



# TEST REPORT

## No. I21Z70040-EMC01

for

**Samsung Electronics Co., Ltd.**

**Tablet PC**

**Model Name: SM-T220**

**FCC ID: ZCASMT220**

**IC number: 25314-SMT220**

with

**Hardware Version: REV1.0**

**Software Version: T220.001**

**Issued Date: 2021-02-28**

**Note:**

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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.

**Test Laboratory:**

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## **REPORT HISTORY**

<b>Report Number</b>	<b>Revision</b>	<b>Description</b>	<b>Issue Date</b>
I21Z70040-EMC01	Rev.0	1 <sup>st</sup> edition	2021-02-28

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 NATIONAL VOLUNTARY LABORATORY ACCREDITATION PROGRAM (NVLAP) with lab code 600118-0, and is also an FCC accredited test laboratory (CN5017), and ISED accredited test laboratory (ISED#: 24849). The detail accreditation scope can be found on NVLAP website.

### **1.2. Testing Location**

#### **CTTL (BDA)**

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

### **1.3. Testing Environment**

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

### **1.4. Project data**

Testing Start Date: 2021-02-03  
Testing End Date: 2021-02-27

### **1.5. Signature**



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Li Yan

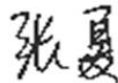
(Prepared this test report)



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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.  
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Email: j1.chun@samsung.com  
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### **2.2. Manufacturer Information**

Company Name: Samsung Electronics. Co., Ltd.  
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City: /  
Postal Code: /  
Country: /  
Contact: 조성훈(Sunghoon Cho)  
Email: ggobi.cho@samsung.com  
Telephone: +82-10-2722-4159

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

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

Description	Tablet PC
Model Name	SM-T220
FCC ID	ZCASMT220
IC number	25314-SMT220
Extreme vol. Limits	3.6VDC to 4.4VDC (nominal: 4.0VDC)

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**

EUT ID*	IME/SNI	HW Version	SW Version	Date of receipt
UT07a	2170040UT07a	REV1.0	T220.001	2021.01.11

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

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

AE ID*	Description	SN	Remarks
AE1	Charger1	/	/
AE2	Charger2	/	/
AE3	Charger3	/	/
AE4	Charger4	/	/
AE5	Charger5	/	/
AE6	Charger6	/	/
AE7	USB cable	/	/
AE8	Headset1	/	/
AE9	Headset2	/	/
AE10	battery	/	/

##### AE1

Model	EP-TA50JWE
Manufacturer	RFTECH Co., Ltd.
Length of cable	/

##### AE2

Model	EP-TA50JWE
Manufacturer	HAEM Co., Ltd.
Length of cable	/

##### AE3

Model	EP-TA200
Manufacturer	DongYang E&P Inc.
Length of cable	/



<b>AE4</b>	
Model	EP-TA200
Manufacturer	HAEM Co., Ltd.
Length of cable	/
<b>AE5</b>	
Model	EP-TA200
Manufacturer	SoluM Co.,Ltd
Length of cable	/
<b>AE6</b>	
Model	EP-TA200
Manufacturer	RFTECH Co., Ltd.
Length of cable	/
<b>AE7</b>	
Model	EP-DT725BWE
Manufacturer	Samsung Electronics Co., Ltd.
Length of cable	/
<b>AE8</b>	
Model	EHS61ASFWE
Manufacturer	ALMUS
Length of cable	/
<b>AE9</b>	
Model	EHS61ASFWE
Manufacturer	Cresyn
Length of cable	/
<b>AE10</b>	
Type	Secondary Li-ion Battery
SN	HQ-3565S
Manufacturer	SCUD (Fujian) Electronics CO.,LTD

Note: The USB cables are shielded.

### **3.4. EUT set-ups**

<b>EUT set-up No.</b>	<b>Combination of EUT and AE</b>	<b>Remarks</b>
Set.1	UT07a + AE1 + AE7+ AE8	Charger1+ Rear Camera + Headset1
Set.2	UT07a + AE2 + AE7+ AE8	Charger2+MP4+ Headset1
Set.3	UT07a + AE3 + AE7+ AE9	Charger3+ Front camera + Headset2
Set.4	UT07a + AE4 + AE7+ AE9	Charger4+MP3+Headset2
Set.5	UT07a + AE5 + AE7	Charger5
Set.6	UT07a + AE6 + AE7	Charger6
Set.7	UT07a + AE7 + AE8	USB SD TO PC + Headset1

## 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 47 CFR Part 15, Subpart B	Radio frequency devices - Unintentional Radiators	2019
ICES-003	Information Technology Equipment (including Digital Apparatus)	Issue 7 2020
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-2** (10 meters×6.7meters×6.1meters) 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; 1MHz—1000MHz, >90dB.
Electrical insulation	> 2 MΩ
Ground system resistance	< 4 Ω

## 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	Clause in IC rules	Section in this report	Verdict	Test Location
1	Radiated Emission	15.109(a)	Section 3	A.1	P	CTTL(BDA)
2	Conducted Emission	15.107(a)	Section 3	A.2	P	CTTL(BDA)

## 7. Test Equipments Utilized

NO.	Description	TYPE	SERIES NUMBER	MANUFACTURE	CAL DUE DATE	CALIBRATION INTERVAL
1	Test Receiver	ESU26	100376	R&S	2021-09-04	1 year
2	Test Receiver	ESCI	100766	R&S	2021-03-10	1 year
3	LISN	ENV216	101459	R&S	2021-03-17	1 year
4	BiLog Antenna	VULB9163	9163-482	Schwarzbeck	2021-11-04	1 year
5	EMI Antenna	3117	00058888	ETS-Lindgren	2021-04-18	1 year
6	Universal Radio Communication Tester	CMW500	159408	R&S	2021-03-04	1 year
7	Printer	P1606dn	VNC3L52122	HP	N/A	N/A
8	Keyboard	KU-1601	2048361	Lenovo	N/A	N/A
9	Mouse	EMS-537A	8021S3MC	Lenovo	N/A	N/A
10	PC	M4000e-17	M706RMW2	Lenovo	N/A	N/A

Test Item	Test Software and Version	Software Vendor
Radiated Continuous Emission	EMC32 V9.01.00	R&S
Conducted Emission	EMC32 V8.52.0	R&S

## **ANNEX A: MEASUREMENT RESULTS**

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

#### **Reference**

FCC: CFR Part 15.109(a).

IC: ICES-003 Section 3.2.2.

#### **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. 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 EUT is operating in the USB mode, charging mode, MP4, CAMERA and SD mode.

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. 10 meters' limit is got by converting.

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

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: 5.40dB, 1GHz-18GHz: 4.32dB,  $k=2$ .

Note) Test data in this section has been taken against the FCC 15.109(a) limit as it is the most stringent limit. By complying with more restrictive FCC 15.109 limit compliance with the ICES-003 Issue 7 limit also demonstrated.

#### Measurement results for Set.1:

##### Charger1+ Rear Camera /Average detector

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)
17693.500	38.54	-22.2	41.2	19.47	54.0	15.5	V
17701.500	38.51	-22.2	41.2	19.45	54.0	15.5	V
17885.500	38.50	-22.6	41.3	19.81	54.0	15.5	H
17696.000	38.47	-22.2	41.2	19.40	54.0	15.5	V
17639.000	38.44	-22.0	41.2	19.25	54.0	15.6	V
17745.000	38.43	-22.3	41.2	19.47	54.0	15.6	V

##### Charger1+ Rear Camera /Peak detector

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)
17694.000	50.9	-22.2	41.2	31.87	74.0	23.1	H
17926.500	50.8	-22.7	41.3	32.16	74.0	23.2	H
17860.000	50.7	-22.5	41.3	31.98	74.0	23.3	V
17822.500	50.7	-22.5	41.3	31.85	74.0	23.3	V
17114.000	50.6	-23.0	41.6	32.08	74.0	23.4	V
17806.500	50.5	-22.4	41.3	31.70	74.0	23.5	V

**Measurement results for Set.2:**

**Charger2+ MP4 /Average detector**

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)
17693.000	38.5	-22.2	41.2	19.45	54.0	15.5	V
17690.500	38.5	-22.2	41.2	19.39	54.0	15.5	V
17687.000	38.4	-22.1	41.2	19.34	54.0	15.6	V
17686.000	38.4	-22.1	41.2	19.33	54.0	15.6	H
17640.500	38.4	-22.0	41.2	19.21	54.0	15.6	V
17693.500	38.4	-22.2	41.2	19.31	54.0	15.6	V

**Charger2+ MP4 /Peak detector**

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)
17699.000	51.05	-22.2	41.2	31.99	74.0	22.9	H
17307.500	50.92	-22.8	41.4	32.35	74.0	23.1	H
17063.500	50.88	-23.0	41.6	32.28	74.0	23.1	H
17769.000	50.69	-22.3	41.3	31.77	74.0	23.3	V
17753.500	50.66	-22.3	41.3	31.71	74.0	23.3	V
17709.000	50.65	-22.2	41.2	31.61	74.0	23.3	V

**Measurement results for Set.3:**

**Charger3+ Front Camera /Average detector**

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)
17698.000	38.48	-22.2	41.2	19.41	54.0	15.5	H
17688.500	38.41	-22.2	41.2	19.32	54.0	15.6	V
17700.500	38.39	-22.2	41.2	19.33	54.0	15.6	V
17694.000	38.39	-22.2	41.2	19.31	54.0	15.6	V
17701.500	38.37	-22.2	41.2	19.31	54.0	15.6	H
17699.500	38.35	-22.2	41.2	19.29	54.0	15.6	V

**Charger3+ Front Camera /Peak detector**

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)
17282.500	51.1	-22.8	41.4	32.47	74.0	22.9	V
16471.500	50.7	-23.1	41.4	32.47	74.0	23.3	V
17681.000	50.7	-22.1	41.2	31.58	74.0	23.3	V
17571.000	50.7	-22.4	41.2	31.87	74.0	23.3	H
17280.500	50.6	-22.8	41.4	31.97	74.0	23.4	V
17049.000	50.6	-23.0	41.7	31.97	74.0	23.4	V

**Measurement results for Set.4:**

**Charger4+ MP3 /Average detector**

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)
17698.000	38.38	-22.2	41.2	19.31	54.0	15.6	V
17683.500	38.27	-22.1	41.2	19.17	54.0	15.7	V
17699.500	38.24	-22.2	41.2	19.18	54.0	15.8	V
17751.500	38.23	-22.3	41.3	19.27	54.0	15.8	H
17637.500	38.23	-22.0	41.2	19.03	54.0	15.8	H
17689.000	38.22	-22.2	41.2	19.14	54.0	15.8	H

**Charger4+MP3 /Peak detector**

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)
17675.000	50.9	-22.1	41.2	31.82	74.0	23.1	V
17065.500	50.7	-23.0	41.6	32.06	74.0	23.3	H
17953.500	50.6	-22.7	41.3	31.99	74.0	23.4	H
17900.000	50.5	-22.6	41.3	31.85	74.0	23.5	V
17529.000	50.5	-22.7	41.2	31.99	74.0	23.5	H
16946.500	50.4	-23.0	41.7	31.72	74.0	23.6	V



**Measurement results for Set.7:**
**USB (SD ) mode /Average detector**

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)
17907.500	37.88	-22.6	41.3	19.2	54.0	16.1	H
17749.000	37.83	-22.3	41.3	18.9	54.0	16.2	H
17682.000	37.81	-22.1	41.2	18.7	54.0	16.2	H
17694.000	37.79	-22.2	41.2	18.7	54.0	16.2	H
17687.000	37.79	-22.1	41.2	18.7	54.0	16.2	V
17685.500	37.78	-22.1	41.2	18.7	54.0	16.2	H

**USB (SD) mode /Peak detector**

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)
17688.000	50.3	-22.2	41.2	31.17	74.0	23.7	H
17499.000	50.1	-22.9	41.2	31.76	74.0	23.9	V
16943.500	50.0	-23.0	41.7	31.37	74.0	24.0	H
17260.000	50.0	-22.8	41.4	31.34	74.0	24.0	V
17843.000	50.0	-22.5	41.3	31.20	74.0	24.0	H
17731.000	49.9	-22.3	41.2	30.89	74.0	24.1	V

**Measurement results for Set.5**
**Charger5 /Average detector**

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)
17690.000	38.26	-22.2	41.2	19.18	54.0	15.7	V
17694.500	38.24	-22.2	41.2	19.17	54.0	15.8	V
17644.500	38.22	-22.0	41.2	19.04	54.0	15.8	V
17693.000	38.20	-22.2	41.2	19.12	54.0	15.8	H
17688.000	38.19	-22.2	41.2	19.11	54.0	15.8	V
17689.000	38.18	-22.2	41.2	19.09	54.0	15.8	V

**Charger5 /Peak detector**

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)
17576.500	51.0	-22.4	41.2	32.19	74.0	23.0	V
17642.500	50.7	-22.0	41.2	31.50	74.0	23.3	V
17100.500	50.3	-23.0	41.6	31.75	74.0	23.7	V
17755.500	50.2	-22.3	41.3	31.28	74.0	23.8	H
17630.000	50.2	-22.0	41.2	30.98	74.0	23.8	V
16891.500	50.1	-23.0	41.6	31.45	74.0	23.9	H

**Measurement results for Set.6**
**Charger6 /Average detector**

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)
17901.000	38.18	-22.6	41.3	19.52	54.0	15.8	V
17746.000	38.11	-22.3	41.2	19.15	54.0	15.9	V
17709.000	38.06	-22.2	41.2	19.02	54.0	15.9	V
17689.000	38.06	-22.2	41.2	18.97	54.0	15.9	V
17685.500	38.04	-22.1	41.2	18.95	54.0	16.0	V
17898.500	38.03	-22.6	41.3	19.37	54.0	16.0	H

**Charger6 /Peak detector**

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)
17971.500	50.7	-22.8	41.3	32.13	74.0	23.3	V
16991.000	50.4	-23.0	41.7	31.70	74.0	23.6	V
16868.500	50.3	-23.0	41.6	31.69	74.0	23.7	V
17225.000	50.1	-22.9	41.5	31.49	74.0	23.9	V
16273.000	50.1	-23.2	41.1	32.08	74.0	23.9	H
17106.500	50.0	-23.0	41.6	31.46	74.0	24.0	H

### Charger1+ Rear Camera, Set.1

15B RE 30MHz-1GHz

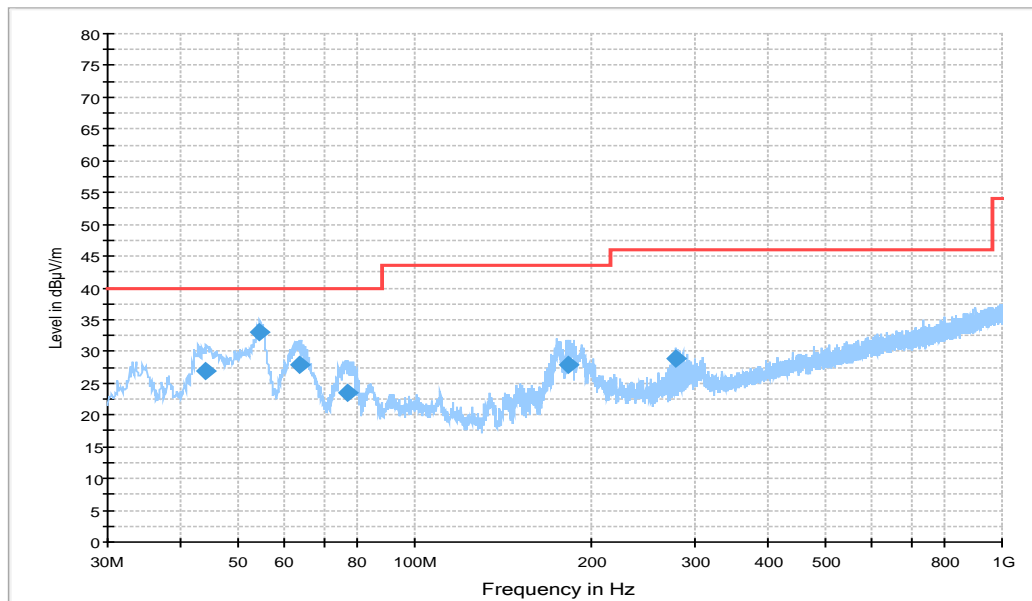
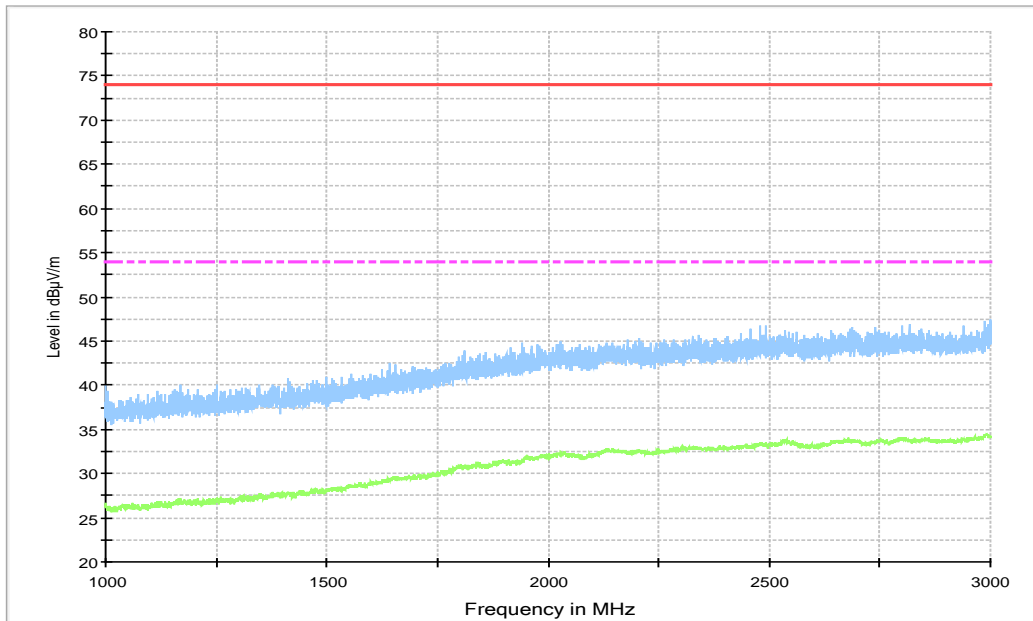


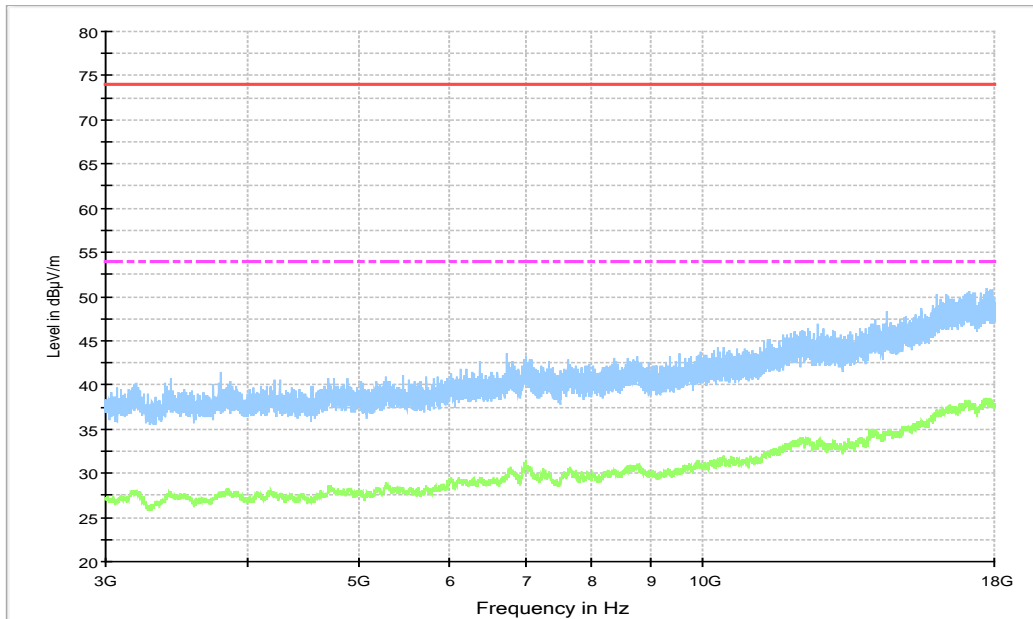
Figure A.1 Radiated Emission from 30MHz to 1GHz

### Final Result 1

Frequency (MHz)	QuasiPeak (dBμV/m)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
44.162000	27.0	100.0	V	45.0	-0.5	13.0	40.0
54.541000	33.1	100.0	V	245.0	-0.6	6.9	40.0
63.562000	27.9	100.0	V	25.0	-2.2	12.1	40.0
77.045000	23.4	119.0	V	0.0	-6.2	16.6	40.0
183.16300	27.8	100.0	V	-14.0	-3.3	15.7	43.5
277.93200	28.8	100.0	H	90.0	0.1	17.2	46.0



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



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

### Charger2+MP4, Set.2

15B RE 30MHz-1GHz

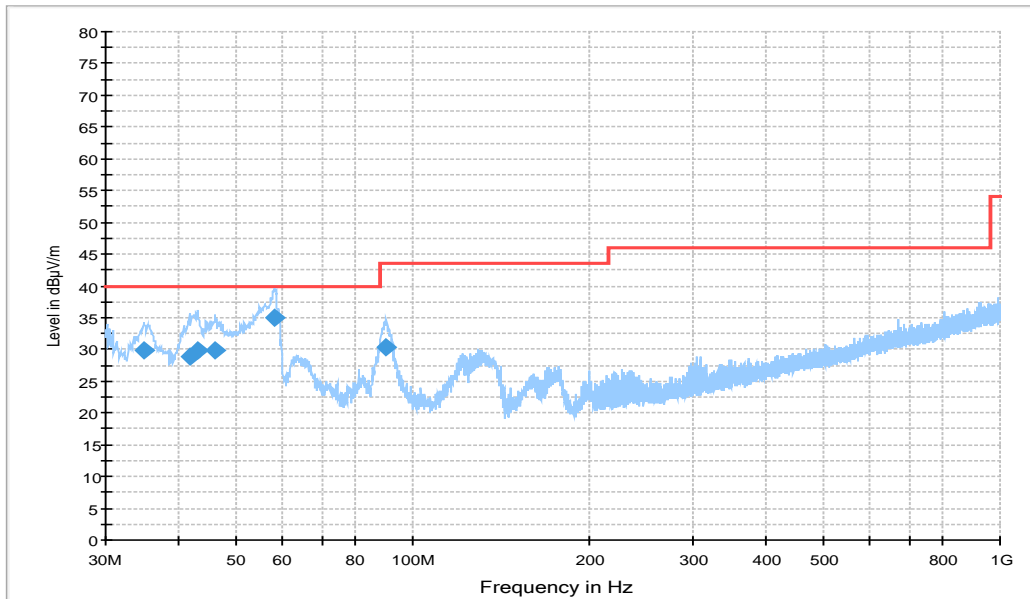
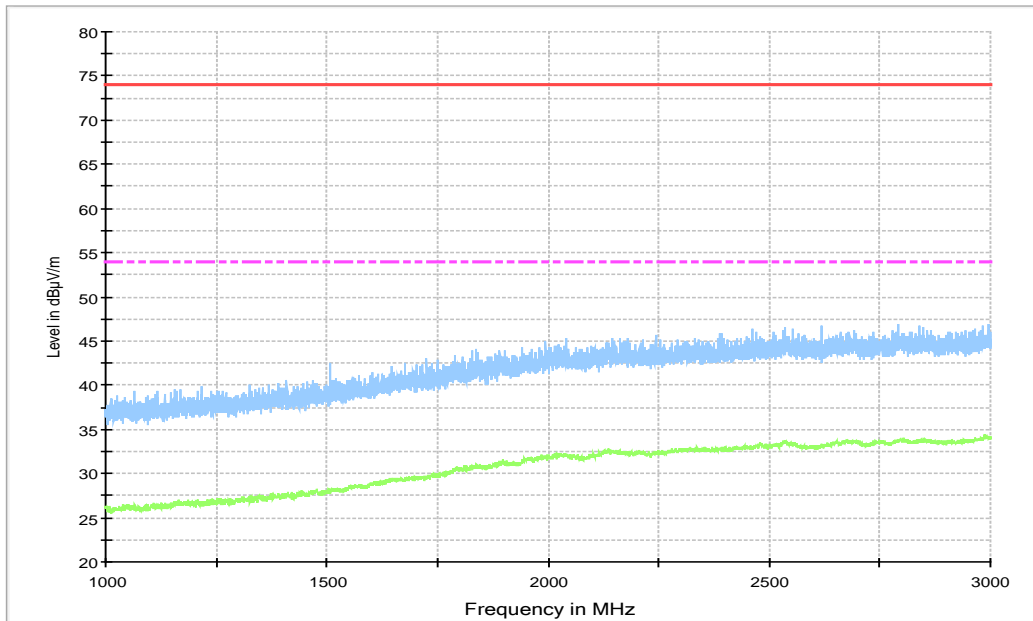


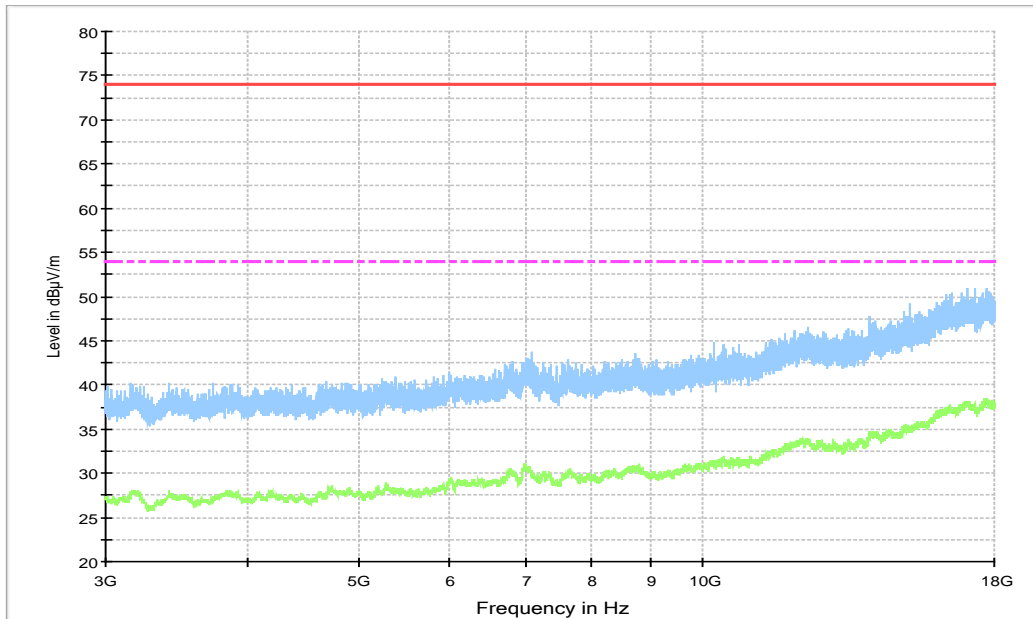
Figure A.4 Radiated Emission from 30MHz to 1GHz

### Final Result 1

Frequency (MHz)	QuasiPeak (dBµV/m)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
37.275000	29.9	100.0	V	138.0	-1.1	10.1	40.0
45.229000	30.4	100.0	V	90.0	-0.5	9.6	40.0
54.250000	36.4	100.0	V	256.0	-0.6	3.6	40.0
54.541000	36.7	100.0	V	261.0	-0.6	3.3	40.0
62.786000	24.4	100.0	V	28.0	-1.9	15.6	40.0
134.85700	25.5	100.0	V	315.0	-5.0	18.0	43.5



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



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

### Charger3+Front Camera, Set.3

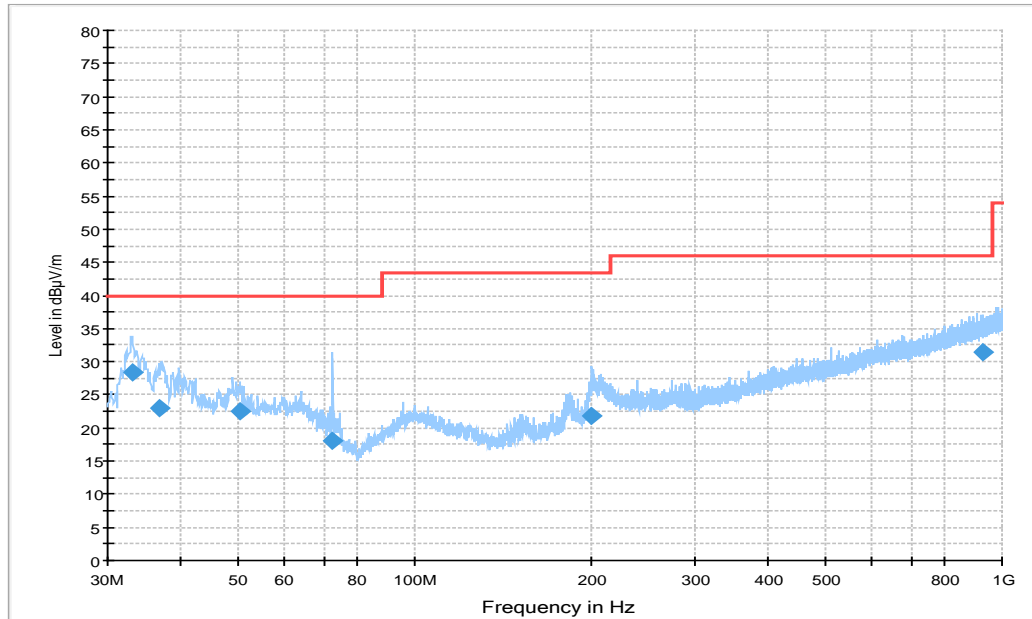
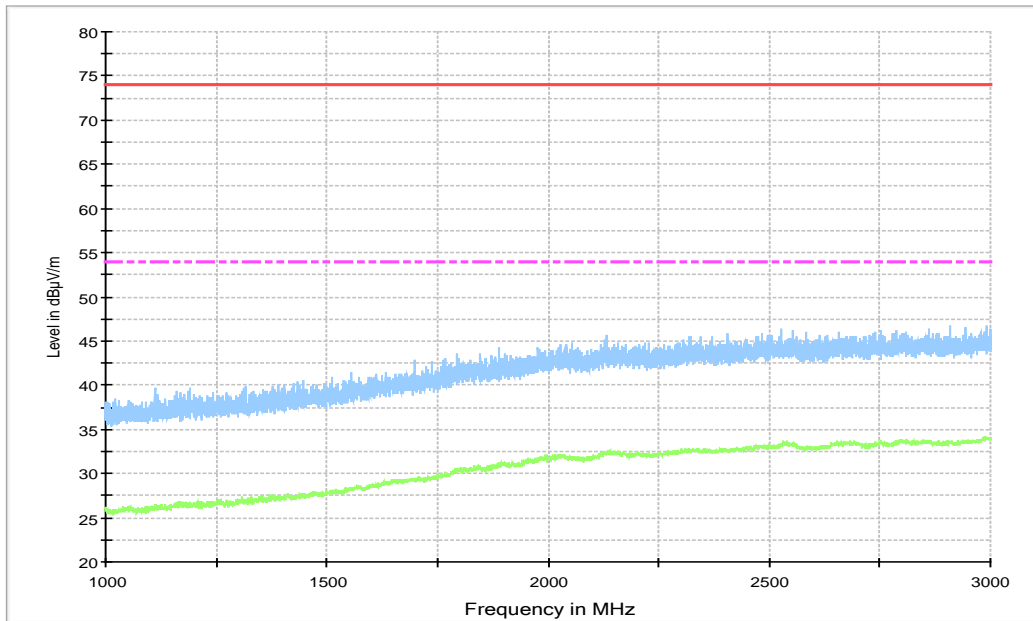


Figure A.7 Radiated Emission from 30MHz to 1GHz

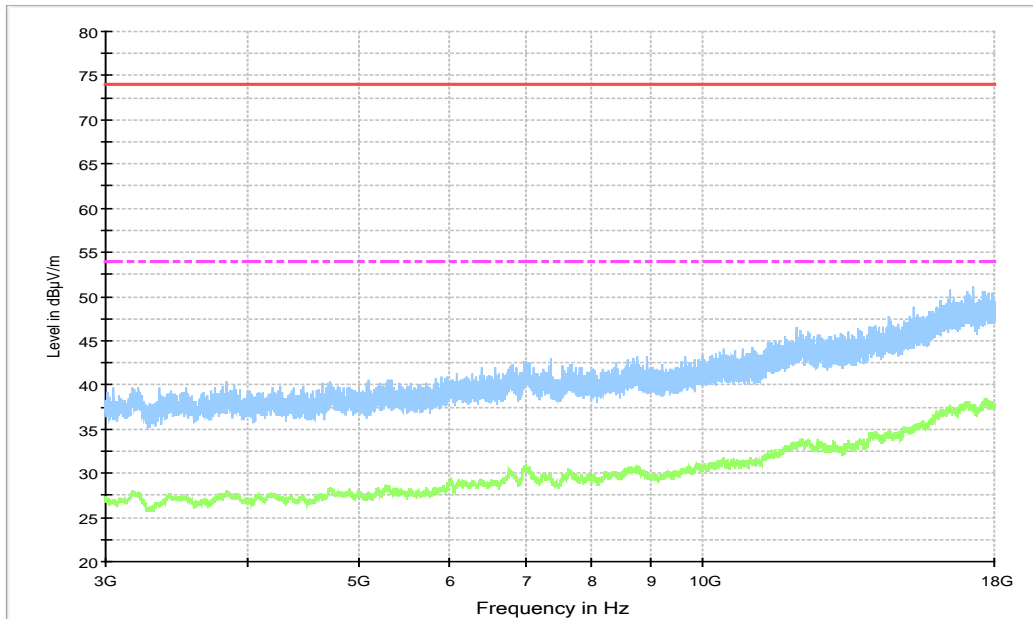
### Final Result 1

Frequency (MHz)	QuasiPeak (dBµV/m)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
33.007000	28.4	110.0	V	146.0	-1.9	11.6	40.0
36.790000	22.9	100.0	V	130.0	-1.2	17.1	40.0
50.370000	22.5	100.0	V	270.0	-0.4	17.5	40.0
72.292000	18.1	125.0	V	-45.0	-5.1	21.9	40.0
200.42900	21.9	100.0	V	270.0	-1.8	21.6	43.5
930.06300	31.3	100.0	H	271.0	12.0	14.7	46.0





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



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

### Charger4+MP3, Set.4

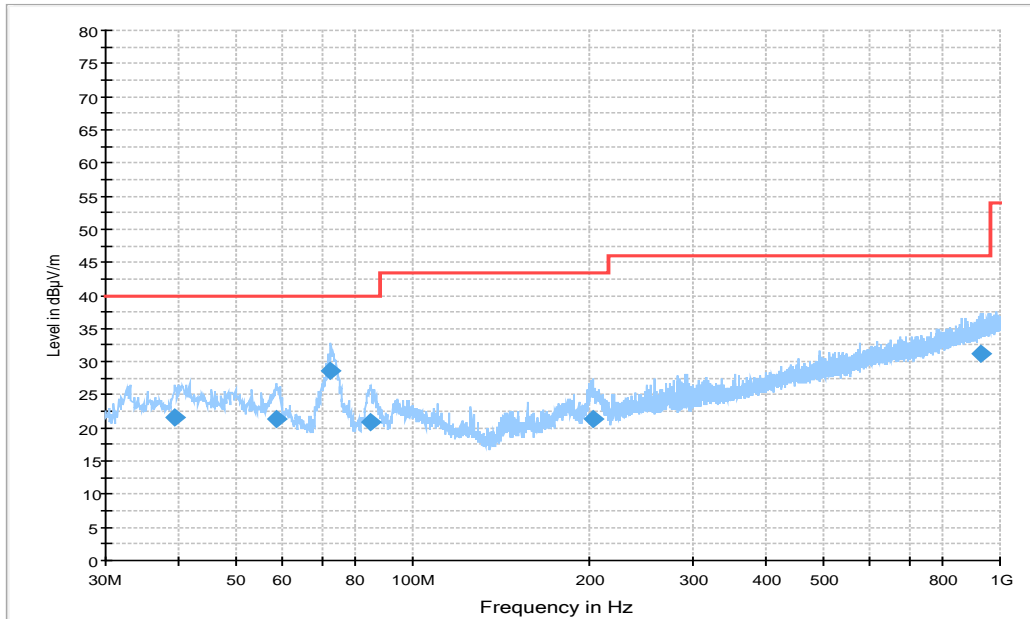
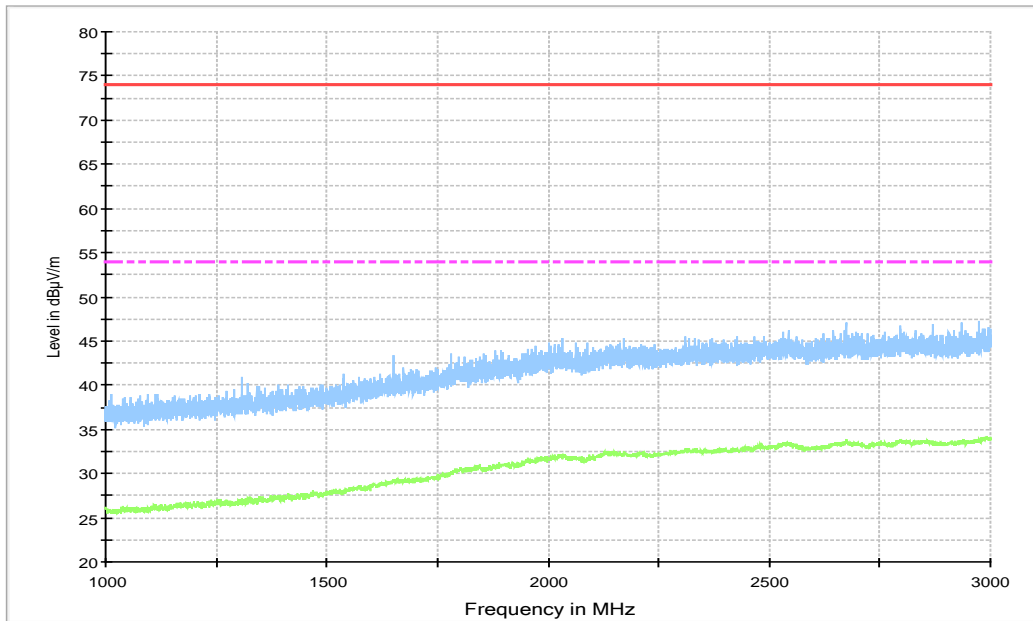


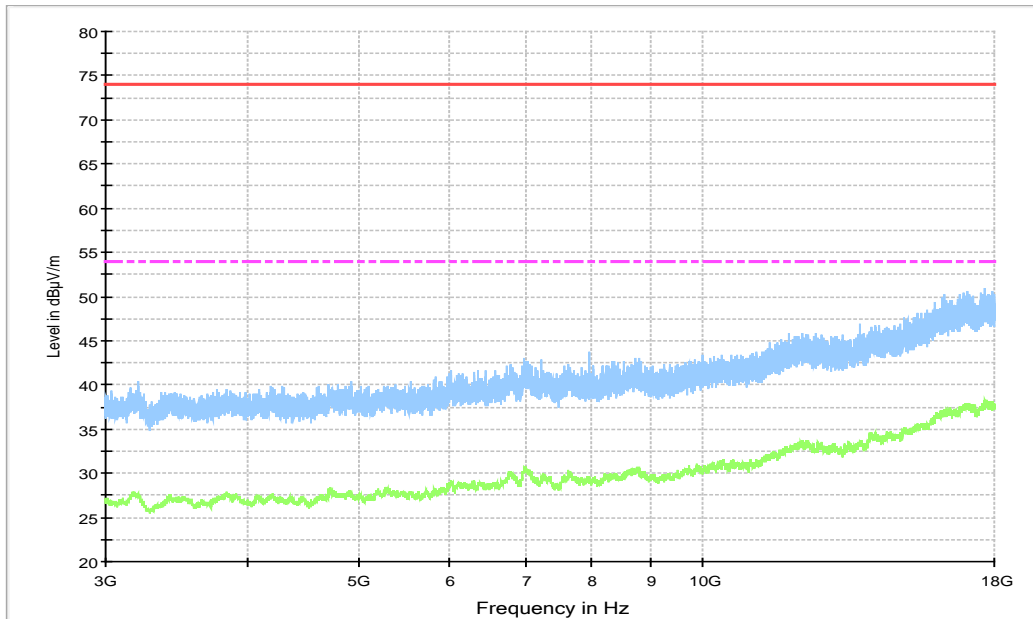
Figure A.10 Radiated Emission from 30MHz to 1GHz

### Final Result 1

Frequency (MHz)	QuasiPeak (dBµV/m)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
39.312000	21.5	125.0	V	36.0	-0.8	18.5	40.0
58.518000	21.3	100.0	V	45.0	-0.8	18.7	40.0
72.583000	28.6	100.0	V	208.0	-5.1	11.4	40.0
84.999000	20.9	125.0	V	225.0	-5.3	19.1	40.0
202.56300	21.2	100.0	V	184.0	-1.7	22.3	43.5
927.73500	31.1	100.0	V	260.0	12.0	14.9	46.0



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



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

USB (SD) mode, Set.7

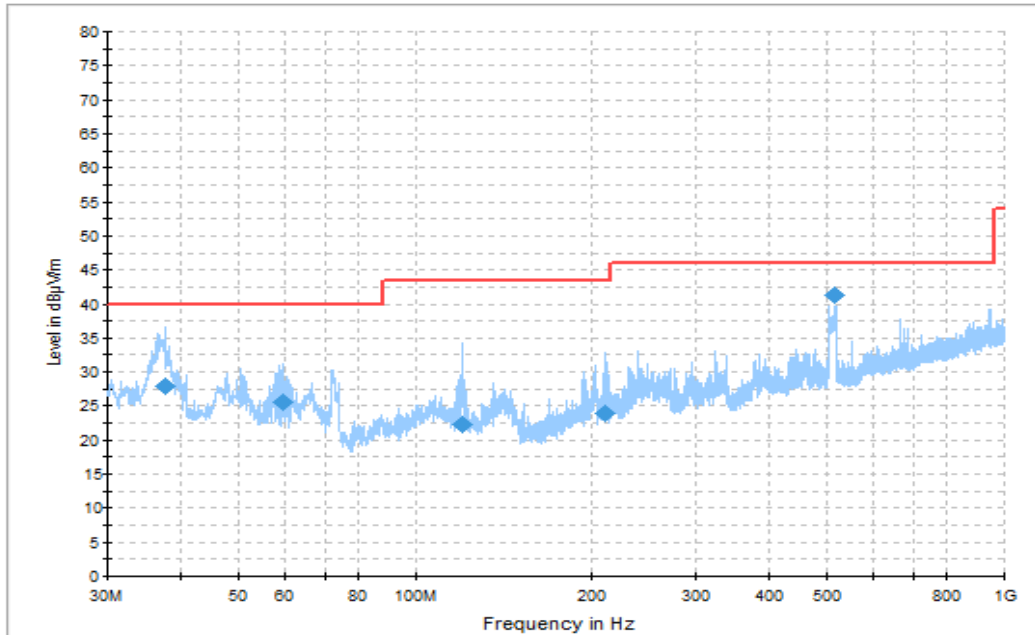


Figure A.13 Radiated Emission from 30MHz to 1GHz

Final Result 1

Frequency (MHz)	QuasiPeak (dBµV/m)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
37.469000	28.0	100.0	V	-41.0	-1.2	12.0	40.0
59.682000	25.7	100.0	V	25.0	-1.0	14.3	40.0
119.91900	22.2	119.0	H	76.0	-4.4	21.3	43.5
210.61400	23.8	110.0	H	-17.0	-1.8	19.7	43.5
517.03700	41.8	125.0	V	-25.0	6.3	4.2	46.0
37.469000	28.0	100.0	V	-41.0	-1.2	12.0	40.0

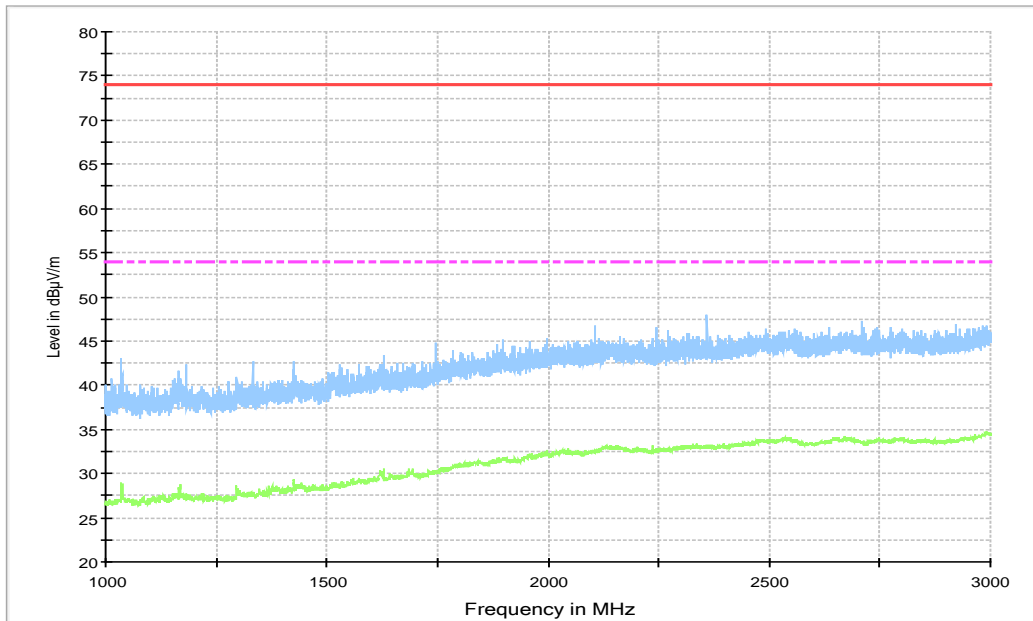


Figure A.14 Radiated Emission from 1GHz to 3GHz

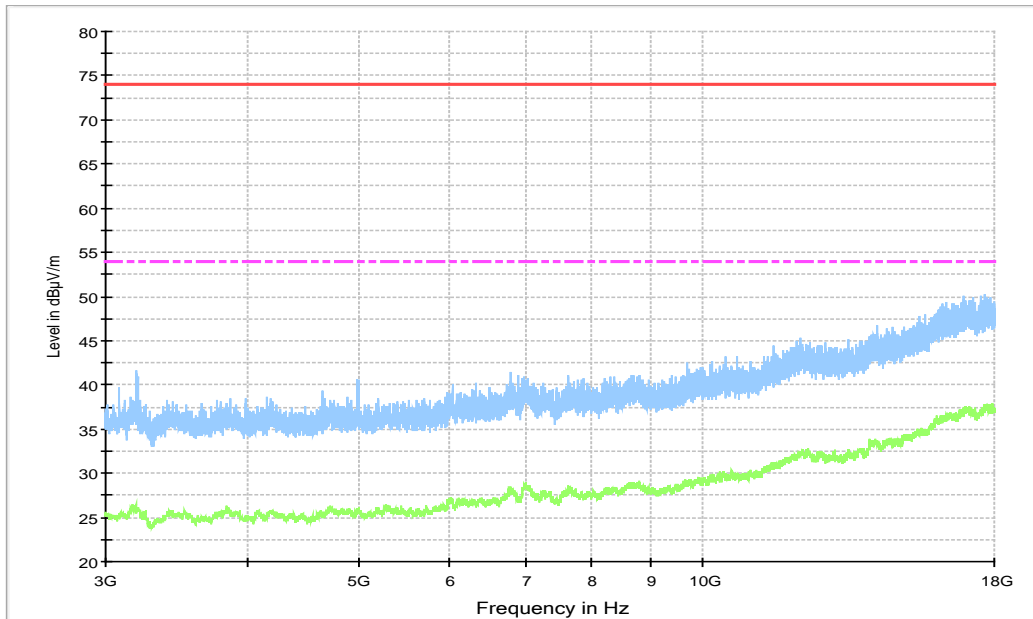


Figure A.15 Radiated Emission from 3GHz to 18GHz

### Charger5, Set.5

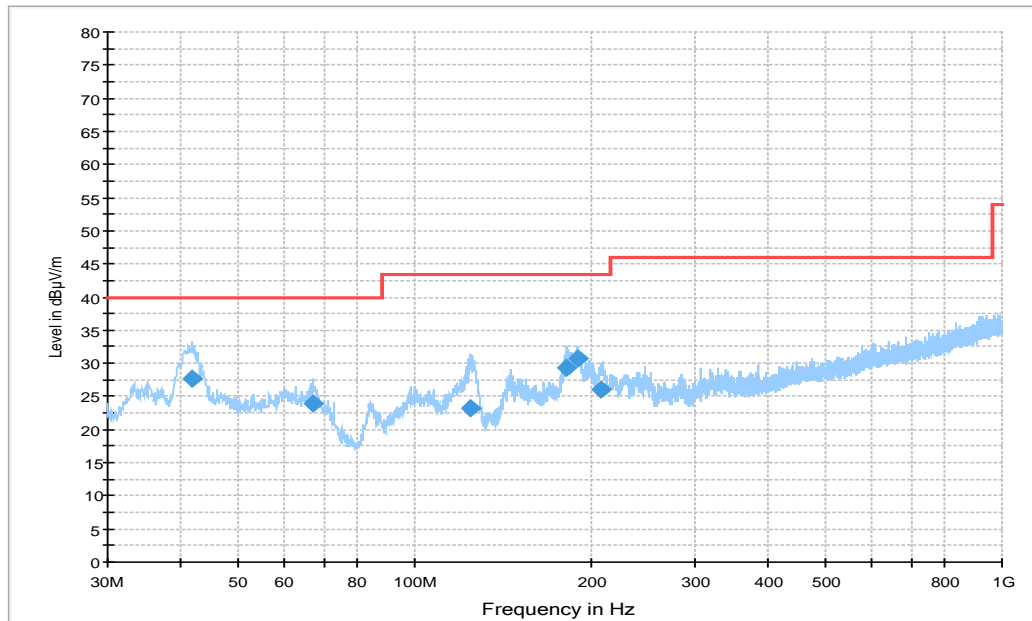
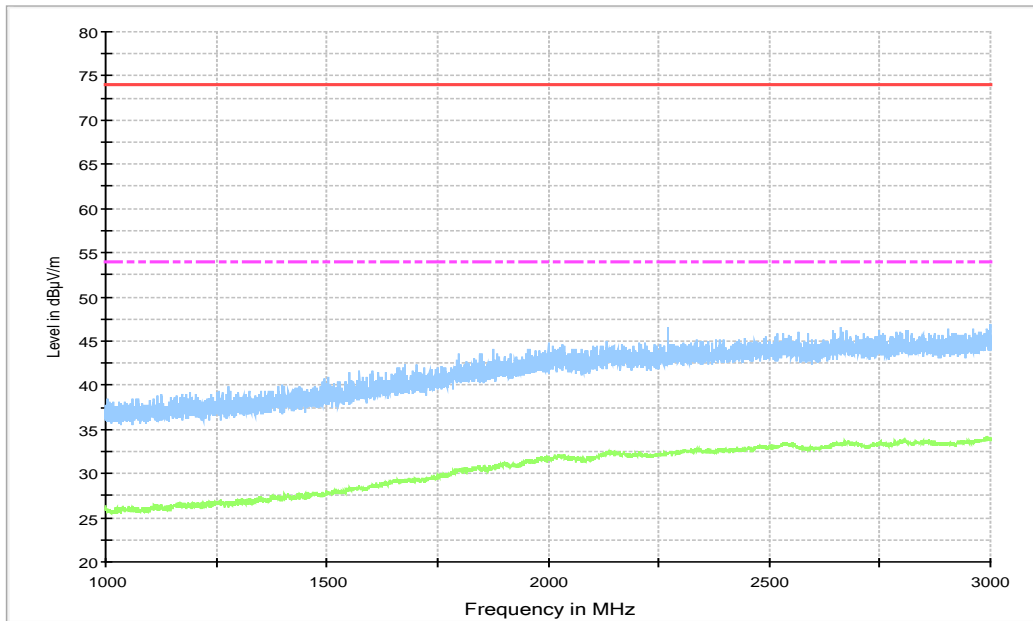


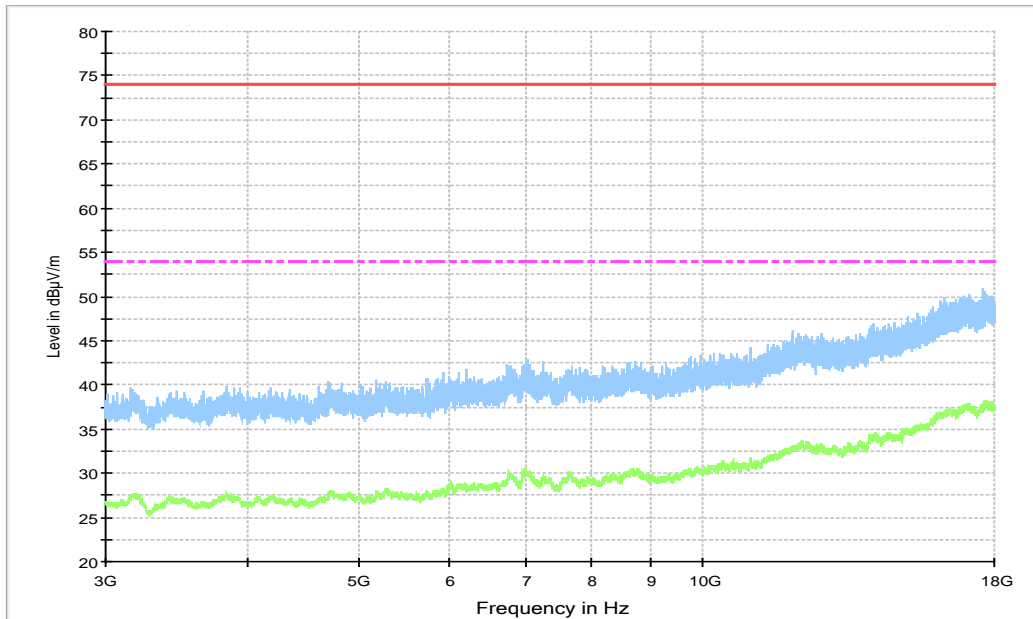
Figure A.16 Radiated Emission from 30MHz to 1GHz

### Final Result 1

Frequency (MHz)	QuasiPeak (dBµV/m)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
41.834000	27.6	119.0	V	101.0	-0.6	12.4	40.0
67.054000	23.8	100.0	V	259.0	-3.5	16.2	40.0
124.76900	23.1	110.0	V	5.0	-4.2	20.4	43.5
181.80500	29.3	100.0	V	0.0	-3.4	14.2	43.5
188.88600	30.6	100.0	V	8.0	-2.7	12.9	43.5
207.89800	26.1	100.0	V	7.0	-1.5	17.4	43.5



**Figure A.17 Radiated Emission from 1GHz to 3GHz**



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

### Charger6, Set.6

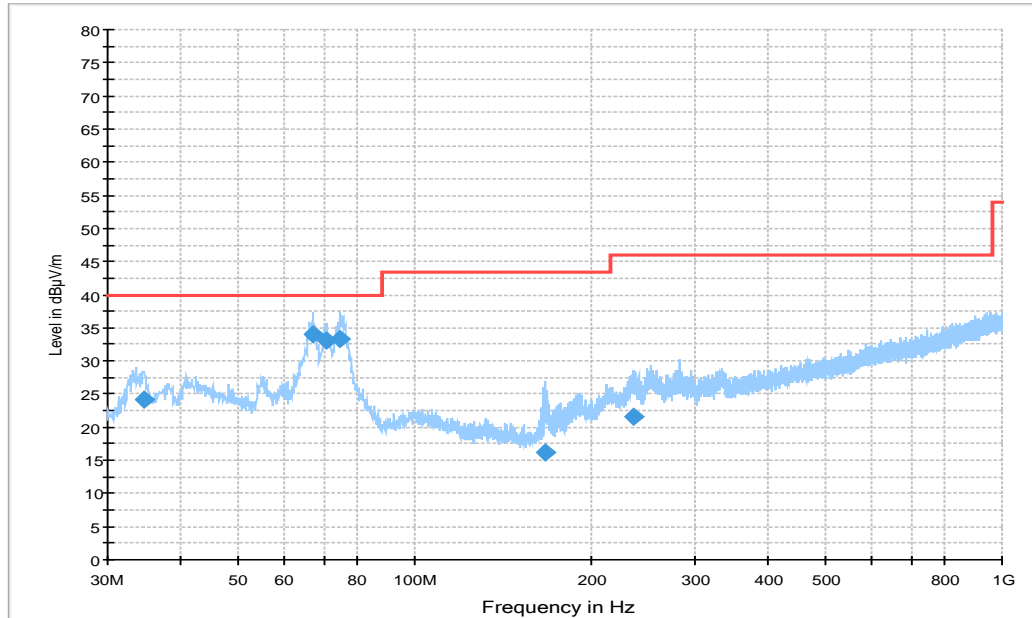
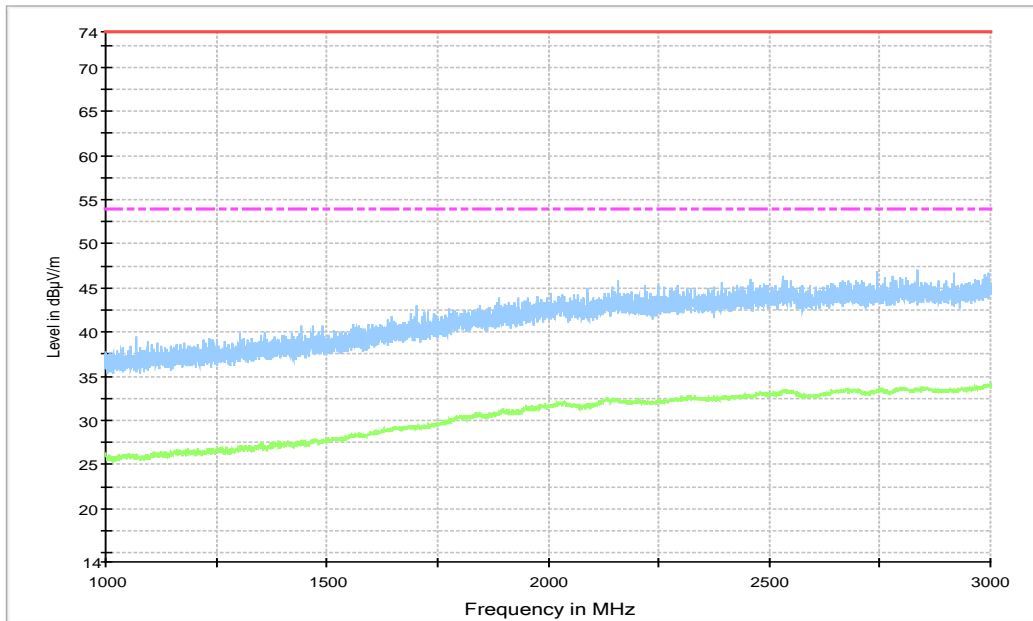


Figure A.19 Radiated Emission from 30MHz to 1GHz

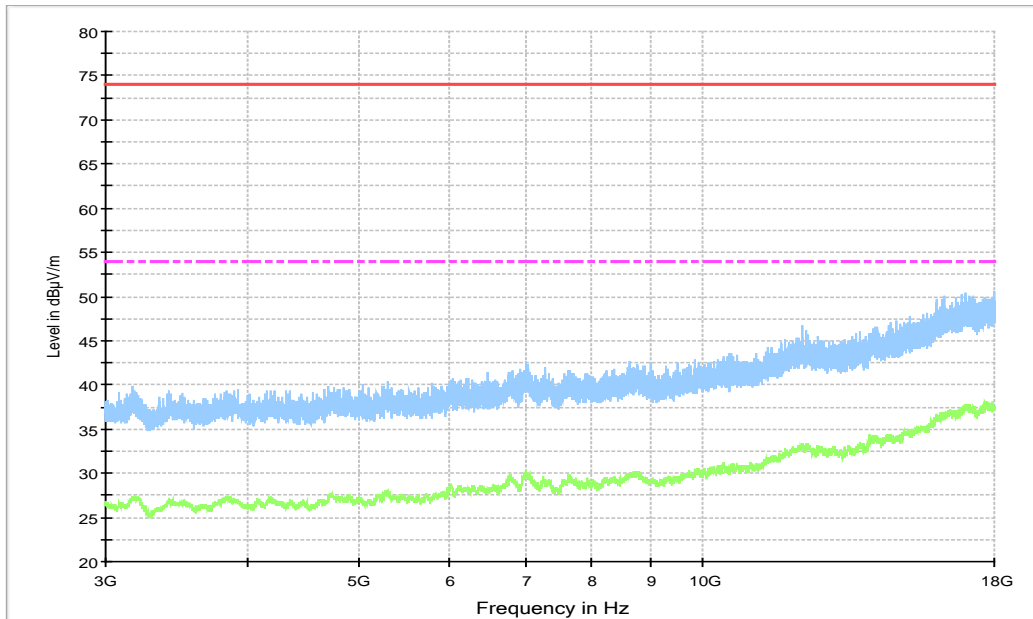
### Final Result 1

Frequency (MHz)	QuasiPeak (dBµV/m)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
34.656000	24.3	110.0	V	245.0	-1.6	15.7	40.0
66.957000	34.0	100.0	V	315.0	-3.5	6.0	40.0
70.643000	33.1	100.0	V	298.0	-4.7	6.9	40.0
74.814000	33.2	100.0	V	285.0	-5.7	6.8	40.0
166.57600	16.2	100.0	V	0.0	-4.2	27.3	43.5
236.51300	21.7	100.0	V	4.0	-0.3	24.3	46.0





**Figure A.20 Radiated Emission from 1GHz to 3GHz**



**Figure A.21 Radiated Emission from 3GHz to 18GHz**

## A.2 Conducted Emission

### Reference

FCC: CFR Part 15.107(a).

IC: ICES-003 Section 3.2.1

### 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 EUT is operating in the USB mode, charging mode, MP4, CAMERA and SD mode.

The software is used to let the PC keep on copying data to EUT, 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,  $k=2$ .

#### Charger1+ Rear Camera, Set.1

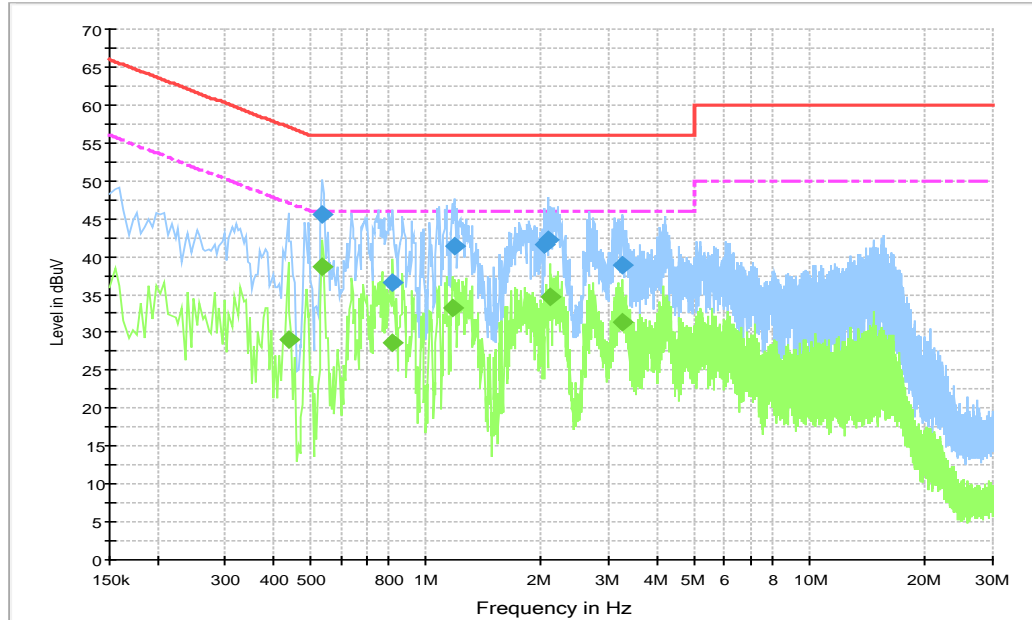


Figure A.22 Conducted Emission

#### Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.537000	45.5	1000.0	9.000	On	L1	19.8	10.5	56.0
0.820500	36.5	1000.0	9.000	On	L1	19.8	19.5	56.0
1.185000	41.3	1000.0	9.000	On	L1	19.7	14.7	56.0
2.040000	41.5	1000.0	9.000	On	L1	19.7	14.5	56.0
2.089500	42.1	1000.0	9.000	On	L1	19.7	13.9	56.0
3.255000	38.9	1000.0	9.000	On	L1	19.6	17.1	56.0

#### Final Result 2

Frequency (MHz)	Average (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.438000	29.0	1000.0	9.000	On	L1	19.9	18.1	47.1
0.537000	38.7	1000.0	9.000	On	L1	19.8	7.3	46.0
0.820500	28.7	1000.0	9.000	On	L1	19.8	17.3	46.0
1.171500	33.2	1000.0	9.000	On	L1	19.7	12.8	46.0
2.103000	34.7	1000.0	9.000	On	L1	19.7	11.3	46.0
3.255000	31.3	1000.0	9.000	On	L1	19.6	14.7	46.0

. Charger2+MP4, Set.2

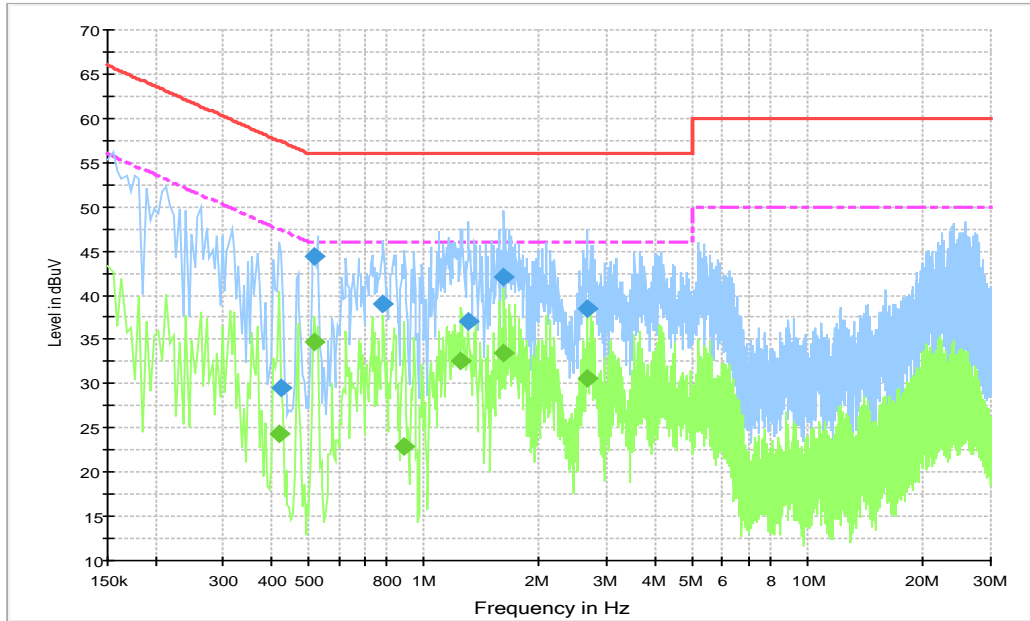


Figure A.23 Conducted Emission

**Final Result 1**

Frequency (MHz)	QuasiPeak (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.424500	29.6	1000.0	9.000	On	L1	19.9	27.8	57.4
0.519000	44.4	1000.0	9.000	On	L1	19.9	11.6	56.0
0.780000	38.9	1000.0	9.000	On	L1	19.8	17.1	56.0
1.306500	37.0	1000.0	9.000	On	L1	19.7	19.0	56.0
1.617000	42.0	1000.0	9.000	On	L1	19.7	14.0	56.0
2.661000	38.6	1000.0	9.000	On	L1	19.6	17.4	56.0

**Final Result 2**

Frequency (MHz)	Average (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.420000	24.2	1000.0	9.000	On	L1	19.9	23.2	47.4
0.519000	34.8	1000.0	9.000	On	L1	19.9	11.2	46.0
0.892500	22.9	1000.0	9.000	On	L1	19.7	23.1	46.0
1.252500	32.6	1000.0	9.000	On	L1	19.7	13.4	46.0
1.617000	33.5	1000.0	9.000	On	L1	19.7	12.5	46.0
2.661000	30.6	1000.0	9.000	On	L1	19.6	15.4	46.0

### Charger3+Front Camera, Set.3

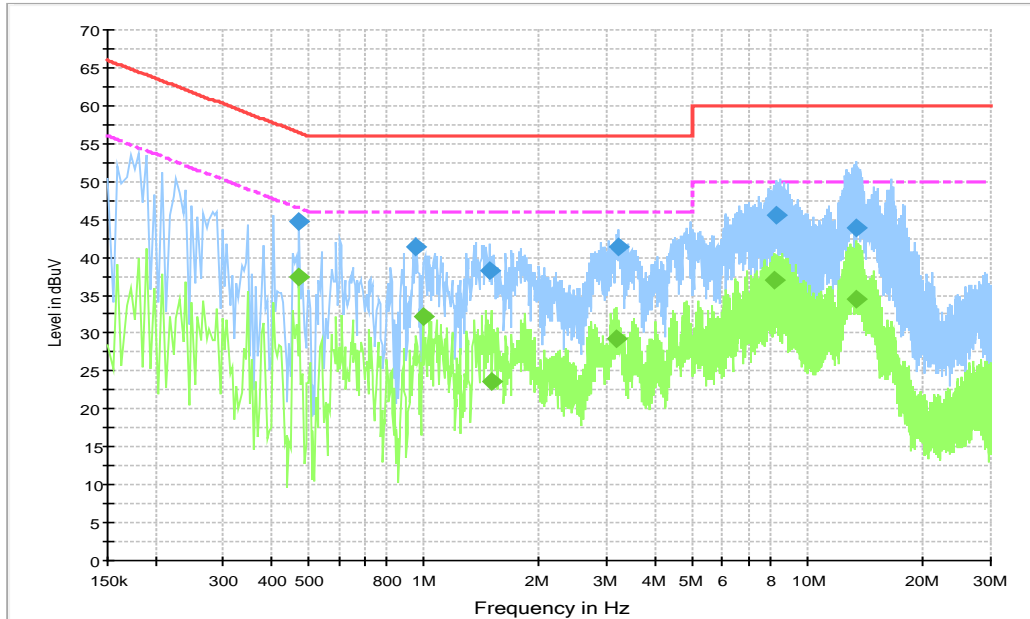


Figure A.24 Conducted Emission

#### Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.474000	44.8	1000.0	9.000	On	L1	19.9	11.6	56.4
0.955500	41.5	1000.0	9.000	On	L1	19.8	14.5	56.0
1.486500	38.3	1000.0	9.000	On	L1	19.7	17.7	56.0
3.210000	41.5	1000.0	9.000	On	L1	19.6	14.5	56.0
8.308500	45.5	1000.0	9.000	On	L1	19.7	14.5	60.0
13.416000	43.9	1000.0	9.000	On	L1	19.8	16.1	60.0

#### Final Result 2

Frequency (MHz)	Average (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.474000	37.3	1000.0	9.000	On	L1	19.9	9.1	46.4
0.996000	32.2	1000.0	9.000	On	L1	19.7	13.8	46.0
1.495500	23.7	1000.0	9.000	On	L1	19.7	22.3	46.0
3.169500	29.3	1000.0	9.000	On	L1	19.6	16.7	46.0
8.227500	36.9	1000.0	9.000	On	L1	19.7	13.1	50.0
13.434000	34.4	1000.0	9.000	On	L1	19.8	15.6	50.0

### Charger4+MP3, Set.4

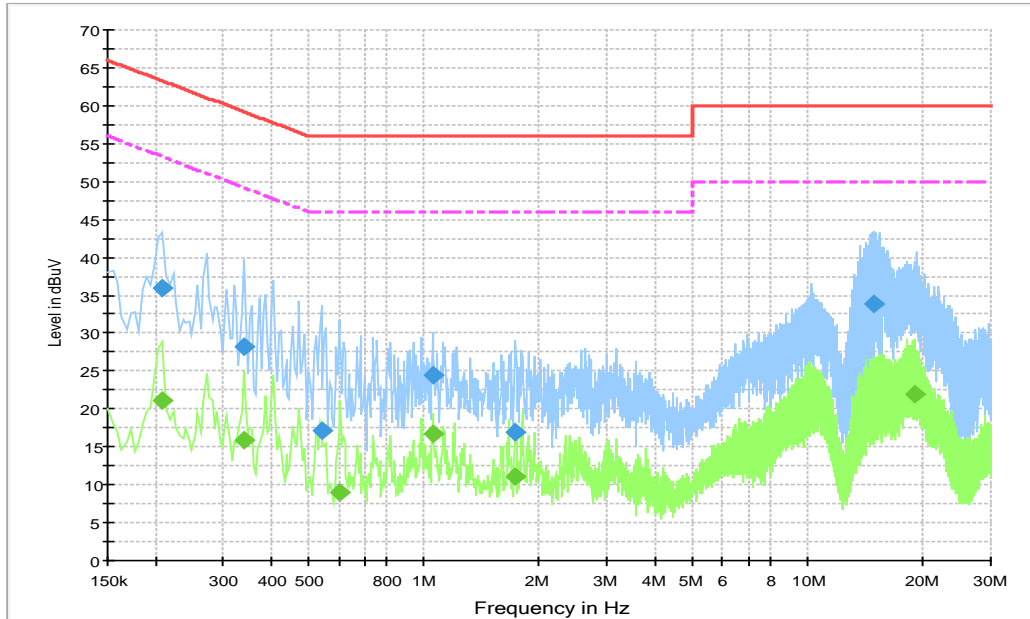


Figure A.25 Conducted Emission

#### Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.208500	36.0	1000.0	9.000	On	L1	19.9	27.3	63.3
0.339000	28.2	1000.0	9.000	On	L1	19.8	31.1	59.2
0.541500	17.0	1000.0	9.000	On	L1	19.8	39.0	56.0
1.054500	24.4	1000.0	9.000	On	L1	19.7	31.6	56.0
1.729500	16.9	1000.0	9.000	On	L1	19.7	39.1	56.0
14.946000	33.9	1000.0	9.000	On	L1	19.8	26.1	60.0

#### Final Result 2

Frequency (MHz)	Average (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.208500	21.1	1000.0	9.000	On	L1	19.9	32.2	53.3
0.339000	16.0	1000.0	9.000	On	L1	19.8	33.3	49.2
0.604500	8.9	1000.0	9.000	On	L1	19.8	37.1	46.0
1.054500	16.7	1000.0	9.000	On	L1	19.7	29.3	46.0
1.734000	11.1	1000.0	9.000	On	L1	19.7	34.9	46.0
18.937500	22.0	1000.0	9.000	On	L1	19.8	28.0	50.0

### Charger5, Set.5

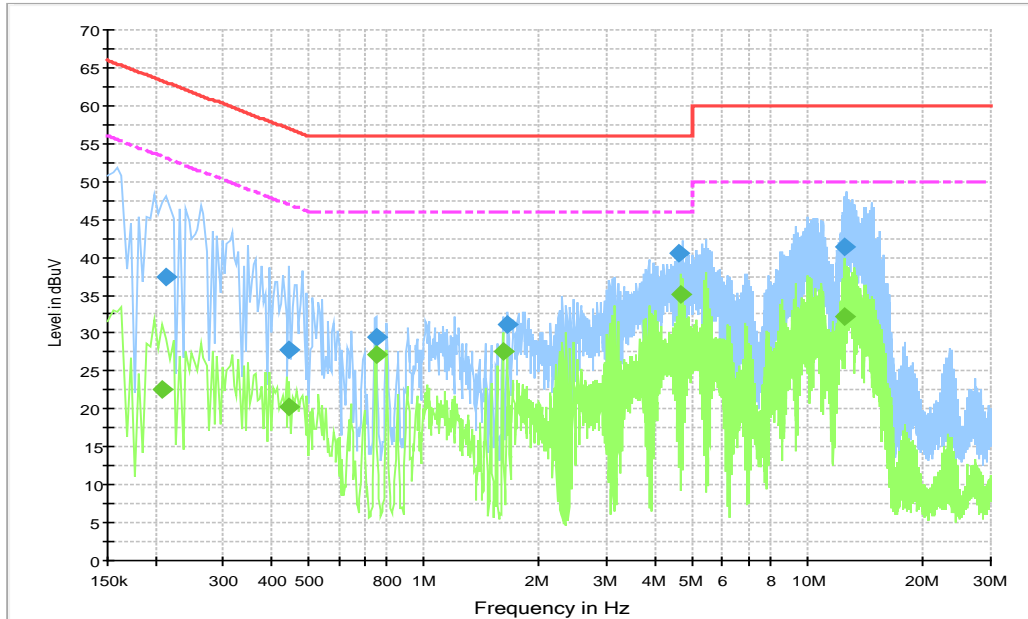


Figure A.26 Conducted Emission

#### Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.213000	37.5	1000.0	9.000	On	N	19.9	25.6	63.1
0.447000	27.9	1000.0	9.000	On	L1	19.9	29.1	56.9
0.753000	29.5	1000.0	9.000	On	N	19.8	26.5	56.0
1.657500	31.2	1000.0	9.000	On	L1	19.7	24.8	56.0
4.600500	40.5	1000.0	9.000	On	L1	19.6	15.5	56.0
12.511500	41.3	1000.0	9.000	On	L1	19.8	18.7	60.0

#### Final Result 2

Frequency (MHz)	Average (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.208500	22.6	1000.0	9.000	On	L1	19.9	30.6	53.3
0.447000	20.2	1000.0	9.000	On	L1	19.9	26.7	46.9
0.753000	27.1	1000.0	9.000	On	L1	19.8	18.9	46.0
1.603500	27.5	1000.0	9.000	On	L1	19.7	18.5	46.0
4.654500	35.2	1000.0	9.000	On	L1	19.6	10.8	46.0
12.511500	32.2	1000.0	9.000	On	L1	19.8	17.8	50.0

### Charger6, Set.6

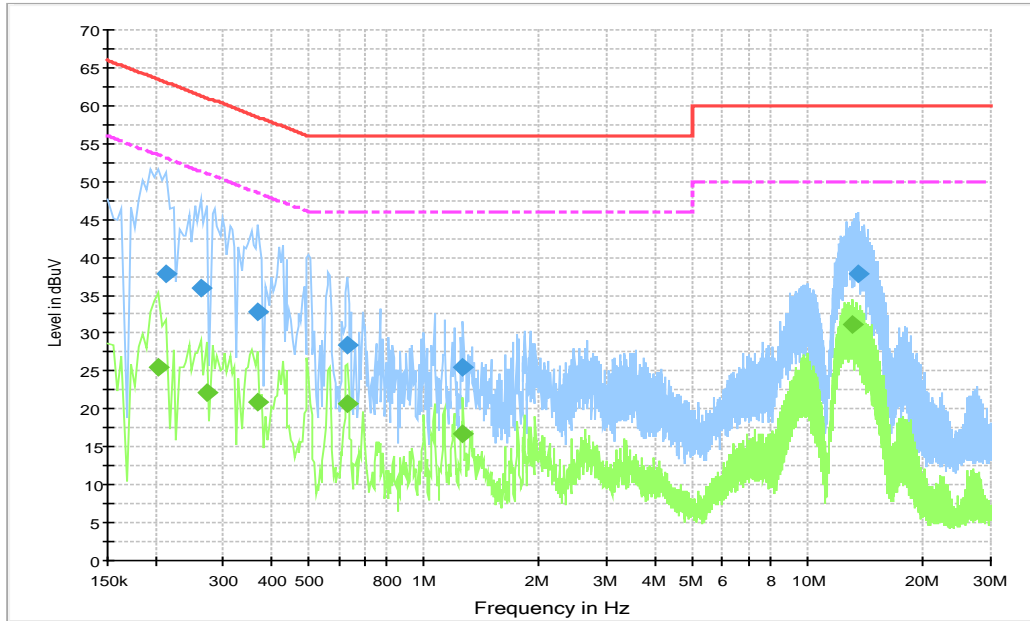


Figure A.27 Conducted Emission

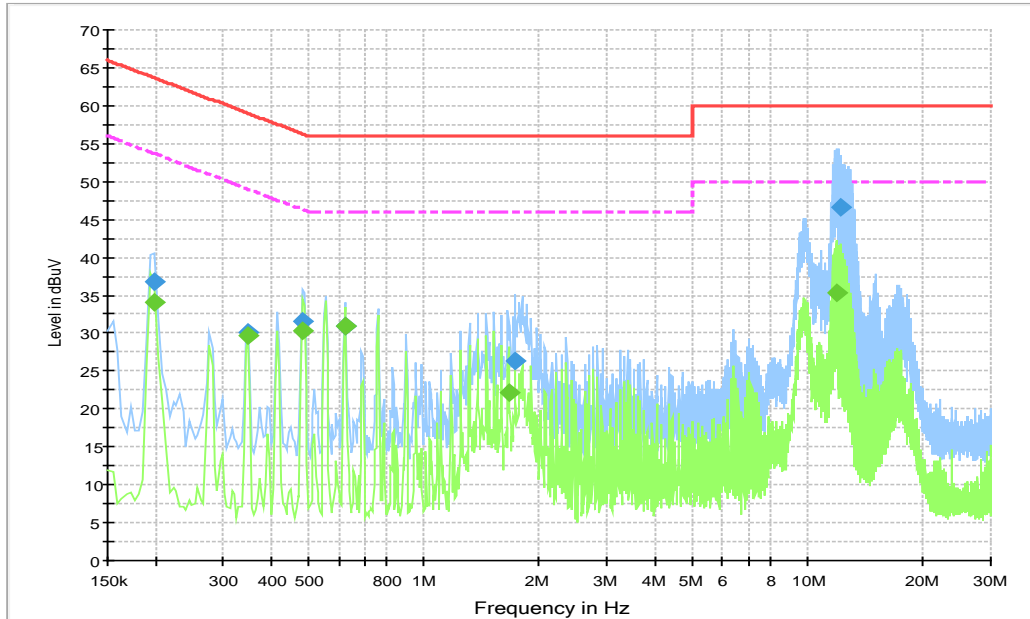
#### Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.213000	37.9	1000.0	9.000	On	L1	19.9	25.2	63.1
0.262500	36.0	1000.0	9.000	On	L1	19.8	25.3	61.4
0.370500	32.8	1000.0	9.000	On	L1	19.9	25.7	58.5
0.631500	28.3	1000.0	9.000	On	L1	19.8	27.7	56.0
1.266000	25.4	1000.0	9.000	On	L1	19.7	30.6	56.0
13.501500	37.9	1000.0	9.000	On	L1	19.8	22.1	60.0

#### Final Result 2

Frequency (MHz)	Average (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.204000	25.4	1000.0	9.000	On	L1	19.9	28.0	53.4
0.271500	22.1	1000.0	9.000	On	L1	19.8	29.0	51.1
0.370500	20.9	1000.0	9.000	On	L1	19.9	27.6	48.5
0.631500	20.7	1000.0	9.000	On	L1	19.8	25.3	46.0
1.266000	16.7	1000.0	9.000	On	L1	19.7	29.3	46.0
13.146000	31.0	1000.0	9.000	On	L1	19.8	19.0	50.0



**USB (SD) mode, Set.7**

**Figure A.28 Conducted Emission**
**Final Result 1**

Frequency (MHz)	QuasiPeak (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.199500	36.7	1000.0	9.000	On	L1	19.9	26.9	63.6
0.348000	30.0	1000.0	9.000	On	N	19.8	29.0	59.0
0.483000	31.6	1000.0	9.000	On	L1	19.9	24.7	56.3
0.622500	30.9	1000.0	9.000	On	L1	19.8	25.1	56.0
1.729500	26.3	1000.0	9.000	On	L1	19.7	29.7	56.0
12.174000	46.6	1000.0	9.000	On	L1	19.8	13.4	60.0

**Final Result 2**

Frequency (MHz)	Average (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.199500	34.1	1000.0	9.000	On	L1	19.9	19.5	53.6
0.348000	29.7	1000.0	9.000	On	N	19.8	19.4	49.0
0.483000	30.2	1000.0	9.000	On	L1	19.9	16.1	46.3
0.622500	31.0	1000.0	9.000	On	L1	19.8	15.0	46.0
1.662000	22.0	1000.0	9.000	On	L1	19.7	24.0	46.0
11.859000	35.3	1000.0	9.000	On	N	19.8	14.7	50.0



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

Test Item	Tester
Radiated Emission	Li Zongliang, Zhao Wenhui
Conducted Emission	Guo Qian

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