



EMC TEST REPORT

Applicant Alcatel-Lucent Shanghai Bell Co., Ltd.
FCC ID 2ADZRXS250WXAB
Product XGSPON ONU
Brand NOKIA
Model XS-250WX-A/XS-240W-A
Report No. RBA1709-0095EMC03R1
Issue Date January 2, 2018

TA Technology (Shanghai) Co., Ltd. tested the above equipment in accordance with the requirements in **FCC Code CFR47 Part15B (2017)/ ANSI C63.4 (2014)**. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

Wei Liu

Guangchang Fan

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Approved by: Guangchang Fan/ Director

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Summary of measurement results

Number	Test Case	Clause in FCC Rules	Conclusion
1	Radiated Emission	15.109, ANSI C63.4-2014	PASS
2	Conducted Emission	15.107, ANSI C63.4-2014	PASS
Date of Testing: September 21, 2017~ October 17, 2017			

1 Test Laboratory

1.1 Notes of the Test Report

This report shall not be reproduced in full or partial, without the written approval of **TA technology (shanghai) co., Ltd.** The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. Measurement Uncertainties were not taken into account and are published for informational purposes only. This report is written to support regulatory compliance of the applicable standards stated above. This report must not be used by the client to claim product certification, approval, or endorsement any government agencies.

1.2 Test facility

CNAS (accreditation number: L2264)

TA Technology (Shanghai) Co., Ltd. has obtained the accreditation of China National Accreditation Service for Conformity Assessment (CNAS).

FCC (Designation number: CN1179, Test Firm Registration Number: 446626)

TA Technology (Shanghai) Co., Ltd. has been listed on the US Federal Communications Commission list of test facilities recognized to perform electromagnetic emissions measurements.

IC (recognition number is 8510A)

TA Technology (Shanghai) Co., Ltd. has been listed by industry Canada to perform electromagnetic emission measurement.

VCCI (recognition number is C-4595, T-2154, R-4113, G-10766)

TA Technology (Shanghai) Co., Ltd. has been listed by industry Japan to perform electromagnetic emission measurement.

A2LA (Certificate Number: 3857.01)

TA Technology (Shanghai) Co., Ltd. has been listed by American Association for Laboratory Accreditation to perform electromagnetic emission measurement.



1.3 Testing Location

Company: TA Technology (Shanghai) Co., Ltd.
Address: No.145, Jintang Rd, Tangzhen Industry Park, Pudong Shanghai, China
City: Shanghai
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Country: P. R. China
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E-mail: xukai@ta-shanghai.com

2 General Description of Equipment under Test

2.1 Client Information

Applicant	Alcatel-Lucent Shanghai Bell CO. Ltd.
Applicant address	388-389#, Ningqiao Road, Pudong Jinqiao, Shanghai, P.R. China
Manufacturer	Alcatel-Lucent Shanghai Bell CO. Ltd.
Manufacturer address	388-389#, Ningqiao Road, Pudong Jinqiao, Shanghai, P.R. China

2.2 General information

EUT Description	
Device Type:	Portable Device
Product Name:	XGSPON ONU
Model Number:	XS-250WX-A/XS-240W-A
SN:	/
HW Version:	3FE 48307 AA /3FE 48631 AA
SW Version:	3FE47059
Antenna Type:	Internal Antenna
Test Mode:	Transfer Data Mode
EUT Accessory	
Adapter	Manufacturer: DELTA electronics, INC. Model: ADP-66CR BC
Auxiliary test equipment	
PC	PC Manufacturer: Dell Model: E5450 (SN : P48G001)
Remark: The information of the EUT is declared by the manufacturer.	



XS-250WX-A	XS-240W-A
With 10GE port	Without 10GE port
Note: Customer declaration, two models is the same except 10GE port. During the test, both of two models are evaluated, XS-250WX-A selected as the worst condition, but only the worst case is recorded in this report.	

	Model	ONU Part number	Kit Part number
US ONU	XS-250WX-A	3FE 48307 AA	-
US Kit	XS-250WX-A	3FE 48307 AA	3FE 48439 AA
US ONU	XS-240W-A	3FE 48631 AA	-
US Kit	XS-240W-A	3FE 48631 AA	3FE 48626 AA



2.3 Applied Standards

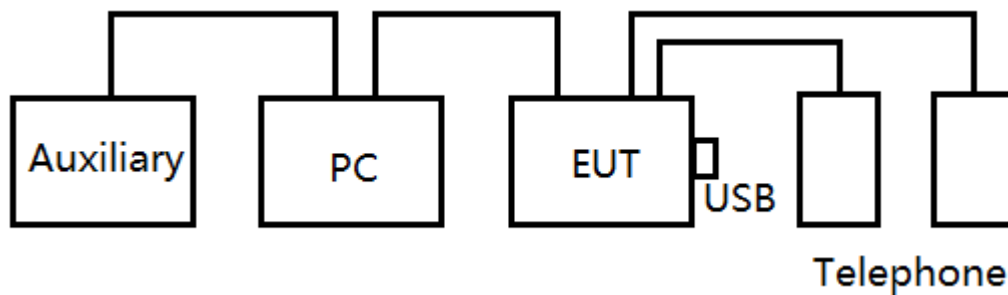
According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

Test standards

FCC Code CFR47 Part15B (2017)

ANSI C63.4 (2014)

2.4 Test Configuration



3 Test Case Results

3.1 Radiated Emission

Ambient condition

Temperature	Relative humidity	Pressure
24°C~26°C	45%~50%	102.5kPa

Methods of Measurement

The EUT is placed on a non-metallic table 0.8m above the horizontal metal reference ground plane. The distance between EUT and receive antenna should be 3 meters. During the test, the EUT was operating in its typical mode. The test method is according to ANSI C63.4-2014. Sweep the whole frequency band through the range from 30MHz to the 5th harmonic of the carrier. During the test, the height of receive antenna shall be moved from 1 to 4 meters, and the antenna shall be performed under horizontal and vertical polarization. The turn table shall be rotated from 0 to 360 degrees for detecting the maximum of radiated signal level.

The data of cable loss and antenna factor has been calibrated in full testing frequency range before the testing. During the test, the EUT is worked at maximum output power.

Set the spectrum analyzer in the following:

Below 1GHz:

RBW=100 kHz / VBW=300 kHz / Sweep=AUTO

Above 1GHz:

(a) PEAK: RBW=1MHz / VBW=3MHz/ Sweep=AUTO

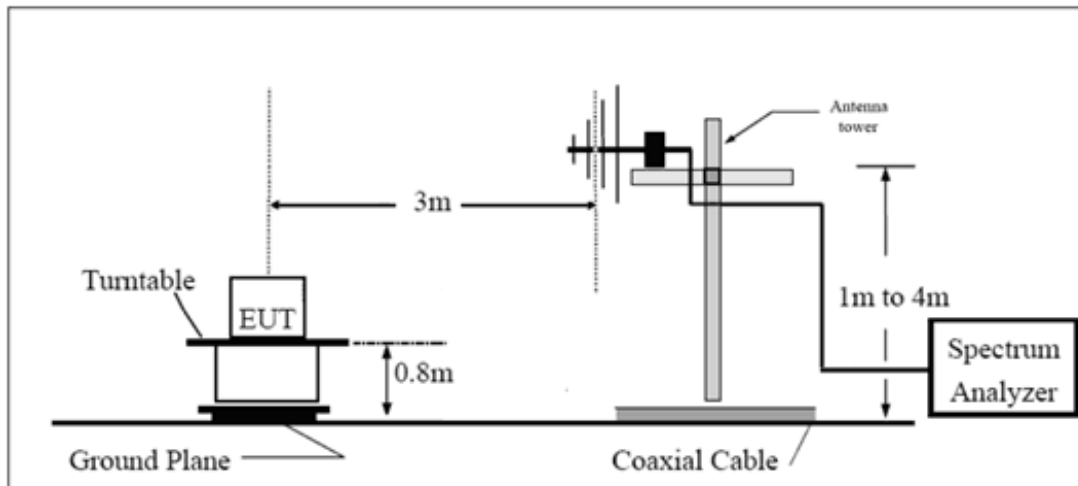
(b) AVERAGE: RBW=1MHz / VBW=3MHz / Sweep=AUTO

The radiated emission was measured in the following position: EUT stand-up position (Z axis), lie-down position (X, Y axis). The worst emission was found in stand-up position (Z axis) and the worst case was recorded.

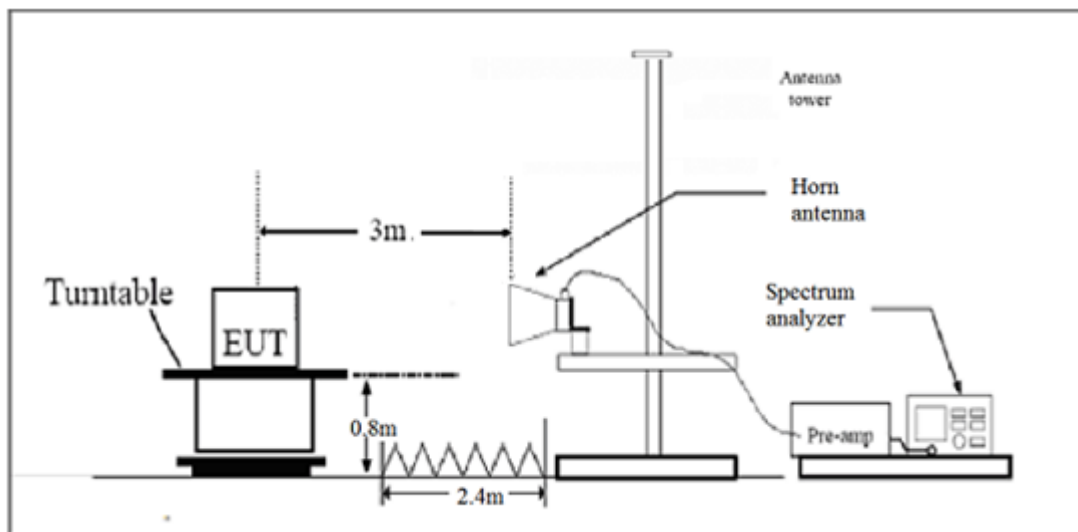
During the test, EUT is connected to a laptop via a USB cable in the case of Transfer Data mode. The EUT is used as the peripheral equipment of the PC and telephone. The data is transferred from EUT to PC; PC is connected to server via a long LAN cable.

Test Setup

Below 1GHz



Above 1GHz



Note: Area side: 2.4mX3.6m

Antenna Tower meets ANSI C63.4 requirements for measurements above 1 GHz by keeping the antenna aimed at the EUT during the antenna's ascent/ descent along the antenna mast.

Limits

Frequency (MHz)	Field Strength (dB μ V/m)	Detector
30 -88	40.0	Quasi-peak
88-216	43.5	Quasi-peak
216 – 960	46.0	Quasi-peak
960-1000	54.0	Quasi-peak
1000-5 th harmonic of the highest frequency or 40GHz, which is lower	54 74	Average Peak

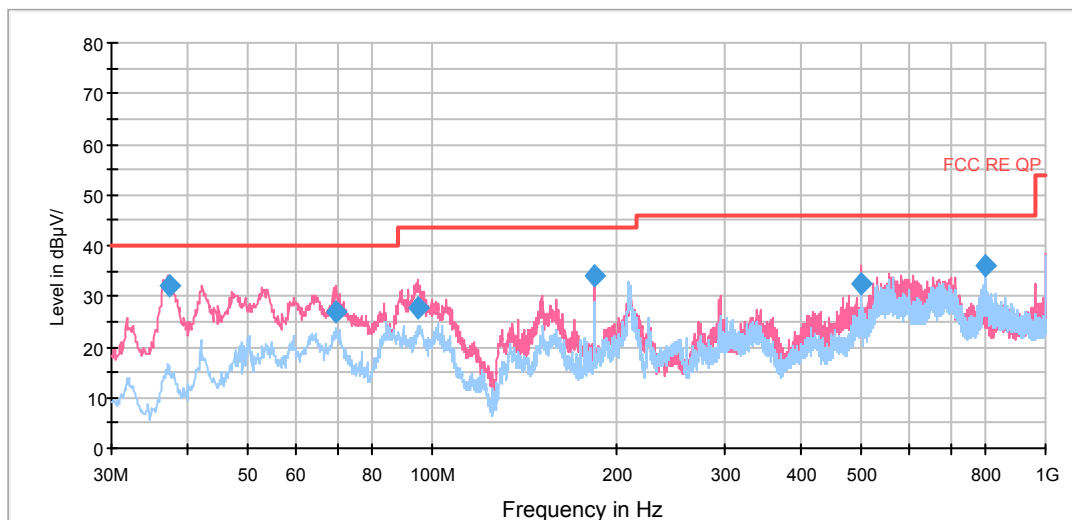
Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor $k = 1.96$. $U = 3.92$ dB.

Test Results

The following graphs display the maximum values of horizontal and vertical by software.
For above 1GHz, Blue trace uses the peak detection, Green trace uses the average detection.

RE 0.03-1GHz QP Class B

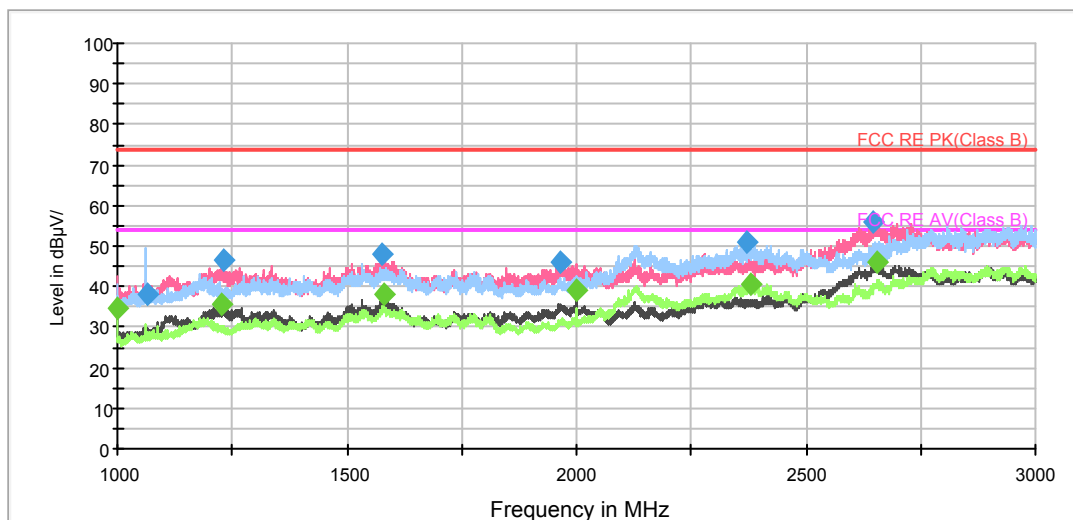


Radiated Emission from 30MHz to 1GHz

Frequency (MHz)	Quasi-Peak (dBuV/m)	Reading value (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
37.255000	32.0	54.0	102.0	V	336.0	-22.0	8.0	40.0
69.831250	27.1	53.7	102.0	V	49.0	-26.6	12.9	40.0
94.686250	27.8	53.4	102.0	V	22.0	-25.6	15.7	43.5
184.250000	33.9	61.5	177.0	V	1.0	-27.6	9.6	43.5
499.985000	32.4	51.4	102.0	V	18.0	-19.0	13.6	46.0
799.998750	36.2	51.0	102.0	H	332.0	-14.8	9.8	46.0

- Remark: 1. Quasi-Peak = Reading value + Correction factor
2. Correction Factor = Antenna factor+ Insertion loss(cable loss+amplifier gain)
3. Margin = Limit – Quasi-Peak

RE 1G-3GHz PK+AV

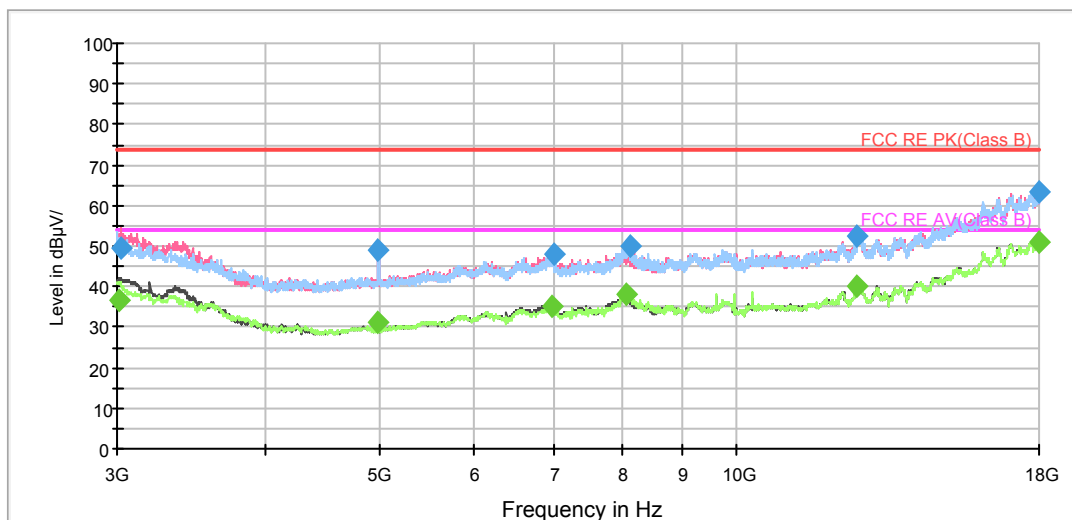


Radiated Emission from 1GHz to 3GHz

Frequency (MHz)	Peak (dBuV/m)	Reading value (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
1064.606250	38.2	47.6	102.0	H	236.0	-9.4	35.8	74
1229.777500	46.6	55.1	102.0	V	346.0	-8.5	27.4	74
1577.923750	48.0	55.7	102.0	V	334.0	-7.7	26.0	74
1965.577500	46.1	51.6	202.0	V	0.0	-5.5	27.9	74
2370.242500	51.0	54.7	202.0	H	322.0	-3.7	23.0	74
2646.113750	56.1	58.3	102.0	V	0.0	-2.2	17.9	74

Frequency (MHz)	Average (dBuV/m)	Reading value (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
1000.028750	34.6	44.2	102.0	H	322.0	-9.6	19.4	54
1229.076250	35.9	44.4	102.0	V	346.0	-8.5	18.1	54
1581.607500	38.3	46.0	102.0	V	334.0	-7.7	15.7	54
1999.911250	39.0	44.6	202.0	V	0.0	-5.6	15.0	54
2378.462500	40.8	44.5	202.0	H	322.0	-3.7	13.2	54
2655.372500	45.9	48.1	102.0	V	0.0	-2.2	8.1	54

RE 3-18GHz PK+AV



Radiated Emission from 3GHz to 18GHz

Frequency (MHz)	Peak (dBuV/m)	Reading value (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
3024.857500	49.4	52.6	103.0	V	45.0	-3.2	24.6	74
4985.446250	49.0	47.3	202.0	H	0.0	1.7	25.0	74
7012.300000	48.0	41.5	202.0	V	0.0	6.5	26.0	74
8116.182500	50.2	42.5	102.0	H	0.0	7.7	23.8	74
12639.722500	52.3	37.8	202.0	H	140.0	14.5	21.7	74
17984.673750	63.2	38.1	302.0	V	205.0	25.1	10.8	74

Frequency (MHz)	Average (dBuV/m)	Reading value (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
3016.147500	36.7	39.9	102.0	V	45.0	-3.2	17.3	54
4986.213750	31.4	29.7	202.0	H	0.0	1.7	22.6	54
6997.558750	35.3	28.8	102.0	V	340.0	6.5	18.7	54
8066.575000	38.0	30.4	102.0	H	0.0	7.6	16.0	54
12640.437500	40.0	25.5	202.0	V	0.0	14.5	14.0	54
17994.862656	51.0	25.7	400.0	H	0.0	25.3	3.0	54

3.2 Conducted Emission

Ambient condition

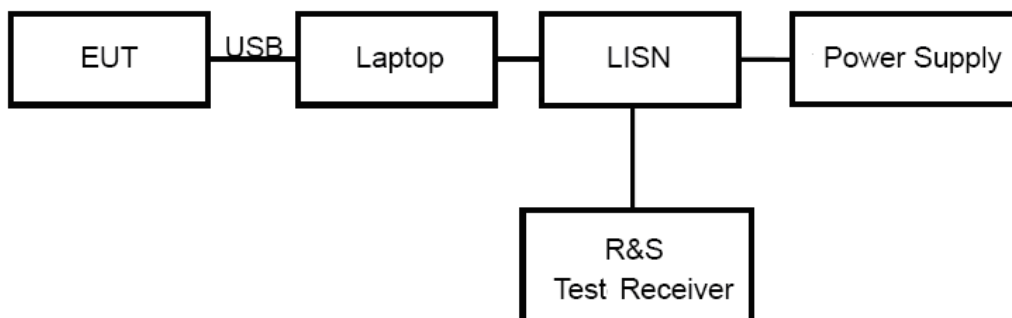
Temperature	Relative humidity	Pressure
24°C ~26°C	50%~55%	102.5kPa

Methods of Measurement

The EUT is placed on a non-metallic table of 80cm height above the horizontal metal reference ground plane. During the test, the EUT was operating in its typical mode. The test method is according to ANSI C63.4-2014. Connect the AC power line of the EUT to the L.I.S.N. Use EMI receiver to detect the average and Quasi-peak value. RBW is set to 9 kHz, VBW is set to 30kHz. The measurement result should include both L line and N line.

During the test, EUT is connected to a laptop via a USB cable in the case of Transfer Data mode. The EUT is used as the peripheral equipment of the PC and telephone. The data is transferred from EUT to PC; PC is connected to server via a long LAN cable.

Test Setup



Note: Power Supply is AC Power source and it is used to change the voltage 120V/60Hz.

Limits

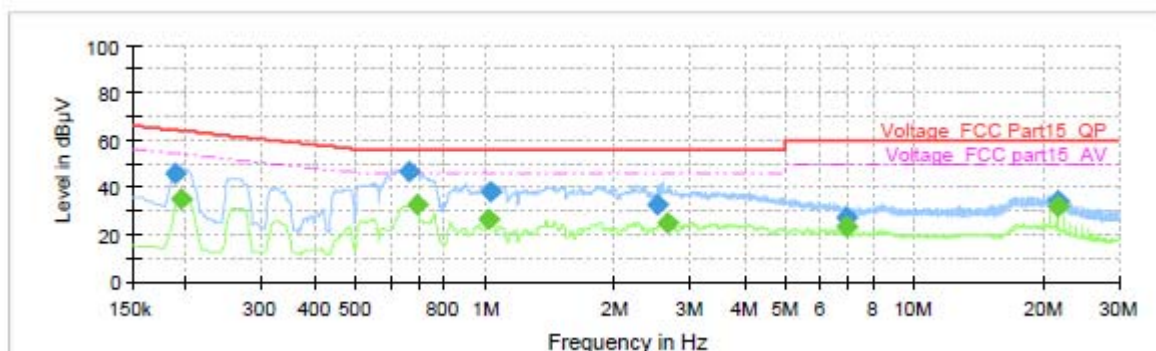
Frequency (MHz)	Conducted Limits(dBμV)	
	Quasi-peak	Average
0.15 - 0.5	66 to 56 *	56 to 46 *
0.5 - 5	56	46
5 - 30	60	50
*: Decreases with the logarithm of the frequency.		

Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor $k = 1.96$. $U = 2.69$ dB.

Test Results

Following plots, Blue trace uses the peak detection; Green trace uses the average detection.

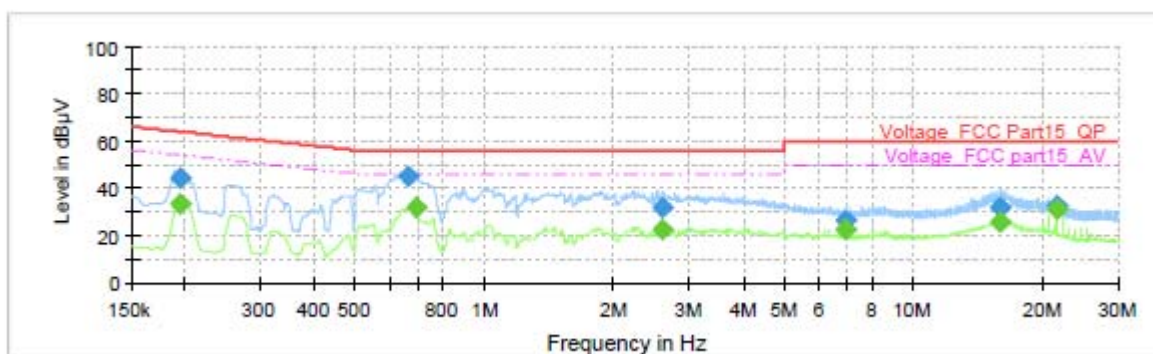


Final Result

Frequency (MHz)	QuasiPeak (dBμV)	Average (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.188250	45.71	---	64.11	18.40	1000.0	9.000	L1	ON	19.2
0.195000	---	35.25	53.82	18.57	1000.0	9.000	L1	ON	19.2
0.663000	46.13	---	56.00	9.87	1000.0	9.000	L1	ON	19.3
0.692250	---	32.49	46.00	13.51	1000.0	9.000	L1	ON	19.3
1.016250	---	26.18	46.00	19.82	1000.0	9.000	L1	ON	19.2
1.025250	37.85	---	56.00	18.15	1000.0	9.000	L1	ON	19.2
2.501250	32.42	---	56.00	23.58	1000.0	9.000	L1	ON	19.0
2.640750	---	24.50	46.00	21.50	1000.0	9.000	L1	ON	19.0
6.906750	---	22.98	50.00	27.02	1000.0	9.000	L1	ON	19.2
6.909000	27.13	---	60.00	32.87	1000.0	9.000	L1	ON	19.2
21.504750	---	31.71	50.00	18.29	1000.0	9.000	L1	ON	19.6
21.504750	33.99	---	60.00	26.01	1000.0	9.000	L1	ON	19.6

L line

Conducted Emission from 150 KHz to 30 MHz



Final Result

Frequency (MHz)	QuasiPeak (dBμV)	Average (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.195000	---	33.56	53.82	20.26	1000.0	9.000	N	ON	19.2
0.195000	44.16	---	63.82	19.66	1000.0	9.000	N	ON	19.2
0.660750	44.93	---	56.00	11.07	1000.0	9.000	N	ON	19.3
0.692250	---	31.67	46.00	14.33	1000.0	9.000	N	ON	19.3
2.584500	---	22.54	46.00	23.46	1000.0	9.000	N	ON	19.0
2.593500	31.82	---	56.00	24.18	1000.0	9.000	N	ON	19.0
6.909000	26.22	---	60.00	33.78	1000.0	9.000	N	ON	19.2
6.909000	---	22.47	50.00	27.53	1000.0	9.000	N	ON	19.2
15.852750	31.66	---	60.00	28.34	1000.0	9.000	N	ON	19.4
15.897750	---	25.61	50.00	24.39	1000.0	9.000	N	ON	19.4
21.504750	---	31.25	50.00	18.75	1000.0	9.000	N	ON	19.5
21.504750	32.94	---	60.00	27.06	1000.0	9.000	N	ON	19.5

N line

Conducted Emission from 150 KHz to 30 MHz

4 Main Test Instrument

Name	Manufacturer	Type	Serial Number	Last Cal.	Cal. Due Date
Signal Analyzer	R&S	FSV30	100815	2016-12-16	2017-12-15
EMI Test Receiver	R&S	ESCI	100948	2017-05-20	2018-05-19
Loop Antenna	SCHWARZBECK	FMZB1519	1519-047	2017-02-18	2019-02-17
Trilog Antenna	SCHWARZBECK	VULB 9163	9163-201	2014-12-06	2017-12-05
Horn Antenna	R&S	HF907	100126	2014-12-06	2017-12-05
Horn Antenna	ETS-Lindgren	3160-09	00102643	2015-01-30	2018-01-29
EMI Test Receiver	R&S	ESCS30	100138	2016-12-16	2017-12-15
LISN	R&S	ENV216	101171	2016-12-16	2019-12-15
Bore Sight Antenna mast	ETS	2171B	00058752	NA	NA

ANNEX A: The EUT Appearance and Test Configuration

A.1 EUT Appearance

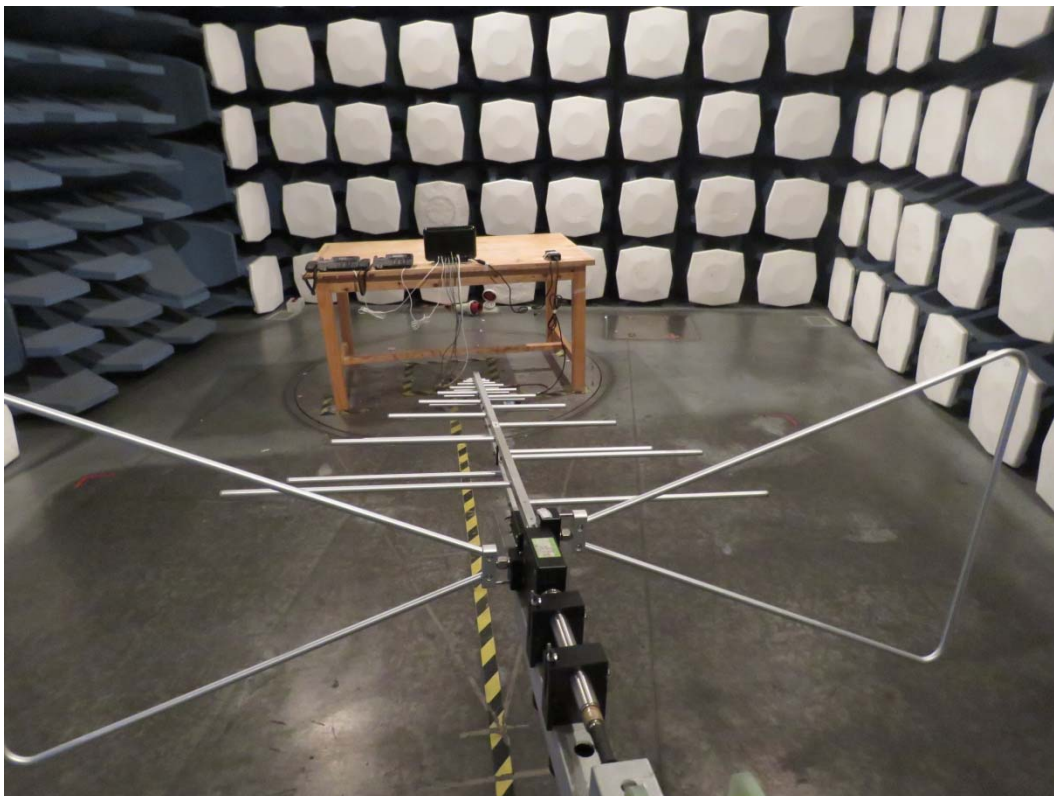


a: EUT

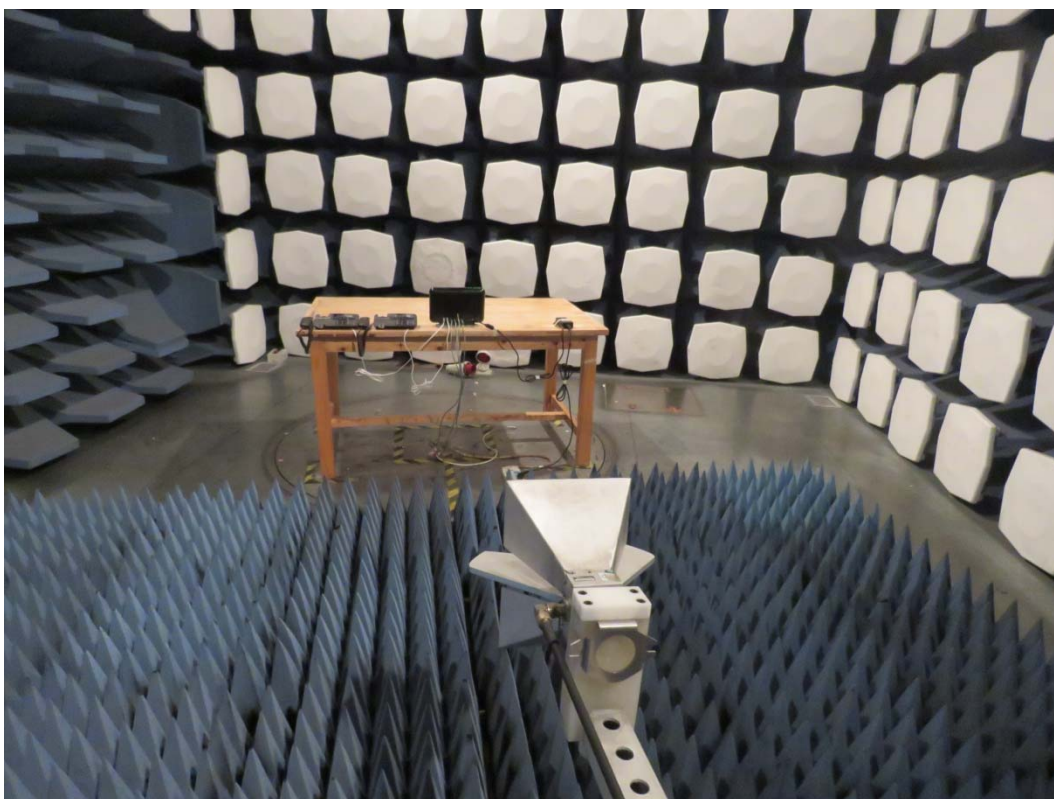


b: Adapter
Picture 1 EUT

A.2 Test Setup

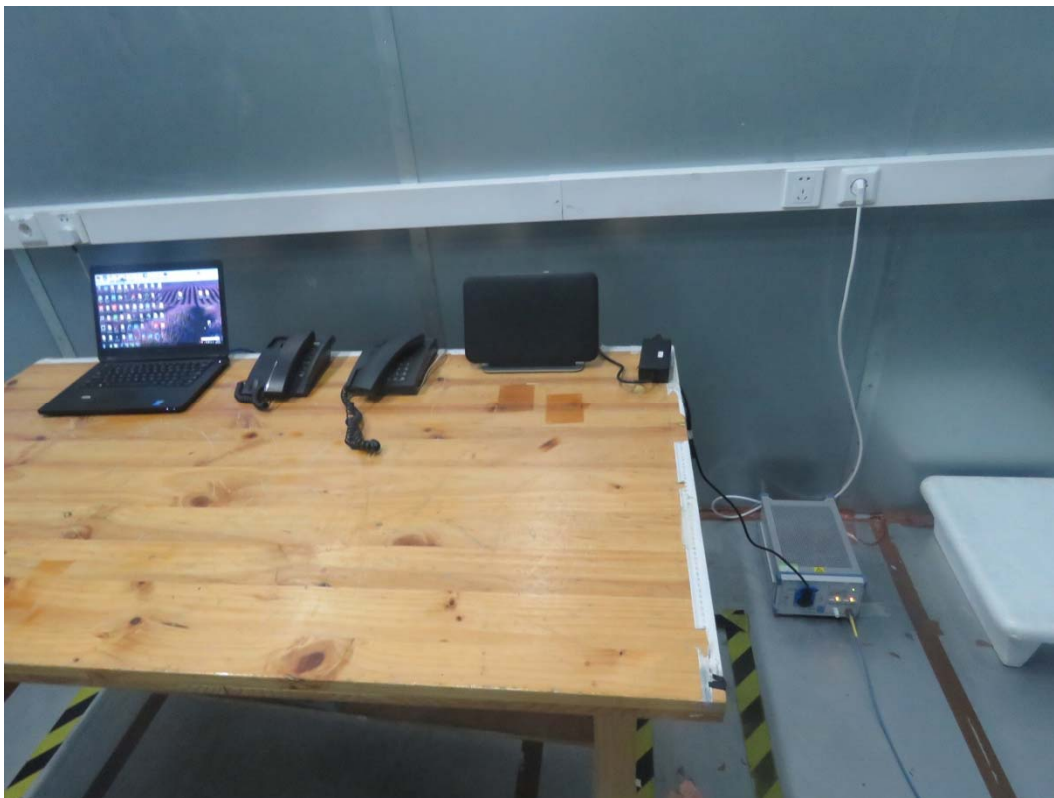


a: Below 1GHz



b: Above 1GHz

Picture 2 Radiated Emission Test Setup



Picture 3 Conducted Emission Test Setup

A.3 Auxiliary test equipment

