



## FCC PART 15 B

## TEST REPORT

For

### Hena Digital Technology (Shenzhen) Co., Ltd.

3F, South Tower, Jiuzhou Electric Building, Southern No, 12Rd High-tech Industrial Park, Nanshan District, Shenzhen, China

**FCC ID: M7C-PAD11641IWL**

<b>Report Type:</b> Original Report	<b>Product Type:</b> Netbook
<b>Test Engineer:</b> <u>Rocky Xiao</u> <i>Rocky Xiao</i>	
<b>Report Number:</b> <u>RDG160308003-00A</u>	
<b>Report Date:</b> <u>2016-03-25</u>	
<b>Reviewed By:</b> <u>Dean Liu</u> RF Engineer	<i>Dean Liu</i>
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Note: This test report is prepared for the customer shown above and for the device described herein. It may not be duplicated or used in part without prior written consent from Bay Area Compliance Laboratories Corp. (Dongguan).

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## GENERAL INFORMATION

### Product Description for Equipment Under Test (EUT)

The *Hena Digital Technology (Shenzhen) Co., Ltd.*'s product, model number: *PAD11641iWL*(*FCC ID: M7C-PAD11641IWL*) (the "EUT") in this report was a *Netbook*, which was measured approximately: 24 cm (L) x 20 cm (W) x 1.9 cm (H), rated input voltage: DC 3.7V rechargeable Li-ion battery or DC5.0V charging from adapter. The highest operating frequency is 2480 MHz.

Adapter information:

Model: TEKA018-0502500UK

Input: AC100-240V, 50/60 Hz, 0.5A

Output: DC5.0V, 2.5A

*Note: The series product, models PAD11641iWL, CB116, VB116, GB116, DB116, QB116, SB116, KB116, EB116 are electrically identical, the differences between them is model name, we selected PAD11641iWL for fully testing, the details was explained in the attached declaration letter.*

*All measurement and test data in this report was gathered from production sample serial number: 1600308003 (Assigned by BACL, Dongguan). The EUT was received on 2016-03-08.*

### Objective

This test report is prepared on behalf of *Hena Digital Technology (Shenzhen) Co., Ltd.* in accordance with Part 2, Subpart J, and Part 15-Subparts A and B of the Federal Communications Commission's rules.

The objective of the manufacturer is to determine the compliance of EUT with FCC Part 15 B Class B.

### Related Submittal(s)/Grant(s)

FCC Part15C DTS submissions with FCC ID: M7C-PAD11641IWL.

FCC Part 15C DSS submissions with FCC ID: M7C-PAD11641IWL.

### Test Methodology

All measurements contained in this report were conducted with ANSI C63.4-2014, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9 kHz to 40 GHz.

All radiated and conducted emissions measurement was performed at Bay Area Compliance Laboratories Corp. (Dongguan).

### Test Facility

The Test site used by Bay Area Compliance Laboratories Corp. (Dongguan) to collect test data is located on the No.69 Pulongcun, Puxinhu Industrial Zone, Tangxia, Dongguan, Guangdong, China

Test site at Bay Area Compliance Laboratories Corp. (Dongguan) has been fully described in reports submitted to the Federal Communications Commission (FCC). The details of these reports have been found to be in compliance with the requirements of Section 2.948 of the FCC Rules on February 06, 2015.

The Federal Communications Commission has the reports on file and is listed under FCC Registration No.: 273710. The test site has been approved by the FCC for public use and is listed in the FCC Public Access Link (PAL) database.

## SYSTEM TEST CONFIGURATION

### Description of Test Configuration

The system was configured for testing in a typical fashion (as normally used by a typical user). Per retest, the full load mode was the worst case and reported in the report.

In the full load mode, the software: 'winthrax.exe' was exercised to transmitting and receiving data with SD card and Hard Disk, pinging the network via WIFI link, and playing video.

### EUT Exercise Software

The software 'winthrax.exe' was used during test.

### Equipment Modifications

No modification was made to the EUT tested.

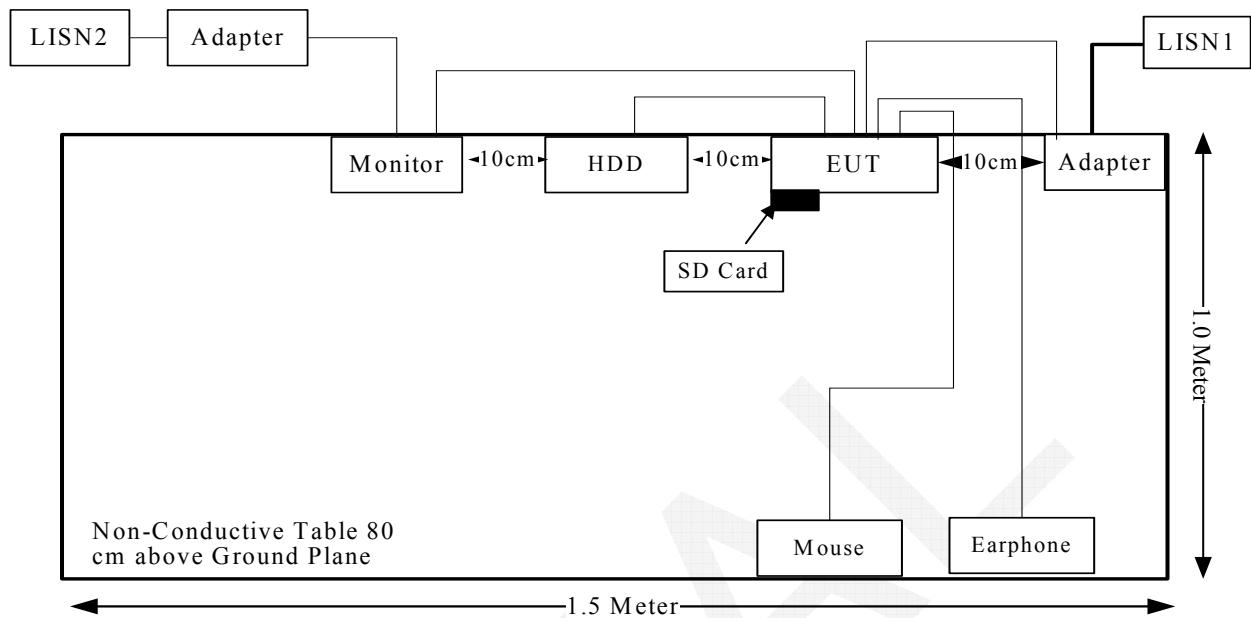
### Local Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
TOSHIBA	Hard Disk	v63700-A	7271TGZ1TSJ2
DELL	Mouse	MO56UOA	F0Y02P7Y
SAMSUNG	Monitor	S22C330H	ZXDCHTHD101491K
VIWA	Earphone	N/A	N/A
SAMSUNG	SD Card	8G	N/A

### Support Cable List and Details

Cable Description	Shielding Type	Ferrite Core	Length (m)	From	To
Mouse Cable	yes	No	1.8	USB Port of EUT	Mouse
HDMI Cable	Yes	Yes	0.8	HDMI Port of EUT	Monitor
USB Cable	No	No	0.4	USB Port of EUT	HDD
Earphone	No	No	1.1	Audio Port of EUT	Earphone
DC Cable	No	NO	0.85	Adapter	EUT

## Configuration of Test Setup



## **SUMMARY OF TEST RESULTS**

<b>FCC Rules</b>	<b>Description of Test</b>	<b>Results</b>
§15.107	Conducted Emissions	Compliance
§15.109	Radiated Emissions	Compliance

## FCC§15.107 - CONDUCTED EMISSIONS

### Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in field of EMC. The factors contributing to uncertainties are Receiver, cable loss, and LISN.

Compliance or non- compliance with a disturbance limit shall be determined in the following manner:

If  $U_{\text{lab}}$  is less than or equal to  $U_{\text{cisp}}$  of Table 1, then:

- compliance is deemed to occur if no measured disturbance level exceeds the disturbance limit;
- non - compliance is deemed to occur if any measured disturbance level exceeds the disturbance limit.

If  $U_{\text{lab}}$  is greater than  $U_{\text{cisp}}$  of Table 1, then:

- compliance is deemed to occur if no measured disturbance level, increased by  $(U_{\text{lab}} - U_{\text{cisp}})$ , exceeds the disturbance limit;
- non - compliance is deemed to occur if any measured disturbance level, increased by  $(U_{\text{lab}} - U_{\text{cisp}})$ , exceeds the disturbance limit.

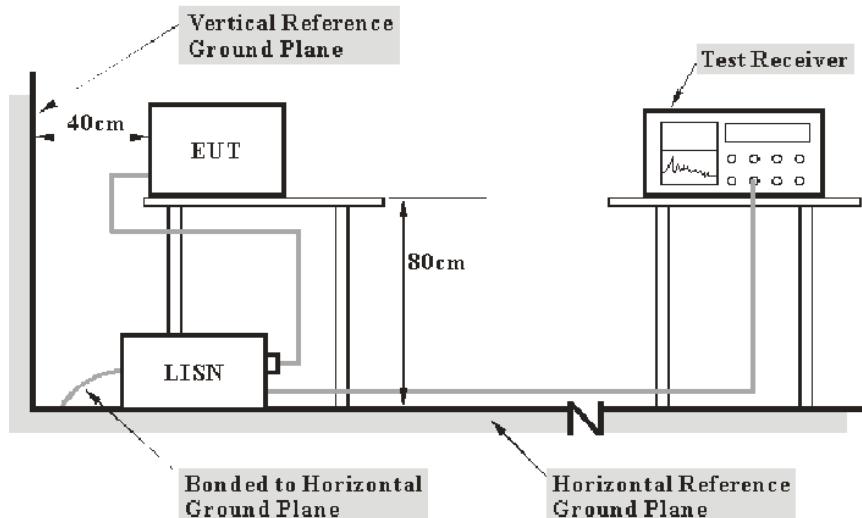
Based on CISPR 16-4-2: 2011, measurement uncertainty of conducted disturbance at mains port using AMN at Bay Area Compliance Laboratories Corp. (Dongguan) is 3.12 dB (150 kHz to 30 MHz).

Table 1 – Values of  $U_{\text{cisp}}$

Measurement	$U_{\text{cisp}}$
Conducted disturbance at mains port using AMN (150 kHz to 30 MHz)	3.4 dB

Note: The  $U_{\text{lab}} > U_{\text{cisp}}$ , so the  $U_{\text{lab}}$  is add in the calculation.

### EUT Setup



Note: 1. Support units were connected to second LISN.  
 2. Both of LISNs (AMN) 80 cm from EUT and at the least 80 cm from other units and other metal planes support units.

The setup of EUT is according with per ANSI C63.4-2014 measurement procedure. The specification used was with the FCC Part 15 B Class B limits.

The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.

The adapter was connected to a 120V/60Hz AC power source.

### EMI Test Receiver Setup

The EMI test receiver was set to investigate the spectrum from 150 kHz to 30 MHz.

During the conducted emission test, the EMI test receiver was set with the following configurations:

Frequency Range	IF B/W
150 kHz – 30 MHz	9 kHz

### Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	EMI Test Receiver	ESCS 30	830245/006	2015-10-20	2016-10-20
R&S	L.I.S.N	ESH2-Z5	892107/021	2015-07-16	2016-07-15
R&S	Two-line V-network	ENV 216	3560.6550.12	2015-11-26	2016-11-25
N/A	Coaxial Cable	1.8m	N/A	2015-05-06	2016-05-06
R&S	Test Software	EMC32	Version8.53.0	N/A	N/A

\* Statement of Traceability: Bay Area Compliance Laboratories Corp. (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

### Test Procedure

During the conducted emission test, the adapter was connected to the outlet of the first LISN and the other support equipments were connected to the outlet of the second LISN.

Maximizing procedure was performed on the six (6) highest emissions of the EUT.

All data was recorded in the Quasi-peak and average detection mode.

### Corrected Amplitude & Margin Calculation

The basic equation is as follows:

$$V_C = V_R + A_C + VDF$$

Herein,

$V_C$ : corrected voltage amplitude

$V_R$ : reading voltage amplitude

$A_c$ : attenuation caused by cable loss

VDF: voltage division factor of AMN or ISN

The “Margin” column of the following data tables indicates the degree of compliance within the applicable limit. For example, a margin of 7dB means the emission is 7dB below the maximum limit. The equation for margin calculation is as follows:

$$\text{Margin} = \text{Limit} - \text{Corrected Amplitude}$$

## Test Results Summary

According to the recorded data in following table, the EUT complied with the FCC Part 15 B Class B, with the worst margin reading of:

**14.0 dB at 17.183363 MHz** in the **Neutral** conducted mode

## Test Data

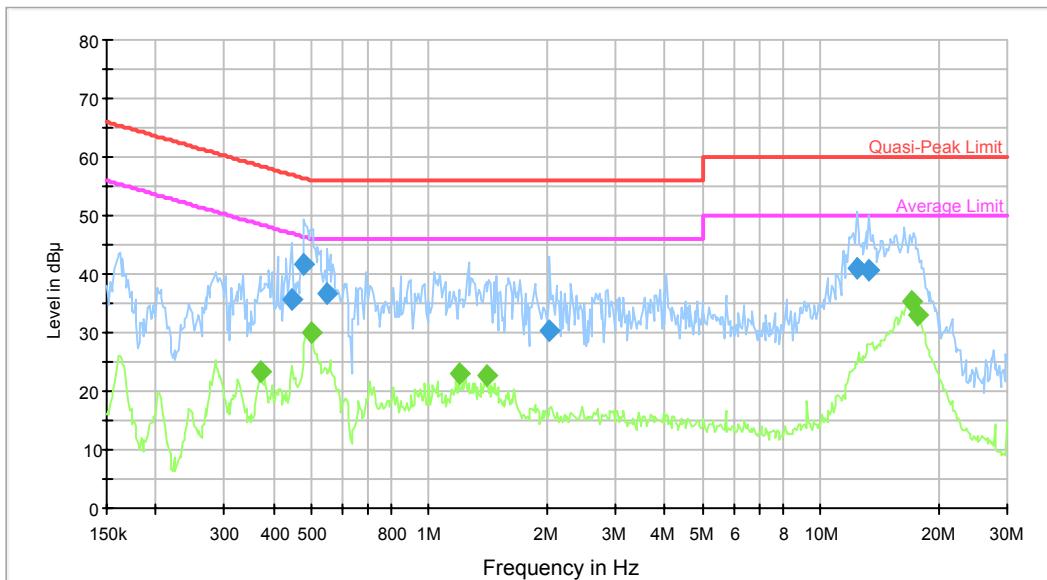
### Environmental Conditions

<b>Temperature:</b>	23°C
<b>Relative Humidity:</b>	46 %
<b>ATM Pressure:</b>	101.6 kPa

*The testing was performed by Rocky Xiao on 2016-03-10.*

*Test Mode: Full Load*

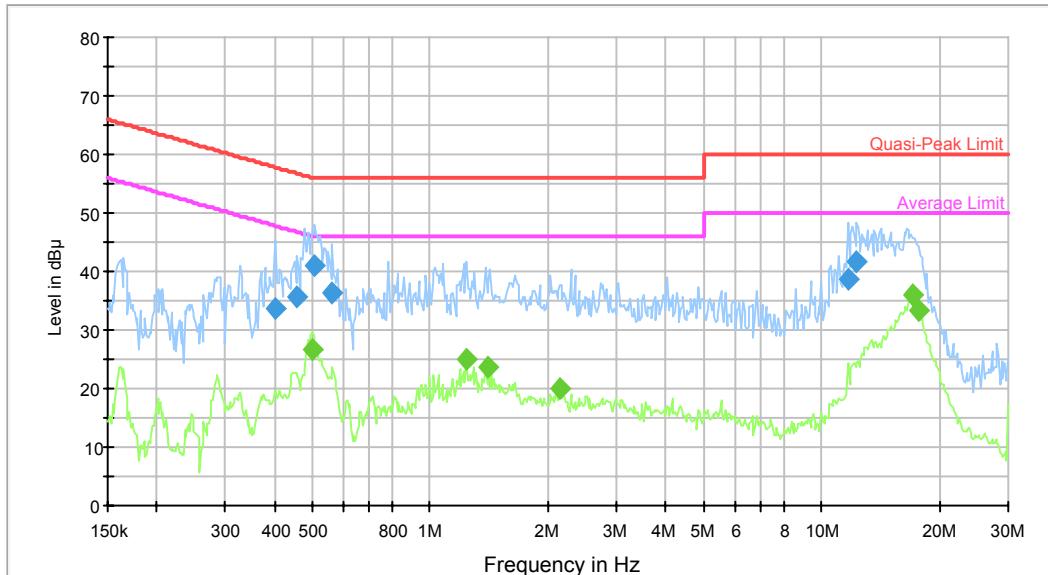
**AC120V, 60Hz, Line:**



Frequency (MHz)	Quasi Peak (dB $\mu$ V)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dB $\mu$ V)	Comment
0.446873	35.8	9.000	L1	9.8	21.1	56.9	Compliance
0.480097	41.8	9.000	L1	9.8	14.5	56.3	Compliance
0.549741	36.6	9.000	L1	9.8	19.4	56.0	Compliance
2.030886	30.3	9.000	L1	9.8	25.7	56.0	Compliance
12.394424	41.2	9.000	L1	10.1	18.8	60.0	Compliance
13.315918	40.6	9.000	L1	10.1	19.4	60.0	Compliance

Frequency (MHz)	Average (dB $\mu$ V)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dB $\mu$ V)	Comment
0.369089	23.2	9.000	L1	9.7	25.3	48.5	Compliance
0.499611	29.9	9.000	L1	9.8	16.1	46.0	Compliance
1.190776	22.9	9.000	L1	9.8	23.1	46.0	Compliance
1.407671	22.8	9.000	L1	9.8	23.2	46.0	Compliance
17.183363	35.2	9.000	L1	10.1	14.8	50.0	Compliance
17.739864	33.0	9.000	L1	10.1	17.0	50.0	Compliance

AC120V, 60Hz, Neutral:



Frequency (MHz)	Quasi Peak (dB $\mu$ V)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dB $\mu$ V)	Comment
0.402900	33.8	9.000	N	9.7	24.0	57.8	Compliance
0.457684	35.6	9.000	N	9.7	21.1	56.7	Compliance
0.507637	41.1	9.000	N	9.7	14.9	56.0	Compliance
0.563041	36.2	9.000	N	9.7	19.8	56.0	Compliance
11.722024	38.7	9.000	N	10.0	21.3	60.0	Compliance
12.296055	41.7	9.000	N	10.1	18.3	60.0	Compliance

Frequency (MHz)	Average (dB $\mu$ V)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dB $\mu$ V)	Comment
0.499611	26.6	9.000	N	9.7	19.4	46.0	Compliance
1.239175	25.0	9.000	N	9.8	21.0	46.0	Compliance
1.407671	23.7	9.000	N	9.8	22.3	46.0	Compliance
2.147382	19.9	9.000	N	9.8	26.1	46.0	Compliance
17.183363	36.0	9.000	N	10.1	14.0	50.0	Compliance
17.739864	33.2	9.000	N	10.1	16.8	50.0	Compliance

## FCC §15.109 - RADIATED SPURIOUS EMISSIONS

### Measurement Uncertainty

Compliance or non- compliance with a disturbance limit shall be determined in the following manner:

If  $U_{\text{lab}}$  is less than or equal to  $U_{\text{cispr}}$  of Table 1, then:

- compliance is deemed to occur if no measured disturbance level exceeds the disturbance limit;
- non - compliance is deemed to occur if any measured disturbance level exceeds the disturbance limit.

If  $U_{\text{lab}}$  is greater than  $U_{\text{cispr}}$  of Table 1, then:

- compliance is deemed to occur if no measured disturbance level, increased by  $(U_{\text{lab}} - U_{\text{cispr}})$ , exceeds the disturbance limit;
- non - compliance is deemed to occur if any measured disturbance level, increased by  $(U_{\text{lab}} - U_{\text{cispr}})$ , exceeds the disturbance limit.

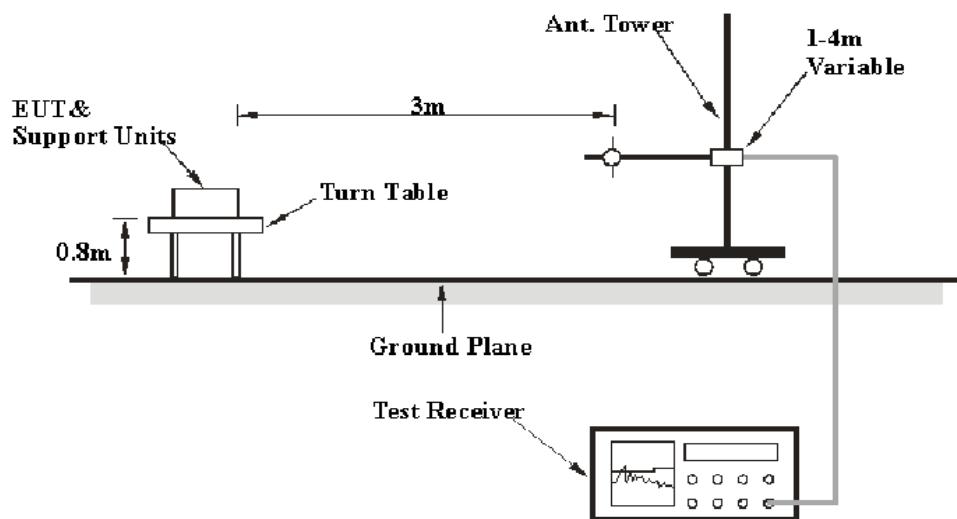
Based on CISPR 16-4-2: 2011, measurement uncertainty of radiated emission at a distance of 10m at Bay Area Compliance Laboratories Corp. (Dongguan) is:30M~200MHz: 4.55 dB for Horizontal, 4.57 dB for Vertical; 200M~1GHz: 4.66 dB for Horizontal, 4.56 dB for Vertical; measurement uncertainty of radiated emission at a distance of 3m at Bay Area Compliance Laboratories Corp. (Dongguan) is:30M~200MHz: 4.58 dB for Horizontal, 4.59 dB for Vertical; 200M~1GHz: 4.83 dB for Horizontal, 5.85 dB for Vertical; 1G~6GHz: 4.45 dB, 6G~18GHz: 5.23 dB

Table 1 – Values of  $U_{\text{cispr}}$

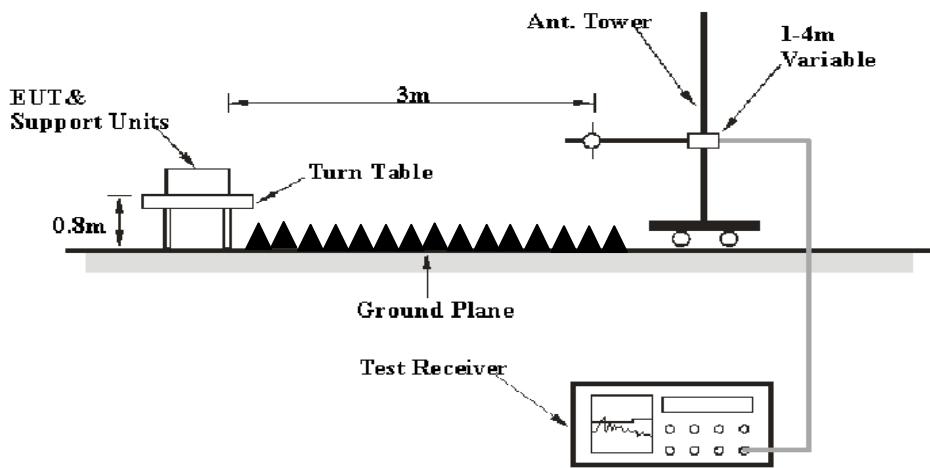
Measurement		$U_{\text{cispr}}$
Radiated disturbance (electric field strength at an OATS or in a SAC)	(30 MHz to 1000 MHz)	6.3 dB
Radiated disturbance (electric field strength in a FAR)	(1 GHz to 6 GHz)	5.2 dB
Radiated disturbance (electric field strength in a FAR)	(6 GHz to 18 GHz)	5.5 dB

### EUT Setup

Below 1GHz:



Above 1GHz:



The radiated emission tests were performed in the 3 meters chamber test site, using the setup accordance with the ANSI C63.4-2014. The specification used was the FCC Part 15.109 Class B limits.

### EMI Test Receiver Setup

The system was investigated from 30 MHz to 13 GHz.

During the radiated emission test, the EMI test receiver was set with the following configurations:

Frequency Range	RBW	Video B/W	IF B/W	Detector
30 MHz – 1000 MHz	120 kHz	300 kHz	120 kHz	QP
Above 1 GHz	1 MHz	3 MHz	/	Peak
	1 MHz	10 Hz	/	AVG

### Test Procedure

Maximizing procedure was performed on the highest emissions to ensure that the EUT complied with all installation combinations.

The data was recorded in the Quasi-peak detection mode for below 1 GHz, peak and average detection mode above 1 GHz.

## Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	EMI Test Receiver	ESCI	100224	2015-08-03	2016-08-02
Sunol Sciences	Antenna	JB3	A060611-3	2014-11-06	2017-11-05
HP	Amplifier	8447E	2434A02181	2015-09-01	2016-09-01
Agilent	Spectrum Analyzer	E4440A	SG43360054	2015-11-23	2016-11-22
ETS-Lindgren	Horn Antenna	3115	9808-5557	2015-09-06	2018-09-06
Mini-Circuit	Amplifier	ZVA-213-S+	054201245	2016-02-19	2017-02-19
N/A	Coaxial Cable	14m	N/A	2015-05-06	2016-05-06
N/A	Coaxial Cable	8m	N/A	2015-05-06	2016-05-06
Farad	Test Software	EZ-EMC	V1.1.4.2	N/A	N/A

\* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

## Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Loss and Cable Loss, and subtracting the Amplifier Gain from the Meter Reading. The basic equation is as follows:

$$\text{Corrected Amplitude} = \text{Meter Reading} + \text{Antenna Loss} + \text{Cable Loss} - \text{Amplifier Gain}$$

The “Margin” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of 7 dB means the emission is 7 dB below the limit. The equation for margin calculation is as follows:

$$\text{Margin} = \text{Limit} - \text{Corrected Amplitude}$$

## Test Results Summary

According to the data in the following table, the EUT complied with the FCC Part 15 B Class B, with the worst margin reading of:

**7.10 dB at 30.0000 MHz** in the **Vertical** polarization

## Test Data

### Environmental Conditions

Temperature:	20.4 °C
Relative Humidity:	65 %
ATM Pressure:	100.6 kPa

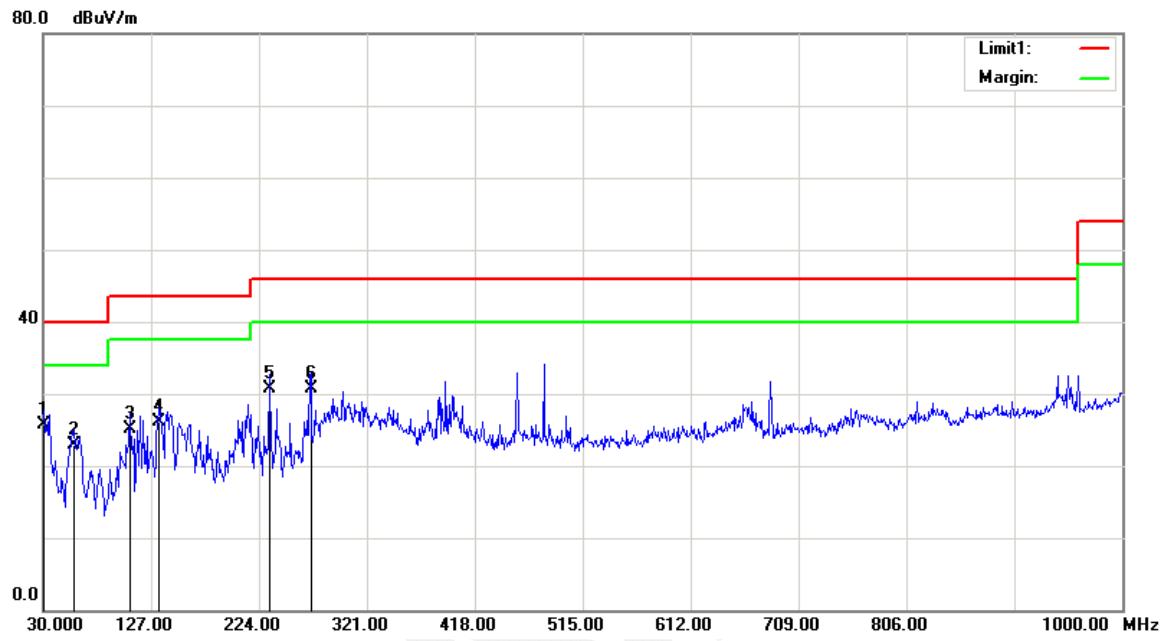
*The testing was performed by Rocky Xiao on 2016-03-24.*

*Test Result: Compliance*

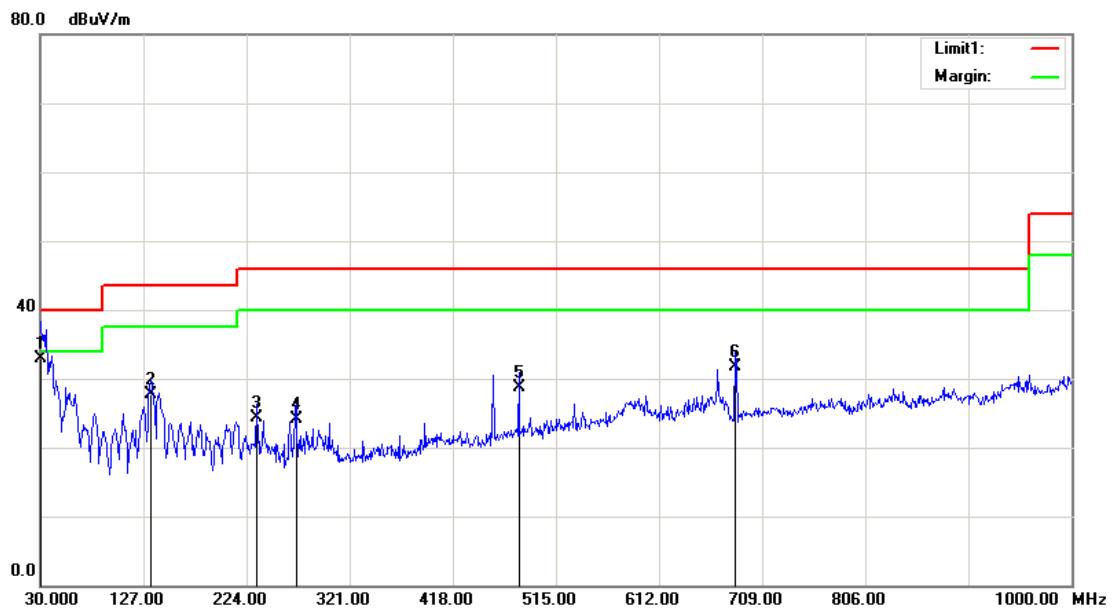
*Test Mode: Full Load*

**1) Below 1GHz:**

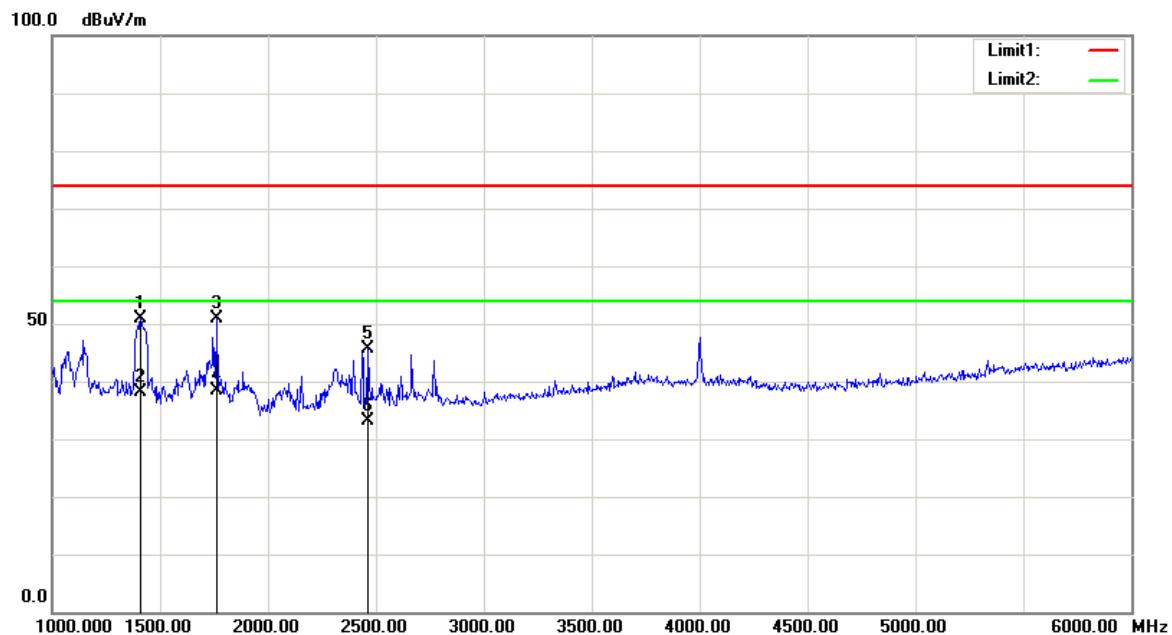
**Horizontal**



Frequency (MHz)	Receiver Reading (dB $\mu$ V)	Detector	Correction Factor (dB/m)	Cord. Amp. (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)
30.9700	23.48	QP	2.22	25.70	40.00	14.30
58.1300	35.96	QP	-13.06	22.90	40.00	17.10
107.6000	32.99	QP	-7.79	25.20	43.50	18.30
133.7900	32.11	QP	-5.91	26.20	43.50	17.30
233.7000	38.86	QP	-8.16	30.70	46.00	15.30
270.5600	37.03	QP	-6.23	30.80	46.00	15.20

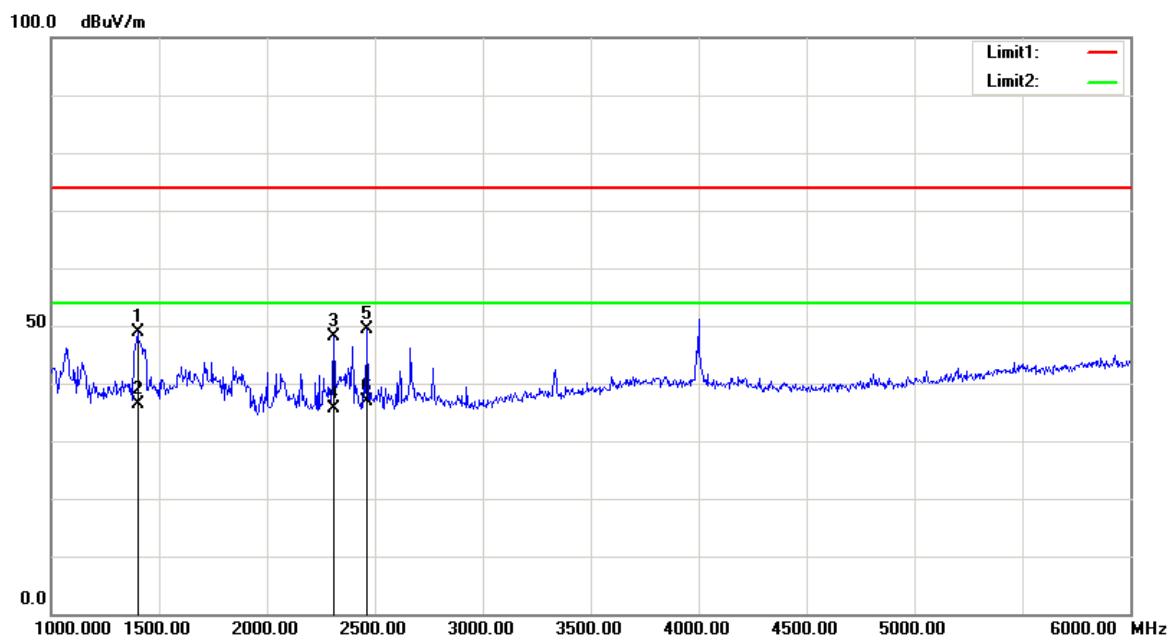
**Vertical**

Frequency (MHz)	Receiver Reading (dB $\mu$ V)	Detector	Correction Factor (dB/m)	Cord. Amp. (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)
30.0000	29.52	QP	3.38	32.90	40.00	7.10
133.7900	33.71	QP	-5.91	27.80	43.50	15.70
233.7000	32.46	QP	-8.16	24.30	46.00	21.70
270.5600	30.43	QP	-6.23	24.20	46.00	21.80
480.0800	30.23	QP	-1.43	28.80	46.00	17.20
683.7800	31.12	QP	0.68	31.80	46.00	14.20

**2) Above 1GHz:****Horizontal**

Frequency (MHz)	Receiver Reading (dB $\mu$ V)	Detector	Correction Factor (dB/m)	Cord. Amp. (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)
1410.000	47.35	peak	3.41	50.76	74.00	23.24
1410.000	34.83	AVG	3.41	38.24	54.00	15.76
1765.000	47.80	peak	3.04	50.84	74.00	23.16
1765.000	35.32	AVG	3.04	38.36	54.00	15.64
2465.000	39.99	peak	5.60	45.59	74.00	28.41
2465.000	27.43	AVG	5.60	33.03	54.00	20.97

Note: For above 6GHz, no emissions were detected.

**Vertical**

Frequency (MHz)	Receiver Reading (dB $\mu$ V)	Detector	Correction Factor (dB/m)	Cord. Amp. (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)
1402.500	45.36	peak	3.46	48.82	74.00	25.18
1402.500	32.81	AVG	3.46	36.27	54.00	17.73
2310.000	43.46	peak	4.67	48.13	74.00	25.87
2310.000	31.02	AVG	4.67	35.69	54.00	18.31
2465.000	43.75	peak	5.60	49.35	74.00	24.65
2465.000	31.21	AVG	5.60	36.81	54.00	17.19

Note: For above 6GHz, no emissions were detected.

## **DECLARATION LETTER**

Hena Digital Technology (Shenzhen) Co., Ltd.  
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Nanshan District, Shenzhen, China  
Tel: (86)0755-8287 7246 Fax: (86)0755-8287 9070  
E-mail: zijian8548@yahoo.com.cn

### **DECLARATION OF SIMILARITY**

FEDERAL COMMUNICATIONS COMMISSION  
Authorization and Evaluation Division  
7435 Oakland Mills Road  
Columbia, MD 21046  
Date: 2016-3-8

Dear Sir or Madam:

We, Hena Digital Technology (Shenzhen) Co., Ltd., hereby declare that product: Netbook, model number: CB116, VB116, GB116, DB116, QB116, SB116, KB116 and EB116 are electrically identical with the model number PAD11641iWL which was tested by BACL. They have the same electromagnetic emissions and electromagnetic compatibility characteristics. The results of which are featured in BACL project: RDG160308003, RDG160308003-20. the FCC ID: M7C-PAD11641iWL

A description of the difference among nine models and those that are declared similar are as follows:

They are the same product, and just have the different model name, the rest are the same.

Please contact me should there be need for any additional clarification or information.

Best Regards,

Chen Yong  
Manager

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