FCC - TEST REPORT

Report Number	: **68.910.15.006.01**	Date of Issue:	July 23, 2015

Model	: IVSCB
Product Type	: Fat scale
Applicant	: Shenzhen Belter Health Measurement and Analysis Technology Co., Ltd.
Address	: 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

1 Table of Contents

TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch
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Shenzhen City, 518052, P. R. China Tel. +86 755 8828 6998, Fax: +86 755 8828 5299

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
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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 Frequency:	2402-2480MHz
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 10-1-2014 Edition	PART 15 - RADIO FREQUENCY DEVICES 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

☐ - **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

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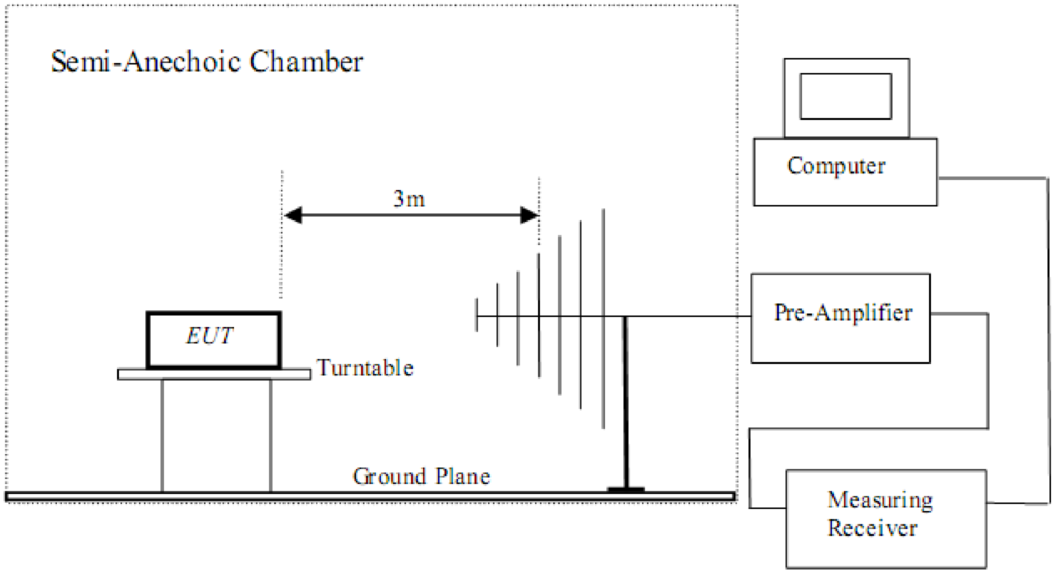
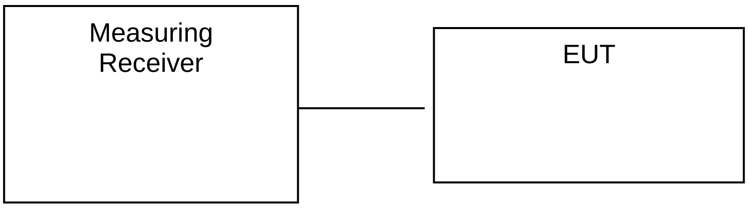
Reviewed by:	Prepared by:	Tested by:
Phoebe Hu EMC Project Manager	Felix Li EMC Project Engineer	Leon Zhang EMC Test Engineer

7 Test Setups

7.1 Radiated test setups



7.2 Conducted RF test setups



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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.

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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≥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 MHz	Limit W	Limit 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

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

9.3 6 dB Bandwidth

Test Method

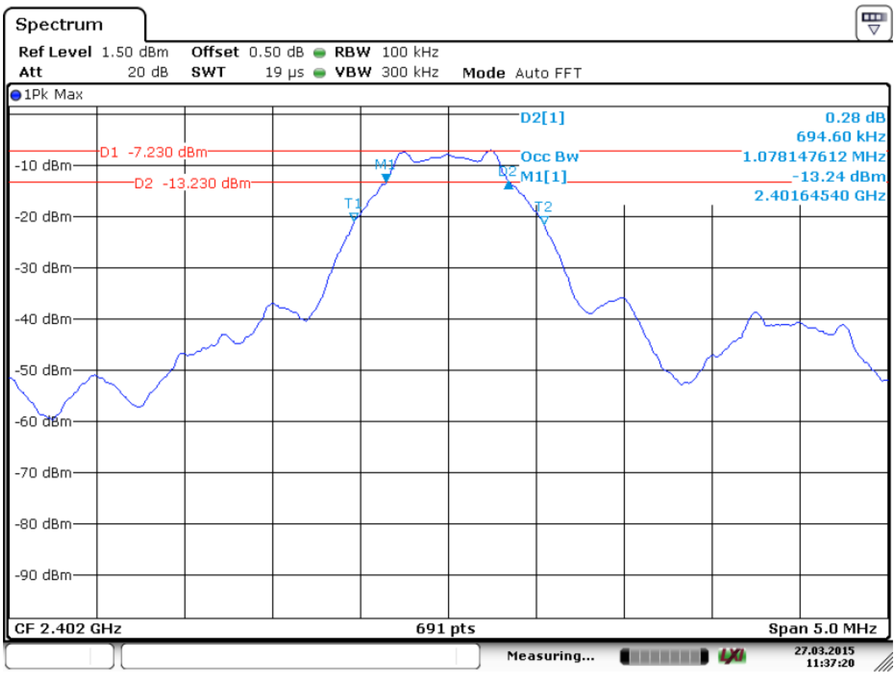
1. Use the following spectrum analyzer settings:
   RBW=100K, VBW≥3RBW, Sweep = auto, Detector function = peak, Trace = max hold
2. 2. Use the automatic bandwidth measurement capability of an instrument, may be employed using the X dB bandwidth mode with X set to 6 dB, care shall be taken so that the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

Limit

Limit [kHz]
≥500

Test result

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



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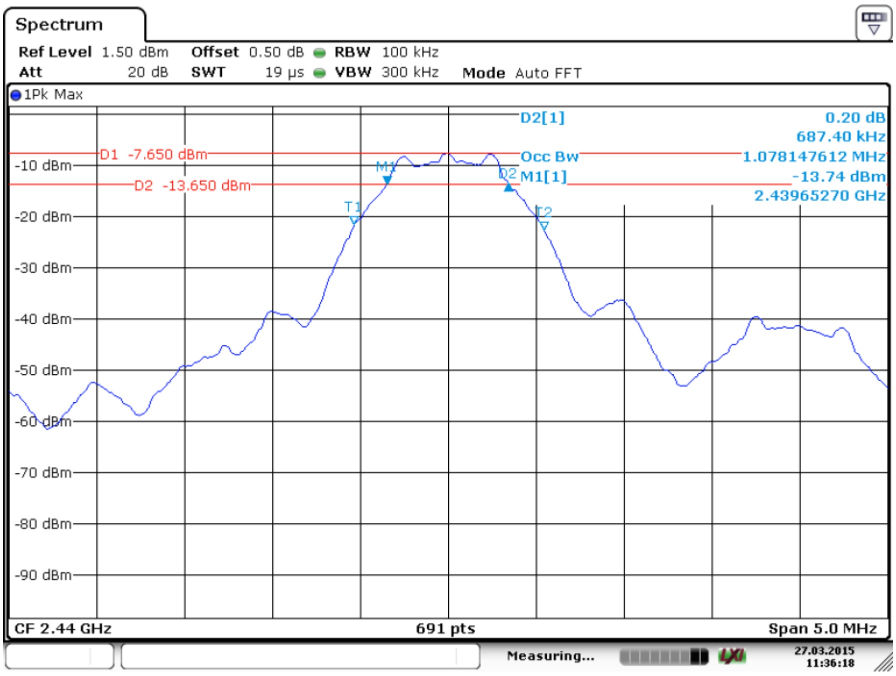

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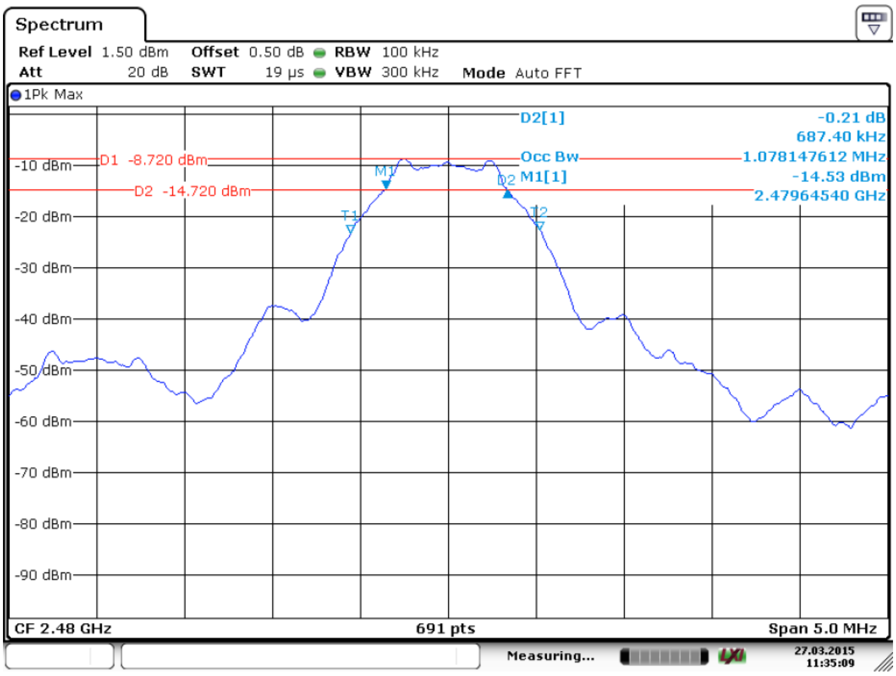

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9.4 Spurious RF conducted emissions

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^{th} 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

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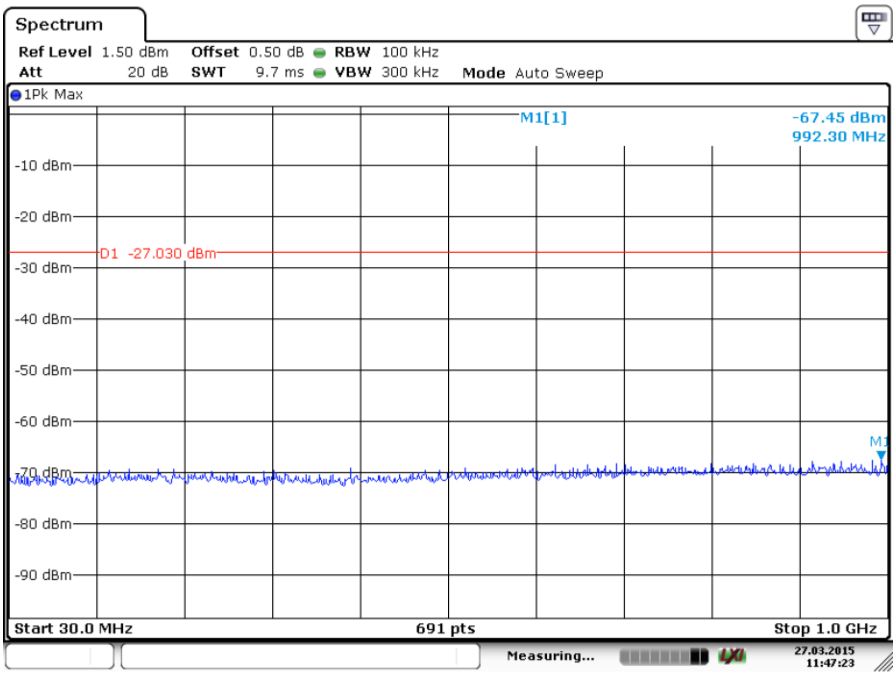
Spurious RF conducted emissions

2402MHz



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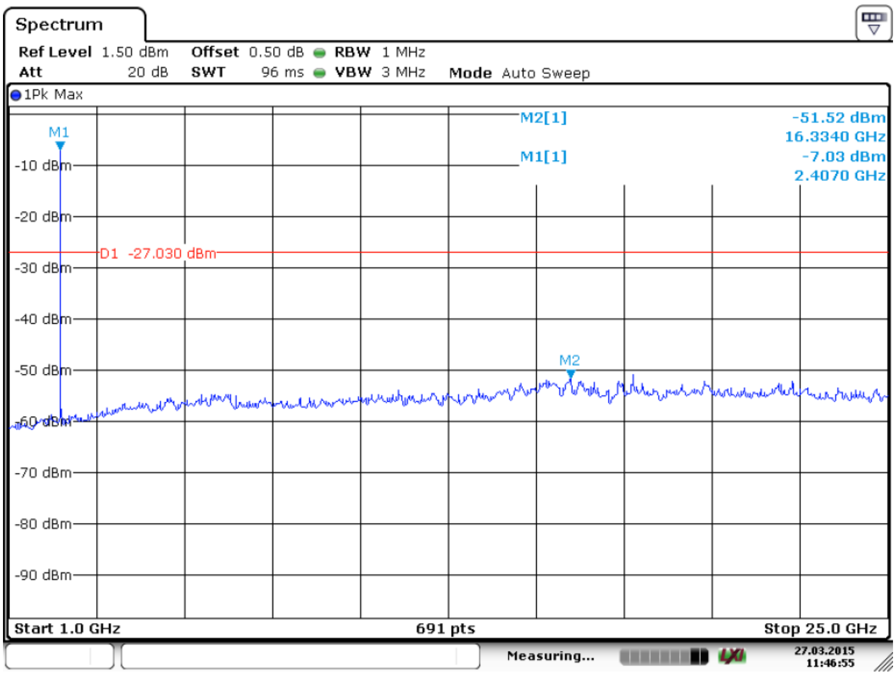

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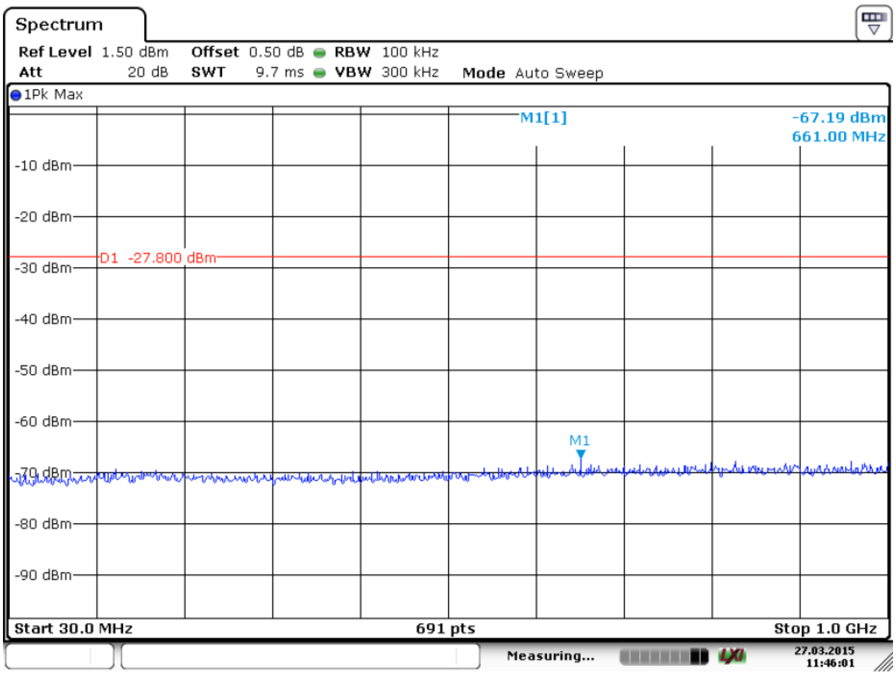
Spurious RF conducted emissions

2440MHz



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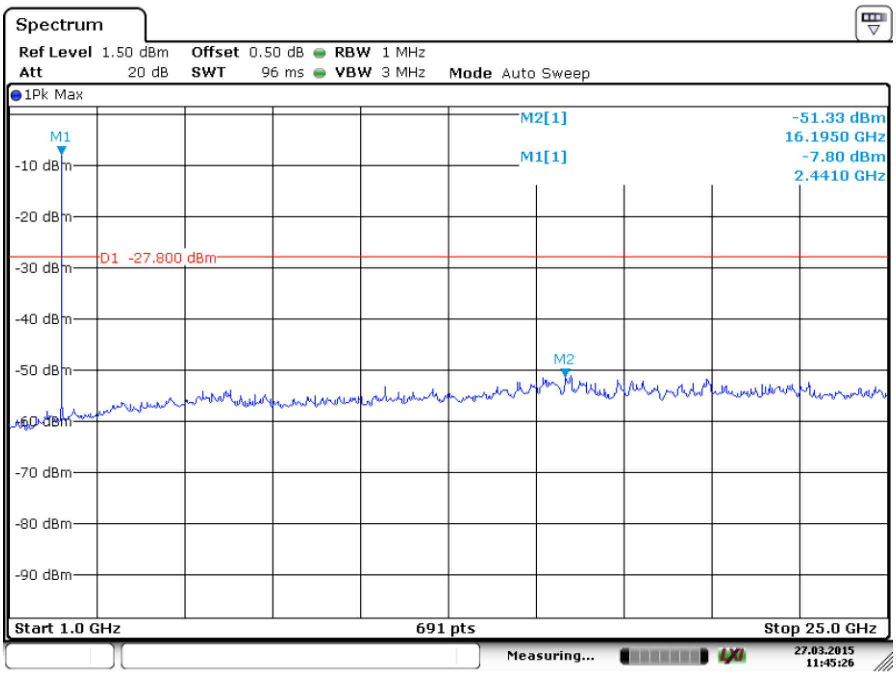

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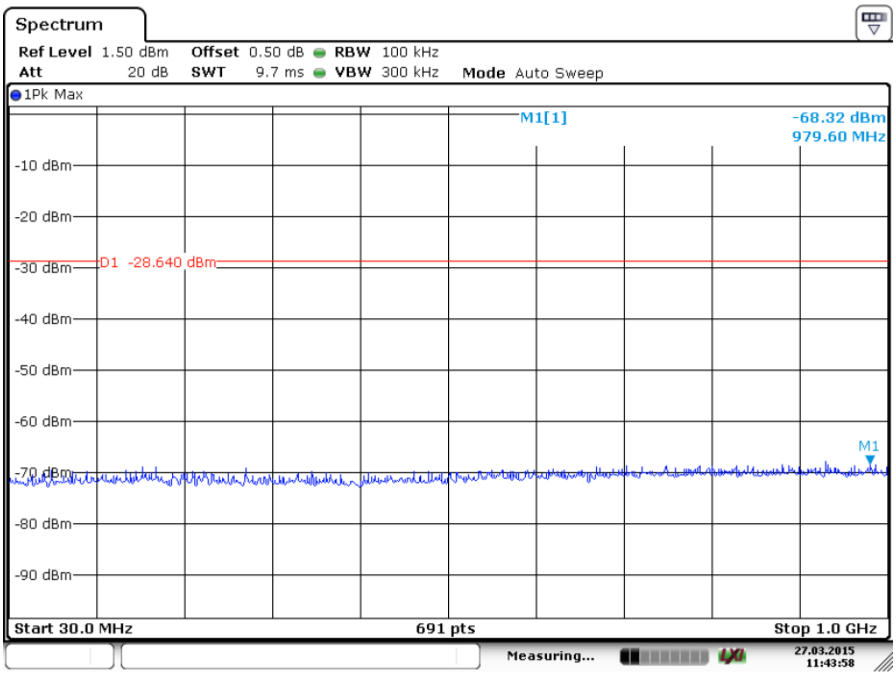
Spurious RF conducted emissions

2480MHz



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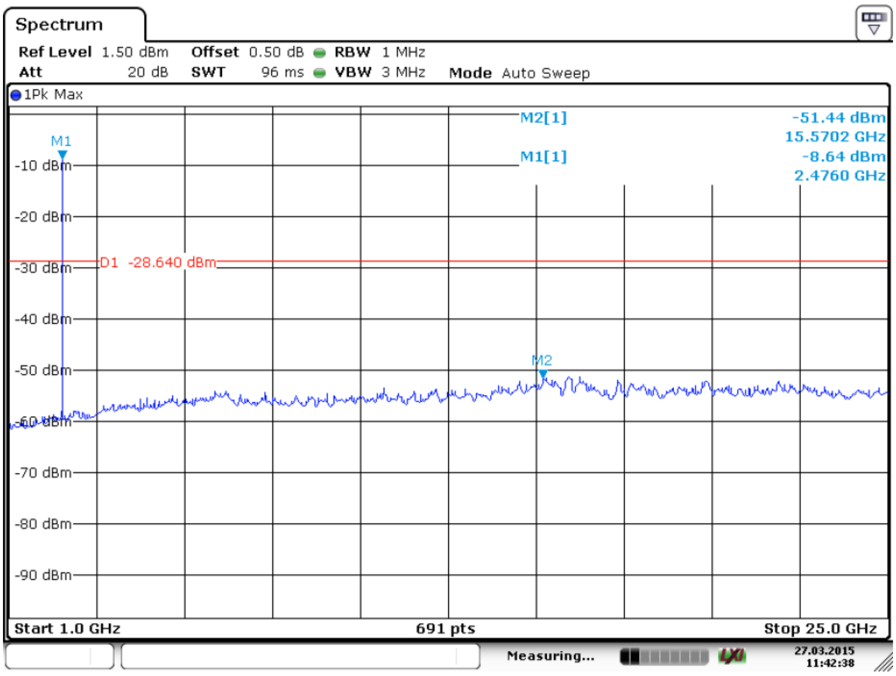

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9.5 Band edge testing

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≥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

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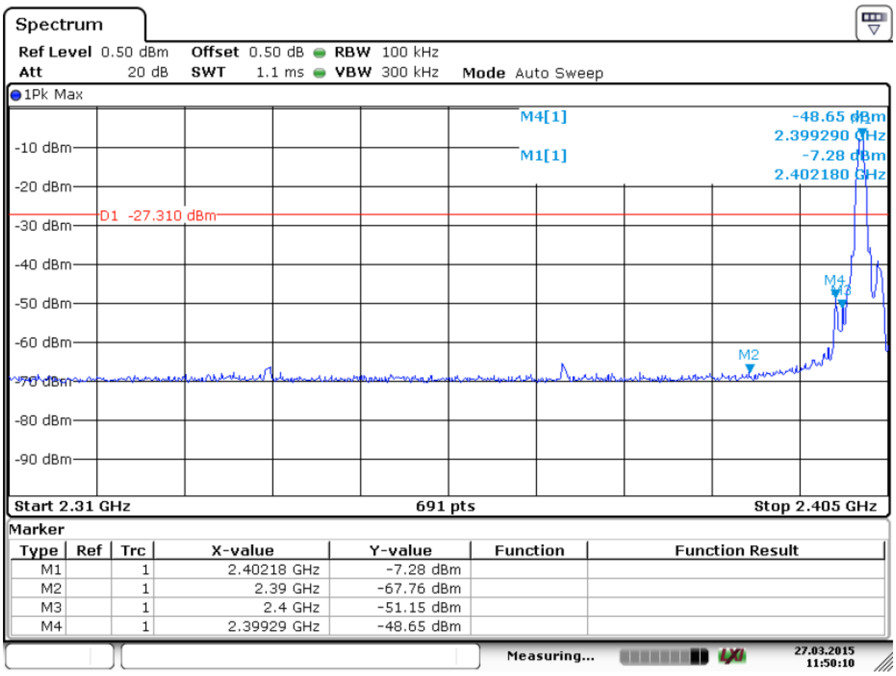
Band edge testing



Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.40218 GHz	-7.28 dBm		
M2		1	2.39 GHz	-67.76 dBm		
M3		1	2.4 GHz	-51.15 dBm		
M4		1	2.39929 GHz	-48.65 dBm		

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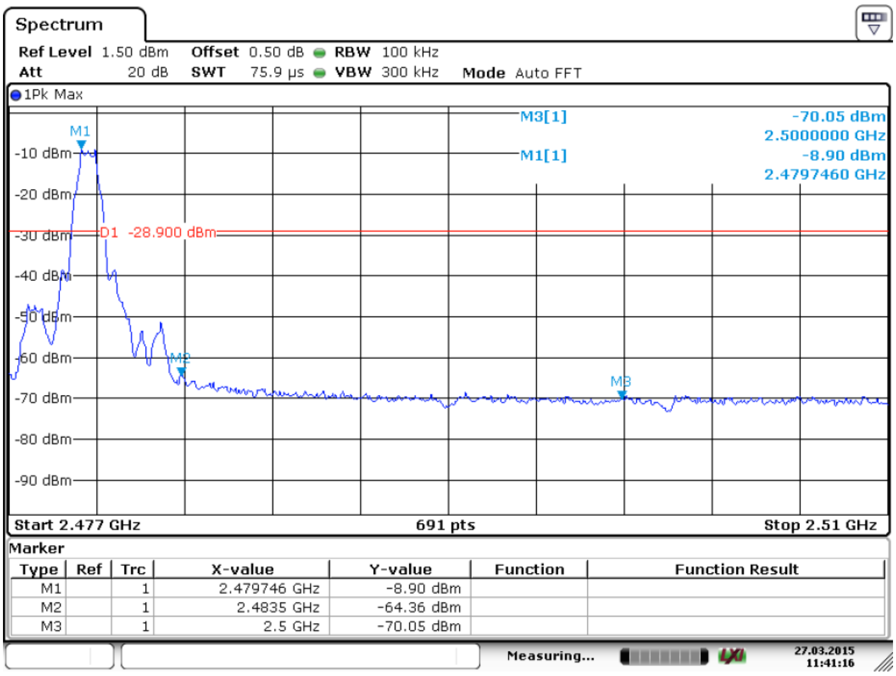

Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.479746 GHz	-8.90 dBm		
M2		1	2.4835 GHz	-64.36 dBm		
M3		1	2.5 GHz	-70.05 dBm		

Date: 27.MAR.2015 11:41:16

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 ≥ 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 uV/m**	**Field Strength dBμV/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

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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	
CE	Test Receiver	Rohde & Schwarz	ESHS10	838693/001	Nov.04, 15	☒
	L.I.S.N.#1	Rohde & Schwarz	ESH2-Z5	834066/011	Nov.04, 15	☒
	L.I.S.N.#3	Kyoritsu	KNW-242C	8-1920-1	May.07, 15	☐
	RF Cable	3D-2W	Fujikura	LISN Cable 1#	May.07, 15	☒
	Coaxial Switch	MP59B	Anritsu	M55367	May.07, 15	☒
	Passive Probe	ESH2-Z3	Rohde & Schwarz	299.7810.52	May.07, 15	☐
	Pulse Limiter	ESH3-Z2	Rohde & Schwarz	100341	May.07, 15	☐
C	Spectrum	Agilent	E4446A	US44300459	May.08, 15	☒
RE < 1 GHz	Test Receiver <1GHz	Rohde & Schwarz	ESVS10	834468/011	May.07, 15	☒
	Amplifier < 1 GHz	HP	8447D	2648A04738	May.07, 15	☒
	HF Cable	Hubersuhne	Sucoflex104	Room 2	May.08, 15	☒
	Bilog Antenna	Schaffner	CBL6111C	2598	Oct.25, 15	☒
RE > 1 GHz	Spectrum > 1GHz	Agilent	E4446A	US44300459	May.08, 15	☒
	Horn Antenna	EMCO	3115	9607-4877	Jun. 24, 15	☒
	Amp > 1 Ghz	HP	8449B	3008A08495	May.08, 15	☒
	HF Cable	Hubersuhne	Sucoflex104	Room1	May.08, 15	☒

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

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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
Radiated spurious emission	4.32dB (30MHz-1GHz) 2.27dB (1GHz -25GHz)
Conducted spurious emission	2.10dB(30MHz-25GHz)
Bandwidth test	$1*10^{-9}$
Conducted emission	2.4dB

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