



# FCC RF Test Report

Product Name: Smart Phone

Model Number: VOG-L29/VOG-L09

Report No.: SYBH(Z-RF)20181224014002-2006

FCC ID : QISVOG-LX9

Authorized	APPROVED (Lab Manager)	PREPARED (Test Engineer)
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DATE	2019-01-28	2019-01-28

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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.
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**MODIFICATION RECORD**

No.	Report No	Modification Description
1	SYBH(Z-RF)20181224014002-2006	First release.

**DECLARATION**

Type	Description
Multiple Models Applications	<p><input type="checkbox"/> The present report applies to single model.</p> <p><input checked="" type="checkbox"/> The present report applies to several models. The practical measurements are performed with the model <u>VOG-L29</u>.</p> <p>These models utilize the similar radio design, shielding, interface, physical layout and so on. The differences and modifications between these models are declared by the applicant and showed in General Description</p> <p>All others between these models are identical.</p> <p>The present report only presents the worst test case of all modes, see relevant test results for detailed.</p>

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## 2 General Information

### 1.1 Test standard/s

Applied Rules :	47 CFR FCC Part 02 47 CFR FCC Part 15 Subpart C (15.225)
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### 1.2 Test Environment

Temperature :	TN	15 to 30	°C during room temperature tests
Ambient Relative Humidity:	20 to 85 %		
Atmospheric Pressure:	Not applicable		
Power supply :	VL	3.6	V
	VN	3.82	V DC by Battery
	VH	4.35	V

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.

### 1.3 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

### 1.4 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

### 1.5 Application details

Date of Receipt Sample:	2019-01-02
Start of test:	2019-01-03
End of test:	2019-01-28

### 3 Summary

FCC Rule No.	Test Description	Test Limit	Test Condition	Test Result	Reference
<b>TRANSMITTER MODE</b>					
15.225 (a)	In-Band Emissions	15,848 $\mu$ V/m @ 30m 13.553 – 13.567 MHz	RADIATED	PASS	Section 5.2
2.1049 15.215	Bandwidth	N/A		PASS	Section 5.1
15.225(b)	In-Band Emissions	334 $\mu$ V/m @ 30m 13.410 – 13.553 MHz 13.567 – 13.710 MHz		PASS	Section 5.2
15.225(c)	In-Band Emissions	106 $\mu$ V/m @ 30m 13.110 – 13.410 MHz 13.710 – 14.010 MHz		PASS	Section 5.2
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
15.225(e)	Frequency Stability Tolerance	$\pm$ 0.01% of Operating Frequency	Temperature Chamber	PASS	Section 5.4
15.207	AC Conducted Emissions 150kHz – 30MHz	FCC: < FCC 15.207 limits	LINE CONDUCTED	PASS	Section 5.5
Note1: 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 Note2: We do not test NFC of VOG-L29/VOG-L09, all test data can refer to No. SYBH(Z-RF)20181218028001-2006 of VOG-L04(FCC ID:QISVOG-L04).					

## 4 Product Description

### 4.1 Product Information

#### 4.1.1 General Description

VOG-L29 is a 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 B4 and B5 and B6 and B8 and B19. The LTE frequency band is B1 and B2 and B3 and B4 and B5 and B6 and B7 and B8 and B9 and B12 and B17 and B18 and B19 and B20 and B26 and B28 and B32 and B34 and B38 and B39 and B40 and B41. 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, Bluetooth, NFC, Wi-Fi and Wirelessly Charging etc. VOG-L29 is a dual SIM smart phone, and one of the SIM card interfaces could be used as Nano memory card interface. Externally it provides type C USB charging port, and the port could be used as the earphone port or data-transfer port.

VOG-L09 is a 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 B4 and B5 and B6 and B8 and B19. The LTE frequency band is B1 and B2 and B3 and B4 and B5 and B6 and B7 and B8 and B9 and B12 and B17 and B18 and B19 and B20 and B26 and B28 and B32 and B34 and B38 and B39 and B40 and B41. 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, Bluetooth, NFC, Wi-Fi and Wirelessly Charging etc. VOG-L09 provides one SIM card interface and one Nano memory card interface. Externally it provides type C USB charging port, and the port could be used as the earphone port or data-transfer port.

The difference between VOG-L29 and VOG-L09

The only difference between VOG-L29 and VOG-L09 is that VOG-L09 deletes into single SIM card by software. Other parts of the two models are the same.

The difference between VOG-L29 and VOG-L04 is show in the below table.

Model	VOG-L29	VOG-L04
PCB	The same	The same
Frequency-GSM	The same	The same

<b>Frequency-WCDMA</b>		The same	The same
<b>Frequency-LTE</b>		The same Support B32 Unsupport B66	Different Support B66 Unsupport B32
<b>4*4 Mimo</b>		The same Support B1、B3、B7	Different Support B2、B4、B7、B66
<b>SIM Card</b>		Dual	Single
<b>Hardware</b>	<b>B32 RF circuit</b>	Support B32  Location ID: SAW filter:Z3401,Z4104, B32 Diplexer:Z3402,Z5403 RF low noise amplifier:U3405,U4103 Capacitor:C3422,C3423,C3425,C3442,C2912,C3411,L3533,L4416,C3418,C4102 Inductor:L3412,L3422,L3413,L3408,L4124,L4137,L4139,L4140 Function Description:B32 main RF circuit and diversity RF circuit	Unsupport B32 Delete components related to the B32 RF circuit.
	<b>4*4 MIMO(the 3rd &amp; 4th antenna)</b>	Support B1/3/7 4*4MIMO and delete/replace components related circuit;  Location ID: B1/3/7 SAW filter of the 4th antenna :Z4403 (Vendor:KYOCERA type:SF18-1842M8SUA3) SAW filter of the 3rd antenna :Z4301 (Vendor:KYOCERA type:SF18-1842M8SUA3) Capacitor:L5507,C5401,C5402,C5517,C3411,L3533,L4416 Inductor:L5510,L4330,L5415,L3408,L4419 Function Description: B1/3/7 4*4MIMO RF circuit	Support B2/7/66(4) 4*4MIMO and delete/replace components related circuit;  Location ID: B2/7/66(4) SAW filter: SAW filter of the 4th antenna :Z4403 (Vendor:MURATA type:SATEY1G96AU3F0AR00) SAW filter of the 3rd antenna :Z4301 (Vendor:MURATA type:SATEY1G96AU3F0AR00) Inductor:L4419,L4412,L4416,C5444,C5407,L5510 Function Description:B2/7/66(4) 4*4MIMO RF circuit
	<b>B1/B3/B32 &amp; B2/B66 RF &amp; CA circuit</b>	Unsupport B66 and delete/replace components related circuit;  Support CA_1-3-32 Location ID: B1/B3 Quadruplexer:Z3502(Vendor:QORVO, type:QM25002TR13-5KHW) Capacitor:C3533 B2 SAW filter: Z4101(Vendor:MURATA ect. type:SAFFB1G96AB0F0AR1X ect. ) L4123,L4122,L3523,L3532,C3520,L3512,L4419 Function Description:B2 RX and CA_1-3-32 diplexer RF circuit	Unsupport CA_1-3-32 and delete/replace components related circuit;  Support B66 &Support CA_2-66 Location ID: B2/B7/B66(4) diversity TRI SAW filter:Z4105 (Vendor:MURATA type:SATEY1G96AU3F0AR00) B2/B66(B4) Quadruplexer:Z3502( Vendor:KYOCERA type:SQ25-1745K6SUA4) Capacitor:C3401,C3402,C3504,L4110 Inductor:L3532,L4111,L4112,L4107,L4109,L4114,L4108,L4118,C3520,L3533,L3512 Function Description:B2/B66 Single-band and CA main and diversity RF circuits



	<b>B7 RX circuit</b>	B7 receive matching circuit include: Inductor:L4127,L4126	B7 receiving matching circuit is adjusted to include: Inductor:C4101 B7 diversity TRI SAW filter:Z4105(Vendor:MURATA type:SATEY1G96AU3F0AR00)
<b>Software</b>		Different	Different
<b>Dimensions</b>		The same	The same
<b>Appearance</b>		The same	The same
<b>main antenna</b>		The same	The same
<b>DIV antenna</b>		The same	The same
<b>BT/Wi-Fi antenna</b>		The same	The same
<b>MIMO antenna</b>		The same	The same
<b>NFC</b>		The same	The same
<b>WPC</b>		The same	The same
<b>Supported CA configurations for DL CA</b>		Different	Different
<b>Supported CA configurations for UL CA</b>		The same	The same
<b>Others</b>		NA	NA

Note1: Only NFC test data included in this report.

Note2: We do not test NFC of VOG-L29/VOG-L09, all test data can refer to No. SYBH(Z-RF)20181218028001-2006 of VOG-L04(FCC ID:QISVOG-L04).















## 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	9.1.0.84(C432E84R1P1)	HL2VOGUEM

### 4.2.2 Sub-Assembly

Sub-Assembly			
Sub-Assembly Name	Model	Manufacturer	Description
Adapter	HW-100400A00	Huawei Technologies Co., Ltd.	Input voltage: 100-240V ~50/60Hz 1.2A Output voltage: 5V  2A OR 9V  2A OR 10V  4A
Adapter	HW-100400U00	Huawei Technologies Co., Ltd.	Input voltage: 100-240V ~50/60Hz 1.2A Output voltage: 5V  2A OR 9V  2A OR 10V  4A
Adapter	HW-100400E00	Huawei Technologies Co., Ltd.	Input voltage: 100-240V ~50/60Hz 1.2A Output voltage: 5V  2A OR 9V  2A OR 10V  4A
Adapter	HW-100400B00	Huawei Technologies Co., Ltd.	Input voltage: 100-240V ~50/60Hz 1.2A Output voltage: 5V  2A OR 9V  2A OR 10V  4A
Battery	HB486486ECW	Huawei Technologies Co., Ltd.	Rated capacity: 4100mAh Nominal Voltage:  +3.82V Charging Voltage:  +4.4V

## 5 Test Results

### 5.1 Bandwidth Measurement

Refer to No. SYBH(Z-RF)20181218028001-2006

### 5.2 In-Band Radiated Spurious Emission Measurements

Refer to No. SYBH(Z-RF)20181218028001-2006

### 5.3 Radiated Spurious Emission Measurements, Out-of-Band

Refer to No. SYBH(Z-RF)20181218028001-2006

### 5.4 Frequency Stability

Refer to No. SYBH(Z-RF)20181218028001-2006

### 5.5 AC Power Line Conducted Emissions

Refer to No. SYBH(Z-RF)20181218028001-2006

## 6 MAIN TEST INSTRUMENTS

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

Devices used during the test described are marked

<input checked="" type="checkbox"/> Main Test Equipment( RE test system)						
Marked	Equipment Name	Manufacturer	Model	Serial Number	Cal Date	Cal-Due
<input checked="" type="checkbox"/>	Test receiver	R&S	ESU26	100387	2019/01/15	2020/01/14
<input checked="" type="checkbox"/>	LOOP Antennas(9kHz-30MHz)	R&S	HFH2-Z2	100262	2017/04/25	2019/04/25
<input type="checkbox"/>	LOOP Antennas(9kHz-30MHz)	R&S	HFH2-Z2	100263	2017/04/25	2019/04/25
<input checked="" type="checkbox"/>	Trilog Broadband Antenna (30M~3GHz)	SCHWARZB ECK	VULB 9163	9163-357	2017/04/21	2019/04/20
<input type="checkbox"/>	Trilog Broadband Antenna (30M~3GHz)	SCHWARZB ECK	VULB 9163	9163-520	2017/3/29	2019/3/28
<input type="checkbox"/>	Trilog Broadband Antenna (30M~3GHz)	SCHWARZB ECK	VULB 9163	9163-491	2017/3/29	2019/3/28
<input type="checkbox"/>	Trilog Broadband Antenna (30M~3GHz)	SCHWARZB ECK	VULB 9163	9163-356	2018/4/9	2020/4/8
<input checked="" type="checkbox"/>	Double-Ridged Waveguide Horn Antenna (1G~18GHz)	R&S	HF907	100305	2017/4/21	2019/4/20
<input type="checkbox"/>	Double-Ridged Waveguide Horn	R&S	HF906	100684	2017/5/27	2019/5/26

	Antenna (1G~18GHz)					
<input type="checkbox"/>	Double-Ridged Waveguide Horn Antenna (1G~18GHz)	R&S	HF906	100683	2017/3/29	2019/3/28
<input checked="" type="checkbox"/>	Pyramidal Horn Antenna(18GHz-26.5GHz)	ETS-Lindgren	3160-09	5140299	2017/07/20	2019/07/19
<input type="checkbox"/>	Pyramidal Horn Antenna(18GHz-26.5GHz)	ETS-Lindgren	3160-09	00206665	2018/4/21	2020/4/20
<input checked="" type="checkbox"/>	Pyramidal Horn Antenna(26.5GHz-40GHz)	ETS-Lindgren	3160-10	00205695	2018/04/20	2020/04/19
<input type="checkbox"/>	Pyramidal Horn Antenna(26.5GHz-40GHz)	ETS-Lindgren	3160-10	LM5947	2017/07/20	2019/07/19
<input checked="" type="checkbox"/>	Measurement Software	R&S	EMC32 V9.25.0	/	/	/

<input checked="" type="checkbox"/> Main Test Equipment( CE test system)						
Marked	Equipment Name	Manufacturer	Model	Serial Number	Cal Date	Cal-Due
<input type="checkbox"/>	Test receiver	R&S	ESU26	100387	2019/01/15	2020/01/14
<input checked="" type="checkbox"/>	Test receiver	R&S	ESCI	101163	2019/01/15	2020/01/14
<input type="checkbox"/>	Artificial Main Network	R&S	ENV4200	100134	2018/05/08	2019/05/07
<input checked="" type="checkbox"/>	Line Impedance Stabilization Network	R&S	ENV216	100382	2018/05/08	2019/05/07
<input checked="" type="checkbox"/>	Measurement Software	R&S	EMC32 V9.25.0	/	/	/

## 7 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 [dB $\mu$ V/m]	For 3 m Chamber: U = 5.90 dB (30 MHz-1 GHz) U = 4.94 dB (1 GHz-18 GHz) U = 4.24 dB (18 GHz-26.5 GHz)
AC Power Line Conducted Emissions	Disturbance Voltage[dB $\mu$ V]	U=2.3 dB

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