



# EMC TEST REPORT

**Applicant** ZTE Corporation  
**FCC ID** SRQ-WF820R  
**Product** Wi-Fi Router  
**Model** WF820+ Router  
**Report No.** RXA1707-0212EMC01R2  
**Issue Date** September 11, 2017

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*

*Performed by: Wei Liu/ Manager*

*Approved by: Guangchang Fan/ Director*

## TA Technology (Shanghai) Co., Ltd.

No.145, Jintang Rd, Tangzhen Industry Park, Pudong Shanghai, China

TEL: +86-021-50791141/2/3

FAX: +86-021-50791141/2/3-8000



## Table of Contents

1	Test Laboratory.....	4
1.1	Notes of the Test Report.....	4
1.2	Test facility.....	4
1.3	Testing Location.....	5
2	General Description of Equipment under Test.....	6
2.1	Client Information.....	6
2.2	General information.....	6
2.3	Applied Standards.....	7
2.4	Test Configuration.....	8
3	Test Case Results.....	9
3.1	Radiated Emission.....	9
3.2	Conducted Emission.....	15
4	Main Test Instrument.....	18
	ANNEX A: The EUT Appearance and Test Configuration.....	19
	A.1 EUT Appearance.....	19
	A.2 Test Setup.....	22



### 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: July 10, 2017 ~ July 18, 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  
Post code: 201201  
Country: P. R. China  
Contact: Xu Kai  
Telephone: +86-021-50791141/2/3  
Fax: +86-021-50791141/2/3-8000  
Website: <http://www.ta-shanghai.com>  
E-mail: [xukai@ta-shanghai.com](mailto:xukai@ta-shanghai.com)

## 2 General Description of Equipment under Test

### 2.1 Client Information

<b>Applicant</b>	ZTE Corporation
<b>Applicant address</b>	ZTE Plaza, Keji Road South, Hi-Tech, Industrial Park, Nanshan District, Shenzhen, Guangdong, P.R.China
<b>Manufacturer</b>	ZTE Corporation
<b>Manufacturer address</b>	ZTE Plaza, Keji Road South, Hi-Tech, Industrial Park, Nanshan District, Shenzhen, Guangdong, P.R.China

### 2.2 General information

EUT Description	
Device Type:	Movable equipment
Model Number:	WF820+ Router
S/N:	6453017220400020
HW Version:	V3.3
SW Version:	CLARO_PER_WF820+_V1.0.0B07
Antenna Type:	Internal Antenna
Telephone	Manufacturer: TCL Model: HCD868(79)TSD
Test Mode:	Transfer Mode
EUT Accessory	
Adapter 1	Manufacturer: AQUILSTAR PRECISION INDUSTRIAL (SHENZHEN) CO., LTD Model: ASSA53A-120150
Adapter 2	Manufacturer: RUIDE Model: RD1201500-C55-1MG
<p>Remark: The information of the EUT is declared by the manufacturer.</p> <p>2. There is more than one Adapter, each one should be applied throughout the compliance test respectively, however, only the worst case (Adapter 1) will be recorded in this report.</p>	



## 2.3 Applied Standards

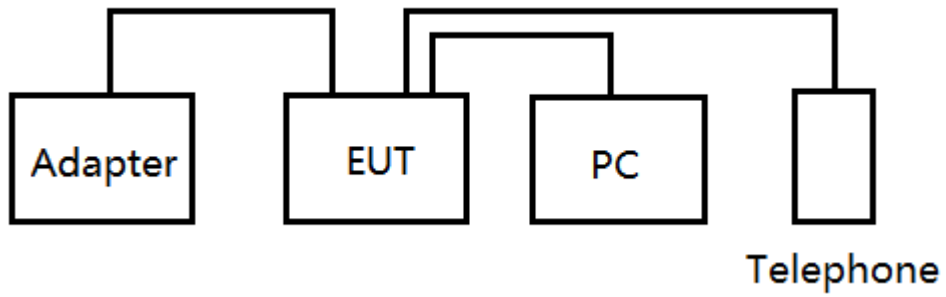
According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

### 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

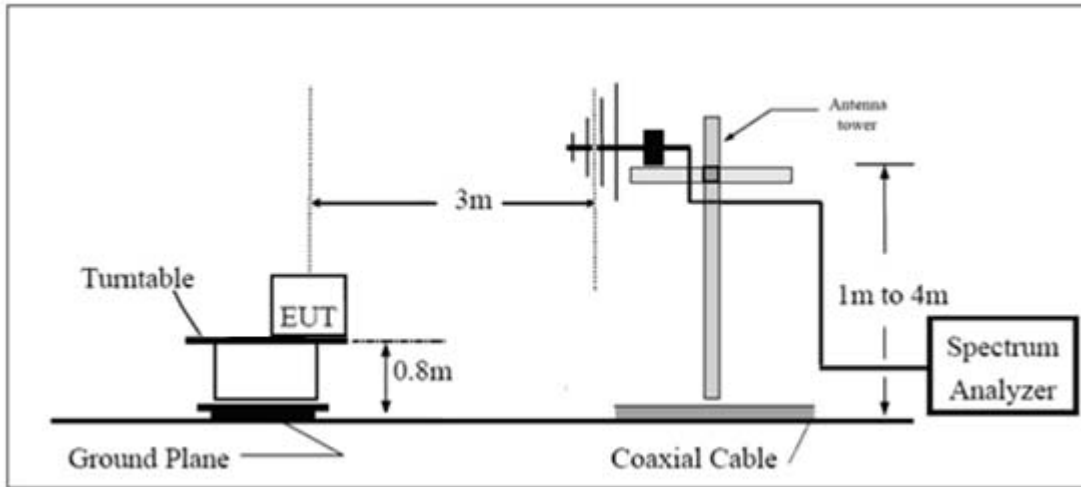
(b) AVERAGE: RBW=1MHz / VBW=3MHz / Sweep=AUTO

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.

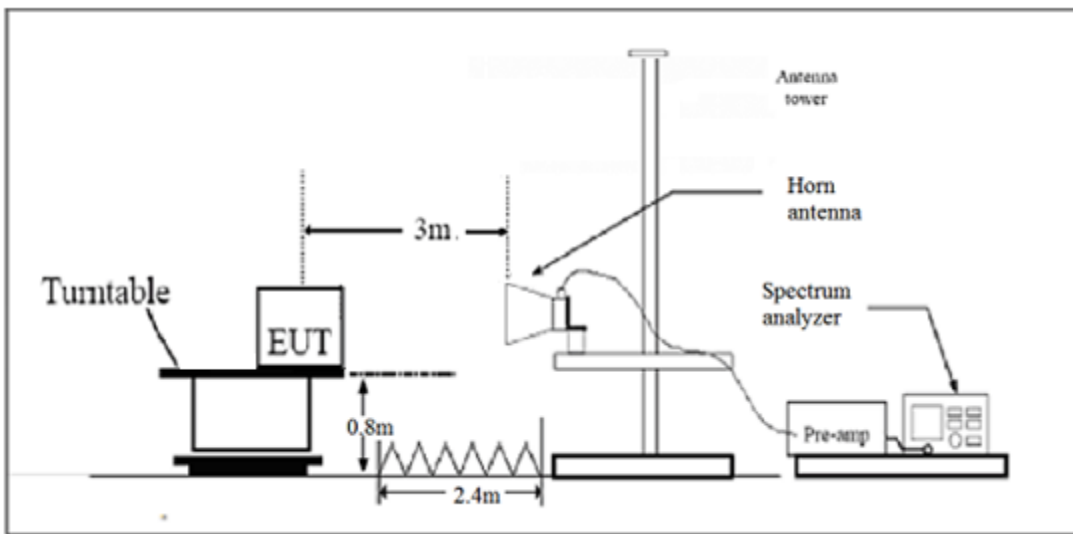
During the test, EUT is connected to a laptop via a USB cable in the case of Transfer Data mode. The EUT is used as the peripheral equipment of the PC and telephone. The data is transferred from EUT to PC; PC is connected to server via a long LAN cable.

**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**

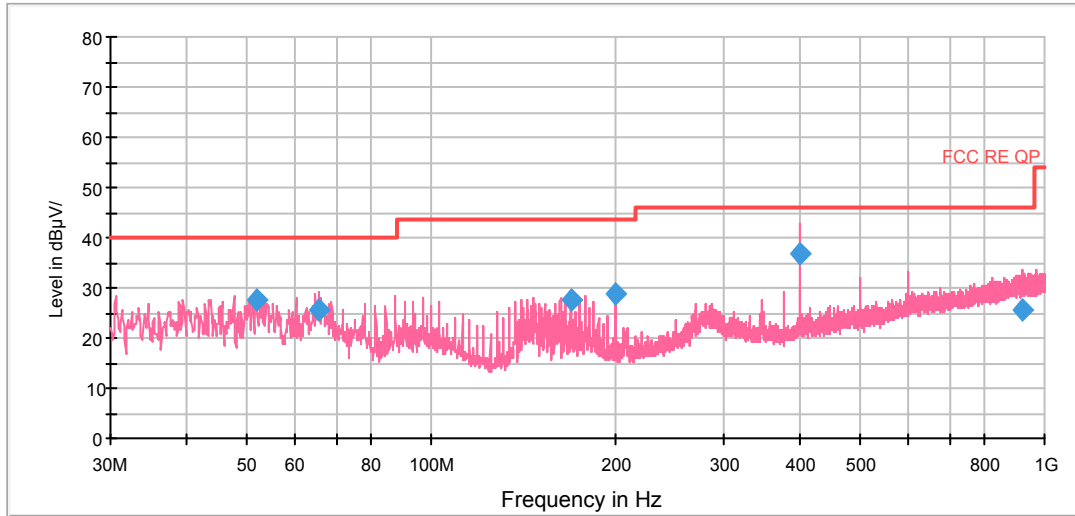
Frequency (MHz)	Field Strength (dB $\mu$ V/m)	Detector
30 -88	40.0	Quasi-peak
88-216	43.5	Quasi-peak
216 – 960	46.0	Quasi-peak
960-1000	54.0	Quasi-peak
1000-5 <sup>th</sup> harmonic of the highest frequency or 40GHz, which is lower	54 74	Average Peak

**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**

FCC RE 0.03-1GHz QP Class B

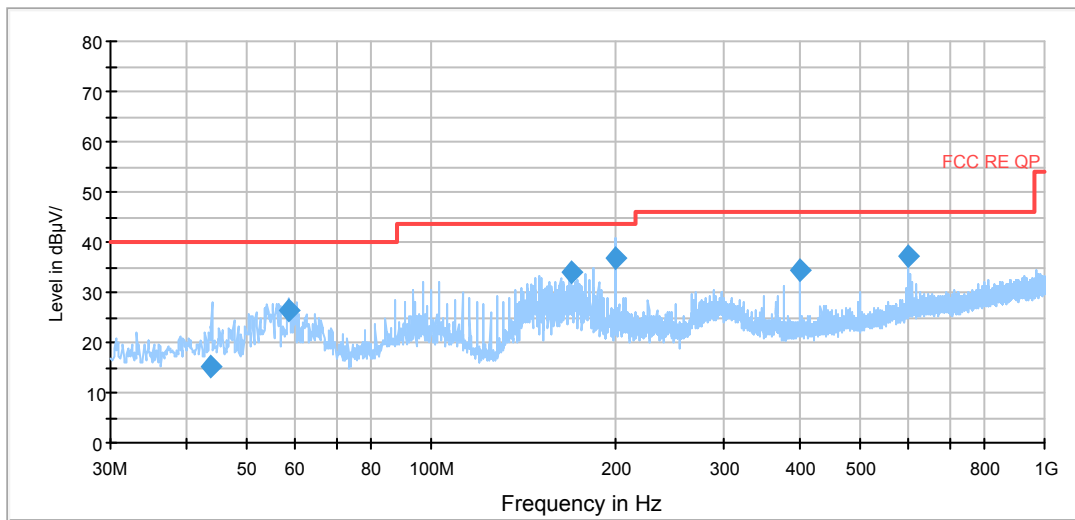


Radiated Emission from 30MHz to 1GHz\_Vertical

Frequency (MHz)	Quasi-Peak (dBuV/m)	Reading value (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
51.785000	27.4	14.3	101.0	V	90.0	13.1	12.6	40.0
65.647500	25.8	15.5	101.0	V	267.0	10.3	14.2	40.0
168.750000	27.8	17.6	203.0	V	0.0	10.2	15.7	43.5
199.991250	28.8	16.6	126.0	V	0.0	12.2	14.7	43.5
399.975000	36.8	18.4	126.0	V	10.0	18.4	9.2	46.0
917.110000	25.5	-1.5	175.0	V	78.0	27.0	20.5	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

FCC RE 0.03-1GHz QP Class B

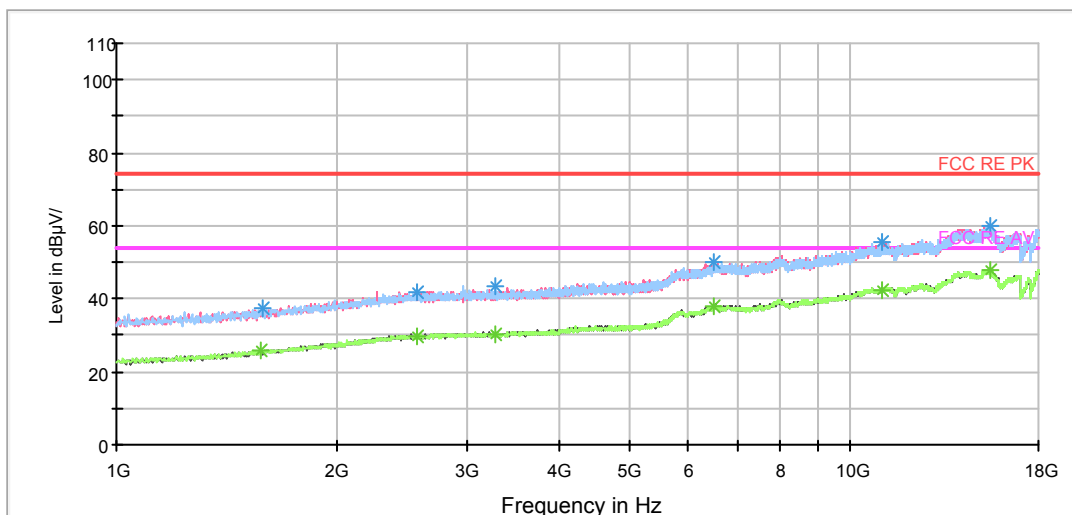


Radiated Emission from 30MHz to 1GHz\_ horizontal

Frequency (MHz)	Quasi-Peak (dBuV/m)	Reading value (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
43.783750	15.1	2.0	125.0	H	10.0	13.1	24.9	40.0
58.696250	26.4	13.7	225.0	H	0.0	12.7	13.6	40.0
168.750000	34.1	23.9	216.0	H	193.0	10.2	9.4	43.5
200.032500	36.6	24.6	175.0	H	34.0	12.0	6.9	43.5
399.975000	34.2	15.8	100.0	H	135.0	18.4	11.8	46.0
599.996250	37.1	14.2	100.0	H	320.0	22.9	8.9	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

FCC RE 1G-18GHz PK+AV Class B



Radiated Emission from 1GHz to 18GHz

Frequency (MHz)	Peak (dBuV/m)	Reading value (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
1578.000000	37.3	43.3	100.0	H	36.0	-6.0	36.7	74
2566.125000	42.1	42.9	100.0	V	334.0	-0.8	31.9	74
3280.125000	43.4	43.6	100.0	H	5.0	-0.2	30.6	74
6503.750000	49.8	42.5	100.0	H	0.0	7.3	24.2	74
11025.750000	55.3	42.1	100.0	V	280.0	13.2	18.7	74
15445.750000	59.8	41.4	100.0	H	255.0	18.4	14.2	74

Frequency (MHz)	Average (dBuV/m)	Reading value (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
1575.875000	25.8	31.8	100.0	V	280.0	-6.0	28.2	54
2566.125000	29.8	30.6	100.0	V	334.0	-0.8	24.2	54
3280.125000	30.1	30.3	100.0	H	5.0	-0.2	23.9	54
6501.625000	37.8	30.5	100.0	V	0.0	7.3	16.2	54
11025.750000	42.3	29.1	100.0	V	280.0	13.2	11.7	54
15447.875000	47.7	29.3	100.0	V	302.0	18.4	6.3	54

### 3.2 Conducted Emission

#### Ambient condition

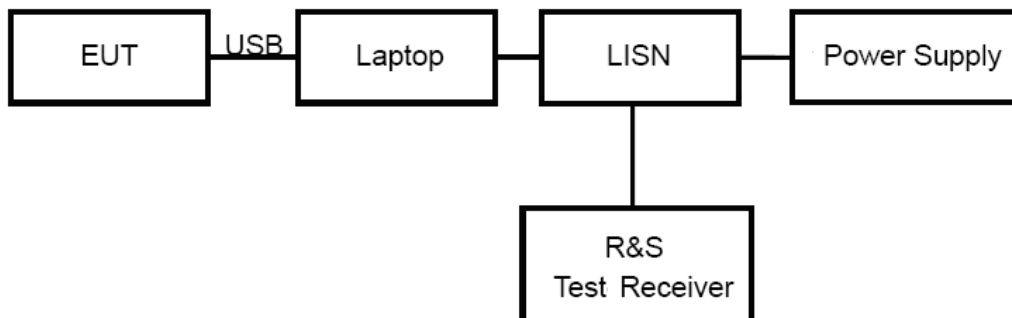
Temperature	Relative humidity	Pressure
24°C ~26°C	50%~55%	102.5kPa

#### 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

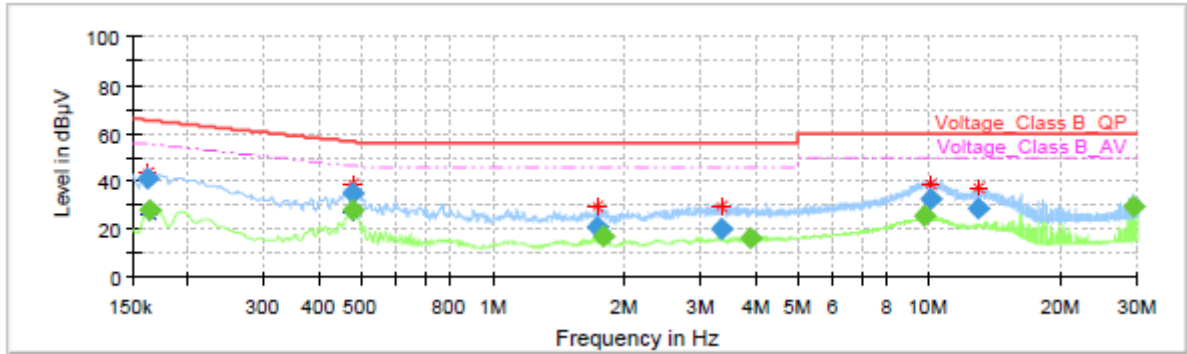
\*: Decreases with the logarithm of the frequency.

#### 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.



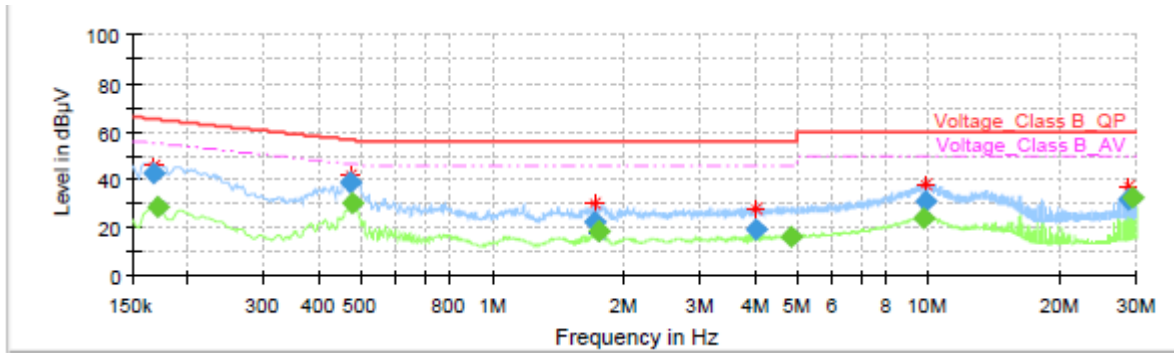
**Final Result**

Frequency (MHz)	QuasiPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.161250	40.72	---	65.40	24.67	1000.0	9.000	L1	ON	19.1
0.163500	---	28.11	55.28	27.17	1000.0	9.000	L1	ON	19.1
0.476250	35.15	---	56.40	21.25	1000.0	9.000	L1	ON	19.2
0.478500	---	27.85	46.37	18.52	1000.0	9.000	L1	ON	19.2
1.736250	20.97	---	56.00	35.03	1000.0	9.000	L1	ON	19.2
1.783500	---	17.02	46.00	28.98	1000.0	9.000	L1	ON	19.2
3.322500	20.28	---	56.00	35.72	1000.0	9.000	L1	ON	19.1
3.882750	---	16.23	46.00	29.77	1000.0	9.000	L1	ON	19.0
9.753000	---	25.27	50.00	24.73	1000.0	9.000	L1	ON	19.4
10.052250	32.86	---	60.00	27.14	1000.0	9.000	L1	ON	19.4
12.914250	28.87	---	60.00	31.13	1000.0	9.000	L1	ON	19.5
29.235750	---	29.69	50.00	20.31	1000.0	9.000	L1	ON	19.8

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)
0.168000	42.55	---	65.06	22.51	1000.0	9.000	N	ON	19.2
0.170250	---	28.64	54.95	26.31	1000.0	9.000	N	ON	19.2
0.471750	38.97	---	56.48	17.52	1000.0	9.000	N	ON	19.2
0.476250	---	30.23	46.40	16.17	1000.0	9.000	N	ON	19.2
1.722750	22.20	---	56.00	33.80	1000.0	9.000	N	ON	19.2
1.752000	---	18.32	46.00	27.68	1000.0	9.000	N	ON	19.2
3.999750	19.29	---	56.00	36.71	1000.0	9.000	N	ON	19.0
4.857000	---	16.37	46.00	29.63	1000.0	9.000	N	ON	19.1
9.726000	---	24.34	50.00	25.66	1000.0	9.000	N	ON	19.4
9.804750	31.12	---	60.00	28.88	1000.0	9.000	N	ON	19.4
28.684500	32.17	---	60.00	27.83	1000.0	9.000	N	ON	19.7
29.235750	---	32.30	50.00	17.70	1000.0	9.000	N	ON	19.7

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

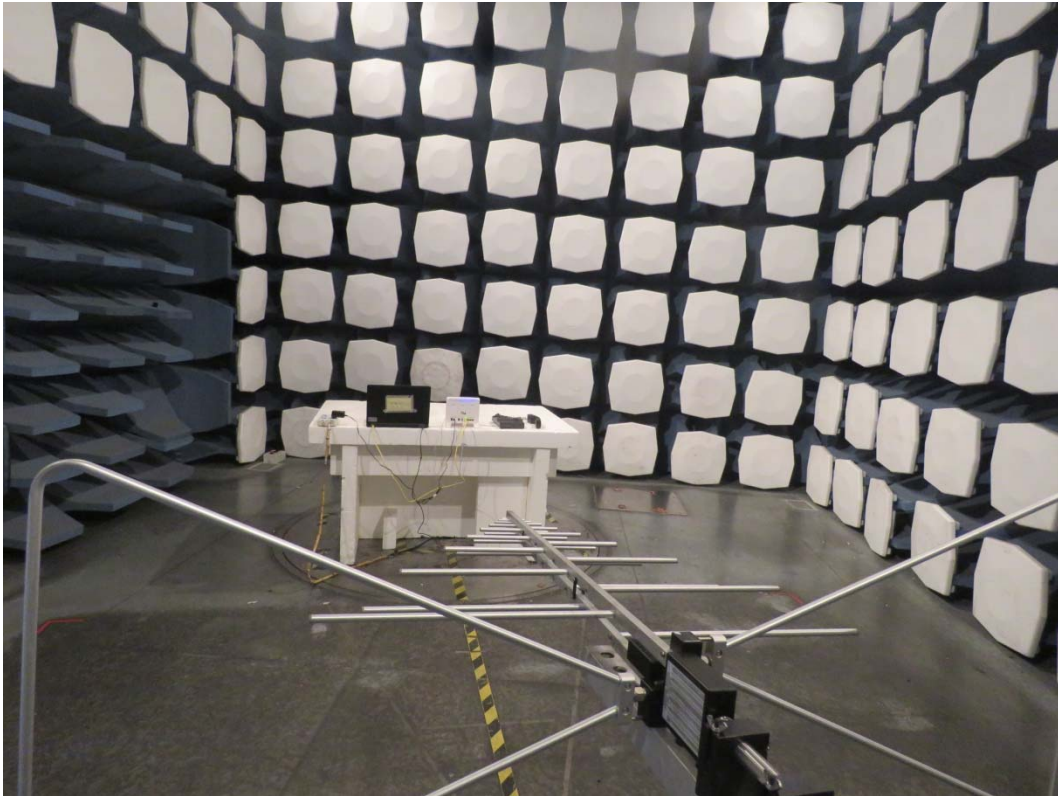


Adapter 1

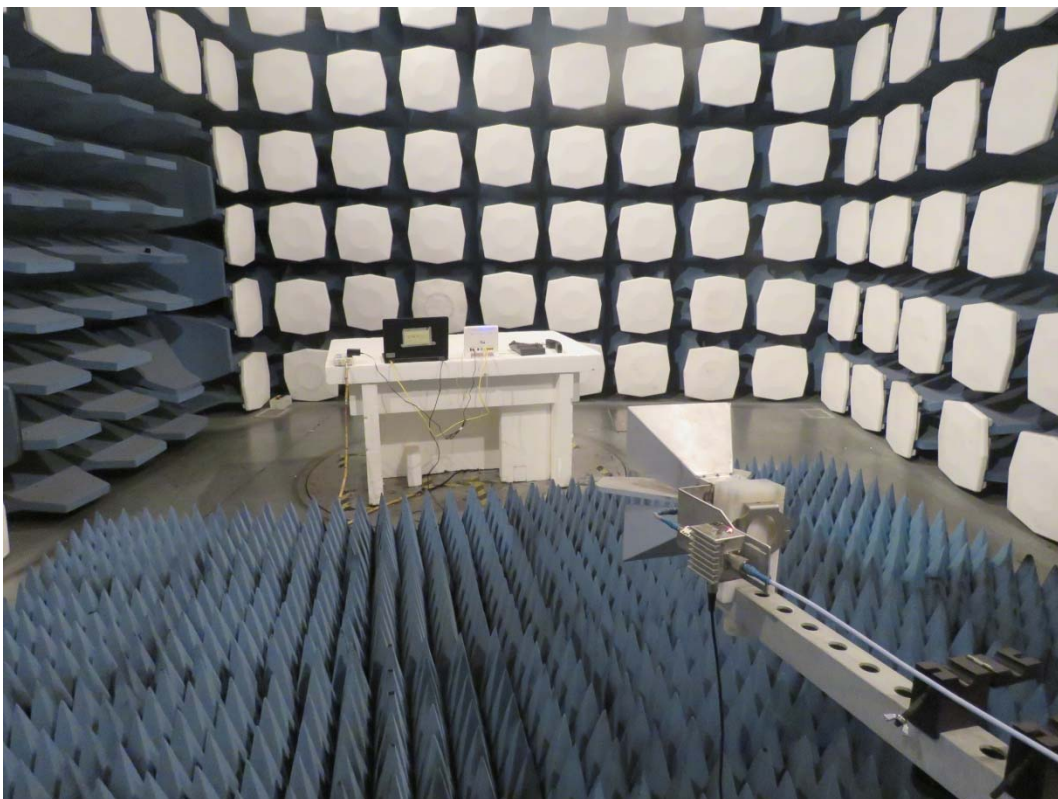


Adapter 2  
b: Adapter  
Picture 1 EUT

## A.2 Test Setup



Below 1GHz



Above 1GHz

**Picture 2 Radiated Emission Test Setup**



Picture 3 Conducted Emission Test Setup