SAICT

TESTREPORT

No.I18N01184-EMC

for

Spectralink Corp

GSM Quad-band/UMTS five-band/LTE/CA Mobile phone

Model Name: 9640

FCC ID: IYG96XX

IC: 2128B-96XX

Hardware Version: PIO

Software Version: vF03

Issued Date: 2018-09-21

Designation Number: CN1210

ISED Assigned Code: 23289

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 SAICT.

Test Laboratory:

Shenzhen Academy of Information and Communications Technology

Building G, Shenzhen International Innovation Center, No.1006 Shennan Road, Futian District, Shenzhen, Guangdong, P. R. China 518026.

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REPORT HISTORY

Report Number	Revision	Description	Issue Date
I18N01184-EMC	Rev.0	1st edition	2018-09-21

CONTENTS

1. Test Laboratory

1.1. TestingLocation

Company Name: Shenzhen Academy of Information and Communications Technology

Address: Building G, Shenzhen International Innovation Center, No.1006 Shennan Road, Futian District, Shenzhen, Guangdong, P. R. China

Postal Code: 518026

Telephone: +86(0)755-33322000

Fax: +86(0)755-33322001

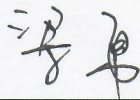## 1.2. TestingEnvironment

Normal Temperature: 15-35℃

Relative Humidity: 20-75%

1.3. Project data

Testing Start Date: 2018-08-09

Testing End Date: 2018-09-20
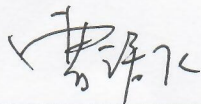
1.4. Signature

_____

Liang Yong

(Prepared this test report)

_____

Zhang Yunzhuan

(Reviewed this test report)

_____

Cao Junfei

Director of the laboratory

(Approvedthis test report)

2. ClientInformation

2.1. Applicant Information

Company Name: Spectralink Corp

Address: 2560 55th Street Boulder, CO 80301 USA

2.2. Manufacturer Information

Company Name: Spectralink Corp

Address: 2560 55th Street Boulder, CO 80301 USA

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

3.1. About EUT

Description	GSM Quad-band/UMTS five-band/LTE/CA Mobile phone
Model Name	9640
FCC ID	IYG96XX
IC number	2128B-96XX
Condition of EUT as received	No obvious damage in appearance

The Equipment Under Test (EUT)are a model of GSM Quad-band/UMTS five-band/LTE/CA Mobile phone with integrated antenna.

The EUT supports GPRS service and EGPRS service.

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 GSM Quad-band/UMTS five-band/LTE/CA Mobile phone 9640 manufactured by Spectralink Corp. According to the declaration of changes, Radiated Emissions test needs to been performed. else results are cited from the initial model. The report number for initial model is I18N00673-EMC

3.2. Internal Identification of EUT

EUT ID*	SN or IMEI
EUT1	357023090001067

*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	/

AE1-1

Model	Rechargeable Li-ion Polymer Battery
Manufacturer	Zhuhai City Gushine Electronic Technology Co., Ltd.
Capacitance	3020 mAh
Nominal Voltage	3.85V

AE1-2

Model	Rechargeable Li-ion Polymer Battery
Manufacturer	Smart Power Electronic (huizhou) Co.,Ltd.
Capacitance	60 mAh
Nominal Voltage	3.7V

AE2

Model	ASUC71w-050912300

Manufacturer	Aquil Star Precision Industrial (ShenZhen) Co., Ltd
S/N	/

AE3-1
Model	Type C 3.0 C13021
Manufacturer	Juwei Electronics Co., Ltd.

AE3-2
Model	Type C 3.0 XG-US008
Manufacturer	Xunguang Electronics Co., Ltd.

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

Note: 60mAh Back up battery just for maintenance of system data and keep silence，cannot support system normal working

AE2: There is just one internal circuit of charger, and the plug of the charger can be replaced to meet worldwide country's requirement.

3.4. EUT set-ups

EUT set-up No.	Combination of EUT and AE	Remarks
Set.1	EUT1+ AE1-1+AE1-2+AE2+AE3-1	Charging mode
Set.2	EUT1+ AE1-1+AE1-2+AE2+AE3-2	Charging mode
Set.3	EUT1+ AE1-1+AE1-2+ AE3-1	USB mode
Set.4	EUT2+ AE1-1+AE1-2+ AE3-2	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	10-1-2017 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	2014
ICES-003	Information Technology Equipment(ITE)-Limits and methods of measurement	Issue 6

5. LABORATORY ENVIRONMENT

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

Temperature	Min. = 15 ℃, Max. = 35℃
Relative humidity	Min. = 15 %, Max. = 75 %
Shielding effectiveness	0.014MHz-1MHz,>60dB; 1MHz-18000MHz,>90dB
Electrical insulation	>2MΩ
Ground system resistance	<4Ω
Normalised site attenuation (NSA)	<±4 dB, 3 m distance, from 30 to 1000 MHz

Shield room did not exceed following limits along the EMC testing:

Temperature	Min. = 15 ℃, Max. = 30 ℃
Relative humidity	Min. =20 %, Max. = 75 %
Shielding effectiveness	0.014MHz-1MHz,>60dB; 1MHz-10000MHz,>90dB
Electrical insulation	>2MΩ
Ground system resistance	<4Ω

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

Temperature	Min. = 15 ℃, Max. = 35℃
Relative humidity	Min. = 15 %, Max. = 75 %
Shielding effectiveness	0.014MHz-1MHz,>60dB; 1MHz-18000MHz,>90dB
Electrical insulation	>2MΩ
Ground system resistance	<4Ω
VoltageStandingWaveRatio（VSWR）	≤ 6 dB, from 1 to 18GHz，3 m distance
Uniformity of field strength	Between 0 and 6 dB, from 80 to 6000 MHz

6. SUMMARY OF TEST RESULTS

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

Items	Test Name	Clause in FCC rules	Clause in IC rules	Section in this report	Verdict
1	Radiated Emission	15.109(a)	Section 5	A.1	P

7. Test Facilities Utilized

NO.	NAME	TYPE	SERIES NUMBER	PRODUCER	CALDUE DATE	CAL PERIOD
1.	Test Receiver	ESR7	101676	R&S	2018.11.29	1 year
2.	Spectrum Analyzer	FSV40	101192	R&S	2019.05.21	1 year
3.	BiLog Antenna	3142E	00224831	ETS-Lindgren	2021.05.17	3 years
4.	Horn Antenna	3117	00066577	ETS-lindgren	2019.04.05	3 years
5.	Universal Radio Communication Tester	CMU200	114545	R&S	2019.05.17	1 year
6.	PC	ThinkPadE480	PF-0Z56NV	Lenovo	/	/
7.	Printer	P1008	VNF6C12491	HP	/	/
8.	Mouse	MOEUUOA	44NY517	Lenovo	/	/
9.	Chamber	FACT3-2.0	1285	ETS-Lindgren	2020.07.20	3 years

ANNEX A: MEASUREMENT RESULTS

A.1 Radiated Emission (§15.109(a))
Reference
FCC: CFR Part 15.109(a)
IC: ICES-003 section 6.2

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 -2014, 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:

MP3 mode: The EUT is keeping on playing mp3.
Camera mode: The EUT is keeping on taking photos.
Charging mode: The MS is synchronized to SS, and able to respond to paging messages and incoming call. An established call has been released. The MS is connected to a charger.
USB mode: The model of the PC is Lenovo ThinkPad E480, and the serial number of the PC is PF-0Z56NV. 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 (µV/m)		
	Quasi-peak	Average	Peak
30-88	100		
88-216	150		
216-960	200		
960-1000	500		
>1000		500	5000

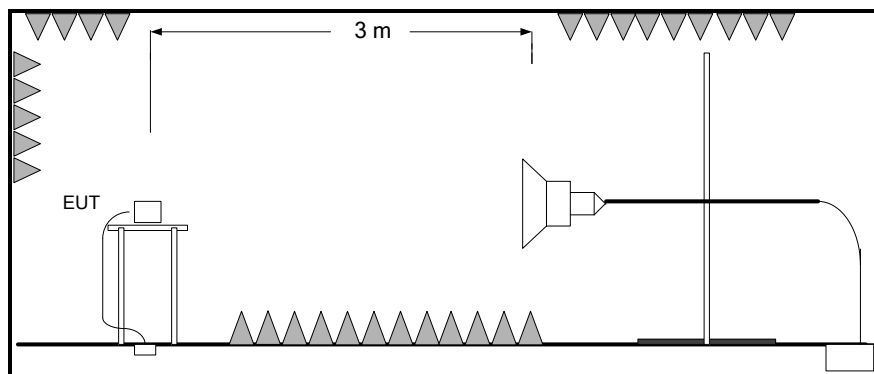*Note: The original limit is defined at 10m test distance. This limit is calculated according to CISPR requirements.

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.1.5Test set-up:

30MHz-1GHz
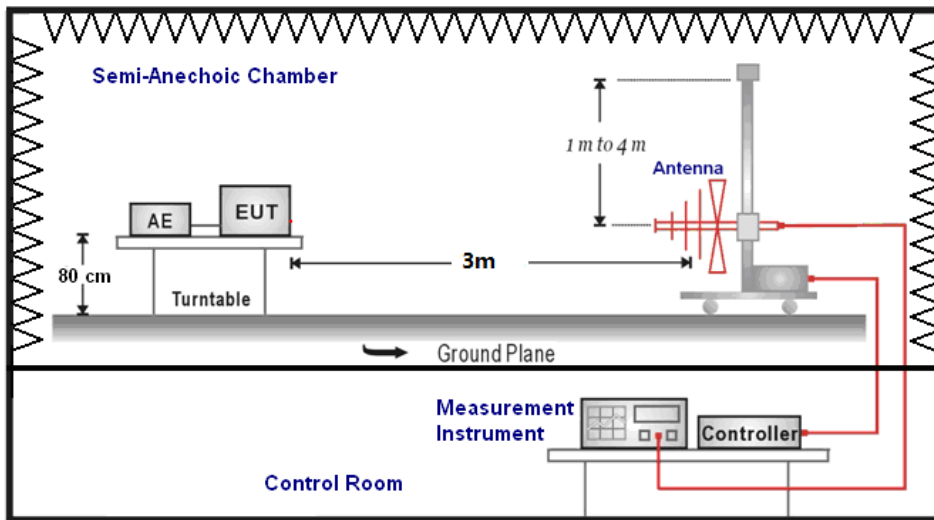
1GHz-18GHz

A.1.6 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}:PathLoss

　　P_{Mea}: Measurement result on receiver.

Note: the result contains vertical part and Horizontal part

RE Measurement uncertainty:30M-1GHz: 4.90dB (k=2);

　　　　　　　　　　　　　1GHz-18GHz: 5.12 dB (k=2)

Set.1 MP3 mode with Charging mode / Peak detector

Frequency(MHz)	Result(dBuV/m)	Limit (dBµV/m)	Margin(dB)	Polarity	ARpl (dB/m)	P_Mea (dBµV)
2862.5	54.61	74	19.39	H	20.4	34.21
2994	53.29	74	20.71	H	21.5	31.79
12981	52.84	74	21.16	H	20.1	32.74
14914.5	53.32	74	20.68	H	20.7	32.62
16553.5	55.35	74	18.65	H	22.4	32.95
17813	53.74	74	20.26	H	22.8	30.94

Set.1 MP3 mode with Charging mode / Average detector

Frequency(MHz)	Result(dBuV/m)	Limit (dBµV/m)	Margin(dB)	Polarity	ARpl (dB/m)	P_Mea (dBµV)
2791.5	42.27	54	11.73	H	21	21.27
2998	41.98	54	12.02	H	21.7	20.28
13047.5	41.37	54	12.63	H	20.1	21.27
14905	42.24	54	11.76	H	20.8	21.44
16674.5	42.89	54	11.11	H	22.1	20.79
17950.5	42.71	54	11.29	H	23.5	19.21

Set.2 Camera mode with Charging mode / Peak detector

Frequency(MHz)	Result(dBuV/m)	Limit (dBµV/m)	Margin(dB)	Polarity	ARpl (dB/m)	P$_{Mea}$ (dBµV)
2820.5	54.12	74	19.88	H	20.3	33.82
2986	53.54	74	20.46	H	21.5	32.04
12637.5	52.73	74	21.27	H	20	32.73
14901.5	52.95	74	21.05	H	20.8	32.15
16646.5	54.68	74	19.32	H	22.4	32.28
17898	53.89	74	20.11	H	24	29.89

Set.2 Camera mode with Charging mode / Average detector

Frequency(MHz)	Result(dBuV/m)	Limit (dBµV/m)	Margin(dB)	Polarity	ARpl (dB/m)	P$_{Mea}$ (dBµV)
2793.5	42.32	54	11.68	H	20.9	21.42
2999.5	42.1	54	11.9	H	21.8	20.3
12637.5	41.38	54	12.62	H	20	21.38
13042.5	41.49	54	12.51	H	20.1	21.39
14915	42.21	54	11.79	H	20.7	21.51
16639	43.01	54	10.99	H	22.5	20.51
17954	42.56	54	11.44	H	23.4	19.16

Set.3 USB mode / Peak detector

Frequency(MHz)	Result(dBuV/m)	Limit (dBµV/m)	Margin(dB)	Polarity	ARpl (dB/m)	P$_{Mea}$ (dBµV)
2786.5	53.9	74	20.1	H	20.8	33.1
2995	53.62	74	20.38	H	21.6	32.02
13077.5	52.76	74	21.24	H	20.2	32.56
14953	53.01	74	20.99	H	20.4	32.61
16646.5	54.53	74	19.47	H	22.4	32.13
17941	53.59	74	20.41	H	23.6	29.99

Set.3 USB mode / Average detector

Frequency(MHz)	Result(dBuV/m)	Limit (dBµV/m)	Margin(dB)	Polarity	ARpl (dB/m)	P$_{Mea}$ (dBµV)
2789	42.32	54	11.68	H	21	21.32
2999.5	42.11	54	11.89	H	21.8	20.31
13027.5	41.21	54	12.79	H	20.1	21.11
14902.5	42.04	54	11.96	H	20.8	21.24
16637	42.58	54	11.42	H	22.5	20.08
17896	42.98	54	11.02	H	24	18.98

Set.4 USB mode / Peak detector

Frequency(MHz)	Result(dBuV/m)	Limit (dBμV/m)	Margin(dB)	Polarity	ARpl (dB/m)	P$_{Mea}$ (dBμV)
2722.5	52.91	74	21.09	H	19	33.91
2998.5	53.25	74	20.75	H	21.8	31.45
14663	53.01	74	20.99	H	20.7	32.31
14932.5	52.66	74	21.34	H	20.5	32.16
16597	53.92	74	20.08	H	22.9	31.02
17839	53.22	74	20.78	H	23.2	30.02

Set.4 USB mode / Average detector

Frequency(MHz)	Result(dBuV/m)	Limit (dBμV/m)	Margin(dB)	Polarity	ARpl (dB/m)	P$_{Mea}$ (dBμV)
2770	42.3	54	11.7	H	21	21.3
2999.5	42	54	12	H	21.8	20.2
14495	41.87	54	12.13	H	20.2	21.67
14898	42.07	54	11.93	H	20.8	21.27
16621.5	42.92	54	11.08	H	22.7	20.22
17895	42.64	54	11.36	H	23.9	18.74

Note: The measurement result of Set.1, Set.2, Set.3, and Set.4 showed here are worst cases of combinations of different batteries and USB cables.

MP3 mode with Charging mode: Set 1
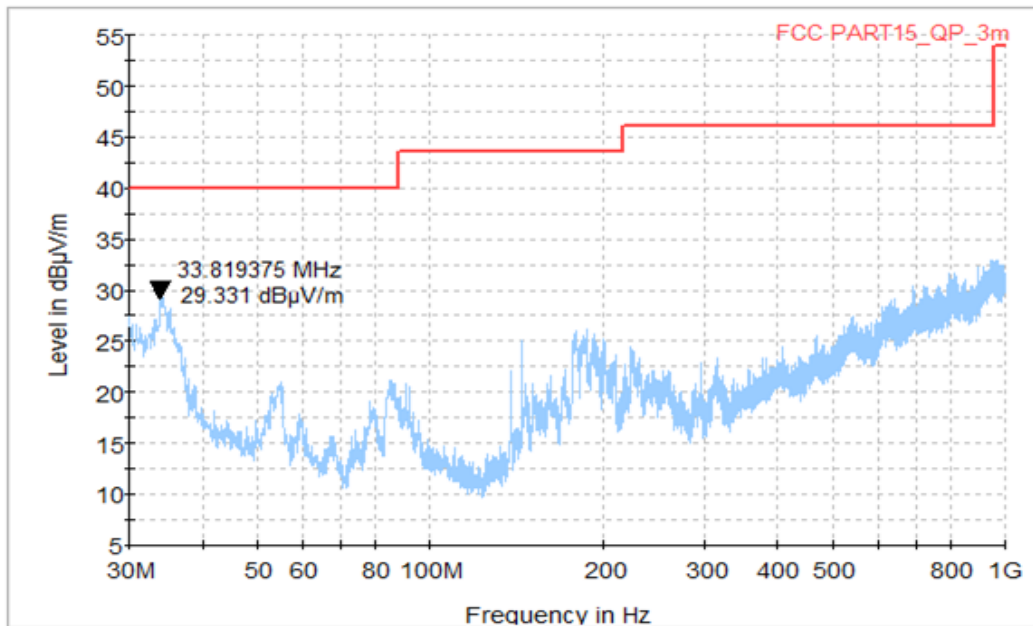
Figure A.1   Radiated Emission from 30MHz to 1GHz

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

Camera mode with Charging mode: Set 2
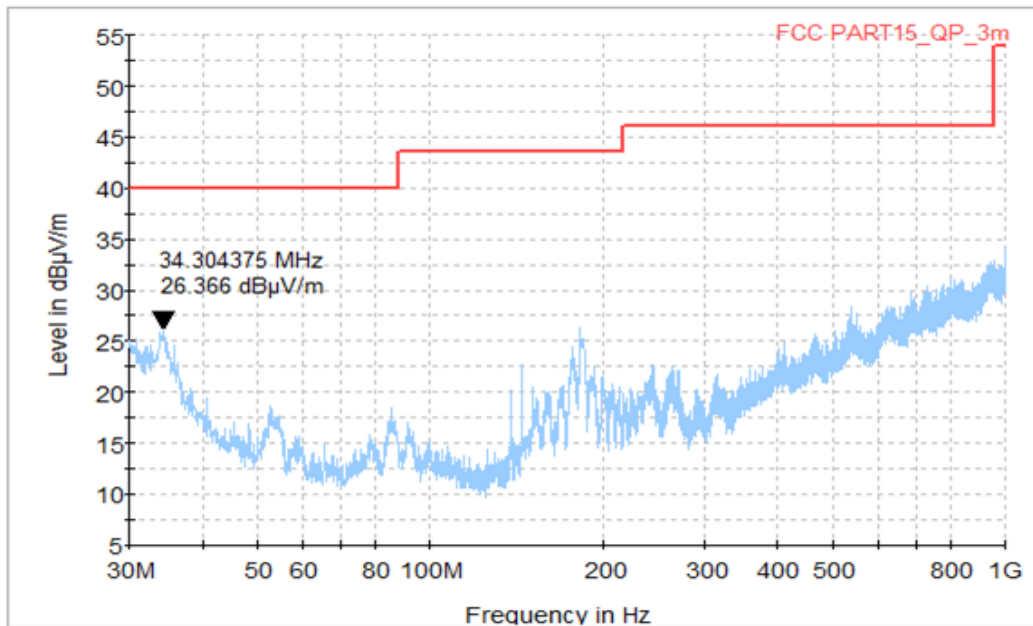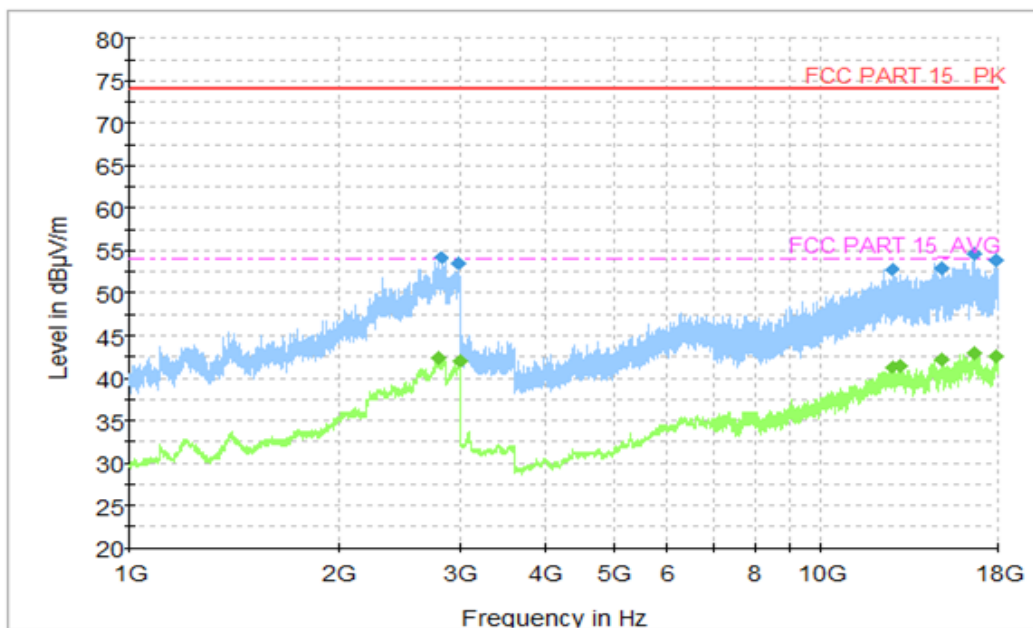

Figure A.1   Radiated Emission from 30MHz to 1GHz

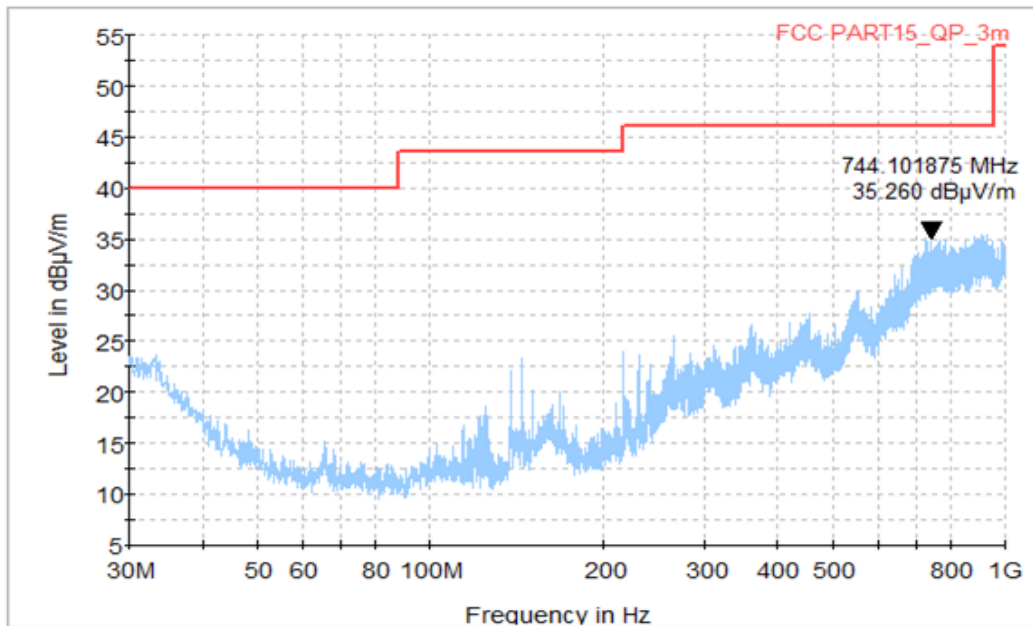**Figure A.2   Radiated Emission from 1GHz to 18GHz**

USB mode: Set3

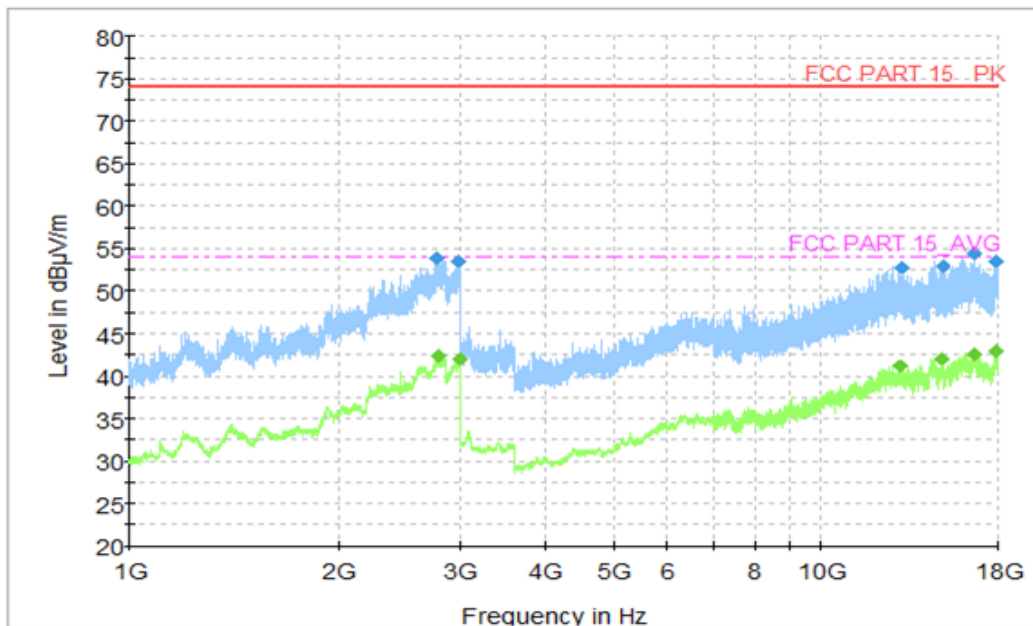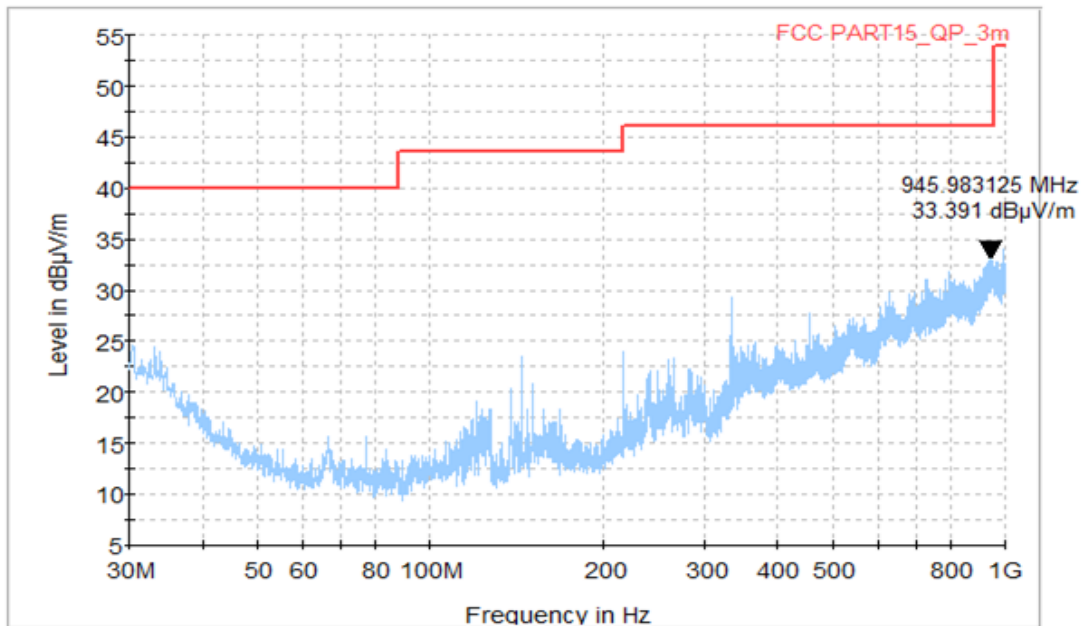

Figure A.1   Radiated Emission from 30MHz to 1GHz

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

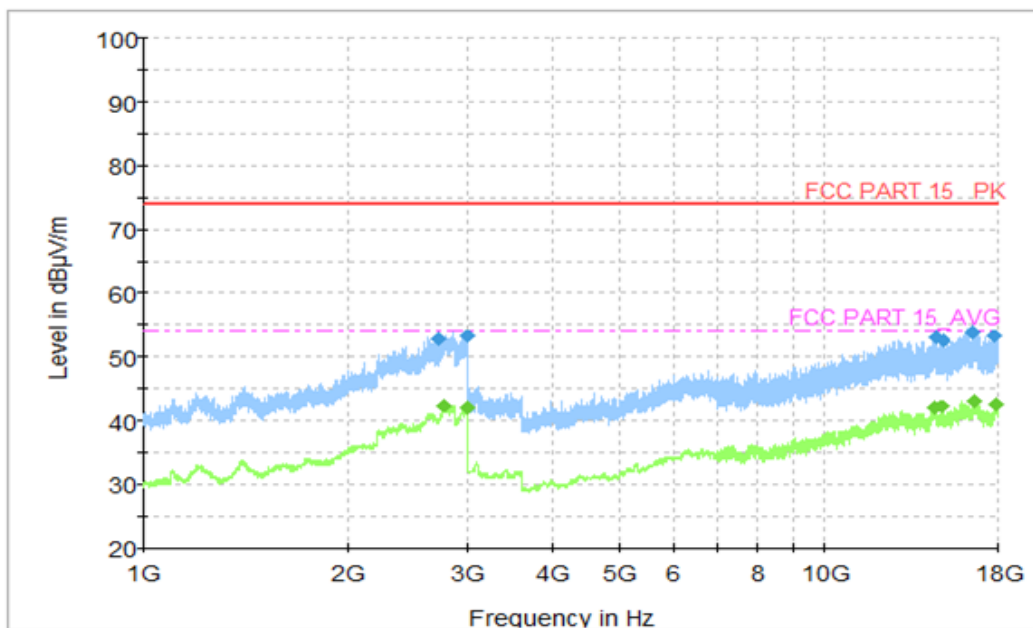**USB mode: Set 4**

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

Figure A.2   Radiated Emission from 1GHz to 18GHz
*****END OF REPORT*****