



TEST REPORT

No. I20Z61600-EMC04

for

TCL Communication Ltd.

Neo – the smart kids watch

Model Name: VKW001

FCC ID: 2ACCJB134

with

Hardware Version: V4.0

Software Version: MT45_ZZ_00.01_01

Issued Date: 2020-11-04

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

Report Number	Revision	Description	Issue Date
I20Z61600-EMC04	Rev.0	1 st edition	2020-10-22
I20Z61600-EMC04	Rev.1	add the information of PC on page 6	2020-11-04

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



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1. Test Laboratory

1.1. Introduction & Accreditation

Telecommunication Technology Labs, CAICT is an ISO/IEC 17025:2005 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 (CN0066). The detail accreditation scope can be found on NVLAP website.

1.2. Testing Location

CTTL (BDA)

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

1.3. Testing Environment

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

1.4. Project data

Testing Start Date: 2020-10-14
Testing End Date: 2020-10-22

1.5. Signature



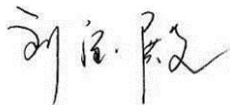
Wang Xue

(Prepared this test report)



Zhang Ying

(Reviewed this test report)



Liu Baodian

Deputy Director of the laboratory
(Approved this test report)



2. Client Information

2.1. Applicant Information

Company Name: TCL Communication Ltd.
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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 Person Gong Zhizhou
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Telephone: 0086-755-36611722
Fax: 0086-755-36612000-81722

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

3.1. About EUT

Description	Neo – the smart kids watch
Model Name	VKW001
FCC ID	2ACCJB134
Extreme vol. Limits	3.6VDC to 4.3VDC (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, CAICT.

3.2. Internal Identification of EUT used during the test

EUT ID*	SN or IMEI	HW Version	SW Version
26a	355810970202472	V4.0	MT45_ZZ_00.01_01

*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	CAC0470001C1	inbuilt
AE2	USB Cable	/	
AE3	PC		Provided by test laboratory

AE1

Model	TLp043E7
Manufacturer	VEKEN
Capacitance	470mAh
Nominal voltage	3.85 v

AE2

Model	CDB0000076CF
Manufacturer	LUXSHARE
Length of cable	/

AE3

Model	Lenovo E42
Manufacturer	/

*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	UT26a + AE1 + AE2 + AE3	Camera + GSM900(Idle)
Set.2	UT26a + AE1 + AE2 + AE3	LTE B12(Idle)

Note:

The device supports GSM 900/1800 and E-UTRA FDD Band 3/7/12/20. It has camera, WLAN



(802.11b/g/n), Bluetooth 4.2(LE) and GNSS(GPS&GLONASS) functions.

The device contains receivers which tune and operate between 30MHz-960MHz in the following bands: GSM900 and LTE Band 12. All licensed band receivers that tune in the range of 30MHz-960MHz are investigated.

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

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

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

7. Test Equipments Utilized

NO.	Description	TYPE	SERIES NUMBER	MANUFACTURE	CAL DUE DATE	CALIBRATION INTERVAL
1	Test Receiver	ESU26	100235	R&S	2021-03-03	1 Year
2	LISN	ENV216	101200	R&S	2021-05-19	1 year
3	Universal Radio Communication Tester	CMW500	116588	R&S	2020-12-05	1 year
4	Test Receiver	ESCI	100344	R&S	2021-02-26	1 Year
5	EMI Antenna	VULB 9163	01223	Schwarzbeck	2021-03-17	1 year
6	EMI Antenna	3115	6914	ETS-Lindgren	2021-01-14	1 year

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/BW	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:

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

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)
17975.067	49.0	-17.7	45.6	21.100	54.000	5.000	H
17981.300	48.8	-17.7	45.6	20.900	54.000	5.200	H
17965.433	48.5	-17.7	45.6	20.600	54.000	5.500	V
17986.400	48.5	-17.7	45.6	20.600	54.000	5.500	H
17938.233	48.5	-17.7	45.6	20.600	54.000	5.500	H
17932.567	48.3	-17.7	45.6	20.400	54.000	5.700	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)
17975.067	57.8	-17.7	45.6	29.900	74.000	16.200	H
17970.533	57.0	-17.7	45.6	29.100	74.000	17.000	H
17952.400	57.0	-17.7	45.6	29.100	74.000	17.000	V
17917.267	56.9	-17.7	45.6	29.000	74.000	17.100	H
17971.667	56.7	-17.7	45.6	28.800	74.000	17.300	H
17964.867	56.5	-17.7	45.6	28.600	74.000	17.500	H

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)
17931.433	49.5	-17.7	45.6	21.600	54.000	4.500	H
17976.200	49.0	-17.7	45.6	21.100	54.000	5.000	H
17980.733	48.6	-17.7	45.6	20.700	54.000	5.400	V
17989.233	48.5	-17.7	45.6	20.600	54.000	5.500	H
17891.200	48.4	-18.5	45.6	21.300	54.000	5.600	H
17973.367	48.1	-17.7	45.6	20.200	54.000	5.900	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)
17975.067	57.1	-17.7	45.6	29.200	74.000	16.900	H
17906.500	57.0	-18.5	45.6	29.900	74.000	17.000	H
17879.867	56.6	-18.5	45.6	29.500	74.000	17.400	V
17976.200	56.6	-17.7	45.6	28.700	74.000	17.400	H
17891.200	56.4	-18.5	45.6	29.300	74.000	17.600	H
17960.333	56.3	-17.7	45.6	28.400	74.000	17.700	H

Measurement results for Set. 1:

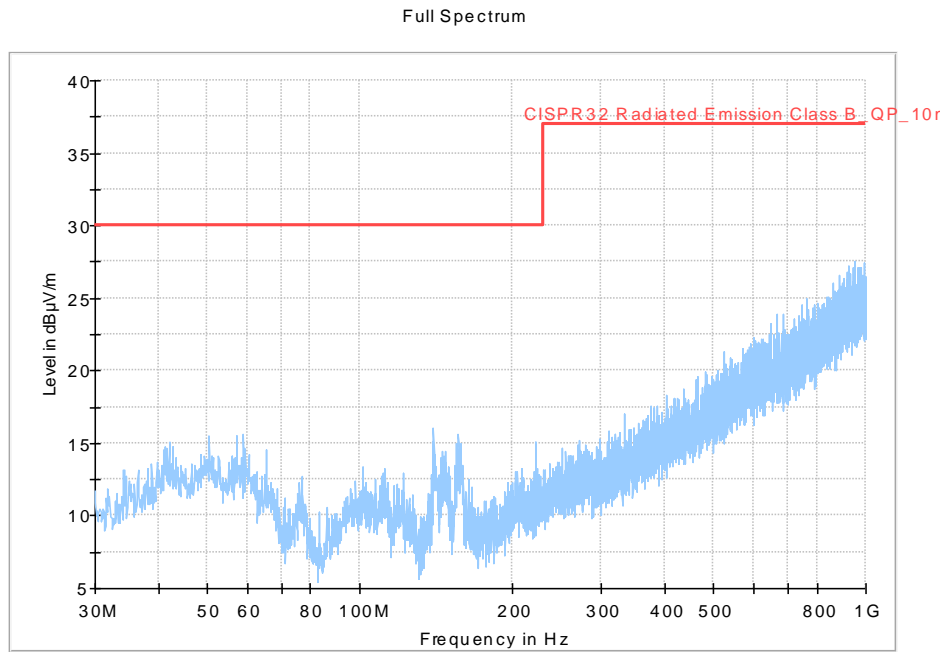


Fig A.1 Radiated Emission from 30MHz to 1GHz

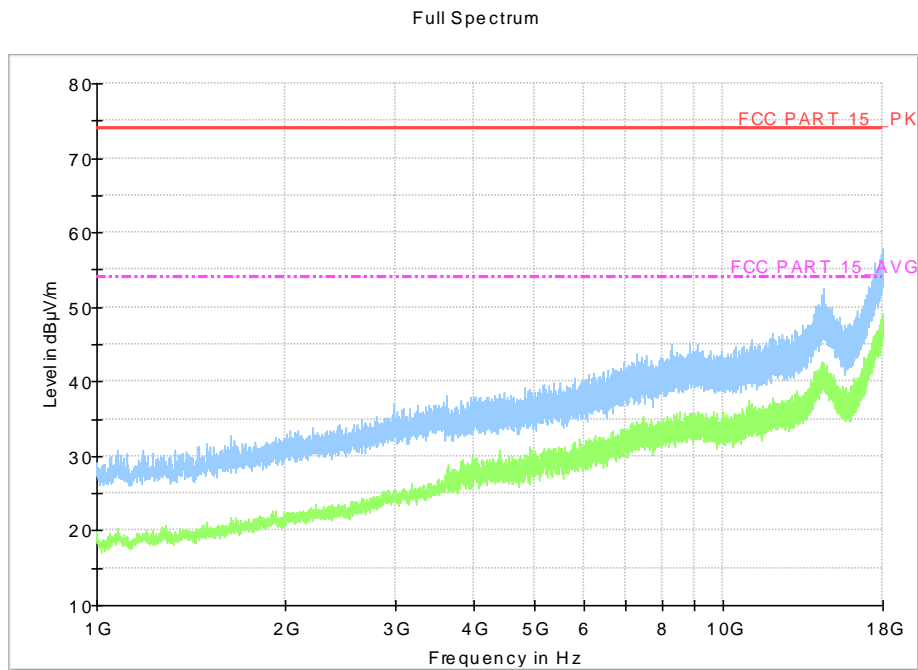


Fig A.2 Radiated Emission from 1GHz to 18GHz

Measurement results for Set.2:

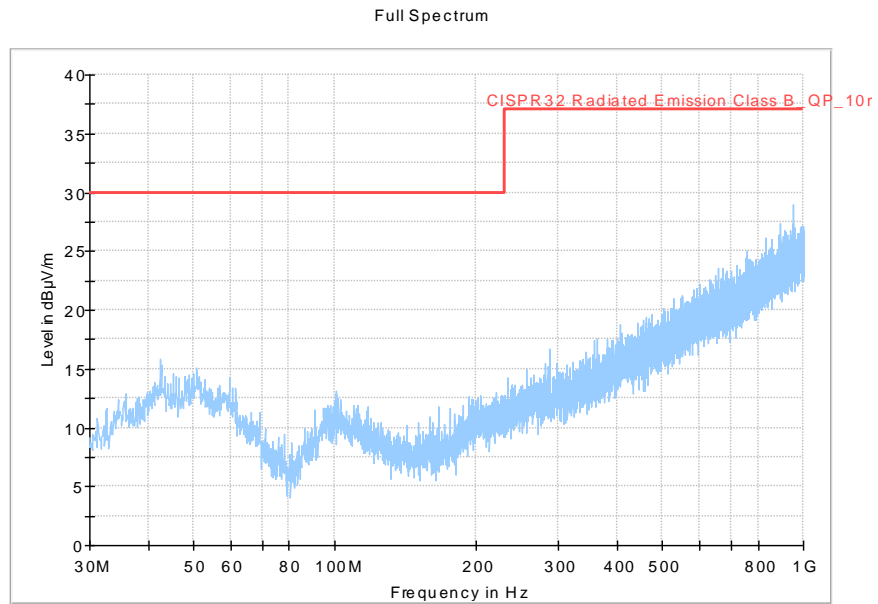


Fig A.3 Radiated Emission from 30MHz to 1GHz

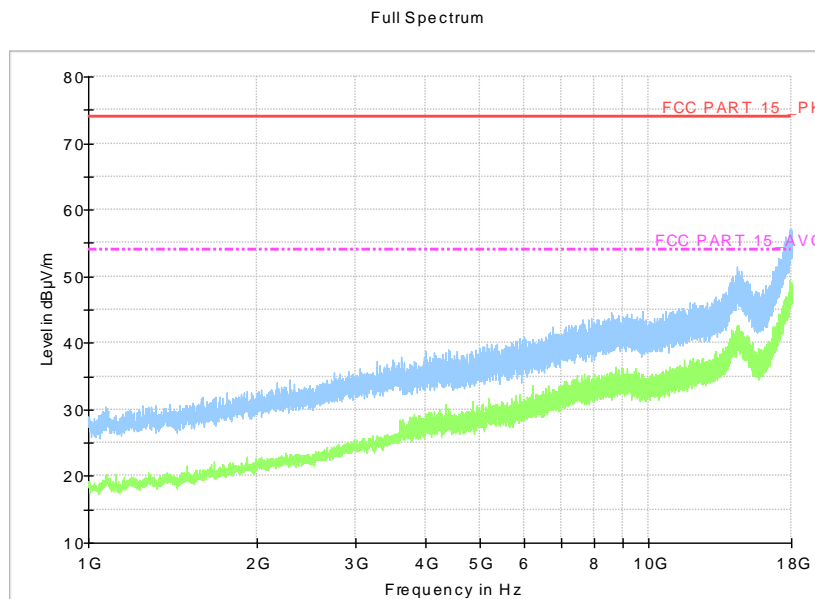


Fig A.4 Radiated Emission from 1GHz to 18GHz

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 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.2.3 Measurement Limit

Frequency of emission (MHz)	Conducted limit (dB μ 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: $U= 3.1 \text{ dB}$, $k=2$.

Charging Mode, Set.1:

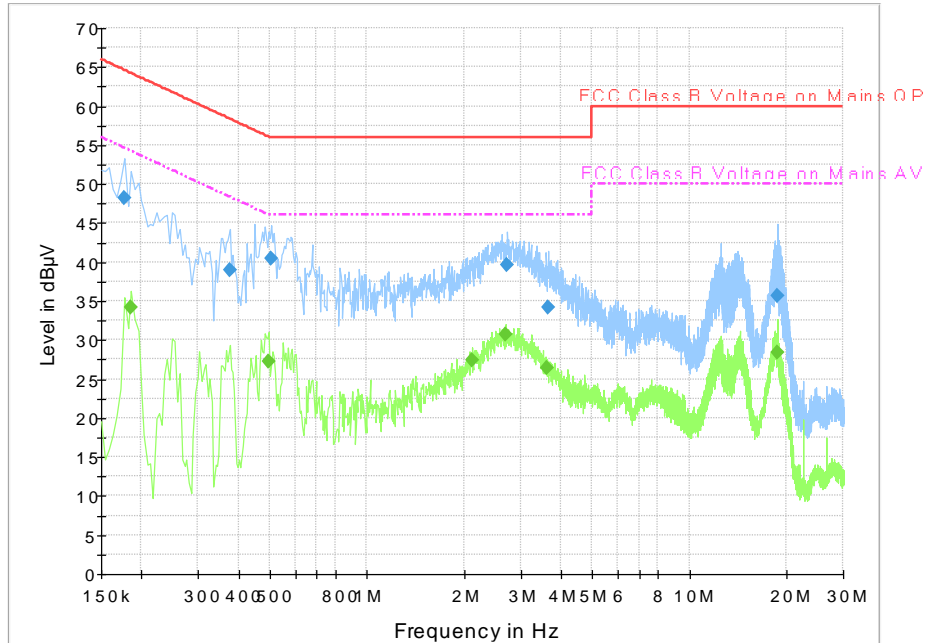


Fig A.5 Radiated Emission from 30MHz to 1GHz

Final Result 1

Frequency (MHz)	QuasiPeak (dBuV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)	Comment
0.177000	48.3	10000.0	9.000	On	N	10.0	16.4	64.6	
0.375000	39.0	10000.0	9.000	On	N	10.0	19.4	58.4	
0.505500	40.4	10000.0	9.000	On	N	10.0	15.6	56.0	
2.728500	39.7	10000.0	9.000	On	N	10.1	16.3	56.0	
3.642000	34.3	10000.0	9.000	On	L1	10.1	21.7	56.0	
18.825000	35.6	10000.0	9.000	On	L1	11.0	24.4	60.0	

Final Result 2

Frequency (MHz)	Average (dBuV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)	Comment
0.186000	34.2	10000.0	9.000	On	L1	10.0	20.0	54.2	
0.496500	27.3	10000.0	9.000	On	L1	10.0	18.7	46.1	
2.116500	27.4	10000.0	9.000	On	N	10.1	18.6	46.0	
2.697000	30.6	10000.0	9.000	On	N	10.1	15.4	46.0	
3.633000	26.5	10000.0	9.000	On	N	10.1	19.5	46.0	
18.703500	28.3	10000.0	9.000	On	L1	10.9	21.7	50.0	

Charging Mode, Set.2:

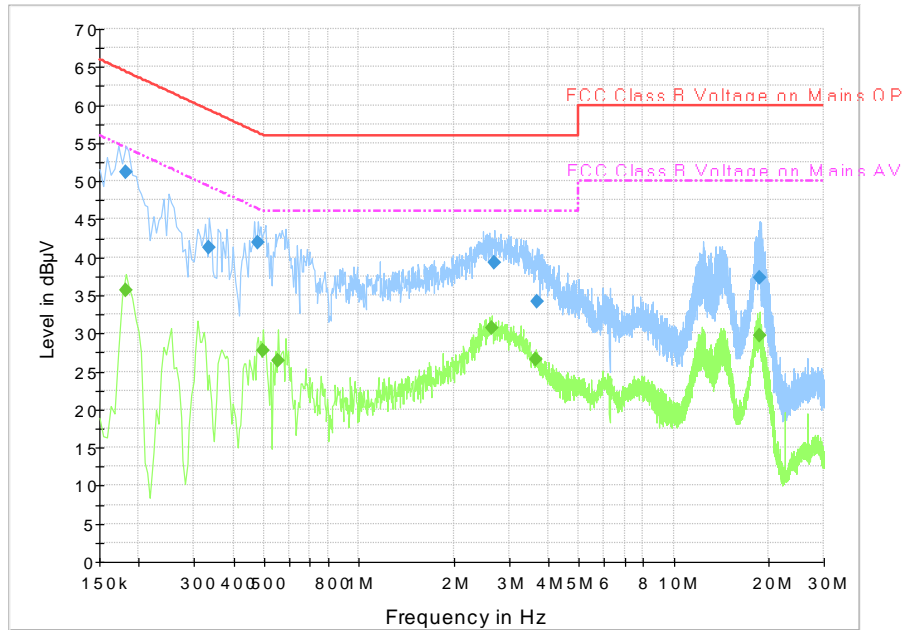


Fig A.6 Radiated Emission from 30MHz to 1GHz

Final Result 1

Frequency (MHz)	QuasiPeak (dBuV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)	Comment
0.181500	51.2	10000.0	9.000	On	N	10.0	13.2	64.4	
0.334500	41.3	10000.0	9.000	On	N	10.0	18.1	59.3	
0.478500	41.9	10000.0	9.000	On	N	10.0	14.4	56.4	
2.692500	39.3	10000.0	9.000	On	N	10.1	16.7	56.0	
3.669000	34.2	10000.0	9.000	On	L1	10.1	21.8	56.0	
18.766500	37.3	10000.0	9.000	On	L1	10.9	22.7	60.0	

Final Result 2

Frequency (MHz)	Average (dBuV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)	Comment
0.181500	35.7	10000.0	9.000	On	N	10.0	18.7	54.4	
0.496500	27.7	10000.0	9.000	On	N	10.0	18.4	46.1	
0.555000	26.5	10000.0	9.000	On	N	10.0	19.5	46.0	
2.647500	30.7	10000.0	9.000	On	N	10.1	15.3	46.0	
3.651000	26.5	10000.0	9.000	On	N	10.1	19.5	46.0	
18.766500	29.7	10000.0	9.000	On	L1	10.9	20.3	50.0	



ANNEX B: PERSONS INVOLVED IN THIS TESTING

Test Item	Test Software and Version	Software Vendor	Test operator
Conducted Emission	EMC32 V8.5.2	R&S	Yan Hanchen
Radiated Emission	EMC32 V9.01.00	R&S	Wang Huan

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