



# TEST REPORT

No.I16N00180-EMC

for

**Huawei Technologies Co., Ltd.**

**Smart Watch**

**Model Name: K1-G03**

**FCC ID: QISK1-G03**

with

**Hardware Version: WD100\_MB**

**Software Version: 2.8.0.0**

**Issued Date: 2016-03-07**

**Test Laboratory:**

*FCC 2.948 Listed: No.342690*

**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 CTTL.

**Test Laboratory:**

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## **REPORT HISTORY**

<b>Report Number</b>	<b>Revision</b>	<b>Description</b>	<b>Issue Date</b>
I16N00180-EMC	Rev.0	1st edition	2016-03-07



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## 1. Test Laboratory

### 1.1. Testing Location

Address: TCL International E city No. 1001 Zhongshanyuan Road, Nanshan District, Shenzhen, Guangdong, China  
Postal Code: 518048  
Telephone: +86(755)33322000  
Fax: +86(755)33322000

### 1.2. Testing Environment

Normal Temperature: 15-35°C  
Relative Humidity: 20-75%

### 1.3. Project data

Testing Start Date: 2016-02-25  
Testing End Date: 2016-03-03

### 1.4. Signature



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Liang Yong  
(Prepared this test report)



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Du Zhaoxuan  
(Reviewed this test report)



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Cao Junfei  
Director of the laboratory  
(Approved this test report)



## **2. Client Information**

### **2.1. Applicant Information**

Company Name: Huawei Technologies Co., Ltd.  
Address: Administration Building, Headquarters of Huawei Technologies Co., Ltd., Bantian, Longgang District, Shenzhen, 518129, P.R.C

### **2.2. Manufacturer Information**

Company Name: Huawei Technologies Co., Ltd.  
Address: Administration Building, Headquarters of Huawei Technologies Co., Ltd., Bantian, Longgang District, Shenzhen, 518129, P.R.C

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

#### **3.1. About EUT**

Description	Smart Watch
Model Name	K1-G03
FCC ID	QISK1-G03
TX Band	GSM850/1900
RX Band	GSM850/1900

K1-G03 is a smart watch; it can be communicated with mobile phone via Bluetooth . It supports GSM, GPS, Bluetooth and wifi IEEE802.11b/g/n. Watch also support built-in accelerometer, gyro sensor.

Remark: The above EUT's information is declared by manufacturer. Please refer to the specifications or user's manual for more detailed information.

#### **3.2. Internal Identification of EUT**

<b>EUT ID*</b>	<b>SN or IMEI</b>
EUT	004401725237826

\*EUT ID: is used to identify the test sample in the lab internally.

#### **3.3. Internal Identification of AE**

<b>AE ID*</b>	<b>Description</b>	<b>SN</b>
AE1	Battery	/
AE2	Travel charger	/
AE3	USB cable	/

##### AE1

Model	SP482230AB
Manufacturer	ATL
Capacitance	300mAh
Nominal voltage	3.8V

##### AE2-1

Model	HW-050100U01
Manufacturer	BYD Company Limited
Length of cable	/
SN	B66660F4100065

##### AE2-2

Model	HW-050100U01
Manufacturer	SHENZHEN HUNTKEY ELECTRIC CO., LTD
Length of cable	/
SN	H666LGF3R03989



AE2-3

Model	HW-050100U01
Manufacturer	PHIHONG TECHNOLOGY
Length of cable	/
SN	P66615FB429974

AE3

Model	AF05
Manufacturer	Huawei Technologies Co., Ltd.
Length of cable	95cm

\*AE ID: is used to identify the test sample in the lab internally.

**3.4. EUT set-ups**

<b>EUT set-up No.</b>	<b>Combination of EUT and AE</b>	<b>Remarks</b>
Set.1	EUT+ AE1 + AE2-1 + AE3	Charging mode
Set.2	EUT+ AE1 + AE2-2 + AE3	Charging mode
Set.3	EUT+ AE1 + AE2-3 + AE3	Charging mode

#### 4. Reference Documents

##### 4.1. Reference Documents for testing

The following documents listed in this section are referred for testing.

<b>Reference</b>	<b>Title</b>	<b>Version</b>
FCC Part 15, Subpart B	Radio frequency devices	10-1-2015 Edition
ANSI C63.4	Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz	2014

## 5. LABORATORY ENVIRONMENT

**Semi-anechoic chamber** did not exceed following limits along the EMC testing:

Temperature	Min. = 15 °C, Max. = 30 °C
Relative humidity	Min. = 35 %, Max. = 60 %
Shielding effectiveness	0.014MHz-1MHz,>60dB; 1MHz-1000MHz,>90dB
Electrical insulation	> 2MΩ
Ground system resistance	< 4 Ω
Normalised site attenuation (NSA)	< ± 4 dB, 3 m distance, from 30 to 1000 MHz
Uniformity of field strength	Between 0 and 6 dB, from 80 to 3000 MHz

**Shielded room** did not exceed following limits along the EMC testing:

Temperature	Min. = 15 °C, Max. = 30 °C
Relative humidity	Min. =35 %, Max. = 60 %
Shielding effectiveness	0.014MHz-1MHz,>60dB; 1MHz-1000MHz,>90dB
Electrical insulation	> 2MΩ
Ground system resistance	< 4 Ω

**Fully-anechoic chamber** did not exceed following limits along the EMC testing:

Temperature	Min. = 15 °C, Max. = 30 °C
Relative humidity	Min. = 35 %, Max. = 60 %
Shielding effectiveness	0.014MHz-1MHz,>60dB; 1MHz-1000MHz,>90dB
Electrical insulation	> 2MΩ
Ground system resistance	< 4 Ω
Voltage Standing Wave Ratio (VSWR)	≤ 6 dB, from 1 to 18 GHz, 3 m distance



## 6. SUMMARY OF TEST RESULTS

Abbreviations used in this clause:	
P	Pass
NA	Not applicable
F	Fail

Items	Test Name	Clause in FCC rules	Section in this report	Verdict
1	Radiated Emission	15.109(a)	A.1	P
2	Conducted Emission	15.107(a)	A.2	P



## 7. Test Facilities Utilized

NO.	NAME	TYPE	SERIES NUMBER	PRODUCER	CALDUE DATE	CAL PERIOD
1.	Test Receiver	ESCI	100701	R&S	2016.08.10	1 year
2.	Test Receiver	ESCI	100702	R&S	2016.05.30	1 year
3.	Spectrum Analyzer	FSP 40	100378	R&S	2016.12.18	1 year
4.	BiLog Antenna	VULB9163	9163 329	Schwarzbeck	2017.01.20	3 years
5.	LISN	ESH2-Z5	100196	R&S	2017.01.12	1 year
6.	Horn Antenna	3117	00066577	ETS-Lindgren	2016.04.01	3 years
7.	Universal Radio Communication Tester	E5515C	GB44051324	Agilent	2016.05.19	1 year

## **ANNEX A: MEASUREMENT RESULTS**

### **A.1 Radiated Emission (§15.109(a))**

#### **Reference**

FCC: CFR Part 15.109(a)

#### **A.1.1 Method of measurement**

The field strength of radiated emissions from the unintentional radiator (charging mode of MS) at a distance of 3 meters is tested. Tested in accordance with the procedures of ANSI C63.4 - 2014, section 8.3.

The EUT was placed on a non-conductive table. The measurement antenna was placed at a distance of 3 meters from the EUT. During the tests, the antenna height and the EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. This maximization process was repeated with the EUT positioned in each of its three orthogonal orientations.

#### **A.1.2 EUT Operating Mode:**

The MS is operating in the charging mode. During the test MS is connected to a charger in the case of charging mode.

#### **A.1.3 Measurement Limit**

Limit from CFR Part 15.109(a)

Frequency range (MHz)	Field strength limit ( $\mu\text{V}/\text{m}$ )		
	Quasi-peak	Average	Peak
30-88	100		
88-216	150		
216-960	200		
960-1000	500		
>1000		500	5000

\*Note: The original limit is defined at 10m test distance. This limit is calculated according to CISPR requirements.

#### **A.1.4 Test Condition**

Frequency of emission (MHz)	RBW/VBW	Sweep Time(s)
30-1000	120kHz (IF bandwidth)	5
Above 1000	1MHz/3MHz	15

### A.1.5 Measurement Results

A "reference path loss" is established and the  $A_{Rpl}$  is the attenuation of "reference path loss". It includes the antenna factor of receive antenna and the path loss.

The measurement results are obtained as described below:

$$\text{Result} = P_{\text{Mea}} + A_{\text{Rpl}} = P_{\text{Mea}} + G_A + G_{\text{PL}}$$

Where

$G_A$ : Antenna factor of receive antenna

$G_{\text{PL}}$ : Path Loss

$P_{\text{Mea}}$ : Measurement result on receiver.

Note: the result contains vertical part and Horizontal part

**RE Measurement uncertainty:** 30M-1GHz: 5.08dB (k=2);  
1GHz-18GHz: 4.56 dB (k=2)

#### Set.1 Charging mode / Peak detector

Frequency(MHz)	Result(dBuV/m)	Polarity	$A_{Rpl}$ (dB)	Margin(dB)	Limit (dB $\mu$ V/m)
14149.500000	58.2	V	13.3	15.8	74.0
14806.500000	59.5	H	13.8	14.5	74.0
15686.500000	60.6	H	14.5	13.4	74.0
16234.500000	61.7	V	15.1	12.3	74.0
16748.000000	61.6	H	15.6	12.4	74.0
17368.500000	61.9	H	16.2	12.1	74.0

#### Set.1 Charging mode / Average detector

Frequency(MHz)	Result(dBuV/m)	Polarity	$A_{Rpl}$ (dB)	Margin(dB)	Limit (dB $\mu$ V/m)
14157.000000	46.5	V	13.3	7.5	54.0
15184.500000	47.5	H	14.3	6.5	54.0
15759.000000	49.0	V	14.6	5.0	54.0
16198.000000	49.7	H	15.1	4.3	54.0
16835.500000	50.2	V	16.0	3.8	54.0
17952.000000	50.0	H	16.9	4.0	54.0

**Set.2 Charging mode / Peak detector**

Frequency(MHz)	Result(dBuV/m)	Polarity	A <sub>Rpl</sub> (dB)	Margin(dB)	Limit (dB $\mu$ V/m)
14182.000000	58.0	H	13.4	16.0	74.0
14726.500000	59.0	H	13.9	15.0	74.0
15758.000000	61.3	V	14.6	12.7	74.0
16273.000000	61.7	V	15.2	12.3	74.0
16896.500000	62.8	H	16.4	11.2	74.0
17412.000000	62.6	H	16.5	11.4	74.0

**Set.2 Charging mode / Average detector**

Frequency(MHz)	Result(dBuV/m)	Polarity	A <sub>Rpl</sub> (dB)	Margin(dB)	Limit (dB $\mu$ V/m)
14185.000000	46.5	V	13.4	7.5	54.0
15182.000000	47.4	H	14.3	6.6	54.0
15671.000000	49.0	H	14.5	5.0	54.0
16206.000000	49.7	H	15.1	4.3	54.0
16771.500000	50.2	H	15.7	3.8	54.0
17405.000000	50.1	H	16.4	3.9	54.0

**Set.3 Charging mode / Peak detector**

Frequency(MHz)	Result(dBuV/m)	Polarity	A <sub>Rpl</sub> (dB)	Margin(dB)	Limit (dB $\mu$ V/m)
13968.500000	58.7	H	12.8	15.3	74.0
14730.000000	59.3	H	13.9	14.7	74.0
15685.000000	61.2	H	14.5	12.8	74.0
16266.500000	62.6	H	15.2	11.4	74.0
16757.000000	62.4	H	15.6	11.6	74.0
17932.500000	61.7	V	16.9	12.3	74.0

**Set.3 Charging mode / Average detector**

Frequency(MHz)	Result(dBuV/m)	Polarity	A <sub>Rpl</sub> (dB)	Margin(dB)	Limit (dB $\mu$ V/m)
14146.500000	46.5	H	13.3	7.5	54.0
15176.500000	47.5	V	14.3	6.5	54.0
15697.000000	49.2	H	14.5	4.8	54.0
16216.000000	49.7	V	15.1	4.3	54.0
16795.500000	50.3	H	15.8	3.7	54.0
17959.000000	50.1	H	16.9	3.9	54.0

Note: The measurement result of Set.1, Set.2 and Set.3 showed here are worst cases of combinations of different batteries and USB cables.

Charging mode: Set 1

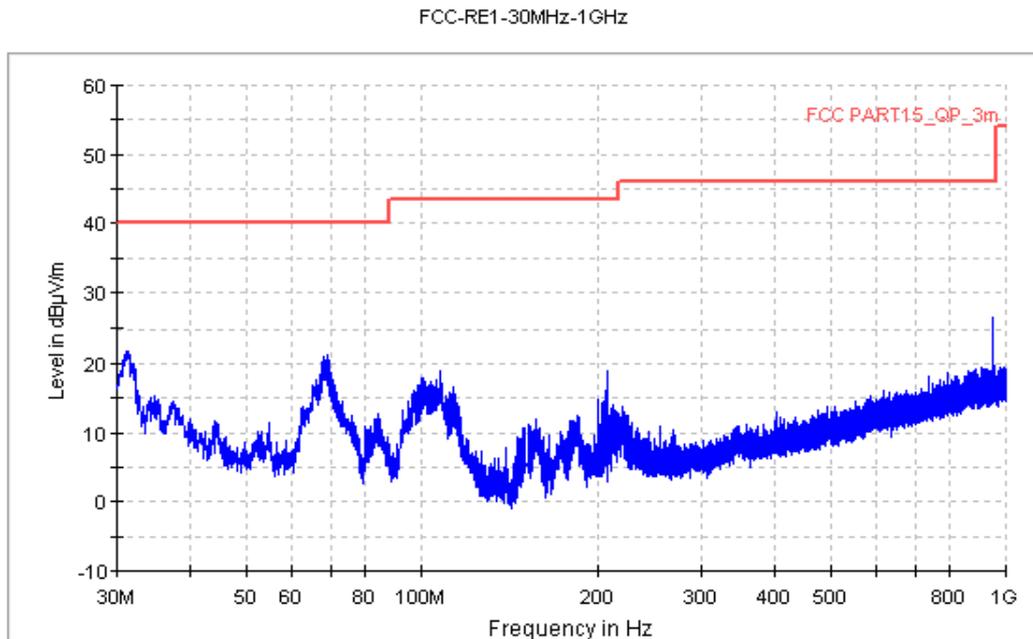


Figure A.1 Radiated Emission from 30MHz to 1GHz

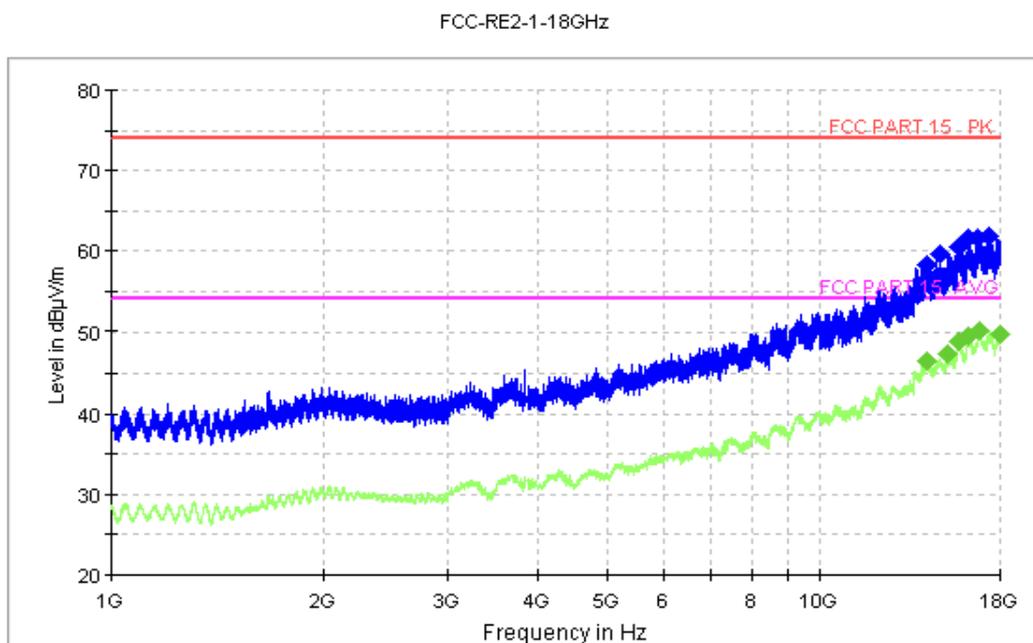


Figure A.2 Radiated Emission from 1GHz to 18GHz

Charging mode: Set 2

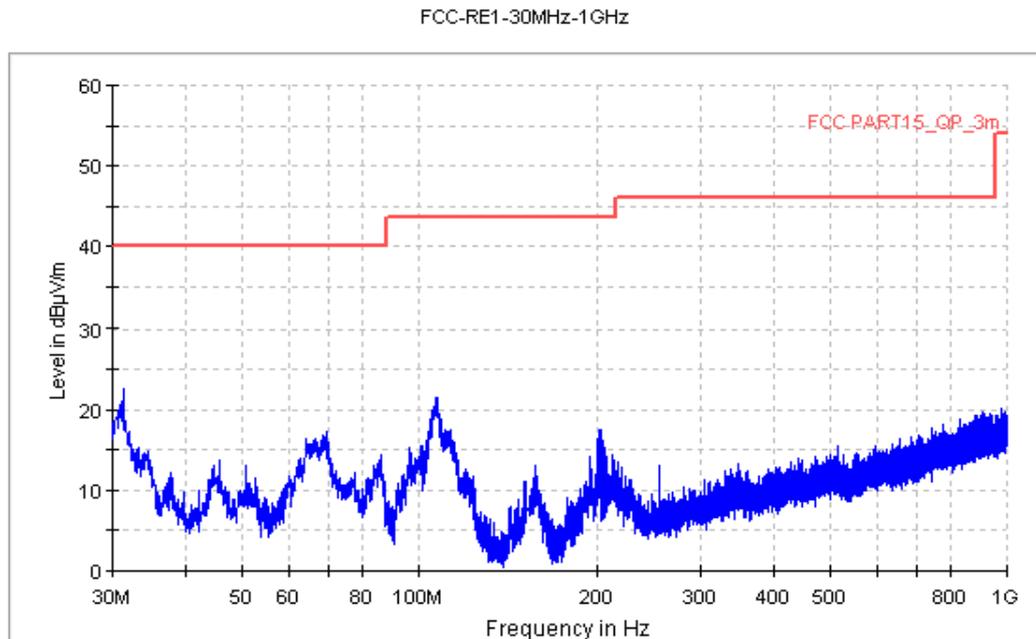


Figure A.3 Radiated Emission from 30MHz to 1GHz

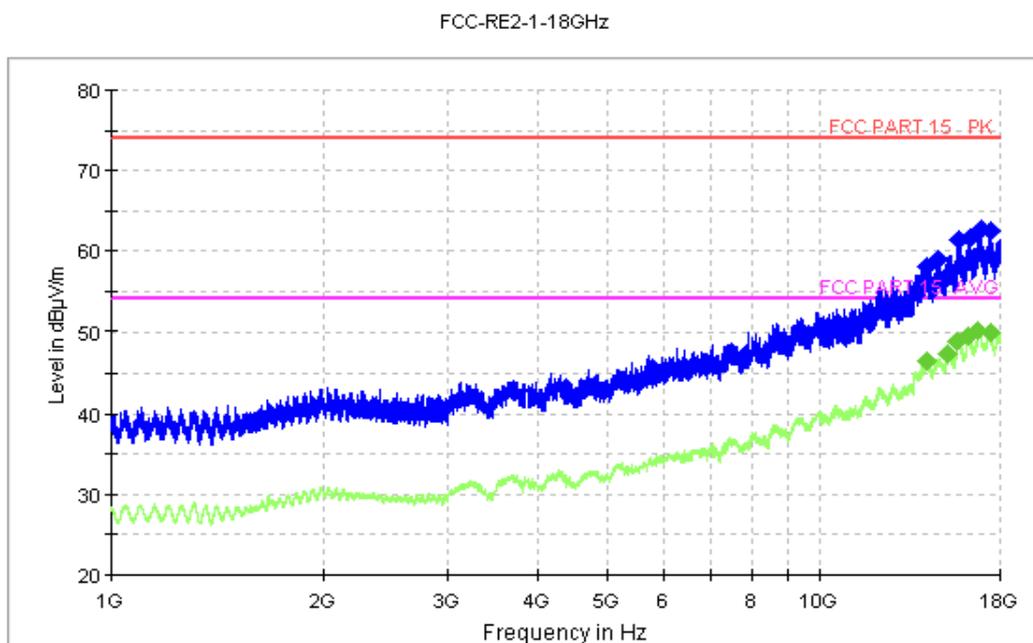


Figure A.4 Radiated Emission from 1GHz to 18GHz

Charging mode: Set 3

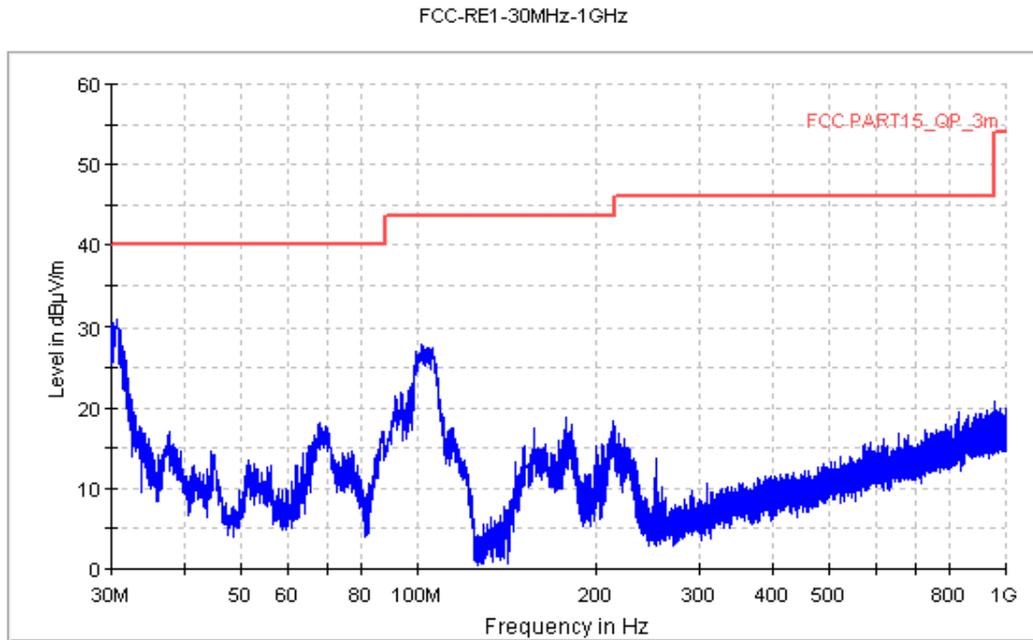


Figure A.5 Radiated Emission from 30MHz to 1GHz

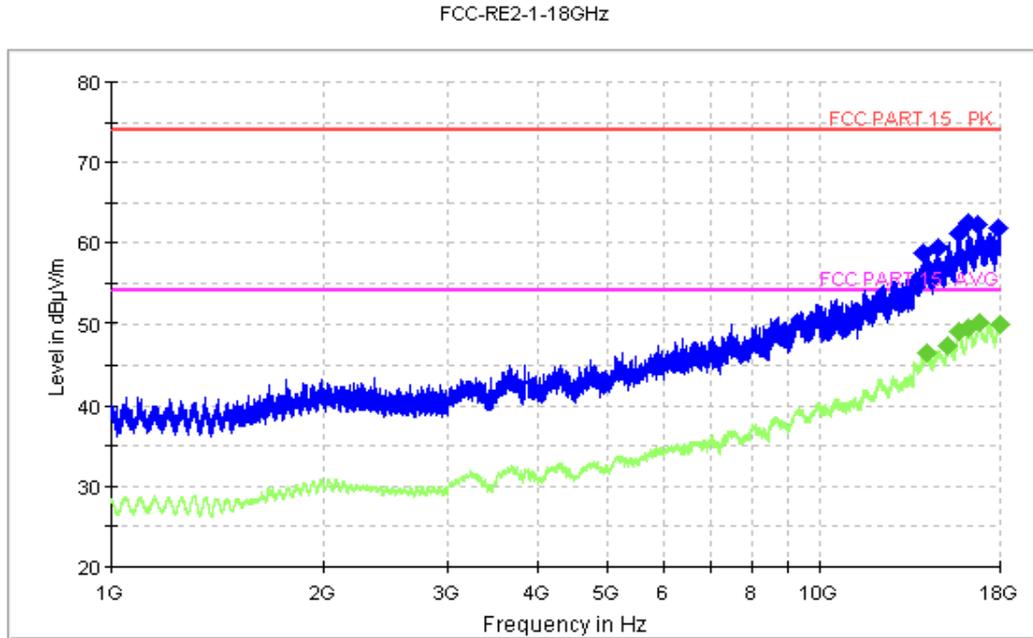


Figure A.6 Radiated Emission from 1GHz to 18GHz

## A.2 Conducted Emission (§15.107(a))

### Reference

FCC: CFR Part 15.107(a)

### A.2.1 Method of measurement

For equipment that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits. Tested in accordance with the procedures of ANSI C63.4 - 2014, section 7.3.

### A.2.2 EUT Operating Mode:

The MS is operating in the charging mode. During the test MS is connected to a charger in the case of charging mode.

### A.2.3 Measurement Limit

Frequency of emission (MHz)	Conducted limit (dB $\mu$ V)	
	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

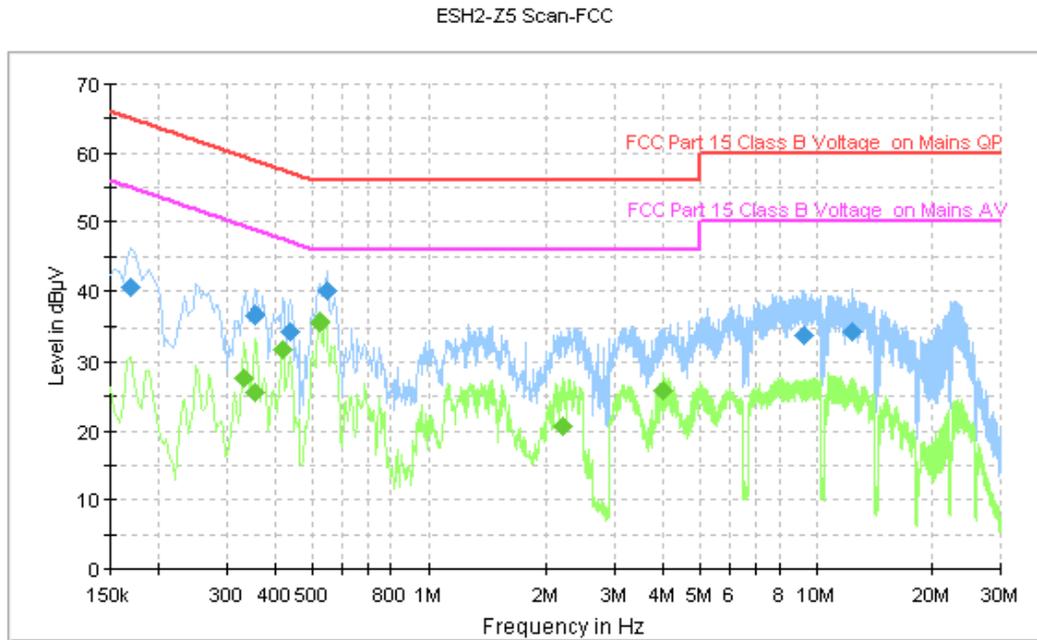
### A.2.4 Test Condition in charging mode

Voltage (V)	Frequency (Hz)
120	60

RBW	Sweep Time(s)
9kHz	1

**CE Measurement uncertainty:** 2.7 dB (k=2)

**A.2.5 Measurement Results**  
**Charging mode:Set.1**



**Figure A.7 Conducted Emission**

**Final Measurement Detector 1**

Frequency (MHz)	QuasiPeak (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.170000	40.5	GND	L1	10.0	24.4	65.0
0.354000	36.6	GND	N	10.1	22.3	58.9
0.438000	34.5	GND	N	10.1	22.6	57.1
0.546000	40.1	GND	N	10.1	15.9	56.0
9.262000	33.7	GND	L1	10.3	26.3	60.0
12.342000	34.4	GND	L1	10.4	25.6	60.0

**Final Measurement Detector 2**

Frequency (MHz)	Average (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.334000	27.5	GND	N	10.0	21.8	49.4
0.354000	25.6	GND	N	10.1	23.3	48.9
0.418000	31.7	GND	N	10.1	15.8	47.5
0.522000	35.7	GND	N	10.1	10.3	46.0
2.214000	20.7	GND	N	10.2	25.3	46.0
4.022000	25.9	GND	N	10.2	20.1	46.0

Charging mode:Set.2

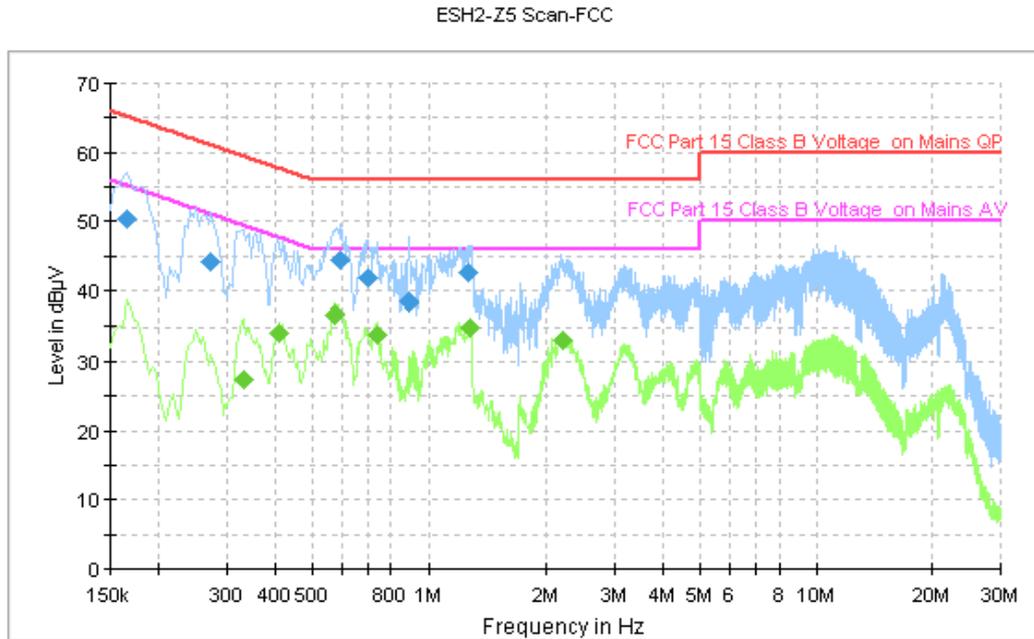


Figure A.8 Conducted Emission

Final Measurement Detector 1

Frequency (MHz)	QuasiPeak (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.166000	50.4	GND	L1	10.0	14.7	65.2
0.274000	44.1	GND	L1	10.0	16.9	61.0
0.594000	44.3	GND	L1	10.1	11.7	56.0
0.698000	41.8	GND	L1	10.0	14.2	56.0
0.894000	38.4	GND	L1	10.1	17.6	56.0
1.270000	42.5	GND	L1	10.1	13.5	56.0

Final Measurement Detector 2

Frequency (MHz)	Average (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.334000	27.5	GND	L1	10.0	21.9	49.4
0.410000	34.1	GND	L1	10.0	13.6	47.6
0.574000	36.7	GND	L1	10.1	9.3	46.0
0.734000	33.7	GND	L1	10.0	12.3	46.0
1.278000	34.8	GND	L1	10.1	11.2	46.0
2.198000	33.1	GND	L1	10.1	12.9	46.0

Charging mode:Set.3

ESH2-Z5 Scan-FCC

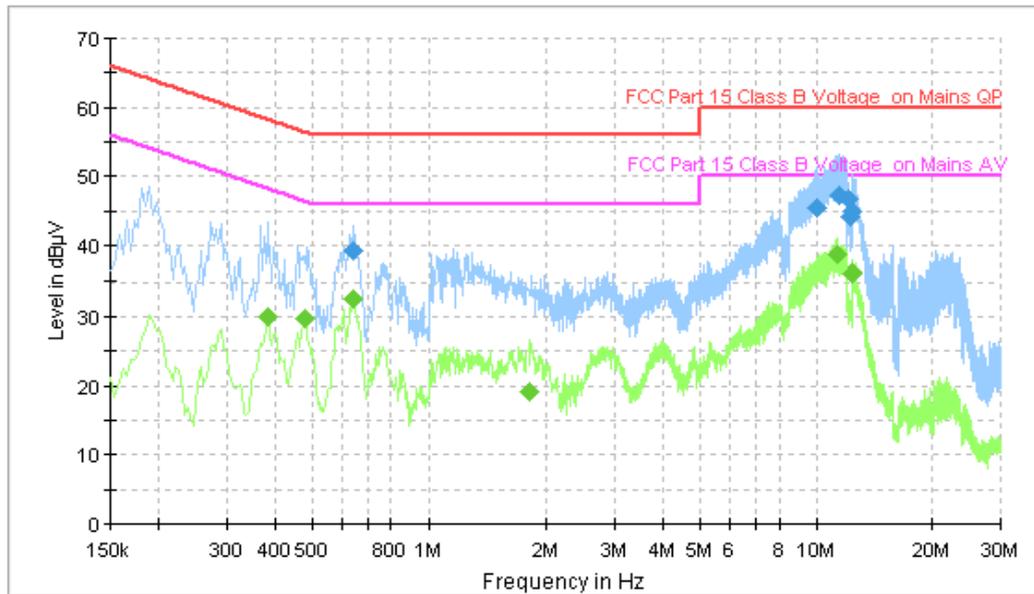


Figure A.9 Conducted Emission

Final Measurement Detector 1

Frequency (MHz)	QuasiPeak (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.642000	39.2	GND	N	10.0	16.8	56.0
10.086000	45.5	GND	L1	10.3	14.5	60.0
11.478000	47.2	GND	L1	10.3	12.8	60.0
12.070000	46.6	GND	L1	10.4	13.4	60.0
12.286000	44.0	GND	L1	10.4	16.0	60.0
12.418000	45.0	GND	L1	10.4	15.0	60.0

Final Measurement Detector 2

Frequency (MHz)	Average (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.382000	30.0	GND	N	10.0	18.2	48.2
0.478000	29.8	GND	N	10.1	16.6	46.4
0.642000	32.6	GND	N	10.0	13.4	46.0
1.814000	19.1	GND	N	10.1	26.9	46.0
11.298000	38.8	GND	L1	10.3	11.2	50.0
12.418000	36.1	GND	L1	10.4	13.9	50.0

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