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-PAD842IW

Report Type:	Product Type:
Original Report	MID

Test Engineer: Allen Qiao

Report Number: RDG151208003-00C

Report Date: 2015-12-18

Reviewed By: Jerry Zhang, EMC Manager

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GENERAL INFORMATION

Product Description for Equipment Under Test (EUT)

The *Hena Digital Technology (Shenzhen) Co., Ltd.*'s product, model number: *PAD824iW (FCC ID: M7C-PAD842IW)* (the "EUT") in this report was a *MID,* which was measured approximately: 21cm (L) x 12 cm (W) x 0.8 cm (H), rated input voltage: DC3.7V rechargeable Li-ion battery or DC5.0V charging from adapter. The highest operating is 1.88 GHz.

Adapter information:
Model:PEF-0500200UA
Input: AC100-240V, 50/60 Hz, 0.3A;
Output: DC 5V, 2.0A

Note : The series product, model PAD824iW, MI80Q8, MID80Q8, MW80Q8, MI-80Q8, MID-80Q8 and MW-80Q8 are electrically identical, the difference between them is just the model name, we selected PAD824iW 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: 151208003 (Assigned by BACL Dongguan). The EUT was received on 2015-12-09.

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 Part 15C DTS submissions with FCC ID: M7C-PAD842IW.
FCC Part 15C DSS submissions with FCC ID: M7C-PAD842IW.

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).

EUT Exercise Software

N/A

Equipment Modifications

No modification was made to the EUT tested.

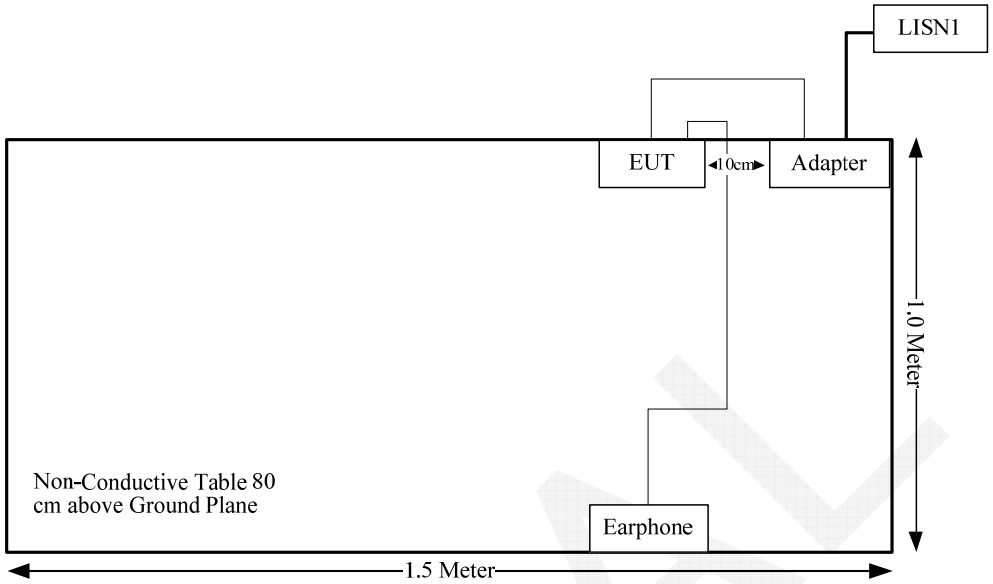
Local Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
Kingston	U-disk	8GB	/

Support Cable List and Details

Cable Description	Shielding Type	Ferrite Core	Length (m)	From Port	To
USB Cable	No	No	1.0	USB Port of Adapter	EUT
Earphone Cable	No	No	1.1	Audio Port of EUT	EUT

Configuration of Test Setup



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Results
§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：

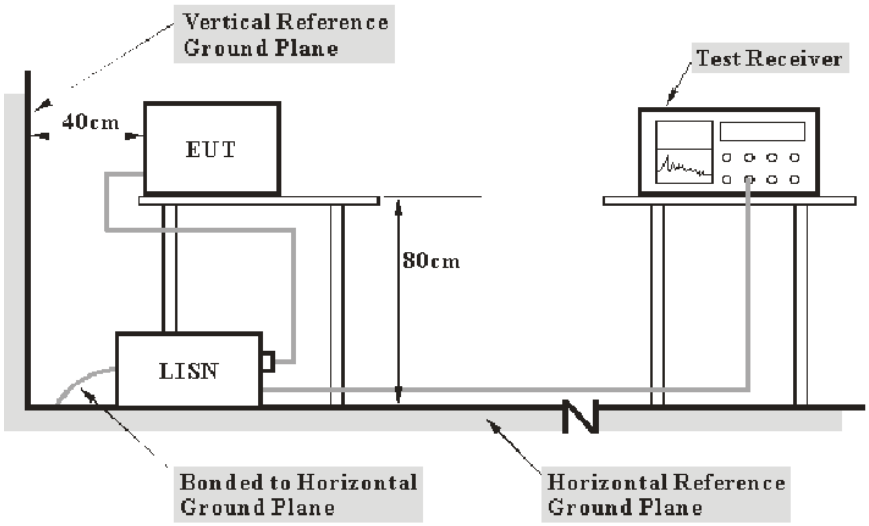
If U_{lab} is less than or equal to U_{cispr} of Table 1, then:
–compliance is deemed to occur if no measured disturbance level exceeds the disturbance limit;
–non - compliance is deemed to occur if any measured disturbance level exceeds the disturbance limit.
If U_{lab} is greater than U_{cispr} of Table 1, then:
–compliance is deemed to occur if no measured disturbance level, increased by ($U_{lab} - U_{cispr}$), exceeds the disturbance limit;
–non - compliance is deemed to occur if any measured disturbance level, increased by ($U_{lab} - U_{cispr}$), 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 3.46 dB (150 kHz to 30 MHz).

Table 1 – Values of U_{cispr}

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

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
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.

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:

Margin = Limit – 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:

6.1 dB at **0.549741 MHz** in the **Line** conducted mode

Test Data

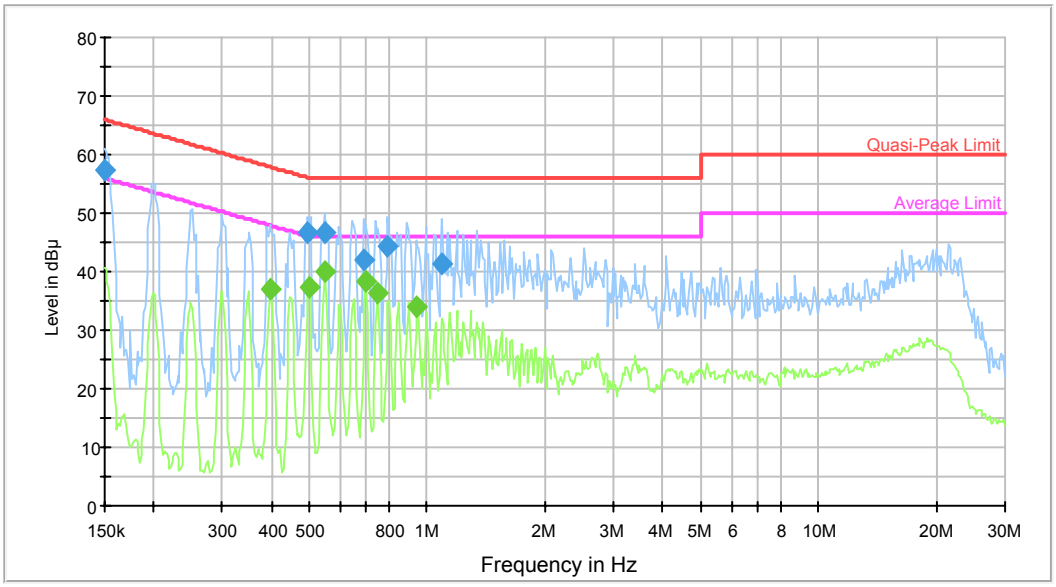
Environmental Conditions

Temperature:	24.3°C
Relative Humidity:	47 %
ATM Pressure:	101.1 kPa

The testing was performed by Allen Qiao on 2015-12-10.

Test Mode: USB playing

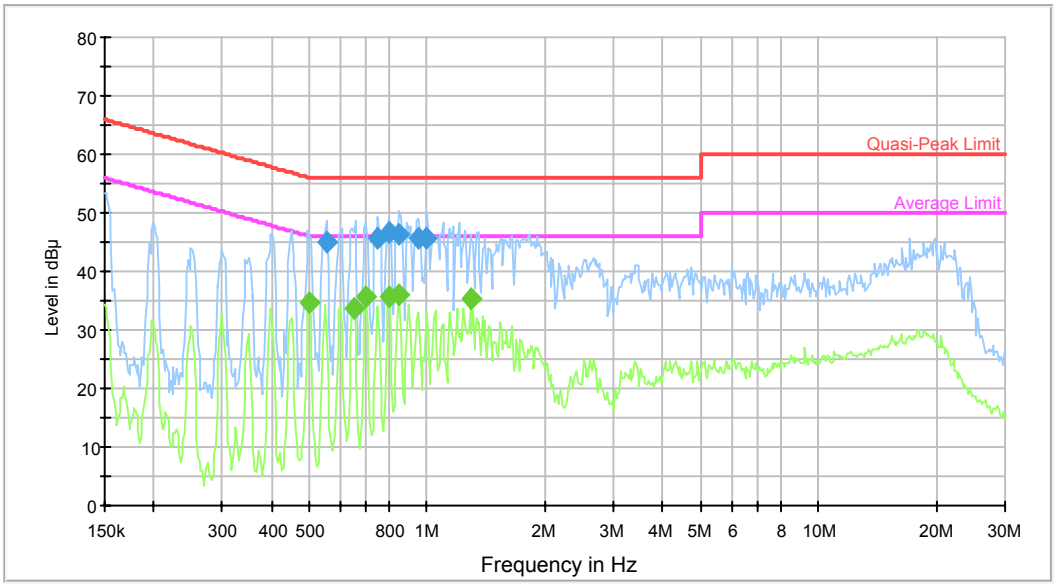
AC120V, 60Hz, Line:



Frequency (MHz)	Quasi Peak (dBµV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.150000	57.4	9.000	L1	9.8	8.6	66.0	Compliance
0.495646	46.7	9.000	L1	9.8	9.4	56.1	Compliance
0.545378	46.8	9.000	L1	9.8	9.2	56.0	Compliance
0.687153	42.0	9.000	L1	9.8	14.0	56.0	Compliance
0.793127	44.3	9.000	L1	9.8	11.7	56.0	Compliance
1.090848	41.4	9.000	L1	9.8	14.6	56.0	Compliance

Frequency (MHz)	Average (dBµV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.399703	37.0	9.000	L1	9.8	10.9	47.9	Compliance
0.499611	37.3	9.000	L1	9.8	8.7	46.0	Compliance
0.549741	39.9	9.000	L1	9.8	6.1	46.0	Compliance
0.698191	38.4	9.000	L1	9.8	7.6	46.0	Compliance
0.750100	36.4	9.000	L1	9.8	9.6	46.0	Compliance
0.945093	33.9	9.000	L1	9.8	12.1	46.0	Compliance

AC120V, 60Hz, Neutral:



Frequency (MHz)	Quasi Peak (dBµV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.554139	45.1	9.000	N	9.7	10.9	56.0	Compliance
0.750100	45.8	9.000	N	9.7	10.2	56.0	Compliance
0.799472	46.5	9.000	N	9.7	9.5	56.0	Compliance
0.852094	46.3	9.000	N	9.8	9.7	56.0	Compliance
0.952654	45.6	9.000	N	9.8	10.4	56.0	Compliance
0.999305	45.8	9.000	N	9.8	10.2	56.0	Compliance

Frequency (MHz)	Average (dBµV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.499611	34.6	9.000	N	9.7	11.4	46.0	Compliance
0.649874	33.8	9.000	N	9.7	12.2	46.0	Compliance
0.698191	35.7	9.000	N	9.7	10.3	46.0	Compliance
0.799472	35.5	9.000	N	9.7	10.5	46.0	Compliance
0.845331	36.0	9.000	N	9.8	10.0	46.0	Compliance
1.289541	35.2	9.000	N	9.8	10.8	46.0	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_{lab} is less than or equal to U_{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_{lab} is greater than U_{cispr} of Table 1, then:
–compliance is deemed to occur if no measured disturbance level, increased by ($U_{lab} - U_{cispr}$), exceeds the disturbance limit;
–non - compliance is deemed to occur if any measured disturbance level, increased by ($U_{lab} - U_{cispr}$), exceeds the disturbance limit.

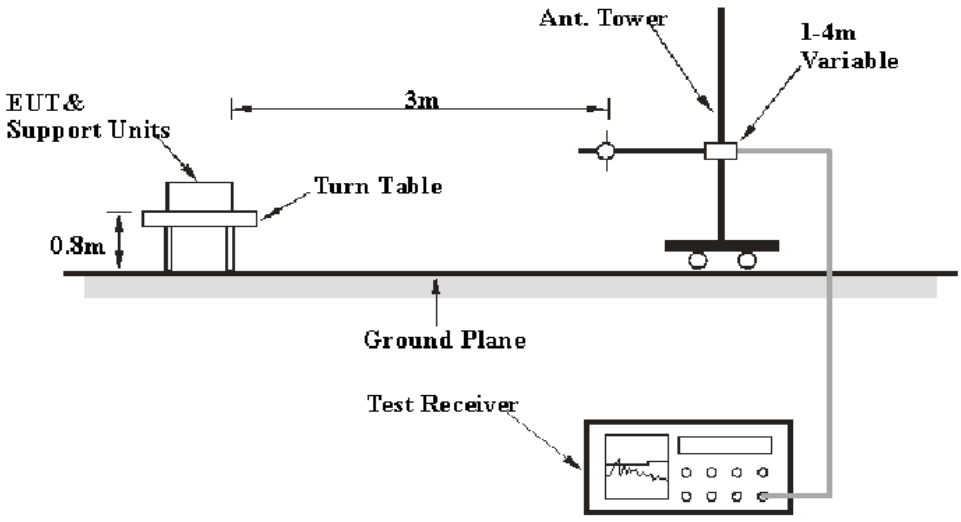
Based on CISPR 16-4-2: 2011, measurement uncertainty of radiated emission at a distance of 3m at Bay Area Compliance Laboratories Corp. (Dongguan) is:30MHz~200MHz: 5.0 dB; 200MHz~1GHz: 6.2 dB; 1GHz~6GHz: 4.45 dB, 6GHz~18GHz: 5.23 dB

Table 1 – Values of U_{cispr}

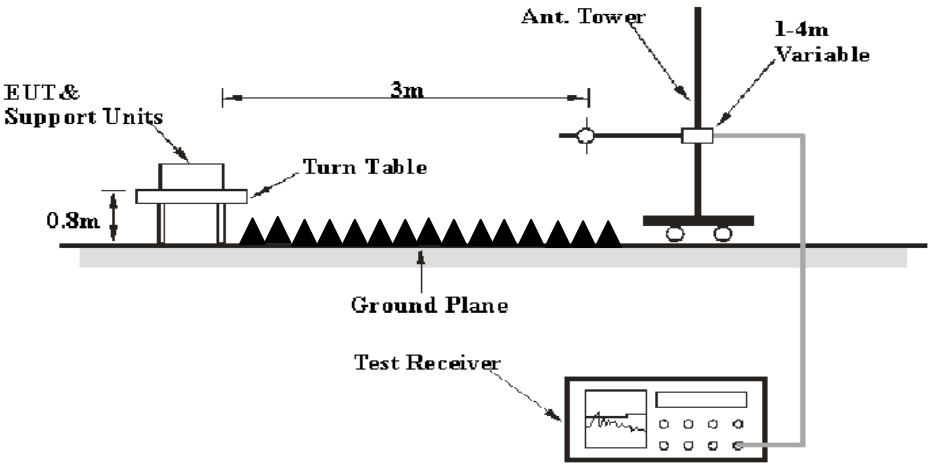
Measurement		U_{cispr}
Radiated disturbance (electric field strength at an OATS or in a SAC)	(30 MHz to 1000 MHz)	6.3 dB
Radiated disturbance (electric field strength in a FAR)	(1 GHz to 6 GHz)	5.2 dB
Radiated disturbance (electric field strength in a FAR)	(6 GHz to 18 GHz)	5.5 dB

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 10 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	/	Ave.

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	2015-02-19	2016-02-19
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:

Corrected Amplitude = Meter Reading + Antenna Loss + Cable Loss - 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:

Margin = Limit – 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:

5.20 dB at **46.4900 MHz** in the **Vertical** polarization for USB playing mode

Test Data

Environmental Conditions

Temperature:	21.6 °C
Relative Humidity:	60 %
ATM Pressure:	101.1 kPa

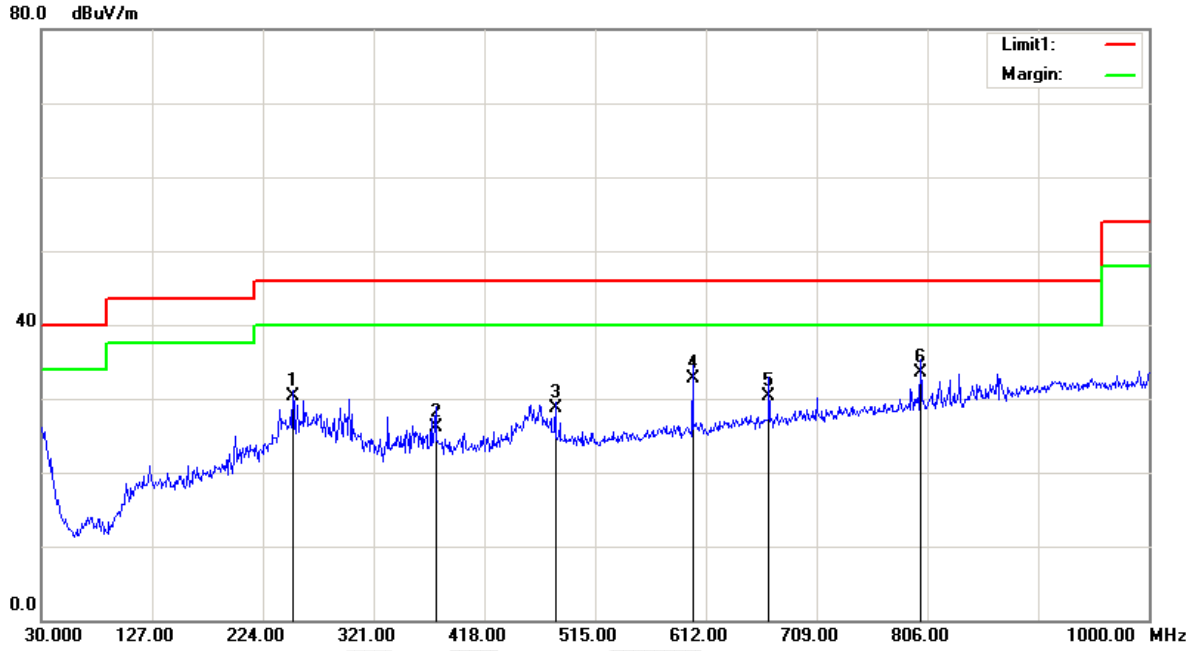
** The testing was performed by Allen Qiao on 2015-12-10.*

Test Result: Compliance

1) Below 1GHz:

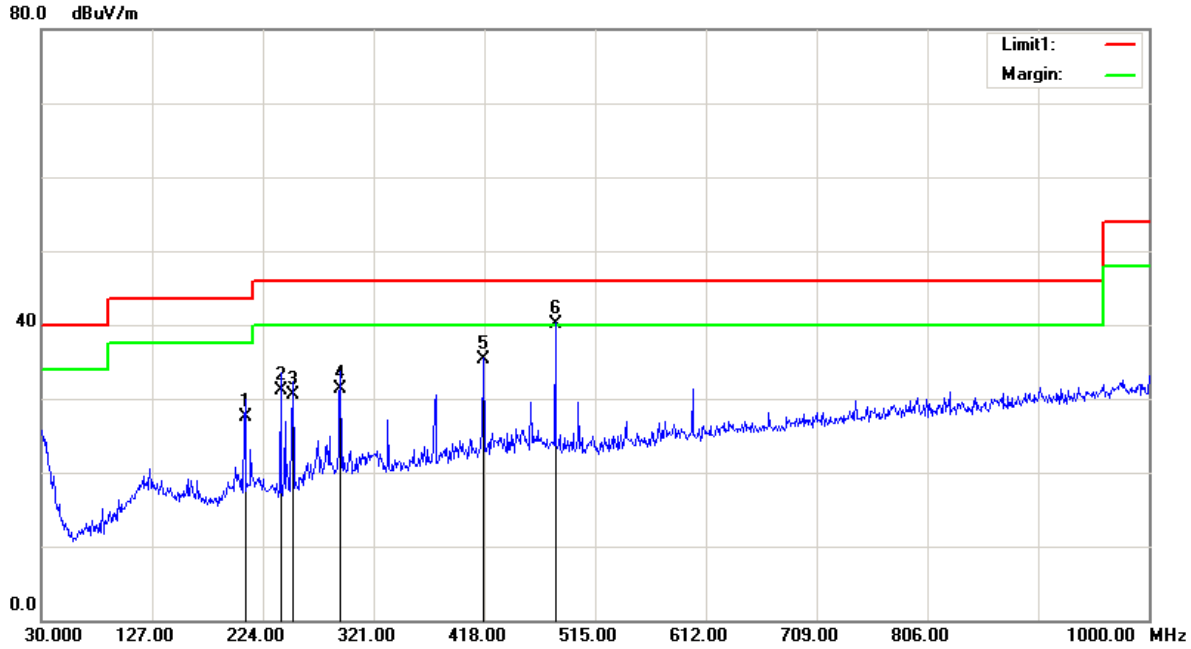
Test Mode: USB Playing

Horizontal



Frequency (MHz)	Receiver Reading (dBµV)	Detector	Correction Factor (dB/m)	Cord. Amp. (dBµV/m)	Limit (dBµV/m)	Margin (dB)
250.1900	38.57	QP	-8.17	30.40	46.00	15.60
375.3200	30.75	QP	-4.55	26.20	46.00	19.80
480.0800	30.40	QP	-1.70	28.70	46.00	17.30
600.3600	33.38	QP	-0.68	32.70	46.00	13.30
667.2900	29.82	QP	0.48	30.30	46.00	15.70
800.1800	31.38	QP	2.22	33.60	46.00	12.40

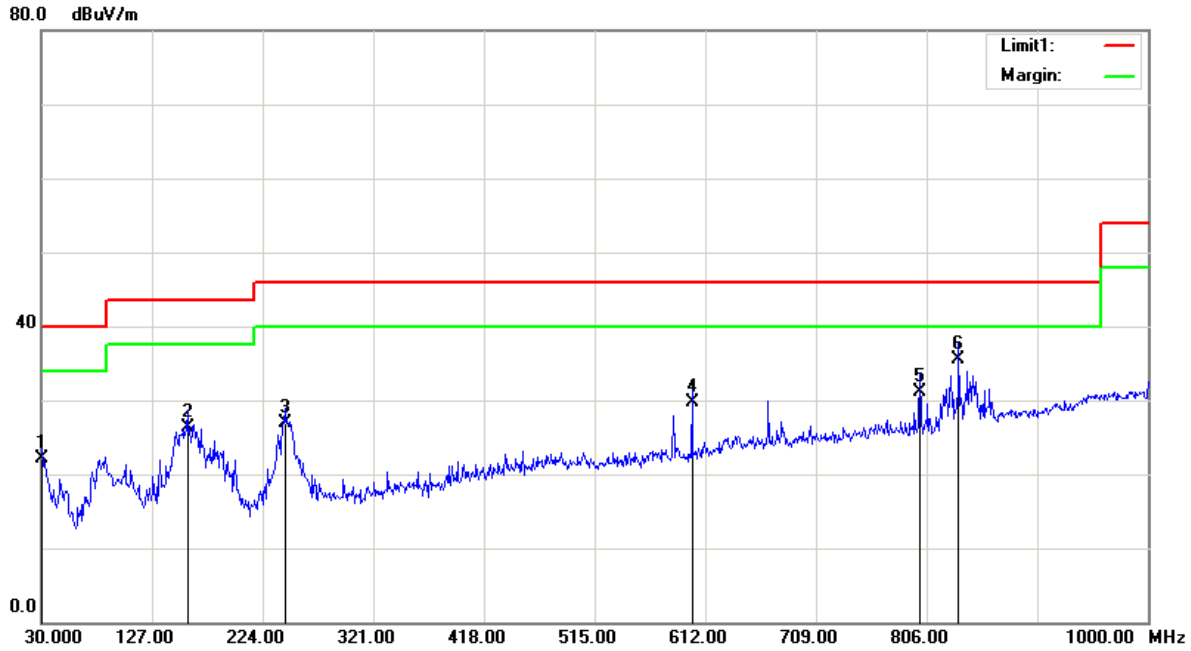
Vertical



Frequency (MHz)	Receiver Reading (dBµV)	Detector	Correction Factor (dB/m)	Cord. Amp. (dBµV/m)	Limit (dBµV/m)	Margin (dB)
208.4800	36.85	QP	-9.25	27.60	43.50	15.90
239.5200	39.34	QP	-8.14	31.20	46.00	14.80
250.1900	38.67	QP	-8.17	30.50	46.00	15.50
291.9000	37.65	QP	-6.25	31.40	46.00	14.60
417.0300	38.70	QP	-3.30	35.40	46.00	10.60
480.0800	41.90	QP	-1.70	40.20	46.00	5.80

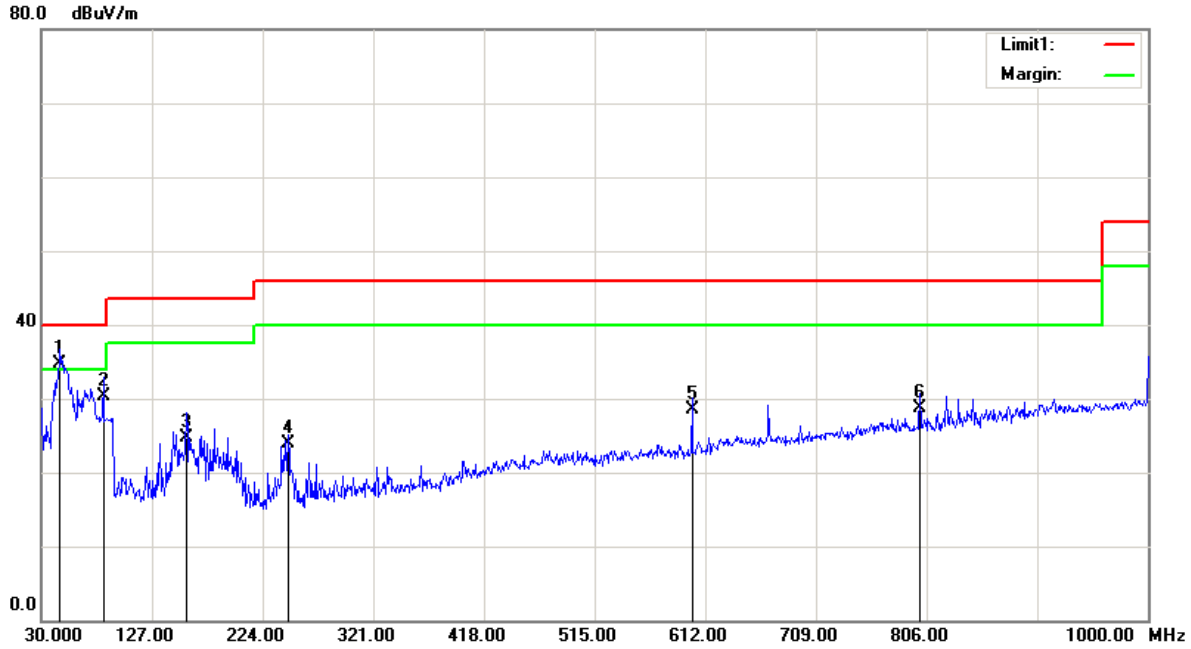
Test Mode: USB Playing

Horizontal



Frequency (MHz)	Receiver Reading (dBµV)	Detector	Correction Factor (dB/m)	Cord. Amp. (dBµV/m)	Limit (dBµV/m)	Margin (dB)
30.0000	21.36	QP	0.74	22.10	40.00	17.90
158.0400	33.81	QP	-7.41	26.40	43.50	17.10
243.4000	35.01	QP	-8.11	26.90	46.00	19.10
600.3600	30.48	QP	-0.68	29.80	46.00	16.20
800.1800	28.98	QP	2.22	31.20	46.00	14.80
834.1300	32.70	QP	2.80	35.50	46.00	10.50

Vertical

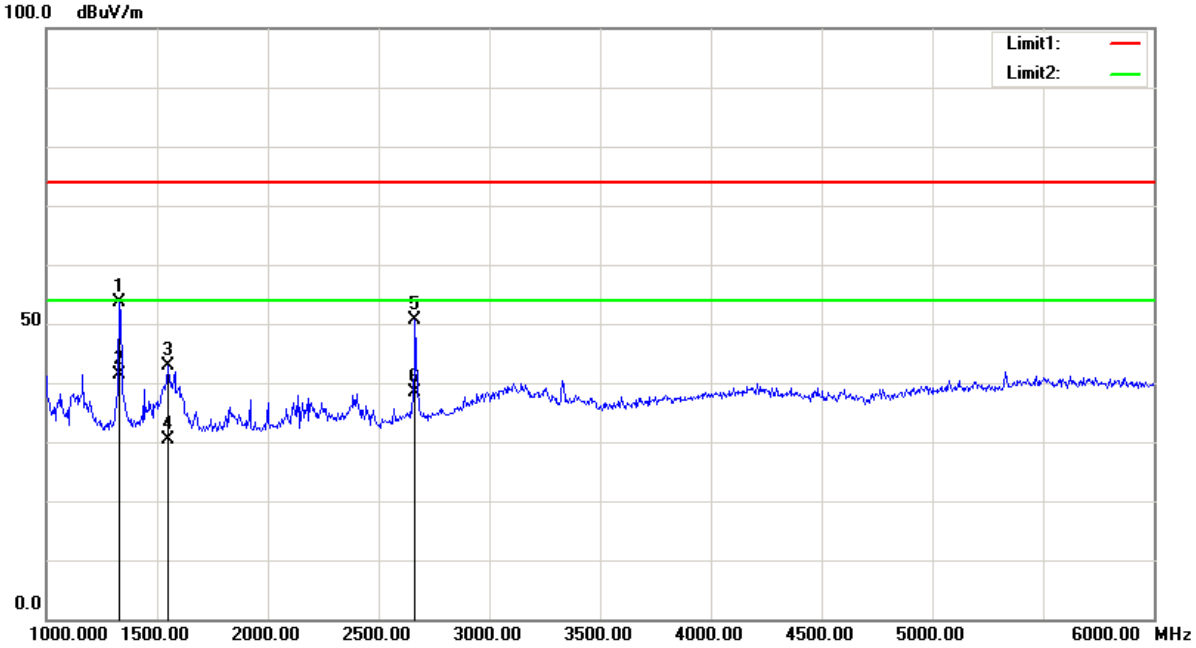


Frequency (MHz)	Receiver Reading (dBµV)	Detector	Correction Factor (dB/m)	Cord. Amp. (dBµV/m)	Limit (dBµV/m)	Margin (dB)
46.4900	45.68	QP	-10.88	34.80	40.00	5.20
84.3200	42.98	QP	-12.58	30.40	40.00	9.60
157.0700	32.11	QP	-7.41	24.70	43.50	18.80
246.3100	32.02	QP	-8.12	23.90	46.00	22.10
600.3600	29.18	QP	-0.68	28.50	46.00	17.50
800.1800	26.58	QP	2.22	28.80	46.00	17.20

2) Above 1GHz:

Test Mode: USB Playing

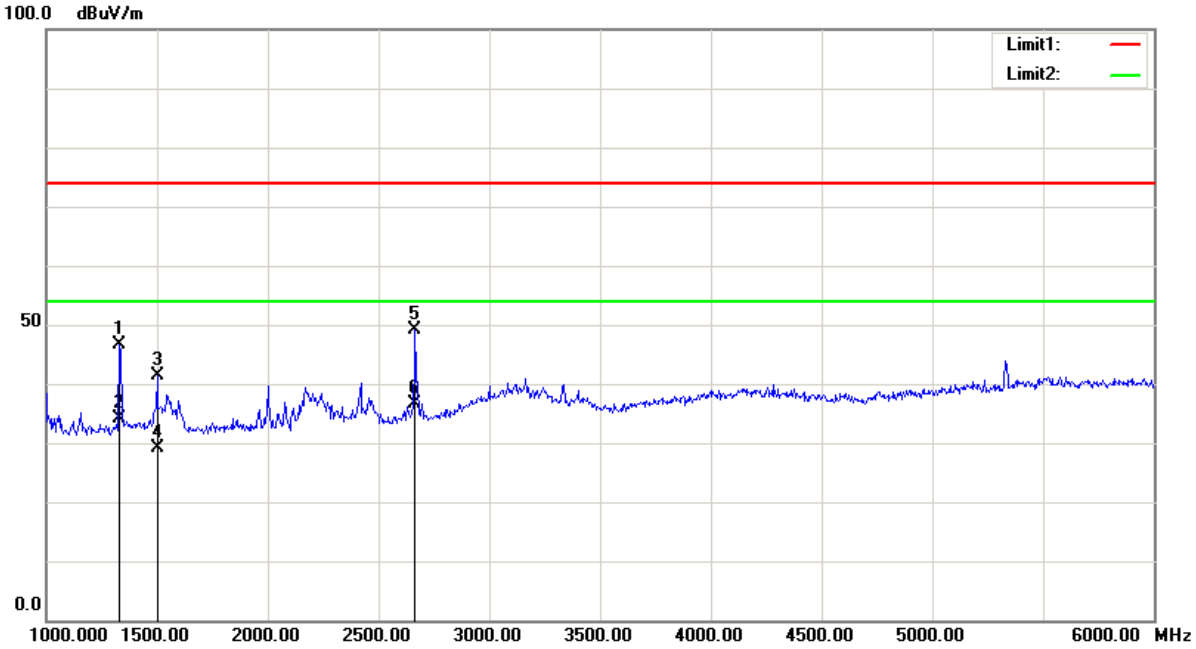
Horizontal



Frequency (MHz)	Receiver Reading (dBµV)	Detector	Correction Factor (dB/m)	Cord. Amp. (dBµV/m)	Limit (dBµV/m)	Margin (dB)
1332.500	54.24	peak	-0.65	53.59	74.00	20.41
1332.500	42.01	Ave	-0.65	41.36	54.00	12.64
1552.500	44.04	peak	-1.26	42.78	74.00	31.22
1552.500	31.75	Ave	-1.26	30.49	54.00	23.51
2667.500	47.19	peak	3.54	50.73	74.00	23.27
2667.500	34.77	Ave	3.54	38.31	54.00	15.69

Note: For above 6 GHz, all radiated emissions are 20dB below the limit or are on the system noise floor level.

Vertical

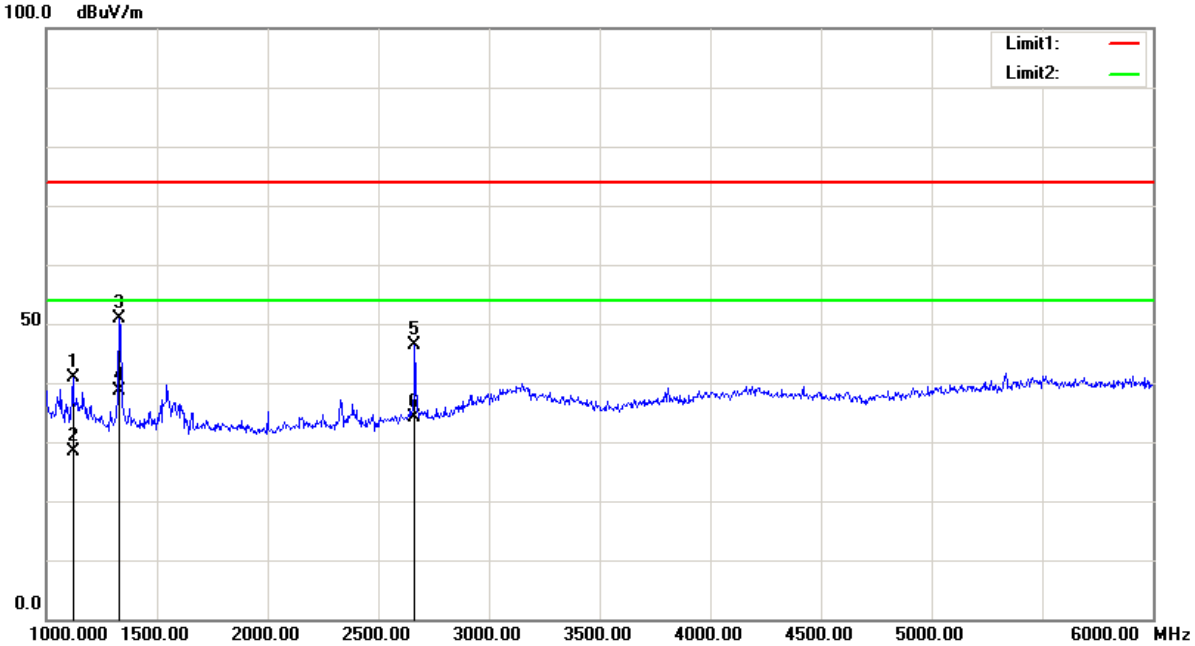


Frequency (MHz)	Receiver Reading (dBµV)	Detector	Correction Factor (dB/m)	Cord. Amp. (dBµV/m)	Limit (dBµV/m)	Margin (dB)
1332.500	47.26	peak	-0.65	46.61	74.00	27.39
1332.500	34.82	Ave	-0.65	34.17	54.00	19.83
1500.000	42.72	peak	-1.23	41.49	74.00	32.51
1500.000	30.29	Ave	-1.23	29.06	54.00	24.94
2667.500	45.49	peak	3.54	49.03	74.00	24.97
2667.500	32.99	Ave	3.54	36.53	54.00	17.47

Note: For above 6 GHz, all radiated emissions are 20dB below the limit or are on the system noise floor level.

Test Mode: USB Playing

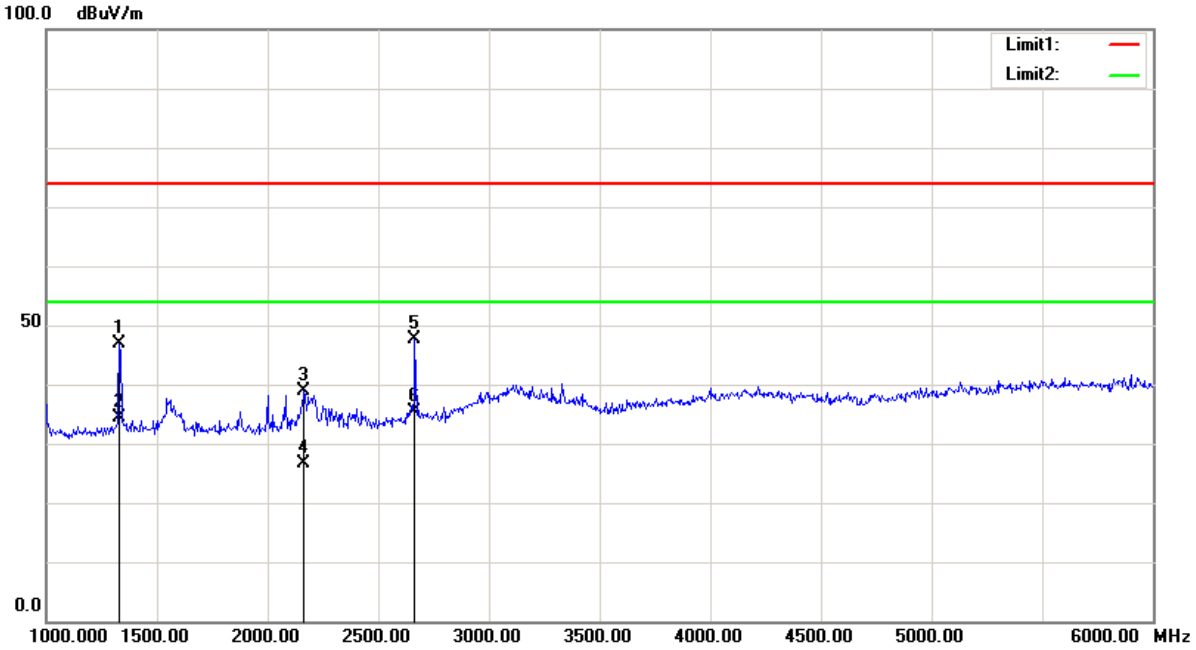
Horizontal



Frequency (MHz)	Receiver Reading (dBµV)	Detector	Correction Factor (dB/m)	Cord. Amp. (dBµV/m)	Limit (dBµV/m)	Margin (dB)
1120.000	41.84	peak	-1.08	40.76	74.00	33.24
1120.000	29.47	Ave	-1.08	28.39	54.00	25.61
1332.500	51.63	peak	-0.65	50.98	74.00	23.02
1332.500	39.32	Ave	-0.65	38.67	54.00	15.33
2667.500	42.76	peak	3.54	46.30	74.00	27.70
2667.500	30.62	Ave	3.54	34.16	54.00	19.84

Note: For above 6 GHz, all radiated emissions are 20dB below the limit or are on the system noise floor level.

Vertical



Frequency (MHz)	Receiver Reading (dBµV)	Detector	Correction Factor (dB/m)	Cord. Amp. (dBµV/m)	Limit (dBµV/m)	Margin (dB)
1332.500	47.44	peak	-0.65	46.79	74.00	27.21
1332.500	34.99	Ave	-0.65	34.34	54.00	19.66
2165.000	38.02	peak	0.92	38.94	74.00	35.06
2165.000	25.71	Ave	0.92	26.63	54.00	27.37
2667.500	44.19	peak	3.54	47.73	74.00	26.27
2667.500	31.82	Ave	3.54	35.36	54.00	18.64

Note: For above 6 GHz, all radiated emissions are 20dB below the limit or are on the system noise floor level.

DECLARATION LETTER

Hena Digital Technology (Shenzhen) Co., Ltd.
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DECLARATION OF SIMILARITY

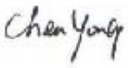
2015-12-17

To: Bay Area Compliance Laboratories Corp.(Dongguan)
No.69 Pulong Village puxinhu Industry Zone Tangxia
Dongguan, China
http://www.baclcorp.com

Dear Sir or Madam:

We, Hena Digital Technology (Shenzhen) Co., Ltd. , hereby declare that testing model product: MID, Model number: PAD824iW.Multiple Models: MI80Q8, MID80Q8, MW80Q8, MI-80Q8, MID-80Q8, MW-80Q8. Multiple Model have the same appearance, structure, PCB, Material and function to the testing product's model, and only are different for model name.
Besides the differences in the above, we declare the products are identical. We guarantee all the information provided above is true, and notice that we'll bear all the consequences caused by any false information or concealing.
Please contact me should there be need for any additional clarification or information.

Best Regards,
Signature



Chen Yong
Manager

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