



TEST REPORT

No. I21Z60782-EMC01

for

TCL Communication Ltd.

GSM four bands /UMTS three bands /LTE ten bands mobile phone

Model Name: 4056L

FCC ID: 2ACCJN048

with

Hardware Version: 03

Software Version: 5G3HU1H0

Issued Date: 2021-05-26

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.

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Test Laboratory:

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REPORT HISTORY

Report Number	Revision	Description	Issue Date
I21Z60782-EMC01	Rev.0	1 st edition	2021-05-26

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: 2021-05-06

Testing End Date: 2021-05-26


1.4. Signature



Wang Xue
(Prepared this test report)



Zhang Ying
(Reviewed this test report)



Zhang Xia
(Approved this test report)



2. Client Information

2.1. Applicant Information

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2.2. Manufacturer Information

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Fax: 0086-755-36612000-81722

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

3.1. About EUT

Description	GSM four bands /UMTS three bands /LTE ten bands mobile phone
Model Name	4056L
FCC ID	2ACCJN048

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

3.2. Internal Identification of EUT used during the test

EUT ID*	SN or IMEI	HW Version	SW Version
EUT1	015999000000519	03	5G3HU1H0

*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	Battery	/	/
AE2	charger	/	/
AE3	USB Cable	/	/
AE4	USB Cable	/	/
AE5	Headset		

AE1

Model	TLi017C7
Manufacturer	VEKEN
Capacity	Typical capacity 1850mAh, rated capacity 1780mAh
Nominal Voltage	/

AE2

Model	UC11US
Manufacturer	PUAN
Length of cable	/

AE3

Model	CDA0000162C2
Manufacturer	Shenghua
Length of cable	/

AE4

Model	CDA0000162C8
Manufacturer	PUAN
Length of cable	/

AE5

Model	/
Manufacturer	/
Length of cable	/

*AE ID: is used to identify the test sample in the lab internally.
Note: The USB cables are shielded.

3.4. EUT set-ups

EUT set-up No.	Combination of EUT and AE	Remarks
Set.1	EUT1 + AE1+AE2+ AE3	REAR Camera+GSM 850 idle
Set.2	EUT1 + AE1+AE2+ AE3	MP4+WCDMA 850 idle
Set.3	EUT1 + AE1+ AE2+ PC	USB+Front Camera +LTE B13 idle
Set.4	EUT1 + AE1+AE2+ AE5	FM

Note:

The device supports GSM/GPRS/EGPRS 850/900/1800/1900, UMTS FDD Band 2/4/5; LTE FDD Band 2/4/5/12/13/25/26/66/71, TDD Band 41. It has WLAN (802.11b/g/n, 802.11n supports 20MHz and 40MHz bandwidth), Bluetooth (EDR, BLE) and GNSS (GPS&GLONASS&BDS& GALILEO) functions.

The device contains receivers which tune and operate between 30MHz-960MHz in the following bands: GSM850, WCDMA850 ,LTE Band 5,LTE Band 12, LTE band 13 and LTE Band 71. All licensed band receivers that tune in the range of 30MHz-960MHz are investigated. Only the worst case emissions are reported.

The I21Z60782 is a variant model based on I20Z62110 for conformance test. According to the declaration of changes, the following test items were performed:

Test Item	Mode or Feature	EUT Set-up
Radiated Continuous Emission	GSM 850MHz, WCDMA band 5,LTE FDD band 13,FM	Set.1/2/3/4

Other results are inherited from the initial model. The report number of initial model is I20Z62110-EMC01.

4. Reference Documents

4.1. Reference Documents for testing

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

Reference	Title	Version
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 (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
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

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)

7. Test Equipments Utilized

NO.	Description	TYPE	SERIES NUMBER	MANUFACTURE	CAL DUE DATE	CALIBRATION INTERVAL
1	Test Receiver	ESU26	100235	R&S	2022-02-23	1 Year
2	Universal Radio Communication Tester	CMW500	163975	R&S	2022-01-11	1 year
3	EMI Antenna	VULB 9163	483	Schwarzbeck	2021-08-27	1 year
4	EMI Antenna	3115	00167250	ETS-Lindgren	2021-05-14	1 year
5	EMI Antenna	3115	6914	ETS-Lindgren	2022-02-03	1 year
5	Signal Generator	SMB100A	102063	R&S	2022-03-03	1 year

※ The EMI Antenna with serial number 00167250 did not exceed the CAL. DUE DATE when used.

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 and charging 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 and charging mode. During the test MS is connected to a PC via a USB cable in the case of USB mode and is connected to a charger in the case of charging 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.

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/1MHz	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_{Mea} : Measurement result on receiver.

Measurement uncertainty (worst case): $U = 4.74 \text{ dB}$, $k=2$.

Measurement results for Set.1:

Charging Mode/Average detector

Frequency (MHz)	Measurement Result (dB μ V/m)	Cable loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dB μ V)	Limit (dB μ V/m)	Margin (dB)	Antenna Pol. (H/V)
17975.633	43.7	-29.1	46.7	26.1	54.0	10.3	V
17621.467	43.4	-29.4	45.2	27.6	54.0	10.6	V
17946.167	43.3	-28.9	46.7	25.6	54.0	10.7	H
17977.900	43.3	-29.1	46.7	25.7	54.0	10.7	V
17945.033	43.2	-28.9	46.7	25.5	54.0	10.8	H
17948.433	43.1	-28.9	46.7	25.4	54.0	10.9	H

Charging Mode/Peak detector

Frequency (MHz)	Measurement Result (dB μ V/m)	Cable loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dB μ V)	Limit (dB μ V/m)	Margin (dB)	Antenna Pol. (H/V)
17993.200	52.5	-29.1	46.7	34.9	74.0	21.5	H
17947.300	52.4	-28.9	46.7	34.7	74.0	21.6	H
17778.433	52.2	-29.6	46.0	35.9	74.0	21.8	H
17862.300	52.1	-29.4	46.0	35.5	74.0	21.9	H
17910.467	52.0	-29.3	46.0	35.4	74.0	22.0	V
17755.767	52.0	-29.6	46.0	35.7	74.0	22.0	V

Measurement results for Set.2:
Charging Mode/Average detector

Frequency (MHz)	Measurement Result (dB μ V/m)	Cable loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dB μ V)	Limit (dB μ V/m)	Margin (dB)	Antenna Pol. (H/V)
17982.433	43.9	-29.1	46.7	26.3	54.0	10.1	V
17946.733	43.5	-28.9	46.7	25.8	54.0	10.5	H
17494.533	43.0	-29.8	44.4	28.4	54.0	11.0	V
17965.433	42.9	-29.1	46.7	25.3	54.0	11.1	H
17976.767	42.8	-29.1	46.7	25.2	54.0	11.2	V
17890.067	42.8	-29.5	46.0	26.4	54.0	11.2	V

Charging Mode/Peak detector

Frequency (MHz)	Measurement Result (dB μ V/m)	Cable loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dB μ V)	Limit (dB μ V/m)	Margin (dB)	Antenna Pol. (H/V)
17956.933	52.6	-28.9	46.7	34.9	74.0	21.4	H
17615.800	52.5	-29.5	45.2	36.8	74.0	21.5	V
17644.133	52.3	-29.6	45.2	36.7	74.0	21.7	H
17985.833	52.2	-29.1	46.7	34.6	74.0	21.8	V
17885.533	52.2	-29.5	46.0	35.8	74.0	21.8	H
17968.267	52.0	-29.1	46.7	34.4	74.0	22.0	H

Measurement results for Set. 3:
USB Mode/Average detector

Frequency (MHz)	Measurement Result (dB μ V/m)	Cable loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dB μ V)	Limit (dB μ V/m)	Margin (dB)	Antenna Pol. (H/V)
17848.133	43.7	-29.3	46.0	27.1	54.0	10.3	V
17993.200	43.5	-29.1	46.7	25.9	54.0	10.5	V
17841.900	43.3	-29.3	46.0	26.7	54.0	10.7	H
17996.600	43.3	-29.1	46.7	25.7	54.0	10.7	H
17911.033	43.3	-29.3	46.0	26.7	54.0	10.7	V
17967.133	43.3	-29.1	46.7	25.7	54.0	10.7	H

USB Mode/Peak detector

Frequency (MHz)	Measurement Result (dB μ V/m)	Cable loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dB μ V)	Limit (dB μ V/m)	Margin (dB)	Antenna Pol. (H/V)
17952.967	52.6	-28.9	46.7	34.9	74.0	21.4	H
17973.933	52.3	-29.1	46.7	34.7	74.0	21.7	V
17933.700	52.1	-29.4	46.7	34.8	74.0	21.9	H
17885.533	52.0	-29.5	46.0	35.6	74.0	22.0	V
17945.033	51.8	-28.9	46.7	34.1	74.0	22.2	H
17842.467	51.6	-29.3	46.0	35.0	74.0	22.4	V

Measurement results for Set.4:
Charging Mode/Average detector

Frequency (MHz)	Measurement Result (dB μ V/m)	Cable loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dB μ V)	Limit (dB μ V/m)	Margin (dB)	Antenna Pol. (H/V)
17966.000	44.6	-29.1	46.7	27.001	54.0	9.4	V
17864.567	43.5	-29.4	46.0	26.939	54.0	10.5	V
17962.033	43.5	-29.1	46.7	25.901	54.0	10.5	H
17964.867	43.4	-29.1	46.7	25.801	54.0	10.6	V
17951.267	43.3	-28.9	46.7	25.583	54.0	10.7	H
17947.300	43.3	-28.9	46.7	25.583	54.0	10.7	V

Charging Mode/Peak detector

Frequency (MHz)	Measurement Result (dB μ V/m)	Cable loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dB μ V)	Limit (dB μ V/m)	Margin (dB)	Antenna Pol. (H/V)
17977.333	52.8	-29.1	46.7	35.2	74.0	21.2	H
17962.600	52.5	-29.1	46.7	34.9	74.0	21.5	H
17988.667	52.4	-29.1	46.7	34.8	74.0	21.6	H
17877.600	52.2	-29.4	46.0	35.6	74.0	21.8	H
17939.367	52.1	-29.4	46.7	34.8	74.0	21.9	V
17752.933	52.1	-29.6	46.0	35.8	74.0	21.9	H

Measurement results for Set.1:

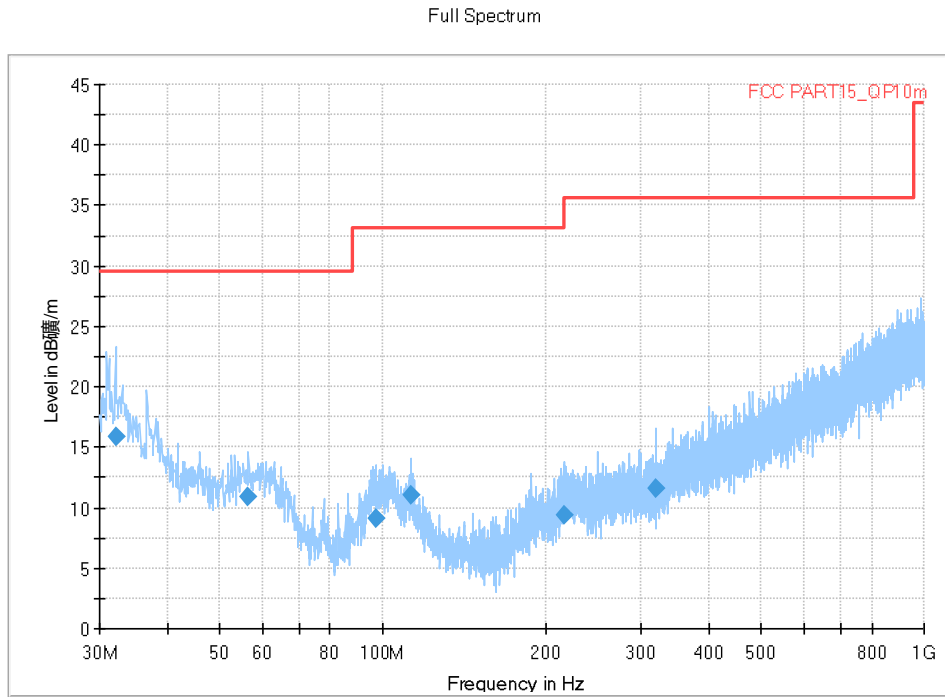


Fig A.1 Radiated Emission from 30MHz to 1GHz

Final Result 1

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)
32.134000	15.84	29.50	13.70	1000.0	120.000	112.0	V	157.0
56.481000	10.87	29.50	18.67	1000.0	120.000	235.0	V	3.0
97.318000	9.09	33.10	23.97	1000.0	120.000	125.0	V	191.0
113.032000	11.01	33.10	22.05	1000.0	120.000	104.0	V	189.0
216.822000	9.45	35.60	26.11	1000.0	120.000	125.0	V	200.0
320.127000	11.64	35.60	23.92	1000.0	120.000	125.0	V	114.0

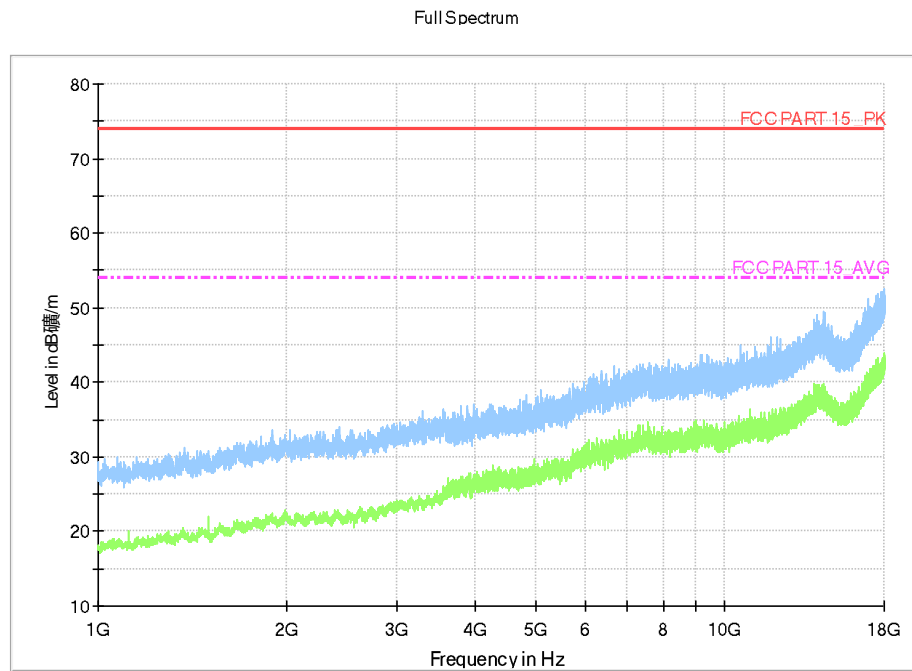


Fig A.2 Radiated Emission from 1GHz to 18GHz

Measurement results for Set. 2:

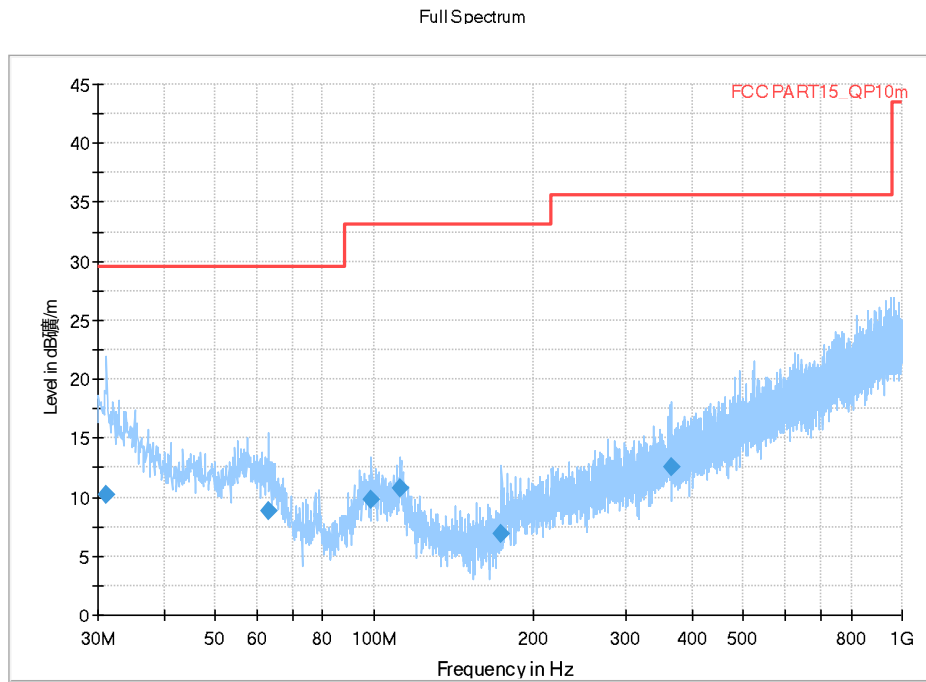


Fig A.3 Radiated Emission from 30MHz to 1GHz

Final Result 1

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)
31.164000	10.24	29.50	19.30	1000.0	120.000	107.0	V	87.0
63.174000	8.77	29.50	20.77	1000.0	120.000	225.0	V	30.0
98.870000	9.79	33.10	23.27	1000.0	120.000	103.0	V	286.0
112.159000	10.80	33.10	22.26	1000.0	120.000	120.0	V	74.0
174.433000	6.96	33.10	26.10	1000.0	120.000	120.0	V	180.0
365.523000	12.59	35.60	22.97	1000.0	120.000	224.0	V	287.0

Full Spectrum

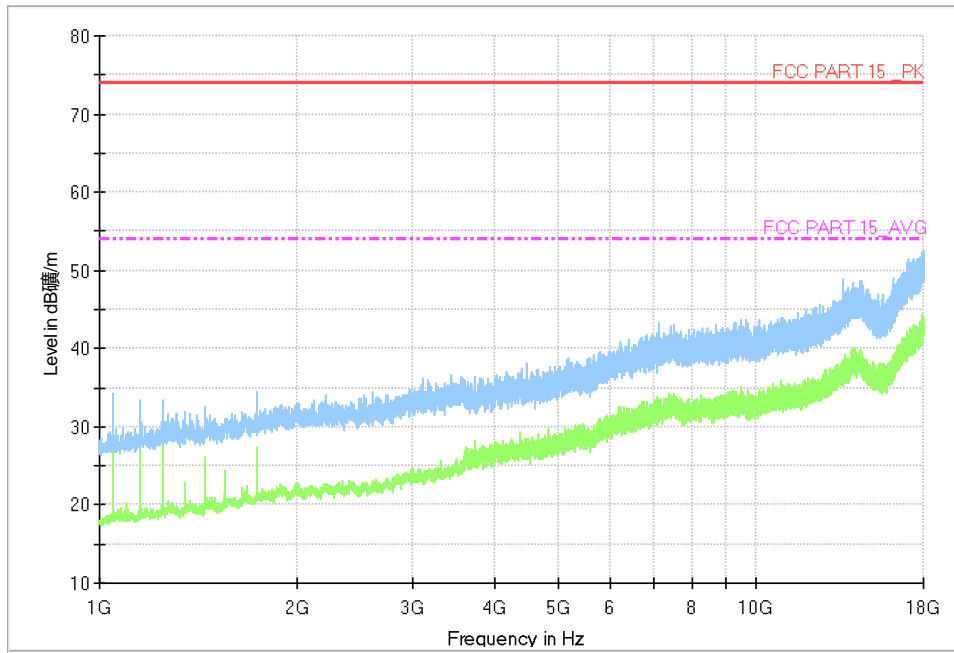


Fig A.4 Radiated Emission from 1GHz to 18GHz

Measurement results for Set.3:

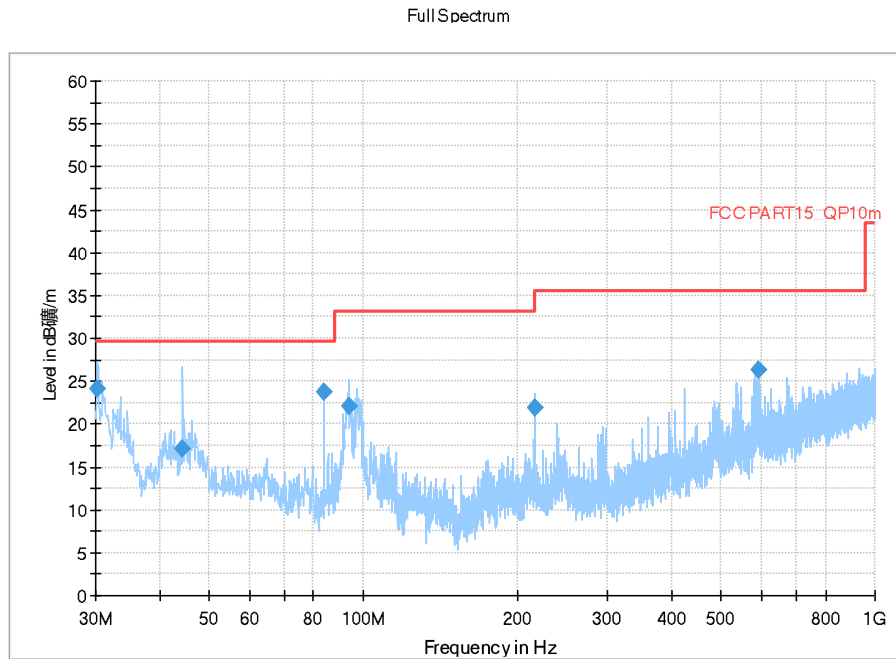


Fig A.5 Radiated Emission from 30MHz to 1GHz

Final Result 1

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)
30.291000	24.11	29.50	5.43	1000.0	120.000	205.0	V	246.0
44.356000	17.03	29.50	12.51	1000.0	120.000	103.0	V	259.0
83.835000	23.74	29.50	5.80	1000.0	120.000	125.0	V	90.0
93.632000	22.13	33.10	10.93	1000.0	120.000	125.0	V	177.0
216.046000	21.83	35.60	13.73	1000.0	120.000	102.0	V	271.0
593.861000	26.23	35.60	9.33	1000.0	120.000	207.0	V	3.0

Full Spectrum

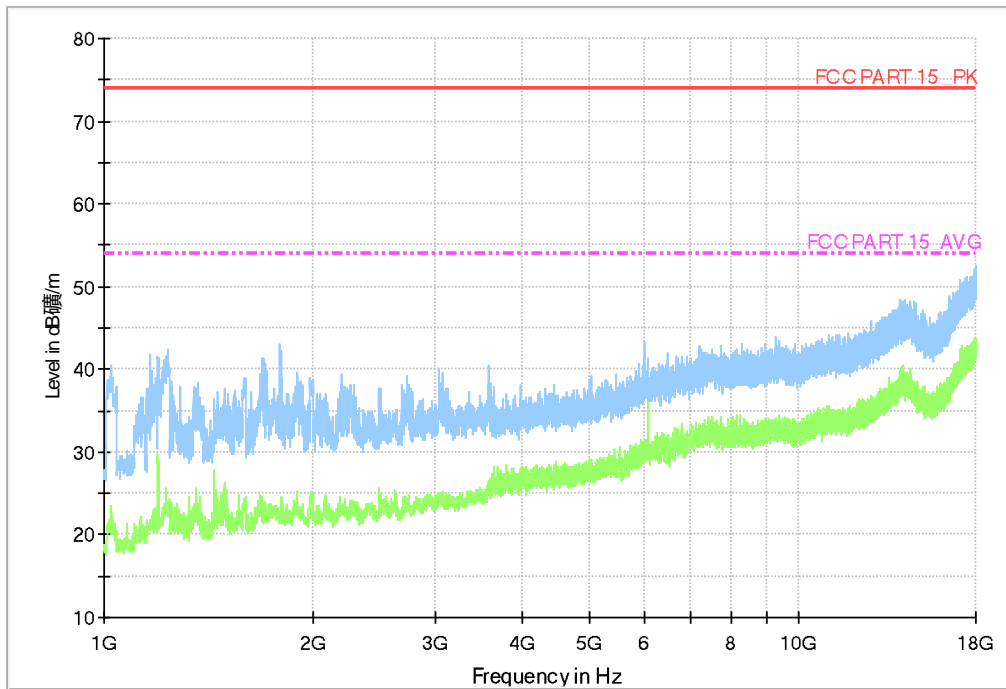


Fig A.6 Radiated Emission from 1GHz to 18GHz

Measurement results for Set.4:

Full Spectrum

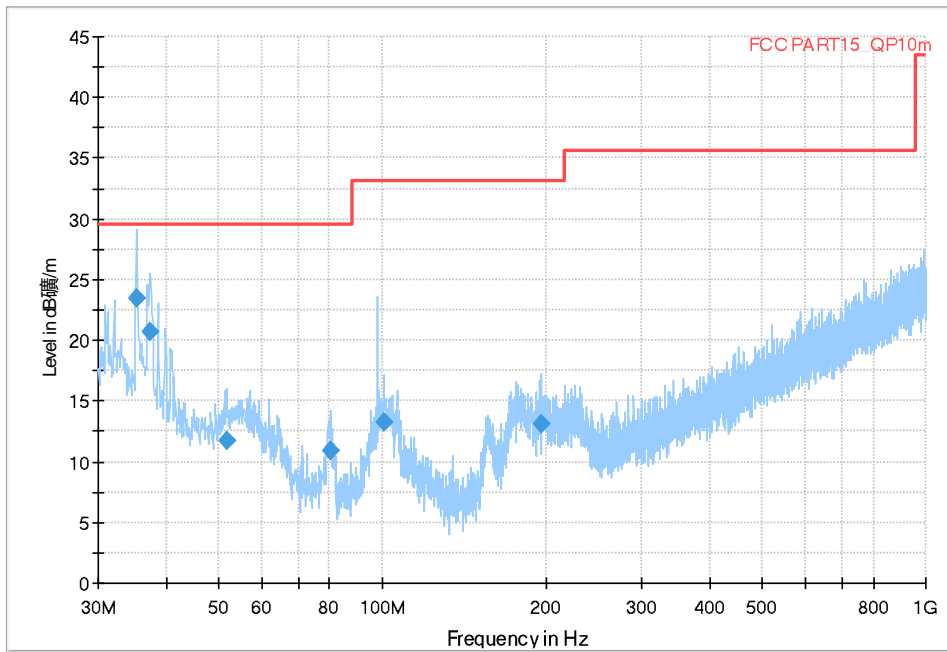


Fig A.7 Radiated Emission from 30MHz to 1GHz

Final Result 1

Frequency (MHz)	QuasiPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)
35.335000	23.48	29.50	6.06	1000.0	120.000	345.0	V	210.0
37.469000	20.70	29.50	8.84	1000.0	120.000	100.0	V	60.0
51.728000	11.75	29.50	17.79	1000.0	120.000	120.0	V	253.0
80.246000	10.90	29.50	18.64	1000.0	120.000	196.0	V	30.0
100.616000	13.30	33.10	19.76	1000.0	120.000	204.0	V	60.0
195.870000	13.07	33.10	19.99	1000.0	120.000	125.0	V	-20.0

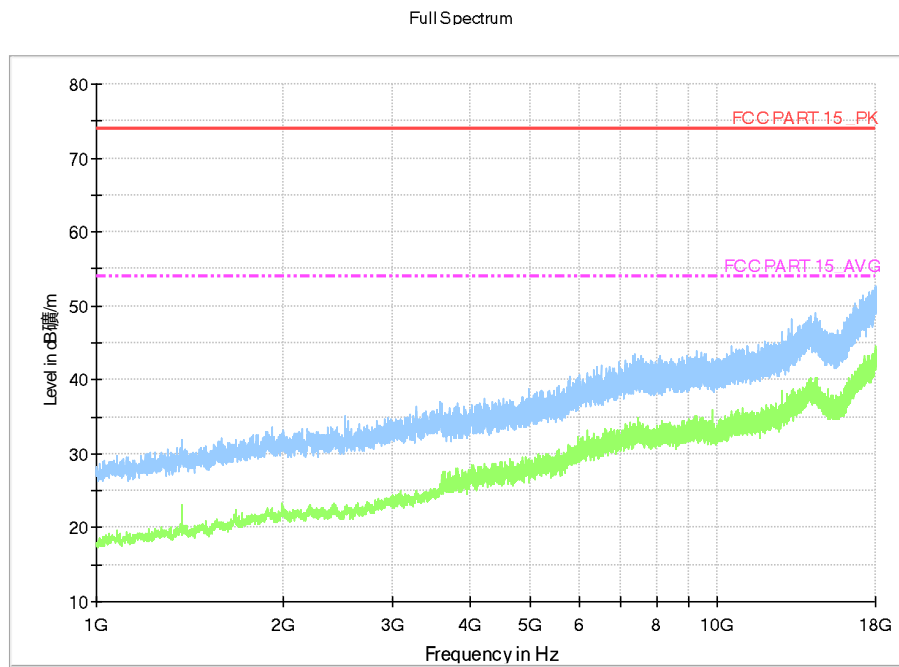


Fig A.8 Radiated Emission from 1GHz to 18GHz



ANNEX B: PERSONS INVOLVED IN THIS TESTING

Test Item	Test Software and Version	Software Vendor	Test operator
Radiated Emission	EMC32 V9.01.00	R&S	Yan Hanchen

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