



EMC TEST REPORT

Applicant Mobiwire SAS
FCC ID QPN-HOTAH
Product MobiWire Hotah
Brand MobiWire
Model MobiWire Hotah
Report No. R1809A0432-E1V1
Issue Date December 5, 2018

TA Technology (Shanghai) Co., Ltd. tested the above equipment in accordance with the requirements in **FCC Code CFR47 Part15B (2018)/ ANSI C63.4 (2014)**. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

Wei Liu

Performed by: Wei Liu/ Manager

Guangchang Fan

Approved by: Guangchang Fan/ Director

TA Technology (Shanghai) Co., Ltd.

No.145, Jintang Rd, Tangzhen Industry Park, Pudong Shanghai, China

TEL: +86-021-50791141/2/3

FAX: +86-021-50791141/2/3-8000



Table of Contents

1	Test Laboratory.....	4
1.1	Notes of the Test Report	4
1.2	Test facility	4
1.3	Testing Location.....	5
2	General Description of Equipment under Test.....	6
2.1	Client Information	6
2.2	General information.....	6
2.3	Applied Standards	8
2.4	Test Mode.....	9
3	Test Case Results	10
3.1	Radiated Emission	10
3.2	Conducted Emission	15
4	Main Test Instrument	17
ANNEX A: The EUT Appearance and Test Configuration.....		18
A.1	EUT Appearance	18
A.2	Test Setup.....	22



Summary of measurement results

Number	Test Case	Clause in FCC Rules	Conclusion
1	Radiated Emission	FCC Part15.109, ANSI C63.4-2014	PASS
2	Conducted Emission	FCC Part15.107, ANSI C63.4-2014	PASS
Test Date: September 24, 2018 ~November 5, 2018			



1 Test Laboratory

1.1 Notes of the Test Report

This report shall not be reproduced in full or partial, without the written approval of **TA technology (shanghai) co., Ltd.** The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein .Measurement Uncertainties were not taken into account and are published for informational purposes only. This report is written to support regulatory compliance of the applicable standards stated above.

1.2 Test facility

CNAS (accreditation number: L2264)

TA Technology (Shanghai) Co., Ltd. has obtained the accreditation of China National Accreditation Service for Conformity Assessment (CNAS).

FCC (Designation number: CN1179, Test Firm Registration Number: 446626)

TA Technology (Shanghai) Co., Ltd. has been listed on the US Federal Communications Commission list of test facilities recognized to perform electromagnetic emissions measurements.

IC (recognition number is 8510A)

TA Technology (Shanghai) Co., Ltd. has been listed by industry Canada to perform electromagnetic emission measurement.

VCCI (recognition number is C-4595, T-2154, R-4113, G-10766)

TA Technology (Shanghai) Co., Ltd. has been listed by industry Japan to perform electromagnetic emission measurement.

A2LA (Certificate Number: 3857.01)

TA Technology (Shanghai) Co., Ltd. has been listed by American Association for Laboratory Accreditation to perform electromagnetic emission measurement.



1.3 Testing Location

Company: TA Technology (Shanghai) Co., Ltd.
Address: No.145, Jintang Rd, Tangzhen Industry Park, Pudong Shanghai, China
City: Shanghai
Post code: 201201
Country: P. R. China
Contact: Xu Kai
Telephone: +86-021-50791141/2/3
Fax: +86-021-50791141/2/3-8000
Website: <http://www.ta-shanghai.com>
E-mail: xukai@ta-shanghai.com



2 General Description of Equipment under Test

2.1 Client Information

Applicant	Mobiwire SAS
Applicant address	79 avenue Francois Arago, 92000 NANTERRE France
Manufacturer	Mobiwire SAS
Manufacturer address	79 avenue Francois Arago, 92000 NANTERRE France

2.2 General information

EUT Description			
Device Type:	Portable Device		
Model Number:	MobiWire Hotah		
IMEI:	IMEI 1: 352361100000082 IMEI 2: 352361100000090		
HW Version:	V01		
SW Version:	V01		
Antenna Type:	Internal Antenna		
Frequency:	Band	Tx (MHz)	Rx (MHz)
	GSM 850	824 ~ 849	869 ~ 894
	GSM 1900	1850 ~ 1910	1930 ~ 1990
	WCDMA Band II	1850 ~ 1910	1930 ~ 1990
	WCDMA Band V	824 ~ 849	869 ~ 894
	LTE Band 2	1850 ~ 1910	1930 ~ 1990
	LTE Band 7	2500 ~ 2570	2620 ~ 2690
	Bluetooth:	2402 ~ 2480	2402 ~ 2480
	WIFI 2.4G:	2412 ~ 2462	2412 ~ 2462
	WIFI 5G(U-NII-2A):	5250 ~ 5350	5250 ~ 5350
	WIFI 5G(U-NII-2C):	5470 ~ 5725	5470 ~ 5725
	NFC	13.56	13.56
Modulation:	GSM: GMSK GPRS: GMSK EGPRS: GMSK/8PSK WCDMA RMC: QPSK HSDPA: QPSK HSUPA: QPSK		



	DC-HSDPA:64QAM LTE: QPSK / 16QAM Bluetooth: GFSK, $\pi/4$ -DQPSK, 8-DPSK Bluetooth v4.2 LE: GFSK WLAN 802.11b: DSSS WLAN 802.11a/g/n: OFDM NFC: ASK
Test Mode:	Transfer Data Mode
EUT Accessory	
Battery	Manufacturer: Ningbo Veken Battery Co.,LTD Model: 178144515
Adapter 1	Manufacturer: DongGuan Aohai Power Technology Co.,Ltd Model: A88-502000
Adapter 2	Manufacturer: Dongguan Aohai Power Technology CO., LTD Model: A824-050200U
Adapter 3	Manufacturer: Dongguan Aohai Power Technology CO., LTD Model: A70-502000
Earphone	Manufacturer: Shenzhen Juwei Electronics Co.,Ltd Model: JWEP0752-M01
USB Cable	Manufacturer: Shenzhen Juwei Electronics Co.,Ltd Model: USB2.0 A/M TO TYPE C/M CABLE 1M
Auxiliary test equipment	
PC	PC Manufacturer: Dell Model: E5430 (SN : R98M9 A02)
Note: The information of the EUT is declared by the manufacturer.	



2.3 Applied Standards

According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

Test standards

FCC Code CFR47 Part15B (2018)

ANSI C63.4 (2014)



2.4 Test Mode

Test Mode	
Mode 1:	Adapter +USB cable+ earphone + Camera On +Idle
Mode 2:	Adapter + USB cable+ earphone + Mp3 +Idle
Mode 3:	USB Copy(EUT with PC) + USB cable +earphone +Idle
Mode 4:	Camera On +earphone +Idle
Mode 5:	Earphone+MP3+Idle

During the test, the preliminary test was performed in all modes, mode 3 was selected as the worst mode. The test data of the worst-case condition was recorded in this report.



3 Test Case Results

3.1 Radiated Emission

Ambient condition

Temperature	Relative humidity	Pressure
24°C~26°C	45%~50%	102.5kPa

Methods of Measurement

The EUT is placed on a non-metallic table 0.8m above the horizontal metal reference ground plane. The distance between EUT and receive antenna should be 3 meters. During the test, the EUT was operating in its typical mode. The test method is according to ANSI C63.4-2014. Sweep the whole frequency band through the range from 30MHz to the 5th harmonic of the carrier. During the test, the height of receive antenna shall be moved from 1 to 4 meters, and the antenna shall be performed under horizontal and vertical polarization. The turn table shall be rotated from 0 to 360 degrees for detecting the maximum of radiated signal level.

The data of cable loss and antenna factor has been calibrated in full testing frequency range before the testing. During the test, the EUT is worked at maximum output power.

Set the spectrum analyzer in the following:

Below 1GHz:

RBW=100 kHz / VBW=300 kHz / Sweep=AUTO

Above 1GHz:

(a) PEAK: RBW=1MHz / VBW=3MHz/ Sweep=AUTO

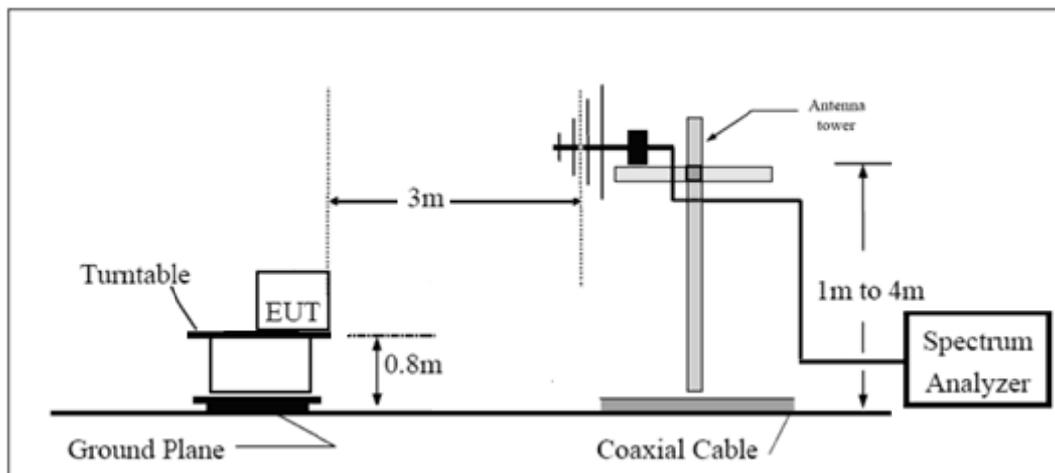
(b) AVERAGE: RBW=1MHz / VBW=1Hz / Sweep=AUTO

The radiated emission was measured in the following position: EUT stand-up position (Z axis), lie-down position (X, Y axis). The worst emission was found in lie-down position (X axis) and the worst case was recorded.

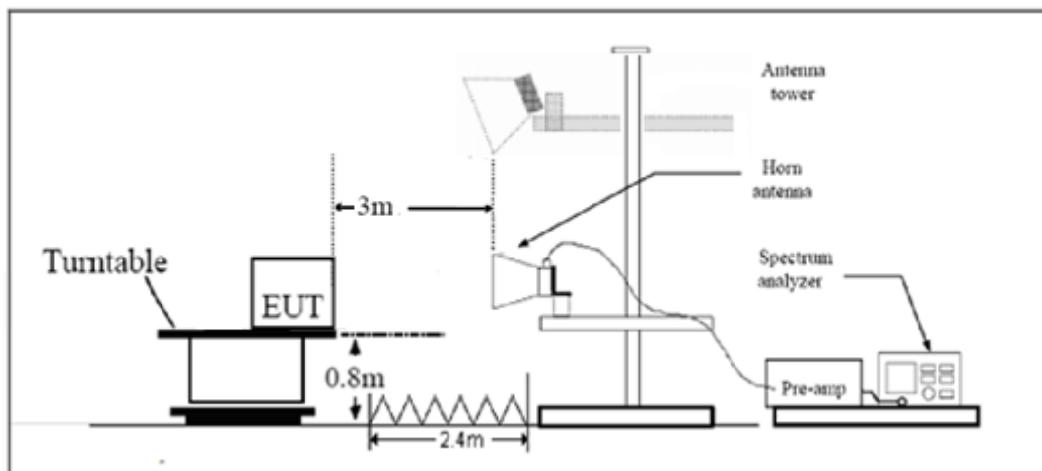
During the test, EUT is connected to a laptop via a USB cable in the case of Transfer Data mode. The EUT is used as the peripheral equipment of the PC. The data is transferred from EUT to PC; PC is connected to server via a long LAN cable.

Test Setup

Below 1GHz



Above 1GHz



Note: Area side:2.4mX3.6m

Antenna Tower meets ANSI C63.4 requirements for measurements above 1 GHz by keeping the antenna aimed at the EUT during the antenna's ascent/ descent along the antenna mast.

**Limits**

Frequency (MHz)	Field Strength (dB μ V/m)	Detector
30 -88	40.0	Quasi-peak
88-216	43.5	Quasi-peak
216 – 960	46.0	Quasi-peak
960-1000	54.0	Quasi-peak
1000-5 th harmonic of the highest frequency or 40GHz,which is lower	54 74	Average Peak

Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor $k = 1.96$.

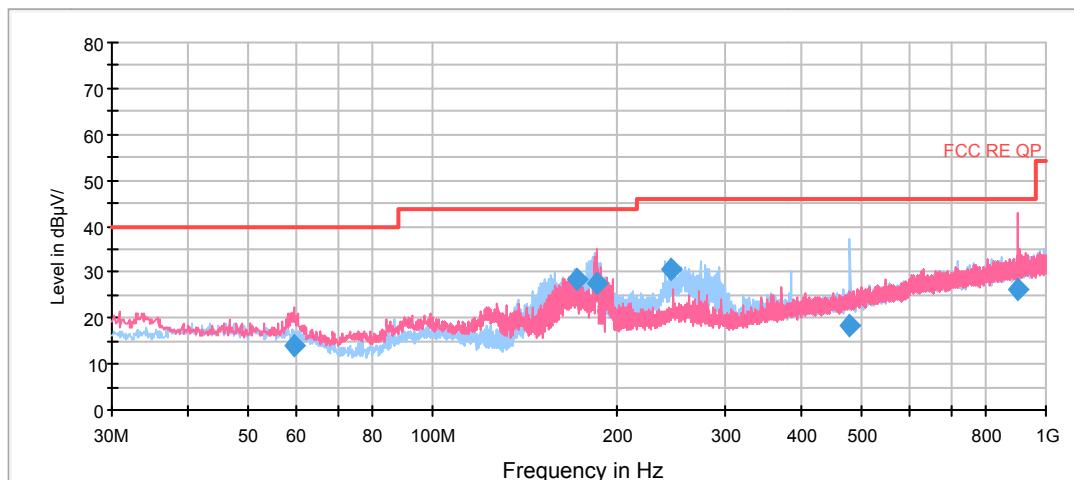
Frequency	Uncertainty
30MHz~200MHz	4.016 dB
200MHz~1000MHz	3.28dB
1GHz~18GHz	3.70 dB
18GHz~26.5GHz	5.78 dB
26.5GHz~40GHz	5.82 dB

Test Results

Sweep the whole frequency band through the range from 30MHz to the 5th harmonic of the carrier, the Emissions in the frequency band 18GHz- 26.5GHz is more than 20dB below the limit are not reported.

The following graphs display the maximum values of horizontal and vertical by software. For above 1GHz, Blue trace uses the peak detection, Green trace uses the average detection.

RE 0.03-1GHz QP Class B



Radiated Emission from 30MHz to 1GHz

Frequency (MHz)	Quasi-Peak (dBuV/m)	Reading value (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
59.383750	13.8	1.2	100.0	V	79.0	12.6	26.2	40.0
172.265000	28.2	17.8	200.0	H	44.0	10.4	15.3	43.5
185.678750	27.5	16.2	100.0	V	2.0	11.3	16.0	43.5
245.415000	30.8	16.8	100.0	H	0.0	14.0	15.2	46.0
479.998750	18.3	-1.9	100.0	H	0.0	20.2	27.7	46.0
900.981250	26.1	-0.7	100.0	V	7.0	26.8	19.9	46.0

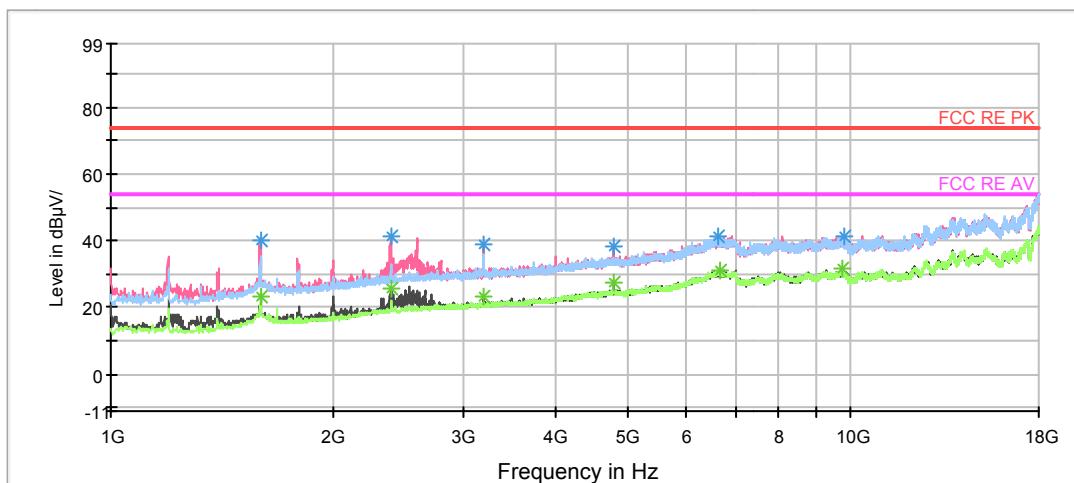
Remark: 1. Quasi-Peak = Reading value + Correction factor

2. Correction Factor = Antenna factor+ Insertion loss(cable loss+amplifier gain)

3. Margin = Limit – Quasi-Peak



FCC RE 1G-18GHz PK+AV Class B



Radiated Emission from 1GHz to 18GHz

Frequency (MHz)	Peak (dBuV/m)	Reading value (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
1595.000000	40.0	50.2	100.0	V	0.0	-10.2	34.0	74
2394.000000	41.5	50.1	100.0	V	359.0	-8.6	32.5	74
3195.125000	38.9	46.1	100.0	V	0.0	-7.2	35.1	74
4791.000000	38.4	42.9	100.0	V	0.0	-4.5	35.6	74
6629.125000	41.2	39.5	100.0	V	164.0	1.7	32.8	74
9803.875000	41.5	37.8	200.0	V	293.0	3.7	32.5	74

Frequency (MHz)	Average (dBuV/m)	Reading value (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
1595.000000	22.4	32.6	100.0	V	0.0	-10.2	31.6	54
2394.000000	23.5	32.1	100.0	V	359.0	-8.6	30.5	54
3195.125000	22.6	29.8	100.0	V	0.0	-7.2	31.4	54
4791.000000	25.1	29.6	100.0	V	0.0	-4.5	28.9	54
6629.125000	29.8	28.1	100.0	V	164.0	1.7	24.2	54
9803.875000	29.6	25.9	200.0	V	293.0	3.7	24.4	54

3.2 Conducted Emission

Ambient condition

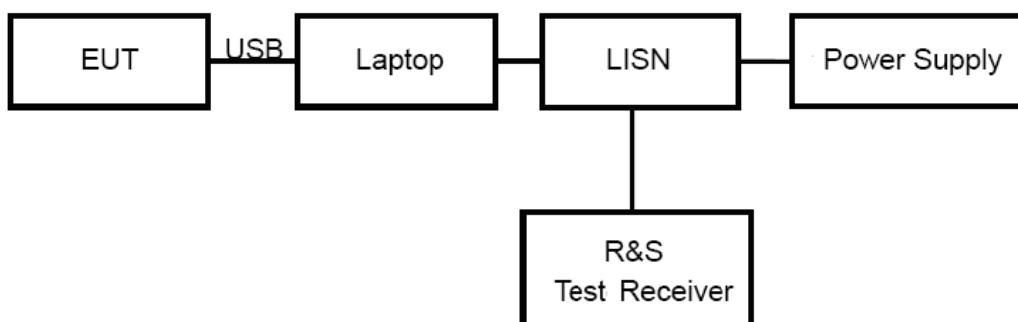
Temperature	Relative humidity	Pressure
24°C ~26°C	50%~55%	102.5kPa

Methods of Measurement

The EUT is placed on a non-metallic table of 80cm height above the horizontal metal reference ground plane. During the test, the EUT was operating in its typical mode. The test method is according to ANSI C63.4-2014. Connect the AC power line of the EUT to the L.I.S.N. Use EMI receiver to detect the average and Quasi-peak value. RBW is set to 9 kHz, VBW is set to 30kHz. The measurement result should include both L line and N line.

During the test, EUT is connected to a laptop via a USB cable in the case of Transfer Data mode. The EUT is used as the peripheral equipment of the PC. The data is transferred from EUT to PC; PC is connected to server via a long LAN cable.

Test Setup



Note: Power Supply is AC Power source and it is used to change the voltage 120V/60Hz.

Limits

Frequency (MHz)	Conducted Limits(dB μ V)	
	Quasi-peak	Average
0.15 - 0.5	66 to 56 [*]	56 to 46 [*]
0.5 - 5	56	46
5 - 30	60	50

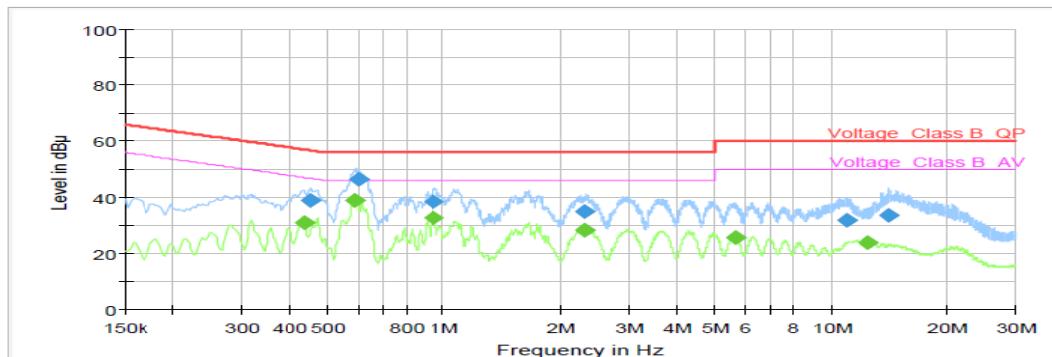
^{*}: Decreases with the logarithm of the frequency.

Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor $k = 1.96$. $U = 2.57$ dB.

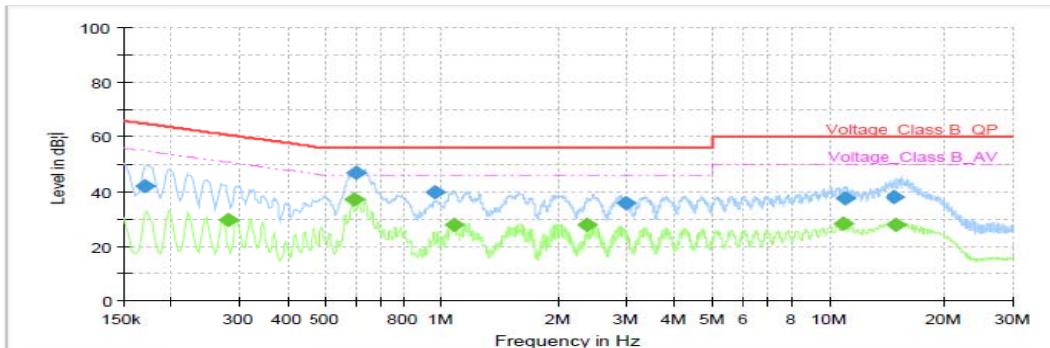
Test Results

Following plots, Blue trace uses the peak detection; Green trace uses the average detection.



Frequency (MHz)	QuasiPeak (dB μ V)	Average (dB μ V)	Limit (dB μ V)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.436250	---	30.99	47.13	16.14	1000.0	9.000	L1	ON	19.2
0.452000	39.15	---	56.84	17.69	1000.0	9.000	L1	ON	19.2
0.591250	---	38.75	46.00	7.25	1000.0	9.000	L1	ON	19.3
0.602250	46.63	---	56.00	9.37	1000.0	9.000	L1	ON	19.3
0.936500	---	32.67	46.00	13.33	1000.0	9.000	L1	ON	19.2
0.939500	38.58	---	56.00	17.42	1000.0	9.000	L1	ON	19.2
2.302750	---	28.21	46.00	17.79	1000.0	9.000	L1	ON	19.0
2.307250	34.99	---	56.00	21.01	1000.0	9.000	L1	ON	19.0
5.705000	---	25.82	50.00	24.18	1000.0	9.000	L1	ON	19.1
11.037000	31.81	---	60.00	28.19	1000.0	9.000	L1	ON	19.4
12.420750	---	23.76	50.00	26.24	1000.0	9.000	L1	ON	19.4
14.203500	33.46	---	60.00	26.54	1000.0	9.000	L1	ON	19.5

L line
Conducted Emission from 150 KHz to 30 MHz



Frequency (MHz)	QuasiPeak (dB μ V)	Average (dB μ V)	Limit (dB μ V)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.170000	41.89	---	64.96	23.07	1000.0	9.000	N	ON	19.2
0.281250	---	29.65	50.78	21.13	1000.0	9.000	N	ON	19.2
0.596000	---	37.12	46.00	8.88	1000.0	9.000	N	ON	19.3
0.602250	46.71	---	56.00	9.29	1000.0	9.000	N	ON	19.3
0.960748	40.03	---	56.00	15.97	1000.0	9.000	N	ON	19.2
1.082000	---	27.75	46.00	18.25	1000.0	9.000	N	ON	19.2
2.367747	---	27.88	46.00	18.12	1000.0	9.000	N	ON	19.0
3.010750	35.91	---	56.00	20.09	1000.0	9.000	N	ON	19.1
10.938224	---	28.11	50.00	21.89	1000.0	9.000	N	ON	19.4
11.067246	37.82	---	60.00	22.18	1000.0	9.000	N	ON	19.4
14.877500	38.17	---	60.00	21.83	1000.0	9.000	N	ON	19.5
14.913951	---	28.05	50.00	21.95	1000.0	9.000	N	ON	19.5

N line
Conducted Emission from 150 KHz to 30 MHz



4 Main Test Instrument

Name	Manufacturer	Type	Serial Number	Last Cal.	Cal. Due Date
Signal Analyzer	R&S	FSV30	100815	2017-12-17	2018-12-16
EMI Test Receiver	R&S	ESCI	100948	2018-05-20	2019-05-19
Trilog Antenna	SCHWARZBECK	VULB 9163	9163-201	2017-11-18	2019-11-17
Horn Antenna	R&S	HF907	100126	2018-07-07	2020-07-06
Horn Antenna	ETS-Lindgren	3160-09	00102643	2018-06-20	2019-06-19
EMI Test Receiver	R&S	ESR	101667	2018-05-20	2019-05-19
LISN	R&S	ENV216	101171	2016-12-16	2019-12-15
Bore Sight Antenna mast	ETS	2171B	00058752	/	/
Test software	EMC32	R&S	9.26.0	/	/

*****END OF REPORT*****

ANNEX A: The EUT Appearance and Test Configuration

A.1 EUT Appearance



Front Side



Back Side

a: EUT



Adapter 1



Adapter 2



Adapter 3

b: Adapter



c. Earphone



d. USB Cable

Picture 1 EUT and Accessory

A.2 Test Setup



a: Below 1GHz



b: Above 1GHz

Picture 2 Radiated Emission Test Setup



Picture 3 Conducted Emission Test Setup