V/m}$)(at 3m)		Class B($\text{dB}\mu\text{V/m}$)(at 3m)	
	PEAK	AVERAGE	PEAK	AVERAGE
Above 1000	80.0	60.0	74.0	54.0

2.5 Configuration of Tested System

Fig. 2-1 Configuration of Tested System

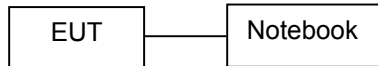


Table 2-1 Equipment Used in Tested System

Item	Equipment	Mfr/Brand	Model/Type No.	FCC ID	Series No.	Note
1.	Targus Wireless USB Receiver	Targus	AMP22R	OXM000047	N/A	<i>EUT</i>
2.	Notebook	DELL	Inspiron 14R-N4110	N/A	78RRRS1	<i>Support Device</i>

Note:

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

3. Summary Of Test Results

FCC Rules	Description Of Test	Result
§15.207	Conducted Emission	Compliant
§15.249 (a),(b),(d),(e) §15.209	Radiated Emission	Compliant
§15.249	Band Edge	Compliant
§15.203	Antenna Requirement	Compliant

4. Description of test modes

The basic operation modes are:

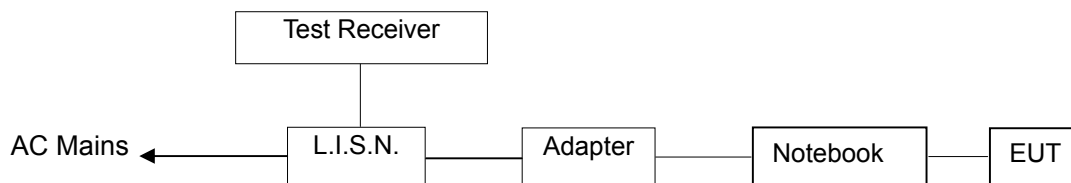
1. Low Channel: TX 2412MHz
2. Middle Channel: TX 2452MHz
3. High Channel: TX 2472MHz

5. Conducted Emissions Test

5.1 Measurement Procedure:

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

5.2 Test SET-UP (Block Diagram of Configuration)



5.3 Measurement Equipment Used:

Conducted Emission Test Site # 4					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Test Receiver	Rohde & Schwarz	ESCS30	828985/018	05/29/2012	05/29/2013
L.I.S.N	Rohde & Schwarz	ESH2-Z5	834549/005	05/29/2012	05/29/2013
50ΩCoaxial Switch	Anritsu	MP59B	M20531	05/29/2012	05/29/2013

5.4 Measurement Result:

Conducted Emission Measurement

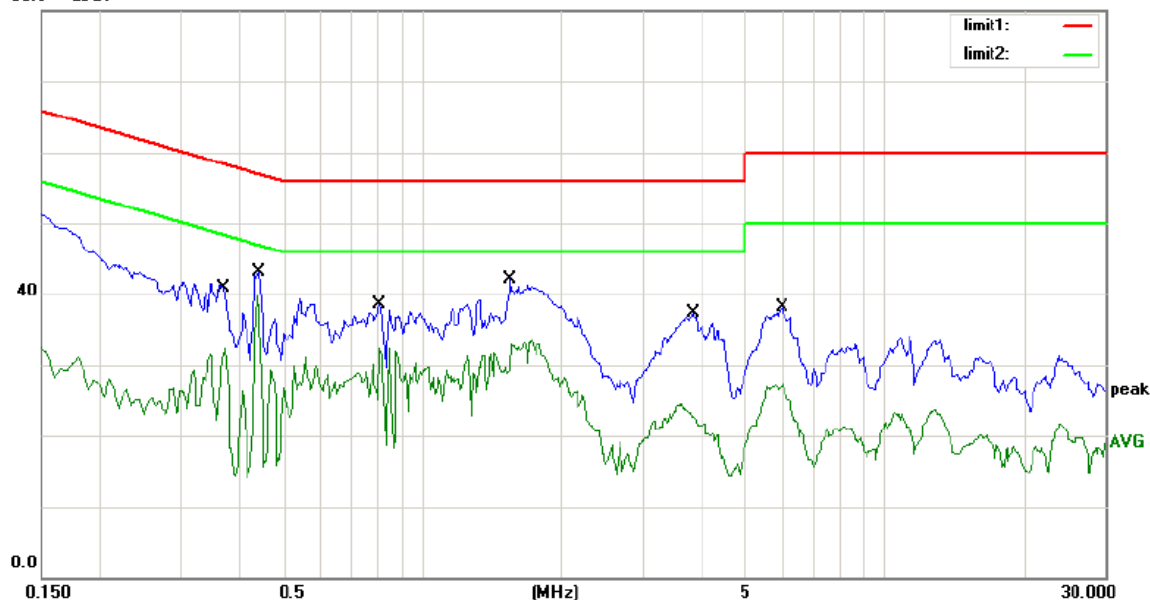
File :AMP22RAMP23R

Data :#3

Date: 13/02/02/

Time: 11/13/48

80.0 dBuV



Site site #1

Phase: **L1**

Temperature: 26

Limit: (CE)FCC PART 15 class C_QP

Power: AC 120V/60Hz(PC Input)

Humidity: 60 %

EUT: Targus Wireless USB Receiver

M/N: AMP22R

Mode: TX

Note:

No. Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1	0.3750	41.23	0.00	41.23	58.39	-17.16	QP	
2	0.3750	32.40	0.00	32.40	48.39	-15.99	AVG	
3	0.4450	43.19	0.00	43.19	56.97	-13.78	QP	
4 *	0.4450	39.72	0.00	39.72	46.97	-7.25	AVG	
5	0.8100	38.49	0.00	38.49	56.00	-17.51	QP	
6	0.8100	32.32	0.00	32.32	46.00	-13.68	AVG	
7	1.5650	42.13	0.00	42.13	56.00	-13.87	QP	
8	1.5650	32.84	0.00	32.84	46.00	-13.16	AVG	
9	3.8500	37.24	0.00	37.24	56.00	-18.76	QP	
10	3.8500	24.55	0.00	24.55	46.00	-21.45	AVG	
11	6.0300	38.19	0.00	38.19	60.00	-21.81	QP	
12	6.0300	27.28	0.00	27.28	50.00	-22.72	AVG	

*:Maximum data x:Over limit l:over margin _ Comment: Factor build in receiver.

Conducted Emission Measurement

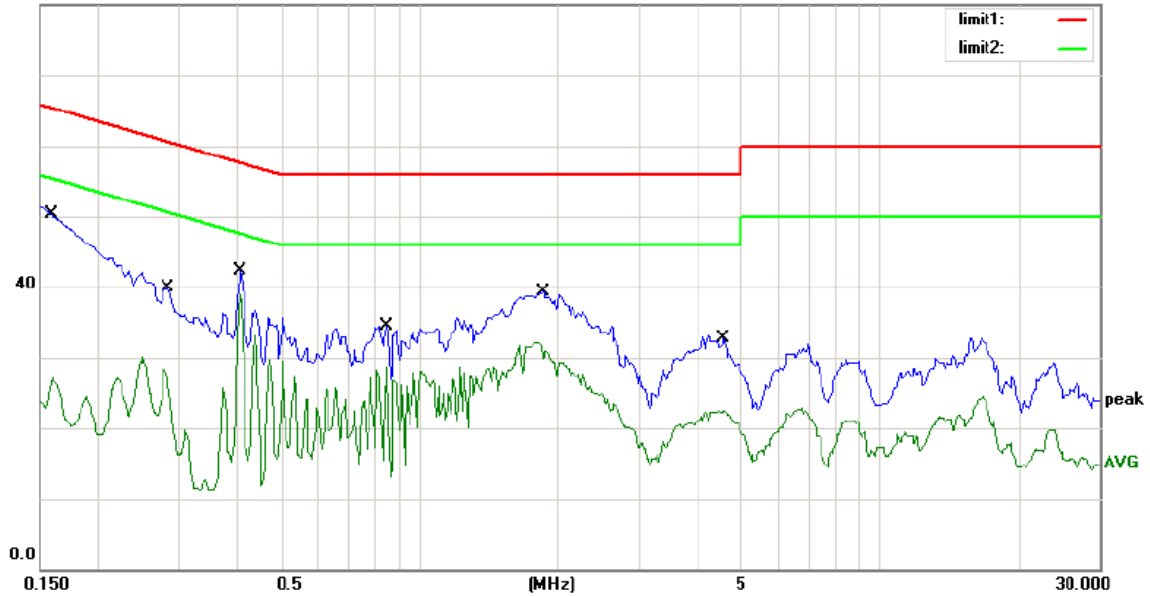
File :AMP22RAMP23R

Data :#4

Date: 13/02/02/

Time: 11/17/26

80.0 dBuV



Site site #1

Phase: N

Temperature: 26

Limit: (CE)FCC PART 15 class C_QP

Power: AC 120V/60Hz(PC Input)

Humidity: 60 %

EUT: Targus Wireless USB Receiver

M/N: AMP22R

Mode: TX

Note:

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1		0.1600	51.52	0.00	51.52	65.46	-13.94	QP	
2		0.1600	27.02	0.00	27.02	55.46	-28.44	AVG	
3		0.2850	39.99	0.00	39.99	60.67	-20.68	QP	
4		0.2850	29.10	0.00	29.10	50.67	-21.57	AVG	
5		0.4100	42.29	0.00	42.29	57.65	-15.36	QP	
6	*	0.4100	38.85	0.00	38.85	47.65	-8.80	AVG	
7		0.8500	34.59	0.00	34.59	56.00	-21.41	QP	
8		0.8500	28.66	0.00	28.66	46.00	-17.34	AVG	
9		1.8650	39.35	0.00	39.35	56.00	-16.65	QP	
10		1.8650	32.13	0.00	32.13	46.00	-13.87	AVG	
11		4.5900	33.19	0.00	33.19	56.00	-22.81	QP	
12		4.5900	22.51	0.00	22.51	46.00	-23.49	AVG	

5.5 Conducted Measurement Photos:



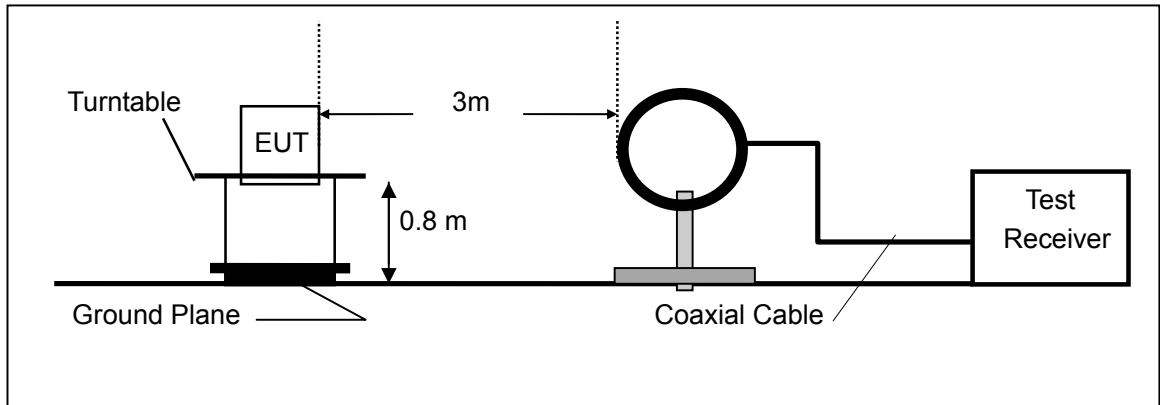
6. Radiated Emission Test

6.1 Measurement Procedure

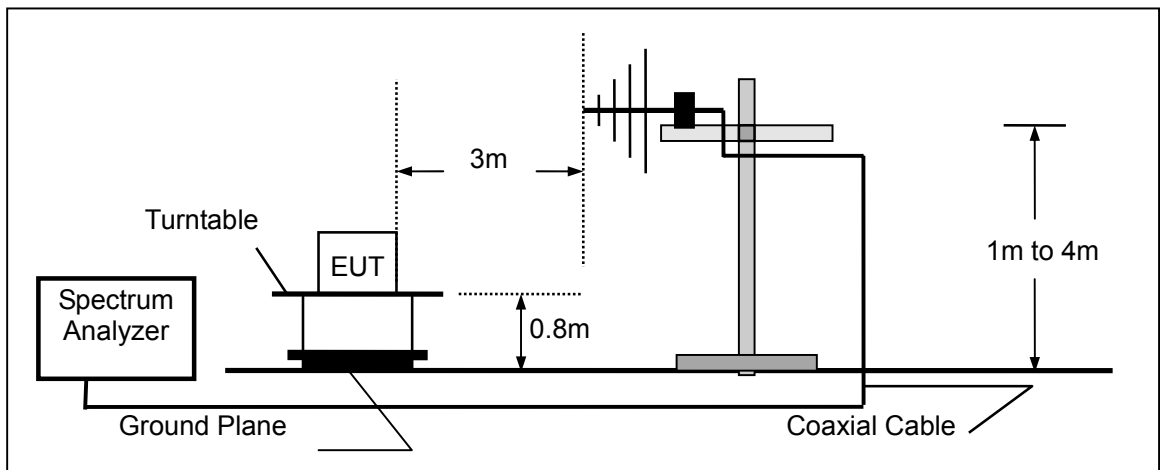
1. The EUT was placed on a turn table which is 0.8m above ground plane.
2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
3. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
4. Repeat above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

6.2 Test SET-UP (Block Diagram of Configuration)

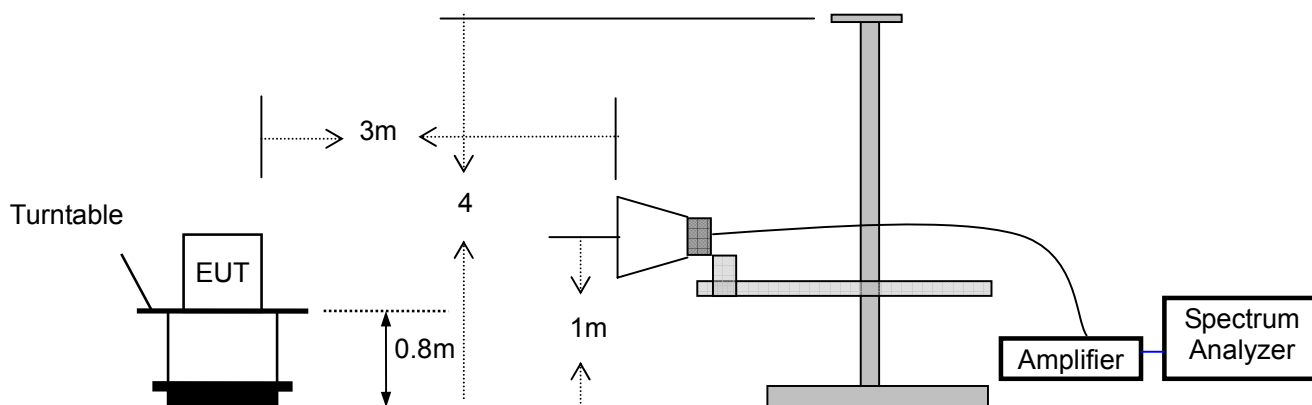
(A) Radiated Emission Test Set-Up, Frequency Below 30MHz



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



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



6.3 Measurement Equipment Used:

EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Spectrum Analyzer	Rohde & Schwarz	FSP7	839511/010	05/29/2012	05/29/2013
Spectrum Analyzer	HP	E4407B	839840481	05/29/2012	05/29/2013
EMI Test Receiver	Rohde & Schwarz	ESCS30	828985/018	05/29/2012	05/29/2013
Pre-Amplifier	HP	8447D	2944A07999	05/29/2012	05/29/2013
Bilog Antenna	Schwarzbeck	VULB9163	142	05/29/2012	05/29/2013
Loop Antenna	ARA	PLA-1030/B	1029	05/29/2012	05/29/2013
Horn Antenna	Electro-Metrics	EM-6961	103314	05/29/2012	05/29/2013
Horn Antenna	Schwarzbeck	BBHA 9120	D143	05/29/2012	05/29/2013

6.4 Out of Band Radiated Measurement Result

Operation Mode: TX Mode Test Date : February 02, 2013
Frequency Range: 30~1000MHz Temperature : 23 °C
Test Result: PASS Humidity : 59 %
Measured Distance: 3m Test By: Andy

Freq. (MHz)	Ant.Pol. H/V	Emission Level (dBuV/m)	Limit 3m (dBuV/m)	Margin (dB)	Note
39.700	H	16.99	40.0	-23.01	QP
130.880	H	23.60	43.5	-19.90	QP
216.240	H	26.99	46.0	-19.01	QP
258.920	H	26.44	46.0	-19.56	QP
298.690	H	28.17	46.0	-17.83	QP
39.700	V	20.76	40.0	-19.24	QP
165.800	V	28.89	40.0	-14.61	QP
280.260	V	34.05	40.0	-11.95	QP
352.040	V	31.49	43.5	-14.51	QP
452.920	V	31.77	43.5	-14.23	QP

Note: (1) All Readings are QP Value.
(2) Emission Level= Reading Level+Probe Factor +Cable Loss
(3) The average measurement was not performed when the peak measured data under the limit of average detection.

No others harmonics emissions are higher than 20dB below the limits of 47 CFR Part 15.209.

Operation Mode: TX (2412MHz) Test Date : February 02, 2013
Frequency Range: 1-25GHz Temperature : 25 °C
Test Result: PASS Humidity : 50 %
Measured Distance: 3m Test By: Andy

Freq. (GHz)	Ant.Pol. H/V	Emission Level(dBuV/m)		Limit 3m(dBuV/m)		Margin(dB)	
		PK	AV	PK	AV	PK	AV
2.412(F)	V	92.63	77.91	114	94	-21.37	-16.09
4.824	V	55.42	39.46	74	54	-18.58	-14.54
7.236	V	57.94	37.38	74	54	-16.06	-16.62
9.648	V	54.71	39.23	74	54	-19.29	-14.77
12.060	V	52.69	35.52	74	54	-21.31	-18.48
2.412(F)	H	94.57	78.79	114	94	-19.43	-15.21
4.824	H	55.32	38.41	74	54	-18.68	-15.59
7.236	H	54.41	35.47	74	54	-19.59	-18.53
9.648	H	58.24	38.55	74	54	-15.76	-15.45
12.060	H	55.78	36.74	74	54	-18.22	-17.26

No others harmonics emissions are higher than 20dB below the limits of 47 CFR Part 15.249.

Note: (1) All Readings are Peak Value and AV.
(2) Emission Level= Reading Level+Probe Factor +Cable Loss
(3) The average measurement was not performed when the peak measured data under the limit of average detection.

Operation Mode: TX(2452MHz) Test Date : February 02, 2013
Frequency Range: 1-25GHz Temperature : 25 °C
Test Result: PASS Humidity : 50 %
Measured Distance: 3m Test By: Andy

Freq. (GHz)	Ant.Pol. H/V	Emission Level(dBuV/m)		Limit 3m(dBuV/m)		Margin(dB)	
		PK	AV	PK	AV	PK	AV
2.452(F)	V	92.45	78.55	114	94	-21.55	-15.45
4.904	V	57.14	38.72	74	54	-16.86	-15.28
7.356	V	58.98	36.87	74	54	-15.02	-17.13
9.808	V	54.76	35.6	74	54	-19.24	-18.40
12.260	V	53.41	37.54	74	54	-20.59	-16.46
2.452(F)	H	92.77	77.36	114	94	-21.23	-16.64
4.904	H	59.33	40.45	74	54	-14.67	-13.55
7.356	H	57.89	38.46	74	54	-16.11	-15.54
9.808	H	54.97	35.86	74	54	-19.03	-18.14
12.260	H	55.24	34.54	74	54	-18.76	-19.46

No others harmonics emissions are higher than 20dB below the limits of 47 CFR Part 15.249.

Note: (1) All Readings are Peak Value and AV.
(2) Emission Level= Reading Level+Probe Factor +Cable Loss
(3) The average measurement was not performed when the peak measured data under the limit of average detection.

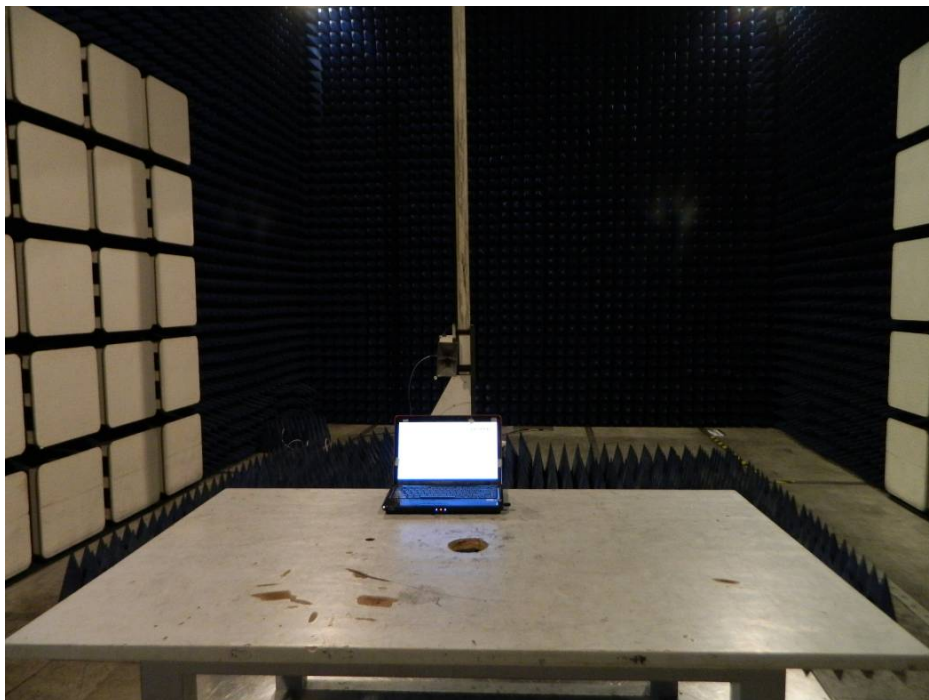
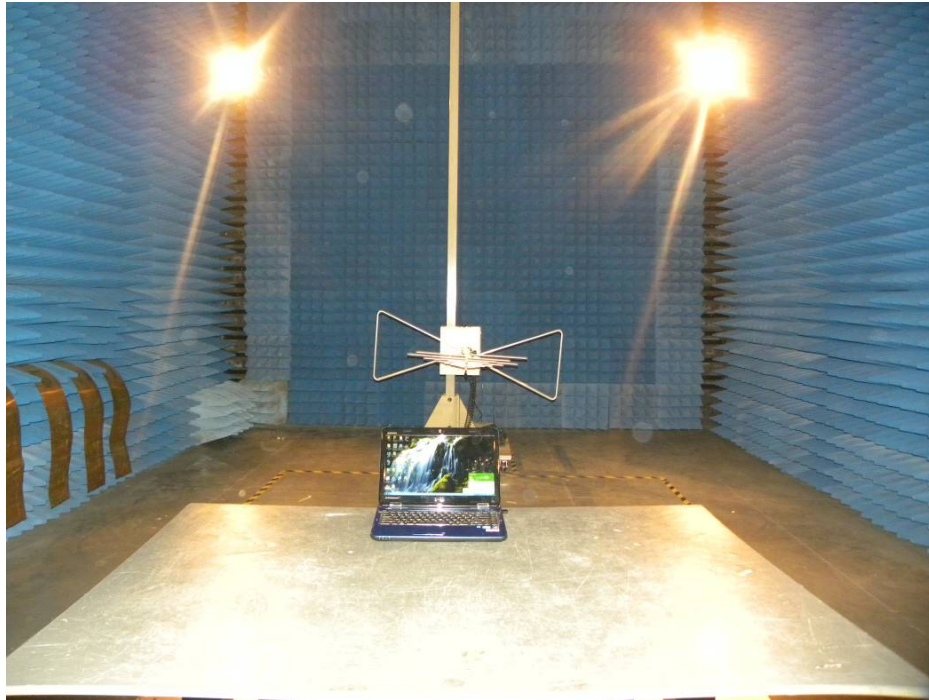
Operation Mode: TX(2472MHz) Test Date : February 02, 2013
Frequency Range: 1-25GHz Temperature : 25 °C
Test Result: PASS Humidity : 50 %
Measured Distance: 3m Test By: Andy

Freq. (GHz)	Ant.Pol. H/V	Emission Level(dBuV/m)		Limit 3m(dBuV/m)		Margin(dB)	
		PK	AV	PK	AV	PK	AV
2.472(F)	V	93.72	77.75	114	94	-20.28	-16.25
4.944	V	56.57	37.87	74	54	-17.43	-16.13
7.416	V	57.36	37.55	74	54	-16.64	-16.45
9.888	V	53.92	36.43	74	54	-20.08	-17.57
12.360	V	55.65	37.01	74	54	-18.35	-16.99
2.472(F)	H	91.92	77.12	114	94	-22.08	-16.88
4.944	H	57.81	37.54	74	54	-16.19	-16.46
7.416	H	53.44	36.42	74	54	-20.56	-17.58
9.888	H	55.35	37.65	74	54	-18.65	-16.35
12.360	H	55.73	35.78	74	54	-18.27	-18.22

No others harmonics emissions are higher than 20dB below the limits of 47 CFR Part 15.249.

Note: (1) All Readings are Peak Value and AV.
(2) Emission Level= Reading Level+Probe Factor +Cable Loss
(3) The average measurement was not performed when the peak measured data under the limit of average detection.

6.5 Radiated Measurement Photos:



7. Band Edge

7.1 Test limits

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 Section 15.209, whichever is the lesser attenuation.

7.2 Measurement Procedure

1. The EUT was placed on a turn table which is 0.8m above ground plane.
2. Set EUT as normal operation.
3. Set SPA Center Frequency=Fundamental frequency, RBW=100KHz, VBW=300KHz.
4. Set SPA Max hold. Mark peak.

7.3 Test SET-UP(Block Diagram of Configuration)

Same as 5.2 Radiated Emission Set-up.

7.4 Measurement Equipment Used:

Same as 5.3 Radiated Emission Measurement.

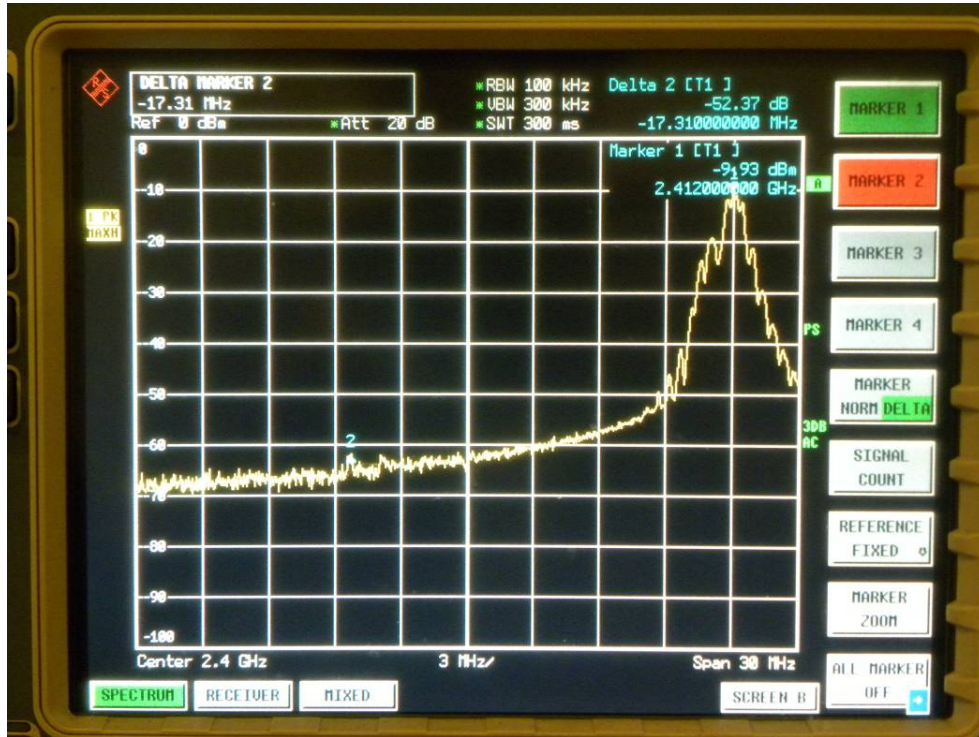
7.5 Measurement Results:

PASS.

The test plots as following:

Test Data:

Low Channel



High Channel



8. Antenna Application

8.1 Antenna requirement

The EUT's antenna used a chip antenna and integrated on PCB, The antenna's gain is 2.12 dBi and meets the requirement.