


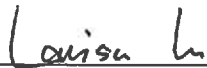
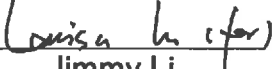
FCC & IC TEST REPORT

Product : MOD-36237 Moto TC Racer
Trade mark : N/A
Item/Lot No. : MOD-36237
P.O. No. : Certs36267
FCC ID : PAV36237
IC : 6384A-36237
Report Number : EESZE09250002
Date : Oct. 19, 2012
Regulations : See below

Test Standards	Results
<input checked="" type="checkbox"/> 47 CFR FCC Part 15 Subpart C 15.249: 2011	PASS
<input checked="" type="checkbox"/> RSS 210 Issue 8	PASS
<input checked="" type="checkbox"/> RSS-Gen Issue 3	PASS

Prepared for
Griffin Technology Inc.
 2030 Lindell Ave. Nashville, TN 37203, United States

Prepared by
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Tested by:  Reviewed by: 
 Approved by:  Date: Oct. 19, 2012
 Jimmy Li
 Lab manager



Check No.: 30000078

TABLE OF CONTENTS

1. GENERAL INFORMATION	3
2. TEST SUMMARY	3
3. MEASUREMENT UNCERTAINTY	4
4. TEST EQUIPMENT LIST	4
5. SUPPORT EQUIPMENT LIST	4
6. PRODUCT INFORMATION	4
7. 20DB & 99% BANDWIDTH MEASUREMENT	5
7.1 LIMITS	5
7.2 BLOCK DIAGRAM OF TEST SETUP	5
7.3 TEST PROCEDURE	5
7.4 TEST RESULT	5
8. RADIATED EMISSIONS MEASUREMENT	8
8.1 LIMITS	8
8.2 BLOCK DIAGRAM OF TEST SETUP	8
8.4 TEST RESULT	10
9. BAND EDGE EMISSION MEASUREMENT	16
9.1 LIMITS	16
9.2 BLOCK DIAGRAM OF TEST SETUP	16
9.3 TEST PROCEDURE	16
9.4 TEST RESULT	16
APPENDIX 1 PHOTOGRAPHS OF TEST SETUP	18
APPENDIX 2 PHOTOGRAPHS OF EUT	19

(Note: N/A means not applicable)

1. GENERAL INFORMATION

Applicant: Griffin Technology Inc.
 2030 Lindell Ave. Nashville, TN 37203, United States
Manufacturer: Griffin Technology
Supplier: HK Asia / Toyabi
FCC ID: PAV36237
IC: 6384A-36237
Item/Lot No.: MOD-36237
P.O. No.: Certs36267
Country of Origin: China
Exported to: Europe, USA, Japan, HK, Singapore, Taiwan, Australia, Mexico, Brazil
Client Specified Age Grading: 8+
Report Number: EESZE09250002
Date of Test: Sep. 25, 2012 to Oct. 19, 2012

The above equipment was tested by Centre Testing International for compliance with the requirements set forth in the FCC & IC Rules and Regulations Part 15, RSS-210, RSS-Gen and the measurement procedure according to ANSI C63.4:2003.

2. TEST SUMMARY

The complete list of measurements is given below:

No.	Test Item	Rule	Result
1	20dB Bandwidth & 99% Bandwidth	FCC 15.215(c) RSS-Gen 4.6.1	PASS
2	Radiated Emission	FCC 15.209 FCC 15.249(a) (d) RSS-210 A2.9 (a)	PASS
3	Out of Band Emission	FCC 15.249 (d) RSS-210 A2.9 (b)	PASS
4	Antenna Requirements *	FCC 15.203 RSS-Gen 7.1.2	PASS

*: According to Section 15.203 and RSS-Gen 7.1.2, 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 EUT has a built in antenna which is a short wire solder on the PCB, this is permanently attached antenna and meets the requirements of this section.

3. MEASUREMENT UNCERTAINTY

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k=2$.

Measurement items	Uncertainty
Radiated Emissions	4.5 dB

4. TEST EQUIPMENT LIST

Equipment	Manufacturer	Model Number	Serial Number	Due Date
3M Chamber & Accessory Equipment	ETS-LINDGREN	FACT-3	3510	07/09/2013
Spectrum Analyzer	Agilent	E4440A	MY46185649	03/07/2013
TRILOG Broadband Antenna	schwarzbeck	VULB 9163	401	07/06/2013
Multi device Controller	ETS-LINGREN	2090	00057230	N/A
Horn Antenna	ETS-LINGREN	3117	00057407	07/06/2013
Microwave Preamplifier	Agilent	8449B	3008A02425	03/29/2013
Loop Antenna	ETS-LINDGERN	6502	71730	07/06/2013

5. SUPPORT EQUIPMENT LIST

No.	Device Type	Brand	Model	Series No.	Data Cable	Power Cord
1.	Mobile phone	Apple	A1136	JQ732022U9m	----	----
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6. PRODUCT INFORMATION

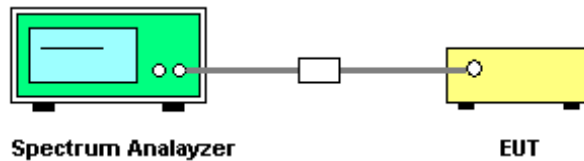
Items	Description
Rating	DC 3.7V
Intentional Transceiver	Intentional Transmitter
Modulation	FHSS
Frequency Range	2404 ~ 2480 MHz
Channel Number	16
Type	PCB Antenna
Connector	fixed on board

7. 20DB & 99% BANDWIDTH MEASUREMENT

7.1 LIMITS

None

7.2 BLOCK DIAGRAM OF TEST SETUP



7.3 TEST PROCEDURE

1. The transmitter output (antenna port) was connected to the spectrum analyzer.
2. Set spectrum analyzer's RBW and VBW to applicable value with Peak in Max Hold.
3. A PEAK output reading and 99% & 20dB OBW function in spectrum analyzer were taken.

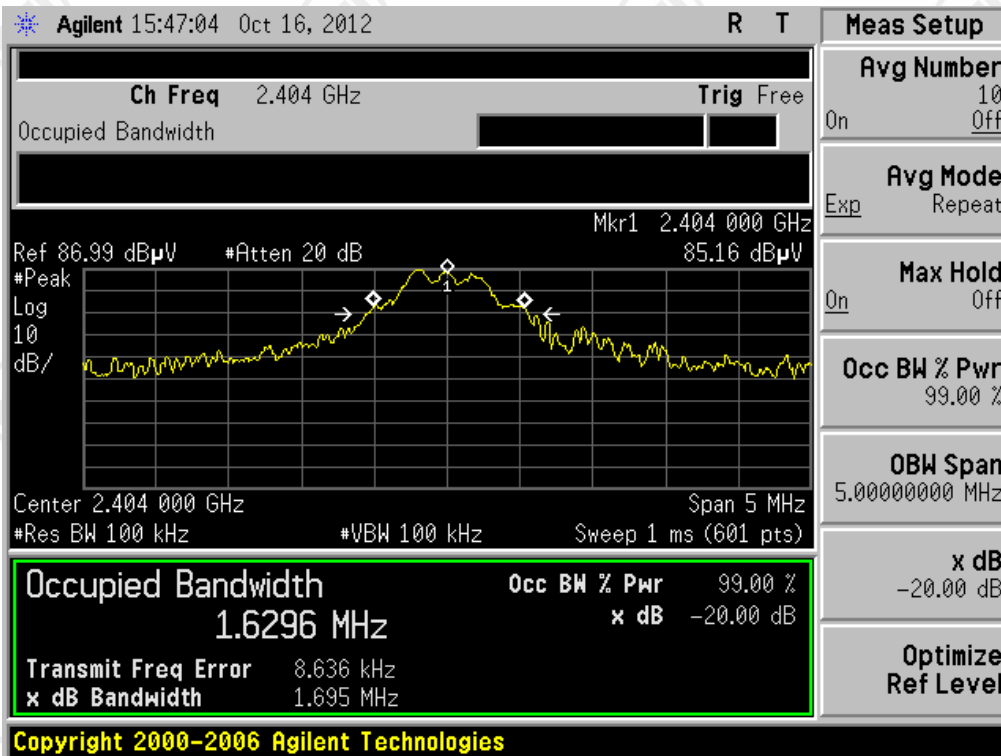
7.4 TEST RESULT

20dB Bandwidth:

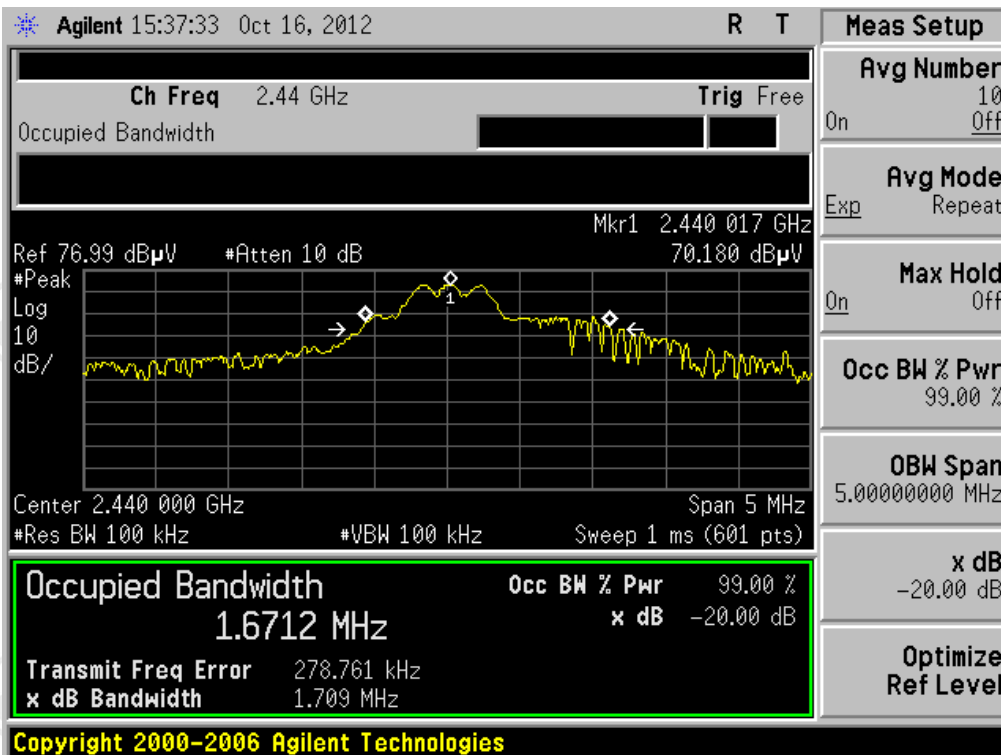
Channel	Frequency (MHz)	20 dB BW (MHz)	Result (MHz)
Low	2404	1.695	1.709
Middle	2440	1.709	
High	2480	1.690	

99% Bandwidth:

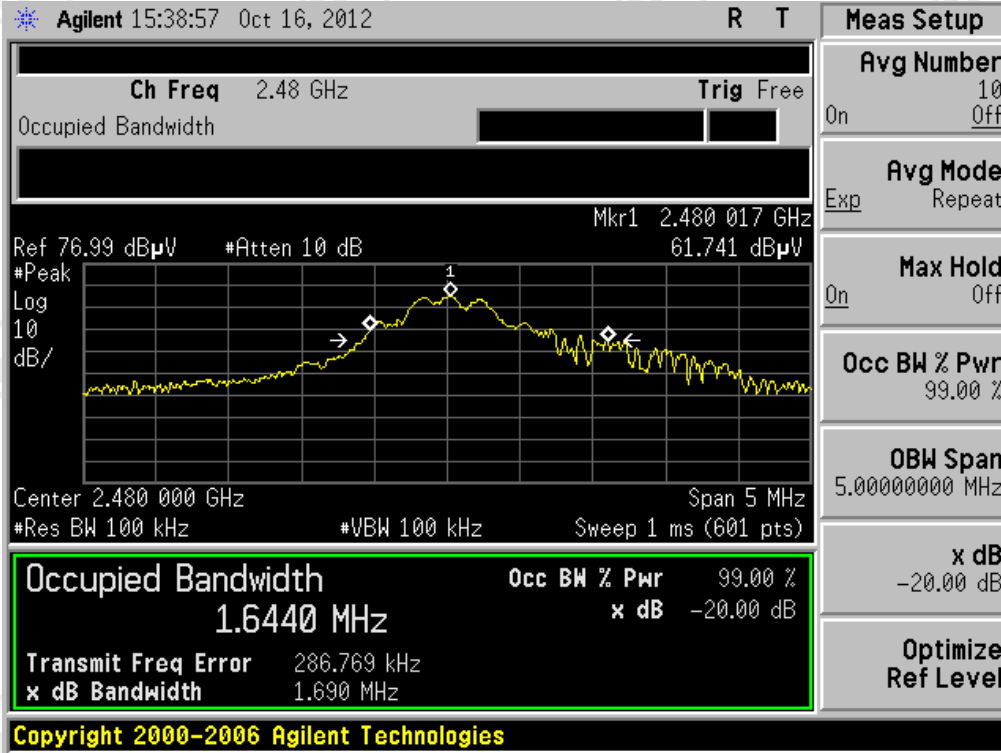
Channel	Frequency (MHz)	99% BW (MHz)	Result (MHz)
Low	2404	1.630	1.671
Middle	2440	1.671	
High	2480	1.644	



Channel low



Channel middle



Channel high

8. RADIATED EMISSIONS MEASUREMENT

8.1 LIMITS

(1) The field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

Fundamental frequency	Field strength of fundamental (millivolts/ meter)	Field strength of harmonics (microvolts/ meter)
902–928 MHz	50	500
2400–2483.5 MHz	50	500
5725–5875 MHz	50	500
24.0–24.25 GHz	250	2500

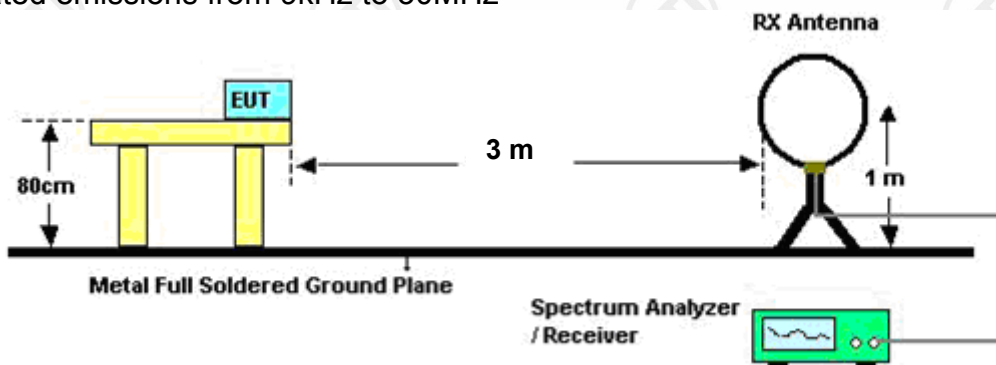
(2) Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in § 15.209 as the following , whichever is the lesser attenuation.

Frequency (MHz)	Field strength (mV/m)	Distance (m)
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

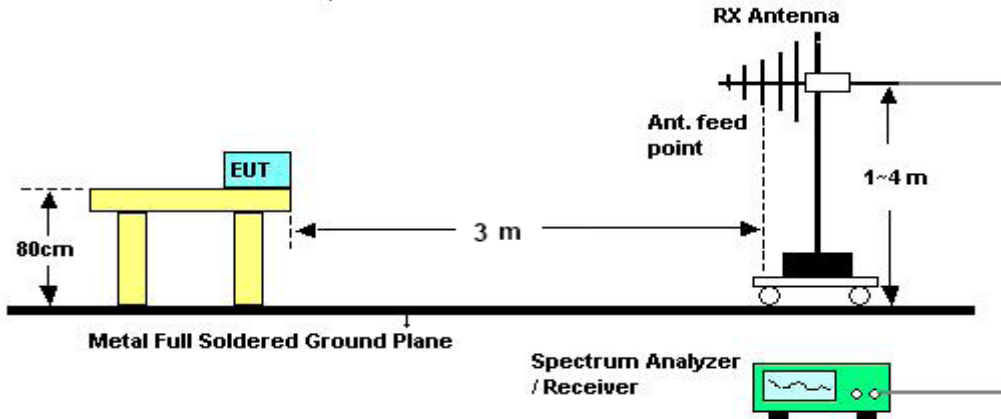
Note: the tighter limit applies at the band edges.

8.2 BLOCK DIAGRAM OF TEST SETUP

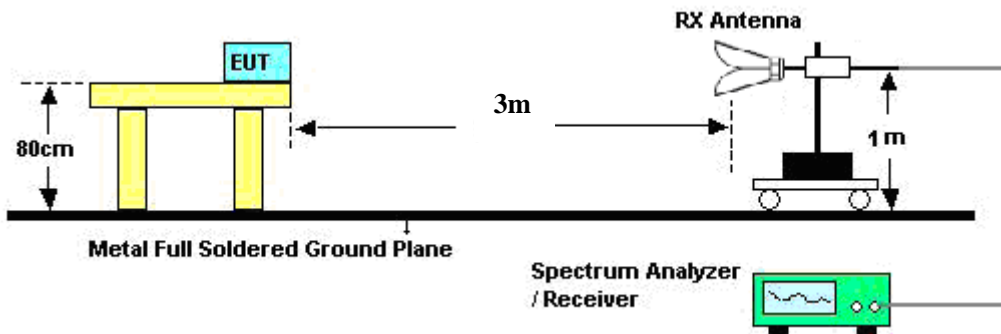
For radiated emissions from 9kHz to 30MHz



For radiated emissions from 30 - 1000MHz



For radiated emissions from 1GHz to 25GHz



8.3 TEST PROCEDURE

Below 30MHz

- The EUT is placed on a turntable 0.8 meters above the ground in the chamber, 1 meter away from the antenna (loop antenna). The maximum values of the field strength are recorded by adjusting the polarizations of the test antenna and rotating the turntable.
- For each suspected emission, the EUT was arranged to its worst case and then turn table was turned from 0 degrees to 360 degrees to find the maximum reading.
- The test frequency analyzer system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

30MHz ~ 1GHz:

- The EUT was placed on the non-conductive turntable 0.8 m above the ground at a chamber.
- Set the spectrum analyzer/receiver in Peak detector, Max Hold mode, and 120 kHz RBW. Record the maximum field strength of all the pre-scan process in the full band when the antenna is varied between 1~4 m in both horizontal and vertical, and the turntable is rotated from 0 to 360 degrees.

c. For each frequency whose maximum record was higher or close to limit, measure its QP value: vary the antenna's height and rotate the turntable from 0 to 360 degrees to find the height and degree where EUT radiated the maximum emission, then set the test frequency analyzer/receiver to QP Detector and specified bandwidth with Maximum Hold Mode, and record the maximum value.

Above 1GHz:

a. The EUT was placed on the non-conductive turntable 0.8 m above the ground at a chamber.

b. Set the spectrum analyzer/receiver in Peak detector, Max Hold mode, and 1MHz RBW. Record the maximum field strength of all the pre-scan process in the full band when the antenna is varied in both horizontal and vertical, and the turntable is rotated from 0 to 360 degrees.

c. For each frequency whose maximum record was higher or close to limit, measure its AV value: rotate the turntable from 0 to 360 degrees to find the degree where EUT radiated the maximum emission, then set the test frequency analyzer/receiver to AV value and specified bandwidth with Maximum Hold Mode, and record the maximum value.

8.4 TEST RESULT

Note: Limit dB μ V/m @3m = Limit dB μ V/m @300m+ 80

Limit dB μ V/m @3m = Limit dB μ V/m @30m + 40

A. Below 30MHz:

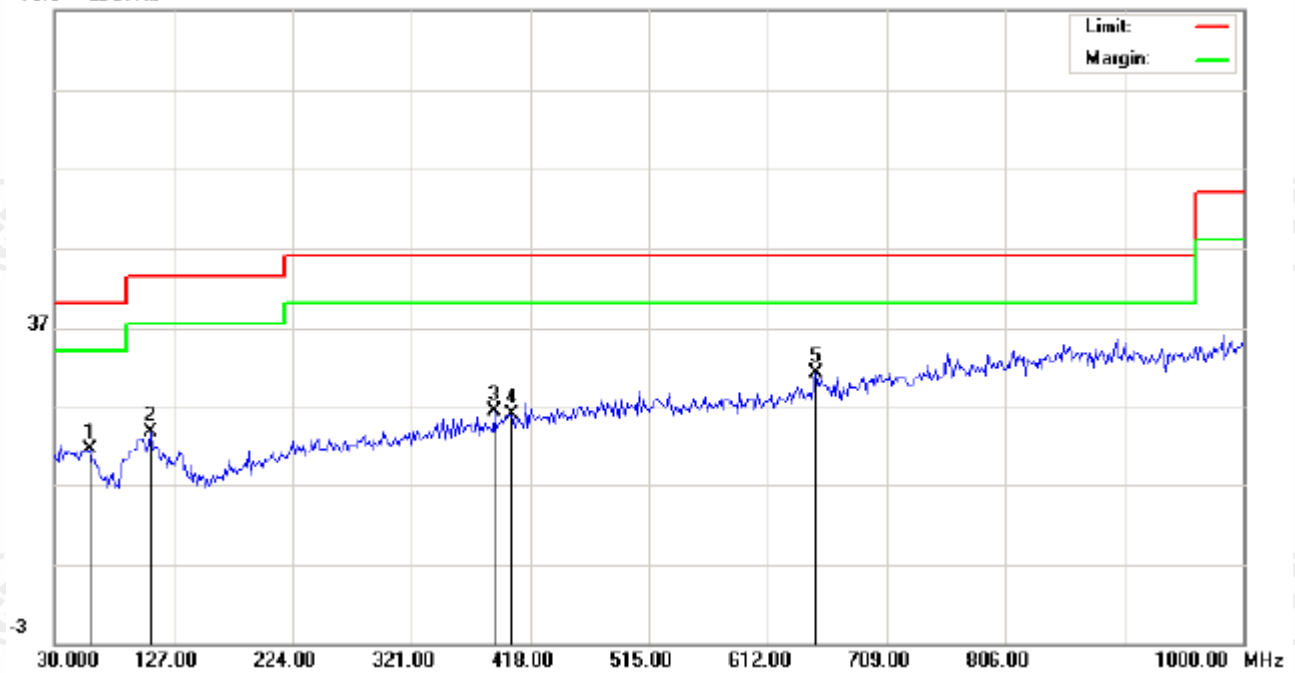
The test data below 30MHz are very low, so they are not recorded.

B. 30MHz ~ 1GHz:

The test data of low channel, middle channel and high channel are almost same in frequency bands 30MHz to 1GHz, and the data of low channel are chosen as representative in below:

H:

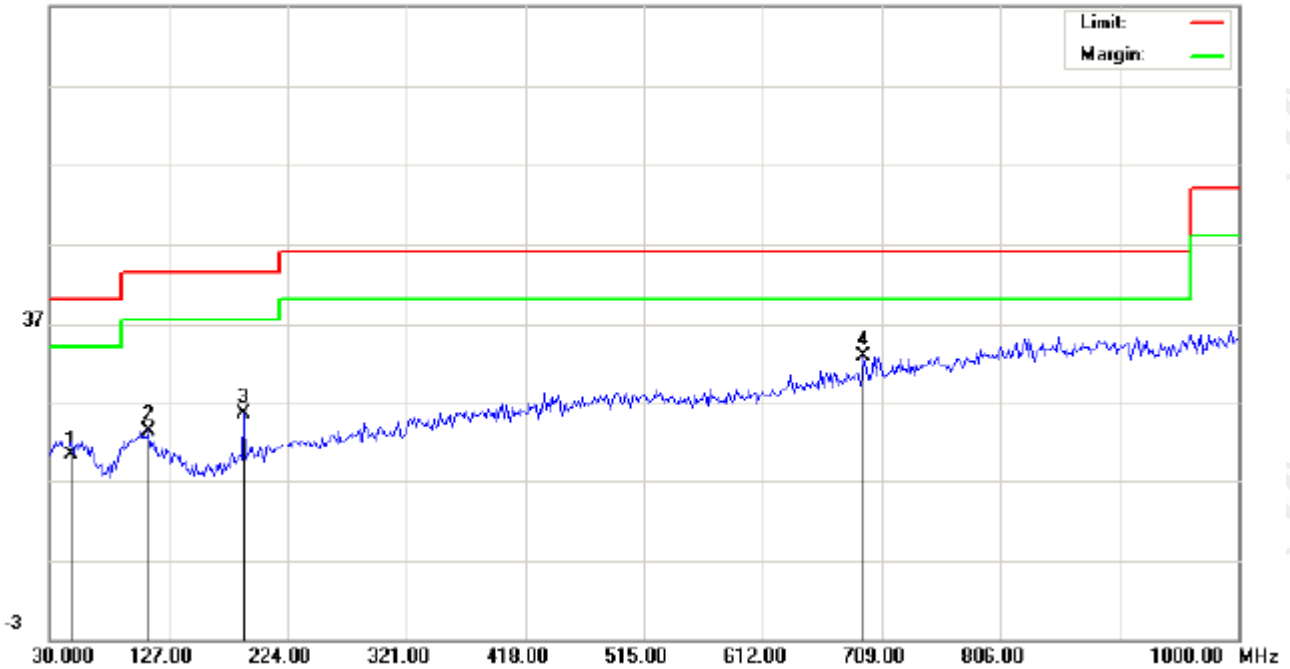
76.9 dBuV/m



No.	Freq. MHz	Reading_Level (dBuV)			Correct Factor dB	Measurement (dBuV/m)			Limit (dBuV/m)		Margin (dB)		P/F	Comment
		Peak	QP	AVG		peak	QP	AVG	QP	AVG	QP	AVG		
1	59.1000	6.93			14.67	21.60			40.00			-18.40		P
2	107.6000	8.56			15.21	23.77			43.50			-19.73		P
3	388.9000	8.32			18.02	26.34			46.00			-19.66		P
4	403.4500	7.76			18.29	26.05			46.00			-19.95		P
5	650.8000	9.58			21.65	31.23			46.00			-14.77		P

V:

76.9 dBuV/m



No.	Freq. MHz	Reading_Level (dBuV)			Correct Factor dB	Measurement (dBuV/m)			Limit (dBuV/m)		Margin (dB)		P/F	Comment
		Peak	QP	AVG		peak	QP	AVG	QP	AVG	QP	AVG		
1	47.7833	5.32			14.93	20.25			40.00		-19.75		P	
2	110.8333	8.61			14.89	23.50			43.50		-20.00		P	
3	188.4333	12.64			12.96	25.60			43.50		-17.90		P	
4	694.4500	9.95			22.92	32.87			46.00		-13.13		P	

C. Above 1GHz:

Test Results-(Measurement Distance: 3m)_Channel low							
Frequency (MHz)	Measurement value			Limit		Antenna (H/V)	Result (P/F)
	PK (dB μ V/m)	AV factor (dB)	AV (dB μ V/m)	PK (dB μ V/m)	AV (dB μ V/m)		
2404.000*	91.36	---	---	114	94	H	P
4808.000	51.63	---	---	74	54	H	P
7376.000	32.12	---	---	74	54	H	P
12602.52	40.20	---	---	74	54	H	P
16100.50	46.24	---	---	74	54	H	P
2404.000*	87.36	---	---	114	94	V	P
4808.000	50.10	---	---	74	54	V	P
11461.00	37.49	---	---	74	54	V	P
13000.50	42.62	---	---	74	54	V	P

*: fundamental frequency

Test Results-(Measurement Distance: 3m)_Channel middle							
Frequency (MHz)	Measurement value			Limit		Antenna	Result
	PK (dB μ V/m)	AV factor (dB)	AV (dB μ V/m)	PK (dB μ V/m)	AV (dB μ V/m)	(H/V)	(P/F)
2440.000*	90.93	---	---	114	94	H	P
4880.000	52.31	---	---	74	54	H	P
8312.000	32.29	---	---	74	54	H	P
11352.50	36.14	---	---	74	54	H	P
14431.00	43.44	---	---	74	54	H	P
2440.000*	86.98	---	---	114	94	V	P
4880.000	50.32	---	---	74	54	V	P
7036.000	31.78	---	---	74	54	V	P
13000.50	42.99	---	---	74	54	V	P

*: fundamental frequency

Test Results-(Measurement Distance: 3m)_Channel high							
Frequency (MHz)	Measurement value			Limit		Antenna	Result
	PK (dB μ V/m)	AV factor (dB)	AV (dB μ V/m)	PK (dB μ V/m)	AV (dB μ V/m)	(H/V)	(P/F)
2480.000*	89.01	---	---	114	94	H	P
4960.000	52.91	---	---	74	54	H	P
13200.50	42.53	---	---	74	54	H	P
14928.50	45.79	---	---	74	54	H	P
2480.000*	85.32	---	---	114	94	V	P
4960.000	51.57	---	---	74	54	V	P
7035.000	31.52	---	---	74	54	V	P
11870.00	36.88	---	---	74	54	V	P
14550.50	44.20	---	---	74	54	V	P

*: fundamental frequency

Remark:

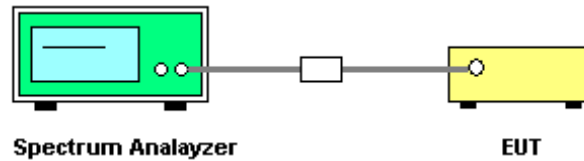
According to the emissions below 18GHz, the data curve is lower than the limit, and the data between 18GHz to 25GHz will be lower than the limit, so they are not recorded in the report.

9. BAND EDGE EMISSION MEASUREMENT

9.1 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 § FCC 15.209 & , whichever is the lesser attenuation.

9.2 BLOCK DIAGRAM OF TEST SETUP

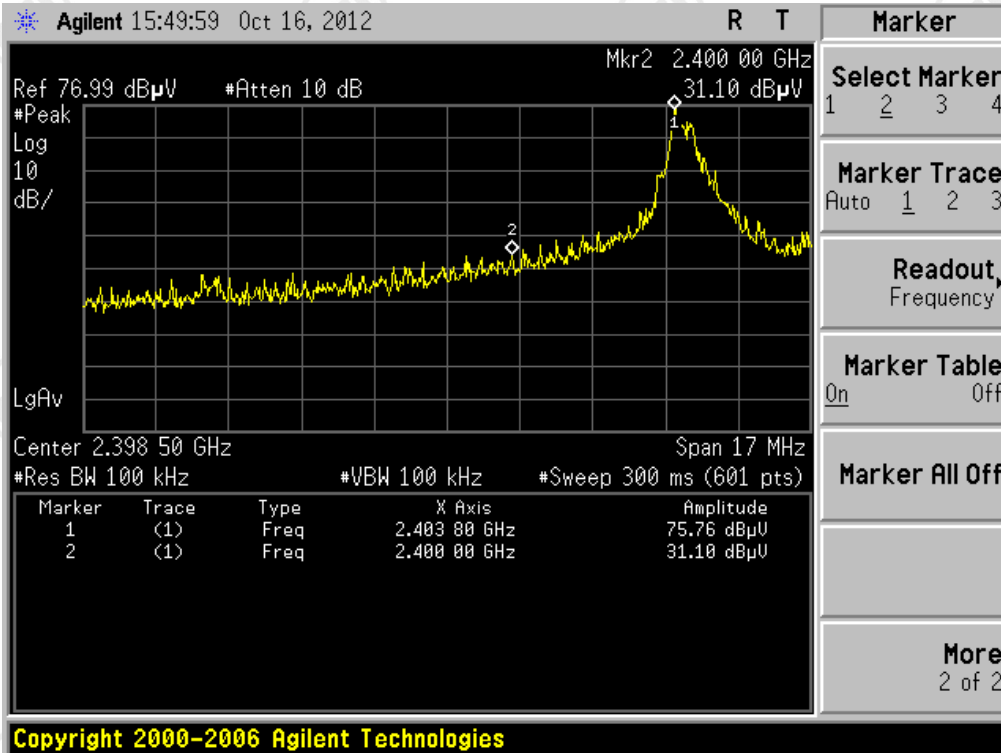


9.3 TEST PROCEDURE

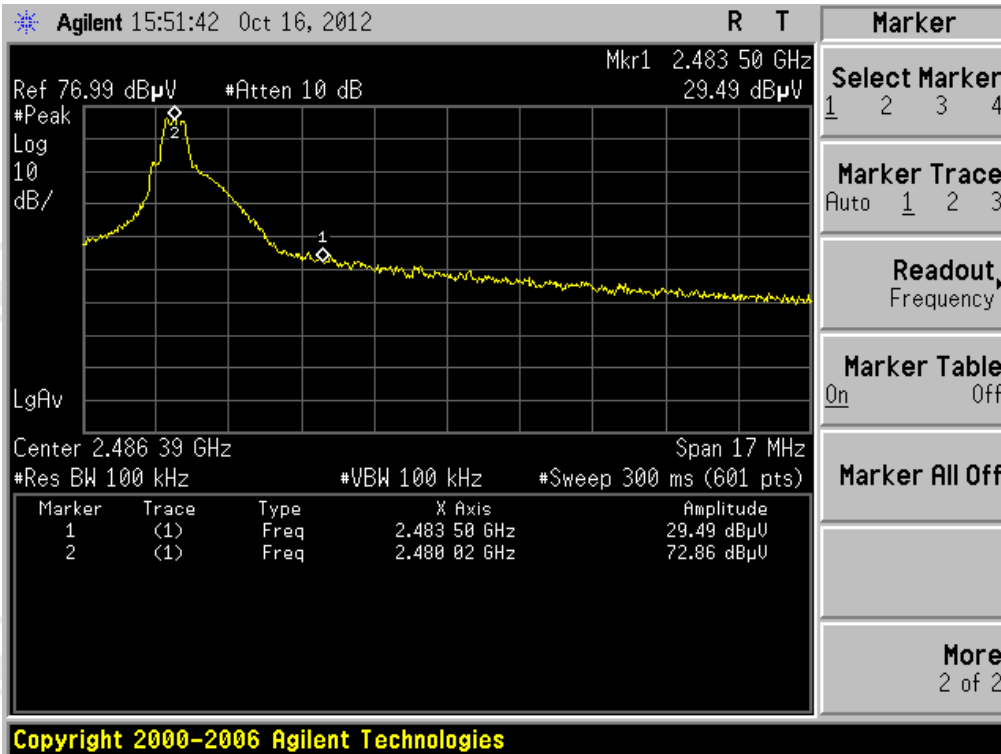
1. The transmitter output (antenna port) was connected to the spectrum analyzer.
2. Set spectrum analyzer's RBW and VBW to applicable value with Peak in Max Hold.
3. Record the emission drops at the band-edge relative to the highest fundamental emission level.
4. Use the marker-delta method to determine band-edge compliance as required.

9.4 TEST RESULT

Channel Frequency (MHz)	Fundamental Emission (dBμV/m)	Delta (dB)	Final Emission (dBμV/m)	Limit (dBμV/m)		Result (Pass / Fail)
	PK		PK	PK	AV	
2404.000	91.36	---	---	---	---	---
2400.000	---	44.66	46.70	74	54	Pass
2480.000	89.01	---	---	---	---	---
2483.500	---	43.37	45.64	74	54	Pass



2404.000MHz

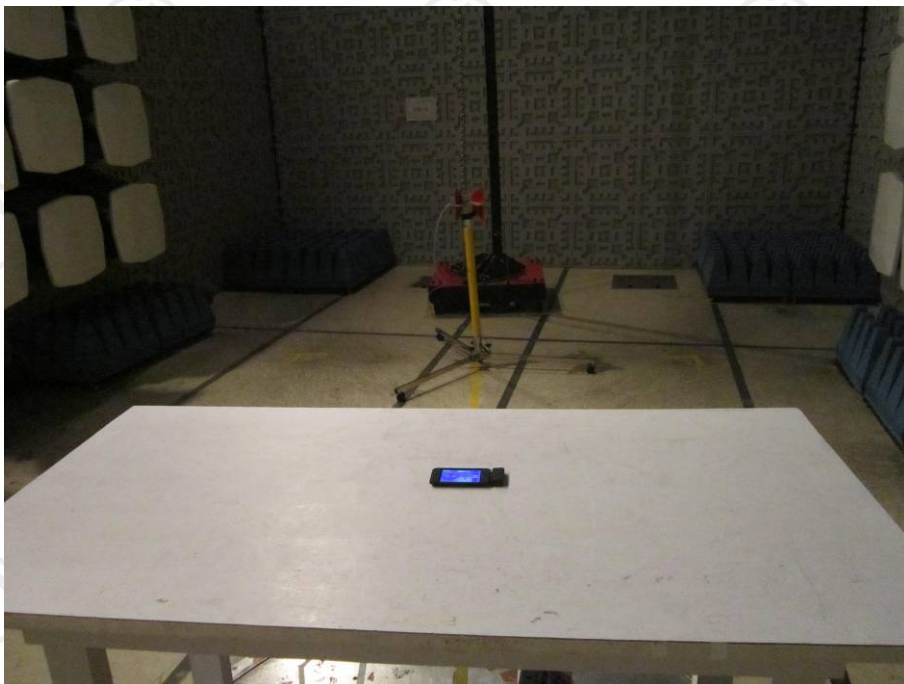


2480.000MHz

APPENDIX 1 PHOTOGRAPHS OF TEST SETUP



TEST SETUP OF RADIATED EMISSION (30MHz~1GHz)



TEST SETUP OF RADIATED EMISSION (Above 1GHz)

APPENDIX 2 PHOTOGRAPHS OF EUT



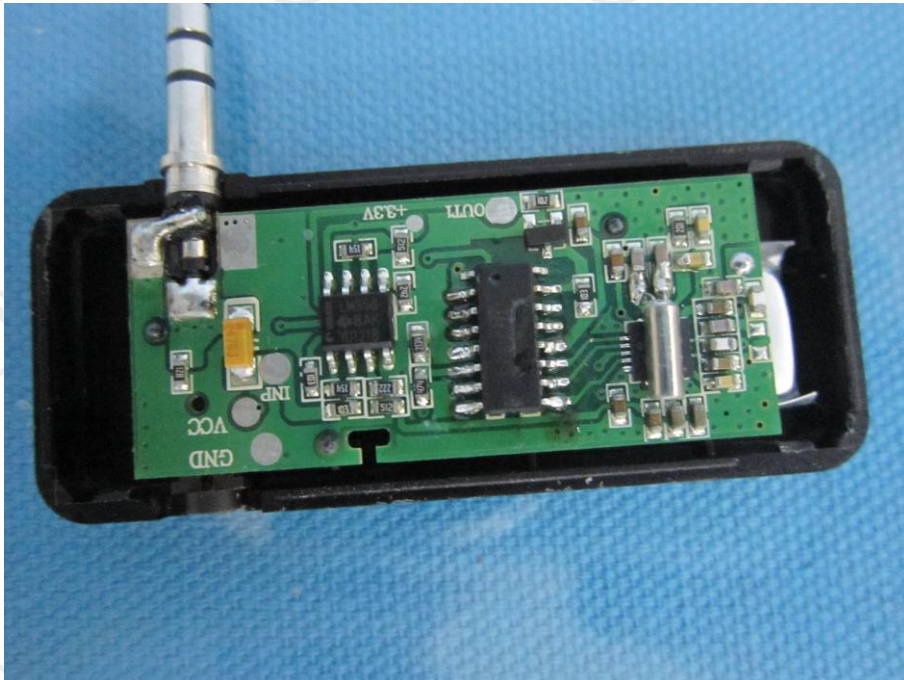
View of external EUT-1



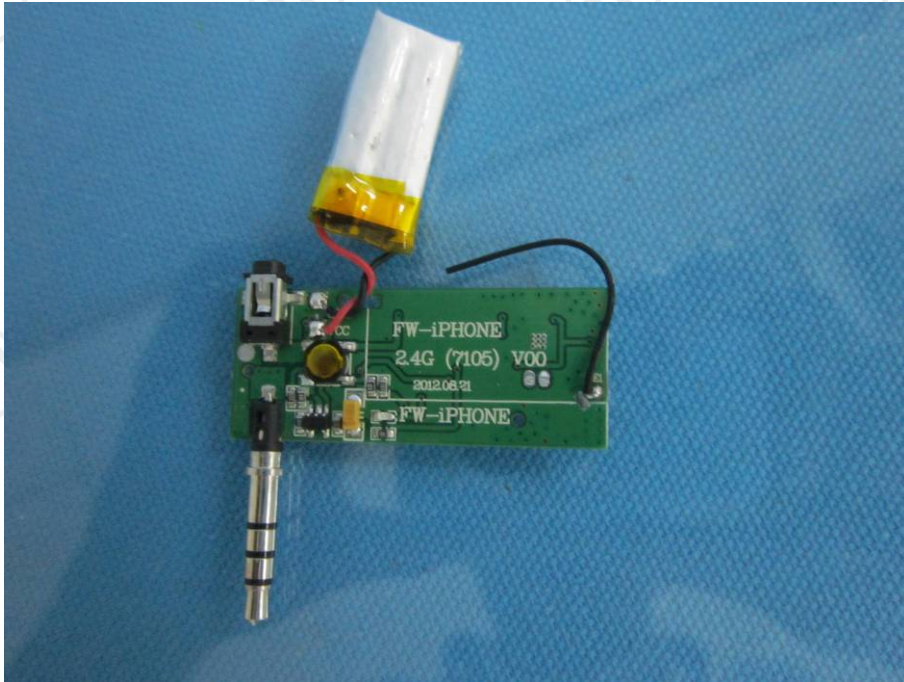
View of external EUT-2



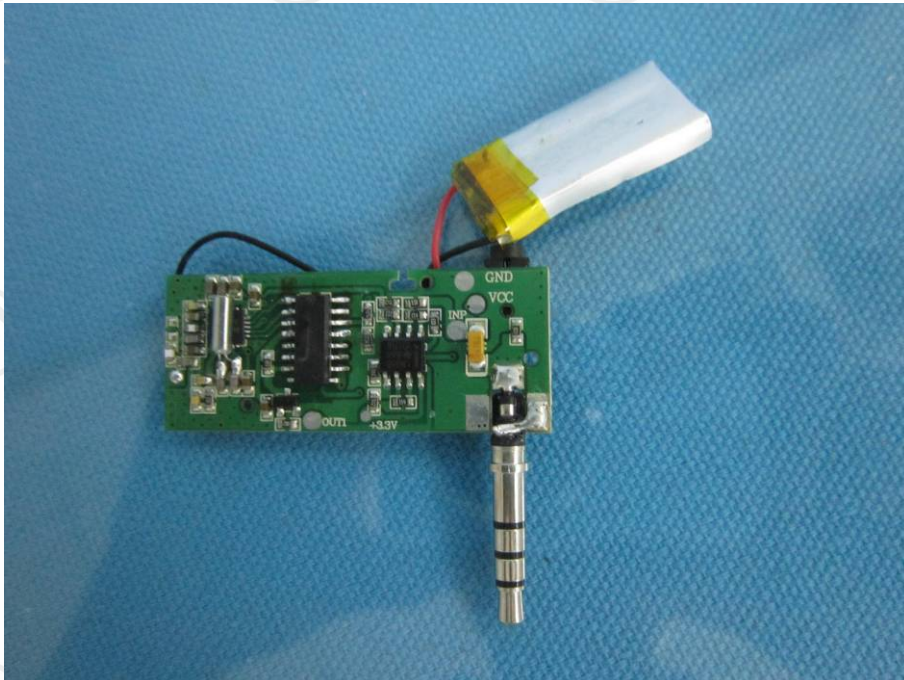
View of internal EUT-1



View of internal EUT-2



View of internal EUT-3



View of internal EUT-4

*** End of report ***

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