



EMC Test Report

Product Name: LTE USB Stick

Model Number: MS2372h-607

FCC ID: QISMS2372H-607

Report No: SYBH(Z-EMC)048092017-2

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

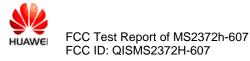
Administration Building, Headquarters of Huawei Technologies Co., Ltd., Bantian, Longgang District, Shenzhen, 518129, P.R.C

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Notice

- 1. The laboratory has obtained the accreditation of China National Accreditation Service for Conformity Assessment (CNAS), and accreditation number: 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 listed by Industry Canada to perform electromagnetic emission measurements. The recognition numbers of test site are 6369A-1.
- 4. The laboratory (Reliability Lab of Huawei Technologies Co., Ltd) is also named as "Global Compliance and Testing Center of Huawei Technologies Co., Ltd", the both names have coexisted since 2009.
- 5. The laboratory has been recognized by the US Federal Communications Commission (FCC) to perform compliance testing subject to the Commission's Declaration Of Conformity (DOC) and Certification rules. The Designation Number is CN1173, and the Test Firm Registration Number is 294140."
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- 7. The test report is invalid if there is any evidence of erasure and/or falsification.
- 8. If there is any dissidence for the test report, please file objection to the test centre within 15 days from the date of receiving the test report.
- 9. Normally, the test report is only responsible for the samples that have undergone the test.
- 10. Context of the test report cannot be used partially or in full for publicity and/or promotional purposes without previous written approval of 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 Test Item:	Sep.25,2017		
Start Date of Test:	Sep.25,2017		
End Date of Test:	Sep.30,2017		

Test Result:

Pass

Approved By	2017-09-30	Roger Zhang	Roger zhang
(Lab Manager)	Date	Name	Signature
			Lus vei
Prepared by	<u>2017-09-30</u>	Luo Wei	
(Test Engineer)	Date	Name	Signature

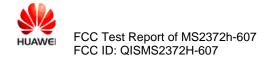
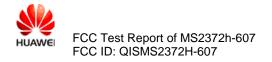


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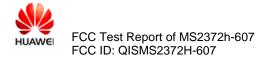


1 General Information

1.1 EUT Description

EUT Description		
Product Name	LTE USB Stick	
Model Number	MS2372h-607	
Serials Number	2NU0117907000016	
Input Rated Voltage	5V	
TX Frequency	GSM 850: 824MHz to 849MHz GSM 1900: 1850MHz to 1910MHz LTE BAND 7: 2500MHz to 2570MHz	
RX Frequency	GSM 850: 869MHz to 894MHz GSM 1900: 1930MHz to 1990MHz LTE BAND 7: 2620MHz to 2690MHz	
HW Version	CL1MS2372HM01 VER.B	
SW Version	21.328.01.07.00	

Remark: The above EUT's information is declared by manufacturer. Please refer to the specifications or user's manual for more detailed information.



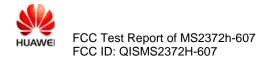
1.2 Test Site Information

Test Site:	RELIABILITY LABORATORY OF HUAWEI TECHNOLOGIES CO., LTD.
Test Site Location:	Administration Building, Headquarters of Huawei Technologies Co., Ltd., Bantian, Longgang District, Shenzhen, 518129, P.R.C

1.3 Applied Standards

APPLIED STANDARD

47 CFR FCC Part 15:2016, Subpart B

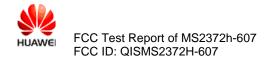


2 Summary of Results

Summary of Results						
Test Items	Test Mode	Performance Class & Required Performance Criteria	Resul t	Site		
Radiated Emissions	Mode 1	CLASS B	Pass	Site1		
Conducted Emissions DC Power Port AC Power Port Telecommunication Ports	DC Power PortMode 1~Mode 2CLASS BPassSite1					
 Note: 1, Measurement taken is within the measurement uncertainty of measurement system. 2, ☐ The item has been tested; ☐ The item has not been tested. 						

During the measurement, the environmental conditions complied with the range listed as below.

Item	Required
Ambient temperature	15°C~35°C
Relative humidity	25%~75%
Atmospheric pressure	86kPa~106kPa



3 System Configuration during EMC Test

3.1 Test Mode

Huawei has verified the construction and function in typical operation. All the test modes are carried out with the EUT under normal operation, which are shown in this test report and defined as below:

Test Mode	
Mode 1:	EUT with PC+ USB Cable+ Idle Mode
Mode 2:	EUT with PC+ USB Cable + Traffic Mode

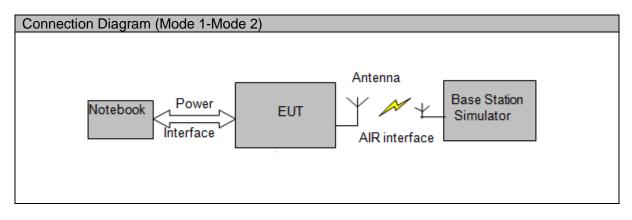
Traffic Mode:

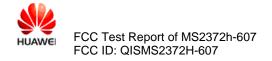
When the EUT state is switched on and with Radio Resource Control (RRC) connection established.

Idle Mode:

When the EUT state is switched on but without Radio Resource Control (RRC) connection.

3.2 Test System Configuration



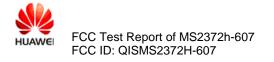


3.3 Cables Used during Test

Cable	Quantity	Length	Type of Cable
USB cable	1	1m	shielded

3.4 Associated Equipment Used during Test

Name	Model	Manufacturer	S/N	Calibrated Deadline
Radio Communication Tester	CMU200	R&S	3607033573	2018-02- 28
Radio Communication Tester	MT8820C	Anritsu	A110518805	2018-05- 15
Notebook	X230	ThinkPad	31090403579	/



4 Electromagnetic Interference (EMI)

4.1 Radiated Disturbance 30MHz to 18GHz

4.1.1 Test Procedure

The test site semi-anechoic chamber has met the requirement of NSA tolerance 4dB according to the standards: ANSI C63.4-2014. The test distance is 3m.The set-up and test methods are according to ANSI C63.4-2014.

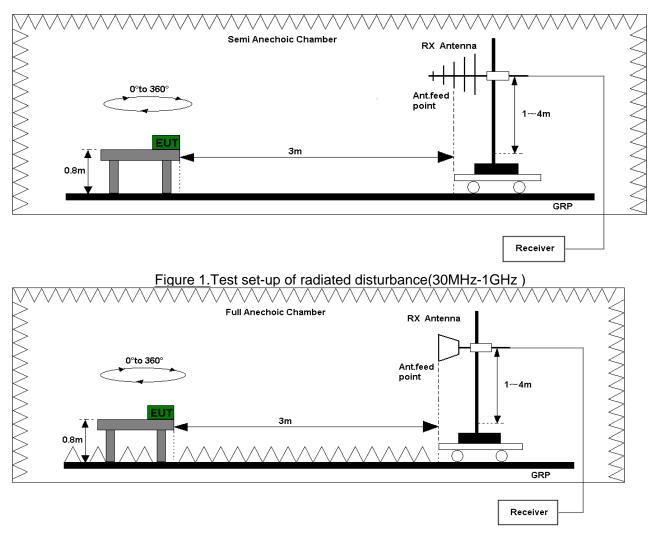
A preliminary scan and a final scan of the emissions are made from 30 MHz to18 GHz by using test script of software; The emissions are measured using Quasi-Peak Detector (30MHz~1GHz) and AV/PK detector (above 1GHz). The maximal emission value is acquired by adjusting the antenna height, polarisation and turntable azimuth in accordance with the software setup. Normally, the height range of antenna is 1m to 4m. The azimuth range of turntable is 0°to 360°. The receiving antenna has two polarizations V and H.

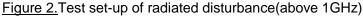
Measurement bandwidth (RBW) for 30MHz to 1000 MHz: 120 kHz;

Measurement bandwidth (RBW) for 1000MHz to 18000 MHz: 1MHz;

EUT is configured in idle mode and the test performed at worst emission state.

4.1.2 Test setup



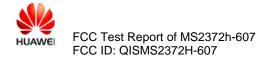




4.1.3 Test Results

The EUT has met the requirements for Radiated Emission of enclosure port. Refer to the section 7.1 of this report for test data.

Test Limits (Class B)				
Frequency of Emission (MHz)	Radiated Limit			
(101112)	Unit(µV/m)		Unit(dBµV/m)
30-88	100		40	
88-216	150		43.5	
216-960	200			46
Above 960	500			54
Above 1000	AV PK		AV	PK
	500	5000	54	74



4.2 Conducted Disturbance 0.15 MHz to 30MHz

4.2.1 Test Procedure

The Table-top EUT is placed upon a non-metallic table 0.8 m above the horizontal metal reference ground plane. EUT is connected to LISN and LISN is connected to reference Ground Plane. EUT is 80cm away from LISN. The set-up and test methods are according to ANSI C63.4-2014. Conducted Disturbance at AC Port measurements are undertaken on the L and N Lines. The

emissions are measured using a Quasi-Peak Detector and Average Detector. EUT is communicated with the simulator through Air interface, the simulator controls the EUT to transmitter the maximum power which defined in specification of product. The EUT operated on the typical channel.

Measurement bandwidth (RBW) for 150 kHz to 30 MHz: 9 kHz;

The EUT is set in the shielded chamber and operated under nominal conditions.

4.2.2 Test Setup

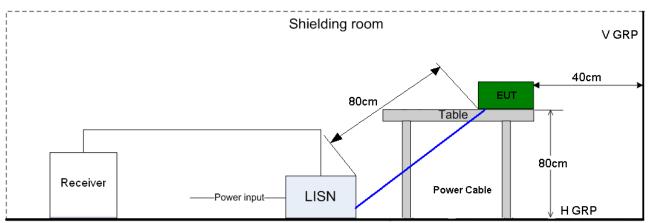
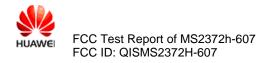


Figure 3. Test Set-up of conducted disturbance

4.2.3 Test Results

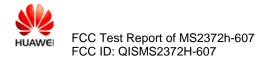
The EUT has met requirements for Conducted disturbance. Refer to the section 7.2 of this report for test data.

Test Limit of AC Power Port				
Frequency range	150kHz ~ 30MHz	150kHz ~ 30MHz		
Fraguanay	Voltage limits			
Frequency	QP AV			
0.15MHz~0.5MHz	66-56 dBµV 56-46 dBµV			
0.5MHz-5MHz	56 dBµV	46 dBµV		
5MHz~30MHz	60 dBµV	50 dBµV		



5 Main Test Instruments

Main Test Equipments									
Test item	Test Instrument	Model	S/N	Manufactu rer	Calibrated deadline	Cal interval (month)			
	EMI Test receiver	ESU26	100150	R&S	Feb. 20, 2018	12			
RE	Broadband Antenna	VULB 9163	9163-491	SCHWAR ZBECK	Mar. 28, 2019	24			
	Horn Antenna	HF906	100683	R&S	Mar. 28, 2019	24			
	EMI Test receiver	ESU26	101163	R&S	Feb. 20, 2018	12			
CE	Artificial Mains Network	ENV216	100382	R&S	May. 15, 2018	12			
	Software Information								
Test Item	Software Name Manufacturer Version					ion			
RE	EMC	32	R&S V9.25.0						
CE	EMC	:32	Ra	&S	V9.2	5.0			



6 System Measurement Uncertainty

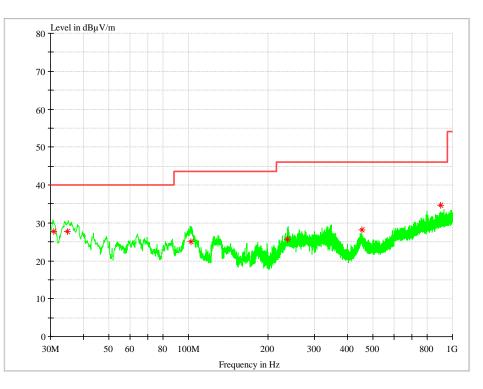
For a 95% confidence level, the measurement expanded uncertainties for defined systems, in accordance with the recommendations of ISO 17025 are:

System Measurement Uncertainty								
Items Extended Uncertainty								
RE(30MHz-1GHz)	Field strength (dBµV/m)	U=4.1dB; k=2						
RE(1GHz-18GHz)	Field strength (dBµV/m)	U=5.0dB; k=2						
CE	Disturbance Voltage (dBµV)	U=2.5dB; k=2						



7 Test Data and Graph

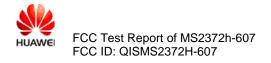
Only the worst test result is shown in this report. **7.1 Radiated Disturbance 7.1.1 30MHz~1GHz** Mode 1:



Frequency	Level	Transd	Limit	Margin	Height	Azimuth	Polarisation
MHz	dBµV/m	dB	dBµV/m	dB	cm	deg	Folansation
30.896950	27.62	14.7	40.00	12.38	100.0	197.0	VERTICAL
34.663200	27.76	15.2	40.00	12.24	100.0	18.0	VERTICAL
101.936650	25.09	13.8	43.50	18.41	143.0	350.0	VERTICAL
237.584400	25.63	14.3	46.00	20.37	129.0	264.0	HORIZONTAL
453.604800	28.20	19.0	46.00	17.80	107.0	208.0	VERTICAL
899.754650	34.73	26.1	46.00	11.27	200.0	197.0	HORIZONTAL

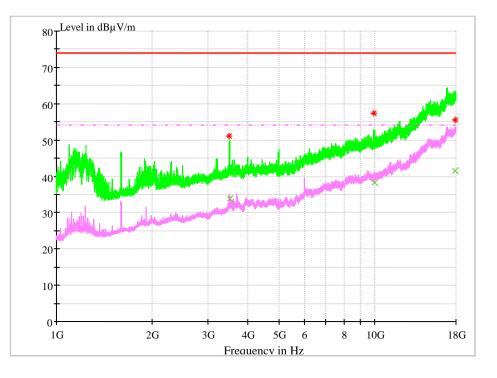
Note:

Level =Reading level by receiver + Transd (Antenna factor + cable loss – preamplifier gain) The reading level is calculated by software which is not shown in the sheet.



7.1.2 1GHz~18GHz

Mode 1:



MEASUREMENT RESULT: PK Detector

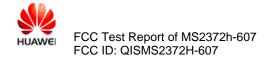
Frequency		Transd	Limit	Margin	Height	Azimuth	Polarisation
MHz	dBµV/m	dB	dBµV/m	dB	cm	deg	
3492.238667	51.13	-3.5	74	22.87	100	316	VERTICAL
9964.602667	57.3	7.4	74	16.7	140	12	VERTICAL
17922.54667	55.43	21.6	74	18.57	256	63	HORIZONTAL

MEASUREMENT RESULT: AV Detector

Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Height cm	Azimuth deg	Polarisation
3499.236	33.9	-3.5	54	20.1	100	316	VERTICAL
9977.314	38.21	7.4	54	15.79	143	7	VERTICAL
17870.98867	41.63	21.5	54	12.37	160	354	HORIZONTAL

Note:

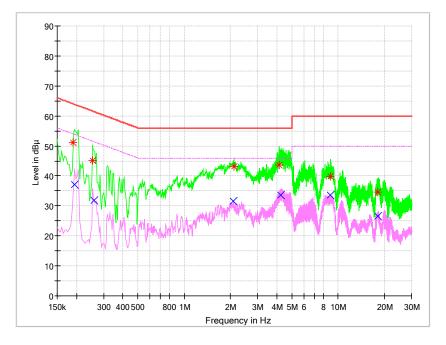
Level =Reading level by receiver + Transd (Antenna factor + cable loss – preamplifier gain) The reading level is calculated by software which is not shown in the sheet.



7.2 Conducted Disturbance

7.2.1 AC Port Test Data

Mode 2:



MEASUREMENT RESULT: QP Detector

Frequency	Level	Line	Transd	Margin	Limit	PE
MHz	dBµV		dB	dB	dBµV	Γ L
0.190489	51.14	N	9.7	12.87	64.02	FLO
0.253845	45.17	L1	9.7	16.46	61.63	FLO
2.098522	43.1	N	9.7	12.9	56	FLO
4.129714	43.52	N	9.8	12.48	56	FLO
8.889401	39.92	L1	9.9	20.08	60	FLO
18.121226	34.5	L1	10.1	25.5	60	FLO

MEASUREMENT RESULT: AV Detector

Frequency	Level	Line	Transd	Margin	Limit	PE
MHz	dBµV		dB	dB	dBµV	PE
0.194539	37.06	L1	9.7	16.78	53.84	FLO
0.259515	31.77	L1	9.7	19.68	51.45	FLO
2.095601	31.6	N	9.7	14.4	46	FLO
4.259456	33.68	N	9.8	12.32	46	FLO
8.890166	33.58	L1	9.9	16.42	50	FLO
18.171019	26.54	L1	10.1	23.46	50	FLO

Note:

Level= Reading level+ Transd (cable loss + correction factor)

The reading level is calculated by software which is not shown in the sheet.

-----END------END------