
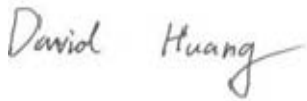



EMC TEST REPORT



Report No.: 16070814-FCC-E

Supersede Report No.:N/A

Applicant	Worldex International Ltd	
Product Name	NEOS400	
Model No.	400	
Serial No.	N/A	
Test Standard	FCC Part 15 Subpart B Class B:2015, ANSI C63.4: 2014	
Test Date	July 08 to 21, 2016	
Issue Date	July 22, 2016	
Test Result	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail	
Equipment complied with the specification <input checked="" type="checkbox"/>		
Equipment did not comply with the specification <input type="checkbox"/>		
		
Loren Luo Test Engineer	David Huang Checked By	
This test report may be reproduced in full only Test result presented in this test report is applicable to the tested sample only		

Issued by:

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

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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
16070814-FCC-E	NONE	Original	July 22, 2016

2. Customer information

Applicant Name	Worldex International Ltd
Applicant Add	3A-8A, Mont Orchid Riverlet, Gongye 3rd Road, Nanshan, Shenzhen, China
Manufacturer	Shenzhen Fortuneship Technology Co., Ltd
Manufacturer Add	6/F, Kanghesheng Building, No.1 Chuangsheng Road, Nanshan District, Shenzhen,Guangdong, 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.	718246
IC Test Site No.	4842E-1
Test Software	Radiated Emission Program-To Shenzhen v2.0

4. Equipment under Test (EUT) Information

Description of EUT:	NEOS400
Main Model:	400
Serial Model:	N/A
Antenna Gain:	GSM850: 0.2dBi PCS1900: 0.5dBi UMTS-FDD Band V: 0.5dBi UMTS-FDD Band II: 0.5dBi Bluetooth/BLE/WIFI: 0dBi GPS: 0dBi
Antenna Type:	FPC antenna
Input Power:	Adapter: Model: TPA - 90C050050UU Input: AC100-240V~50/60Hz;0.2A Output: DC 5.0V,0.5A Battery: Model: 385258AR Spec: 3.7V,1300mAh(4.81Wh) Charge limited voltage: 4.2V
Equipment Category :	JBP
Type of Modulation:	GSM / GPRS: GMSK EGPRS: GMSK UMTS-FDD: QPSK 802.11b/g/n: DSSS, OFDM Bluetooth: GFSK, π /4DQPSK, 8DPSK BLE: GFSK GPS:BPSK

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	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;
RF Operating Frequency (ies):	RX: 1932.4 ~ 1987.6 MHz
	WIFI: 802.11b/g/n(20M): 2412-2462 MHz
	WIFI: 802.11n(40M): 2422-2452 MHz
	Bluetooth& BLE: 2402-2480 MHz
	GPS: 1575.42 MHz
	 GSM 850: 124CH
	PCS1900: 299CH
	UMTS-FDD Band 5: 102CH
	UMTS-FDD Band 2: 277CH
Number of Channels:	WIFI :802.11b/g/n(20M): 11CH
	WIFI :802.11n(40M): 7CH
	Bluetooth: 79CH
	BLE: 40CH
	GPS:1CH
Port:	Power Port, Earphone Port, USB Port
Trade Name :	NEOS
FCC ID:	2ACZ2-400
Date EUT received:	July 07, 2016
Test Date(s):	July 08 to 21, 2016

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	23°C
Relative Humidity	51%
Atmospheric Pressure	1018mbar
Test date :	July 18, 2016
Tested By :	Loren Luo

Requirement(s):

Spec	Item	Requirement	Applicable														
47CFR§15.107	a)	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>	Frequency ranges (MHz)	Limit (dBµV)		QP	Average	0.15 ~ 0.5	66 – 56	56 – 46	0.5 ~ 5	56	46	5 ~ 30	60	50	
Frequency ranges (MHz)	Limit (dBµV)																
	QP	Average															
0.15 ~ 0.5	66 – 56	56 – 46															
0.5 ~ 5	56	46															
5 ~ 30	60	50															

Test Setup	 <p>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.</p>
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Procedure	<ol style="list-style-type: none"> 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. The power supply for the EUT was fed through a 50Ω /50mH EUT LISN, connected to filtered mains.
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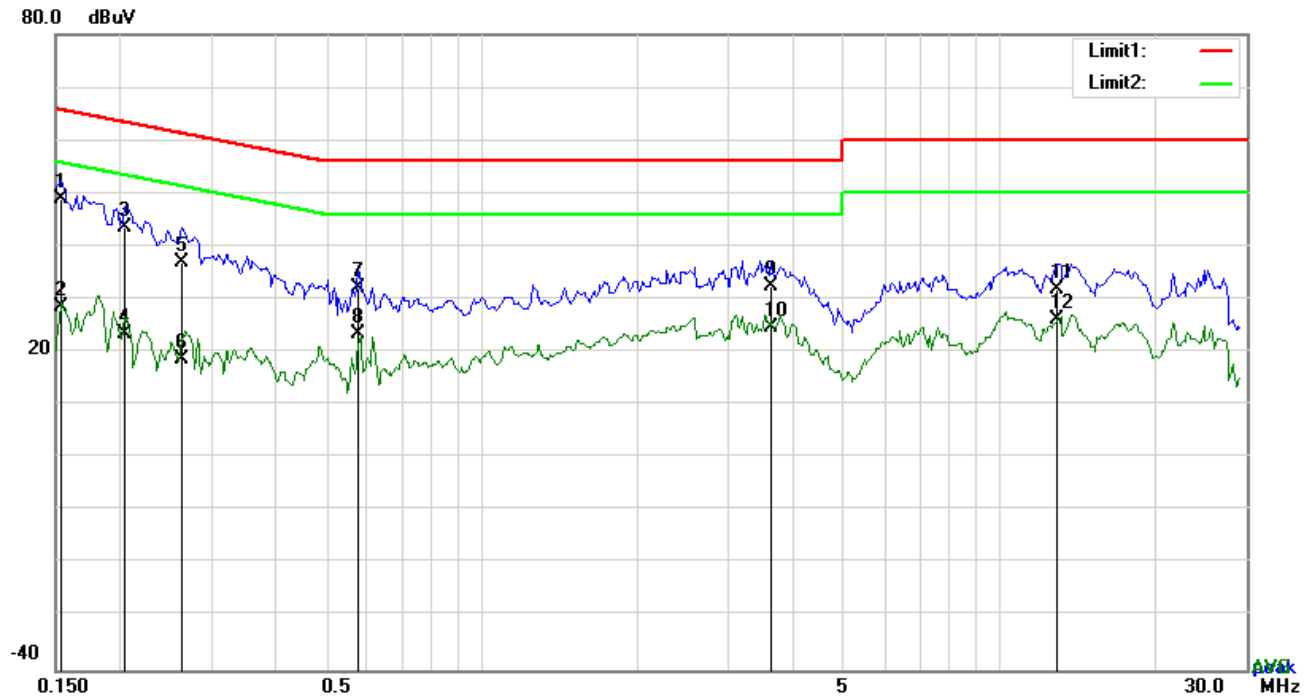
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	<p>3. The RF OUT of the EUT LISN was connected to the EMI test receiver via a low-loss coaxial cable.</p> <p>4. All other supporting equipment were powered separately from another main supply.</p> <p>5. The EUT was switched on and allowed to warm up to its normal operating condition.</p> <p>6. A scan was made on the NEUTRAL line (for AC mains) or Earth line (for DC power) over the required frequency range using an EMI test receiver.</p> <p>7. High peaks, relative to the limit line, The EMI test receiver was then tuned to the selected frequencies and the necessary measurements made with a receiver bandwidth setting of 10 kHz.</p> <p>8. Step 7 was then repeated for the LIVE line (for AC mains) or DC line (for DC power).</p>
Remark	
Result	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail

Test Data ☒ Yes ☐ N/A

Test Plot ☒ Yes (See below) ☐ N/A

Test Mode : USB Mode

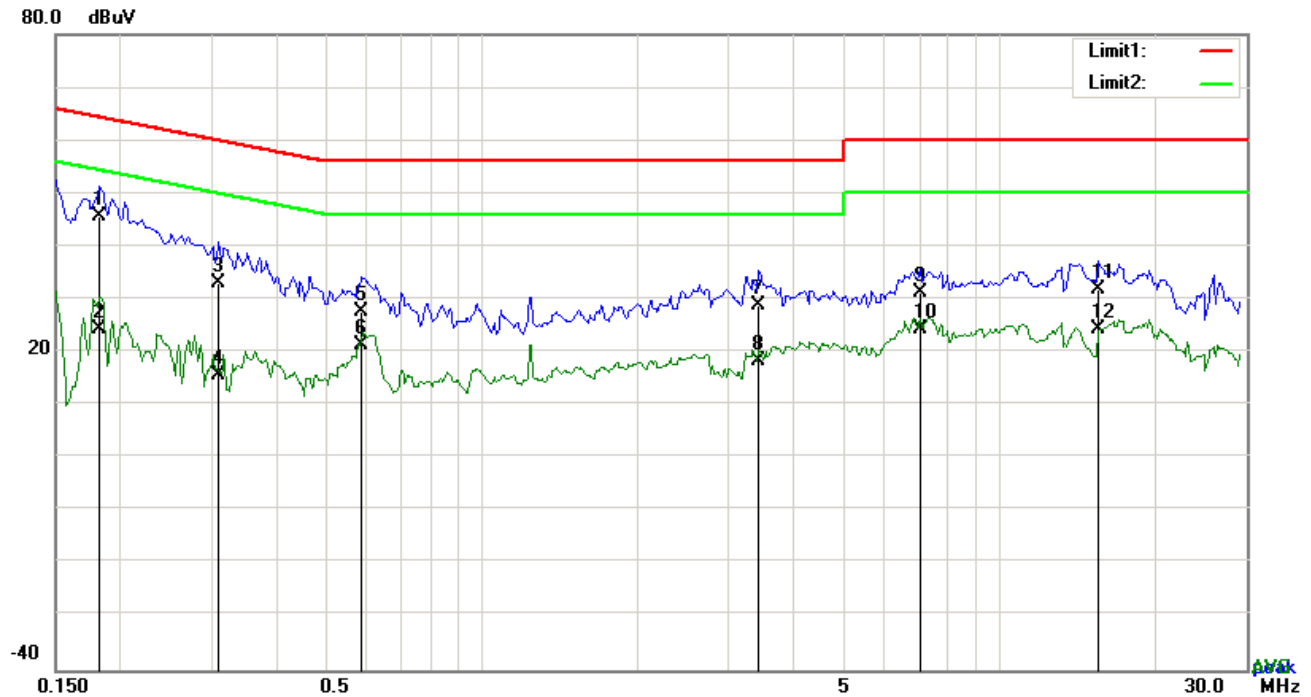


Test Data

Phase Line Plot at 120Vac, 60Hz

No.	P/L	Frequency	Reading	Detector	Corrected	Result	Limit	Margin
		(MHz)	(dBuV)		(dB)	(dBuV)	(dBuV)	(dB)
1	L1	0.1539	38.96	QP	10.03	48.99	65.79	-16.80
2	L1	0.1539	18.66	AVG	10.03	28.69	55.79	-27.10
3	L1	0.2046	33.61	QP	10.03	43.64	63.42	-19.78
4	L1	0.2046	13.50	AVG	10.03	23.53	53.42	-29.89
5	L1	0.2631	26.96	QP	10.03	36.99	61.33	-24.34
6	L1	0.2631	8.59	AVG	10.03	18.62	51.33	-32.71
7	L1	0.5790	22.00	QP	10.03	32.03	56.00	-23.97
8	L1	0.5790	13.40	AVG	10.03	23.43	46.00	-22.57
9	L1	3.6045	22.41	QP	10.06	32.47	56.00	-23.53
10	L1	3.6045	14.51	AVG	10.06	24.57	46.00	-21.43
11	L1	12.9450	21.55	QP	10.19	31.74	60.00	-28.26
12	L1	12.9450	16.10	AVG	10.19	26.29	50.00	-23.71

Test Mode : USB Mode

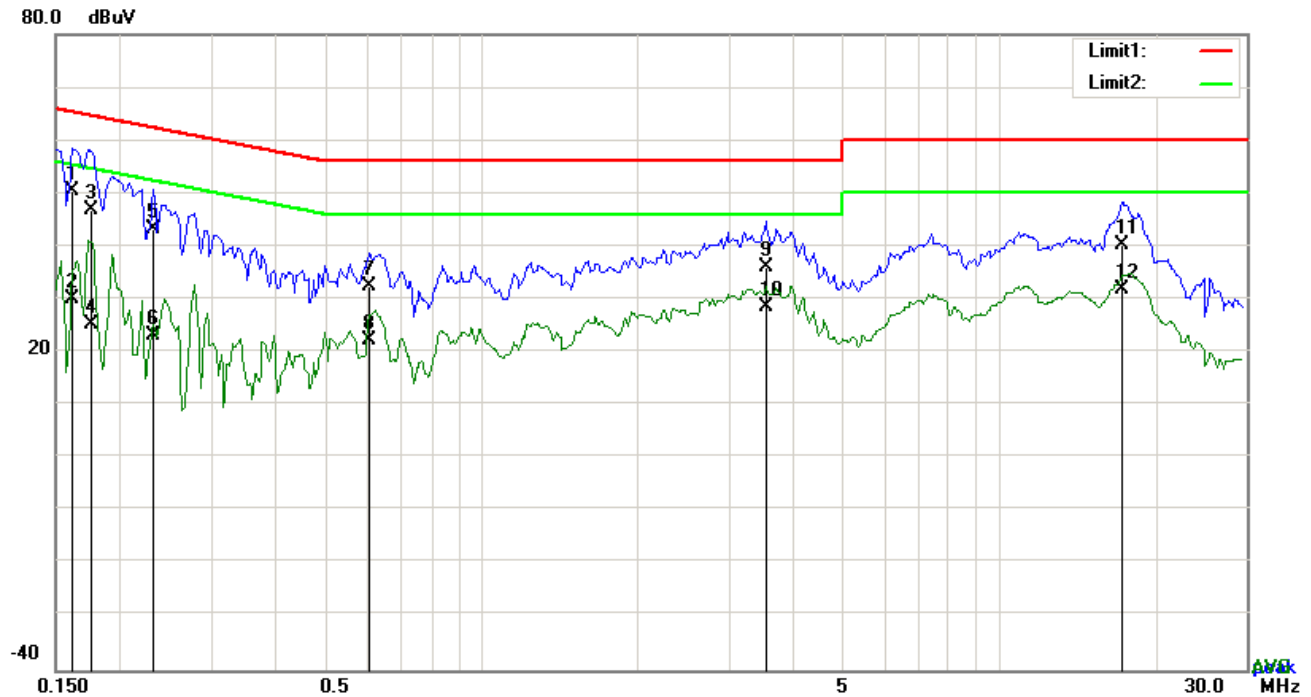


Test Data

Phase Neutral Plot at 120Vac, 60Hz

No.	P/L	Frequency	Reading	Detector	Corrected	Result	Limit	Margin
		(MHz)	(dBuV)		(dB)	(dBuV)	(dBuV)	(dB)
1	N	0.1815	35.60	QP	10.02	45.62	64.42	-18.80
2	N	0.1815	14.47	AVG	10.02	24.49	54.42	-29.93
3	N	0.3099	23.16	QP	10.02	33.18	59.97	-26.79
4	N	0.3099	5.59	AVG	10.02	15.61	49.97	-34.36
5	N	0.5868	17.68	QP	10.02	27.70	56.00	-28.30
6	N	0.5868	11.40	AVG	10.02	21.42	46.00	-24.58
7	N	3.4290	18.72	QP	10.05	28.77	56.00	-27.23
8	N	3.4290	8.27	AVG	10.05	18.32	46.00	-27.68
9	N	7.0404	21.00	QP	10.10	31.10	60.00	-28.90
10	N	7.0404	14.26	AVG	10.10	24.36	50.00	-25.64
11	N	15.4701	21.71	QP	10.21	31.92	60.00	-28.08
12	N	15.4701	14.00	AVG	10.21	24.21	50.00	-25.79

Test Mode : USB Mode

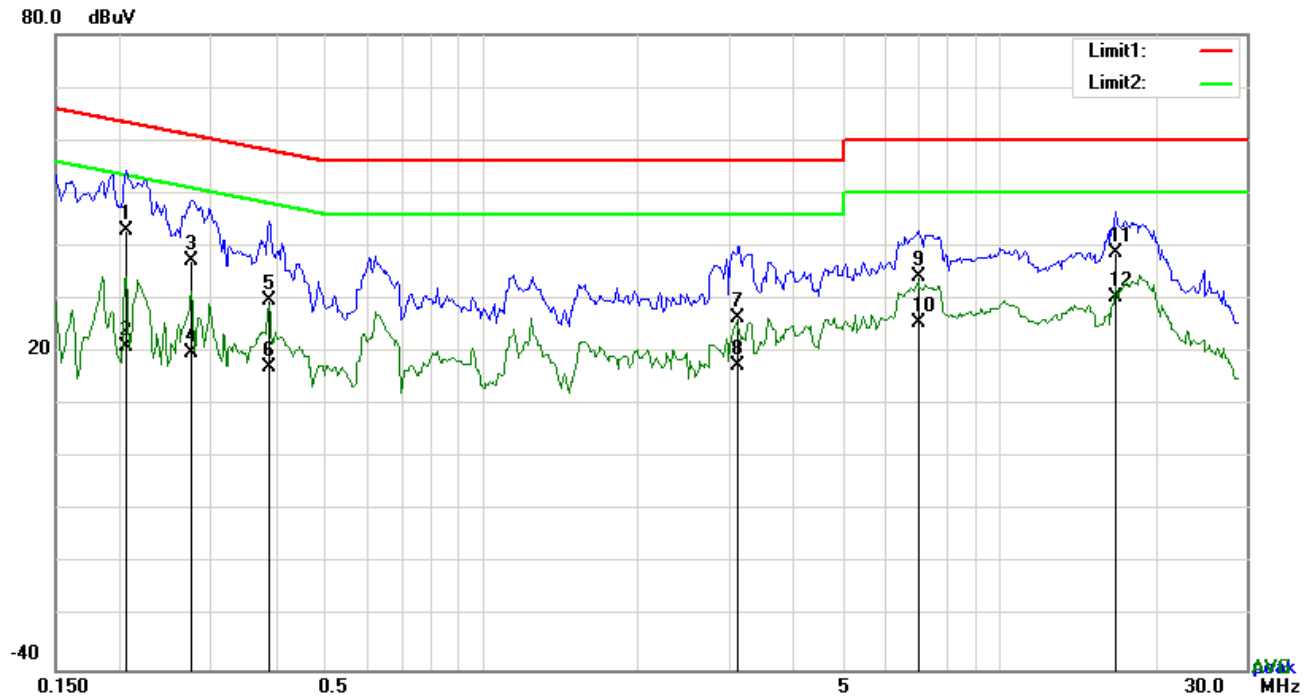


Test Data

Phase Line Plot at 240Vac, 60Hz

No.	P/L	Frequency	Reading	Detector	Corrected	Result	Limit	Margin
		(MHz)	(dBuV)		(dB}	(dBuV)	(dBuV)	(dB)
1	L1	0.1617	40.56	QP	10.03	50.59	65.38	-14.79
2	L1	0.1617	19.95	AVG	10.03	29.98	55.38	-25.40
3	L1	0.1758	36.77	QP	10.03	46.80	64.68	-17.88
4	L1	0.1758	15.19	AVG	10.03	25.22	54.68	-29.46
5	L1	0.2319	33.21	QP	10.03	43.24	62.38	-19.14
6	L1	0.2319	13.10	AVG	10.03	23.13	52.38	-29.25
7	L1	0.6063	22.52	QP	10.03	32.55	56.00	-23.45
8	L1	0.6063	12.32	AVG	10.03	22.35	46.00	-23.65
9	L1	3.5343	26.03	QP	10.06	36.09	56.00	-19.91
10	L1	3.5343	18.53	AVG	10.06	28.59	46.00	-17.41
11	L1	17.2389	29.95	QP	10.26	40.21	60.00	-19.79
12	L1	17.2389	21.52	AVG	10.26	31.78	50.00	-18.22

Test Mode : USB Mode



Test Data

Phase Neutral Plot at 240Vac, 60Hz

No.	P/L	Frequency	Reading	Detector	Corrected	Result	Limit	Margin
		(MHz)	(dBuV)		(dB)	(dBuV)	(dBuV)	(dB)
1	N	0.2050	33.02	QP	10.02	43.04	63.41	-20.37
2	N	0.2050	11.17	AVG	10.02	21.19	53.41	-32.22
3	N	0.2748	27.26	QP	10.02	37.28	60.97	-23.69
4	N	0.2748	9.91	AVG	10.02	19.93	50.97	-31.04
5	N	0.3879	19.64	QP	10.02	29.66	58.11	-28.45
6	N	0.3879	7.08	AVG	10.02	17.10	48.11	-31.01
7	N	3.1326	16.44	QP	10.05	26.49	56.00	-29.51
8	N	3.1326	7.33	AVG	10.05	17.38	46.00	-28.62
9	N	6.9819	24.17	QP	10.10	34.27	60.00	-25.73
10	N	6.9819	15.32	AVG	10.10	25.42	50.00	-24.58
11	N	16.7497	28.48	QP	10.22	38.70	60.00	-21.30
12	N	16.7497	20.02	AVG	10.22	30.24	50.00	-19.76

6.2 Radiated Emissions

Temperature	23°C
Relative Humidity	51%
Atmospheric Pressure	1018mbar
Test date :	July 18, 2016
Tested By :	Loren Luo

Requirement(s):

Spec	Item	Requirement	Applicable	
47CFR§15.109(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	<div><input checked="" type="checkbox"/></div>	
		Frequency range (MHz)		Field Strength (µV/m)
		30 – 88		100
		88 – 216		150
		216 960		200
		Above 960		500

Test Setup	
------------	--

Procedure	<ol style="list-style-type: none"> The EUT was switched on and allowed to warm up to its normal operating condition. The test was carried out at the selected frequency points obtained from the EUT characterization. Maximization of the emissions, was carried out by rotating the EUT, changing the antenna polarization, and adjusting the antenna height in the following manner: <ol style="list-style-type: none"> Vertical or horizontal polarization (whichever gave the higher emission level
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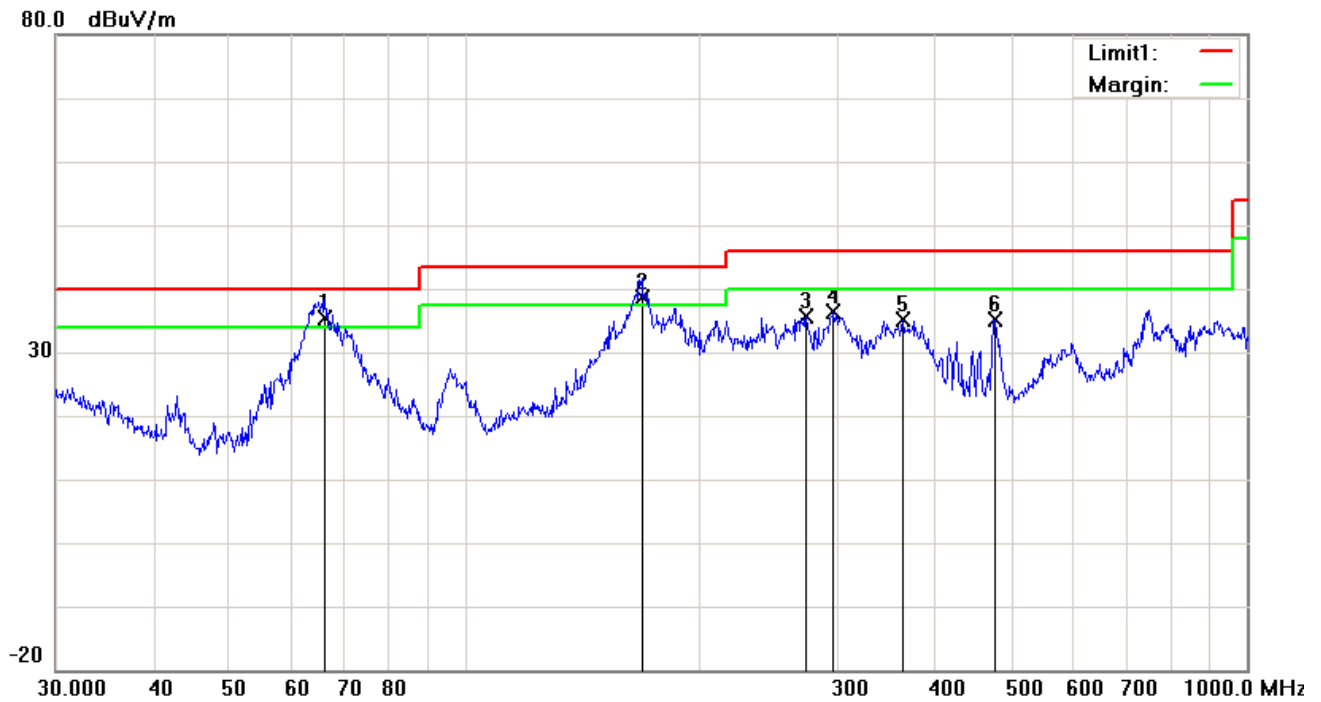
	<p>over a full rotation of the EUT) was chosen.</p> <p>b. The EUT was then rotated to the direction that gave the maximum emission.</p> <p>c. Finally, the antenna height was adjusted to the height that gave the maximum emission.</p> <p>3. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 kHz for Quasi Peak detection at frequency below 1GHz.</p> <p>4. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3MHz with Peak detection for Peak measurement at frequency above 1GHz.</p> <p>The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth with Peak detection for Average Measurement as below at frequency above 1GHz.</p> <p>■ 1 kHz (Duty cycle < 98%) □ 10 Hz (Duty cycle > 98%)</p> <p>5. Steps 2 and 3 were repeated for the next frequency point, until all selected frequency points were measured.</p>
Remark	
Result	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail

Test Data ☒ Yes ☐ N/A

Test Plot ☒ Yes (See below) ☐ N/A

Test Mode : USB Mode

Below 1GHz

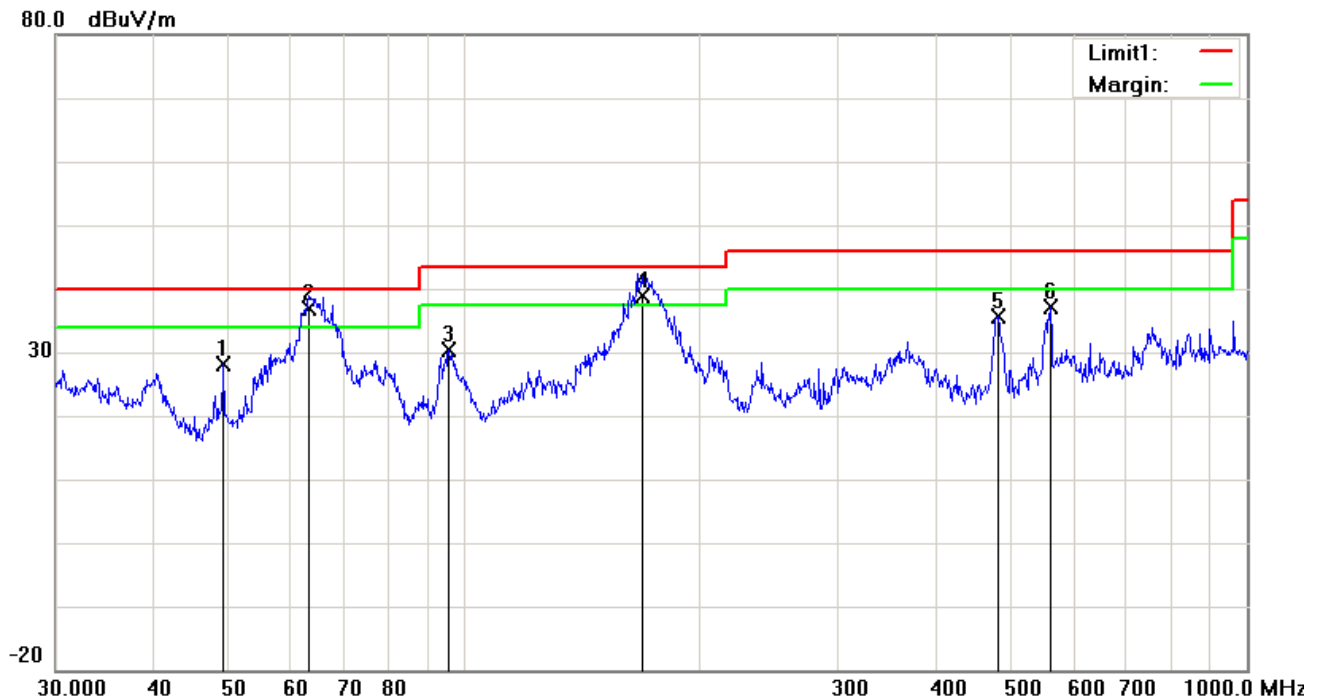


Test Data

Horizontal Polarity Plot @3m

No.	P/L	Frequency	Reading	Detector	Corrected	Result	Limit	Margin	Height	Degree
		(MHz)	(dBuV/m)		(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(°)
1	H	66.2662	49.16	QP	-13.87	35.29	40.00	-4.71	100	248
2	H	168.4138	47.66	QP	-8.97	38.69	43.50	-4.81	100	88
3	H	273.2341	43.81	peak	-8.13	35.68	46.00	-10.32	100	212
4	H	296.1836	43.47	peak	-7.08	36.39	46.00	-9.61	100	175
5	H	362.9845	40.24	peak	-5.16	35.08	46.00	-10.92	100	349
6	H	475.4991	37.55	peak	-2.37	35.18	46.00	-10.82	100	146

Below 1GHz



Test Data

Vertical Polarity Plot @3m

No.	P/L	Frequency	Reading	Detector	Corrected	Result	Limit	Margin	Height	Degree
		(MHz)	(dBuV/m)		(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(°)
1	V	49.1866	41.00	peak	-12.82	28.18	40.00	-11.82	100	230
2	V	63.3132	50.88	QP	-14.09	36.79	40.00	-3.21	100	88
3	V	95.4270	42.46	peak	-12.02	30.44	43.50	-13.06	100	152
4	V	168.4138	47.84	QP	-8.97	38.87	43.50	-4.63	100	248
5	V	480.5276	37.82	peak	-2.23	35.59	46.00	-10.41	100	189
6	V	560.6928	37.73	peak	-0.64	37.09	46.00	-8.91	100	214

Above 1GHz

Frequency (MHz)	Amplitude (dBμV/m)	Azimuth	Height (cm)	Polarity (H/V)	Factors (dB)	Limit (dBμV/m)	Margin (dB)	Detector (PK/AV)
1588.12	50.54	88	158	V	-23.54	74	-23.46	PK
2033.25	49.66	98	120	V	-22.15	74	-24.34	PK
1654.16	50.43	72	169	V	-22.67	74	-23.57	PK
2189.64	49.12	66	200	H	-22.83	74	-24.88	PK
2855.28	48.63	80	170	H	-22.74	74	-25.37	PK
1851.69	50.58	91	120	H	-21.44	74	-23.42	PK

Note1: The highest frequency of the EUT is 2480 MHz, so the testing has been conformed to $5 \times 2472 \text{ MHz} = 12,360 \text{ MHz}$.

Note2: The frequency that above 3GHz is mainly from the environment noise.

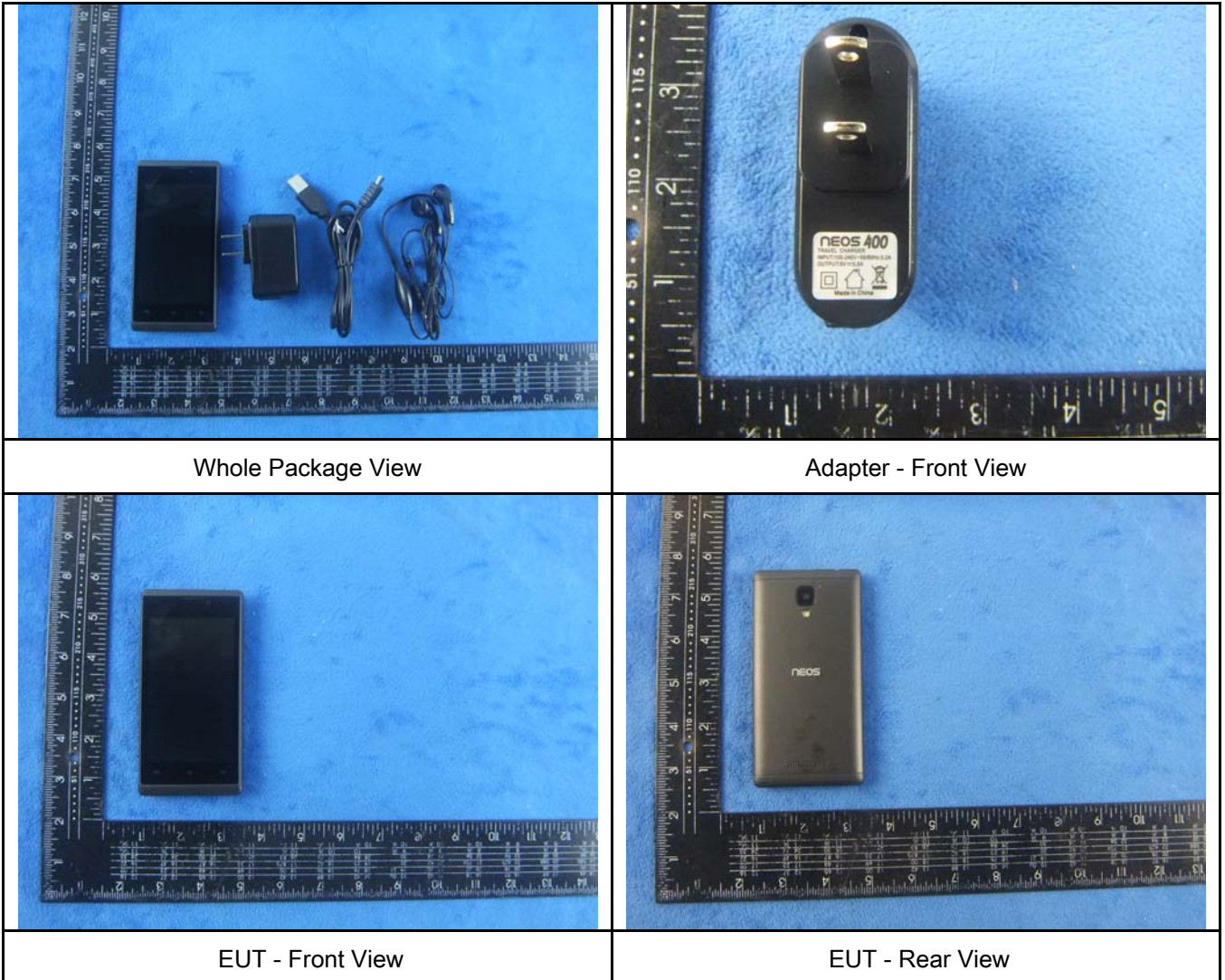
Note3: The AV measurement performed, more than 20dB below limit so AV test data was not presented.

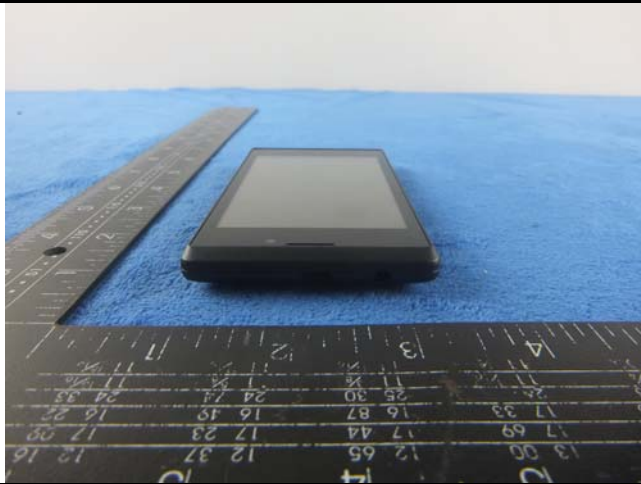
Annex A. TEST INSTRUMENT

Instrument	Model	Serial #	Cal Date	Cal Due	In use
AC Line Conducted Emissions					
EMI test receiver	ESCS30	8471241027	09/17/2015	09/16/2016	<input checked="" type="checkbox"/>
Line Impedance Stabilization Network	LI-125A	191106	09/25/2015	09/24/2016	<input checked="" type="checkbox"/>
Line Impedance Stabilization Network	LI-125A	191107	09/25/2015	09/24/2016	<input checked="" type="checkbox"/>
LISN	ISN T800	34373	09/25/2015	09/24/2016	<input checked="" type="checkbox"/>
Transient Limiter	LIT-153	531118	09/01/2015	08/31/2016	<input checked="" type="checkbox"/>
Radiated Emissions					
EMI test receiver	ESL6	100262	09/17/2015	09/16/2016	<input checked="" type="checkbox"/>
OPT 010 AMPLIFIER (0.1-1300MHz)	8447E	2727A02430	09/01/2015	08/31/2016	<input checked="" type="checkbox"/>
Microwave Preamplifier (1 ~ 26.5GHz)	8449B	3008A02402	03/24/2016	03/23/2017	<input checked="" type="checkbox"/>
Bilog Antenna (30MHz~6GHz)	JB6	A110712	09/21/2015	09/20/2016	<input checked="" type="checkbox"/>
Double Ridge Horn Antenna	AH-118	71259	09/24/2015	09/23/2016	<input checked="" type="checkbox"/>

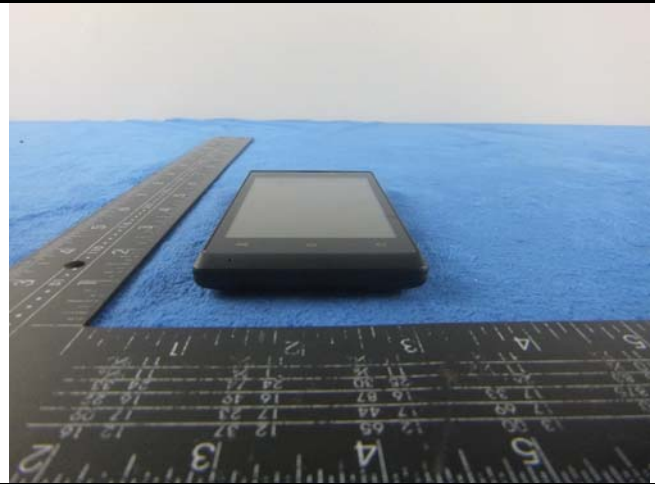
Annex B. EUT And Test Setup Photographs

Annex B.i. Photograph: EUT External Photo

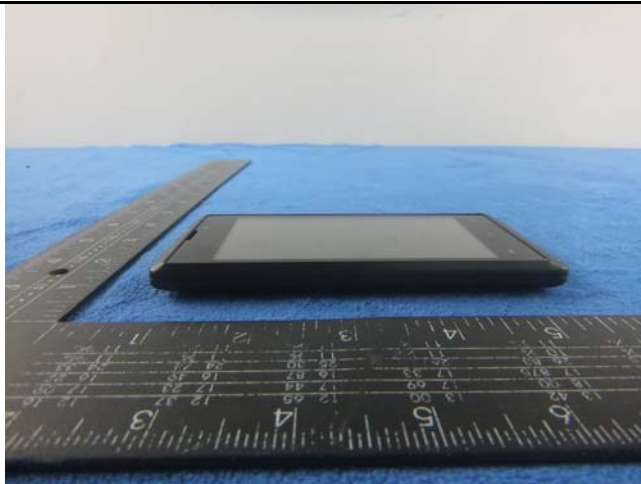




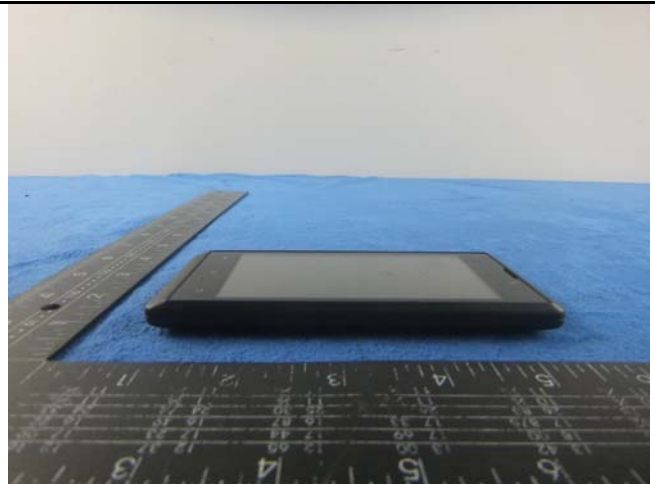
EUT - Top View



EUT - Bottom View



EUT - Left View



EUT - Right View

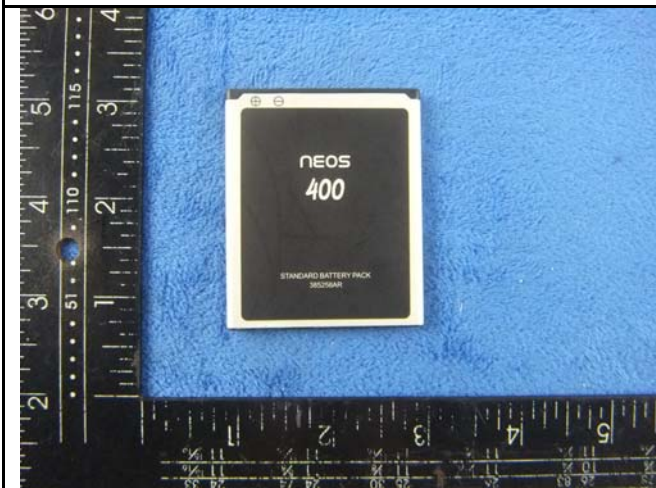
Annex B.ii. Photograph: EUT Internal Photo



Cover Off - Top View 1



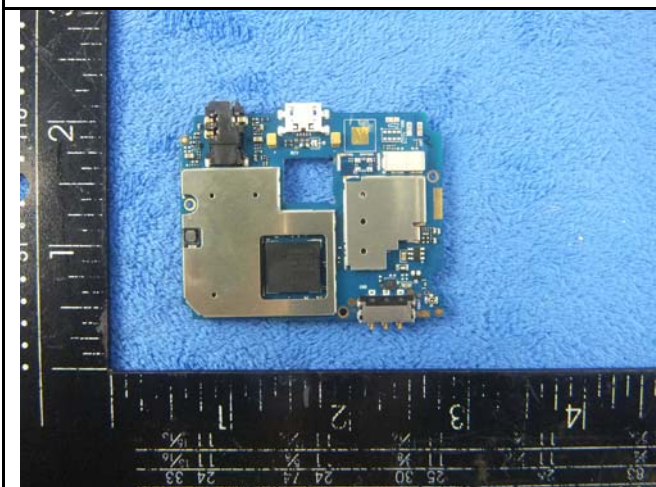
Cover Off - Top View 2



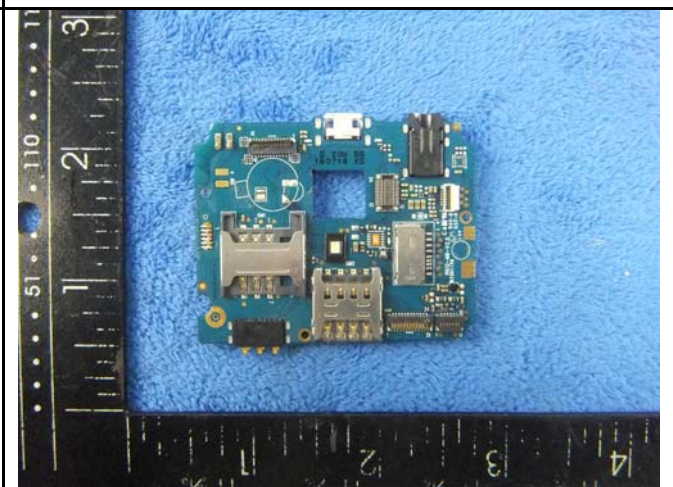
Battery - Front View



Battery - Rear View



Mainboard with Shielding - Front View



Mainboard without Shielding - Front View

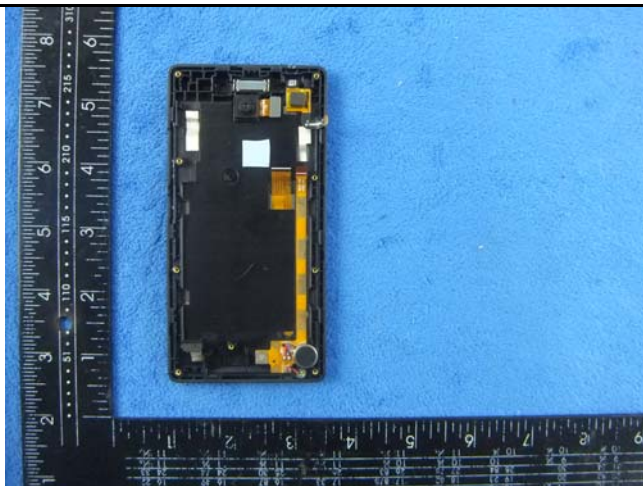
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Mainboard - Rear View



LCD - Front View



LCD - Rear View



GSM/PCS/UMTS-FDD Antenna View



WIFI/BT/BLE/GPS - Antenna View

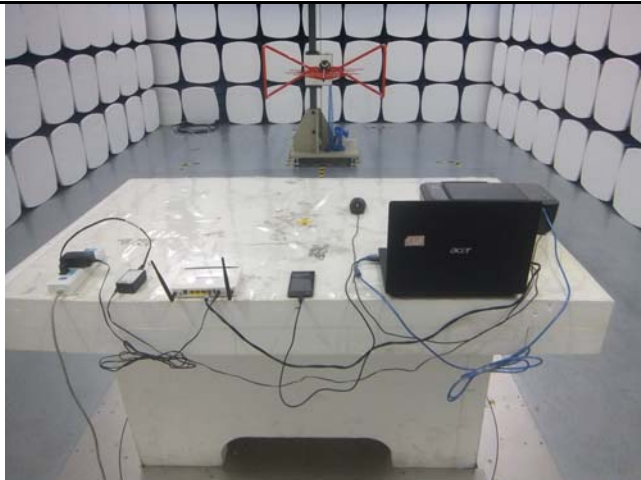
Annex B.iii. Photograph: Test Setup Photo



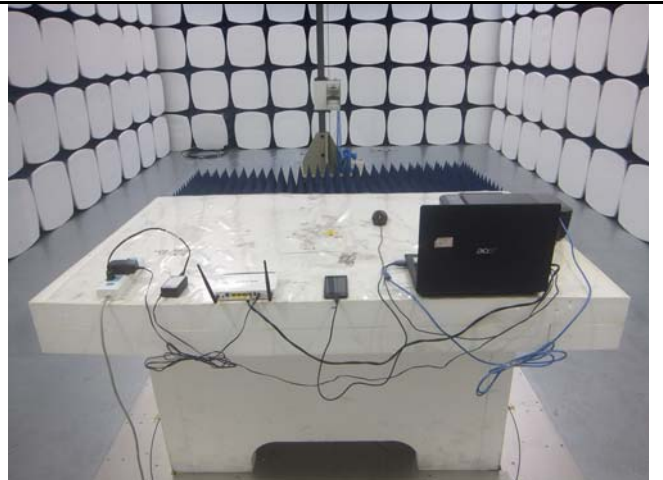
Conducted Emissions Test Setup – Front View



Conducted Emissions Test Setup – Side View



Radiated Emissions Test Setup Below 1GHz

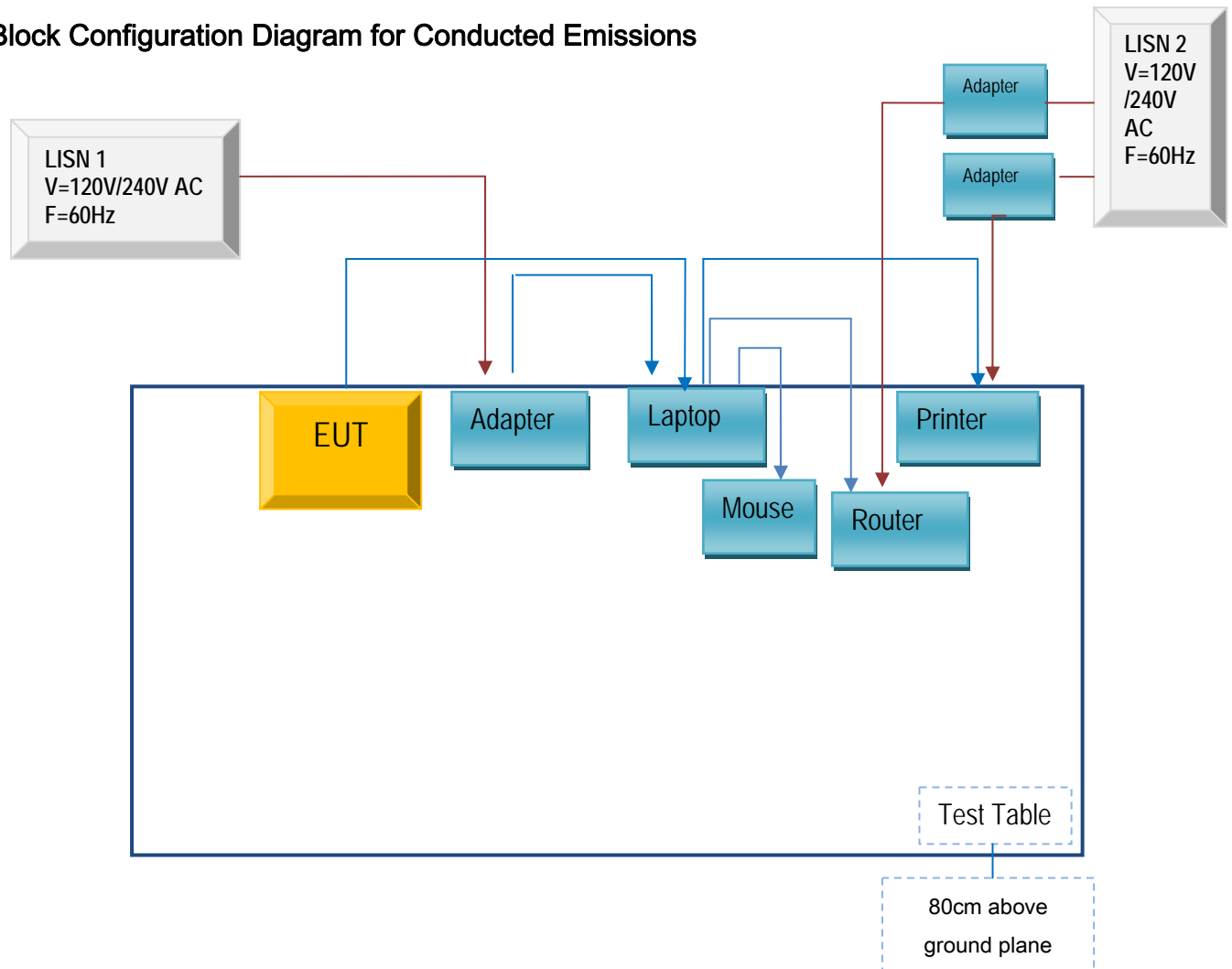


Radiated Emissions Test Setup Above 1GHz

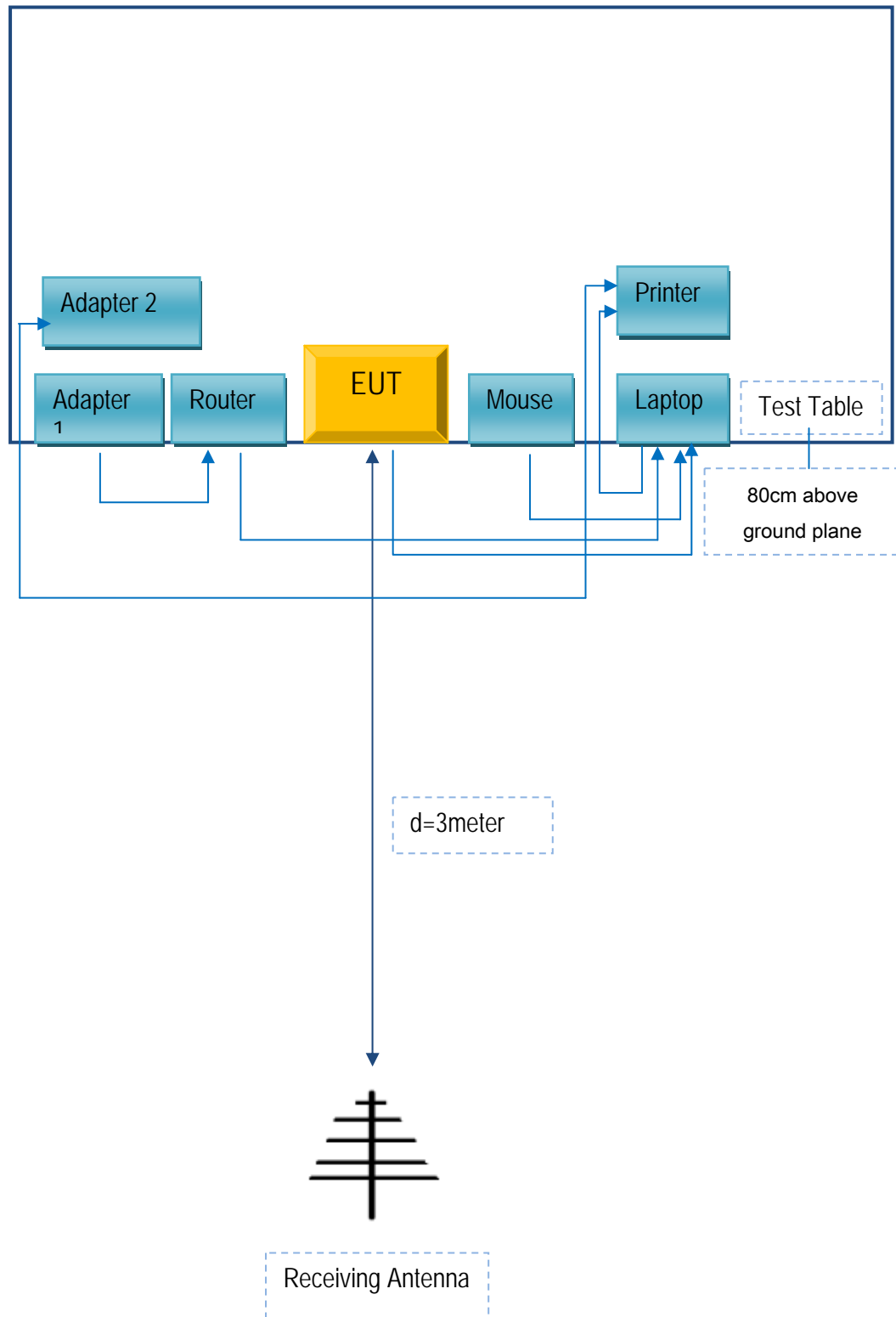
Annex C. TEST SETUP AND SUPPORTING EQUIPMENT

Annex C.ii. TEST SET UP BLOCK

Block Configuration Diagram for Conducted Emissions



Block Configuration Diagram for Radiated Emissions



Annex C. ii. SUPPORTING EQUIPMENT DESCRIPTION

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

Supporting Equipment:

Manufacturer	Equipment Description	Model	Serial No
Lenovo	Laptop	E40	LR-1EHRX
GOLDWEB	Router	R102	1202032094
SHENZHEN TIANYIN ELECTRONICS CO., LTD.	Adapter	TPA - 90C050050UU	S201183
Lenovo	AC Adapter	42T4416	21D9JU
HP	Printer	VCVRA-1003	CN36M19JWX
DELL	Mouse	E100	912NMTUT41481
BULL	Socket	GN-403	GN201203

Supporting Cable:

Cable type	Shield Type	Ferrite Core	Length	Serial No
USB Cable	Un-shielding	No	2m	JX120051274
USB Cable	Un-shielding	No	2m	JX110725002
RJ45 Cable	Un-shielding	No	2m	KX156327541
Router Power cable	Un-shielding	No	2m	13274630Z
Printer Power cable	Un-shielding	No	2m	127581031
Power Cable	Un-shielding	No	0.8m	GT211032

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

Please see the attachment

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Annex E. DECLARATION OF SIMILARITY

N/A