



RF TEST REPORT

Applicant Huawei Technologies Co., Ltd.
FCC ID QISSTK-LX1
Product Smart Phone
Model STK-LX1
Report No. R1903H0032-R3V1
Issue Date March 27, 2019

TA Technology (Shanghai) Co., Ltd. tested the above equipment in accordance with the requirements in **FCC CFR47 Part 2 (2018)/ FCC CFR47 Part 27C (2018)**. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

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Summary of Measurement Results

Number	Test Case	Clause in FCC rules	Verdict
8	Radiates Spurious Emission	2.1053 /27.53(m)	PASS
Date of Testing: February 28, 2019 ~ March 7, 2019			
Note: PASS: The EUT complies with the essential requirements in the standard. FAIL: The EUT does not comply with the essential requirements in the standard.			

1 Test Laboratory

1.1 Notes of the Test Report

This report shall not be reproduced in full or partial, without the written approval of **TA technology (shanghai) co., Ltd.** The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein .Measurement Uncertainties were not taken into account and are published for informational purposes only. This report is written to support regulatory compliance of the applicable standards stated above.

1.2 Test facility

CNAS (accreditation number: L2264)

TA Technology (Shanghai) Co., Ltd. has obtained the accreditation of China National Accreditation Service for Conformity Assessment (CNAS).

FCC (Designation number: CN1179, Test Firm Registration Number: 446626)

TA Technology (Shanghai) Co., Ltd. has been listed on the US Federal Communications Commission list of test facilities recognized to perform electromagnetic emissions measurements.

IC (recognition number is 8510A)

TA Technology (Shanghai) Co., Ltd. has been listed by industry Canada to perform electromagnetic emission measurement.

VCCI (recognition number is C-4595, T-2154, R-4113, G-10766)

TA Technology (Shanghai) Co., Ltd. has been listed by industry Japan to perform electromagnetic emission measurement.

A2LA (Certificate Number: 3857.01)

TA Technology (Shanghai) Co., Ltd. has been listed by American Association for Laboratory Accreditation to perform electromagnetic emission measurement.

1.3 Testing Location



Company: TA Technology (Shanghai) Co., Ltd.
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City: Shanghai
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2 General Description of Equipment under Test

Client Information

Applicant	Huawei Technologies Co., Ltd.
Applicant address	Administration Building, Headquarters of Huawei Technologies Co., Ltd., Bantian, Longgang District, Shenzhen, 518129, P.R.China.
Manufacturer	Huawei Technologies Co., Ltd.
Manufacturer address	Administration Building, Headquarters of Huawei Technologies Co., Ltd., Bantian, Longgang District, Shenzhen, 518129, P.R.China.

General information

EUT Description			
Model	STK-LX1		
IMEI	IMEI 1:860815040043101 IMEI 2:860815040048027		
Hardware Version	HL1STKM		
Software Version	STK-LX1 9.0.1.18		
Power Supply	Battery/AC adapter		
Antenna Type	Internal Antenna		
Test Mode(s)	LTE Band 7;		
Test Modulation	QPSK 16QAM;		
LTE Category	6		
Rated Power Supply Voltage:	3.82V		
Extreme Voltage	Minimum: 3.6V Maximum: 4.4V		
Extreme Temperature	Lowest: 0°C Highest: +35°C		
Operating Frequency Range(s)	Mode	Tx (MHz)	Rx (MHz)
	LTE Band 7	2500 ~ 2570	2620 ~ 2690
EUT Accessory			
Adapter 1	Manufacturer: Huawei Technologies Co., Ltd. Model: HW-050200U01 Input Voltage: 100-240V ~50/60Hz 0.5A Output Voltage: 5V  2A		
Adapter 2	Manufacturer: Huawei Technologies Co., Ltd. Model: HW-050200E01 Input Voltage: 100-240V ~50/60Hz 0.5A Output Voltage: 5V  2A		
Adapter 3	Manufacturer: Huawei Technologies Co., Ltd. Model: HW-050200B01		

	Input Voltage: 100-240V ~50/60Hz 0.5A Output Voltage: 5V  2A
Adapter 4	Manufacturer: Huawei Technologies Co., Ltd. Model: HW-050200A01 Input Voltage: 100-240V ~50/60Hz 0.5A Output Voltage: 5V  2A
Adapter 5	Manufacturer: Huawei Technologies Co., Ltd. Model: HW-050200U02 Input Voltage: 100-240V ~50/60Hz 0.5A Output Voltage: 5V  2A
Adapter 6	Manufacturer: Huawei Technologies Co., Ltd. Model: HW-050200E02 Input Voltage: 100-240V ~50/60Hz 0.5A Output Voltage: 5V  2A
Adapter 7	Manufacturer: Huawei Technologies Co., Ltd. Model: HW-050200A02 Input Voltage: 100-240V ~50/60Hz 0.5A Output Voltage: 5V  2A
Adapter 8	Manufacturer: Huawei Technologies Co., Ltd. Model: HW-050200B02 Input Voltage: 100-240V ~50/60Hz 0.5A Output Voltage: 5V  2A
Battery	Manufacturer: Huawei Technologies Co., Ltd. Model: HB446486ECW Rated capacity: 3900mAh Nominal Voltage:  +3.82V Charging Voltage:  +4.40V
Earphone 1	Manufacturer: Boluo County Quancheng Electronic Co.,Ltd Model: 1293-3283-3.5MM-322
Earphone 2	Manufacturer: Jiangxi Lianchuang Hongsheng Electronic Co.,LTD Model: MEND1532B528A02
USB cable 1	Manufacturer: NingBo Broad Telecommunication Co.,Ltd. Model: WA0020
USB cable 2	Manufacturer: LUXSHARE Precision Industry Co., Ltd. Model: L99UC131-CS-H



USB cable 3	Manufacturer: HONGFUJIN PRECISION INDUSTRIAL (SHENZHEN).LTD Model: CUDU01B-HC295-EH
USB cable 4	Manufacturer: Freeport Resources Enterprises (Jiangxi) Co.,Ltd Model: 18-93C2CHO-001HF
USB cable 5	Manufacturer: Dongguan Mingji Electronics Technology Group Co.,Ltd Model: 203-1572-0
Note: 1.The information of the EUT is declared by the manufacturer. 2. There is more than one SIM/ Adapter /USB cable /Earphone, each one should be applied throughout the compliance test respectively, and however, only the worst case (SIM 1/Adapter 1/USB cable 2/ Earphone 2) will be recorded in this report.	

Band	Second-Antenna	Main-Antenna
	Gain (dBi)	Gain (dBi)
LTE B7	-3.3	-0.1

3 Applied Standards

According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

Test standards

FCC CFR47 Part 2 (2018)

FCC CFR47 Part 27C (2018)

ANSI C63.26 (2015)

KDB 971168 D01 Power Meas License Digital Systems v03r01

4 Test Configuration

There is more than one SIM card slot, each one should be applied throughout the compliance test respectively, and however, only the worst case (SIM 1) will be recorded in this report

Radiated measurements are performed by rotating the EUT in three different orthogonal test planes. EUT stand-up position (Z axis), lie-down position (X, Y axis). Receiver antenna polarization (horizontal and vertical), the worst emission was found in position (Z axis, horizontal polarization) and the worst case was recorded.

All mode and data rates and positions and RB size and modulations were investigated.

Subsequently, only the worst case emissions are reported.

Test modes are chosen to be reported as the worst case configuration below for LTE Band 7:

Test items	Modes	Bandwidth (MHz)						Modulation		RB			Test Channel		
		1.4	3	5	10	15	20	QPSK	16QAM	1	50%	100%	L	M	H
Radiates Spurious Emission	LTE 7	-	-	O	-	-	O	O	-	O	-	-	-	O	-
Note	1. The mark "O" means that this configuration is chosen for testing. 2. The mark "-" means that this configuration is not testing.														

5 Test Case Results

5.1 Radiates Spurious Emission

Ambient condition

Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

Method of Measurement

1. The testing follows FCC KDB 971168 D01 v03r01 Section 5.8 and ANSI C63.26 (2015).
2. Below 1GHz: The EUT is placed on a turntable 0.8 meters above the ground in the chamber, 3 meter away from the antenna. The maximal emission value is acquired by adjusting the antenna height, polarisation and turntable azimuth. Normally, the height range of antenna is 1 m to 4 m, the azimuth range of turntable is 0° to 360°, and the receive antenna has two polarizations Vertical (V) and Horizontal (H). Above 1GHz: (Note: the FCC's permission to use 1.5m as an alternative per TCBC Conf call of Dec. 2, 2014.) The EUT is placed on a turntable 1.5 meters above the ground in the chamber, 3 meter away from the antenna. The maximal emission value is acquired by adjusting the antenna height, polarisation and turntable azimuth. Normally, the height range of antenna is 1 m to 4 m, the azimuth range of turntable is 0° to 360°, and the receive antenna has two polarizations Vertical (V) and Horizontal (H).
3. A loop antenna, A log-periodic antenna or horn antenna shall be substituted in place of the EUT. The log-periodic antenna will be driven by a signal generator and the level will be adjusted till the same power value on the spectrum analyzer or receiver. The level of the spurious emissions can be calculated through the level of the signal generator, cable loss, the gain of the substitution antenna and the reading of the spectrum analyzer or receiver.
4. The EUT is then put into continuously transmitting mode at its maximum power level during the test. Set Test Receiver or Spectrum RBW=200Hz,VBW=600Hz for 9kHz150kHz , RBW=10kHz, VBW=30kHz 150kHz-30MHz ,RBW=100kHz,VBW=300kHz for 30MHz to 1GHz and RBW=1MHz, VBW=3MHz for above 1GHz And the maximum value of the receiver should be recorded as (Pr).
5. The EUT shall be replaced by a substitution antenna. In the chamber, an substitution antenna for the frequency band of interest is placed at the reference point of the chamber. An RF Signal source for the frequency band of interest is connected to the substitution antenna with a cable that has been constructed to not interfere with the radiation pattern of the antenna. A power (PMea) is applied to the input of the substitution antenna, and adjust the level of the signal generator output until the value of the receiver reach the previously recorded (Pr). The power of signal source (PMea) is recorded. The test should be performed by rotating the test item and adjusting the receiving antenna polarization.
6. A amplifier should be connected to the Signal Source output port. And the cable should be connect between the Amplifier and the Substitution Antenna. The cable loss (Pcl) ,the Substitution Antenna Gain (Ga) and the Amplifier Gain (PAg) should be recorded after test.
7. The measurement results are obtained as described below:

$$\text{Power(EIRP)} = \text{PMea} - \text{PAg} - \text{Pcl} + \text{Ga}$$

The measurement results are amend as described below:

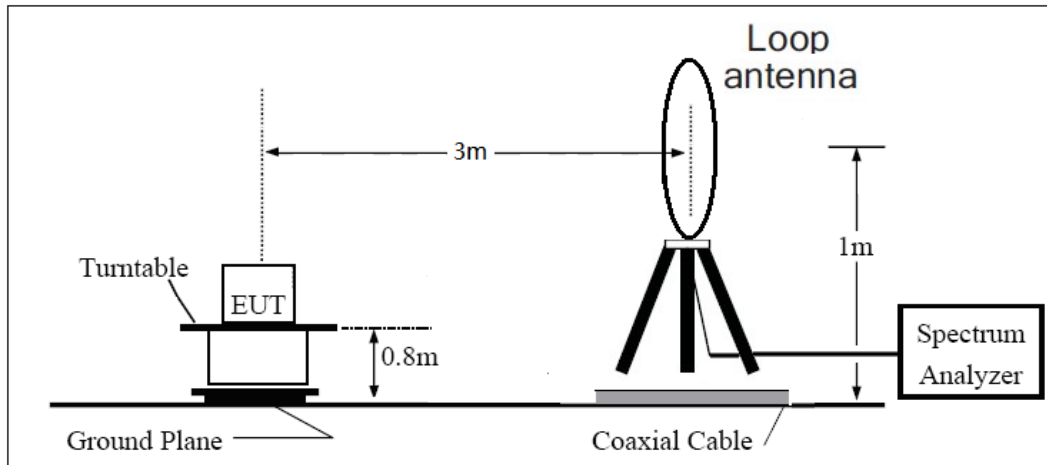
Power(EIRP)=PMea- Pcl + Ga

8. This value is EIRP since the measurement is calibrated using an antenna of known gain (2.15 dBi) and known input power. ERP can be calculated from EIRP by subtracting the gain of the dipole, ERP = EIRP-2.15dBi.

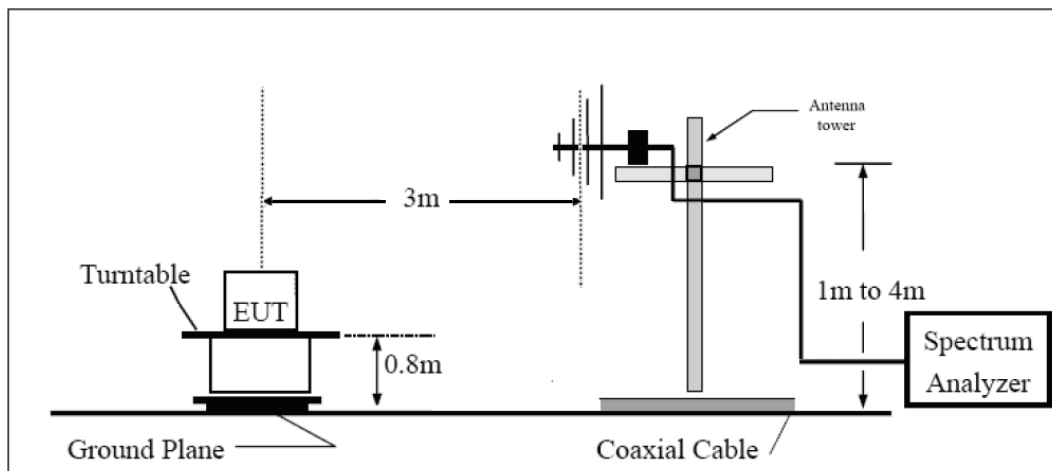
The modulation mode and RB allocation refer to section 5.1, using the maximum output power configuration.

Test setup

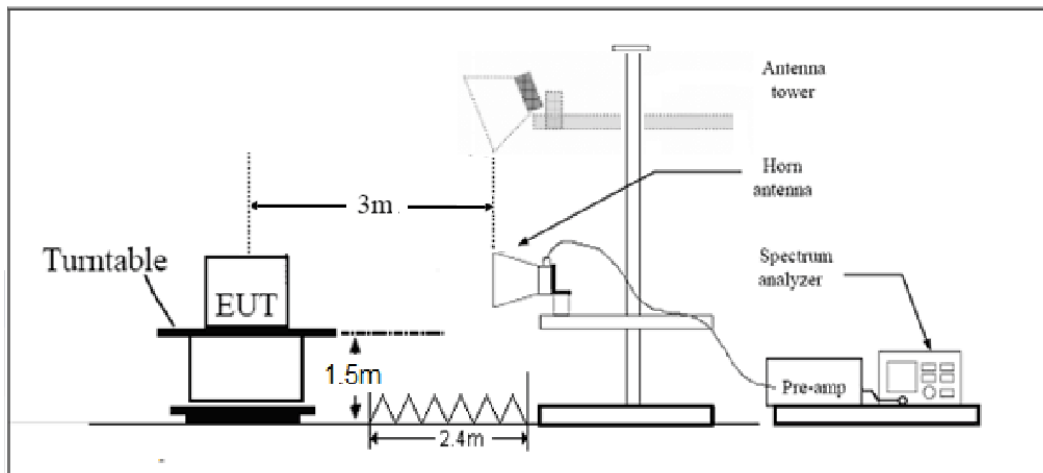
9KHz ~ 30MHz



30MHz ~ 1GHz



Above 1GHz



Note: Area side:2.4mX3.6m

Limits

LTE -7 Rule Part 27.53(m) $55 + 10 \log (P)$ dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(4) of this section.

Part 27.53(m) Limit	-25 dBm
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Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor $k = \pm 1.96$, $U = \pm 3.55$ dB.

Test Result

Sweep the whole frequency band through the range from 9kHz to the 10th harmonic of the carrier, the emissions below the noise floor will not be recorded in the report.

Main-Antenna

LTE Band 7 QPSK 5MHz CH-Middle, RB 1

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	EIRP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	5,065.8	-46.87	2.00	9.15	Horizontal	-39.72	-25.00	14.72	90
3	7,598.6	-49.50	2.50	11.35	Horizontal	-40.65	-25.00	15.65	135
4	10,130.6	-53.11	4.20	12.05	Horizontal	-45.26	-25.00	20.26	135
5	12,675.0	-53.25	5.20	12.85	Horizontal	-45.60	-25.00	20.60	45
6	15,210.0	-55.50	5.50	14.23	Horizontal	-46.77	-25.00	21.77	0
7	17,745.0	-51.86	5.70	14.15	Horizontal	-43.41	-25.00	18.41	225
8	20,280.0	--	--	--	--	--	--	--	--
9	22,815.0	--	--	--	--	--	--	--	--
10	25,350.0	--	--	--	--	--	--	--	--

Note: 1.The other Spurious RF Radiated emissions level is no more than noise floor.

2. The worst emission was found in the antenna is Horizontal position.

LTE Band 7 QPSK 20MHz CH-Middle, RB 1

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	EIRP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	5,052.4	-51.23	2.00	10.15	Horizontal	-43.08	-25.00	18.08	225
3	7,605.0	-45.97	2.50	11.35	Horizontal	-37.12	-25.00	12.12	45
4	10,140.0	-53.33	4.20	12.05	Horizontal	-45.48	-25.00	20.48	90
5	12,675.0	-52.40	5.20	14.85	Horizontal	-42.75	-25.00	17.75	135
6	15,210.0	-54.79	5.50	13.23	Horizontal	-47.06	-25.00	22.06	135
7	17,745.0	-50.30	5.70	12.15	Horizontal	-43.85	-25.00	18.85	90
8	20,280.0	--	--	--	--	--	--	--	--
9	22,815.0	--	--	--	--	--	--	--	--
10	25,350.0	--	--	--	--	--	--	--	--

Note: 1.The other Spurious RF Radiated emissions level is no more than noise floor.

2. The worst emission was found in the antenna is Horizontal position.

Second-Antenna

LTE Band 7 QPSK 5MHz CH-Middle, RB 1

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	EIRP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	5,065.8	-51.37	2.00	9.15	Horizontal	-44.22	-25.00	19.22	45
3	7,598.6	-49.08	2.50	11.35	Horizontal	-40.23	-25.00	15.23	315
4	10,130.6	-53.03	4.20	12.05	Horizontal	-45.18	-25.00	20.18	225
5	12,675.0	-53.12	5.20	12.85	Horizontal	-45.47	-25.00	20.47	90
6	15,210.0	-54.90	5.50	14.23	Horizontal	-46.17	-25.00	21.17	0
7	17,745.0	-51.88	5.70	14.15	Horizontal	-43.43	-25.00	18.43	180
8	20,280.0	--	--	--	--	--	--	--	--
9	22,815.0	--	--	--	--	--	--	--	--
10	25,350.0	--	--	--	--	--	--	--	--

Note: 1.The other Spurious RF Radiated emissions level is no more than noise floor.
2. The worst emission was found in the antenna is Horizontal position.

LTE Band 7 QPSK 20MHz CH-Middle, RB 1

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	EIRP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	5,052.4	-55.35	2.00	10.15	Horizontal	-47.20	-25.00	22.20	180
3	7,605.0	-44.29	2.50	11.35	Horizontal	-35.44	-25.00	10.44	270
4	10,140.0	-50.75	4.20	12.05	Horizontal	-42.90	-25.00	17.90	0
5	12,675.0	-51.59	5.20	14.85	Horizontal	-41.94	-25.00	16.94	315
6	15,210.0	-54.04	5.50	13.23	Horizontal	-46.31	-25.00	21.31	225
7	17,745.0	-49.59	5.70	12.15	Horizontal	-43.14	-25.00	18.14	135
8	20,280.0	--	--	--	--	--	--	--	--
9	22,815.0	--	--	--	--	--	--	--	--
10	25,350.0	--	--	--	--	--	--	--	--

Note: 1.The other Spurious RF Radiated emissions level is no more than noise floor.
2. The worst emission was found in the antenna is Horizontal position.

6 Main Test Instruments

Name	Manufacturer	Type	Serial Number	Calibration Date	Expiration Date
Base Station Simulator	R&S	CMW500	113824	2018-05-20	2019-05-19
Power Splitter	Hua Xiang	SHX-GF2-2-13	10120101	/	/
Spectrum Analyzer	Key sight	N9010A	MY50210259	2018-05-20	2019-05-19
Signal Analyzer	R&S	FSV30	100815	2018-12-16	2019-12-15
Loop Antenna	SCHWARZBECK	FMZB1519	1519-047	2017-09-26	2019-09-25
Trilog Antenna	SCHWARZBECK	VUBL 9163	9163-201	2017-11-18	2019-11-17
Horn Antenna	R&S	HF907	100126	2018-07-07	2020-07-06
Horn Antenna	ETS-Lindgren	3160-09	00102643	2018-06-20	2020-06-19
Signal generator	R&S	SMB 100A	102594	2018-05-20	2019-05-19
Climatic Chamber	ESPEC	SU-242	93000506	2017-12-17	2020-12-16
Preamplifier	R&S	SCU18	102327	2018-05-20	2019-05-19
MOB COMMS DC SUPPLY	Keysight	66319D	MY43004105	2018-05-21	2019-05-20
RF Cable	Agilent	SMA 15cm	0001	2018-12-16	2019-03-15
Software	R&S	EMC32	9.26.0	/	/

*****END OF REPORT *****