

EMC TEST REPORT



Report No.: 16070416-FCC-E

Supersede Report No.: N/A

Applicant	Movitelco Trade, S.L	
Product Name	GSM mobile phone	
Model No.	M14	
Serial No.	N/A	
Test Standard	FCC Part 15 Subpart B Class B:2015, ANSI C63.4: 2014	
Test Date	April 27 to May 20, 2016	
Issue Date	May 20, 2016	
Test Result	☒ Pass ☐ Fail	
Equipment complied with the specification ☒		
Equipment did not comply with the specification ☐		
<i>Winnie Zhang</i>	<i>David Huang</i>	
Winnie Zhang Test Engineer	David Huang Checked By	
This test report may be reproduced in full only Test result presented in this test report is applicable to the tested sample only		

Issued by:

SIEMIC (SHENZHEN-CHINA) LABORATORIES

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

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

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

Test Report	16070416-FCC-E
Page	3 of 30

This page has been left blank intentionally.

CONTENTS

1. REPORT REVISION HISTORY	5
2. CUSTOMER INFORMATION	5
3. TEST SITE INFORMATION	5
4. EQUIPMENT UNDER TEST (EUT) INFORMATION	6
5. TEST SUMMARY	8
6. MEASUREMENTS, EXAMINATION AND DERIVED RESULTS	9
6.1 AC POWER LINE CONDUCTED EMISSIONS.....	9
6.2 RADIATED EMISSIONS.....	15
ANNEX A. TEST INSTRUMENT.....	20
ANNEX B. EUT AND TEST SETUP PHOTOGRAPHS.....	21
ANNEX C. TEST SETUP AND SUPPORTING EQUIPMENT.....	26
ANNEX D. USER MANUAL / BLOCK DIAGRAM / SCHEMATICS / PARTLIST	29
ANNEX E. DECLARATION OF SIMILARITY	30

1. Report Revision History

Report No.	Report Version	Description	Issue Date
16070416-FCC-E	NONE	Original	May 20, 2016

2. Customer information

Applicant Name	Movitelco Trade, S.L
Applicant Add	Street: ABTAO,25-1Floor A-office MADRID-SPAIN
Manufacturer	Movitelco Trade, S.L
Manufacturer Add	Street: ABTAO,25-1Floor A-office MADRID-SPAIN

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 mobile phone
Main Model:	M14
Serial Model:	N/A
Date EUT received:	April 26, 2016
Test Date(s):	April 27 to May 20, 2016
Equipment Category :	Class B
Antenna Gain:	GSM850: -0.5dBi PCS1900: -0.8dBi Bluetooth: 0.4dBi
Type of Modulation:	GSM / GPRS: GMSK Bluetooth: GFSK
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 Bluetooth: 2402-2480 MHz
Number of Channels:	GSM 850: 124CH PCS1900: 299CHH Bluetooth: 79CH
Port:	Power Port, Earphone Port, USB Port
Input Power:	Adapter: Model: M14 Input: AC 100-240V; 50/60Hz;0.20A Output: DC 5.0V,300mA Battery: Model: MTT4C Spec:3.7V,600mAh,2.22Wh(min/typ) Limited charger voltage :4.2V

Test Report	16070416-FCC-E
Page	7 of 30

Trade Name : MTT

GPRS Multi-slot class 8/10/12

FCC ID: 2ACQKTELCO009

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
-	-	-

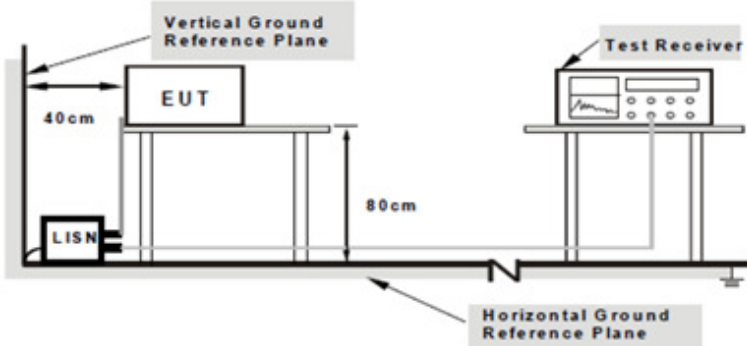
6. Measurements, Examination And Derived Results

6.1 AC Power Line Conducted Emissions

Temperature	22°C
Relative Humidity	53%
Atmospheric Pressure	1029mbar
Test date :	April 29, 2016
Tested By :	Winnie Zhang

Requirement(s):

Spec	Item	Requirement	Applicable														
47CFR§15.107	a)	For Low-power radio-frequency devices that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 kHz to 30 MHz, shall not exceed the limits in the following table, as measured using a 50 [mu] H/50 ohms line impedance stabilization network (LISN). The lower limit applies at the boundary between the frequencies ranges.															
		<table><tr><th rowspan="2">Frequency ranges (MHz)</th><th colspan="2">Limit (dBµV)</th></tr><tr><th>QP</th><th>Average</th></tr><tr><td>0.15 ~ 0.5</td><td>66 – 56</td><td>56 – 46</td></tr><tr><td>0.5 ~ 5</td><td>56</td><td>46</td></tr><tr><td>5 ~ 30</td><td>60</td><td>50</td></tr></table>		Frequency ranges (MHz)	Limit (dBµV)		QP	Average	0.15 ~ 0.5	66 – 56	56 – 46	0.5 ~ 5	56	46	5 ~ 30	60	50
		Frequency ranges (MHz)			Limit (dBµV)												
				QP	Average												
		0.15 ~ 0.5		66 – 56	56 – 46												
0.5 ~ 5	56	46															
5 ~ 30	60	50															

Test Setup	 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.
------------	---

Procedure	- The EUT and supporting equipment were set up in accordance with the requirements of the standard on top of a 1.5m x 1m x 0.8m high, non-metallic table. - The power supply for the EUT was fed through a 50W/50mH EUT LISN, connected to filtered mains.
-----------	---

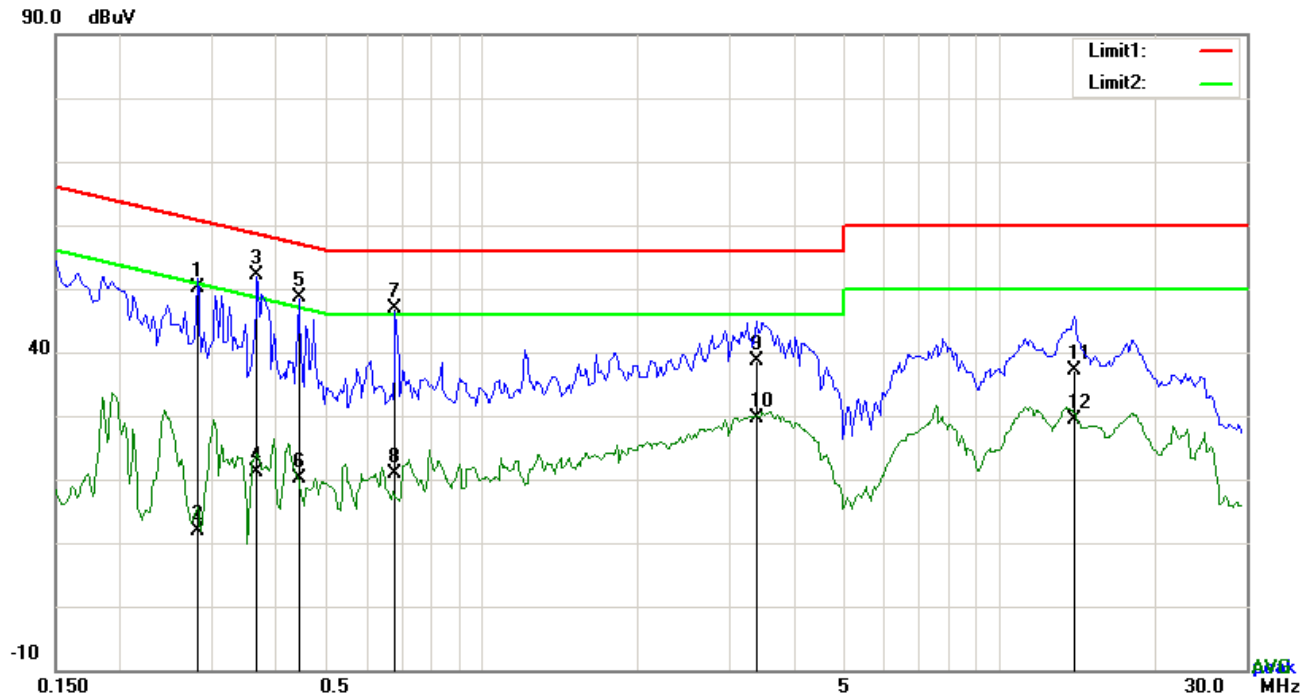
Test Report	16070416-FCC-E
Page	10 of 30

	3. The RF OUT of the EUT LISN was connected to the EMI test receiver via a low-loss 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: USB Mode

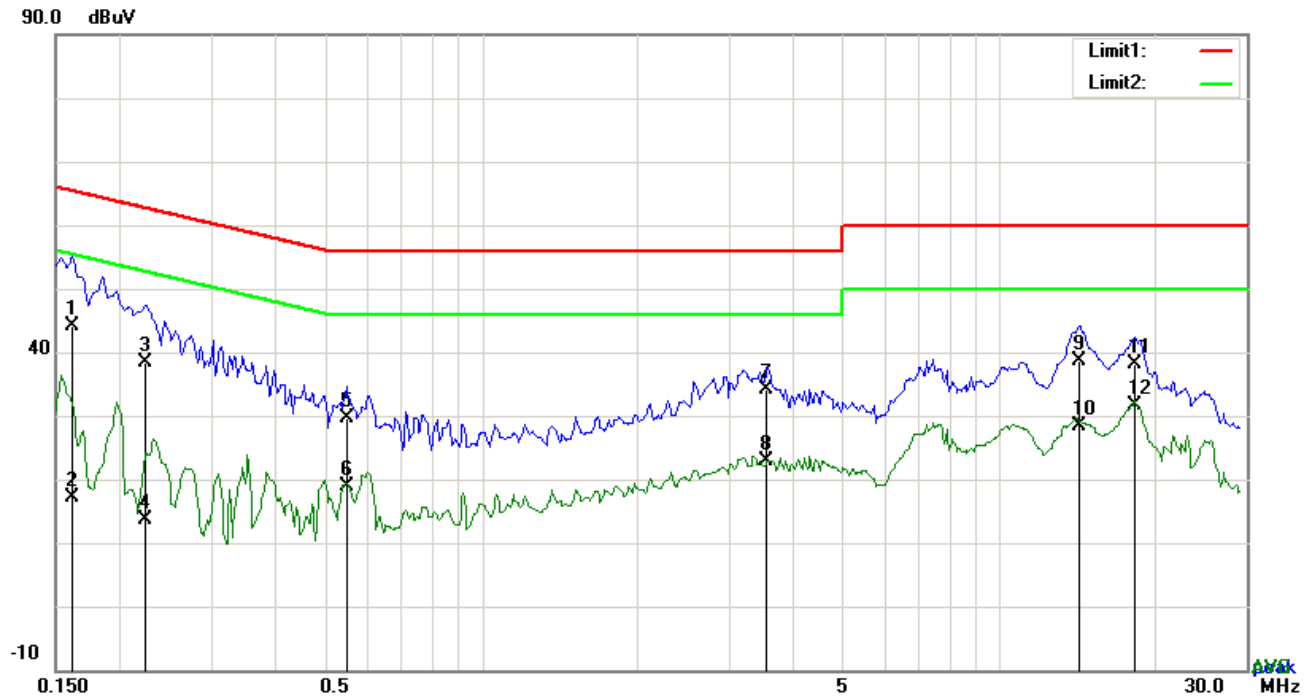


Test Data

Phase Line Plot at 120Vac, 60Hz

No.	P/L	Frequency	Reading	Detector	Corrected	Result	Limit	Margin
		(MHz)	(dBuV)		(dB}	(dBuV)	(dBuV)	(dB)
1	L1	0.2826	40.03	QP	10.03	50.06	60.74	-10.68
2	L1	0.2826	1.91	AVG	10.03	11.94	50.74	-38.80
3	L1	0.3684	42.01	QP	10.03	52.04	58.54	-6.50
4	L1	0.3684	11.00	AVG	10.03	21.03	48.54	-27.51
5	L1	0.4425	38.69	QP	10.03	48.72	57.01	-8.29
6	L1	0.4425	10.10	AVG	10.03	20.13	47.01	-26.88
7	L1	0.6804	36.82	QP	10.03	46.85	56.00	-9.15
8	L1	0.6804	10.83	AVG	10.03	20.86	46.00	-25.14
9	L1	3.3861	28.67	QP	10.06	38.73	56.00	-17.27
10	L1	3.3861	19.53	AVG	10.06	29.59	46.00	-16.41
11	L1	13.9551	26.92	QP	10.21	37.13	60.00	-22.87
12	L1	13.9551	19.09	AVG	10.21	29.30	50.00	-20.70

Test Mode: USB Mode

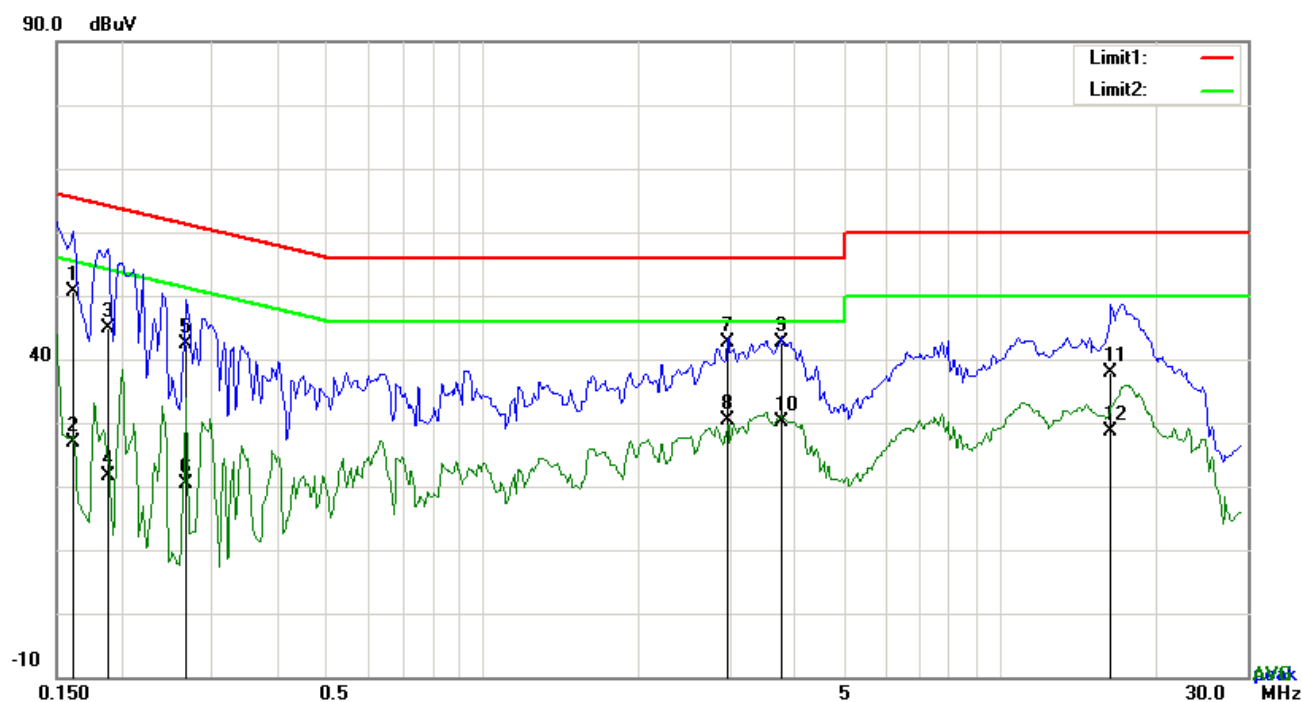


Test Data

Phase Neutral Plot at 120Vac, 60Hz

No.	P/L	Frequency	Reading	Detector	Corrected	Result	Limit	Margin
		(MHz)	(dBuV)		(dB}	(dBuV)	(dBuV)	(dB)
1	N	0.1617	34.19	QP	10.02	44.21	65.38	-21.17
2	N	0.1617	7.19	AVG	10.02	17.21	55.38	-38.17
3	N	0.2241	28.44	QP	10.02	38.46	62.67	-24.21
4	N	0.2241	3.62	AVG	10.02	13.64	52.67	-39.03
5	N	0.5478	19.50	QP	10.02	29.52	56.00	-26.48
6	N	0.5478	8.85	AVG	10.02	18.87	46.00	-27.13
7	N	3.5616	24.17	QP	10.06	34.23	56.00	-21.77
8	N	3.5616	12.82	AVG	10.06	22.88	46.00	-23.12
9	N	14.2671	28.48	QP	10.19	38.67	60.00	-21.33
10	N	14.2671	18.29	AVG	10.19	28.48	50.00	-21.52
11	N	18.2451	27.88	QP	10.24	38.12	60.00	-21.88
12	N	18.2451	21.50	AVG	10.24	31.74	50.00	-18.26

Test Mode: USB Mode

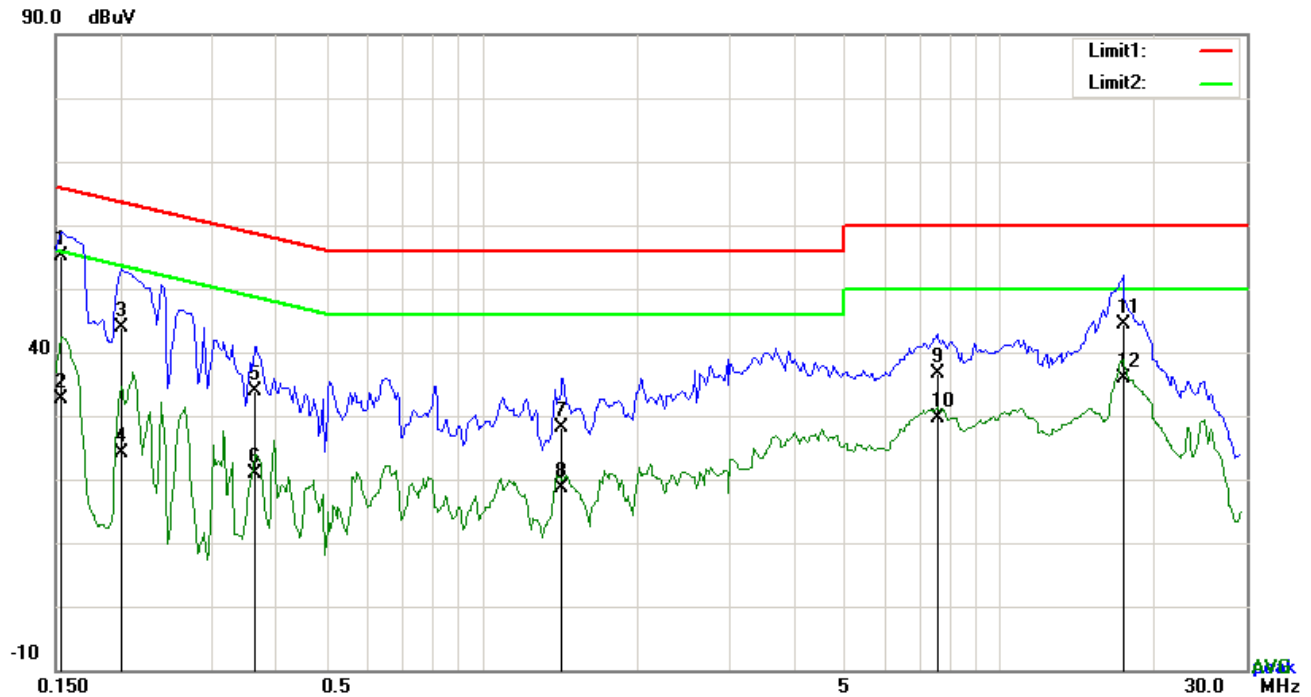


Test Data

Phase Line Plot at 240Vac, 60Hz

No.	P/L	Frequency	Reading	Detector	Corrected	Result	Limit	Margin
		(MHz)	(dBuV)		(dB)	(dBuV)	(dBuV)	(dB)
1	L1	0.1617	40.64	QP	10.03	50.67	65.38	-14.71
2	L1	0.1617	16.78	AVG	10.03	26.81	55.38	-28.57
3	L1	0.1890	34.95	QP	10.03	44.98	64.08	-19.10
4	L1	0.1890	11.70	AVG	10.03	21.73	54.08	-32.35
5	L1	0.2670	32.32	QP	10.03	42.35	61.21	-18.86
6	L1	0.2670	10.41	AVG	10.03	20.44	51.21	-30.77
7	L1	2.9775	32.66	QP	10.05	42.71	56.00	-13.29
8	L1	2.9775	20.36	AVG	10.05	30.41	46.00	-15.59
9	L1	3.7605	32.63	QP	10.06	42.69	56.00	-13.31
10	L1	3.7605	20.01	AVG	10.06	30.07	46.00	-15.93
11	L1	16.3536	27.60	QP	10.25	37.85	60.00	-22.15
12	L1	16.3536	18.47	AVG	10.25	28.72	50.00	-21.28

Test Mode: USB Mode



Test Data

Phase Neutral Plot at 240Vac, 60Hz

No.	P/L	Frequency	Reading	Detector	Corrected	Result	Limit	Margin
		(MHz)	(dBuV)		(dB)	(dBuV)	(dBuV)	(dB)
1	N	0.1539	45.14	QP	10.02	55.16	65.79	-10.63
2	N	0.1539	22.67	AVG	10.02	32.69	55.79	-23.10
3	N	0.2007	33.98	QP	10.02	44.00	63.58	-19.58
4	N	0.2007	14.04	AVG	10.02	24.06	53.58	-29.52
5	N	0.3645	23.98	QP	10.02	34.00	58.63	-24.63
6	N	0.3645	10.85	AVG	10.02	20.87	48.63	-27.76
7	N	1.4331	18.17	QP	10.03	28.20	56.00	-27.80
8	N	1.4331	8.64	AVG	10.03	18.67	46.00	-27.33
9	N	7.5747	26.45	QP	10.11	36.56	60.00	-23.44
10	N	7.5747	19.46	AVG	10.11	29.57	50.00	-20.43
11	N	17.3715	34.03	QP	10.23	44.26	60.00	-15.74
12	N	17.3715	25.75	AVG	10.23	35.98	50.00	-14.02

6.2 Radiated Emissions

Temperature	22°C
Relative Humidity	53%
Atmospheric Pressure	1029mbar
Test date :	April 29, 2016
Tested By :	Winnie Zhang

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		
		Frequency range (MHz)		Field Strength (µV/m)
		30 – 88		100
		88 – 216		150
		216 960		200
		Above 960		500

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

Procedure	- The EUT was switched on and allowed to warm up to its normal operating condition. - The test was carried out at the selected frequency points obtained from the EUT characterization. Maximization of the emissions, was carried out by rotating the EUT, changing the antenna polarization, and adjusting the antenna height in the following manner: - Vertical or horizontal polarization (whichever gave the higher emission level
-----------	--

Test Report	16070416-FCC-E
Page	16 of 30

	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 Quasi 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 with Peak detection for Average Measurement as below at frequency above 1GHz. ■ 1 kHz (Duty cycle < 98%) □ 10 Hz (Duty cycle > 98%) 5. Steps 2 and 3 were repeated for the next frequency point, until all selected frequency points were measured.
Remark	
Result	☒ Pass ☐ Fail

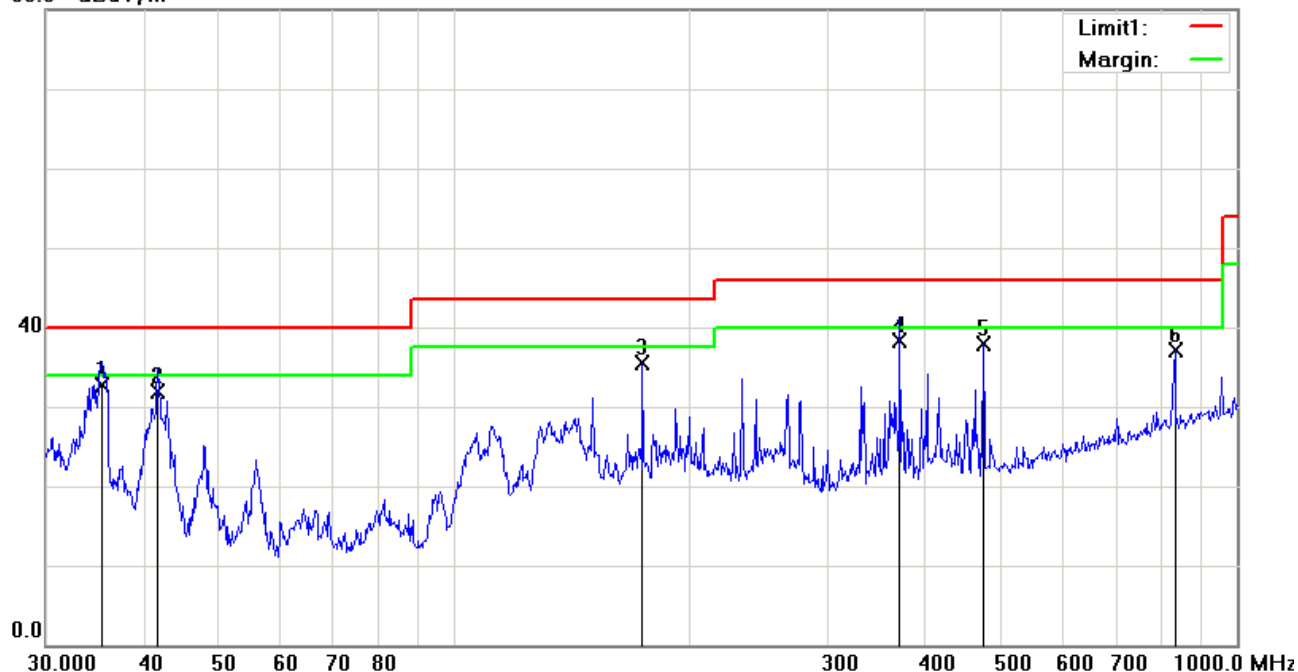
Test Data ☒ Yes ☐ N/A

Test Plot ☒ Yes (See below) ☐ N/A

Test Mode : USB Mode

Below 1GHz

80.0 dBuV/m

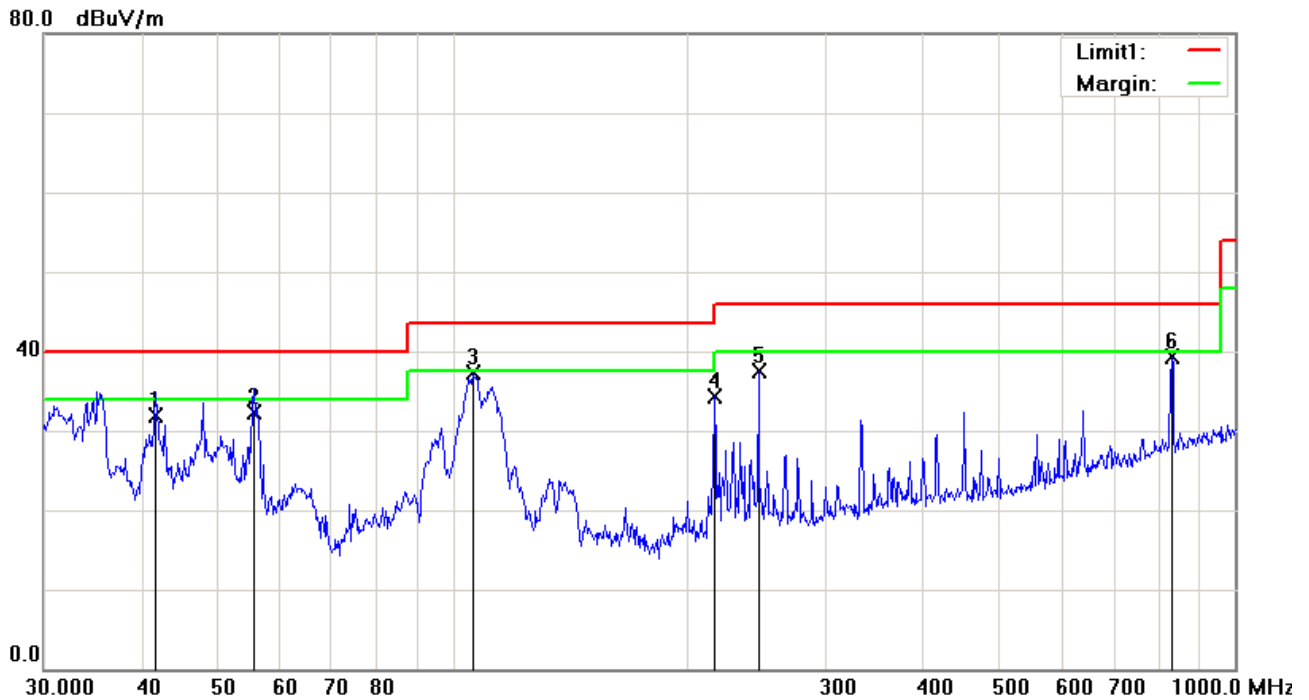


Test Data

Horizontal Polarity Plot @3m

No.	P/L	Frequency	Reading	Detector	Corrected	Result	Limit	Margin	Height	Degree
		(MHz)	(dBuV/m)		(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(°)
1	H	35.3750	36.93	QP	-4.21	32.72	40.00	-7.28	100	85
2	H	41.7130	40.60	QP	-8.73	31.87	40.00	-8.13	100	360
3	H	173.8135	44.90	peak	-9.41	35.49	43.50	-8.01	100	0
4	H	370.7023	43.25	QP	-4.98	38.27	46.00	-7.73	100	0
5	H	473.8347	40.26	peak	-2.41	37.85	46.00	-8.15	100	0
6	H	833.3171	33.44	peak	3.61	37.05	46.00	-8.95	100	70

Below 1GHz



Test Data

Vertical Polarity Plot @3m

No.	P/L	Frequency	Reading	Detector	Corrected	Result	Limit	Margin	Height	Degree
		(MHz)	(dBuV/m)		(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(°)
1	V	41.7130	40.64	QP	-8.73	31.91	40.00	-8.09	100	154
2	V	55.8047	46.25	QP	-13.86	32.39	40.00	-7.61	100	94
3	V	106.0126	47.06	peak	-9.73	37.33	43.50	-6.17	100	188
4	V	216.0240	43.11	peak	-8.88	34.23	46.00	-11.77	100	94
5	V	245.9509	46.65	peak	-9.15	37.50	46.00	-8.50	100	169
6	V	830.4002	35.70	peak	3.57	39.27	46.00	-6.73	100	45

Above 1GHz

Frequency (MHz)	Amplitude (dBμV/m)	Azimuth	Height (cm)	Polarity (H/V)	Factors (dB)	Limit (dBμV/m)	Margin (dB)	Detector (PK/AV)
1588.31	49.22	67	120	V	-22.57	74	-24.78	PK
2074.82	48.57	120	131	V	-22.34	74	-25.43	PK
1768.12	49.69	73	160	V	-21.82	74	-24.31	PK
2158.74	50.21	62	200	H	-22.60	74	-23.79	PK
2859.43	49.55	127	110	H	-23.65	74	-24.45	PK
1878.68	49.25	60	147	H	-21.78	74	-24.75	PK

Note1: The highest frequency of the EUT is 2480 MHz, so the testing has been conformed to $5 \times 2480 \text{ MHz} = 12,400 \text{ MHz}$.

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

Note3, X-Axis, Y-Axis and -Axis were investigated. The results above show only the worst case.

Note4: The AV measurement performed, more than 20dB below limit so AV test data was not presented.

Annex A. TEST INSTRUMENT

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

Annex B. EUT And Test Setup Photographs

Annex B.i. Photograph: EUT External Photo



Test Report	16070416-FCC-E
Page	22 of 30



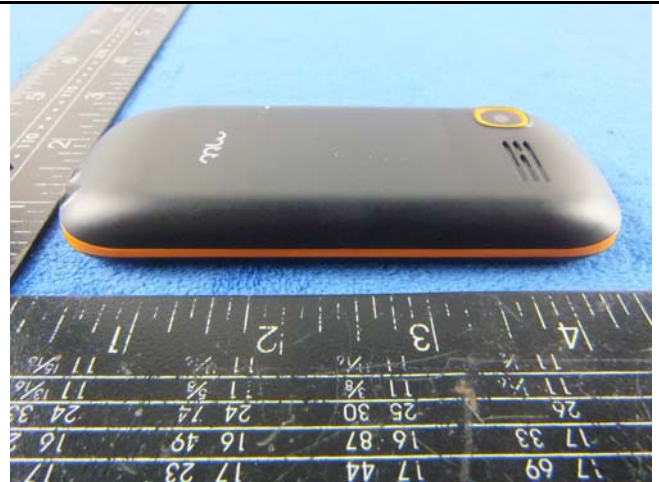
EUT - Top View



EUT - Bottom View



EUT - Left View



EUT - Right View

Annex B.ii. Photograph: EUT Internal Photo



Cover Off - Top View 1



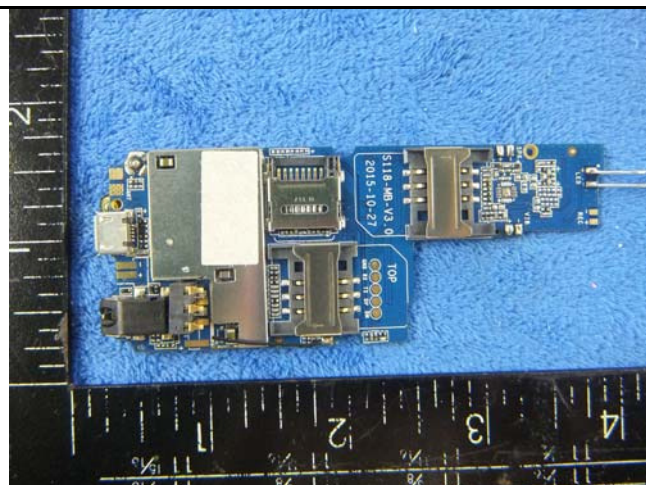
Cover Off - Top View 2



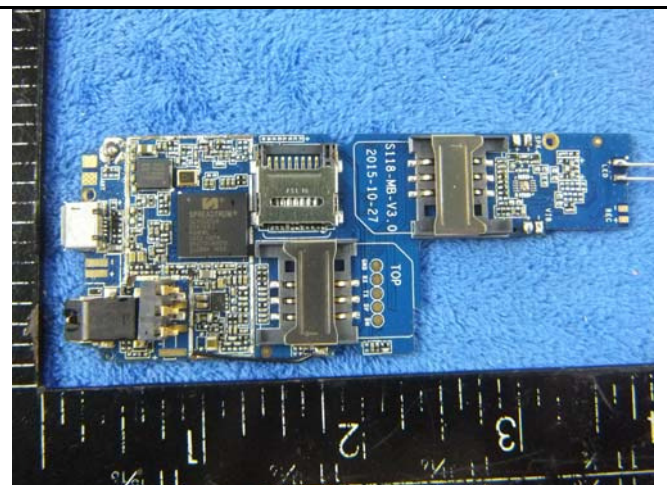
Battery - Front View



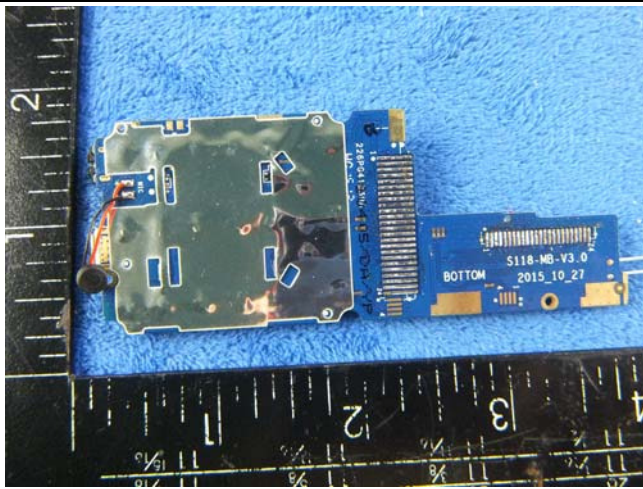
Battery - Rear View



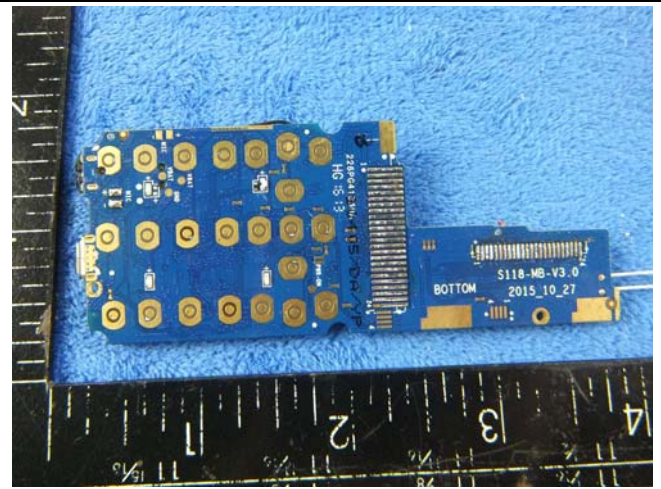
Mainboard with Shielding - Front View



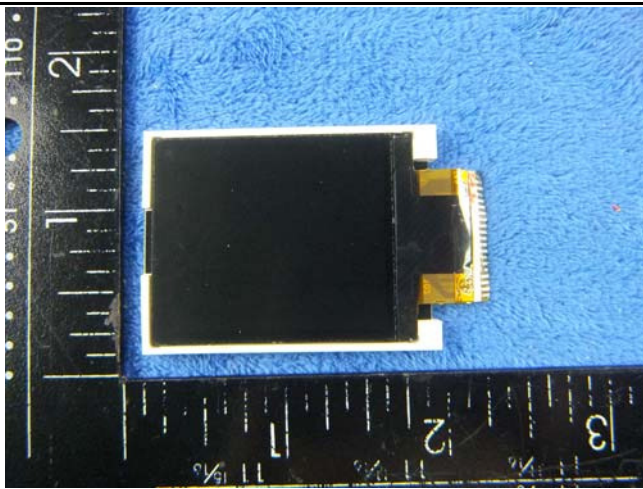
Mainboard without Shielding - Front View



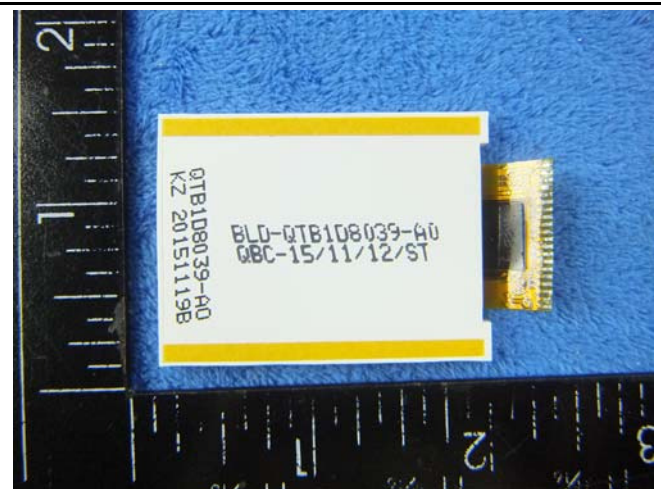
Mainboard with Shielding - Rear View



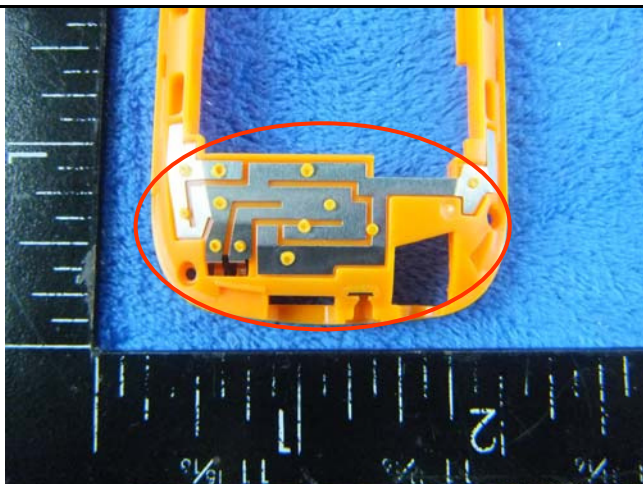
Mainboard without Shielding - Rear View



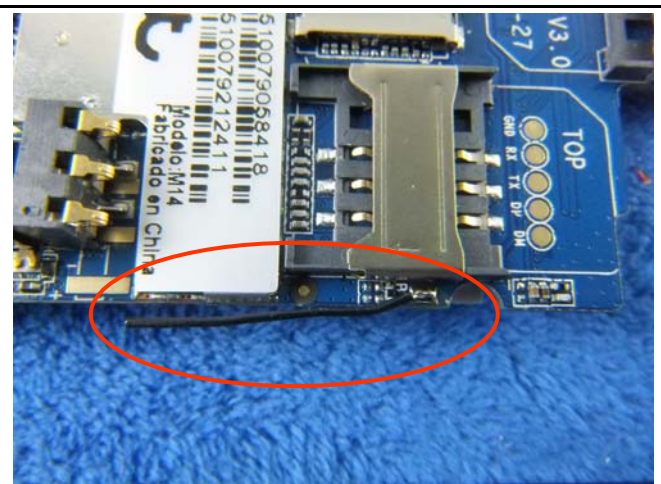
LCD - Front View



LCD - Rear View



GSM/PCS Antenna View



BT- Antenna View

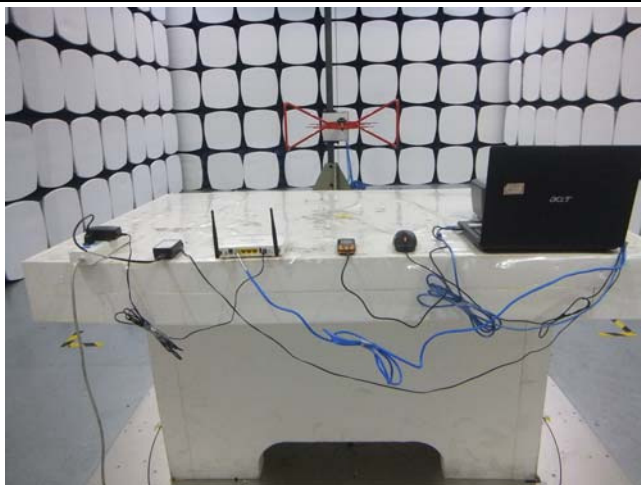
Annex B.iii. Photograph: Test Setup Photo



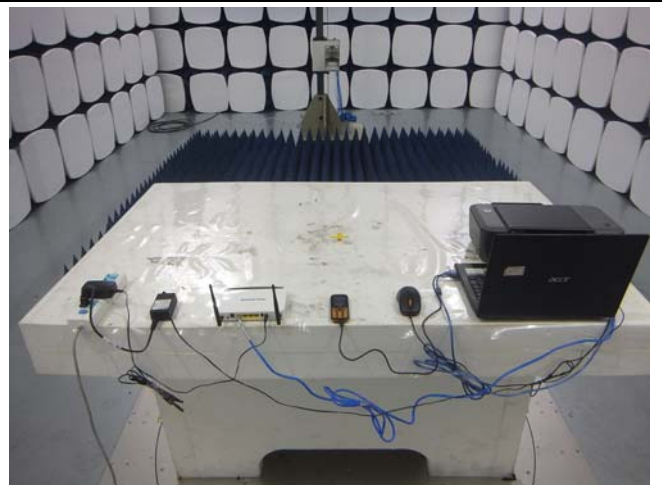
Conducted Emissions Test Setup – TF Card Front View



Conducted Emissions Test Setup – TF Card Side View



Radiated Emissions Test Setup Below 1GHz - TF Card Front View

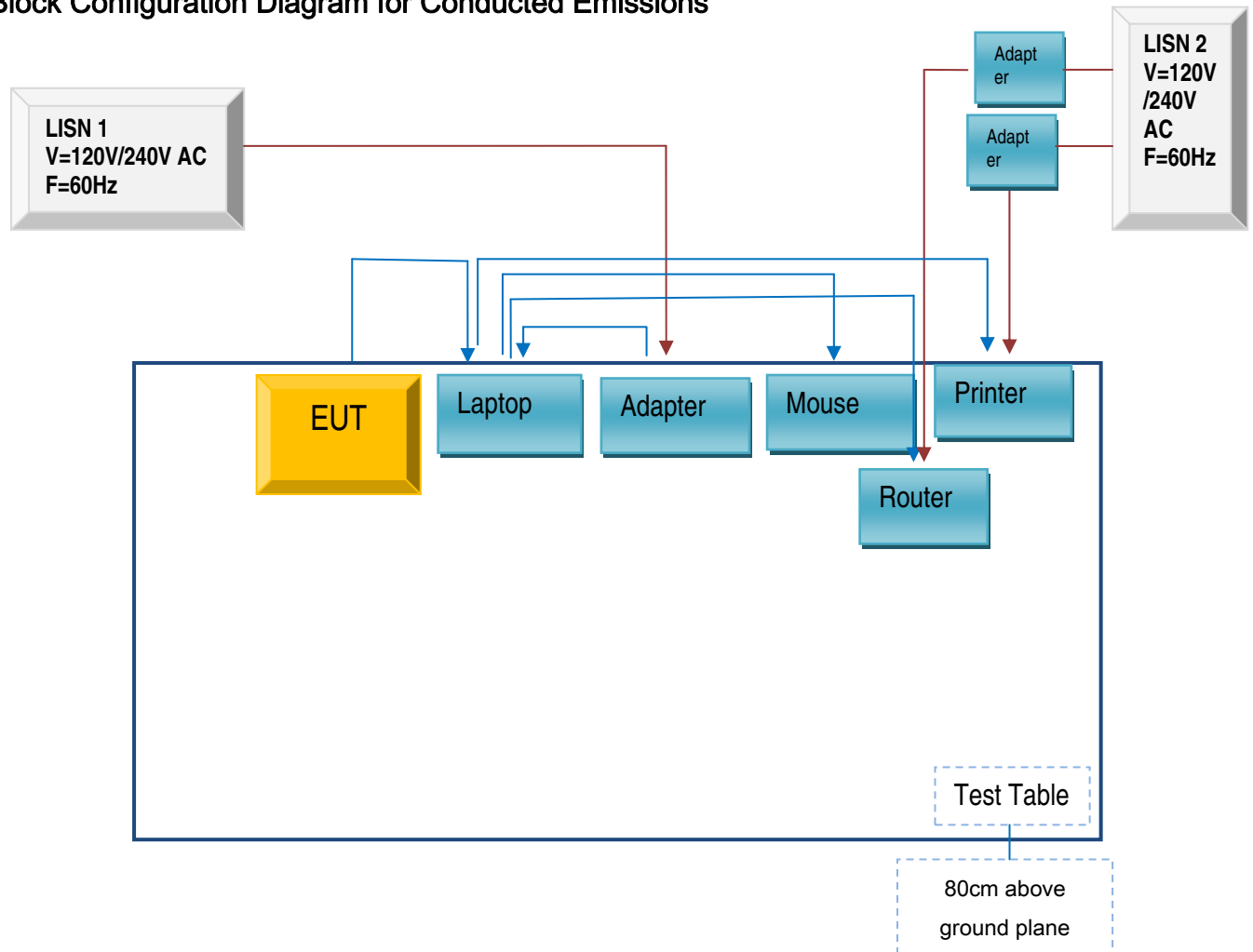


Radiated Emissions Test Setup Above 1GHz - TF Card Side View

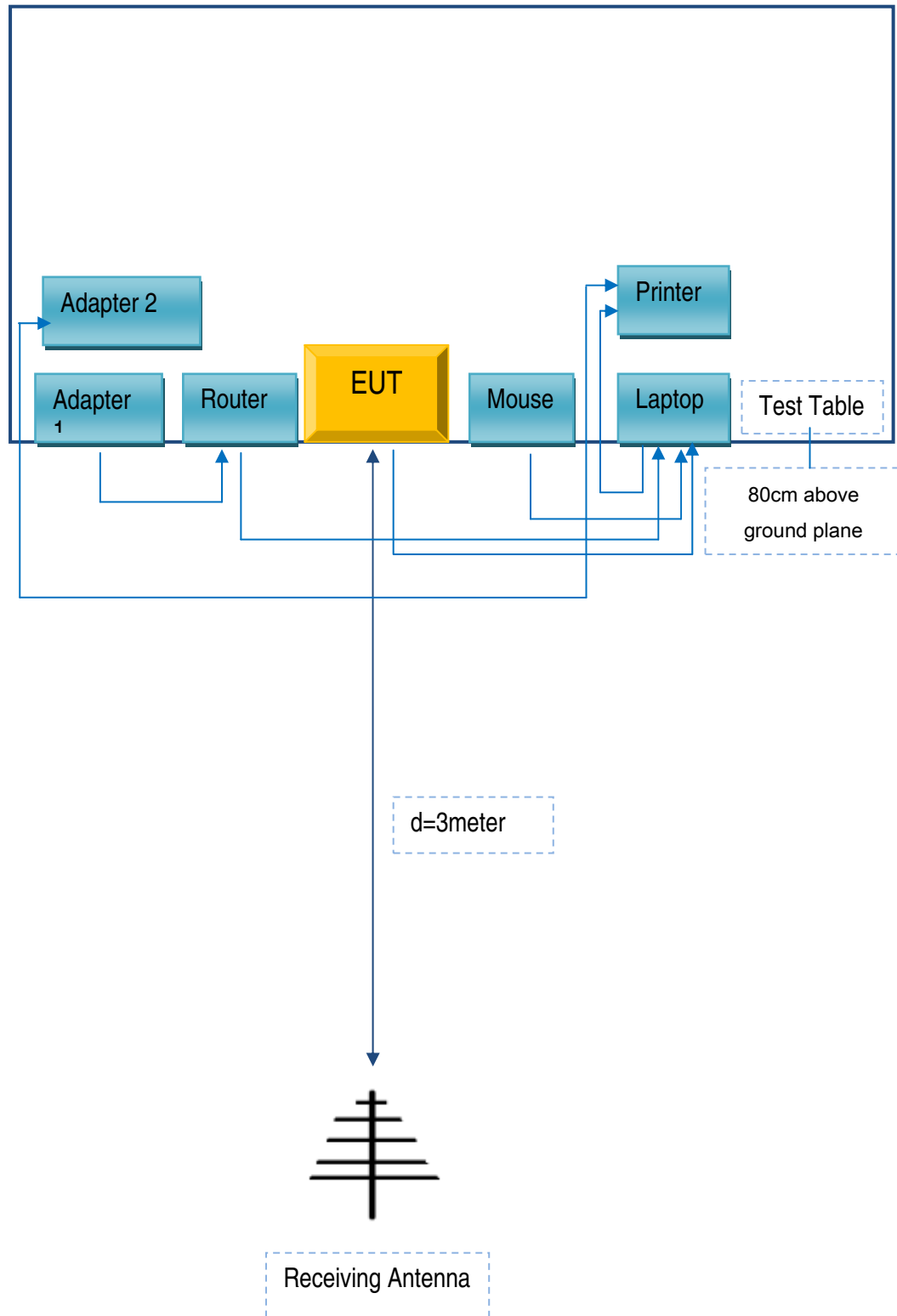
Annex C. TEST SETUP AND SUPPORTING EQUIPMENT

Annex C.ii. TEST SET UP BLOCK

Block Configuration Diagram for Conducted Emissions



Block Configuration Diagram for Radiated Emissions



Annex C. II. SUPPORTING EQUIPMENT DESCRIPTION

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

Supporting equipment:

Manufacturer	Equipment Description	Model	Serial No
Lenovo	Laptop	E40	LR-1EHRX
GOLDWEB	Router	R102	1202032094
Movitelco Trade, S.L	Adapter	M14	C2016012
Lenovo	AC Adapter	42T4416	21D9JU
HP	Printer	VCVRA-1003	CN36M19JWX
DELL	Mouse	E100	912NMTUT41481
BULL	Socket	GN-403	GN201203

Supporting Cable:

Cable type	Shield Type	Ferrite Core	Length	Serial No
USB Cable	Un-shielding	No	2m	JX120051274
USB Cable	Un-shielding	No	2m	C2016012
RJ45 Cable	Un-shielding	No	2m	KX156327541
Router Power cable	Un-shielding	No	2m	13274630Z
Printer Power cable	Un-shielding	No	2m	127581031
Power Cable	Un-shielding	No	0.8m	GT211032

Test Report	16070416-FCC-E
Page	29 of 30

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

Please see attachment

Test Report	16070416-FCC-E
Page	30 of 30

Annex E. DECLARATION OF SIMILARITY

N/A