



# EMC Test Report

**Product Name: LTE cube**

**Model Number: E5180s-610**

**Report No: SYBH(Z-EMC)029112014 -2**

**FCC ID: QISE5180S-610**

**Reliability Laboratory of Huawei Technologies Co., Ltd.**

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

Tel: +86 755 28780808 Fax: +86 755 89652518

## 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 on the US Federal Communications Commission list of test facilities recognized to perform electromagnetic emissions measurements. The site recognition number is 97456.
4. The laboratory has been listed by industry Canada to perform electromagnetic emission measurement. The site recognition number is 6369A-2.
5. The test report is invalid if not marked with "exclusive stamp for the test report".
6. The test report is invalid if not marked with the stamps or the signatures of the persons responsible for performing, revising and approving the test report.
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:** Nov.13, 2014  
**Start Date of Test:** Nov.14, 2014  
**End Date of Test:** Nov.15, 2014

**Test Result:** Pass

**Approved By  
(Lab Manager)**

2014-11-15  
Date

Liu Chunlin  
Name

Signature

**Operator  
(Test Engineer)**

2014-11-15  
Date

Li ZongHai  
Name

Signature



### Modification Record

No.	Last Report No.	Modification Description
1	NA	First report

## TABLE OF CONTENT

1	General Information .....	6
1.1	EUT Description .....	6
1.2	Differences Description .....	7
1.3	Test Site Information .....	8
1.4	Applied Standards .....	8
2	Summary of Results .....	9
3	System Configuration during EMC Test .....	10
3.1	Test Mode .....	10
3.2	Test System Configuration .....	10
3.3	Cables Used during Test.....	11
3.4	Associated Equipment Used during Test.....	11
4	Electromagnetic Interference (EMI).....	12
4.1	Radiated Disturbance 30MHz to 18GHz.....	12
5	Main Test Instruments .....	14
6	System Measurement Uncertainty .....	14
7	Test Data and Graph .....	15
7.1	Radiated Disturbance.....	15

## 1 General Information

### 1.1 EUT Description

EUT Description	
Product Name	LTE cube
Model Number	E5180s-610
Serials Number	7S2XAP14AX000008
Working Voltage	12.0Vdc
TX Frequency	GSM850: 824MHz To 849MHz GSM1900: 1850MHz To 1910MHz WCDMA Band II: 1850MHz To 1910MHz WCDMA Band V: 824MHz To 849MHz LTE Band 3:1710MHz To 1785MHz LTE Band 5:824MHz To 849MHz LTE Band 7: 2500MHz To 2570MHz
RX Frequency	GSM850: 869MHz To 894MHz GSM1900: 1930MHz To 1990MHz WCDMA Band II: 1930MHz To 1990MHz WCDMA Band V: 869MHz To 894MHz LTE Band 3: 1805MHz To 1880MHz LTE Band 5: 869MHz To 894MHz LTE Band 7: 2620MHz To 2690MHz
HW Version	CL1E5180SR &CL1E5180SM07
SW Version	21.270.25.00.00
EUT Accessory	
Adapter	BRAND: HUAWEI Model: HW-120100A6W Input voltage: 100V-240V~50/60Hz, 0.8A Output voltage: 12.0V $\overline{\text{---}}$ 1.0A SN: H6361WE6E00039 SN: X636A1E7800120
Adapter	BRAND: HUAWEI Model: HW-120100U6W Input voltage: 100V-240V~50/60Hz, 0.8A Output voltage: 12.0V $\overline{\text{---}}$ 1.0A SN: X636A1E9500413

Remark: The information of the EUT is declared by the manufacturer. Please refer to the specifications or user manual for details.



## 1.2 Differences Description

The test for E5180s-610 is based on E5180s-517 with the report No. SYBH(Z-EMC)002092014. Besides that all the test projects on E5180s-610, RE tests are necessary and indispensable.

E5180s-517 and E5180s-610 have the same PCB layout and enclosure, the difference is: they have different RF bands.

The following table shows the 2 Models.

	E5180s-517	E5180s-610
GSM 850M/900M/1800M/1900M	support	support
DC-HSPA+/HSPA+/HSPA/WCDMA 2100M/900M/1900M/850M	support	support
DC-HSPA+/HSPA+/HSPA/WCDMA 1700M	Yes	No, delete by hardware
LTE band 5/7	support	support
LTE band 1/2/4/8	Yes	No, delete by hardware
LTE band 3	No	Yes, add by hardware,
WiFi 2.4G 11(b+g+n) , internal antenna	The same	The same
two external antenna port	The same	The same
external antenna hole on enclosure	The same	The same
PCB layout	The same	The same
Adapters	HW-120100U6W	HW-120100U6W HW-120100A6W
RJ45 ports	The same	The same
RJ11 ports	The same	The same
Size	The same	The same
Other Accessory	no	no



### 1.3 Test Site Information

Test Site 1:	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

### 1.4 Applied Standards

APPLIED STANDARD

47 CFR FCC Part 15:2013, Subpart B

## 2 Summary of Results

Summary of Results				
Test Items	Test Mode	Performance Class & Required Performance Criteria	Result	Site
<u>Radiated Emissions</u> Enclosure Port	Mode2	CLASS B	Pass	Site1
Note: Measurement taken is within the uncertainty of test system.				

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

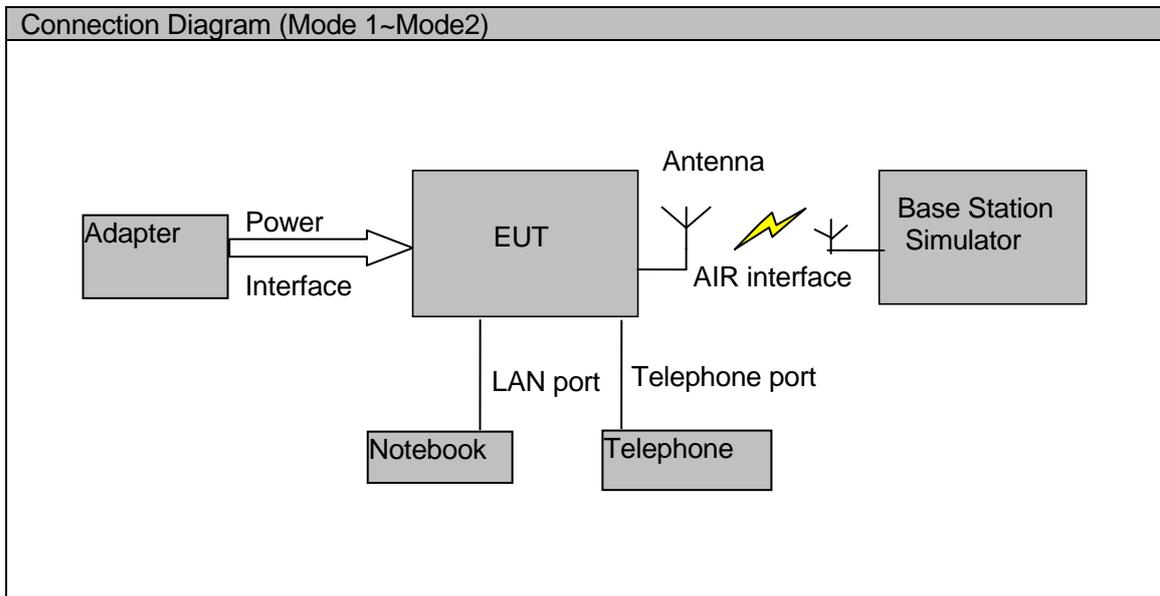
#### 3.1 Test Mode

The EUT was configured, installed, arranged and operated in a manner consistent with typical application. The following mode(s) were applied during the compliance test.

Test Mode	
Mode 1:	Adapter + SIM Card + LAN + wireless service TRAFFIC mode
Mode 2:	Adapter + SIM Card + LAN + wireless service IDLE mode

Remark: If there is more than one adapter, each one should be applied throughout the compliance test respectively, however, only the worst case will be recorded in this report.

#### 3.2 Test System Configuration



### 3.3 Cables Used during Test

Cable	Quantity	Length	Type of Cable
LAN Cable	1	<3m	unshielded

### 3.4 Associated Equipment Used during Test

Name	Model	Manufacturer	S/N	Calibrated Deadline	Cal interval (month)
Radio Communication Tester	CMU200	R&S	117057	2015-10-28	12
Notebook	X200	ThinkPad	31090403588	/	/
Telephone	HCD868(37)TSD	TCL	010Y0B20L70913402225	/	/

## 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 C63.4-2009. The test distance was 3m. The set-up and test methods were according to ANSI C63.4-2009.

A preliminary scan and a final scan of the emissions were made from 30 MHz to 18 GHz by using test script of software; The emissions were measured using Quasi-Peak Detector (30MHz~1GHz) and AV/PK detector (above 1GHz). The maximal emission value was acquired by adjusting the antenna height, polarisation and turntable azimuth in accordance with the software setup. Normally, the height range of antenna was 1m to 4m. The azimuth range of turntable was 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 was configured in idle mode and the test performed at worst emission state.

#### 4.1.2 Test setup

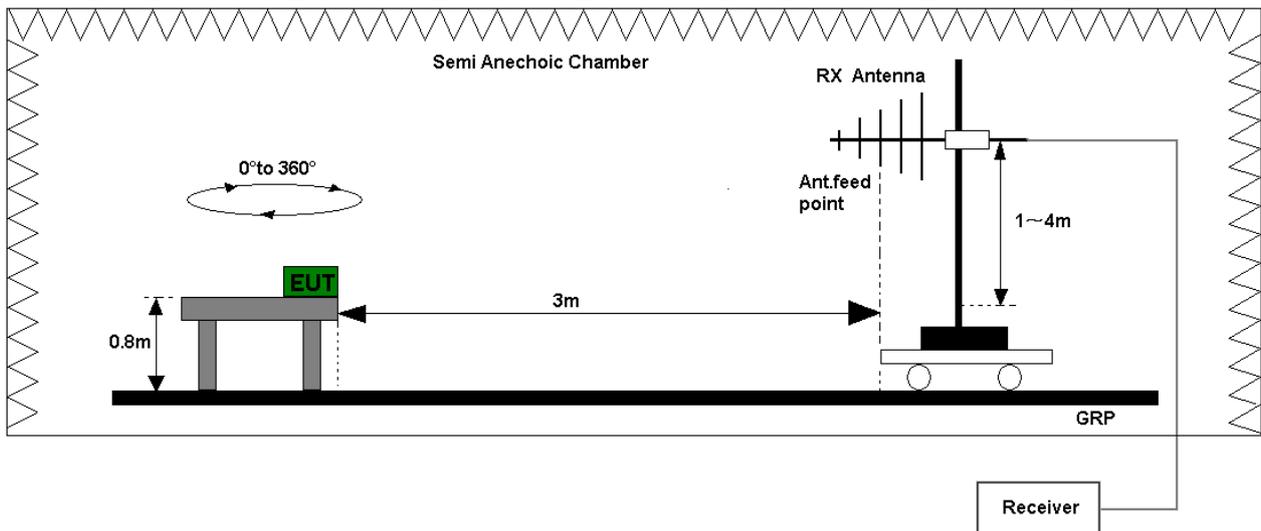


Figure 1. Test set-up of radiated disturbance(30MHz-1GHz)

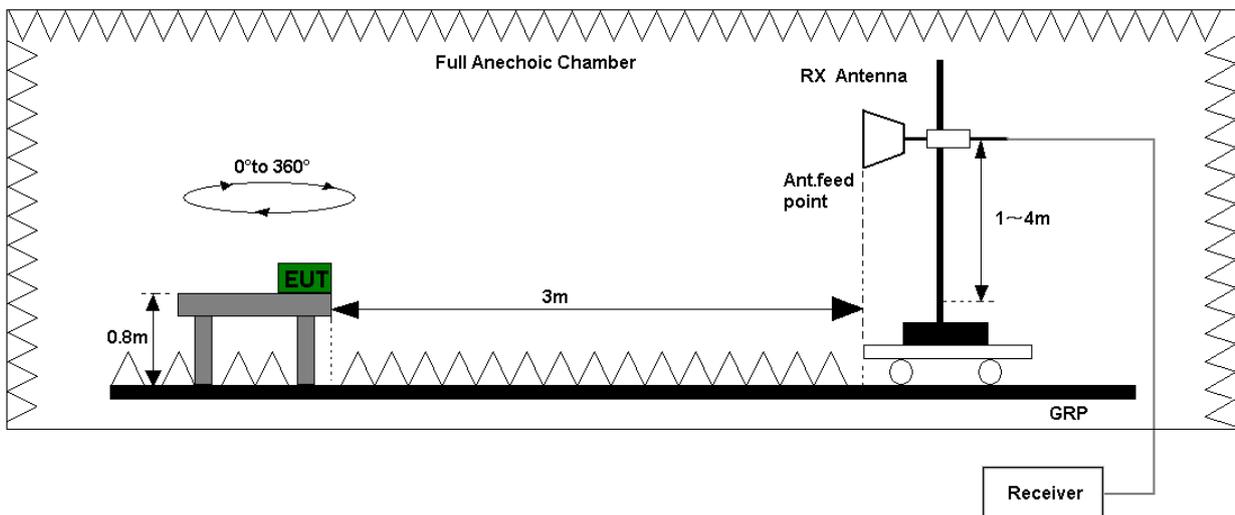


Figure 2. Test set-up of radiated disturbance(above 1GHz)

### 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			
	Unit( $\mu$ V/m)		Unit(dB $\mu$ V/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

## 5 Main Test Instruments

Main Test Equipments						
Test item	Test Instrument	Model	S/N	Manufacturer	Calibrated Deadline	Cal interval (month)
RE	EMI Test receiver	ESU26	100150	R&S	May.08, 2015	12
	Broadband Antenna	VULB 9163	9163-520	SCHWARZBECK	Dec.20, 2015	24
	Double Ridged Horn Antenna	HF906	100683	R&S	Feb.01, 2015	24
Software Information						
Test Item	Software Name		Manufacturer		Version	
RE	ES-K1		R&S		V1.7.1	

## 6 System Measurement Uncertainty

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

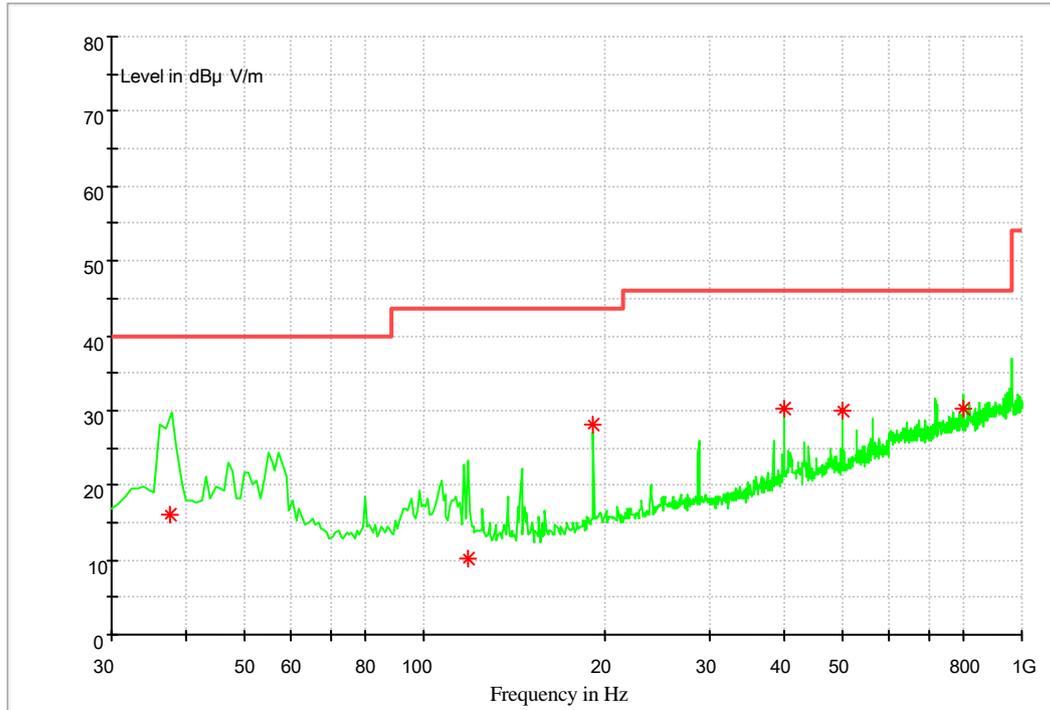
System Measurement Uncertainty		
	Items	Extended Uncertainty
RE(30MHz-1GHz)	Field strength (dB $\mu$ V/m)	U=4.1dB; k=2
RE(1GHz-18GHz)	Field strength (dB $\mu$ V/m)	U=5.0dB; k=2

## 7 Test Data and Graph

Only the worst test results were shown

### 7.1 Radiated Disturbance

#### 7.1.1 30MHz~1GHz



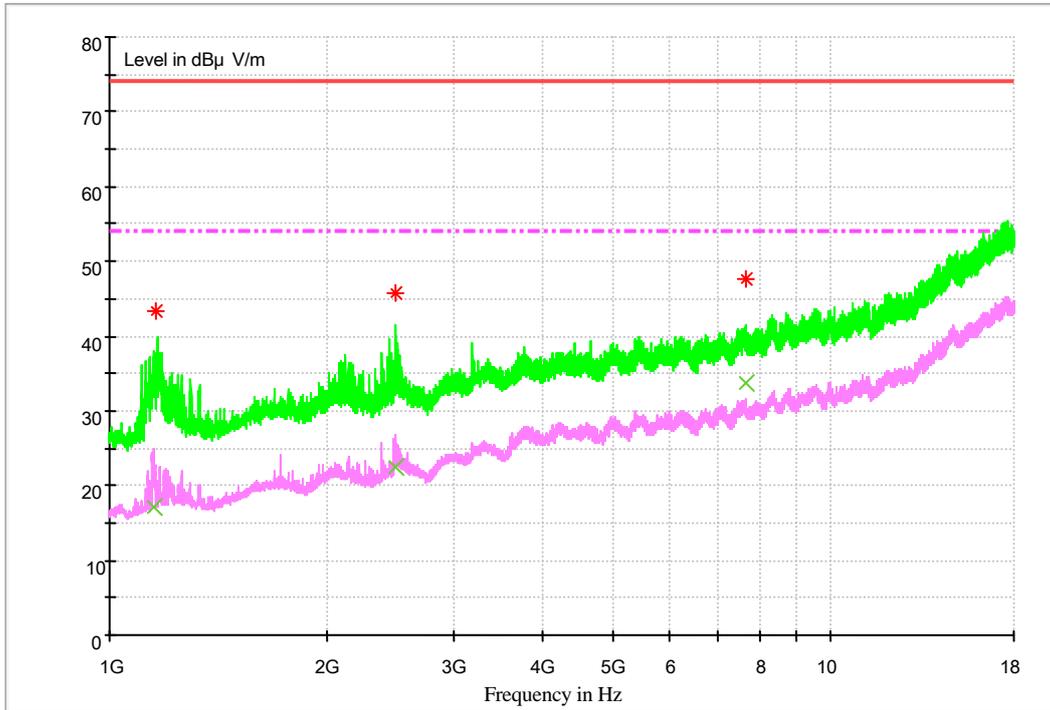
#### MEASUREMENT RESULT: QP Detector

Frequency MHz	Level dBµV/m	Transducer dB	Limit dBµV/m	Margin dB	Height cm	Azimuth deg	Polarisation
37.429760	16.0	14.9	40.0	24.0	100.0	342.0	VERTICAL
118.176000	10.1	12.1	43.5	33.4	100.0	172.0	VERTICAL
191.992000	28.0	12.4	43.5	15.5	163.0	139.0	HORIZONTAL
400.013760	30.1	18.0	46.0	15.9	100.0	122.0	VERTICAL
500.017920	30.1	19.8	46.0	15.9	131.0	2.0	HORIZONTAL
800.036160	30.4	24.0	46.0	15.6	139.0	258.0	HORIZONTAL

Note:

Level = Reading level by receiver + Transducer (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



#### MEASUREMENT RESULT: PK Detector

Frequency MHz	Level dBµV/m	Transducer dB	Limit dBµV/m	Margin dB	Height cm	Azimuth deg	Polarisation
1158.003333	43.3	-14.4	74.0	30.7	100.0	22.0	VERTICAL
2497.010667	45.8	-7.7	74.0	28.2	100.0	300.0	VERTICAL
7633.205333	47.7	6.0	74.0	26.3	100.0	14.0	VERTICAL

#### MEASUREMENT RESULT: AV Detector

Frequency MHz	Level dBµV/m	Transducer dB	Limit dBµV/m	Margin dB	Height cm	Azimuth deg	Polarisation
1153.414667	17.2	-14.4	54.0	36.8	100.0	330.0	VERTICAL
2496.153333	22.6	-7.7	54.0	31.4	100.0	299.0	VERTICAL
7629.430667	33.8	6.0	54.0	20.2	100.0	299.0	HORIZONTAL

Note:

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

-----**END**-----