



FCC

RF Test Report

Product Name: Smart Phone

Model Number: STK-LX1

Report No.: SYBH(Z-RF)20190214006001-2004

FCC ID: QISSTK-LX1

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DATE	2019-03-19	2019-03-19

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1. The laboratory has passed the accreditation by The American Association for Laboratory Accreditation (A2LA). The accreditation number is 2174.01.
2. The laboratory 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.
3. The laboratory has been recognized by the Innovation, Science and Economic Development Canada (ISED) to test to Canadian radio equipment requirements. The CAB identifier is CN0003, and the ISED# is 21741.
4. The laboratory (Reliability Lab 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.
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MODIFICATION RECORD

No.	Report No	Modification Description
1	SYBH(Z-RF)2019021 4006001-2004	First release.

DECLARATION

Type	Description
Multiple Models Applications	☒ The present report applies to single model. ☐ The present report applies to several models. The practical measurements are performed with the model. Note: The present report only presents the worst test case of all modes, see relevant test results for detailed.

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2 General Information

2.1 Test standard/s

Applied Rules :	47 CFR FCC Part 2, Subpart J 47 CFR FCC Part 15, Subpart C
Test Method :	FCC KDB 558074 D01 DTS Meas Guidance v05r01 ANSI C63.10-2013, American National Standard for Testing Unlicensed Wireless Devices.

2.2 Test Environment

Temperature :	TN	15 to 30	°C during room temperature tests
Ambient Relative Humidity:	20 to 85 %		
Atmospheric Pressure:	Not applicable		
Power supply :	VN	3.82	V DC by Battery

NOTE 1: 1) VN= nominal voltage, VL= low extreme test voltage, VH= High extreme test voltage;

TN= normal temperature, TL= low extreme test temperature, TH= High extreme test temperature.

NOTE 2: The values used in the test report may be stringent than the declared.

2.3 Test Laboratories

Test Location 1:	RELIABILITY LABORATORY OF HUAWEI TECHNOLOGIES CO., LTD.
Address of Test Location 1:	No.2, New City Avenue, Songshan Lake Sci. & Tech. Industry Park, Dongguan, 523808, P.R.C

2.4 Applicant and Manufacturer

Company Name :	HUAWEI TECHNOLOGIES CO., LTD
Address :	Administration Building, Headquarters of Huawei Technologies Co., Ltd., Bantian, Longgang District, Shenzhen, 518129, P.R.C

2.5 Application details

Date of Receipt Sample:	2019-02-27
Start of test:	2019-02-28
End of test:	2019-03-19

3 Test Summary

Test Item	FCC Rule No.	Requirements	Test Result	Verdict	Testing location
DTS (6 dB) Bandwidth	15.247(a)(2)	≥ 500 kHz.	Appendix A	Pass	Test Location 1
Occupied Bandwidth	---	No limit.	Appendix B	Pass	Test Location 1
Duty Cycle	KDB 558074 D01 (6.0)	No limit.	Appendix C	Pass	Test Location 1
Maximum Conducted Average Output Power	15.247(b)(3)	FCC: For directional gain: Conducted < 30 dBm – (G[dBi] – 6 [dB]); Otherwise: Conducted < 30 dBm,	Appendix D	Pass	Test Location 1
Maximum Power Spectral Density Level	15.247(e)	Conducted < 8 dBm/3 kHz.	Appendix E	Pass	Test Location 1
Band Edges Compliance	15.247(d)	< -30 dBm/100 kHz if total average power ≤ power limit.	Appendix F	Pass	Test Location 1
Unwanted Emissions into Non-Restricted Frequency Bands			Appendix G	Pass	Test Location 1
NOTE1: According to KDB 558074 D01, antenna-port conducted measurements are acceptable as an alternative to radiated measurements for demonstrating compliance to the limits in the restricted frequency bands. If conducted measurements are performed, then proper impedance matching must be ensured and an additional radiated test for cabinet/case emissions will also be required.					



Test Item	FCC Rule No.	Requirements	Test Result	Verdict	Testing location
NOTE2: The transmitter has an integral PCB loop antenna that is enclosed within the housing of the EUT and meets the requirements of FCC 15.203					

4 Description of the Equipment under Test (EUT)

4.1 General Description

STK-LX1 is subscriber equipment in the GSM/WCDMA/LTE system. The GSM frequency band includes GSM850 and GSM900 and DCS1800 and PCS1900. The UMTS frequency band is B1 and B2 and B5 and B8. The LTE frequency band is B1 and B3 and B7 and B8 and B2. 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, earphone port and different versions of the software, the phone may support single SIM card or double SIM card. 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.

Note1: Only Bluetooth BLE test data included in this report.

4.2 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.

4.2.1 Board

Board		
Description	Software Version	Hardware Version
Main Board	STK-LX1 9.0.1.18	HL1STKM

4.2.2 Sub- Assembly

Sub-Assembly			
Sub-Assembly Name	Model	Manufacturer	Description
Adapter	HW-050200U01	Huawei Technologies Co.,Ltd.	Input Voltage:100V-240V~50/60Hz, 0.5A Output Voltage: 5V  2A
Adapter	HW-050200E01	Huawei Technologies Co.,Ltd.	Input Voltage:100V-240V~50/60Hz, 0.5A Output Voltage: 5V  2A
Adapter	HW-050200B01	Huawei Technologies Co.,Ltd.	Input Voltage:100V-240V~50/60Hz, 0.5A Output Voltage: 5V  2A
Adapter	HW-050200A01	Huawei Technologies Co.,Ltd.	Input Voltage:100V-240V~50/60Hz, 0.5A Output Voltage: 5V  2A
Adapter	HW-050200U02	Huawei Technologies Co.,Ltd.	Input Voltage:100V-240V~50/60Hz, 0.5A Output Voltage: 5V  2A
Adapter	HW-050200E02	Huawei Technologies Co.,Ltd.	Input Voltage:100V-240V~50/60Hz, 0.5A Output Voltage: 5V  2A
Adapter	HW-050200A02	Huawei Technologies Co.,Ltd.	Input Voltage:100V-240V~50/60Hz, 0.5A Output Voltage: 5V  2A
Adapter	HW-050200B02	Huawei Technologies Co.,Ltd.	Input Voltage:100V-240V~50/60Hz, 0.5A Output Voltage: 5V  2A
Li-ion Polymer Battery	HB446486ECW	Huawei Technologies Co.,Ltd.	Rated capacity: 3900mAh Nominal Voltage:  +3.82V Charging Voltage: :  +4.4V

4.3 Technical Description

NOTE: For the detailed technical descriptions, see the applicant/manufacturer's specifications or user manual.

Characteristics	Description	
TX/RX Operating Range	2400-2483.5 MHz band	$f_c = 2402 \text{ MHz} + N * 2 \text{ MHz}$, where: - f_c = "Operating Frequency" in MHz, - N = "Channel Number" with the range from 0 to 39.
Modulation Type	Digital	GFSK,
Emission Designator	GFSK for BT 4.2: 708KFXD	
Bluetooth Power Class	Class 1	
Antenna	Description	Isotropic Antenna
	Type	☒ Integral ☐ External ☐ Dedicated
	Ports	☒ Ant 1, ☐ Ant 2, ☐ Ant 3
	Gain	-2.5dBi (per antenna port, max.)
	Remark	When the EUT is put into service, the practical maximum antenna gain should NOT exceed the value as described above.
Power Supply	Type	☐ External DC mains, ☒ Battery, ☐ AC/DC Adapter, ☐ Powered over Ethernet (PoE). ☐ Other

5 General Test Conditions / Configurations

5.1 EUT Configurations

5.1.1 General Configurations

Configuration	Description
Test Antenna Ports	Until otherwise specified, - All TX tests are performed at all TX antenna ports of the EUT, and - All RX tests are performed at all RX antenna ports of the EUT.
Multiple RF Sources	Other than the tested RF source of the EUT, other RF source(s) are disabled or shutdown during measurements.
Sensors and Antenna	Sensors and Antenna optimization function should be disabled during testing by software method to get the stable maximum power and avoid the influence of uncertain conditions

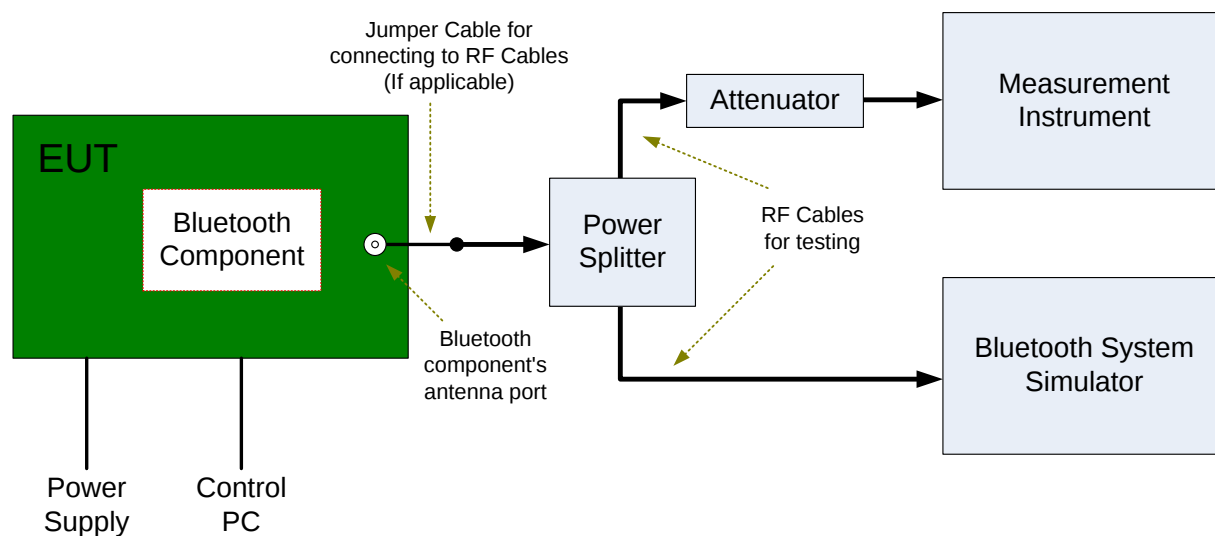
5.1.2 Customized Configurations

# EUT Conf.	Signal Description	Operating Frequency	Duty cycle
TM1_Ch0	GFSK for BT 4.2 modulation, package type DH5, hopping off.	Ch No. 0 / 2402 MHz	60.50
TM1_Ch19	GFSK for BT 4.2 modulation, package type DH5, hopping off.	Ch No. 19 / 2440 MHz	60.50
TM1_Ch39	GFSK for BT 4.2 modulation, package type DH5, hopping off.	Ch No. 39 / 2480 MHz	60.50

5.2 Test Setups

5.2.1 Test Setup 1

The Bluetooth component's antenna ports(s) of the EUT are connected to the measurement instrument per an appropriate attenuator. The EUT is controlled by Bluetooth System Simulator and/or PC/software to emit the specified signals for the purpose of measurements.



5.3 Test Conditions

Test Case	Test Conditions	
	Configuration	Description
6dB Emission Bandwidth (EBW)	Meas. Method	FCC KDB 558074 D01 §8.2 Option 2.
	Test Env.	TN/VN
	Test Setup	Test Setup 1
	EUT Conf.	TM1_Ch0, TM1_Ch19, TM1_Ch39.
Occupied Bandwidth	Meas. Method	FCC KDB 558074 D01 §8.2 Option 2.
	Test Env.	TN/VN
	Test Setup	Test Setup 1
	EUT Conf.	TM1_Ch0, TM1_Ch19, TM1_Ch39.
Maximum peak Conducted Output Power	Meas. Method	FCC KDB 558074 D01 §8.3.1.1
	Test Env.	TN/VN
	Test Setup	Test Setup 1
	EUT Conf.	TM1_Ch0, TM1_Ch19, TM1_Ch39.
Maximum Power Spectral Density Level	Meas. Method	FCC KDB 558074 D01 §8.4
	Test Env.	TN/VN
	Test Setup	Test Setup 1
	EUT Conf.	TM1_Ch0, TM1_Ch19, TM1_Ch39.
Band edge spurious emission	Meas. Method	FCC KDB 558074 D01§8.7
	Test Env.	TN/VN
	Test Setup	Test Setup 1
	EUT Conf.	TM1_Ch0, TM1_Ch39.
Unwanted Emissions into Non-Restricted Frequency Bands	Meas. Method	FCC KDB 558074 D01§8.5
	Test Env.	TN/VN
	Test Setup	Test Setup 1
	EUT Conf.	TM1_Ch0, TM1_Ch19, TM1_Ch39.

6 Main Test Instruments

This table gives a complete overview of the RF measurement equipment.

Devices used during the test described are marked ☒

☒ Main Test Equipment (BT/WIFI test system)						
Marked	Equipment Name	Manufacturer	Model	Serial Number	Cal Date	Cal-Due
☒	JS1120-3 BT/WIFI test system	JS Tonscend	JS0806-2	/	2018/05/30	2019/05/30
☐	Power Detecting & Samplig Unit	R&S	OSP-B157	101429	2018/07/23	2019/07/23
☐	Power Sensor	R&S	NRP2	103085/106211	2018/05/17	2019/05/17
☐	DC Power Supply	KEITHLEY	2303	1342889	2018/10/24	2019/10/24
☐	DC Power Supply	KEITHLEY	2303	000500E	2018/05/21	2019/05/21
☐	DC Power Supply	KEITHLEY	2303	1288003	2018/05/21	2019/05/21
☐	DC Power Supply	KEITHLEY	2303	000381E	2018/05/21	2019/05/21
☐	DC Power Supply	KEITHLEY	2303	000510E	2018/10/24	2019/10/24
☐	Temperature Chamber	WEISS	WKL64	56246002940010	2018/12/13	2019/12/13
☒	Spectrum Analyzer	Agilent	N9030A	MY51380032	2018/07/23	2019/07/23
☐	Spectrum Analyzer	Agilent	N9030A	MY49431698	2018/07/23	2019/07/23
☐	Spectrum Analyzer	Keysight	N9040B	MY57212529	2018/06/28	2019/06/28
☐	Signal Analyzer	R&S	FSQ31	200021	2018/07/23	2019/07/23
☐	Signal Analyzer	R&S	FSU26	201069	2018/11/2	2019/11/2
☐	Universal Radio Communication Tester	R&S	CMW500	159302	2018/07/23	2019/07/23
☐	Wireless Communication Test set	Agilent	N4010A	MY49081592	2018/07/23	2019/07/23
☒	Signal generator	Agilent	E8257D	MY51500314	2018/04/27	2019/04/27
☐	Signal generator	Agilent	E8257D	MY49281095	2018/07/23	2019/07/23
☐	Vector Signal Generator	R&S	SMW200A	103447	2018/05/31	2019/05/31
☐	Vector Signal Generator	R&S	SMU200A	104162	2018/07/23	2019/07/23

7 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
Transmit Output Power Data	Power [dBm]	U = 0.39 dB
RF Power Density, Conducted	Power [dBm]	U = 0.64 dB
Bandwidth	Magnitude [%]	U=7%
Band Edge Compliance	Disturbance Power [dBm]	U = 0.9 dB
Spurious Emissions, Conducted	Disturbance Power [dBm]	20MHz~3.6GHz: U=0.88dB 3.6GHz~8.4GHz: U=1.08dB 8.4GHz~13.6GHz: U=1.24dB 13.6GHz~22GHz: U=1.34dB 22GHz~26.5GHz: U=1.36dB
Frequency Stability	Frequency Accuracy [Hz]	U=41.58Hz
Duty Cycle	Duty Cycle [%]	U=±2.06 %

8 Appendixes

Appendix No.	Description
SYBH(Z-RF)20190214006001-2004-A	Appendix for Bluetooth BLE

END