TEST REPORT

No. 2013TAR819

for

TCT Mobile Limited

HSUPA/HSDPA/UMTS dual band/GSM Tri band mobile phone

Model Name: Yaris-4 VF

Marketing Name: Vodafone 785

FCC ID: RAD439

with

Hardware Version: PIO

Software Version: SVN05

Issued Date: Dec. 25th, 2013

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 TMC Beijing.

Test Laboratory:

FCC 2.948 Listed: No.733176

IC O.A.T.S listed: No.6629A-1

TMC Beijing, Telecommunication Metrology Center of Ministry of Industry and Information Technology

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

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1. Test Laboratory

1.1. Testing Location

Location D

Company Name:	TMC Beijing, Telecommunication Metrology Center of MIIT
Address:	No.18A, Kangding Street, Beijing Economic-Technological Development Area, Beijing, China
Postal Code:	100176

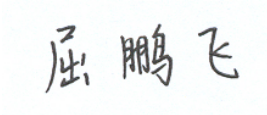
1.2. Testing Environment

Normal Temperature:	15-35℃
Relative Humidity:	20-75%

1.3. Project data

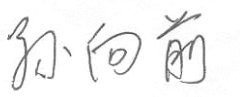
Testing Start Date:	Dec. 03rd, 2013
Testing End Date:	Dec. 24th, 2013

1.4. Signature



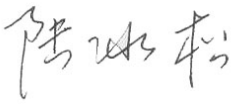
Qu Pengfei

(Prepared this test report)



Sun Xiangqian

(Reviewed this test report)



Lu Bingsong

Deputy Director of the laboratory

(Approved this test report)

2. Client Information

2.1. Applicant Information

Company Name:	TCT Mobile Limited
Address /Post:	5F, C building, No. 232, Liang Jing Road ZhangJiang High-Tech Park, Pudong Area Shanghai, P.R. China.
City:	Shanghai
Postal Code:	201203
Country:	China
Contact Person:	Gong Zhizhou
Contact Email	zhizhou.gong@jrdcom.com
Telephone:	0086-21-61460890
Fax:	0086-21-61460602

2.2. Manufacturer Information

Company Name:	TCT Mobile Limited
Address /Post:	5F, C building, No. 232, Liang Jing Road ZhangJiang High-Tech Park, Pudong Area Shanghai, P.R. China.
City:	Shanghai
Postal Code:	201203
Country:	China
Telephone:	0086-21-61460890
Fax:	0086-21-61460602

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

3.1. About EUT

Description	HSUPA/HSDPA/UMTS dual band/GSM Tri band mobile phone
Model Name	Yaris-4 VF
Marketing Name	Vodafone 785
FCC ID	RAD439
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 Telecommunication Metrology Center of MIIT of People's Republic of China.

3.2. Internal Identification of EUT used during the test

EUT ID*	SN or IMEI	HW Version	SW Version
EUT3	359729050101493	PIO	SVN05

*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
AE1	Battery	/
AE2	Battery	/
AE3	Battery	/
AE4	Battery	/
AE5	Battery	TCT-B-1876
AE6	Travel charger	TCT-CHR-1608
AE7	Travel charger	TCT-CHR-1597
AE8	USB cable	/
AE9	USB cable	/
AE10	USB Cable	TCT-DC-0261
AE11	USB Cable	/
AE20	Battery	/

AE1

Model	CAB31P0000C1
Manufacturer	BYD
Capacitance	1300 mAh
Nominal Voltage	3.7 V

AE2

Model	CAB31P0000C3
Manufacturer	SCUD
Capacitance	1300 mAh
Nominal Voltage	3.7 V

AE3

Model	CAB1400018C2
Manufacturer	SCUD
Capacitance	1400 mAh
Nominal Voltage	3.7 V

AE4

Model	CAB60B0000C2
Manufacturer	BAK
Capacitance	1400 mAh
Nominal Voltage	3.7 V

AE5

Model	CAB1400017C1
Manufacturer	BYD
Capacitance	1400 mAh
Nominal Voltage	3.7 V

AE6

Model	CBA3008AG0C1
Manufacturer	BYD
Length of cable	101 cm (length of USB cable)

AE7

Model	CBA3008AG0C1
Manufacturer	BYD
Length of cable	101 cm (length of USB cable)

AE8

Model	CDA3122002C1
Manufacturer	Juwei
Length of cable	101 cm

AE9

Model	CDA3122002C2
Manufacturer	Shenghua
Length of cable	100 cm

AE10

Model	CDA6050000C1
Manufacturer	Juwei
Length of cable	101 cm

AE11	
Model	CDA3122005C2
Manufacturer	Shenghua
Length of cable	100 cm
AE20	
Model	CAB60BA000C1
Manufacturer	SCUD
Capacitance	1400 mAh
Nominal Voltage	3.7 V

*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	EUT3+ AE2/AE4/AE5 + AE6 + AE10/AE11	Charging mode
Set.3	EUT3+ AE2/AE4/AE5+ AE10/AE11	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	10-1-12 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	2009

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	< 4Ω
Normalised site attenuation (NSA)	**<** ± 4 dB, 3m/10m distance, from 30 to 1000 MHz
Site voltage standing-wave ratio (S_{VSWR})	Between 0 and 6 dB, from 1GHz to 18GHz
Uniformity of field strength	Between 0 and 6 dB, from 80 to 3000 MHz

Fully-anechoic chamber FAC-3 (9 meters×6.5 meters×4 meters) 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
Site voltage standing-wave ratio (S_{VSWR})	Between 0 and 6 dB, from 1GHz to 18GHz
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

Clause	List	Clause in FCC rules	Verdict	Location
1	Radiated Emission	15.109(a)	P	D
2	Conducted Emission	15.107(a)	P	D

7. Test Equipments Utilized

NO.	Description	TYPE	SERIES NUMBER	MANUFACTURE	CAL DUE DATE
6	LISN	ESH2-Z5	829991/012	R&S	2014-04-14
8	Universal Radio Communication Tester	CMU200	109914	R&S	2014-04-18
10	PC	OPTIPLEX 380	2X1YV2X	DELL	N/A
11	Monitor	E178FPc	CN-OWR979-64180-7AJ-D2MS	DELL	N/A
12	Printer	P1606dn	VNC3L52122	HP	N/A
13	Keyboard	L100	CN0RH659658907ATOI40	DELL	N/A
14	Mouse	M-UAE119	LZ935220ZRC	Lenovo	N/A
15	Test Receiver	ESCI	100344	R&S	2014-03-28
16	Test Receiver	ESCI 7	100948	R&S	2014-07-18
18	EMI Antenna	VULB 9163	9163-483	Schwarzbeck	2014-02-16
19	EMI Antenna	3115	6914	ETS-Lindgren	2014-12-15
20	Test Receiver	FSU26	200728	R&S	2014-01-30

ANNEX A: MEASUREMENT RESULTS

A.1 Radiated Emission (§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 (above 1GHz) and 10 meters (below 1GHz) is tested. Tested in accordance with the procedures of ANSI C63.4 - 2009, section 8.3.

The EUT was placed on a non-conductive table. The measurement antenna was placed at a distance of 3 meters (above 1GHz) and 10 meters (below 1GHz) 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 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.

A.1.3 Measurement Limit

Frequency range (MHz)	Field strength limit (μV/m)		
	Quasi-peak	Average	Peak
30-88	100		
88-216	150		
216-960	200		
960-1000	500		
>1000		500	5000

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:

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

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 dB, k=2.

Measurement result for Set.1:

Charging Mode/Average detector

Frequency(MHz)	Result(dBμV/m)	G_{PL} (dB)	G_A (dB/m)	P_{Mea}(dBμV)	Polarity
5703.000	37.5	-34.2	35.1	36.600	V
5999.000	37.5	-33.6	35.1	36.000	V
5937.000	37.5	-33.5	35.1	35.900	V
5961.000	37.5	-33.5	35.1	35.900	H
5705.500	37.4	-33.8	35.1	36.100	V
5944.500	37.4	-33.5	35.1	35.800	H

Charging Mode/Peak detector

Frequency(MHz)	Result(dBμV/m)	G_{PL} (dB)	G_A (dB/m)	P_{Mea}(dBμV)	Polarity
5841.500	49.6	-33.8	35.1	48.300	H
5944.500	49.6	-33.5	35.1	48.000	V
5820.000	49.4	-33.8	35.1	48.100	V
5723.000	49.4	-33.8	35.1	48.100	H
5833.500	49.2	-33.8	35.1	47.900	V
5832.000	49.1	-33.8	35.1	47.800	V

Measurement result for Set.3:

USB Mode/Average detector

Frequency(MHz)	Result(dBμV/m)	G_{PL} (dB)	G_A (dB/m)	P_{mea}(dBμV)	Polarity
1875.000	35.6	-35.6	25.3	45.900	H
1874.375	34.8	-35.6	25.3	45.100	V
1498.125	34.8	-40.3	24.1	51.000	H
1498.750	34.6	-40.3	24.1	50.800	V
1497.500	34.3	-40.3	24.1	50.500	H
1496.875	34.0	-40.3	24.1	50.200	H

USB Mode/ Peak detector

Frequency(MHz)	Result(dBμV/m)	G_{PL} (dB)	G_A (dB/m)	P_{mea}(dBμV)	Polarity
1995.625	55.7	-35.7	25.3	66.100	H
1195.000	51.7	-41.2	24.1	68.800	V
1998.750	49.0	-35.7	25.3	59.400	V
1499.375	48.1	-40.3	24.1	64.300	H
1498.750	48.0	-40.3	24.1	64.200	H
1498.125	47.9	-40.3	24.1	64.100	V

Charging Mode, Set.1

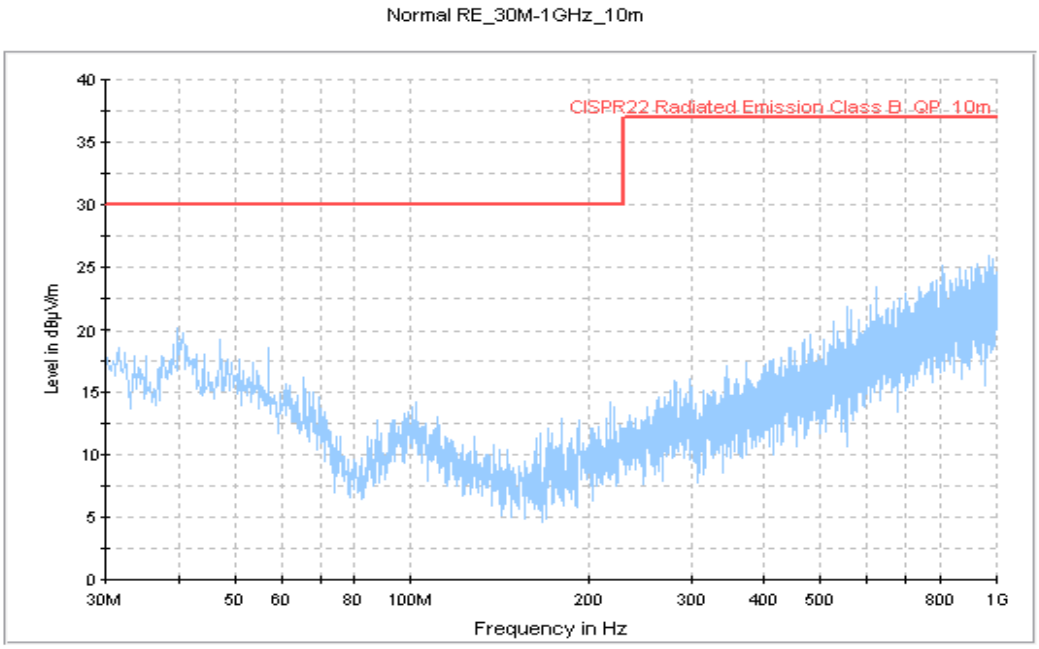


Figure A.1 Radiated Emission from 30MHz to 1GHz

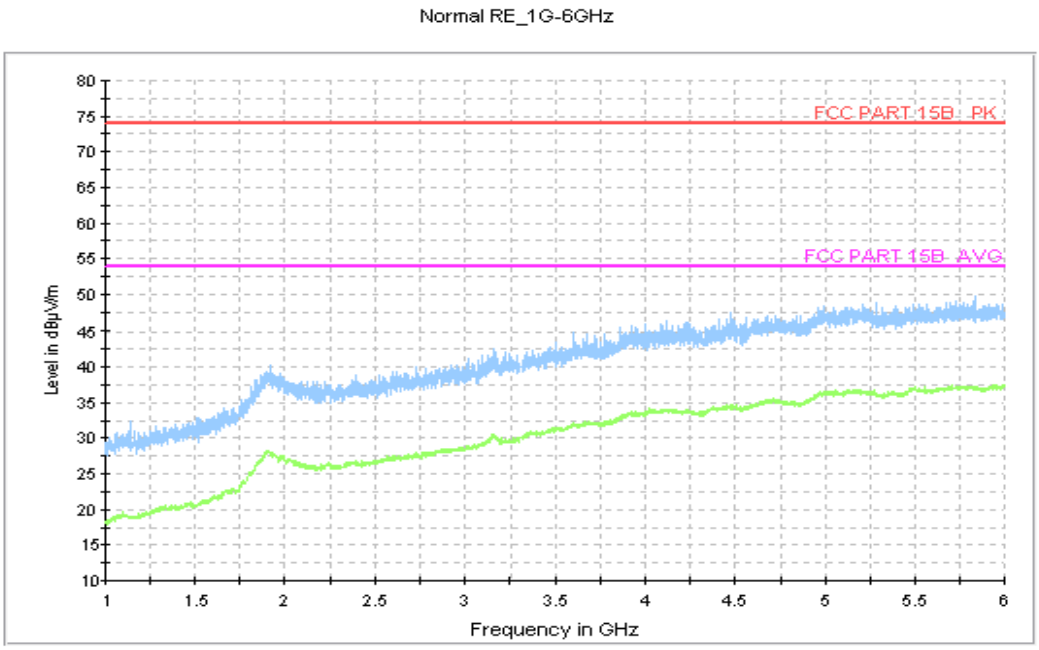


Figure A.2 Radiated Emission from 1GHz to 6GHz

USB Mode, Set.3

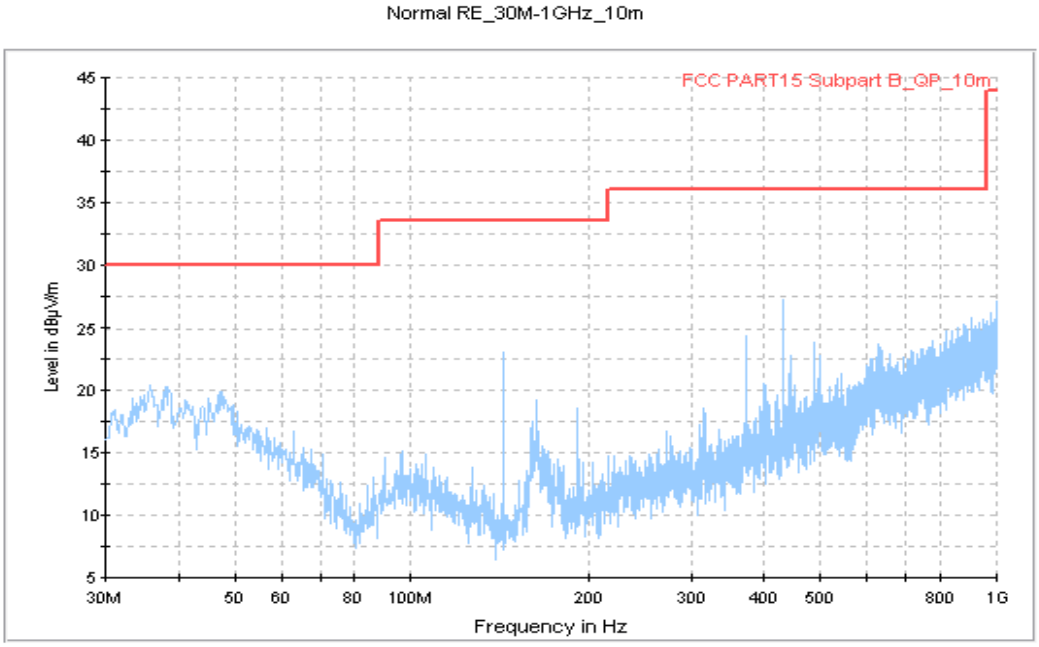


Figure A.3 Radiated Emission from 30MHz to 1GHz

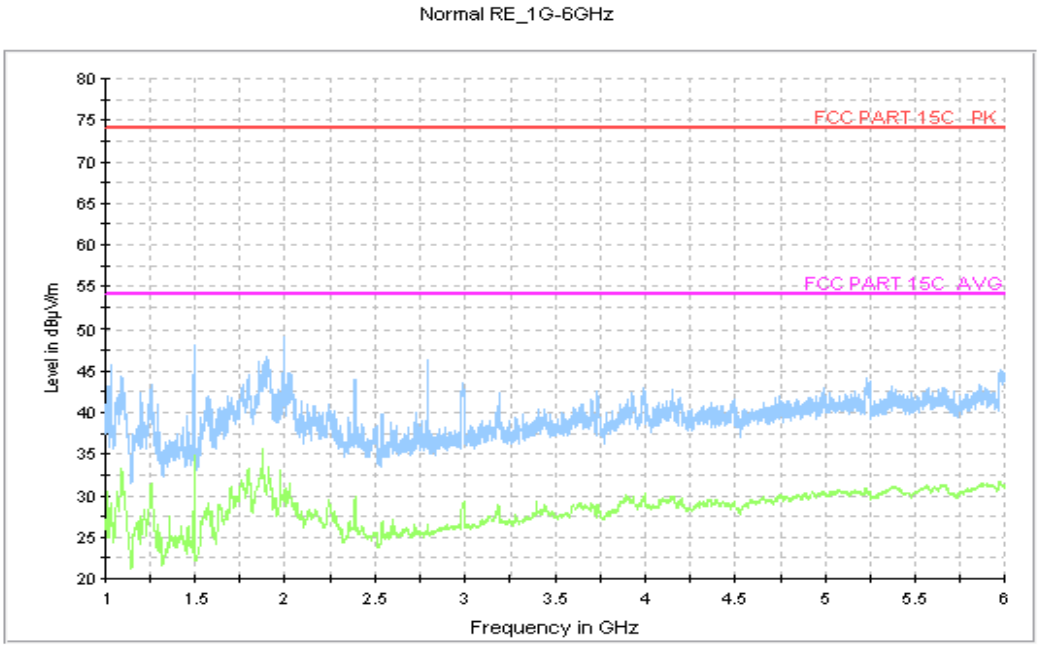


Figure A.4 Radiated Emission from 1GHz to 6GHz

A.2 Conducted Emission (§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 - 2009, 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 OPTIPLEX 380, and the serial number of the PC is2X1YV2X. 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/IF bandwidth	Sweep Time(s)
9kHz	1

A.2.5 Measurement Results

Measurement uncertainty: *U*= 2.9 dB, *k*=2.

Charging Mode, Set.1

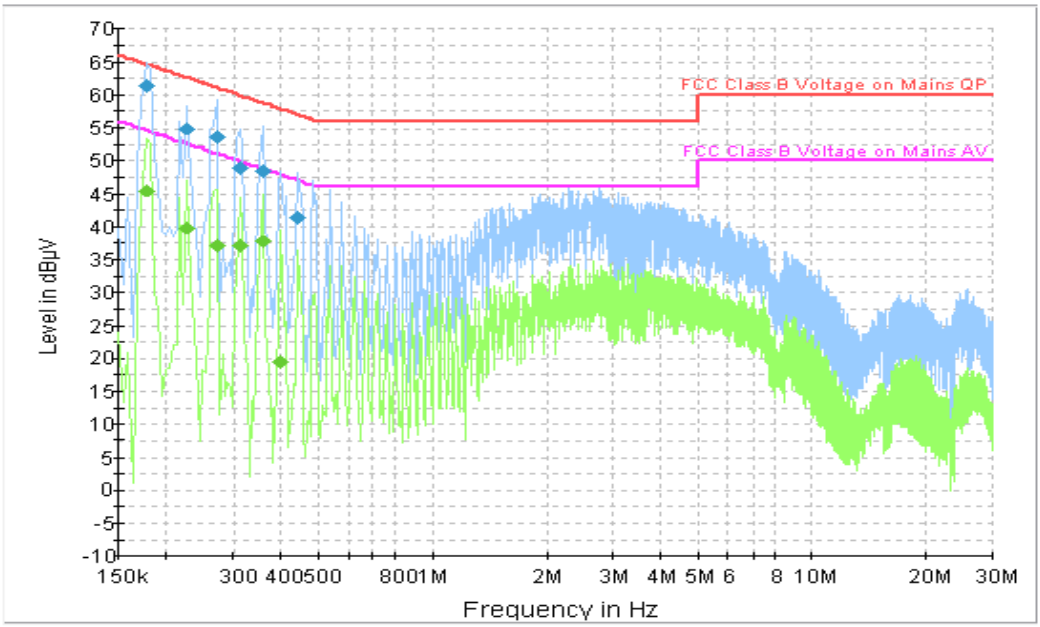


Figure A.5 Conducted Emission

Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.177000	61.3	GND	N	9.8	3.3	64.6
0.226500	55.0	GND	L1	9.8	7.6	62.6
0.271500	53.6	GND	L1	9.8	7.5	61.1
0.312000	48.8	GND	N	9.8	11.1	59.9
0.357000	48.4	GND	L1	9.8	10.4	58.8
0.442500	41.2	GND	N	9.8	15.8	57.0

Final Result 2

Frequency (MHz)	Average (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.177000	45.4	GND	N	9.8	9.2	54.6
0.226500	39.8	GND	N	9.8	12.8	52.6
0.271500	37.1	GND	L1	9.8	13.9	51.1
0.312000	37.2	GND	N	9.8	12.7	49.9
0.357000	37.8	GND	L1	9.8	11.0	48.8
0.402000	19.5	GND	L1	9.8	28.3	47.8

USB Mode, Set.3

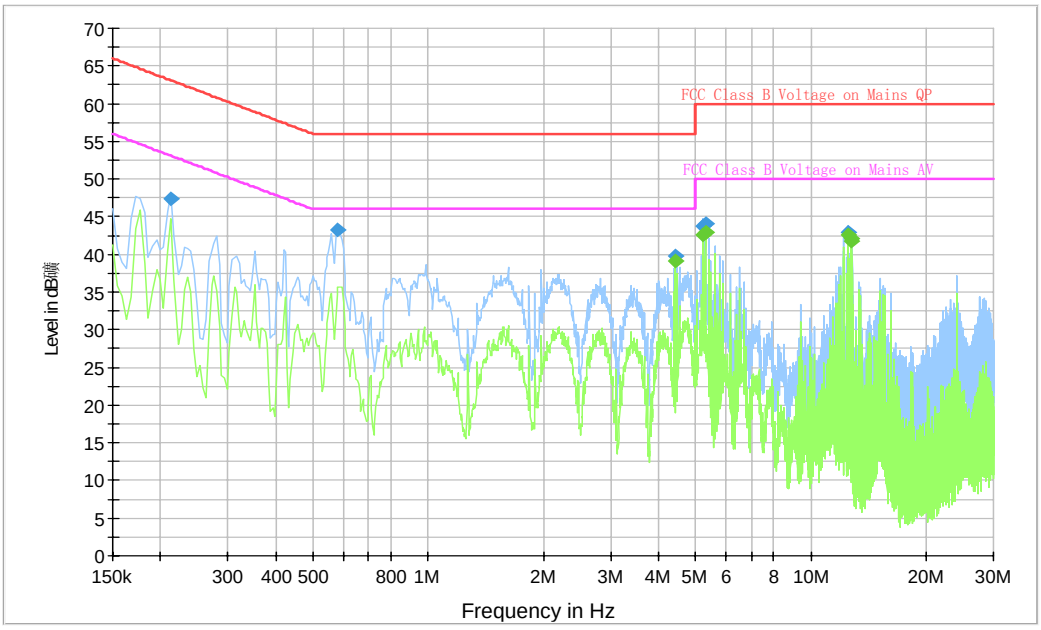


Figure A.6 Conducted Emission

Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.213000	47.4	GND	N	9.8	15.7	63.1
0.577500	43.3	GND	L1	9.8	12.7	56.0
4.411500	39.7	GND	N	9.7	16.3	56.0
5.235000	43.7	GND	N	9.7	16.3	60.0
5.298000	44.0	GND	N	9.7	16.0	60.0
12.502500	42.9	GND	L1	9.5	17.1	60.0

Final Result 2

Frequency (MHz)	Average (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
4.411500	39.2	GND	N	9.7	6.8	46.0
5.235000	42.5	GND	N	9.7	7.5	50.0
5.298000	43.0	GND	N	9.7	7.0	50.0
12.502500	42.6	GND	N	9.6	7.4	50.0
12.745500	41.8	GND	N	9.5	8.2	50.0
12.808500	42.0	GND	N	9.5	8.0	50.0

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