EMC TEST REPORT

Report No.: 15020210-FCC-E1
Supersede Report No.: N/A

Applicant	Beijing InHand Networks Technology Co., Ltd.
Product Name	Embedded Computer
Model No.	InBOX300
Serial Model No.	InBOX310、InBOX320、InBOX330、InBOX300S、InBOX310S、InBOX320S、InBOX330S
Test Standard	FCC Part 15 Subpart B Class B:2016 ANSI C63.4: 2014
Test Date	December 22,2015 to January 04, 2016
Issue Date	January 22, 2016
Test Result	☑ **Pass** ☐ **Fail**
Equipment complied with the specification	☑
Equipment did not comply with the specification	☐

Winnie Zhang	David Huang	
Winnie Zhang **Test Engineer**	**David Huang** **Checked By**	

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Test result presented in this test report is applicable to the tested sample only

Issued by:
SIEMIC (SHENZHEN-CHINA) LABORATORIES
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Laboratories Introduction

SIEMIC, headquartered in the heart of Silicon Valley, with superior facilities in US and Asia, is one of the leading independent testing and certification facilities providing customers with one-stop shop services for Compliance Testing and Global Certifications.

In addition to testing and certification, SIEMIC provides initial design reviews and compliance management throughout a project. Our extensive experience with China, Asia Pacific, North America, European, and International compliance requirements, assures the fastest, most cost effective way to attain regulatory compliance for the global markets.

Accreditations for Conformity Assessment

Country/Region	Scope
USA	EMC, RF/Wireless, SAR, Telecom
Canada	EMC, RF/Wireless, SAR, Telecom
Taiwan	EMC, RF, Telecom, SAR, Safety
Hong Kong	RF/Wireless, SAR, Telecom
Australia	EMC, RF, Telecom, SAR, Safety
Korea	EMI, EMS, RF, SAR, Telecom, Safety
Japan	EMI, RF/Wireless, SAR, Telecom
Singapore	EMC, RF, SAR, Telecom
Europe	EMC, RF, SAR, Telecom, Safety

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1. Report Revision History

Report No.	Report Version	Description	Issue Date
15020210-FCC-E1	NONE	Original	January 22, 2016

2. Customer information

Applicant Name	Beijing InHand Networks Technology Co., Ltd.
Applicant Add	101,West Wing,11th Floor,No.101,Lize central Park Wangjing,Chaoyang District,Beijing,100102,China
Manufacturer	Beijing InHand Networks Technology Co., Ltd.
Manufacturer Add	101,West Wing,11th Floor,No.101,Lize central Park Wangjing,Chaoyang District,Beijing,100102,China

3. Test site information

Lab performing tests	SIEMIC (Shenzhen-China) LABORATORIES
Lab Address	Zone A, Floor 1, Building 2 Wan Ye Long Technology Park South Side of Zhoushi Road, Bao'an District, Shenzhen, Guangdong China 518108
FCC Test Site No.	535293
IC Test Site No.	4842E-1
Test Software	EZ_EMC

4. Equipment under Test (EUT) Information

Description of EUT:	Embedded Computer
Main Model:	InBOX300
Serial Model:	InBOX310、InBOX320、InBOX330、InBOX300S、InBOX310S、InBOX320S、InBOX330S
Date EUT received:	July 13,2015
Test Date(s):	December 22,2015 to January 04, 2016
Antenna Gain:	GSM850/PCS1900:1 dBi UMTS-FDD Band V /UMTS-FDD Band II :2.5 dBi WIFI:802.11b/g/n(20M/40M): 2dBi
Type of Modulation:	GSM : GMSK UMTS-FDD: QPSK WIFI:802.11b/g/n(20M/40M): DSSS, OFDM
RF Operating Frequency Band(s):	GSM850 TX: 824.2 ~ 848.8 MHz; RX: 869.2 ~ 893.8 MHz PCS1900 TX: 1850.2 ~ 1909.8 MHz; RX: 1930.2 ~ 1989.8 MHz UMTS-FDD Band V TX: 826.4 ~ 846.6 MHz; RX: 871.4 ~ 891.6 MHz UMTS-FDD Band II TX:1852.4 ~ 1907.6 MHz; RX: 1932.4 ~ 1987.6 MHz WIFI:802.11b/g/n(20M): 2412-2462 MHz (TX/RX) WIFI:802.11n(40M): 2422-2452 MHz (TX/RX)
Number of Channels:	GSM 850: 124CH、PCS1900: 299CH UMTS-FDD Band Ⅴ: 102CH UMTS-FDD Band Ⅱ : 277CH WIFI :802.11b/g/n(20M): 11CH WIFI:802.11n(40M):7CH
Port:	Power Port、USB Port*4、Micro SD Port、ttyO6/7 Port , HDMI Port、SIM Port、Speaker Port、MIC Port、ttyO3*2、ttyO5*2、LAN Port
Input Power:	DC 9-24V
Trade Name :	Inhand
FCC ID:	2AANYBOX

Note: We use the main model to test and the main model configuration is the most complete
Note: the difference between these models please refer to **Annex E. DECLARATION OF SIMILARITY.**

5. Test Summary

The product was tested in accordance with the following specifications.
All testing has been performed according to below product classification:

FCC Rules	Description of Test	Result
§15.107; ANSI C63.4: 2014	AC Power Line Conducted Emissions	Compliance
§15.109; ANSI C63.4: 2014	Radiated Emissions	Compliance

Measurement Uncertainty

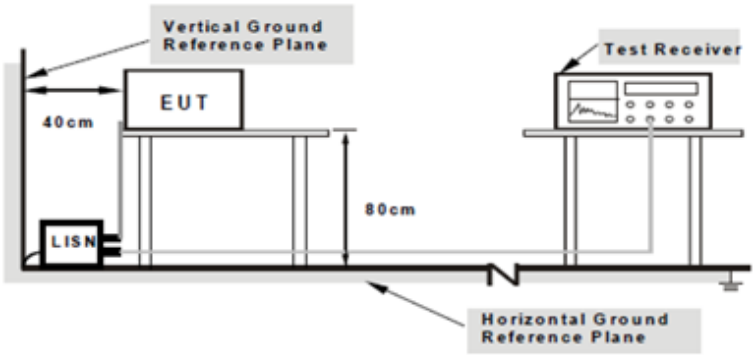
Emissions		
Test Item	**Description**	**Uncertainty**
Band Edge and Radiated Spurious Emissions	Confidence level of approximately 95% (in the case where distributions are normal), with a coverage factor of 2 (for EUTs < 0.5m X 0.5m X 0.5m)	+5.6dB/-4.5dB

6. Measurements, Examination And Derived Results

6.1 AC Power Line Conducted Emissions

Temperature	27.9°C
Relative Humidity	61%
Atmospheric Pressure	1019mbar
Test date :	December 22, 2015
Tested By :	Winnie Zhang

Requirement(s):

<table>
<tr><th>Spec</th><th>Item</th><th>Requirement</th><th>Applicable</th></tr>
<tr><td>47CFR§15.107</td><td>a)</td><td>For Low-power radio-frequency devices that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 kHz to 30 MHz, shall not exceed the limits in the following table, as measured using a 50 [mu]H/50 ohms line impedance stabilization network (LISN). The lower limit applies at the boundary between the frequencies ranges.
<table>
<tr><th rowspan="2">Frequency ranges (MHz)</th><th colspan="2">Limit (dBμV)</th></tr>
<tr><th>QP</th><th>Average</th></tr>
<tr><td>0.15 ~ 0.5</td><td>66 – 56</td><td>56 – 46</td></tr>
<tr><td>0.5 ~ 5</td><td>56</td><td>46</td></tr>
<tr><td>5 ~ 30</td><td>60</td><td>50</td></tr>
</table></td><td>☑</td></tr>
<tr><td>Test Setup</td><td colspan="3"> 

Note: 1.Support units were connected to second LISN.
2.Both of LISNs (AMN) are 80cm from EUT and at least 80cm from other units and other metal planes support units.</td></tr>
<tr><td>Procedure</td><td colspan="3">- The EUT and supporting equipment were set up in accordance with the requirements of the standard on top of a 1.5m x 1m x 0.8m high, non-metallic table, as shown in Annex B.
- The power supply for the EUT was fed through a 50 [mu]H/50 EUT LISN, connected to filtered mains.
- The RF OUT of the EUT LISN was connected to the EMI test receiver via a low-loss coaxial cable.
- All other supporting equipment were powered separately from another main supply.</td></tr>
<tr><td>Remark</td><td colspan="3"></td></tr>
<tr><td>Result</td><td colspan="3">☑ Pass ☐ Fail</td></tr>
</table>

Test Data ☑ Yes ☐ N/A

Test Plot ☑ Yes (See below) ☐ N/A

Data sample

No.	P/L	Frequency	Reading	Detector	Corrected	Result	Limit	Margin	Comment
		(MHz)	(dBuV)	QP	(dB}	(dBuV)	(dBuV)	(dB)	

P/L=Phase Line or Neutral

Frequency (MHz) = Emission frequency in MHz

Reading (dBμV) = Receiver Reading Value

Detector=Quasi Peak Detector or Average Detector

Corrected (dB) = cable loss+ Insertion loss of LISN+ Insertion loss of transient limiter (The transient limiter included 10dB attenuation)

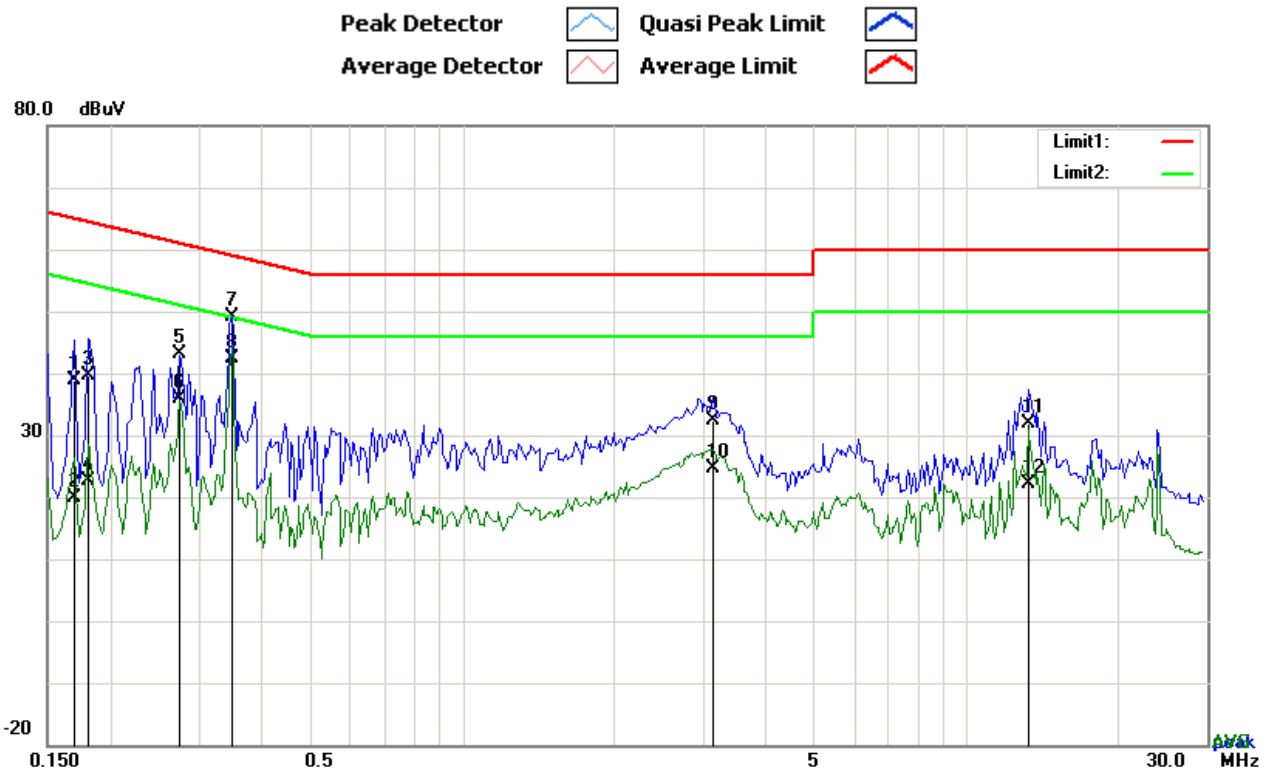
Result (dBμV) = Reading Value + Corrected Value

Limit (dBμV) = Limit stated in standard

Calculation Formula:

Margin (dB) = Result (dBμV) – limit (dBμV)

Test Mode:	Transmitting Mode

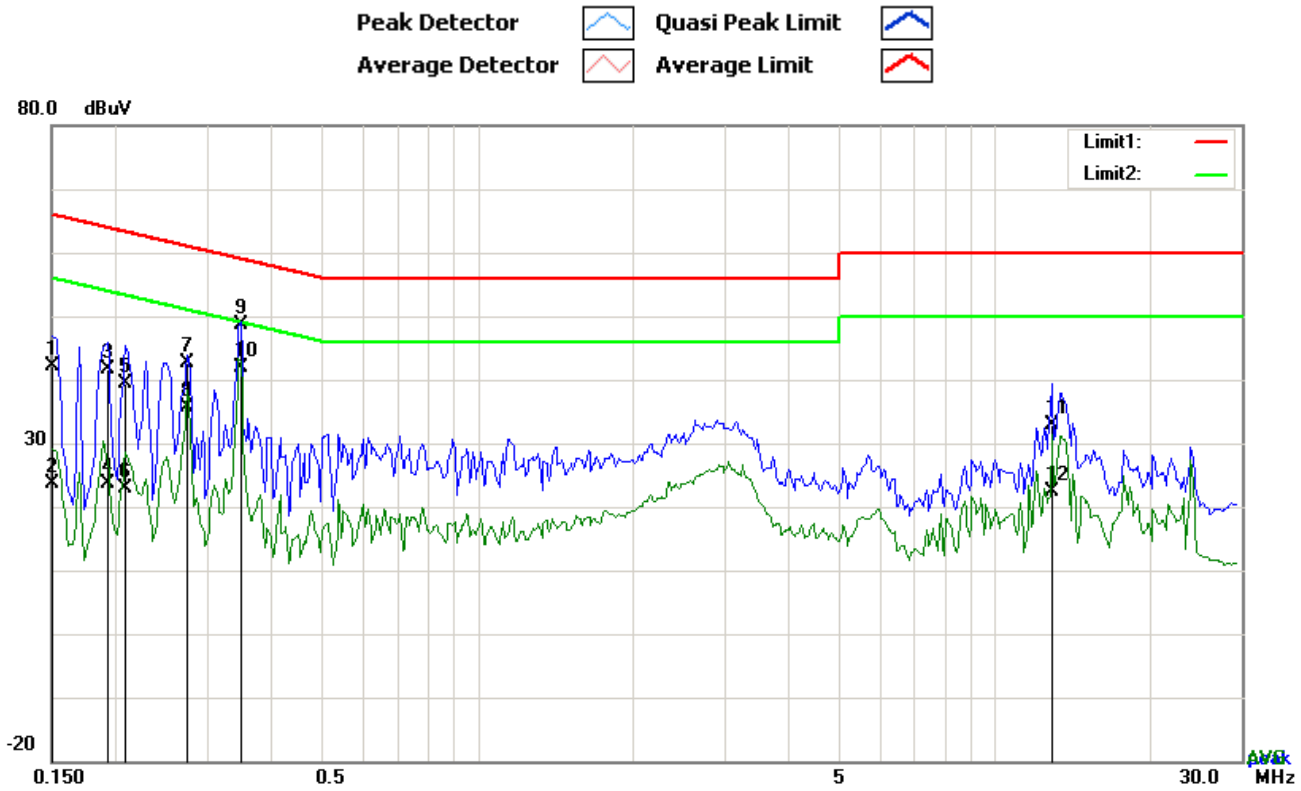


Test Data

Phase Line Plot at 240Vac, 50Hz

No.	P/L	Frequency (MHz)	Reading (dBuV)	Detector	Corrected (dB}	Result (dBuV)	Limit (dBuV)	Margin (dB)	Comment
1	L1	0.1695	28.82	QP	10.03	38.85	64.98	-26.13	
2	L1	0.1695	9.93	AVG	10.03	19.96	54.98	-35.02	
3	L1	0.1812	29.54	QP	10.03	39.57	64.43	-24.86	
4	L1	0.1812	12.60	AVG	10.03	22.63	54.43	-31.80	
5	L1	0.2748	33.06	QP	10.03	43.09	60.97	-17.88	
6	L1	0.2748	25.87	AVG	10.03	35.90	50.97	-15.07	
7	L1	0.3489	39.11	QP	10.03	49.14	58.99	-9.85	
8	L1	0.3489	32.28	AVG	10.03	42.31	48.99	-6.68	
9	L1	3.1404	22.32	QP	10.06	32.38	56.00	-23.62	
10	L1	3.1404	14.46	AVG	10.06	24.52	46.00	-21.48	
11	L1	13.3272	21.59	QP	10.20	31.79	60.00	-28.21	
12	L1	13.3272	12.04	AVG	10.20	22.24	50.00	-27.76	

Test Mode:	Transmitting Mode

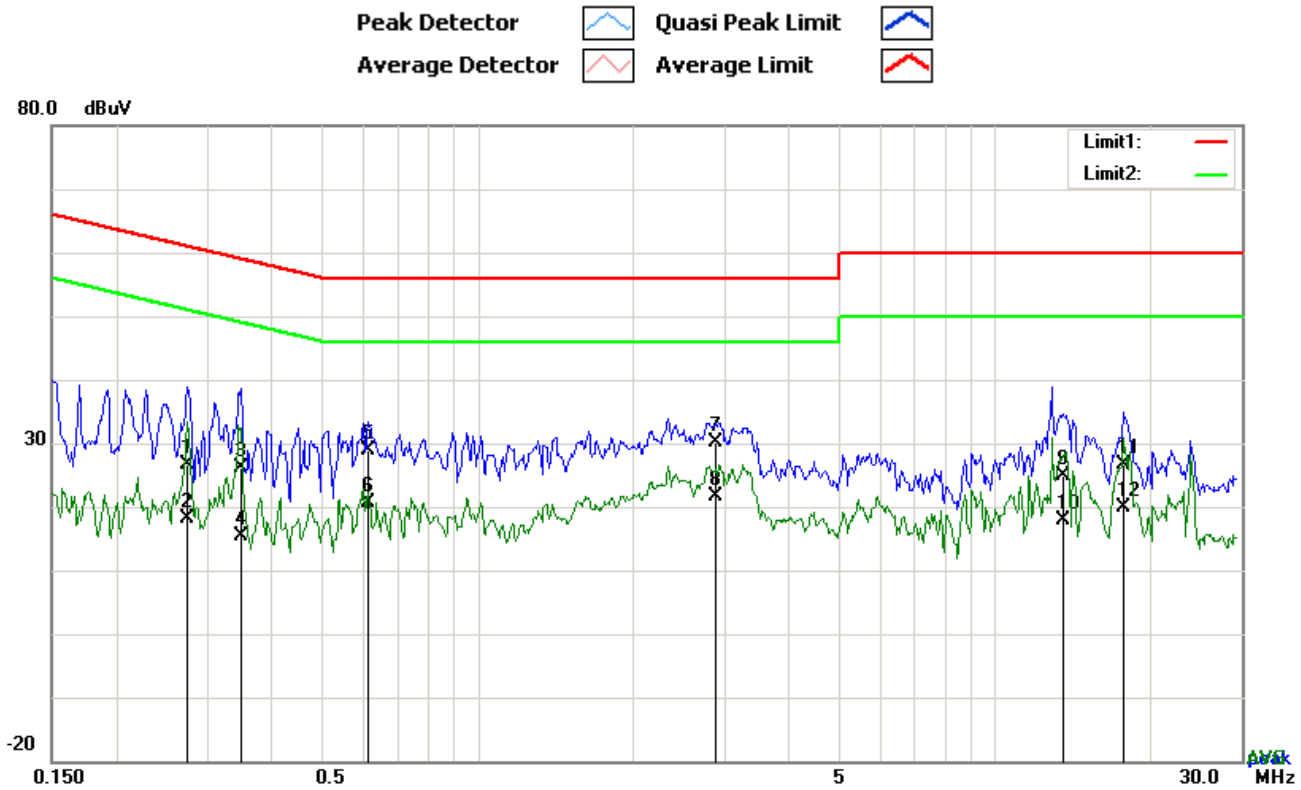


Test Data

Phase Neutral Plot at 240Vac, 50Hz

No.	P/L	Frequency (MHz)	Reading (dBuV)	Detector	Corrected (dB}	Result (dBuV)	Limit (dBuV)	Margin (dB)	Comment
1	N	0.1500	32.06	QP	10.02	42.08	66.00	-23.92	
2	N	0.1500	13.64	AVG	10.02	23.66	56.00	-32.34	
3	N	0.1929	31.57	QP	10.02	41.59	63.91	-22.32	
4	N	0.1929	13.67	AVG	10.02	23.69	53.91	-30.22	
5	N	0.2085	29.35	QP	10.02	39.37	63.26	-23.89	
6	N	0.2085	12.77	AVG	10.02	22.79	53.26	-30.47	
7	N	0.2748	32.73	QP	10.02	42.75	60.97	-18.22	
8	N	0.2748	25.51	AVG	10.02	35.53	50.97	-15.44	
9	N	0.3489	38.68	QP	10.02	48.70	58.99	-10.29	
10	N	0.3489	31.91	AVG	10.02	41.93	48.99	-7.06	
11	N	12.8943	22.80	QP	10.17	32.97	60.00	-27.03	
12	N	12.8943	12.18	AVG	10.17	22.35	50.00	-27.65	

Test Mode:	Transmitting Mode



Test Data

Phase Line Plot at 120Vac, 50Hz

No.	P/L	Frequency (MHz)	Reading (dBuV)	Detector	Corrected (dB}	Result (dBuV)	Limit (dBuV)	Margin (dB)	Comment
1	L	0.2748	16.51	QP	10.02	26.53	60.97	-34.44	
2	L	0.2748	8.08	AVG	10.02	18.10	50.97	-32.87	
3	L	0.3489	16.14	QP	10.02	26.16	58.99	-32.83	
4	L	0.3489	5.30	AVG	10.02	15.32	48.99	-33.67	
5	L	0.6141	18.93	QP	10.02	28.95	56.00	-27.05	
6	L	0.6141	10.67	AVG	10.02	20.69	46.00	-25.31	
7	L	2.8845	20.18	QP	10.05	30.23	56.00	-25.77	
8	L	2.8845	11.56	AVG	10.05	21.61	46.00	-24.39	
9	L	13.5509	14.68	QP	10.18	24.86	60.00	-35.14	
10	L	13.5509	7.60	AVG	10.18	17.78	50.00	-32.22	
11	L	17.6952	16.34	QP	10.23	26.57	60.00	-33.43	
12	L	17.6952	9.64	AVG	10.23	19.87	50.00	-30.13	

Test Mode:	Transmitting Mode

Test Data

Phase Neutral Plot at 120Vac, 50Hz

No.	P/L	Frequency (MHz)	Reading (dBuV)	Detector	Corrected (dB}	Result (dBuV)	Limit (dBuV)	Margin (dB)	Comment
1	N	0.2748	19.20	QP	10.02	29.22	60.97	-31.75	
2	N	0.2748	12.46	AVG	10.02	22.48	50.97	-28.49	
3	N	0.3489	18.16	QP	10.02	28.18	58.99	-30.81	
4	N	0.3489	11.16	AVG	10.02	21.18	48.99	-27.81	
5	N	2.9112	20.23	QP	10.05	30.28	56.00	-25.72	
6	N	2.9112	13.04	AVG	10.05	23.09	46.00	-22.91	
7	N	5.6988	17.30	QP	10.08	27.38	60.00	-32.62	
8	N	5.6988	6.47	AVG	10.08	16.55	50.00	-33.45	
9	N	13.4080	17.58	QP	10.18	27.76	60.00	-32.24	
10	N	13.4080	9.05	AVG	10.18	19.23	50.00	-30.77	
11	N	23.9781	13.27	QP	10.32	23.59	60.00	-36.41	
12	N	23.9781	8.45	AVG	10.32	18.77	50.00	-31.23	

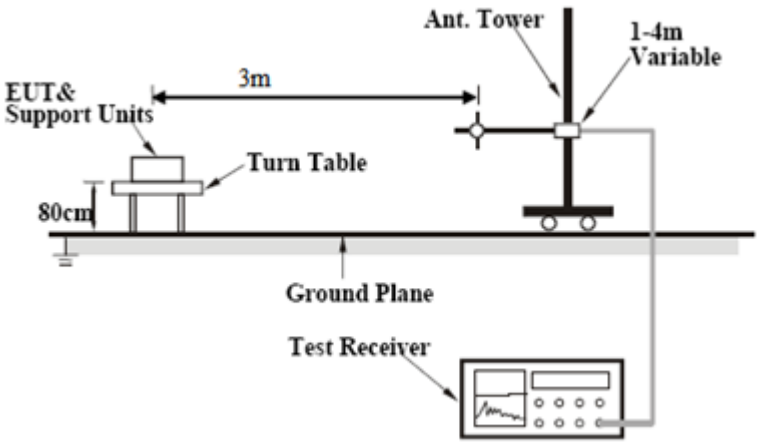
6.2 Radiated Emissions

Temperature	26°C
Relative Humidity	60%
Atmospheric Pressure	1019mbar
Test date :	January 04, 2016
Tested By :	Winnie Zhang

Requirement(s):

Spec	Item	Requirement	Applicable
47CFR§15.107(d)	a)	Except higher limit as specified elsewhere in other section, the emissions from the low-power radio-frequency devices shall not exceed the field strength levels specified in the following table and the level of any unwanted emissions shall not exceed the level of the fundamental emission. The tighter limit applies at the band edges	☑

Frequency range (MHz)	Field Strength (μV/m)
30 – 88	100
88 – 216	150
216 960	200
Above 960	500

Test Setup	
Procedure	1. The EUT was switched on and allowed to warm up to its normal operating condition. 2. The test was carried out at the selected frequency points obtained from the EUT characterisation. Maximization of the emissions, was carried out by rotating the EUT, changing the antenna polarization, and adjusting the antenna height in the following manner: a. Vertical or horizontal polarisation (whichever gave the higher emission level over a full rotation of the EUT) was chosen. b. The EUT was then rotated to the direction that gave the maximum emission. c. Finally, the antenna height was adjusted to the height that gave the maximum emission. 3. A Quasi-peak measurement was then made for that frequency point. 4. Steps 2 and 3 were repeated for the next frequency point, until all selected frequency points were measured.
Remark	
Result	☑ Pass ☐ Fail

Test Data ☑ Yes ☐ N/A

Test Plot ☑ Yes (See below) ☐ N/A

Data sample

No.	P/L	Frequency	Reading	Detector	Corrected	Result	Limit	Margin	Height	Degree	Comment
		(MHz)	(dBuV/m)		(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	( )	

P/L=Vertical or Horizontal of Receiver antenna

Frequency (MHz) = Emission frequency in MHz

Reading (dBμV/m) = Receiver Reading Value

Detector= Peak Detector or Quasi Peak Detector

Corrected (dB) = Antenna factor + cable loss- antenna gain

Result (dBμV/m) = Reading Value + Corrected Value

Limit (dBμV/m) = Limit stated in standard

Height (cm) = Height of Receiver antenna

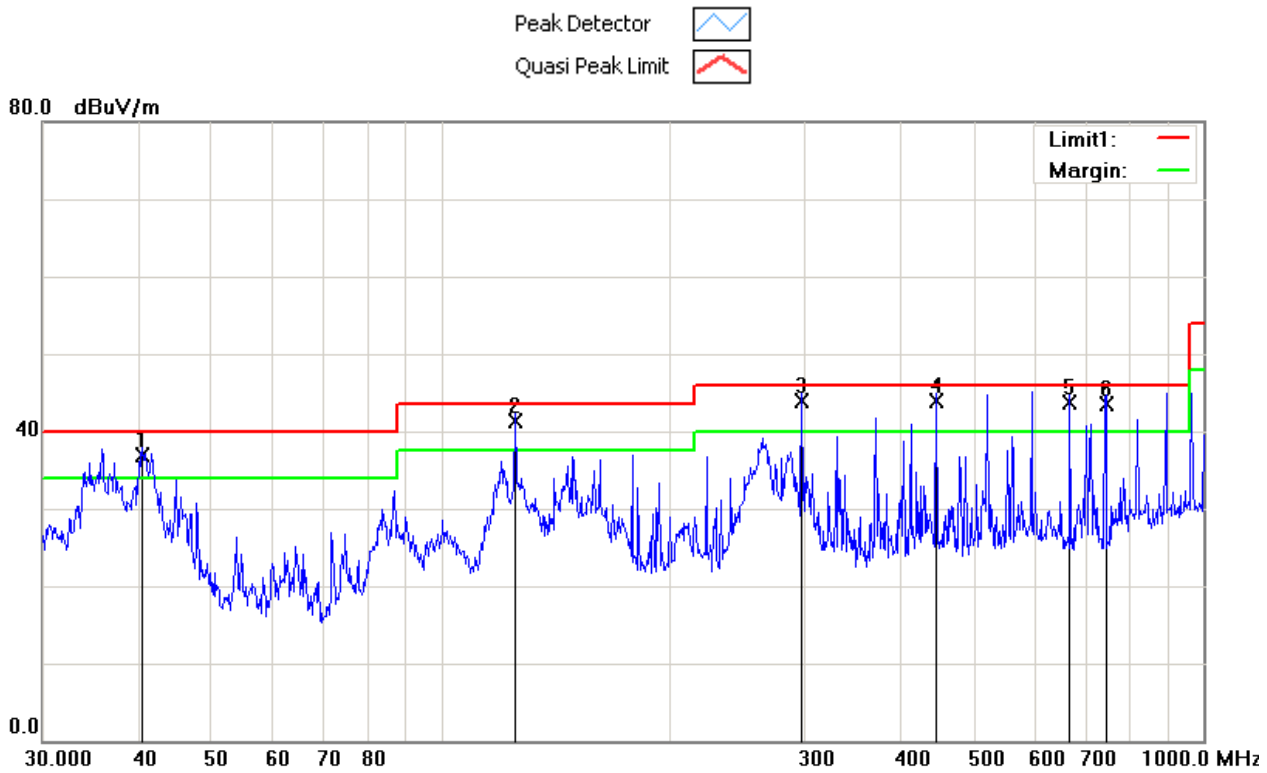
Degree = Turn table degree

Calculation Formula:

Margin (dB) = Result (dBμV/m) – limit (dBμV/m)

Test Mode:	Transmitting Mode

(Below 1GHz)



Test Data

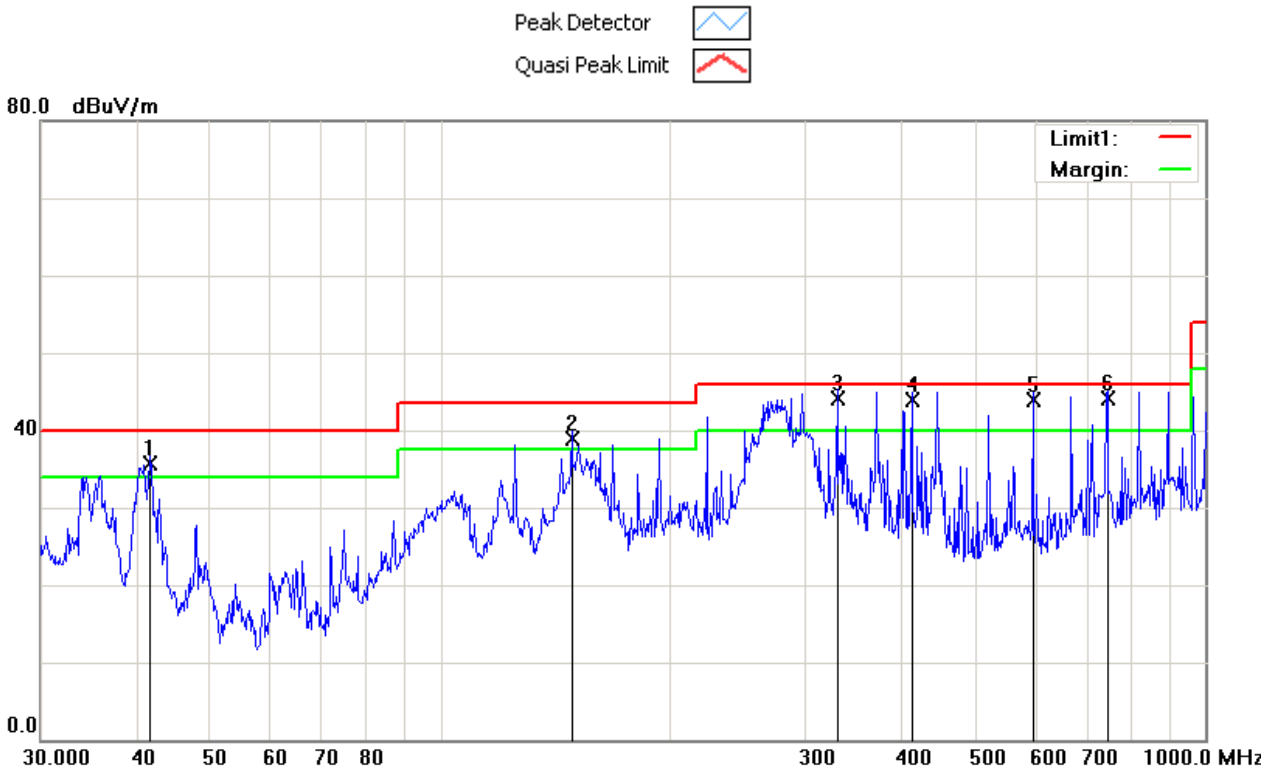
Vertical Polarity Plot @3m

No.	P/L	Frequency (MHz)	Reading (dBuV/m)	Detector	Corrected (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree ( )	Comment
1	V	40.5591	44.79	QP	-7.96	36.83	40.00	-3.17	100	32	
2	V	125.0066	48.86	QP	-7.62	41.24	43.50	-2.26	100	14	
3	V	297.2241	50.83	QP	-7.02	43.81	46.00	-2.19	100	200	
4	V	446.4141	47.10	QP	-3.17	43.93	46.00	-2.07	100	35	
5	V	668.1423	42.61	QP	1.02	43.63	46.00	-2.37	100	54	
6	V	744.8661	41.29	QP	2.31	43.60	46.00	-2.40	100	127	

Note: The data above 1 GHz which below 20 dB to the limit was not recorded.

Test Mode:	Transmitting Mode

(Below 1GHz)



Test Data

Horizontal Polarity Plot @3m

No.	P/L	Frequency (MHz)	Reading (dBuV/m)	Detector	Corrected (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree ( )	Comment
1	H	41.7130	44.53	QP	-8.73	35.80	40.00	-4.20	100	316	
2	H	148.4410	47.26	QP	-8.42	38.84	43.50	-4.66	100	119	
3	H	330.1949	50.24	QP	-6.04	44.20	46.00	-1.80	100	116	
4	H	413.2706	47.82	QP	-3.97	43.85	46.00	-2.15	100	247	
5	H	595.1329	44.01	QP	-0.07	43.94	46.00	-2.06	100	302	
6	H	744.8661	41.82	QP	2.31	44.13	46.00	-1.87	100	207	

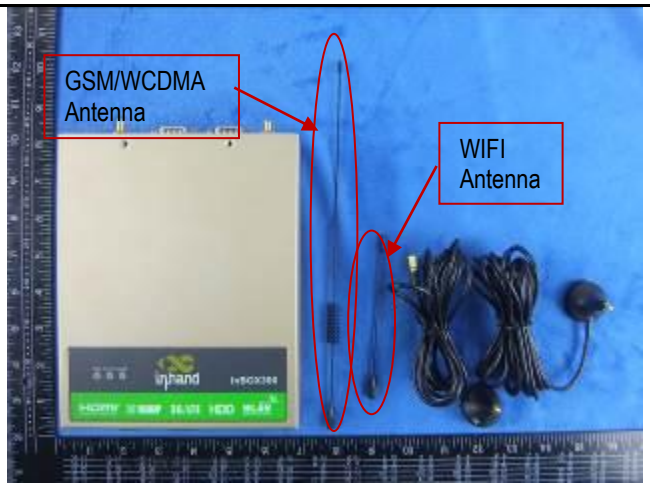
Note: The data above 1 GHz which below 20 dB to the limit was not recorded.

Annex A. TEST INSTRUMENT

Instrument	Model	Serial #	Cal Date	Cal Due	In use
AC Line Conducted Emissions					
EMI test receiver	ESCS30	8471241027	09/17/2015	09/16/2016	☑
Line Impedance Stabilization Network	LI-125A	191106	09/25/2015	09/24/2016	☑
Line Impedance Stabilization Network	LI-125A	191107	09/25/2015	09/24/2016	☑
LISN	ISN T800	34373	09/25/2015	09/24/2016	☑
Transient Limiter	LIT-153	531118	09/01/2015	08/31/2016	☑
Radiated Emissions					
EMI test receiver	ESL6	100262	09/17/2015	09/16/2016	☑
OPT 010 AMPLIFIER (0.1-1300MHz)	8447E	2727A02430	09/01/2015	08/31/2016	☑
Microwave Preamplifier (1 ~ 26.5GHz)	8449B	3008A02402	03/25/2015	03/24/2016	☑
Bilog Antenna (30MHz~6GHz)	JB6	A110712	09/21/2015	09/20/2016	☑
Double Ridge Horn Antenna	AH-118	71259	09/24/2015	09/23/2016	☑

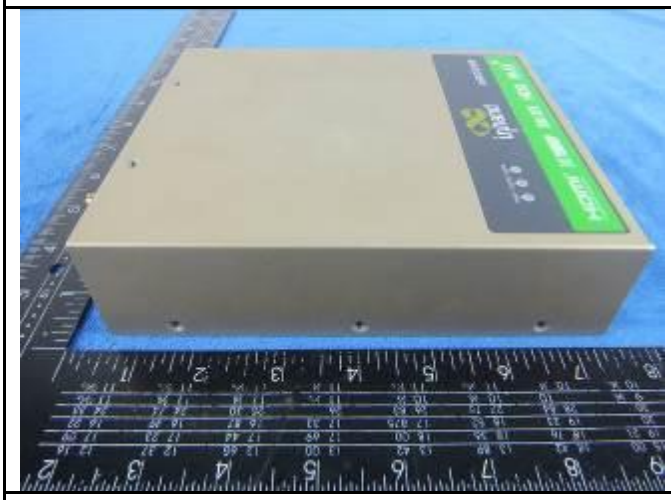
Annex B. EUT And Test Setup Photographs

Annex B.i. Photograph: EUT External Photo

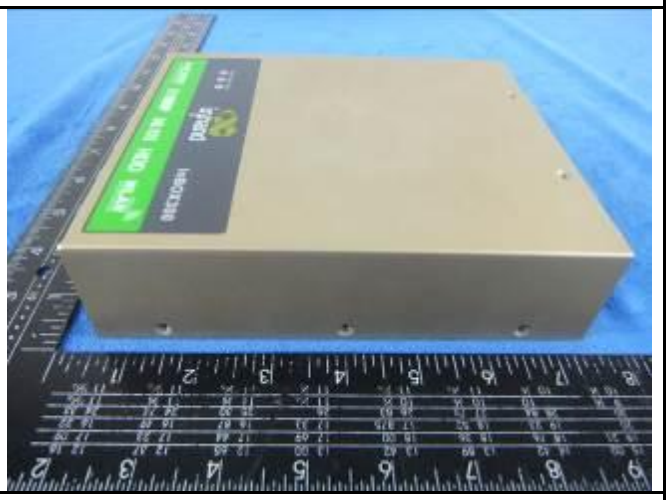


EUT – Top View

EUT – Bottom View



EUT – Left View



EUT – Right View

EUT - Front View

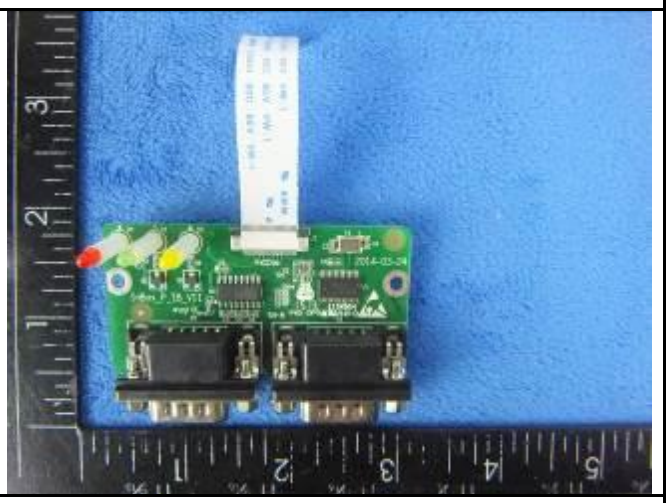
EUT - Rear View

Annex B.ii. Photograph: EUT Internal Photo

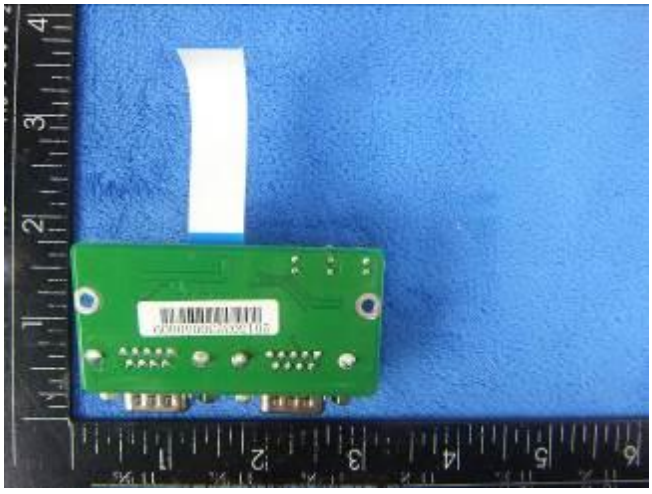
EUT – Uncover Front View 1

EUT – PCB 1 Front View

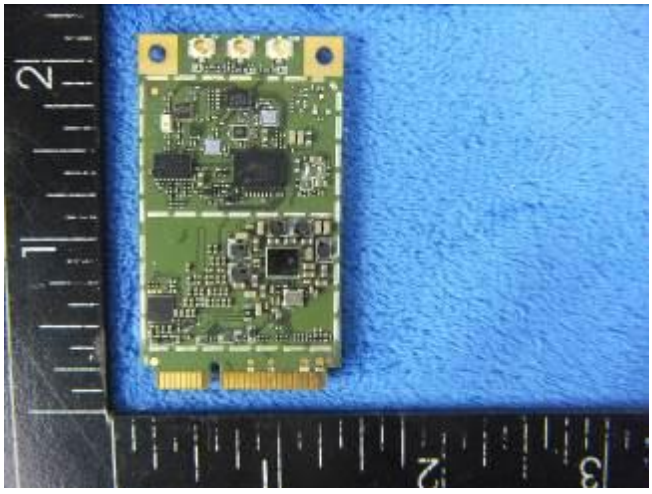
EUT – PCB 1 Rear View



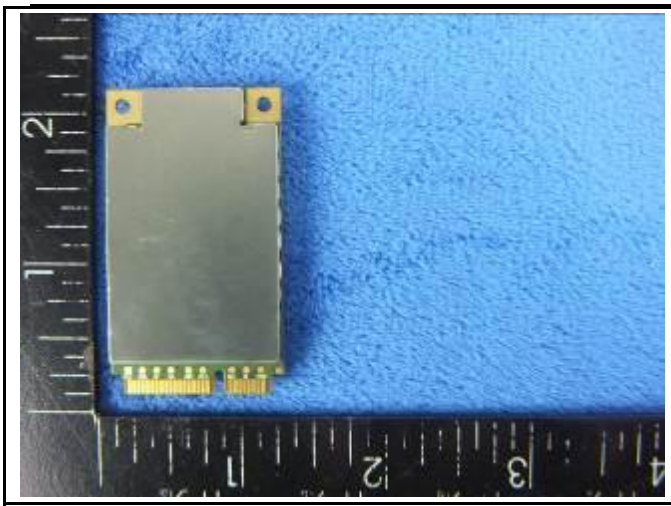
EUT – PCB 2 Front View



EUT – PCB 2 Rear View

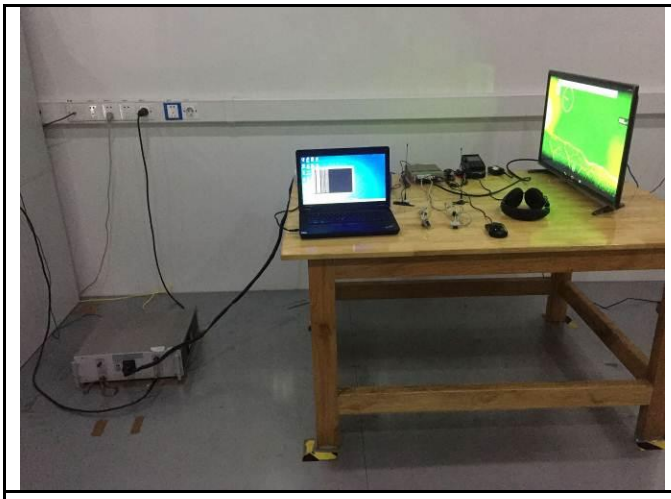


EUT – PCB 3 Front View



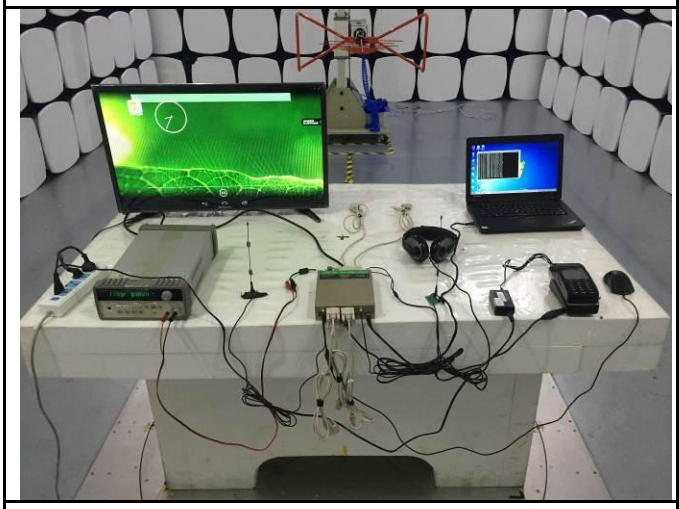
EUT – PCB 3 Rear View

Annex B.iii. Photograph: Test Setup Photo



Conducted Emissions Test Setup – Front View

Conducted Emissions Test Setup – Rear View



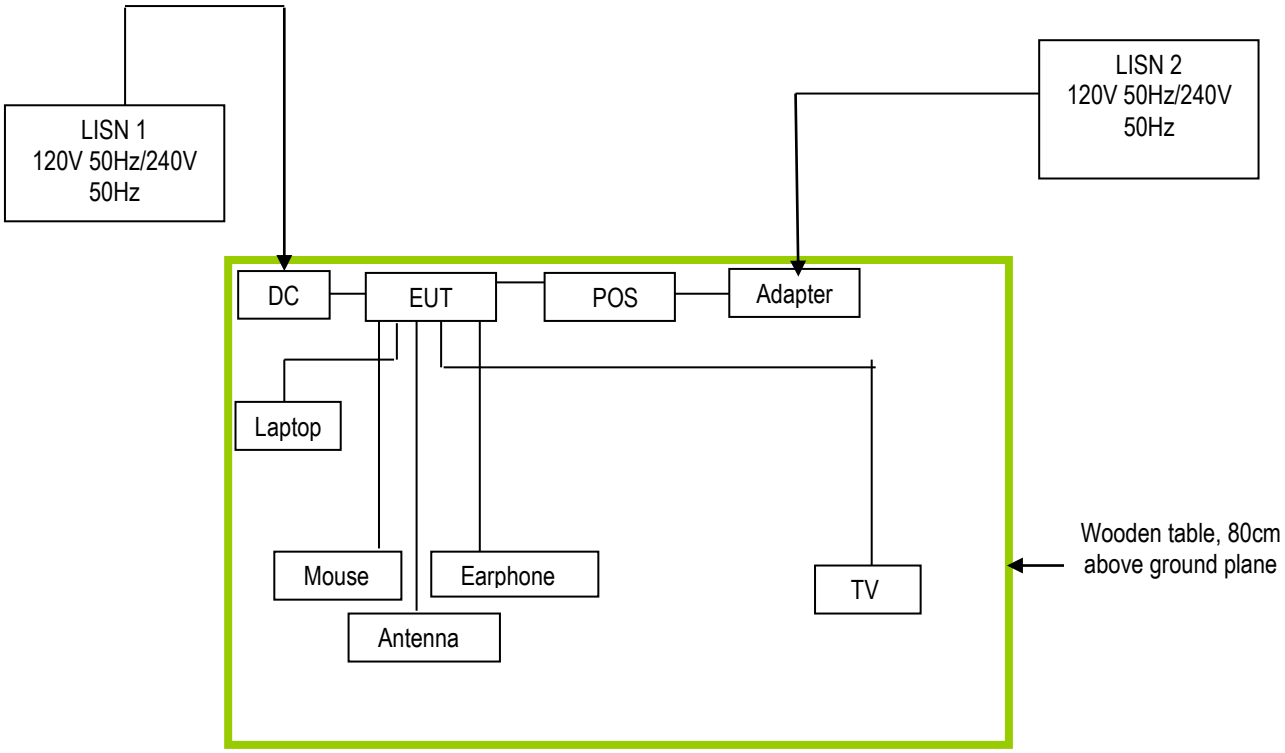
Radiated Spurious Emissions Test Setup Below 1GHz

Radiated Spurious Emissions Test Setup Above 1GHz

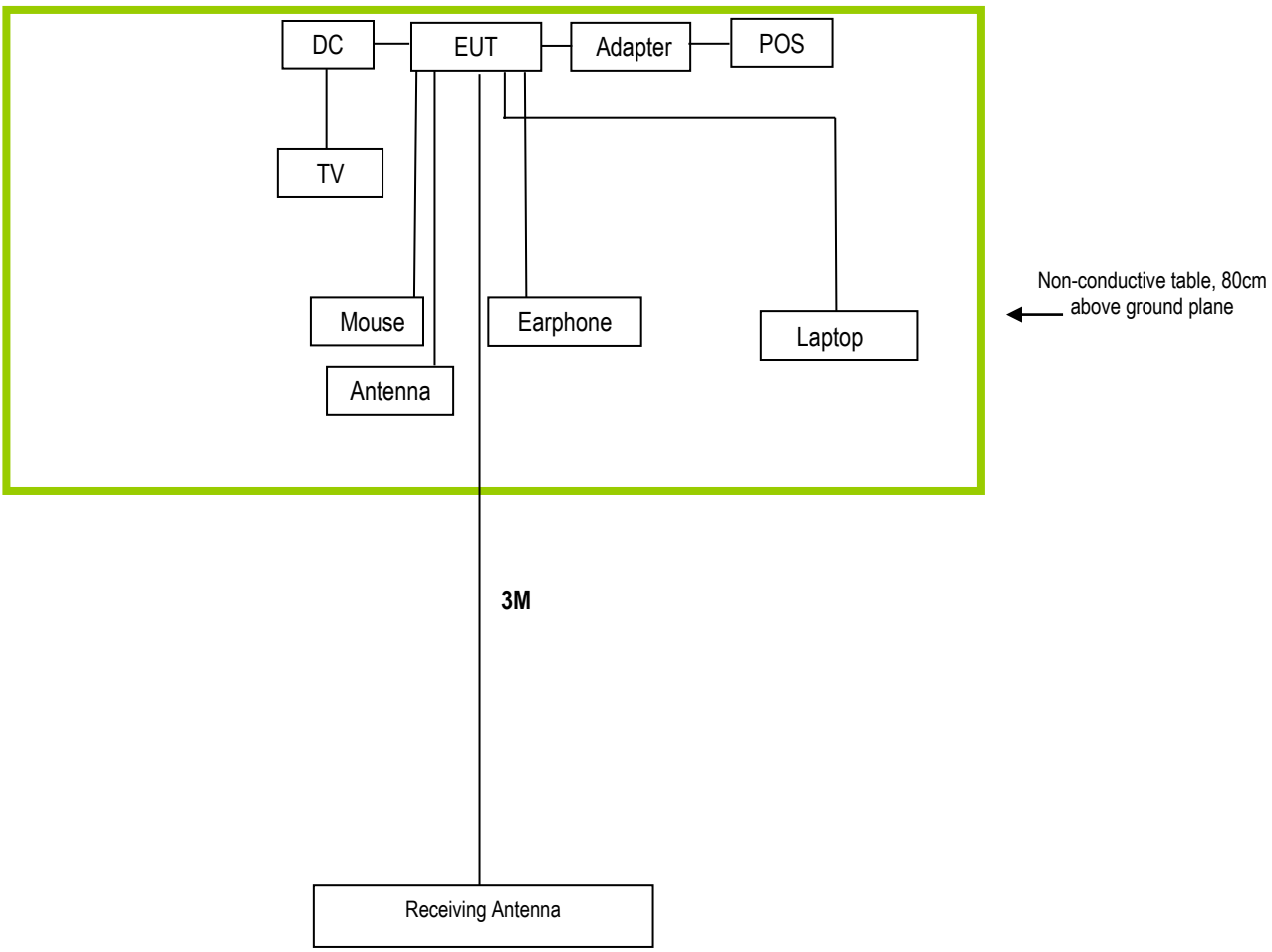
Annex C. TEST SETUP AND SUPPORTING EQUIPMENT

Annex C.i. TEST SET UP BLOCK

Block Configuration Diagram for Conducted Emissions



Block Configuration Diagram for Radiated Emissions



Annex C. il. SUPPORTING EQUIPMENT DESCRIPTION

The following is a description of supporting equipment and details of cables used with the EUT.

Manufacturer	Equipment Description	Model	Calibration Date	Calibration Due Date
Lenovo	Lenovo Laptop	E40& 0579A52	N/A	N/A
HongXun	POS	8210	N/A	N/A
Sennheiser	Earphone	MX80	N/A	N/A
DELL	Mouse	E100	N/A	N/A
Mi	Adapter	DX-13250	N/A	N/A
BK PRECISION	DC Power Supply	1786B	N/A	N/A
Skyworth	TV	32X3	N/A	N/A

Supporting Cable:

Cable type	Shield Type	Ferrite Core	Length	Serial No
USB Cable	Un-shielding	No	2m	JX120051274
RJ45 Cable	Un-shielding	No	2m	KX156327541
RS232 cable	Un-shielding	No	2m	127581031
Power Cable	Un-shielding	No	2m	Y1120224
Power Cable	Un-shielding	No	2m	Y1120149

Annex D. User Manual / Block Diagram / Schematics / Partlist

Please see Attachment

Annex E. DECLARATION OF SIMILARITY

Beijing InHand Networks Technology Co., Ltd

To: SIEMIC (SHENZHEN-CHINA) LABORATORIES
Zone A, Floor 1, Building 2
Wan Ye Long Technology Park
South Side of Zhoushi Road, Bao' an District
Shenzhen, Guangdong, CHINA 518108

Dear Sir,

For our business issue and marketing requirement, we would like to list different models numbers reports, as following:

Model No.: InBOX300 InBOX310 InBOX320 InBOX330
InBOX300S InBOX310S InBOX320S InBOX330S

The eight models are basically the same in appearance, hardware, PCB layout but they have different number of interfaces: USB, Serial port and different software functions. The software does not affect the RF parameters of the device.

Thank you!

Signature: 

Printed name/title:Biao Wang/ EMC engineer
Address: 101,West Wing,11th Floor,No.101,Lize central Park Wangjing,Chaoyang District,Beijing,100102,China