FCC
RF Test Report

Product Name: Smart Phone

Model Number: HRY-LX2

Report No.: SYBH(Z-RF)20180907024002-2003

FCC ID：QISHRY-LX2

Reliability Laboratory of Huawei Technologies Co., Ltd.

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

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

1. The laboratory has passed the accreditation by China National Accreditation Service for Conformity Assessment (CNAS). The accreditation number is L0310.

2. The laboratory has passed the accreditation by The American Association for Laboratory Accreditation (A2LA). The accreditation number is 2174.01 .

3. 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.

4. The laboratory has been listed by Industry Canada to perform electromagnetic emission measurements. The recognition numbers of test site are 6369A-1.

5. 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.

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

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

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

9. 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:	2018-09-25
Start Date of Test:	2018-10-08
End Date of Test:	2018-11-20

Test Result:	Pass

Approved by Senior Engineer:	2018-11-20	He Hao	He Hao
	Date	Name	Signature

Prepared by:	2018-11-20	zhoulingbo	zhoulingbo
	Date	Name	Signature

CONTENT

1 General Information

1.1 Applied Standard

Applied Rules: 47 CFR FCC Part 2, Subpart J

47 CFR FCC Part 15, Subpart C

Test Method: FCC PUBLIC NOTICE DA 00-705 Filing and Measurement Guidelines for Frequency Hopping Spread Spectrum Systems (Released March 30, 2000)

ANSI C63.10-2013, American National Standard for Testing Unlicensed Wireless Devices.

1.2 Test Location

Test Location :   Reliability Laboratory of Huawei Technologies Co., Ltd.

Address1:   No.2 New City Avenue Songshan Lake Sci. &Tech. Industry Park, Dongguan, Guangdong, P.R.C

1.3 Test Environment Condition

Ambient Temperature: 19.5 to 25 °C

Ambient Relative Humidity: 45 to 55 %

Atmospheric Pressure: Not applicable

2   Test Summary

Test Item	FCC Rule No.	Requirements	Test Result	Verdict (NOTE)	Test Address
20dB Emission Bandwidth (EBW)	15.247(a)(1)	No limit.	Appendix A	Pass	Address 1
Carrier Frequency Separation	15.247(a)(1)	≥ MAX {25kHz, IIF{output power ≤125mW, 2/3*20dB EBW, 20dB EBW }}.	Appendix B	Pass	Address 1
Number of Hopping Channel	15.247(a)(1) (iii)	≥15 channels.	Appendix C	Pass	Address 1
Time of Occupancy (Dwell Time)	15.247(a)(1) (iii)	< 0.4s within a period of (0.4s*hopping number).	Appendix D	Pass	Address 1
Maximum Peak Output Power	15.247(b)(1)	Conducted < 1 W if using ≥75 non-overlapping channels.	Appendix E	Pass	Address 1
Band edge spurious emission	15.247(d)	< -20 dBr/100 kHz if total peak power ≤ power limit.	Appendix F	Pass	Address 1
Conducted RF Spurious Emission			Appendix G	Pass	Address 1

3   Description of the Equipment under Test (EUT)

3.1   General Description

HRY-LX2 is subscriber equipment in the GSM/WCDMA/LTE system. The GSM frequency bands include GSM850, GSM900, DCS1800 and PCS1900. The UMTS frequency band includes band I, band II, band IV, band V and band VIII. The LTE frequency bands include band 1, band 2, band 3, band 4, band 5, band 7, band 8, band 28, band 38, band 40 and band 41. 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 (to provide voice service) and one and two SIM card interface. HRY-LX2 is dual and single 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.

NOTE1: Only Bluetooth test data included in this report.
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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.

3.2.1   Board

Board		
Description	Software version	Hardware version
Main Board	9.0.1.111(C900E110R1P9)	HL1HRYM

3.2.2 Sub- Assembly

Sub-Assembly			
Sub-Assembly Name	Model	Manufacturer	Description
Adapter	HW-050200U02	Huawei Technologies Co.,Ltd.	Input Voltage:100V-240V~50/60Hz, 0.5A Output Voltage: 5V === 2A
Adapter	HW-050200U01	Huawei Technologies Co.,Ltd.	nput Voltage:100V-240V~50/60Hz, 0.5A Output Voltage: 5V === 2A
Rechargeable Li-ion	HB396286ECW	Huawei Technologies Co.,Ltd.	Rated capacity: 3320mAh Nominal Voltage: +3.82V Charging Voltage: +4.4V

3.3 Technical Description

Characteristics	Description	
TX/RX Operating Range	2400-2483.5 MHz band	fc = 2402 MHz + N * 1 MHz, where: - fc = "Operating Frequency" in MHz, - N = "Channel Number" with the range from 0 to 78.
Modulation Type	Carrier	Frequency Hopping Spread Spectrum (FHSS)
	Digital	GFSK, π/4-DQPSK, 8DPSK
Emission Designator	GFSK: 950KFXD π/4-DQPSK: 1M27GXD 8DPSK: 1M27GXD	
Bluetooth Power Class	Class 1	
Antenna Description	Isotropic Antenna	
Antenna Type	☐ External, ☒ Integrated	
Antenna Gain	-1.81 (per antenna port, max.)	
Power Supply	☒ AC/DC Adapter ☐ PoE: ☐ Other:	

4   General Test Conditions / Configurations

4.1   EUT Configurations

4.1.1   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.

4.1.2   Customized Configurations

# EUT Conf.	Signal Description	Operating Frequency
TM1_DH5_Hop	GFSK modulation, package type DH5, hopping on.	---
TM1_DH5_Ch0	GFSK modulation, package type DH5, hopping off.	Ch No. 0 / 2402 MHz
TM1_DH5_Ch39	GFSK modulation, package type DH5, hopping off.	Ch No. 39 / 2441 MHz
TM1_DH5_Ch78	GFSK modulation, package type DH5, hopping off.	Ch No. 78 / 2480 MHz
TM2_2DH5_Hop	π/4-DQPSK modulation, package type 2DH5, hopping on.	---
TM2_2DH5_Ch0	π/4-DQPSK modulation, package type 2DH5, hopping off.	Ch No. 0 / 2402 MHz
TM2_2DH5_Ch39	π/4-DQPSK modulation, package type 2DH5, hopping off.	Ch No. 39 / 2441 MHz
TM2_2DH5_Ch78	π/4-DQPSK modulation, package type 2DH5, hopping off.	Ch No. 78 / 2480 MHz
TM3_3DH5_Hop	8DPSK modulation, package type 3DH5, hopping on.	---
TM3_3DH5_Ch0	8DPSK modulation, package type 3DH5, hopping off.	Ch No. 0 / 2402 MHz
TM3_3DH5_Ch39	8DPSK modulation, package type 3DH5, hopping off.	Ch No. 39 / 2441 MHz
TM3_3DH5_Ch78	8DPSK modulation, package type 3DH5, hopping off.	Ch No. 78 / 2480 MHz

4.2 Test Environments

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

Environment Parameter	Selected Values During Tests		
	Temperature	Voltage	Relative Humidity
NTNV	Ambient	3.82 VDC	Ambient

4.3 Antenna requirements

Excerpt from §15.203 of the FCC Rules/Regulations:
"An intentional radiator antenna shall be designed to ensure that no antenna other than that furnished by the responsible party can be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section."

The antennas of the **HRY-LX2** are **permanently attached.**
There are no provisions for connection to an external antenna.

Conclusion:
The Smart Phone **FCC ID: QISHRY-LX2** unit complies with the requirement of §15.203.
Ch. Frequency (MHz)

Ch.	Frequency (MHz)
00	2402
. .	. .
39	2441
. .	. .
78	2480

Frequency/ Channel Operations

4.4   Description of tests

4.4.1   Bandwidth measurement
(a) Connect EUT test port to universal communication tester.
(b) Set the EUT to transmit maximum output power at 2.4GHz and switch off frequency hopping function, then set the measuring frequency number, finally test the bandwidth with universal communication tester.

4.4.2   Carrier frequency separation measurement
(a) Connect EUT test port to spectrum analyzer and universal communication tester.
(b) Set the EUT to transmit maximum output power at 2.4GHz and switch off frequency hopping function, then set the measured frequency number to two adjacent channels separately and test the carrier frequency separation with spectrum analyzer.

4.4.3   Number of hopping channel
(a) Connect EUT test port to spectrum analyzer and universal communication tester.
(b) Set the EUT to transmit maximum output power at 2.4GHz and switch on frequency hopping function, then set enough count time (larger than 5000 times) to get all the hopping frequency channel displayed on the screen of spectrum analyzer.
(c) Count the quantity of peaks to get the number of hopping channels.

4.4.4   Time of occupancy

(a) Connect test port of EUT to spectrum analyzer and universal communication tester.
(b) Set the EUT to transmit maximum output power at 2.4GHz and switch on frequency hopping function.
(c) Set the span of spectrum analyzer to 0 Hz, and set the resolution bandwidth to1 MHz and the vedio bandwidth to 1 MHz, then get the time domain measured diagram. and set sweep time to 2 times of one burst occupancy time, and measure the time of occupancy of one burst.
(d) Set the resolution bandwidth to1 MHz and the vedio bandwidth to 3 MHz ,and set the sweep time to a period (0.4 seconds multiplied by the number of hopping channels employed), and count the number of the bursts.
(e) Calculate the time of occupancy in a period with time occupancy of a burst and quantity of bursts

4.4.5   Peak output power
(a) Connect EUT test port to spectrum analyzer and universal communication tester.
(b) Set the EUT to transmit maximum output power at 2.4GHz and switch off frequency hopping function.
(c) Then set the EUT to transmit at high, middle and low frequency and measure the conducted output power separately.

4.4.6   Band edge spurious emission

(a) Connect EUT test port to spectrum analyzer and universal communication tester

(b) Set the EUT to transmit maximum output power at 2.4GHz and switch off frequency hopping function.

(c) Then set the EUT to transmit at high, low frequency and measure the conducted band edge spurious separately.

(d) Switch on the frequency hopping function, and repeat above measurement.

4.4.7   Conducted RF Spurious

(a) Connect EUT test port to spectrum analyzer and universal communication tester

(b) Set the EUT to transmit maximum output power at 2.4GHz and switch off frequency hopping function.

(c) Then set the EUT to transmit at high, middle and low frequency and measure the conducted spurious separately.

(d) Switch on the frequency hopping function, and repeat the above measurement.

4.5   Test Setups

4.5.1   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.
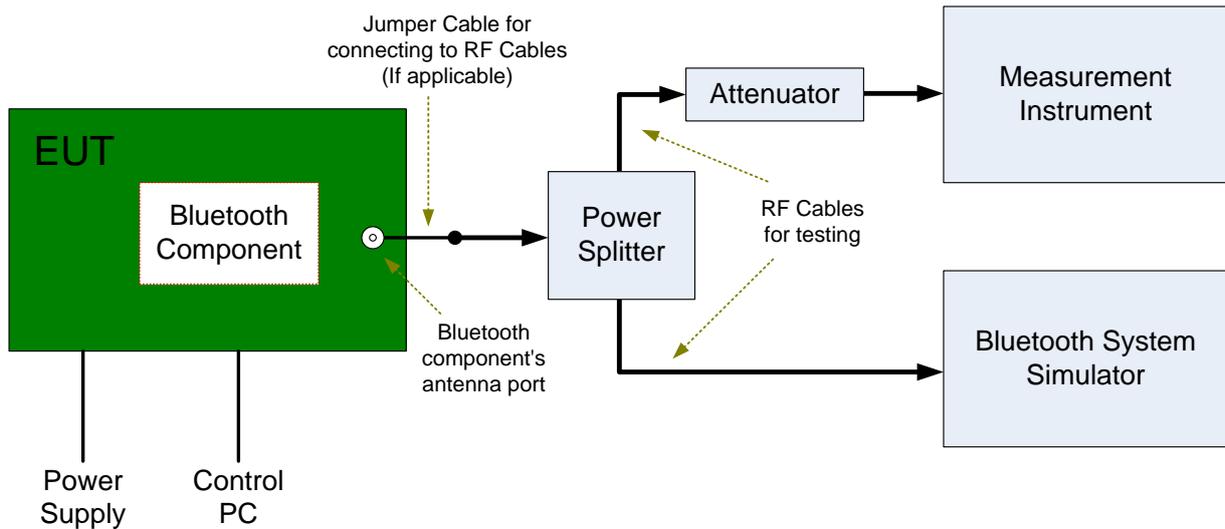
4.6 Test Conditions

Test Case	Test Conditions	
	Configuration	Description
20dB Emission Bandwidth (EBW)	Meas. Method	DA 00-705
	Test Env.	NTNV
	Test Setup	Test Setup 1
	EUT Conf.	TM1_DH5_Ch0, TM1_DH5_Ch39, TM1_DH5_Ch78, TM2_2DH5_Ch0, TM2_2DH5_Ch39, TM2_2DH5_Ch78, TM3_3DH5_Ch0, TM3_3DH5_Ch39, TM3_3DH5_Ch78.
Carrier Frequency Separation	Meas. Method	DA 00-705
	Test Env.	NTNV
	Test Setup	Test Setup 1
	EUT Conf.	TM1_DH5_Hop, TM2_2DH5_Hop, TM3_3DH5_Hop.
Number of Hopping Channel	Meas. Method	DA 00-705
	Test Env.	NTNV
	Test Setup	Test Setup 1
	EUT Conf.	TM1_DH5_Hop, TM2_2DH5_Hop, TM3_3DH5_Hop.
Time of Occupancy (Dwell Time)	Meas. Method	DA 00-705
	Test Env.	NTNV
	Test Setup	Test Setup 1
	EUT Conf.	TM1_DH5_Ch39, TM2_2DH5_Ch39, TM3_3DH5_Ch39.
Maximum Peak Conducted Output Power	Meas. Method	DA 00-705
	Test Env.	NTNV
	Test Setup	Test Setup 1
	EUT Conf.	TM1_DH5_Ch0, TM1_DH5_Ch39, TM1_DH5_Ch78, TM2_2DH5_Ch0, TM2_2DH5_Ch39, TM2_2DH5_Ch78, TM3_3DH5_Ch0, TM3_3DH5_Ch39, TM3_3DH5_Ch78.
Band edge spurious emission	Meas. Method	DA 00-705
	Test Env.	NTNV
	Test Setup	Test Setup 1
	EUT Conf.	TM1_DH5_Ch0, TM1_DH5_Ch78, TM2_2DH5_Ch0, TM2_2DH5_Ch78, TM3_3DH5_Ch0, TM3_3DH5_Ch78.
Conducted RF Spurious Emission	Meas. Method	DA 00-705
	Test Env.	NTNV

Test Case	Test Conditions	
	Configuration	Description
	Test Setup	Test Setup 1
	EUT Conf.	TM1_DH5_Ch0, TM1_DH5_Ch39, TM1_DH5_Ch78, TM2_2DH5_Ch0, TM2_2DH5_Ch39, TM2_2DH5_Ch78, TM3_3DH5_Ch0, TM3_3DH5_Ch39, TM3_3DH5_Ch78.

5   Main Test Instruments

Main Test Equipments					
Equipment Name	Manufacturer	Model	Serial Number	Cal Date	Cal- Due
Power supply	KEITHLEY	2303	000381E	2018/05/21	2019/05/21
Universal Radio Communication Tester	R&S	CMU200	110932	2018/4/27	2019/4/27
Universal Radio Communication Tester	R & S	CMW500	159302	2018/7/23	2019/7/23
Signal Analyzer	R&S	FSQ31	200021	2018/7/23	2019/7/23
Spectrum Analyzer	Agilent	N9030A	MY49431698	2018/7/23	2019/7/23
Temperature Chamber	WEISS	WKL64	56246002940010	2017/12/13	2018/12/13
Signal generator	Agilent	E8257D	MY49281095	2018/7/23	2019/7/23
Vector Signal Generator	R&S	SMU200A	104162	2018/7/23	2019/7/23
Power Detecting & Samplig Unit	R&S	OSP-B157	101429	2018/7/23	2019/7/23
Spectrum Analyzer	Keysight	N9040B	MY57212529	2018/6/28	2019/6/28

6   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
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 %

7   Appendixes

Appendix No.	Description
SYBH(Z-RF)20180907024002-2003-A	Appendix for Bluetooth

END