RF TEST REPORT

GLOBAL TESTING & CERTIFICATIONS
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Report No.: 16070174-FCC-R4

Supersede Report No.: N/A

Applicant	SWAGTEK
Product Name	4.5 inch Smart Phone
Model No.	X4.5 LITE
Serial No.	SPARK，UM450
Test Standard	FCC Part 15.247: 2015, ANSI C63.10: 2013
Test Date	Feb 25 to March 27，2016
Issue Date	April 08, 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

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

South Side of Zhoushi Road, Bao' an District, Shenzhen, Guangdong China 518108

Phone: +86 0755 2601 4629801 Email: China@siemic.com.cn

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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CONTENTS

1. Report Revision History

Report No.	Report Version	Description	Issue Date
16070174-FCC-R4	NONE	Original	March 28, 2016
16070174-FCC-R4	V1	Change product name	April 08, 2016

2. Customer information

Applicant Name	SWAGTEK
Applicant Add	10205 NW19th Street,STE101,Miami, Florida, 33172, United States
Manufacturer	SWAGTEK
Manufacturer Add	10205 NW19th Street,STE101,Miami, Florida, 33172, United States

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:	4.5 inch Smart Phone
Main Model:	X4.5 LITE
Serial Model:	SPARK，UM450
Date EUT received:	Feb 24，2016
Test Date(s):	Feb 25 to March 27，2016
Equipment Category：	DTS
Antenna Gain:	GSM850: -1.5 dBi PCS1900: 1.2dBi UMTS-FDD Band V:-1.2dBi UMTS-FDD Band IV:1.8 dBi UMTS-FDD Band II: 1.9dBi Bluetooth/BLE: 2.1dBi WIFI:2.5dBi GPS:1.5dBi
Type of Modulation:	GSM / GPRS: GMSK UMTS-FDD: QPSK, 16QAM 802.11b/g/n: DSSS, OFDM Bluetooth: GFSK, π /4DQPSK, 8DPSK BLE: GFSK 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; RX : 2112.4 ~ 2152.6 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 GPS RX:1575.42 MHz
Max. Output Power:	-5.082dBm
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
Port:	Power Port, Earphone Port, USB Port
Trade Name :	LOGIC，ISWAG，UNONU
Input Power:	Adapter: Model: N/A Input: AC 100-240V; 50/60Hz;0.2A Output: DC 5.0V,700mA Battery: Model: N/A Capacity: 1700mAh Related Voltage:3.7V

GPRS Multi-slot class: 8/10/12

FCC ID: O55-45012

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

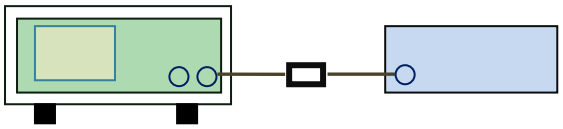
The EUT has 2 antennas:
A permanently attached PIFA antenna for Bluetooth/BLE/WIFI/GPS, the gain is 2.1dBi for Bluetooth/BLE, the gain is 2.5dBi for WIFI, the gain is 1.5dBi for GPS.
A permanently attached PIFA antenna for GSM/PCS and UMTS, the gain is -1.5dBi for GSM850, 1.2dBi for PCS1900,-1.2dBi for UMTS-FDD Band V, 1.9dBi for UMTS-FDD Band II.

The antenna meets up with the ANTENNA REQUIREMENT.

Result: Compliance.

6.2 DTS (6 dB) Channel Bandwidth

Temperature	24℃
Relative Humidity	59%
Atmospheric Pressure	1007mbar
Test date :	March 07, 2016
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 v03r03, 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

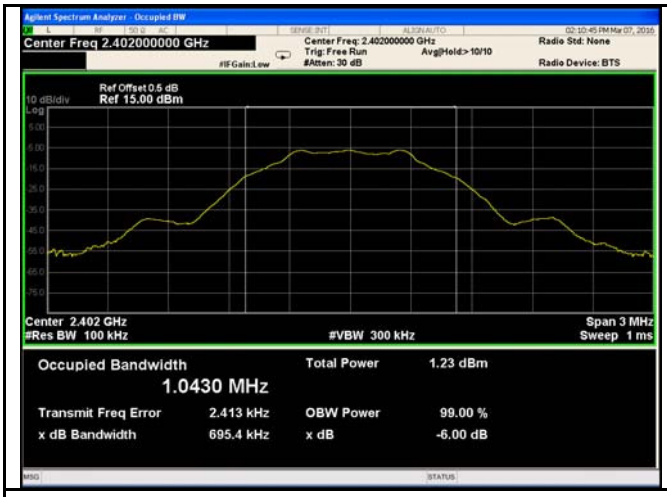
Test Plot ☑ Yes (See below) ☐ N/A

6dB Bandwidth measurement result

Test Data

CH	Freq (MHz)	6dB Bandwidth (kHz)	99% Occupied Bandwidth (MHz)
Low	2402	695.4	1.0430
Mid	2440	697.8	1.0429
High	2480	698.9	1.0421

Test Plots



6dB Bandwidth - Low CH 2402

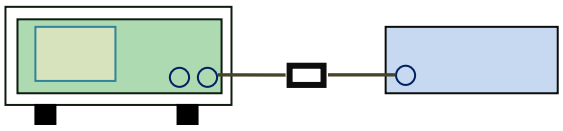
6dB Bandwidth - Mid CH 2440

6dB Bandwidth - High CH 2480

6.3 Maximum Output Power

Temperature	24℃
Relative Humidity	59%
Atmospheric Pressure	1007mbar
Test date :	March 07, 2016
Tested By :	Winnie Zhang

Requirement(s):

Spec	Item	Requirement	Applicable
§15.247(b)(3),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)	DTS in 902-928MHz, 2400-2483.5MHz: ≤ 1 Watt	☑
Test Setup	 Spectrum Analyzer EUT		
Test Procedure	558074 D01 DTS MEAS Guidance v03r03, 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

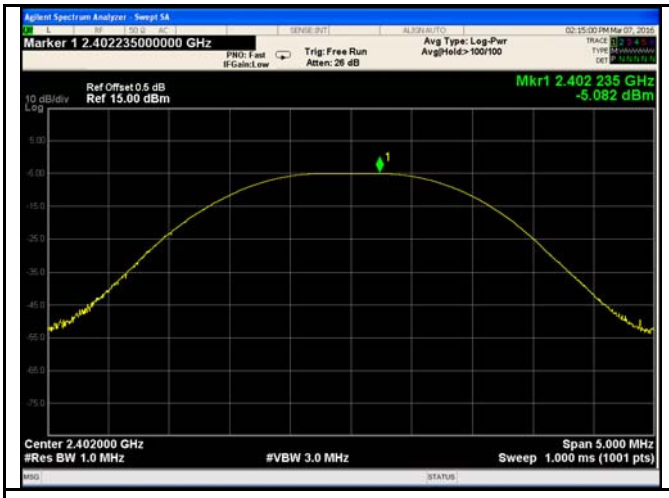
Test Plot ☑ Yes (See below) ☐ N/A

Output Power measurement result

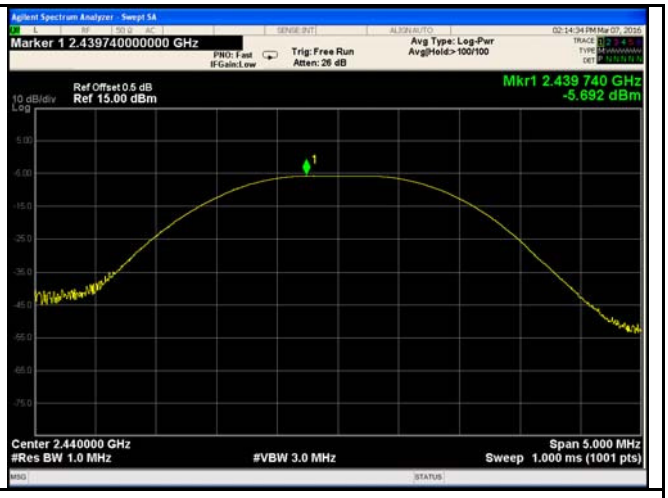
Test Data

Type	CH	Freq (MHz)	Conducted Power (dBm)	Limit (dBm)	Result
Output power	Low	2402	**-5.082**	30	Pass
	Mid	2440	-5.692	30	Pass
	High	2480	-6.635	30	Pass

Test Plots



AV Output power - Low CH 2402

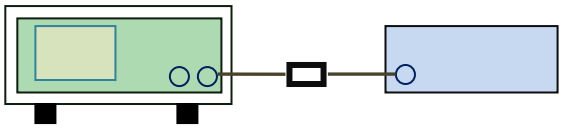


AV Output power - Mid CH 2440

AV Output power - High CH 2480

6.4 Power Spectral Density

Temperature	24℃
Relative Humidity	59%
Atmospheric Pressure	1007mbar
Test date :	March 07, 2016
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	 Spectrum Analyzer EUT		
Test Procedure	558074 D01 DTS MEAS Guidance v03r03, 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)	Reading (dBm)	Factor (dB)	Result (dBm)	Limit (dBm)	Result
PSD	Low	2402	-15.168	-5.23	20.398	8	Pass
	Mid	2440	-15.828	-5.23	-21.058	8	Pass
	High	2480	-16.716	-5.23	-21.946	8	Pass

Note: factor=10log(3/10)=-5.23

Test Plots

PSD - Low CH 2402

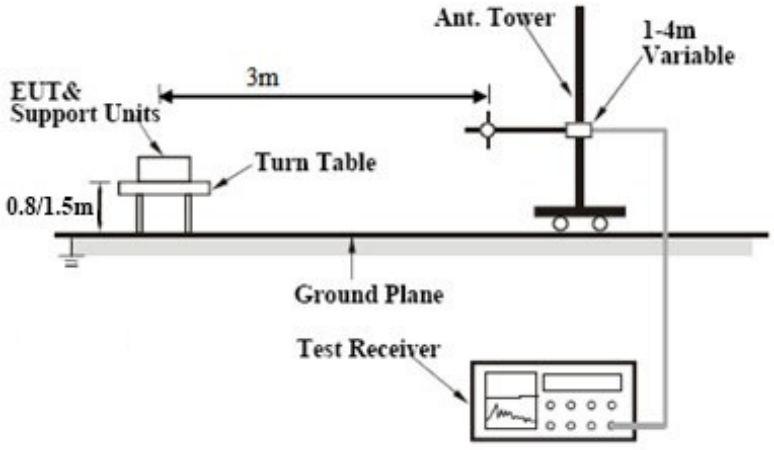
PSD - Mid CH 2440

PSD - High CH 2480

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

Temperature	24℃
Relative Humidity	53%
Atmospheric Pressure	1011mbar
Test date :	March 11, 2016
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.		

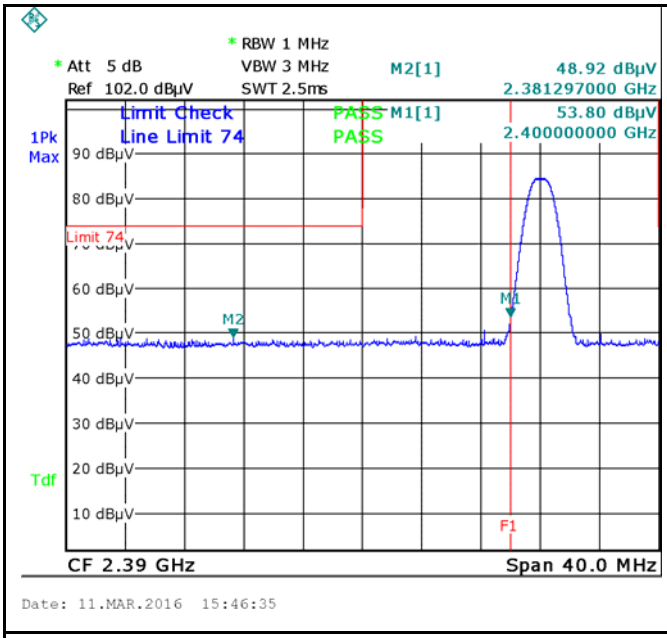
	- 3. First, set both RBW and VBW of spectrum analyzer to 100 kHz with a convenient frequency span including 100kHz bandwidth from band edge, check the emission of EUT, if pass then set Spectrum Analyzer as below: a. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 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

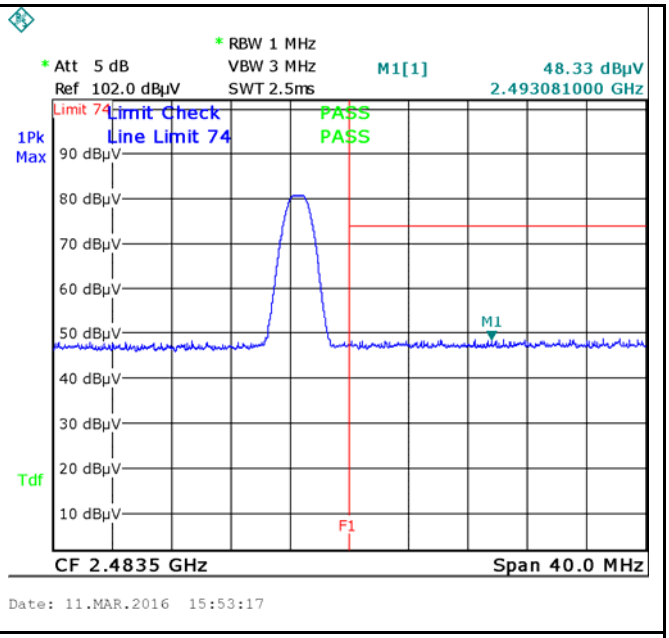
Test Plots

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)

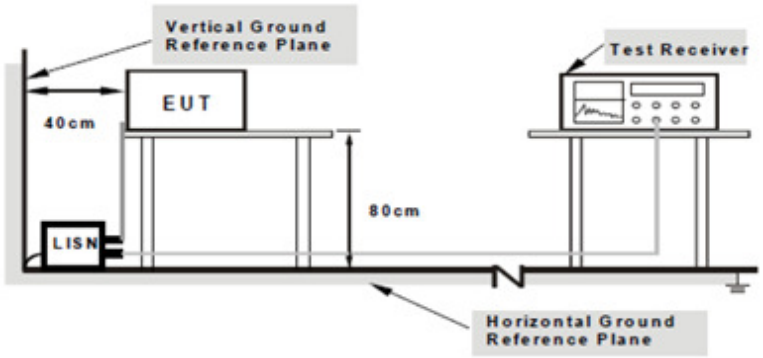
Band Edge, Left Side-AV

Band Edge, Right Side-AV

6.6 AC Power Line Conducted Emissions

Temperature	23℃
Relative Humidity	52%
Atmospheric Pressure	1010mbar
Test date :	March 10, 2016
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"> 

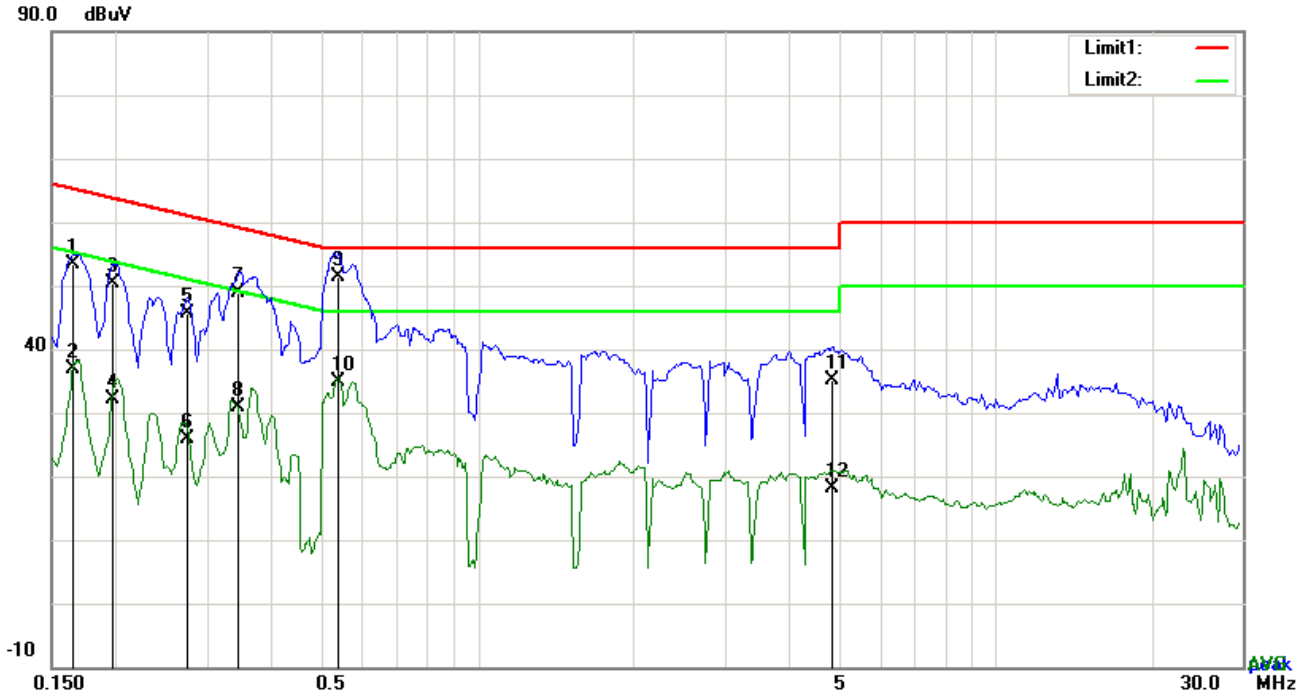
Note: 1.Support units were connected to second LISN.
2.Both of LISNs (AMN) are 80cm from EUT and at least 80cm from other units and other metal planes support units.</td></tr>
<tr><td>Procedure</td><td colspan="3">1. The EUT and supporting equipment were set up in accordance with the requirements of 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

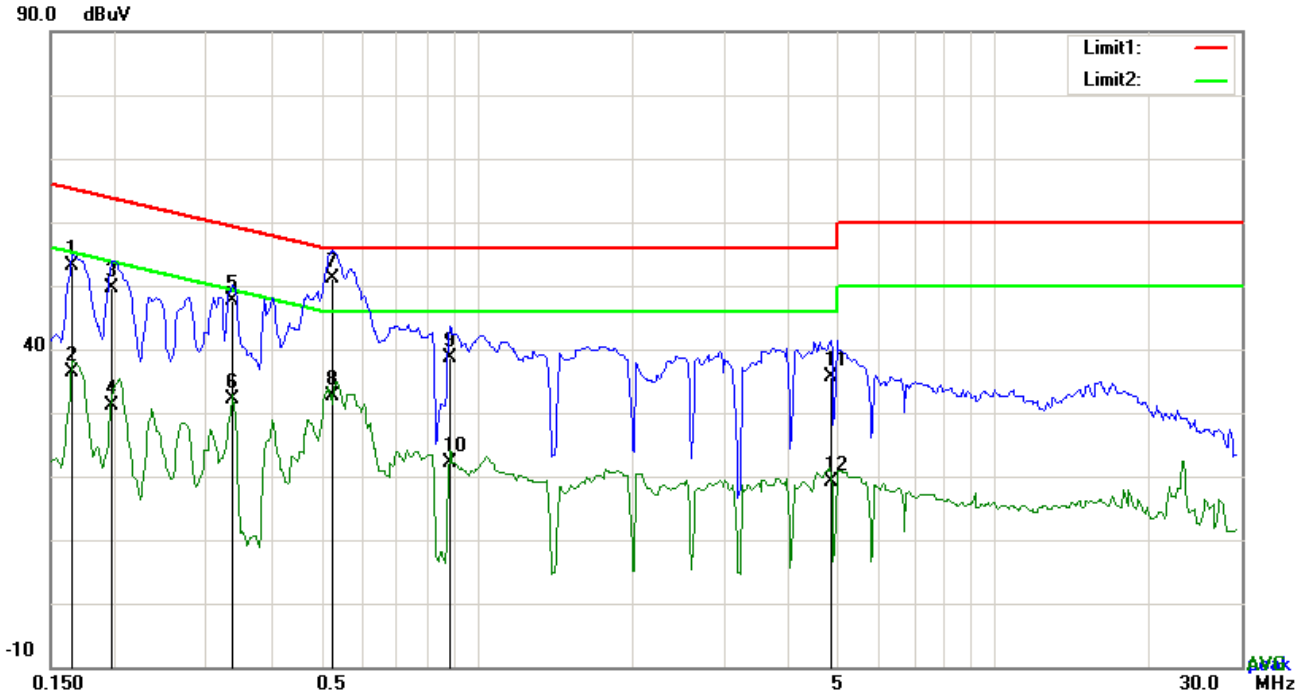


Test Data

Phase Line Plot at 120Vac, 60Hz

No.	P/L	Frequency (MHz)	Reading (dBµV)	Detector	Corrected (dB)	Result (dBµV)	Limit (dBµV)	Margin (dB)
1	L1	0.1656	43.31	QP	10.03	53.34	65.18	-11.84
2	L1	0.1656	26.86	AVG	10.03	36.89	55.18	-18.29
3	L1	0.1968	40.33	QP	10.03	50.36	63.74	-13.38
4	L1	0.1968	21.98	AVG	10.03	32.01	53.74	-21.73
5	L1	0.2748	35.56	QP	10.03	45.59	60.97	-15.38
6	L1	0.2748	15.91	AVG	10.03	25.94	50.97	-25.03
7	L1	0.3450	38.81	QP	10.03	48.84	59.08	-10.24
8	L1	0.3450	20.77	AVG	10.03	30.80	49.08	-18.28
9	L1	0.5400	41.47	QP	10.03	51.50	56.00	-4.50
10	L1	0.5400	24.73	AVG	10.03	34.76	46.00	-11.24
11	L1	4.8369	25.17	QP	10.08	35.25	56.00	-20.75
12	L1	4.8369	7.98	AVG	10.08	18.06	46.00	-27.94

Test Mode:	Transmitting Mode

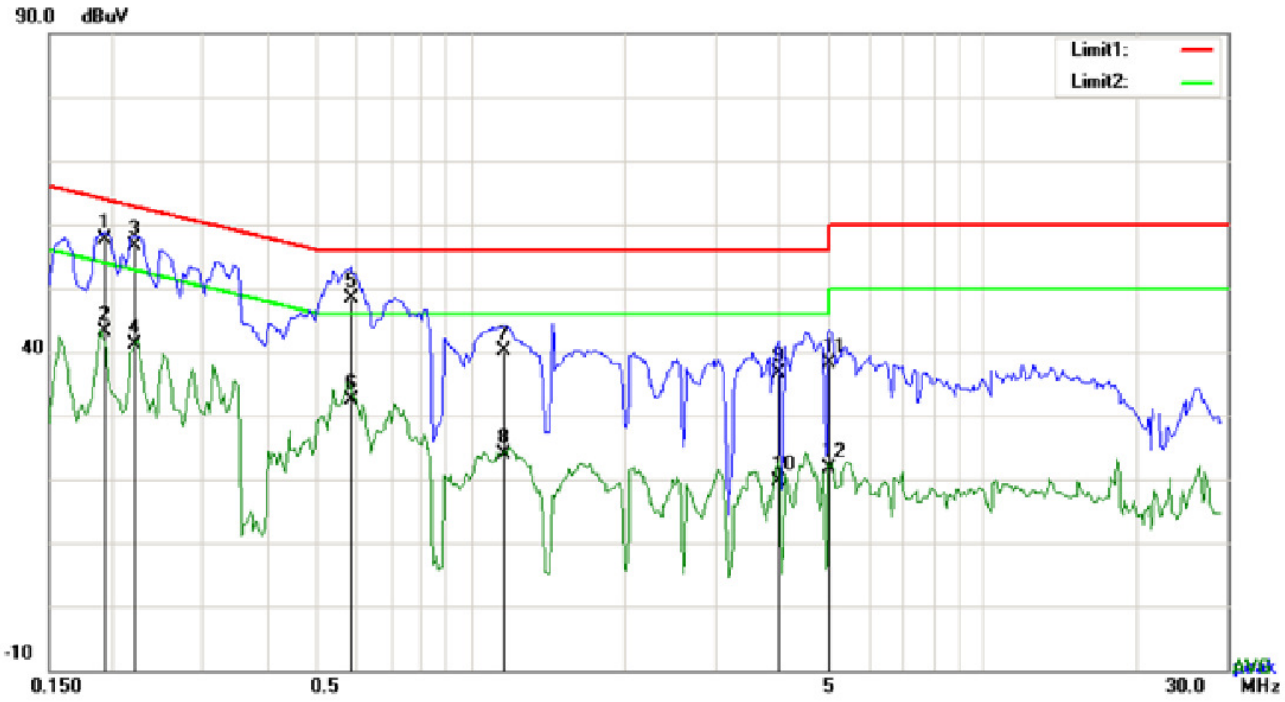


Test Data

Phase Neutral Plot at 120Vac, 60Hz

No.	P/L	Frequency (MHz)	Reading (dBµV)	Detector	Corrected (dB)	Result (dBµV)	Limit (dBµV)	Margin (dB)
1	N	0.1656	39.92	QP	13.14	53.06	65.18	-12.12
2	N	0.1656	23.21	AVG	13.14	36.35	55.18	-18.83
3	N	0.1968	36.71	QP	13.03	49.74	63.74	-14.00
4	N	0.1968	18.01	AVG	13.03	31.04	53.74	-22.70
5	N	0.3372	35.20	QP	12.50	47.70	59.27	-11.57
6	N	0.3372	19.61	AVG	12.50	32.11	49.27	-17.16
7	N	0.5244	39.14	QP	11.88	51.02	56.00	-4.98
8	N	0.5244	20.75	AVG	11.88	32.63	46.00	-13.37
9	N	0.8871	27.04	QP	11.51	38.55	56.00	-17.45
10	N	0.8871	10.57	AVG	11.51	22.08	46.00	-23.92
11	N	4.8408	23.79	QP	11.88	35.67	56.00	-20.33
12	N	4.8408	7.20	AVG	11.88	19.08	46.00	-26.92

Test Mode:	Transmitting Mode

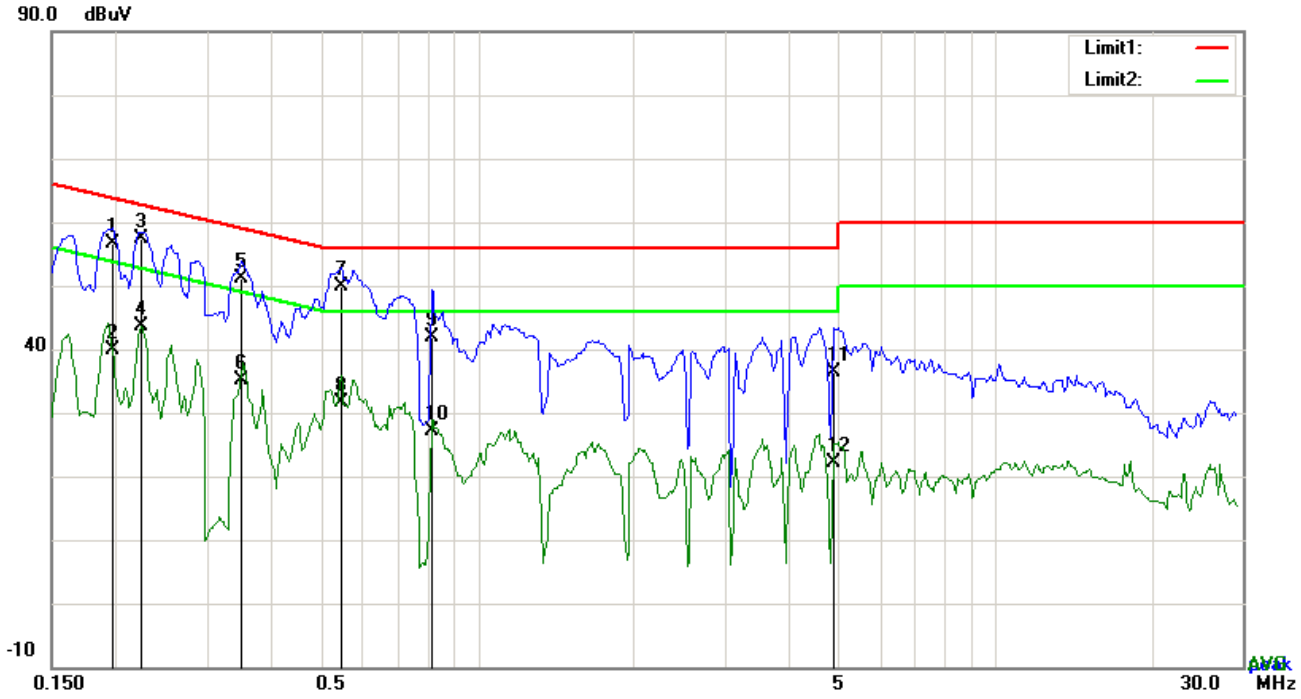


Test Data

Phase Line Plot at 240Vac, 60Hz

No.	P/L	Frequency (MHz)	Reading (dBµV)	Detector	Corrected (dB)	Result (dBµV)	Limit (dBµV)	Margin (dB)
1	L1	0.1929	44.60	QP	13.04	57.64	63.91	-6.27
2	L1	0.1929	30.20	AVG	13.04	43.24	53.91	-10.67
3	L1	0.2202	43.77	QP	12.94	56.71	62.81	-6.10
4	L1	0.2202	28.20	AVG	12.94	41.14	52.81	-11.67
5	L1	0.5829	36.49	QP	11.82	48.31	56.00	-7.69
6	L1	0.5829	20.64	AVG	11.82	32.46	46.00	-13.54
7	L1	1.1640	28.74	QP	11.40	40.14	56.00	-15.86
8	L1	1.1640	12.41	AVG	11.40	23.81	46.00	-22.19
9	L1	4.0023	25.13	QP	11.40	36.53	56.00	-19.47
10	L1	4.0023	8.30	AVG	11.40	19.70	46.00	-26.30
11	L1	5.0280	26.60	QP	11.41	38.01	60.00	-21.99
12	L1	5.0280	10.31	AVG	11.41	21.72	50.00	-28.28

Test Mode:	Transmitting Mode



Test Data

Phase Neutral Plot at 240Vac, 60Hz

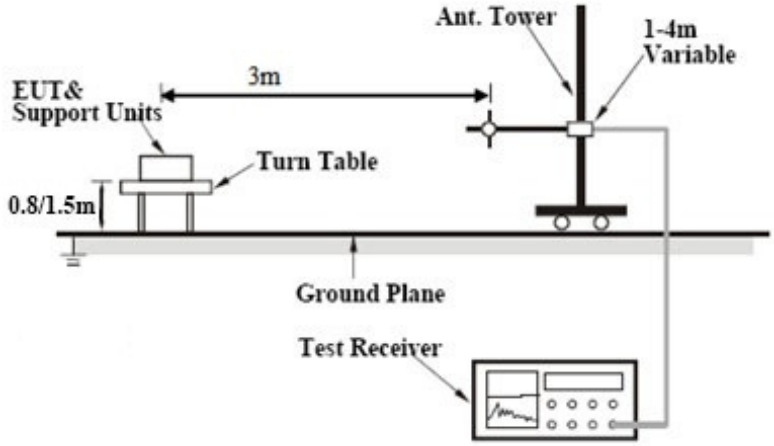
No.	P/L	Frequency (MHz)	Reading (dBµV)	Detector	Corrected (dB)	Result (dBµV)	Limit (dBµV)	Margin (dB)
1	N	0.1968	43.72	QP	13.03	56.75	63.74	-6.99
2	N	0.1968	26.83	AVG	13.03	39.86	53.74	-13.88
3	N	0.2241	44.58	QP	12.92	57.50	62.67	-5.17
4	N	0.2241	30.65	AVG	12.92	43.57	52.67	-9.10
5	N	0.3489	38.71	QP	12.46	51.17	58.99	-7.82
6	N	0.3489	22.73	AVG	12.46	35.19	48.99	-13.80
7	N	0.5439	38.01	QP	11.86	49.87	56.00	-6.13
8	N	0.5439	19.87	AVG	11.86	31.73	46.00	-14.27
9	N	0.8169	30.33	QP	11.58	41.91	56.00	-14.09
10	N	0.8169	15.47	AVG	11.58	27.05	46.00	-18.95
11	N	4.8603	24.40	QP	11.88	36.28	56.00	-19.72
12	N	4.8603	10.19	AVG	11.88	22.07	46.00	-23.93

6.7 Radiated Spurious Emissions

Temperature	23℃
Relative Humidity	52%
Atmospheric Pressure	1010mbar
Test date :	March 10, 2016
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>

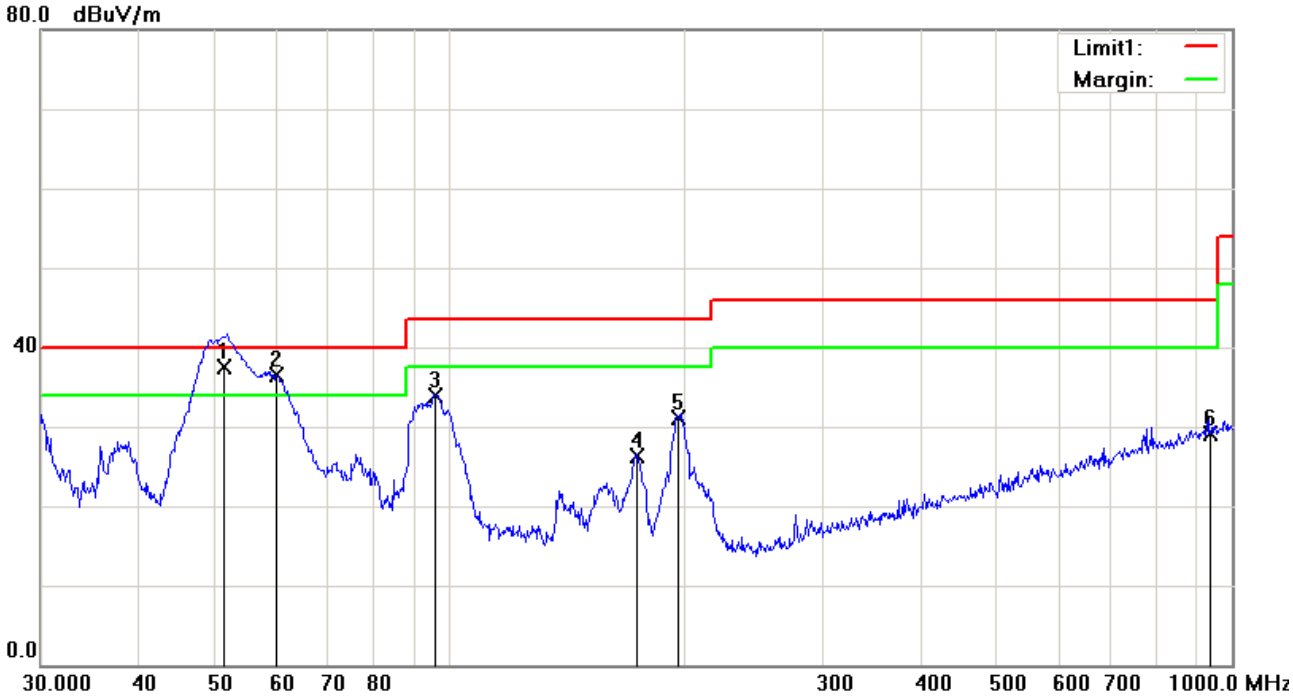
Test Setup	
Procedure	1. The EUT was switched on and allowed to warm up to its normal operating condition. 2. The test was carried out at the selected frequency points obtained from the EUT characterization. Maximization of the emissions, was carried out by rotating the EUT, changing the antenna polarization, 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

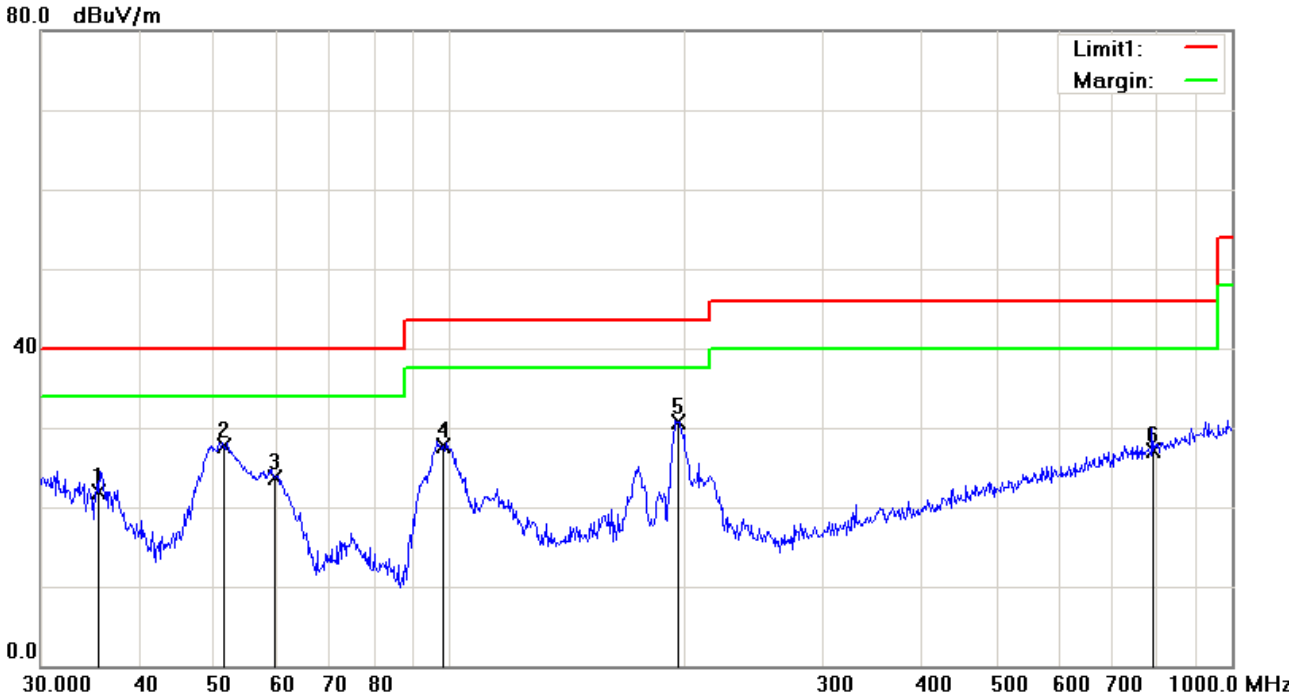


Test Data

Vertical Polarity Plot @3m

No	P/L	Frequency (MHz)	Reading (dBμV)	Detector	Corrected (dB)	Result (dBμV)	Limit (dBμV)	Margin (dB)	Height	Degree
1	V	51.4807	50.78	QP	-13.35	37.43	40.00	-2.57	100	156
2	V	60.0691	50.95	peak	-14.36	36.59	40.00	-3.41	100	156
3	V	95.7622	45.84	peak	-11.93	33.91	43.50	-9.59	100	194
4	V	173.8135	35.70	peak	-9.41	26.29	43.50	-17.21	100	70
5	V	195.8220	40.08	peak	-8.94	31.14	43.50	-12.36	100	190
6	V	938.8326	24.09	peak	5.03	29.12	46.00	-16.88	100	246

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	35.6240	26.32	peak	-4.40	21.92	40.00	-18.08	100	132
2	H	51.4807	41.06	peak	-13.35	27.71	40.00	-12.29	100	225
3	H	59.8588	38.00	peak	-14.34	23.66	40.00	-16.34	100	221
4	H	98.1419	39.04	peak	-11.30	27.74	43.50	-15.76	100	184
5	H	195.8220	39.61	peak	-8.94	30.67	43.50	-12.83	100	105
6	H	793.3960	23.98	peak	3.11	27.09	46.00	-18.91	100	132

Above 1GHz

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	36.45	AV	V	33.83	6.86	31.72	45.42	54	-8.58
4804	34.87	AV	H	33.83	6.86	31.72	43.84	54	-10.16
4804	45.98	PK	V	33.83	6.86	31.72	54.95	74	-19.05
4804	46.02	PK	H	33.83	6.86	31.72	54.99	74	-19.01

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	39.92	AV	V	33.86	6.82	31.82	48.78	54	-5.22
4880	37.37	AV	H	33.86	6.82	31.82	46.23	54	-7.77
4880	46.08	PK	V	33.86	6.82	31.82	54.94	74	-19.06
4880	46.38	PK	H	33.86	6.82	31.82	55.24	74	-18.76

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	37.89	AV	V	33.9	6.76	31.92	46.63	54	-7.37
4960	35.26	AV	H	33.9	6.76	31.92	44	54	-10.0
4960	46.34	PK	V	33.9	6.76	31.92	55.08	74	-18.92
4960	45.77	PK	H	33.9	6.76	31.92	54.51	74	-19.49

Note:

*1, The testing has been conformed to 10*2480MHz=24,800MHz*
2, All other emissions more than 30 dB below the limit

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	11/19/2015	11/18/2016	☑
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 (1 ~18GHz)	AH-118	71283	09/24/2015	09/23/2016	☑
Universal Radio Communication Tester	CMU200	121393	09/25/2015	09/24/2016	☑

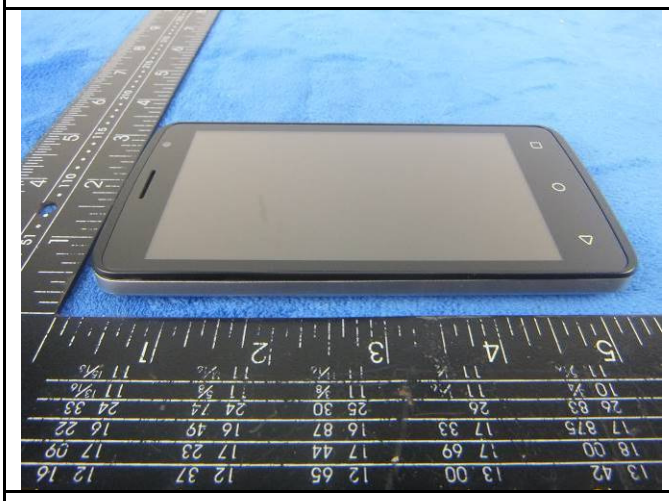
Annex B. EUT And Test Setup Photographs

Annex B.i. Photograph: EUT External Photo

<table>
<tr><td>  </td><td> 
</td></tr>
<tr><td>Whole Package 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

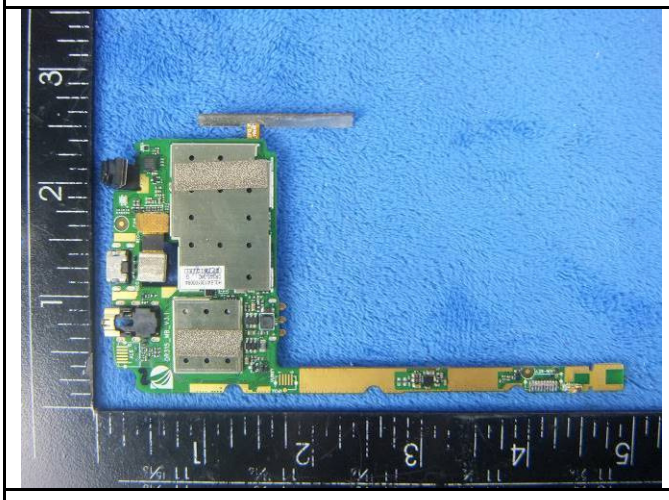
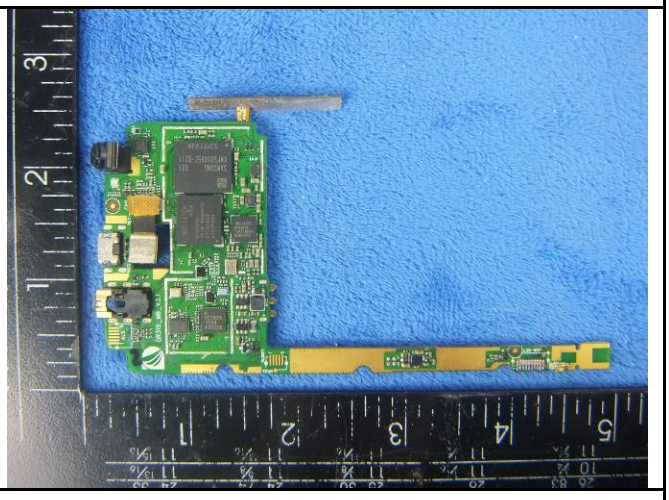
EUT - Bottom View

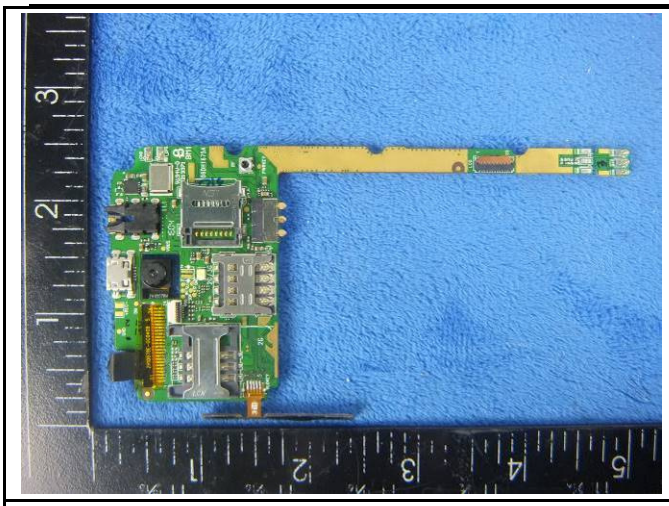


EUT - Left View

EUT - Right View

Annex B.ii. Photograph: EUT Internal Photo

<table>
<tr><td>  </td><td>  </td></tr>
<tr><td>Cover Off - Top View 1</td><td>Cover Off - Top View 2</td></tr>
<tr><td>  </td><td> 
</td></tr>
<tr><td>Battery - Front View</td><td>Battery - Rear View</td></tr>
<tr><td>  </td><td>  </td></tr>
<tr><td>Mainbard with Shielding - Front View</td><td>Mainbard without Shielding- Front View</td></tr>
</table>

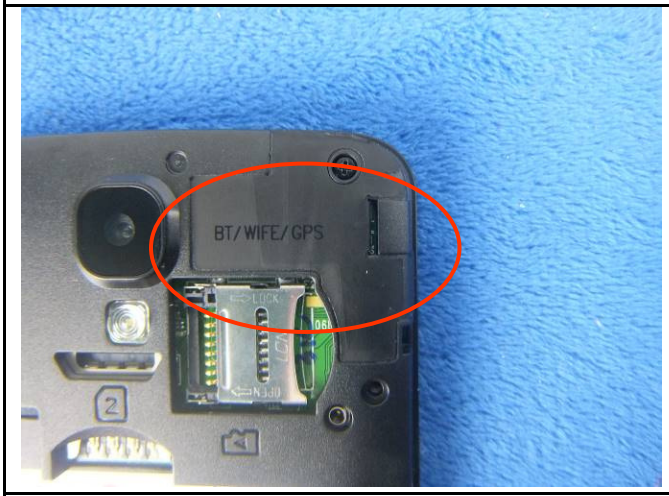


Mainbard without Shielding - Rear View

LCD – Front View

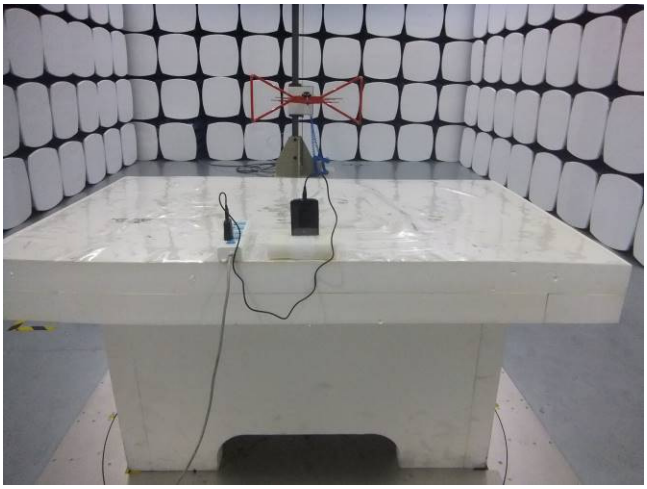
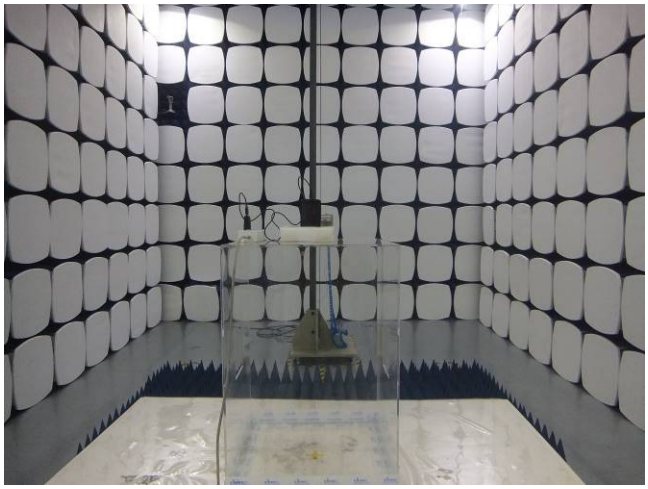
LCD – Rear View

GSM/PCS/UMTS-FDD Antenna View



BT/BLE/WIFI/GPS - Antenna View

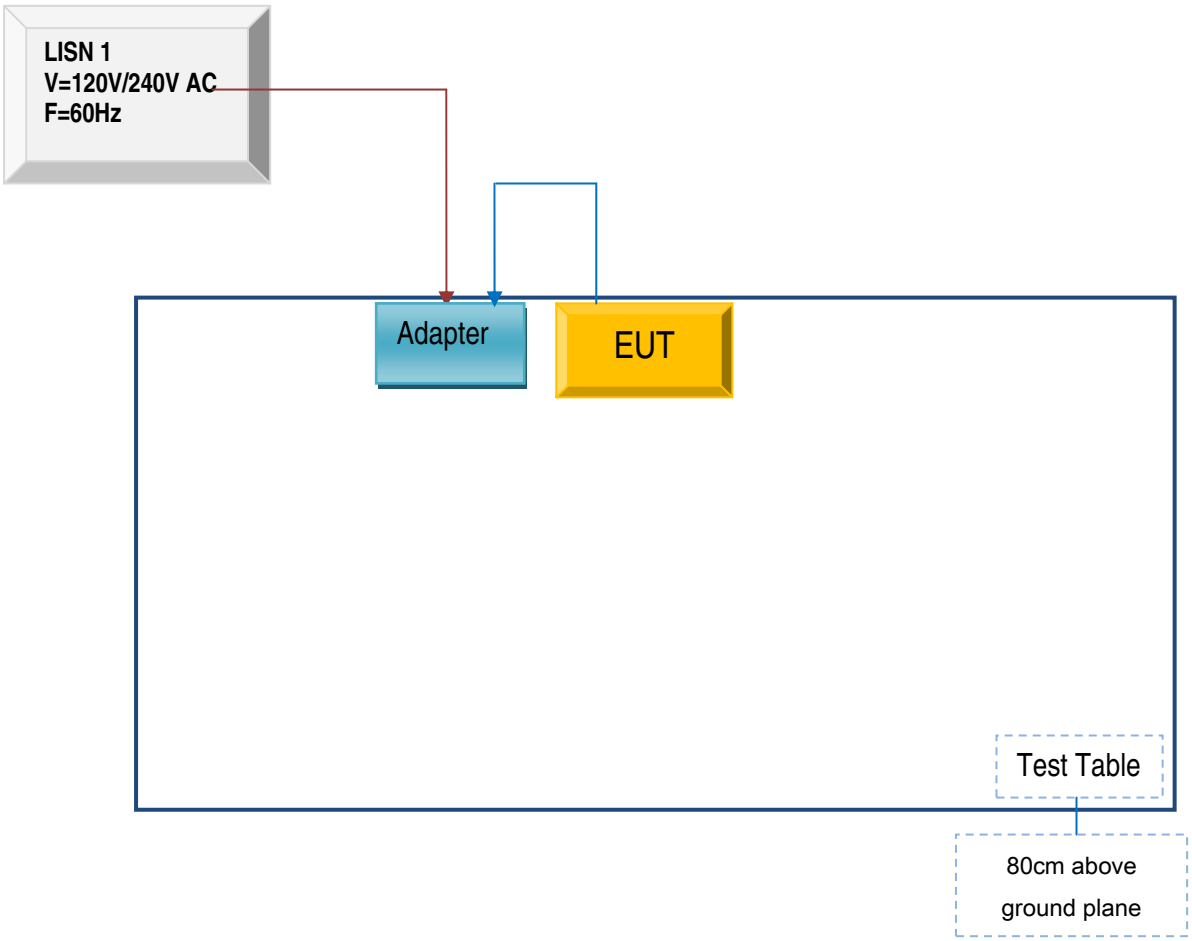
Annex B.iii. Photograph: Test Setup Photo

	
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

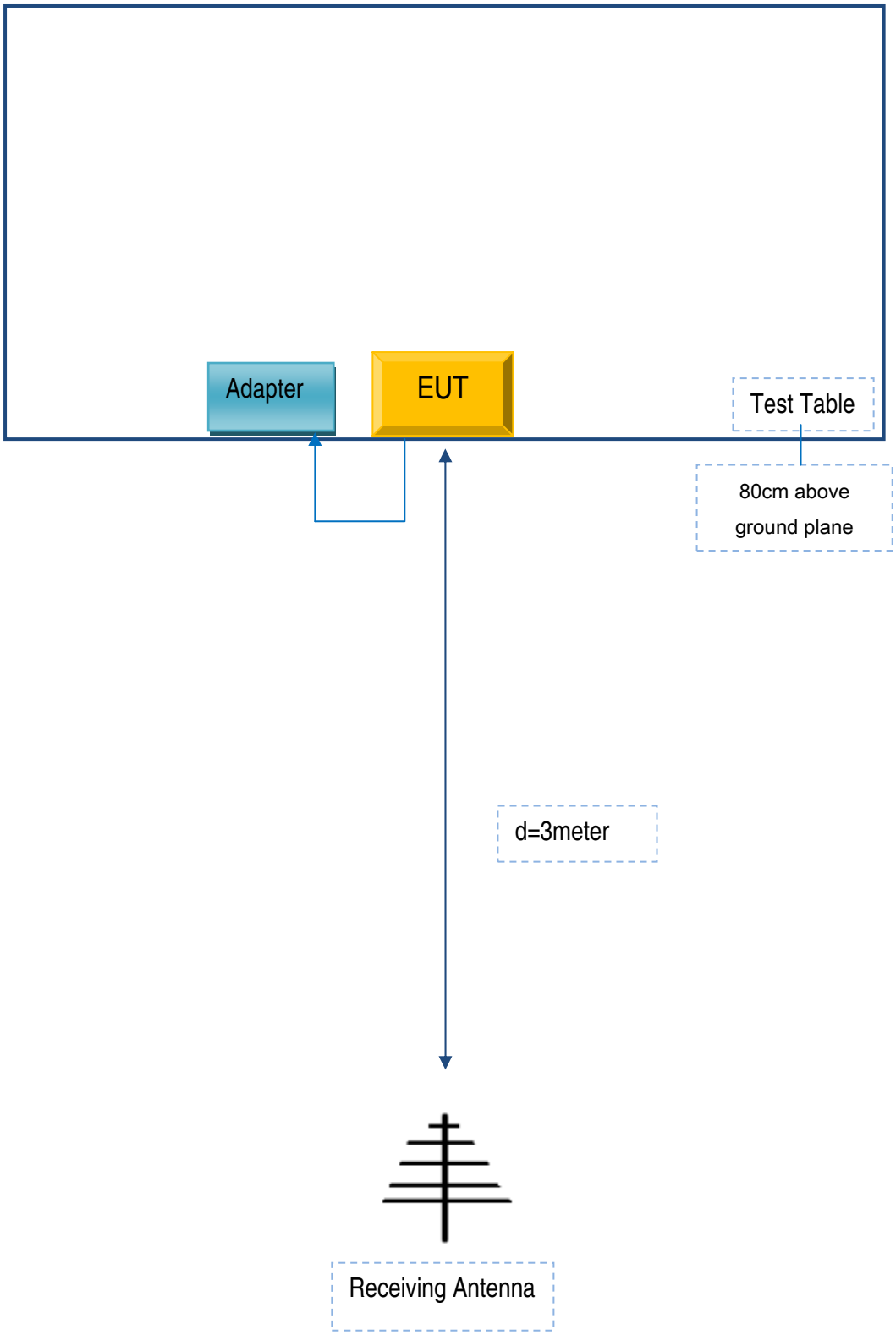
Annex C. TEST SETUP AND SUPPORTING EQUIPMENT

Annex C.ii. TEST SET UP BLOCK

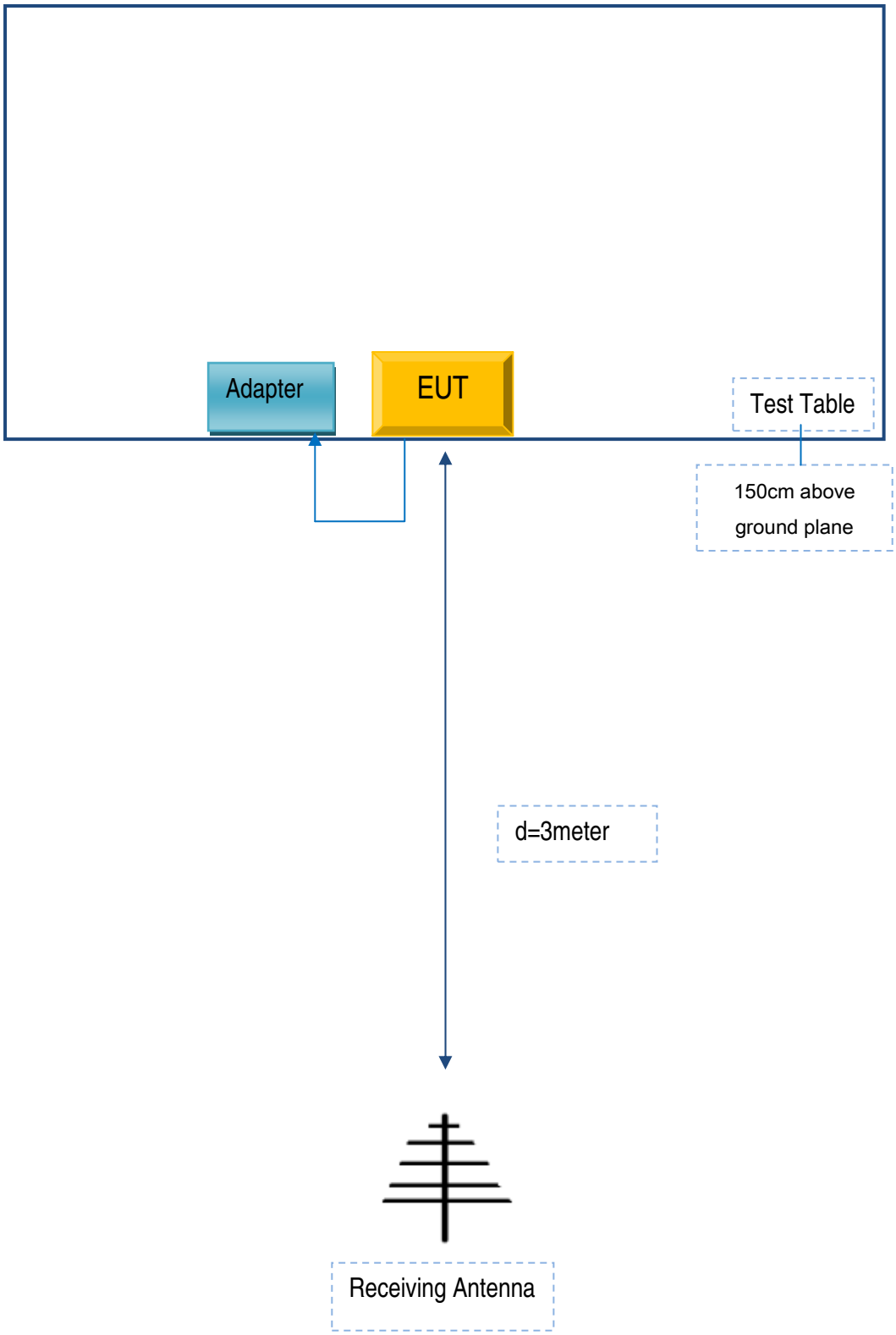
Block Configuration Diagram for AC Line Conducted Emissions



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.

Supporting Equipment:

Manufacturer	Equipment Description	Model	Serial No
SWAGTEK	Adapter	N/A	N/A

Supporting Cable:

Cable type	Shield Type	Ferrite Core	Length	Serial No
USB Cable	Un-shielding	No	0.8m	JX1502736

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

N/A

Annex E. DECLARATION OF SIMILARITY

Swagtek
ADD: 10205 NW 19th Street,STE101,Miami, FL, 33172, USA
Tel: 305 421 9938 Fax: 305 471 9011

DECLARATION OF SIMILARITY

Date: 2016-2-26

Dear Sir or Madam:

We, Swagtek, hereby declare that product: 4.5" Smart Phone, model X4.5 LITE is electrically identical with the models: Spark and UM450, which was tested by Siemic with the same electromagnetic emissions and electromagnetic compatibility characteristics. The results of which are featured in Siemic projects: 16070174.

A description of the difference between the three models and those that are declared similar are as follows:

They are the same product, and just have the different model name, the rest are the same.

Please contact me should there be need for any additional clarification or information.

Best Regards,

Charles Cheng
Manager