



# FCC PART 15B TEST REPORT

No. 24T04Z100274-003

for

**TCL Communication Ltd.**

**GSM/UMTS/LTE/NR Mobile phone**

**Model name: T614WS**

**FCC ID: 2ACCJH179**

with

**Hardware Version: 06**

**Software Version: 7G83**

**Issued Date: 2024-03-22**

**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>
24T04Z100274-003	Rev.0	1 <sup>st</sup> edition	2024-02-29
24T04Z100274-003	Rev.1	2 <sup>nd</sup> edition	2024-03-22

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



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## 1. Test Laboratory

### 1.1. Testing Location

CTTL (huayuan North Road)

Address: No. 52, Huayuan North Road, Haidian District, Beijing,  
P. R. China 100191

### 1.2. Testing Environment

Normal Temperature: 15-35°C

Relative Humidity: 20-75%

### 1.3. Project data

Testing Start Date: 2024-02-06

Testing End Date: 2024-02-07

### 1.4. Signature



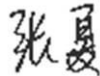
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Wang Xue  
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## **2. Client Information**

### **2.1. Applicant Information**

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### **2.2. Manufacturer Information**

Company Name: TCL Communication Ltd.  
Address: 5/F, Building 22E, 22 Science Park East Avenue, Hong Kong Science Park, Shatin, NT, Hong Kong  
Contact: Annie Jiang  
Email: nianxiang.jiang@tcl.com  
Tel: +86 755 3661 1621  
Fax: +86 755 3661 2000-81722

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

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

Description	GSM/UMTS/LTE/NR Mobile phone
Model Name	T614WS
FCC ID:	2ACCJH179

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*	SN or IMEI	HW Version	SW Version
EUT1	016525002004818/ 016525002004826	06	7G83

\*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	Model	Manufacture
AE1	Battery1	TLp049FA	TMB
AE2	Battery2	TLp049F7	Veken
AE3	Charger1	QC13US	PUAN
AE4	Charger2	QC13US	JUWEI
AE5	USB Cable1	CDA0000256C1	JUWEI
AE6	USB Cable2	CDA0000256C2	SHENGHUA
AE7	Headset	/	Provided by laboratory

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

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

EUT set-up No.	Combination of EUT and AE	Remarks
Set.1	EUT1 + AE1/AE2 +AE3+AE5/AE6	Charger1+MP3+F Camera +GSM 850 idle
Set.2	EUT1 + AE1/AE2 +AE4+AE5/AE6	Charger2+R Camera + WCDMA B5 idle
Set.3	EUT1 + AE1/AE2 + AE5/AE6 + AE7	USB + FM + LTE B5
Set.4	EUT1 + AE1/AE2+ Cable + EUT2	OTG + NR n5

Note:

Equipment Under Test (EUT) is a model of GSM/UMTS/LTE/NR Mobile phone.

It supports

GSM Band 850/900/1800/1900

UMTS Band FDD Band I/III/IV/V/VIII

LTE Band FDD Bands 1/2/3/4/5/7/12/13/20/25/26/28/29/66/71,TDD Bands 38/40/41/48

NR Band n2/n5/n25/n41/n66/n71/n77/n78

It has MP3, Camera, USB memory, Bluetooth 5.3, Wi-Fi (802.11a/b/g/n/ac, 802.11n supports 20MHz and 40MHz bandwidth, 802.11ac supports 20MHz, 40MHz and 80MHz bandwidth) and GPS function.

The device contains receivers which tune and operate between 30MHz-960MHz in the



following mode: GSM 850, WCDMA850, LTE Band 5/12/13/17/26/29/71, NR Band n5/n71, FM. All licensed band receivers that tune in the range of 30MHz-960MHz are investigated. Only the worst-case emissions are reported.

## **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 - Unintentional Radiators	2019
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-1** 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 M $\Omega$
Ground system resistance	< 4 $\Omega$
Normalised site attenuation (NSA)	< $\pm 4$ dB, 3m distance
Site voltage standing-wave ratio ( $S_{VSWR}$ )	Between 0 and 6 dB, from 1GHz to 6GHz
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 M $\Omega$
Ground system resistance	< 4 $\Omega$



## 6. SUMMARY OF TEST RESULTS

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

Items	Test Name	Clause in FCC rules	Section in this report	Verdict	Test Location
1	Radiated Emission	15.109(a)	B.1	P	CTTL(huayuan North Road)

※NOTE: The model T614WS is a variant model based on T614D. According to the declaration of changes, the following items are tested. Other results please refer to 23T04Z80421-03

Test Item	Mode or Feature	EUT Set-up
Radiated Continues Emission	Charging mode/USB mode /OTG mode	Set.1/2/3/4

Only the worst-case emissions are reported.

## 7. Test Equipments Utilized

NO.	Description	TYPE	SERIES NUMBER	MANUFACTURE	CAL DUE DATE	CALIBRATION INTERVAL
1	Test Receiver	ESW44	103023	R&S	2024-07-08	1 Year
2	EMI Antenna	VULB 9163	01222	SCHWARZBECK	2024-02-28	1 Year
3	EMI Antenna	3115	6914	ETS-Lindgren	2024-04-25	1 Year
4	Signal Generator	SMBV100A	260613	R&S	2024-03-14	1 Year
5	Universal Communication Tester	CMU200	116455	R&S	2024-05-26	1 Year
6	Universal Radio Communication Tester	CMW500	150344	R&S	2025-02-03	1 Year
7	Universal Radio Communication Tester	E7515B	MY60102215	Keysight	2024-07-09	1 Year

Test software information		
Test Item	Software	Version
Radiated Emission	EMC32	V11.50.00

## **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 (USB mode of MS) at distances 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 3/10 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 USB mode. During the test MS is connected to a PC via a USB cable in the case of USB 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 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.

The model of the PC is M4000E-17, and the serial number of the PC is M706GWXD. 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.

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 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.

#### **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:

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

Where

$G_A$ : Antenna factor of receive antenna

$G_{PL}$ : Path Loss

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

Measurement uncertainty (worst case):  $U = 4.84 \text{ dB}$ ,  $k=2$ .

### Measurement results for Set.1:

#### Charging 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)
17987.420	40.80	-29.06	46.66	23.20	54.00	13.20	H
17901.740	40.70	-29.33	45.95	24.07	54.00	13.30	V
17793.960	40.60	-29.89	45.95	24.53	54.00	13.40	V
17882.020	40.60	-29.53	45.95	24.18	54.00	13.40	V
17990.480	40.60	-29.06	46.66	23.00	54.00	13.40	H
17941.860	40.50	-28.94	46.66	22.78	54.00	13.50	H

#### Charging 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)
17994.560	51.10	-29.06	46.66	33.50	74.00	22.90	H
17985.720	50.90	-29.06	46.66	33.30	74.00	23.10	V
17986.400	50.80	-29.06	46.66	33.20	74.00	23.20	V
17969.060	50.70	-29.06	46.66	33.10	74.00	23.30	V
17879.300	50.40	-29.39	45.95	33.84	74.00	23.60	V
17790.220	50.40	-29.89	45.95	34.33	74.00	23.60	H

**Measurement results for Set.2:**
**Charging 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)
17901.060	40.40	-29.33	45.95	23.77	54.00	13.60	H
17984.360	40.20	-29.06	46.66	22.60	54.00	13.80	H
17963.960	40.10	-29.06	46.66	22.50	54.00	13.90	V
17797.020	40.00	-29.89	45.95	23.93	54.00	14.00	V
17900.040	40.00	-29.33	45.95	23.37	54.00	14.00	V
17887.800	40.00	-29.53	45.95	23.58	54.00	14.00	V

**Charging 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)
17889.500	50.80	-29.53	45.95	34.38	74.00	23.20	H
17808.920	50.40	-29.63	45.95	34.08	74.00	23.60	V
17882.360	50.10	-29.53	45.95	33.68	74.00	23.90	H
17985.720	50.10	-29.06	46.66	32.50	74.00	23.90	H
17994.220	50.10	-29.06	46.66	32.50	74.00	23.90	H
17774.580	49.90	-29.63	45.95	33.57	74.00	24.10	V

**Measurement results for Set.3:**
**USB 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)
17976.200	41.00	-29.06	46.66	23.40	54.00	13.00	H
17869.440	41.00	-29.39	45.95	24.44	54.00	13.00	V
17999.320	40.80	-29.06	46.66	23.20	54.00	13.20	H
17973.480	40.50	-29.06	46.66	22.90	54.00	13.50	V
17933.020	40.50	-29.40	46.66	23.24	54.00	13.50	V
17989.120	40.50	-29.06	46.66	22.90	54.00	13.50	H

**USB 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)
17780.360	51.80	-29.89	45.95	35.73	74.00	22.20	V
17963.960	50.70	-29.06	46.66	33.10	74.00	23.30	H
17982.320	50.60	-29.06	46.66	33.00	74.00	23.40	V
17996.940	50.60	-29.06	46.66	33.00	74.00	23.40	V
17884.060	50.50	-29.53	45.95	34.08	74.00	23.50	V
17999.320	50.50	-29.06	46.66	32.90	74.00	23.50	H

**Measurement results for Set.4:**
**OTG 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)
17995.240	40.60	-29.06	46.66	23.00	54.00	13.40	H
17962.260	40.30	-29.06	46.66	22.70	54.00	13.70	V
17780.020	40.00	-29.89	45.95	23.93	54.00	14.00	H
17997.280	40.00	-29.06	46.66	22.40	54.00	14.00	V
17990.820	40.00	-29.06	46.66	22.40	54.00	14.00	V
17780.360	39.90	-29.89	45.95	23.83	54.00	14.10	V

**OTG 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)
17987.080	50.90	-29.06	46.66	33.30	74.00	23.10	V
17999.660	50.70	-29.06	46.66	33.10	74.00	23.30	H
17788.180	50.40	-29.89	45.95	34.33	74.00	23.60	H
17867.060	50.00	-29.39	45.95	33.44	74.00	24.00	V
17791.580	50.00	-29.89	45.95	33.93	74.00	24.00	V
17894.260	50.00	-29.53	45.95	33.58	74.00	24.00	V

Measurement results for Set.1:

Full Spectrum

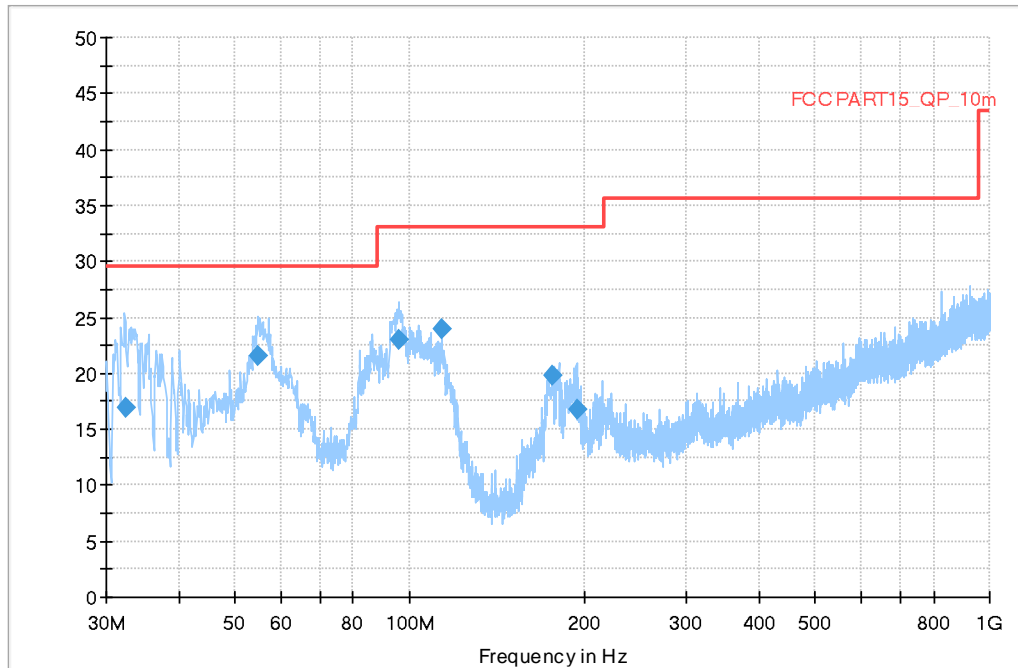


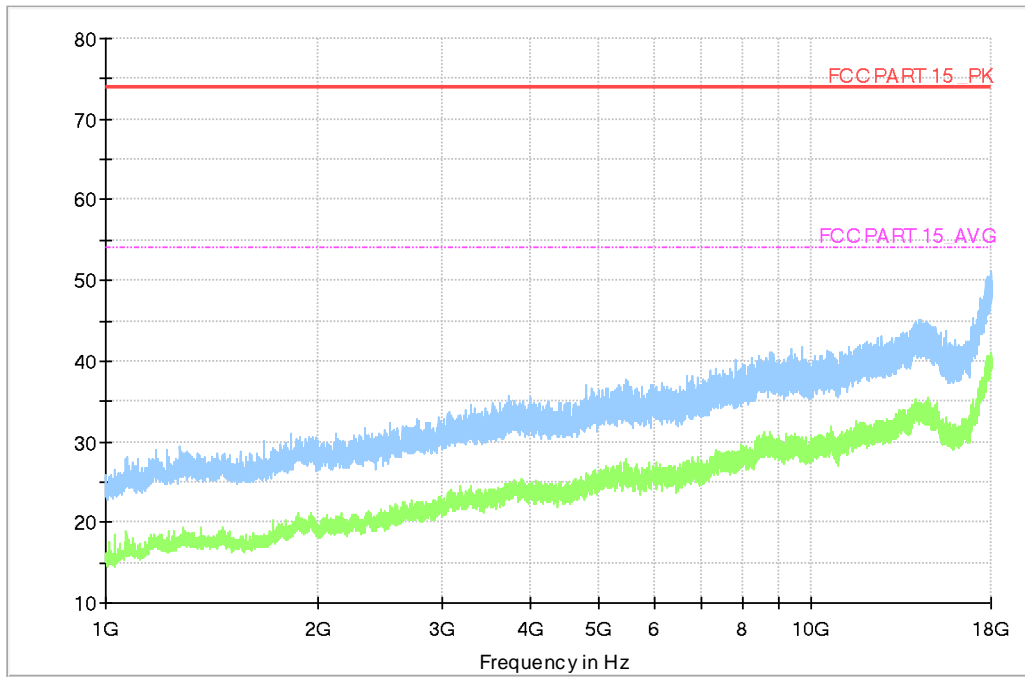
Fig A.1 Radiated Emission from 30MHz to 1GHz

Final Result 1

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Bandwidth (kHz)	Height (cm)	PoI	Azimuth (deg)
32.328000	16.89	29.54	12.65	120.000	101.0	V	225.0
54.735000	21.59	29.54	7.95	120.000	101.0	V	265.0
95.669000	23.08	33.06	9.98	120.000	101.0	V	-26.0
113.517000	23.96	33.06	9.10	120.000	101.0	V	-45.0
175.888000	19.77	33.06	13.29	120.000	101.0	V	245.0
194.027000	16.77	33.06	16.29	120.000	101.0	V	245.0



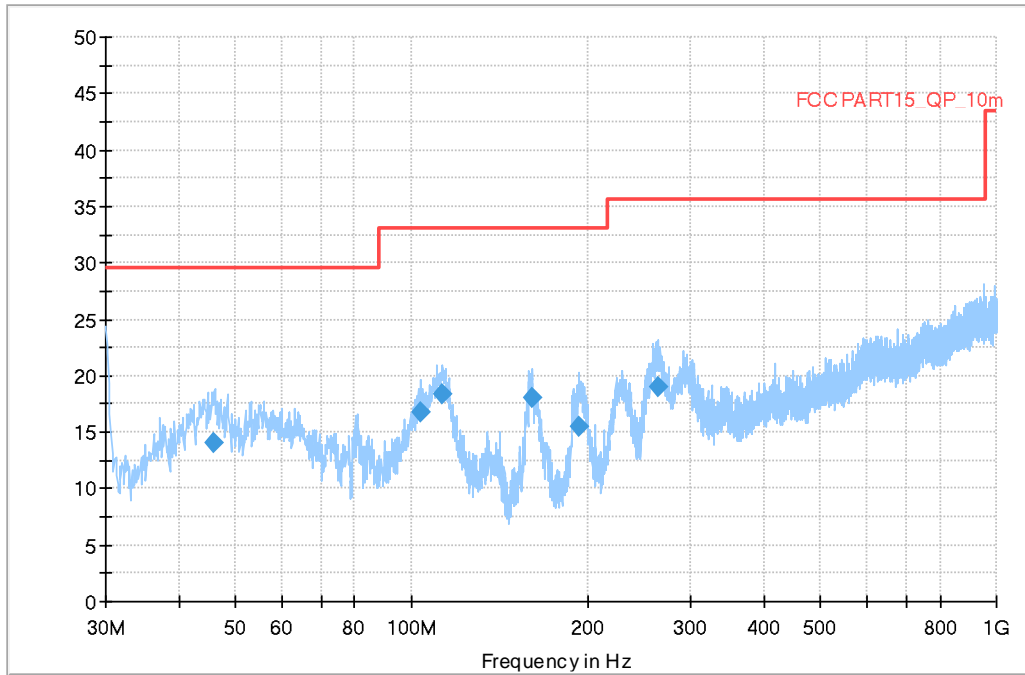
Full Spectrum



**Fig A.2 Radiated Emission from 1GHz to 18GHz**

**Measurement results for Set.2:**

Full Spectrum

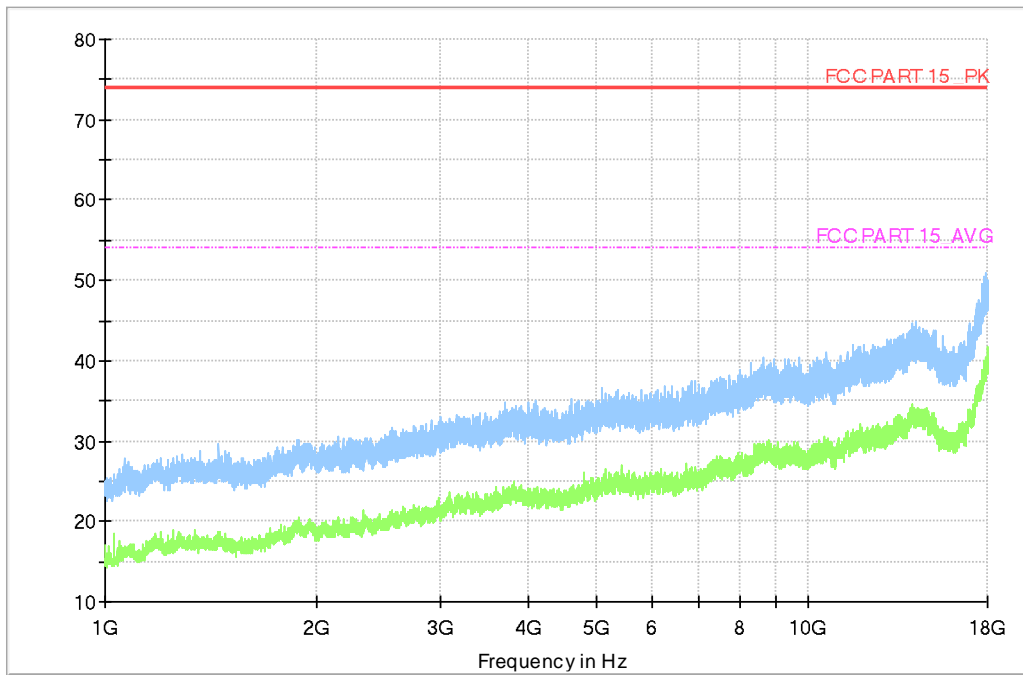


**Fig A.3 Radiated Emission from 30MHz to 1GHz**

**Final Result 1**

Frequency (MHz)	QuasiPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Bandwidth (kHz)	Height (cm)	PoI	Azimuth (deg)
45.908000	14.13	29.54	15.41	120.000	176.0	V	-6.0
103.623000	16.72	33.06	16.34	120.000	101.0	V	173.0
112.838000	18.43	33.06	14.63	120.000	101.0	V	174.0
160.465000	18.04	33.06	15.02	120.000	187.0	V	-25.0
193.833000	15.48	33.06	17.58	120.000	102.0	V	245.0
263.867000	19.07	35.56	16.49	120.000	101.0	V	137.0

Full Spectrum



**Fig A.4 Radiated Emission from 1GHz to 18GHz**

Measurement results for Set.3:

Full Spectrum

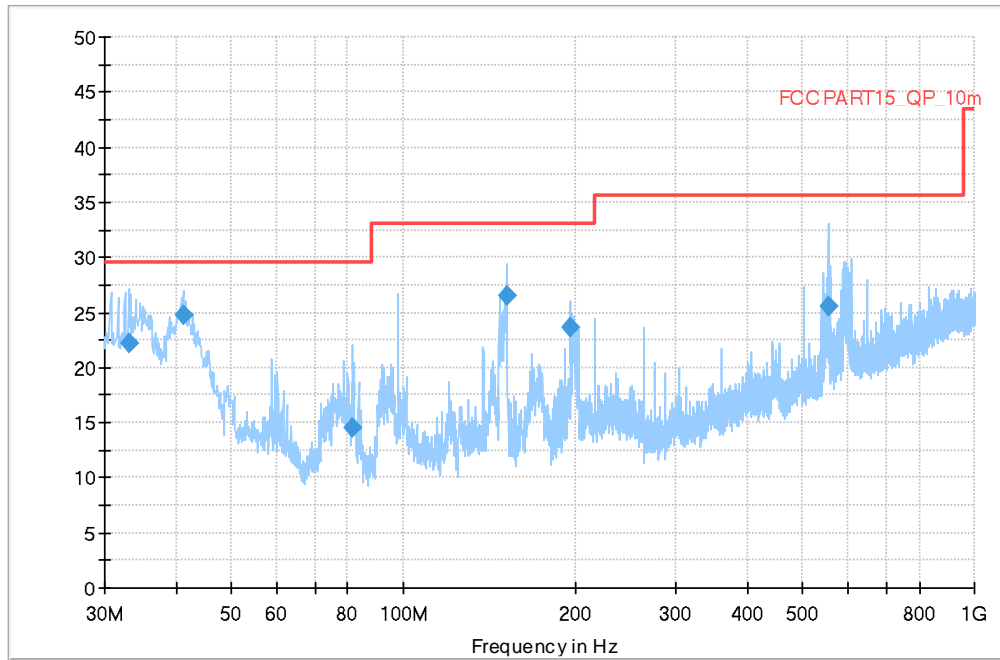
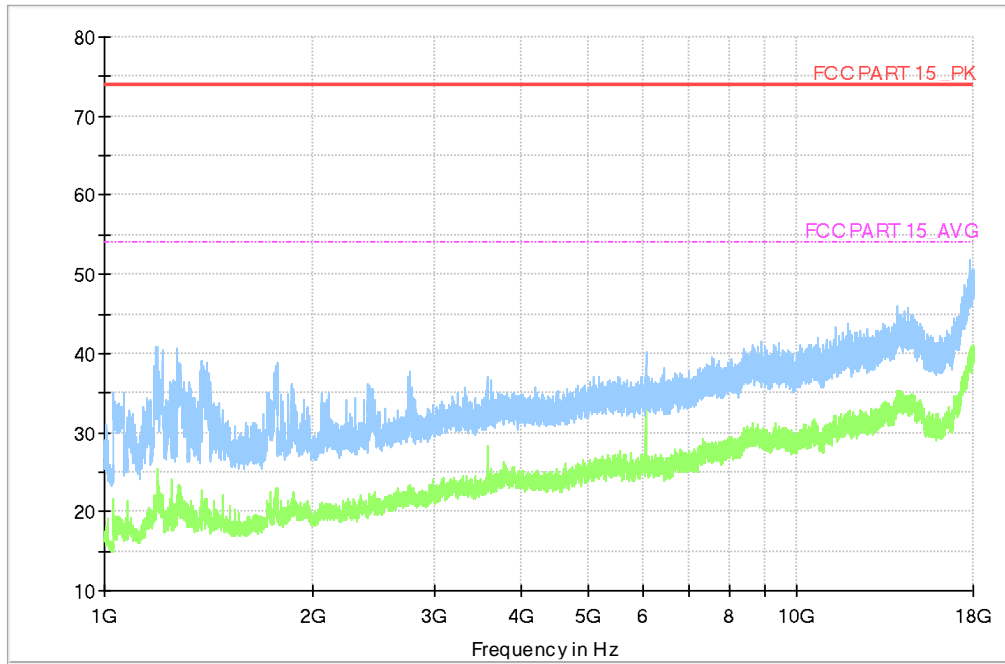


Fig A.5 Radiated Emission from 30MHz to 1GHz

Final Result 1

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)
33.104000	22.21	29.54	7.33	120.000	100.0	V	225.0
41.155000	24.79	29.54	4.75	120.000	175.0	V	135.0
81.604000	14.58	29.54	14.96	120.000	175.0	V	123.0
151.832000	26.57	33.06	6.49	120.000	100.0	V	-44.0
196.452000	23.68	33.06	9.38	120.000	100.0	V	-24.0
554.576000	25.61	35.56	9.95	120.000	225.0	V	-44.0

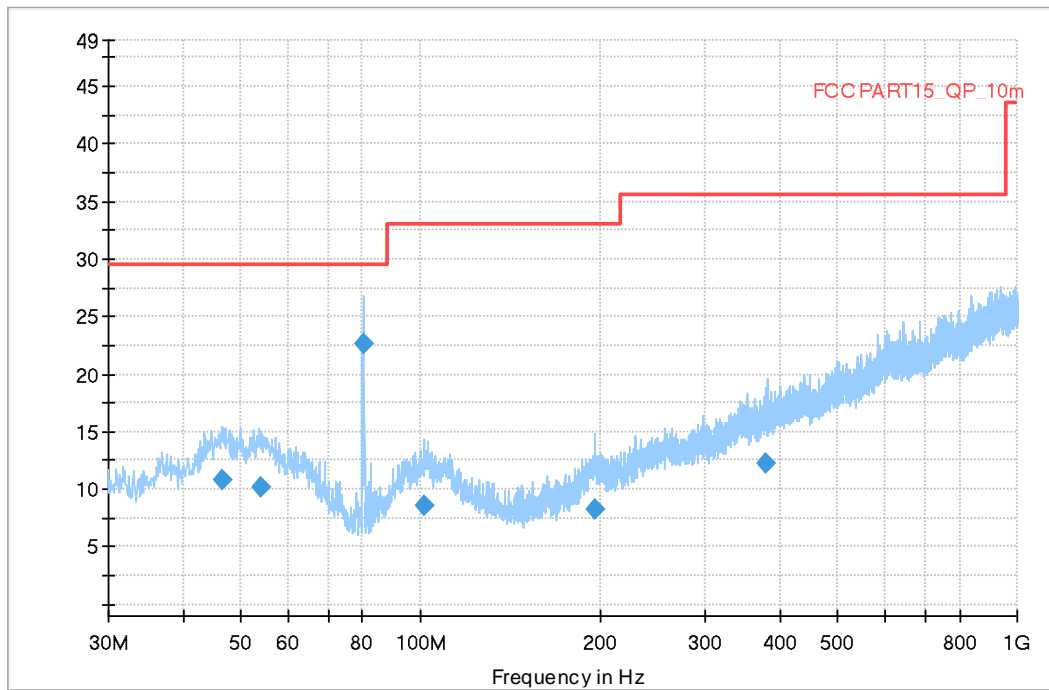
Full Spectrum



**Fig A.6 Radiated Emission from 1GHz to 18GHz**

**Measurement results for Set.4:**

Full Spectrum

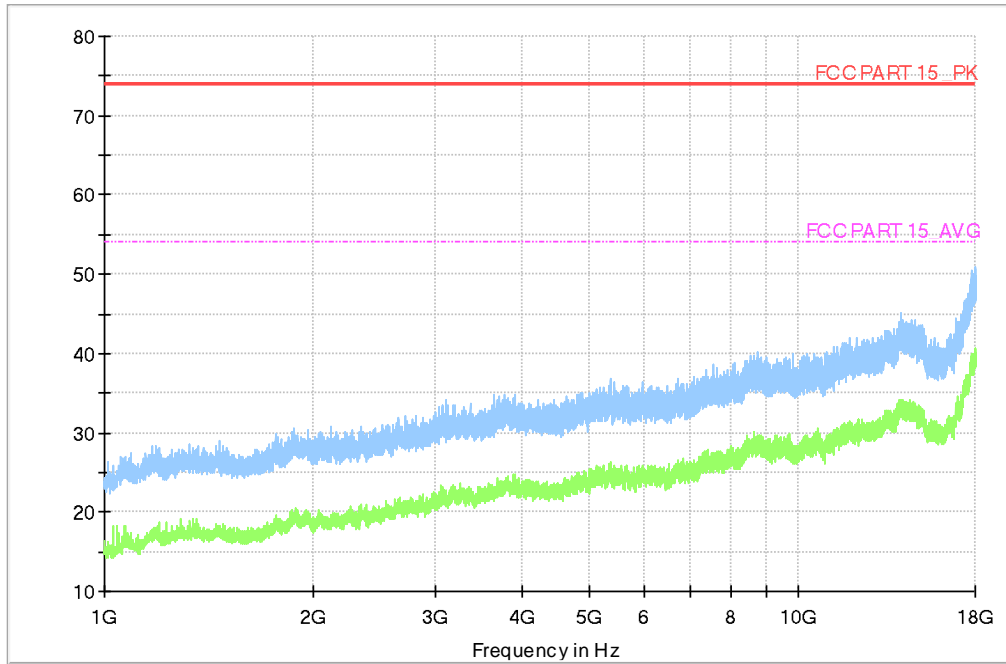


**Fig A.7 Radiated Emission from 30MHz to 1GHz**

**Final Result 1**

Frequency (MHz)	QuasiPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Bandwidth (kHz)	Height (cm)	PoI	Azimuth (deg)
46.684000	10.80	29.54	18.74	120.000	176.0	H	226.0
54.153000	10.21	29.54	19.33	120.000	187.0	H	84.0
80.052000	22.60	29.54	6.94	120.000	175.0	V	244.0
101.586000	8.59	33.06	24.47	120.000	323.0	H	245.0
196.355000	8.33	33.06	24.73	120.000	287.0	H	46.0
379.297000	12.25	35.56	23.31	120.000	125.0	H	245.0

Full Spectrum



**Fig A.8 Radiated Emission from 1GHz to 18GHz**

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