

FCC Test Report

FCC EVALUATION REPORT	
Project Reference No.	182932
Product	Interactive Whiteboard
Brand Name	
Model	JC850-100
Alternate Model	JC850-100: Dimensions: 2135*1330 102.0 /Sensor technology: Electromagnetic induction/ Positioning accuracy: 1mm JC850-99: Dimensions: 1745*1275 85.1 /Sensor technology: Electromagnetic induction/ Positioning accuracy: 1mm JC850-88: Dimensions: 1600*1170 78 /Sensor technology: Electromagnetic induction/ Positioning accuracy: 1mm JC850-60: Dimensions: 1215*615 100 /Sensor technology: Electromagnetic induction/ Positioning accuracy: 1mm JC850-F: Dimensions: 1735*1235 83.7 /Sensor technology: Electromagnetic induction/ Positioning accuracy: 1mm JC850-G: Dimensions: 1735*1235 83.7 /Sensor technology: Electromagnetic induction/ Positioning accuracy: 1mm
Tested according to	FCC Rules and Regulations Part 15 Subpart B Class B 2010, ANSI C63.4-2003

Tested in period	2011-09-11 to 2011-10-11
Issued date	2011-10-19
Name and address of the Test House	 Nemko Shanghai Ltd. 7F, No.1 Building, No. 2007 Hong Mei Road, Xuhui district, Shanghai, P.R. China Phone : +86 21 5445 3132 Fax : +86 21 5445 3215
Tested by	 Susan Zhou
Verified by	 Harry Zhao
	2011-10-19 date

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1. Client Information

1.1 Applicant

Company Name: **Shanghai HSJC High-tech Co., Ltd**
Company Address: **Bldg.D-817, No.4299 Jindu Road, Minhang District, Shanghai, China**

1.2 Manufacturer

Company Name: **Shanghai HSJC High-tech Co., Ltd**
Company Address: **Bldg.D-817, No.4299 Jindu Road, Minhang District, Shanghai, China**

Factory Name: **Shenzhen Linkun Digital Technology Co., Ltd**
Factory Address: **4th Floor, building B1, JunFeng Industrial Zone, ChongQing Road, HePing Village, Fuyong Town, BaoAn District, Shenzhen, China**

1.3 Scope

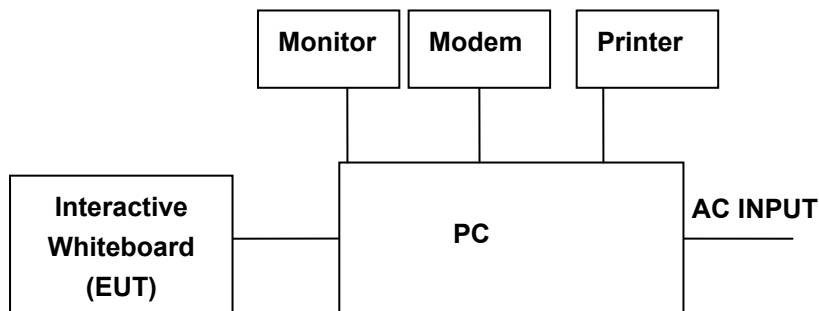
•Measurement and determination of electromagnetic emissions (EME) of radio frequency devices including intentional and/or unintentional radiators for compliance with the technical rules and regulations of the Federal Communications Commission under FCC part 15.

2. Equipment under Test (EUT)

2.1 Identification of EUT

Category:	Interactive Whiteboard
Model Names:	JC850-100 JC850-100: Dimensions: 2135*1330 102.0 /Sensor technology: Electromagnetic induction/ Positioning accuracy: 1mm JC850-99: Dimensions: 1745*1275 85.1 /Sensor technology: Electromagnetic induction/ Positioning accuracy: 1mm JC850-88: Dimensions: 1600*1170 78 /Sensor technology: Electromagnetic induction/ Positioning accuracy: 1mm
Alternate model:	JC850-60: Materials is different from another except JC850-100/Sensor technology: Electromagnetic induction/ Positioning accuracy: 1mm JC850-F: Dimensions: 1735*1235 83.7 /Sensor technology: Electromagnetic induction/ Positioning accuracy: 1mm JC850-G: Dimensions: 1735*1235 83.7 /Sensor technology: Electromagnetic induction/ Positioning accuracy: 1mm
Brand name:	
Technical data (Rating, etc.):	USB DC 5V, <0.6W
USB Cable:	2m, shielded, with two ferrite cores (model:0431164951; manufacturer: Fair-Rite; 6cm distance fro the USB port)
USB Extension Cable:	0.5m, shielded, with two ferrite cores (model:0431164951; manufacturer: Fair-Rite; 5cm distance fro the USB port)

2.2 Setup drawing



2.3 Support Equipment List

Name	Brand Name	Model Name	Serial Number	Certification
Desk PC	DELL	OPTIPLEX 330	6XG2B2X	FCC DoC
LCD Monitor	DELL	E198PFI	CN-OTP211-72872-7B5-1PPH	FCC DoC
Mouse	DELL	MPC5UO	H0204KS4	FCC DoC
Keyboard	DELL	L100	CN0RH656658907CK015E	FCC DoC
Print	EPSON	B162A	EK69003616	FCC DoC
Modem	N/A	Super6000	KX0120091100444	FCC DoC

2.3 Model differences

All the models are identical except for the size of the white board.

So the maximum one JC850-100 is chosen to perform the test.

2.4 Additional Information Related to Testing

TM 1 120V AC 60Hz

Continuously writing on the white board, data is transmitted to PC through USB cable

EUT is powered by USB 5V through USB cable

3. General Test Conditions

3.1 Location

Audix Technology (Shanghai) Co., Ltd.

FCC Registration No.: 91789

Nemko EMC Lab Registration ELA – 603

Address: 3F 34Bldg., 680 Guiping Rd., Shanghai, China

Note: All tests are witnessed by NEMKO engineer

3.2 Operating Environment

All tests and measurements were performed in a shielded enclosure or a controlled environment suitable for the tests conducted. The climatic conditions in the test area are automatically controlled and recorded continuously.

Parameters	Recording during test	Accepted deviation
Ambient temperature	20-25°C	15 – 35 °C
Relative humidity	45-55%	30 - 60%
Atmospheric pressure	101.2 kPa -101.3kPa	86-106kPa

3.3 Operating During Test

- The PC is operated at 120V~ 60Hz during all tests.
- EUT is USB 5V powered by USB cable hosted in Desk PC.
- Run software “banbantong” supplied by the manufacturer.
- EUT is continuously writing with pen and communicating with PC.

3.4 Test Equipment

The test equipments used in testing are calibrated on a regular basis. For most of the testing equipments accredited calibration is conducted once a year. For certain equipment the calibration interval is longer. Between the calibrations all test equipment are controlled and verified on a regular basis. The test equipments used are defined in each test section of this report.

4. Measurement Uncertainty

The Measurement Uncertainties stated were calculated in accordance with the requirements of NIST Technical Note 1297 with the confidence level of 95 %.

No.	Item	Uncertainty	Remark
1	Conducted Emission Test	2.24dB	
2	Radiated Emission Test	3.46dB	3m chamber



FCC ID: A68JC850-XXX

Reference No.: 182932

5. Conducted Emission (150 kHz to 30 MHz)

5.1 Test Procedure

Since the floor-standing EUT was typically installed with its base in direct electrical contact with, connected to, a grounded metal floor or grid, the EUT is placed directly on, site (or turntable) reference ground plane in a manner representative of this contact or connection.

The supported PC system 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. This provided a 50-ohm coupling impedance for the EUT (Please refer to the test setup photographs). The other peripheral devices power cord connected to the power mains through another line impedance stabilization network.

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 C63.4-2003 on conducted Emission test.

The bandwidth of test receiver is set at 9kHz. The frequency range from 150kHz to 30MHz is checked. The test result are reported as below.

5.2 Measurement Equipment

	Equipment	Last Calibration	Type	Equipment No.	Manufacturer
☒	EMI Test Receiver	2011-04-28	ESCI	100658	R&S
☒	AMN	2011-04-28	ENV216	100065	R&S

5.3 Test Result

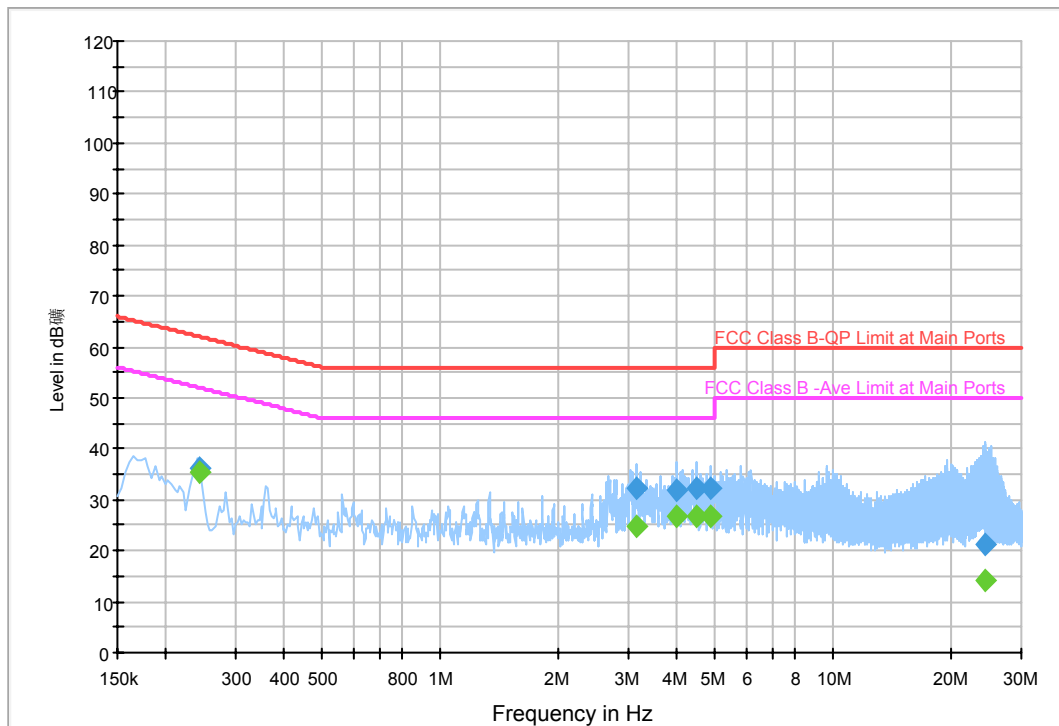
Connect mode	Power Line	Test Data	Test Result
TM1	L	Diagram 001	Pass
	N	Diagram 002	Pass

NOTES:

1. Measurements using CISPR quasi-peak mode & average mode.
2. All modes of operation were investigated and the worst -case emission are reported. See attached Plots.
3. Measurement =Reading + LISN Factor + Cable Loss
4. LINE: L =Line, N = Neutral
5. The limit for Class B device is on the FCC Part section 15.107(a).

5.3.1 Diagram 001

FCC Class B ITE EMI_ENV216 LISN Auto Test



Final Result (QP)

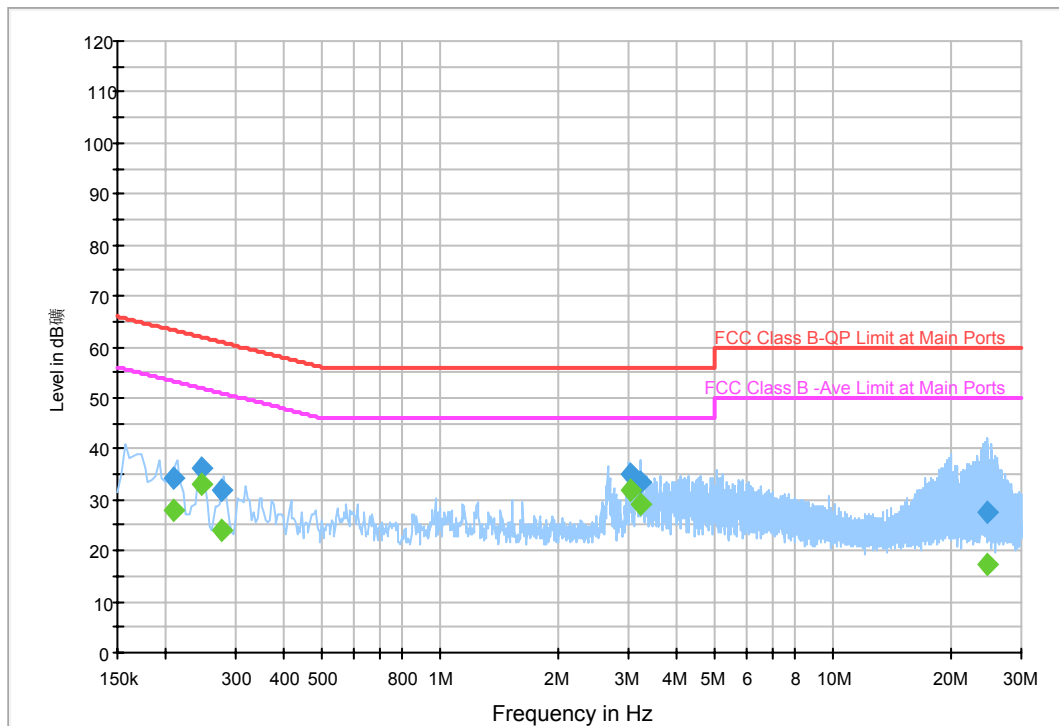
Frequency (MHz)	QuasiPeak (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.243050	36.3	1000.000	9.000	Off	L1	9.6	25.7	62.0	
3.134231	32.2	1000.000	9.000	Off	L1	9.7	23.8	56.0	
3.992956	32.0	1000.000	9.000	Off	L1	9.7	24.0	56.0	
4.466556	32.4	1000.000	9.000	Off	L1	9.7	23.6	56.0	
4.847412	32.1	1000.000	9.000	Off	L1	9.7	23.9	56.0	
24.320538	21.3	1000.000	9.000	Off	L1	10.1	38.7	60.0	

Final Result (AV)

Frequency (MHz)	Average (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.244050	35.2	1000.000	9.000	Off	L1	9.6	16.8	52.0	
3.134231	24.8	1000.000	9.000	Off	L1	9.7	21.2	46.0	
3.992956	26.6	1000.000	9.000	Off	L1	9.7	19.4	46.0	
4.466556	26.9	1000.000	9.000	Off	L1	9.7	19.1	46.0	
4.847412	26.7	1000.000	9.000	Off	L1	9.7	19.3	46.0	
24.325538	14.2	1000.000	9.000	Off	L1	10.1	35.8	50.0	

5.3.2 Diagram 002

FCC Class B ITE EMI_ENV216 LISN Auto Test



Final Result (QP)

Frequency (MHz)	QuasiPeak (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.208931	34.3	1000.000	9.000	Off	N	9.5	28.9	63.2	
0.246512	36.1	1000.000	9.000	Off	N	9.5	25.8	61.9	
0.276094	32.1	1000.000	9.000	Off	N	9.5	28.8	60.9	
3.020100	35.0	1000.000	9.000	Off	N	9.7	21.0	56.0	
3.224050	33.3	1000.000	9.000	Off	N	9.7	22.7	56.0	
24.698662	27.6	1000.000	9.000	Off	N	10.1	32.4	60.0	

Final Result (AV)

Frequency (MHz)	Average (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.208931	28.1	1000.000	9.000	Off	N	9.5	25.1	53.2	
0.246512	33.2	1000.000	9.000	Off	N	9.5	18.7	51.9	
0.276094	24.1	1000.000	9.000	Off	N	9.5	26.8	50.9	
3.019100	31.9	1000.000	9.000	Off	N	9.7	14.1	46.0	
3.228050	29.0	1000.000	9.000	Off	N	9.7	17.0	46.0	
24.698662	17.5	1000.000	9.000	Off	N	10.1	32.5	50.0	

6. Radiated Electromagnetic Disturbances

6.1 Test Procedure

Since the floor-standing EUT is typically installed with its base in direct electrical contact with, connected to, a grounded metal floor or grid, the EUT is placed directly on, site (or turntable) reference ground plane in a manner representative of this contact or connection.

An antenna was located 3m from the EUT on an adjustable mast.

The EUT were rotated 0 to 360 degree and the antenna height was varied between 1m and 4m in order to maximize the emission. Measurements in both horizontal and vertical polarities were made and the data was recorded. The test result are reported as below.

RBW=120 kHz; VBW=300KHz. The frequency range from 30MHz to 1000MHz is checked.

6.2 Measurement Equipment

	Equipment	Last Calibration	Type	Serial No.	Manufacturer
☒	Test Receiver	2011-3-7	ESVS10	844594/001	R&S
☒	Preamplifier	2011-3-19	8447D	2944A10548	Agilent
☒	Bi-log Antenna	2010-12-1	CBL6112D	23192	TESEQ
☒	Spectrum	2011-3-19	E7405A	MY45106600	Agilent

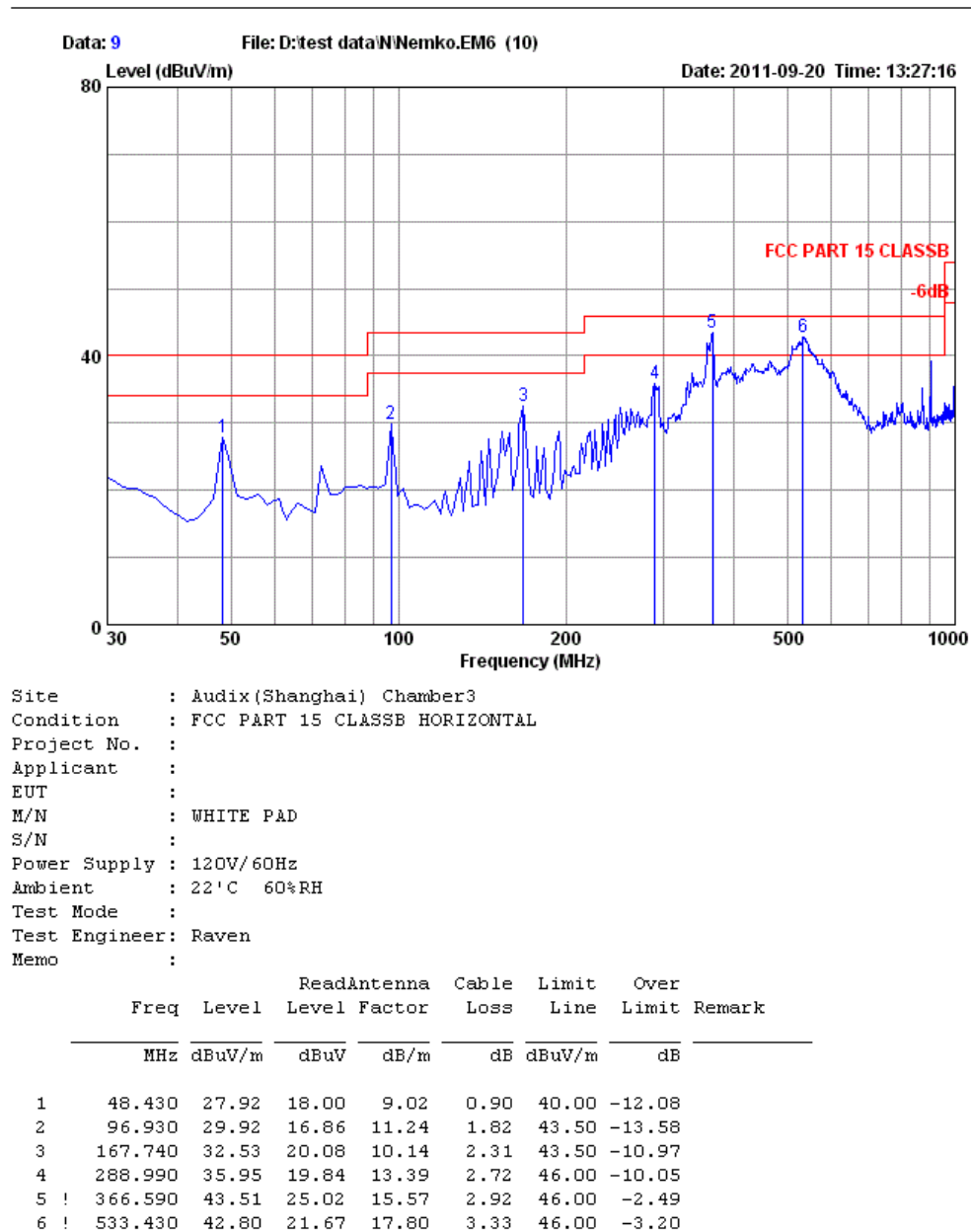
6.3 Test Result

Connect mode	Remark	Antenna Polarity	Test Data	Test Result
TM1	30MHz~1GHz, 3m test distance	H	Diagram 003	Pass
		V	Diagram 004	Pass

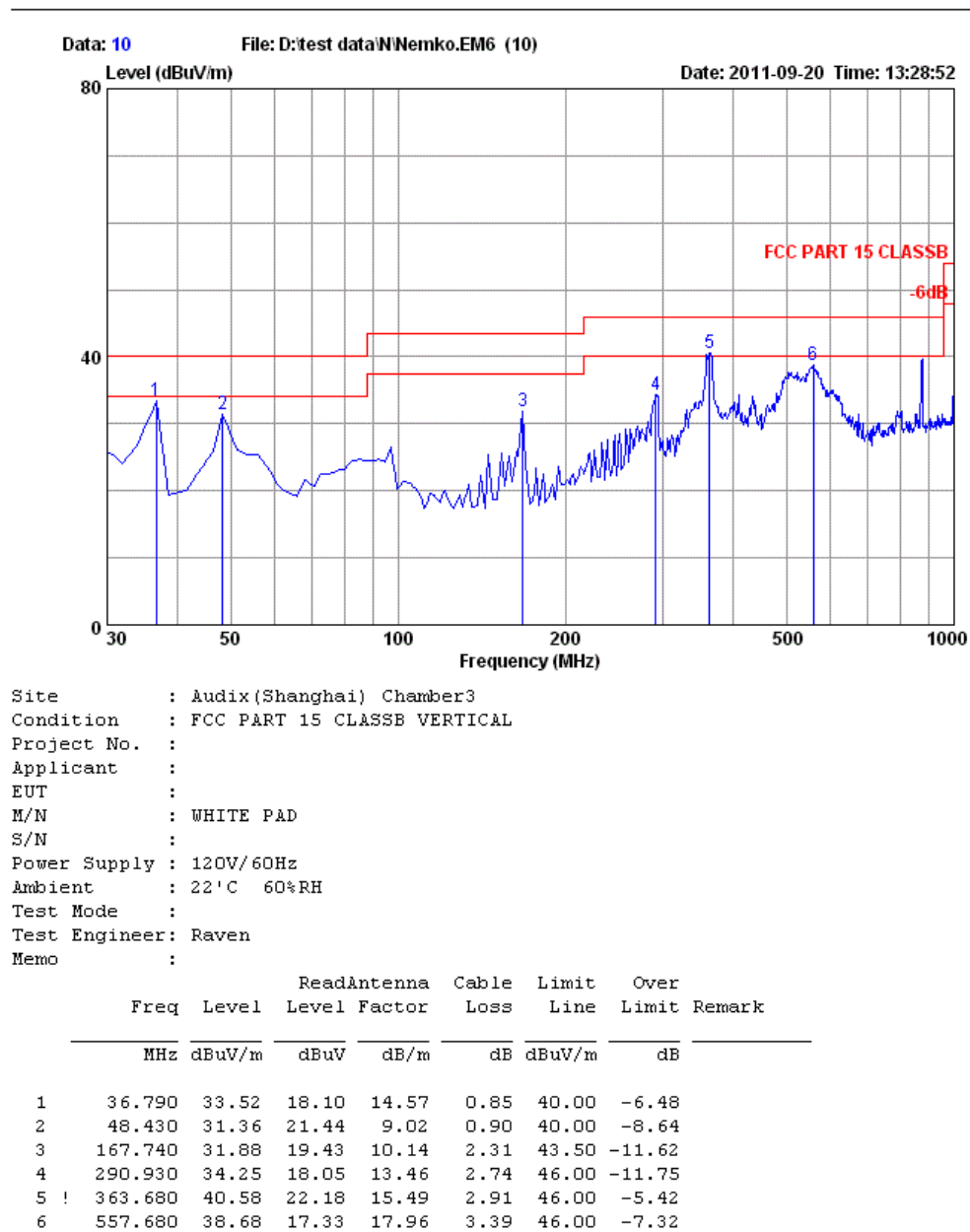
NOTES:

1. All modes were measured and the worst case emission was reported.
2. H =Horizontal V=Vertical
3. Measurement = Reading + Antenna Factor + Cable Loss- Amp Factor
4. Measurements using CISPR quasi-peak mode.
5. The limit for Class B device is on the FCC Part section 15.109(a).
6. The internal frequency is 24MHz, lower than 108MHz ,so the test above 1GHz is no application

6.3.1 Diagram 003



6.3.2 Diagram 004





Appendix A Sample Label

Labelling Requirements

The sample label shown shall be permanently affixed at a conspicuous location on the device and be readily visible to the user at the time of purchase.

*** The following paragraph specified in the user manual.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Use of shielded cable with ferrite cores is required to comply with Class B limits in Subpart B of Part 15 of the FCC rules.

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