





FCC RF Test Report

Product Name: Smart Phone

Model Number: POT-LX1

Report No.: SYBH(Z-RF)20180912013001-2008

FCC ID: QISPOT-LX1

Reliability Laboratory of Huawei Technologies Co., Ltd.

(Global Compliance and Testing Center of Huawei Technologies Co., Ltd)

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Notice

 The Reliability Laboratory of Huawei Technologies Co., Ltd has passed the accreditation by The American Association for Laboratory Accreditation (A2LA). The accreditation number is 2174.01
The Laboratory of Sporton International (Shenzhen) Inc has passed the accreditation by National Voluntary Laboratory Accreditation Program (NVLAP). The NVLAP LAB CODE is 600156-0.
The Reliability Laboratory of Huawei Technologies Co., Ltd has been recognized by the US Federal Communications Commission (FCC) to perform compliance testing subject to the Commission's Certification rules. The Designation Number is CN1173, and the Test Firm Registration Number is 294140.

4. The Laboratory of Sporton International (Shenzhen) Inc has been recognized by the US Federal Communications Commission (FCC) to perform compliance testing subject to the Commission's Certification rules. The Designation Number is CN5019, and the Test Firm Registration Number is 577730.

5. The Reliability Laboratory of Huawei Technologies Co., Ltd has been listed by Industry Canada to perform electromagnetic emission measurements. The recognition numbers of test site are 6369A-1.

6. The Reliability Laboratory of Huawei Technologies Co., Ltd is also named "Global Compliance and Testing Center of Huawei Technologies Co., Ltd", the both names have coexisted since 2009.

7. The test report is invalid if not marked with the signatures of the persons responsible for preparing and approving the test report.

8. The test report is invalid if there is any evidence of erasure and/or falsification.

9. The test report is only valid for the test samples.

10. Content of the test report, in part or in full, cannot be used for publicity and/or promotional purposes without prior written approval from the laboratory.

Applicant:	Huawei Technologies Co., Ltd.
Address:	Administration Building, Headquarters of Huawei Technologies Co., Ltd.,
	Bantian, Longgang District, Shenzhen, 518129, P.R.C

Date of Receipt Sample:	2018-10-08
Start Date of Test:	2018-10-09
End Date of Test:	2018-11-05

Test Result: Pass

Approved by Senior
Engineer:2018-11-05He HaoHe HaoDateNameSignaturePrepared by:2018-11-05zhoulingboDateNameSignature



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1 General Information

Applied Standard 1.1 47 CFR FCC Part 02 **Applied Rules:** 47 CFR FCC Part 15 Subpart C (15.225) 1.2 **Test Location** Reliability Laboratory of Huawei Technologies Co., Ltd. Test Location 1: Address1: No.2 New City Avenue Songshan Lake Sci. & Tech. Industry Park, Dongguan, Guangdong, P.R.C Test Location 2: Sporton International (Shenzhen) Inc. No.3 Building, the third floor of south, Shahe River west, Fengzeyuan Address1: warehouse, Nanshan District, Shenzhen, Guangdong, P.R.China 1.3 **Test Environmental Condition** 20 – 25 °C Ambient Temperature: 45 – 55 % Ambient Relative Humidity: Atmospheric Pressure: 101 kPa

Public

2 Summary

FCC Rule No.	Test Description	Test Limit	Test Condition	Test Result	Reference	Testing location		
TRANSMITTER MODE								
15.225 (a)	In-Band Emissions	15,848µV/m @ 30m 13.553 – 13.567 MHz		Pass	Section 5.2	Location 2		
2.1049	Bandwidth	N/A		Pass	Section 5.1	Location 1		
15.225(b)	In-Band Emissions	334µV/m @ 30m 13.410 – 13.553 MHz 13.567 – 13.710 MHz		Pass	Section 5.2	Location 2		
15.225(c)	In-Band Emissions	106µV/m @ 30m 13.110 – 13.410 MHz 13.710 – 14.010 MHz	RADIATED	RADIATED	RADIATED	Pass	Section 5.2	Location 2
15.225(d) 15.209	Out-of-Band Emissions	FCC: Emissions outside of the specified band (13.110 – 14.010 MHz) must meet the radiated limits detailed in 15.209		Pass	Section 5.3	Location 2		
15.225(e)	Frequency Stability Tolerance	± 0.01% of Operating Frequency	Temperature Chamber	Pass	Section 5.4	Location 1		
15.207	AC Conducted Emissions 150kHz – 30MHz	FCC: < FCC 15.207 limits	LINE CONDUCTED	Pass	Section 5.5	Location 1		
15.203	Antenna requirement	FCC 15.203	/	pass	See Note1	Location 1		
Note1: The transmitter has an integral PCB loop antenna that is enclosed within the housing of the EUT and meets the requirements of this section.								



3 **Product Description**

3.1 Product Information

3.1.1 General Description

POT-LX1 is subscriber equipment in the GSM/WCDMA/LTE system. The GSM frequency band includes GSM850, GSM900, DCS1800 and PCS1900. The UMTS frequency band is band I, band V and band VIII. The LTE frequency band is band 1, band 3, band 7, band 8, band 20. The LTE frequency band for intra-band carrier aggregation downlink operation band is CA_1C and CA_3C and CA_7C and CA_3A_3A. The LTE frequency band for inter-band carrier aggregation downlink operation band is CA_1C and CA_3C_A and CA_3C_20C and CA_7C_20C. The Mobile Phone implements such functions as RF signal receiving/transmitting, LTE/HSPA/UMTS and GSM/GPRS/EDGE protocol processing, voice, video MMS service, GPS, AGPS and WIFI etc. Externally it provides one micro SD card interface (it can also used as SIM card interface), earphone port (to provide voice service) and one SIM card interface. POT-LX1 is dual SIM smart phone. It also provides Bluetooth module to synchronize data between a PC and the phone, or to use the built-in modem of the phone to access the Internet with a PC, or to exchange data with other Bluetooth devices.

Note: Only NFC test data included in this report.

3.2 EUT Identity

NOTE: Unless otherwise noted in the report, the functional boards installed in the units shall be selected from the below list, but not means all the functional boards listed below shall be installed in one unit.



Board				
Description	Hardware Version	Software Version		
Main Board	HL3POTM	5.0.1.50M(SP2C900E61R1P9)		

3.2.2 Sub-Assembly

Sub-Assembly						
Sub-Assembly Name	Model	Manufacturer	Description			
Adapter	HW-050200U01	Huawei Technologies Co.,Ltd	Input voltage: 100-240V ~50/60Hz 0.5A Output voltage: 5V 2A			
Adapter	HW-050200U02	Huawei Technologies Co.,Ltd	Input voltage: 100-240V ~50/60Hz 0.5A Output voltage: 5V 2A			
Li-Polymer Battery	HB396286ECW	Huawei Technologies Co.,Ltd	Rated capacity: 3320mAh Nominal Voltage: +3.82V Charging Voltage: +4.40V			

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4 Main Test Instruments

Test Location 1:Main Test Equipments						
Equipment Name	Manufacturer	Model	Serial Number	Cal Date	Cal- Due	
Test receiver	R&S	ESU26	100387	2018/1/20	2019/1/19	
Spectrum analyzer	R&S	FSU3	200474	2018/1/20	2019/1/19	
LOOP Antennas(9kHz- 30MHz)	R&S	HFH2-Z2	100262	2017/4/25	2019/4/25	
Trilog Broadband Antenna (30M~3GHz)	SCHWARZBECK	VULB 9163	9163-490	2017/3/29	2019/3/29	
Trilog Broadband Antenna (30M~3GHz)	SCHWARZBECK	VULB 9163	9163-521	2017/4/9	2019/4/9	
Artificial Main Network	R&S	ENV4200	100134	2018/5/8	2019/5/7	
Line Impedance Stabilization Network	R&S	ENV216	100382	2018/5/8	2019/5/7	
Software Information						
Test Item	Software N	ame	Manufac	turer	Version	
RSE	EMC32		R&S		V8.40.0	

Test Location 1:Main Test Equipments						
Equipment Name	Manufacturer	Model	Serial Number	Cal Date	Cal- Due	
EMI Test Receiver&SA	Agilent	N9038A	N9038A	2018/8/30	2019/8/29	
Loop Antenna	R&S	HFH2-Z2	HFH2-Z2	2018/5/30	2020/5/29	
Bilog Antenna	TeseQ	CBL6112D	CBL6112D	2018/6/5	2019/6/4	
LF Amplifier	Amplifier Burgeon BPA-53		BPA-530	2018/4/20	2019/4/19	
	S	oftware Infor	mation			
Test Item Software Name Ma			Manufac	turer	Version	
RE	E3		AUDIX		6.2009-8- 24(sporton)	

5 <u>Test Results</u>

5.1 Bandwidth

The 99% emission bandwidth is measured with a spectrum analyzer connected via a receive antenna placed near the EUT while the EUT is operating in transmission mode.

5.1.1 Test Set-up



5.1.2 Test Result



Date: 22.0CT.2018 14:16:17

<u>Result:</u> The result of the measurement is passed.

Test Environment	OBW (Hz)	FL@OBW (MHz)	FH@OBW (MHz)	Verdict
TN/VN	673.077	13.559394231	13.560067308	PASS



5.2 In-Band Radiated Spurious Emission Measurements

5.2.1 Test Setup



Measurement parameters			
Detector:	Quasi Peak		
Sweep time:	-/-		
Resolution bandwidth:	10 kHz		
Video bandwidth:	10 kHz		
Span:	-/-		
Trace-Mode:	Max Hold		

5.2.2 Test Result



NOTES:

1. All measurements were performed using a loop antenna. The antenna was positioned in three orthogonal positions (X front, Y side, Z top) and the position with the highest emission level was recorded.

2. Measurements were performed at 3m and the data was extrapolated to the specified measurement distance of 30m using the square of an inverse linear distance extrapolation factor (40 dB/decade) as specified in 15.31(f)(2). Extrapolation Factor = 20 log10(30/3)2 = 40dB

3. All measurements were recorded using a spectrum analyzer employing a quasi-peak detector.

4. Level =Reading level by receiver + Transd (Antenna factor + cable loss – preamplifier gain). The reading level is calculated by software which is not shown in the sheet.

The result of the measurement is passed.

5.3 Radiated Spurious Emission Measurements, Out-of-Band

5.3.1 Test Setup



Measurement parameters			
Detector:	Quasi Peak		
Sweep time:	Auto		
Resolution bandwidth:	9 kHz – 150 kHz: 200 Hz		
	150 kHz – 30 MHz: 9 kHz		
	30 MHz – 1000 MHz: 100 kHz		
Video bandwidth:	9 kHz – 150 kHz: 200 Hz		
	150 kHz – 30 MHz: 9 kHz		
	30 MHz – 1000 MHz: 100 kHz		
Span:	See Plots		
Trace-Mode:	Max Hold		

5.3.2 Test Result

9k~30MHz



















NOTES:

1. All measurements were recorded using a spectrum analyzer employing a quasi-peak detector for emissions below 960MHz.

2. Both Vertical and Horizontal polarities of the receive antenna were evaluated with the worst case emissions being reported. Below 30MHz the Loop antenna was positioned in 3 separate radials.

3. The EUT is supplied with nominal AC voltage and/or a new/fully-recharged battery.

4. The spectrum is measured from 9kHz to the 10th harmonic and the worst-case emissions are reported.

5. Level =Reading level by receiver + Transd (Antenna factor + cable loss – preamplifier gain). The reading level is calculated by software which is not shown in the sheet.

The result of the measurement is passed.

5.4 Frequency Stability

5.4.1 Test Setup

The EUT was placed in a Climatic Chamber. A small whip antenna was placed close to the EUT, and connected to the measuring Spectrum Analyzer. Measurement performed without modulation on TX.

5.4.2 Test Result

VOLTAGE	POWER	TEMP (°C)	Frequency	Freq. Dev.	Deviation (%)
(%)	Battery		(Hz)	(Hz)	
100%		-20	13560017	17	0.00000125369
100%		-10	13559982	-18	-0.00013274336
100%		0	13560019	19	0.00000140118
100%		10	13560012	12	0.00000884956
100%		20	13560011	11	0.000000811209
100%		30	13559985	-15	-0.00011061947
100%		40	13560009	9	0.00006637168
100%		50	13559981	-19	-0.00000140118
Battery End Point	3.6	20	13560015	-15	-0.00011061947
115%	4.35	20	13559986	-14	-0.00010324484

The result of the measurement is passed.

5.5 AC Power Line Conducted Emissions

5.5.1 Test Setup

The mains cable of the EUT (maybe per AC/DC Adapter) must be connected to LISN. The LISN shall be placed 0.8 m from the boundary of EUT and bonded to a ground reference plane for LISN mounted on top of the ground reference plane. This distance is between the closest points of the LISN and the EUT. All other units of the EUT and associated equipment shall be at least 0.8m from the LISN.

Ground connections, where required for safety purposes, shall be connected to the reference ground point of the LISN and, where not otherwise provided or specified by the manufacturer, shall be of same length as the mains cable and run parallel to the mains connection at a separation distance of not more than 0.1 m.





5.5.2 Test Result



MEASUREMENT RESULT: QP Detector

Frequency	Level	Limit	Transd	Margin	Line	PF
MHz	dBµV	dBµV	dB	dB	Eine	• =
0.184678	47.42	64.27	9.7	16.85	L1	FLO
0.36738	36.67	58.56	9.7	21.89	N	FLO
0.593013	43.35	56	9.7	12.65	L1	FLO
1.053967	36.15	56	9.7	19.85	L1	FLO
2.349416	34.99	56	9.8	21.01	L1	FLO
4.891806	32.99	56	9.8	23.01	L1	FLO

MEASUREMENT RESULT: AV Detector

Frequency	Level	Limit	Transd	Margin	Line	DE
MHz	dBµV	dBµV	dB	dB	dBµV	ΓL
0.573236	36.18	46	9.7	9.82	Ν	FLO
1.036206	31.1	46	9.7	14.9	Ν	FLO
1.449505	30.05	46	9.7	15.95	N	FLO
2.395772	29.91	46	9.7	16.09	N	FLO
4.003784	27.96	46	9.8	18.04	N	FLO
4.895913	27.91	46	9.8	18.09	N	FLO

Note:

1, Level =Reading level by receiver + Transd (Antenna factor + cable loss - preamplifier gain)

The reading level is calculated by software which is not shown in the sheet.

2, Margin=Limit - Level

The result of the measurement is passed.



6 System Measurement Uncertainty

For a 95% confidence level (k = 2), the measurement expanded uncertainties for defined systems, in accordance with the recommendations of ISO 17025 as following:

Test Item	Extended Uncertainty		
All Emissions, Radiated	Field Strength [dBµV/m]	For 3 m Chamber: U = 4 8 dB (30 MHz-1 GHz)	
AC Power Line Conducted Emissions	Disturbance Voltage[dBµV]	U=2.3 dB	

------The END------