Report Number: 68.910.15.006.01



# FCC - TEST REPORT

Report Number	68.910.15.006.01 Date of Issue: July 23, 2015
Model Product Type	IVSCB Fat scale
Applicant	Shenzhen Belter Health Measurement and Analysis Technology
Address	Co., Ltd. 702, 704, Block C, Tsinghua Unis Science Park, Hi-Tech Industrial Park North, Nanshan
Production Facility	Dongguan Simple Industrial Co., Ltd.
Address	No.192, Shaxin Road, Science Message Park, Tangxia Town,
	Dongguan, Guangdong China
Test Result	■ Positive □ Negative
Total pages including Appendices	22

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	De De Su Su Ge Te Sy Te 0.1 0.2 0.3 0.4 0.5 0.6 Te	<ul> <li>Power spectral density</li></ul>



# 2 Details about the Test Laboratory

## **Details about the Test Laboratory**

Test Site 1

Company name:	TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch Building 12&13, Zhiheng Wisdomland Business Park, Nantou Checkpoint Road 2, Nanshan District, 518052, Shenzhen,P.R.C.
Telephone:	86 755 8828 6998
Fax:	86 755 8828 5299



# **3** Description of the Equipment Under Test

Product:	Fat scale
Model no.:	IVSCB
FCC ID:	2AAEEEIVSCB
Options and accessories:	NIL
Rating:	DC6.0V (Supplied by 4xAAA batteries)
RF Transmission	2402-2480MHz
Frequency: No. of Operated Channel:	40
Modulation:	GFSK
Antenna Type:	PIFA
Antenna Gain:	0dBi
Description of the EUT:	The Equipment Under Test (EUT) is a Fat scale with BLE function.



# 4 Summary of Test Standards

	Test Standards
FCC Part 15 Subpart C	PART 15 - RADIO FREQUENCY DEVICES
10-1-2014 Edition	Subpart C - Intentional Radiators

All the test methods were according to KDB558074 D01 DTS Meas Guidance v03r02 issued by FCC on July 05, 2014 and ANSI C63.10 (2009).



# 5 Summary of Test Results

Technical Requirements				
FCC Part 15 Subpart C				
Test Condition		Pages	Test Site	Test Result
§15.207	Conducted emission AC power port			N/A
§15.247(b)(1)	Conducted peak output power	10	Site 1	Pass
§15.247(e)	Power spectral density	11	Site 1	Pass
§15.247(a)(2)	6dB bandwidth	12	Site 1	Pass
§15.247(a)(1)	20dB bandwidth and 99% Occupied Bandwidth			N/A
§15.247(a)(1)	Carrier frequency separation			N/A
§15.247(a)(1)(iii)	Number of hopping frequencies			N/A
§15.247(a)(1)(iii)	Dwell Time			N/A
§15.247(d)	Spurious RF conducted emissions	14	Site 1	Pass
§15.247(d)	Band edge	18	Site 1	Pass
§15.247(d) & §15.209 &15.205	Spurious radiated emissions for transmitter	20	Site 1	Pass
§15.203	Antenna requirement	See	note 2	Pass

Note 1: N/A=Not Applicable.

Note 2: The EUT uses a permanently PIFA antenna, which gain is 0dBi. In accordance 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: 2AAEEEIVSCB 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
- I Not Performed

The Equipment under Test

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

Sample Received Date: 17 March, 2015

Testing Start Date: 18 March, 2015

Testing End Date:

31 March, 2015

TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch

Reviewed by:

Prepared by:

Pann

Phoebe Hu EMC Project Manager

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Felix Li EMC Project Engineer Tested by:

Jon zha

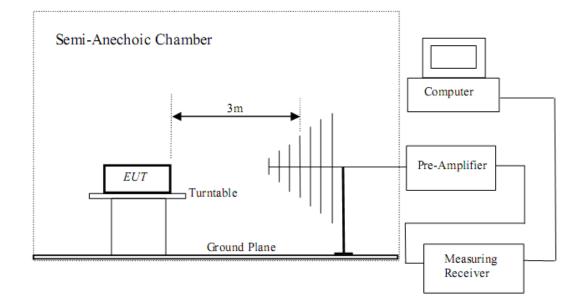
Leon Zhang EMC Test Engineer



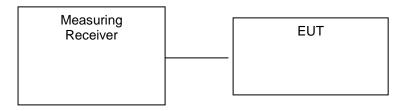


# 7 Test Setups

## 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	X220	

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



# 9 Technical Requirement

# 9.1 Conducted peak output power

## **Test Method**

- Use the following spectrum analyzer settings: RBW > the 6 dB bandwidth of the emission being measured, VBW≥3RBW, Span≥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	Limit	Limit
MHz	W	dBm
2400-2483.5	≤1	≤30

## **Test Result**

Frequency MHz	Conducted Peak Output Power dBm	Result
Low channel 2402MHz	-7.0	Pass
Middle channel 2440MHz	-7.2	Pass
High channel 2480MHz	-8.57	Pass



## 9.2 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≥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]

≤8

### **Test Result**

Frequency	Power spectral	Limit	Result
MHz	density	dBm	
2402	-18.94	8	Pass
2440	-19.37	8	Pass
2480	-20.28	8	Pass



## 9.3 6 dB Bandwidth

#### **Test Method**

- Use the following spectrum analyzer settings: RBW=100K, VBW≥3RBW, Sweep = auto, Detector function = peak, Trace = max hold
- 2. 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.

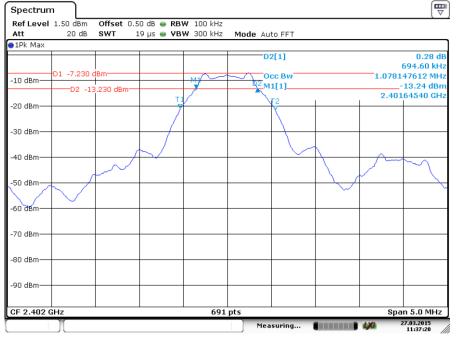
## Limit

Limit [kHz]

≥500

### **Test result**

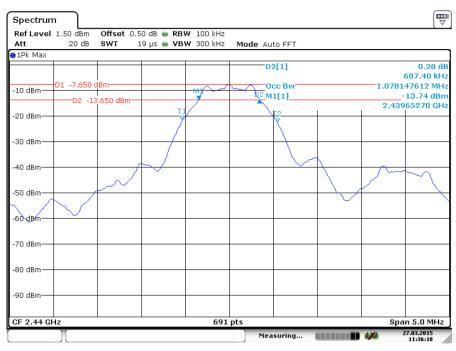
Frequency	6 dB Bandwidth	Limit	Result
MHz	KHz	kHz	
2402	694.6	≥500	Pass
2440	687.4	≥500	Pass
2480	687.4	≥500	Pass



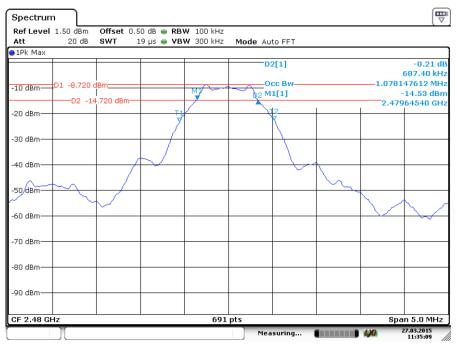
Date: 27.MAR.2015 11:37:20

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Date: 27.MAR.2015 11:36:18



Date: 27.MAR.2015 11:35:09

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# 9.4 Spurious RF conducted emissions

### **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 emissions (e.g., harmonics) from the lowest frequency generated in the EUT up through the 10<sup>th</sup> harmonic. Typically, several plots are required to cover this entire span. RBW = 100 kHz, VBW≥RBW, Sweep = auto, Detector function = peak, Trace = max hold
- 2. Allow the trace to stabilize. Set the marker on the peak of any spurious emission recorded.
- 3. The level displayed must comply with the limit specified in this Section. Submit these plots.
- 4. Repeat above procedures until all frequencies measured were complete.

## Limit

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



## **Spurious RF conducted emissions**

#### 2402MHz

Ref Level Att	1.50 dBm 20 dB	SWT			3W 100 kH: 3W 300 kH:				
Att 1Pk Max	20 aB	SWI	9.7 m	is 🥌 VI	3W 3UU KH:	Mode Auto Sweep			
						M1[1]			-67.45 dBn
									992.30 MH
10 dBm—									
20 dBm									
	01 07 000	40.00							
30 dBm	D1 -27.030	dBm					_		
40 dBm									
50 dBm									
50 dBm-							_		
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v-v-v-v0~~40			-a-ora						
30 dBm									
90 dBm									
tart 30.0	NAL 1-					1 pts			op 1.0 GHz
	2015 11:47:2	23				Measuring		<b>1</b> 490	27.03.2015 11:47:23
e: 27.MAR. Spectrum	2015 11:47:2		0.50					<b>)</b> 4,904	11:47:23
e: 27.MAR. Spectrum	2015 11:47:2				<b>3W</b> 1 MHz <b>3W</b> 3 MHz	Measuring		<b>1</b> 436	11:47:23
e: 27.MAR. Spectrum Ref Level Att	2015 11:47:2	Offset			<b>3W</b> 1 MHz		0.000	<b>)</b> 430	27.03.2015 11:47:23
e: 27.MAR. Spectrum Ref Level Att 1Pk Max	2015 11:47:2	Offset			<b>3W</b> 1 MHz	Measuring	Contract of		-51.52 dBn
te: 27.MAR. Bpectrum Ref Level Att 1Pk Max M1	2015 11:47:2	Offset			<b>3W</b> 1 MHz	Measuring Mode Auto Sweep M2[1]			-51.52 dBn L6.3340 GH
e: 27.MAR. Spectrum Ref Level Att 1Pk Max	2015 11:47:2	Offset			<b>3W</b> 1 MHz	Measuring Mode Auto Sweep			-51.52 dBn 16.3340 GH -7.03 dBn
e: 27.MAR. Spectrum Ref Level Att 1Pk Max M1 10 dBm	2015 11:47:2	Offset			<b>3W</b> 1 MHz	Measuring Mode Auto Sweep M2[1]			-51.52 dBn 16.3340 GH -7.03 dBn
e: 27.MAR. Spectrum Ref Level Att 1Pk Max M1 10 dBm	2015 11:47:2	Offset			<b>3W</b> 1 MHz	Measuring Mode Auto Sweep M2[1]			-51.52 dBn 16.3340 GH -7.03 dBn
e: 27.MAR. Spectrun Ref Level Att 1Pk Max M1 10 dBm- 20 dBm-	2015 11:47:2	Offset SWT			<b>3W</b> 1 MHz	Measuring Mode Auto Sweep M2[1]			-51.52 dBn 16.3340 GH -7.03 dBn
e: 27.MAR. Spectrun Ref Level Att 1Pk Max M1 10 dBm- 20 dBm-	2015 11:47:2 1.50 dBm 20 dB	Offset SWT			<b>3W</b> 1 MHz	Measuring Mode Auto Sweep M2[1]			11:47:23
e: 27.MAR. Spectrun Ref Level Att 1Pk Max M1 10 dBm 20 dBm 30 dBm	2015 11:47:2 1.50 dBm 20 dB	Offset SWT			<b>3W</b> 1 MHz	Measuring Mode Auto Sweep M2[1]			-51.52 dBn 16.3340 GH -7.03 dBn
e: 27.MAR. Spectrun Ref Level Att 1Pk Max M1 10 dBm 20 dBm 30 dBm	2015 11:47:2 1.50 dBm 20 dB	Offset SWT			<b>3W</b> 1 MHz	Measuring Mode Auto Sweep M2[1]			-51.52 dBn 16.3340 GH -7.03 dBn
e: 27.MAR. Spectrun Ref Level Att 1Pk Max M1 10 dBm 20 dBm 40 dBm 40 dBm	2015 11:47:2 1.50 dBm 20 dB	Offset SWT			<b>3W</b> 1 MHz	Measuring Mode Auto Sweep M2[1]			-51.52 dBn 16.3340 GH -7.03 dBn
e: 27.MAR. Spectrun Ref Level Att IPk Max M1 L0 dBm 20 dBm 40 dBm 40 dBm	2015 11:47:2 1.50 dBm 20 dB 01 -27.030	Offset SWT	96 m		3W 1 MHz 3W 3 MHz	Measuring           Mode         Auto           M2[1]         M1[1]           M1[1]         M1[1]			-51.52 dBn 16.3340 GH -7.03 dBn 2.4070 GH
e: 27.MAR. Spectrum Ref Level MI IPk Max M1 20 dBm 30 dBm 40 dBm 50 dB	2015 11:47:2 1.50 dBm 20 dB	Offset SWT	96 m		3W 1 MHz 3W 3 MHz	Mode Auto Sweep M2[1] M1[1]	La		-51.52 dBn 16.3340 GH -7.03 dBn 2.4070 GH
e: 27.MAR. Spectrum Ref Level MI IPk Max M1 20 dBm 30 dBm 40 dBm 50 dB	2015 11:47:2 1.50 dBm 20 dB 01 -27.030	Offset SWT	96 m		3W 1 MHz 3W 3 MHz	Measuring           Mode         Auto           M2[1]         M1[1]           M1[1]         M1[1]			-51.52 dBn 16.3340 GH -7.03 dBn
e: 27.MAR. Spectrum Ref Level Att IPk Max M1 10 dBm 20 dBm 40 dBm 50 dBm 50 dBm	2015 11:47:2 1.50 dBm 20 dB 01 -27.030	Offset SWT	96 m		3W 1 MHz 3W 3 MHz	Measuring           Mode         Auto           M2[1]         M1[1]           M1[1]         M1[1]			-51.52 dBn 16.3340 GH -7.03 dBn 2.4070 GH
e: 27.MAR. Spectrum Ref Level Att IPk Max M1 10 dBm 20 dBm 40 dBm 50 dBm 50 dBm	2015 11:47:2 1.50 dBm 20 dB 01 -27.030	Offset SWT	96 m		3W 1 MHz 3W 3 MHz	Measuring           Mode         Auto           M2[1]         M1[1]           M1[1]         M1[1]			-51.52 dBn 16.3340 GH -7.03 dBn 2.4070 GH
ie: 27.MAR.           Spectrum           Ref Level           Att           IPK Max           M1           10 dBm           20 dBm           30 dBm           40 dBm           50 dBm           50 dBm           70 dBm	2015 11:47:2 1.50 dBm 20 dB 01 -27.030	Offset SWT	96 m		3W 1 MHz 3W 3 MHz	Measuring           Mode         Auto           M2[1]         M1[1]           M1[1]         M1[1]			-51.52 dBn 16.3340 GH -7.03 dBn 2.4070 GH
ie: 27.MAR.           Spectrum           Ref Level           Att           IPK Max           M1           10 dBm           20 dBm           30 dBm           40 dBm           50 dBm           50 dBm           70 dBm	2015 11:47:2 1.50 dBm 20 dB 01 -27.030	Offset SWT	96 m		3W 1 MHz 3W 3 MHz	Measuring           Mode         Auto           M2[1]         M1[1]           M1[1]         M1[1]			-51.52 dBn 16.3340 GH -7.03 dBn 2.4070 GH
ie: 27.MAR.           Spectrum           Ref Level           Att           IPK Max           M1           10 dBm           20 dBm           30 dBm           50 dBm	2015 11:47:2 1.50 dBm 20 dB 01 -27.030	Offset SWT	96 m		3W 1 MHz 3W 3 MHz	Measuring           Mode         Auto           M2[1]         M1[1]           M1[1]         M1[1]			-51.52 dBn 16.3340 GH -7.03 dBn 2.4070 GH
EPECTRUM EPECTRUM Ref Level Att 1Pk Max M1 10 dBm 20 dBm	2015 11:47:2 1.50 dBm 20 dB 01 -27.030	Offset SWT	96 m		3W 1 MHz 3W 3 MHz	Measuring           Mode         Auto           M2[1]         M1[1]           M1[1]         M1[1]			-51.52 dBn 16.3340 GH -7.03 dBn 2.4070 GH
e: 27.MAR. Spectrum Ref Level Att IPk Max M1 10 dBm 20 dBm 30 dBm 50 dBm 50 dBm 70 dBm 30 dBm	2015 11:47:2	Offset SWT	96 m		3W 1 MHz 3W 3 MHz 	Measuring           Mode         Auto           M2[1]         M1[1]           M1[1]         M1[1]			-51.52 dBn 16.3340 GH -7.03 dBn 2.4070 GH

Date: 27.MAR.2015 11:46:55

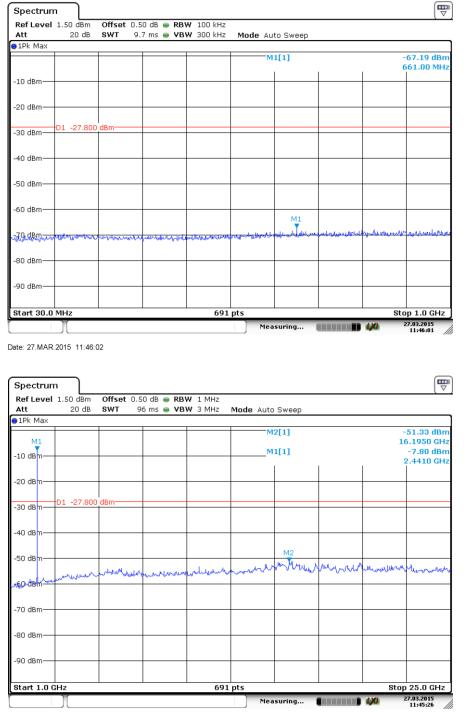
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### **Spurious RF conducted emissions**

#### 2440MHz



Date: 27.MAR.2015 11:45:26

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## **Spurious RF conducted emissions**

#### 2480MHz

Ref Level 1.50 dBr		50 dB 👄 RBW					
Att 20 d 1Pk Max	B SWT 9.	7 ms 👄 VBW	300 kHz	Mode Auto Sweep			
	_	F F		M1[1]		-	68.32 dBr
				wit[1]			79.60 MH
10 dBm							
TO UBIN							
20 dBm							
30 dBm D1 -28.6	540 dBm						
40 dBm							
50 dBm							
JU UBIII							
60 dBm							
							. M1
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80 dBm		_ ↓			+		
90 dBm							
90 ubili							
Start 30.0 MHz			691 p	ots			p 1.0 GHz 7.03.2015
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te: 27.MAR.2015 11:	43:58						
ate: 27.MAR.2015 11:	43:58						_
te: 27.MAR.2015 11:	43:58						
Spectrum		50 dB 🖷 RBW	1 MHz				
Spectrum	m Offset 0.5	50 dB 🖷 RBW 16 ms 🖷 VBW		1ode Auto Sweep			
Spectrum Ref Level 1.50 dBr Att 20 d	m Offset 0.5			lode Auto Sweep			
Spectrum Ref Level 1.50 dBr Att 20 d	m Offset 0.5			1ode Auto Sweep M2[1]			(⊽ 51.44 dBr
Spectrum Ref Level 1.50 dBr Att 20 d	m Offset 0.5			M2[1]		15	( ▼ 51.44 dBr 5.5702 GH
Spectrum Ref Level 1.50 dBr Att 20 d 1Pk Max	m Offset 0.5					15	51.44 dBr 5.5702 GH -8.64 dBr
Spectrum Ref Level 1.50 dBr Att 20 d 11Pk Max	m Offset 0.5			M2[1]		15	51.44 dBr 5.5702 GH -8.64 dBr
Spectrum Ref Level 1.50 dBr Att 20 d 1Pk Max M1 10 dBm	m Offset 0.5			M2[1]		15	51.44 dBr 5.5702 GH -8.64 dBr
Spectrum Ref Level 1.50 dBr Att 20 d 1Pk Max M1 10 dBm	m Offset 0.5			M2[1]		15	51.44 dBr 5.5702 GH -8.64 dBr
Spectrum Ref Level 1.50 dBr Att 20 d 1Pk Max M1 10 dBm 20 dBm	m Offset 0.3			M2[1]		15	51.44 dBr 5.5702 GH -8.64 dBr
Spectrum Ref Level 1.50 dBr Att 20 d 1Pk Max M1 10 dBm 20 dBm	m Offset 0.3			M2[1]		15	51.44 dBr 5.5702 GH -8.64 dBr
Spectrum           Ref Level         1.50 dBi           Att         20 d           1PK Max         10 dBm           20 dBm         20 dBm           30 dBm         01 -28.6	m Offset 0.3			M2[1]		15	51.44 dBr 5.5702 GH -8.64 dBr
Spectrum         Ref Level 1.50 dBr           Att         20 d           h1Pk Max         10 dBm           20 dBm         01 -28.6	m Offset 0.3			M2[1]		15	(⊽ 51.44 dBr
Spectrum         Ref Level 1.50 dBr           Att         20 d           h1Pk Max         10 dBm           20 dBm         01 -28.6	m Offset 0.3			M2[1]		15	51.44 dBr 5.5702 GH -8.64 dBr
Spectrum           Ref Level         1.50 dBi           Att         20 d           1PK Max         10 dBm           20 dBm         10 dBm           30 dBm         01 -28.0           40 dBm         10 dBm	m Offset 0.3	6 ms  VBW	3 MHz N	M2[1] M1[1]		15	51.44 dBr 5.5702 GH -8.64 dBr
Spectrum           Ref Level 1.50 dBm           Att 20 d           11Pk Max           M1           10 dBm           20 dBm           30 dBm           50 dBm	m Offset 0.5 B SWT 9		3 MHz N	M2[1]	Mmerine	15	51.44 dBr 5.5702 GH -8.64 dBr
Spectrum           Ref Level 1.50 dBm           Att 20 d           11Pk Max           M1           10 dBm           20 dBm           30 dBm           50 dBm	m Offset 0.5 B SWT 9	6 ms  VBW	3 MHz N	M2[1] M1[1]	A Marine Ma Marine Marine Mari	15	51.44 dBr 5.5702 GH -8.64 dBr
Spectrum           Ref Level         1.50 dBr           Att         20 d           piPk Max         10 dBm           20 dBm         20 dBm           30 dBm         D1 -28.6           40 dBm         50 dBm	m Offset 0.5 B SWT 9	6 ms  VBW	3 MHz N	M2[1] M1[1]	Mmmmm	15	51.44 dBr 5.5702 GH -8.64 dBr
Spectrum           Ref Level 1.50 dBn           Att 20 d           01Pk Max           M1           10 dBm           20 dBm           30 dBm           30 dBm           50 dBm           50 dBm	m Offset 0.5 B SWT 9	6 ms  VBW	3 MHz N	M2[1] M1[1]	Maria	15	51.44 dBr 5.5702 GH -8.64 dBr
Spectrum           Ref Level         1.50 dBr           Att         20 d           piPk Max         10 dBm           20 dBm         20 dBm           30 dBm         D1 -28.6           40 dBm         50 dBm	m Offset 0.5 B SWT 9	6 ms  VBW	3 MHz N	M2[1] M1[1]	Mmmmun	15	51.44 dBr 5.5702 GH -8.64 dBr
Spectrum           Ref Level         1.50 dBr           Att         20 d           p1Pk Max         10 dBm           20 dBm         20 dBm           30 dBm         D1 -28.6           40 dBm         50 dBm           50 dBm         10 dBm           70 dBm         20 dBm	m Offset 0.5 B SWT 9	6 ms  VBW	3 MHz N	M2[1] M1[1]	Armana and Armana	15	51.44 dBr 5.5702 GH -8.64 dBr
Spectrum           Ref Level 1.50 dBr           Att 20 d           11Pk Max           M1           10 dBr           20 dBm           30 dBm           50 dBm           50 dBm           50 dBm	m Offset 0.5 B SWT 9	6 ms  VBW	3 MHz N	M2[1] M1[1]		15	51.44 dBr 5.5702 GH -8.64 dBr
Spectrum           Ref Level 1.50 dBn           Att 20 d           11Pk Max           M1           10 dBm           20 dBm           30 dBm           50 dBm           50 dBm           50 dBm           70 dBm	m Offset 0.5 B SWT 9	6 ms  VBW	3 MHz N	M2[1] M1[1]		15	51.44 dBr 5.5702 GH -8.64 dBr
Spectrum           Ref Level 1.50 dBn           Att 20 d           11Pk Max           M1           10 dBm           20 dBm           30 dBm           50 dBm           50 dBm           50 dBm           70 dBm	m Offset 0.5 B SWT 9	6 ms  VBW	3 MHz N	M2[1] M1[1]		15	51.44 dBr 5.5702 GH -8.64 dBr
Spectrum           Ref Level 1.50 dBn           Att 20 d           11Pk Max           M1           10 dBm           20 dBm           30 dBm           50 dBm           50 dBm           70 dBm           70 dBm           80 dBm	m Offset 0.5 B SWT 9	6 ms  VBW	3 MHz N	M2[1] M1[1]		15	51.44 dBr 5.5702 GH -8.64 dBr

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EMC\_SZ\_FR\_21.00 FCC Release 2014-03-20 TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch Building 12&13, Zhiheng Wisdomland Business Park, Nantou Checkpoint Road 2, Nanshan District, Shenzhen City, 518052, P. R. China Tel. +86 755 8828 6998, Fax: +86 755 8828 5299

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# 9.5 Band edge testing

#### **Test Method**

- 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≥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

## Band edge testing

Spectrum	Γ										
Ref Level 0.5	0 dBm	Offset	0.50 dB 🧉	▶ RBW	100 kHz						
Att	20 dB	SWT	1.1 ms 🍯	VBW	300 kHz	Mode Au	to Swee	p			
1Pk Max											
						M	4[1]				-48.65 🙀 n
10 dBm										2.3	99290 <b>(</b> Hz
						M	1[1]				-7.28 dBn
20 dBm										2.4	02180 GH
		l,									
30 dBm D1	-27.310	dBm						_			
											1 11
40 dBm			_								
											M48
50 dBm											
											լյլ
-60 dBm								-		M2	4
			un un			and the second second second	. N	-	all and a start	M2	un .
76 <sup>1</sup> dBn1~~~		, and the rest		1448-becking	and	decomposition of	1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 -				
80 dBm											
90 dBm											
Start 2.31 GH	-				691 p	h.c.				Oton	2.405 GHz
larker	2				091 h					atup	2.403 GHZ
	Trc	X-va	-l		r-value	Func	•!		<b>E</b>	tion Result	
Type Ref M1	1		1100 40218 GHz		-7.28 dBm		tion		Func	tion Resul	[
M2	1	2.5	2.39 GHz		-67.76 dBm						
M3	1		2.39 GHz	_	-51.15 dBm						
M4	1	2.3	39929 GHz		-48.65 dBm						
	· ·					)	suring			Da	27.03.2015

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Spect	rum													
Ref Le	vel 1	.50 dBm												
Att		20 dB	SWT 75.	9 µs 👄	VBW	300 kHz	Mo	de Aut	to FFT					
●1Pk Ma	ах													
	м1							M	3[1]					0.05 dBm
-10 dBm														0000 GHz
-10 aBm	איי							M	1[1]					8.90 dBm
00 40-	11										1	1	2.479	7460 GHz
-20 dBm														
-30 dBm	Ц'n	1 -28.90												
-30 aBm	Πľ	1 -20,90												
-40 dB		<u>م</u>												
-40 060	· ·	1												
-50 d6m		1												
-70 40	-	1.1												
-60 dBm		- 1011												
700 ubii	'													
-70 dBm			manna	mmy	uan a	and a second				M				-
70 abii	·						~ ~			~~~~~			~~~~	- more and
-80 dBm			_											
00 000														
-90 dBm														
50 abri														
Start 2	.477	GHz				691	nts						Ston	2.51 GHz
Marker							P							
Type	Ref	Trc	X-value	. 1	•	r-value	1	Funct	tion		Fur	nction R	esult	1
M1		1	2.4797			-8.90 dB	m							
M2		1	2.48	35 GHz		-64.36 dB	m							
MЗ		1	2	.5 GHz		-70.05 dB	m							
		)[						Mea	suring.	. 1		LXI		.03.2015 11:41:16

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# 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.
- Use the following spectrum analyzer settings: Span = wide enough to fully capture the emission being measured, RBW = 1 MHz for f ≥ 1GHz, 100 kHz for f < 1 GHz, VBW ≥ 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 20log(duty cycle/100 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 section15.205, must comply with the radiated emission limits specified in section 15.209.

Frequency MHz	Field Strength	Field Strength	Detector
	uV/m	dBµV/m	
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 ANSI 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 Test Result

Frequency	Emission Level	Polarization	Limit	Detector	Result
MHz	dBuV/m		dBµV/m		
30-1000		Horizontal		QP	Pass
30-1000		Vertical		QP	Pass
*4804	39.75	Horizontal	74	PK	Pass
*4804		Horizontal	54	AV	Pass
*4804	42.73	Vertical	74	PK	Pass
*4804		Vertical	54	AV	Pass

#### 2440MHz Test Result

Frequency	Emission Level	Polarization	Limit	Detector	Result
MHz	dBuV/m		dBµV/m		
*4880	41.84	Horizontal	74	PK	Pass
*4880		Horizontal	54	AV	Pass
*4880	42.51	Vertical	74	PK	Pass
*4880		Vertical	74	AV	Pass

#### 2480MHz Test Result

Frequency	Emission Level	Polarization	Limit	Detector	Result
MHz	dBuV/m		dBµV/m		
*4960	44.64	Horizontal	74	PK	Pass
*4960		Horizontal	54	AV	Pass
*4960	43.79	Vertical	74	PK	Pass
*4960		Vertical	54	AV	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(duty cycle)
- (2) Data of measurement within this 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	
	Test Receiver	Rohde & Schwarz	ESHS10	838693/001	Nov.04, 15	$\square$
	L.I.S.N.#1	Rohde & Schwarz	ESH2-Z5	834066/011	Nov.04, 15	$\square$
	L.I.S.N.#3	Kyoritsu	KNW-242C	8-1920-1	May.07, 15	
CE	RF Cable	3D-2W	Fujikura	LISN Cable 1#	May.07, 15	$\square$
01	Coaxial Switch	MP59B	Anritsu	M55367	May.07, 15	$\square$
	Passive Probe	ESH2-Z3	Rohde & Schwarz	299.7810.52	May.07, 15	
	Pulse Limiter	ESH3-Z2	Rohde & Schwarz	100341	May.07, 15	
С	Spectrum	Agilent	E4446A	US44300459	May.08, 15	$\square$
RE < 1	Test Receiver <1GHz	Rohde & Schwarz	ESVS10	834468/011	May.07, 15	$\boxtimes$
GHz	Amplifier < 1 GHz	HP	8447D	2648A04738	May.07, 15	$\square$
	HF Cable	Hubersuhne	Sucoflex104	Room 2	May.08, 15	$\square$
	Bilog Antenna	Schaffner	CBL6111C	2598	Oct.25, 15	$\square$
RE	Spectrum > 1GHz	Agilent	E4446A	US44300459	May.08, 15	$\square$
> 1 GHz	Horn Antenna	EMCO	3115	9607-4877	Jun. 24, 15	$\square$
	Amp > 1 Ghz	HP	8449B	3008A08495	May.08, 15	$\square$
	HF Cable	Hubersuhne	Sucoflex104	Room1	May.08, 15	$\square$

C - Conducted RF tests

- Conducted peak output power
- 6dB bandwidth
- 20dB bandwidth and 99% Occupied Bandwidth
- Carrier frequency separation
- Number of hopping frequencies
- Dwell Time
- Power spectral density
- Spurious RF conducted emissions
- Band edge



# **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:

Bystem Medsdrement Oncertainty				
Items	Extended Uncertainty			
Redicted enurious emission	4.32dB (30MHz-1GHz)			
Radiated spurious emission	2.27dB (1GHz -25GHz)			
Conducted spurious emission	2.10dB(30MHz-25GHz)			
Bandwidth test	1*10 <sup>-9</sup>			
Conducted emission	2.4dB			

#### System Measurement Uncertainty