



Hong Kong

## FCC / IC – Test report

Report Number : **60/790.13.033.01** Date of Issue: 03<sup>rd</sup> January 2014

Model : **CM9.3A**

Product Type : **BIKE COMPUTER**

Applicant : Dayton Industrial Co., Ltd.

Address : 11A,2-12 Kwai Fat Road, Kwai Chung, New Territories, Hong Kong

Production Facility : Kendy Electronics (Dongguan) Co.Ltd,

Address : Xingsi Huangtang Village, Hengli Town, Dongguan City, Guangdong Province, P.R.China

Test Result :  **Positive**     **Negative**

Total pages including Appendices : 22

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Report Number: **60/790.13.033.01**

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Rev. no.: 2.1



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Hong Kong

## 2. Details about the Test Laboratory

### Details about the Test Laboratory

#### Test site 1

Company name: TÜV SÜD HONG KONG LTD.  
3/F, West Wing, Lakeside 2,  
10 Science Park West Avenue,  
Science Park, Shatin  
HK.

Telephone: 852 2776 1323

Fax: 852 2776 1372

#### Test site 2

Company name: Audix Technology(Shenzhen) Co., Ltd.  
No.6,Ke Feng Road,Block 52,Shenzhen Science & Industry  
Park,Nanshan,Shenzhen,Guangdong,China (518057)



### 3. Description of the Equipment Under Test

#### Description of the Equipment Under Test

Product:	BIKE COMPUTER
Model no.:	CM9.3A
Serial number:	NIL
Options and accessories:	NIL
FCC ID:	O4GCM93A
Rated Voltage:	3 VDC
Rated Current:	NIL
Rated Power:	NIL
Frequency:	2450-2457MHz
RF Transmission Frequency:	2450MHz,2457MHz
Antenna gain:	0 dBi
No. of Operated Channel:	2
Modulation:	GFSK
Description of the EUT:	Battery operated – 1x 3.0V CR2032 battery



#### 4. Summary of Test Standards

<b>Test Standards</b>	
FCC Part 15 Subpart C, Intentional Radiators, 10-1-12 Edition	PART 15 – RADIO FREQUENCY DEVICES Subpart C – Intentional Radiators
RSS-Gen Issue 3 December 2010	General Requirements and Information for the Certification of Radio Apparatus
RSS-210 Issue 8 December 2010	RSS-210 — Licence-exempt Radio Apparatus (All Frequency Bands): Category I Equipment

## 5. Summary of Test Standards and Results

Emission Tests					
Test Condition	Pages	Test site	Test Result		
			Pass	Fail	N/A
Conducted Emission (47 CFR 15.207, 15.209 & RSS-GEN 7.2.4)	NIL	/	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Radiated Emission (47 CFR 15.249, 15.209 & RSS-210 A2.9, GEN 7.2.5 & RSS-GEN 6.1)	9	Site 2	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
20dB Bandwidth (47 CFR 15.215)	16	Site 2	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
99% occupied bandwidth (RSS-GEN 4.6.1)	16	Site 2			
Bandedge Emission (47 CFR 15.249)	19	Site 2	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

## 6. General Remarks

### Remarks

This submittal(s) (test report) is intended for FCC ID: O4GCM93A complies with the FCC Part 15, Subpart C Rules.

All the configurations of the product were tested and only the worst test results are listed in the report.

### SUMMARY:

All tests according to the regulations cited on page 5 were

- - Performed
- - **Not** Performed

The Equipment Under Test

- - **Fulfills** the general approval requirements.
- - **Does not** fulfill the general approval requirements.

Sample Received Date: 12<sup>th</sup> December 2013

Testing Start Date: 17<sup>th</sup> December 2013

Testing End Date: 24<sup>th</sup> December 2013

- TÜV SÜD HONG KONG LTD. -

Reviewed by:



Edmond FUNG



Prepared by:



CHAN Kwong Ngai

## 7. Emission Test Results

### 7.1 Duty cycle

Date of test : 19<sup>th</sup> December 2013

Test requirement : NIL

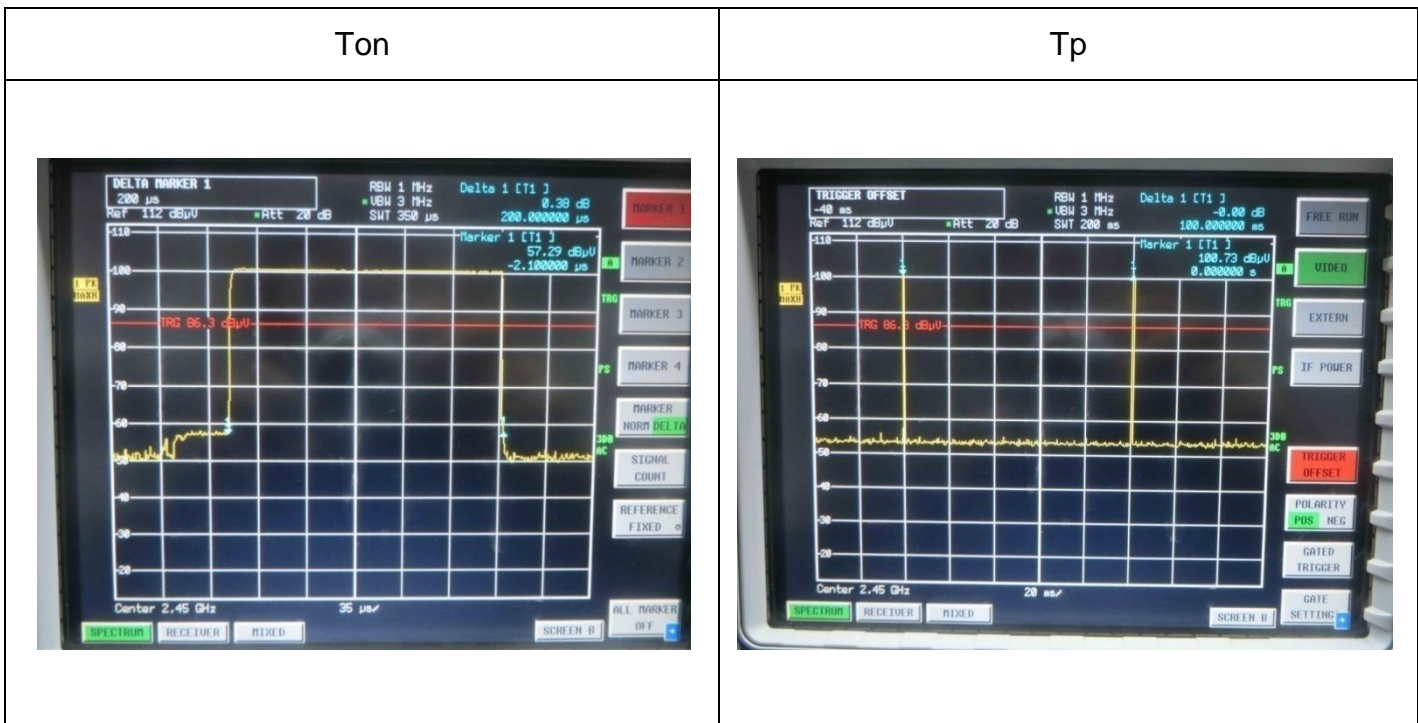
Test method : NIL

Operating mode : Transmit mode

Frequency channel : 2450MHz

Remarks : NIL

Ton(ms)	Tp(ms)	Duty cycle	Duty cycle factor(dB)
0.20	100	0.20%	-54.00



Remark:  $Duty\ cycle = \frac{Ton}{Tp} * 100\%$   
 $Duty\ cycle\ factor = 20lg(Duty\ cycle)$



## 7.2 Radiated Emission Test (Fundamental)

Date of test : 19<sup>th</sup> December 2013  
 Test requirement : FCC Part 15  
 Test method : ANSI C63.4:2009  
 Operating mode : Transmit mode  
 Frequency channel : 2450MHz  
 Remarks : NIL

Test Result	
<input checked="" type="checkbox"/>	Passed
<input type="checkbox"/>	Not Passed

Frequency (MHz)	Polarity (H/V)	Result (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Detector
2450.000	H	83.21	114	-30.79	Peak
2450.000	H	29.21	94	-64.79	Average
2450.000	V	91.65	114	-22.35	Peak
2450.000	V	37.65	94	-56.35	Average

Remark: 1.The EUT was placed on the top of the turntable in test site area.  
 The test shall be made in the operation mode. The turntable was rotated by 360 degrees to determine the position of the highest radiation.  
 For emissions measurement, the receiving antenna was placed 3 meters far away from the turntable. The antenna was fixed on the same height with the EUT to find each suspected emissions of both horizontal and vertical polarization.  
 Adjust the emission and slightly rotate the turntable to locate the position with maximum reading.  
 Adjust the emission and slightly height of the antenna to locate the position with maximum reading.

2.Average=Peak+ duty cycle factor

Date of test : 19th December 2013  
 Test requirement : FCC Part 15  
 Test method : ANSI C63.4:2009  
 Operating mode : Transmit mode  
 Frequency channel : 2457MHz  
 Remarks : NIL

Test Result	
<input checked="" type="checkbox"/>	Passed
<input type="checkbox"/>	Not Passed

Frequency (MHz)	Polarity (H/V)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector
2457.000	H	91.13	114	-22.87	Peak
2457.000	H	37.13	94	-56.87	Average
2457.000	V	84.14	114	-29.86	Peak
2457.000	V	30.14	94	-63.86	Average

Remark: 1.The EUT was placed on the top of the turntable in test site area.  
 The test shall be made in the operation mode. The turntable was rotated by 360 degrees to determine the position of the highest radiation.  
 For emissions measurement, the receiving antenna was placed 3 meters far away from the turntable. The antenna was fixed on the same height with the EUT to find each suspected emissions of both horizontal and vertical polarization.  
 Adjust the emission and slightly rotate the turntable to locate the position with maximum reading.  
 Adjust the emission and slightly height of the antenna to locate the position with maximum reading.

2.Average=Peak+ duty cycle factor

**Radiated Emission Test (Spurious Emission)**

Date of test : 19th December 2013  
 Test requirement : FCC Part 15  
 Test method : ANSI C63.4:2009  
 Operating mode : Transmit mode  
 Frequency channel : 2450MHz  
 Remarks : 9kHz-25GHz

Test Result	
<input checked="" type="checkbox"/>	Passed
<input type="checkbox"/>	Not Passed

Frequency (MHz)	Polarity (H/V)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector
30.000	H	20.93	40.00	-19.07	Quasi Peak
117.300	H	14.36	43.50	-29.14	Quasi Peak
701.240	H	25.00	46.00	-21.00	Quasi Peak
4900.000	H	52.95	74.00	-21.05	Peak
4900.000	H	/	54.00	/	Average
7350.000	H	46.28	74.00	-27.72	Peak
7350.000	H	/	54.00	/	Average

Remark: 1.The EUT was placed on the top of the turntable in test site area.  
 The test shall be made in the operation mode. The turntable was rotated by 360 degrees to determine the position of the highest radiation.  
 For emissions measurement, the receiving antenna was placed 3 meters far away from the turntable.  
 The antenna was fixed on the same height with the EUT to find each suspected emissions of both horizontal and vertical polarization.  
 Adjust the emission and slightly rotate the turntable to locate the position with maximum reading.  
 Adjust the emission and slightly height of the antenna to locate the position with maximum reading.  
 2. Average=Peak+ duty cycle factor  
 3.For harmonics, the calculated average value were negative that not recorded.

**Radiated Emission Test (Spurious Emission)**

Date of test : 19th December 2013  
 Test requirement : FCC Part 15  
 Test method : ANSI C63.4:2009  
 Operating mode : Transmit mode  
 Frequency channel : 2450MHz  
 Remarks : 9kHz-25GHz

Test Result	
<input checked="" type="checkbox"/>	Passed
<input type="checkbox"/>	Not Passed

Frequency (MHz)	Polarity (H/V)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector
30.000	V	20.96	40.00	-19.04	Quasi Peak
117.300	V	14.54	43.50	-28.96	Quasi Peak
701.240	V	25.33	46.00	-20.67	Quasi Peak
4900.000	V	49.56	74.00	-24.44	Peak
4900.000	V	/	54.00	/	Average
7350.000	V	42.18	74.00	-31.82	Peak
7350.000	V	/	54.00	/	Average

Remark: 1.The EUT was placed on the top of the turntable in test site area.  
 The test shall be made in the operation mode. The turntable was rotated by 360 degrees to determine the position of the highest radiation.  
 For emissions measurement, the receiving antenna was placed 3 meters far away from the turntable.  
 The antenna was fixed on the same height with the EUT to find each suspected emissions of both horizontal and vertical polarization.  
 Adjust the emission and slightly rotate the turntable to locate the position with maximum reading.  
 Adjust the emission and slightly height of the antenna to locate the position with maximum reading.  
 2. Average=Peak+ duty cycle factor  
 3.For harmonics, the calculated average value were negative that not recorded.

**Radiated Emission Test (Spurious Emission)**

Date of test : 19th December 2013  
 Test requirement : FCC Part 15  
 Test method : ANSI C63.4:2009  
 Operating mode : Transmit mode  
 Frequency channel : 2457MHz  
 Remarks : 9kHz-25GHz

Test Result	
<input checked="" type="checkbox"/>	Passed
<input type="checkbox"/>	Not Passed

Frequency (MHz)	Polarity (H/V)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector
30.000	H	21.05	40.00	-18.95	Quasi Peak
117.300	H	14.22	43.50	-29.28	Quasi Peak
701.240	H	24.81	46.00	-21.19	Quasi Peak
4914.000	H	52.56	74.00	-21.44	Peak
4914.000	H	/	54.00	/	Average
7371.000	H	45.04	74.00	-28.96	Peak
7371.000	H	/	54.00	/	Average

Remark: 1.The EUT was placed on the top of the turntable in test site area.  
 The test shall be made in the operation mode. The turntable was rotated by 360 degrees to determine the position of the highest radiation.  
 For emissions measurement, the receiving antenna was placed 3 meters far away from the turntable.  
 The antenna was fixed on the same height with the EUT to find each suspected emissions of both horizontal and vertical polarization.  
 Adjust the emission and slightly rotate the turntable to locate the position with maximum reading.  
 Adjust the emission and slightly height of the antenna to locate the position with maximum reading.  
 2. Average=Peak+ duty cycle factor  
 3.For harmonics, the calculated average value were negative that not recorded.

**Radiated Emission Test (Spurious Emission)**

Date of test : 19th December 2013  
 Test requirement : FCC Part 15  
 Test method : ANSI C63.4:2009  
 Operating mode : Transmit mode  
 Frequency channel : 2457MHz  
 Remarks : 9kHz-25GHz

Test Result	
<input checked="" type="checkbox"/>	Passed
<input type="checkbox"/>	Not Passed

Frequency (MHz)	Polarity (H/V)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector
30.000	V	20.48	40.00	-19.52	Quasi Peak
117.300	V	14.96	43.50	-28.54	Quasi Peak
701.240	V	25.21	46.00	-20.79	Quasi Peak
4914.000	V	50.28	74.00	-23.72	Peak
4914.000	V	/	54.00	/	Average
7371.000	V	43.87	74.00	-30.13	Peak
7371.000	V	/	54.00	/	Average

Remark: 1.The EUT was placed on the top of the turntable in test site area.  
 The test shall be made in the operation mode. The turntable was rotated by 360 degrees to determine the position of the highest radiation.  
 For emissions measurement, the receiving antenna was placed 3 meters far away from the turntable.  
 The antenna was fixed on the same height with the EUT to find each suspected emissions of both horizontal and vertical polarization.  
 Adjust the emission and slightly rotate the turntable to locate the position with maximum reading.  
 Adjust the emission and slightly height of the antenna to locate the position with maximum reading.  
 2. Average=Peak+ duty cycle factor  
 3.For harmonics, the calculated average value were negative that not recorded.

## Test Equipment List

### Radiated Emission Test

DESCRIPTION	Type No.	Serial No.	Calibrated date	Calibrated until
Antenna	VULB9163	9163 330	2013.02.25	2014.02.24
Antenna	3117	00066577	2013.04.02	2014.04.01
Antenna	3160-09	00118388	2013.09.06	2014.09.05
Loop Antenna	6512	29604	2013.09.25	2014.09.24
Spectrum Analyzer	FSP 40	100378	2012.12.23	2013.12.22
EMI Test Receiver	ESCI	100701	2013.08.04	2014.08.03
Spectrum Analyzer	FSV40	100903	2013.01.27	2014.01.26
Test Cable	SUCOFLEX 104	MY2320/4	2013.02.18	2014.02.17
Amplifier	150A250	326446	2013.03.19	2014.03.17
Temp. & Humid. Chamber	FACT5-2.0	4166	2013.11.22	2014.11.21

### 7.3 20dB & 99% bandwidth measurement

Date of test : 19th December 2013  
 Test requirement : FCC Part 15  
 Test method : ANSI C63.4:2009  
 Operating mode : Transmit mode  
 Frequency channel : 2450MHz  
 Remarks : NIL

Test Result	
<input checked="" type="checkbox"/>	Passed
<input type="checkbox"/>	Not Passed

20 dB Bandwidth	99% OBW	Result
kHz	kHz	
689.4	851.3	Pass







Date of test : 19th December 2013

Test requirement : FCC Part 15

Test method : ANSI C63.4:2009

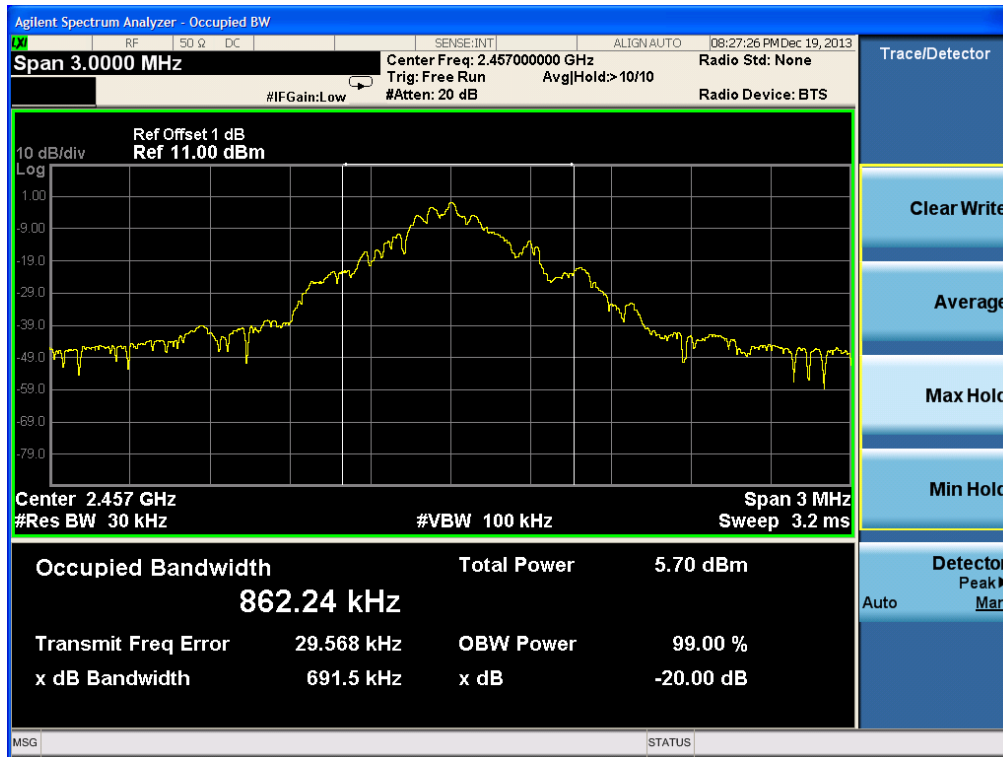
Operating mode : Transmit mode

Frequency channel : 2457MHz

Remarks : NIL

<b>Test Result</b>	
<input checked="" type="checkbox"/>	Passed
<input type="checkbox"/>	Not Passed

20 dB Bandwidth	99% OBW	Result
kHz	kHz	
691.5	862.2	Pass



## Test Equipment List

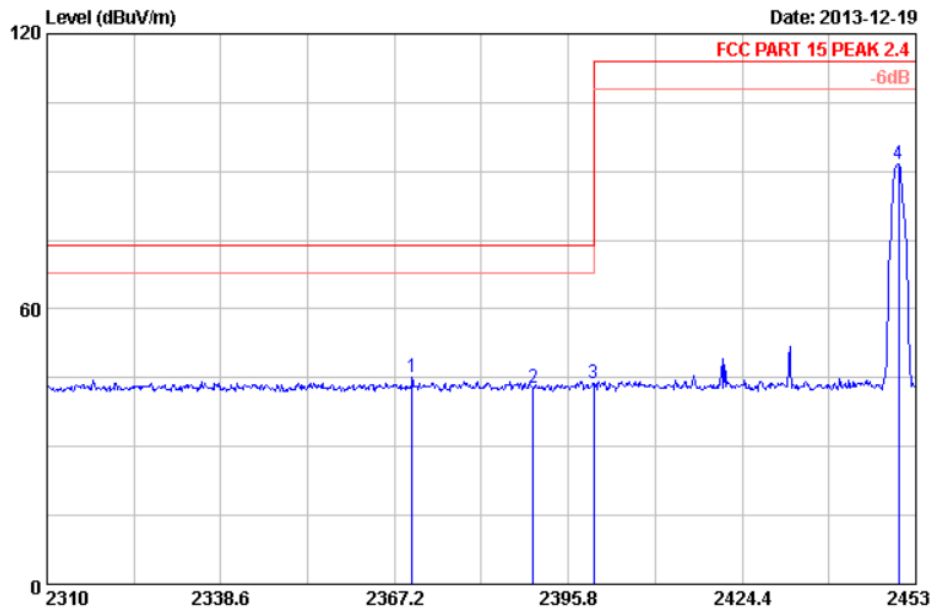
### 20dB & 99% bandwidth measurement

DESCRIPTION	Type No.	Serial No.	Calibrated date	Calibrated until
Antenna	VULB9163	9163 330	2013.02.25	2014.02.24
Antenna	3117	00066577	2013.04.02	2014.04.01
Antenna	3160-09	00118388	2013.09.06	2014.09.05
Loop Antenna	6512	29604	2013.09.25	2014.09.24
Spectrum Analyzer	FSP 40	100378	2012.12.23	2013.12.22
EMI Test Receiver	ESCI	100701	2013.08.04	2014.08.03
Spectrum Analyzer	FSV40	100903	2013.01.27	2014.01.26
Test Cable	SUCOFLEX 104	MY2320/4	2013.02.18	2014.02.17
Amplifier	150A250	326446	2013.03.19	2014.03.17
Temp. & Humid. Chamber	FACT5-2.0	4166	2013.11.22	2014.11.21

### 7.4 Bandedge measurement

Date of test : 19th December 2013  
 Test requirement : FCC Part 15  
 Test method : ANSI C63.4:2009  
 Operating mode : Transmit mode  
 Frequency channel : 2450MHz  
 Remarks : NIL

Test Result	
<input checked="" type="checkbox"/>	Passed
<input type="checkbox"/>	Not Passed

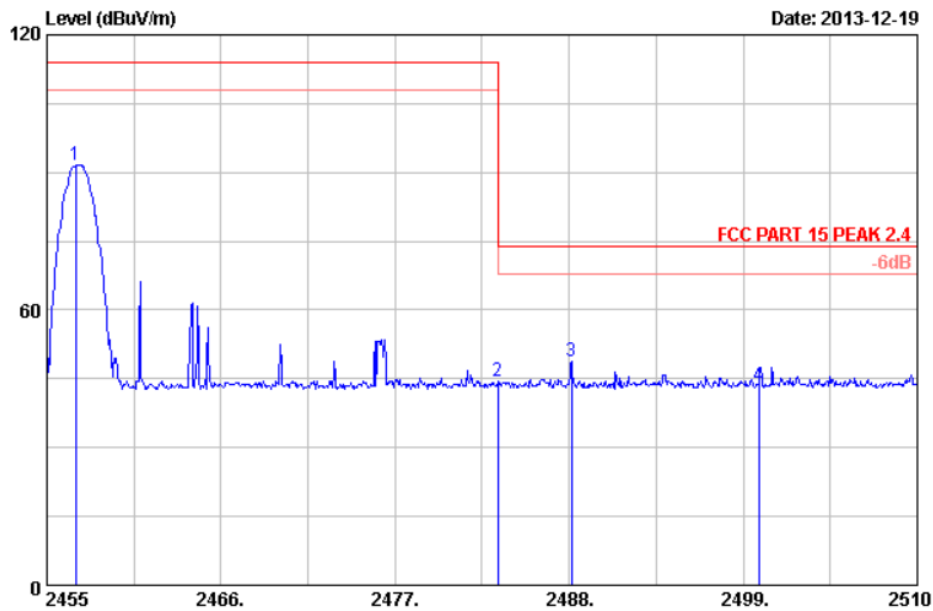


Frequency (MHz)	Reading (dB $\mu$ V)	Corr. (dB/m)	Test result (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Detector
2400.000	45.38	-1.72	43.66	74.0	-30.34	Peak
2400.000	/	-1.72	/	54.0	/	Average

Remark: 1. Use the following spectrum analyzer settings:  
 Span = wide enough to capture the peak level of the emission operating on the channel closest to the bandedge, as well as any modulation products which fall outside of the authorized band of operation  
 RBW  $\geq$  1% of the span  
 VBW  $\geq$  RBW  
 Sweep = auto  
 Detector function = peak  
 Trace = max hold  
 2. For harmonics, the calculated average value were negative that not recorded.

Date of test : 19th December 2013  
 Test requirement : FCC Part 15  
 Test method : ANSI C63.4:2009  
 Operating mode : Transmit mode  
 Frequency channel : 2457MHz  
 Remarks : NIL

Test Result	
<input checked="" type="checkbox"/>	Passed
<input type="checkbox"/>	Not Passed



Frequency (MHz)	Reading (dBuV)	Corr. (dB/m)	Test result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
2483.500	45.72	-1.42	44.30	74.0	-29.70	Peak
2483.500	/	-1.42	/	54.0	/	Average

Remark:

- Use the following spectrum analyzer settings:  
 Span = wide enough to capture the peak level of the emission operating on the channel closest to the bandedge, as well as any modulation products which fall outside of the authorized band of operation  
 RBW  $\geq$  1% of the span  
 VBW  $\geq$  RBW  
 Sweep = auto  
 Detector function = peak  
 Trace = max hold
- For harmonics, the calculated average value were negative that not recorded.

## Test Equipment List

### Bandedge measurement

DESCRIPTION	Type No.	Serial No.	Calibrated date	Calibrated until
Antenna	VULB9163	9163 330	2013.02.25	2014.02.24
Antenna	3117	00066577	2013.04.02	2014.04.01
Antenna	3160-09	00118388	2013.09.06	2014.09.05
Loop Antenna	6512	29604	2013.09.25	2014.09.24
Spectrum Analyzer	FSP 40	100378	2012.12.23	2013.12.22
EMI Test Receiver	ESCI	100701	2013.08.04	2014.08.03
Spectrum Analyzer	FSV40	100903	2013.01.27	2014.01.26
Test Cable	SUCOFLEX 104	MY2320/4	2013.02.18	2014.02.17
Amplifier	150A250	326446	2013.03.19	2014.03.17
Temp. & Humid. Chamber	FACT5-2.0	4166	2013.11.22	2014.11.21

## 8. System Measurement Uncertainty

For a 95% confidence level, the measurement expanded uncertainties for defined systems, in accordance with the recommendations of ISO 17025 were:

### System Measurement Uncertainty

	Items	Extended Uncertainty
RE	Field strength (dB $\mu$ V/m)	U=3.59dB (9kHz-30MHz) U=5.08dB (30MHz-1GHz) U=4.56dB (1GHz-18GHz) U=4.42dB (18GHz-25GHz)
CE	Disturbance Voltage (dB $\mu$ V)	U=2.7dB