



中国认可
国际互认
检测
TESTING
CNAS L0310



FCC RF Test Report

Product Name: Smart Phone

Model Number: MHA-L09

Report No: SYBH(Z-RF)028082016-2006

FCC ID: QISMHA-L09

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,
Shenzhen, 518129, P.R.C

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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: 2016-08-04
Start Date of Test: 2016-08-04
End Date of Test: 2016-08-20

Test Result: Pass

**Approved by Senior
Engineer:**

2016-08-31

Roger Zhang

Roger Zhang

Date

Name

Signature

Prepared by:

2016-08-31

Wu Tingsi

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	Test Description	Test Limit	Test Condition	Test Result	Reference
TRANSMITTER MODE						
15.225 (a)		In-Band Emissions	15,848μV/m @ 30m 13.553 – 13.567 MHz	RADIATED	SYBH(Z-RF)028072 016-2006	Section 5.2
2.1049		20 dB Bandwidth	N/A		SYBH(Z-RF)028072 016-2006	Section 5.1
15.225(b)		In-Band Emissions	334μV/m @ 30m 13.410 – 13.553 MHz 13.567 – 13.710 MHz		SYBH(Z-RF)028072 016-2006	Section 5.2
15.225(c)		In-Band Emissions	106μV/m @ 30m 13.110 – 13.410 MHz 13.710 – 14.010 MHz		SYBH(Z-RF)028072 016-2006	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		SYBH(Z-RF)028072 016-2006	Section 5.3
15.225(e)		Frequency Stability Tolerance	± 0.01% of Operating Frequency	Temperature Chamber	SYBH(Z-RF)028072 016-2006	Section 5.4
15.207		AC Conducted Emissions 150kHz – 30MHz	< FCC 15.207 limits	LINE CONDUCTED	SYBH(Z-RF)028072 016-2006	Part 15B report



3 Product Description

3.1 Product Information

3.1.1 General Description

MHA-L09 is subscriber equipment in the LTE/ WCDMA/GSM system. The LTE frequency band is Band I,Band II,Band III,Band IV,Band V, Band VII,Band VIII, Band VIII, Band XII,BandXVII, Band XVIII ,Band XIX, Band XX, Band XXVI, Band XXVIII, Band XXIX,Band XXXVIII,BandXXXIX, Band XL and Band XLI. The HSUPA/HSDPA/UMTS frequency band is Band I, Band II, Band IV, Band V, Band VI, Band VIII and Band XIX, The GSM/GPRS/EDGE frequency band includes GSM850 and GSM900 and DCS1800 and PCS1900. The Mobile Phone implements such functions as RF signal receiving/transmitting, LTE/ WCDMA /GSM protocol processing, voice, video, MMS service, GPS, AGPS,NFC and WIFI etc. Externally it provides earphone port (to provide voice service) and USIM card interface. 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.

NOTE2: We do not test NFC of MHA-L09, all the test data refer to **SYBH(Z-RF)028072016-2006** of MHA-L29.

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	HLIAMHAM	M300-L09C900B095



3.2.2 Sub-Assembly

Sub-Assembly			
Sub-Assembly Name	Model	Manufacturer	Description
Adapter	HW-050450B00	Huawei Technologies Co., Ltd.	Input Voltage: ~100-240V 50/60Hz 0.75A Output Voltage: 5V  2A/4.5A Rated Power: 10W/22.5W
Adapter	HW-050450E00	Huawei Technologies Co., Ltd.	Input Voltage: ~100-240V 50/60Hz 0.75A Output Voltage: 5V  2A/4.5A Rated Power: 10W/22.5W
Adapter	HW-050450U00	Huawei Technologies Co., Ltd.	Input Voltage: ~100-240V 50/60Hz 0.75A Output Voltage: 5V  2A/4.5A Rated Power: 10W/22.5W
Adapter	HW-050450A00	Huawei Technologies Co., Ltd.	Input Voltage: ~100-240V 50/60Hz 0.75A Output Voltage: 5V  2A/4.5A Rated Power: 10W/22.5W
Rechargeable Li-ion	HB396689ECW	Huawei Technologies Co., Ltd.	Rated capacity: 3900mAh Nominal Voltage:  +3.82V Charging Voltage:  +4.4V

4 Main Test Instruments

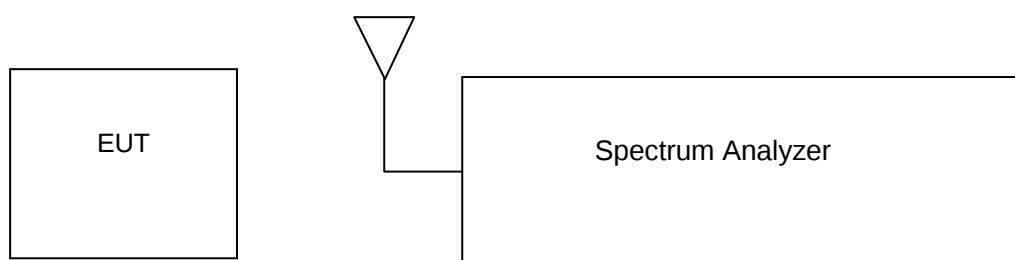
Main Test Equipments					
Equipment Name	Manufacturer	Model	Serial Number	Cal Date	Cal- Due
Power supply	KEITHLEY	2303	1342889	2015/9/16	2017/9/15
Wireless Communication Test set	Agilent	N4010A	MY49081592	2015/10/30	2016/10/29
Spectrum Analyzer	Agilent	N9020A	MY52090652	2016/6/29	2017/6/29
Signal Analyzer	R&S	FSQ31	200021	2015/10/30	2016/10/29
Spectrum Analyzer	Agilent	N9030A	MY49431698	2015/10/30	2016/10/29
Temperature Chamber	WEISS	WKL64	56246002940010	2016/1/21	2017/1/20
Signal generator	Agilent	E8257D	MY49281095	2015/10/30	2016/10/29
Vector Signal Generator	R&S	SMU200A	104162	2015/10/30	2016/10/29
Test receiver	R&S	ESU26	100387	2016/6/21	2017/6/20
Test receiver	R&S	ESCI	101163	2015/11/11	2016/11/10
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



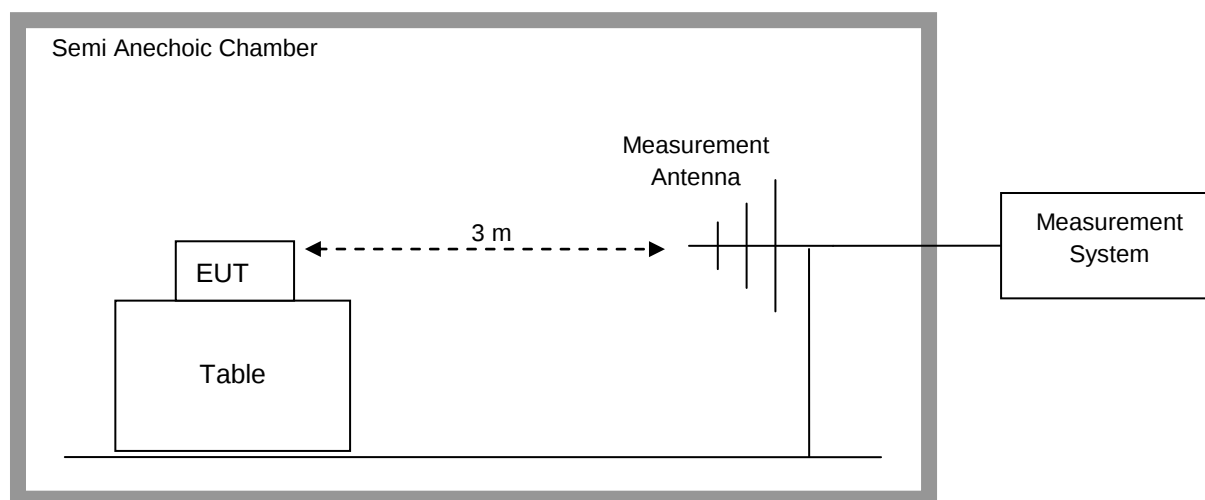
5.1.2 Test Result

Frequency	Occupied Bandwidth
13.56MHz	200KHz

The result of the measurement is passed.

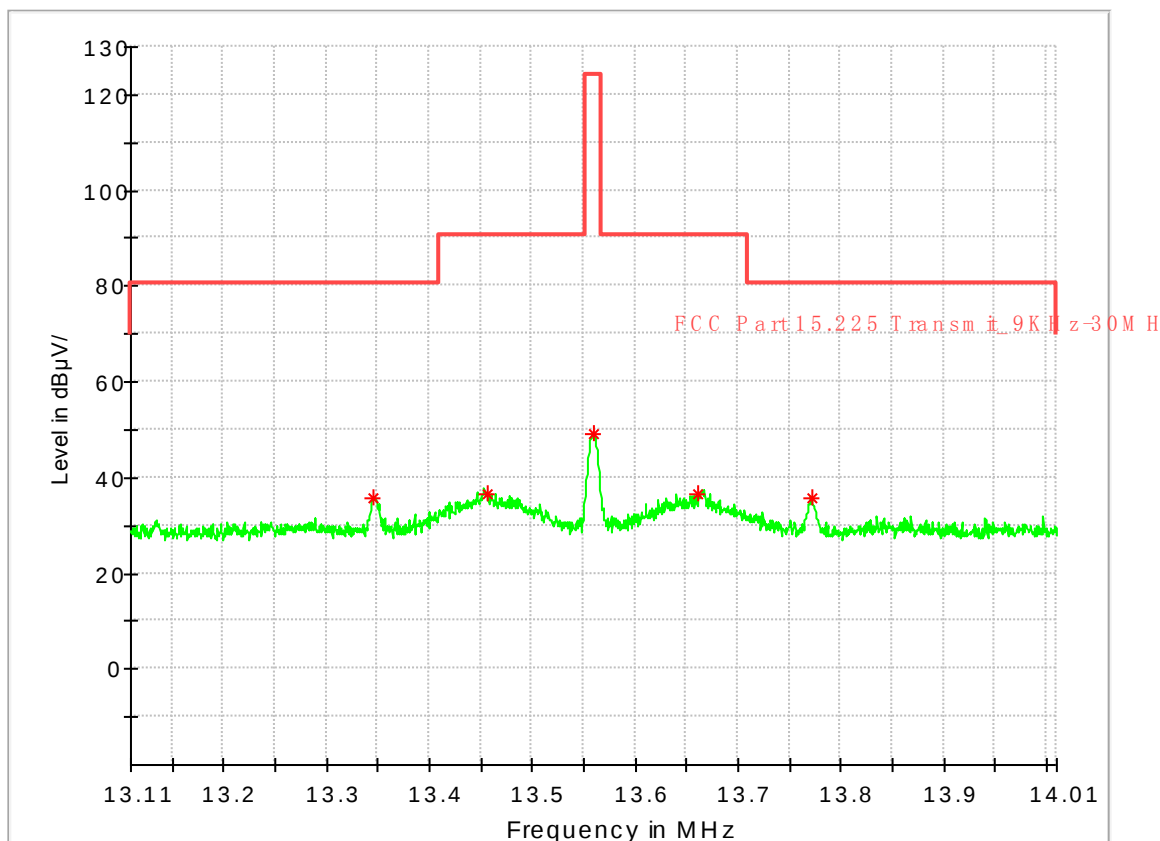
5.2 In-Band Radiated Spurious Emission Measurements

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 (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Azimuth (deg)	Transd (dB)
13.345286	35.54	80.50	44.96	128.0	20.8
13.455857	36.70	90.50	53.80	260.0	20.8
13.559357	49.31	124.00	74.69	236.0	20.8
13.661571	36.39	90.50	54.11	53.0	20.8
13.772143	35.69	80.50	44.81	86.0	20.8

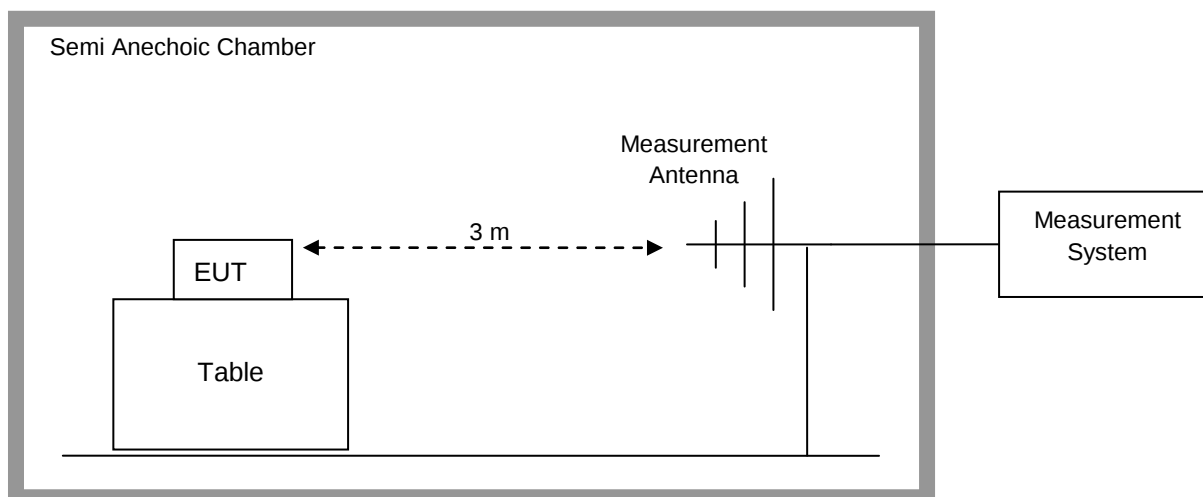
NOTES:

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. Measurements were performed at 3m and the data was extrapolated to the specified measurement distance of 30m using the square of an inverse linear distance extrapolation factor (40 dB/decade) as specified in §15.31(f)(2). Extrapolation Factor = $20 \log_{10}(30/3)^2 = 40\text{dB}$
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

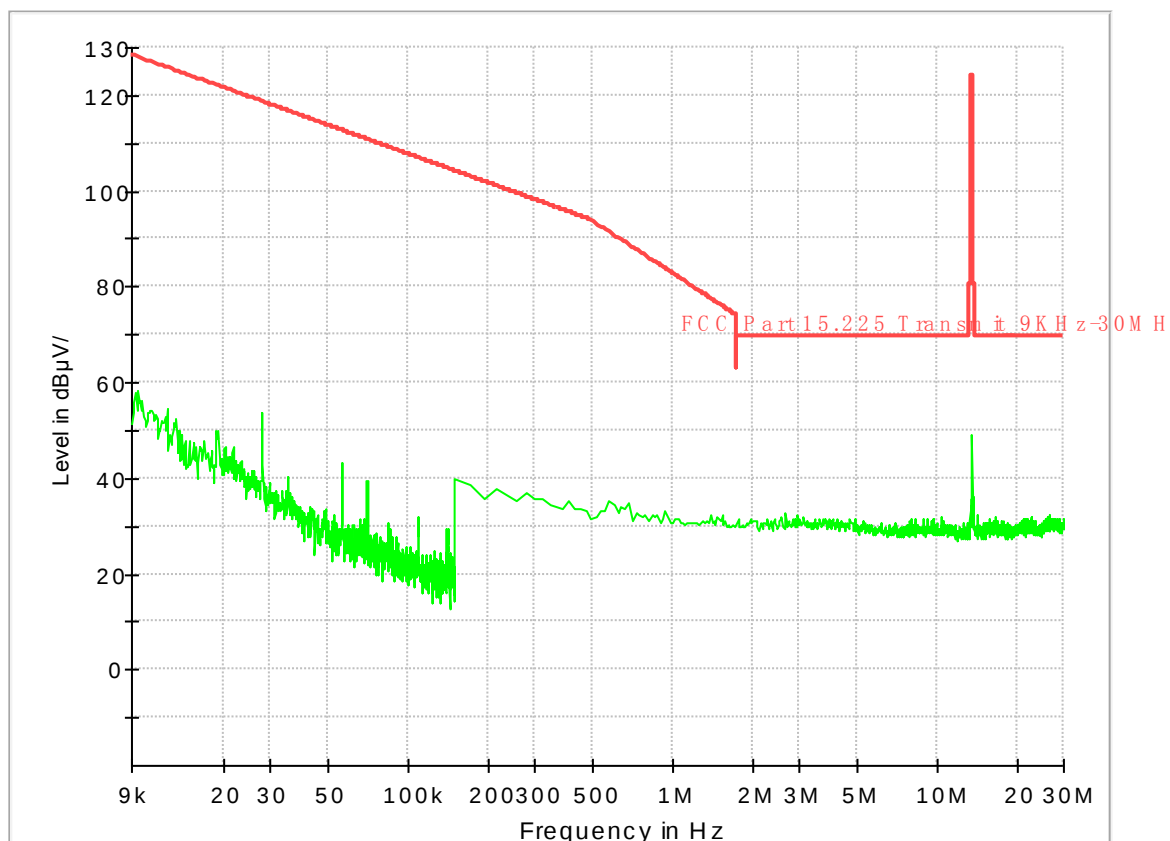
5.3.1 Test Setup



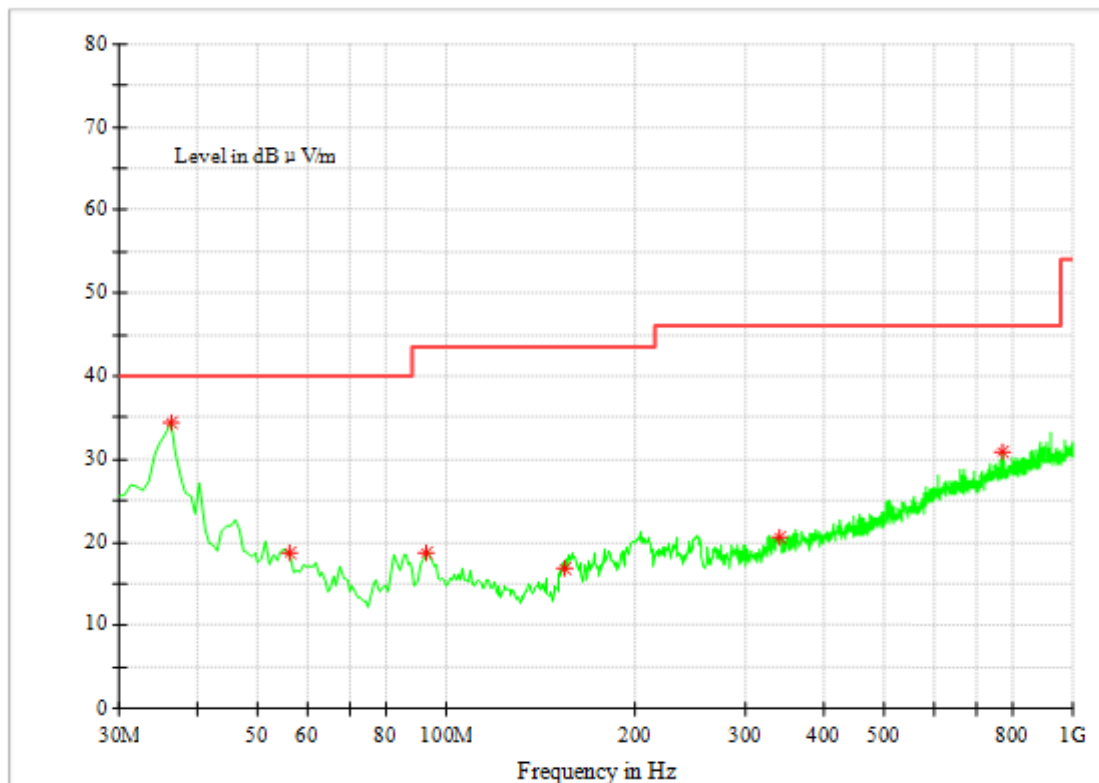
Measurement parameters	
Detector:	Quasi Peak
Sweep time:	Auto
Resolution bandwidth:	9 kHz – 150 kHz: 200 Hz 150 kHz – 30 MHz: 9 kHz 30 MHz – 1000 MHz: 100 kHz
Video bandwidth:	9 kHz – 150 kHz: 200 Hz 150 kHz – 30 MHz: 9 kHz 30 MHz – 1000 MHz: 100 kHz
Span:	See Plots
Trace-Mode:	Max Hold

5.3.2 Test Result

9k~30MHz



30M~1GHz



Frequency (MHz)	QuasiPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Polarisation	Azimuth (deg)	Transd (dB)
36.235714	34.31	40.00	5.69	100.0	V	267.0	14.6
56.328571	18.66	40.00	21.34	100.0	V	167.0	14.2
93.050000	18.73	43.50	24.77	100.0	V	58.0	12.4
154.714286	16.93	43.50	26.57	100.0	V	267.0	10.1
340.400000	20.64	46.00	25.36	100.0	H	312.0	16.6
774.821429	30.91	46.00	15.09	100.0	H	50.0	23.6

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	13559980	11	0.0000008112135
100%		-10	13560007	-14	-0.0000010324483
100%		0	13560002	8	0.0000005899700
100%		10	13560003	13	0.0000011061935
100%		20	13560007	-15	-0.0000011061941
100%		30	13560010	11	0.0000015486713
100%		40	13560002	-12	-0.0000011061941
100%		50	13560009	14	0.0000008849551
Battery End Point	3.6	20	13559993	-7	-0.0000006637176
115%	4.35	20	13560003	13	0.0000011061935

The result of the measurement is passed.

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