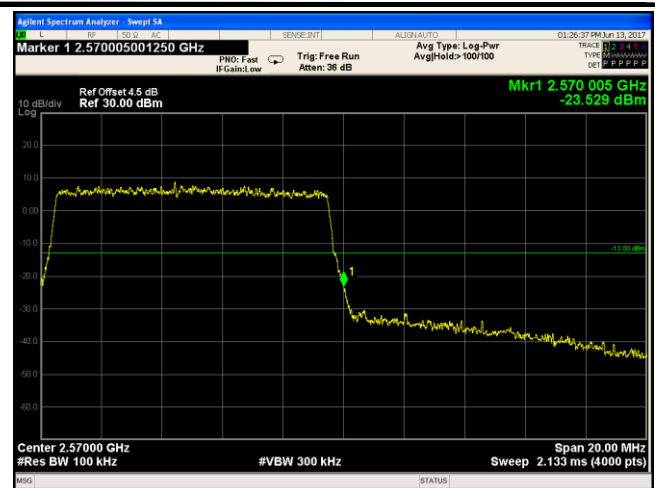
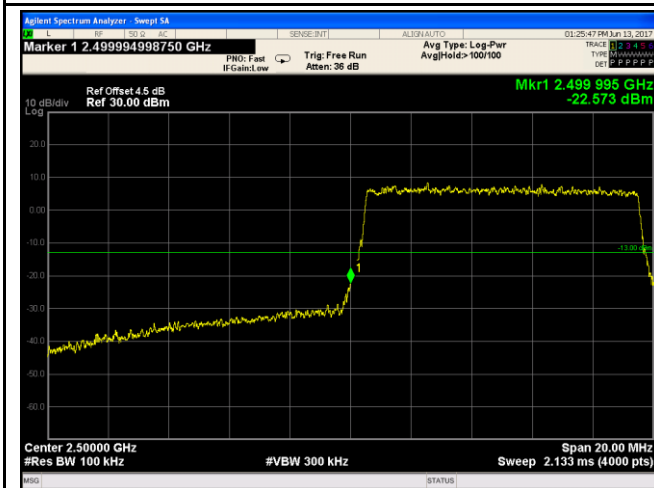


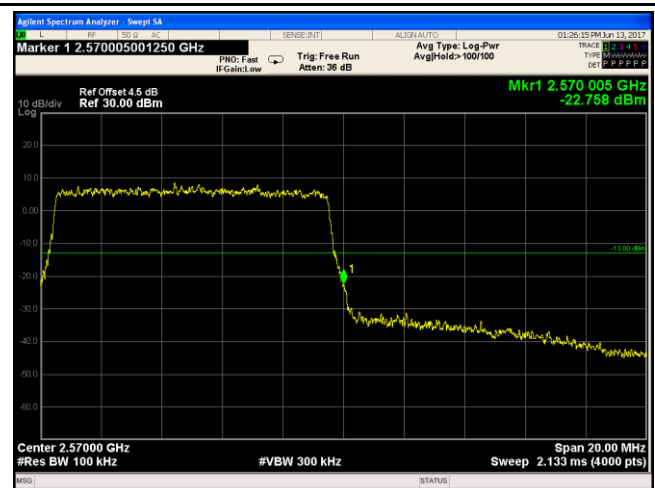
LTE Band VII - Low Channel QPSK-10



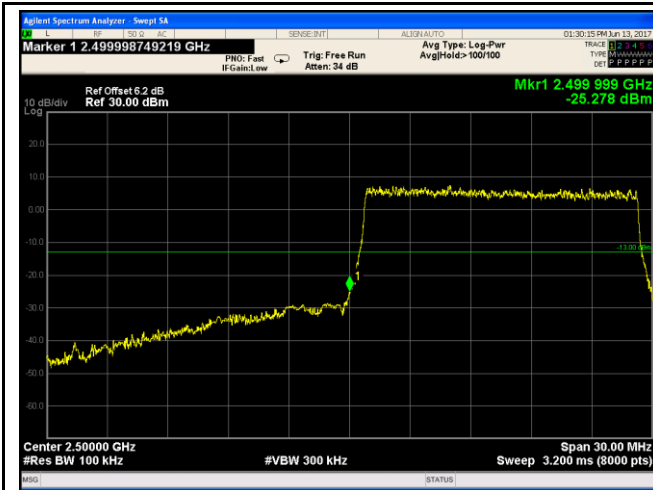
LTE Band VII - High Channel QPSK-10



LTE Band VII - Low Channel 16QAM-10

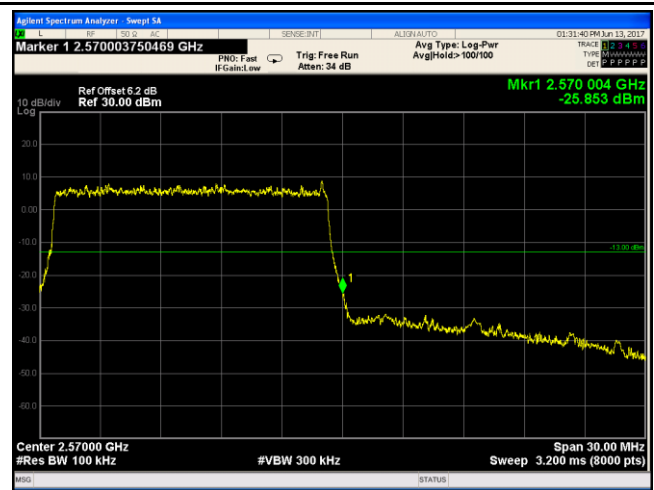


LTE Band VII - High Channel 16QAM-10



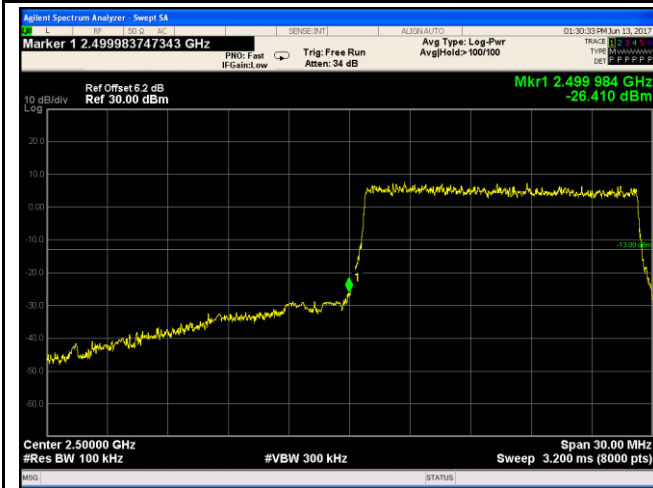
LTE Band VII - Low Channel QPSK-15

Note: Offset=Cable loss (4.5) + 10log  
(148.0/100)=4.5+1.7=6.2 dB



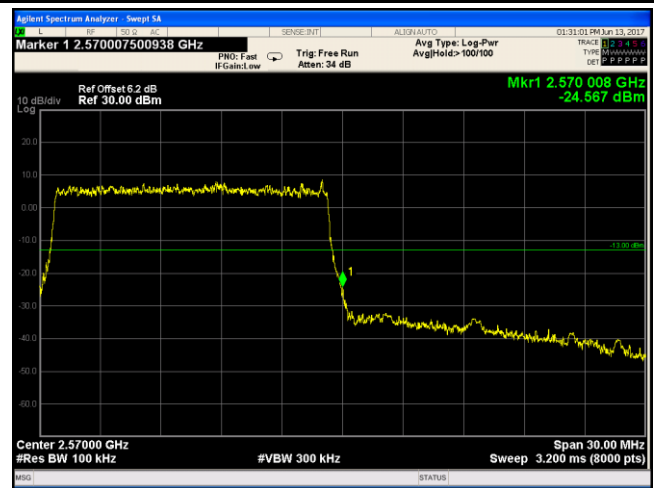
LTE Band VII - High Channel QPSK-15

Note: Offset=Cable loss (4.5) + 10log  
(148.2/100)=4.5+1.7=6.2 dB



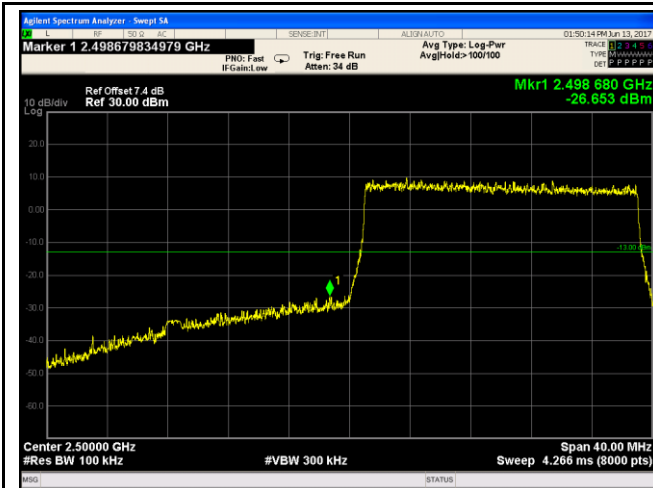
LTE Band VII - Low Channel 16QAM-15

Note: Offset=Cable loss (4.5) + 10log  
(148/100)=4.5+1.7=6.2dB



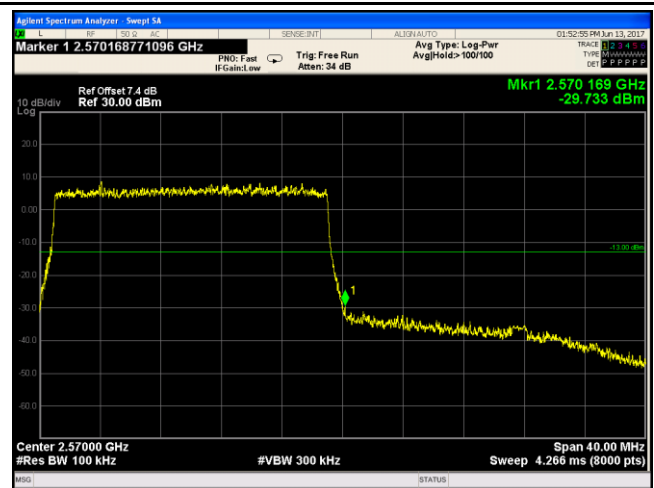
LTE Band VII - High Channel 16QAM-15

Note: Offset=Cable loss (4.5) + 10log  
(147.4/100)=4.5+1.7=6.2 dB



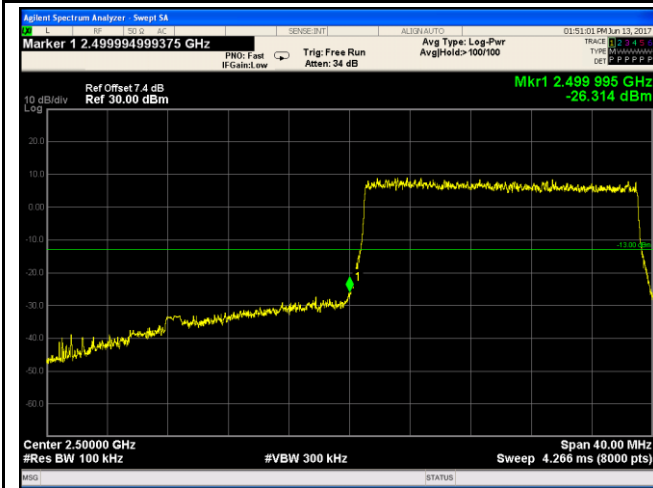
LTE Band VII - Low Channel QPSK-20

Note: Offset=Cable loss (4.5) + 10log  
(193.4/100)=4.5+2.9=7.4 dB



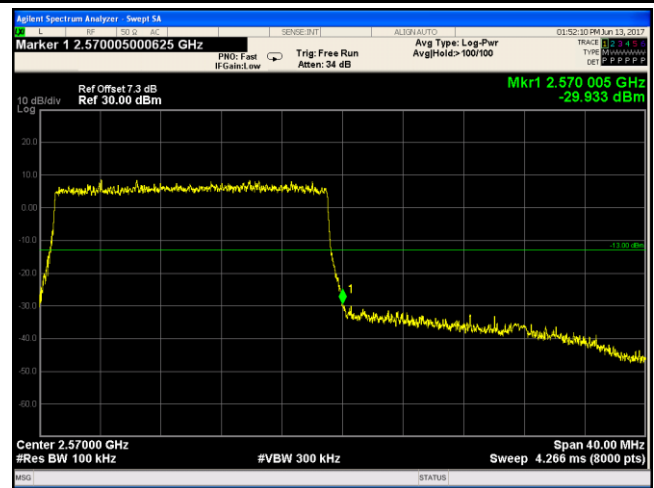
LTE Band VII - High Channel QPSK-20

Note: Offset=Cable loss (4.5) + 10log  
(195.4 /100)=4.5+2.9=7.4dB



LTE Band VII - Low Channel 16QAM-20

Note: Offset=Cable loss (4.5) + 10log  
(193.6/100)=4.5+2.9=7.4 dB




LTE Band VII - High Channel 16QAM-20

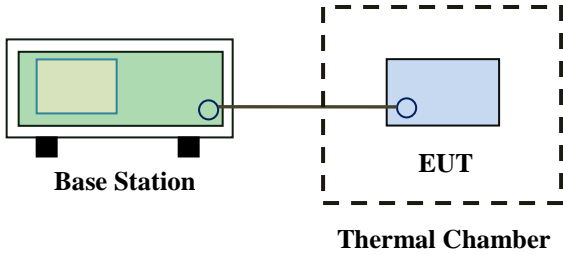
Note: Offset=Cable loss (4.5) + 10log  
(192.7/100)=4.5+2.8=7.3 dB

## 6.9 Frequency Stability

Temperature	23 °C
Relative Humidity	53%
Atmospheric Pressure	1010mbar
Test date :	June 12, 2017
Tested By :	Loren Luo

### Requirement(s):

Spec	Item	Requirement	Applicable																																
§2.1055, §22.355 & §24.235 § 27.5(h); § 27.54	a)	<p>According to §22.355, the carrier frequency of each transmitter in the Public Mobile Services must be maintained within the tolerances given in Table below:</p> <p>Frequency Tolerance for Transmitters in the Public Mobile Services</p> <table border="1"> <thead> <tr> <th>Frequency Range (MHz)</th><th>Base, fixed (ppm)</th><th>Mobile ≤ 3 watts (ppm)</th><th>Mobile ≤ 3 watts (ppm)</th></tr> </thead> <tbody> <tr> <td>25 to 50</td><td>20.0</td><td>20.0</td><td>50.0</td></tr> <tr> <td>□□ to 450</td><td>5.0</td><td>5.0</td><td>50.0</td></tr> <tr> <td>450 to 512</td><td>2.5</td><td>5□0</td><td>5□0</td></tr> <tr> <td>821 to 896</td><td>1.5</td><td>2.5</td><td>2.5</td></tr> <tr> <td>928 to 929.</td><td>□0</td><td>N/A</td><td>N/A</td></tr> <tr> <td>929 to 960.</td><td>1.5</td><td>N/A</td><td>N/A</td></tr> <tr> <td>2110 to 2220</td><td>10.0</td><td>N/A</td><td>N/A</td></tr> </tbody> </table> <p>According to §24.235, the frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized frequency block.</p> <p>According to §27.54, The frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation.</p>	Frequency Range (MHz)	Base, fixed (ppm)	Mobile ≤ 3 watts (ppm)	Mobile ≤ 3 watts (ppm)	25 to 50	20.0	20.0	50.0	□□ to 450	5.0	5.0	50.0	450 to 512	2.5	5□0	5□0	821 to 896	1.5	2.5	2.5	928 to 929.	□0	N/A	N/A	929 to 960.	1.5	N/A	N/A	2110 to 2220	10.0	N/A	N/A	
Frequency Range (MHz)	Base, fixed (ppm)	Mobile ≤ 3 watts (ppm)	Mobile ≤ 3 watts (ppm)																																
25 to 50	20.0	20.0	50.0																																
□□ to 450	5.0	5.0	50.0																																
450 to 512	2.5	5□0	5□0																																
821 to 896	1.5	2.5	2.5																																
928 to 929.	□0	N/A	N/A																																
929 to 960.	1.5	N/A	N/A																																
2110 to 2220	10.0	N/A	N/A																																

Test setup	 <p>The diagram illustrates the test setup. On the left, a green rectangular box represents the 'Base Station'. A line connects it to a blue rectangular box labeled 'EUT' (Equipment Under Test). The 'EUT' is enclosed within a dashed-line rectangle labeled 'Thermal Chamber'.</p>
Procedure	<p>A communication link was established between EUT and base station. The frequency error was monitored and measured by base station under variation of ambient temperature and variation of primary supply voltage.</p> <p>Limit: The frequency stability of the transmitter shall be maintained within <math>\pm 0.00025\%</math> (<math>\pm 2.5\text{ppm}</math>) of the center frequency.</p>
Remark	<p>Frequency Stability versus Temperature: The Frequency tolerance of the carrier signal shall be maintained within 2.5ppm of the operating frequency over a temperature variation of <math>-10^{\circ}\text{C}</math> to <math>+55^{\circ}\text{C}</math> at normal supply voltage.</p>
Result	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail

Test Data ☒ Yes ☐ N/A

Test Plot ☐ Yes (See below) ☒ N/A

### LTE Band II (Part 24E) result

Middle Channel, $f_0 = 1880$ MHz				
Temperature (°C)	Power Supplied (V <sub>DC</sub> )	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
-10	3.8	-6	0.0032	2.5
0		-8	0.0043	2.5
10		-9	0.0048	2.5
20		-11	0.0059	2.5
30		-12	0.0064	2.5
40		-8	0.0043	2.5
50		-7	0.0037	2.5
55		-10	0.0053	2.5
25	3.5	-12	0.0064	2.5
	4.3	-12	0.0064	2.5

### LTE Band IV (Part 27) result

Middle Channel, $f_0 = 1732.5$ MHz				
Temperature (°C)	Power Supplied (V <sub>DC</sub> )	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
-10	3.8	-11	0.0063	2.5
0		-9	0.0052	2.5
10		-14	0.0081	2.5
20		-10	0.0058	2.5
30		-9	0.0052	2.5
40		-9	0.0052	2.5
50		-11	0.0063	2.5
55		-12	0.0069	2.5
25	3.5	-13	0.0075	2.5
	4.3	-19	0.0110	2.5

### LTE Band VII (Part 27) result

Middle Channel, $f_0 = 2535$ MHz				
Temperature (°C)	Power Supplied (V <sub>DC</sub> )	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
-10	3.8	-9	0.0036	2.5
0		-7	0.0028	2.5
10		-8	0.0032	2.5
20		-8	0.0032	2.5
30		-11	0.0043	2.5
40		-9	0.0036	2.5
50		-10	0.0039	2.5
55		-4	0.0016	2.5
25	3.5	-10	0.0039	2.5
	4.3	-9	0.0036	2.5

### LTE Band XII (Part 27) result

Middle Channel, $f_0 = 707.5\text{MHz}$				
Temperature (°C)	Power Supplied (V <sub>DC</sub> )	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
-10	3.8	-9	0.0027	2.5
0		-10	0.0059	2.5
10		-9	0.0037	2.5
20		-11	0.0053	2.5
30		-11	0.0064	2.5
40		-8	0.0048	2.5
50		-10	0.0064	2.5
55		-9	0.0032	2.5
25	3.5	-10	0.0059	2.5
	4.3	-9	0.0053	2.5

### LTE Band XVII (Part 27) result

Middle Channel, $f_0 = 710\text{ MHz}$				
Temperature (°C)	Power Supplied (V <sub>DC</sub> )	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
-10	3.8	9	0.0127	2.5
0		5	0.0070	2.5
10		5	0.0070	2.5
20		4	0.0056	2.5
30		7	0.0099	2.5
40		5	0.0070	2.5
50		11	0.0155	2.5
55		10	0.0141	2.5
25	3.5	11	0.0155	2.5
	4.3	10	0.0141	2.5



## Annex A. TEST INSTRUMENT

Instrument	Model	Serial #	Cal Date	Cal Due	In use
<b>RF Conducted Test</b>					
Agilent ESA-E SERIES SPECTRUM ANALYZER	E4407B	MY45108319	09/15/2016	09/14/2017	<input checked="" type="checkbox"/>
Power Splitter	1#	1#	08/31/2016	08/30/2017	<input checked="" type="checkbox"/>
Universal Radio Communication Tester	CMU200	121393	09/24/2016	09/23/2017	<input checked="" type="checkbox"/>
Wideband Radio Communication Tester	CMW500	120906	03/26/2017	03/25/2018	<input checked="" type="checkbox"/>
Temperature/Humidity Chamber	UHL-270	001	10/08/2016	10/07/2017	<input checked="" type="checkbox"/>
DC Power Supply	E3640A	MY40004013	09/16/2016	09/15/2017	<input checked="" type="checkbox"/>
RF Power Sensor	Dare RPR3006C/P/W	AY554013	09/16/2016	09/15/2017	<input checked="" type="checkbox"/>
<b>Radiated Emissions</b>					
EMI test receiver	ESL6	100262	09/16/2016	09/15/2017	<input checked="" type="checkbox"/>
OPT 010 AMPLIFIER (0.1-1300MHz)	8447E	2727A02430	08/31/2016	08/30/2017	<input checked="" type="checkbox"/>
Microwave Preamplifier (0.5 ~ 18GHz)	PAM-118	443008	08/31/2016	08/30/2017	<input checked="" type="checkbox"/>
Bilog Antenna (30MHz~6GHz)	JB6	A110712	09/20/2016	09/19/2017	<input checked="" type="checkbox"/>
Bilog Antenna (30MHz~2GHz)	JB1	A112017	09/20/2016	09/19/2017	<input checked="" type="checkbox"/>
Double Ridge Horn Antenna (1 ~18GHz)	AH-118	71259	09/23/2016	09/22/2017	<input checked="" type="checkbox"/>
Double Ridge Horn Antenna (1 ~18GHz)	AH-118	71283	09/23/2016	09/22/2017	<input checked="" type="checkbox"/>
SYNTHESIZED SIGNAL GENERATOR	8665B	3744A01293	09/16/2016	09/15/2017	<input checked="" type="checkbox"/>
Tunable Notch Filter	3NF-800/1000-S	AA4	08/31/2016	08/30/2017	<input checked="" type="checkbox"/>

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Tunable Notch Filter	3NF- 1000/2000-S	AM 4	08/31/2016	08/30/2017	<input checked="" type="checkbox"/>
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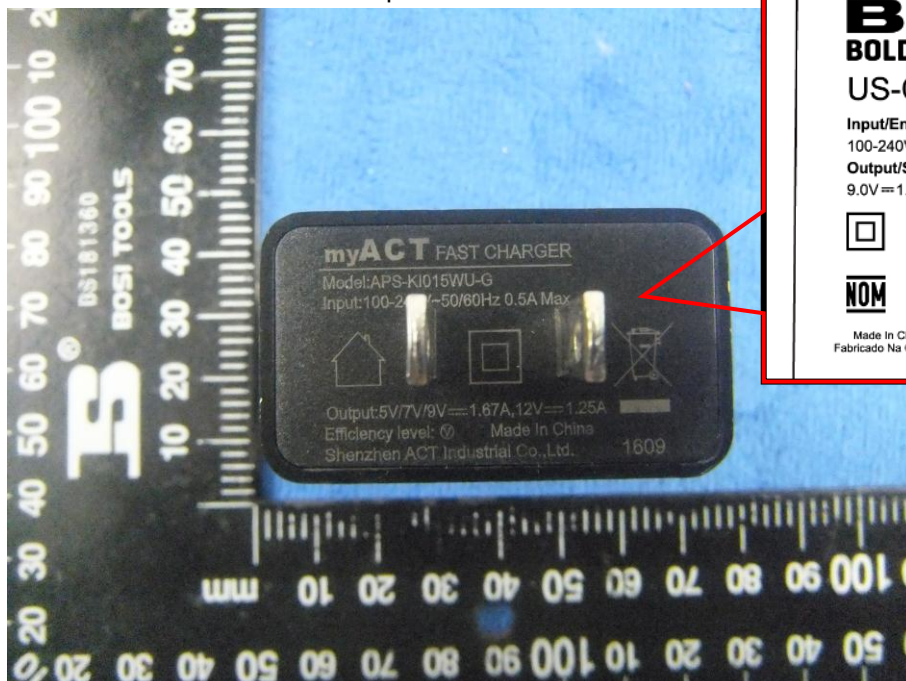
## Annex B. EUT And Test Setup Photographs

### Annex B.i. Photograph: EUT External Photo

Whole Package View



Adapter - Front View





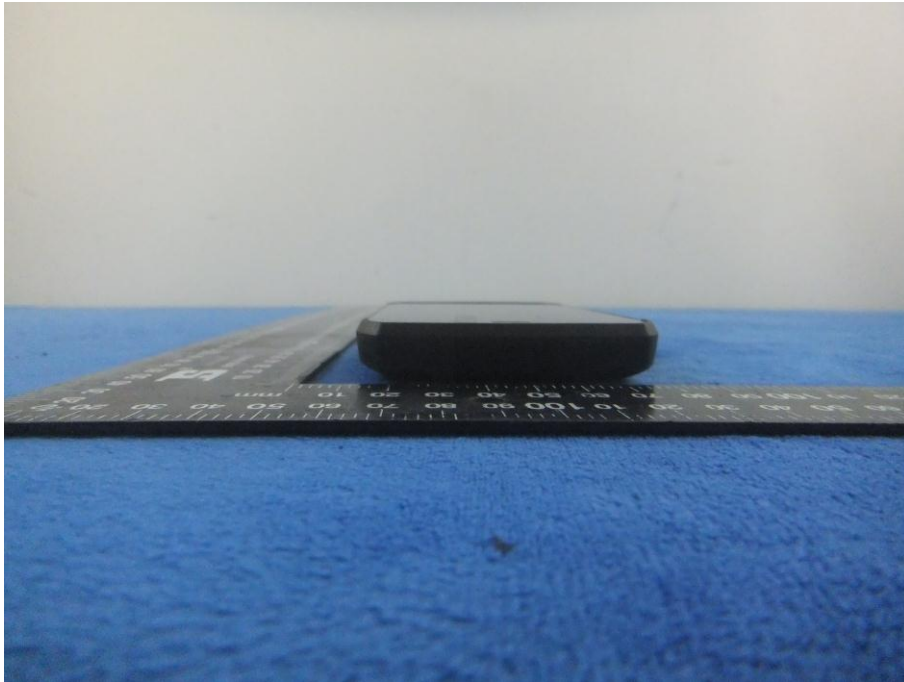
EUT - Front View



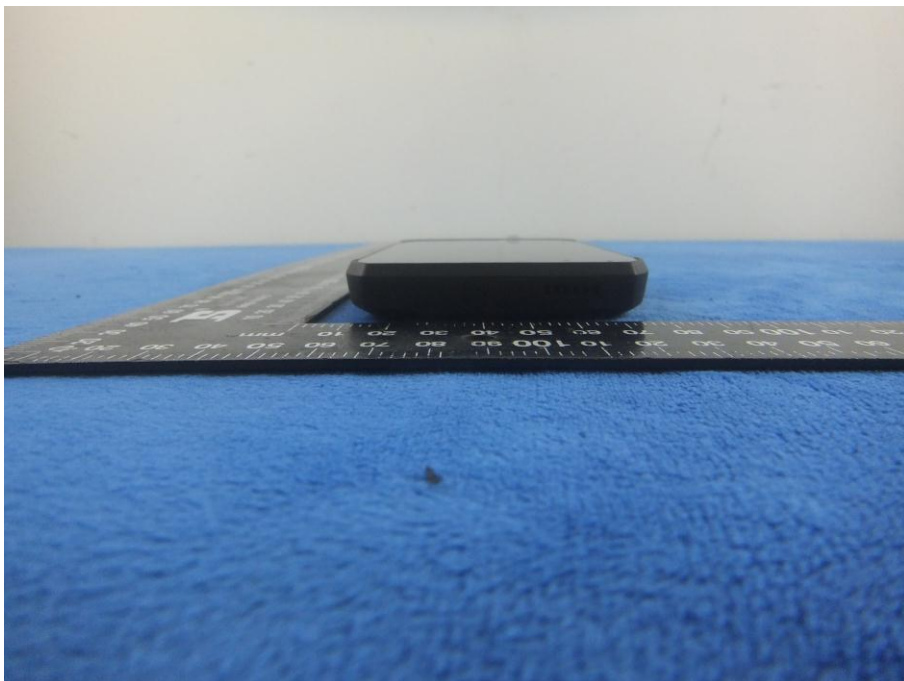
EUT - Rear View



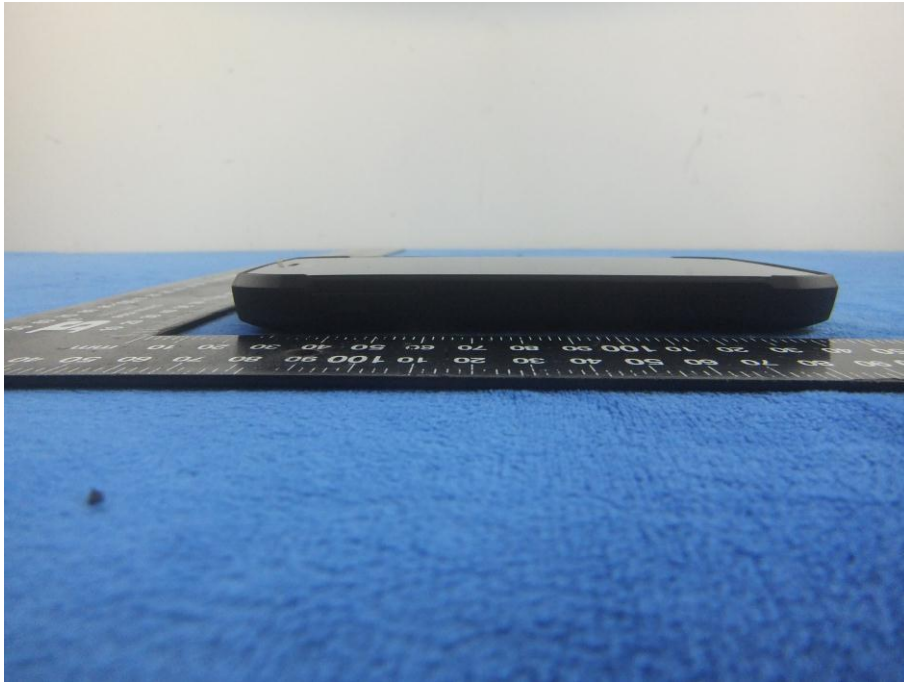
EUT - Top View



EUT - Bottom View



EUT - Left View



EUT - Right View





**Annex B.ii. Photograph: EUT Internal Photo**

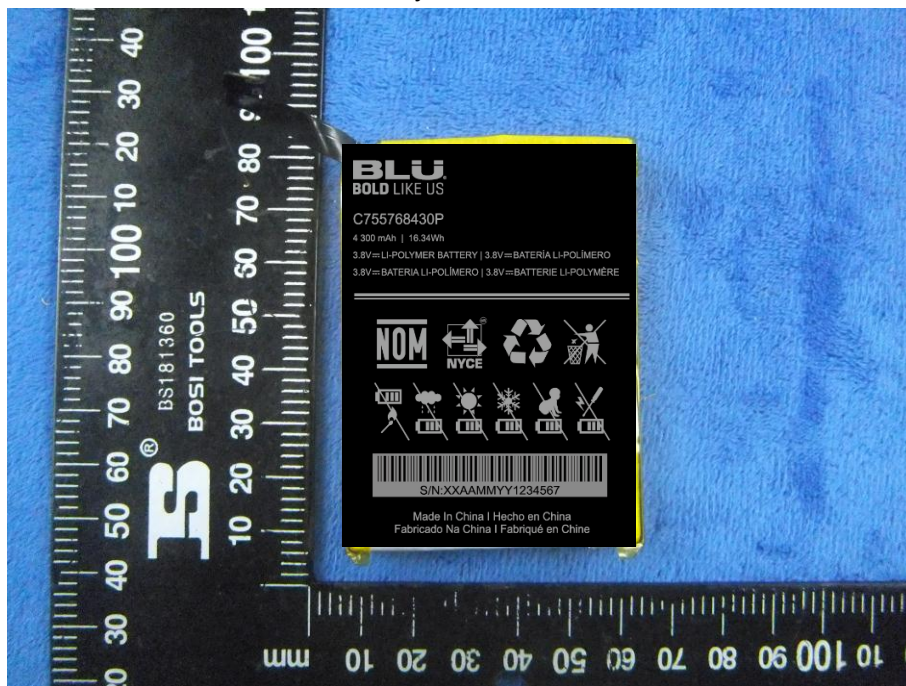
Cover Off - Top View 1



Cover Off - Top View 2



Battery - Front View

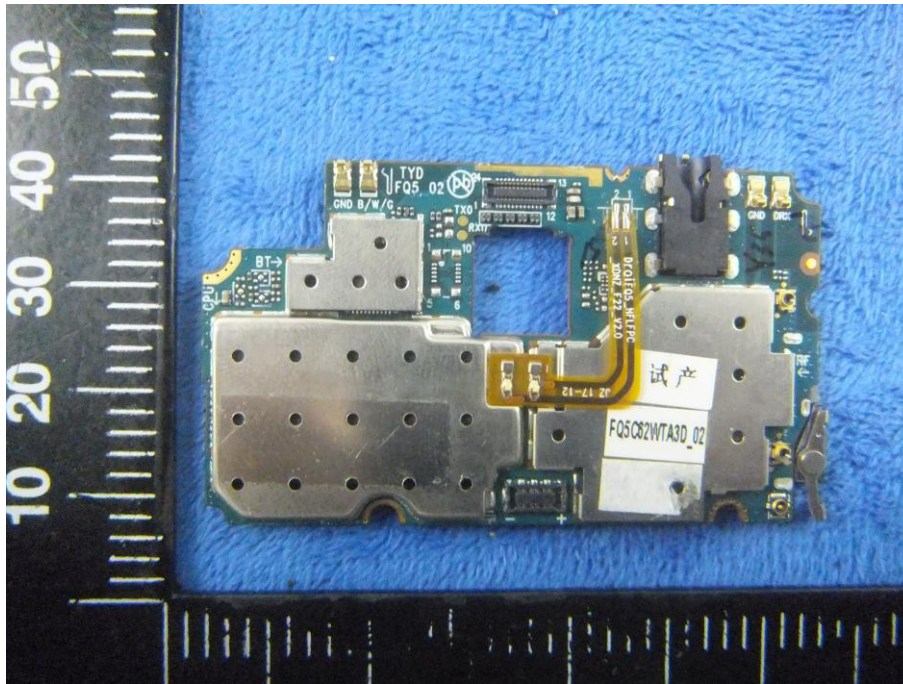


Battery - Rear View

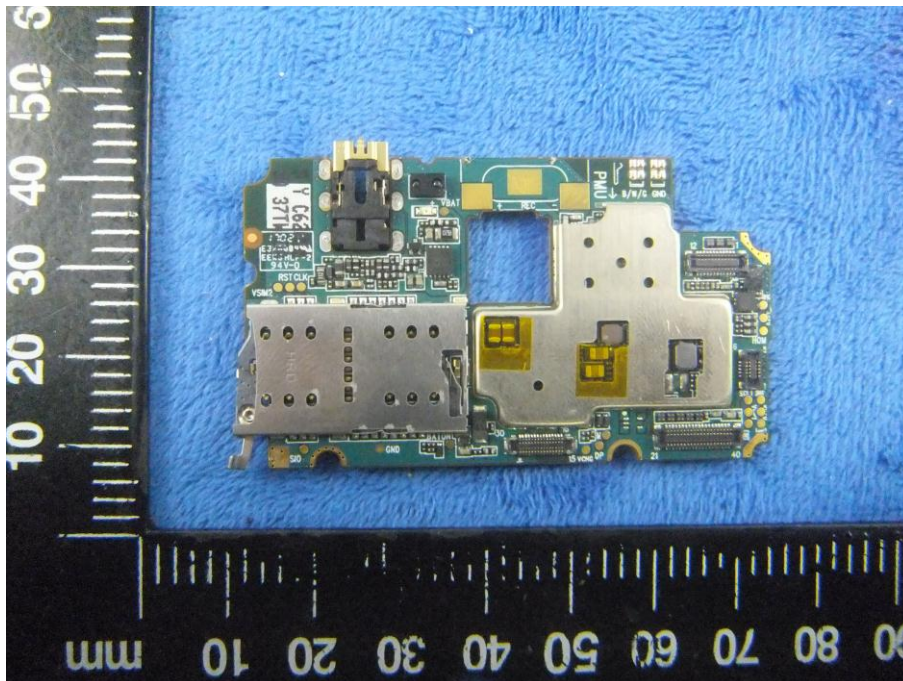




Mainboard with Shielding - Front View

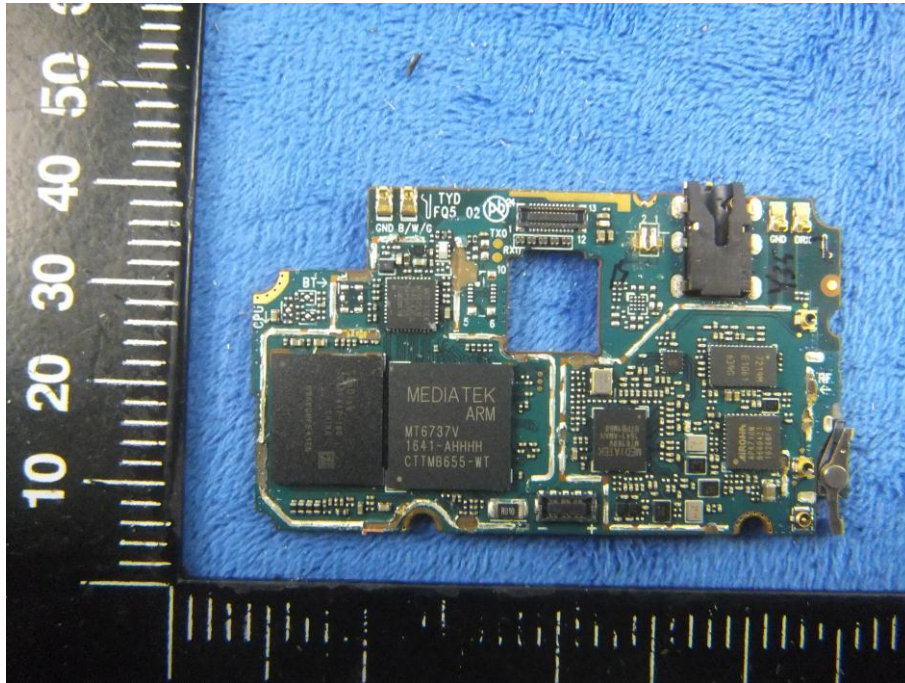


Mainboard without Shielding - Rear View

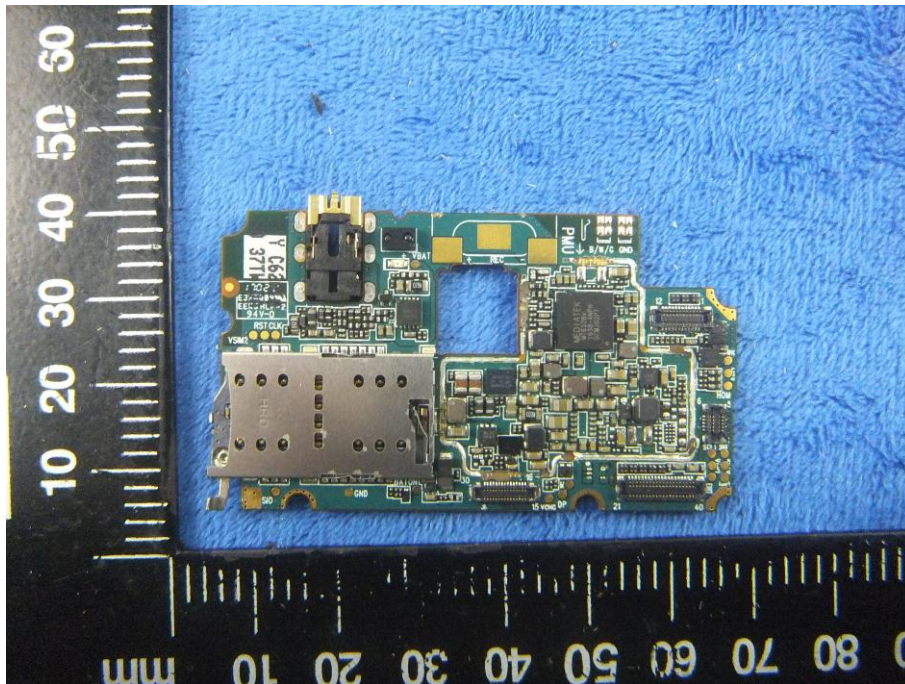




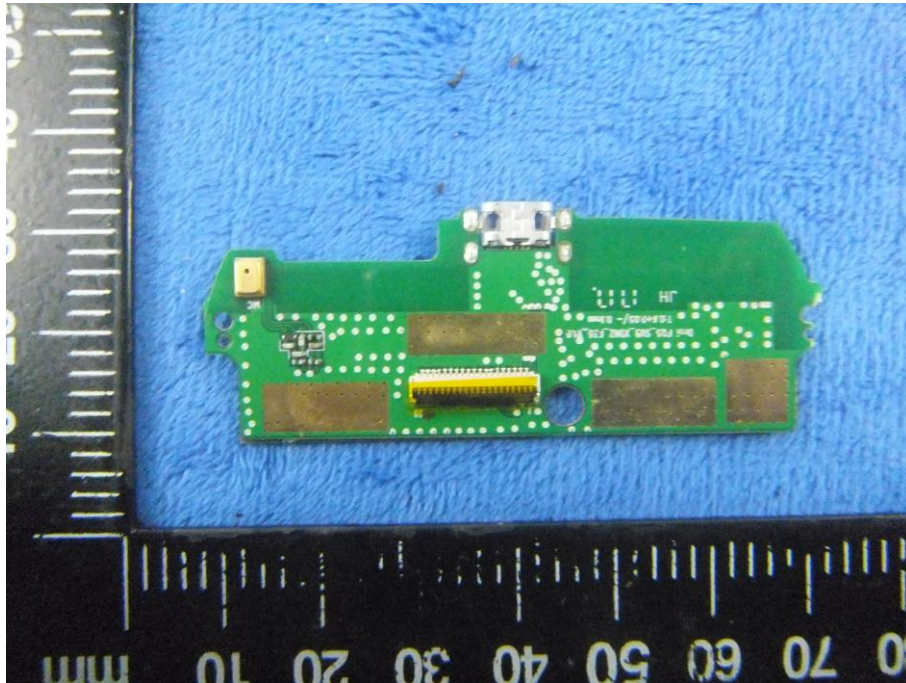
Mainboard without Shielding - Front View



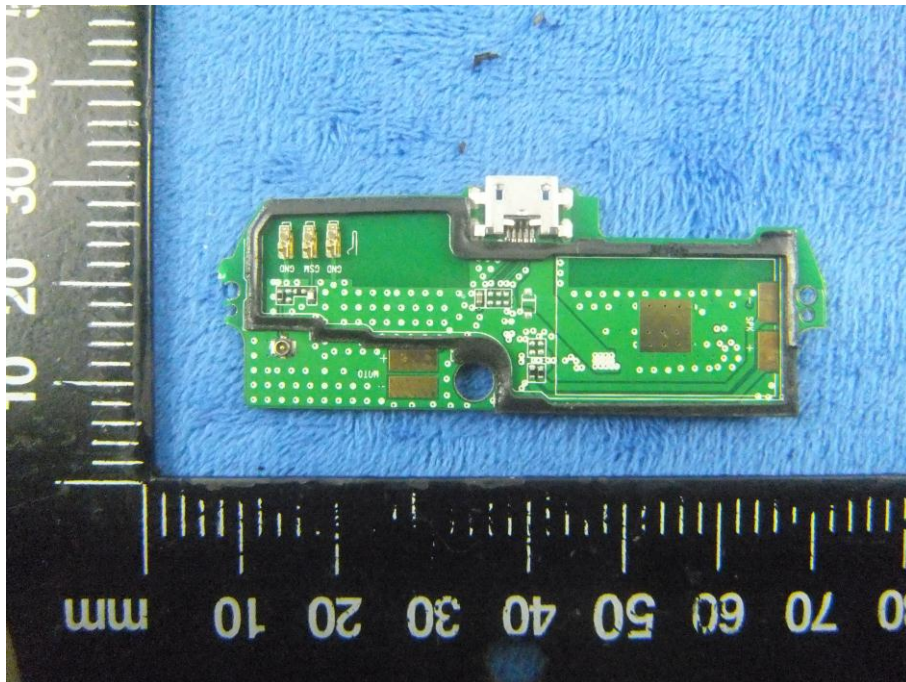
Mainboard without Shielding - Rear View



Small Mainboard - Front View



Small Mainboard - Rear View





LCD – Front View



LCD – Rear View



GSM/PCS/UMTS - Antenna View



BT/WIFI - Antenna View

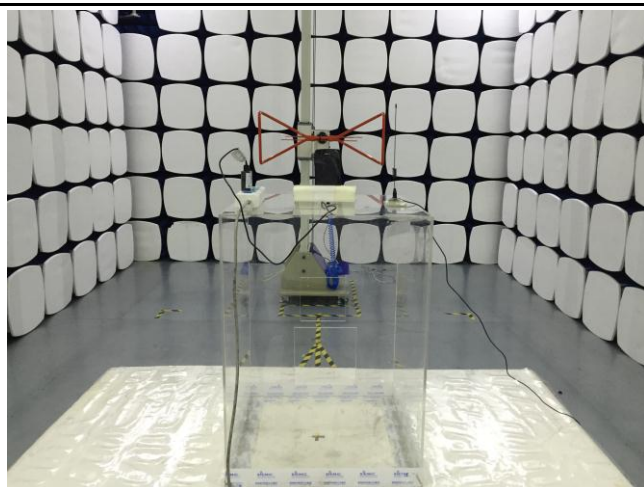




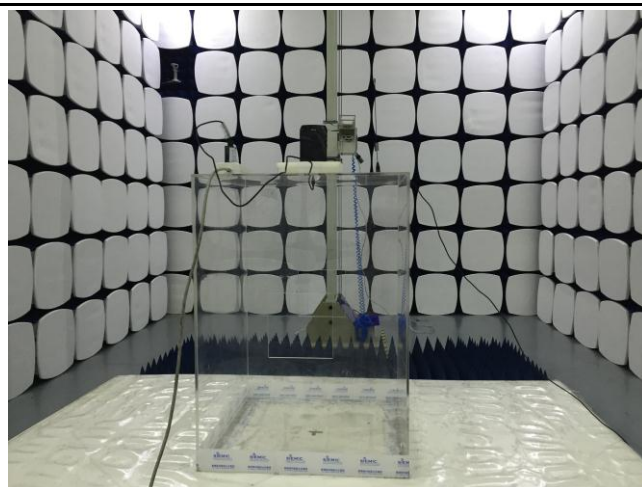
LTE - Antenna View



**Annex B.iii. Photograph: Test Setup Photo**



Radiated Spurious Emissions Test Setup Below 1GHz

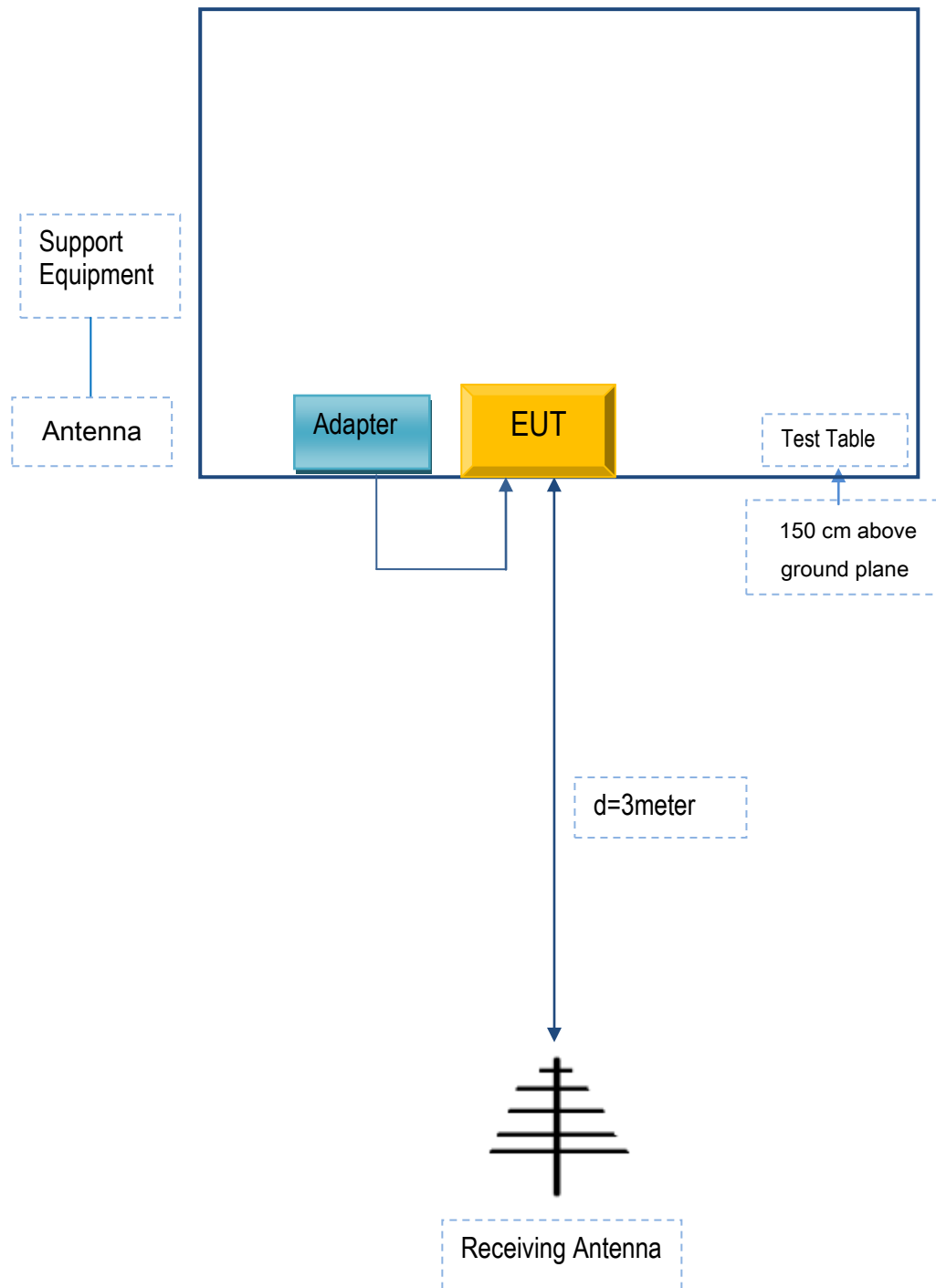


Radiated Spurious Emissions Test Setup Above  
1GHz

## Annex C. TEST SETUP AND SUPPORTING EQUIPMENT

### Annex C.ii. TEST SET UP BLOCK

#### Block Configuration Diagram for 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
BLU Products, Inc.	Adapter	US-CB-1670	SO542

### **Supporting Cable:**

Cable type	Shield Type	Ferrite Core	Length	Serial No
USB Cable	Un-shielding	No	0.8m	SO542

## Annex C.ii. EUT OPERATING CONKITIONS

N/A

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

Please see the attachment

## Annex E. DECLARATION OF SIMILARITY

N/A