

## FCC PART 15B

## TEST REPORT

For

### Digicine Oristar Technology Development(Beijing) Co., Ltd.

Building B2, Shumazhuangyuan, No.1, Disheng West Street, BDA, Beijing

**FCC ID: 2ACGGCHN-III**

<b>Report Type:</b> Original Report	<b>Product Type:</b> CHN-III
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<b>Report Number:</b>	R2BJ140516053-00
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\* This report may contain data that are not covered by the NVLAP accreditation and shall be marked with an asterisk "★" (Rev.2). This report is valid only with a valid digital signature. The digital signature may be available only under the Adobe software above version 7.0.

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## GENERAL INFORMATION

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

The *Digicine Oristar Technology Development(Beijing) Co., Ltd*'s product, model number: *CHN-III* (FCC ID: 2ACGGCHN-III) (the "EUT") in this report was a *CHN-III*, which was measured approximately: 29.3 cm (L) x 23.8 cm (W) x 7.1 cm (H), rated input voltage: DC 12.0V from adapter. The highest operating frequency is 2.13 GHz.

Adapter information: Huntkey  
Model: HKA06012050-7A  
Input: AC 100-240V, 50/60Hz, 1.5A  
Output: DC 12.0V, 5.0A

\* All measurement and test data in this report was gathered from production sample serial number: 140516053 (Assigned by BACL.Dongguan). The EUT was received on 2014-05-19.

### Objective

This report is prepared on behalf of *Digicine Oristar Technology Development(Beijing) Co., Ltd* in accordance with Part 2, Subpart J, Part 15, Subparts A and B of the Federal Communication Commissions rules.

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

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

No related submittal(s).

### 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 02, 2012. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4-2003.

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.

Additionally, Bay Area Compliance Laboratories Corp. (Dongguan) is an ISO/IEC 17025 accredited laboratory, and is accredited by National Voluntary Laboratory Accredited Program (Lab Code 500069-0).



The current scope of accreditations can be found at <http://ts.nist.gov/standards/scopes/5000690.htm>

## SYSTEM TEST CONFIGURATION

### Justification

The system was configured for testing in a typical fashion (as normally used by a typical user).

### EUT Exercise Software

No software was used.

### Equipment Modifications

No equipment modifications.

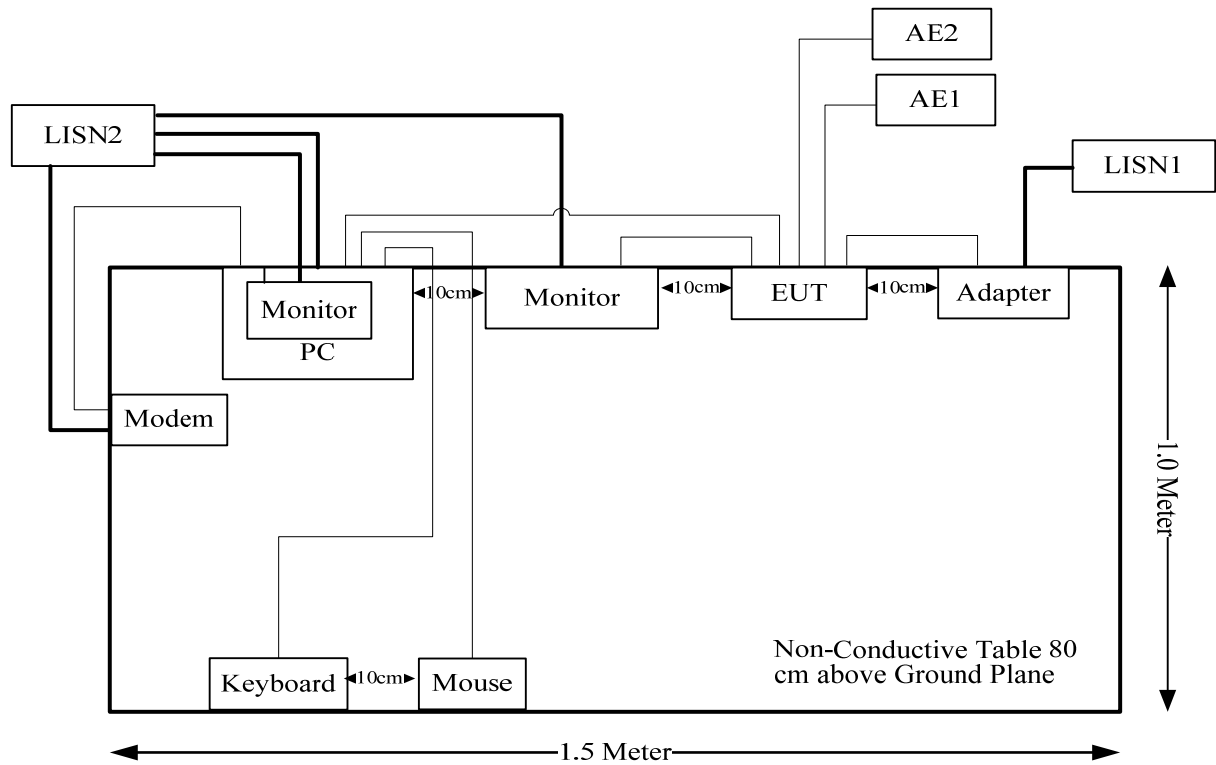
### Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
SAST	Modem	AEM-2100	090200213
DELL	Monitor	U3011t	CN-OPH5NY-74445-17M-114L
DELL	Monitor	U3011t	CN-OT9401-71619-588-AJ9X
DELL	Mouse	MOS6UOA	FOY02P7Y
DELL	Keyboard	SK-8115	CN-0J4628-71616-52H-ORT6
HP	PC	N/A	N/A

### External I/O Cable

Cable Description	Length (m)	From Port	To
Shielded Detachable VGA Cable	1.5	VGA Port of EUT	Monitor
Shielded Detachable VGA Cable	1.5	VGA Port of PC	Monitor
Shielded Detachable RJ45 Cable	2.0	RJ45 Port(audio) of EUT	AE1
Shielded Detachable RJ45 Cable	2.0	RJ45 Port (audio) of EUT	AE2
Shielded Detachable RJ45 Cable	2.0	RJ45 Port of EUT	PC
Shielded Detachable Keyboard Cable	2.0	USB Port of PC	Keyboard
Shielded Detachable mouse Cable	2.0	USB Port of PC	Mouse
Unshielded Detachable Serial Cable	1.5	Serial Port of EUT	Modem

## Block Diagram of Test Setup



## SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Results
§15.107	AC Line Conducted Emissions	Compliance
§15.109	Radiated Emissions	Compliance

## FCC §15.107 – AC LINE CONDUCTED 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:

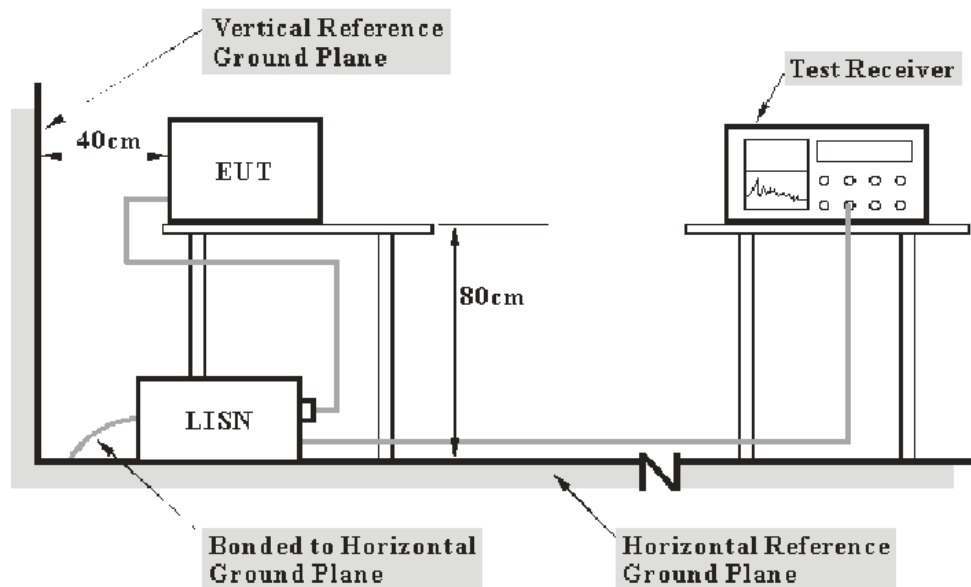
- compliance is deemed to occur if no measured disturbance level, increased by  $(U_{lab} - U_{cispr})$ , exceeds the disturbance limit;
- non-compliance is deemed to occur if any measured disturbance level, increased by  $(U_{lab} - U_{cispr})$ , exceeds the disturbance limit.

Based on CISPR 16-4-2: 2011, measurement uncertainty of 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 C63.4-2003 measurement procedure. The specification used was with the FCC Part 15.107 Class B limits.

The spacing between the peripherals was 10 cm.

The adapter was connected to a 120 VAC/60 Hz 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 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:

$$V_C = V_R + A_C + VDF$$

$$C_f = A_C + VDF$$

Herein,

$V_C$  (cord. Reading): corrected voltage amplitude

$V_R$ : reading voltage amplitude

$A_C$ : attenuation caused by cable loss

VDF: voltage division factor of AMN

$C_f$ : Correction Factor

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 Equipment List and Details**

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	EMI Test Receiver	ESCS 30	830245/006	2013-11-20	2014-11-19
R&S	Two-line V-network	ENV216	3560.6550.12	2014-01-22	2015-01-21
R&S	L.I.S.N	ESH3-Z5	100113	N/A	N/A
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 in accordance to NVLAP requirements, traceable to National Primary Standards and International System of Units (SI).

**Test Results Summary**

According to the recorded data in following table, the EUT complied with the FCC Part 15.107, with the worst margin reading of:

**13.8 dB at 0.768247 MHz** in the **Neutral** conducted mode

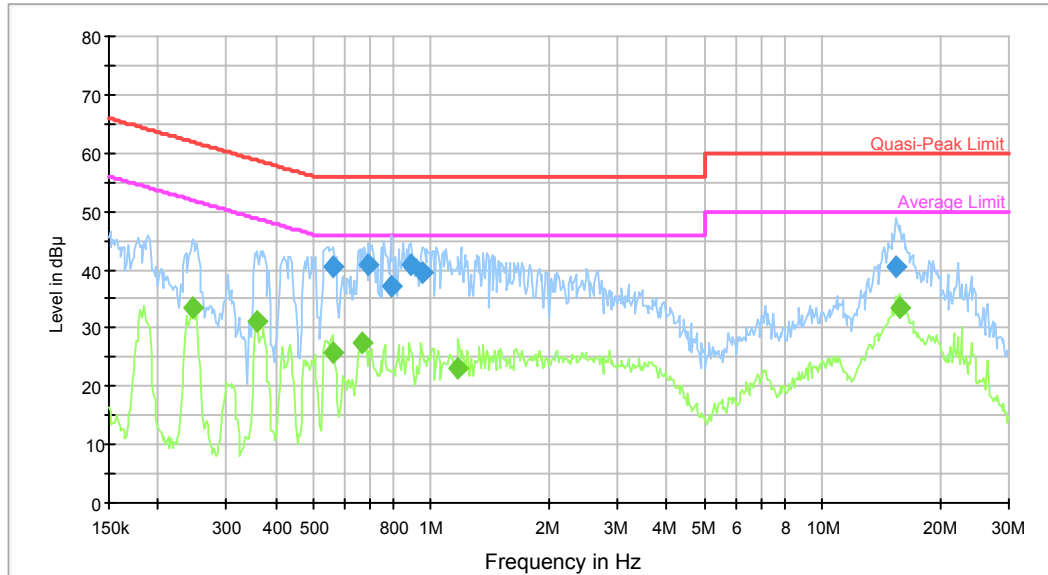
**Test Data****Environmental Conditions**

<b>Temperature:</b>	25.9 °C
<b>Relative Humidity:</b>	60 %
<b>ATM Pressure:</b>	100 kPa

*The testing was performed by Star Xie on 2014-05-19.*

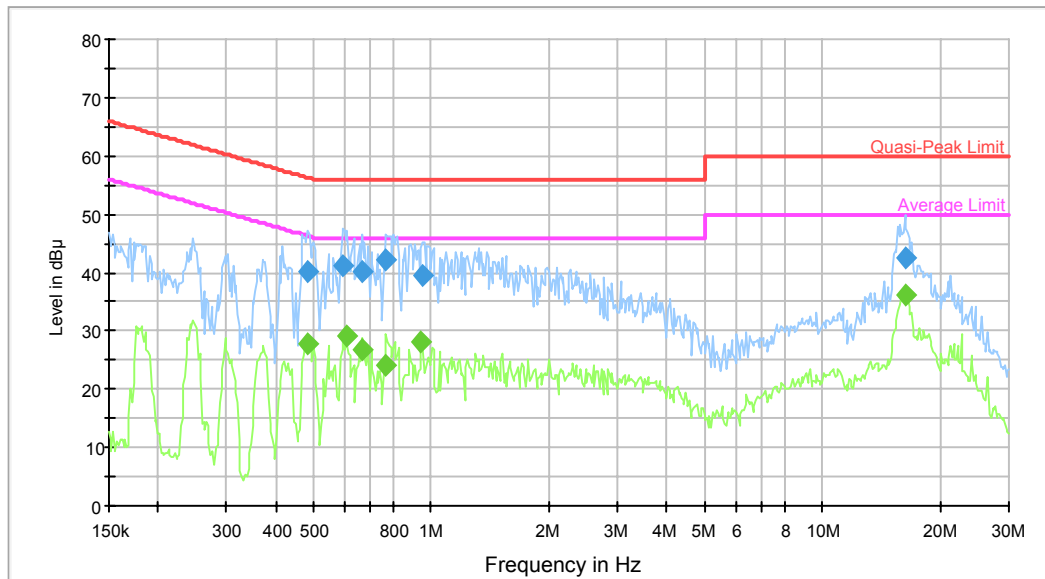
Test mode: Operating

AC120 V, 60 Hz, Line:



Frequency (MHz)	Corrected Quasi-Peak (dBμV)	Bandwidth (kHz)	Line	Corr. Factor (dB)	Margin (dB)	Limit (dBμV)	Comment
0.563041	40.4	9.000	L1	10.4	15.6	56.0	Compliance
0.692650	40.8	9.000	L1	10.6	15.2	56.0	Compliance
0.786832	37.0	9.000	L1	10.5	19.0	56.0	Compliance
0.886728	40.8	9.000	L1	10.5	15.2	56.0	Compliance
0.952654	39.5	9.000	L1	10.5	16.5	56.0	Compliance
15.492490	40.6	9.000	L1	10.7	19.4	60.0	Compliance

Frequency (MHz)	Corrected Average (dBμV)	Bandwidth (kHz)	Line	Corr. Factor (dB)	Margin (dB)	Limit (dBμV)	Comment
0.245835	33.3	9.000	L1	10.7	18.6	51.9	Compliance
0.360371	31.1	9.000	L1	10.7	17.6	48.7	Compliance
0.558572	25.9	9.000	L1	10.4	20.1	46.0	Compliance
0.665597	27.6	9.000	L1	10.6	18.4	46.0	Compliance
1.171949	22.9	9.000	L1	10.4	23.1	46.0	Compliance
15.741362	33.6	9.000	L1	10.7	16.4	50.0	Compliance

**AC120 V, 60 Hz, Neutral:**

Frequency (MHz)	Corrected Quasi-Peak (dBμV)	Bandwidth (kHz)	Line	Corr. Factor (dB)	Margin (dB)	Limit (dBμV)	Comment
0.483938	40.2	9.000	N	10.5	16.1	56.3	Compliance
0.595338	41.3	9.000	N	10.5	14.7	56.0	Compliance
0.665597	40.2	9.000	N	10.6	15.8	56.0	Compliance
0.768247	42.2	9.000	N	10.6	13.8	56.0	Compliance
0.952654	39.5	9.000	N	10.5	16.5	56.0	Compliance
16.251162	42.7	9.000	N	10.7	17.3	60.0	Compliance

Frequency (MHz)	Corrected Average (dBμV)	Bandwidth (kHz)	Line	Corr. Factor (dB)	Margin (dB)	Limit (dBμV)	Comment
0.483938	27.7	9.000	N	10.5	18.6	46.3	Compliance
0.604902	29.3	9.000	N	10.5	16.7	46.0	Compliance
0.665597	26.6	9.000	N	10.6	19.4	46.0	Compliance
0.768247	24.2	9.000	N	10.6	21.8	46.0	Compliance
0.945093	28.2	9.000	N	10.5	17.8	46.0	Compliance
16.251162	36.0	9.000	N	10.7	14.0	50.0	Compliance

## FCC §15.109 - RADIATED 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  $U_{cisp}$  of Table 2, 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  $U_{cisp}$  of Table 1, then:

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

30M~200MHz: 5.0 dB

200M~1GHz: 6.2 dB

1G~6GHz: 4.45 dB

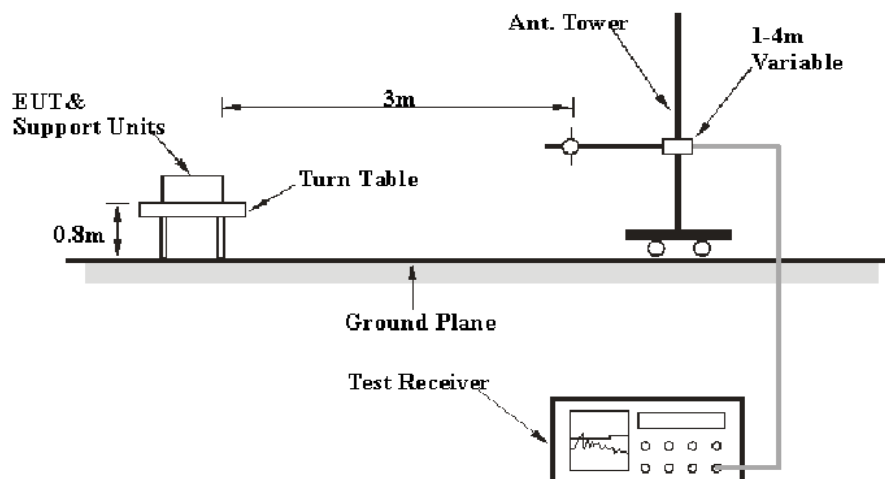
6G~18GHz: 5.23 dB

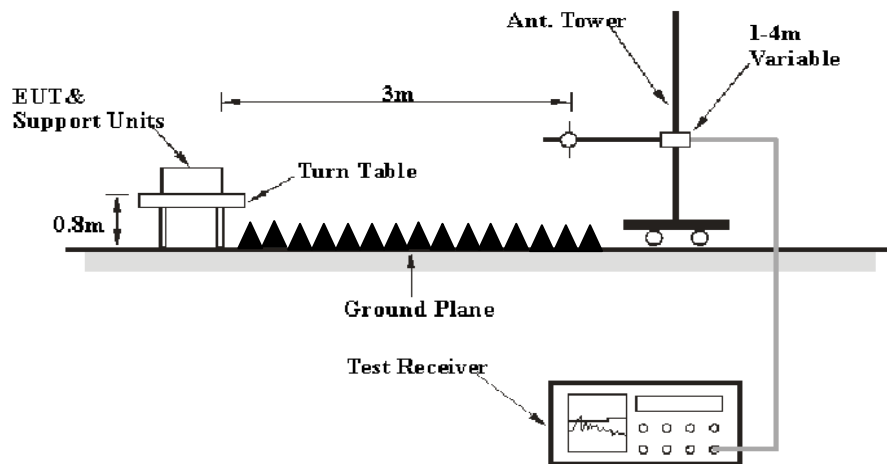
Table 2 – Values of  $U_{cisp}$

Measurement	$U_{cisp}$
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 1 GHz:



**Above 1GHz:**

The radiated emission tests were performed in the 3 meters chamber test site, using the setup accordance with the ANSI C63.4-2003. The specification used was the FCC Part 15.109, 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 spacing between the peripherals was 10 cm.

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

**EMI Test Receiver Setup**

According to FCC 15.33 requirements, the system was measured from 30 MHz to 10.7 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	/	PK
	1 MHz	10 Hz	/	Ave.

**Test Procedure**

For the radiated emissions test, the adapter was connected to the first AC floor outlet and the other support equipments were connected to the second AC floor outlet.

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

The data was recorded in Quasi-peak detection mode for 30 MHz to 1 GHz, Peak and average detection mode above 1 GHz.

## 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 7dB means the emission is 7dB below the limit. The equation for margin calculation is as follows:

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

## Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	EMI Test Receiver	ESCI	100224	2014-05-09	2015-05-08
Sunol Sciences	Antenna	JB3	A060611-1	2011-09-06	2014-09-05
HP	Amplifier	8447E	2434A02181	2013-09-06	2014-09-05
R&S	Spectrum Analyzer	FSEM	DE31388	2014-05-09	2015-05-08
ETS-Lindgren	Horn Antenna	3115	000 527 35	2012-09-06	2015-09-05
Mini-Circuit	Amplifier	ZVA-213-S+	054201245	2014-02-19	2015-02-18
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 in accordance to NVLAP requirements, traceable to National Primary Standards and International System of Units (SI).

## Test Results Summary

According to the data in the following table, the EUT complied with the FCC §15.109, Class B, with the worst margin reading of:

**4.90 dB at 250.1900 MHz in the Horizontal polarization**

## Test Data

### Environmental Conditions

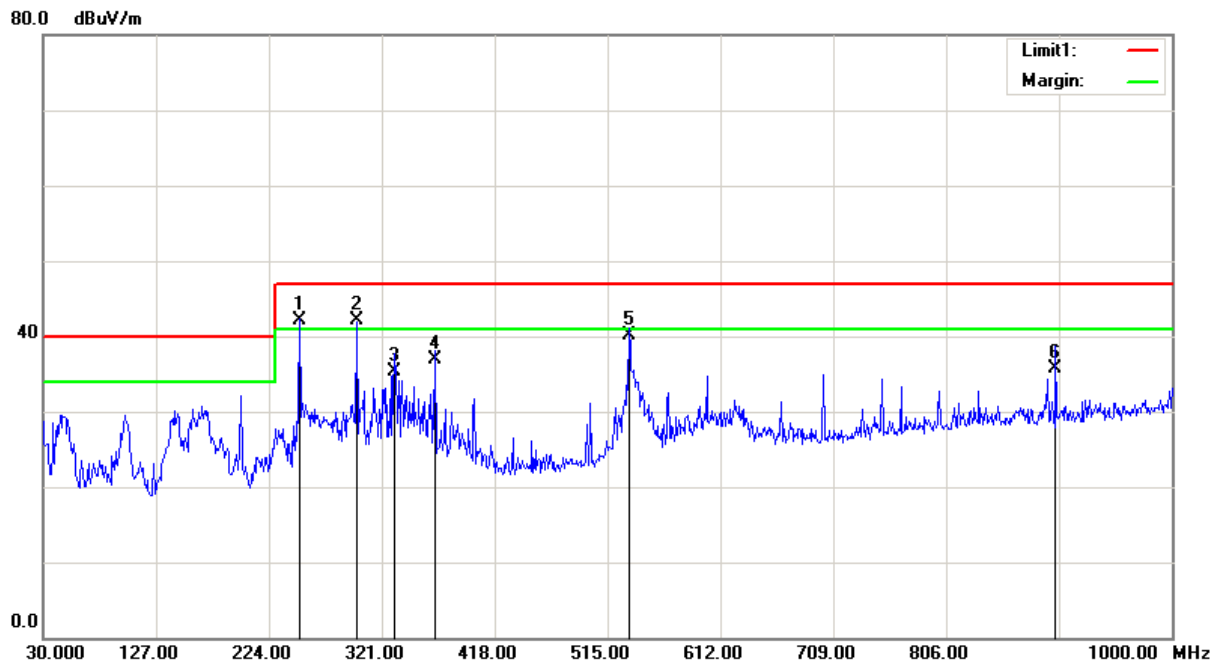
<b>Temperature:</b>	26.1 °C
<b>Relative Humidity:</b>	606%
<b>ATM Pressure:</b>	100.2 kPa

*The testing was performed by Star Xie on 2014-05-20.*

Test mode: Operating

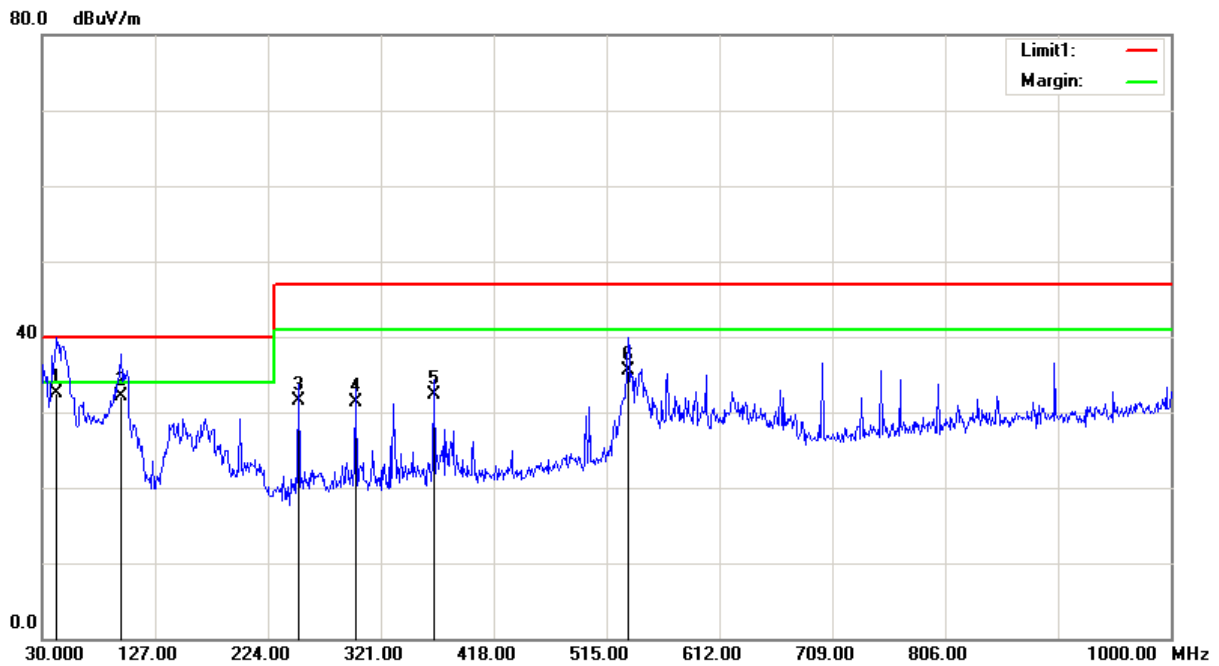
### 1) Below 1 GHz:

#### Horizontal:



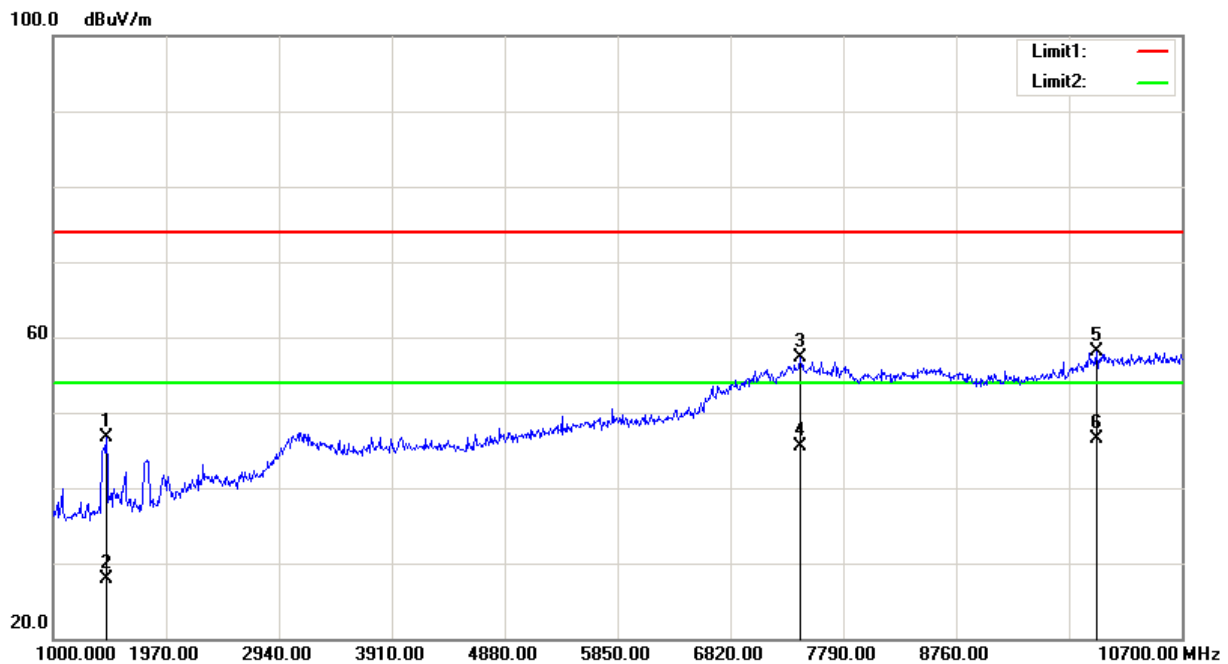
Frequency (MHz)	Receiver Reading (dBμV)	Detector (PK/QP/Ave)	Correction Factor (dB/m)	Cord. Amp. (dBμV/m)	Limit (dBμV/m)	Margin (dB)
250.1900	49.67	QP	-7.57	42.10	47.00	4.90*
299.6600	47.75	QP	-5.75	42.00	47.00	5.00*
331.6700	40.15	QP	-4.85	35.30	47.00	11.70
366.5900	40.88	QP	-3.88	37.00	47.00	10.00
533.4300	41.43	QP	-1.23	40.20	47.00	6.80
900.0900	31.56	QP	4.14	35.70	47.00	11.30

\*Within measurement uncertainty!

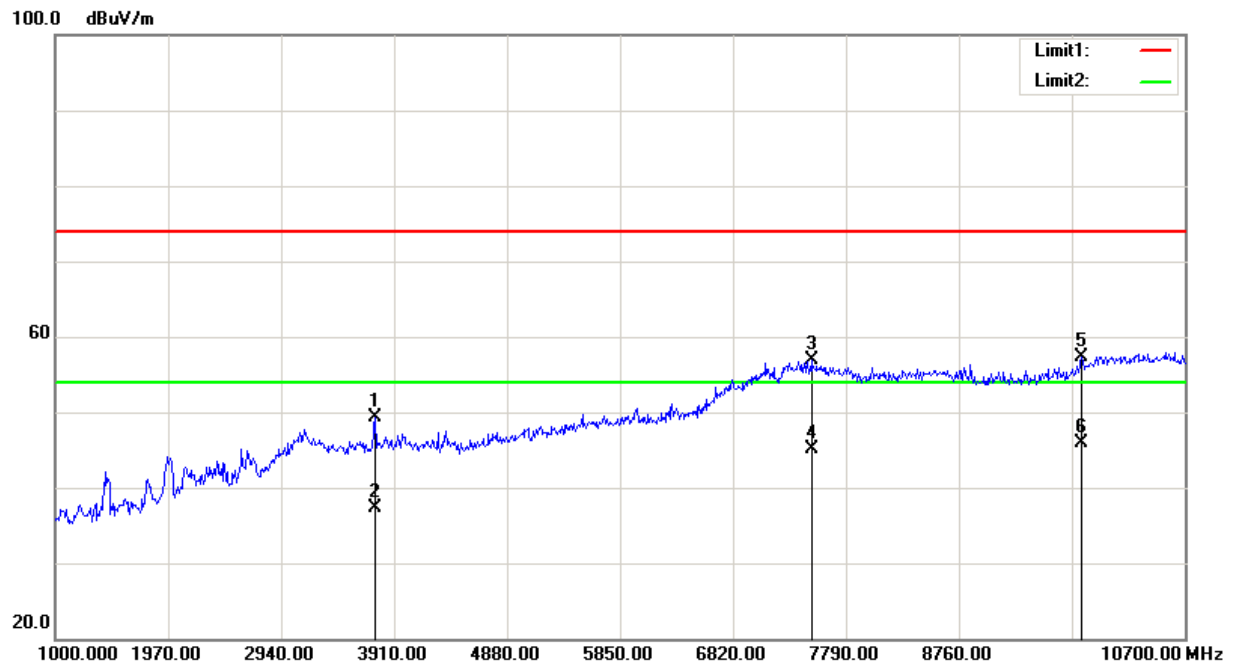
**Vertical:**

Frequency (MHz)	Receiver Reading (dBμV)	Detector (PK/QP/Ave)	Correction Factor (dB/m)	Cord. Amp. (dBμV/m)	Limit (dBμV/m)	Margin (dB)
42.6100	40.74	QP	-8.14	32.60	40.00	7.40
97.9000	42.38	QP	-10.28	32.10	40.00	7.90
250.1900	39.07	QP	-7.57	31.50	47.00	15.50
299.6600	37.15	QP	-5.75	31.40	47.00	15.60
366.5900	36.28	QP	-3.88	32.40	47.00	14.60
533.4300	36.83	QP	-1.23	35.60	47.00	11.40



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

Frequency (MHz)	Receiver Reading (dBμV)	Detector (PK/QP/Ave)	Correction Factor (dB/m)	Cord. Amp. (dBμV/m)	Limit (dBμV/m)	Margin (dB)
1456.814	47.32	peak	-0.60	46.72	74.00	27.28
1456.814	28.57	AVG	-0.60	27.97	54.00	26.03
7424.549	41.00	peak	16.26	57.26	74.00	16.74
7424.549	29.27	AVG	16.26	45.53	54.00	8.47
9971.042	38.89	peak	19.24	58.13	74.00	15.87
9971.042	27.34	AVG	19.24	46.58	54.00	7.42

**Vertical:**

Frequency (MHz)	Receiver Reading (dBμV)	Detector (PK/QP/Ave)	Correction Factor (dB/m)	Cord. Amp. (dBμV/m)	Limit (dBμV/m)	Margin (dB)
3750.601	42.28	peak	6.96	49.24	74.00	24.76
3750.601	30.25	AVG	6.96	37.21	54.00	16.79
7492.585	40.57	peak	16.28	56.85	74.00	17.15
7492.585	28.84	AVG	16.28	45.12	54.00	8.88
9815.531	39.14	peak	18.25	57.39	74.00	16.61
9815.531	27.58	AVG	18.25	45.83	54.00	8.17

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