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检测
TESTING
CNAS L0310



FCC

RF Test Report

Product Name: Smart Phone

Model Number: DUB-LX3

Report No.: SYBH(Z-RF)20181012007001-2002

FCC ID: QISDUB-LX3

Reliability Laboratory of Huawei Technologies Co., Ltd.

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

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Notice

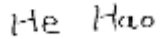
1. The laboratory has passed the accreditation by China National Accreditation Service for Conformity Assessment (CNAS). The accreditation number is L0310.
2. The laboratory has passed the accreditation by The American Association for Laboratory Accreditation (A2LA). The accreditation number is 2174.01.
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: 2018-10-29
Start Date of Test: 2018-10-31
End Date of Test: 2018-11-26

Test Result: Pass

Approved by Senior Engineer:	2018-11-26	He Hao	
	Date	Name	Signature

Prepared by:	2018-11-26	Mao Wenli	
	Date	Name	Signature



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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 KDB 558074 D01 DTS Meas Guidance v04
ANSI C63.10-2013, American National Standard for Testing Unlicensed
Wireless Devices.

1.2 Test Location

Test Location 1: 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: 19.5to 25 °C
Ambient Relative Humidity: 40 to 55 %
Atmospheric Pressure: Not applicable

2 Test Summary

Test Item	FCC Rule No.	Requirements	Test Result	Verdict	Test Address
DTS (6 dB) Bandwidth	15.247(a)(2)	≥ 500 kHz.	Appendix A	Pass	Address 1
Occupied Bandwidth	---	No limit	Appendix B	Pass	Address 1
Duty Cycle	KDB 558074 D01 (6.0)	No limit	Appendix C	Pass	Address 1
Maximum 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	Address 1
Maximum Power Spectral Density Level	15.247(e)	Conducted < 8 dBm/3 kHz.	Appendix E	Pass	Address 1
Band Edges Compliance	15.247(d)	< -30 dBm/100 kHz if total average power $\leq$ power limit.	Appendix F	Pass	Address 1
Unwanted Emissions into Non-Restricted Frequency Bands			Appendix G	Pass	Address 1
NOTE: 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.					

3 Description of the Equipment under Test (EUT)

3.1 General Description

DUB-LX3 is subscriber equipment in the GSM/WCDMA/LTE system. The GSM frequency bands include GSM850, GSM900, DCS1800 and DCP1900. The UMTS frequency band includes band I, band II, band IV, band V and band VIII. The LTE frequency bands include band 2, band 4, band 5, band 7, band 8, band 28. 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 SIM card interface. 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 2.4G WIFI 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.

3.2.1 Board

Board		
Description	Hardware Version	Software Version
Main Board	HL3DUBM	DUB-LX3 8.2.0.107(C900)

3.2.2 Sub- Assembly

Sub-Assembly			
Sub-Assembly Name	Model	Manufacturer	Description
Adapter	HW-050200E01	Huawei Technologies Co., Ltd.	Input voltage: 100-240V Output voltage: 5V  2A
Adapter	HW-050200E02	Huawei Technologies Co., Ltd.	Input voltage: 100-240V Output voltage: 5V  2A
Adapter	HW-050200U01	Huawei Technologies Co., Ltd.	Input voltage: 100-240V Output voltage: 5V  2A
Adapter	HW-050200U02	Huawei Technologies Co., Ltd.	Input voltage: 100-240V Output voltage: 5V  2A
Adapter	HW-050200A01	Huawei Technologies Co., Ltd.	Input voltage: 100-240V Output voltage: 5V  2A
Adapter	HW-050200A02	Huawei Technologies Co., Ltd.	Input voltage: 100-240V Output voltage: 5V  2A
Adapter	HW-050200B01	Huawei Technologies Co., Ltd.	Input voltage: 100-240V Output voltage: 5V  2A
Adapter	HW-050200B02	Huawei Technologies Co., Ltd.	Input voltage: 100-240V Output voltage: 5V  2A
Li-ion Battery	HB406689ECW	Huawei Technologies Co., Ltd.	Rated capacity: 3900mAh Nominal Voltage:  +3.82V Charging Voltage:  +4.4V

3.3 Technical Description

Characteristics	Description			
IEEE 802.11 WLAN Mode Supported	☒ 802.11b (20 MHz channel bandwidth), ☒ 802.11g (20 MHz channel bandwidth) ☒ 802.11n (20 MHz channel bandwidth), ☒ 802.11n (40 MHz channel bandwidth)			
TX/RX Operating Range	2412-2462 MHz band	fc = 2407 MHz + N * 5 MHz, where: - fc = “Operating Frequency” in MHz, - N = “Channel Number” with the range from 1 to 11 for the 20 MHz channel bandwidth, or 3 to 9 for the 40 MHz channel bandwidth.		
Data Rate	802.11b	1 Mbps, 2 Mbps, 5.5 Mbps, 11 Mbps		
	802.11g	6 Mbps, 9 Mbps, 12 Mbps, 18 Mbps, 24 Mbps, 36 Mbps, 48 Mbps, 54 Mbps		
	802.11n (SISO)	MCS 0 to MCS 7		
Modulation Type	DBPSK/DQPSK/CCK (DSSS), BPSK/QPSK/16QAM/64QAM (OFDM).			
Emission Designator	10M2G7D (for 802.11b mode), 16M4G7D (for 802.11g mod), 16M4G7D (for 802.11n20 mode) 35M3G7D (for 802.11n40 mode)			
TX Power Control	☐ Supported, ☒ Not Supported			
Standby Mode	☐ Supported, ☒ Not Supported			
Equipment Type	☐ Stand-alone equipment, ☐ Plug-in radio device, ☒ Combined equipment			
Antenna	Description	Isotropic Antenna		
	Type	☐ External, ☒ Integrated		
	Ports	☒ Ant 1, ☐ Ant 2, ☐ Ant 3		
	Smart System	☒ SISO (for 802.11b/g/n), ☐ MIMO (for 802.11n): 2 Tx & 2 Rx, ☐ Diversity (for 802.11b/g) : Tx & Rx		
	Gain	-1.3 dBi (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	☒ AC/DC Adapter	☐ PoE:	☐ Other:

4 General Test Conditions / Configurations

4.1 Test Modes

NOTE: Worst cases for each IEEE 802.11 mode are selected to perform tests.

Test Mode	Test Modes Description
11B	IEEE 802.11b with data rate of 1 Mbps using SISO mode.
11G	IEEE 802.11g with data rate of 6 Mbps using SISO mode.
11N20	IEEE 802.11n with data rate of MCS0 and bandwidth of 20 MHz using SISO mode.
11N40	IEEE 802.11n with data rate of MCS0 and bandwidth of 40 MHz using SISO mode.

4.2 EUT Configurations

4.2.1 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.

4.2.2 Customized Configurations

Test Mode	RF Ch.	TX Freq. [MHz]	RX Freq. [MHz]	Ch. BW [MHz]	Power Conf., per Port	Duty cycle [%]
11B	L	Ch No. 1 / 2412 MHz	---	20	18	97.59
	M	Ch No. 6 / 2437 MHz	---	20	18	97.59
	H	Ch No.11 / 2462 MHz	---	20	18	97.59
11G	L	Ch No. 1 / 2412 MHz	---	20	11.5	87.12
	L	Ch No. 2 / 2417 MHz	---	20	13.5	87.12
	L	Ch No. 3 / 2422 MHz	---	20	15	87.12
	M	Ch No. 6 / 2437 MHz	---	20	15	87.19
	H	Ch No. 9 / 2452 MHz	---	20	15	87.12
	H	Ch No. 10 / 2457 MHz	---	20	14	87.12
	H	Ch No. 11 / 2462 MHz	---	20	13	87.12
11N20	L	Ch No. 1 / 2412 MHz	---	20	11.5	86.43
	L	Ch No. 2 / 2417 MHz	---	20	13.5	86.34
	L	Ch No. 3 / 2422 MHz	---	20	15	86.41
	M	Ch No. 6 / 2437 MHz	---	20	15	86.34
	H	Ch No. 9 / 2452 MHz	---	20	15	86.41



Test Mode	RF Ch.	TX Freq. [MHz]	RX Freq. [MHz]	Ch. BW [MHz]	Power Conf., per Port	Duty cycle [%]
	H	Ch No. 10 / 2457 MHz	---	20	14	86.34
	H	Ch No. 11 / 2462 MHz	---	20	13	86.34
11N40	L	Ch No. 3 / 2422 MHz	---	40	9	75.91
	L	Ch No. 4 / 2427 MHz	---	40	11.5	75.76
	L	Ch No. 5 / 2432 MHz	---	40	12.5	75.87
	M	Ch No. 6 / 2437 MHz	---	40	12.5	75.76
	H	Ch No. 7 / 2442 MHz	---	40	12.5	75.91
	H	Ch No. 8 / 2447MHz	---	40	10.5	75.76
	H	Ch No. 9 / 2452 MHz	---	40	9	75.87

4.3 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

4.4 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 **DUB-LX3** are **permanently attached**.

There are no provisions for connection to an external antenna.

Conclusion:

The **EUT FCC ID: QISDUB-LX3** unit complies with the requirement of §15.203.

Ch. Frequency (MHz)

Ch.	Frequency (MHz)
01	2412
.	.
.	.
06	2437
.	.
.	.
11	2462

Frequency/ Channel Operations

4.5 Description of tests

4.5.1 Bandwidth measurement

- (a) Connect EUT test port to spectrum analyzer.
- (b) Set the EUT to transmit maximum output power at 2.4GHz, then set the measured frequency number and test the bandwidth with spectrum analyzer.

4.5.2 Average output power

- (a) Connect EUT test port to spectrum analyzer.
- (b) Set the EUT to transmit maximum output power at 2.4GHz.
- (c) Then set the EUT to transmit at high, middle and low frequency and measure the conducted output power separately.

4.5.3 Band edge spurious emission

- (a) Connect EUT test port to spectrum analyzer
- (b) Set the EUT to transmit maximum output power at 2.4GHz.
- (c) Then set the EUT to transmit at high, low frequency and measure the conducted band edge spurious separately.

4.5.4 Conducted RF spurious

- (a) Connect EUT test port to spectrum analyzer
- (b) Set the EUT to transmit maximum output power at 2.4GHz.
- (c) Then set the EUT to transmit at high, middle and low frequency and measure the conducted spurious separately.

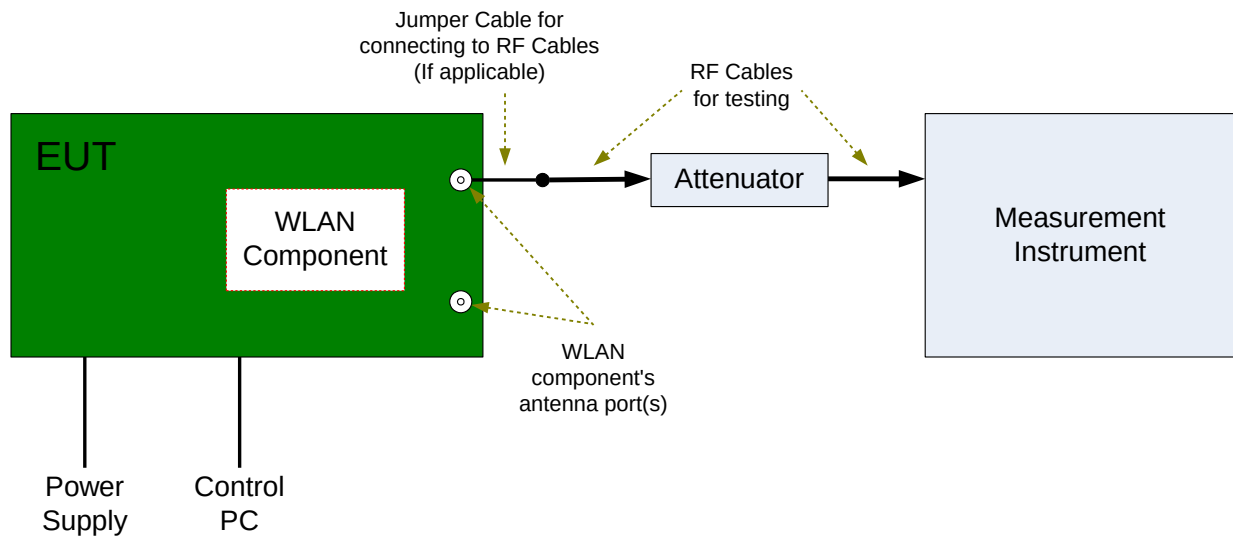
4.5.5 Power spectral density

- (a) Connect EUT test port to spectrum analyzer
- (b) Set the EUT to transmit maximum output power at 2.4GHz.
- (c) Then set the EUT to transmit at high, middle and low frequency and measure the conducted power spectral density.

4.6 Test Setups

4.6.1 Test Setup 1

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



4.7 Test Conditions

Test Case	Test Conditions	
	Configuration	Description
DTS (6 dB) Bandwidth	Measurement Method	FCC KDB 558074 D01 §8.1 Option 2.
	Test Environment	NTNV
	Test Setup	Test Setup 1
	EUT Configuration	11B_L@Ant1, 11B_M@Ant1, 11B_H@Ant1 11G_L@Ant1, 11G_M@Ant1, 11G_H@Ant1 11N20_L@Ant1,11N20_M@Ant1,11N20_H@Ant1 11N40_L@Ant1,11N40_M@Ant1,11N40_H@Ant1
Occupied Bandwidth	Measurement Method	FCC KDB 558074 D01 §8.2 Option 2.
	Test Environment	NTNV
	Test Setup	Test Setup 1
	EUT Configuration	11B_L@Ant1, 11B_M@Ant1, 11B_H@Ant1 11G_L@Ant1, 11G_M@Ant1, 11G_H@Ant1 11N20_L@Ant1,11N20_M@Ant1,11N20_H@Ant1 11N40_L@Ant1,11N40_M@Ant1,11N40_H@Ant1
Maximum Conducted Average Output Power	Measurement Method	FCC KDB 558074 D01 §9.2 .2. 4
	Test Environment	NTNV
	Test Setup	Test Setup 1
	EUT Configuration	11B_L@Ant1, 11B_M@Ant1, 11B_H@Ant1 11G_L@Ant1, 11G_M@Ant1, 11G_H@Ant1 11N20_L@Ant1,11N20_M@Ant1,11N20_H@Ant1 11N40_L@Ant1,11N40_M@Ant1,11N40_H@Ant1
Maximum Power Spectral Density Level	Measurement Method	FCC KDB 558074 D01 §10.1
	Test Environment	NTNV
	Test Setup	Test Setup 1
	EUT Configuration	11B_L@Ant1, 11B_M@Ant1, 11B_H@Ant1 11G_L@Ant1, 11G_M@Ant1, 11G_H@Ant1 11N20_L@Ant1,11N20_M@Ant1,11N20_H@Ant1 11N40_L@Ant1,11N40_M@Ant1,11N40_H@Ant1
Band Edges Compliance	Measurement Method	FCC KDB 558074 D01 §13.0.
	Test Environment	NTNV
	Test Setup	Test Setup 1
	EUT Configuration	11B_L@Ant1, 11B_M@Ant1, 11B_H@Ant1 11G_L@Ant1, 11G_M@Ant1, 11G_H@Ant1 11N20_L@Ant1,11N20_M@Ant1,11N20_H@Ant1 11N40_L@Ant1,11N40_M@Ant1,11N40_H@Ant1
Unwanted Emissions into Non-Restricted	Measurement Method	FCC KDB 558074 D01 §11.0
	Test Environment	NTNV
	Test Setup	Test Setup 1



Test Case	Test Conditions	
	Configuration	Description
Frequency Bands	EUT Configuration	11B_L@Ant1, 11B_M@Ant1, 11B_H@Ant1 11G_L@Ant1, 11G_M@Ant1, 11G_H@Ant1 11N20_L@Ant1,11N20_M@Ant1,11N20_H@Ant1 11N40_L@Ant1,11N40_M@Ant1,11N40_H@Ant1



5 Main Test Instruments

Main Test Equipments					
Equipment Name	Manufacturer	Model	Serial Number	Cal Date	Cal- Due
Spectrum Analyzer	Agilent	N9030A	MY49431698	2018/7/23	2019/7/22
Signal generator	Agilent	E8257D	MY49281095	2018/7/23	2019/7/22

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
RF Power Density, Conducted	Power [dBm]	U = 0.64 dB
Bandwidth	Magnitude [kHz]	20MHz: U=41.78kHz 40MHz: U=82.12kHz
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)20181012007001-2002	Appendix for 2.4G WLAN

END