TCT 通测检测
TESTING CENTRE TECHNOLOGY

TEST REPORT

FCC ID: 2AEF5M10G1BA01

Product: Minno10

Model No.: M10G1BA01

Additional Model No.: A10G1BA01

Trade Mark: Minno, Armtab

Report No.: TCT150225E031

Issued Date: Apr. 29, 2015

Issued for:

Minno LLC

421 North Milpas Street, Santa Barbara, CA 93103 U.S.A.

Issued By:

Shenzhen TCT Testing Technology Co., Ltd.
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1. Test Certification

Product:	Minno10
Model No.:	M10G1BA01
Additional Model No.	A10G1BA01
Applicant:	Minno LLC
Address:	421 North Milpas Street, Santa Barbara, CA 93103 U.S.A.
Manufacturer:	Shenzhen Longhorn Technology Co., Ltd.
Address:	Longhorn Hi-Tech Estate, Gongyeyuan Rd., Dalang Street, Baoan, Shenzhen, China
Date of Test:	Mar. 28, 2015- Apr. 29, 2015
Applicable Standards:	47 CFR FCC Part 15 Subpart B: 2014 ANSI C63.4: 2009

The above equipment has been tested by Shenzhen TCT Testing Technology Co., Ltd. and found compliance with the requirements set forth in the technical standards mentioned above. The results of testing in this report apply only to the product/system, which was tested. Other similar equipment will not necessarily produce the same results due to production tolerance and measurement uncertainties.

Tested By:	***SKY***	***Date:***	***Apr. 17, 2015***
Check By:	***Joe Zhou***	***Date:***	***Apr. 29, 2015***
Approved By:	***Tomsin***	***Date:***	***Apr. 29, 2015***

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2. Test Result Summary

Emission		
Test Method	**Item**	**Result**
FCC 47 CFR Part 15 Subpart B	Conducted Emission	PASS
	Radiated Emission	PASS

Note:

1. PASS: Test item meets the requirement.
2. Fail: Test item does not meet the requirement.
3. N/A: Test case does not apply to the test object.
4. The test result judgment is decided by the limit of test standard.
5. The information of measurement uncertainty is available upon the customer's request.

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3. EUT Description

Product Name:	Minno LLC
Model No.:	M10G1BA01
Additional Model No.	A10G1BA01
Trade Mark:	**Minno, Armtab**
Operation frequency:	BT/BLE: 2402~2480MHz WIFI: 2412~2462MHz GPS: 1575.42MHz
Power Supply:	Rechargeable Li-ion Battery DC3.7V, 4000mAh
AC Adapter:	Model: SPFXQ-NA Input: 100-240V, 50/60Hz, 0.3A Output: 5V, 2.1A
Model Difference:	All models above are identical in interior structure, electrical circuits and components, and just differ in look and model for the marketing requirement.
AC Line(PC):	☐ Shielded ☒ Unshielded, ☒ Detachable ☐ Un-detachable ☐No applicable ☒Length: 1.2 m
AC Line(Monitor):	☐ Shielded ☒ Unshielded, ☒ Detachable ☐ Un-detachable ☐No applicable ☒Length: 1.2 m
AC Line(Printer):	☐ Shielded ☒ Unshielded, ☒ Detachable ☐ Un-detachable ☐No applicable ☒Length: 1.2 m
USB Line (PC to EUT):	☐ Shielded ☒ Unshielded, ☒ Detachable ☐ Un-detachable ☐No applicable ☒Length: 1.0 m
USB Line (PC to Printer):	☐ Shielded ☒ Unshielded, ☒ Detachable ☐ Un-detachable ☐No applicable ☒Length: 0.8 m
USB Line (Mouse):	☐ Shielded ☒ Unshielded, ☒ Detachable ☐ Un-detachable ☐No applicable ☒Length: 1.5 m
USB Line (Keyboard):	☐ Shielded ☒ Unshielded, ☒ Detachable ☐ Un-detachable ☐No applicable ☒Length: 1.5 m
VGA Line	☐ Shielded ☒ Unshielded, ☒ Detachable ☐ Un-detachable ☐No applicable ☒Length: 1.2 m
Earphone Line	☐ Shielded ☒ Unshielded, ☒ Detachable ☐ Un-detachable ☐No applicable ☒Length: 1.0 m

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4. Test Methodology

4.1. Test Mode

The following test mode(s) were assessed:

Test Mode
Radiated Emission
Mode 1: BT idle + WIFI idle + GPS Rx + Camera on + Adapter + Earphone
Mode 2: BT idle + WIFI idle + GPS Rx + Play MP4 + Adapter + Earphone
Mode 3: BT idle + WIFI idle + GPS Rx + Play MP3 + Adapter + Earphone
Mode 4: BT idle + WIFI idle + GPS Rx + USB link + Earphone
Conducted Emission
Mode 1: BT idle + WIFI idle + GPS Rx + Camera on + Adapter + Earphone
Mode 2: BT idle + WIFI idle + GPS Rx + Play MP4 + Adapter + Earphone
Mode 3: BT idle + WIFI idle + GPS Rx + Play MP3 + Adapter + Earphone
Mode 4: BT idle + WIFI idle + GPS Rx + USB link + Earphone
Remark: The highlight part means the worst case modes which were shown in report.

4.2. EUT System Operation

1. Set up EUT with the support equipments.
2. Make sure the EUT work normally during the test.

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5. Setup of Equipment under Test

5.1. Description of Support Units

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Equipment	Model No.	Serial No.	FCC ID	Trade Name
EMC Test Computer	5492	D1PFCG008HP	--	ASUS
Monitor	VX239	VX239H	--	ASUS
Keyboard	PK1100UE	04G104180039DP	--	ASUS
Mouse	MOBTUO	04G125610170DP	--	ASUS
Pinter	L11121E	FE2-2902	--	CANON

Note:

(1) All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.

(2) Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.

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6. Facilities and Accreditations

6.1. Facilities

All measurement facilities used to collect the measurement data are located at TCT Lab.
The sites are constructed in conformance with the requirements of ANSI C63.4 and CISPR Publication 22. All receiving equipment conforms to CISPR Publication 16-1, “Radio Interference Measuring Apparatus and Measurement Methods.”

6.2. Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

No.	Item	MU
1.	Temperature	±0.1℃
2.	Humidity	±1.0 %
3.	Spurious Emissions, Conducted	±2.56 dB
4.	All Emissions, Radiated	±4.28 dB

This uncertainty represents an expanded uncertainty expressed at approximately the 95 % confidence level using a coverage factor of k=2.

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7. Emission Test

7.1. Conducted Emission at Mains Terminals

7.1.1. Test Specification

Test Requirement:	FCC 47 CFR Part 15 Subpart B
Test Method:	ANSI C63.4:2009
Frequency Range:	150 kHz to 30 MHz

7.1.2. Limits

Frequency (MHz)	Class A dB(uV)		Class B dB(uV)	
	Quasi-peak	Average	Quasi-peak	Average
0.15 - 0.5	79	66	66 – 56[a]	56 – 46[a]
0.50 - 5.0	73	60	56	46
5.0 - 30.0	73	60	60	50
a) Decreases with the logarithm of the frequency				

7.1.3. Test Instruments

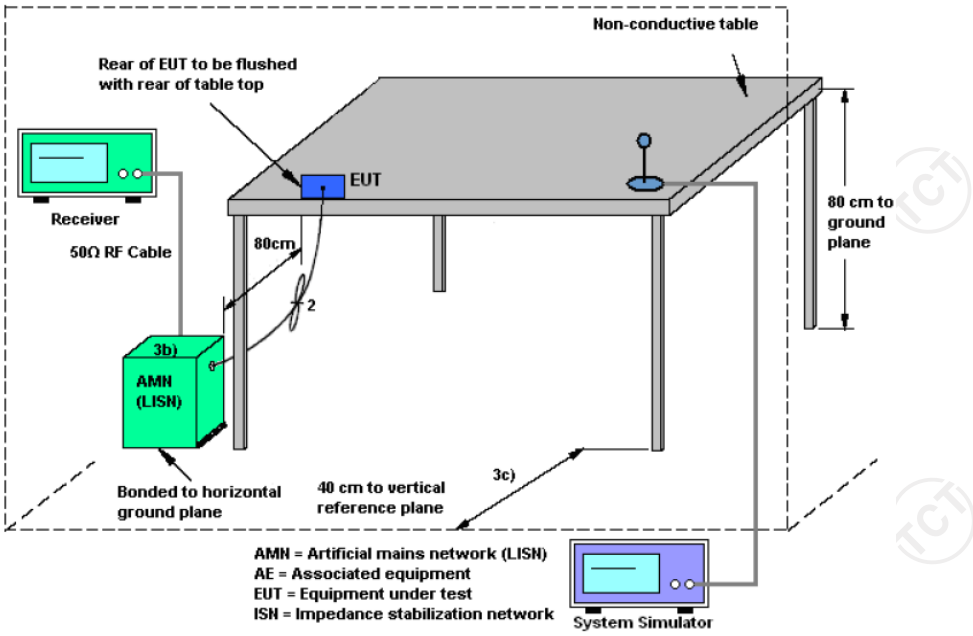
Conducted Emission Shielding Room Test Site (843)				
Equipment	**Manufacturer**	**Model**	**Serial Number**	**Calibration Due**
EMI Test Receiver	R&S	ESCS30	100139	Sep. 16, 2015
LISN	Schwarzbeck	NSLK 8126	8126453	Sep. 29, 2015

Note: The calibration interval of the above test instruments is 12 months and the calibrations are traceable to international system unit (SI).

7.1.4. Test Method

The AMN was placed 0.8 m from the boundary of the unit under test and bonded to a ground reference plane. This distance was between the closest points of the AMN and the EUT. All other units of the EUT and associated equipment was at least 0.8 m from the AMN. All power was connected to the system through Artificial Mains Network (AMN). Conducted voltage measurements on mains lines were made at the output of the AMN

7.1.5. Block Diagram of Test Setup



For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

7.1.6. Test Results

Test Environment:	Temp.:	23 ℃	Humid.:	51 %	Press.:	96 kPa
Test Mode:	Mode 1					
Test Voltage:	AC 120V/60Hz					
Test Result:	Pass					

Note:

L1 = Live Line / N = Neutral Line

"---" denotes the emission level was or more than 2dB below the Average limit, so no re-check anymore.

Freq. = Emission frequency in MHz

Reading level dB(μV) = Receiver reading

Corr. Factor (dB) = Attenuator factor + Cable loss

Level dB(μV) = Reading level dB(μV) + Corr. Factor (dB)

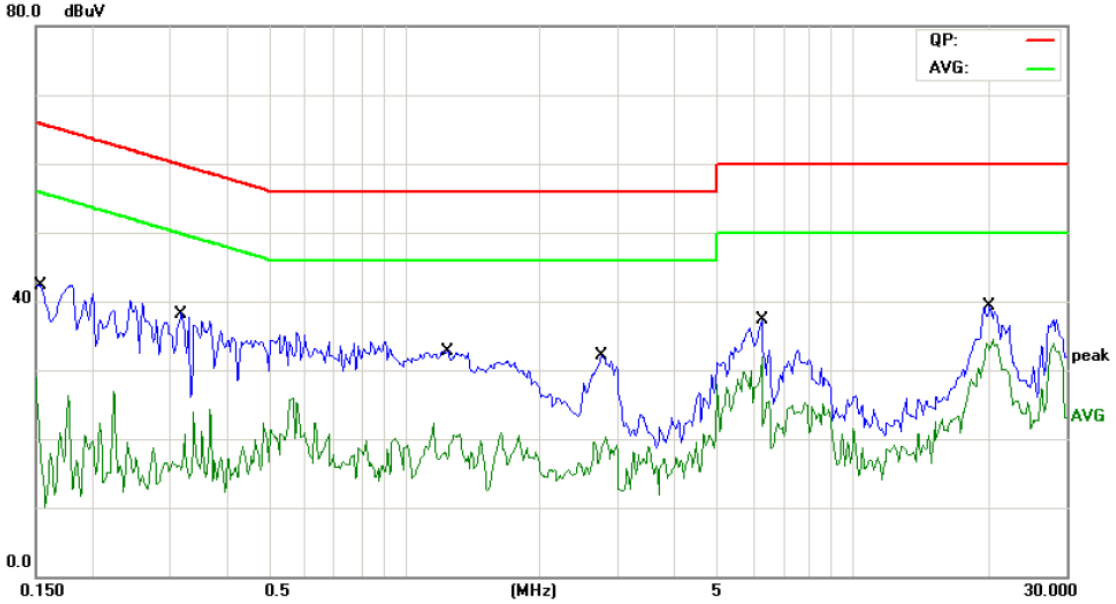
Limit dB(μV) = Limit stated in standard

Margin (dB) = Level dB(μV) – Limits dB(μV)

Q.P. =Quasi-Peak

AVG=Average

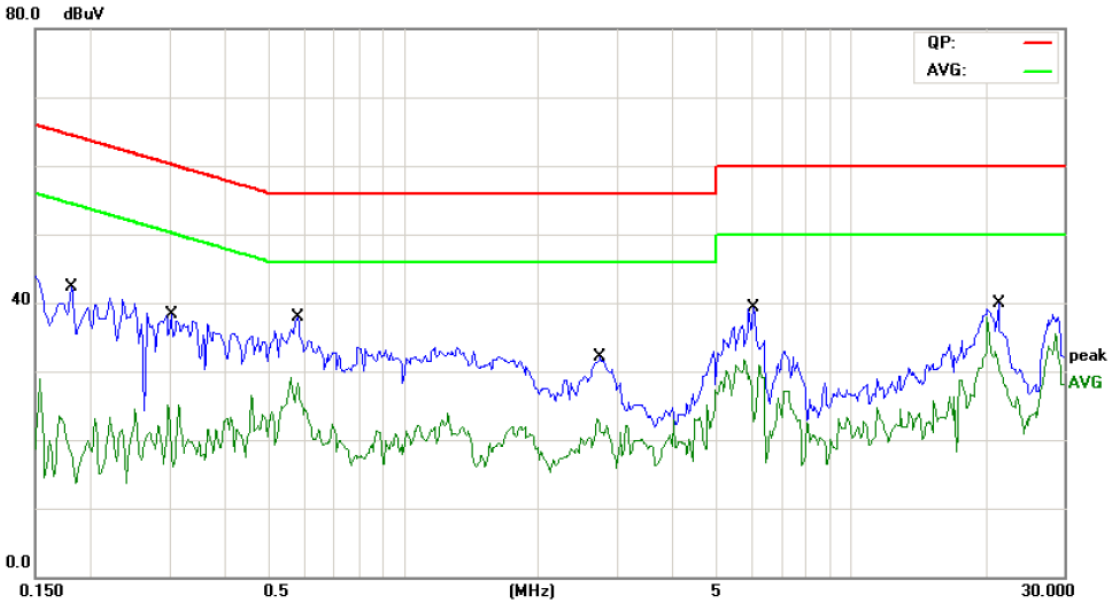
Please refer to following diagram for individual



Site Chamber #1 Phase: *L1* Temperature: 25 (C)

Limit: FCC PART15 Conduction(QP) Power: AC 120V/60Hz Humidity: 55 %

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1539	24.60	11.49	36.09	65.78	-29.69	QP	
2		0.1539	6.57	11.49	18.06	55.78	-37.72	AVG	
3		0.3180	21.25	11.40	32.65	59.76	-27.11	QP	
4		0.3180	6.70	11.40	18.10	49.76	-31.66	AVG	
5		1.2477	16.14	11.29	27.43	56.00	-28.57	QP	
6		1.2477	5.91	11.29	17.20	46.00	-28.80	AVG	
7		2.7359	14.85	11.41	26.26	56.00	-29.74	QP	
8		2.7359	4.90	11.41	16.31	46.00	-29.69	AVG	
9		6.2852	19.44	10.80	30.24	60.00	-29.76	QP	
10		6.2852	3.80	10.80	14.60	50.00	-35.40	AVG	
11	*	20.2109	22.80	10.54	33.34	60.00	-26.66	QP	
12		20.2109	5.51	10.54	16.05	50.00	-33.95	AVG	



Site Chamber #1 Phase: *N* Temperature: 25 (C)

Limit: FCC PART15 Conduction(QP) Power: AC 120V/60Hz Humidity: 55 %

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1812	22.90	11.50	34.40	64.43	-30.03	QP	
2		0.1812	6.76	11.50	18.26	54.43	-36.17	AVG	
3		0.3023	19.44	11.43	30.87	60.18	-29.31	QP	
4		0.3023	8.07	11.43	19.50	50.18	-30.68	AVG	
5		0.5797	21.89	11.27	33.16	56.00	-22.84	QP	
6	*	0.5797	16.46	11.27	27.73	46.00	-18.27	AVG	
7		2.7516	15.76	11.41	27.17	56.00	-28.83	QP	
8		2.7516	8.56	11.41	19.97	46.00	-26.03	AVG	
9		6.0703	21.49	10.78	32.27	60.00	-27.73	QP	
10		6.0703	5.76	10.78	16.54	50.00	-33.46	AVG	
11		21.4727	22.74	10.62	33.36	60.00	-26.64	QP	
12		21.4727	8.53	10.62	19.15	50.00	-30.85	AVG	

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7.2. Radiated Emission

7.2.1. Test Specification

Test Requirement:	FCC 47 CFR Part 15 Subpart B
Test Method:	ANSI C63.4:2009
Frequency Range:	30 MHz to 1000 MHz 1GHz to 6GHz
Measurement Distance:	3 m
Antenna Polarization:	Horizontal & Vertical

7.2.2. Limits

Frequency (MHz)	Field Strength (microvolts/meter)	Measurment Distance (meters)
30 ~ 88	100	3
88 ~ 216	150	3
216 ~ 960	200	3
Above 960	500	3

Frequency (MHz)	Field Strength (microvolts/meter)	Measurment Distance (meters)	Detector
	500	3	Average
Above 1GHz	5000	3	Peak

Note:
(1) The lower limit shall apply at the transition frequencies.
(2) Emission level dB(μV/m) = 20 log Emission level (μV/m).

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7.2.3. Test Instruments

Radiated Emission Test Site (966)				
Name of Equipment	**Manufacturer**	**Model**	**Serial Number**	**Calibration Due**
EMI Test Receiver	R&S	ESVD	100008	Sep. 16, 2015
Spectrum Analyzer	R&S	FSEM	848597-001	Sep. 16, 2015
Amplifier	HP	8447D	2727A05017	Sep. 16, 2015
Amplifier	EM	EM30265	07032613	Sep. 16, 2015
Broadband Antenna	Schwarzbeck	VULB9163	340	Sep. 17, 2015
Horn Antenna	Schwarzbeck	BBHA 9120D	631	Sep. 17, 2015

Note: The calibration interval of the above test instruments is 12 months and the calibrations are traceable to international system unit (SI).

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7.2.4. Test Method

1. The EUT was placed on a turntable with 0.8 meter above ground.

2. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.

3. The table was rotated 360 degrees to determine the position of the highest radiation.

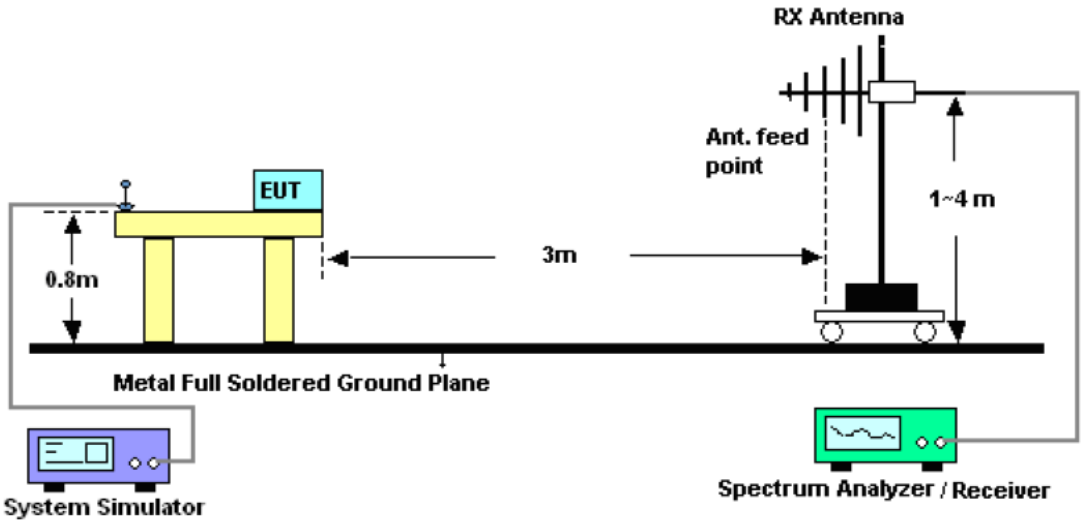
4. The antenna is a Bi-Log antenna and its height is adjusted between one to four meters above ground to find the maximum value of the field strength for both horizontal polarization and vertical polarization of the antenna.

5. For each suspected emission, the EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading.

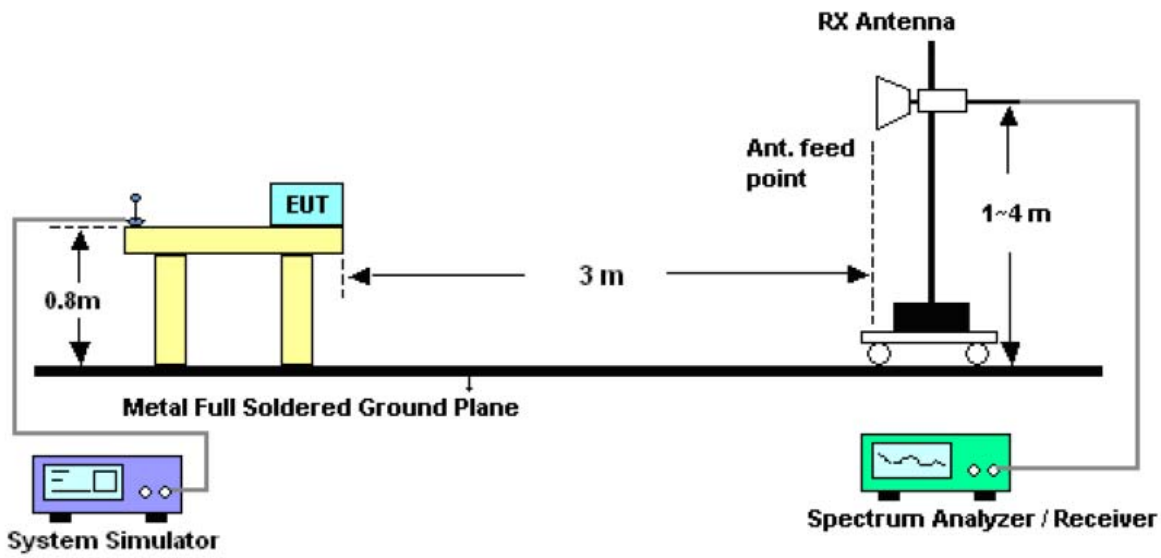
6. Set the test-receiver system to Peak Detect Function and specified bandwidth with Maximum Hold Mode (RBW=120kHz/VBW=300kHz for frequency below 1GHz; RBW=1MHz VBW=3MHz (Peak), RBW=1MHz/VBW=10Hz (Average) for frequency above 1GHz).

7.2.5. Block Diagram of Test Setup

Below 1GHz



Above 1GHz



For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

7.2.6. Test Results

Test Environment:	Temp.:	23 ℃	Humid.:	52%	Press.:	96 kPa
Test Mode:	Mode 4					
Test Voltage:	AC 120V/60Hz					
Test Result:	Pass					

Note:

Freq. = Emission frequency in MHz

Reading level dB(μV) = Receiver reading

Corr. Factor (dB) = Antenna factor + Cable loss

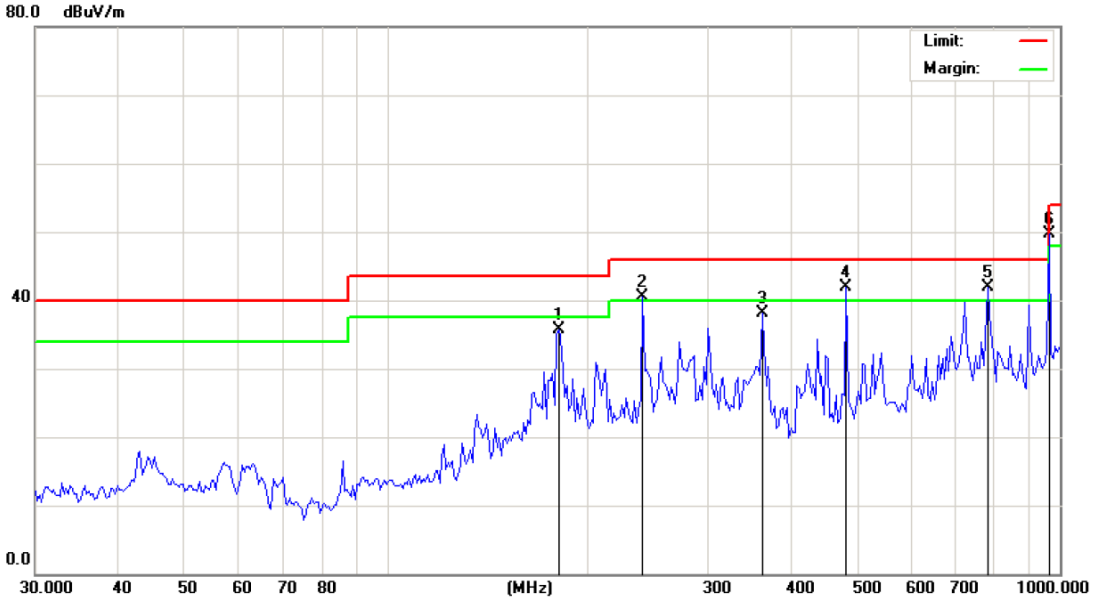
Measurement dB(μV/m) = Reading level dB(μV) + Corr. Factor (dB)

Limit dB(μV/m) = Limit stated in standard

Margin (dB) = Measurement dB(μV/m) – Limits dB(μV/m)

Q.P. =Quasi-Peak

Please refer to following diagram for individual



Site

Limit: FCC Part 15B Class B RE_3 m

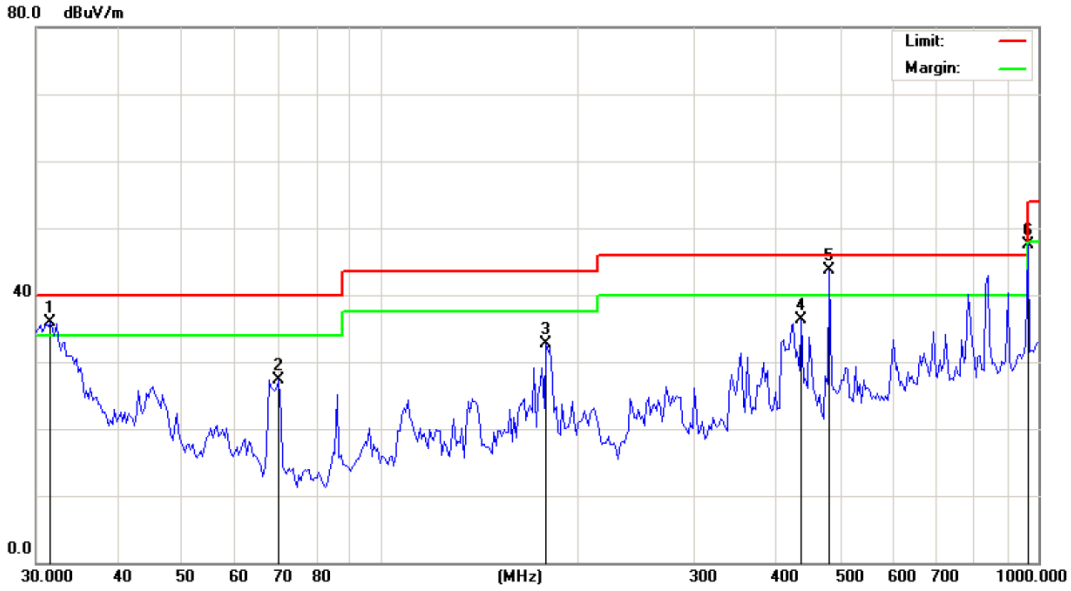
Polarization: *Horizontal*

Power: AC 120V/60Hz

Temperature: 22℃

Humidity: 58 %

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		180.0304	48.81	-13.06	35.75	43.50	-7.75	peak		0	
2	!	240.1442	50.73	-10.31	40.42	46.00	-5.58	peak		0	
3		360.9775	45.10	-6.99	38.11	46.00	-7.89	peak		0	
4	!	481.5112	45.54	-3.56	41.98	46.00	-4.02	peak		0	
5	*	781.9606	40.77	1.22	41.99	46.00	-4.01	peak		0	
6	!	965.4741	44.74	4.89	49.63	54.00	-4.37	peak		0	



Site

Limit: FCC Part 15B Class B RE_3 m

Polarization: *Vertical*

Power: AC 120V/60Hz

Temperature: 22℃

Humidity: 58 %

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1	!	31.5126	49.50	-13.53	35.97	40.00	-4.03	peak		0	
2		70.2096	43.90	-16.50	27.40	40.00	-12.60	peak		0	
3		178.7697	45.76	-13.15	32.61	43.50	-10.89	peak		0	
4		436.3956	41.42	-5.02	36.40	46.00	-9.60	peak		0	
5	*	481.5112	47.23	-3.56	43.67	46.00	-2.33	QP	100	0	
6		965.4742	42.67	4.89	47.56	54.00	-6.44	peak		0	

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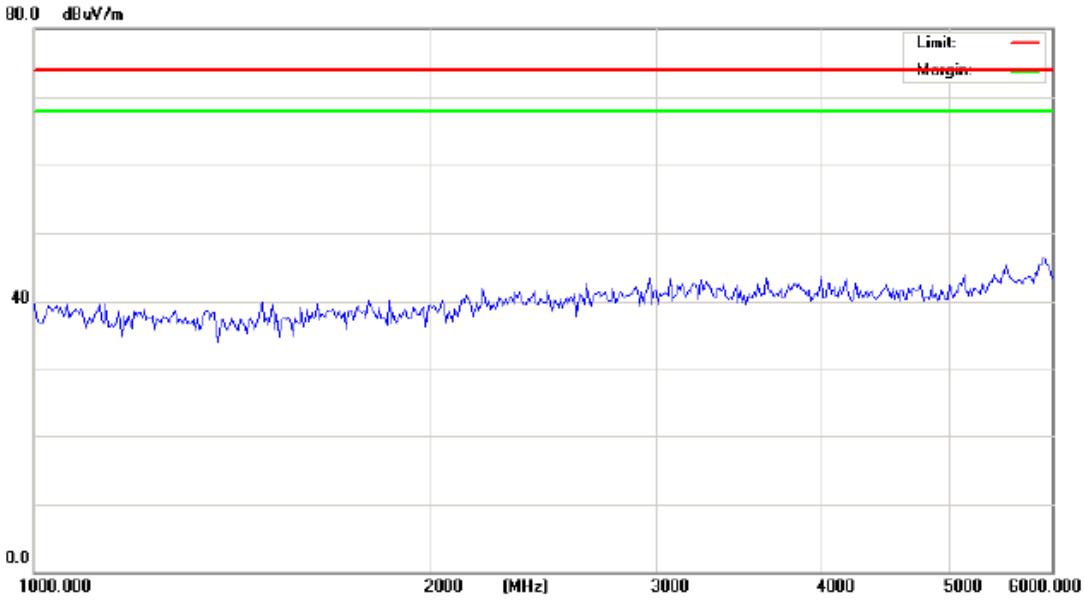

Site	Polarization: *Horizontal*	Temperature: 23
Limit: FCC ABOVE1G	Power: AC 120V/60Hz	Humidity: 53 %

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment

Note: Any value more than 10 dB below limit have not been specifically reported.

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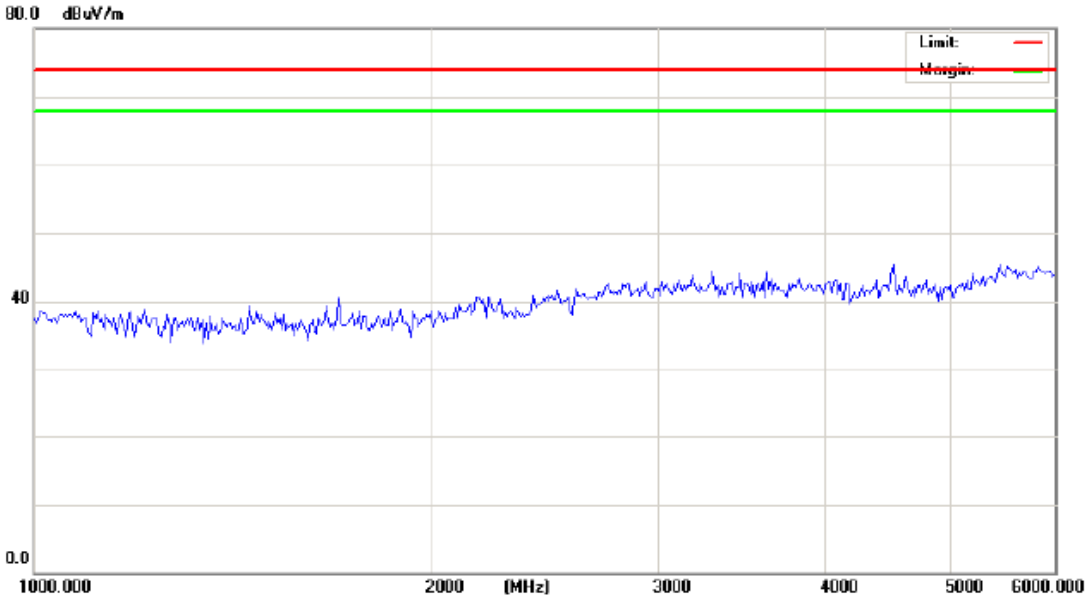


Site

Limit: FCC ABOVE1G

Polarization: *Vertical*

Power: AC 120V/60Hz

Temperature: 23

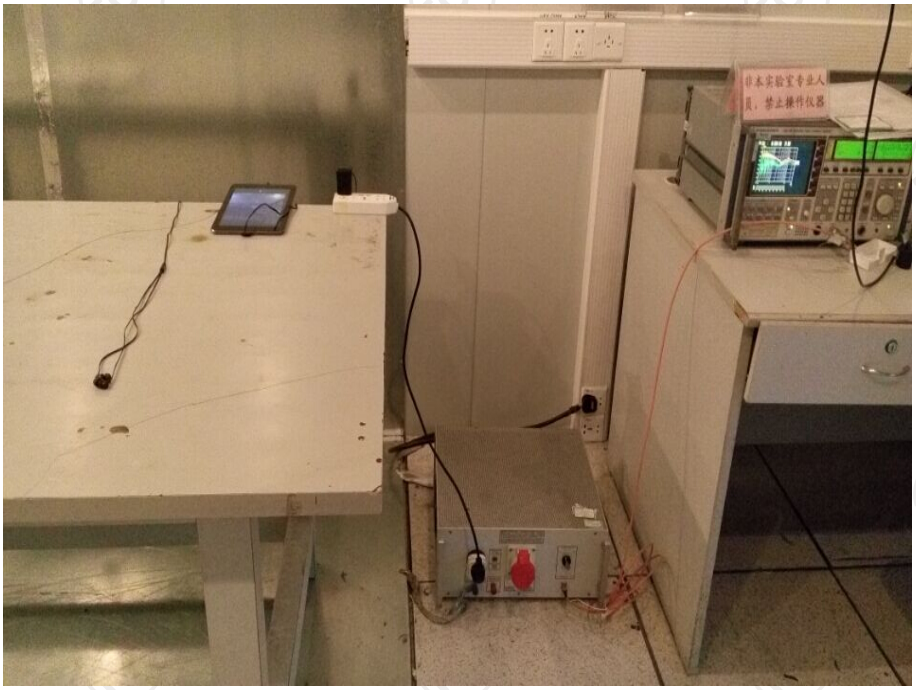
Humidity: 53 %

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment

Note: Any value more than 10 dB below limit have not been specifically reported.

8. Photographs of Test Configuration

Conducted Emission Test View



Radiated Emission Test View

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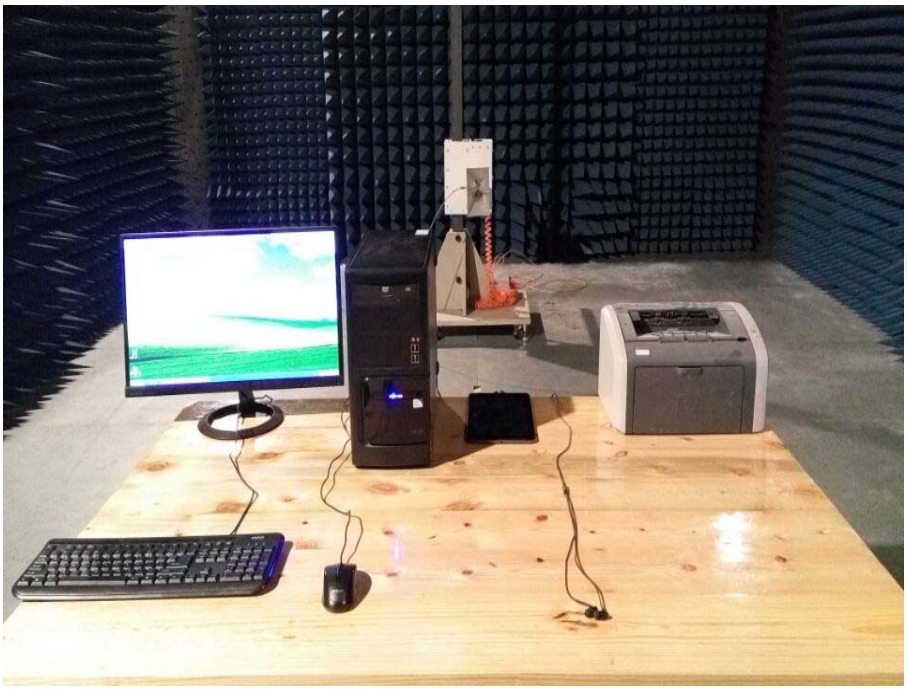

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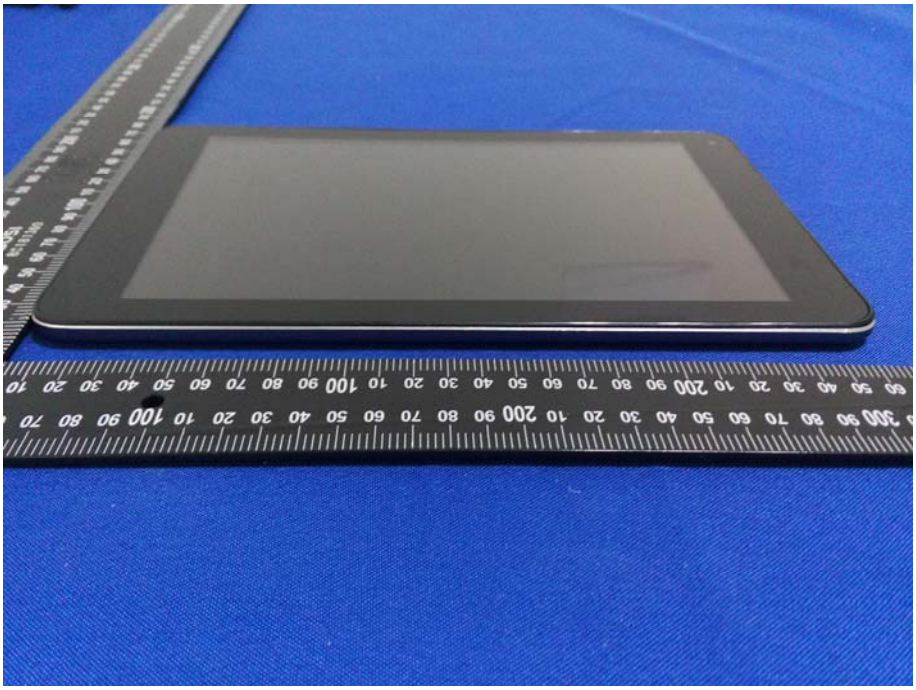
9. Photographs of EUT

Outside View



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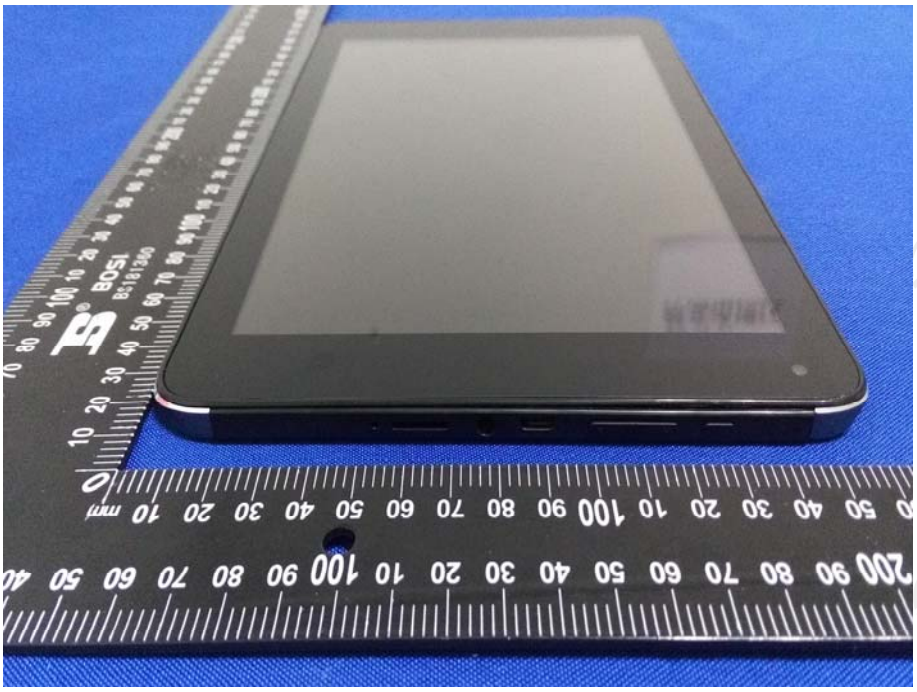

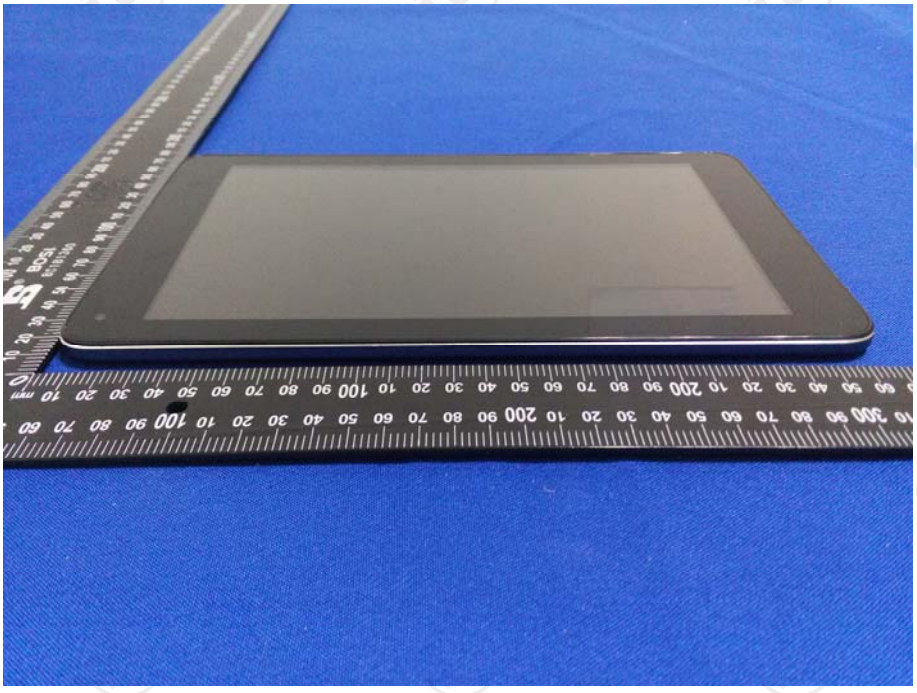

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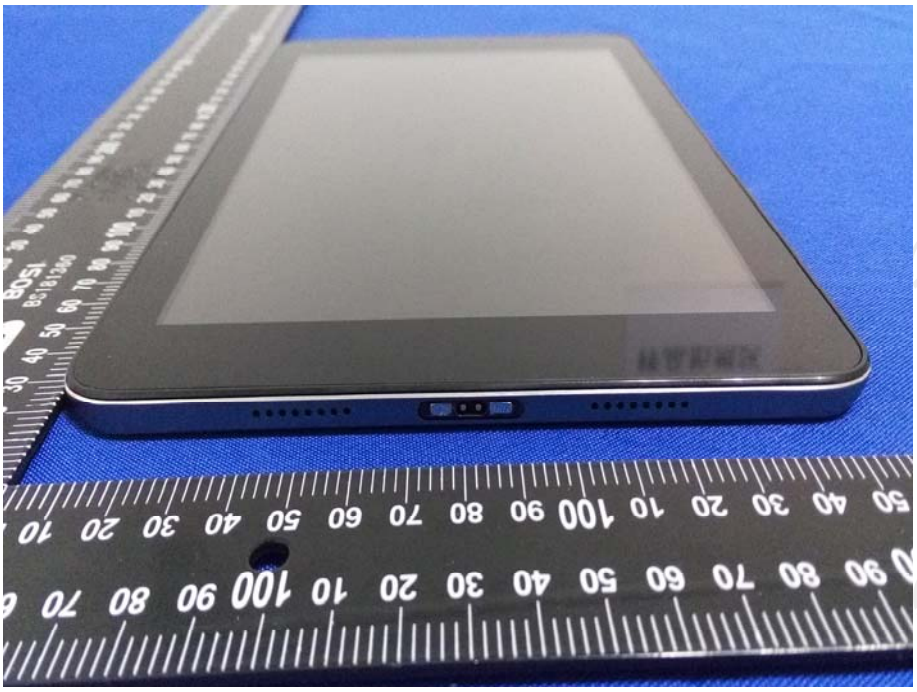
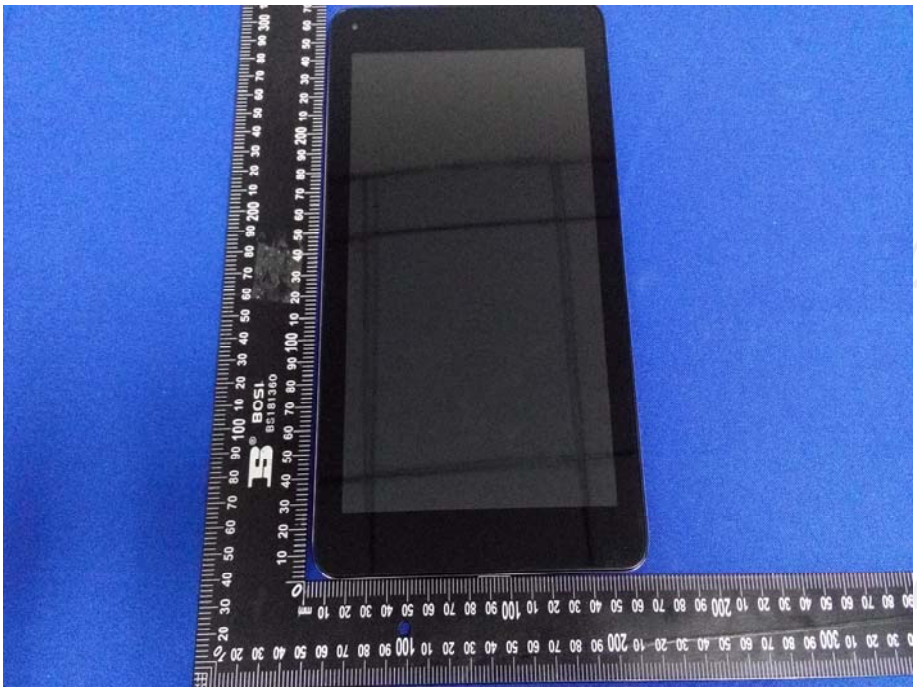
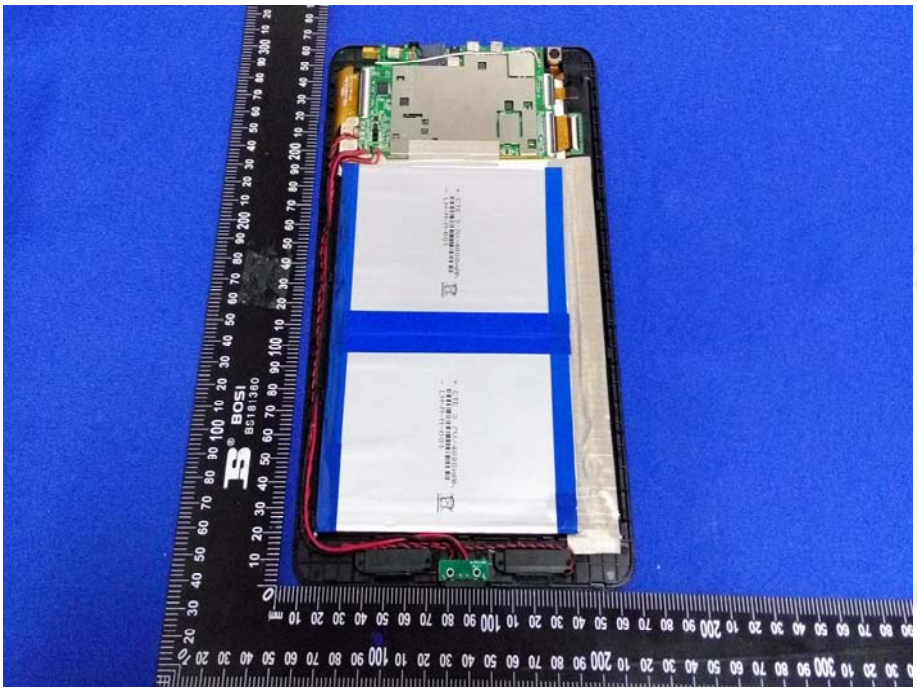
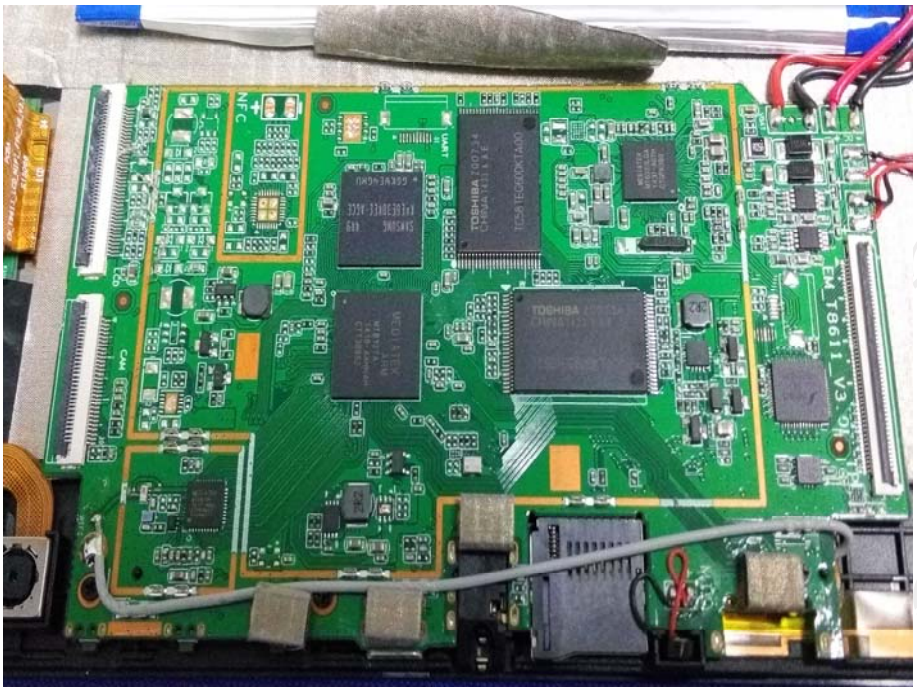




Inside View

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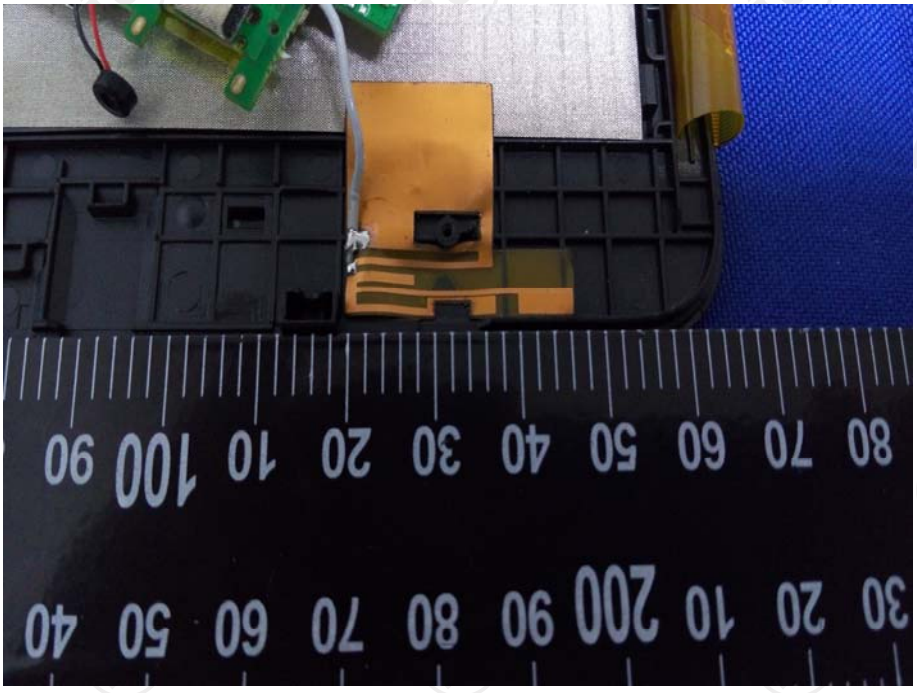
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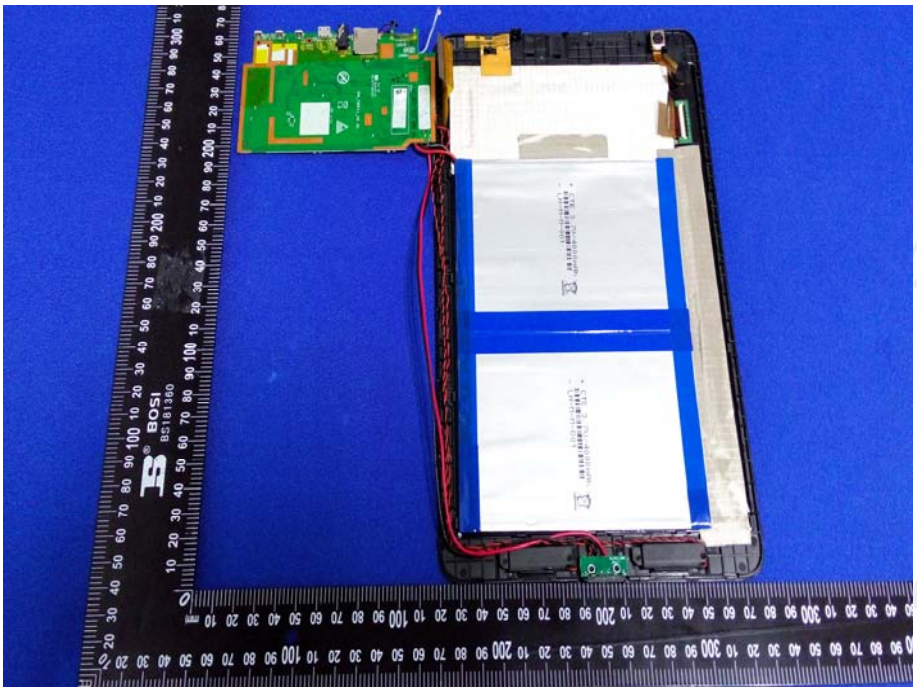

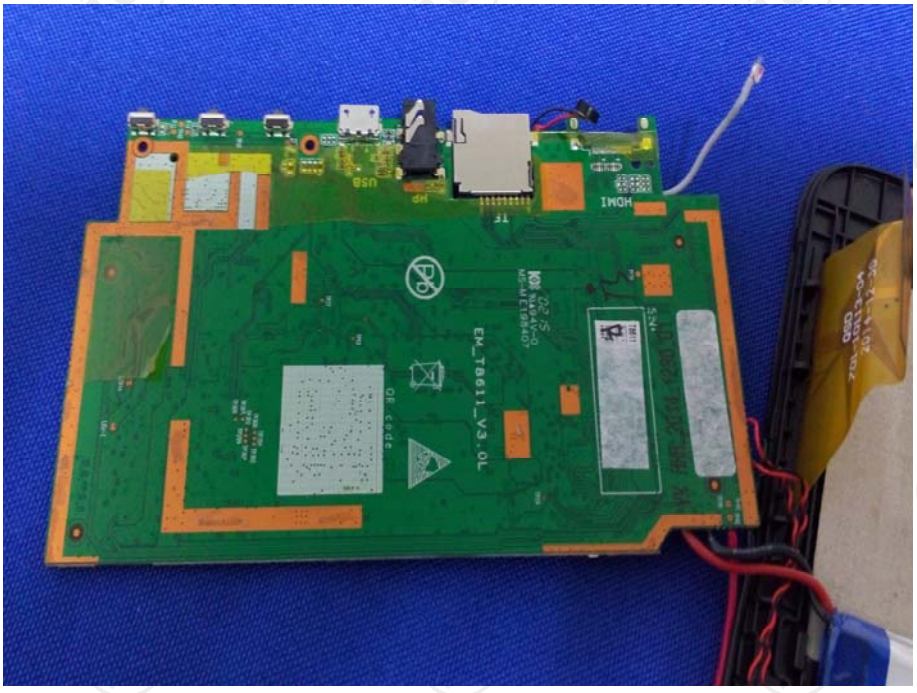

END OF REPORT

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