



# TEST REPORT

## No. I23Z70158-EMC01

for

**Samsung Electronics Co., Ltd.**

**Multi-band GSM/WCDMA/LTE/5GNR Tablet with Bluetooth, WLAN**

**Model Name: SM-X216B**

with

**FCC ID: ZCASM216B**

**Hardware Version: REV1.0**

**Software Version: X216B.001**

**Issued Date: 2023-08-30**

**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.

The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the U.S. Government.

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## **REPORT HISTORY**

<b>Report Number</b>	<b>Revision</b>	<b>Description</b>	<b>Issue Date</b>
I23Z70158-EMC01	Rev.0	1 <sup>st</sup> edition	2023-08-30

Note: the latest revision of the test report supersedes all previous versions.

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## 1. Test Laboratory

### 1.1. Introduction & Accreditation

Telecommunication Technology Labs, CAICT is an ISO/IEC 17025:2017 accredited test laboratory under American Association for Laboratory Accreditation (A2LA) with lab code 7049.01, and is also an FCC accredited test laboratory (CN1349), and ISED accredited test laboratory (CAB identifier:CN0066). The detail accreditation scope can be found on A2LA website.

### 1.2. Testing Location

#### CTTL (BDA)

Address: No. 18A, Kangding Street, Beijing Economic-Technology Development Area, Beijing, 100176, P.R. China

### 1.3. Testing Environment

Normal Temperature: 15-35°C

Relative Humidity: 20-75%

### 1.4. Project data

Testing Start Date: 2023-08-07

Testing End Date: 2023-08-25

### 1.5. Signature



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Li Yan

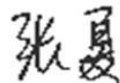
(Prepared this test report)



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Zhang Ying

(Reviewed this test report)



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Zhang Xia

Deputy Director of the laboratory

(Approved this test report)



## **2. Client Information**

### **2.1. Applicant Information**

Company Name: Samsung Electronics Co., Ltd.  
Address: 19 Chapin Rd., Building D Pine Brook, NJ 07058  
City: /  
Postal Code: /  
Country: /  
Contact Person: Jenni Chun  
Contact Email: j1.chun@samsung.com  
Telephone: +1-201-937-4203  
Fax: /

### **2.2. Manufacturer Information**

Company Name: Samsung Electronics. Co., Ltd.  
Address: Samsung R5, Maetan dong 129, Samsung ro  
Youngtong gu, Suwon city 443 742, Korea  
City: /  
Postal Code: /  
Country: /  
Contact Person: JP KIM  
Contact Email: jp426.kim@samsung.com  
Telephone: +82-10-4376-0326  
Fax: /

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

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

Description	Multi-band GSM/WCDMA/LTE/5G NR Tablet with Bluetooth, WLAN
Model name	SM-X216B
FCC ID	ZCASM X216B

Note: Components list, please refer to documents of the manufacturer; it is also included in the original test record of CTTL, Telecommunication Technology Labs, CAICT.

#### **3.2. Internal Identification of EUT used during the test**

<b>EUT ID*</b>	<b>IMEI/SN</b>	<b>HW Version</b>	<b>SW Version</b>
UT30a	2370158UT30a	REV1.0	X216B.001
UT31a	2370158UT31a	REV1.0	X216B.001

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

#### **3.3. Internal Identification of AE used during the test**

<b>AE ID*</b>	<b>Name</b>	<b>Model</b>	<b>Manufacturer</b>
AE1	Battery	WT-S-W11	SCUD (Fujian) Electronics Co., Ltd.
AE2*	Adapter	EP-T1510	DONGGUAN DONGWON ELECTRONICS CO.,LTD.
AE3-1	Date Cable1 C-C	EP-DN980BWE	Guangxi Broad Telecommunication Co.,Ltd.
AE3-2	Date Cable2 C-C	EP-DN980BWE	RFTECH Co., Ltd.
AE3-3	Date Cable3 C-C	EP-DN980BWE	CRESYN HANOI Co., Ltd
AE4*	Date Cable4 A-C	EP-DR140AWE	Samsung Electronics Co.,Ltd
AE5*	Headset	ESH61ASFWE	/
AE6*	PC	/	/
AE7*	SD card	/	/
AE8*	MHD	/	/
AE9*	Keyboard	/	Samsung Electronics Co.,Ltd

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

\* The USB cables are shielded.

\*AE2, AE4, AE5 and AE9 are not the AE for EUT, provided by the client for relevant tests.

\*AE6, AE7 and AE8 are not the AE for EUT, provided by the Lab for relevant tests.

### 3.4. General Description

Equipment under Test (EUT) is a model of Multi-band GSM/WCDMA/LTE/5G NR Tablet with Bluetooth, WLAN with integrated antenna.

Description	Multi-band GSM/WCDMA/LTE/5G NR Tablet with Bluetooth, WLAN	
Model name	SM-X216B	
Marketing name	Galaxy Tab A9+	
Brand name	SAMSUNG	
Cellular Bands	<input checked="" type="checkbox"/> GSM	Bands 850/900/1800/1900MHz
	<input type="checkbox"/> CDMA	/
	<input checked="" type="checkbox"/> WCDMA	Bands 1/2/4/5/8
	<input checked="" type="checkbox"/> LTE	Bands 1/2/3/4/5/7/8/12/13/17/20/26/28/38/40/41/66
	<input checked="" type="checkbox"/> 5G NR SA	Bands 1/3/5/7/8/20/28/38/40/41/66/77/78
	<input checked="" type="checkbox"/> 5G NR NSA	Refer to the manufacturer's specifications
Unlicensed Radio	<input checked="" type="checkbox"/> Wi-Fi 2.4GHz	802.11b/g/n(20MHz)
	<input checked="" type="checkbox"/> Wi-Fi 5GHz	802.11a/n(20MHz,40MHz)/ac(20MHz,40MHz,80MHz)
	<input checked="" type="checkbox"/> Wi-Fi 5.8GHz	802.11a/n(20MHz,40MHz)/ac(20MHz,40MHz,80MHz)
	<input checked="" type="checkbox"/> Bluetooth	<input checked="" type="checkbox"/> EDR <input type="checkbox"/> BLE4 <input checked="" type="checkbox"/> BLE5
Other	<input checked="" type="checkbox"/> GNSS	<input checked="" type="checkbox"/> GPS <input type="checkbox"/> BDS <input checked="" type="checkbox"/> Gallileo <input checked="" type="checkbox"/> Glonass
	<input type="checkbox"/> FM <input checked="" type="checkbox"/> MP3 <input checked="" type="checkbox"/> MP4 <input checked="" type="checkbox"/> Camera <input checked="" type="checkbox"/> USB	
	<input checked="" type="checkbox"/> External memory	
Temperature	-10-55°C	
Normal Voltage	3.85V	
Extreme Low Voltage	3.55V	
Extreme High Voltage	4.4V	

The device contains receivers which tune and operate between 30MHz-960MHz in the following bands: GSM850 MHz, WCDMA Band 5, LTE Band 5, LTE Band 12, LTE Band 13, LTE Band 17, LTE Band 26 and 5G NR Band5.

Samples undergoing test were selected by the client.

Manual and specifications of the EUT were provided to fulfil the test.

For more EUT information please refer to the manufacturer's specifications or user's manual.

### 3.5. EUT set-ups

#### Set-up

EUT set-up No.	Combination of EUT and AE	Remarks
Set.1	UT31a + AE2 + AE3-1 +AE5	Adapter + cable1+ headset
Set.2	UT31a + AE2 + AE3-2	Adapter + cable2
Set.3	UT31a + AE2 + AE3-3 +AE5	Adapter + cable3+ headset
Set.4	UT31a + AE3-1/2/3 + UT30a +AE5	EUT+EUT+ headset
Set.5	UT31a + AE3-1/2/3 + HD	EUT+HD+ headset
Set.6	UT30a + AE3-1/2/3 + AE5 +PC	Type C communication with PC
Set.7	UT31a + AE4 + AE5 + PC + SD	USB communication with PC+SD
Set.8	UT31a + AE2 + AE3 + AE5 + AE9	EUT+ Keyboard

#### Test mode

Mode No.	Operating mode	Remarks
mode.1	MP4 Play	RE, CE
mode.2	Front Camera	RE, CE
mode.3	Rear Camera	RE, CE
mode.4	OTG Phone to Phone	RE only
mode.5	OTG + Mobile HD+MP4	RE only
mode.6	USB DATA (TYPE C)	RE, CE
mode.7	USB DATA (USB, SD TO PC)	RE, CE
mode.8	Keyboard input	RE, CE
mode.9	CXX RX mode	GSM850 MHz, WCDMA Band 5, LTE Band 5, LTE Band 12, LTE Band 13, LTE Band 17, LTE Band 26 and 5G NR Band5 (Low/Mid/High channel)



## 4. Reference Documents

### 4.1. Documents supplied by applicant

EUT parameters are supplied by the client or manufacturer, which is the basis of testing.

### 4.2. Reference Documents for testing

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

Reference	Title	Version
FCC 47 CFR Part 15, Subpart B	Radio frequency devices - Unintentional Radiators	2021
ANSI C63.4	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	2014

Note: The test methods have no deviation with standards.

## 5. LABORATORY ENVIRONMENT

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

Temperature	Min. = 15 °C, Max. = 35 °C
Relative humidity	Min. = 15 %, Max. = 75 %
Shielding effectiveness	0.014MHz - 1MHz, >60dB; 1MHz - 1000MHz, >90dB.
Electrical insulation	> 2 MΩ
Ground system resistance	< 4 Ω
Normalised site attenuation (NSA)	< ± 4 dB, 3m distance, from 30 to 1000 MHz
Site voltage standing-wave ratio ( $S_{VSWR}$ )	Between 0 and 6 dB, from 1GHz to 18GHz
Uniformity of field strength	Between 0 and 6 dB, from 80 to 6000 MHz

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

Temperature	Min. = 15 °C, Max. = 35 °C
Relative humidity	Min. = 20 %, Max. = 75 %
Shielding effectiveness	0.014MHz-1MHz, >60dB;
Electrical insulation	1MHz— 1000MHz, >90dB. > 2 MΩ
Ground system resistance	< 4 Ω
Temperature	Min. = 15 °C, Max. = 35 °C

## 6. SUMMARY OF TEST RESULTS

Abbreviations used in this clause:		
Verdict Column	P	Pass
	NA	Not applicable
	F	Fail
	BR	Re-use test data from basic model report.

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

## 7. Test Equipments Utilized

### Test Equipment

NO.	Description	TYPE	SERIES NUMBER	MANUFACTURER	CAL DUE DATE	CALIBRATION INTERVAL
1	Test Receiver	ESU26	100376	R&S	2023-09-22	1 year
2	Test Receiver	ESCI	100766	R&S	2024-02-29	1 year
3	LISN	ENV216	101459	R&S	2024-03-30	1 year
4	BiLog Antenna	VULB9163	01177	Schwarzbeck	2023-09-03	1 year
5	EMI Antenna	3115	00119021	ETS-Lindgren	2024-06-24	1 year
6	Universal Radio Communication Tester	CMW500	159408	R&S	2024-04-26	1 year
7	Universal Radio Communication Tester	SP9500	20482	StarPoint	2023-11-30	1 Year
8	Printer	P1606dn	VNC3L52122	HP	N/A	N/A
9	Keyboard	KU-1601	2048361	Lenovo	N/A	N/A
10	Mouse	EMS-537A	8021S3MC	Lenovo	N/A	N/A
11	PC	M4000e-17	M706RMW2	Lenovo	N/A	N/A
12	PC	T14S	PC-1RP0TY	Lenovo	N/A	N/A

### Test Software

Test Item	Test Software and Version	Software Vendor
Radiated Continuous Emission	EMC32 V8.53.0	R&S
Conducted Emission	EMC32 V8.53.0	R&S

## **ANNEX A: MEASUREMENT RESULTS**

### **A.1 Radiated Emission**

#### **Reference**

FCC: CFR Part 15.109(a).

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

The field strength of radiated emissions from the unintentional radiator at distances of 3 meters (for 30MHz-1GHz) and 3 meters (for above 1GHz) 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 and arranged in a typical configuration in accordance with ANSI C63.4-2014 and manipulated to obtain worst case emissions. 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.

For the test setup photographs please see the test setup photos document.

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

The EUT is operating in the USB mode, charging mode, MP3, MP4, CAMERA, OTG, SD, Keyboard and cellular RX mode.

The EUT was tested while operating in licensed band RX mode. All licensed band receivers that tune in the range of 30MHz-960MHz, as listed in the Section 3.4, are investigated. Only the worst case emissions are reported.

All equipment is placed on the test table top and arranged in a typical configuration in accordance with ANSI C63.4-2014 and manipulated to obtain worst case emissions.

Note: I/O information: Printer – USB, Mouse – PS/2, Keyboard – USB.

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

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 above limit is for 3 meters test distance.

#### A.1.4 Test Condition

Voltage (V)	Frequency (Hz)
120	60

Frequency range (MHz)	RBW/VBW	Sweep Time (s)	Detector
30-1000	120kHz (IF Bandwidth)	5	Peak/Quasi-peak
Above 1000	1MHz/3MHz	15	Peak, Average

#### 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

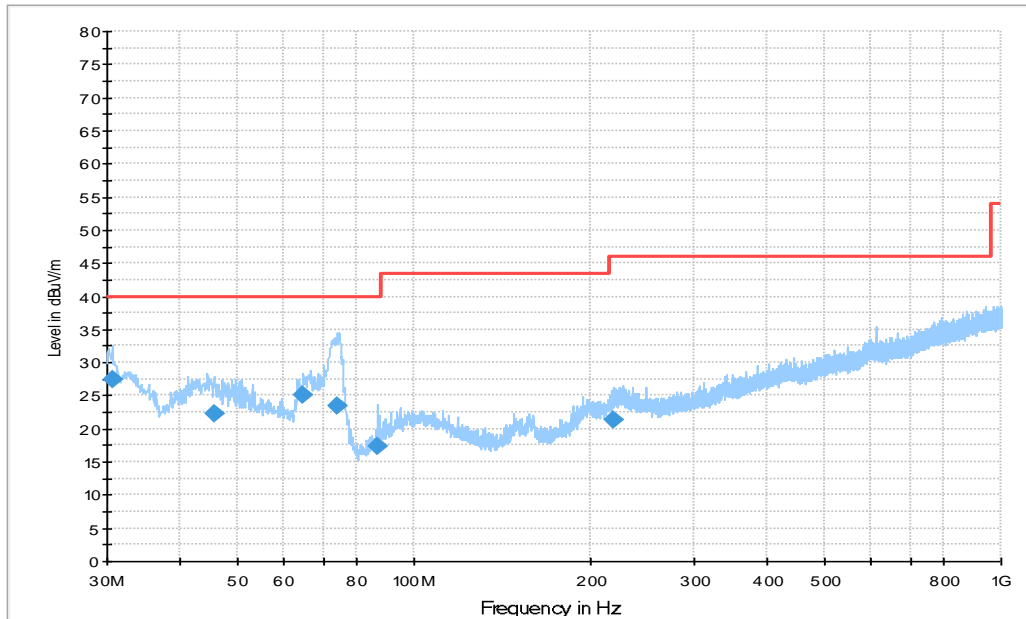
$G_{\text{PL}}$ : Path Loss

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

Measurement uncertainty (worst case): 30MHz-1GHz: 5.73dB, 1GHz-18GHz: 5.58dB,  $k=2$ .

Note: all the set-up and operating mode list in section 3.5 were tested, only the worst test data are showed in this section.

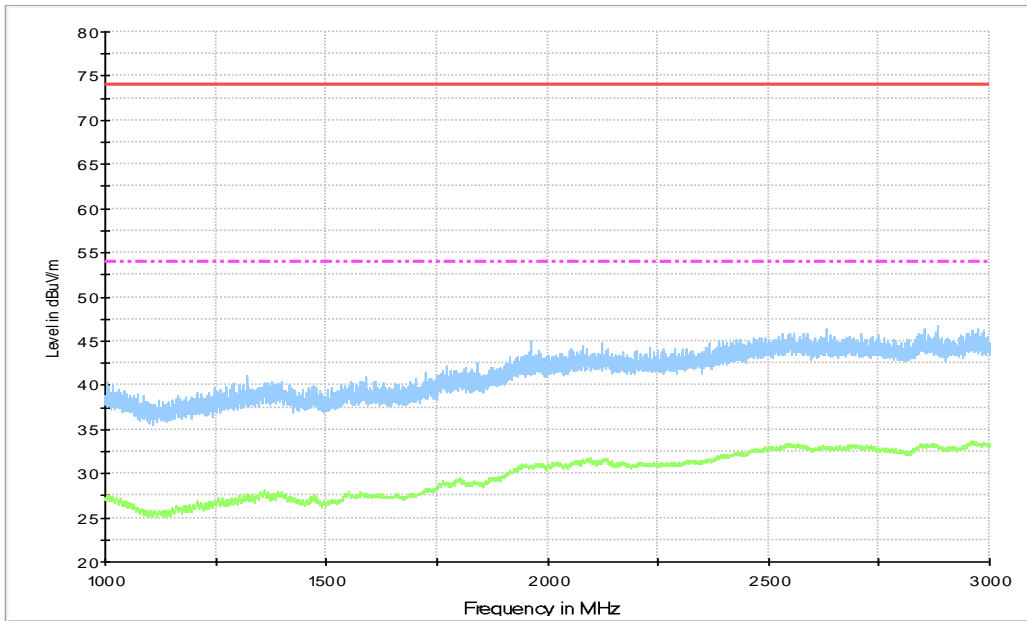
**Set.1+Mode3, Rear Camera**



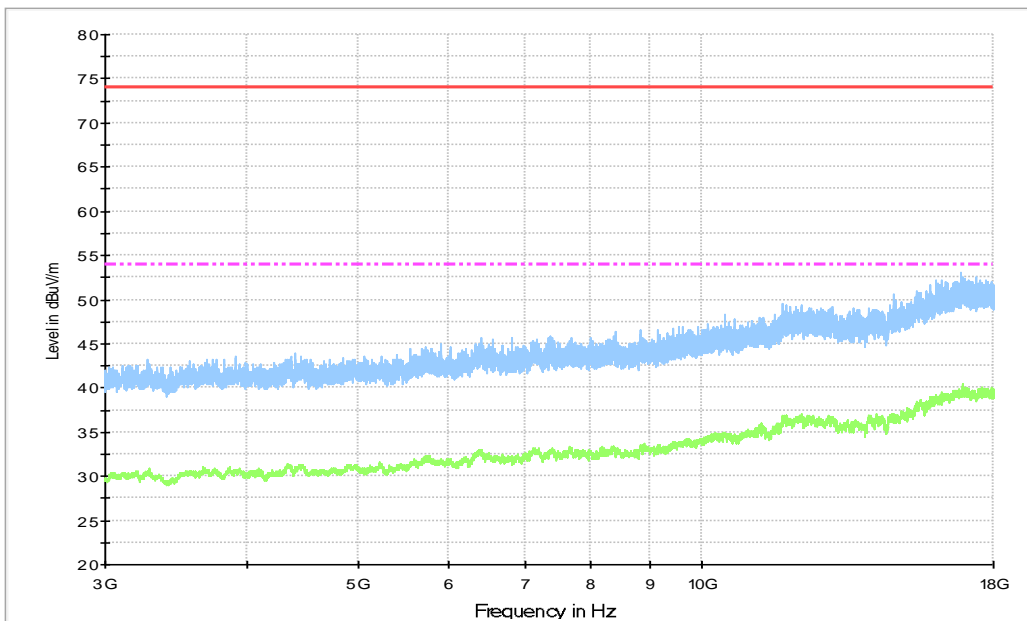
**Figure A.1 Radiated Emission from 30MHz to 1GHz**

**Final Result 1**

Frequency (MHz)	QuasiPeak (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBuV/m)
30.582000	27.3	100.0	V	-45.0	-3.6	12.7	40.0
45.617000	22.3	100.0	V	70.0	0.0	17.7	40.0
64.823000	25.1	100.0	H	161.0	-2.3	14.9	40.0
74.038000	23.4	125.0	V	301.0	-5.7	16.6	40.0
86.551000	17.4	125.0	V	282.0	-5.0	22.6	40.0
218.08300	21.4	113.0	H	250.0	-1.0	24.6	46.0



**Figure A.2 Radiated Emission from 1GHz to 3GHz**



**Figure A.3 Radiated Emission from 3GHz to 18GHz**



**Average detector result**

Frequency (MHz)	Measurement Result (dBμV/m)	Cable loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBμV)	Limit (dBμV/m)	Margin (dB)	Antenna Pol. (H/V)
16926.000	40.43	-24.6	41.2	23.83	54.0	13.6	V
16928.000	40.36	-24.6	41.2	23.75	54.0	13.6	V
16924.500	40.33	-24.7	41.3	23.73	54.0	13.7	V
16923.500	40.33	-24.7	41.3	23.73	54.0	13.7	V
16933.000	40.29	-24.6	41.2	23.68	54.0	13.7	V
16916.000	40.25	-24.7	41.3	23.66	54.0	13.7	V

**Peak detector result**

Frequency (MHz)	Measurement Result (dBμV/m)	Cable loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBμV)	Limit (dBμV/m)	Margin (dB)	Antenna Pol. (H/V)
16829.500	53.0	-25.0	41.3	36.69	74.0	21.0	H
17391.500	52.5	-24.1	40.7	35.98	74.0	21.5	V
16942.500	52.5	-24.6	41.2	35.91	74.0	21.5	V
16954.000	52.3	-24.6	41.2	35.69	74.0	21.7	V
16897.500	52.3	-24.7	41.3	35.72	74.0	21.7	V
17718.500	52.3	-23.7	40.6	35.34	74.0	21.7	V

Set.2+Mode1+Mode9, MP4 +RX LTE B5

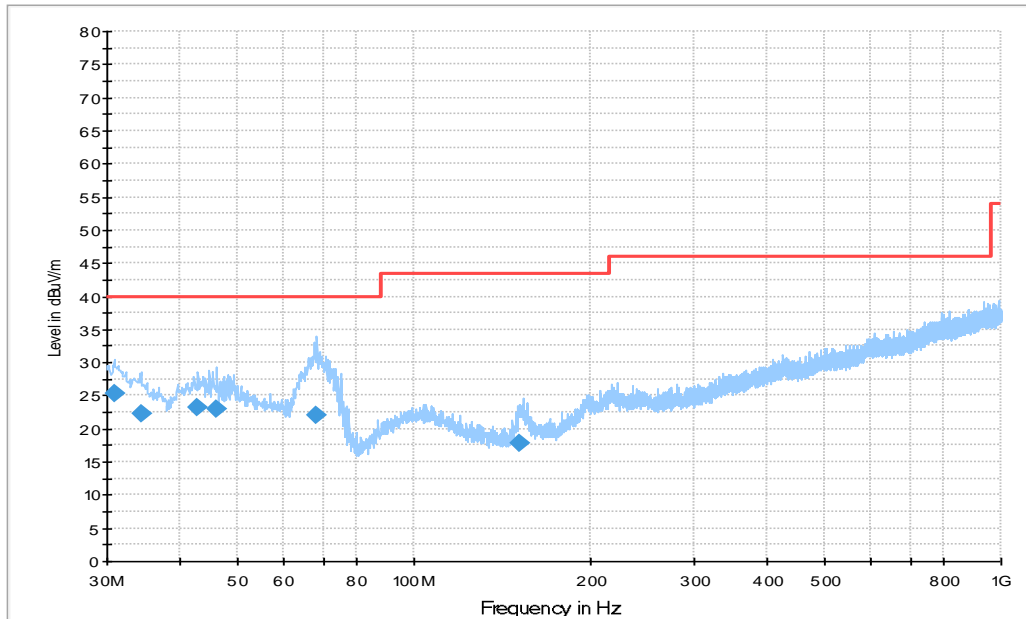
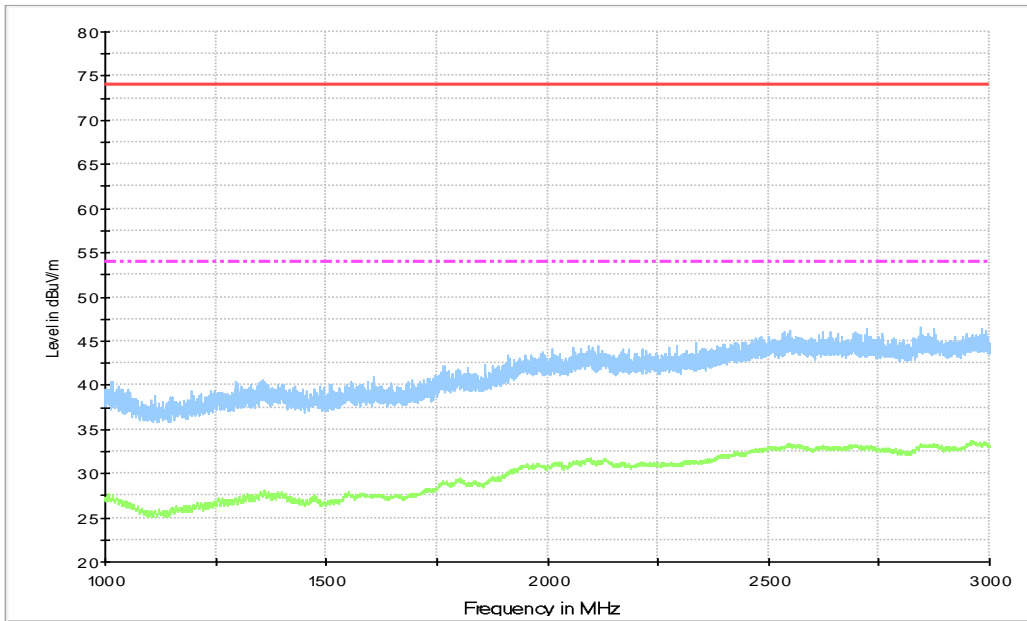


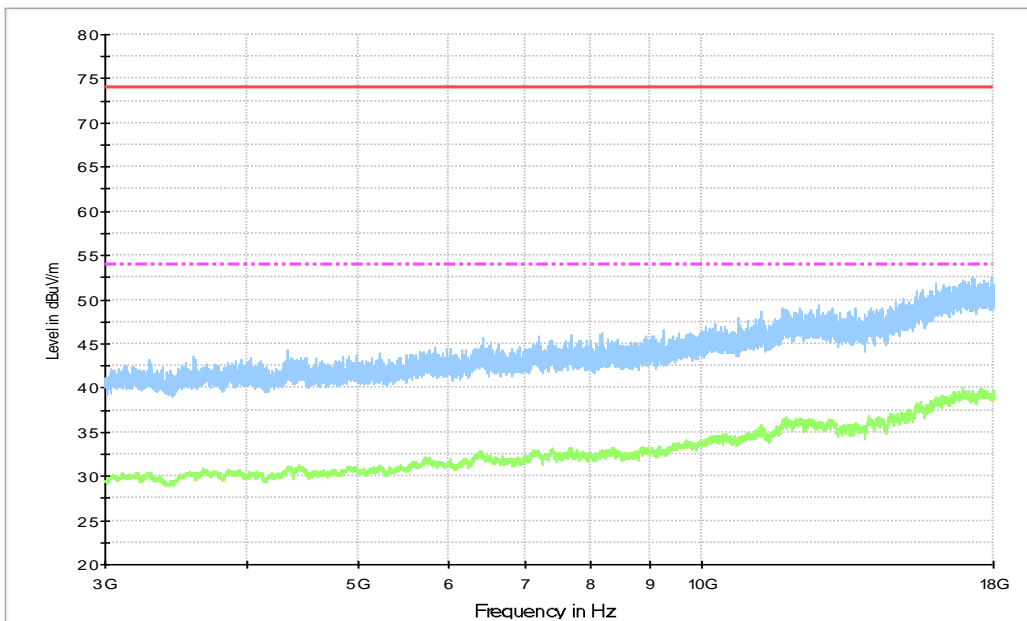
Figure A.4 Radiated Emission from 30MHz to 1GHz

Final Result 1

Frequency (MHz)	QuasiPeak (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBuV/m)
30.873000	25.4	100.0	V	315.0	-3.3	14.6	40.0
34.268000	22.2	125.0	V	-39.0	-2.8	17.8	40.0
42.804000	23.3	100.0	V	31.0	-0.2	16.7	40.0
46.005000	23.1	100.0	V	-1.0	0.5	16.9	40.0
68.315000	22.0	113.0	H	135.0	-3.2	18.0	40.0
150.95900	17.8	100.0	V	211.0	-4.5	25.7	43.5



**Figure A.5 Radiated Emission from 1GHz to 3GHz**



**Figure A.6 Radiated Emission from 3GHz to 18GHz**

**Average detector result**

Frequency (MHz)	Measurement Result (dB $\mu$ V/m)	Cable loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dB $\mu$ V)	Limit (dB $\mu$ V/m)	Margin (dB)	Antenna Pol. (H/V)
16925.000	40.13	-24.6	41.2	23.53	54.0	13.9	H
16920.000	39.90	-24.7	41.3	23.30	54.0	14.1	H
16926.000	39.89	-24.6	41.2	23.29	54.0	14.1	V
16930.000	39.89	-24.6	41.2	23.28	54.0	14.1	H
16931.000	39.89	-24.6	41.2	23.28	54.0	14.1	H
16929.000	39.88	-24.6	41.2	23.28	54.0	14.1	H

**Peak detector result**

Frequency (MHz)	Measurement Result (dB $\mu$ V/m)	Cable loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dB $\mu$ V)	Limit (dB $\mu$ V/m)	Margin (dB)	Antenna Pol. (H/V)
17935.500	52.6	-23.4	40.5	35.45	74.0	21.4	H
17245.500	52.6	-24.3	40.8	36.09	74.0	21.4	H
17324.000	52.3	-24.2	40.8	35.72	74.0	21.7	V
17633.000	52.3	-23.7	40.6	35.33	74.0	21.7	V
16918.500	52.2	-24.7	41.3	35.62	74.0	21.8	V
17015.500	52.1	-24.6	41.1	35.65	74.0	21.9	H

Set.4+Mode2+Mode4+ Mode9, Front Camera + OTG +RX GSM850MHz

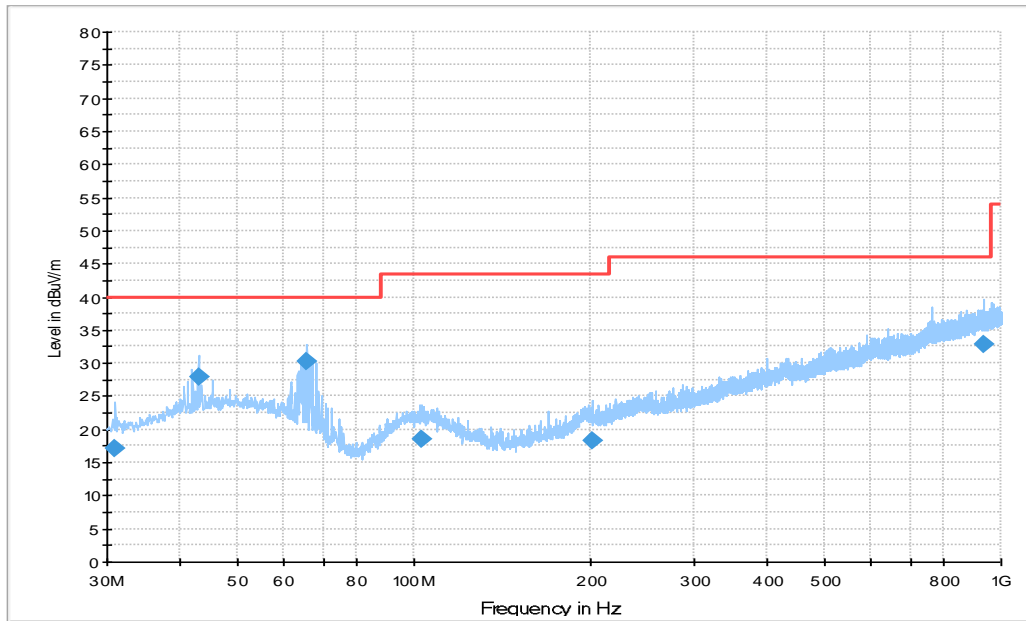
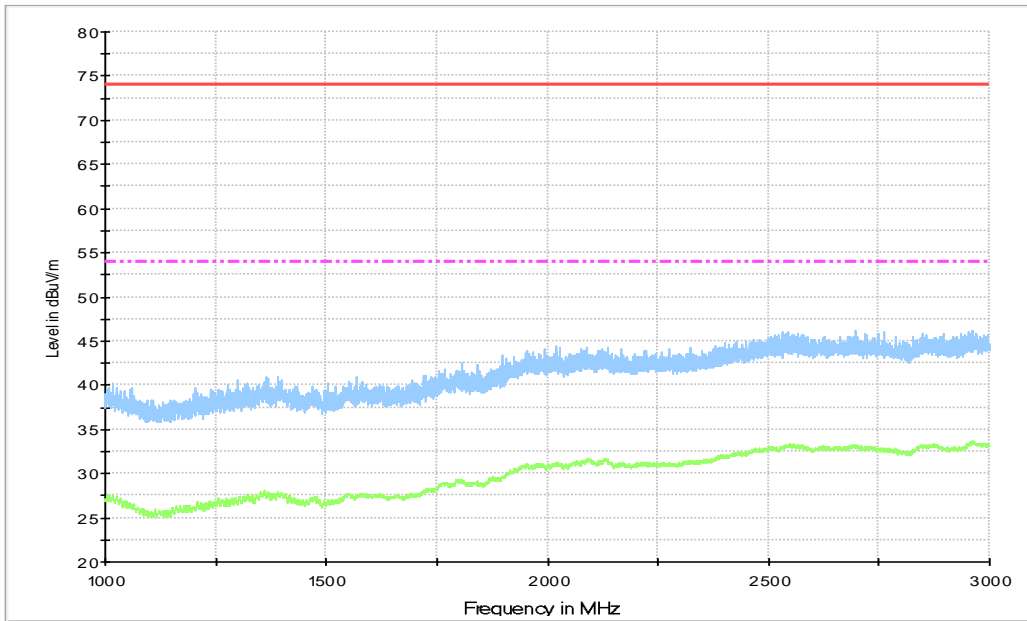


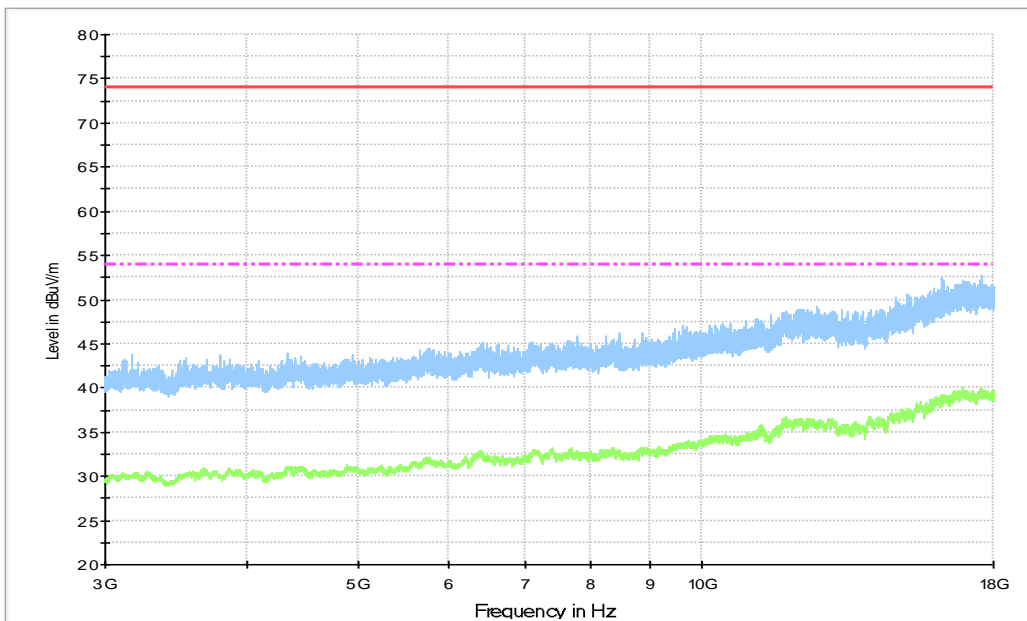
Figure A.7 Radiated Emission from 30MHz to 1GHz

Final Result 1

Frequency (MHz)	QuasiPeak (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBuV/m)
30.970000	17.1	100.0	V	289.0	-3.4	22.9	40.0
42.998000	27.9	100.0	V	32.0	-0.2	12.1	40.0
65.793000	30.3	125.0	H	89.0	-2.2	9.7	40.0
103.04100	18.5	113.0	H	301.0	-0.9	25.0	43.5
201.01100	18.3	125.0	H	294.0	-0.8	25.2	43.5
936.65900	32.8	100.0	H	276.0	13.5	13.2	46.0



**Figure A.8 Radiated Emission from 1GHz to 3GHz**



**Figure A.9 Radiated Emission from 3GHz to 18GHz**

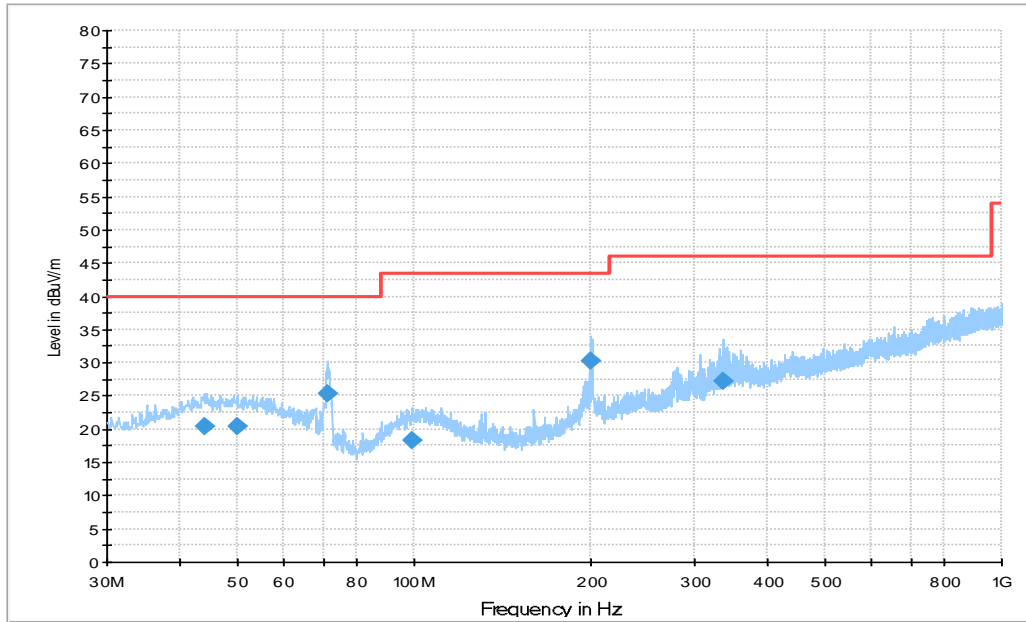
**Average detector result**

Frequency (MHz)	Measurement Result (dB $\mu$ V/m)	Cable loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dB $\mu$ V)	Limit (dB $\mu$ V/m)	Margin (dB)	Antenna Pol. (H/V)
16931.000	40.14	-24.6	41.2	23.53	54.0	13.9	H
16932.000	40.07	-24.6	41.2	23.46	54.0	13.9	H
16928.500	40.07	-24.6	41.2	23.46	54.0	13.9	H
16926.000	39.99	-24.6	41.2	23.39	54.0	14.0	H
16926.500	39.95	-24.6	41.2	23.34	54.0	14.1	H
16929.500	39.94	-24.6	41.2	23.33	54.0	14.1	H

**Peak detector result**

Frequency (MHz)	Measurement Result (dB $\mu$ V/m)	Cable loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dB $\mu$ V)	Limit (dB $\mu$ V/m)	Margin (dB)	Antenna Pol. (H/V)
17605.500	52.7	-23.7	40.6	35.89	74.0	21.3	V
16242.500	52.5	-25.4	40.8	37.09	74.0	21.5	H
16282.500	52.2	-25.2	40.9	36.49	74.0	21.8	H
17493.500	52.1	-24.0	40.6	35.55	74.0	21.9	H
17601.000	52.1	-23.8	40.6	35.29	74.0	21.9	H
16930.500	52.1	-24.6	41.2	35.53	74.0	21.9	V

**Set.7+Mode7, USB (SD TO PC)**

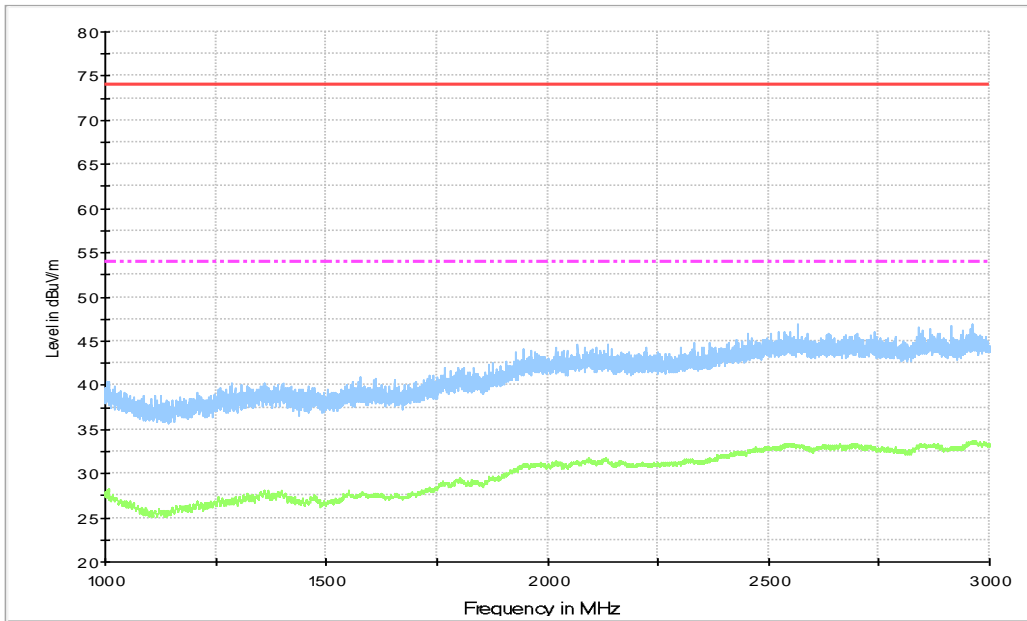


**Figure A.10 Radiated Emission from 30MHz to 1GHz**

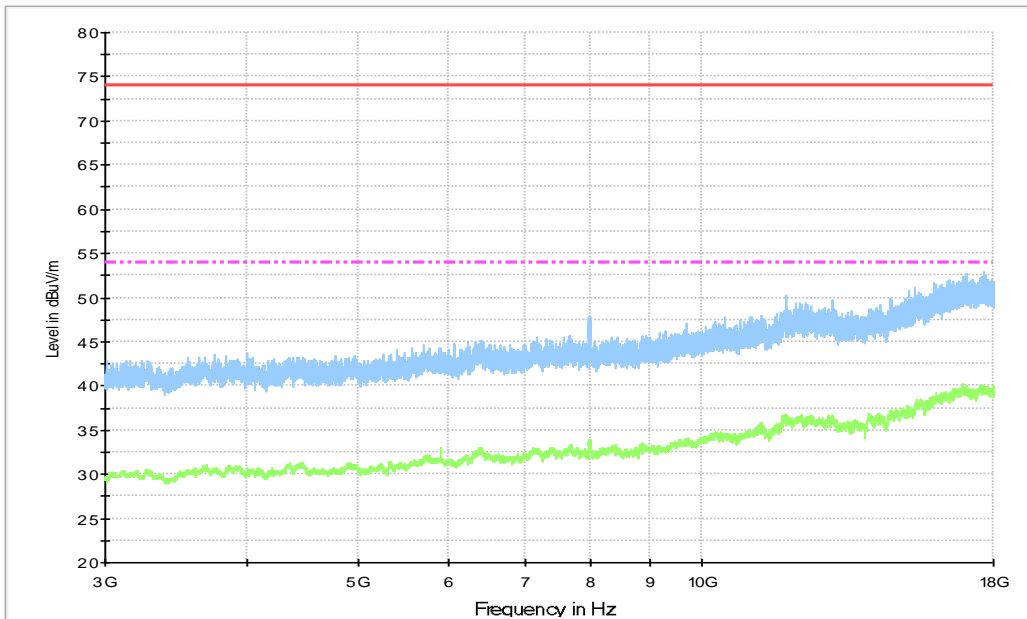
**Final Result 1**

Frequency (MHz)	QuasiPeak (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBuV/m)
43.968000	20.4	100.0	V	270.0	-0.1	19.6	40.0
49.885000	20.4	100.0	H	45.0	0.6	19.6	40.0
71.031000	25.3	125.0	H	108.0	-4.2	14.7	40.0
99.064000	18.2	100.0	H	198.0	-1.3	25.3	43.5
199.94400	30.3	125.0	H	282.0	-0.7	13.2	43.5
335.64700	27.2	100.0	H	315.0	3.4	18.8	46.0





**Figure A.11 Radiated Emission from 1GHz to 3GHz**



**Figure A.12 Radiated Emission from 3GHz to 18GHz**

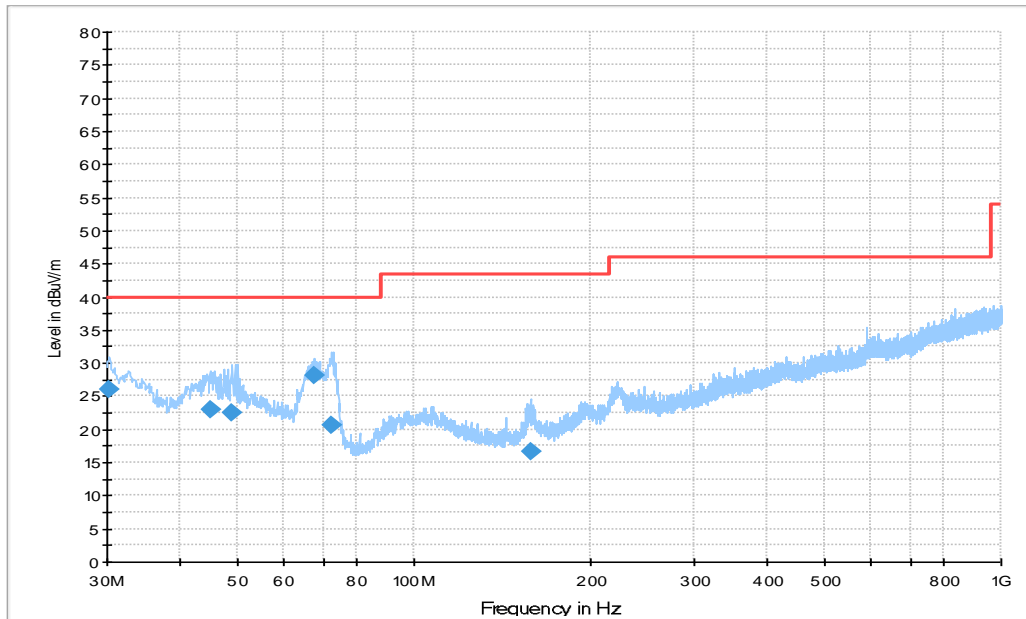
**Average detector result**

Frequency (MHz)	Measurement Result (dB $\mu$ V/m)	Cable loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dB $\mu$ V)	Limit (dB $\mu$ V/m)	Margin (dB)	Antenna Pol. (H/V)
7985.500	33.84	-32.8	35.7	30.93	54.0	20.2	V
16924.000	41.33	-24.7	41.3	34.73	54.0	12.7	H
16929.000	39.78	-24.6	41.2	33.18	54.0	14.2	H
16927.000	40.28	-24.6	41.2	33.67	54.0	13.7	H
16931.500	40.21	-24.6	41.2	33.61	54.0	13.8	H
16924.500	40.31	-24.7	41.3	33.71	54.0	13.7	H

**Peak detector result**

Frequency (MHz)	Measurement Result (dB $\mu$ V/m)	Cable loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dB $\mu$ V)	Limit (dB $\mu$ V/m)	Margin (dB)	Antenna Pol. (H/V)
7978.500	47.7	-32.8	35.7	44.83	74.0	26.3	V
17679.500	52.8	-23.7	40.6	35.90	74.0	21.2	H
17072.000	52.7	-24.7	41.0	36.40	74.0	21.3	H
17696.000	52.6	-23.7	40.6	35.62	74.0	21.4	V
17004.500	52.4	-24.6	41.1	35.92	74.0	21.6	H
17682.000	52.4	-23.7	40.6	35.46	74.0	21.6	V

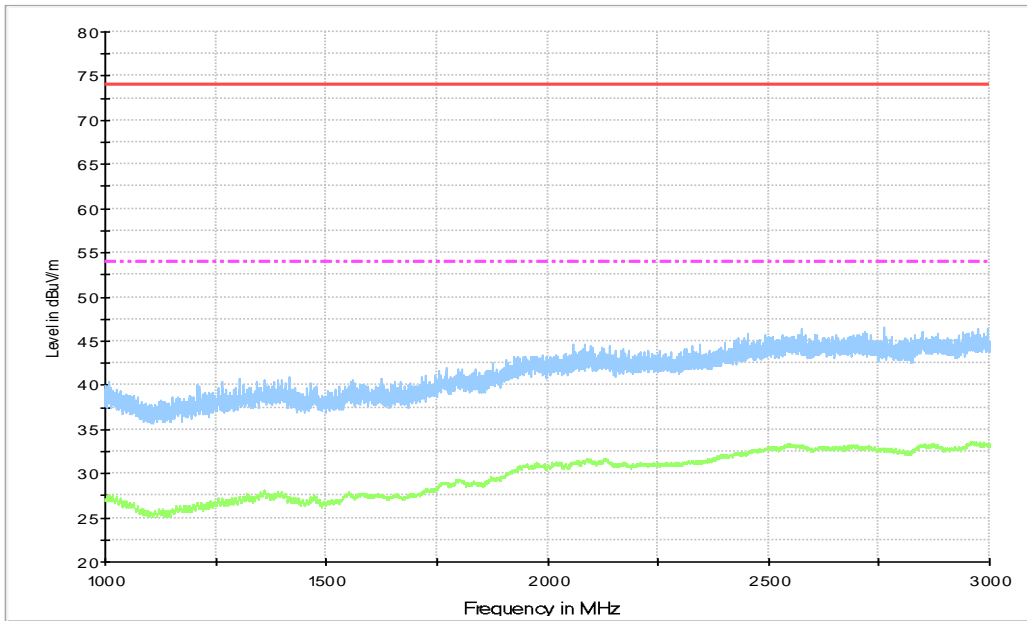
**Set.8+Mode8+Mode9, Keyboard + RX NR Band5**



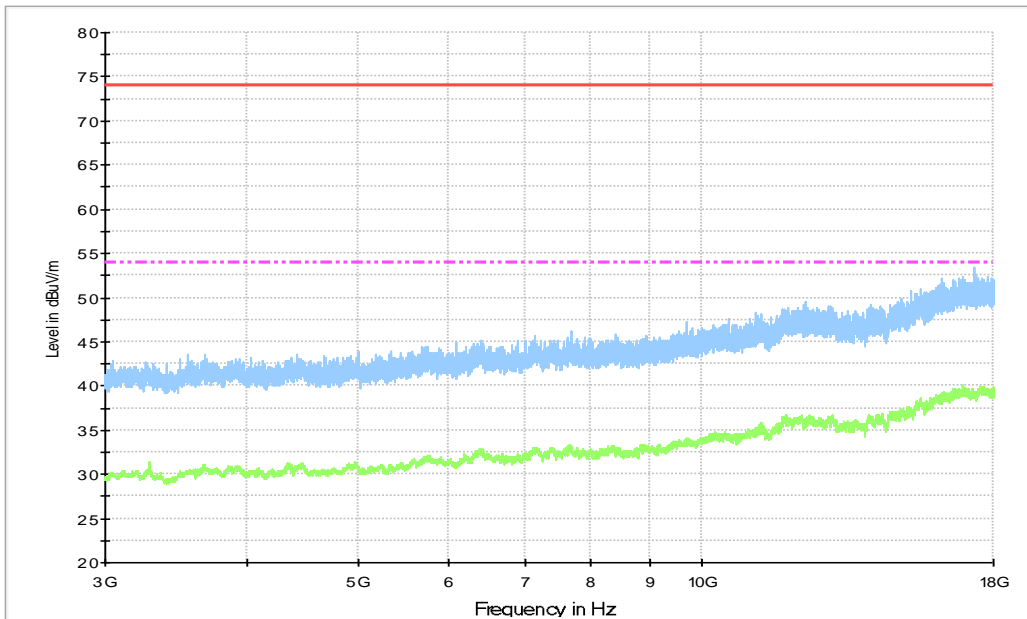
**Figure A.13 Radiated Emission from 30MHz to 1GHz**

**Final Result 1**

Frequency (MHz)	QuasiPeak (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBuV/m)
30.291000	26.0	100.0	V	-39.0	-3.3	14.0	40.0
44.938000	23.1	100.0	V	-40.0	0.2	16.9	40.0
49.109000	22.6	125.0	V	231.0	0.5	17.4	40.0
67.539000	28.0	125.0	H	57.0	-2.9	12.0	40.0
72.292000	20.6	100.0	V	141.0	-4.7	19.4	40.0
157.74900	16.6	100.0	V	-39.0	-4.1	26.9	43.5



**Figure A.14 Radiated Emission from 1GHz to 3GHz**



**Figure A.15 Radiated Emission from 3GHz to 18GHz**

**Average detector result**

Frequency (MHz)	Measurement Result (dB $\mu$ V/m)	Cable loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dB $\mu$ V)	Limit (dB $\mu$ V/m)	Margin (dB)	Antenna Pol. (H/V)
16926.500	40.14	-24.6	41.2	23.54	54.0	13.9	H
16930.000	40.13	-24.6	41.2	23.52	54.0	13.9	H
16935.000	40.07	-24.6	41.2	23.45	54.0	13.9	H
16929.000	40.06	-24.6	41.2	23.45	54.0	13.9	H
16925.000	40.04	-24.6	41.2	23.44	54.0	14.0	H
16923.500	40.03	-24.7	41.3	23.43	54.0	14.0	H

**Peak detector result**

Frequency (MHz)	Measurement Result (dB $\mu$ V/m)	Cable loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dB $\mu$ V)	Limit (dB $\mu$ V/m)	Margin (dB)	Antenna Pol. (H/V)
17305.000	53.4	-24.2	40.8	36.82	74.0	20.6	H
17412.000	52.6	-24.1	40.7	36.07	74.0	21.4	H
16925.500	52.4	-24.6	41.2	35.81	74.0	21.6	H
17303.500	52.4	-24.2	40.8	35.82	74.0	21.6	H
17309.500	52.4	-24.2	40.8	35.77	74.0	21.6	H
17772.000	52.3	-23.6	40.5	35.43	74.0	21.7	H

## A.2 Conducted Emission

### 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.

For the test setup photographs please see the test setup photos document.

#### A.2.2 EUT Operating Mode

The EUT is operating in the USB mode, charging mode, MP3, MP4, CAMERA, SD, Keyboard and cellular RX mode.

The software is used to let the PC keep on copying data to MS, reading and erasing the data after copy action was finished.

Note: I/O information: Printer – USB, Mouse – PS/2, Keyboard – USB.

#### 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

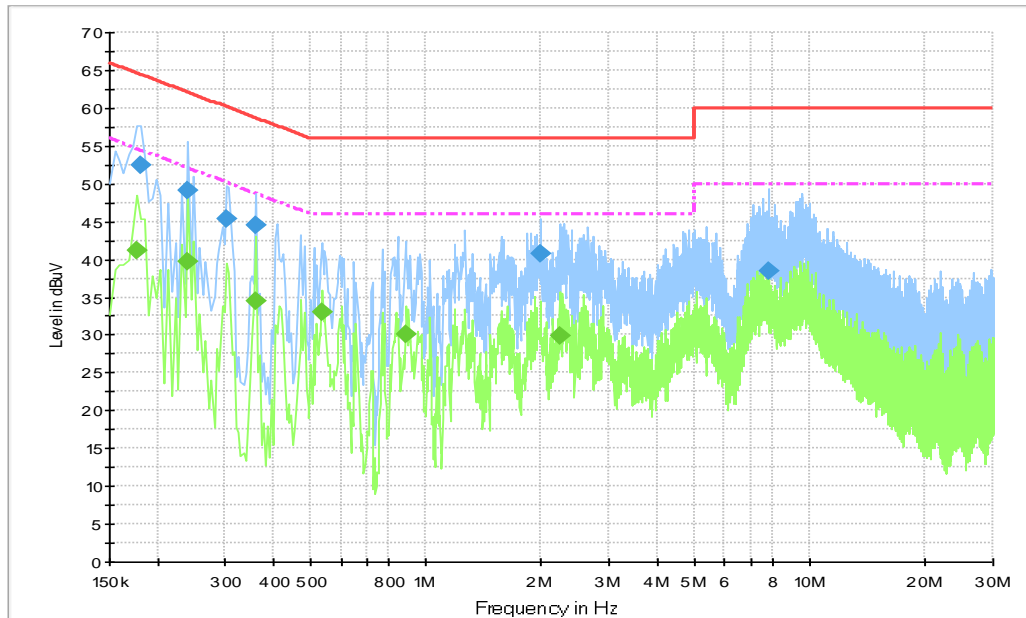
RBW/IF bandwidth	Sweep Time(s)
9kHz	1

### A.2.5 Measurement Results

Measurement uncertainty:  $U= 3.10$  dB,  $k=2$ .

Note: all the set-up and operating mode list in section 3.5 were tested, only the worst test data are showed in this section.

#### Set.1+Mode3



Note: The graphic result above is the maximum of the measurements for both phase line and neutral line.

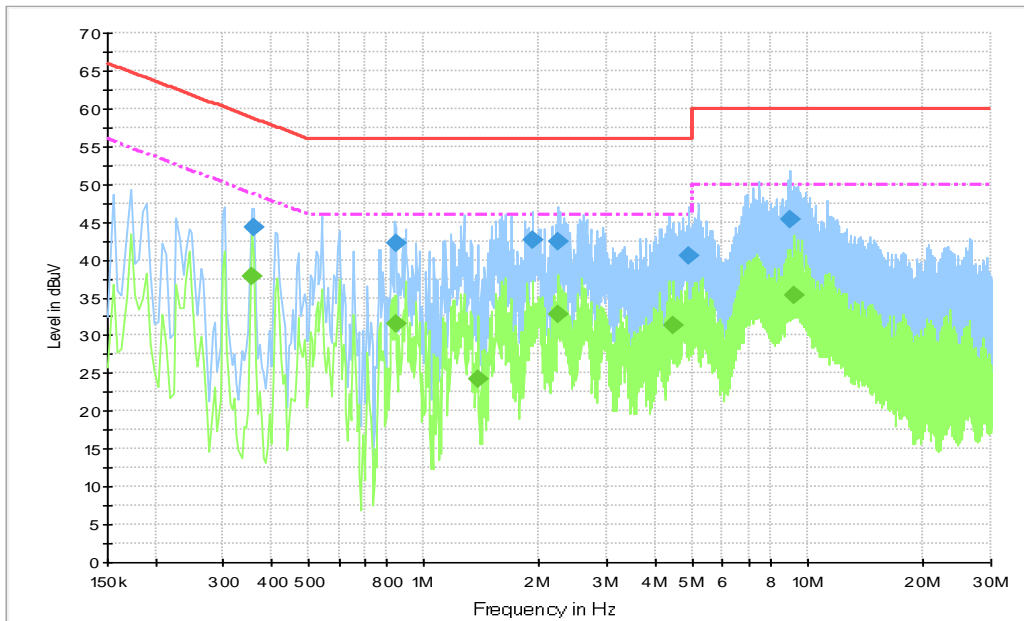
**Figure A.16 Conducted Emission**

#### Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.181500	52.5	2000.0	9.000	N	19.5	11.9	64.4
0.240000	49.1	2000.0	9.000	L1	19.5	13.0	62.1
0.303000	45.4	2000.0	9.000	L1	19.4	14.8	60.2
0.361500	44.5	2000.0	9.000	N	19.4	14.2	58.7
1.990500	40.8	2000.0	9.000	N	19.5	15.2	56.0
7.809000	38.5	2000.0	9.000	L1	19.7	21.5	60.0

#### Final Result 2

Frequency (MHz)	Average (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.177000	41.1	2000.0	9.000	N	19.4	13.5	54.6
0.240000	39.6	2000.0	9.000	N	19.5	12.5	52.1
0.361500	34.4	2000.0	9.000	N	19.4	14.3	48.7
0.537000	33.0	2000.0	9.000	L1	19.5	13.0	46.0
0.892500	30.2	2000.0	9.000	L1	19.4	15.8	46.0
2.224500	29.9	2000.0	9.000	L1	19.5	16.1	46.0

**Set.2+Mode1+ Mode9**


Note: The graphic result above is the maximum of the measurements for both phase line and neutral line.

**Figure A.17 Conducted Emission**

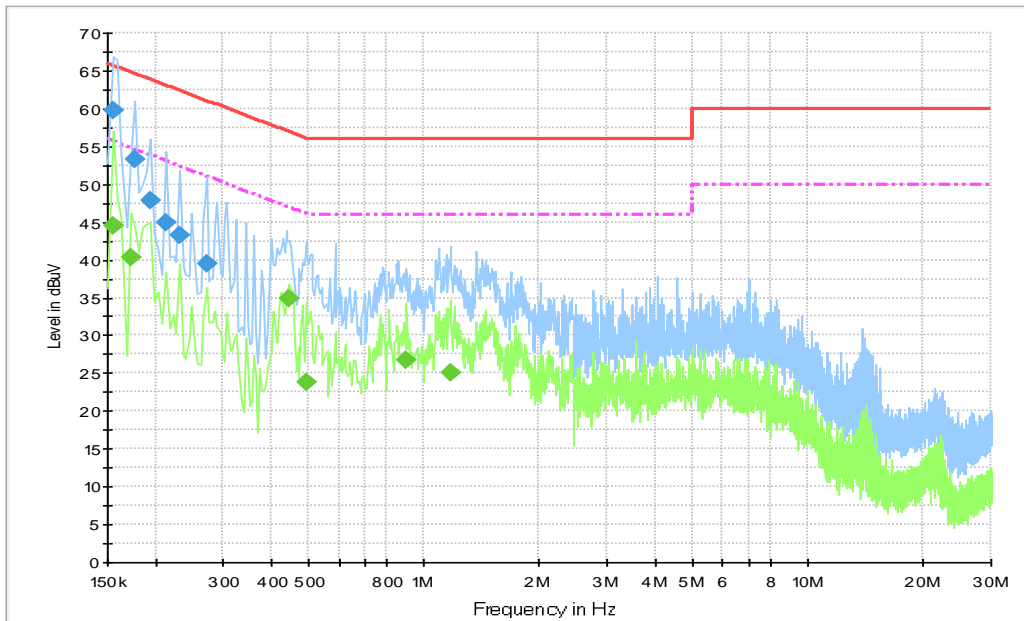
**Final Result 1**

Frequency (MHz)	QuasiPeak (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.361500	44.3	2000.0	9.000	L1	19.4	14.4	58.7
0.843000	42.1	2000.0	9.000	L1	19.5	13.9	56.0
1.918500	42.6	2000.0	9.000	N	19.5	13.4	56.0
2.229000	42.4	2000.0	9.000	N	19.5	13.6	56.0
4.875000	40.6	2000.0	9.000	N	19.6	15.4	56.0
9.024000	45.3	2000.0	9.000	N	19.7	14.7	60.0

**Final Result 2**

Frequency (MHz)	Average (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.357000	37.7	2000.0	9.000	N	19.4	11.1	48.8
0.843000	31.6	2000.0	9.000	N	19.5	14.4	46.0
1.383000	24.3	2000.0	9.000	L1	19.4	21.7	46.0
2.229000	32.7	2000.0	9.000	N	19.5	13.3	46.0
4.452000	31.3	2000.0	9.000	N	19.6	14.7	46.0
9.186000	35.3	2000.0	9.000	L1	19.7	14.7	50.0



**Set.7+Mode7+Mode9**


Note: The graphic result above is the maximum of the measurements for both phase line and neutral line.

**Figure A.18 Conducted Emission**

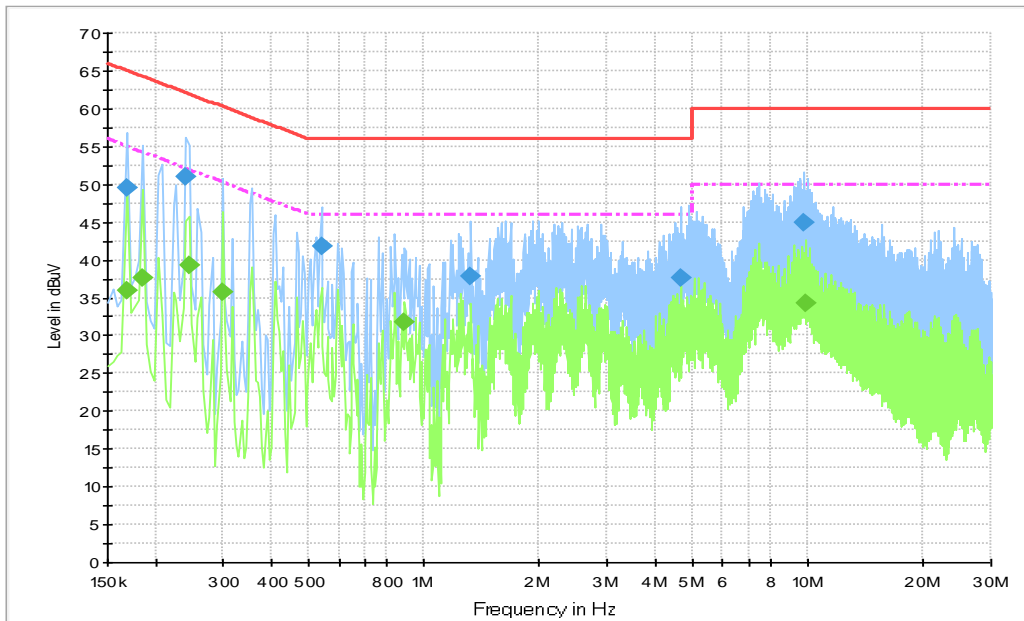
**Final Result 1**

Frequency (MHz)	QuasiPeak (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.154500	59.7	2000.0	9.000	N	27.7	6.1	65.8
0.177000	53.2	2000.0	9.000	N	23.5	11.4	64.6
0.195000	47.8	2000.0	9.000	N	20.5	16.0	63.8
0.213000	44.9	2000.0	9.000	N	19.7	18.2	63.1
0.231000	43.2	2000.0	9.000	N	19.7	19.2	62.4
0.271500	39.4	2000.0	9.000	N	19.7	21.6	61.1

**Final Result 2**

Frequency (MHz)	Average (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.154500	44.5	2000.0	9.000	L1	27.7	11.2	55.8
0.172500	40.4	2000.0	9.000	L1	24.3	14.5	54.8
0.447000	34.9	2000.0	9.000	L1	19.8	12.0	46.9
0.492000	23.8	2000.0	9.000	N	19.8	22.3	46.1
0.901500	26.8	2000.0	9.000	N	19.6	19.2	46.0
1.176000	25.1	2000.0	9.000	N	19.6	20.9	46.0

**Set.8+Mode8+Mode9**



Note: The graphic result above is the maximum of the measurements for both phase line and neutral line.

**Figure A.19 Conducted Emission**

**Final Result 1**

Frequency (MHz)	QuasiPeak (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.168000	49.5	2000.0	9.000	L1	19.5	15.5	65.1
0.240000	50.9	2000.0	9.000	N	19.5	11.2	62.1
0.541500	41.9	2000.0	9.000	N	19.5	14.1	56.0
1.324500	37.8	2000.0	9.000	L1	19.5	18.2	56.0
4.686000	37.5	2000.0	9.000	L1	19.6	18.5	56.0
9.789000	44.8	2000.0	9.000	N	19.7	15.2	60.0

**Final Result 2**

Frequency (MHz)	Average (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.168000	36.0	2000.0	9.000	L1	19.5	19.1	55.1
0.186000	37.7	2000.0	9.000	N	19.5	16.6	54.2
0.244500	39.3	2000.0	9.000	L1	19.5	12.7	51.9
0.298500	35.8	2000.0	9.000	L1	19.4	14.5	50.3
0.892500	31.7	2000.0	9.000	L1	19.4	14.3	46.0
9.861000	34.3	2000.0	9.000	L1	19.7	15.7	50.0



**ANNEX B: Persons involved in this testing**

Test Item	Tester
Radiated Emission	Zhao Wenhui& Sun Tianyuan
Conducted Emission	Guo Qian

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