

# EMC TEST REPORT



Report No.: 15050016-FCC-E

Applicant	Micron Electronics LLC.	
Product Name	GSM Tracker	
Model No.	Prime bolt	
Serial No.	N/A	
Test Standard	FCC Part 15 Subpart B Class B:2014, ANSI C63.4: 2014	
Test Date	May 18 to June 02, 2015	
Issue Date	June 03, 2015	
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"/>	
<i>Lucifer He</i>	<i>Chris You</i>	
Lucifer He Test Engineer	Chris You 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**

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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
15050016-FCC-E	NONE	Original	June 03, 2015

## 2. Customer information

Applicant Name	Micron Electronics LLC.
Applicant Add	1001 Yamato Road, Suite 400, Boca Raton, FL 33431, USA
Manufacturer	Micron Electronics LLC.
Manufacturer Add	1001 Yamato Road, Suite 400, Boca Raton, FL 33431, USA

## 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:	GSM Tracker
Main Model:	Prime bolt
Serial Model:	N/A
Date EUT received:	May 06, 2015
Test Date(s):	May 18 to June 02, 2015
Equipment Category :	JBP
Antenna Gain:	GSM850:-5 dBi PCS1900:-4 dBi
Type of Modulation:	GPRS: GMSK EGPRS: GMSK, 8PSK
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
Number of Channels:	GSM 850: 124CH PCS1900: 299CH
Port:	USB Port
Input Power:	Battery: Model:G200 Spec: 3.7V 8800mAh Charger Max Voltage:4.2V AC Adapter: Input: AC 100-240V;1000mA Output: DC 5.0V; 1A
Trade Name :	Prime

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GPRS/EGPRS Multi-slot class      8/10/12

FCC ID:                                      ZKQ-BLT

## 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	22°C
Relative Humidity	57%
Atmospheric Pressure	1029mbar
Test date :	May 29, 2015
Tested By :	Lucifer He

#### Requirement(s):

Spec	Item	Requirement	Applicable														
47CFR§15.107	a)	<p>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 [μ] H/50 ohms line impedance stabilization network (LISN). The lower limit applies at the boundary between the frequencies ranges.</p> <table border="1"> <thead> <tr> <th rowspan="2">Frequency ranges (MHz)</th> <th colspan="2">Limit (dBμV)</th> </tr> <tr> <th>QP</th> <th>Average</th> </tr> </thead> <tbody> <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> </tbody> </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	<input checked="" type="checkbox"/>
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 style="text-align: center;"> <b>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.</b> </p>
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Procedure	<ol style="list-style-type: none"> <li>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.</li> <li>The power supply for the EUT was fed through a 50W/50mH EUT LISN, connected to filtered mains.</li> </ol>
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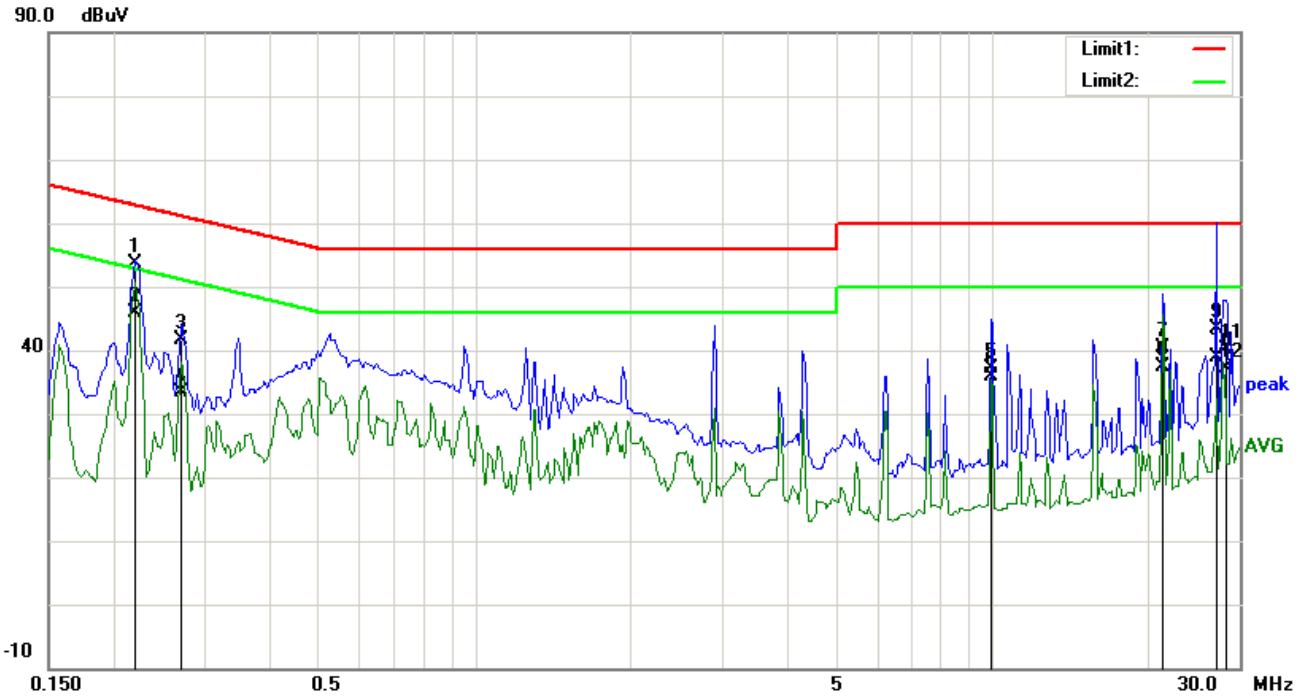
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	<ol style="list-style-type: none"> <li>3. The RF OUT of the EUT LISN was connected to the EMI test receiver via a low-loss coaxial cable.</li> <li>4. All other supporting equipment were powered separately from another main supply.</li> <li>5. The EUT was switched on and allowed to warm up to its normal operating condition.</li> <li>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.</li> <li>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.</li> <li>8. Step 7 was then repeated for the LIVE line (for AC mains) or DC line (for DC power).</li> </ol>
Remark	
Result	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail

Test Data     Yes                       N/A

Test Plot     Yes (See below)             N/A

<b>Test Mode 1:</b>	<b>Charging Mode</b>
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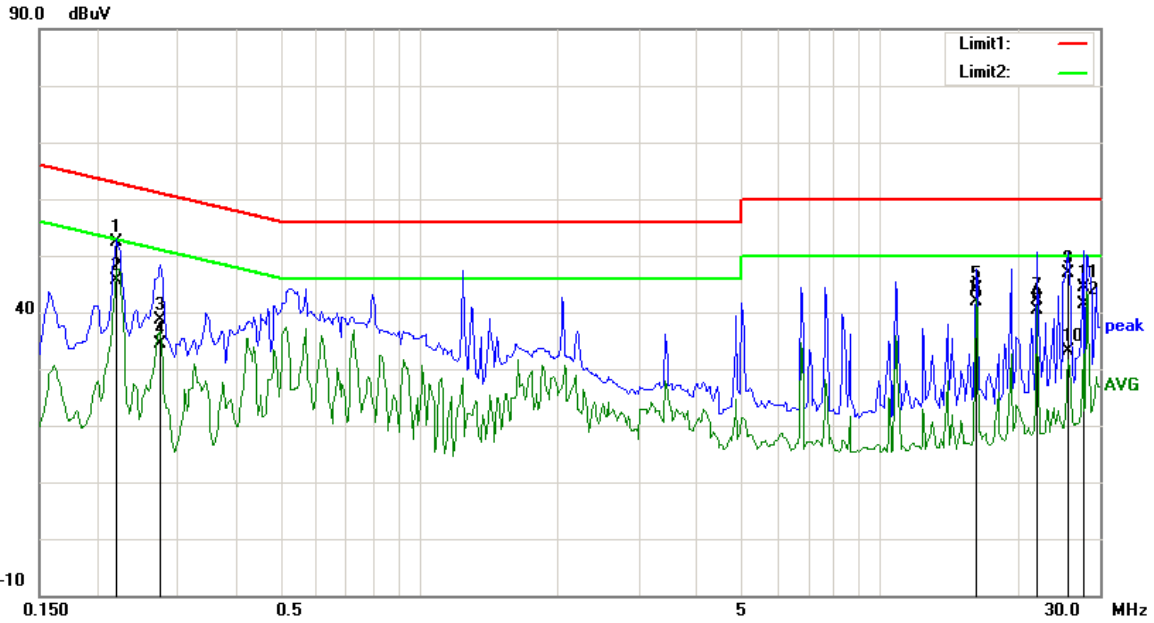


**Test Data**

Phase Line Plot at 120Vac, 60Hz

No.	P/L	Frequency	Reading	Detector	Corrected	Result	Limit	Margin	Comment
		(MHz)	(dBuV)		(dB}	(dBuV)	(dBuV)	(dB)	
1	L1	0.2208	40.76	QP	12.94	53.70	62.79	-9.09	
2	L1	0.2208	33.05	AVG	12.94	45.99	52.79	-6.80	
3	L1	0.2711	29.00	QP	12.75	41.75	61.08	-19.33	
4	L1	0.2711	20.66	AVG	12.75	33.41	51.08	-17.67	
5	L1	9.9570	24.01	QP	13.18	37.19	60.00	-22.81	
6	L1	9.9570	22.80	AVG	13.18	35.98	50.00	-14.02	
7	L1	21.3320	25.36	QP	14.93	40.29	60.00	-19.71	
8	L1	21.3320	22.41	AVG	14.93	37.34	50.00	-12.66	
9	L1	27.0156	29.12	QP	14.19	43.31	60.00	-16.69	
10	L1	27.0156	24.80	AVG	14.19	38.99	50.00	-11.01	
11	L1	28.4492	26.24	QP	14.00	40.24	60.00	-19.76	
12	L1	28.4492	23.21	AVG	14.00	37.21	50.00	-12.79	

<b>Test Mode 1:</b>	<b>Charging Mode</b>
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**Test Data**

**Phase Neutral Plot at 120Vac, 60Hz**

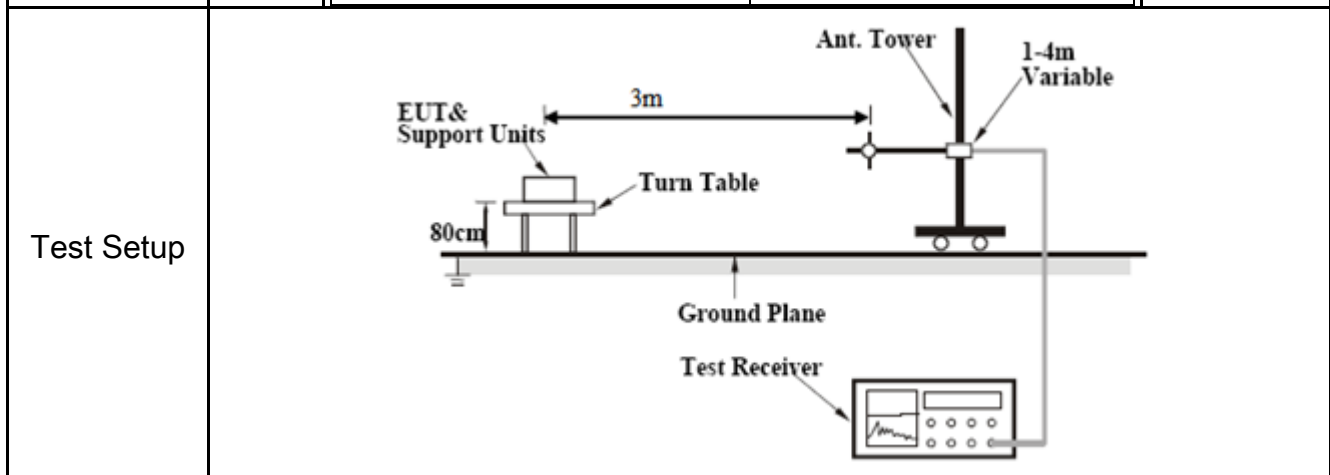
No.	P/L	Frequency (MHz)	Reading (dBuV)	Detector	Corrected (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Comment
1	N	0.2208	39.56	QP	12.94	52.50	62.79	-10.29	
2	N	0.2208	32.63	AVG	12.94	45.57	52.79	-7.22	
3	N	0.2750	26.00	QP	12.74	38.74	60.97	-22.23	
4	N	0.2750	21.69	AVG	12.74	34.43	50.97	-16.54	
5	N	16.1914	29.65	QP	14.38	44.03	60.00	-15.97	
6	N	16.1914	27.56	AVG	14.38	41.94	50.00	-8.06	
7	N	21.8828	26.24	QP	15.82	42.06	60.00	-17.94	
8	N	21.8828	24.59	AVG	15.82	40.41	50.00	-9.59	
9	N	25.6289	29.71	QP	17.24	46.95	60.00	-13.05	
10	N	25.6289	15.83	AVG	17.24	33.07	50.00	-16.93	
11	N	27.5625	26.43	QP	17.97	44.40	60.00	-15.60	
12	N	27.5625	23.53	AVG	17.97	41.50	50.00	-8.50	

## 6.2 Radiated Emissions

Temperature	22°C
Relative Humidity	57%
Atmospheric Pressure	1029mbar
Test date :	May 29, 2015
Tested By :	Lucifer He

### Requirement(s):

Spec	Item	Requirement	Applicable										
47CFR§15.107(d)	a)	Except higher limit as specified elsewhere in other section, the emissions from the low-power radio-frequency devices shall not exceed the field strength levels specified in the following table and the level of any unwanted emissions shall not exceed the level of the fundamental emission. The tighter limit applies at the band edges	<input checked="" type="checkbox"/>										
		<table border="1"> <thead> <tr> <th>Frequency range (MHz)</th> <th>Field Strength (<math>\mu\text{V/m}</math>)</th> </tr> </thead> <tbody> <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> </tbody> </table>		Frequency range (MHz)	Field Strength ( $\mu\text{V/m}$ )	30 – 88	100	88 – 216	150	216 960	200	Above 960	500
		Frequency range (MHz)		Field Strength ( $\mu\text{V/m}$ )									
		30 – 88		100									
		88 – 216		150									
216 960	200												
Above 960	500												



Procedure	<ol style="list-style-type: none"> <li>1. The EUT was switched on and allowed to warm up to its normal operating condition.</li> <li>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:             <ol style="list-style-type: none"> <li>a. Vertical or horizontal polarization (whichever gave the higher emission level</li> </ol> </li> </ol>
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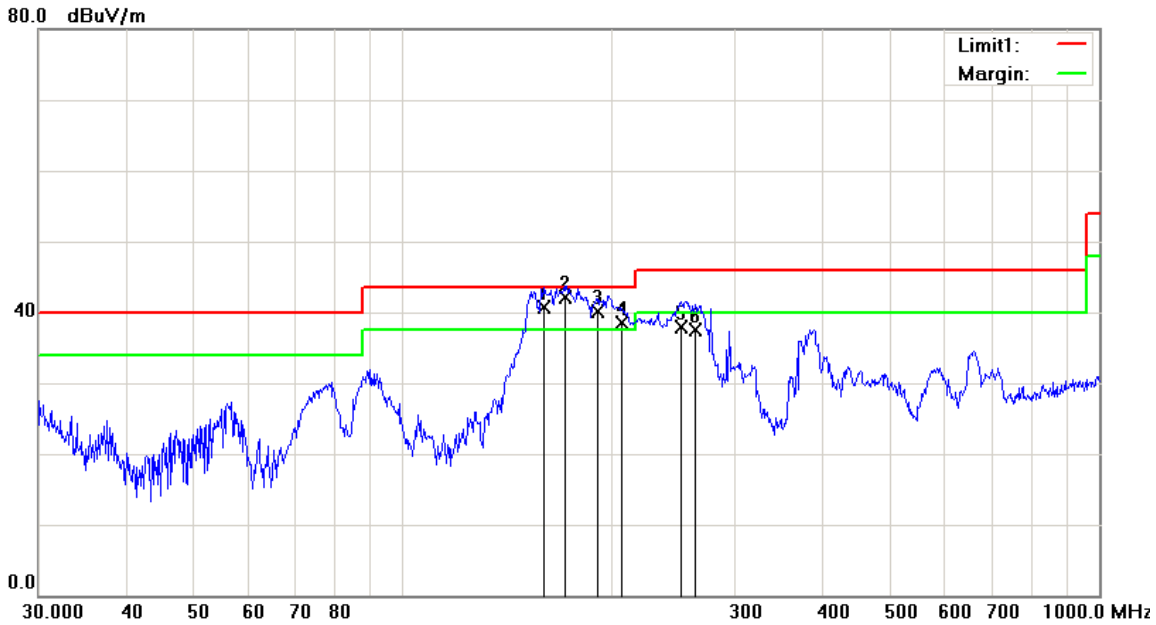
	<p>over a full rotation of the EUT) was chosen.</p> <p>b. The EUT was then rotated to the direction that gave the maximum emission.</p> <p>c. Finally, the antenna height was adjusted to the height that gave the maximum emission.</p> <p>3. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 kHz for Quasiy 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.      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.      ■ 1 kHz (Duty cycle &lt; 98%) □ 10 Hz (Duty cycle &gt; 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

<b>Test Mode:</b>	<b>Charging Mode</b>
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**Below 1GHz**



**Test Data**

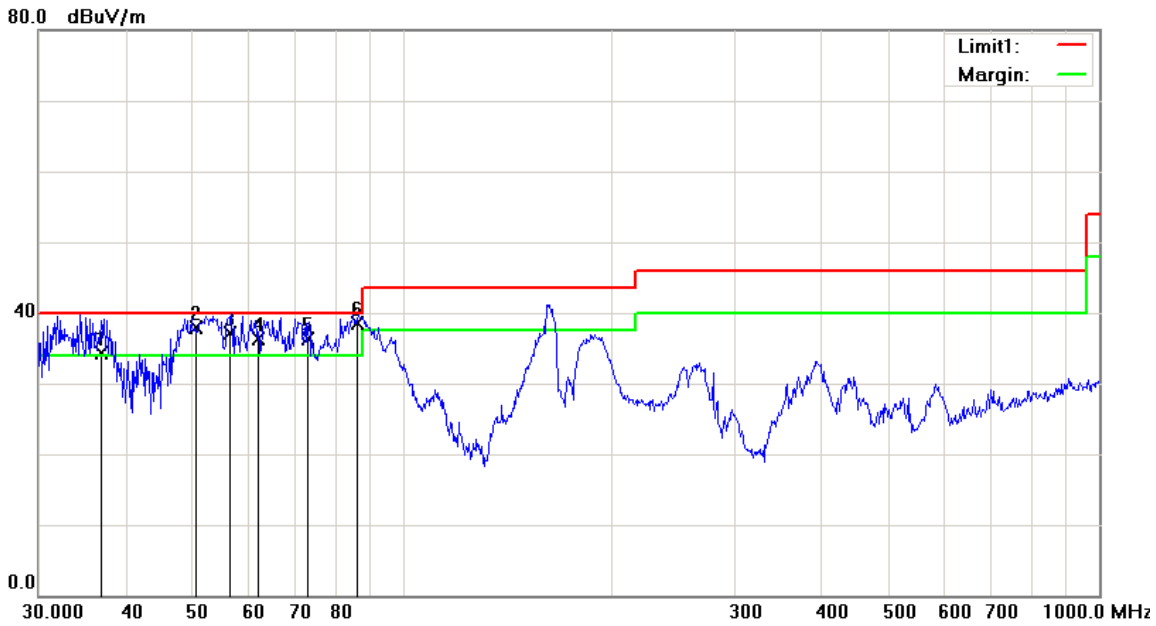
**Horizontal Polarity Plot @3m**

No.	P/L	Frequency (MHz)	Reading (dBuV/m)	Detector	Corrected (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree ( )	Comment
1	H	158.8877	48.95	QP	-8.30	40.65	43.50	-2.85	100	136	
2	H	170.9580	51.29	QP	-9.18	42.11	43.50	-1.39	200	136	
3	H	190.4678	49.37	QP	-9.20	40.17	43.50	-3.33	200	136	
4	H	206.3976	47.36	QP	-8.80	38.56	43.50	-4.94	200	136	
5	H	250.3352	47.07	QP	-9.18	37.89	46.00	-8.11	100	254	
6	H	262.4100	46.10	QP	-8.62	37.48	46.00	-8.52	200	95	

**Above 1GHz**

*Note: The frequency that above 1GHz is mainly from the environment noise.*

**Below 1GHz**



**Test Data**

**Vertical Polarity Plot @3m**

No.	P/L	Frequency (MHz)	Reading (dBuV/m)	Detector	Corrected (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree ( )	Comment
1	V	36.9543	39.74	QP	-5.37	34.37	40.00	-5.63	200	161	
2	V	50.4461	51.15	QP	-13.23	37.92	40.00	-2.08	200	14	
3	V	56.5061	51.15	QP	-13.95	37.20	40.00	-2.80	200	183	
4	V	61.8153	50.53	QP	-14.21	36.32	40.00	-3.68	100	161	
5	V	72.9937	49.95	QP	-13.68	36.27	40.00	-3.73	200	14	
6	V	85.7936	51.97	QP	-13.48	38.49	40.00	-1.51	100	161	

**Above 1GHz**

*Note: The frequency that above 1GHz is mainly from the environment noise.*

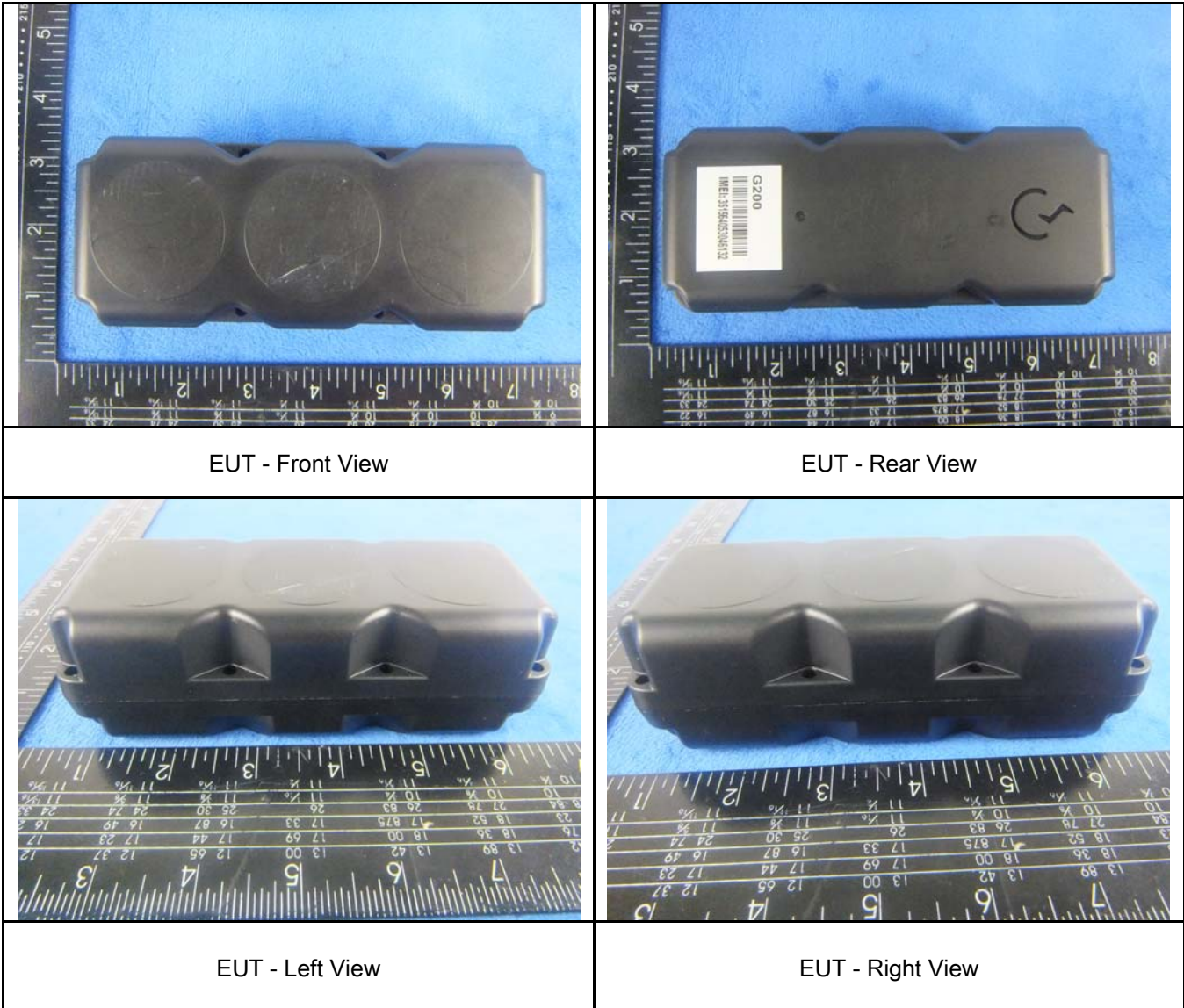


## Annex A. TEST INSTRUMENT

Instrument	Model	Serial #	Cal Date	Cal Due	In use
<b>AC Line Conducted Emissions</b>					
EMI test receiver	ESCS30	8471241027	09/18/2014	09/17/2015	<input checked="" type="checkbox"/>
Line Impedance Stabilization Network	LI-125A	191106	09/26/2014	09/25/2015	<input checked="" type="checkbox"/>
Line Impedance Stabilization Network	LI-125A	191107	09/26/2014	09/25/2015	<input checked="" type="checkbox"/>
LISN	ISN T800	34373	09/26/2014	09/25/2015	<input checked="" type="checkbox"/>
Transient Limiter	LIT-153	531118	09/02/2014	09/01/2015	<input checked="" type="checkbox"/>
<b>Radiated Emissions</b>					
EMI test receiver	ESL6	100262	09/18/2014	09/17/2015	<input checked="" type="checkbox"/>
OPT 010 AMPLIFIER (0.1-1300MHz)	8447E	2727A02430	09/02/2014	09/01/2015	<input checked="" type="checkbox"/>
Microwave Preamplifier (1 ~ 26.5GHz)	8449B	3008A02402	03/25/2015	03/24/2016	<input checked="" type="checkbox"/>
Bilog Antenna (30MHz~6GHz)	JB6	A110712	09/22/2014	09/21/2015	<input checked="" type="checkbox"/>
Double Ridge Horn Antenna	AH-118	71259	09/25/2014	09/24/2015	<input checked="" type="checkbox"/>

**Annex B. EUT And Test Setup Photographs**

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



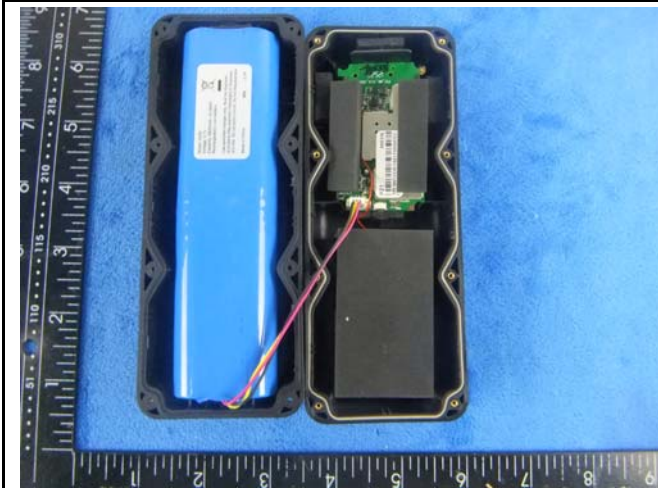


EUT - Top View

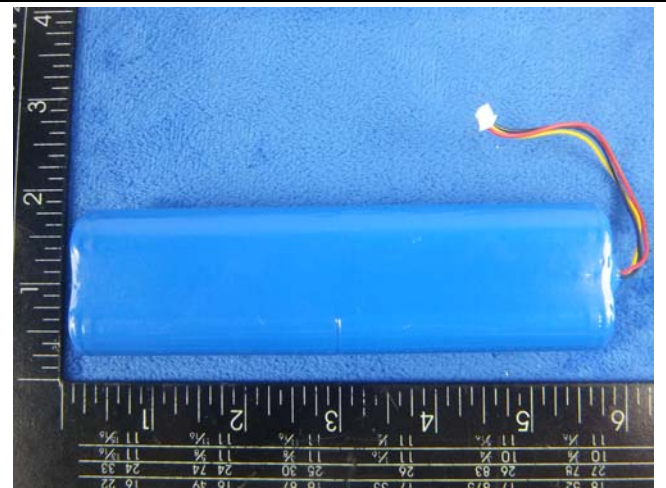


EUT - Button View

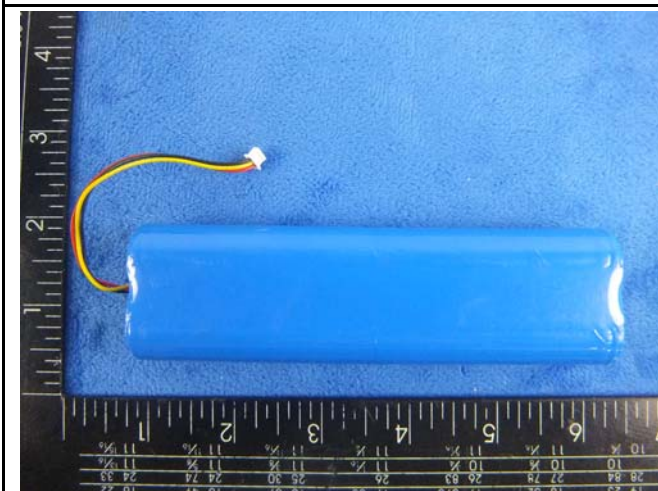
**Annex B.ii. Photograph: EUT Internal Photo**



Cover Off - Top View 1



Battery - Top View



Battery - Bottom View



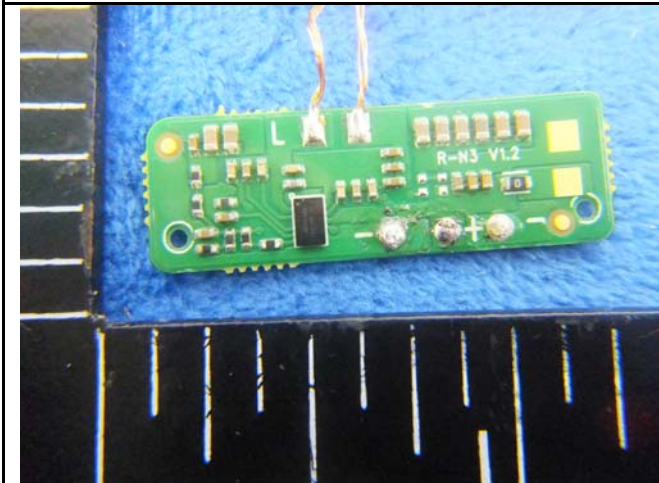




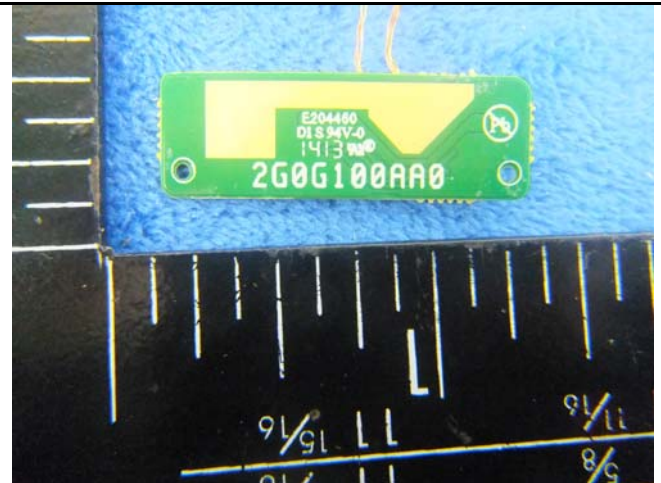
Mainboard With Shielding - Front View



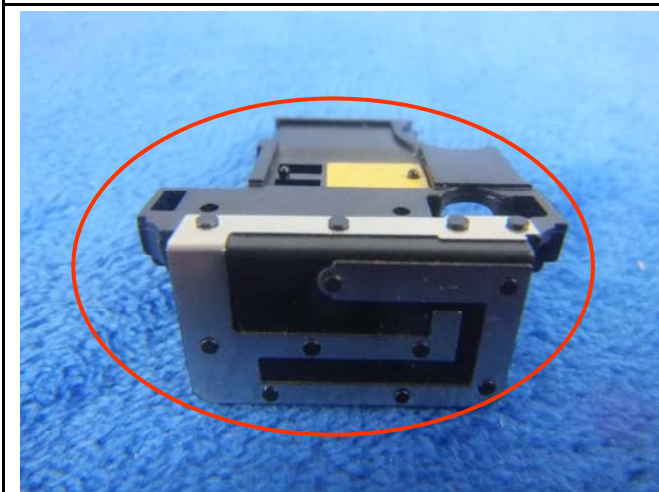
Mainboard Without Shielding - Front View



Mainboard With Shielding - rear View



Mainboard Without Shielding - rear View



GSM/PCS Antenna View

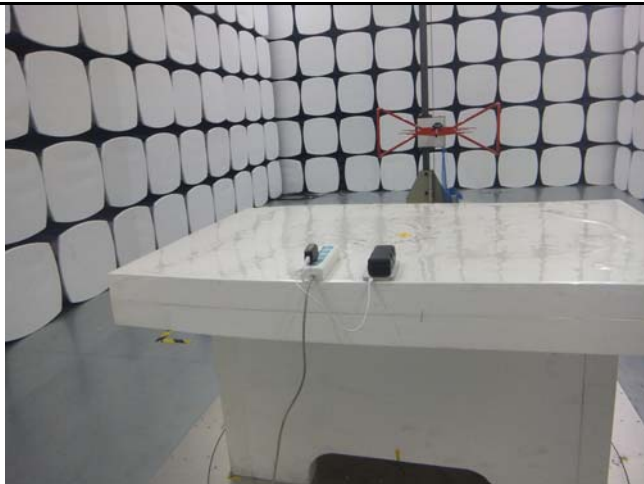
**Annex B.iii. Photograph: Test Setup Photo**



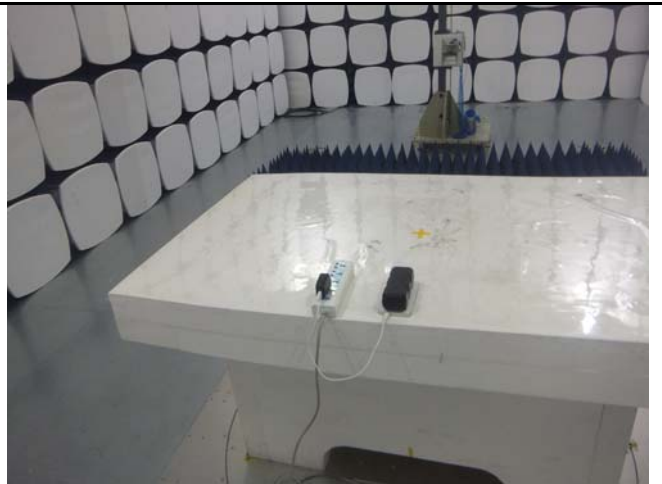
Conducted Emissions Test Setup – Front View



Conducted Emissions Test Setup – Side View



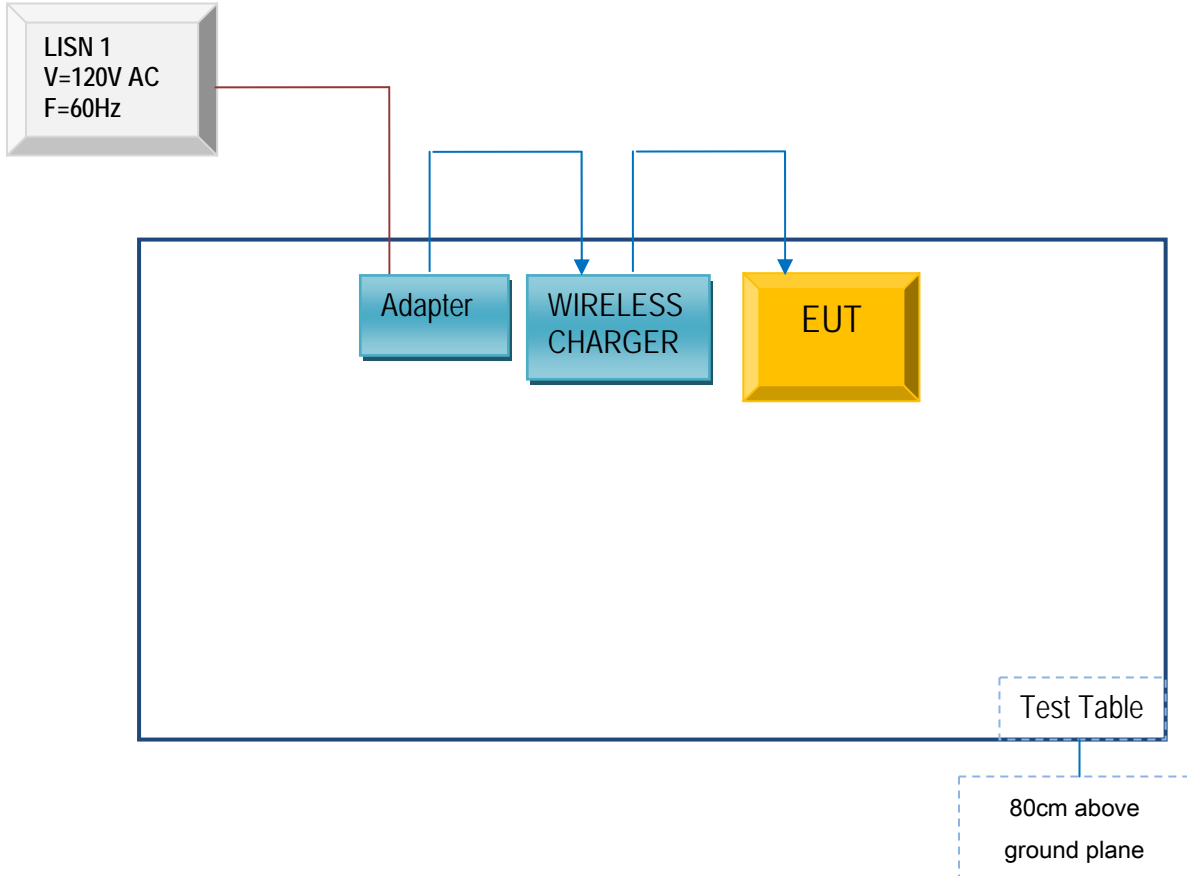
Radiated Spurious Emissions Test Setup Below 1GHz



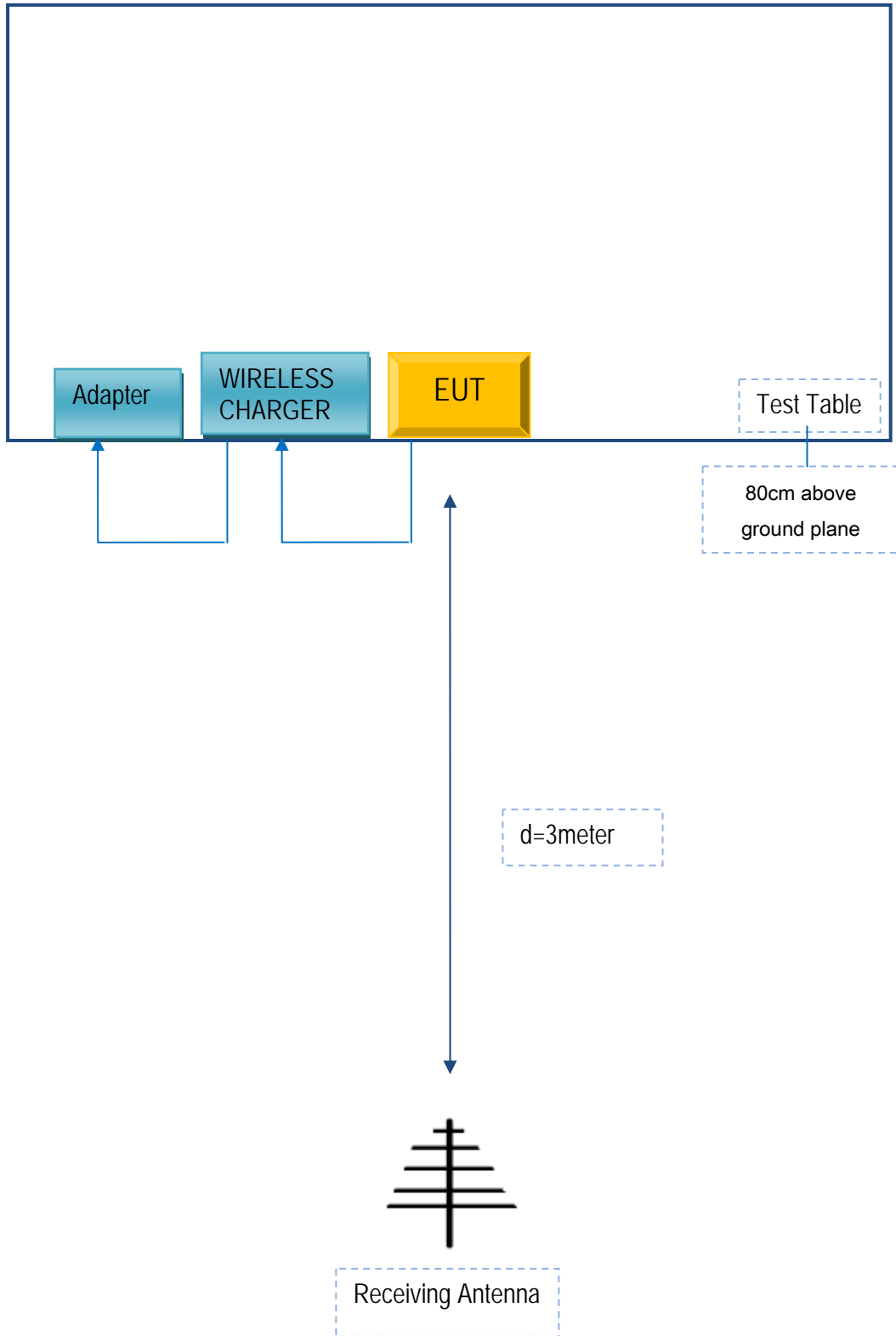
Radiated Spurious Emissions Test Setup Above 1GHz

## Annex C. TEST SETUP AND SUPPORTING EQUIPMENT

### Block Configuration Diagram for Conducted Emissions



### Block Configuration Diagram for Radiated Emissions





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**Annex C. ii. SUPPORTING EQUIPMENT DESCRIPTION**

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

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

Please see Attachment

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## Annex E. DECLARATION OF SIMILARITY

N/A