

FCC / Certification Test Report

EverPro Technologies Company Ltd.

USB3.0 AOC Cable

Model: EPU3C-NNMMXYYYM

REPORT# 14WB0528020F Rev 0

FCC ID: 2ACI5-EPU3C001

June.17, 2014

Prepared for:

EverPro Technologies Company Ltd.

4# Guanshan Er Road, Wuhan 430073 P, R, China

Prepared by:

WASHINGTON TECHNOLOGY INTERNATIONAL LIMITED

This report applies only to the sample evaluated prior to the preparation date stated above.

This report must be copied in its entirety, including all technical documents

FCC / Certification Test Report

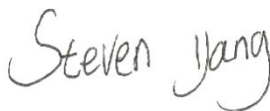
For the
EverPro Technologies Company Ltd.
USB3.0 AOC Cable
MODEL: EPU3C-NNMMXYYM
FCC ID: 2ACI5-EPU3C001
WLL REPORT# 14WB0528020F Rev 0
June.17, 2014

Prepared by:



Henry guo

Reviewed by:



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Abstract

This report has been prepared on behalf of EverPro Technologies Company Ltd. to document compliance with the limits for a digital device required under Part 15B of the FCC Rules and Regulations This Industrial scientific and medical equipment (FCC) Test Report documents the test configuration and test results for the EverPro Technologies Company Ltd. USB3.0 AOC Cable. Testing was performed on TA Beijing Limited has been accepted by the FCC, the FCC Registration Number is 413514.

The EverPro Technologies Company Ltd. USB3.0 AOC Cable complies with the requirements for a Part 15B Class B personal computers and peripherals device.

Revision History	Reason	Date
Rev 0	Initial Release	June.17, 2014

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1 Introduction

1.1 Compliance Statement

The EverPro Technologies Company Ltd. USB3.0 AOC Cable complied with the requirements for a personal computers and peripherals device under Part 15B of the FCC Rules and Regulations

1.2 Test Scope Summary

Tests for radiated and conducted emissions were performed. All measurements were performed according to the 2009 version of ANSI C63.4. The measurement equipment conforms to ANSI C63.2 Specifications for Electromagnetic Noise and Field Strength Instrumentation.

Test Specification	Specific Description	Date Completed	Result	Test location	Modifications (Y/N)
CFR47 Part 15B	Conducted Emissions at the Mains Port	June.13, 2014	Complied	TA Beijing Limited	N
CFR47 Part 15B	Radiated Emissions	June.13, 2014	Complied	TA Beijing Limited	N

1.3 Contract Information

Customer: EverPro Technologies Company Ltd.

4# Guanshan Er Road, Wuhan 430073 P, R, China

Abbreviations

A	A mpere
ac	a lternating c urrent
AM	A mplitude M odulation
Amps	A mpere s
b/s	b its per second
BW	B and W idth
CE	C onducted E mission
cm	c entime t er
CW	C ontinuous W ave
dB	d eci B el
dc	d irect c urrent
EMI	E lectromagnetic I nterference
EUT	E quipment U nder T est
FM	F requency M odulation
G	g iga - prefix for 10^9 multiplier
Hz	H ertz
IF	I ntermediate F requency
k	k ilo - prefix for 10^3 multiplier
LISN	L ine I mpedance S tabilization N etwork
M	M ega - prefix for 10^6 multiplier
m	m eter
μ	m icro - prefix for 10^{-6} multiplier
NB	N arrow b and
QP	Q uasi- P eak
RE	R adiated E missions
RF	R adio F requency
rms	r oot- m ean- s quare
SN	S erial N umber
S/A	S pectrum A nalyzer
V	V olt

2 Equipment Under Test

2.1 EUT Identification

The results obtained relate only to the item(s) tested.

Table 1: Overview of USB3.0 AOC Cable, Equipment Under Test

Model(s) Tested:	EPU3C-A0A0B100M
EUT Specifications:	In the tests the primary power was provided by AC 120V/60Hz
Test Date(s):	June.13, 2014

2.2 EUT Description

Product Name: USB3.0 AOC Cable

Model No. : EPU3C-A0A0B100M

EUT Rated Voltage: AC 120V/60Hz

EUT highest working frequency: 2.5GHz

2.3 Test Configuration

The EverPro Technologies Company Ltd. USB3.0 AOC Cable, Equipment Under Test (EUT), was operated from USB port.

The USB3.0 AOC Cable was configured as below:

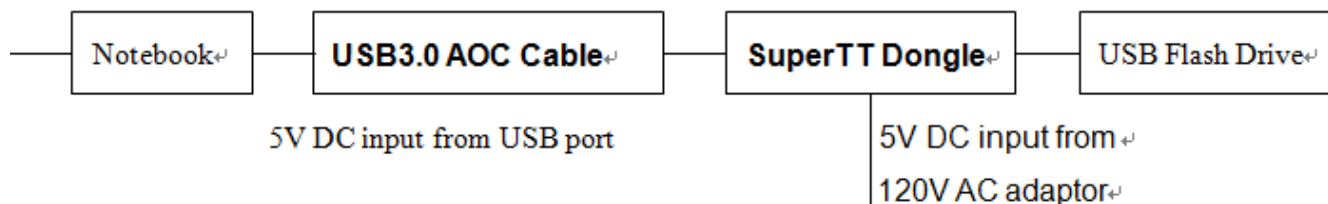


Figure 1: Test Configuration

2.4 Equipment Configuration

The EUT was set up as outlined in Figure 1. The EUT was comprised of the following equipment. (All Modules, PCBs, etc. listed were considered as part of the EUT, as tested.)

Table 2: Equipment Configuration

Slot #	Name / Description	Model Number	Part Number	Serial Number	Revision
1.	USB3.0 AOC Cable	EPU3C-A0A0B100M	/	/	/

2.5 Interface Cables

Table 3: Interface Cables

Port Identification	Connector Type	Cable Length	Shielded (Y/N)	Termination Point
Fiber Cable	USB, Undetachable	100m	N	EUT

2.6 Support Equipment

	Description	Manufacturer	Model	Serial Number	Approved type
1	Notebook	Lenovo	B490	WB13103812	DOC
2	SuperTT Dongle	EverPro	EPU3D02ARSM	/	FCC ID:2ACI6-EPU3D-001
3	Power Adapter	Shenzhen Nalin Elec. Tech. CO., LTD.	NLD200050T1A	/	Verification
4	USB disk	Kingston	DataTraveler 100 G3	/	DOC

2.7 Testing Algorithm

The USB3.0 AOC Cable was operated continuously by normal operating conditions.

2.8 Test Location

Name: TA Beijing Limited

FCC Registration Number: 413514.

Address: Building B-4, No.1, JingHai 3rd Road, BDA East Park, Beijing 100176, China

2.9 EUT Modification

N/A

2.10 Measurements

2.10.1 Measurement Method

All measurements herein were performed according to the 2009 version of ANSI C63.4. The measurement equipment conforms to ANSI C63.2 Specifications for Electromagnetic Noise and Field Strength Instrumentation. Calibration checks are made periodically to verify proper performance of the measuring instrumentation.

2.11 Measurement Uncertainty

All results reported herein relate only to the equipment tested. The basis for uncertainty calculation uses ANSI/NCSL Z540-2-1997 with a type B evaluation of the standard uncertainty. Elements contributing to the standard uncertainty are combined using the method described in Equation 1 to arrive at the total standard uncertainty. The standard uncertainty is multiplied by the coverage factor to determine the expanded uncertainty which is generally accepted for use in commercial, industrial, and regulatory applications and when health and safety are concerned (see Equation 2). A coverage factor was selected to yield a 95% confidence in the uncertainty estimation.

Equation 1: Standard Uncertainty

$$u_c = \pm \sqrt{\frac{a^2}{div_a^2} + \frac{b^2}{div_b^2} + \frac{c^2}{div_c^2} + \dots}$$

where u_c = standard uncertainty

a, b, c, \dots = individual uncertainty elements

div_a, b, c = the individual uncertainty element divisor based on the probability distribution

divisor = 1.732 for rectangular distribution

divisor = 2 for normal distribution

divisor = 1.414 for trapezoid distribution

Equation 2: Expanded Uncertainty

$$U = ku_c$$

where U = expanded uncertainty

k = coverage factor

$k \leq 2$ for 95% coverage (ANSI/NCSL Z540-2 Annex G)

u_c = standard uncertainty

The measurement uncertainty complies with the maximum allowed uncertainty from CISPR 16-4-2. Measurement uncertainty is not used to adjust the measurements to determine compliance. The expanded uncertainty values for the various scopes in the WLL accreditation are provided in Table 4 below.

Table 4: Expanded Uncertainty List

Scope	Standard(s)	Band	Expanded Uncertainty
Uncertainty for Conduction emission test	FCC Part 15	9 KHz-150 KHz	3. 62dB
		150 KHz-30 MHz	3. 20dB
Uncertainty for Radiation Emission test in 3m chamber	FCC Part 15	30MHz-1GHz	4. 84dB
		1GHz-3GHz	4. 7dB
		3GHz-6GHz	4. 4dB

3 Test Results

3.1 Conducted Emissions

3.1.1 Requirements

Test Arrangement: Table Top

Compliance Standard: FCC Part 15B

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.

3.1.2 Test Equipment

Item	Equipment Description	Model	Serial Num	Calibration Period	Calibration Due Date	Calibrated By	Manufacturer
1	EMI Receiver	ESIB26	100301	1 year	2015/3/27	TMC	R&S
2	LISN	ENV216	101094	1year	2015/3/27	TMC	R&S

3.1.3 Test Procedure

The EUT was placed on a non-metallic table, 80cm above the ground plane. The EUT Power connected to the power mains through a line impedance stabilization network (L.I.S.N. #1). This provided a 50-ohm coupling impedance for the EUT (Please refer to the block diagram of the test setup and photographs). The other peripheral devices power cord connected to the power mains through a line impedance stabilization network (L.I.S.N.#2).Both sides of power line were checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipments and all of the interface cables were changed according to ANSI C63.4: 2009 on conducted Emission test.

The bandwidth of the R&S Test Receiver ESHS20 was set at 9kHz.

The frequency range from 150kHz to 30MHz is checked.

3.1.4 Test Data

The EUT USB3.0 AOC Cable complied with the Conducted Emissions requirements. Table 5 provides the test results for Conducted Emissions.

Test Engineer(s): Han Min

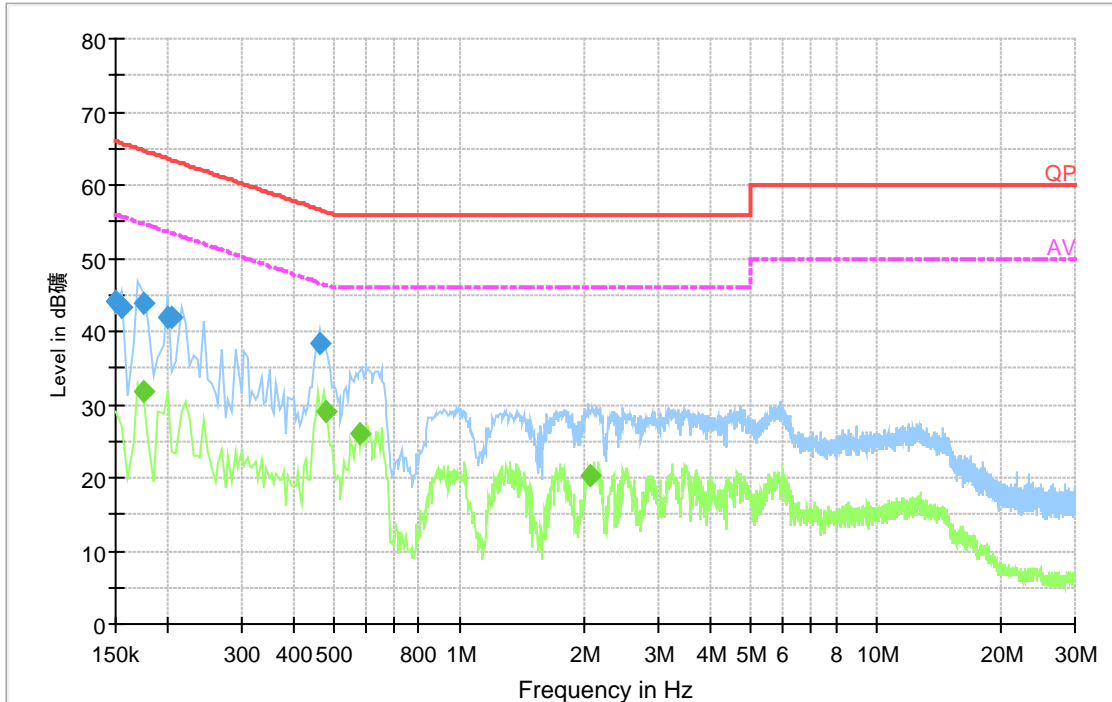
Test Date(s): Jun.13, 2014

Test Location: TA Beijing Limited

Table 5: Conducted Emissions Test Data

L

ENV216 Main Voltage Class B_L



Final Result 1

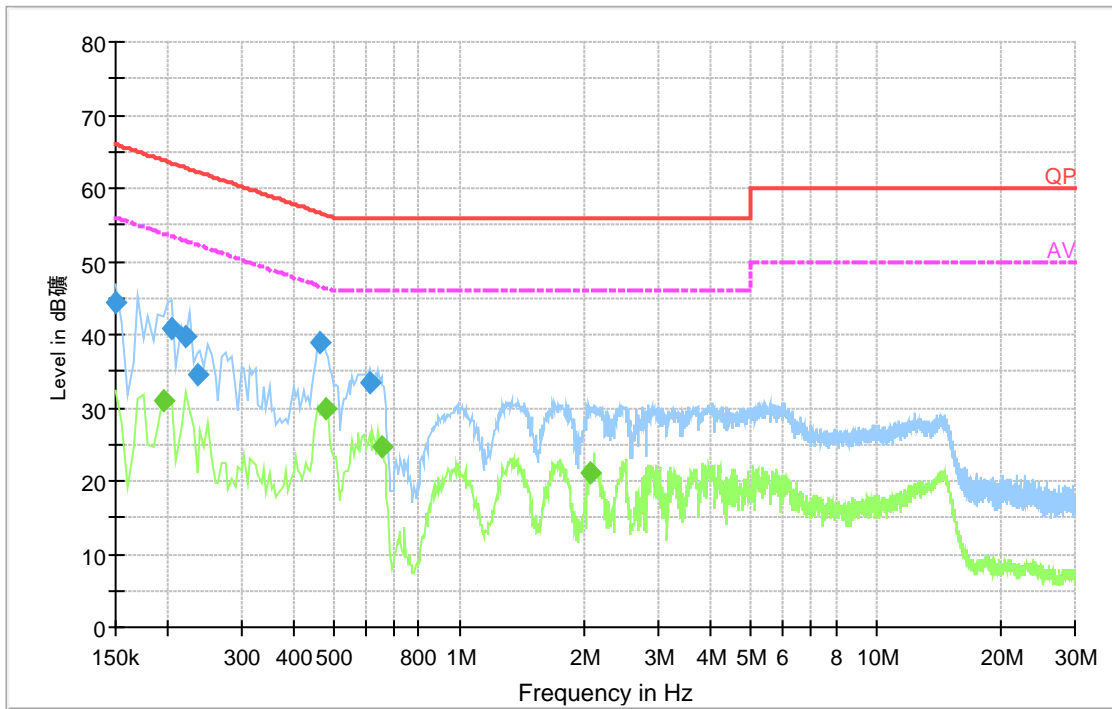
Frequency (MHz)	QuasiPeak (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.150000	44.1	1000.0	0.200	On	L1	10.0	21.9	66.0
0.155000	43.2	15000.0	9.000	On	L1	10.1	22.5	65.7
0.175000	43.8	15000.0	9.000	On	L1	10.2	20.9	64.7
0.200000	42.0	15000.0	9.000	On	L1	9.9	21.6	63.6
0.205000	41.8	15000.0	9.000	On	L1	9.9	21.6	63.4
0.465000	38.3	15000.0	9.000	On	L1	10.1	18.3	56.6

Final Result 2

Frequency (MHz)	Average (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.175000	31.7	15000.0	9.000	On	L1	10.2	23.1	54.7
0.480000	29.0	15000.0	9.000	On	L1	10.1	17.3	46.3
0.580000	25.9	15000.0	9.000	On	L1	10.1	20.1	46.0
2.065000	20.2	15000.0	9.000	On	L1	9.8	25.8	46.0

N

ENV216 Main Voltage Class B_N



Final Result 1

Frequency (MHz)	QuasiPeak (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.150000	44.4	1000.0	0.200	On	N	10.2	21.6	66.0
0.205000	40.9	15000.0	9.000	On	N	9.9	22.5	63.4
0.220000	39.7	15000.0	9.000	On	N	9.9	23.2	62.8
0.235000	34.6	15000.0	9.000	On	N	9.9	27.7	62.3
0.465000	39.0	15000.0	9.000	On	N	10.1	17.6	56.6
0.610000	33.5	15000.0	9.000	On	N	10.0	22.5	56.0

Final Result 2

Frequency (MHz)	Average (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.195000	31.0	15000.0	9.000	On	N	10.0	22.8	53.8
0.480000	29.8	15000.0	9.000	On	N	10.1	16.5	46.3
0.650000	24.7	15000.0	9.000	On	N	10.0	21.3	46.0
2.070000	21.0	15000.0	9.000	On	N	9.8	25.0	46.0

3.2 Radiated Emissions

3.2.1 Requirements

Test Arrangement: Table Top

Compliance Standard: FCC Part 15B

Test Limits (Class B)				
Frequency of Emission (MHz)	Radiated Limit			
	Unit(μV/m)		Unit(dBμV/m)	
30-88	100		40	
88-216	150		43.5	
216-960	200		46	
Above 960	500		54	
Above 1000	AV	PK	AV	PK
	500	5000	54	74

3.2.2 Test Equipment

For frequency range 30MHz~3GHz (At Anechoic Chamber)

Item	Equipment Description	Model	Serial Num	Calibration Period	Calibration Due Date	Calibrated By	Manufacturer
1	EMI Receiver	ESIB26	100301	1 year	2015/3/27	TMC	R&S
2	BiLog Antenna	HL562	100488	3 years	2015/2/15	NIM	R&S
3	30MHz~3GHz Pre-amplifier	SCU03	10005	\	\	\	R&S
4	Filters Array	TS-Filt	\	\	\	\	R&S
5	Switches Array	TS-RSP	100241	\	\	\	R&S
6	Multi-Device Controller	2090	00049393	\	\	\	ETS-Lindgren

For frequency range 3 – 13GHz (At Anechoic Chamber)

Item	Equipment Description	Model	Serial Num	Calibration Period	Calibration Due Date	Calibrated By	Manufacturer
1	EMI Receiver	ESIB26	100301	1 year	2015/3/27	TMC	R&S
2	Double Ridge Guide Horn Antenna	EMCO 3117	00056645	3 years	2015/2/15	NIM	ETS-Lindgren
3	3GHz~18GHz Pre-amplifier	AFS42-00101800-25-S-42	1078388	\	\	\	R&S
4	Filters Array	TS-Filt	\	\	\	\	R&S
5	Switches Array	TS-RSP	100241	\	\	\	R&S
6	Multi-Device Controller	2090	00049393	\	\	\	ETS-Lindgren

3.2.3 Test Procedure

The requirements of FCC Part 15B call for the EUT to be placed on an 80 cm(100cm for 9kHz-30MHz) high 1 X 1.5 meters non-conductive motorized turntable for radiated testing on a 3-meter chamber. The emissions from the EUT were measured continuously at every azimuth by rotating the turntable. Bi-conical and log periodic broadband antennas were mounted on an antenna mast to determine the height of maximum emissions. The height of the antenna was varied between 1 and 4 meters. The output of the antenna was connected to the input of the spectrum analyzer and the emissions in the frequency range of 9 KHz to 1 GHz were measured. The peripherals were placed on the table in accordance with ANSI C63.4-2003. Cables were varied in position to produce maximum emissions. Both the horizontal and vertical field components were measured.

The output from the antenna was connected, via a preamplifier, to the input of the spectrum analyzer. The detector function was set to quasi-peak or peak, as appropriate. Above 1GHz average measurement are recorded. The measurement bandwidth of the spectrum analyzer system was set to at least 120 kHz, with all post-detector filtering no less than 10 times the measurement bandwidth. Frequencies above 1GHz were performed using a measurement bandwidth of 1MHz with a video bandwidth setting of 10 Hz for the average measurement.

3.2.4 Radiated Data Reduction and Reporting

To convert the raw spectrum analyzer radiated data into a form that can be compared with the FCC limits, it is necessary to account for various calibration factors that are supplied with the antennas and other measurement accessories. These factors are included into the antenna factor (AF) column of the table and in the cable factor (CF) column of the table. The AF (in dB/m) and the CF (in dB) is algebraically added to the raw Spectrum Analyzer Voltage in dBμV to obtain the Radiated Electric Field in dBμV/m. This logarithm amplitude is converted to a linear amplitude, then compared to the FCC limit. Example:

Spectrum Analyzer Voltage: VdBμV

Antenna Correction Factor: dB/m

Electric Field: $Ed_{\mu V/m} = V_{dB\mu V} + AF_{dB/m} + CF_{dB} - G_{dB}$

To convert to linear units of measure: $Ed_{BV/m/20} \text{ Inv log}$

3.2.5 Test Data

The EUT Hair removal & rejuvenation instrument complied with the Radiated Emissions requirements. Table 6 provides the test results for radiated emissions.

Test Engineer(s): Han Min

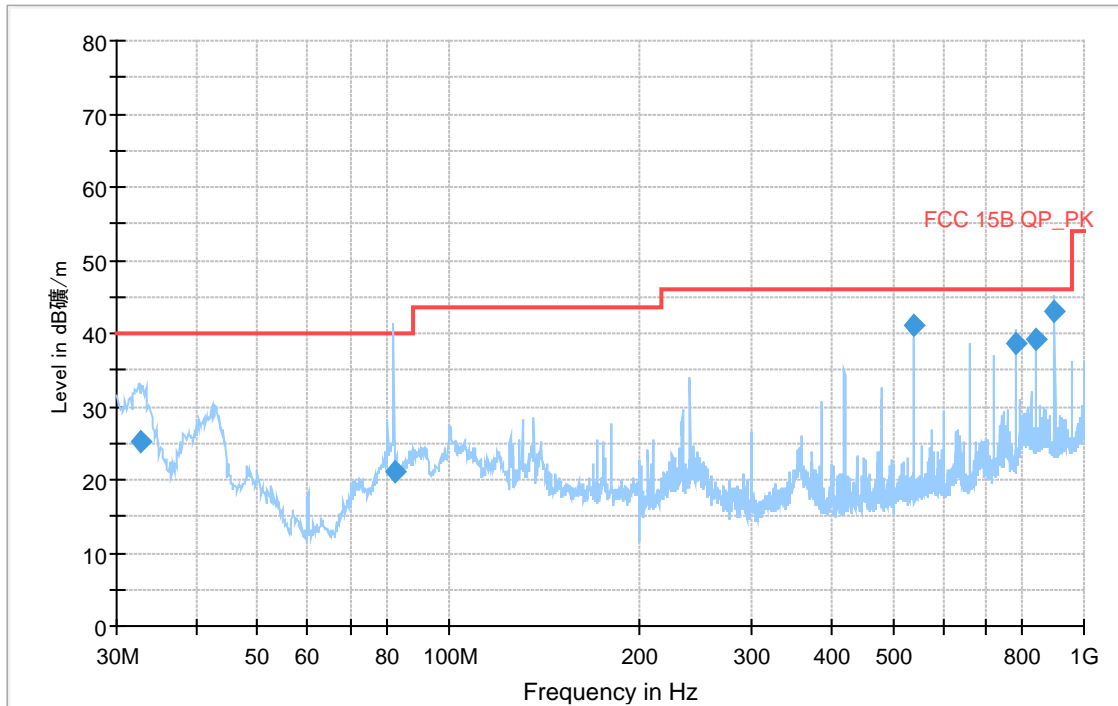
Test Date(s): Jun.13, 2014

Test Location: TA Beijing Limited

Table 6: Radiated Emission Test Data

30MHz – 1GHz

FCC 15B Met

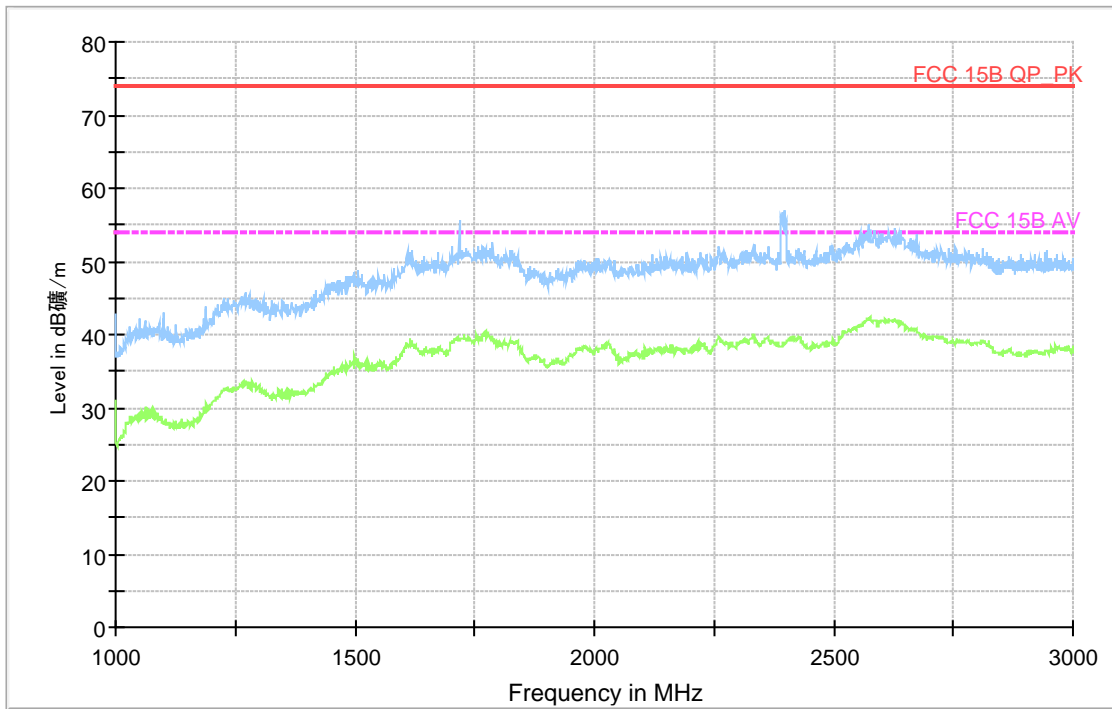


Final Result 1

Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
32.685050	25.3	15000.0	120.000	100.0	V	276.0	-18.3	14.70	40.00
82.303808	21.0	15000.0	120.000	100.0	V	78.0	-27.1	19.00	40.00
539.850160	41.0	15000.0	120.000	100.0	V	-11.0	-16.8	5.00	46.00
780.029920	38.7	15000.0	120.000	100.0	H	129.0	-12.9	7.30	46.00
840.009760	39.1	15000.0	120.000	100.0	H	61.0	-11.2	6.90	46.00
900.040000	43.1	15000.0	120.000	100.0	H	79.0	-10.3	2.90	46.00

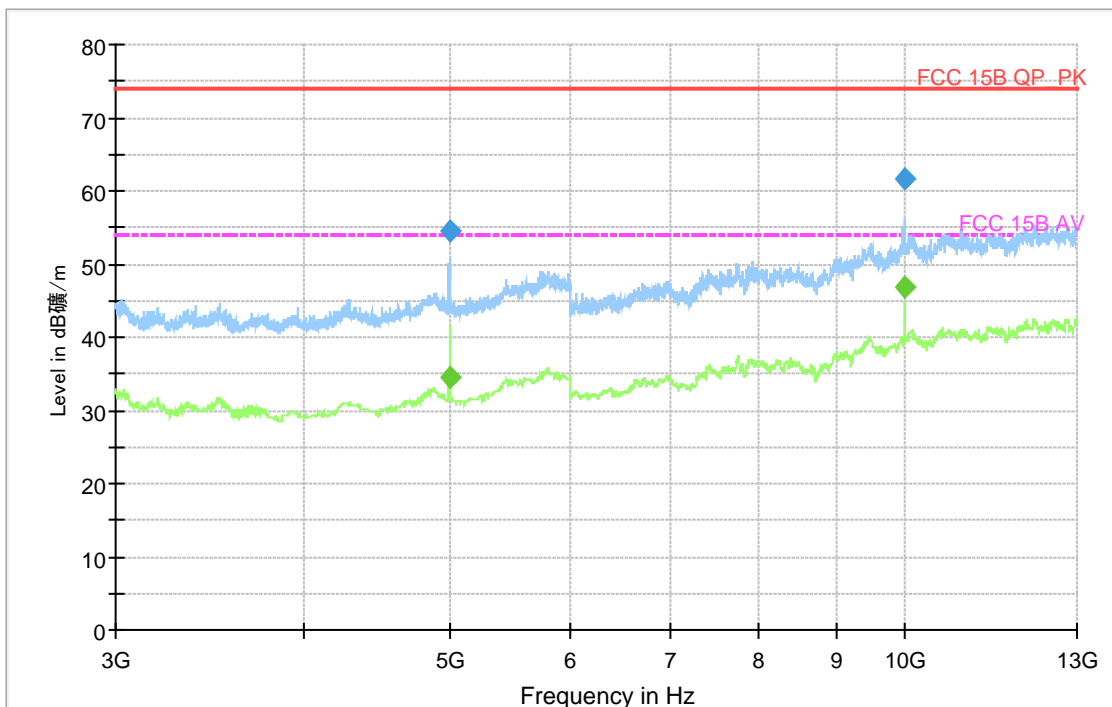
1 – 3GHz

FCC 15B ABS



3 – 13GHz

FCC 15B ABS



Final Result 1

Frequency (MHz)	MaxPeak (dBμV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
4999.498597	54.6	1000.0	1000.000	200.0	V	202.0	2.8	19.40	74.00
9998.100000	61.7	1000.0	1000.000	100.0	V	292.0	20.3	12.30	74.00

Final Result 2

Frequency (MHz)	Average (dBμV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
4999.298597	34.6	1000.0	1000.000	100.0	V	180.0	2.8	19.40	54.00
10000.000000	47.0	1000.0	1000.000	100.0	V	270.0	20.4	7.00	54.00

4 Information to User

The following warning or similar statement shall be provided in a conspicuous location in the operator's manual so that the user of a digital device is aware of its interference potential. Additional information about corrective measures may also be provided to the user at the manufacturer's option.

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

Reorient or relocate the receiving antenna

Increase the separation between the equipment and receiver

Connect the equipment into an outlet on a circuit different from that to which the receiver is connected

Consult the dealer or an experienced radio/TV technician for help

The instruction manual for a digital device that is separately marketed shall also include sufficient information to insure that the complete system is capable of complying with the requirements for a digital device. The manual should also caution the user that changes or modifications not expressly approved by the manufacturer could void the user's authority to operate the equipment. Finally, the manual should instruct the user to use any special accessories, i.e. shielded cables, necessary for compliance with the standards.

In cases where the manual is provided only in a form other than paper, such as on a computer disk or over the Internet, the information required above may be included in the manual in that alternative form, provided that the user can be reasonably expected to have the capability to access information in that form.

-----The End-----