



TEST REPORT

No.I15N01121-EMC

for

TCL Communication Ltd

GSM Quad band &UMTS Dual band mobile phone

Model Name:2045X

FCC ID: 2ACCJB038

with

Hardware Version: P10

Software Version: V1.0

Issued Date: 2015-10-20

Test Laboratory:

FCC 2.948 Listed: No.342690

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:

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REPORT HISTORY

Report Number	Revision	Description	Issue Date
I15N01121-EMC	Rev.0	1st edition	2015-10-20

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1. Test Laboratory

1.1. TestingLocation

Address: TCL International E city No. 1001 Zhongshanyuan Road, Nanshan District, Shenzhen, Guangdong, China
Postal Code: 518048
Telephone: +86(755)33322000
Fax: +86(755)33322000

1.2. TestingEnvironment

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

1.3. Project data

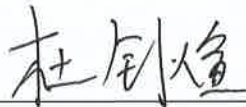
Testing Start Date: 2014-11-24
Testing End Date: 2014-12-04

1.4. Signature



Liang Yong

(Prepared this test report)



Du Zhaoxuan

(Reviewed this test report)



Cao Junfei

Director of the laboratory
(Approved this test report)



2. ClientInformation

2.1. Applicant Information

Company Name: TCL Communication Ltd.
Address /Post: 5F, E building, No. 232, Liang Jing Road, ZhangJiang High-Tech
Park, Pudong Area,Shanghai,201203,P.R.China
City: ShenZhen
Postal Code: 518057

2.2. Manufacturer Information

Company Name: TCL Communication Ltd.
Address /Post: 5F, E building, No. 232, Liang Jing Road, ZhangJiang High-Tech
Park, Pudong Area,Shanghai,201203,P.R.China
City: ShenZhen
Postal Code: 518057

3. Equipment UnderTest (EUT) and Ancillary Equipment (AE)

3.1. About EUT

Description	GSM Quad band &UMTS Dual band mobile phone
Model Name	2045X
FCC ID	2ACCJB038

Remark: The above EUT's information is declared by manufacturer. Please refer to the specifications or user's manual for more detailed information.

Note: The mobile phone 2045X manufactured by TCL Communication Ltd is a variant model based on 2045M for conformance test. According to the declaration of changes, no test needs to been performed. all results are cited from the initial model. The report number for initial model is I14N01400.

3.2. Internal Identification of EUT

EUT ID*	SN or IMEI
N0.1	/

*EUT ID: is used to identify the test sample in the lab internally.

3.3. Internal Identification of AE

AE ID*	Description	SN
AE1	Battery	/
AE2	Travel charger	/
AE3	USB cable	/

AE1

Model	CAB3120000C1
Manufacturer	BYD
Capacitance	850mAh
Nominal voltage	3.8V

AE2

Model	CBA3007AG0C1
Manufacturer	BYD
Length of cable	95cm

AE3

Model	CDA0000029C3
Manufacturer	JiaYiKang
Length of cable	95cm

*AE ID: is used to identify the test sample in the lab internally.

3.4. EUT set-ups

EUT set-up No.	Combination of EUT and AE	Remarks
Set.1	EUT1+ AE1 + AE2	Charging mode
Set.2	EUT1+ AE1 + AE3	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	10-1-2014 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	2003

5. LABORATORY ENVIRONMENT

Semi-anechoic chamber did not exceed following limits along the EMC testing:

Temperature	Min. = 15 °C, Max. = 30 °C
Relative humidity	Min. = 35 %, Max. = 60 %
Shielding effectiveness	0.014MHz-1MHz,>60dB; 1MHz-1000MHz,>90dB
Electrical insulation	> 2M Ω
Ground system resistance	< 4 Ω
Normalised site attenuation (NSA)	< ± 4 dB, 3 m distance, from 30 to 1000 MHz
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. = 30 °C
Relative humidity	Min. = 35 %, Max. = 60 %
Shielding effectiveness	0.014MHz-1MHz,>60dB; 1MHz-1000MHz,>90dB
Electrical insulation	> 2M Ω
Ground system resistance	< 4 Ω

Fully-anechoic chamber did not exceed following limits along the EMC testing:

Temperature	Min. = 15 °C, Max. = 30 °C
Relative humidity	Min. = 35 %, Max. = 60 %
Shielding effectiveness	0.014MHz-1MHz,>60dB; 1MHz-1000MHz,>90dB
Electrical insulation	> 2M Ω
Ground system resistance	< 4 Ω
Voltage Standing Wave Ratio (VSWR)	≤ 6 dB, from 1 to 6 GHz, 3 m distance

6. SUMMARY OF TEST RESULTS

Abbreviations used in this clause:	
P	Pass
NA	Not applicable
F	Fail

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

7. Test Facilities Utilized

NO.	NAME	TYPE	SERIES NUMBER	PRODUCER	CALDUE DATE	CAL PERIOD
1.	Test Receiver	ESCI	100701	R&S	2016.08.10	1 year
2.	Test Receiver	ESCI	100702	R&S	2016.05.30	1 year
3.	Spectrum Analyzer	FSP 40	100378	R&S	2015.12.19	1 year
4.	BiLog Antenna	VULB9163	9163 329	Schwarzbeck	2017.01.20	3 years
5.	LISN	ESH2-Z5	100196	R&S	2016.01.13	1 year
6.	Horn Antenna	3117	00066577	ETS-Lindgren	2016.04.01	3 years
7.	Universal Radio Communication Tester	E5515C	GB44051324	Agilent	2016.05.19	1 year
8.	PC	M4099t	SA08850737	Lenovo	/	/
9.	Monitor	L1710d	0M04340B10 01010	Lenovo	/	/
10.	Printer	P1008	VNF6C12491	HP	/	/
11.	Keyboard	KB-0225	0723779	Lenovo	/	/
12.	Mouse	MO28UOL	44B39412	Lenovo	/	/

ANNEX A: MEASUREMENT RESULTS

A.1 Radiated Emission (§15.109(a))

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 a distance of 3 meters is tested. Tested in accordance with the procedures of ANSI C63.4 - 2003, section 8.3.

The EUT was placed on a non-conductive table. The measurement antenna was placed at a distance of 3 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 Lenovo Thinkcentre M4099t, and the serial number of the PC is SA08850737. The software is used to let the PC keep on copying data to MS, reading and erasing the data after copy action was finished.

A.1.3 Measurement Limit

Limit from CFR Part 15.109(a)

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 original limit is defined at 10m test distance. This limit is calculated according to CISPR requirements.

A.1.4 Test Condition

Frequency of emission (MHz)	RBW/VBW	Sweep Time(s)
30-1000	120kHz (IF bandwidth)	5
Above 1000	1MHz/3MHz	15

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.

Note: the result contains vertical part and Horizontal part

RE Measurement uncertainty: 30M-1GHz: 5.08dB (K=2);
1GHz-18GHz: 4.56 dB (K=2)

Set.1 Charging mode / Peak detector

Frequency(MHz)	Result(dBuV/m)	Polarity	A_{Rpl} (dB)	Margin(dB)	Limit (dB μ V/m)
14212.000000	56.3	H	12.7	17.7	74.0
14879.000000	57.0	V	13.6	17.0	74.0
15670.000000	59.3	V	13.8	14.7	74.0
16295.000000	59.0	V	14.8	15.0	74.0
16814.000000	59.9	V	15.4	14.1	74.0
17445.000000	58.5	V	15.6	15.5	74.0

Set.1 Charging mode / Average detector

Frequency(MHz)	Result(dBuV/m)	Polarity	A_{Rpl} (dB)	Margin(dB)	Limit (dB μ V/m)
14403.000000	44.7	H	13.4	9.3	54.0
14973.000000	45.2	H	13.8	8.8	54.0
15779.000000	46.8	V	14.2	7.2	54.0
16324.000000	46.8	H	15.0	7.2	54.0
16844.000000	47.4	V	15.6	6.6	54.0
17414.000000	47.1	V	15.6	6.9	54.0

Set.2 USB mode / Peak detector

Frequency(MHz)	Result(dBuV/m)	Polarity	A _{Rpl} (dB)	Margin(dB)	Limit (dBμV/m)
14446.000000	56.6	H	13.1	17.4	74.0
15158.000000	57.0	V	13.0	17.0	74.0
15653.000000	58.5	V	13.8	15.5	74.0
16363.000000	58.4	H	15.2	15.6	74.0
16625.000000	59.3	H	15.1	14.7	74.0
17354.000000	59.1	V	15.5	14.9	74.0

Set.2 USB mode / Average detector

Frequency(MHz)	Result(dBuV/m)	Polarity	A _{Rpl} (dB)	Margin(dB)	Limit (dBμV/m)
14401.000000	44.8	H	13.4	9.2	54.0
14974.000000	45.3	H	13.8	8.7	54.0
15790.000000	47.2	H	14.2	6.8	54.0
16298.000000	47.1	H	14.9	6.9	54.0
16828.000000	47.7	H	15.5	6.3	54.0
17419.000000	47.0	H	15.6	7.0	54.0

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

Charging mode: Set 1

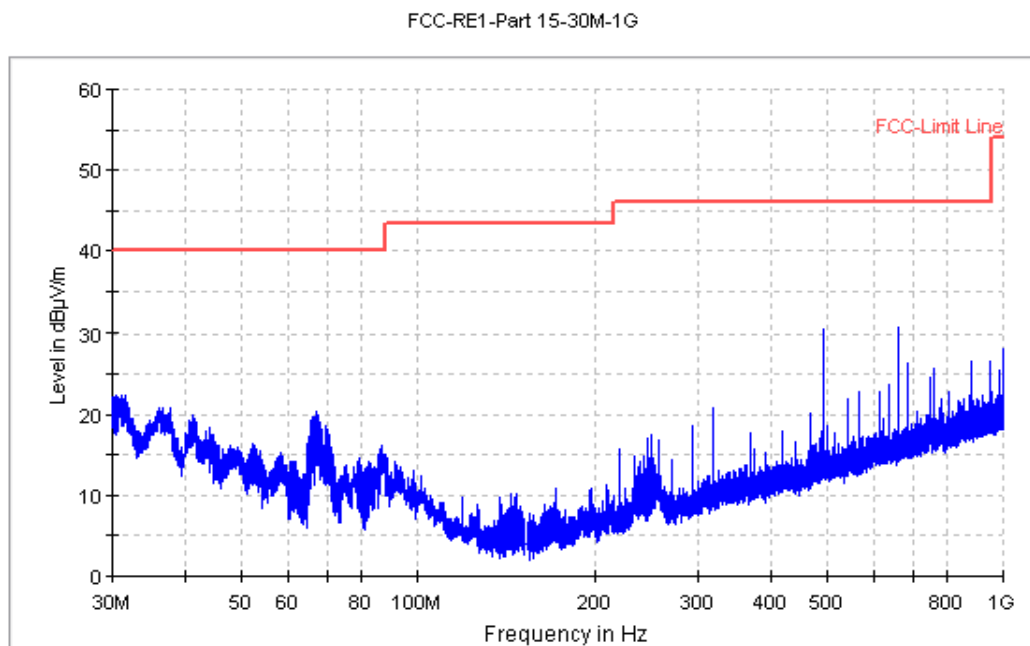


Figure A.1 Radiated Emission from 30MHz to 1GHz

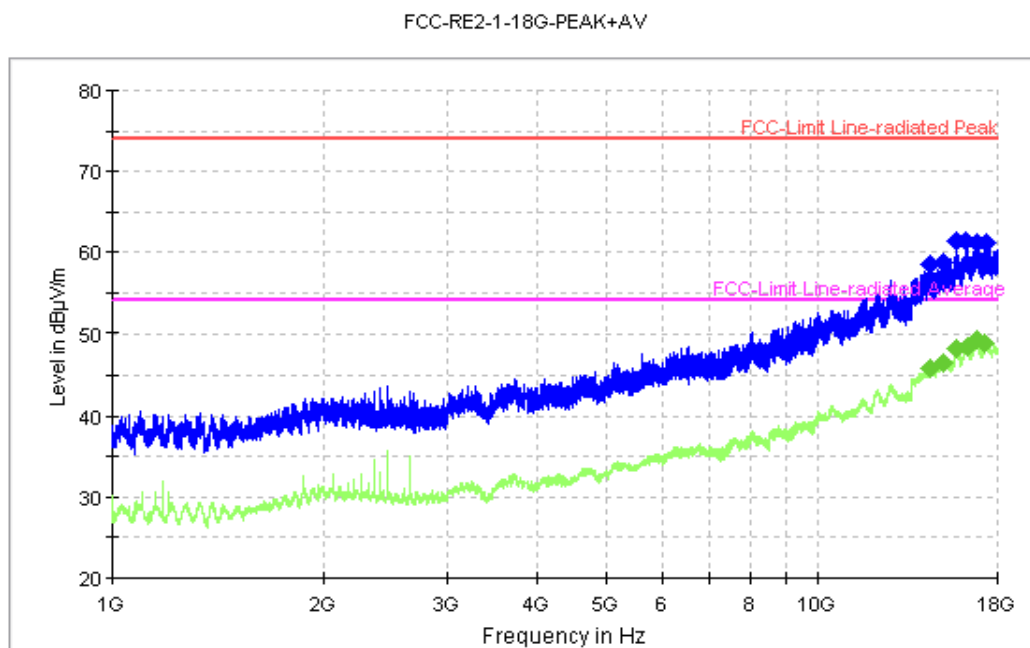


Figure A.2 Radiated Emission from 1GHz to 18GHz

USB mode: Set 2

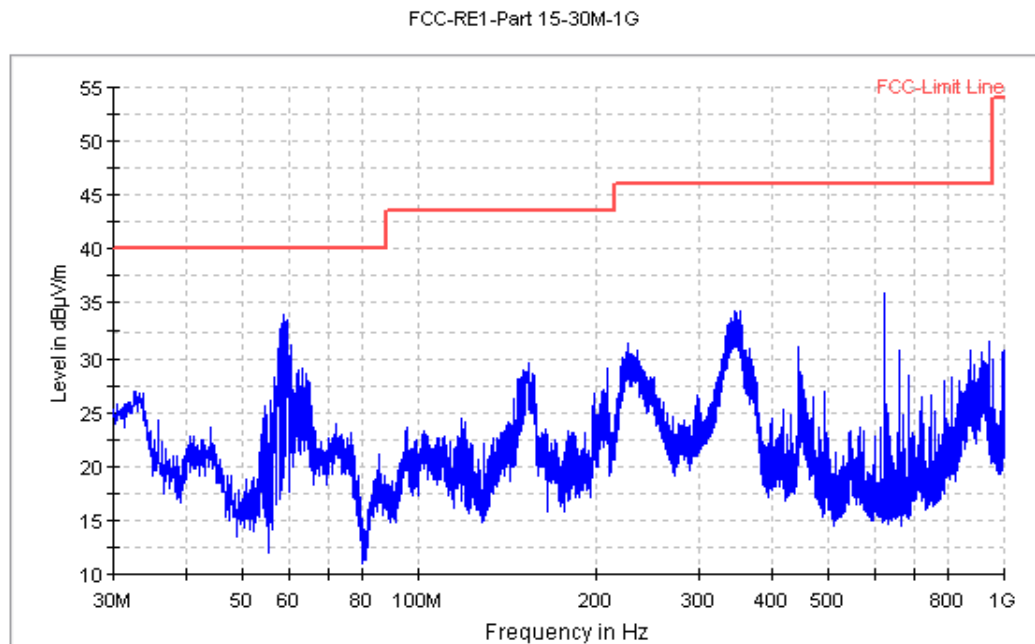


Figure A.3 Radiated Emission from 30MHz to 1GHz

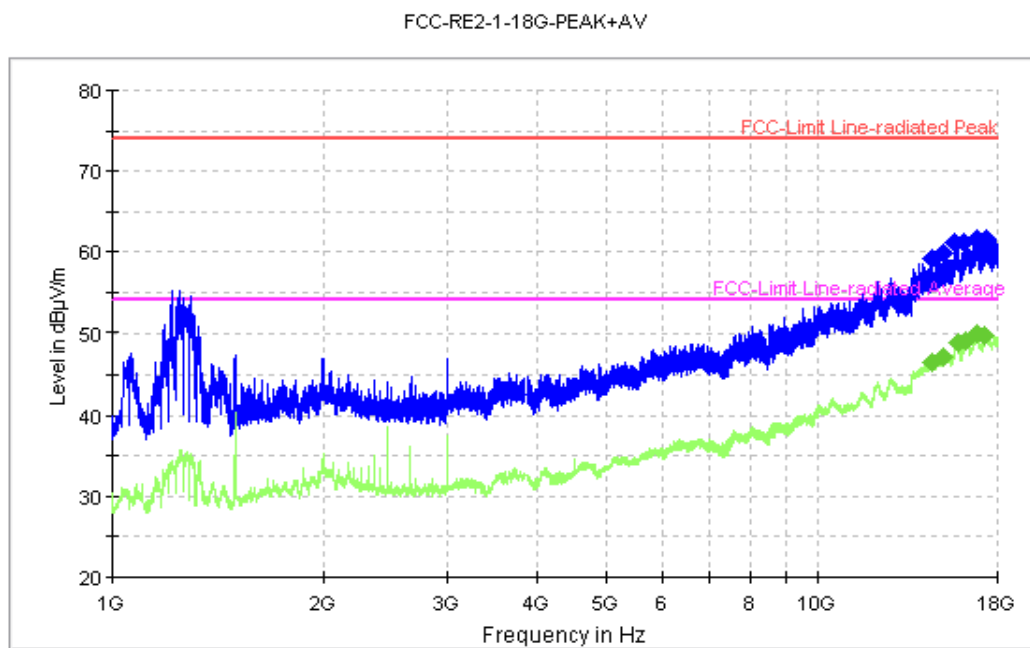


Figure A.4 Radiated Emission from 1GHz to 18GHz

A.2 Conducted Emission (§15.107(a))**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 - 2003, section 7.2.

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 Lenovo Thinkcentre M4099t, and the serial number of the PC is SA08850737. The software is used to let the PC keep on copying data to MS, reading and erasing the data after copy action was finished.

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	Sweep Time(s)
9kHz	1

CE Measurement uncertainty: 2.7 dB (K=2)

A.2.5 Measurement Results

Charging mode:Set.1

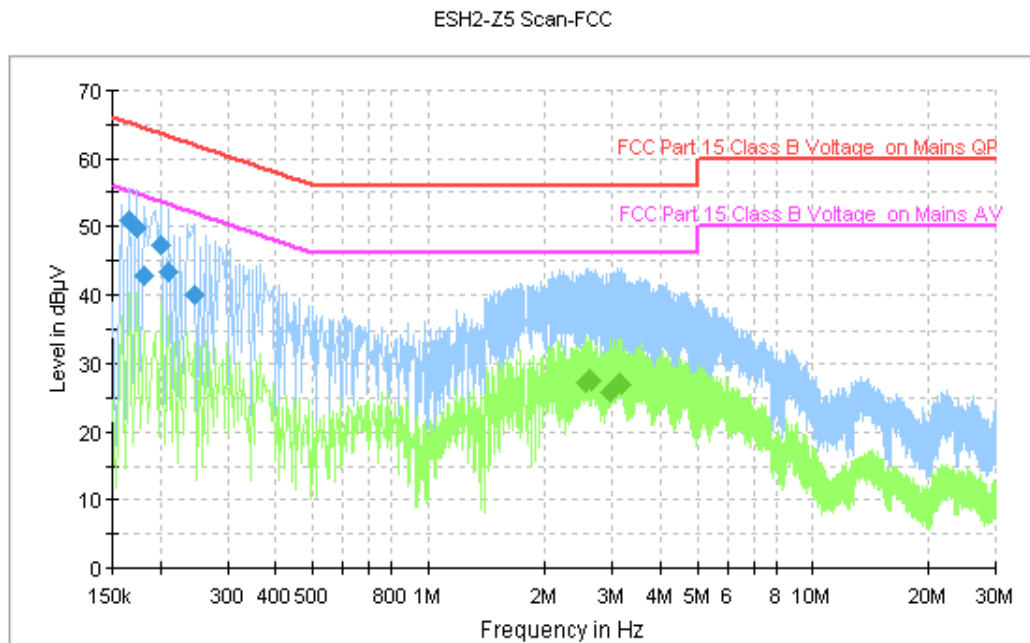


Figure A.5 Conducted Emission

Final Measurement Detector 1

Frequency (MHz)	QuasiPeak (dB µV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dB µV)
0.166000	50.8	FLO	L1	10.0	14.4	65.2
0.174000	49.8	FLO	N	10.1	14.9	64.8
0.182000	42.7	FLO	N	10.1	21.7	64.4
0.202000	47.4	FLO	L1	10.0	16.2	63.5
0.210000	43.4	FLO	N	10.1	19.8	63.2
0.246000	39.9	FLO	L1	10.0	22.0	61.9

Final Measurement Detector 2

Frequency (MHz)	Average (dB µV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dB µV)
2.550000	27.3	FLO	L1	10.2	18.7	46.0
2.606000	27.8	FLO	L1	10.2	18.2	46.0
2.646000	27.5	FLO	L1	10.2	18.5	46.0
2.954000	25.9	FLO	L1	10.1	20.1	46.0
3.134000	27.3	FLO	L1	10.2	18.7	46.0
3.162000	26.9	FLO	L1	10.2	19.1	46.0

USB mode:Set.2

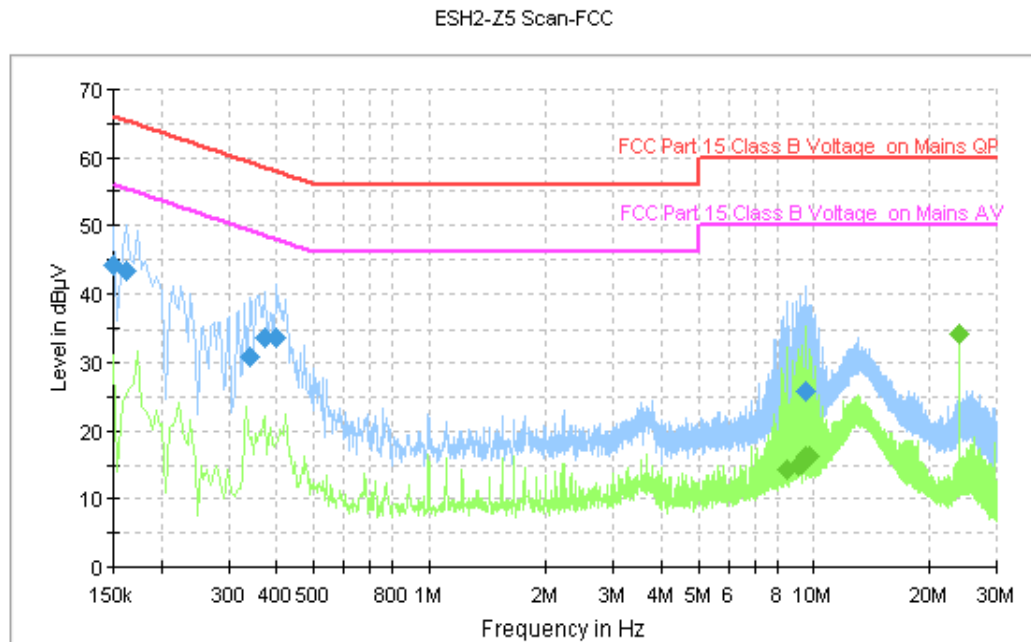


Figure A.6 Conducted Emission

Final Measurement Detector 1

Frequency (MHz)	QuasiPeak (dB µV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dB µV)
0.150000	44.0	FLO	N	10.1	22.0	66.0
0.162000	43.2	FLO	N	10.1	22.1	65.4
0.342000	30.8	FLO	N	10.0	28.3	59.2
0.374000	33.7	FLO	L1	10.0	24.7	58.4
0.398000	33.8	FLO	L1	10.0	24.1	57.9
9.538000	25.7	FLO	N	10.3	34.3	60.0

Final Measurement Detector 2

Frequency (MHz)	Average (dB µV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dB µV)
8.546000	14.4	FLO	L1	10.3	35.6	50.0
9.102000	15.0	FLO	L1	10.3	35.0	50.0
9.322000	15.1	FLO	L1	10.3	34.9	50.0
9.538000	16.3	FLO	N	10.3	33.7	50.0
9.754000	16.3	FLO	N	10.3	33.7	50.0
24.002000	34.3	FLO	N	10.6	15.7	50.0

END OF REPORT