



TEST REPORT

No. I16Z40480-EMC01

for

TCL Communication Ltd

GSM Quad-band/UMTS Tri-band / LTE Tri-band mobile phone

Model Name: 5056N, 5056W

FCC ID: 2ACCJB062

with

Hardware Version: 02

Software Version: VUB5M

Issued Date: 2016-05-12

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:

FCC 2.948 Listed: No.525429

CTTL, Telecommunication Technology Labs, Academy of Telecommunication Research, MIIT

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

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REPORT HISTORY

Report Number	Revision	Description	Issue Date
I16Z40480-EMC01	Rev.0	1 st edition	2016-05-12

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1. Test Laboratory

1.1. Testing Location

Location 1: 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: 2016-04-29

Testing End Date: 2016-05-11

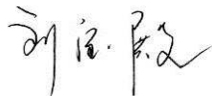
1.4. Signature



Zhang Hui
(Prepared this test report)



Qu Pengfei
(Reviewed this test report)



Liu Baodian
Deputy Director of the laboratory
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2. Client Information

2.1. Applicant Information

Company Name: TCL Communication Ltd
Address /Post: 5F, C building, No. 232, Liang Jing Road ZhangJiang High-Tech Park,
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2.2. Manufacturer Information

Company Name: TCL Communication Ltd
Address /Post: 5F, C building, No. 232, Liang Jing Road ZhangJiang High-Tech Park,
Pudong Area Shanghai, P.R. China. 201203
City: Shanghai
Postal Code: 201203
Country: P. R. China
Telephone: 0086-21-31363544
Fax: 0086-21-61460602

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

3.1. About EUT

Description	GSM Quad-band/UMTS Tri-band / LTE Tri-band mobile phone
Model Name	5056N
FCC ID	2ACCJB062
Extreme vol. Limits	3.55VDC to 4.35VDC (nominal: 3.8VDC)

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
EUT3	014650000100483	02	VUB5M

*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	/	Inbuilt
AE2	Travel	/	16TCT-BA-0145
AE3	Travel	/	16TCT-BA-0135
AE4	USB cable	/	15TCT-DC-0304
AE5	USB cable	/	15TCT-DC-0307

AE1

Model	CAC2500037C2
Manufacturer	SCUD
Capacitance	2500 mAh
Nominal voltage	3.8V

AE2,AE3

Model	CBA0058AGAC2
Manufacturer	TENPAO
Length of cable	/

AE4,AE5

Model	CDA3122005C1(Reach)
Manufacturer	/
Length of cable	98cm

*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	EUT3 + AE1 + AE2 + AE4	Charging mode
Set.2	EUT3 + AE1 + AE4	USB mode

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	10-1-15 Edition
ANSI C63.4	Methods of Measurement of Radio-Noise Emissions from Low - Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz	2014

5. LABORATORY ENVIRONMENT

Semi-anechoic chamber SAC-1 (23 meters×17meters×10meters) 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, 10 m 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 3000 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
Location Column	A/B/C/D	The test is performed in test location A, B, C or D which are described in section 1.1 of this 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 5	B.1	P	A
2	Conducted Emission	15.107(a)	Section 5	B.2	P	A

7. Test Equipments Utilized

NO.	Description	TYPE	SERIES NUMBER	MANUFACTUR E	CAL DUE DATE	CALIBRATI ON INTERVAL
1	Test Receiver	ESU26	100235	R&S	2017-03-02	1 year
2	Universal Radio Communication Tester	CMW500	143008	R&S	2016-12-09	1 year
3	LISN	ENV216	101200	R&S	2016-07-07	1 year
4	EMI Antenna	VULB 9163	9163-301	Schwarzbeck	2017-12-16	3 years
5	EMI Antenna	3115	6914	ETS-Lindgren	2016-12-15	3 years
6	Test Receiver	ESCI7	100948	R&S	2016-07-07	1 year
7	PC	OPTIPLEX 380	2X1YV2X	DELL	N/A	N/A
8	Printer	P1606dn	VNC3L52122	HP	N/A	N/A
9	Keyboard	L100	CN0RH6596589 07ATOI40	DELL	N/A	N/A
10	Mouse	M-UAE119	LZ935220ZRC	Lenovo	N/A	N/A

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 10 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 3/10 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 model of the PC is DELL OPTIPLEX 380, and the serial number of the PC is 2X1YV2X. 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 ($\mu\text{V/m}$)		
	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): $U = 4.3 \text{ dB}$, $k=2$.

Measurement results for Set.1:

Charging Mode/Average detector

Frequency(MHz)	Result(dB μ V/m)	G_{PL} (dB)	G_A (dB/m)	P_{Mea} (dB μ V)	Polarity
17947.300	51.0	-17.7	45.6	23.100	VERTICAL
17879.300	50.6	-18.5	45.6	23.500	HORIZONTAL
17916.700	50.5	-17.7	45.6	22.600	VERTICAL
17958.350	50.5	-17.7	45.6	22.600	HORIZONTAL
17850.400	50.5	-18.5	45.6	23.400	VERTICAL
17893.750	50.5	-18.5	45.6	23.400	HORIZONTAL

Charging Mode/Peak detector

Frequency(MHz)	Result(dB μ V/m)	G_{PL} (dB)	G_A (dB/m)	P_{Mea} (dB μ V)	Polarity
17916.700	61.2	-17.7	45.6	33.300	HORIZONTAL
17801.950	60.9	-18.5	45.6	33.800	HORIZONTAL
17940.500	60.7	-17.7	45.6	32.800	VERTICAL
17978.750	60.7	-17.7	45.6	32.800	HORIZONTAL
17799.400	60.7	-18.5	45.6	33.600	HORIZONTAL
17881.850	60.7	-18.5	45.6	33.600	HORIZONTAL

Measurement results for Set.2:**USB Mode/Average detector**

Frequency(MHz)	Result(dB μ V/m)	G _{PL} (dB)	G _A (dB/m)	P _{mea} (dB μ V)	Polarity
17993.200	50.8	-17.7	45.6	22.900	HORIZONTAL
17977.050	50.7	-17.7	45.6	22.800	HORIZONTAL
17995.750	50.5	-17.7	45.6	22.600	VERTICAL
17966.850	50.5	-17.7	45.6	22.600	HORIZONTAL
17998.300	50.5	-17.7	45.6	22.600	HORIZONTAL
17889.500	50.4	-18.5	45.6	23.300	HORIZONTAL

USB Mode/ Peak detector

Frequency(MHz)	Result(dB μ V/m)	G _{PL} (dB)	G _A (dB/m)	P _{mea} (dB μ V)	Polarity
17864.850	60.6	-18.5	45.6	33.500	HORIZONTAL
17965.150	60.6	-17.7	45.6	32.700	VERTICAL
17875.900	60.5	-18.5	45.6	33.400	VERTICAL
17664.250	60.5	-18.9	45.6	33.800	HORIZONTAL
17995.750	60.4	-17.7	45.6	32.500	VERTICAL
17988.950	60.4	-17.7	45.6	32.500	HORIZONTAL

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

Charging Mode, Set.1

Normal RE_30M-1GHz_10m

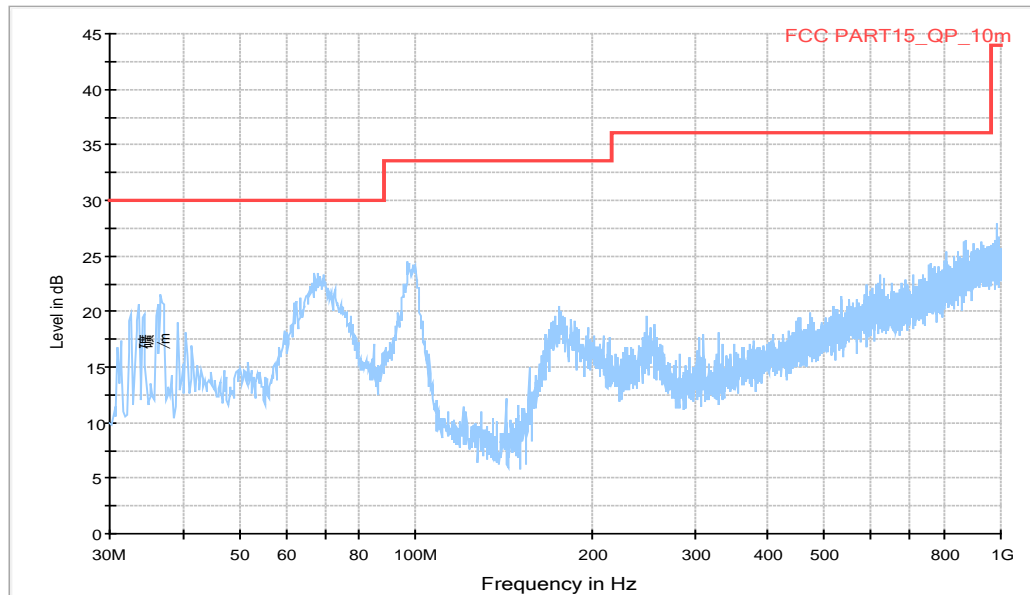


Figure A.1 Radiated Emission from 30MHz to 1GHz

Normal RE_1G-18GHz

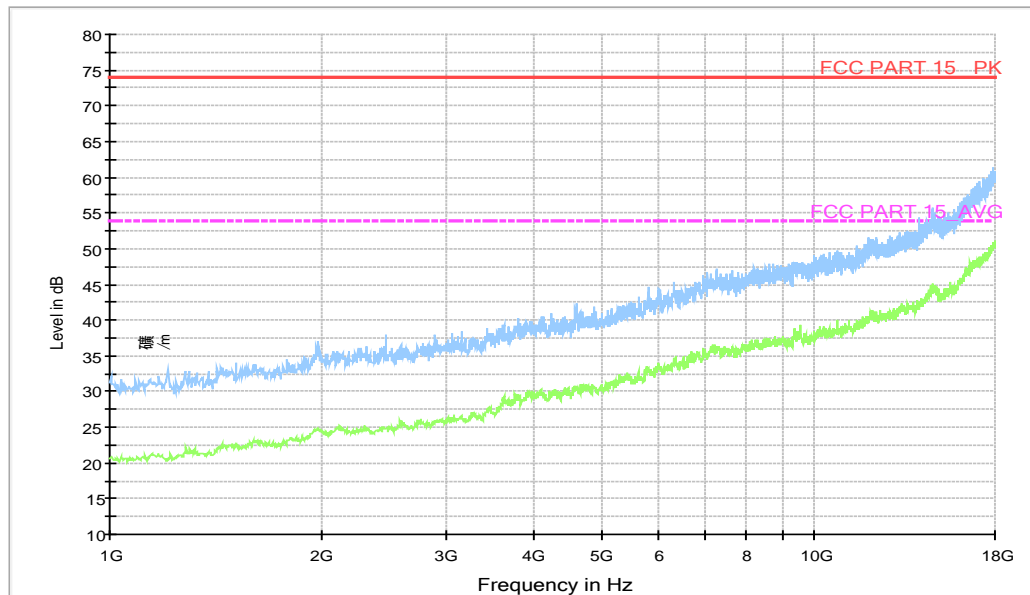


Figure A.2 Radiated Emission from 1GHz to 18GHz

USB Mode, Set.2

Normal RE_30M-1GHz_10m

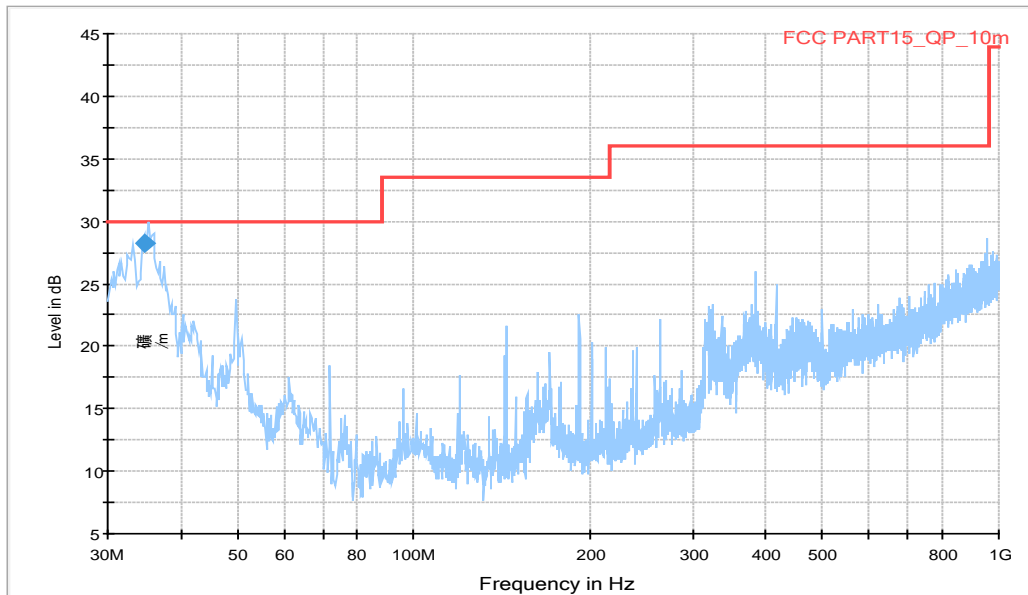


Figure A.3 Radiated Emission from 30MHz to 1GHz

Final Result 1

Frequency (MHz)	QuasiPeak (dBμV/m)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
34.781000	28.2	104.0	V	241.0	-13.2	1.8	30.0

Normal RE_1G-18GHz

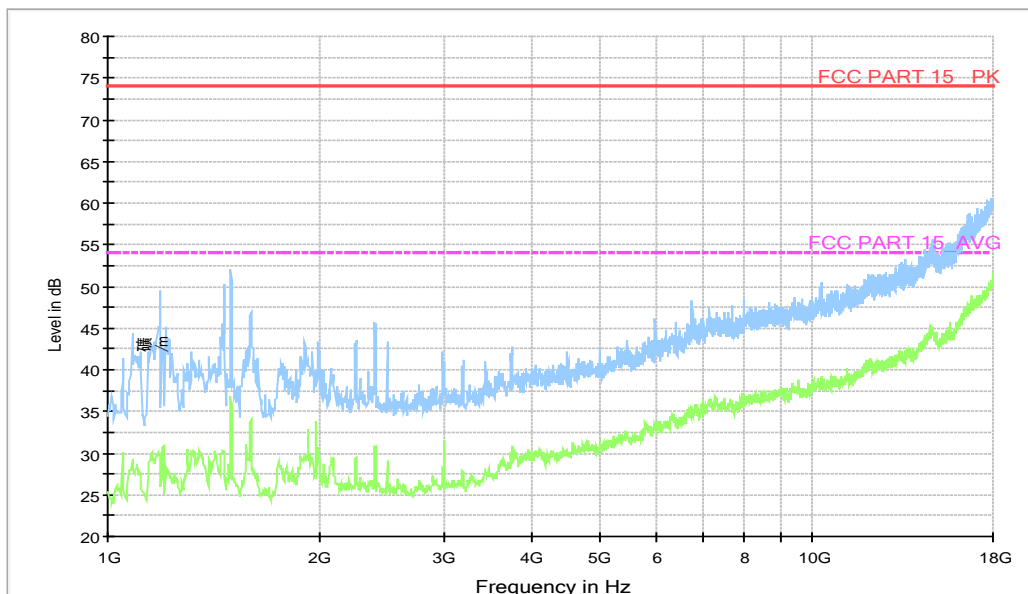


Figure A.4 Radiated Emission from 1GHz to 18GHz

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.

A.2.2 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 model of the PC is DELL OPTIPLEX 380, and the serial number of the PC is 2X1YV2X. 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 (dBμV)	
	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: $U= 2.9$ dB, $k=2$.

Charging Mode, Set.1

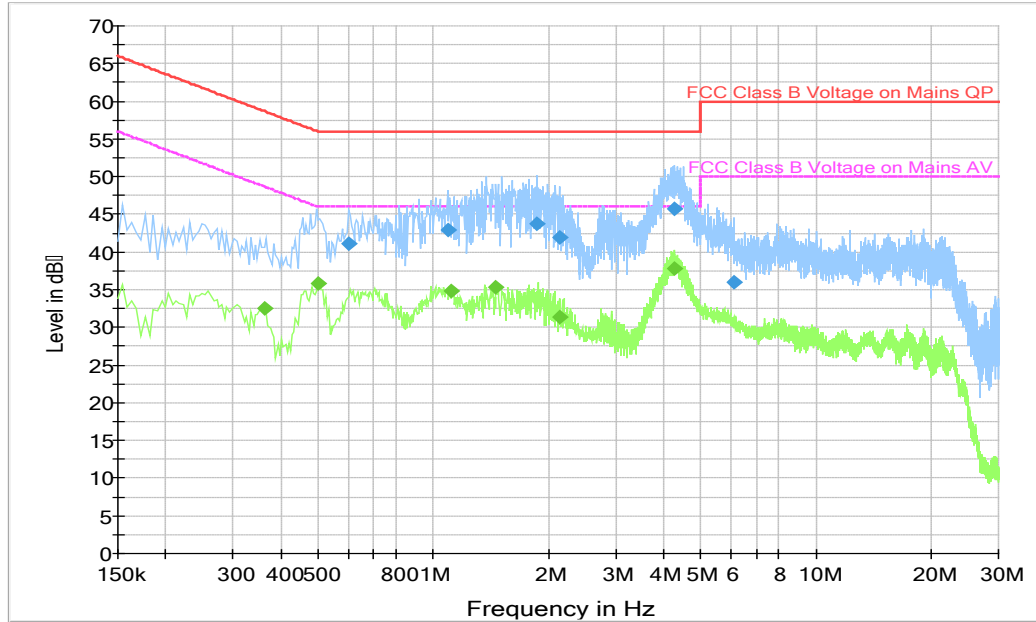


Figure A.5 Conducted Emission

Final Result 1

Frequency (MHz)	QuasiPeak (dBμV)	Meas. Time(ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.600000	41.1	2000.0	9.000	On	N	19.8	14.9	56.0
1.090500	42.9	2000.0	9.000	On	L1	19.7	13.1	56.0
1.873500	43.7	2000.0	9.000	On	L1	19.7	12.3	56.0
2.134500	42.0	2000.0	9.000	On	L1	19.5	14.0	56.0
4.258500	45.7	2000.0	9.000	On	L1	19.6	10.3	56.0
6.130500	36.1	2000.0	9.000	On	N	19.6	23.9	60.0

Final Result 2

Frequency (MHz)	CAverage (dBμV)	Meas. Time(ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.361500	32.4	2000.0	9.000	On	N	19.8	16.3	48.7
0.501000	35.9	2000.0	9.000	On	N	19.9	10.1	46.0
1.117500	34.9	2000.0	9.000	On	N	19.7	11.1	46.0
1.459500	35.4	2000.0	9.000	On	N	19.7	10.6	46.0
2.134500	31.4	2000.0	9.000	On	L1	19.5	14.6	46.0
4.267500	37.8	2000.0	9.000	On	L1	19.6	8.2	46.0

Note: The measurement results showed here are worst cases of the combinations of different batteries and USB cables.

USB Mode, Set.2

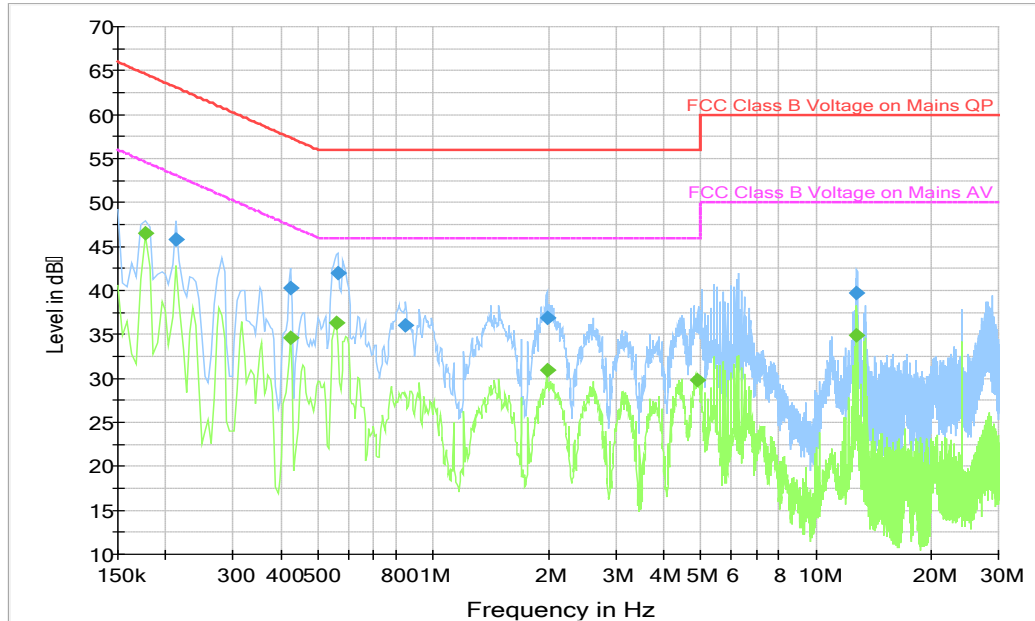


Figure A.6 Conducted Emission

Final Result 1

Frequency (MHz)	QuasiPeak (dBμV)	Meas. Time(ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.213000	45.8	2000.0	9.000	On	N	19.8	17.3	63.1
0.424500	40.3	2000.0	9.000	On	N	19.9	17.0	57.4
0.564000	41.9	2000.0	9.000	On	L1	19.9	14.1	56.0
0.847500	36.1	2000.0	9.000	On	N	19.8	19.9	56.0
1.981500	36.8	2000.0	9.000	On	N	19.7	19.2	56.0
12.808500	39.7	2000.0	9.000	On	L1	19.8	20.3	60.0

Final Result 2

Frequency (MHz)	CAverage (dBμV)	Meas. Time(ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.177000	46.5	2000.0	9.000	On	N	19.8	8.1	54.6
0.424500	34.7	2000.0	9.000	On	N	19.9	12.7	47.4
0.559500	36.4	2000.0	9.000	On	L1	19.9	9.6	46.0
1.981500	30.9	2000.0	9.000	On	N	19.7	15.1	46.0
4.884000	29.9	2000.0	9.000	On	N	19.6	16.1	46.0
12.750000	34.9	2000.0	9.000	On	N	19.8	15.1	50.0

Note: The measurement results showed here are worst cases of the combinations of different batteries and USB cables.

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