



TEST REPORT

No. I17Z40060-EMC01

for

TCL Communication Ltd.

GSM on band WCDMA dual band Connected Watch

Model Name: SM05

FCC ID: 2ACCJAT01

with

Hardware Version: 04

Software Version: 4K08

Issued Date: 2017-03-22

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:

FCC 2.948 Listed: No.525429

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

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REPORT HISTORY

Report Number	Revision	Description	Issue Date
I17Z40060-EMC01	Rev.0	1 st edition	2017-03-22

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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

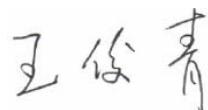
1.2. Testing Environment

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

1.3. Project data

Testing Start Date: 2017-02-28
Testing End Date: 2017-03-10

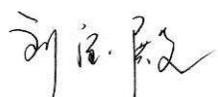
1.4. Signature



Wang Junqing
(Prepared this test report)



Qu Pengfei
(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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Telephone: 0086-21-31363544
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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
Contact Person: Gong Zhizhou
Contact Email: zhizhou.gong@tcl.com
Telephone: 0086-21-31363544
Fax: 0086-21-61460602

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

3.1. About EUT

Description	GSM on band WCDMA dual band Connected Watch
Model Name	SM05
FCC ID	2ACCJAT01
Extreme vol. Limits	3.5VDC to 4.2VDC (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
EUT1	014688000001988	04	4K08

*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
AE4	Charger	/	1740060CH012
AE5	Charger	/	1740060CH013
AE6	Charger	/	1740060CH014
AE7	USB Cable	/	1740060CH025
AE8	USB Cable	/	1740060CH020
AE9	USB Cable	/	1740060CH022

AE1

Model	CAC0490001C1(TLp004D1)
Manufacturer	BYD
Capacitance	490mAh (Minimum)
Nominal voltage	3.85V

AE4, AE5, AE6

Model	S005AYU0500100, UC11US
Manufacturer	TEPAO
Length of cable	/

AE7, AE8, AE9

Model	L8EU2004-CS-R
Manufacturer	LUXSHARE-ICT
Length of cable	85cm

*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+ AE4+ AE7	Charger
Set.2	EUT1+ AE1+ AE7	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
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	Edition 2014

Note: The test methods have no deviation with standards.

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 (SvSWR)	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

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)
2	Conducted Emission	15.107(a)	B.2	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	2018-03-01	1 year
2	Test Receiver	ESCI 7	100344	R&S	2017-07-05	1 year
3	Universal Radio Communication Tester	CMW500	143008	R&S	2017-12-01	1 year
4	Universal Radio Communication Tester	CMW500	155415	R&S	2018-02-15	1 year
5	LISN	ENV216	101200	R&S	2017-07-10	1 year
6	EMI Antenna	VULB 9163	9163-301	Schwarzbeck	2017-12-16	3 years
7	EMI Antenna	3115	6914	ETS-Lindgren	2017-12-15	3 years
8	PC	OPTIPLEX 380	2X1YV2X	DELL	N/A	N/A
9	Printer	P1606dn	VNC3L52122	HP	N/A	N/A
10	Keyboard	L100	CN0RH6596589 07ATOI40	DELL	N/A	N/A
11	Mouse	M-UAE119	LZ935220ZRC	Lenovo	N/A	N/A

Test Item	Test Software and Version	Software Vendor
Radiated Continuous Emission	EMC32 V9.01	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).

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 (μ 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
17873.633	44.6	-18.5	45.6	17.500	H
17901.400	44.6	-18.5	45.6	17.500	H
17893.467	44.6	-18.5	45.6	17.500	V
17891.767	44.5	-18.5	45.6	17.400	H
17874.200	44.5	-18.5	45.6	17.400	H
17900.267	44.5	-18.5	45.6	17.400	V

Charging Mode/Peak detector

Frequency(MHz)	Result(dB μ V/m)	G_{PL} (dB)	G_A (dB/m)	P_{Mea} (dB μ V)	Polarity
17890.633	56.1	-18.5	45.6	29.000	H
17868.533	56.1	-18.5	45.6	29.000	H
17997.733	55.9	-17.7	45.6	28.000	V
17904.800	55.9	-18.5	45.6	28.800	V
17906.500	55.8	-18.5	45.6	28.700	V
17971.667	55.7	-17.7	45.6	27.800	H

Sample calculation: Peak detector, 17890.633MHz

$$\text{Result} = P_{\text{Mea}} (29.000 \text{dB}\mu\text{V}) + G_A (45.6 \text{dB/m}) + G_{PL} (-18.5 \text{dB}) = 56.1 \text{dB}\mu\text{V/m}$$

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
17972.233	44.6	-17.7	45.6	16.700	H
17879.867	44.6	-18.5	45.6	17.500	V
17869.100	44.5	-18.5	45.6	17.400	V
17878.167	44.4	-18.5	45.6	17.300	H
17980.167	44.4	-17.7	45.6	16.500	H
17867.967	44.4	-18.5	45.6	17.300	H

USB Mode/ Peak detector

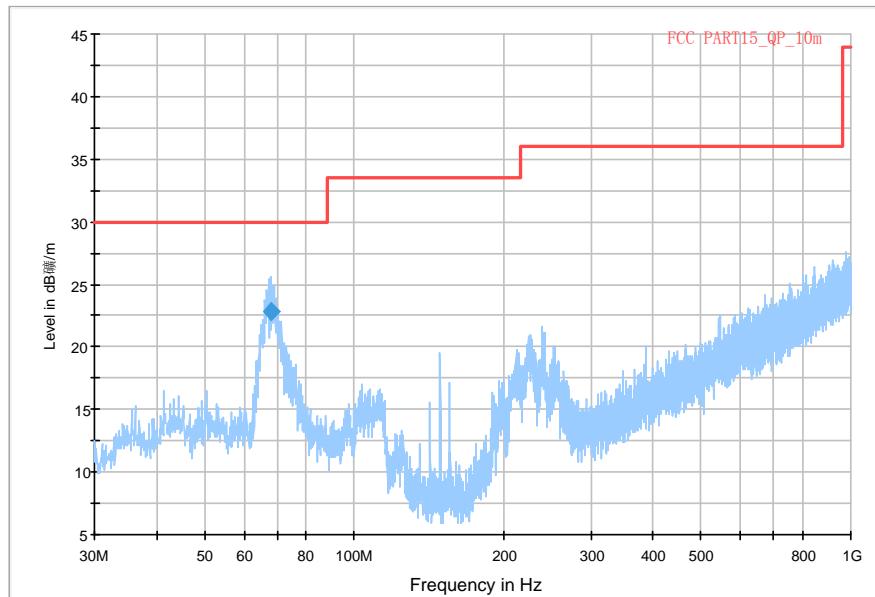
Frequency(MHz)	Result(dB μ V/m)	G _{PL} (dB)	G _A (dB/m)	P _{mea} (dB μ V)	Polarity
17905.367	56.4	-18.5	45.6	29.300	H
17980.167	55.9	-17.7	45.6	28.000	H
17895.733	55.9	-18.5	45.6	28.800	V
17874.200	55.7	-18.5	45.6	28.600	H
17966.000	55.5	-17.7	45.6	27.600	H
17877.600	55.5	-18.5	45.6	28.400	V

Sample calculation: Peak detector, 17905.367MHz

$$\text{Result} = P_{\text{Mea}} (29.300 \text{dB}\mu\text{V}) + G_A (45.6 \text{dB/m}) + G_{\text{PL}} (-18.5 \text{ dB}) = 56.4 \text{dB}\mu\text{V/m}$$

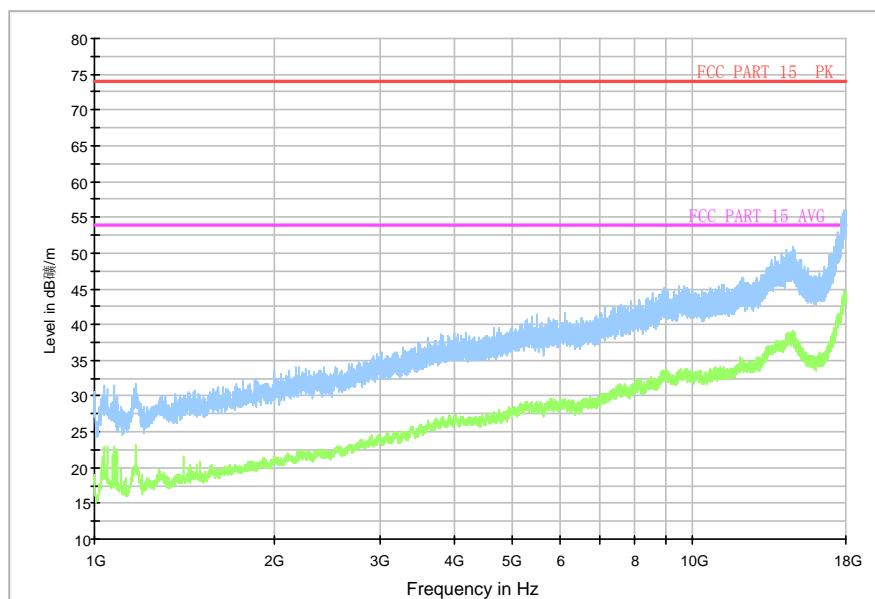
Charging Mode, Set.1

Normal RE_30M-1GHz_10m_Class B


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

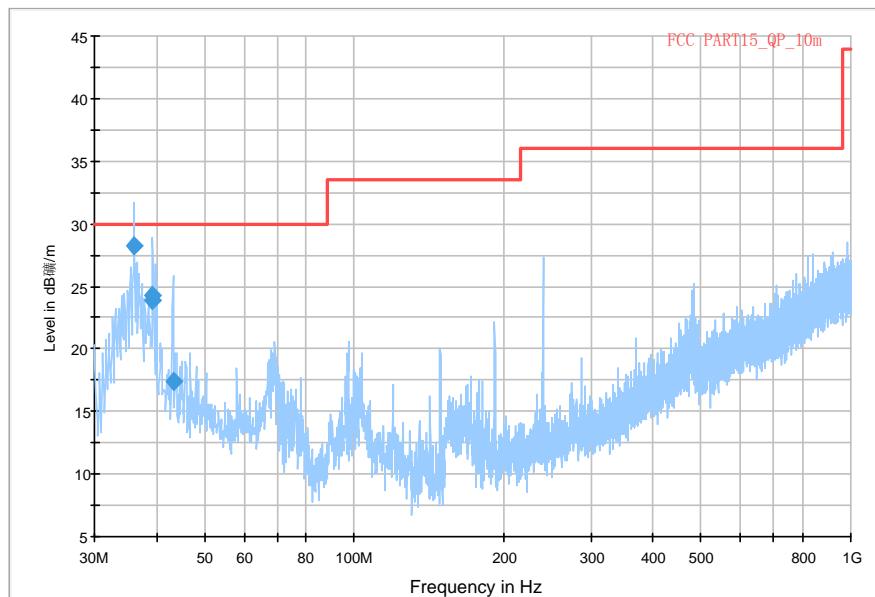
Frequency (MHz)	QuasiPeak (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBuV/m)
67.987000	22.9	100.0	V	-11.0	-14.4	7.1	30.0

Normal RE_1G-18GHz_directly


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

USB Mode, Set.2

Normal RE_30M-1GHz_10m_Class B


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

Frequency (MHz)	QuasiPeak (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBuV/m)
36.074000	28.3	225.0	V	150.0	-12.0	1.7	30.0
39.312000	23.8	201.0	V	300.0	-11.3	6.2	30.0
39.354000	24.3	100.0	V	300.0	-11.3	5.7	30.0
43.192000	17.4	275.0	V	175.0	-11.1	12.6	30.0

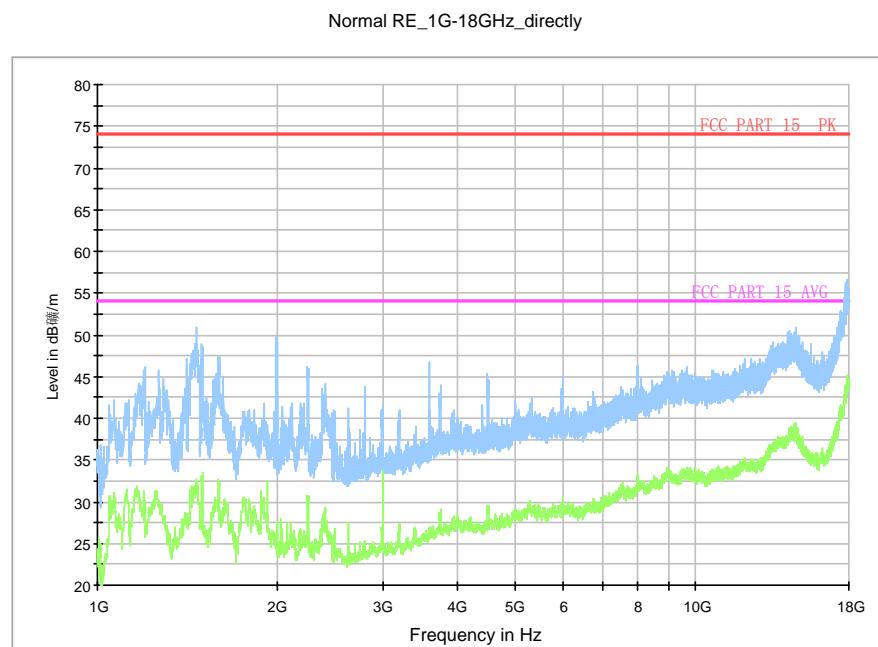


Figure A.8 Radiated Emission from 1GHz to 18GHz

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 (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: $U = 2.9 \text{ dB}$, $k=2$.

Charging Mode, Set.1

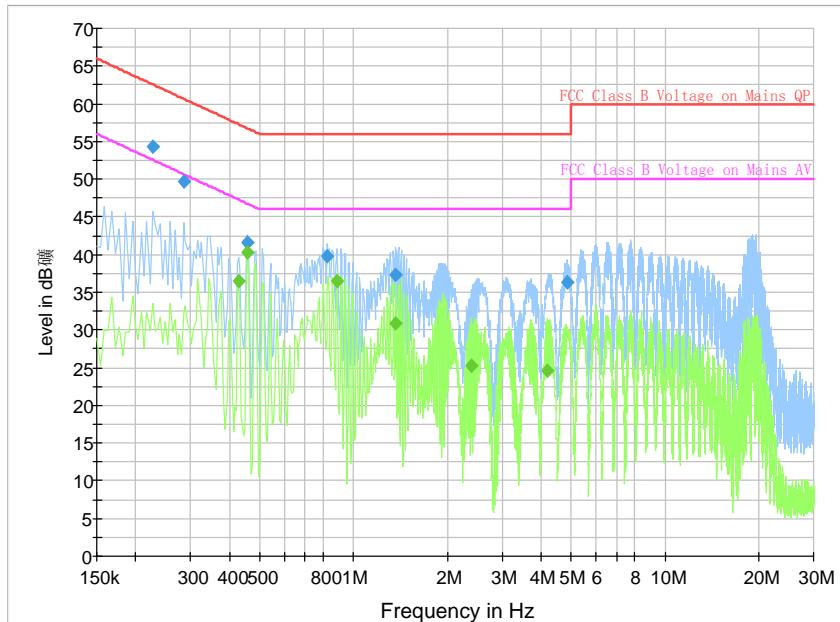


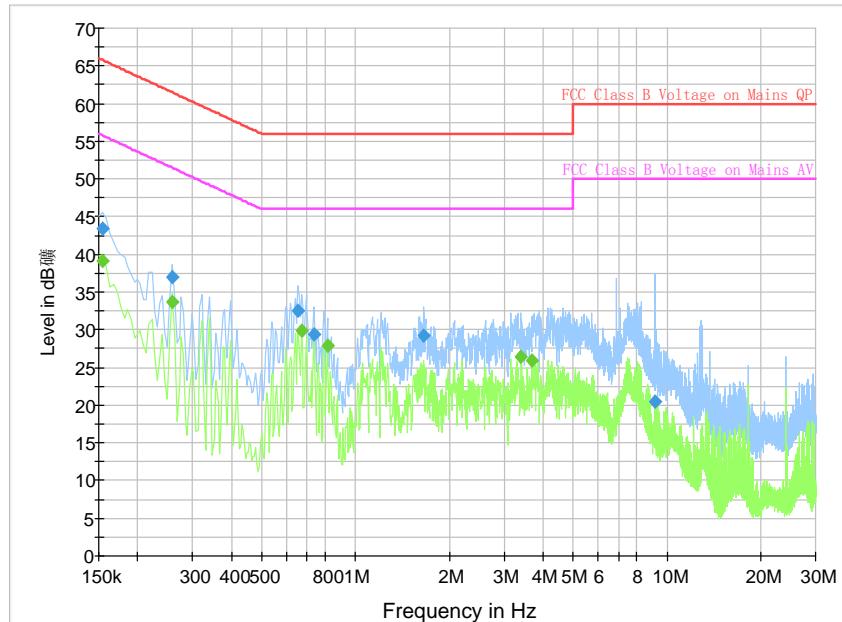
Figure A.9 Conducted Emission

Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.226500	54.3	2000.0	9.000	On	L1	19.8	8.3	62.6	
0.285000	49.8	2000.0	9.000	On	L1	19.8	10.9	60.7	
0.456000	41.6	2000.0	9.000	On	N	19.9	15.2	56.8	
0.825000	39.8	2000.0	9.000	On	N	19.8	16.2	56.0	
1.369500	37.3	2000.0	9.000	On	L1	19.7	18.7	56.0	
4.852500	36.4	2000.0	9.000	On	N	19.6	19.6	56.0	

Final Result 2

Frequency (MHz)	Average (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.429000	36.5	2000.0	9.000	On	L1	19.9	10.8	47.3	
0.456000	40.3	2000.0	9.000	On	N	19.9	6.4	46.8	
0.883500	36.5	2000.0	9.000	On	N	19.8	9.5	46.0	
1.369500	30.8	2000.0	9.000	On	L1	19.7	15.2	46.0	
2.391000	25.3	2000.0	9.000	On	N	19.2	20.7	46.0	
4.195500	24.6	2000.0	9.000	On	L1	19.6	21.4	46.0	

USB Mode, Set.2

Figure A.12 Conducted Emission
Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.154500	43.4	2000.0	9.000	On	L1	20.1	22.4	65.8	
0.258000	37.1	2000.0	9.000	On	L1	19.8	24.4	61.5	
0.654000	32.4	2000.0	9.000	On	L1	19.8	23.6	56.0	
0.739500	29.5	2000.0	9.000	On	L1	19.8	26.5	56.0	
1.662000	29.3	2000.0	9.000	On	L1	19.7	26.7	56.0	
9.154500	20.4	2000.0	9.000	On	N	19.7	39.6	60.0	

Final Result 2

Frequency (MHz)	Average (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.154500	39.2	2000.0	9.000	On	L1	20.1	16.6	55.8	
0.258000	33.7	2000.0	9.000	On	L1	19.8	17.8	51.5	
0.672000	29.8	2000.0	9.000	On	L1	19.8	16.2	46.0	
0.811500	27.9	2000.0	9.000	On	L1	19.8	18.1	46.0	
3.403500	26.4	2000.0	9.000	On	N	19.4	19.6	46.0	
3.682500	26.0	2000.0	9.000	On	N	19.5	20.0	46.0	

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