



TEST REPORT

No. I17Z60508-EMC01

for

TCL Communication Ltd.

GSM QUAD Band/UMTS Tri band/LTE 5 band mobile phone

Model Name: 5049Z, 5049W

FCC ID: 2ACCJB089

with

Hardware Version: 02

Software Version: 6H11

Issued Date: 2017-06-19

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
I17Z60508-EMC01	Rev.0	1 st edition	2017-06-19

CONTENTS

1. TEST LABORATORY	4
1.1. TESTING LOCATION	4
1.2. TESTING ENVIRONMENT	4
1.3. PROJECT DATA	4
1.4. SIGNATURE	4
2. CLIENT INFORMATION	5
2.1. APPLICANT INFORMATION.....	5
2.2. MANUFACTURER INFORMATION.....	5
3. EQUIPMENT UNDER TEST (EUT) AND ANCILLARY EQUIPMENT (AE)	6
3.1. ABOUT EUT.....	6
3.2. INTERNAL IDENTIFICATION OF EUT USED DURING THE TEST	6
3.3. INTERNAL IDENTIFICATION OF AE USED DURING THE TEST.....	6
3.4. EUT SET-UPS	6
4. REFERENCE DOCUMENTS.....	7
4.1. REFERENCE DOCUMENTS FOR TESTING.....	7
5. LABORATORY ENVIRONMENT.....	8
6. SUMMARY OF TEST RESULTS.....	9
7. TEST EQUIPMENTS UTILIZED.....	10
ANNEX A: MEASUREMENT RESULTS	11

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℃

Relative Humidity: 20-75%

1.3. Project data

Testing Start Date: 2017-05-12

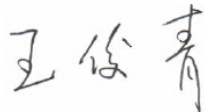
Testing End Date: 2017-06-19

1.4. Signature



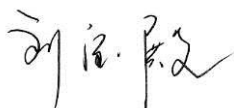
Zhang Ying

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(Reviewed this test report)



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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 /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
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 QUAD Band/UMTS Tri band/LTE 5 band mobile phone
Model Name	5049Z,5049W
FCC ID	2ACCJB089
Extreme vol. Limits	3.5VDC to 4.4VDC (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
EUT5	014940000200726	02	6H11

*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	/	/
AE4	Travel charger	/	17TCT-CH-0301
AE5	USB Cable	/	17TCT-DC-0245

AE1

Model	Tlp029c1
Manufacturer	BYD
Capacitance	2900 mAh
Nominal voltage	3.85V

AE4

Model	CBA0059AGAC2
Manufacturer	TENPAO
Length of cable	/

AE5

Model	CDA0000024C2
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.5	EUT5 + AE1 + AE4 + AE5	Charger
Set.6	EUT5 + AE1 + AE4	USB

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	2016 Edition
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 (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

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

7. Test Equipments Utilized

NO.	Description	TYPE	SERIES NUMBER	MANUFACTURE	CAL DUE DATE	CALIBRATI ON INTERVAL
1	Test Receiver	ESU26	100235	R&S	2018-03-01	1 year
2	Test Receiver	ESCI	100344	R&S	2018-02-15	1 year
3	Universal Radio Communication Tester	CMW500	116588	R&S	2017-12-01	1 year
4	Universal Radio Communication Tester	CMW200	109914	R&S	2018-03-12	1 year
5	LISN	ENV216	101200	R&S	2017-07-10	1 year
6	EMI Antenna	VULB 9163	9163-301	Schwarzbeck	2017-12-15	3 years
7	EMI Antenna	3115	6914	ETS-Lindgren	2017-09-21	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	Test operator
Radiated Continuous Emission	EMC32 V9.01	R&S	Shi Suolan
Conducted Emission	EMC32 V8.52.0	R&S	Shi Suolan

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 (charging mode of MS) at distances of 3 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 charging mode. During the test MS is connected to a charger in the case of charging mode.

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:

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

Where

G_A : Antenna factor of receive antenna

G_{PL} : Path Loss

P_{Mea} : Measurement result on receiver.

Measurement uncertainty (worst case): 30MHz-1GHz: 4.86dB, 1GHz-18GHz: 5.26dB, $k=2$.

Measurement results for Set.5:**Charging Mode/Average detector**

Frequency(MHz)	Result(dB μ V/m)	G_{PL} (dB)	G_A (dB/m)	P_{Mea} (dB μ V)	Polarity
17950.700	44.0	-17.7	45.6	16.100	H
17934.833	44.0	-17.7	45.6	16.100	H
17916.133	43.9	-17.7	45.6	16.000	V
17967.700	43.9	-17.7	45.6	16.000	H
17957.500	43.9	-17.7	45.6	16.000	H
17921.800	43.9	-17.7	45.6	16.000	H

Charging Mode/Peak detector

Frequency(MHz)	Result(dB μ V/m)	G_{PL} (dB)	G_A (dB/m)	P_{Mea} (dB μ V)	Polarity
17884.967	55.7	-18.5	45.6	28.600	H
17866.267	55.5	-18.5	45.6	28.400	H
17969.967	55.2	-17.7	45.6	27.300	H
17890.067	55.1	-18.5	45.6	28.000	H
17968.833	54.9	-17.7	45.6	27.000	H
17963.167	54.9	-17.7	45.6	27.000	H

Measurement results for Set.6:
USB Mode/Average detector

Frequency(MHz)	Result(dB μ V/m)	G _{PL} (dB)	G _A (dB/m)	P _{Mea} (dB μ V)	Polarity
17896.867	44.0	-18.5	45.6	16.900	H
17856.633	43.9	-18.5	45.6	16.800	H
17949.000	43.8	-17.7	45.6	15.900	V
17943.900	43.8	-17.7	45.6	15.900	H
17944.467	43.8	-17.7	45.6	15.900	H
17955.800	43.8	-17.7	45.6	15.900	H

Charging Mode/Peak detector

Frequency(MHz)	Result(dB μ V/m)	G _{PL} (dB)	G _A (dB/m)	P _{Mea} (dB μ V)	Polarity
17937.667	55.2	-17.7	45.6	27.300	H
17928.033	55.0	-17.7	45.6	27.100	H
17777.300	54.6	-18.5	45.6	27.500	H
17990.933	54.6	-17.7	45.6	26.700	H
17924.067	54.5	-17.7	45.6	26.600	H
17986.967	54.4	-17.7	45.6	26.500	H

Sample calculation: Peak detector, 17937.667MHz

Result =P_{Mea} (27.300dB μ V)+ G_A (45.6dB/m)+ G_{PL}(-17.7dB) =55.2dB μ V/m

Charging Mode, Set.5

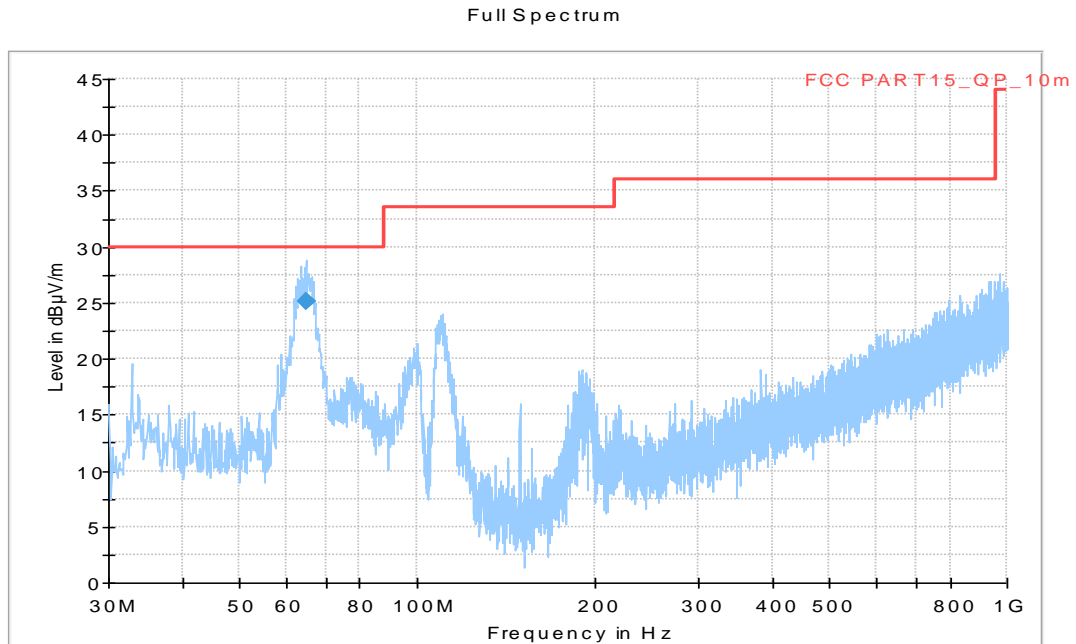


Figure A.1 Radiated Emission from 30MHz to 1GHz

Final_Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)
64.966000	25.18	30.00	4.82	105.0	V	198.0

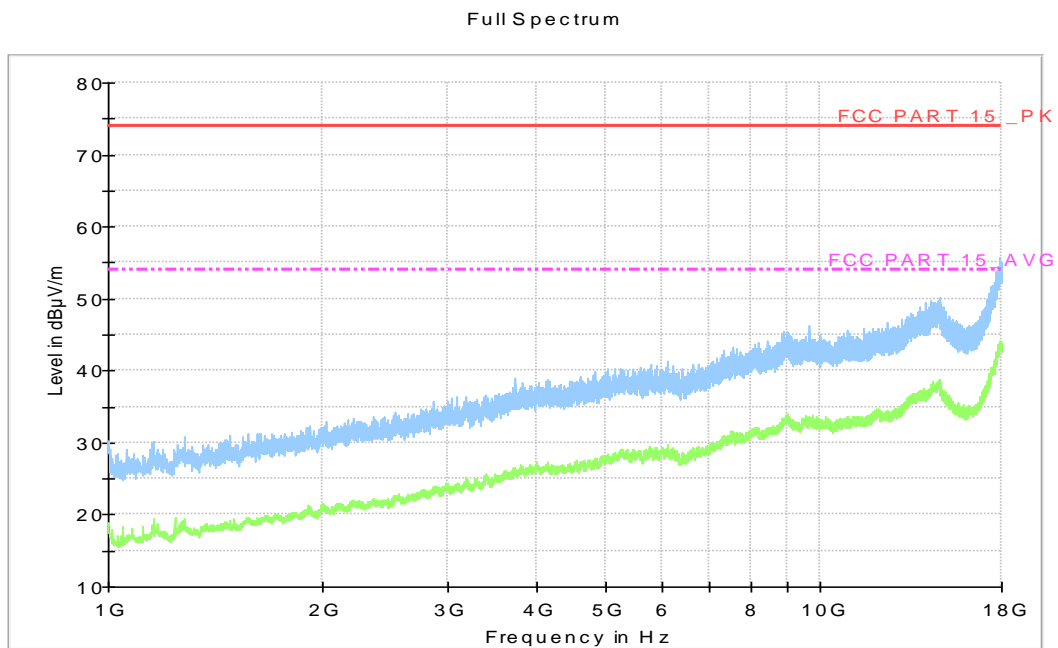


Figure A.2 Radiated Emission from 1GHz to 18GHz

USB Mode, Set.6

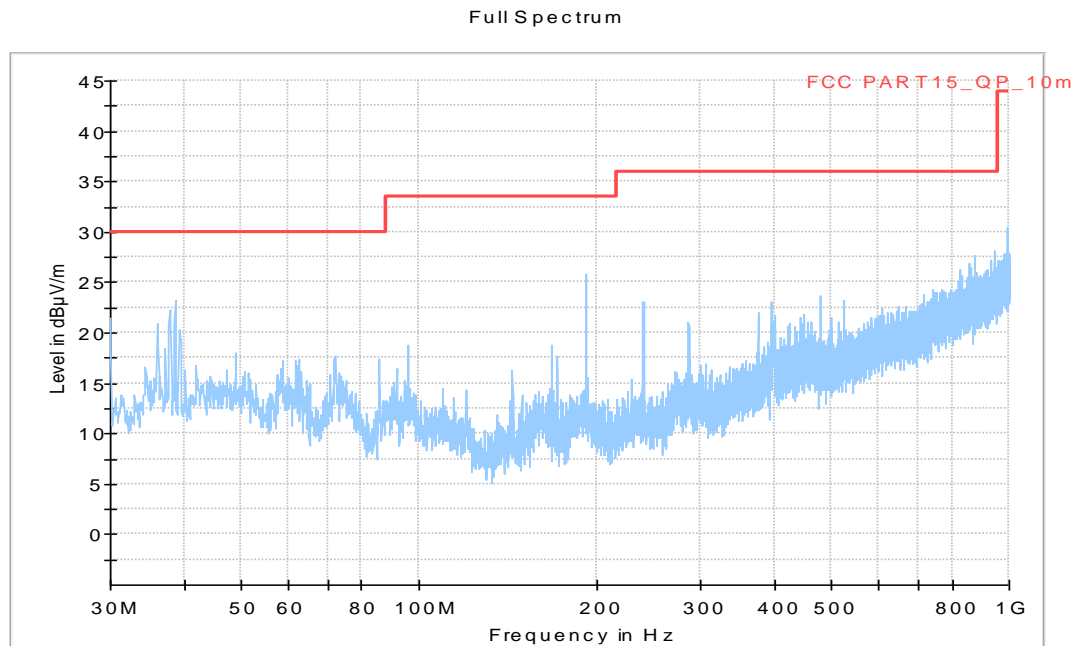


Figure A.4 Radiated Emission from 30MHz to 1GHz

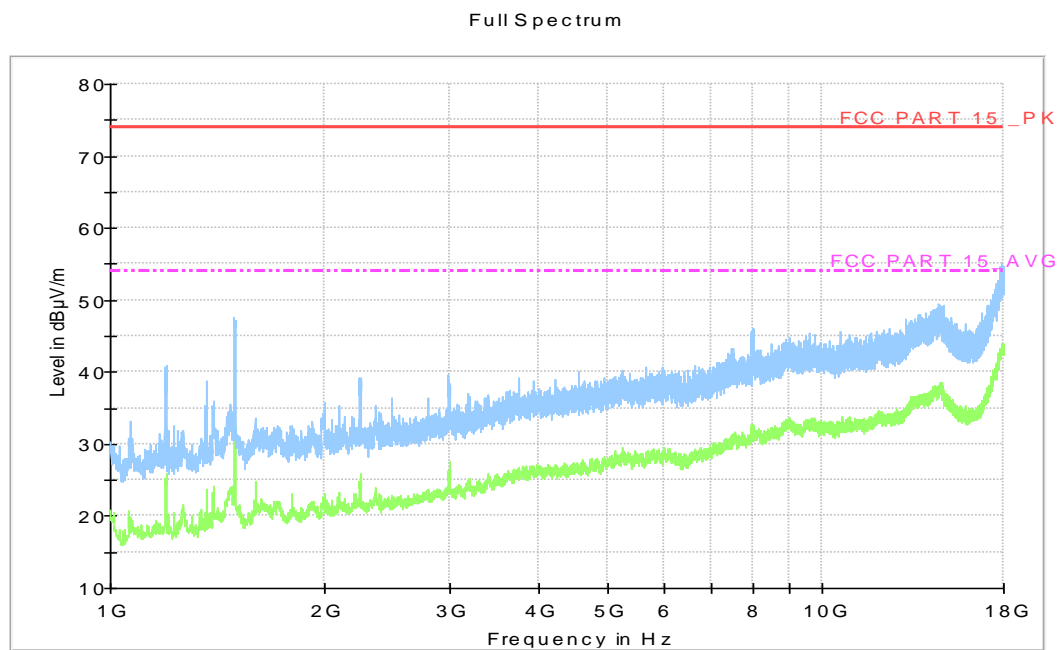


Figure A.5 Radiated Emission from 1GHz to 18GHz

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 charging mode. During the test MS is connected to a charger in the case of charging mode.

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: $U = 3.38\text{dB}$, $k=2$.

Charging Mode, Set.5

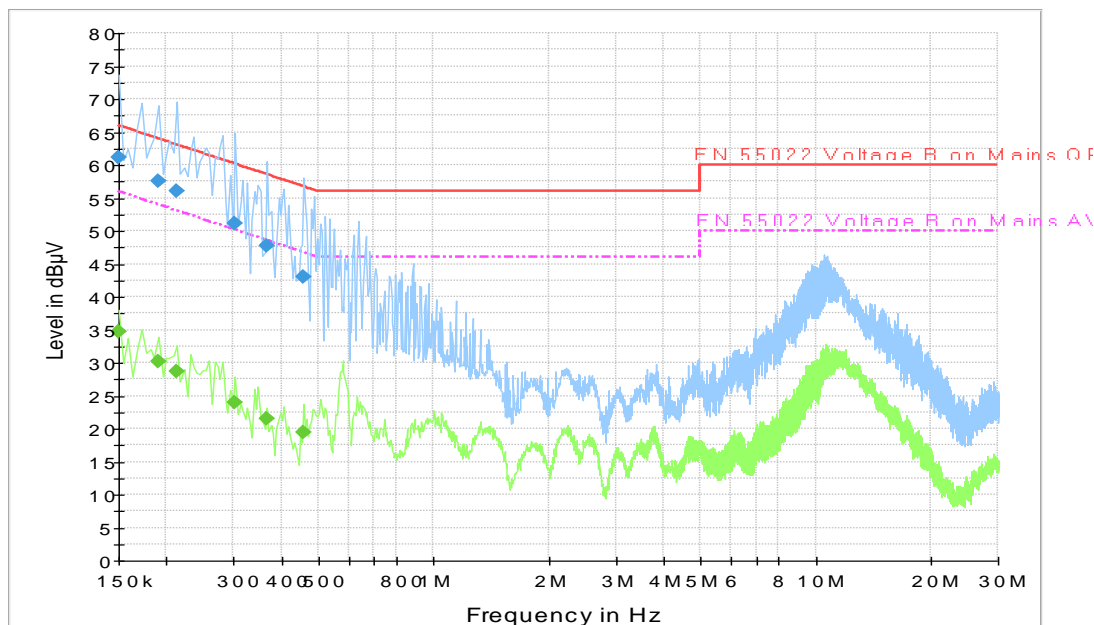


Figure A.16 Conducted Emission

Final Result 1

Frequency (MHz)	QuasiPeak (dBμV)	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.150000	61.0	N	20.2	5.0	66.0
0.190500	57.5	N	19.8	6.5	64.0
0.213000	56.0	N	19.8	7.1	63.1
0.303000	51.1	N	19.8	9.1	60.2
0.366000	47.7	N	19.8	10.8	58.6
0.456000	43.0	L1	19.9	13.7	56.8

Final Result 2

Frequency (MHz)	CAverage (dBμV)	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.150000	34.7	N	20.2	21.3	56.0
0.190500	30.3	N	19.8	23.7	54.0
0.213000	28.7	N	19.8	24.4	53.1
0.303000	24.0	N	19.8	26.1	50.2
0.366000	21.5	N	19.8	27.1	48.6
0.456000	19.5	L1	19.9	27.2	46.8

USB Mode, Set.6

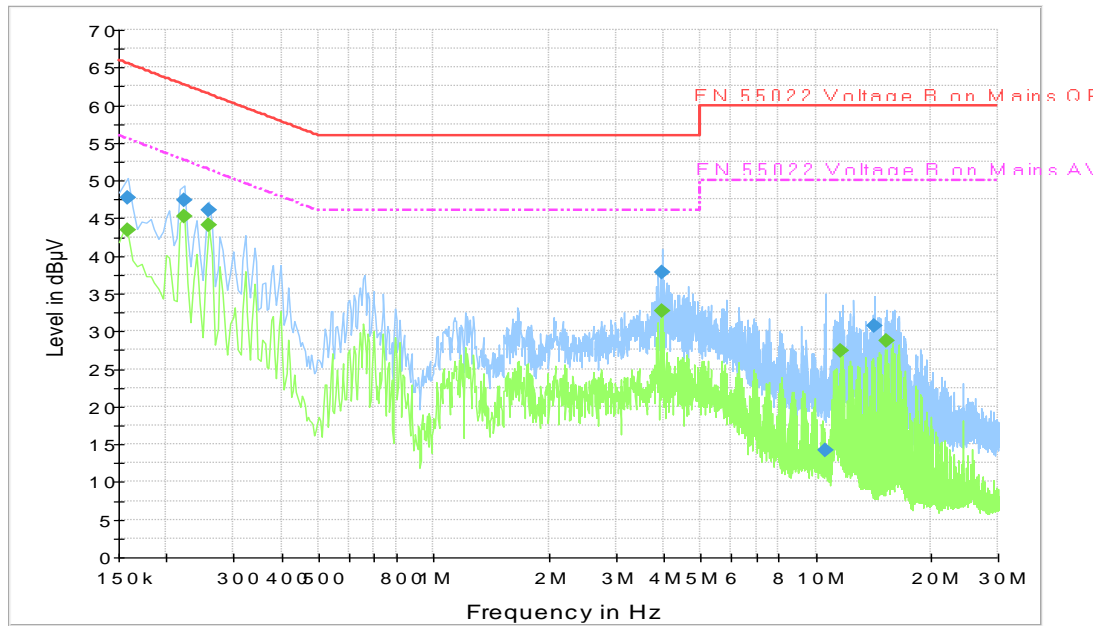


Figure A.17 Conducted Emission

Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.159000	47.7	N	19.9	17.8	65.5
0.222000	47.4	N	19.8	15.4	62.7
0.258000	46.0	N	19.8	15.5	61.5
3.966000	37.8	L1	19.5	18.2	56.0
10.590000	14.2	N	19.8	45.8	60.0
14.235000	30.6	L1	19.8	29.4	60.0

Final Result 2

Frequency (MHz)	CAverage (dBµV)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.159000	43.4	N	19.9	12.2	55.5
0.222000	45.2	N	19.8	7.6	52.7
0.258000	44.1	N	19.8	7.4	51.5
3.966000	32.6	L1	19.5	13.4	46.0
11.607000	27.5	L1	19.7	22.5	50.0
15.333000	28.8	L1	19.8	21.2	50.0

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