

## FCC- TEST REPORT

Report Number	:	<b>68.710.13.408.01</b>	Date of Issue:	<u>09 December 2013</u>
Model	:	<u>BLE05</u>		
Product Type	:	<u>Pedometer</u>		
Applicant	:	<u>Shenzhen Belter Health Measurement and Analysis Technology Co., Ltd.</u>		
Address	:	<u>702/704, Block C, Tsinghua Unis Science Park, No. 13 Langshan Rd,</u> <u>Hi-Tech Industrial Park(north), Nanshan District 518057 Shenzhen</u>		
Production Facility	:	<u>Dongguan Simple Industrial Co., Ltd.</u>		
Address	:	<u>No, 192, Shixin Road, Science Message Park, Tangxia Town,</u> <u>Dongguan, Guangdong, China</u>		
Test Result	:	<input checked="" type="checkbox"/> <b>Positive</b>	<input type="checkbox"/> <b>Negative</b>	
Total pages including Appendices	:	<u>24</u>		

Jiangsu TÜV Product Service Ltd. – Shenzhen Branch is a subcontractor to TÜV SÜD Product Service GmbH according to the principles outlined in ISO 17025.

Jiangsu TÜV Product Service Ltd. – Shenzhen Branch reports apply only to the specific samples tested under stated test conditions. Construction of the actual test samples has been documented. It is the manufacturer's responsibility to assure that additional production units of this model are manufactured with identical electrical and mechanical components. The manufacturer/importer is responsible to the Competent Authorities in Europe for any modifications made to the production units which result in non-compliance to the relevant regulations. Jiangsu TÜV Product Service Ltd. – Shenzhen Branch shall have no liability for any deductions, inferences or generalizations drawn by the client or others from Jiangsu TÜV Product Service Ltd. – Shenzhen Branch issued reports.

This report is the confidential property of the client. As a mutual protection to our clients, the public and ourselves, extracts from the test report shall not be reproduced except in full without our written approval

## 1 Table of Contents

1	Table of Contents .....	2
2	Details about the Test Laboratory.....	3
3	Description of the Equipment under Test .....	4
4	Summary of Test Standards .....	5
5	Summary of Test Results.....	6
6	General Remarks .....	7
7	Test Setups .....	8
8	Systems test configuration.....	9
9	Technical Requirement .....	10
9.1	Conducted peak output power.....	10
9.2	6dB bandwidth .....	11
9.3	Power spectral density.....	13
9.4	Spurious RF conducted emissions .....	14
9.5	Band edge .....	19
9.6	Spurious radiated emissions for transmitter .....	21
10	Test Equipment List.....	23
11	System Measurement Uncertainty .....	24

## 2 Details about the Test Laboratory

### Details about the Test Laboratory

#### Test Site 1

Company name: Jiangsu TÜV Product Service Ltd. Shenzhen Branch  
6th Floor, H Hall, Culture Creative Park,  
No. 4001, Fuqiang Road,  
Futian District 518048,  
Shenzhen, P.R.C.

Telephone: 86 755 8828 6998  
Fax: 86 755 828 5299

#### Test Site 2

Company name: Audix Technology (shenzhen) Co.,Ltd  
Block Shenzhen, Science & Industry Park,  
Nantou, Shenzhen,  
Guangdong,  
China

Telephone: 86 755 2663 9496  
Fax: 86 755 2663 2877

### 3 Description of the Equipment under Test

#### Description of the Equipment Under Test

Product:	Pedometer
Model no.:	BLE05
FCC ID:	2AAEELBLE05
Options and accessories:	NIL
Rating:	DC3.0V supplied by CR2032 Cell battery
RF Transmission Frequency:	2402-2480MHz
No. of Operated Channel:	40
Modulation:	GFSK
Duty Cycle:	69.6%
Antenna Type:	Ceramic Antenna
Antenna Gain:	0dBi
Description of the EUT:	The Equipment Under Test (EUT) is a wireless pedometer with Bluetooth 4.0 function operating at 2.4GHz

## 4 Summary of Test Standards

Test Standards	
FCC Part 15 Subpart C 10-1-2012 Edition	PART 15 - RADIO FREQUENCY DEVICES Subpart C - Intentional Radiators

All the test methods were according to KDB558074 D01 DTS Meas Guidance v03r01 and ANSI C63.10 (2013).

## 5 Summary of Test Results

Technical Requirements						
FCC Part 15 Subpart C		Pages	Test Site	Test Result		
Test Condition				Pass	Fail	N/A
§15.207 Conducted emission AC power port	---	---	---	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
§15.247 (b) (1) Conducted peak output power	10	---	Site 2	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
§15.247(a)(1) 20dB bandwidth	---	---	---	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
§15.247(a)(1) Carrier frequency separation	---	---	---	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
§15.247(a)(1)(iii) Number of hopping frequencies	---	---	---	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
§15.247(a)(1)(iii) Dwell Time	---	---	---	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
§15.247(a)(2) 6dB bandwidth	11	---	Site 2	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
§15.247(e) Power spectral density	13	---	Site 2	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
§15.247(d) Spurious RF conducted emissions	14	---	Site 2	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
§15.247(d) Band edge	19	---	Site 2	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
§15.247(d) & §15.209 Spurious radiated emissions for transmitter	21	---	Site 2	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
§15.203 Antenna requirement	See note 1		---	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Remark 1: N/A – Not Applicable.

Note 1: The EUT uses a permanently ceramic antenna, which gain is 0dBi. According to §15.203, it is considered sufficiently to comply with the provisions of this section.

## 6 General Remarks

### Remarks

This submittal(s) (test report) is intended for FCC ID: 2AAEEBLE05 complies with Section 15.207, 15.209, 15.247 of the FCC Part 15, Subpart C Rules.

### 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: November 7, 2013

Testing Start Date: November 8, 2013

Testing End Date: November 29, 2013

- Jiangsu TÜV Product Service Ltd. – Shenzhen Branch -

Reviewed by:

Prepared by:

Tested by:



Ken Li  
EMC Project Manager



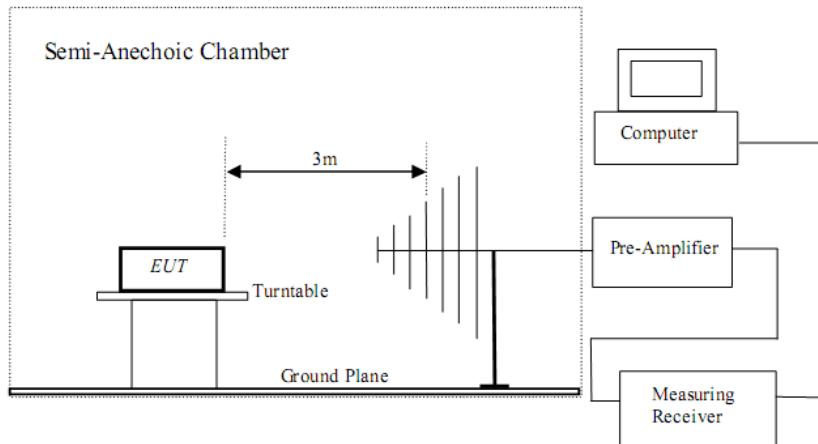
Felix Li  
EMC Project Engineer



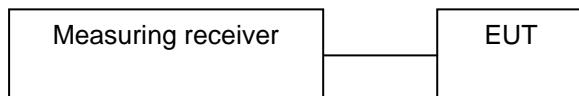
Leo Li  
EMC Test Engineer

## 7 Test Setups

### 7.1 Radiated test setups



### 7.2 Conducted RF test setups



## 8 Systems test configuration

Auxiliary Equipment Used during Test:

DESCRIPTION	MANUFACTURER	MODEL NO.(SHIELD)	S/N(LENGTH)
Notebook	Lenovo	X200	---

Test software: uEnergy\_Tools\_2\_0\_0\_99, which is used to control the EUT in continues transmitting mode.

The system was configured to channel 0, 19, and 39 for the test.

## 9 Technical Requirement

### 9.1 Conducted peak output power

#### Test Method

1. Use the following spectrum analyzer settings:  
RBW > the 6 dB bandwidth of the emission being measured,  $VBW \geq 3RBW$ ,  $Span \geq 3RBW$   
Sweep = auto, Detector function = peak, Trace = max hold
2. Add a correction factor to the display.
3. Allow the trace to stabilize. Use the marker-to-peak function to set the marker to the peak of the emission. The indicated level is the peak output power

#### Limits

According to §15.247 (b) (1), conducted peak output power limit as below:

Frequency Range MHz	Limit W	Limit dBm
2400-2483.5	≤1	≤30

Test result as below table

Frequency MHz	Conducted Peak Output Power dBm	Result
Top channel 2402MHz	-3.42	Pass
Middle channel 2440MHz	-2.34	Pass
Bottom channel 2480MHz	-1.59	Pass

## 9.2 6dB bandwidth

### Test Method

1. Use the following spectrum analyzer settings:  
RBW=100K, VBW $\geq$ 3RBW, Sweep = auto, Detector function = peak, Trace = max hold
2. Use the automatic bandwidth measurement capability of an instrument, may be employed using the X dB bandwidth mode with X set to 6 dB, care shall be taken so that the bandwidth measurement is not influenced by any intermediate power nulls in the fundamental emission that might be  $\geq$  6 dB.
3. Allow the trace to stabilize, record the X dB Bandwidth value.

### Limit

Limit [kHz]

$\geq 500$

### Test result

Frequency MHz	6dB bandwidth kHz	Result
Top channel 2402MHz	689.4	Pass
Middle channel 2440MHz	690.1	Pass
Bottom channel 2480MHz	687.2	Pass

2402MHz



## 2440MHz



## 2480MHz



## 9.3 Power spectral density

### Test Method

This procedure shall be used if maximum peak conducted output power was used to demonstrate compliance:

1. Set analyzer center frequency to DTS channel center frequency.  
RBW=3kHz, VBW $\geq$ 3RBW, Span=1.5 times DTS bandwidth, Detector=Peak, Sweep=auto, Trace= max hold
2. Allow trace to fully stabilize, use the peak marker function to determine the maximum amplitude level within the RBW.
3. Repeat above procedures until other frequencies measured were completed

### Limit

Limit [dBm]

$\leq 8$

### Test result

Frequency MHz	Power spectral density dBm	Result
Top channel 2402MHz	-17.84	Pass
Middle channel 2440MHz	-17.75	Pass
Bottom channel 2480MHz	-16.36	Pass

## 9.4 Spurious RF conducted emissions

### Test Method

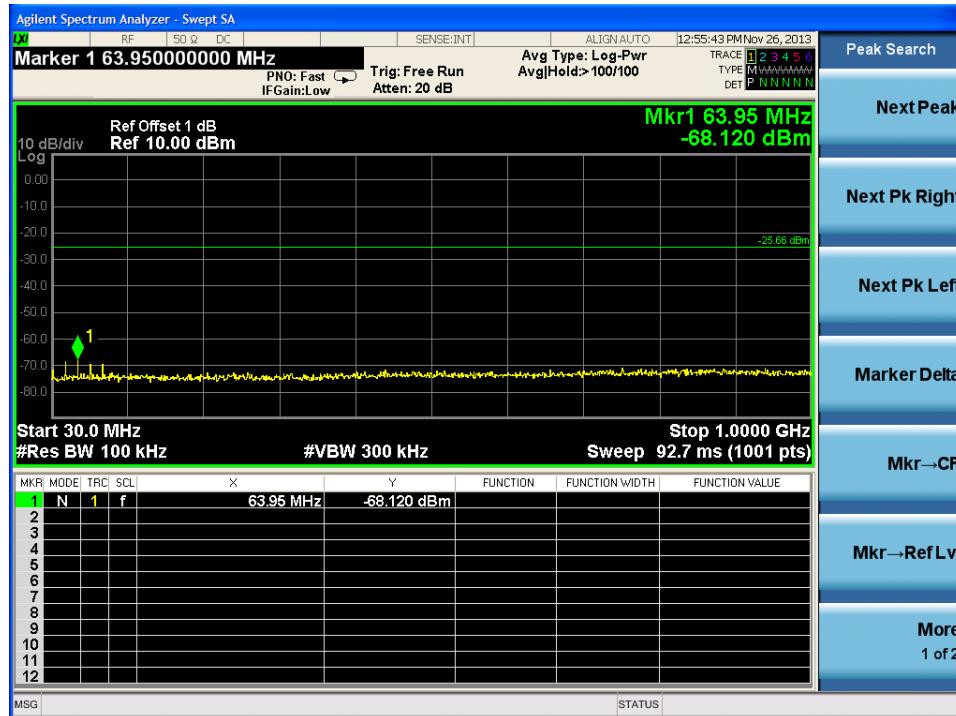
1. Establish a reference level by using the following procedure:
  - a. Set RBW=100 kHz. VBW $\geq$ 3RBW. Detector =peak, Sweep time = auto couple, Trace mode = max hold.
  - b. Allow trace to fully stabilize, use the peak marker function to determine the maximum PSD level.
2. Use the maximum PSD level to establish the reference level.
  - a. Set the center frequency and span to encompass frequency range to be measured.
  - b. Use the peak marker function to determine the maximum amplitude level. Ensure that the amplitude of all unwanted emissions outside of the authorized frequency band (excluding restricted frequency bands) are attenuated by at least the minimum requirements, report the three highest emissions relative to the limit.
3. Repeat above procedures until other frequencies measured were completed.

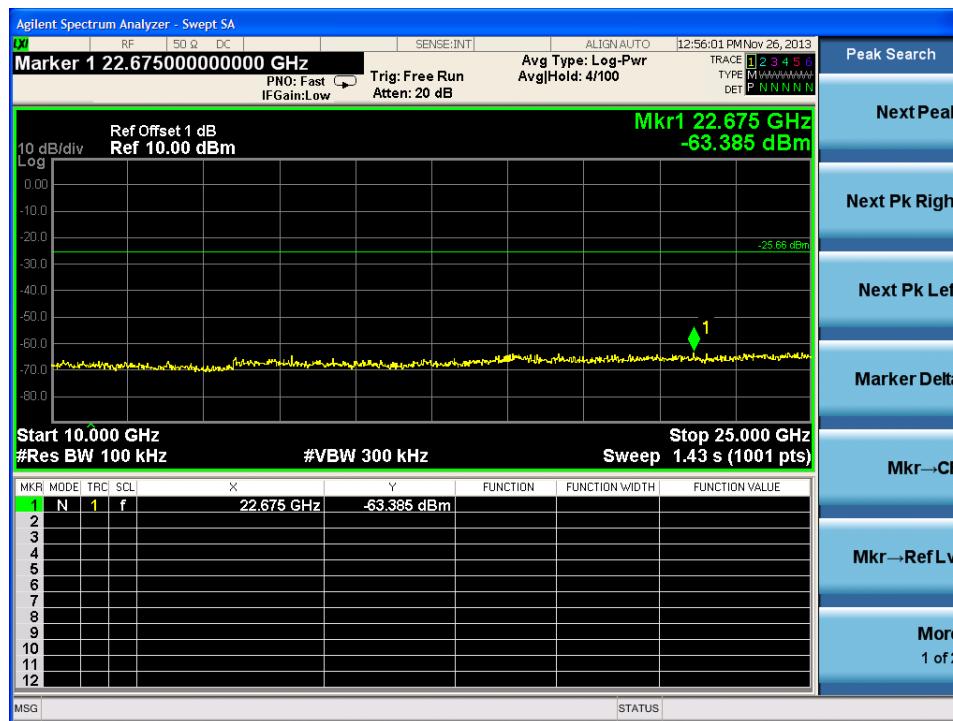
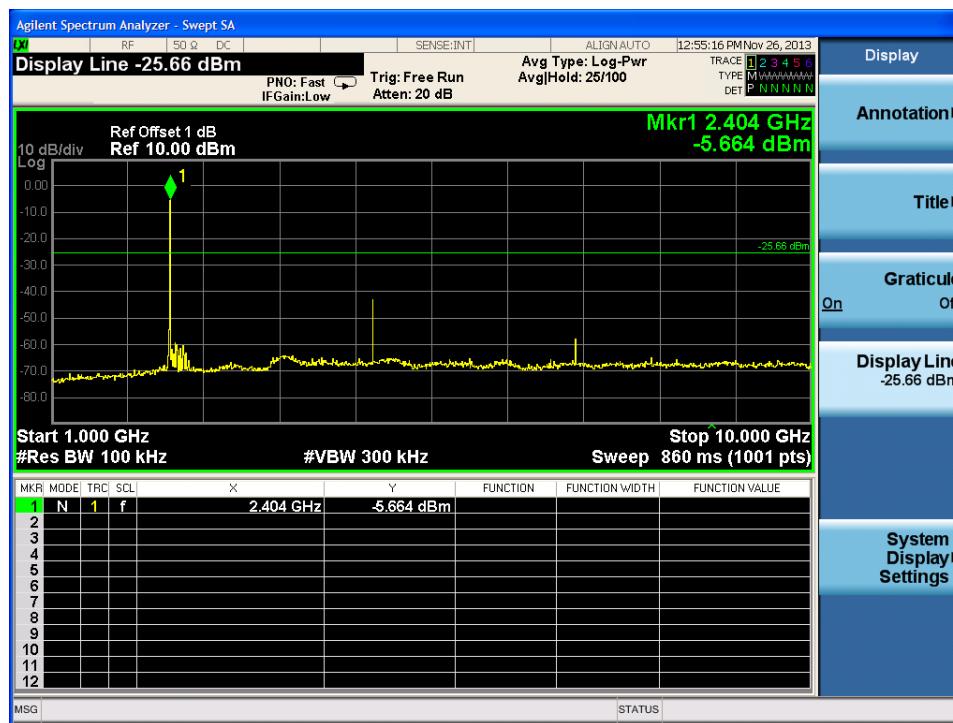
### Limit

Frequency Range MHz	Limit (dBc)
30-25000	-20

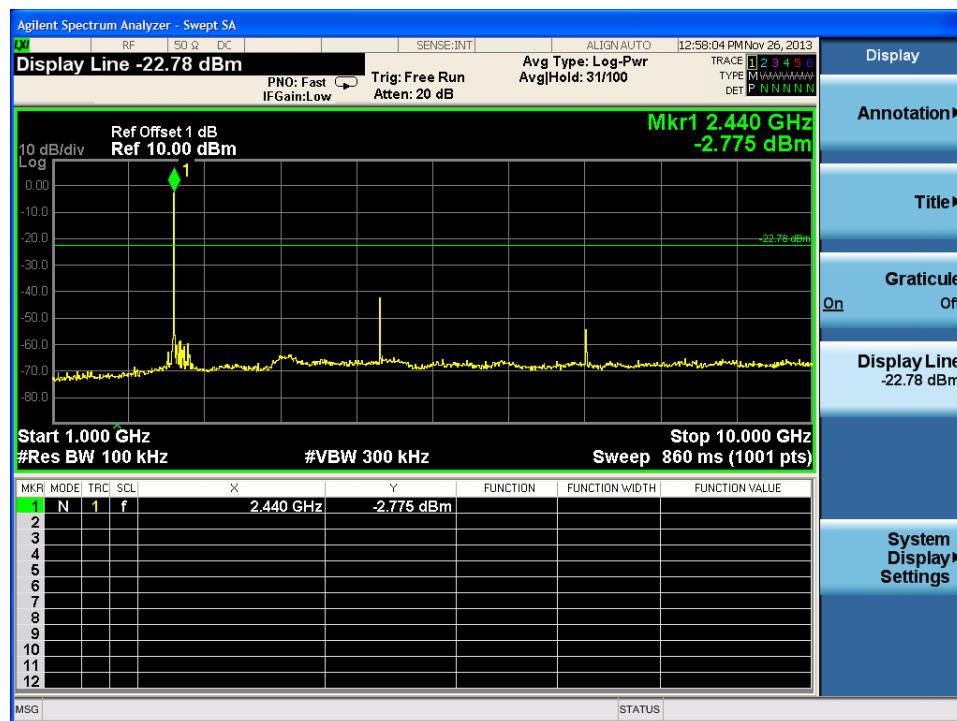
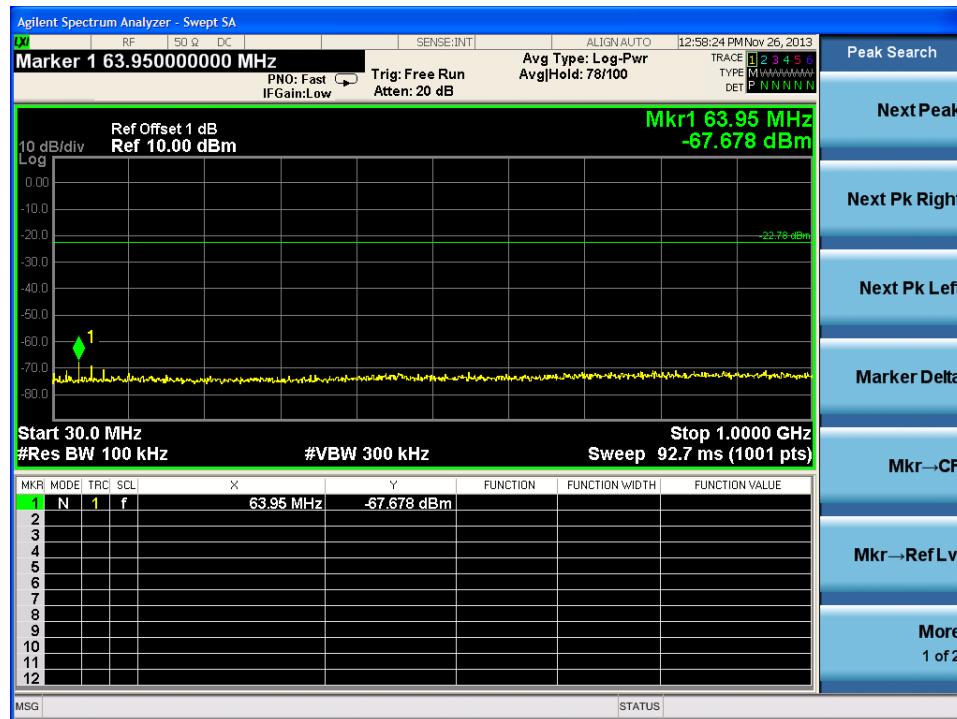
## Spurious RF conducted emissions

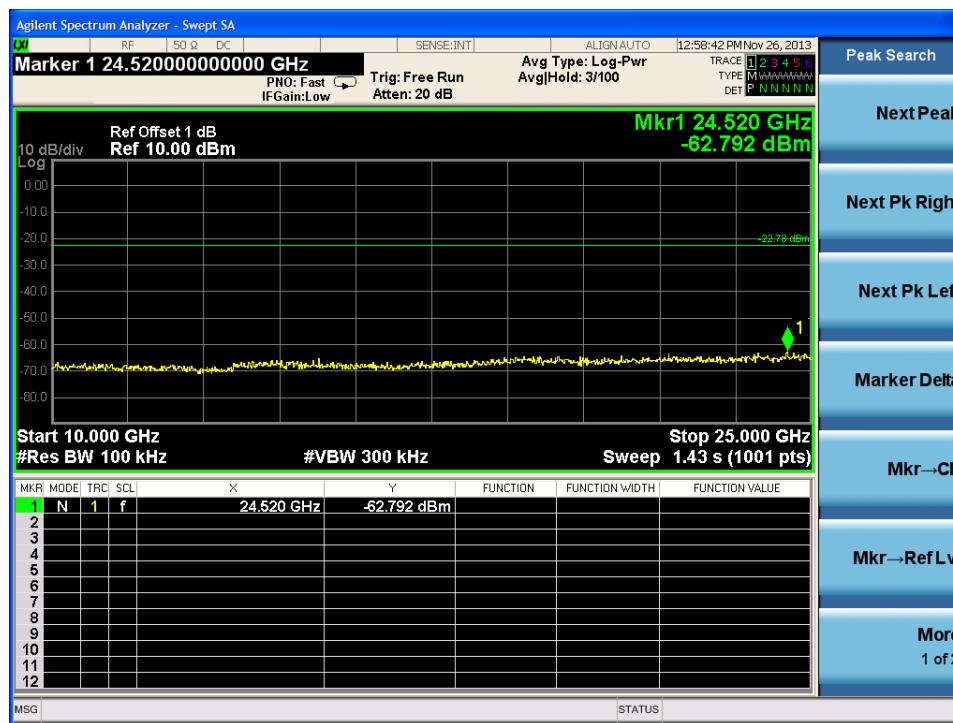
2402MHz



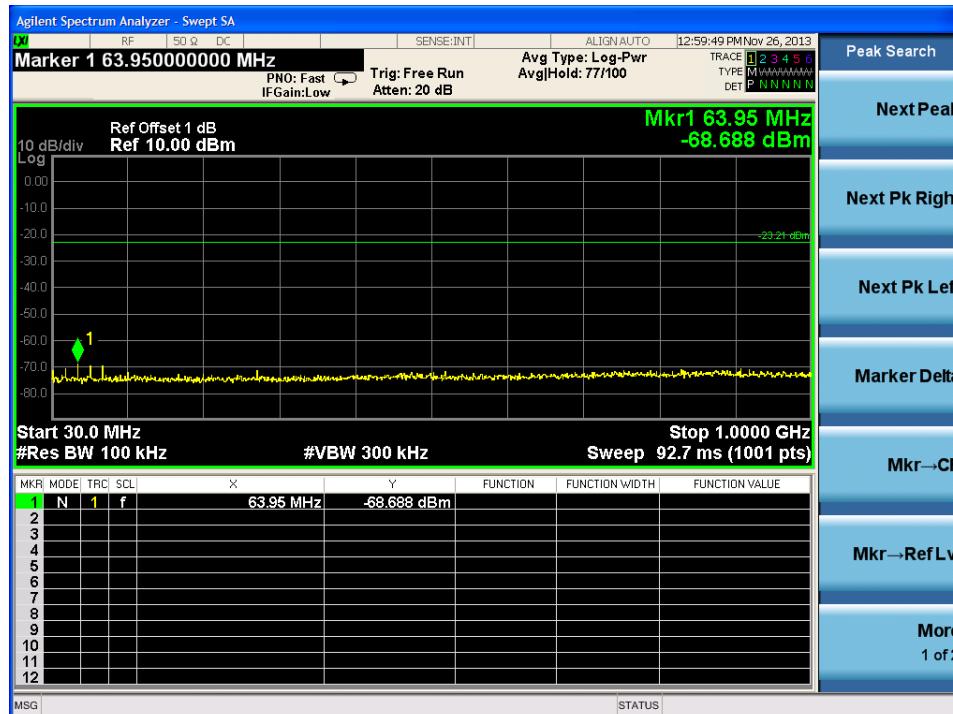


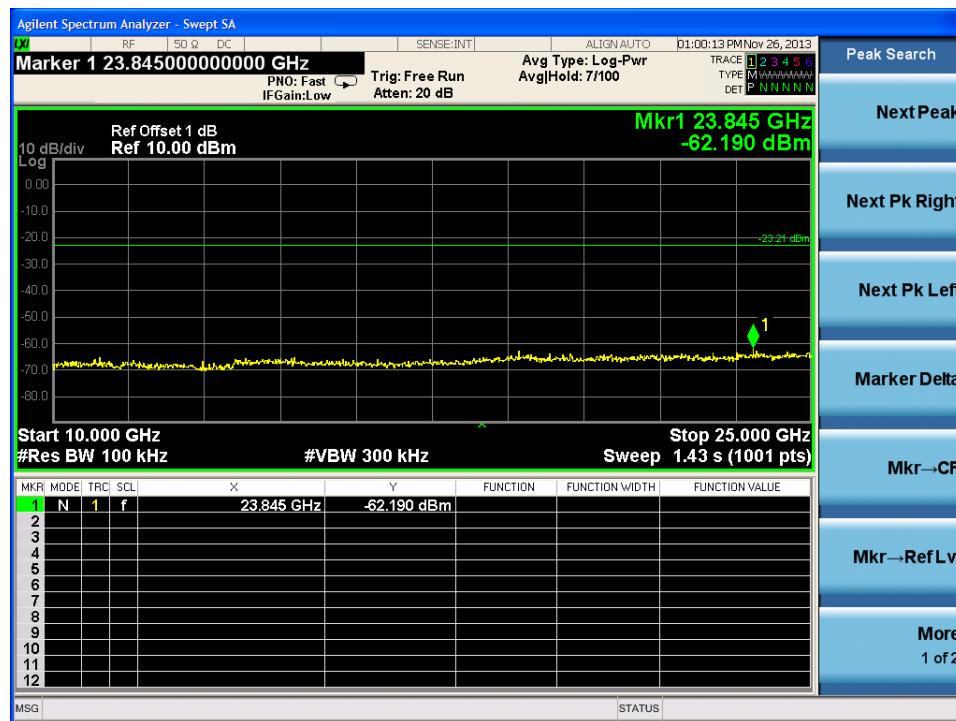
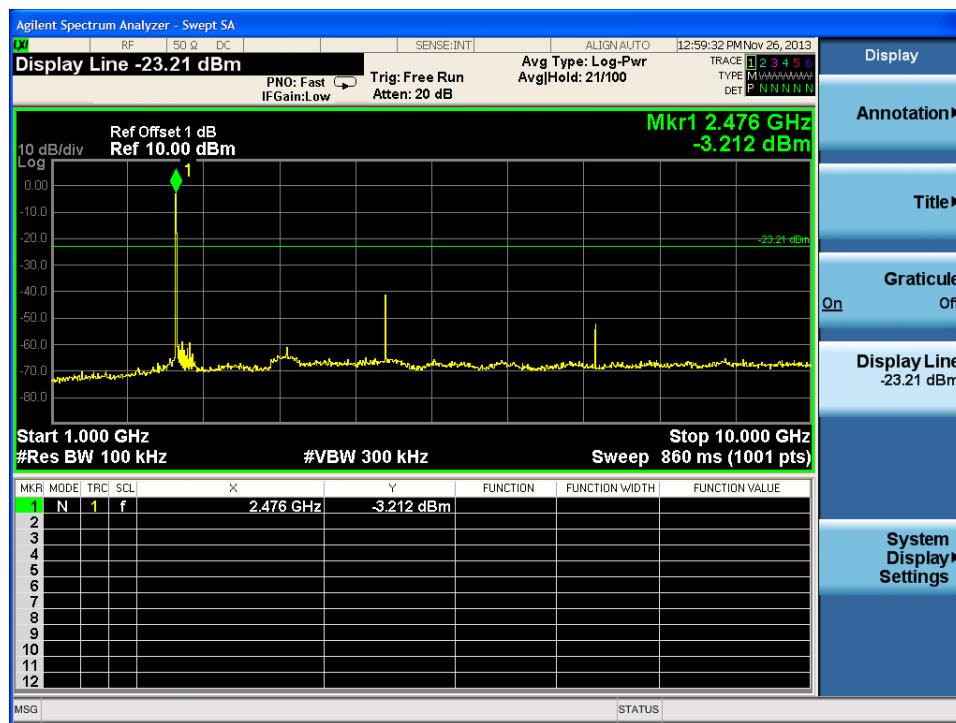
## 2440MHz





2480MHz





## 9.5 Band edge

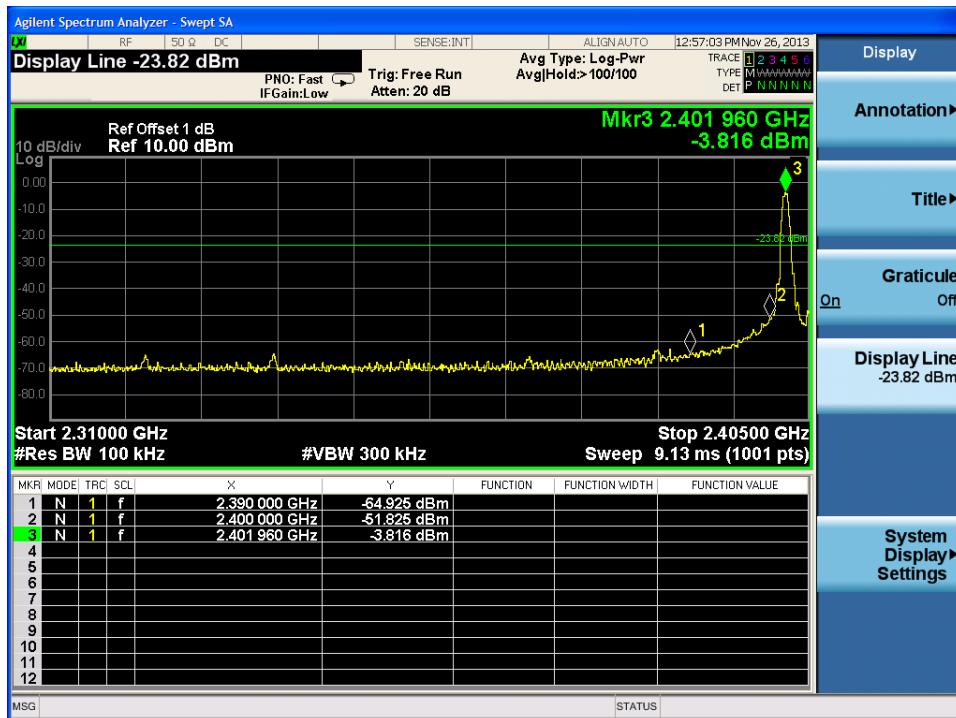
### Test Method

- 1 Use the following spectrum analyzer settings:  
Span = wide enough to capture the peak level of the in-band emission and all spurious  
RBW = 100 kHz, VBW  $\geq$  RBW, Sweep = auto, Detector function = peak, Trace = max hold
- 2 Allow the trace to stabilize, use the peak and delta measurement to record the result.
- 3 The level displayed must comply with the limit specified in this Section.

### Limit

Frequency Range MHz	Limit (dBc)
30-25000	-20

### Test result





## 9.6 Spurious radiated emissions for transmitter

### Test Method

1. The EUT is placed on a turntable, which is 0.8m above ground plane.
2. EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emissions.
3. Use the following spectrum analyzer settings:  
Span = wide enough to fully capture the emission being measured, RBW = 1 MHz for  $f \geq 1\text{GHz}$ , 100 kHz for  $f < 1\text{ GHz}$ , VBW  $\geq$  RBW, Sweep = auto, Detector function = peak, Trace = max hold
4. Follow the guidelines in ANSI C63.4-1992 with respect to maximizing the emission by rotating the EUT, adjusting the measurement antenna height and polarization, etc.  
The peak reading of the emission, after being corrected by the antenna factor, cable loss, pre-amp gain, etc., is the peak field strength, submit this data. Each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
5. Set the VBW to 10 Hz, while maintaining all of the other instrument settings. This peak level, once corrected, must comply with the limit specified in Section 15.209. If the duty cycle per channel of the hopping signal is less than 100 ms, then the reading obtained with the 10 Hz VBW may be further adjusted by a "duty cycle correction factor", derived from  $20\log(\text{duty cycle}/100\text{ ms})$ , in an effort to demonstrate compliance with the 15.209 limit. Submit this data.

### Limit

According to part 15.247(d), the radio emission outside the operating frequency band shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power. Radiated emissions which fall in the restricted bands, as defined in section 15.205, must comply with the radiated emission limits specified in section 15.209.

Frequency MHz	Field Strength uV/m	Field Strength dB $\mu$ V/m	Detector
30-88	100	40	QP
88-216	150	43.5	QP
216-960	200	46	QP
960-1000	500	54	QP
Above 1000	500	54	AV
Above 1000	5000	74	PK

## Spurious radiated emissions for transmitter

According to C63.10, if the peak (or quasi-peak) measured value complies with the average limit, it is unnecessary to perform an average measurement, so AV emission value did not show in below table if the peak value complies with average limit.

### Transmitting spurious emission test result as below:

#### 2402MHz

Frequency	Antenna Factor	Cable Loss	Amp. Factor	Reading	Emission Level	Polarization	Limit	Detector	Result
MHz	dB/m	dB	dB	dBuV	dBuV/m		dB $\mu$ V/m		
30-1000	-	-	-	-	-	Horizontal	-	-	Pass
30-1000	-	-	-	-	-	Vertical	-	-	Pass
2402	26.77	6.02	35.92	90.01	86.88	Horizontal	-	PK	-
2402	26.77	6.02	35.92	86.81	83.68	Vertical	-	PK	-
*4804	32.47	8.67	35.72	44.60	50.02	Horizontal	74	PK	Pass
*4804	32.47	8.67	35.72	44.59	50.01	Vertical	74	PK	Pass

#### 2440MHz

Frequency	Antenna Factor	Cable Loss	Amp. Factor	Reading	Emission Level	Polarization	Limit	Detector	Result
MHz	dB/m	dB	dB	dBuV	dBuV/m		dB $\mu$ V/m		
2440	27.02	6.09	35.92	90.68	87.87	Horizontal	-	PK	-
2440	27.02	6.09	35.92	87.36	84.55	Vertical	-	PK	-
*4880	32.64	8.74	35.69	45.07	50.76	Horizontal	74	PK	Pass
*4880	32.64	8.74	35.69	44.70	50.39	Vertical	74	PK	Pass

#### 2480MHz

Frequency	Antenna Factor	Cable Loss	Amp. Factor	Reading	Emission Level	Polarization	Limit	Detector	Result
MHz	dB/m	dB	dB	dBuV	dBuV/m		dB $\mu$ V/m		
2480	27.27	6.15	35.92	92.36	89.86	Horizontal	-	PK	-
2480	27.27	6.15	35.92	86.02	83.52	Vertical	-	PK	-
*4960	32.81	8.81	35.66	44.96	50.92	Horizontal	74	PK	Pass
*4960	32.81	8.81	35.66	45.36	51.32	Vertical	74	PK	Pass

#### Remark:

- (1) QP Emission Level= Antenna Factor +Cable Loss + Reading  
PK Emission Level= Antenna Factor +Cable Loss - Amp. Factor + Reading  
AV Emission Level= PK Emission Level+20log (dutycycle)
- (2) Data of measurement within 30-1000MHz frequency range shown “--” 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.
- (3) “\*” means the emission(s) appear within the restrict bands shall follow the requirement of section 15.205.

## 10 Test Equipment List

### List of Test Instruments

DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	CAL. DUE DATE
Spectrum	Agilent	E4446A	US44300459	May.08, 14
Amp	HP	8449B	3008A08495	May.08, 14
Amplifier	HP	8447D	2648A04738	May.08, 12
Antenna	EMCO	3115	9510-4580	May.17, 14
Bilog Antenna	Schaffner	CBL6111C	2598	Dec.26, 14
HF Cable	Hubersuhne	Sucoflex104	-	May.08, 14
EMI Spectrum	Agilent	E4407B	MY41440292	May.08, 14
Test Receiver	Rohde & Schwarz	ESVS10	834468/011	May.08, 14
Power Sensor	Anritsu	MA2491A	033005	May.08, 14
Noise Figure	HP	8970B	3247U02193	May.08, 14
Noise Source	HP	346B	3318A13134	May.08, 14

## 11 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
Radiation emission	U=4.32dB (30MHz-25GHz)
Output power test	0.94 dB
Power density test	2.10 dB
Bandwidth	1x10 <sup>-9</sup>