EMC TEST REPORT

Applicant	MOBIWIRE MOBILES (NINGBO) CO.,LTD
FCC ID	WS5DFB0210
Product	Bar phone
Brand	Doro
Model	DFB-0210
Report No.	R1805A0263-E2
Issue Date	June 14, 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

Performed by: Wei Liu/ Manager

Guangchang Fan

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

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
Test Date: March 29, 2018 ~ April 18, 2018			

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.

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

2 General Description of Equipment under Test

2.1 Client Information

Applicant	MOBIWIRE MOBILES (NINGBO) CO.,LTD
Applicant address	No.999,Dacheng East Road,Fenghua City,Zhejiang Province，China
Manufacturer	Doro AB
Manufacturer address	Doro AB Magistratsvägen 10，SE-22643 Lund，Sweden

2.2 General information

EUT Description			
Device Type:	Portable		
Model Number:	DFB-0210		
IMEI:	356877090003626		
HW Version:	V00(HW code:1011/1021)		
SW Version:	1370_UL231_N_S01A_V01_M180313_SMP		
Antenna Type:	Internal Antenna		
Frequency:	Band	TX:	RX:
	GSM1900:	1850MHz ~ 1910MHz	1930MHz ~ 1990MHz
	Bluetooth:	2400MHz ~ 2483.5MHz	2400MHz ~ 2483.5MHz
Modulation:	GSM: GMSK GPRS: GMSK Bluetooth: GFSK, π/4-DQPSK, 8-DPSK		
Test Mode:	Transfer Data Mode		
EUT Accessory			
Adapter 1	Manufacturer: DONGGUAN AOHAI POWER TECHNOLOGY CO.,LTD Model: A31–500550		
Adapter 2	Manufacturer: TEN PAO INDUSTRIAL CO.,LTD Model: S003ATB0500055		
Adapter 3	Manufacturer: DONGGUAN AOHAI POWER TECHNOLOGY CO.,LTD Model: A806A-050100U-UK		
Adapter 4	Manufacturer: DONGGUAN AOHAI POWER TECHNOLOGY CO.,LTD Model: A2-501000		
Adapter 5	Manufacturer: DONGGUAN AOHAI POWER TECHNOLOGY CO.,LTD		

	Model: A31A-050055U-EU1
Charging Cradle	Manufacturer: MOBIWIRE MOBILES (NINGBO) CO.,LTD Model: DFB-0210
Battery 1	Manufacturer: Ningbo Veken Battery Co., Ltd Model: DBO-1000A(Halogen Free)
Battery 2	Manufacturer: Ningbo Veken Battery Co., Ltd Model: DBO-1000A(Non Halogen Free)
Earphone 1	Manufacturer: Huizhou Juwei Electronics Co.,Ltd Model: JWEP0944-M01R
Earphone 2	Manufacturer: Shenzhen Juwei Electronics Co.,Ltd Model: JWEP0782-M01
USB Cable	Manufacturer: Fukangyuan Model: M039B0800150
Auxiliary test equipment	
PC	PC Manufacturer: Dell Model: E5430 (SN : R98M9 A02)
Note: The information of the EUT is declared by the manufacturer.	

Item	Configure 1	Configure 2
Memory	1st source Memory	2nd source Memory
HW code	1011	1021
Supplier	GD	GD
Model name	GD25LQ128CWIG	GD25LQ128CVIG
Note: Customer declaration, two configures is the same, except for Memory. There are more than one Configure, each one should be applied throughout the compliance test respectively, however, only the worst case (Configure 1) will be recorded in this report.		

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 Mode

Test Mode	
Mode 1:	Adapter + USB cable+ earphone + Camera On + MP3 +Idle
Mode 2:	Adapter + USB cable+ earphone + MP3 +Idle
Mode 3:	Adapter + USB cable+ earphone +Idle
Mode 4:	Adapter + USB cable +Idle
Mode 5:	USB Copy(EUT with PC) + USB cable + earphone + Camera On + MP3 +Idle
Mode 6:	Camera On +earphone +Idle
Mode 7:	Earphone+MP3+Idle
Mode 8:	Earphone +Idle

During the test, the preliminary test was performed in all modes (Camera/MP3) with all frequency bands (GSM/BT), mode 5 (USB Copy + USB cable +earphone + Camera On + MP3+Idle) selected as the worst condition. The test data of the worst-case condition was recorded in this report.

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

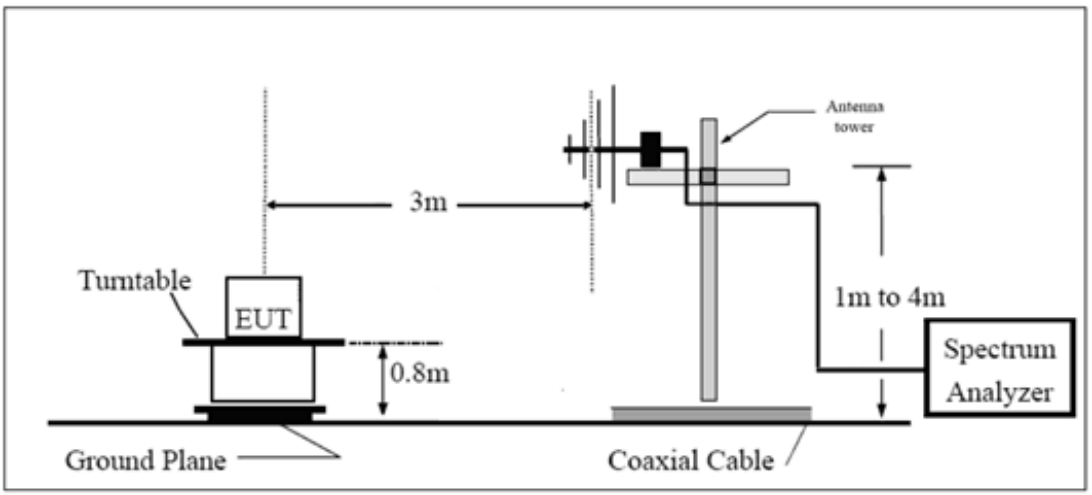
The EUT is placed on a non-metallic table 0.8m above the horizontal metal reference ground plane. The distance between EUT and receive antenna should be 3 meters. During the test, the EUT was operating in its typical mode. The test method is according to ANSI C63.4-2014. Sweep the whole frequency band 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=1Hz / 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 lie-down position (X axis) and the worst case was recorded.

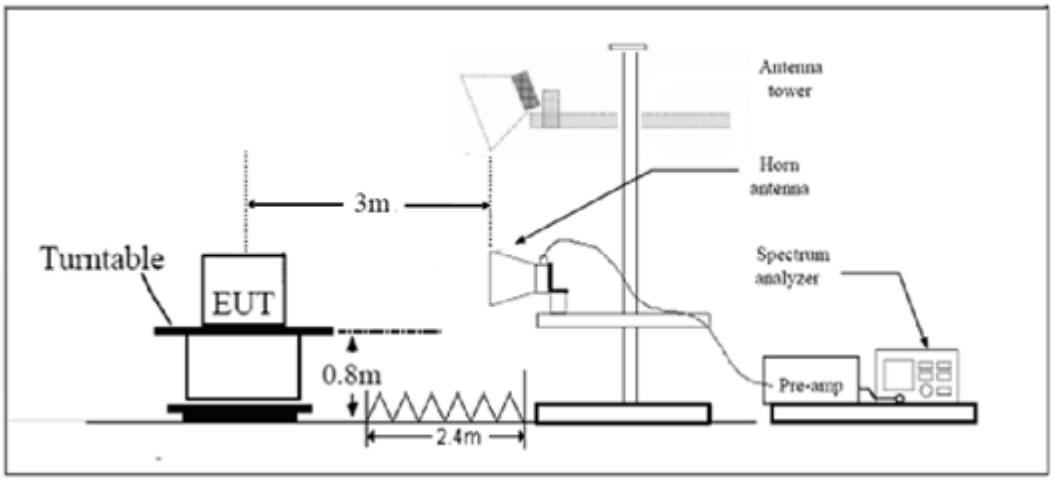
During the test, EUT is connected to a laptop via a USB cable in the case of Transfer Data mode. The EUT is used as the peripheral equipment of the PC. The data is transferred from EUT to PC; PC is connected to server via a long LAN cable.

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 (dBμV/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
1000-5th harmonic of the highest frequency or 40GHz,which is lower	54 74	Average Peak

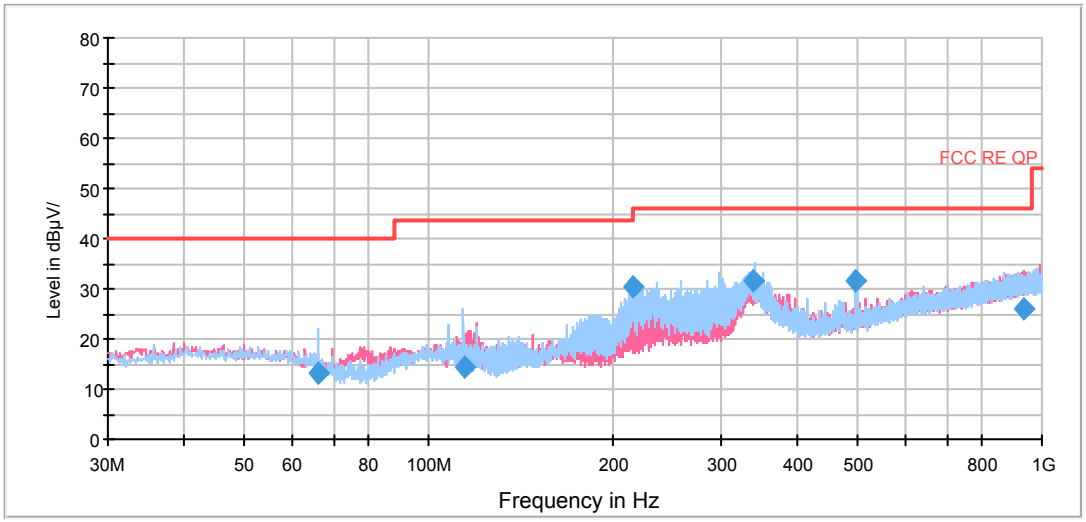
Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor *k* = 1.96. U= 3.704 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.

FCC RE 0.03-1GHz QP Class B



Radiated Emission from 30MHz to 1GHz

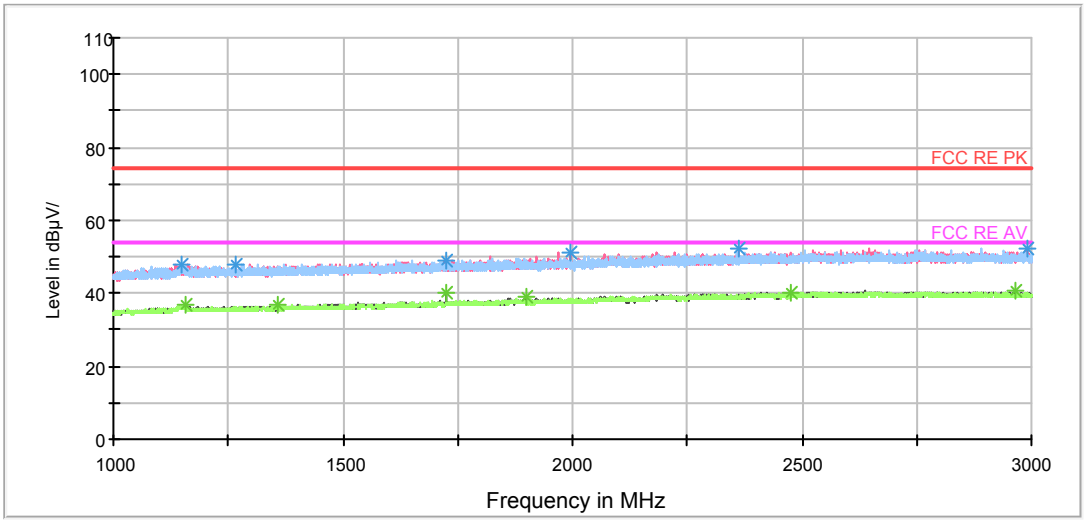
Frequency (MHz)	Quasi-Peak (dBuV/m)	Reading value (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
66.051250	13.1	2.8	225.0	H	22.0	10.3	26.9	40.0
114.226250	14.6	3.0	225.0	H	10.0	11.6	28.9	43.5
215.997500	30.6	17.7	125.0	H	103.0	12.9	12.9	43.5
339.592500	31.6	15.2	100.0	H	240.0	16.4	14.4	46.0
497.906250	31.4	10.8	175.0	H	97.0	20.6	14.6	46.0
937.960000	26.2	-0.9	100.0	V	278.0	27.1	19.8	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

FCC RE 1G-3GHz PK+AV Class B



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)
1149.500000	47.8	45.5	200.0	H	359.0	2.3	26.2	74
1264.250000	48.1	45.5	200.0	H	92.0	2.6	25.9	74
1725.500000	49.1	44.9	100.0	V	134.0	4.2	24.9	74
1994.750000	51.1	45.9	100.0	V	296.0	5.2	22.9	74
2364.000000	52.0	45.3	200.0	V	0.0	6.7	22.0	74
2992.500000	52.4	44.8	100.0	V	29.0	7.6	21.6	74

Frequency (MHz)	Average (dBuV/m)	Reading value (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
1157.500000	36.6	34.3	200.0	H	0.0	2.3	17.4	54
1358.250000	37.0	34.1	200.0	V	345.0	2.9	17.0	54
1724.750000	40.3	36.1	100.0	V	148.0	4.2	13.7	54
1898.000000	39.0	34.2	100.0	V	60.0	4.8	15.0	54
2474.000000	40.1	33.0	200.0	H	339.0	7.1	13.9	54
2965.250000	40.5	33.0	200.0	V	0.0	7.5	13.5	54

3.2 Conducted Emission

Ambient condition

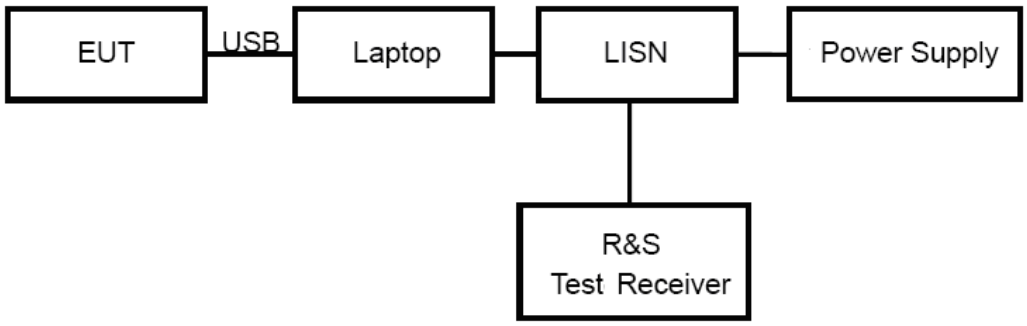
Temperature	Relative humidity	Pressure
24°C ~26°C	50%~55%	102.5kPa

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. 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

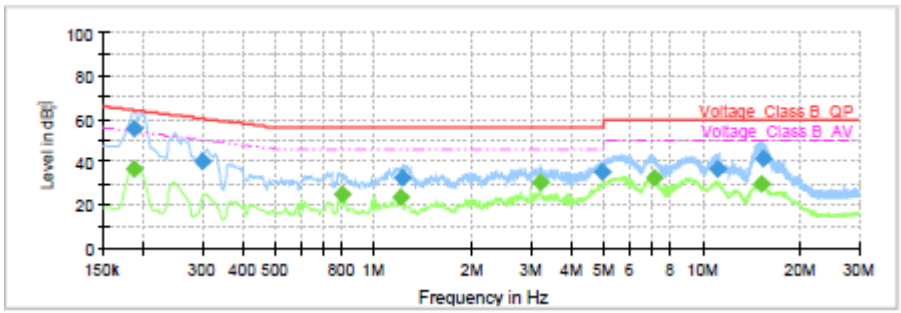
Frequency (MHz)	Conducted Limits(dBμV)	
	Quasi-peak	Average
0.15 - 0.5	66 to 56 *	56 to 46 *
0.5 - 5	56	46
5 - 30	60	50
*: Decreases with the logarithm of the frequency.		

Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor *k* = 1.96. U= 2.57 dB.

Test Results

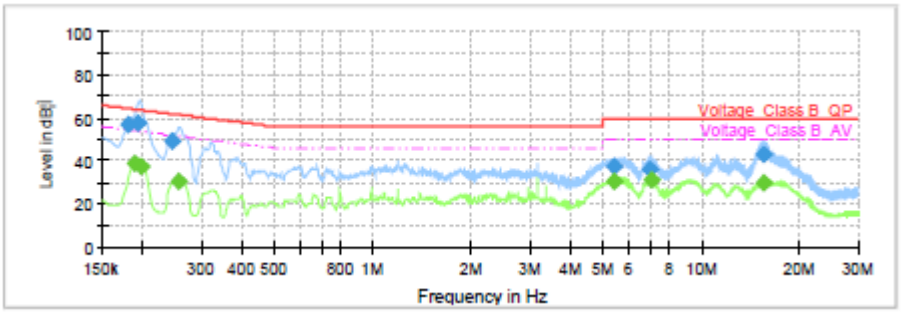
Following plots, Blue trace uses the peak detection; Green trace uses the average detection.



Frequency (MHz)	QuasiPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Filter
0.186000	---	36.80	54.21	17.42	1000.0	9.000	L1	ON
0.186000	55.45	---	64.21	8.77	1000.0	9.000	L1	ON
0.300750	40.58	---	60.22	19.64	1000.0	9.000	L1	ON
0.802500	---	24.84	46.00	21.16	1000.0	9.000	L1	ON
1.203000	---	23.49	46.00	22.51	1000.0	9.000	L1	ON
1.221000	32.77	---	56.00	23.23	1000.0	9.000	L1	ON
3.207750	---	30.75	46.00	15.25	1000.0	9.000	L1	ON
4.944750	35.65	---	56.00	20.35	1000.0	9.000	L1	ON
7.118250	---	32.34	50.00	17.66	1000.0	9.000	L1	ON
11.184000	36.66	---	60.00	23.34	1000.0	9.000	L1	ON
15.162000	---	29.66	50.00	20.34	1000.0	9.000	L1	ON
15.312750	41.87	---	60.00	18.13	1000.0	9.000	L1	ON

L line

Conducted Emission from 150 KHz to 30 MHz



Frequency (MHz)	QuasiPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Filter
0.179250	57.21	---	64.52	7.31	1000.0	9.000	N	ON
0.188250	---	38.80	54.11	15.31	1000.0	9.000	N	ON
0.192750	57.76	---	63.92	6.16	1000.0	9.000	N	ON
0.197250	---	37.16	53.73	16.56	1000.0	9.000	N	ON
0.244500	49.55	---	61.94	12.40	1000.0	9.000	N	ON
0.255750	---	30.80	51.57	20.77	1000.0	9.000	N	ON
5.406000	---	30.67	50.00	19.33	1000.0	9.000	N	ON
5.419500	37.73	---	60.00	22.27	1000.0	9.000	N	ON
6.990000	36.41	---	60.00	23.59	1000.0	9.000	N	ON
7.057500	---	31.53	50.00	18.47	1000.0	9.000	N	ON
15.479250	42.86	---	60.00	17.14	1000.0	9.000	N	ON
15.578250	---	29.80	50.00	20.20	1000.0	9.000	N	ON

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	2017-12-17	2018-12-16
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	2017-11-18	2020-11-17
Horn Antenna	R&S	HF907	100126	2014-12-06	2019-12-05
Horn Antenna	ETS-Lindgren	3160-09	00102643	2015-01-30	2020-01-29
EMI Test Receiver	R&S	ESR	101667	2017-09-06	2018-09-05
LISN	R&S	ENV216	101171	2016-12-16	2019-12-15
Bore Sight Antenna mast	ETS	2171B	00058752	NA	NA
Test software	EMC32	R&S	V9.26.0	NA	NA

*******END OF REPORT *******

ANNEX A： The EUT Appearance and Test Configuration

A.1 EUT Appearance

a: EUT

Adapter 1

Adapter 2

Adapter 3

Adapter 4

Adapter 5

b: Adapter

c: Charging Cradle

Earphone 1

Earphone 2

d: Earphone

e: USB Cable

Battery 1

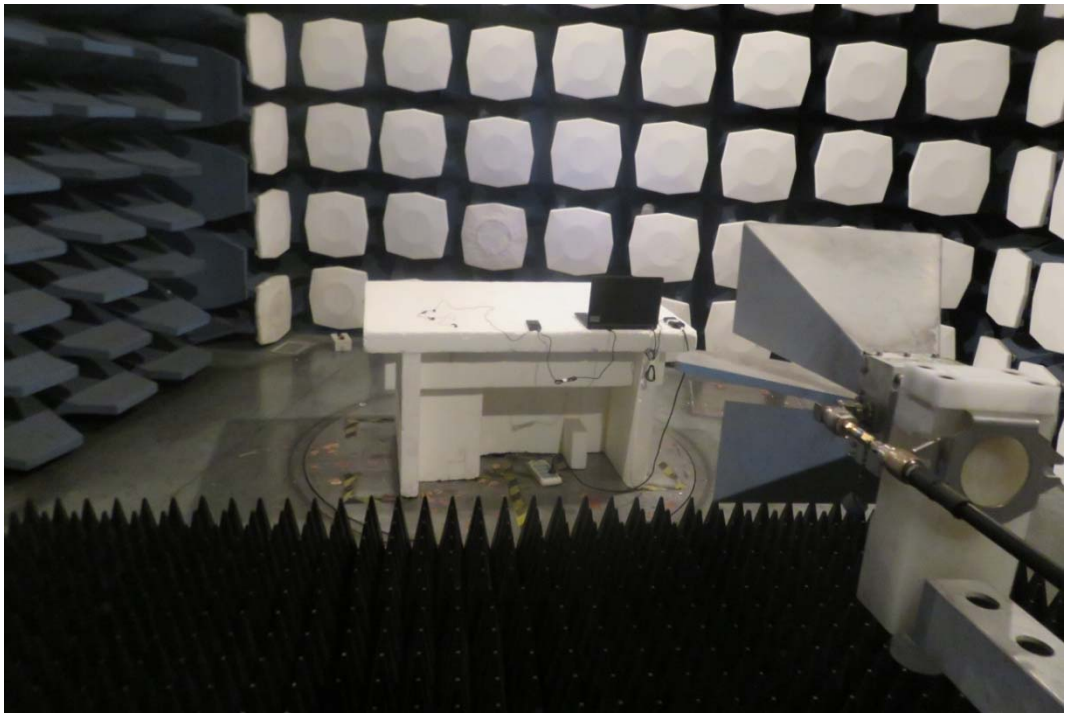
Battery 2

f: Battery

Picture 1 EUT and Accessory

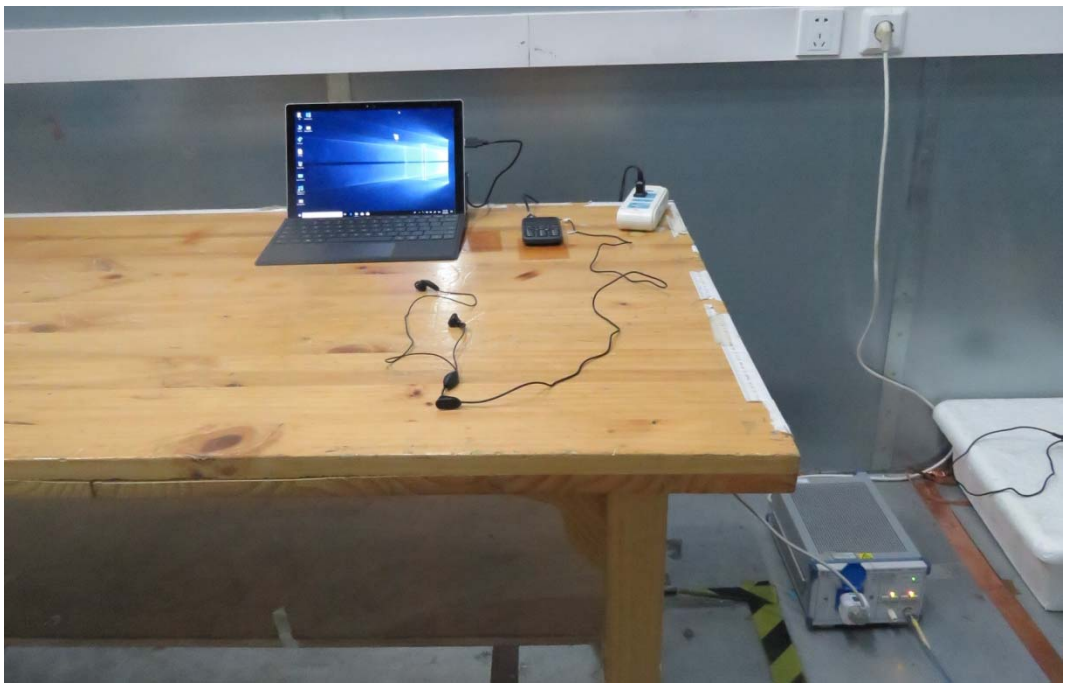
A.2 Test Setup

a: Below 1GHz



b: Above 1GHz

Picture 2 Radiated Emission Test Setup



Picture 3 Conducted Emission Test Setup