EMC TEST REPORT

Report No.: 17071218-FCC-E

Supersede Report No: N/A

Applicant	Telepower Communication Co., Ltd
Product Name	Smart POS Terminal
Model No.	TPS900
Serial No.	N/A
Test Standard	FCC Part 15 Subpart B Class B:2017, ANSI C63.4: 2014
Test Date	November 09, 2017 to January 29, 2018
Issue Date	January 30, 2018
Test Result	☑ Pass ☐ Fail
Equipment complied with the specification	☑
Equipment did not comply with the specification	☐

Evans He	David Huang	
Test Engineer	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

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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
17071218-FCC-E	NONE	Original	January 30, 2018

2. Customer information

Applicant Name	Telepower Communication Co., Ltd
Applicant Add	5 Bld, Zone A, Hantian Technology Town,No.17 ShenHai RD, Nanhai District Foshan, China
Manufacturer	Telepower Communication Co., Ltd
Manufacturer Add	5 Bld, Zone A, Hantian Technology Town,No.17 ShenHai RD, Nanhai District Foshan, China

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.	535293
IC Test Site No.	4842E-1
Test Software of Radiated Emission	Radiated Emission Program-To Shenzhen v2.0
Test Software of Conducted Emission	EZ-EMC(ver.Icp-03A1)

4. Equipment under Test (EUT) Information

Description of EUT:	Smart POS Terminal
Main Model:	TPS900
Serial Model:	N/A
Antenna Gain:	GSM850: -4dBi PCS1900: 0dBi UMTS-FDD Band V: -4dBi UMTS-FDD Band II: 0dBi LTE Band II: 0dBi LTE Band IV: 1dBi LTE Band V: -4dBi WIFI: 2.7dBi Bluetooth/BLE: 2.7dBi GPS: 1.6dBi
Antenna Type:	PIFA antenna
Input Power:	Adapter: Model: SC/10WA050200US Input: AC100-240V~50/60Hz,0.5A Output: DC 5.0V,2A Battery Model: 325987P Spec: 7.4V/2200mAh,16.28Wh Charging limited voltage: 8.4V
Equipment Category：	JBP

Type of Modulation:	GPRS: GMSK EGPRS: GMSK,8PSK UMTS-FDD: QPSK LTE Band: 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 II TX:1852.4 ~ 1907.6 MHz; RX: 1932.4 ~ 1987.6 MHz LTE Band II TX: 1850.7 ~ 1909.3MHz; RX : 1930.7 ~ 1989.3 MHz LTE Band IV TX: 1710.7 ~ 1754.3 MHz; RX : 2110.7~ 2154.3 MHz LTE Band V TX: 824.7~ 848.3 MHz; RX : 869.7 ~ 893.3MHz WIFI: 802.11b/g/n(20M): 2412-2462 MHz WIFI: 802.11n(40M): 2422-2452 MHz Bluetooth& BLE: 2402-2480 MHz GPS: 1575.42 MHz
Number of Channels:	GSM 850: 124CH PCS1900: 299CH UMTS-FDD Band V: 102CH UMTS-FDD Band II: 277CH WIFI :802.11b/g/n(20M): 11CH WIFI :802.11n(40M): 7CH Bluetooth: 79CH BLE: 40CH GPS:1CH
Port:	Please refer to user manual
Trade Name :	N/A
FCC ID:	2AJ2B-TPS900

Date EUT received: November 09, 2017

Test Date(s): November 09, 2017 to January 29, 2018

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

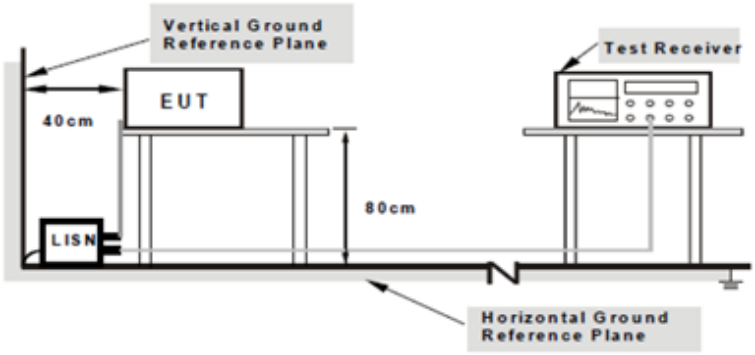
Parameter	Uncertainty
AC Power Line Conducted Emissions (150kHz~30MHz)	±3.11dB
Radiated Emission(30MHz~1GHz)	±5.12dB
Radiated Emission(1GHz~6GHz)	±5.34dB

6. Measurements, Examination And Derived Results

6.1 AC Power Line Conducted Emissions

Temperature	23℃
Relative Humidity	54%
Atmospheric Pressure	1020mbar
Test date :	December 28, 2017
Tested By :	Evans He

Requirement(s):

<table>
<tr><th>Spec</th><th>Item</th><th>Requirement</th><th>Applicable</th></tr>
<tr><td>47CFR§15.107</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 50Ω /50mH EUT LISN, connected to filtered mains.</td></tr>
</table>

	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 1:	**USB Mode**

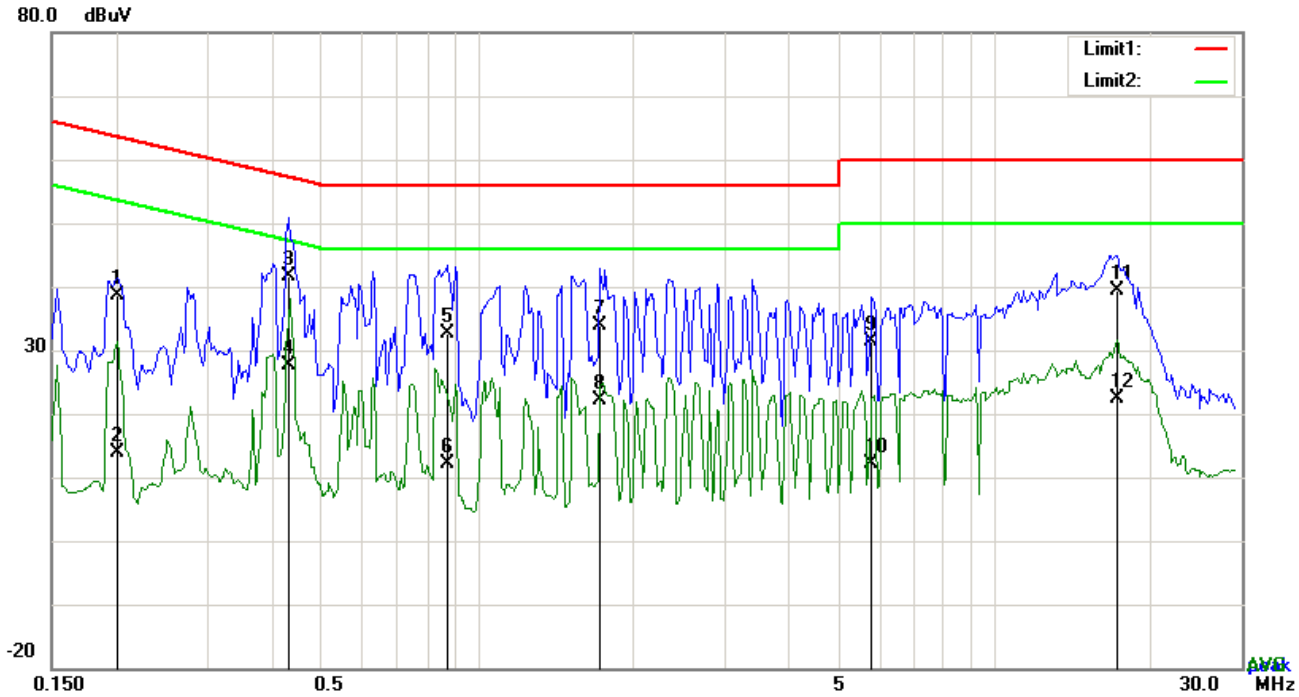
Test Mode 2:	**MP4 Mode**

Test Mode 3:	**Camera Mode**

Test Mode 4:	**FM Mode**

Note: All modes were investigated, the results below show only the worst case(USB mode).

Test Mode 1:	USB Mode

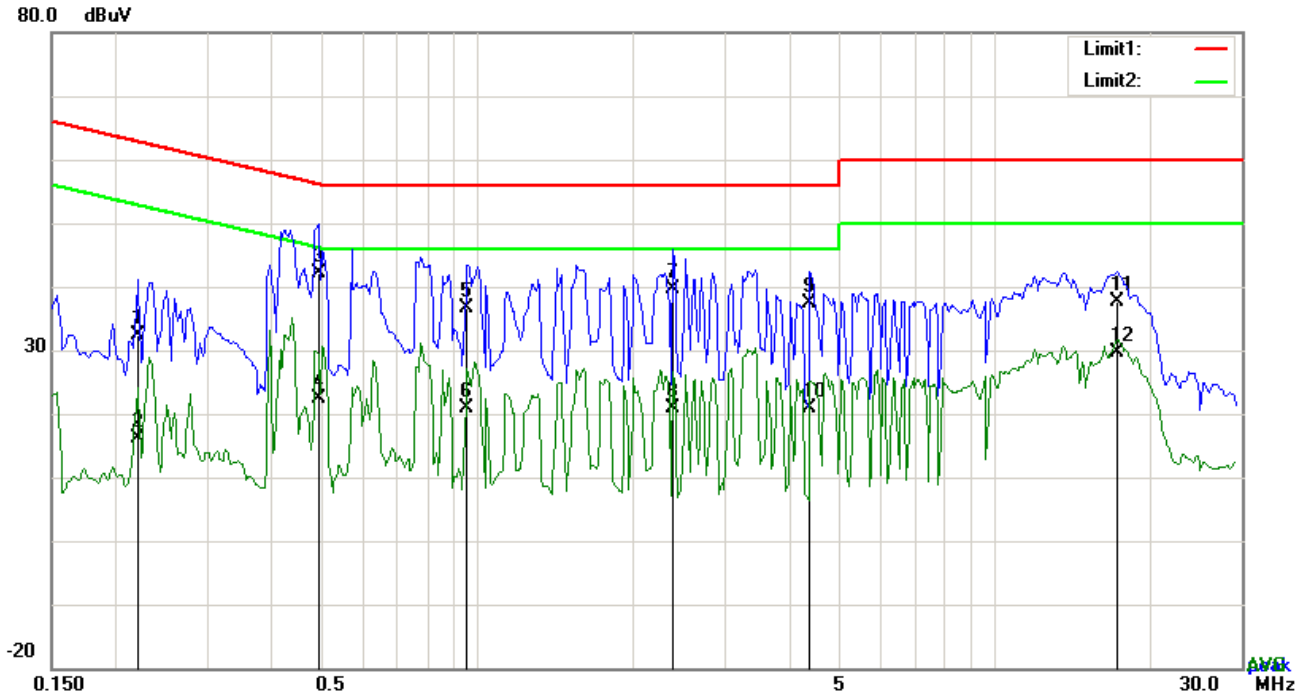


Test Data

Phase Line Plot at 120Vac, 60Hz

No.	P/L	Frequency	Reading	Detector	Corrected	Result	Limit	Margin
		(MHz)	(dBuV)		(dB}	(dBuV)	(dBuV)	(dB)
1	L1	0.2007	28.58	QP	10.03	38.61	63.58	-24.97
2	L1	0.2007	3.96	AVG	10.03	13.99	53.58	-39.59
3	L1	0.4308	31.64	QP	10.03	41.67	57.24	-15.57
4	L1	0.4308	17.55	AVG	10.03	27.58	47.24	-19.66
5	L1	0.8754	22.68	QP	10.03	32.71	56.00	-23.29
6	L1	0.8754	2.21	AVG	10.03	12.24	46.00	-33.76
7	L1	1.7217	23.79	QP	10.04	33.83	56.00	-22.17
8	L1	1.7217	12.14	AVG	10.04	22.18	46.00	-23.82
9	L1	5.7885	21.32	QP	10.09	31.41	60.00	-28.59
10	L1	5.7885	1.95	AVG	10.09	12.04	50.00	-37.96
11	L1	17.2272	29.15	QP	10.26	39.41	60.00	-20.59
12	L1	17.2272	12.07	AVG	10.26	22.33	50.00	-27.67

Test Mode 1:	USB Mode

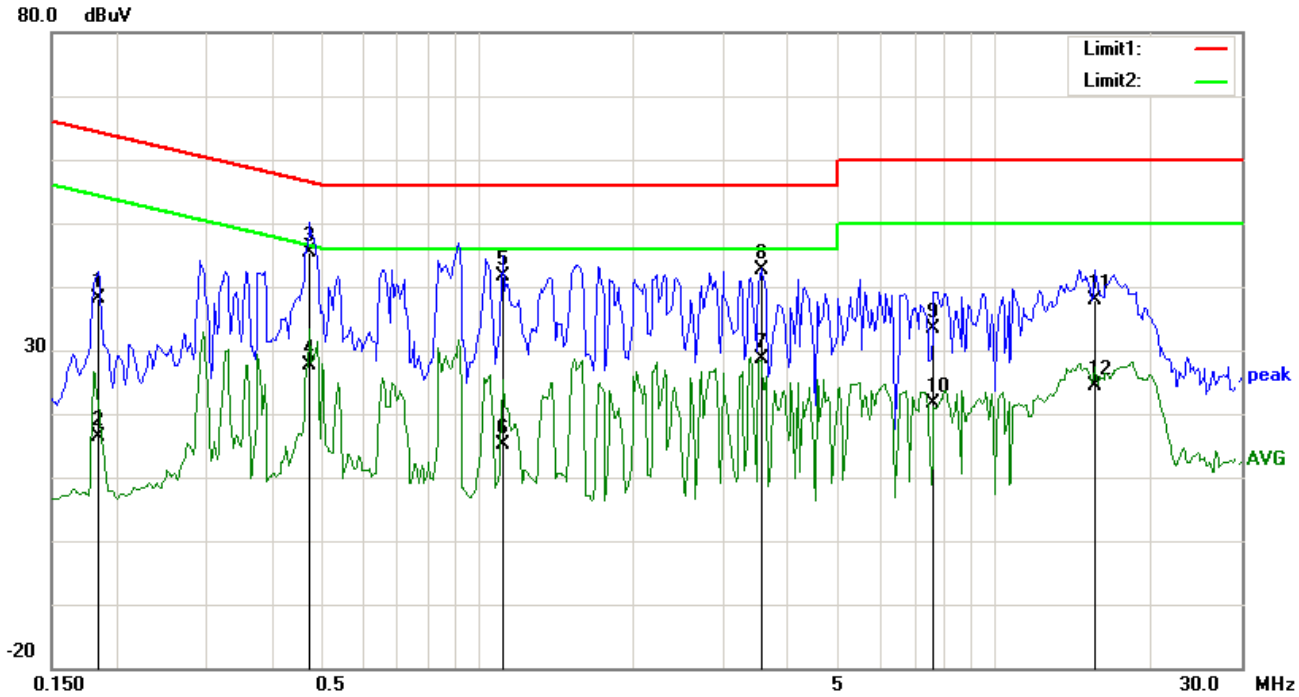


Test Data

Phase Neutral Plot at 120Vac, 60Hz

No.	P/L	Frequency	Reading	Detector	Corrected	Result	Limit	Margin
		(MHz)	(dBuV)		(dB}	(dBuV)	(dBuV)	(dB)
1	N	0.2202	22.34	QP	10.02	32.36	62.81	-30.45
2	N	0.2202	6.20	AVG	10.02	16.22	52.81	-36.59
3	N	0.4932	32.13	QP	10.02	42.15	56.11	-13.96
4	N	0.4932	12.26	AVG	10.02	22.28	46.11	-23.83
5	N	0.9534	26.65	QP	10.03	36.68	56.00	-19.32
6	N	0.9534	10.85	AVG	10.03	20.88	46.00	-25.12
7	N	2.3925	29.51	QP	10.04	39.55	56.00	-16.45
8	N	2.3925	10.93	AVG	10.04	20.97	46.00	-25.03
9	N	4.4040	27.31	QP	10.06	37.37	56.00	-18.63
10	N	4.4040	10.90	AVG	10.06	20.96	46.00	-25.04
11	N	17.2155	27.39	QP	10.23	37.62	60.00	-22.38
12	N	17.2155	19.42	AVG	10.23	29.65	50.00	-20.35

Test Mode 1:	USB Mode

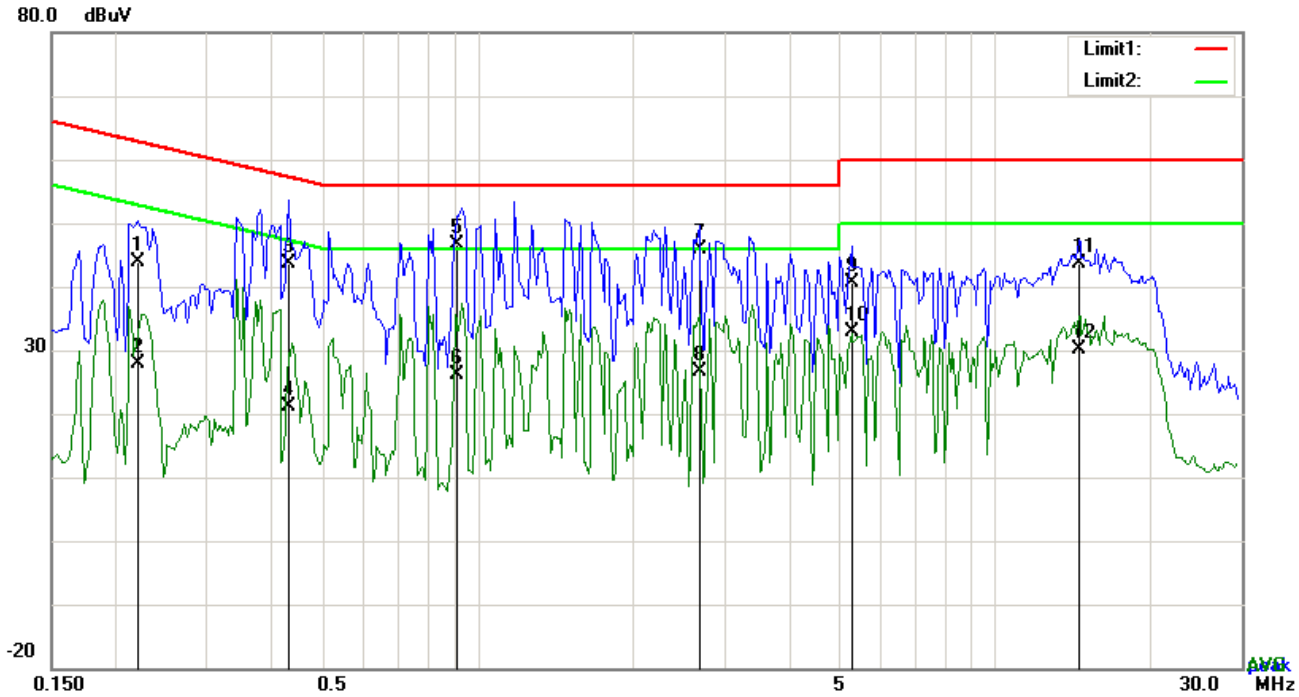


Test Data

Phase Line Plot at 240Vac, 60Hz

No.	P/L	Frequency	Reading	Detector	Corrected	Result	Limit	Margin
		(MHz)	(dBuV)		(dB}	(dBuV)	(dBuV)	(dB)
1	L1	0.1851	28.15	QP	10.02	38.17	64.25	-26.08
2	L1	0.1851	6.29	AVG	10.02	16.31	54.25	-37.94
3	L1	0.4737	35.48	QP	10.02	45.50	56.45	-10.95
4	L1	0.4737	17.54	AVG	10.02	27.56	46.45	-18.89
5	L1	1.1211	31.54	QP	10.03	41.57	56.00	-14.43
6	L1	1.1211	5.08	AVG	10.03	15.11	46.00	-30.89
7	L1	3.5382	18.48	AVG	10.06	28.54	46.00	-17.46
8	L1	3.5382	32.56	QP	10.06	42.62	56.00	-13.38
9	L1	7.6137	23.39	QP	10.11	33.50	60.00	-26.50
10	L1	7.6137	11.44	AVG	10.11	21.55	50.00	-28.45
11	L1	15.5658	27.71	QP	10.21	37.92	60.00	-22.08
12	L1	15.5658	14.11	AVG	10.21	24.32	50.00	-25.68

Test Mode 1:	USB Mode



Test Data

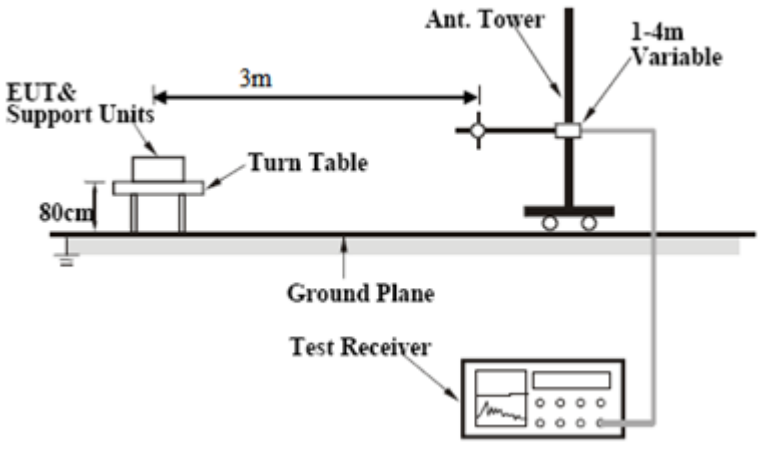
Phase Neutral Plot at 240Vac, 60Hz

No.	P/L	Frequency	Reading	Detector	Corrected	Result	Limit	Margin
		(MHz)	(dBuV)		(dB}	(dBuV)	(dBuV)	(dB)
1	N	0.2202	33.75	QP	10.02	43.77	62.81	-19.04
2	N	0.2202	17.81	AVG	10.02	27.83	52.81	-24.98
3	N	0.4308	33.63	QP	10.02	43.65	57.24	-13.59
4	N	0.4308	11.05	AVG	10.02	21.07	47.24	-26.17
5	N	0.9183	36.55	QP	10.03	46.58	56.00	-9.42
6	N	0.9183	16.01	AVG	10.03	26.04	46.00	-19.96
7	N	2.6811	35.88	QP	10.05	45.93	56.00	-10.07
8	N	2.6811	16.66	AVG	10.05	26.71	46.00	-19.29
9	N	5.2815	30.47	QP	10.07	40.54	60.00	-19.46
10	N	5.2815	22.70	AVG	10.07	32.77	50.00	-17.23
11	N	14.5908	33.49	QP	10.20	43.69	60.00	-16.31
12	N	14.5908	19.87	AVG	10.20	30.07	50.00	-19.93

6.2 Radiated Emissions

Temperature	23℃
Relative Humidity	54%
Atmospheric Pressure	1020mbar
Test date :	December 28, 2017
Tested By :	Evans He

Requirement(s):

<table>
<tr><th>Spec</th><th>Item</th><th>Requirement</th><th>Applicable</th></tr>
<tr><td>47CFR§15.109(d)</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>Test Setup</td><td colspan="3"> 
</td></tr>
<tr><td>Procedure</td><td colspan="3">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</td></tr>
</table>

	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 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 1:	**USB Mode**

Test Mode 2:	**MP4 Mode**

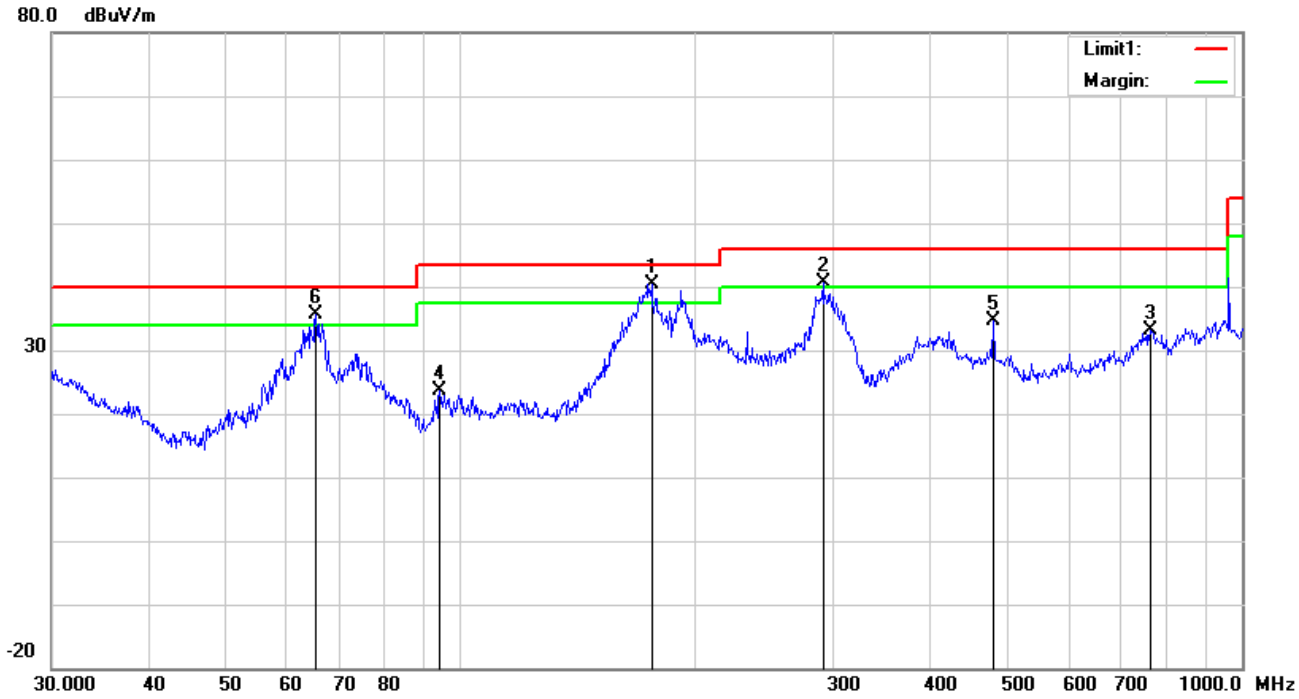
Test Mode 3:	**Camera Mode**

Test Mode 4:	**FM Mode**

Note: All modes were investigated, the results below show only the worst case(USB mode).

Test Mode 1:	USB Mode

Below 1GHz

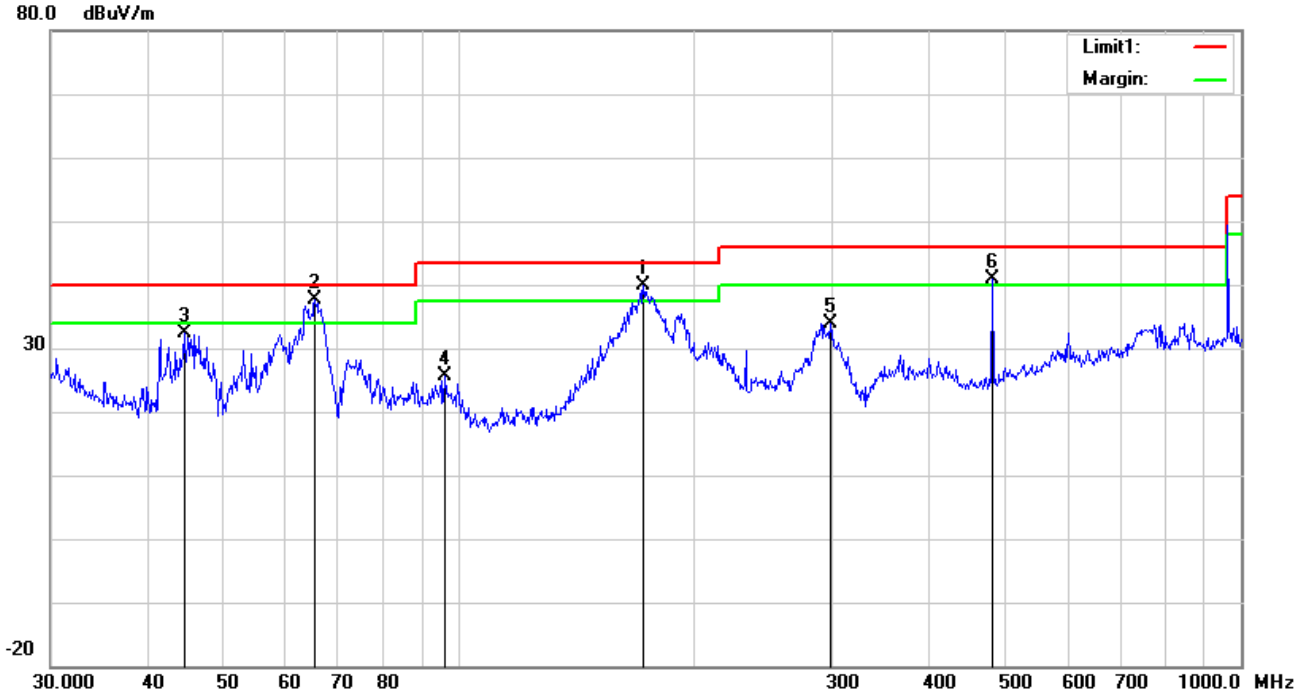


Test Data

Horizontal Polarity Plot @3m

No.	P/L	Frequency	Reading	Detector	Ant_F	PA_G	Cab_L	Result	Limit	Margin	Height	Degree
		(MHz)	(dBuV/m)		(dB/m)	(dB)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	( )
1	H	175.6516	49.95	QP	11.35	22.25	1.36	40.41	43.50	-3.09	100	112
2	H	291.0360	47.85	QP	13.21	22.29	1.77	40.54	46.00	-5.46	100	158
3	H	763.3757	30.58	peak	20.96	21.23	2.89	33.20	46.00	-12.80	100	329
4	H	94.0979	35.96	peak	8.98	22.32	0.98	23.60	43.50	-19.90	100	201
5	H	480.5276	36.84	peak	17.31	21.85	2.31	34.61	46.00	-11.39	100	115
6	H	65.3432	49.63	QP	7.57	22.39	0.89	35.70	40.00	-4.30	100	203

Below 1GHz



Test Data

Vertical Polarity Plot @3m

No.	P/L	Frequency	Reading	Detector	Ant_F	PA_G	Cab_L	Result	Limit	Margin	Height	Degree
		(MHz)	(dBuV/m)		(dB/m)	(dB)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	( )
1	V	171.9946	49.12	QP	11.64	22.26	1.36	39.86	43.50	-3.64	100	7
2	V	65.3432	51.49	QP	7.57	22.39	0.89	37.56	40.00	-2.44	100	285
3	V	44.4308	42.84	peak	10.98	22.29	0.75	32.28	40.00	-7.72	100	178
4	V	95.7622	37.53	peak	9.38	22.32	1.01	25.60	43.50	-17.90	100	176
5	V	298.2681	40.85	peak	13.52	22.29	1.79	33.87	46.00	-12.13	100	118
6	V	480.5276	43.21	QP	17.31	21.85	2.31	40.98	46.00	-5.02	100	63

Above 1GHz

Frequency (MHz)	Read_level (dBμV/m)	Azimuth	Height (cm)	Polarity (H/V)	Level (dBμV/m)	Factors (dB)	Limit (dBμV/m)	Margin (dB)	Detector (PK/AV)
1231.72	68.83	344	100	V	-20.1	48.73	74	-25.27	PK
1767.88	63.47	342	100	V	-16.95	46.52	74	-27.48	PK
3010.25	60.92	303	100	V	-12.99	47.93	74	-26.07	PK
1140.99	65.06	120	100	H	-20.78	44.28	74	-29.72	PK
1997.57	63.58	315	100	H	-15.44	48.14	74	-25.86	PK
3703.99	57.53	285	100	H	-10.94	46.59	74	-27.41	PK

*Note1: The highest frequency of the EUT is 2480MHz, so the testing has been conformed to 5*2480MHz =12400MHz.*

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

Note3: 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	09/15/2017	09/14/2018	☑
Line Impedance Stabilization Network	LI-125A	191106	09/23/2017	09/22/2018	☑
Line Impedance Stabilization Network	LI-125A	191107	09/23/2017	09/22/2018	☑
LISN	ISN T800	34373	09/23/2017	09/22/2018	☑
Transient Limiter	LIT-153	531118	08/30/2017	08/29/2018	☑
Radiated Emissions					
EMI test receiver	ESL6	100262	09/15/2017	09/14/2018	☑
OPT 010 AMPLIFIER (0.1-1300MHz)	8447E	2727A02430	08/30/2017	08/29/2018	☑
Microwave Preamplifier (1 ~ 26.5GHz)	8449B	3008A02402	03/23/2017	03/22/2018	☑
Bilog Antenna (30MHz~6GHz)	JB6	A110712	09/19/2017	09/18/2018	☑
Double Ridge Horn Antenna	AH-118	71259	09/22/2017	09/21/2018	☑

Annex B. EUT And Test Setup Photographs

Annex B.i. Photograph: EUT External Photo

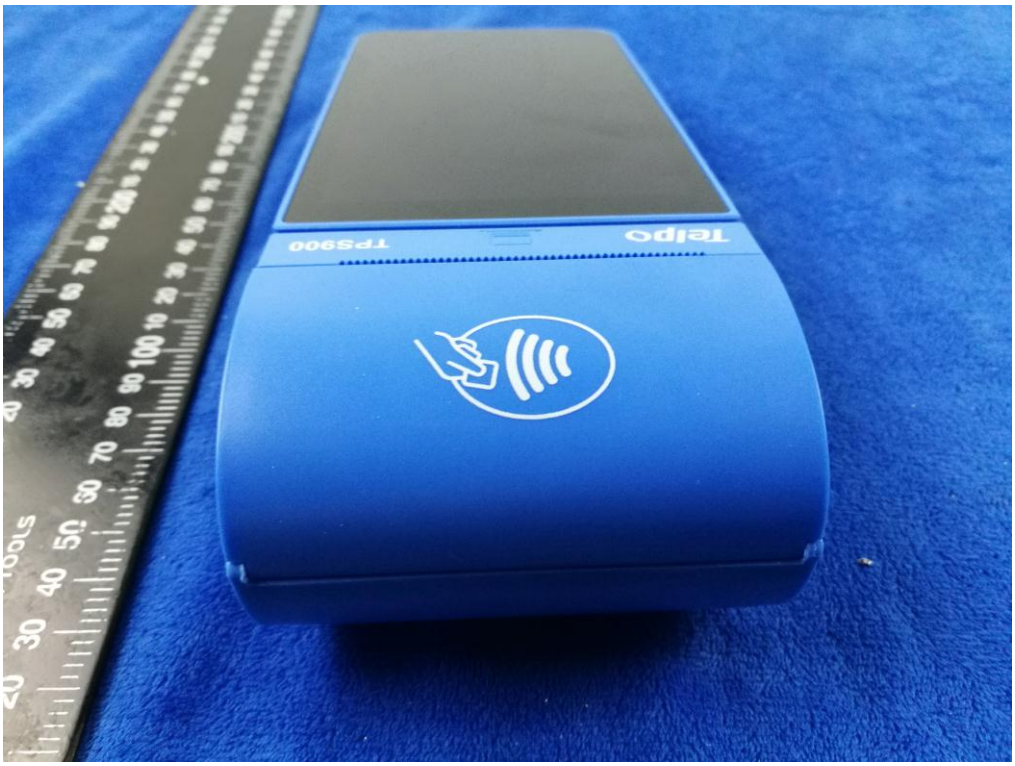
Whole Package View

Adapter - Lable View

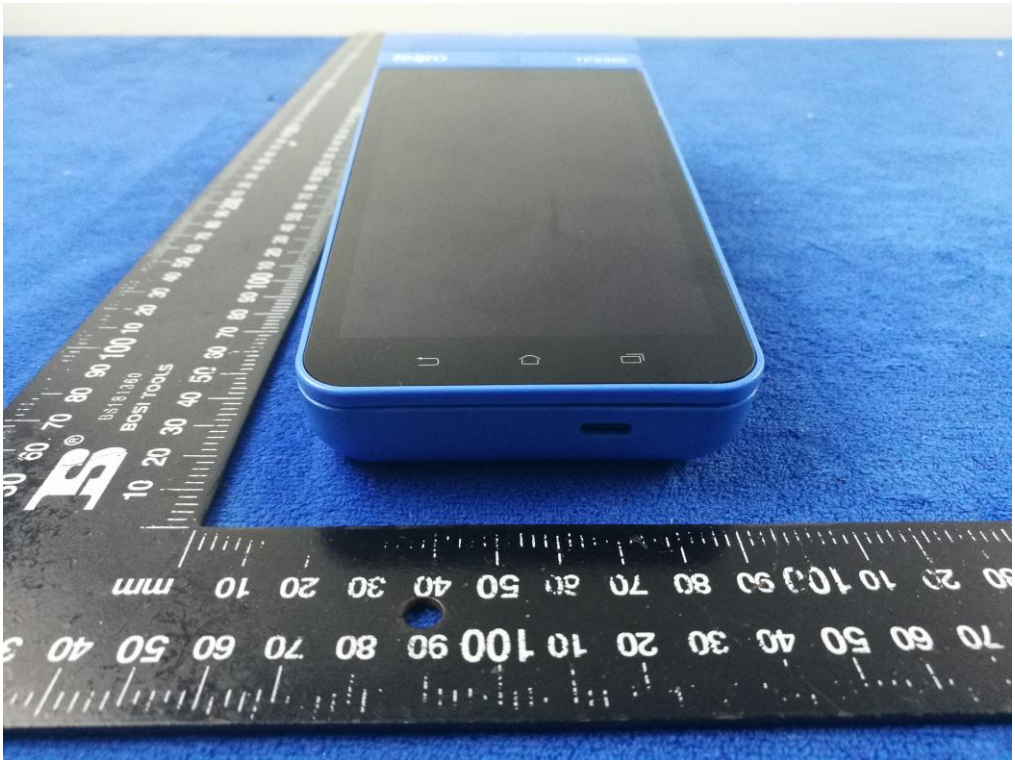
EUT - Front View

EUT - Rear View

EUT - Top View



EUT - Bottom View



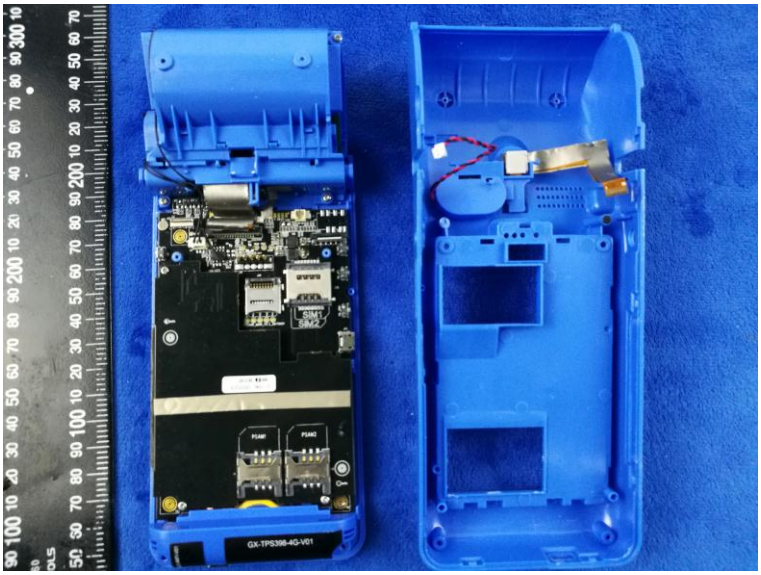
EUT - Left View

EUT - Right View

Annex B.ii. Photograph: EUT Internal Photo

Cover Off - Top View 1

Cover Off - Top View 2



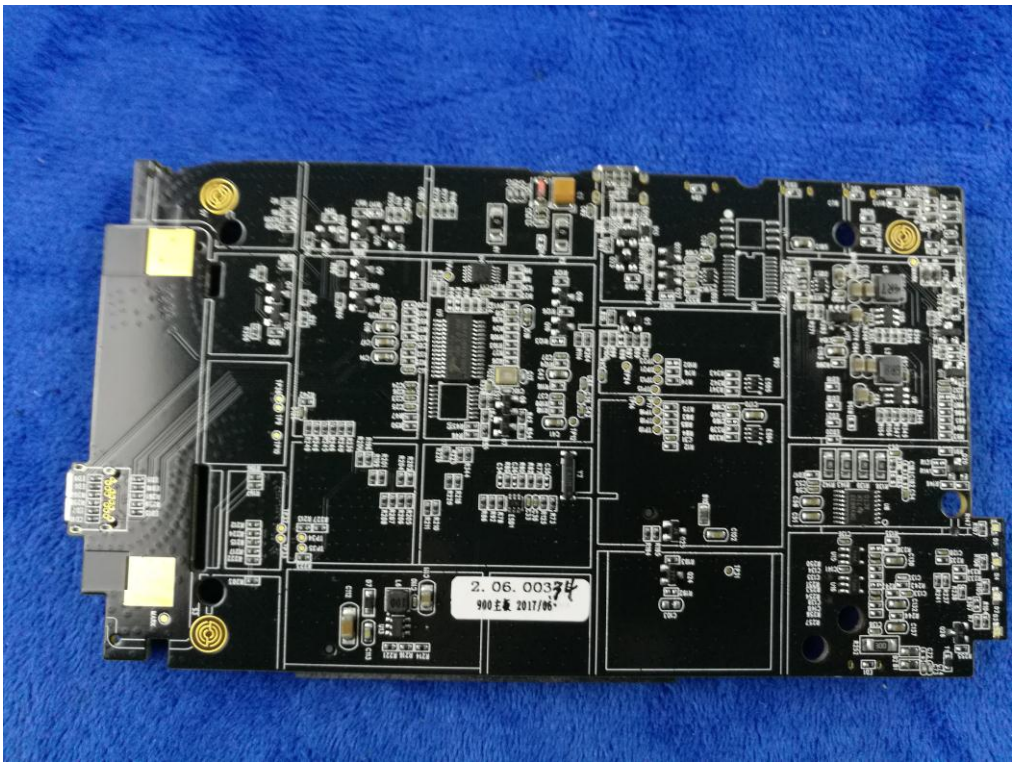
Battery - Front View

Battery - Rear View

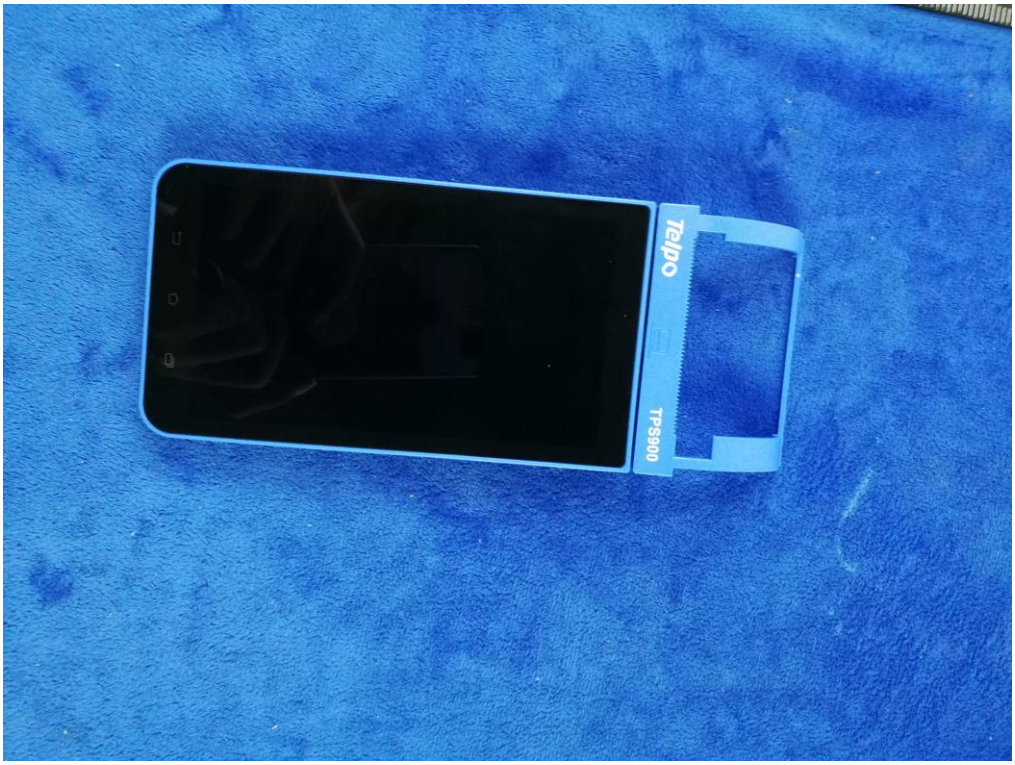
Mainboard with Shielding - Front View

Mainboard without Shielding - Front View

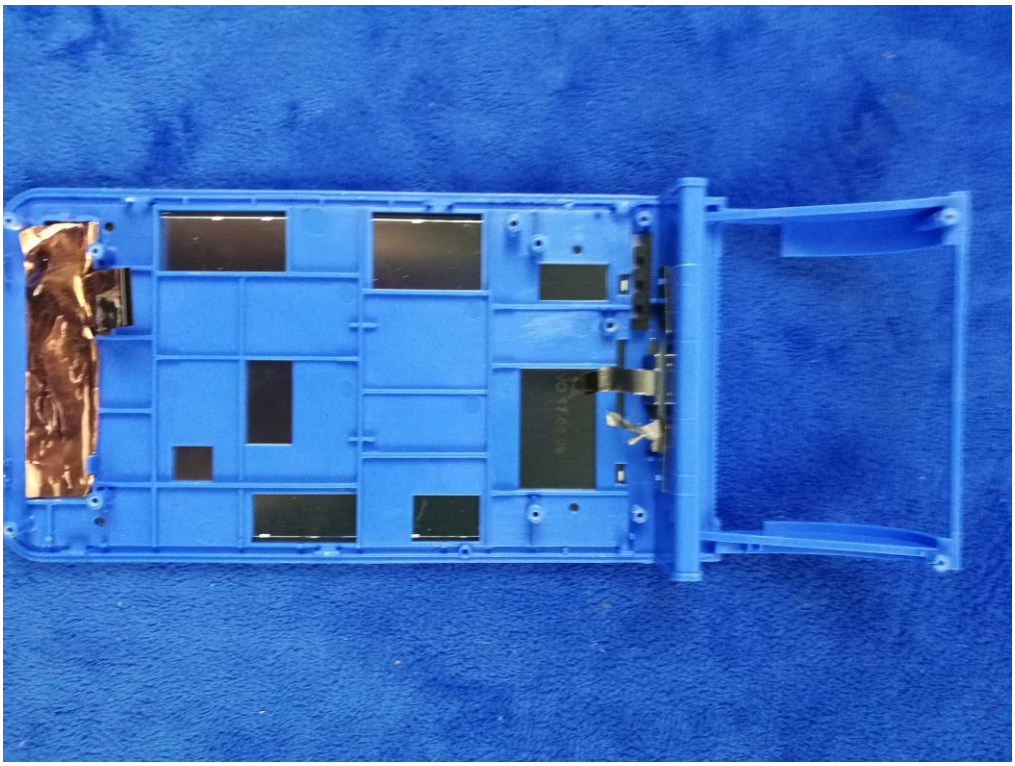
Mainboard – Rear View



LCD – Front View



LCD – Rear View



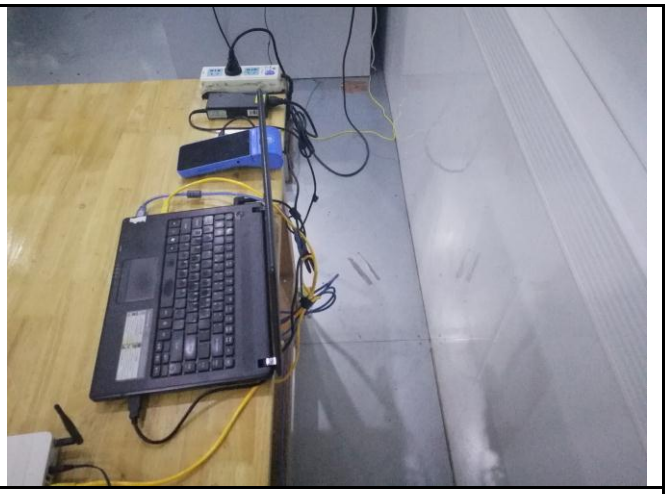
GSM/PCS/UMTS-FDD/LTE Antenna View

WIFI/BT/BLE - Antenna View

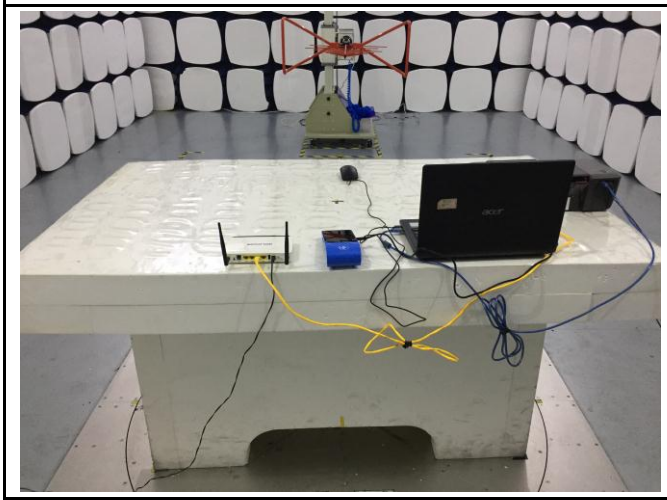
GPS - Antenna View

Annex B.iii. Photograph: Test Setup Photo

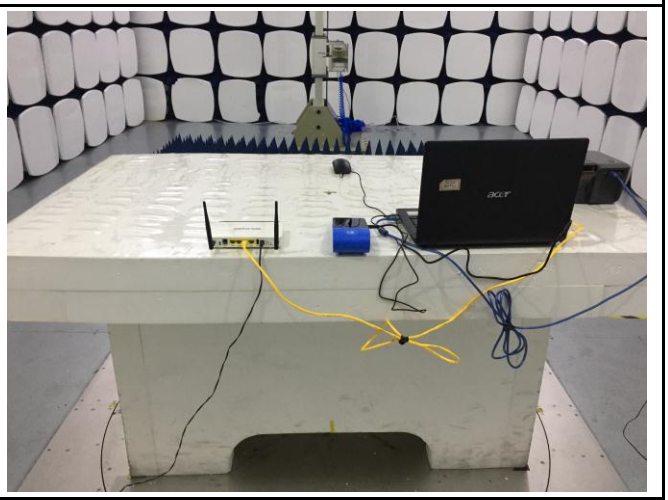
Conducted Emissions Test Setup – Front View



Conducted Emissions Test Setup – Side View



Radiated Emissions Test Setup Below 1GHz

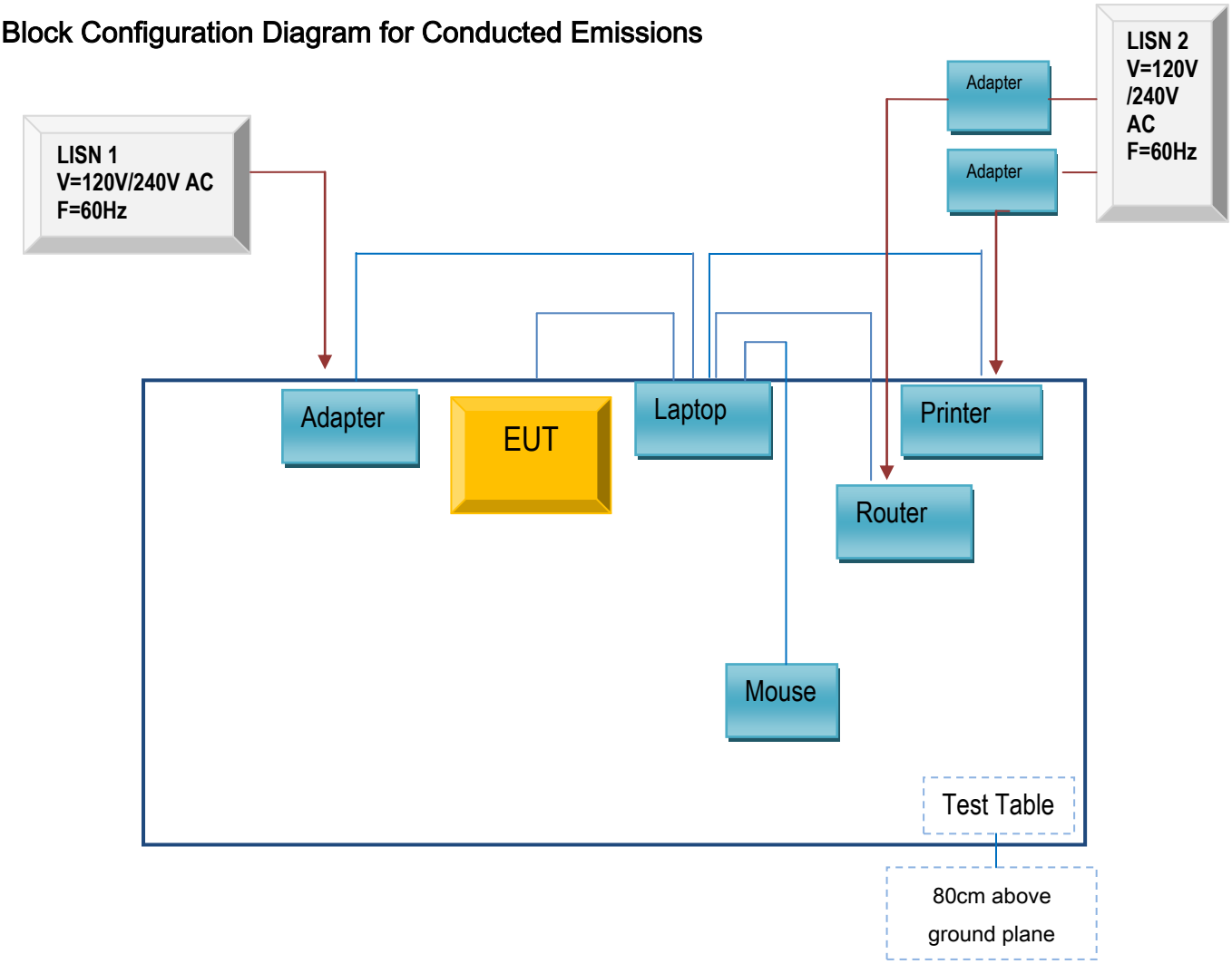


Radiated Emissions Test Setup Above 1GHz

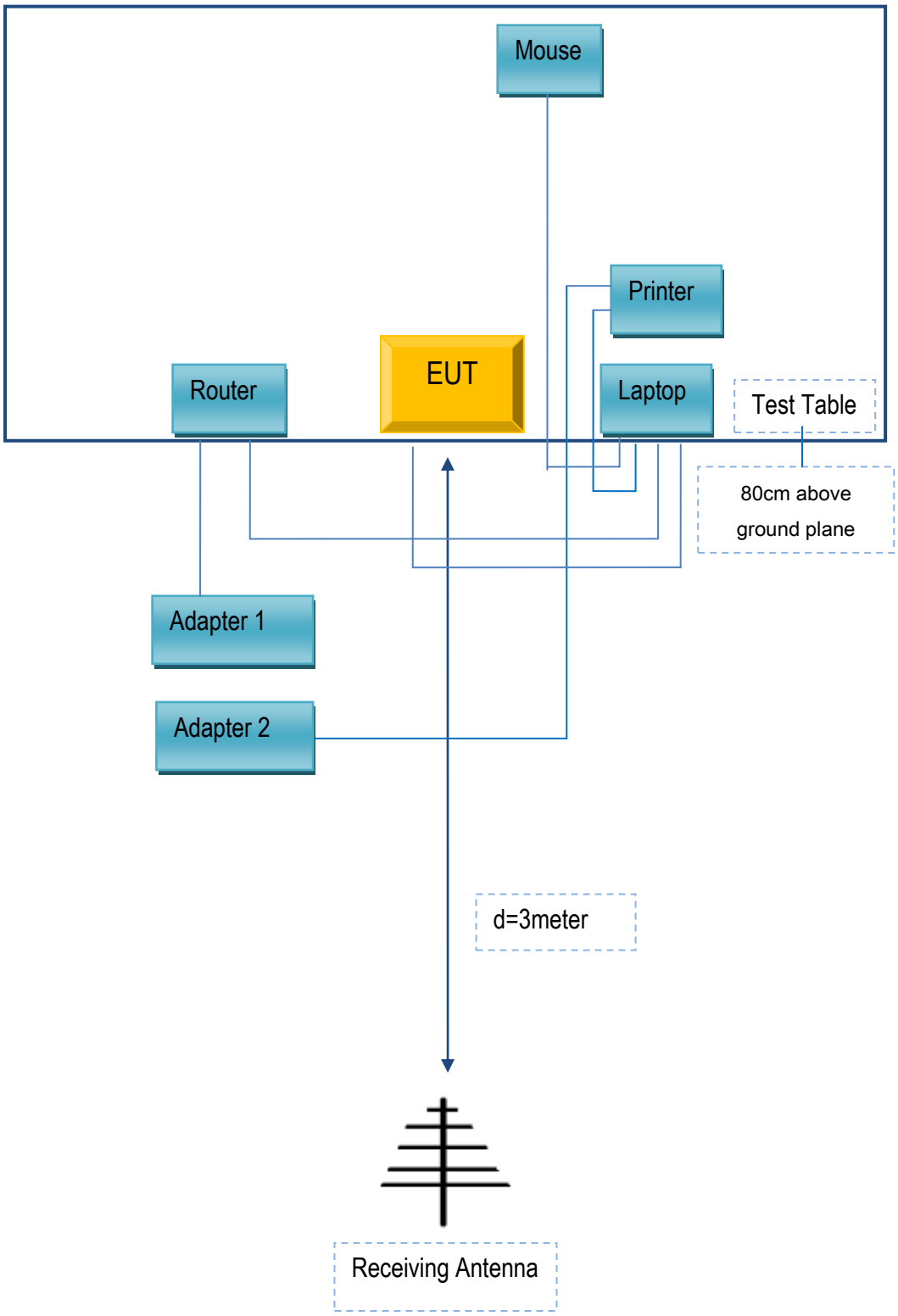
Annex C. TEST SETUP AND SUPPORTING EQUIPMENT

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
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	CBA3000AH0C1
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

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

Please see the attachment

Annex E. DECLARATION OF SIMILARITY

N/A