



中国认可  
国际互认  
检测  
TESTING  
CNAS L0310



# FCC RF Test Report

**Product Name: Smart Phone**

**Model Number: WAS-LX1**

**Report No: SYBH(Z-RF)005122016-2006**

**FCC ID: QISWAS-LX1**

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

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

Administration Building, Headquarters of Huawei Technologies Co., Ltd., Bantian, Longgang District,  
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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 listed by the US Federal Communications Commission to perform electromagnetic emission measurements. The site recognition number is 97456.
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 test report is invalid if not marked with the signatures of the persons responsible for preparing and approving the test report.
6. The test report is invalid if there is any evidence of erasure and/or falsification.
7. The test report is only valid for the test samples.
8. 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.
9. The laboratory has Passed the accreditation by China National Accreditation Service for Conformity Assessment (CNAS). The accreditation number is L0310.
10. 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.



**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:** 2016-12-19  
**Start Date of Test:** 2016-12-24  
**End Date of Test:** 2017-01-26

**Test Result:** Pass

<b>Approved by Senior</b>	2017-02-06	Roger Zhang	
<b>Engineer:</b>	Date	Name	Signature

<b>Prepared by:</b>	2017-02-06	Wu Tingsi	
	Date	Name	Signature



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## 1 General Information

1.1 Applied Standard	
Applied Rules:	47 CFR FCC Part 02: 2014 FCC Part 15 Subpart C (15.225): 2014
1.2 Test Location	
Test Location 1:	Reliability Laboratory of Huawei Technologies Co., Ltd.
Address:	Administration Building, Headquarters of Huawei Technologies Co., Ltd., Bantian, Longgang District, Shenzhen, 518129, P.R.C
1.3 Test Environmental Condition	
Ambient Temperature:	20 – 25 °C
Ambient Relative Humidity:	45 – 55 %
Atmospheric Pressure:	101 kPa



## 2 Summary

FCC Section	Part Section	Test Description	Test Limit	Test Condition	Test Result	Reference
TRANSMITTER MODE						
15.225 (a)	In-Band Emissions	15,848 $\mu$ V/m @ 30m 13.553 – 13.567 MHz	RADIATED	Pass	Pass	Section 5.2
2.1049	20 dB Bandwidth	N/A		Pass	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	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	Pass	Section 5.2
15.225(d) 15.209	Out-of-Band Emissions	Emissions outside of the specified band (13.110 – 14.010 MHz) must meet the radiated limits detailed in 15.209		Pass	Pass	Section 5.3
15.225(e)	Frequency Stability Tolerance	$\pm$ 0.01% of Operating Frequency	Temperature Chamber	Pass	Pass	Section 5.4
15.207	AC Conducted Emissions 150kHz – 30MHz	< FCC 15.207 limits	LINE CONDUCTED	Pass	Pass	Section 5.5



### 3 Product Description

#### 3.1 Product Information

##### 3.1.1 General Description

WAS-LX1 is subscriber equipment in the GSM/UMTS/LTE system. The GSM frequency band includes GSM850 and GSM900 and DCS1800 and PCS1900. The UMTS frequency band is band 1/2/5/8,. The LTE frequency band is band 7. The Mobile Phone implements such functions as RF signal receiving/transmitting, LTE/UMTS and GSM/GPRS/EDGE protocol processing, voice, video MMS service, GPS and WIFI etc. Externally it provides micro SD card interface, earphone port (to provide voice service) . 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 NFC 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	HL2WASM	WAS-LX1C900B083

##### 3.2.2 Sub-Assembly

Sub-Assembly			
Sub-Assembly Name	Model	Manufacturer	Description
Adapter	HW-059200EHQ	Huawei Technologies Co., Ltd.	Input Voltage: ~100-240V 5V 0.75A Output Voltage: 9V/5V <input type="text"/> 2A
Adapter	HW-059200AHQ	Huawei Technologies Co., Ltd.	Input Voltage: ~100-240V 5V 0.75A Output Voltage: 9V/5V <input type="text"/> 2A
Adapter	HW-059201BHQ	Huawei Technologies Co., Ltd.	Input Voltage: ~100-240V 5V 0.75A Output Voltage: 9V/5V <input type="text"/> 2A
Adapter	HW-059200UHQ	Huawei Technologies Co., Ltd.	Input Voltage: ~100-240V 5V 0.75A Output Voltage: 9V/5V <input type="text"/> 2A
Rechargeable Li-ion	HB366481ECW	Huawei Technologies Co., Ltd.	Rated capacity: 2900mAh Nominal Voltage: <input type="text"/> +3.82V



## 4 Main Test Instruments

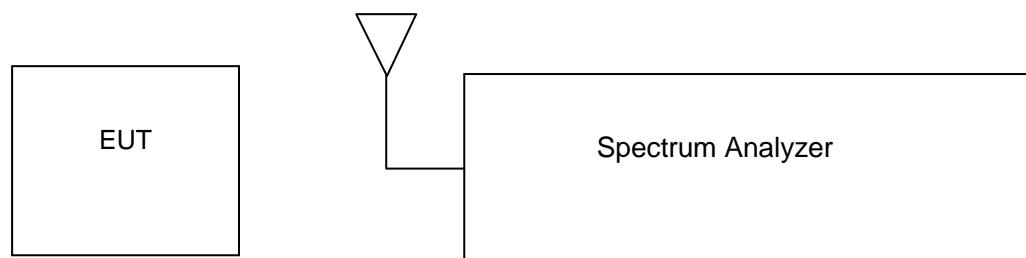
Main Test Equipments					
Equipment Name	Manufacturer	Model	Serial Number	Cal Date	Cal- Due
Power supply	KEITHLEY	2303	1342889	2015/9/16	2017/9/15
Wireless Communication Test set	Agilent	N4010A	MY49081592	2016/8/5	2017/8/5
Spectrum Analyzer	Agilent	N9020A	MY52090652	2016/6/29	2017/6/29
Signal Analyzer	R&S	FSQ31	200021	2016/8/5	2017/8/5
Spectrum Analyzer	Agilent	N9030A	MY49431698	2016/8/5	2017/8/5
Temperature Chamber	WEISS	WKL64	56246002940010	2016/1/21	2017/12/21
Signal generator	Agilent	E8257D	MY49281095	2016/8/5	2017/8/5
Vector Signal Generator	R&S	SMU200A	104162	2016/8/5	2017/8/5
Test receiver	R&S	ESU26	100387	2016/6/21	2017/6/21
Test receiver	R&S	ESCI	101163	2016/11/10	2017/11/10
Spectrum analyzer	R&S	FSU3	200474	2016/5/24	2017/5/23
Spectrum analyzer	R&S	FSU43	100144	2015/6/2	2017/6/2
LOOP Antennas(9kHz-30MHz)	R&S	HFH2-Z2	100262	2015/4/30	2017/4/29
LOOP Antennas(9kHz-30MHz)	R&S	HFH2-Z2	100263	2015/4/30	2017/4/29
Trilog Broadband Antenna (30M~3GHz)	SCHWARZBECK	VULB 9163	9163-490	2015/4/30	2017/4/29
Trilog Broadband Antenna (30M~3GHz)	SCHWARZBECK	VULB 9163	9163-520	2015/4/30	2017/4/29
Double-Ridged Waveguide Horn Antenna (1G~18GHz)	R&S	HF907	100304	2015/4/30	2017/4/29
double ridged horn antenna (0.8G-18GHz)	R&S	HF907	100305	2015/4/30	2017/4/29
Pyramidal Horn Antenna(18GHz-26.5GHz)	ETS-Lindgren	Sep-60	5140299	2015/7/15	2017/7/14
Artificial Main Network	R&S	ENV4200	100134	2016/6/2	2017/6/1
Line Impedance Stabilization Network	R&S	ENV216	100382	2016/6/2	2017/6/1
Signal Generator	Agilent	E4438C	MY49071538	2016/3/1	2017/3/1
Software Information					
Test Item	Software Name		Manufacturer	Version	
RE	EMC32		R&S	V9.25.0	
CE	EMC32		R&S	V9.25.0	

## 5 Test Results

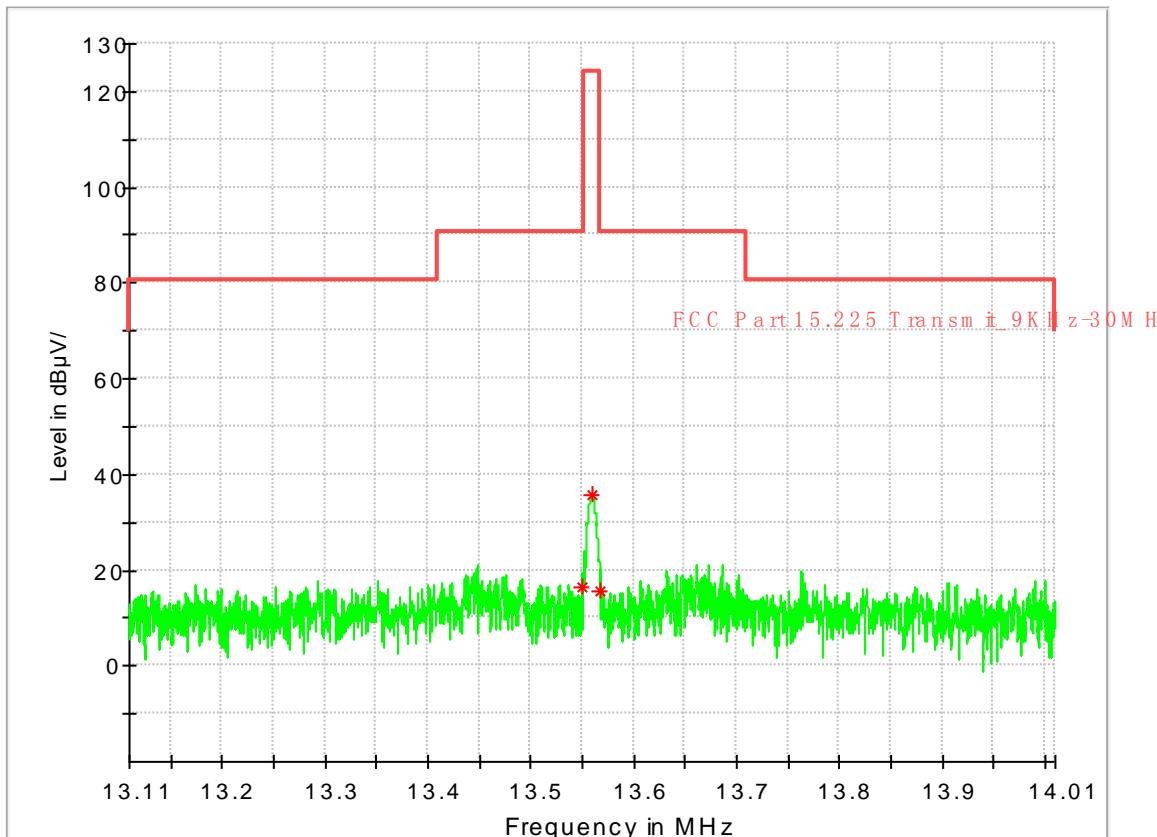
### 5.1 20dB Bandwidth Measurement

The 20dB bandwidth is measured with a spectrum analyzer connected via a receive antenna placed near the EUT while the EUT is operating in transmission mode.

#### 5.1.1 Test Setup



### 5.1.2 Test Result

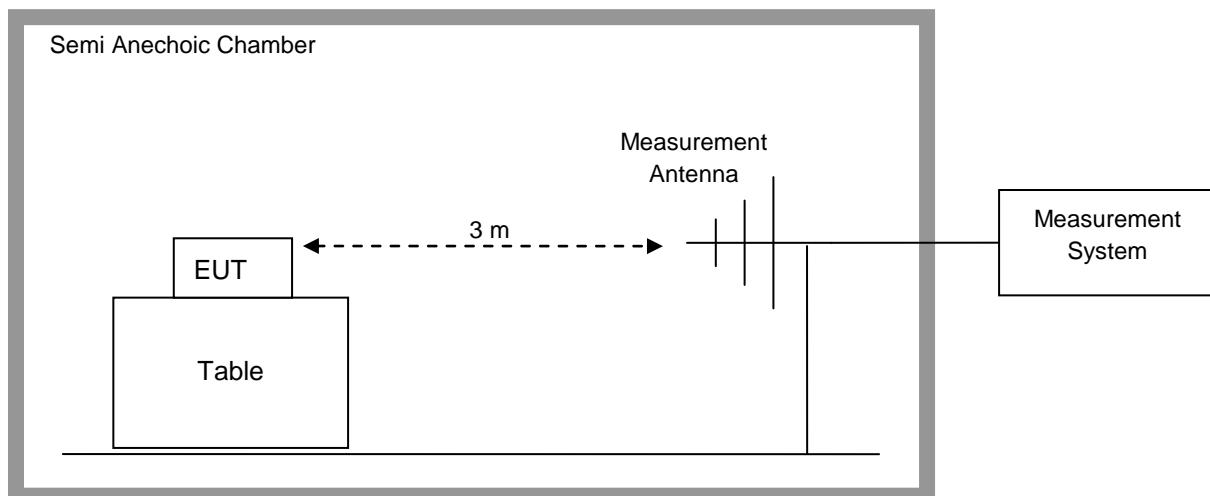


OBW (KHz)	FL@OBW (MHz)	FH@OBW (MHz)	Verdict
16.2	13.551180	13.567380	PASS

The result of the measurement is passed.

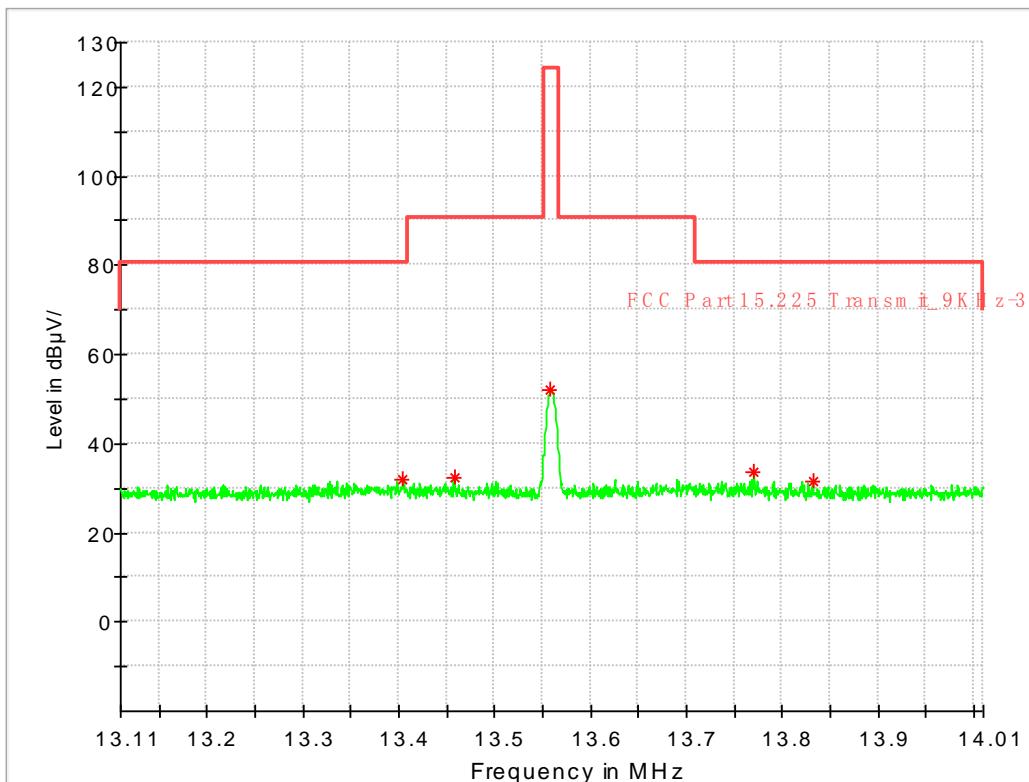
## 5.2 In-Band Radiated Spurious Emission Measurements

### 5.2.1 Test Setup



Measurement parameters	
Detector:	Quasi Peak
Sweep time:	-/-
Resolution bandwidth:	10 kHz
Video bandwidth:	10 kHz
Span:	-/-
Trace-Mode:	Max Hold

### 5.2.2 Test Result



#### MEASUREMENT RESULT: QP Detector

Frequency (MHz)	QuasiPeak (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Pol	Azimuth (deg)	Transd (dB)
13.405071	32.13	61.9	29.77	V	270.0	21.1
13.457786	32.26	71.9	39.64	V	90.0	21.1
13.558714	52.11	105.4	53.29	V	180.0	21.1
13.770857	33.49	71.9	38.41	V	270.0	21.1
13.831929	31.70	61.9	30.2	V	270.0	21.1

#### NOTES:

1. All measurements were performed using a loop antenna. The antenna was positioned in three orthogonal positions (X front, Y side, Z top) and the position with the highest emission level was recorded.
2. When using other measurement distance, according to the standard C63.10, If that point is closer to the EUT than  $\lambda/2\pi$  and the limit distance is greater than  $\lambda/2\pi$ , the data was extrapolated to the specified measurement distance of 30m using extrapolation factor as specified in §6.4.4.2.

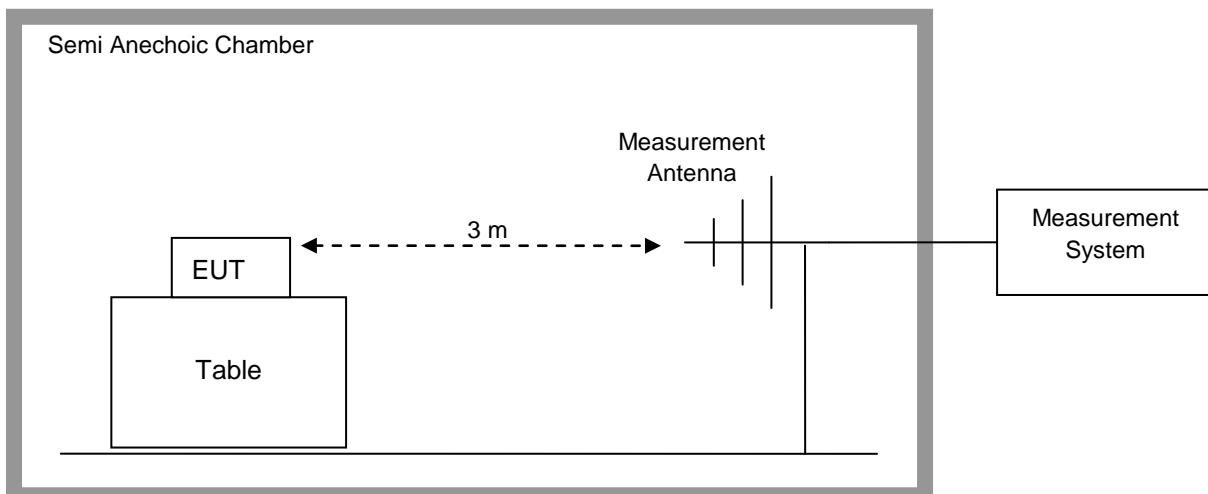
$$\text{Extrapolation Factor} = 40\log\left(\frac{d_{\text{near field}}}{d_{\text{measure}}}\right) + 20\log\left(\frac{d_{\text{limit}}}{d_{\text{near field}}}\right).$$

3. All measurements were recorded using a spectrum analyzer employing a quasi-peak detector.
4. 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.

**The result of the measurement is passed.**

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

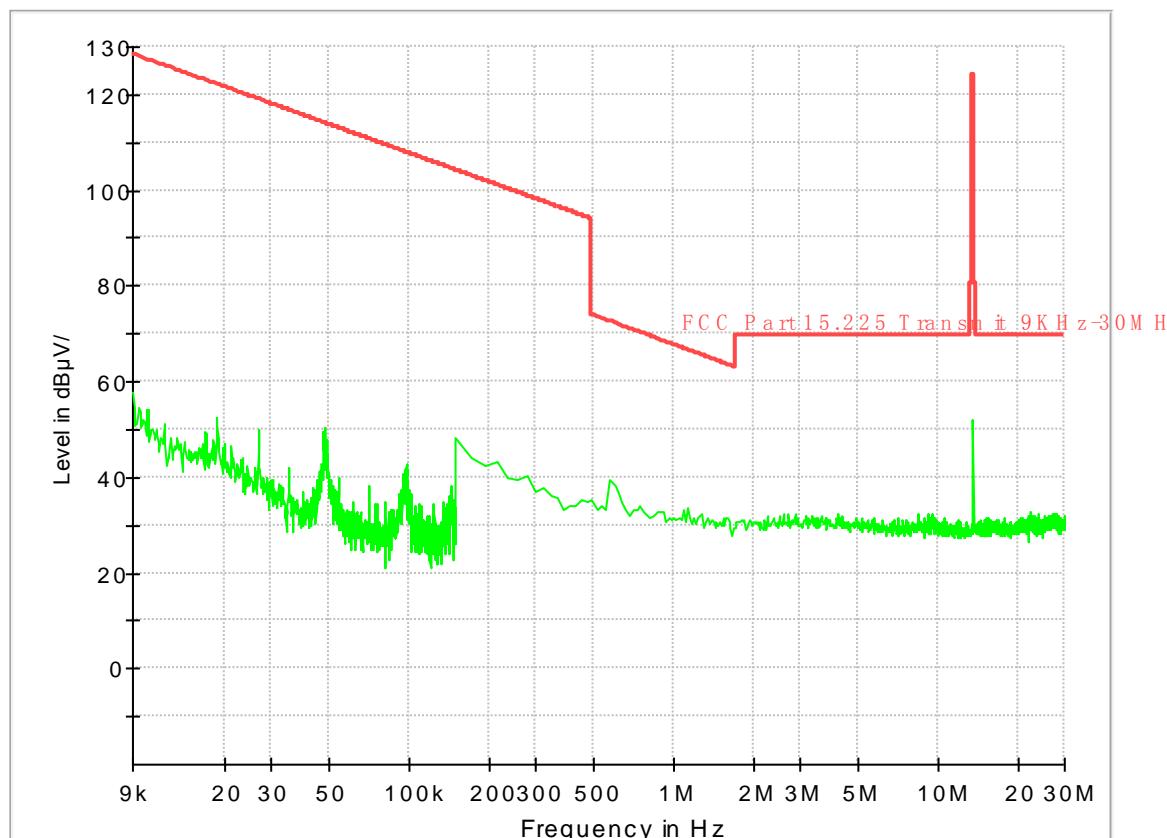
### 5.3.1 Test Setup



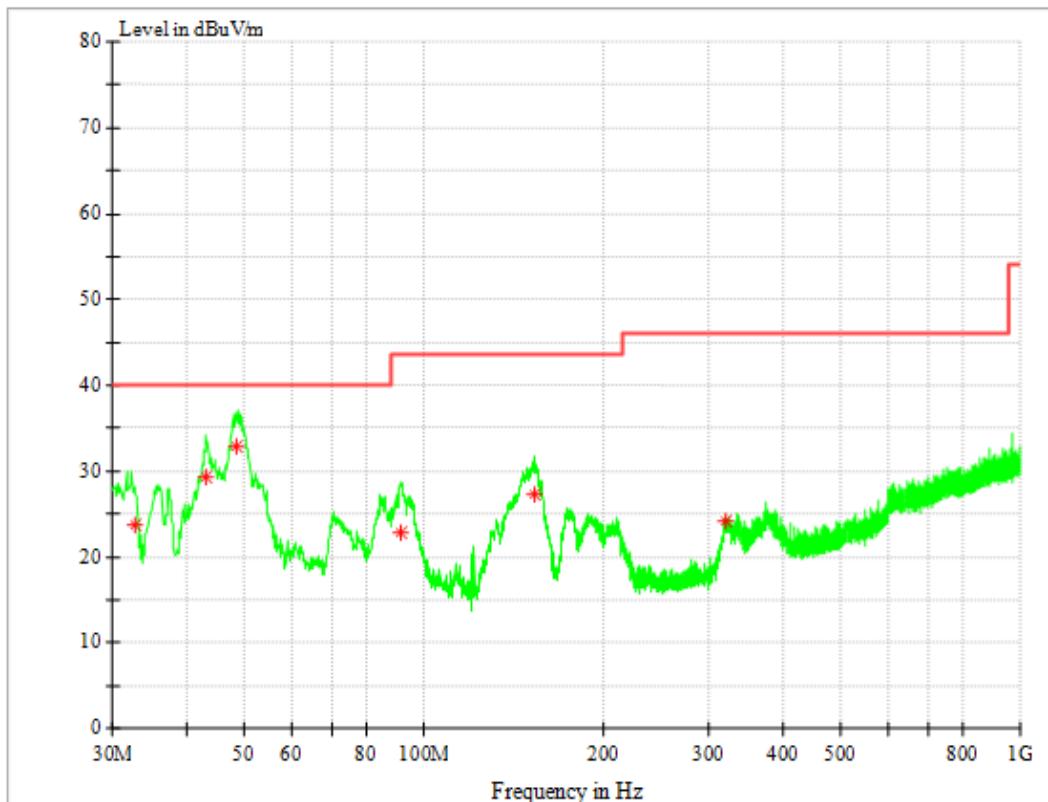
Measurement parameters	
Detector:	Quasi Peak
Sweep time:	Auto
Resolution bandwidth:	9 kHz – 150 kHz: 200 Hz 150 kHz – 30 MHz: 9 kHz 30 MHz – 1000 MHz: 100 kHz
Video bandwidth:	9 kHz – 150 kHz: 200 Hz 150 kHz – 30 MHz: 9 kHz 30 MHz – 1000 MHz: 100 kHz
Span:	See Plots
Trace-Mode:	Max Hold

### 5.3.2 Test Result

9k~30MHz



30M~1GHz



Frequency (MHz)	QuasiPeak (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Height (cm)	Polar isation	Azimuth (deg)	Transd (dB)
32.802050	23.73	40.00	16.27	100.0	V	226.0	14.9
43.164150	29.18	40.00	10.82	100.0	V	-4.0	15.3
48.570950	32.80	40.00	7.20	100.0	V	23.0	15.2
91.606700	22.79	43.50	20.71	200.0	V	97.0	12.5
153.280600	27.25	43.50	16.25	100.0	H	42.0	10.3
321.664400	24.06	46.00	21.94	129.0	V	168.0	16.3

**NOTES:**

1. All measurements were recorded using a spectrum analyzer employing a quasi-peak detector for emissions below 960MHz.
2. Both Vertical and Horizontal polarities of the receive antenna were evaluated with the worst case emissions being reported. Below 30MHz the Loop antenna was positioned in 3 separate radials.
3. The EUT is supplied with nominal AC voltage and/or a new/fully-recharged battery.
4. The spectrum is measured from 9kHz to the 10th harmonic and the worst-case emissions are reported.
5. 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.

**The result of the measurement is passed.**



## 5.4 Frequency Stability

### 5.4.1 Test Setup

The EUT was placed in a Climatic Chamber. A small whip antenna was placed close to the EUT, and connected to the measuring Spectrum Analyzer. Measurement performed without modulation on TX.

### 5.4.2 Test Result

VOLTAGE (%)	POWER Battery	TEMP (°C)	Frequency (Hz)	Freq. Dev. (Hz)	Deviation (%)
100%		-20	13559988	-12	-0.0000008849557
100%		-10	13560009	9	0.0000006637168
100%		0	13560016	16	0.0000011799410
100%		10	13560011	11	0.0000008112094
100%		20	13560007	7	0.0000005162241
100%		30	13560010	10	0.0000007374631
100%		40	13560002	2	0.0000014749262
100%		50	13560009	9	0.0000006637168
Battery End Point	3.6	20	13559990	-10	-0.0000007374631
115%	4.35	20	13560004	4	0.0000002949852

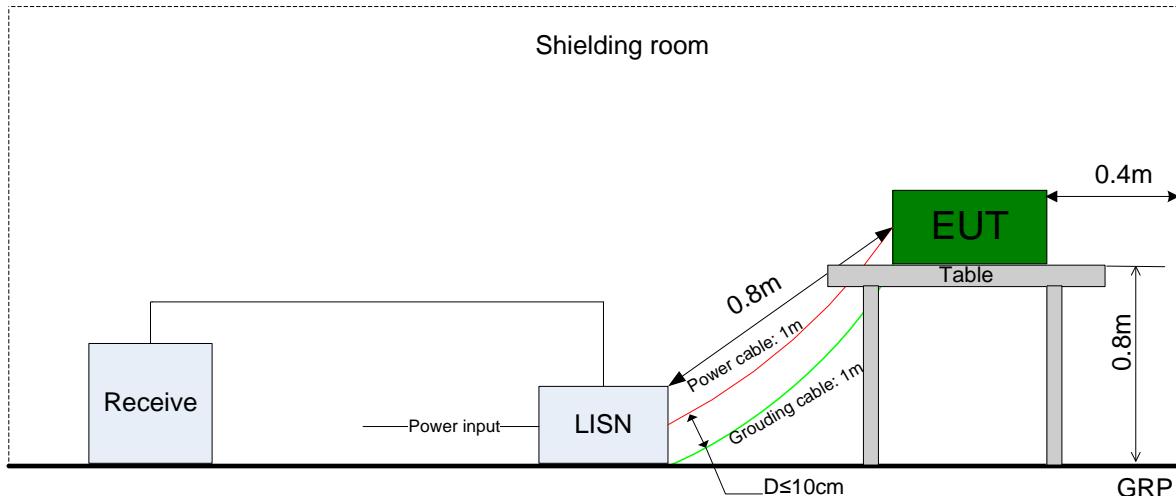
The result of the measurement is passed.

## 5.5 AC Power Line Conducted Emissions

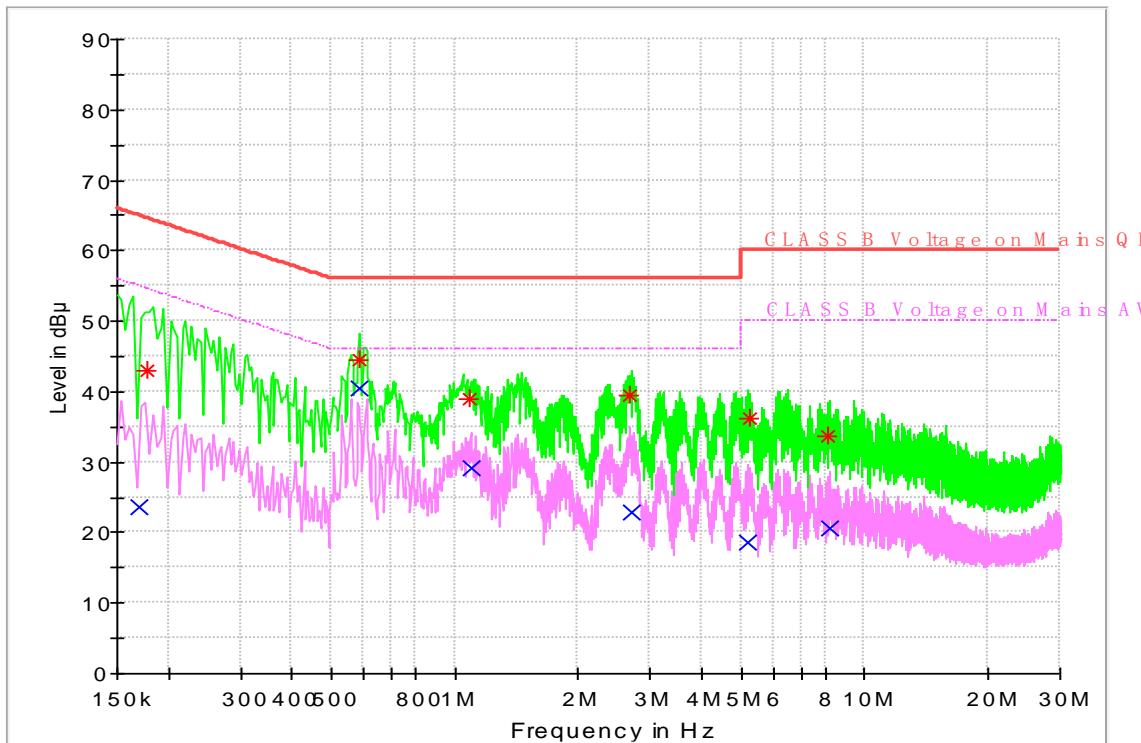
### 5.5.1 Test Setup

The mains cable of the EUT (maybe per AC/DC Adapter) must be connected to LISN. The LISN shall be placed 0.8 m from the boundary of EUT and bonded to a ground reference plane for LISN mounted on top of the ground reference plane. This distance is between the closest points of the LISN and the EUT. All other units of the EUT and associated equipment shall be at least 0.8m from the LISN.

Ground connections, where required for safety purposes, shall be connected to the reference ground point of the LISN and, where not otherwise provided or specified by the manufacturer, shall be of same length as the mains cable and run parallel to the mains connection at a separation distance of not more than 0.1 m.



### 5.5.2 Test Result



Frequency (MHz)	QuasiPeak (dB $\mu$ V)	Average (dB $\mu$ V)	Limit (dB $\mu$ V)	Margin (dB)	Line	Filter	Corr. (dB)
0.169469	---	23.71	54.99	31.28	N	ON	9.7
0.177873	43.00	---	64.58	21.58	N	ON	9.7
0.583220	---	40.49	46.00	5.51	L1	ON	9.7
0.586300	44.46	---	56.00	11.54	N	ON	9.7
1.088616	39.08	---	56.00	16.92	N	ON	9.7
1.094664	---	29.12	46.00	16.88	L1	ON	9.7
2.676167	39.54	---	56.00	16.46	L1	ON	9.8
2.699539	---	22.81	46.00	23.19	L1	ON	9.8
5.195108	---	18.62	50.00	31.38	L1	ON	9.8
5.221664	36.23	---	60.00	23.77	N	ON	9.8
8.157876	33.65	---	60.00	26.35	N	ON	9.9
8.200704	---	20.53	50.00	29.47	N	ON	9.9

Note2:

1, 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.

2, Margin=Limit - Level

**The result of the measurement is passed.**

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