RF TEST REPORT

GLOBAL TESTING & CERTIFICATIONS
YOUR CHOICE FOR- TCB FCB CB NB CAB RCB

Report No.: 15070892-FCC-R4

Supersede Report No.: N/A

Applicant	SENMAX INC.
Product Name	LTE Phone
Model No.	Carbon
Serial No.	N/A
Test Standard	FCC Part 15.247: 2014, ANSI C63.10: 2013
Test Date	October 10 to October 31, 2015
Issue Date	October 31,2015
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

Zone A, Floor 1, Building 2 Wan Ye Long Technology Park

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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
15070892-FCC-R4	NONE	Original	October 31,2015

2. Customer information

Applicant Name	SENMAX INC.
Applicant Add	2300 GRAYSON DR # 1611 GRAPEVINE, TX 76051
Manufacturer	SENMAX INC.
Manufacturer Add	2300 GRAYSON DR # 1611 GRAPEVINE, TX 76051

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:	LTE Phone
Main Model:	Carbon
Serial Model:	N/A
Date EUT received:	October 09, 2015
Test Date(s):	October 10 to October 31, 2015
Equipment Category：	DTS
Antenna Gain:	GSM850: -7.22 dBi PCS1900: -2.93 dBi UMTS-FDD Band V: -7.22 dBi UMTS-FDD Band IV: -2.55 dBi UMTS-FDD Band II:-2.93 dBi Bluetooth/BLE:-2.94 dBi WIFI:-2.94 dBi LTE Band 2: -3.96 dBi LTE Band 4: -2.33 dBi LTE Band 7: -2.54 dBi LTE Band 17: -8.25 dBi GPS:-3.56 dBi
Type of Modulation:	GSM / GPRS: GMSK EGPRS: GMSK, 8PSK UMTS-FDD: QPSK, 16QAM 802.11b/g/n: DSSS, OFDM Bluetooth: GFSK, π /4DQPSK, 8DPSK BLE: GFSK LTE Band: QPSK, 16QAM GPS:BPSK
RF Operating Frequency (ies):	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 IV TX:1712.4 ~ 1752.6 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 WIFI:802.11n(40M): 2422-2452 MHz Bluetooth& BLE: 2402-2480 MHz LTE Band 2 TX: 1852.5 ~ 1907.5 MHz; RX : 1932.5 ~ 1987.5 MHz LTE Band 4 TX: 1712.5 ~ 1752.5 MHz; RX : 2112.5 ~ 2152.5 MHz LTE Band 7 TX: 2502.5 ~ 2567.5 MHz; RX : 2622.5 ~ 2687.5 MHz LTE Band 17 TX: 706.5 ~ 713.5 MHz; RX : 736.5 ~ 743.5 MHz GPS RX:1575.42 MHz
Max. Output Power:	-7.952dBm
Number of Channels:	GSM 850: 124CH PCS1900: 299CH UMTS-FDD Band V : 102CH UMTS-FDD Band IV: 202CH UMTS-FDD Band II : 277CH WIFI :802.11b/g/n(20M): 11CH WIFI :802.11n(40M): 7CH Bluetooth: 79CH BLE: 40CH GPS:1CH
Input Power:	Battery: Spec:3.8V,2850mAh Adapter: Model:TPA-955100UU Input: 100-240V; 50/60Hz; 150mA Output: DC 5.0V,1000mA
Port:	Power Port, Earphone Port, USB Port
Trade Name :	Ojji
GPRS/EGPRS Multi-slot class:	8/10/12
FCC ID:	2AF99CARBON

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
§15.203	Antenna Requirement	Compliance
§15.247 (a)(2)	DTS (6 dB) CHANNEL BANDWIDTH	Compliance
§15.247(b)(3)	Conducted Maximum Output Power	Compliance
§15.247(e)	Power Spectral Density	Compliance
§15.247(d)	Band-Edge & Unwanted Emissions into Non-Restricted Frequency Bands	Compliance
§15.207 (a),	AC Power Line Conducted Emissions	Compliance
§15.205, §15.209, §15.247(d)	Radiated Spurious Emissions & Unwanted Emissions into Restricted Frequency Bands	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 Antenna Requirement

Applicable Standard

According to § 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the user of a standard antenna jack or electrical connector is prohibited.
The structure and application of the EUT were analyzed to determine compliance with section §15.203 of the rules. §15.203 state that the subject device must meet the following criteria:

a. Antenna must be permanently attached to the unit.

b. Antenna must use a unique type of connector to attach to the EUT.

Unit must be professionally installed, and installer shall be responsible for verifying that the correct antenna is employed with the unit.
And according to FCC 47 CFR section 15.247 (b), if the transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

Antenna Connector Construction

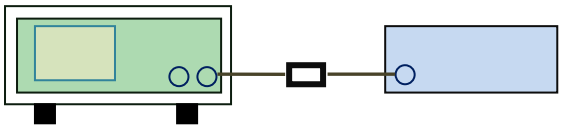
The EUT has 4 antennas:
A permanently attached PIFA antenna for Bluetooth/BLE/WIFI, the gain is -2.94dBi.
A permanently attached PIFA antenna for GSM and UMTS, the gain is -7.22dBi for GSM850, -2.93dBi for PCS1900, -7.22dBi for UMTS-FDD Band V, -2.55dBi for UMTS-FDD Band IV, -2.93dBi for UMTS-FDD Band II.
A permanently attached PIFA antenna for LTE, the gain is -3.96dBi LTE Band 2, the gain is -2.33dBi LTE Band 4, the gain is -2.54dBi LTE Band 7, the gain is -8.25dBi LTE Band 17.
A permanently attached PIFA antenna for GPS, the gain is -3.56dBi for GPS,

The antenna meets up with the ANTENNA REQUIREMENT.

Result: Compliance.

6.2 DTS (6 dB) Channel Bandwidth

Temperature	24℃
Relative Humidity	57%
Atmospheric Pressure	1015mbar
Test date :	October 15, 2015
Tested By :	Winnie Zhang

Spec	Item	Requirement	Applicable
§ 15.247(a)(2)	a)	6dB BW≥ 500kHz;	☑
RSS Gen(4.6.1)	b)	99% BW: For FCC reference only; required by IC.	☑
Test Setup	 Spectrum Analyzer EUT		
Test Procedure	558074 D01 DTS MEAS Guidance v03r02, 8.1 DTS bandwidth 6dB Emission bandwidth measurement procedure - Set RBW = 100 kHz. - Set the video bandwidth (VBW) ≥ 3 ´ RBW. - Detector = Peak. - Trace mode = max hold. - Sweep = auto couple. - Allow the trace to stabilize. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.		
Remark			
Result	☑ Pass ☐ Fail		

Test Data ☑ Yes ☐ N/A

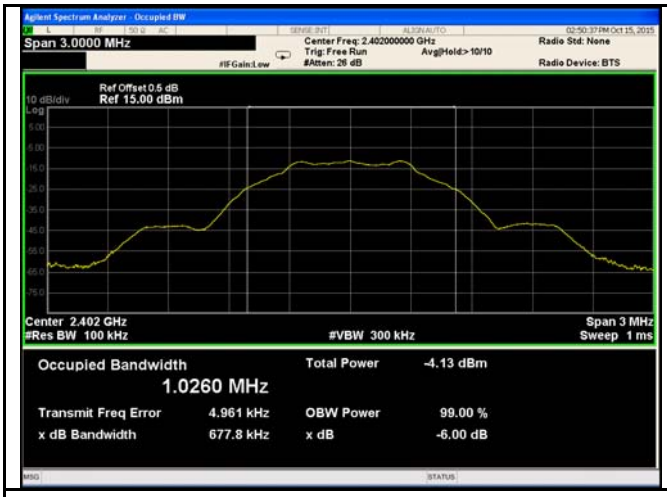
Test Plot ☑ Yes (See below) ☐ N/A

6dB Bandwidth measurement result

Test Data

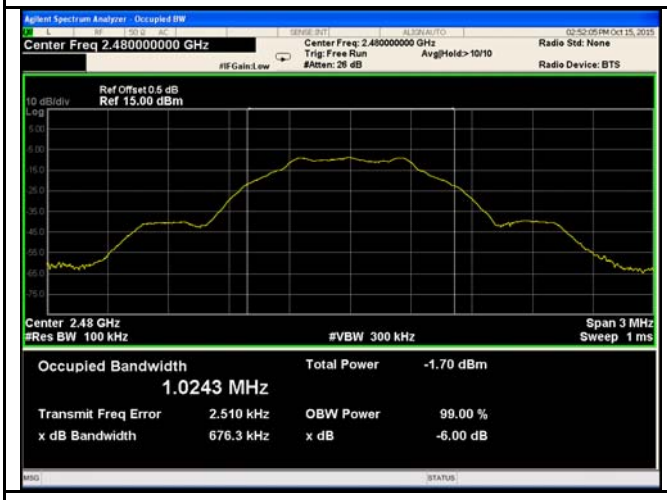
CH	Freq (MHz)	6dB Bandwidth (kHz)	99% Occupied Bandwidth (MHz)
Low	2402	677.8	1.0260
Mid	2440	683.1	1.0253
High	2480	676.3	1.0243

Test Plots



6dB Bandwidth - Low CH 2402

6dB Bandwidth - Mid CH 2440

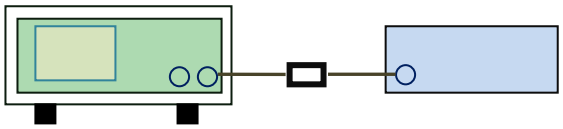


6dB Bandwidth - High CH 2480

6.3 Maximum Output Power

Temperature	24℃
Relative Humidity	57%
Atmospheric Pressure	1015mbar
Test date :	October 15, 2015
Tested By :	Winnie Zhang

Requirement(s):

Spec	Item	Requirement	Applicable
§15.247(b)(2),RSS210(A8.4)	a)	FHSS in 2400-2483.5MHz with ≥ 75 channels: ≤ 1 Watt	☐
	b)	FHSS in 5725-5850MHz: ≤ 1 Watt	☐
	c)	For all other FHSS in the 2400-2483.5MHz band: ≤ 0.125 Watt.	☐
	d)	FHSS in 902-928MHz with ≥ 50 channels: ≤ 1 Watt	☐
	e)	FHSS in 902-928MHz with ≥ 25 & <50 channels: ≤ 0.25 Watt	☐
	f)	DSSS in 902-928MHz, 2400-2483.5MHz, 5725-5850MHz: ≤ 1 Watt	☑
Test Setup	 Spectrum Analyzer EUT		
Test Procedure	558074 D01 DTS MEAS Guidance v03r02, 9.1.2 Integrated band power method Maximum output power measurement procedure a) Set the RBW ≥ DTS bandwidth. b) Set VBW ≥ 3 × RBW. c) Set span ≥ 3 x RBW d) Sweep time = auto couple. e) Detector = peak. f) Trace mode = max hold. g) Allow trace to fully stabilize. h) Use peak marker function to determine the peak amplitude level.		
Remark			

Result	☑ Pass	☐ Fail

Test Data ☑ Yes ☐ N/A

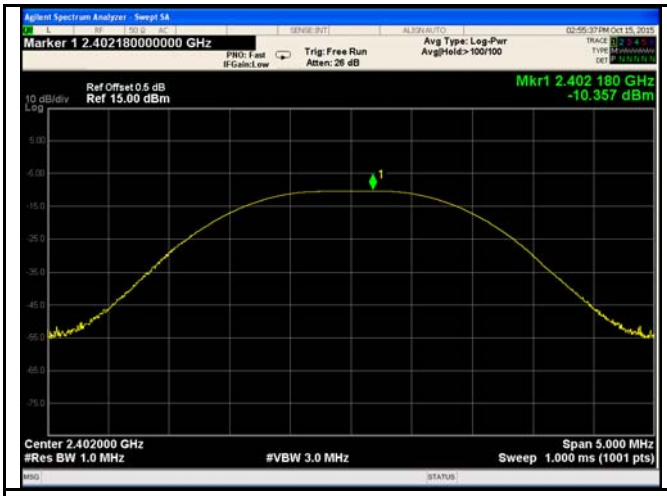
Test Plot ☑ Yes (See below) ☐ N/A

Output Power measurement result

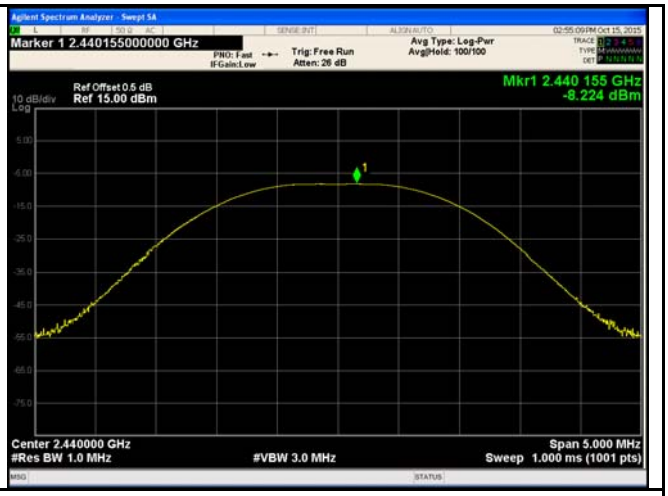
Test Data

Type	CH	Freq (MHz)	Conducted Power (dBm)	Limit (dBm)	Result
Output power	Low	2402	-10.357	30	Pass
	Mid	2440	-8.224	30	Pass
	High	2480	**-7.952**	30	Pass

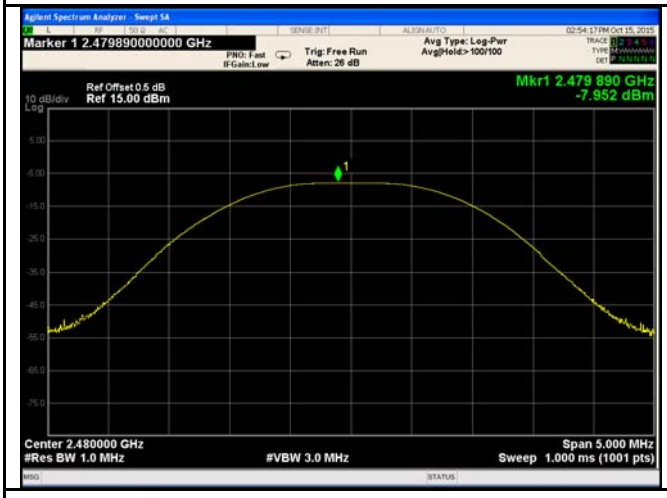
Test Plots



AV Output power - Low CH 2402



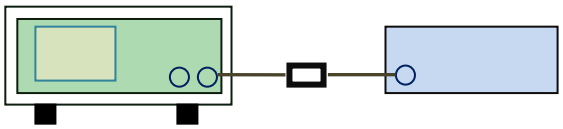
AV Output power - Mid CH 2440



AV Output power - High CH 2480

6.4 Power Spectral Density

Temperature	24℃
Relative Humidity	57%
Atmospheric Pressure	1015mbar
Test date :	October 15, 2015
Tested By :	Winnie Zhang

Spec	Item	Requirement	Applicable
§15.247(e)	a)	The power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.	☑
Test Setup			
Test Procedure	558074 D01 DTS MEAS Guidance v03r02, 10.2 power spectral density method power spectral density measurement procedure - a) Set analyzer center frequency to DTS channel center frequency. - b) Set the span to 1.5 times the DTS bandwidth. - c) Set the RBW to: 3 kHz ≤ RBW ≤ 100 kHz. - d) Set the VBW ≥ 3 × RBW. - e) Detector = peak. - f) Sweep time = auto couple. - g) Trace mode = max hold. - h) Allow trace to fully stabilize. - i) Use the peak marker function to determine the maximum amplitude level within the RBW. - j) If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.		
Remark			
Result	☑ Pass ☐ Fail		

Test Data ☑ Yes ☐ N/A

Test Plot ☑ Yes (See below) ☐ N/A

Power Spectral Density measurement result

Test Data

Type	CH	Freq (MHz)	PSD (dBm)	Limit (dBm)	Result
PSD	Low	2402	-20.288	8	Pass
	Mid	2440	-18.204	8	Pass
	High	2480	-17.932	8	Pass

Test Plots

PSD - Low CH 2402

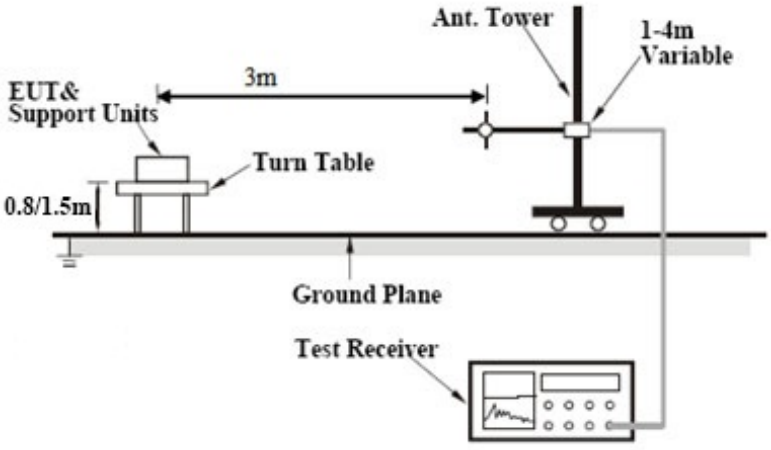
PSD - Mid CH 2440

PSD - High CH 2480

6.5 Band-Edge & Unwanted Emissions into Non-Restricted Frequency Bands

Temperature	24℃
Relative Humidity	56%
Atmospheric Pressure	1023mbar
Test date :	October 23, 2015
Tested By :	Winnie Zhang

Requirement(s):

Spec	Item	Requirement	Applicable
§15.247(d)	a)	In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits.	☑
Test Setup			
Test Procedure	Radiated Method Only - 1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator. - 2. Position the EUT without connection to measurement instrument. Put it on the Rotated table and turn on the EUT and make it operate in transmitting mode. Then set it to Low Channel and High Channel within its operating range, and make sure the instrument is operated in its linear range.		

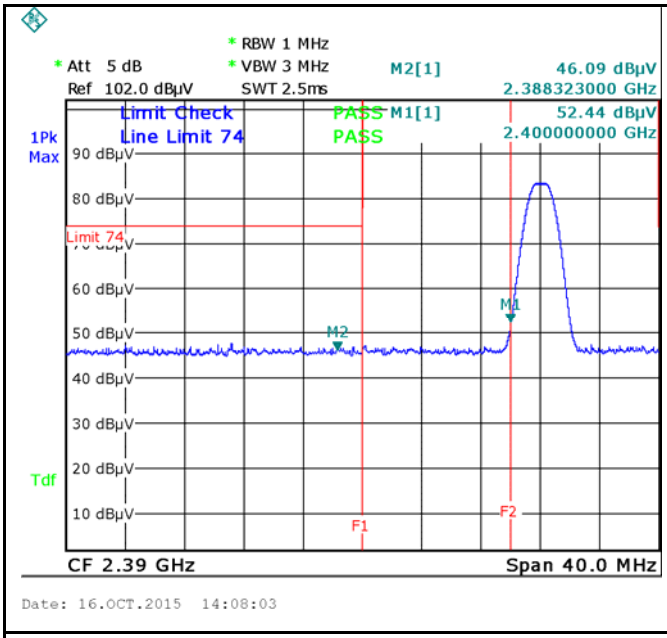
	- 3. First, set both RBW and VBW of spectrum analyzer to 100 kHz with a convenient frequency span including 100kHz bandwidth from band edge, check the emission of EUT, if pass then set Spectrum Analyzer as below: a. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 kHz for Quasiy Peak detection at frequency below 1GHz. b. 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. c. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 10Hz with Peak detection for Average Measurement as below at frequency above 1GHz. - 4. Measure the highest amplitude appearing on spectral display and set it as a reference level. Plot the graph with marking the highest point and edge frequency. - 5. Repeat above procedures until all measured frequencies were complete.
Remark	
Result	☑ Pass ☐ Fail

Test Data ☑ Yes ☐ N/A

Test Plot ☑ Yes (See below) ☐ N/A

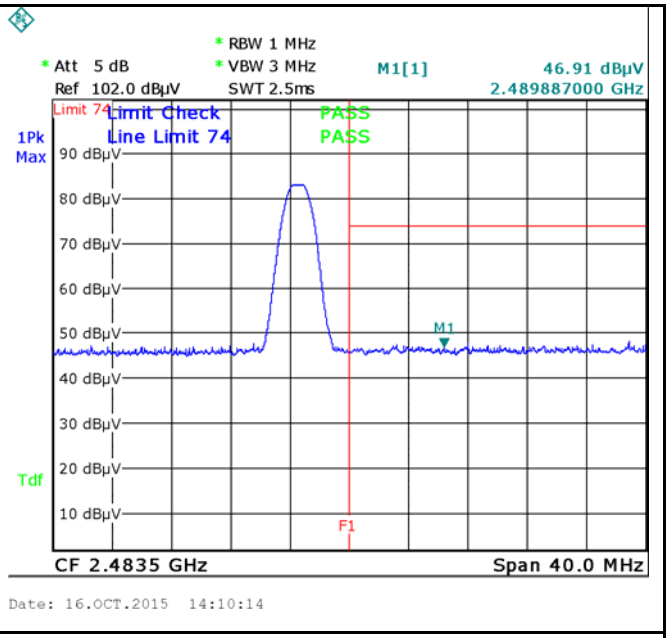
Test Plots

Band Edge measurement result



Band Edge, Left Side (Peak)

Note: F1 is frequency 2390MHz; F2 is frequency 2400MHz



Band Edge, Right Side (Peak)

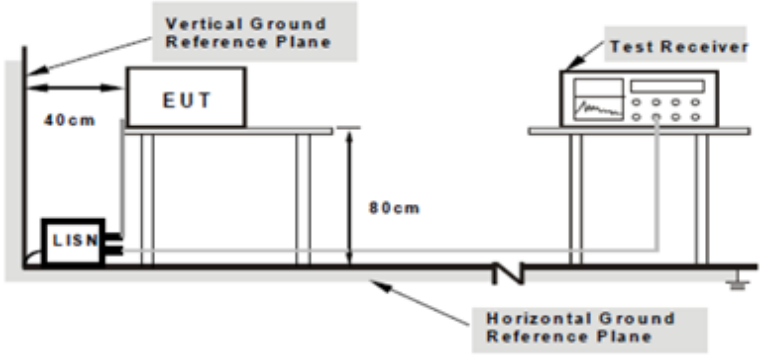
Note: F1 is frequency 2483.5MHz

Note: (no need if PK value less than the AV limit)	Note: (no need if PK value less than the AV limit)
Band Edge, Left Side-AV	Band Edge, Right Side-AV

6.6 AC Power Line Conducted Emissions

Temperature	24℃
Relative Humidity	56%
Atmospheric Pressure	1023mbar
Test date :	October 23, 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§15.207, RSS210 (A8.1)</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"> 

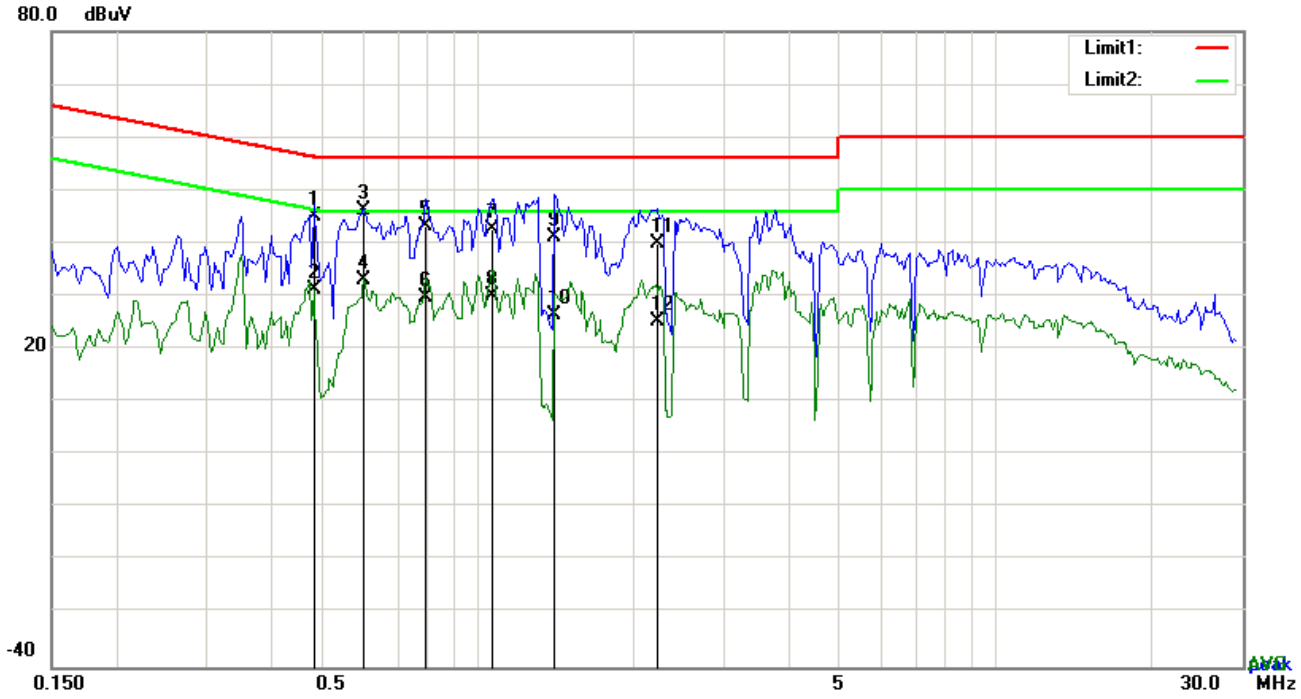
Note: 1.Support units were connected to second LISN.
2.Both of LISNs (AMN) are 80cm from EUT and at least 80cm from other units and other metal planes support units.</td></tr>
<tr><td>Procedure</td><td colspan="3">1. The EUT and supporting equipment were set up in accordance with the requirements of the standard on top of a 1.5m x 1m x 0.8m high, non-metallic table.
2. The power supply for the EUT was fed through a 50W/50mH EUT LISN, connected to filtered mains.
3. The RF OUT of the EUT LISN was connected to the EMI test receiver via a low-loss</td></tr>
</table>

	coaxial cable. 4. All other supporting equipment were powered separately from another main supply. 5. The EUT was switched on and allowed to warm up to its normal operating condition. 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. 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. 8. Step 7 was then repeated for the LIVE line (for AC mains) or DC line (for DC power).
Remark	
Result	☑ Pass ☐ Fail

Test Data ☑ Yes ☐ N/A

Test Plot ☑ Yes (See below) ☐ N/A

Test Mode:	Transmitting Mode

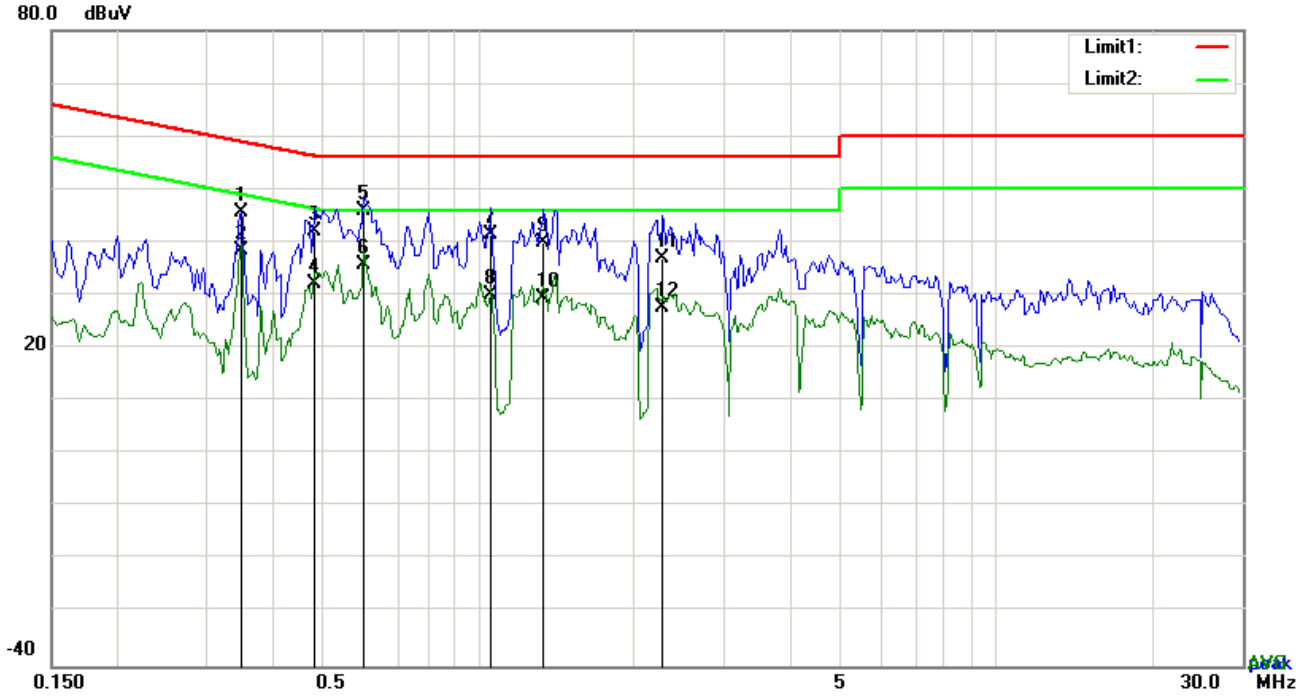


Test Data

Phase Line Plot at 120Vac, 60Hz

No.	P/L	Frequency (MHz)	Reading (dBµV)	Detector	Corrected (dB)	Result (dBµV)	Limit (dBµV)	Margin (dB)
1	L1	0.4815	34.99	QP	10.03	45.02	56.31	-11.29
2	L1	0.4815	21.32	AVG	10.03	31.35	46.31	-14.96
3	L1	0.6024	36.20	QP	10.03	46.23	56.00	-9.77
4	L1	0.6024	22.97	AVG	10.03	33.00	46.00	-13.00
5	L1	0.7935	33.20	QP	10.03	43.23	56.00	-12.77
6	L1	0.7935	19.77	AVG	10.03	29.80	46.00	-16.20
7	L1	1.0704	32.75	QP	10.03	42.78	56.00	-13.22
8	L1	1.0704	20.09	AVG	10.03	30.12	46.00	-15.88
9	L1	1.4097	31.09	QP	10.04	41.13	56.00	-14.87
10	L1	1.4097	16.46	AVG	10.04	26.50	46.00	-19.50
11	L1	2.2326	30.04	QP	10.05	40.09	56.00	-15.91
12	L1	2.2326	15.21	AVG	10.05	25.26	46.00	-20.74

Test Mode:	Transmitting Mode

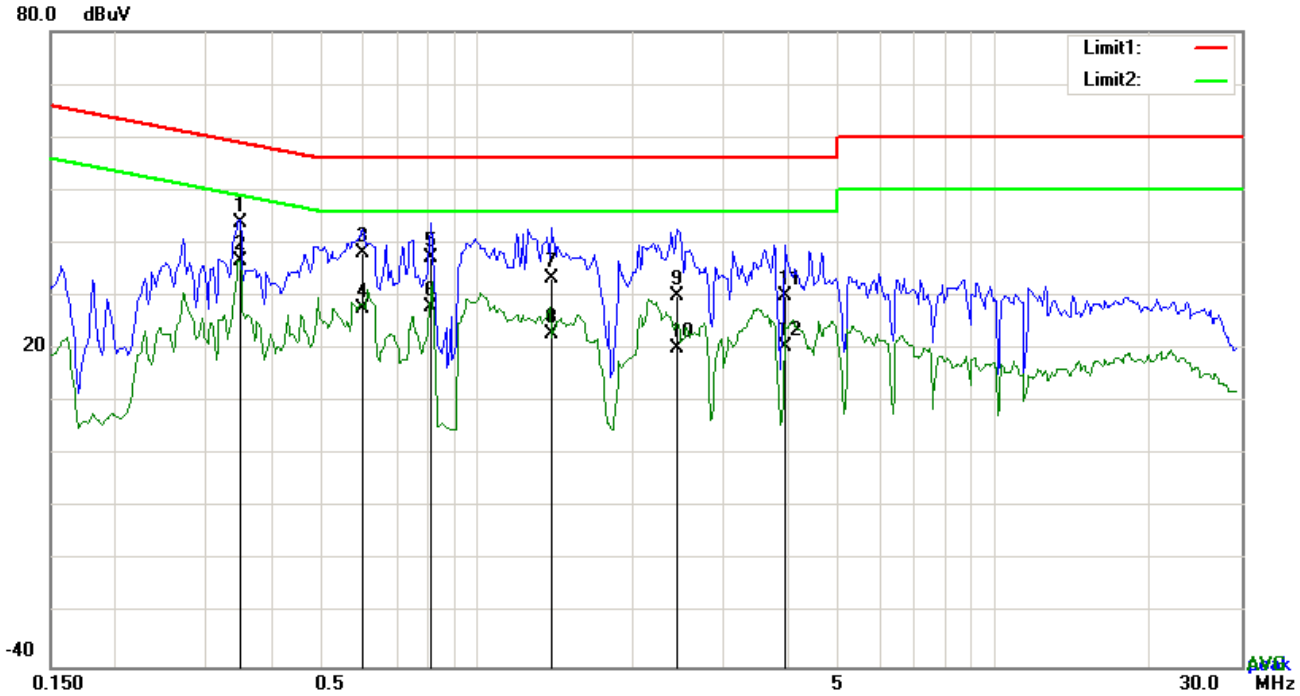


Test Data

Phase Neutral Plot at 120Vac, 60Hz

No.	P/L	Frequency (MHz)	Reading (dBµV)	Detector	Corrected (dB)	Result (dBµV)	Limit (dBµV)	Margin (dB)
1	N	0.3489	35.54	QP	10.02	45.56	58.99	-13.43
2	N	0.3489	28.46	AVG	10.02	38.48	48.99	-10.51
3	N	0.4815	32.08	QP	10.02	42.10	56.31	-14.21
4	N	0.4815	22.02	AVG	10.02	32.04	46.31	-14.27
5	N	0.6024	36.03	QP	10.02	46.05	56.00	-9.95
6	N	0.6024	25.62	AVG	10.02	35.64	46.00	-10.36
7	N	1.0626	31.52	QP	10.03	41.55	56.00	-14.45
8	N	1.0626	19.94	AVG	10.03	29.97	46.00	-16.03
9	N	1.3395	29.81	QP	10.03	39.84	56.00	-16.16
10	N	1.3395	19.40	AVG	10.03	29.43	46.00	-16.57
11	N	2.2833	26.86	QP	10.04	36.90	56.00	-19.10
12	N	2.2833	17.62	AVG	10.04	27.66	46.00	-18.34

Test Mode:	Transmitting Mode

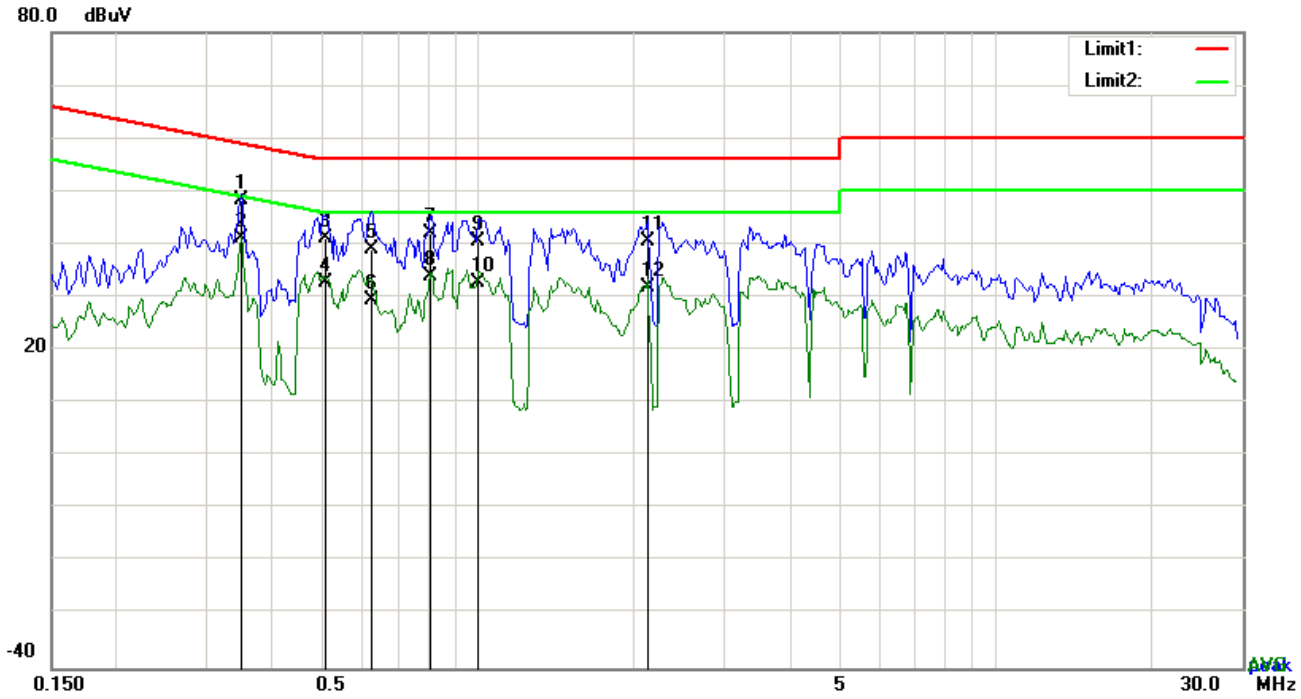


Test Data

Phase Line Plot at 240Vac, 60Hz

No.	P/L	Frequency (MHz)	Reading (dBµV)	Detector	Corrected (dB)	Result (dBµV)	Limit (dBµV)	Margin (dB)
1	L1	0.3489	33.95	QP	10.03	43.98	58.99	-15.01
2	L1	0.3489	26.58	AVG	10.03	36.61	48.99	-12.38
3	L1	0.6024	28.20	QP	10.03	38.23	56.00	-17.77
4	L1	0.6024	17.72	AVG	10.03	27.75	46.00	-18.25
5	L1	0.8169	27.21	QP	10.03	37.24	56.00	-18.76
6	L1	0.8169	18.00	AVG	10.03	28.03	46.00	-17.97
7	L1	1.3902	23.31	QP	10.03	33.34	56.00	-22.66
8	L1	1.3902	12.96	AVG	10.03	22.99	46.00	-23.01
9	L1	2.4432	20.10	QP	10.05	30.15	56.00	-25.85
10	L1	2.4432	10.05	AVG	10.05	20.10	46.00	-25.90
11	L1	3.9399	20.07	QP	10.07	30.14	56.00	-25.86
12	L1	3.9399	10.34	AVG	10.07	20.41	46.00	-25.59

Test Mode:	Transmitting Mode



Test Data

Phase Neutral Plot at 240Vac, 60Hz

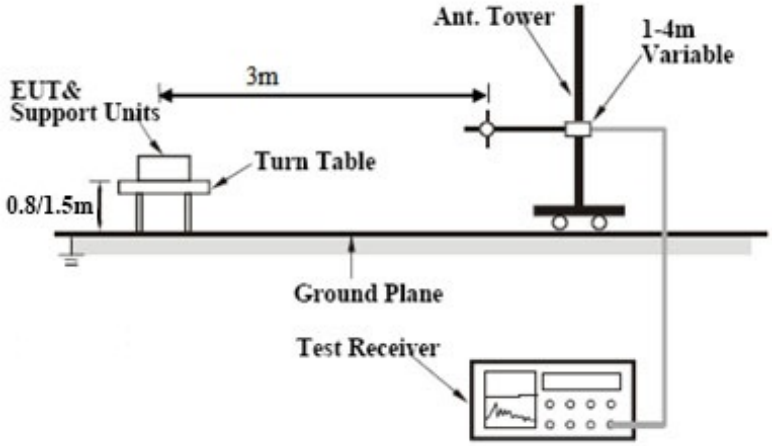
No.	P/L	Frequency (MHz)	Reading (dBµV)	Detector	Corrected (dB)	Result (dBµV)	Limit (dBµV)	Margin (dB)
1	N	0.3489	38.26	QP	10.02	48.28	58.99	-10.71
2	N	0.3489	31.12	AVG	10.02	41.14	48.99	-7.85
3	N	0.5088	31.10	QP	10.02	41.12	56.00	-14.88
4	N	0.5088	22.86	AVG	10.02	32.88	46.00	-13.12
5	N	0.6258	29.16	QP	10.02	39.18	56.00	-16.82
6	N	0.6258	19.55	AVG	10.02	29.57	46.00	-16.43
7	N	0.8130	31.90	QP	10.03	41.93	56.00	-14.07
8	N	0.8130	23.81	AVG	10.03	33.84	46.00	-12.16
9	N	1.0041	30.42	QP	10.03	40.45	56.00	-15.55
10	N	1.0041	22.77	AVG	10.03	32.80	46.00	-13.20
11	N	2.1234	30.40	QP	10.04	40.44	56.00	-15.56
12	N	2.1234	21.86	AVG	10.04	31.90	46.00	-14.10

6.7 Radiated Emissions

Temperature	24℃
Relative Humidity	56%
Atmospheric Pressure	1023mbar
Test date :	October 23, 2015
Tested By :	Winnie Zhang

Requirement(s):

<table>
<tr><th>Spec</th><th>Item</th><th>Requirement</th><th>Applicable</th></tr>
<tr><td rowspan="3">47CFR§15.247(d), RSS210 (A8.5)</td><td>a)</td><td>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
<table>
<tr><th>Frequency range (MHz)</th><th>Field Strength (μV/m)</th></tr>
<tr><td>30 – 88</td><td>100</td></tr>
<tr><td>88 – 216</td><td>150</td></tr>
<tr><td>216 960</td><td>200</td></tr>
<tr><td>Above 960</td><td>500</td></tr>
</table></td><td>☑</td></tr>
<tr><td>b)</td><td>For non-restricted band, In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB or 30dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, determined by the measurement method on output power to be used. Attenuation below the general limits specified in § 15.209(a) is not required
☒ 20 dB down ☐ 30 dB down</td><td>☑</td></tr>
<tr><td>c)</td><td>or restricted band, emission must also comply with the radiated emission limits specified in 15.209</td><td>☑</td></tr>
</table>

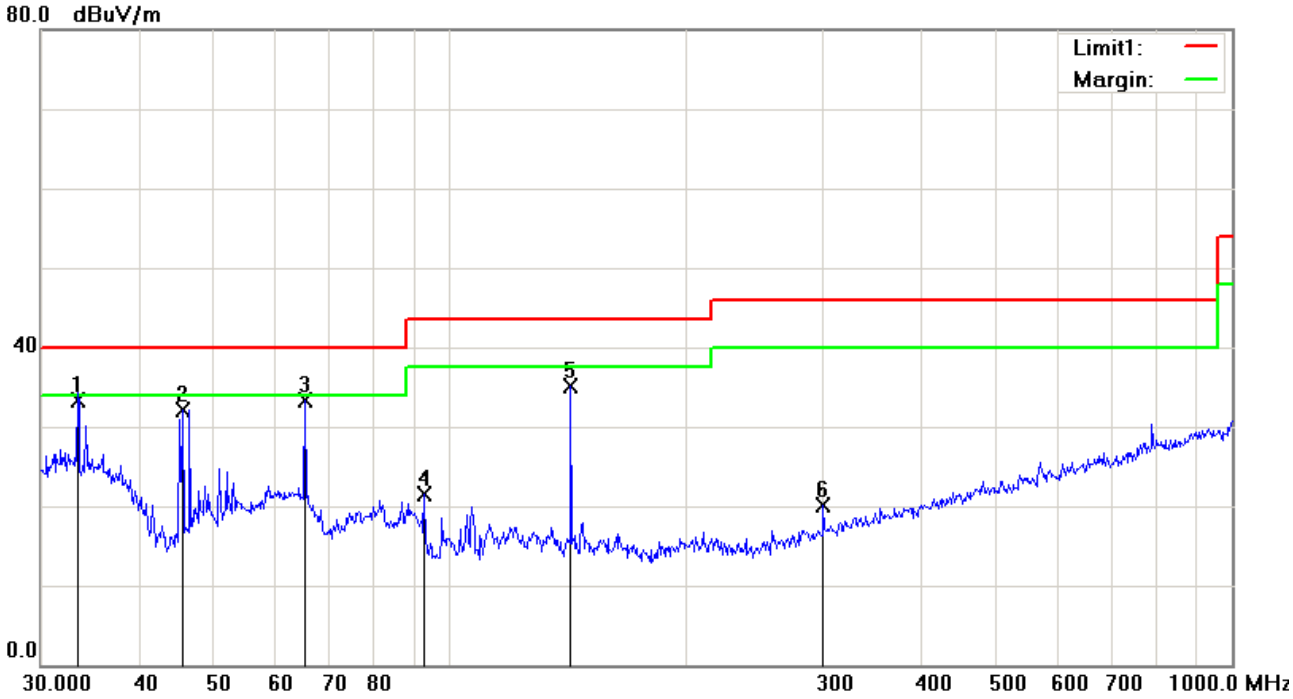
Test Setup	
Procedure	1. The EUT was switched on and allowed to warm up to its normal operating condition. 2. The test was carried out at the selected frequency points obtained from the EUT characterization. Maximization of the emissions, was carried out by rotating the EUT, changing the antenna polarization, and adjusting the antenna height in the following manner: a. Vertical or horizontal polarization (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. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 kHz for Quasiy Peak detection at frequency below 1GHz. 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. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 10Hz with Peak detection for Average Measurement as below at frequency above 1GHz. 5. Steps 2 and 3 were repeated for the next frequency point, until all selected frequency points were measured.
Remark	Different RF configuration has been evaluated but not much difference was found. The data presented here is the worst case data with EUT under 802.11n – HT20-2437MHz mode.
Result	☑ Pass ☐ Fail

Test Data ☑ Yes ☐ N/A

Test Plot ☑ Yes (See below) ☐ N/A

Test Mode:	Transmitting Mode

Below 1GHz

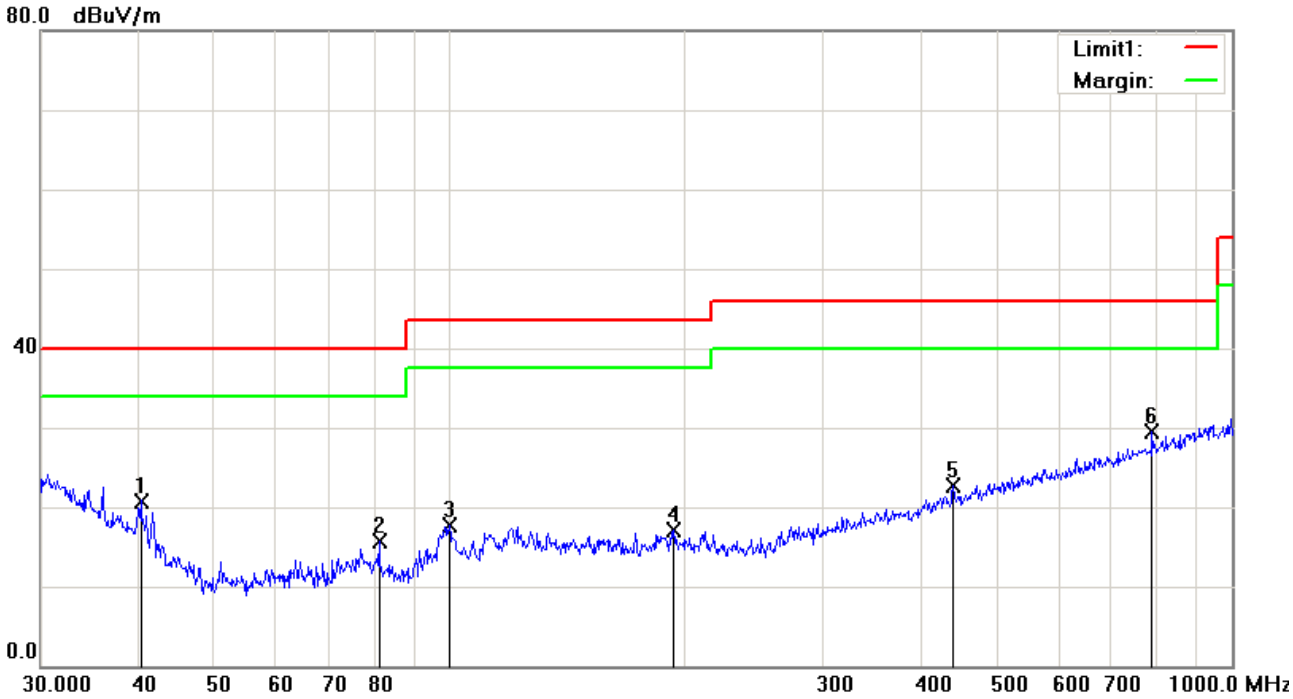


Test Data

Vertical Polarity Plot @3m

No	P/L	Frequency (MHz)	Reading (dBµV)	Detector	Corrected (dB)	Result (dBµV)	Limit (dBµV)	Margin (dB)	Height	Degree
1	V	33.4449	36.05	peak	-2.79	33.26	40.00	-6.74	100	197
2	V	45.5348	43.26	peak	-11.18	32.08	40.00	-7.92	100	208
3	V	65.3432	47.16	peak	-13.93	33.23	40.00	-6.77	100	216
4	V	92.7872	34.27	peak	-12.68	21.59	43.50	-21.91	100	156
5	V	142.8244	43.60	peak	-8.50	35.10	43.50	-8.40	100	197
6	V	300.3673	27.05	peak	-6.89	20.16	46.00	-25.84	100	197

Below 1GHz



Test Data

Horizontal Polarity Plot @3m

No	P/L	Frequency (MHz)	Reading (dBµV)	Detector	Corrected (dB)	Result (dBµV)	Limit (dBµV)	Margin (dB)	Height	Degree
1	H	40.2757	28.57	peak	-7.77	20.80	40.00	-19.20	100	236
2	H	81.2117	29.36	peak	-13.71	15.65	40.00	-24.35	100	177
3	H	99.8777	28.61	peak	-10.83	17.78	43.50	-25.72	100	278
4	H	193.0945	26.23	peak	-9.08	17.15	43.50	-26.35	100	244
5	H	440.1963	26.07	peak	-3.32	22.75	46.00	-23.25	100	30
6	H	790.6188	26.36	peak	3.06	29.42	46.00	-16.58	100	124

Test Mode:	Transmitting Mode

Low Channel (2402 MHz)

Frequency (MHz)	S.A. Reading (dBµV)	Detector (PK/AV)	Polarity (H/V)	Ant. Factor (dB/m)	Cable Loss (dB)	Pre-Amp. Gain (dB)	Cord. Amp. (dBµV/m)	Limit (dBµV/m)	Margin (dB)
4804	38.53	AV	V	33.83	6.86	31.72	47.5	54	-6.5
4804	38.19	AV	H	33.83	6.86	31.72	47.16	54	-6.84
4804	46.81	PK	V	33.83	6.86	31.72	55.78	74	-18.22
4804	46.35	PK	H	33.83	6.86	31.72	55.32	74	-18.68

Middle Channel (2440 MHz)

Frequency (MHz)	S.A. Reading (dBµV)	Detector (PK/AV)	Polarity (H/V)	Ant. Factor (dB/m)	Cable Loss (dB)	Pre-Amp. Gain (dB)	Cord. Amp. (dBµV/m)	Limit (dBµV/m)	Margin (dB)
4880	38.46	AV	V	33.86	6.82	31.82	47.32	54	-6.68
4880	38.02	AV	H	33.86	6.82	31.82	46.88	54	-7.12
4880	46.73	PK	V	33.86	6.82	31.82	55.59	74	-18.41
4880	46.28	PK	H	33.86	6.82	31.82	55.14	74	-18.86

High Channel (2480 MHz)

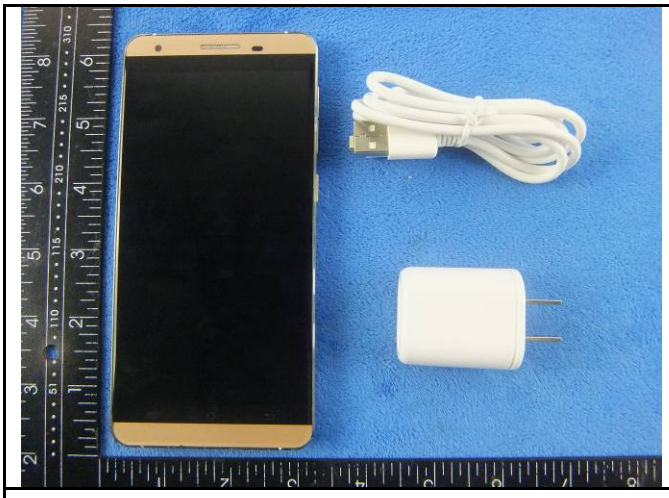
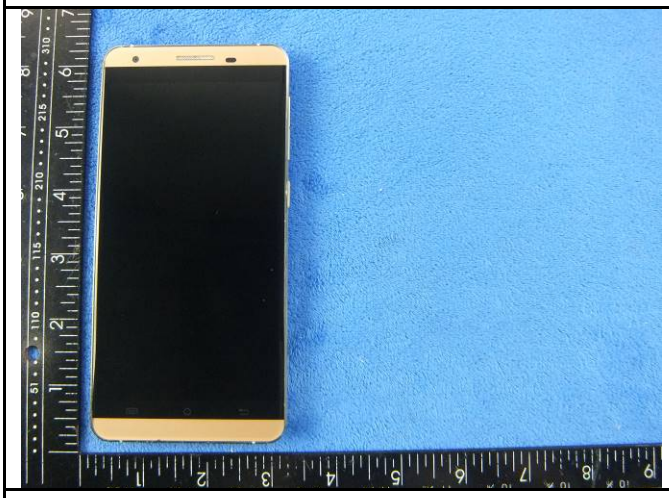
Frequency (MHz)	S.A. Reading (dBµV)	Detector (PK/AV)	Polarity (H/V)	Ant. Factor (dB/m)	Cable Loss (dB)	Pre-Amp. Gain (dB)	Cord. Amp. (dBµV/m)	Limit (dBµV/m)	Margin (dB)
4960	38.31	AV	V	33.9	6.76	31.92	47.05	54	-6.95
4960	38.15	AV	H	33.9	6.76	31.92	46.89	54	-7.11
4960	46.69	PK	V	33.9	6.76	31.92	55.43	74	-18.57
4960	46.12	PK	H	33.9	6.76	31.92	54.86	74	-19.14

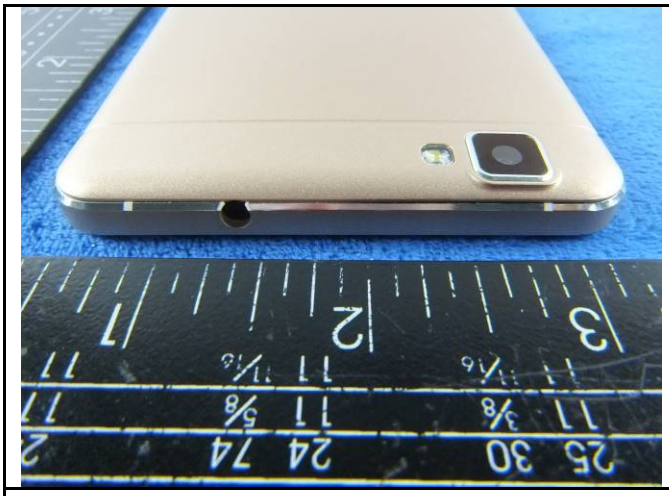
Annex A. TEST INSTRUMENT

Instrument	Model	Serial #	Cal Date	Cal Due	In use
AC Line Conducted					
EMI test receiver	ESCS30	8471241027	09/17/2015	09/16/2016	☑
Line Impedance	LI-125A	191106	09/25/2015	09/24/2016	☑
Line Impedance	LI-125A	191107	09/25/2015	09/24/2016	☑
LISN	ISN T800	34373	09/25/2015	09/24/2016	☑
Double Ridge Horn Antenna (1 ~18GHz)	AH-118	71283	09/24/2015	09/23/2016	☑
Transient Limiter	LIT-153	531118	09/01/2015	08/31/2016	☑
RF conducted test					
Agilent ESA-E SERIES	E4407B	MY45108319	09/17/2015	09/16/2016	☑
Power Splitter	1#	1#	09/01/2015	08/31/2016	☑
DC Power Supply	E3640A	MY40004013	09/17/2015	09/16/2016	☑
Radiated Emissions					
EMI test receiver	ESL6	100262	09/17/2015	09/16/2016	☑
Positioning Controller	UC3000	MF780208282	11/20/2014	11/19/2015	☑
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 (1 ~18GHz)	AH-118	71283	09/24/2015	09/23/2016	☑
Universal Radio Communication Tester	CMU200	121393	09/25/2015	09/23/2016	☑

Annex B. EUT And Test Setup Photographs

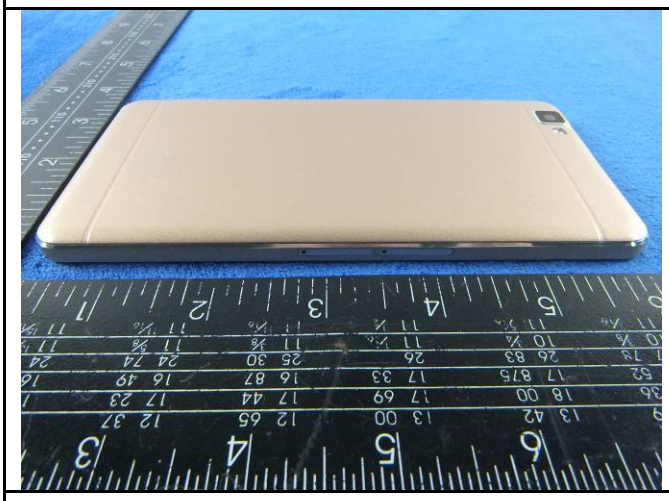
Annex B.i. Photograph: EUT External Photo

<table>
<tr><td>  </td><td> 
</td></tr>
<tr><td>Whole Package - Top View</td><td>Adapter - Front View</td></tr>
<tr><td>  </td><td>  </td></tr>
<tr><td>EUT - Front View</td><td>EUT - Rear View</td></tr>
</table>

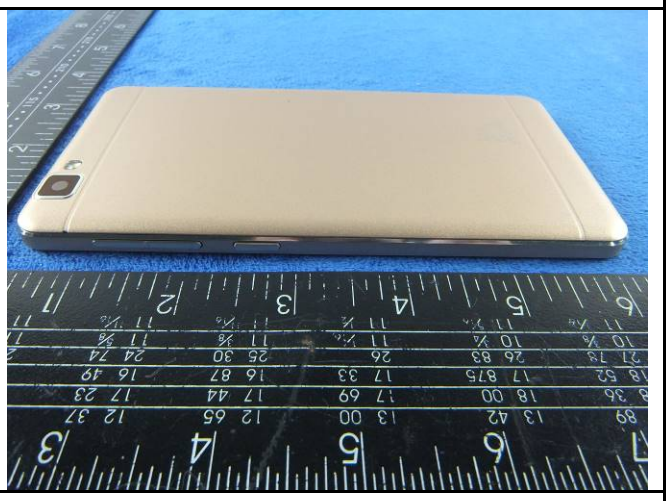


EUT - Top View

EUT - Bottom View

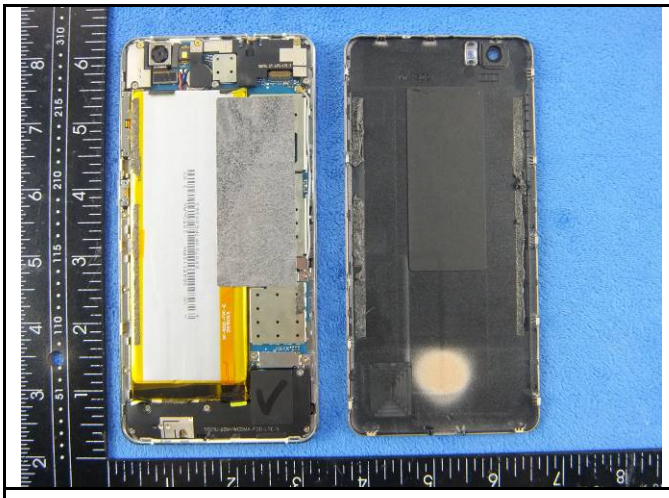


EUT - Left View



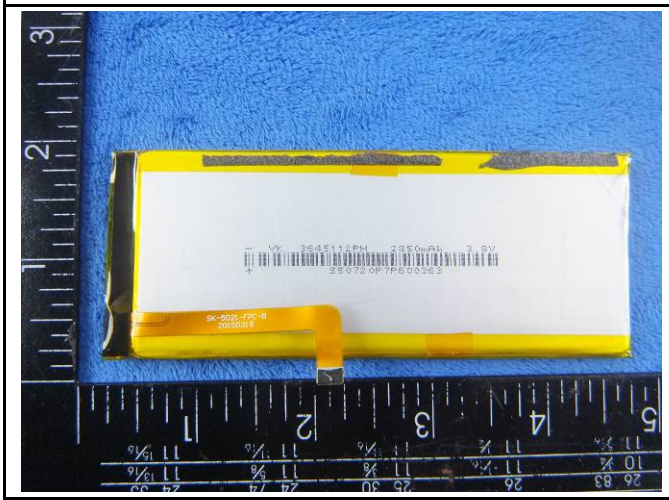
EUT - Right View

Annex B.ii. Photograph: EUT Internal Photo

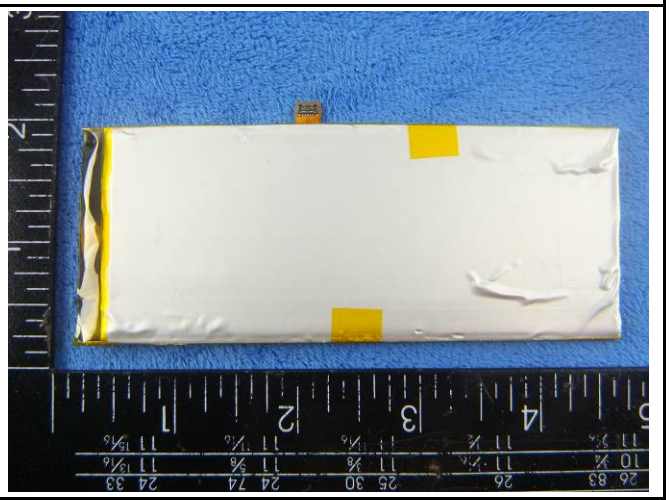


Cover Off - Top View 1

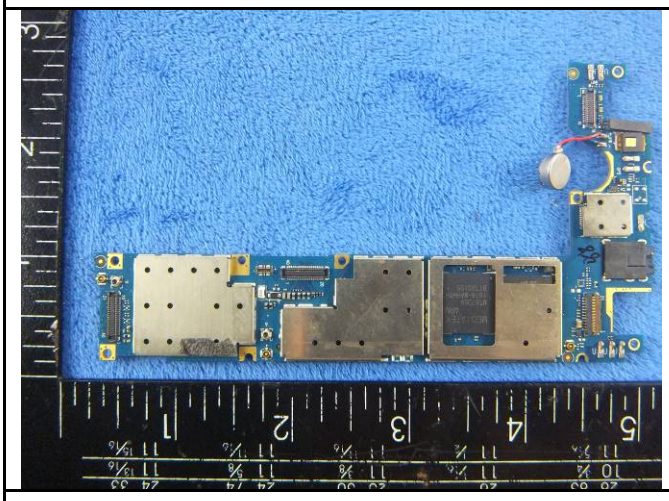
Cover Off - Top View 2



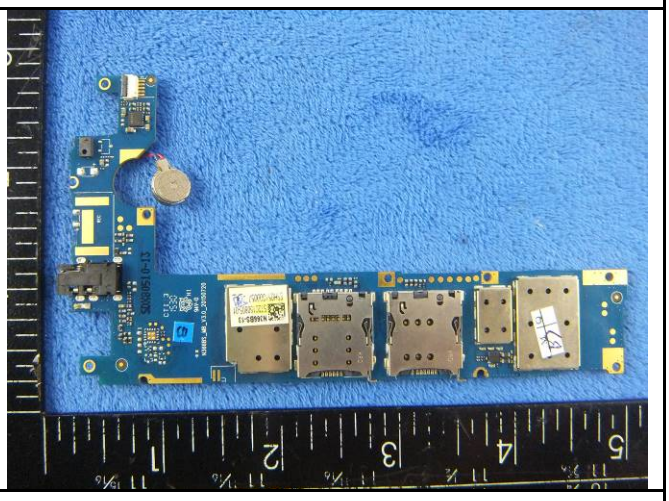
Battery - Top View



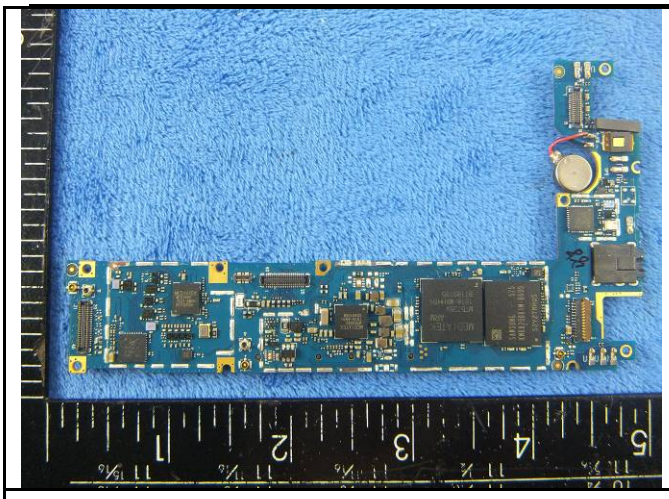
Battery - Bottom View



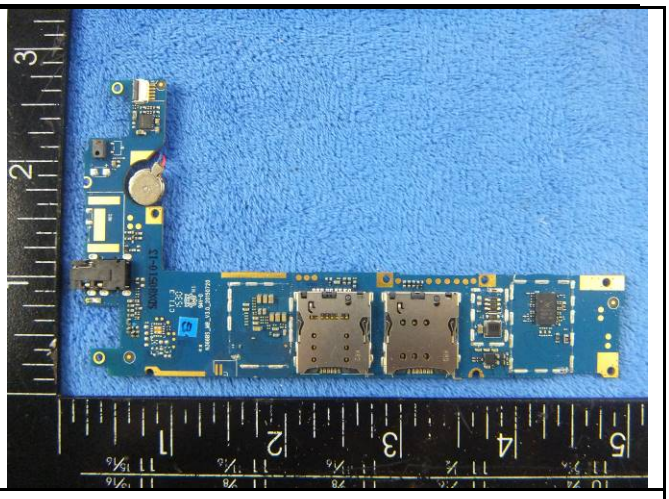
Mainborad With Shielding - Front View



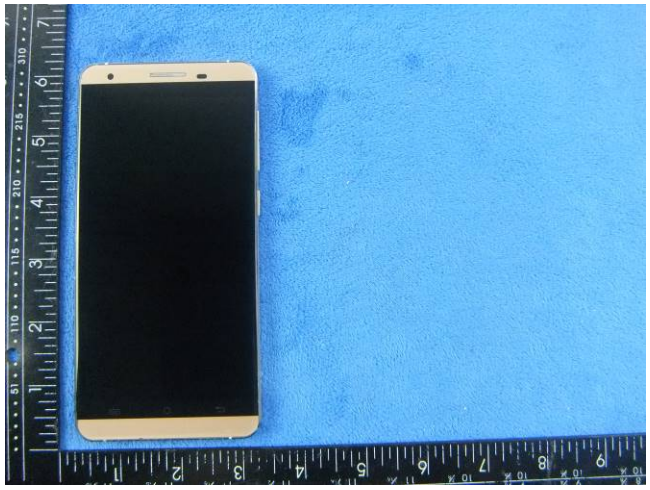
Mainborad With Shielding - Rear View



Mainborad Without Shielding - Front View



Mainborad Without Shielding - Rear View

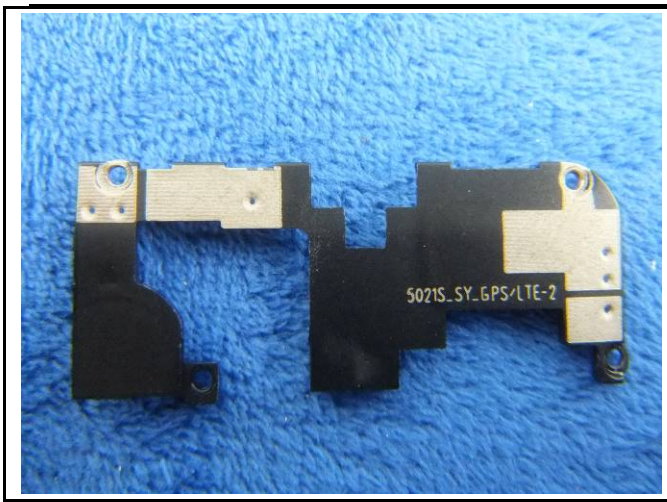


LCD – Front View

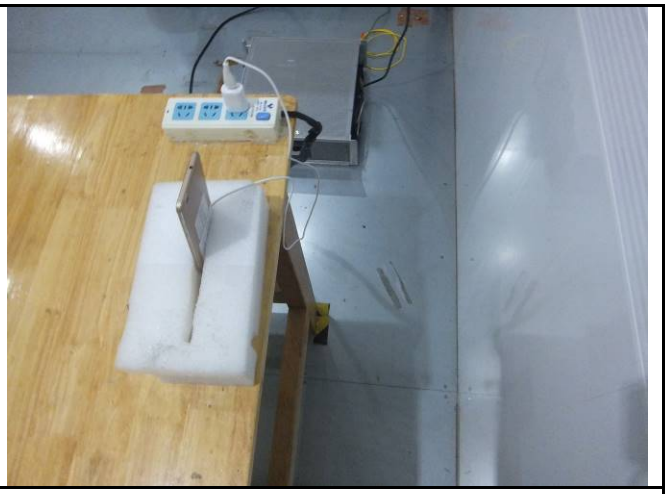
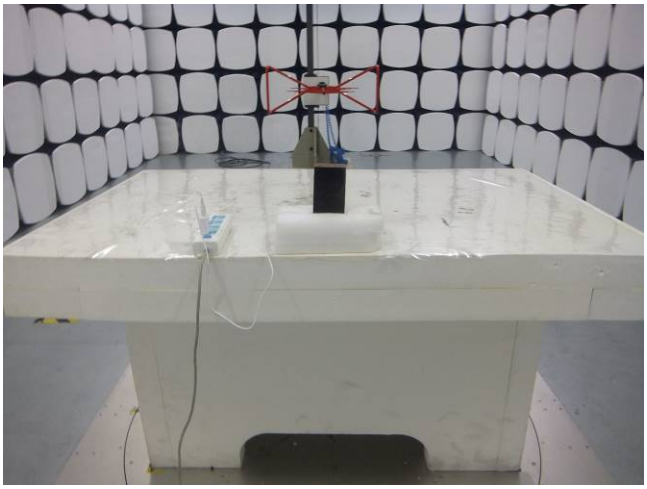
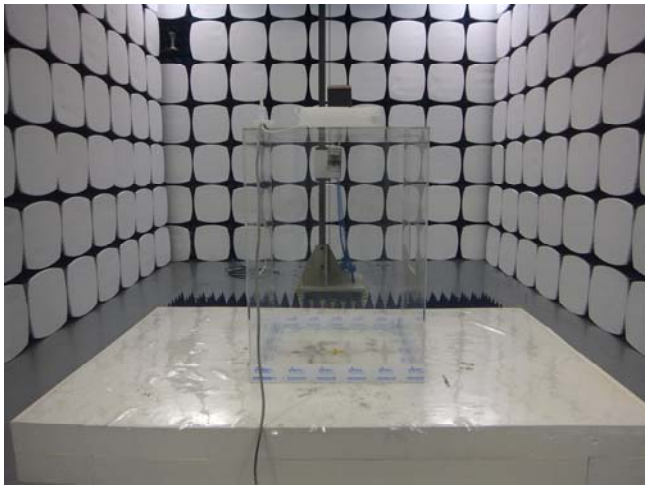
LCD – Rear View

GSM/PCS/UMTS-FDD Antenna View

WIFI/BT/BLE - Antenna View

	
GPS/LTE - Antenna View	

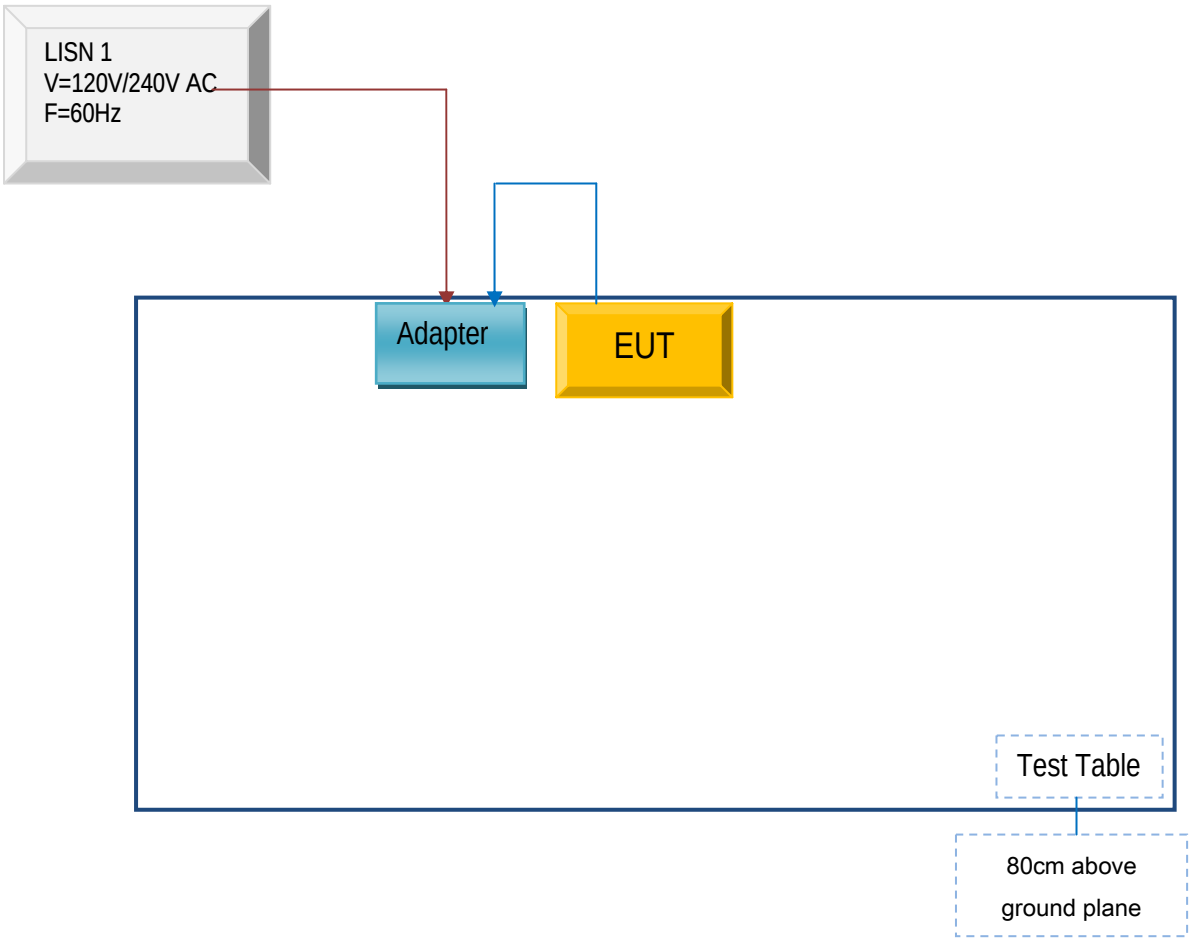
Annex B.iii. Photograph: Test Setup Photo

	
Conducted Emissions Test Setup Front View	Conducted Emissions Test Setup Side View
	
Radiated Spurious Emissions Test Setup Below 1GHz	Radiated Spurious Emissions Test Setup Above 1GHz

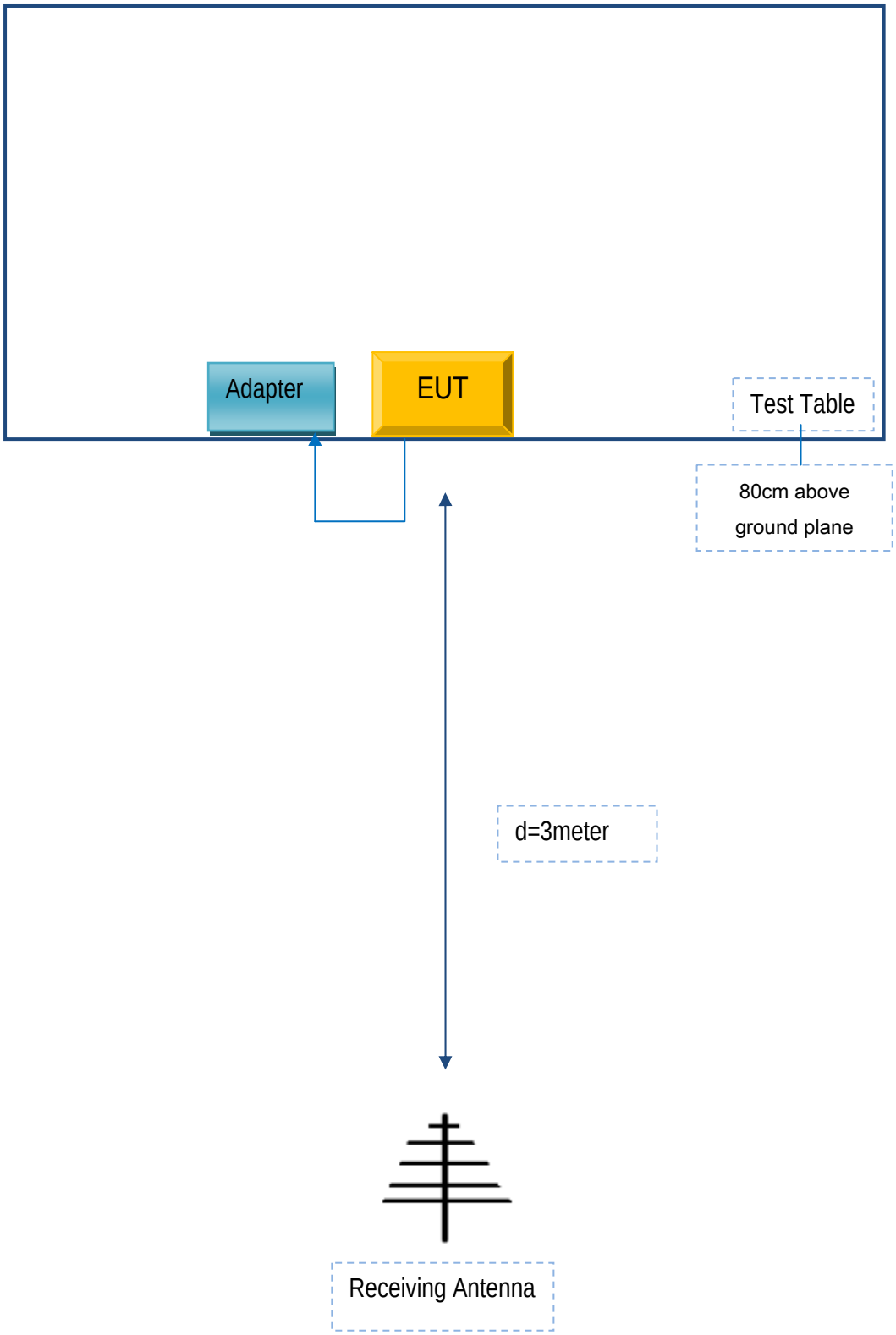
Annex C. TEST SETUP AND SUPPORTING EQUIPMENT

Annex C.ii. TEST SET UP BLOCK

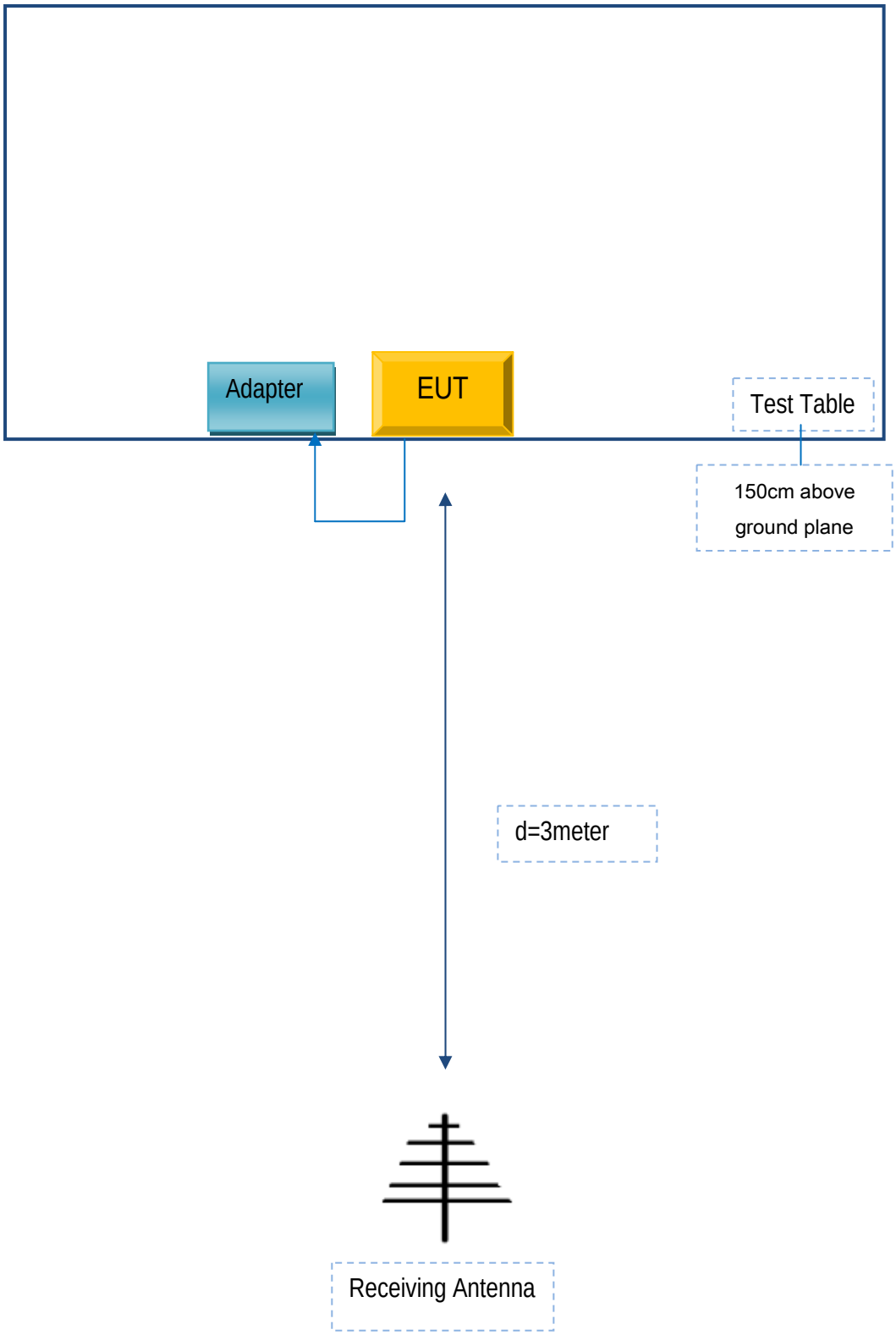
Block Configuration Diagram for AC Line Conducted Emissions



Block Configuration Diagram for Radiated Emissions （ Below 1GHz ）.



Block Configuration Diagram for Radiated Emissions （Above 1GHz）.



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
N/A	N/A	N/A	N/A	N/A

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

Please see attachment

Annex E. DECLARATION OF SIMILARITY

N/A