

# FCC EMC TEST REPORT

No. GCCT16CFR01-EMC

For

OBI Connect FZE

Product Name: Mobile Phone

Model Name: Obi Worldphone SF1

Trade Name: OBI

Issued Date: 2016-03-28

**Note:**

The test results in this test report relate only to the devices specified in this report. This report shall not be reproduced except in full without the written approval of GCCT.

To verify test report authenticity, send full test report to Email: gaoxiaqing0310@126.com

**Test Laboratory:**

GCCT, Guangdong Telecommunications Terminal Products Quality Supervision and Testing Center

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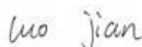
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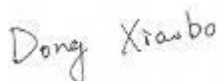
## GENERAL SUMMARY

<b>Product Name</b>	Mobile Phone
<b>Model Name</b>	Obi Worldphone SF1
<b>Trade Name</b>	OBI
<b>Applicant</b>	OBI Connect FZE
<b>Manufacturer</b>	CK Telecom Limited
<b>Test Laboratory</b>	GCCT, Guangdong Telecommunications Terminal Products Quality Supervision and Testing Center
<b>Reference Standards</b>	FCC Part 15, Subpart B "Radio frequency devices". ANSI C63.4-2014: "American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz"
<b>Test Conclusion</b>	This portable wireless equipment has been measured in all cases requested by the relevant standards. Test results in annex B of this test report are below limits specified in the relevant standards.  General Judgment: Pass  Date of issue: 2016.03.28
<b>Comment</b>	The test results in this report apply only to the tested sample of the stated device/equipment.

Approved by:

Luo Jian  
Manager

Reviewed by:

Dong Xiaobo  
Deputy Manager

Tested by:

Li Longliang  
Test Engineer

## 1. Test Laboratory

### 1.1 Testing Location

Company Name	GCCT, Guangdong Telecommunications Terminal Products Quality Supervision and Testing Center
Address	Keji Road, High-tech Zone, Heyuan, Guangdong Province, PR.China
CNAS Registration No.	L4992
Postal Code	517001
Telephone	+86-762-3607221
Fax	+86-762-3603336

### 1.2 Testing Environment

**Control room and Power Amplifier room** did not exceed following limits along the EMC testing:

Project	Control room	Power Amplifier room
Temperature	15℃~35℃	15℃~35℃
Relative humidity	20% ~80%	20% ~80%
Shielding effectiveness	> 110dB	> 110dB
Electrical insulation	> 2MΩ	> 2MΩ
Ground system resistance	< 1Ω	< 1Ω

**Semi-anechoic chamber** (9.73 meters×6.70meters×6.12meters) did not exceed following limits along the EMC testing:

Temperature	15℃~30℃
Relative humidity	35% ~60%
Shielding effectiveness	> 110dB
Electrical insulation	> 10kΩ
Ground system resistance	< 1Ω
Normalised site attenuation (NSA)	< ±3.5dB, 3m distance, from 30 to 1000 MHz
voltage standing-wave ratio (VSWR)	< ±6dB, 3m distance, above 1 GHz
Uniformity of field strength(FU)	80MHz ~6000MHz, 0 ~6dB

**EMC(1) room** did not exceed following limits along the EMC testing:

Temperature	15℃～35℃
Relative humidity	30%～60%

### 1.3 Project Data

Project Leader:	Dong Xiaobo
Testing Start Date:	2016-03-15
Testing End Date:	2016-03-28

## 2. Client Information

### 2.1 Applicant Information

<b>Company Name</b>	OBI Connect FZE
<b>Address</b>	B-21,Dubai Airport Free zone, PO BOX 371475, United Arab Emirates
<b>City</b>	Dubai
<b>Postal Code</b>	/
<b>Country</b>	United Arab Emirates

### 2.2 Manufacturer Information

<b>Company Name</b>	CK Telecom Limited
<b>Address</b>	Technology Road.High-Tech Development Zone. Heyuan, Guangdong,P.R.China.
<b>City</b>	Heyuan
<b>Postal Code</b>	/
<b>Country</b>	China

**3. Equipment Under Test (EUT) and Ancillary Equipment (AE)****3.1 About EUT**

<b>Model Name</b>	Obi Worldphone SF1
<b>FCC ID</b>	2AGBLSF1
<b>Tx Frequency</b>	GSM850:824 ~ 848 MHz PCS1900 : 1850 ~ 1909MHz WCDMA Band II: 1852 ~ 1908MHz WCDMA Band V: 826 ~ 846MHz Bluetooth& BLE: 2402 ~ 2480MHz WIFI(802.11b/g/n-20): 2412 ~ 2462MHz WIFI(802.11n-40): 2422 ~ 2452MHz
<b>Rx Frequency</b>	GSM850: 869 ~ 893MHz GSM1900: 1930 ~ 1989MHz WCDMA Band II: 1932 ~ 1987MHz WCDMA Band V: 871 ~ 891MHz Bluetooth& BLE: 2402 ~ 2480MHz WIFI(802.11b/g/n-20): 2412 ~ 2462MHz WIFI(802.11n-40): 2422 ~ 2452MHz GPS:1575MHz
<b>Number of Channels</b>	GSM850 :25 GSM1900 : 60 WCDMA Band II: 60 WCDMA Band V: 25 Bluetooth:79 BLE:40 WIFI(802.11b/g/n-20):11 WIFI(802.11n-40):7
<b>Modulation</b>	GSM:GMSK WCDMA:BPSK/QPSK BLE:GFSK Bluetooth: GFSK& $\pi/4$ -DQPSK&8DPSK WIFI:CCK/OFDM
<b>Antenna Type</b>	PIFA(GSM/DCS/WCDMA); MONOPOLE (Bluetooth/WIFI)

<b>Antenna Gain</b>	GSM850&1900:-0.5dBi GSM900&1800:-0.5dBi WCDMA Band II&V: -1dBi Bluetooth&BLE&WIFI: -1dBi GPS: -1dBi
<b>Normal Voltage</b>	3.8V
<b>Extreme Low Voltage</b>	3.6V
<b>Extreme High Voltage</b>	4.2V
<b>Extreme Low Temperature</b>	0℃
<b>Extreme High Temperature</b>	40℃

Note: Photographs of EUT are shown in ANNEX A of this test report.

Note: high and low voltage values in extreme condition test are given by manufacturer

### 3.2 Internal Identification of EUT

EUT ID *	IMEI	HW Version	SW Version
GCCT16CFR01 -M03	/	MIRAGE03-V1.0	OBI-SJ1.5-000-Ver1.5

\*EUT ID: is used to identify the test sample in the lab internally. GCCT16CFR01-M01 and GCCT16CFR01-M03 are the same mobile phone.

### 3.3 Internal Identification of AE

AE ID *	Description	Type	SN
GCCT16CFR01-B03	Battery	OB3000CK	DONG GUAN DRN NEW ENERGY CO.,LTD.
GCCT16CFR01-C03	Adapter	AOD2A5V	DONGGUAN AOHAI POWER TECHNOLOGY CO,LTD.

\*AE ID: is used to identify the test sample in the lab internally. GCCT16CFR01-B01 and GCCT16CFR01-B03 are the same accessories, GCCT16CFR01-C01 and GCCT16CFR01-C03 are the same accessories.



## 4. Test Mode and Performance Criteria

### 4.1 Test Mode

Frequency range was investigated: Conducted emission test: from 150 kHz to 30MHz; Radiated emission test: 30MHz to the 5th harmonic of the highest fundamental frequency or to 40GHz, whichever is lower. All test modes were pre-scanned and only shown the worst in bold.

Test Item
<b>Radiated Emission &lt; 1GHz</b>
<b>Mode 1: GSM850 Idle + WIFI+USB Cable (Charging from PC)</b>
Mode 2: GSM1900 Idle + WIFI+USB Cable (Charging from PC)
Mode 3: WCDMA Band II Idle + WIFI+USB Cable (Charging from PC)
Mode 4: WCDMA Band V Idle + WIFI+ Bluetooth Idle + USB Cable (Data Link with PC)
<b>Radiated Emission ≥ 1GHz</b>
Mode 1: GSM850 Idle + BT+USB Cable (Charging from PC)
Mode 2: GSM1900 Idle + WIFI+ USB Cable (Charging from PC)
Mode 3: WCDMA Band II Idle + WIFI+ Bluetooth Idle + USB Cable (Data Link with PC)
<b>Mode 4: WCDMA Band V Idle + WIFI+ USB Cable (Charging from PC)</b>
<b>AC Conducted Emission</b>
Mode 1: WIFI + USB Cable (Charging from PC)
<b>Mode 2: GSM1900 Idle + WIFI+ USB Cable (Data Link with PC)</b>
Mode 3: Bluetooth + USB Cable (Charging from PC)
Mode 4: BLE + USB Cable (Data Link with PC)

Remark:

1. The worst case of AC Conducted Emission is mode 2; only the test data of this mode was reported.
2. The worst case of RE < 1G is mode 3; only the test data of this mode was reported.
3. Data Link with PC means data application transferred mode between EUT and PC.

## 5. Test Results

### 5.1 Summary of Test Results

Clause (FCC Part 15B)	Test Case	Verdict
15.109(a)	Radiated Emission	Pass
15.107(a)	AC Conducted Emission	Pass

Note: Please refer to Annex B in this test report for the detailed test results.

### 5.2 Statements

GCCT has evaluated the test cases requested by the applicant/manufacture as listed in section 5.1 of this report, for the EUT specified in section 3, according to the standards or reference documents listed in general summary.

## 6. Test Equipments Utilized

### 6.1 List of Measuring Equipment

**Table 1. Measurement Equipments**

Hardware						
No.	Name	Model	SN	Manufacturer	CAL. DATE	CAL. Due DATE
1	Spectrum Analyzer	E4440A	MY48250641	Agilent	2015-8-21	2016-8-20
2	RF Filter Section	N9039A	MY48260024	Agilent	2015-8-21	2016-8-20
3	BiCoNilog Antenna	3142D	00110050	ETS-Lindgren	2015-9-15	2017-9-14
4	Horn Antenna	3117	00129169	ETS-Lindgren	2015-9-15	2017-9-14
5	RF Notch filter	/	/	ETS-Lindgren	/	/
6	Signal Generator	N5183A-532	MY49060563	Agilent	2015-8-21	2016-8-20
7	Signal Generator	N5181A-506	MY49061300	Agilent	2015-8-21	2016-8-20
8	Power Amplifier	AR75A250	0333065	AR	/	/
9	Power Amplifier	250W1000A	0332703	AR	/	/
10	Power Amplifier	AS0860-40/4	AS0860-40/45	Milmega	/	/
11	EMS antenna	ATL80M1G	0332624	AR	/	/
12	EMS antenna	High Gain HornAntenna	BBHA 9120 E 456	SCHWARZBE CK	/	/
13	Power Meter	N1913A	MY50000213	Agilent	2015-8-21	2016-8-20
14	Power Meter	N1913A	MY50000214	Agilent	2015-8-21	2016-8-20
15	CDN	FCC-801-M2 -16A	100230	FCC	2015-8-21	2016-8-20
16	BCI	F-120-9A	100334	FCC	2015-8-21	2016-8-20
17	LISN	LI-125	191012 191013	Com-power	2015-8-21	2016-8-20
18	Electrostatic Discharge	Dito	V0946105513	EMTEST	2015-8-21	2016-8-20
19	The ultra-compact simulator and its	UCS 500 N5	V0946105514	EMTEST	2015-8-21	2016-8-20

20	Motor driven AC source	MV2616	V0946105516	EMTEST	2015-8-21	2016-8-20
21	Universal Radio Communication Tester	CMU200	118627	R&S	2015-8-21	2016-8-20
22	Universal Radio Communication Tester	E5515C	MY48367105	Agilent	2015-8-21	2016-8-20
23	Bluetooth Tester	MT8852B	1307002	Anristu	2015-8-21	2016-8-20
24	Software	MEAS	/	ETS-Lindgren	/	/
25	PC	G450	/	LENEVO	/	/
<b>Software</b>						
1	Software	TILE4.5	/	ETS-Lindgren	/	/

**Table 2. List of Accessories**

No.	Name	Model	SN	Manufacturer	Length	Shielding
1	PC	Pavilion dv2	CNC9112F68	HP	/	/
2	Printer	BOISB-0604-00	VNF3L52398	HP	/	/
3	Mouse	M-UAV-DE L8	/	DELL	/	/
4	Power line for printer	I-SHENG	/	/	1.3m	unshielding
5	Power line for PC	A003145	/	/	2.8m	unshielding
6	USB cable	SHIELDED	E174089	/	/	unshielding
7	Adapter	Series PPP009D	HP	/	/	/

## 6.2 Uncertainty

RE Uncertainty Evaluation (30MHz~1000MHz)	
Uncertainty for 95% Confidence	5.2dB
RE Uncertainty Evaluation (Above 1GHz)	
Uncertainty for 95% Confidence	5.4dB
CE Uncertainty Evaluation (150kHz~30MHz)	
Uncertainty for 95% Confidence	3.8dB

## ANNEX A: EUT Photograph

**EUT Front View**



**EUT behind View**



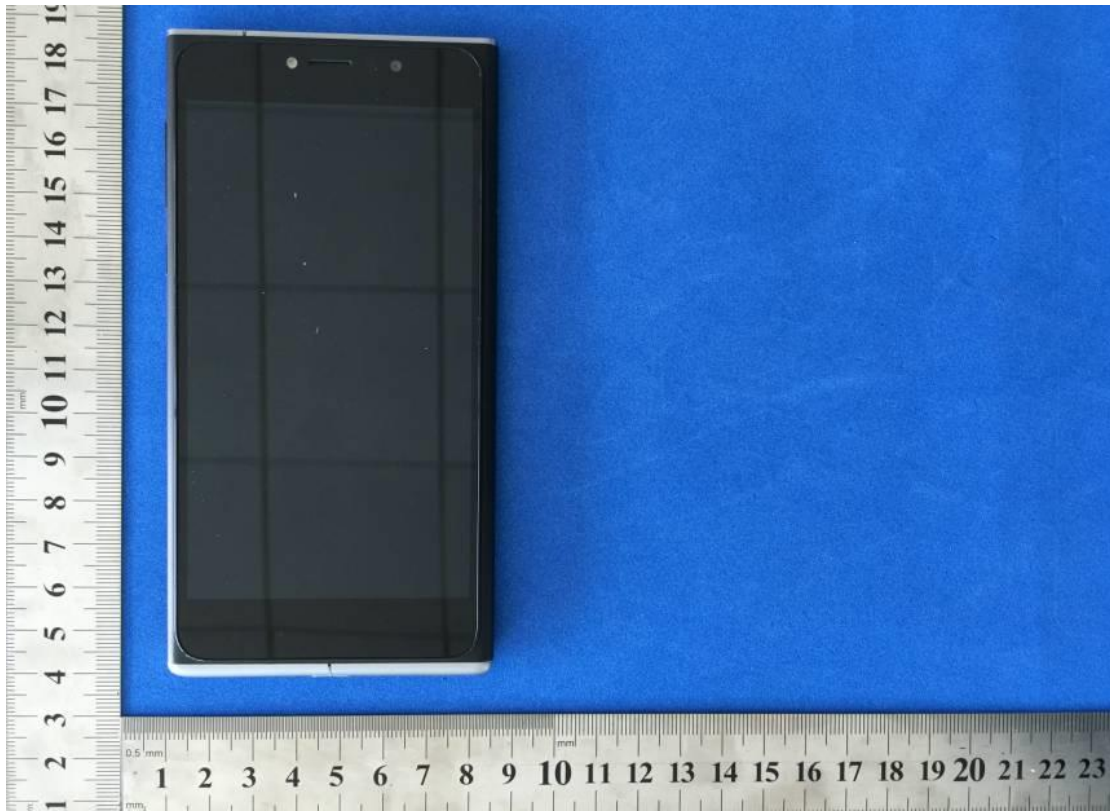
**EUT Left View**



**EUT Right View**



**EUT Top View**

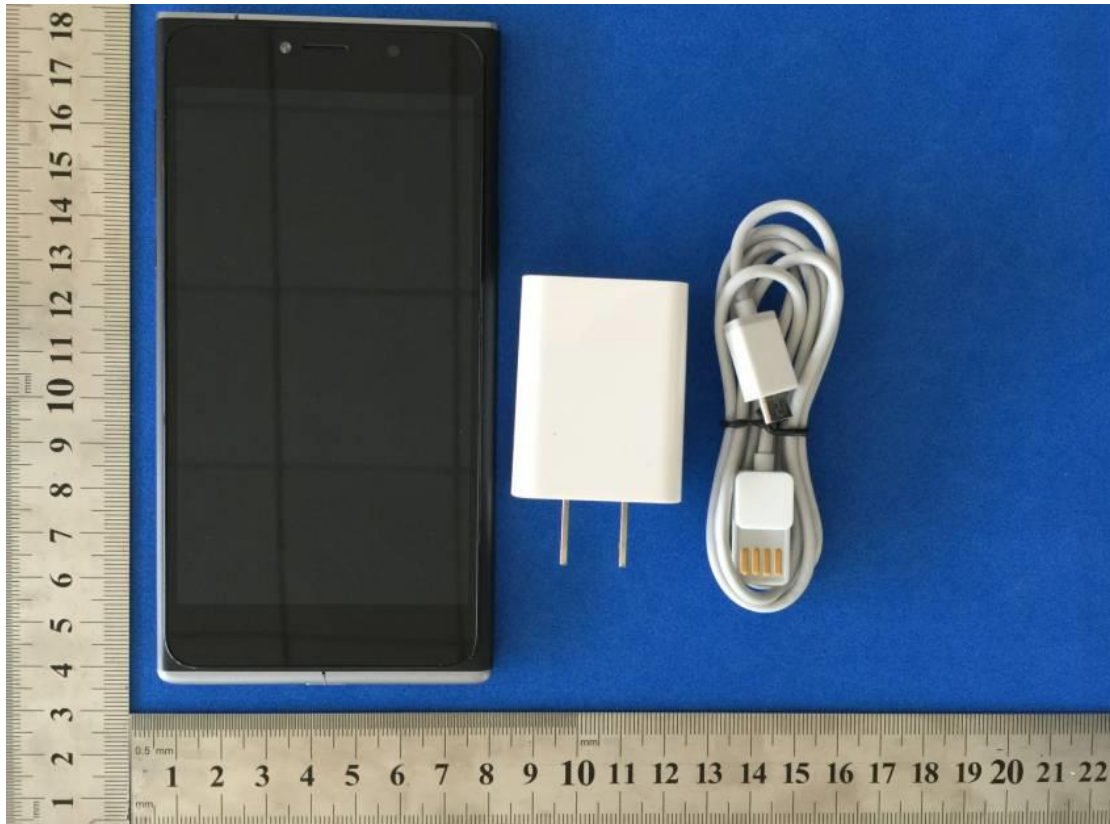


**EUT Rear View**





All

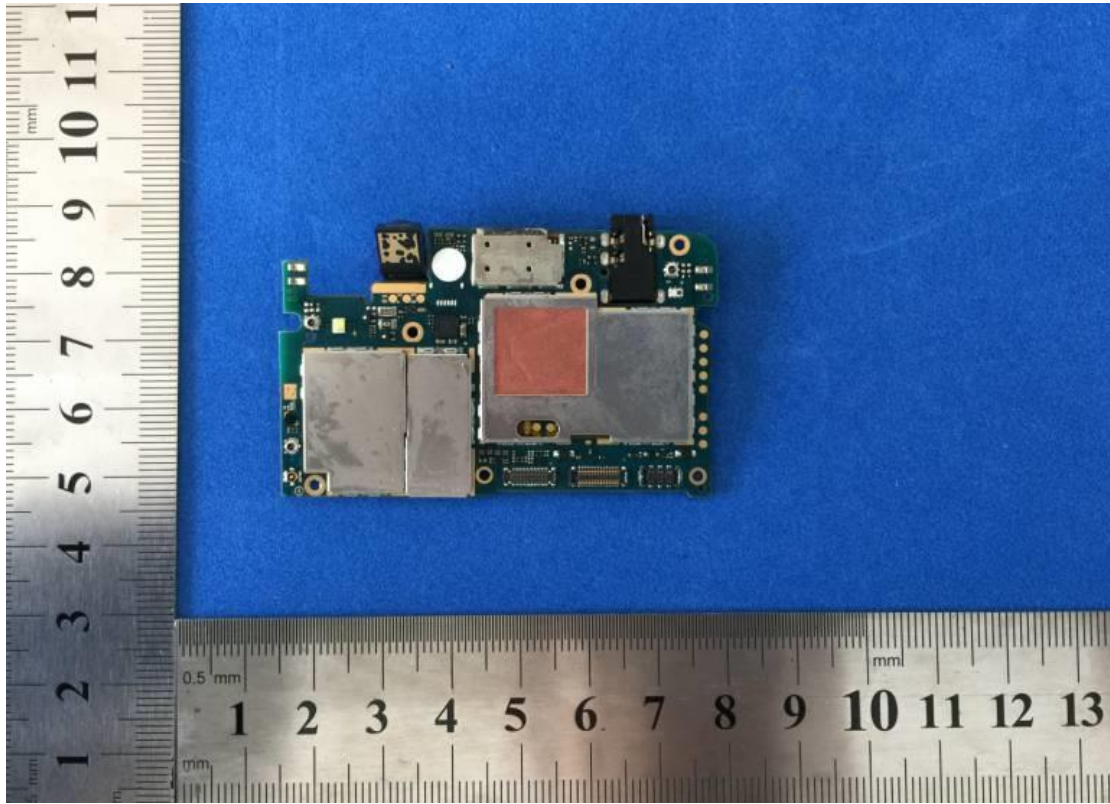


Cover off





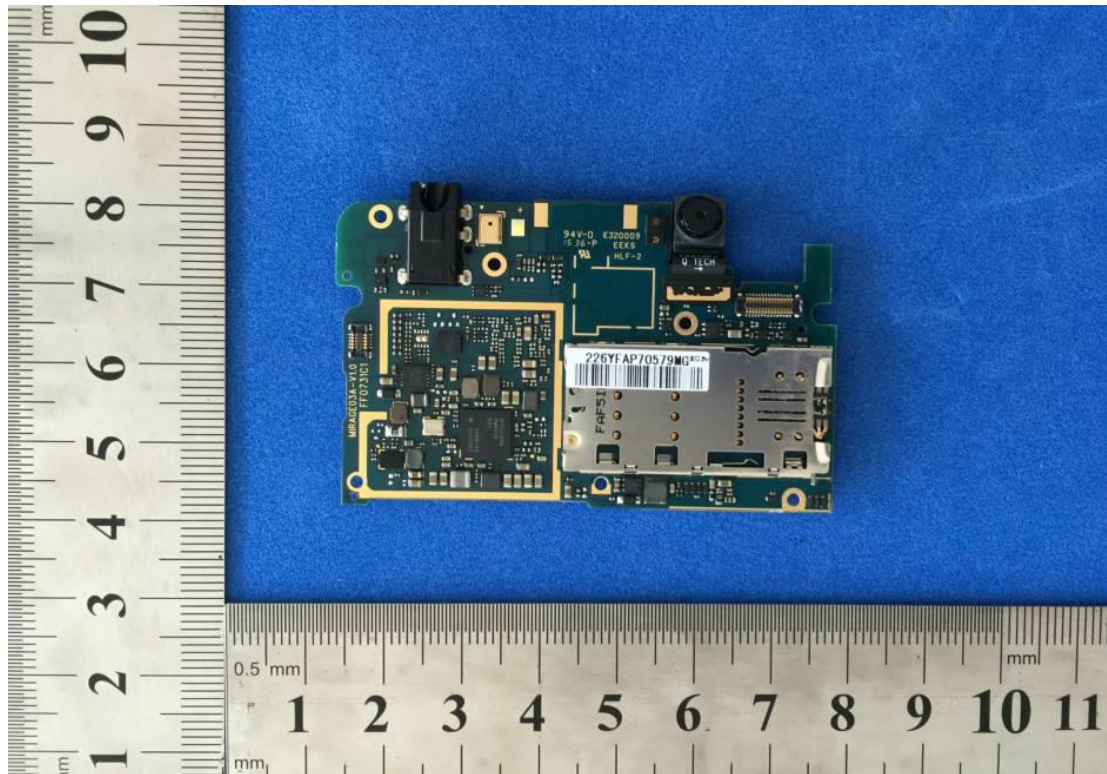
**Main board with shielding Front View**



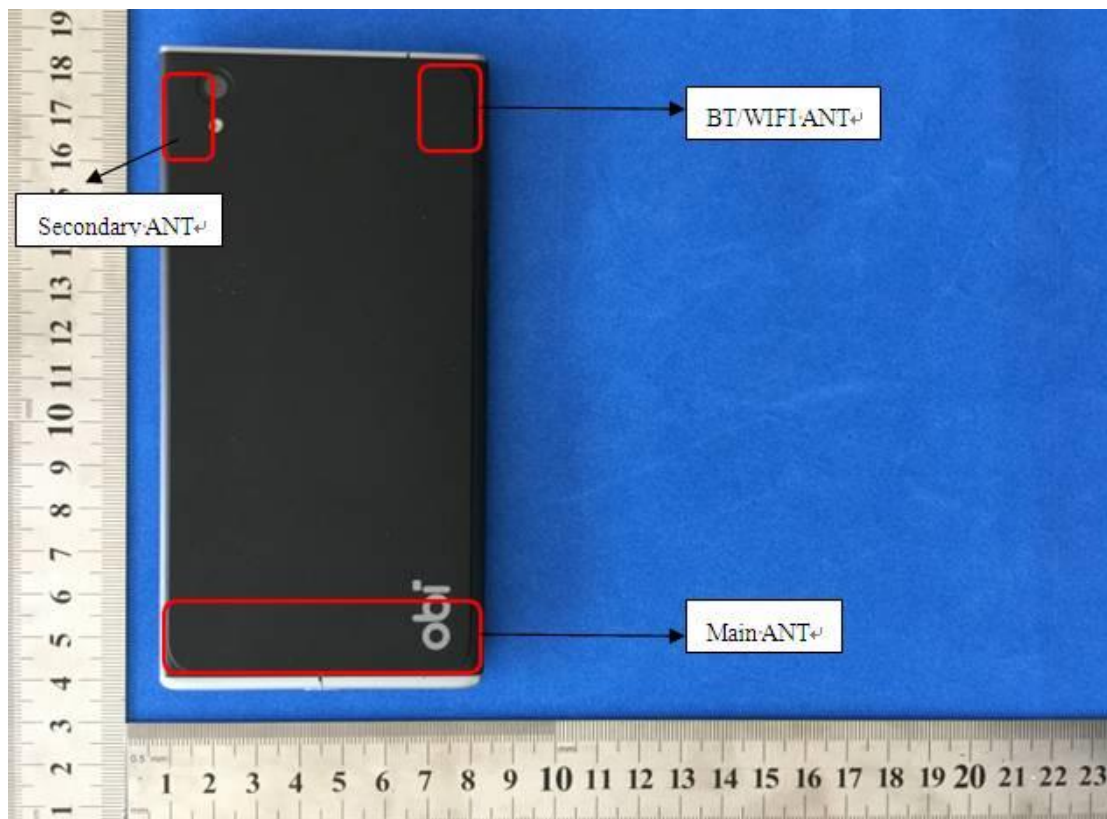
**Main board without shielding Front View**



Main board Rear View

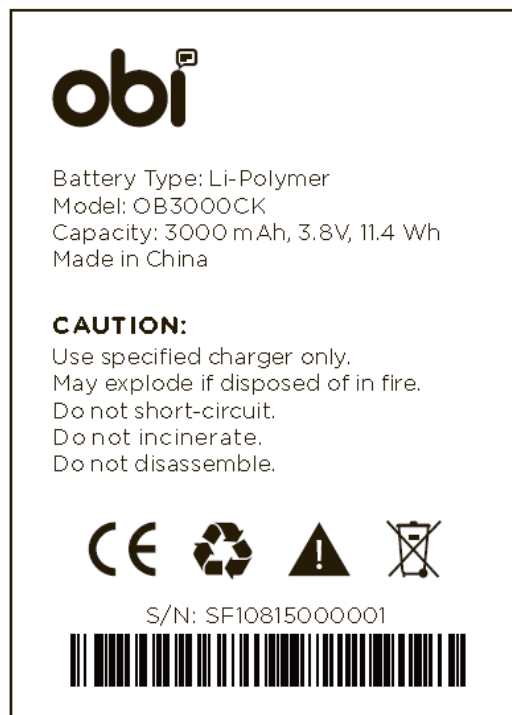


Antenna View





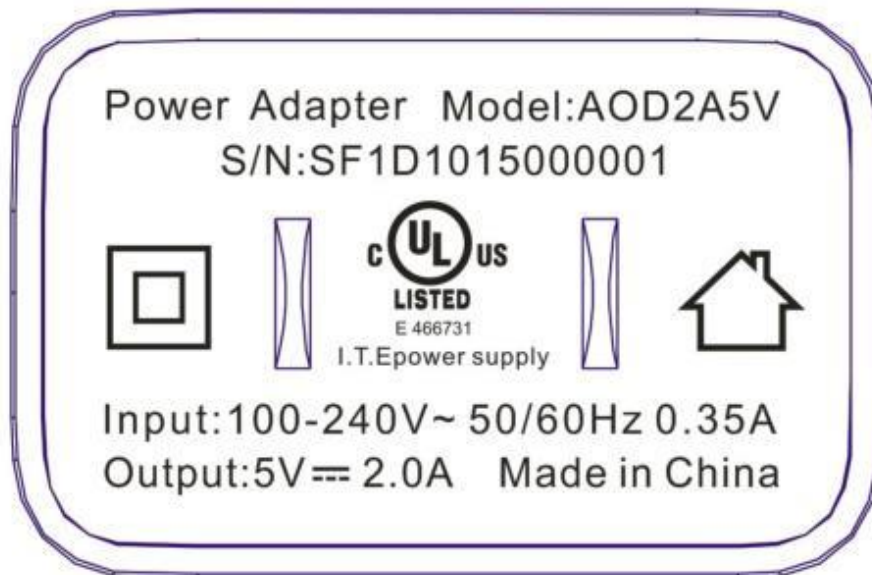
## Battery label View



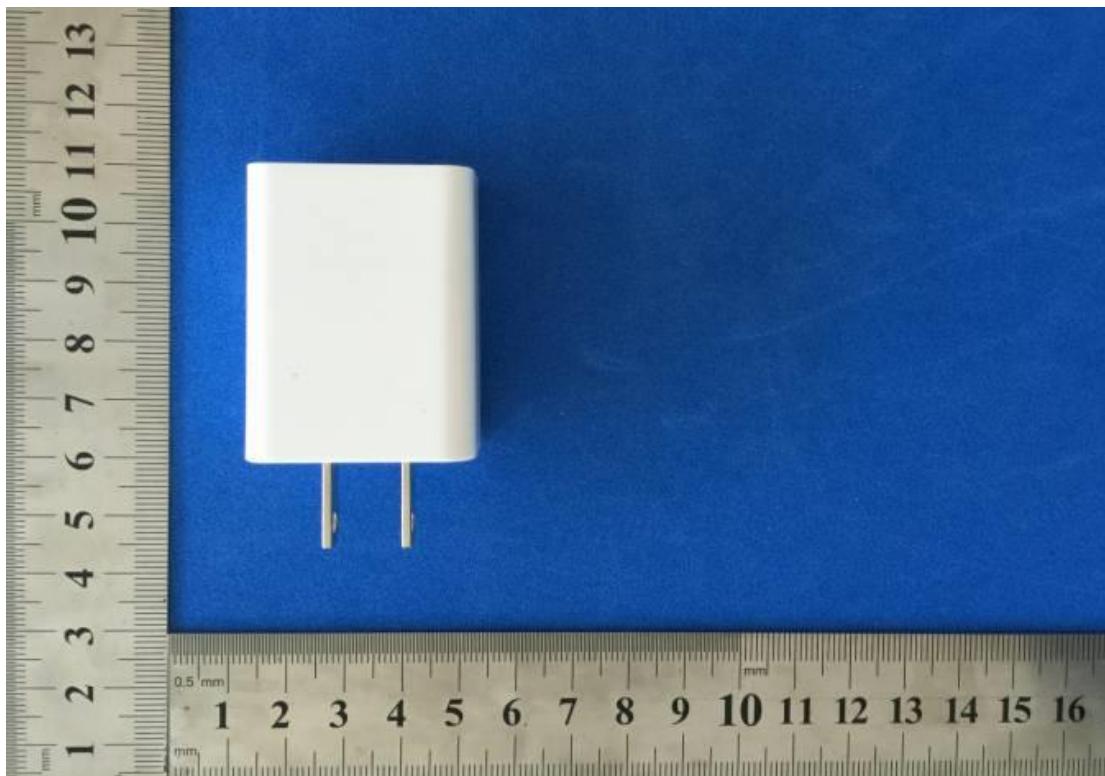
## Battery View



Adapter label view



Adapter view



## ANNEX B: EMC Emission Measurements Test Results

### B.1 Test of Radiated Emissions

#### B.1.1 Limit of Radiated Emissions (At a measuring distance of 3 m)

Frequency range (MHz)	Field Strength (microvolts/m)
30 to 88	100
88 to 216	150
216 to 960	200
Above 960	500

#### B.1.2 Test Procedure

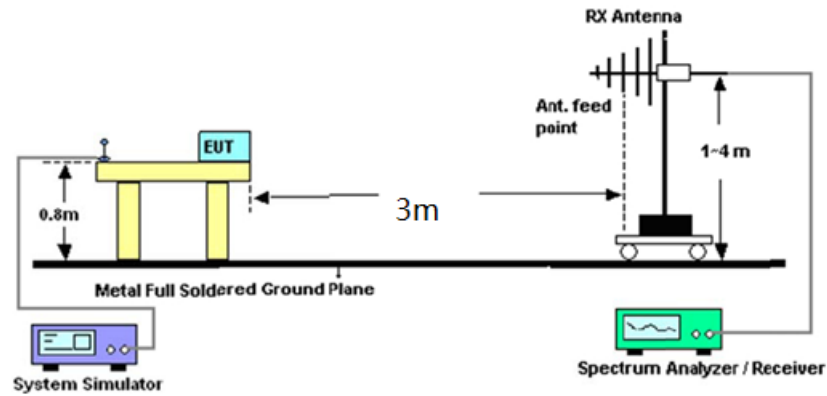
- The EUT was placed on a turntable with 1.5 meter above ground.
- The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
- The table was rotated 360 degrees to determine the position of the highest radiation.
- The height of the antenna is varied between one meter and four meters above ground to find the maximum value of the field strength for both horizontal polarization and vertical polarization of the antenna.
- For each suspected emission, the EUT was arranged to its worst case and then tune the antenna tower(from 1 m to 4 m)and turntable(from 0 degree to 360 degrees)to find the maximum reading.
- Set the test-receiver system to Peak Detect Function and specified bandwidth with Maximum Hold Mode.
- If the emission level of the EUT in peak mode was 20dB lower than the limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be repeated one by one using the quasi-peak method and reported.
- Emission level (dB $\mu$ V/m) = 20 log Emission level ( $\mu$ V/m).

During the radiated emission test, the Spectrum Analyzer was set with the following configurations:

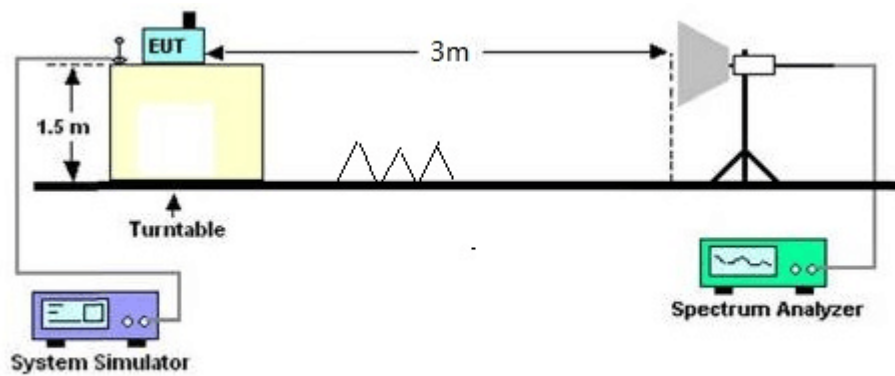
Frequency Band(MHz)	Function	Resolution Bandwidth	Video Bandwidth
30 to 1000	Peak	100kHz	100kHz
Above 1000	Peak	1MHz	1MHz
	Average	1MHz	10Hz

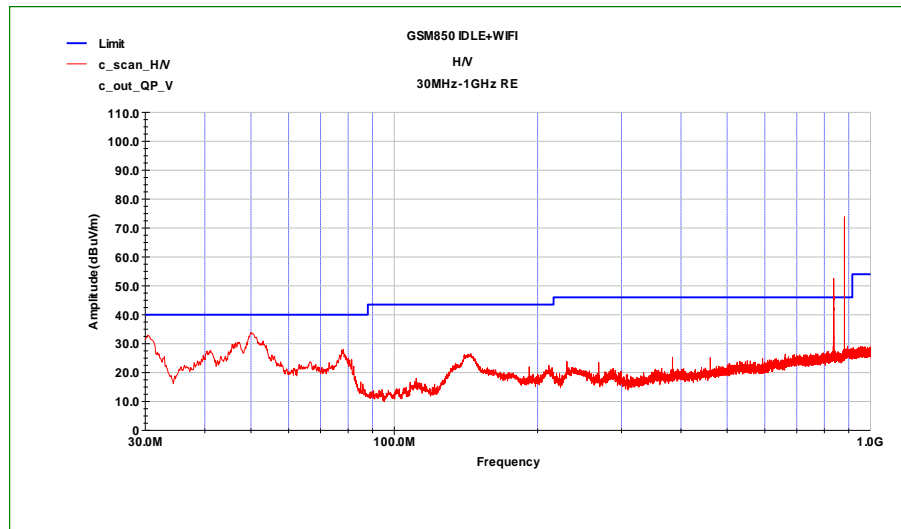
## B.1.3 Test Setup

### B.1.3.1 Radiated Emissions Frequency: 30MHz to 1000MHz



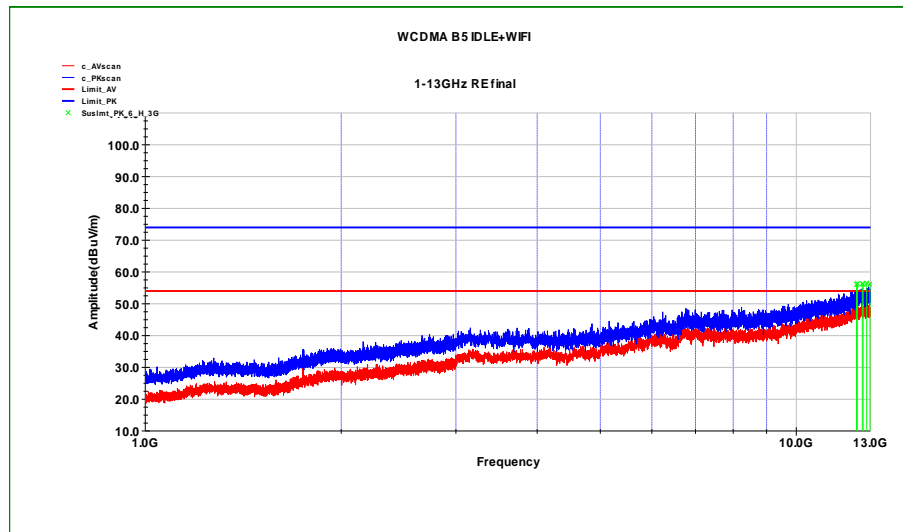
### B.1.3.2 Radiated Emissions Frequency: Above 1000 MHz



**B.1.4 Test Results****Mode 1: GSM850 Idle + WIFI+USB Cable (Charging from PC)**

Frequency (MHz)	Polarization (H/ V)	Tower (cm)	Table ( ° )	QP	
				Limit dB(μV/m)	QP dB(μV/m)
47.12	V	125	156	40	26.98
50.23	V	109	282	40	30.91
78.30	V	104	291	40	24.08
909.04	H	104	203	46	22.86
937.38	H	190	0	54	22.94
944.75	H	104	108	54	22.90

Note: only record low 6dB or measuring higher than the limit value than the limit value.

**Mode 4: WCDMA Band V Idle + WIFI+USB Cable (Charging from PC) (Above 1000 MHz)**

Frequency (MHz)	Polarization (H/ V)	Tower (cm)	Table ( ° )	PK		AV	
				Limit dB(μV/m)	PK dB(μV/m)	Limit dB(μV/m)	AV dB(μV/m)
12374	H	100	0	74	56.03	54	48.21
12409	H	100	12	74	56.41	54	47.77
12626	H	100	16	74	56.33	54	46.33
12665	H	100	23	74	56.13	54	47.19
12826	H	100	0	74	56.48	54	47.81
12977	H	100	2	74	56.18	54	48.04

Note: only record low 6dB or measuring higher than the limit value than the limit value.



## B.1.5 Test Setup

### B.1.5.1 Radiated Emissions Frequency: 30MHz to 1000MHz



### B.1.5.2 Radiated Emissions Frequency: Above 1000 MHz





### B.1.6 Measurement Uncertainty

RE Uncertainty Evaluation (30MHz~1000MHz)	
Uncertainty for 95% Confidence	5.2dB
RE Uncertainty Evaluation (1GHz~6GHz)	
Uncertainty for 95% Confidence	5.4dB

## B.2 Test of AC Conducted Emission

### B.2.1 Limit of AC Conducted Emission

Frequency (MHz)	QP Limit (dB $\mu$ V)	AV Limit (dB $\mu$ V)
0.15~0.5	66~56	56~46
0.5~5	56	46
5~30	60	50

\*Decreases with the logarithm of the frequency.

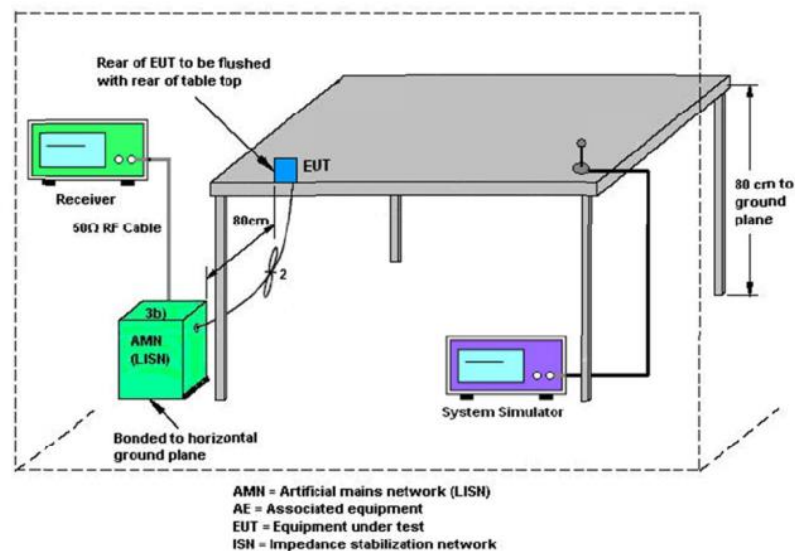
### B.2.2 Test Procedures

- a. The EUT was placed on a desk 0.8 meters height from the metal ground plane and 0.4 meters

from the conducting wall of the shielding room and it was kept at least 0.8 meters from any other grounded conducting surface.

- b. Connect EUT to the power mains through a line impedance stabilization network (LISN).
- c. All the support units are connecting to the other LISN.
- d. The LISN provides 50 ohm coupling impedance for the measuring instrument.
- e. The FCC states that a 50 ohm, 50 microhenry LISN should be used.
- f. Both sides of AC line were checked for maximum conducted interference.
- g. The frequency range from 150 kHz to 30 MHz was scanned.
- h. Set the test-receiver system to Peak Detect Function and specified bandwidth with Maximum Hold Mode.
- i. The EMI test receiver was then turned to the selected frequencies and the necessary measurements made with a receiver bandwidth setting of 10kHz .For FCC test, only Quasi-peak measurements were made.

## B.2.3 Test Setup





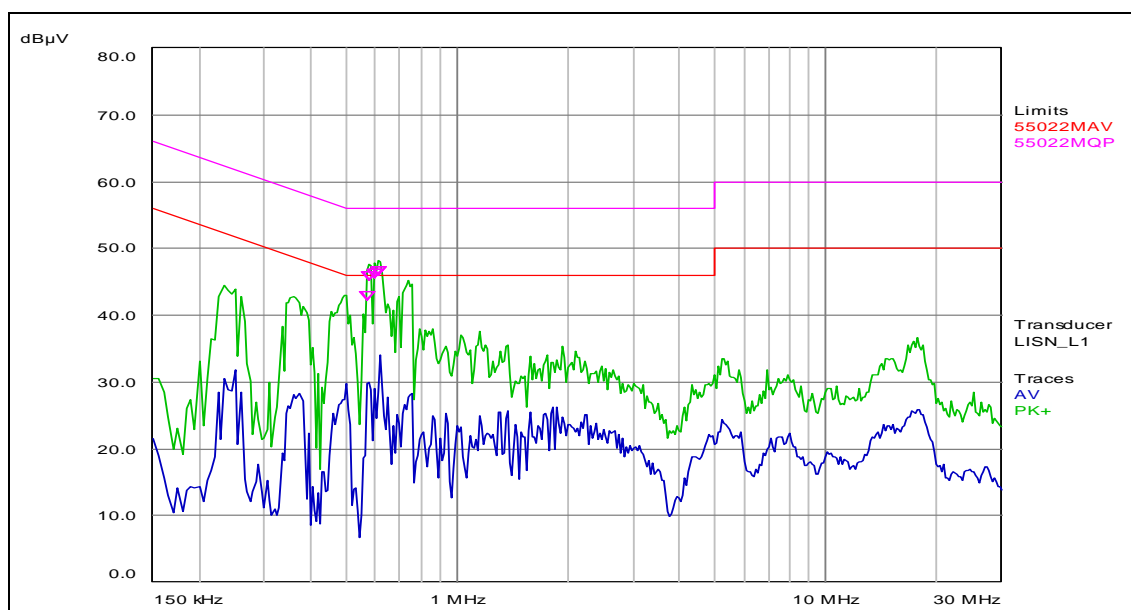
## B.2.4 Measurement Uncertainty

CE Uncertainty Evaluation (150kHz~30MHz)	
Uncertainty for 95% Confidence	3.8dB

## B.2.5 Test Results

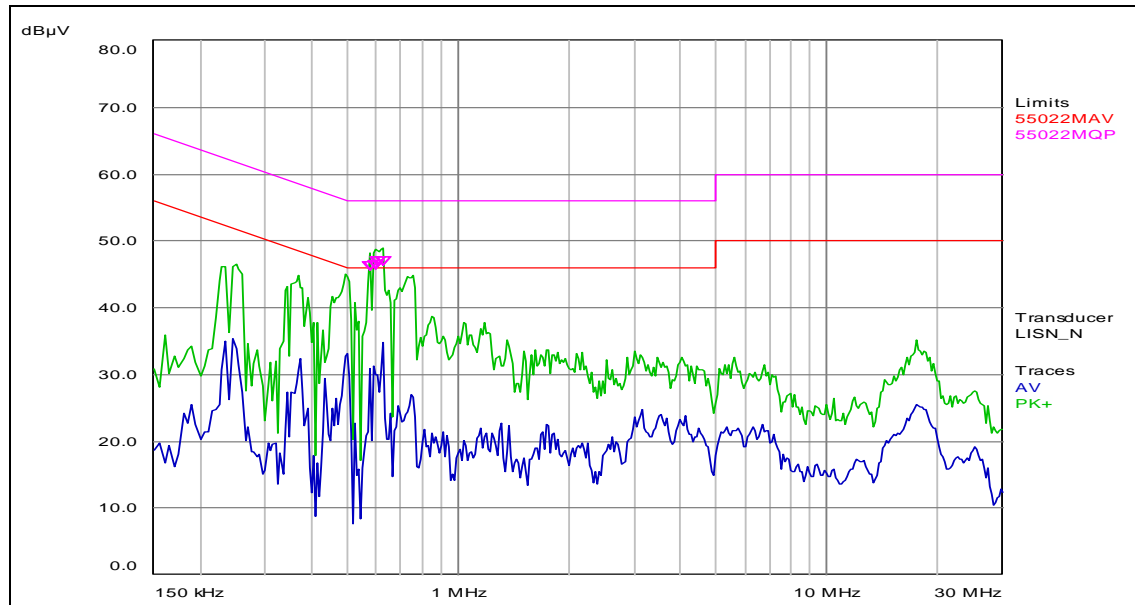
### Mode 2: GSM1900 Idle + USB Cable (Charging from PC)

LINE L:



Trace	Frequency	Level	Limit	Delta Limit	Comment
	(MHz)	(dB $\mu$ V)	(dB $\mu$ V)	(dB)	
QP	0.57	42.32	56.00	-13.68	L1 / on
QP	0.58	45.13	56.00	-10.87	L1 / on
QP	0.60	45.51	56.00	-10.49	L1 / on
QP	0.61	45.96	56.00	-10.04	L1 / on

LINE N:



Trace	Frequency	Level	Limit	Delta Limit	Comment
	(MHz)	(dB $\mu$ V)	(dB $\mu$ V)	(dB)	
QP	0.58	45.66	56.00	-10.34	N / on
QP	0.60	45.85	56.00	-10.15	N / on
QP	0.61	46.25	56.00	-9.75	N / on
QP	0.63	46.37	56.00	-9.63	N / on

Note: only record low 10dB or measuring higher than the limit value than the limit value.

## ANNEX C: Report Revision History

Report NO.	Report version	Description	Issue Date
GCCT16CFR01-EMC	NONE	Original	2016.03.28

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