telefication bv
The Netherlands
Chamber of Commerce
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FCC Test Report for Parts 15.209, 15.207

Product name : Taxi Butler One

Applicant : Taxi Butler

FCC ID : 2AQJV-TB18

Test report No. : 171200647 03 Ver 3.00

Laboratory information

Accreditation

Telefication is designated by the FCC as an Accredited Test Firm for compliance testing of equipment subject to Certification under Parts 15 & 18. The Designation number is: NL0001.

The Industry Canada registration number for the 3 meter test chamber of Telefication is: 4173A-1.

Documentation

Telefication complies with the accreditation criteria for test laboratories as laid down in ISO/IEC 17025:2005. The accreditation covers the quality system of the laboratory as well as the specific activities as described in the authorized annex bearing the accreditation number L021 and is granted on 30 November 1990 by the Dutch Council For Accreditation (RvA: Raad voor Accreditatie).

The test report must always be reproduced in full; reproduction of an excerpt only is subject to written approval of the testing laboratory. The documentation of the testing performed on the tested devices is archived for 10 years at Telefication Netherlands.

Testing Location

Test Site	Telefication BV
Test Site location	Edisonstraat 12a 6902 PK Zevenaar The Netherlands Tel. +31889983600 Fax. +31316583189
Test Site FCC	NL0001

Revision History

Version	Date	Remarks	By
v0.50	26-03-2018	First draft	RvB
v1.00	16-04-2018	First release version	RvB
v2.00	20-12-2018	Added FCC id and removed ISED references	RvB
v3.00	17-06-2018	Added test mode and supporting instrument	RvB

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Summary of Test results

FCC	Description	Section in report	Verdict
15.209 (a)	Radiated Spurious emissions	3.1	Pass
15.205 (a)	Spurious emissions in the restricted bands	3.1	Pass
15.207 (a)	Conducted spurious on AC mains	3.2	Pass

1 General Description

1.1 Applicant

Client name:	Taxi Butler
Address	Keizergracht 127, Amsterdam
Zip code:	1015 CJ
Country:	The Netherlands
E-mail:	Otto.ruys@taxibutler.com

1.2 Manufacturer

Manufacturer name:	Taxi Butler
Address:	Keizergracht 127, Amsterdam
Zip code:	1015 CJ
Country:	The Netherlands
E-mail:	Otto.ruys@taxibutler.com

1.3 Tested Equipment Under Test (EUT)

Product name:	Taxi Butler One
Brand name:	Taxi Butler
Product Type:	Taxi ordering device
FCC id:	2AQJV-TB18
Model(s):	See chapter 1.6 “observations and remarks”
Software version:	--
Hardware version:	VA
Date of receipt	20-12-2017
Tests started:	05-01-2018
Testing ended:	04-04-2018

1.4 Product specifications of Equipment under test

TX frequency range:	HSPA+: 824 – 1910 MHz; LTE: 704 - 1910 MHz;
RX frequency range:	HSPA+: 824 – 1910 MHz; LTE: 704 - 1910 MHz;
Antenna type :	Surface mount device antenna.
Antenna gain:	1.1 dBi at 698 MHz and 4.5 dBi at 1.71 GHz.
Type of modulation:	Acc. to LTE specifications.

1.5 Modification of the Equipment Under Test (EUT)

None.

1.6 Observations and remarks

Model overview:

Model	Trademark	Type designation	Software ver.	Hardware ver.
Taxi Butler ONE – 2G WORLD	Taxi Butler	ONE – 2G WORLD	--	VA
Taxi Butler ONE – 4g Americas	Taxi Butler	ONE – 4g Americas	--	VA
Taxi Butler ONE – 4g EMEA	Taxi Butler	ONE – 4g EMEA	--	VA
Taxi Butler ONE – 4G AUS/NZ	Taxi Butler	ONE – 4G AUS/NZ	--	VA

The Taxi Butler ONE – 4g Americas was used for all the measurements contained in this test report.
The EUT was during the tests attached to the BS simulator in transmitting / receiving mode.
No additional test software or modifications to the software were required to connect to the BS.
The conducted output power was verified to be the same as stated in the module test report.

1.7 Environmental conditions

Test date	05-01-2018	04-04-2018
Ambient temperature	20.9 °C	23.7 °C
Humidity	39.7 %	31.7 %

1.8 Measurement Standards

- ANSI C63.10:2013

1.9 Applicable Standards

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

- FCC Part 15 Subpart C §15.209, §15.207

1.10 Conclusions

The sample of the product showed NO NON-COMPLIANCES to the specifications stated in paragraph 1.9 of this report.

The results of the test as stated in this report, are exclusively applicable to the product items as identified in this report. Telefication accepts no responsibility for any properties of product items in this test report, which are not supported by the tests as specified in paragraph 1.9 *"Applicable standards".*

All tests are performed by:

Name : ing. R. van Barneveld

Review of test methods and report by:

Name : ing P.A. Suringa

The above conclusions have been verified by the following signatory:

Date : 25-06-2019

Name : ing K.A. Roes

Function : Coordinator Radio Laboratory

Signature :

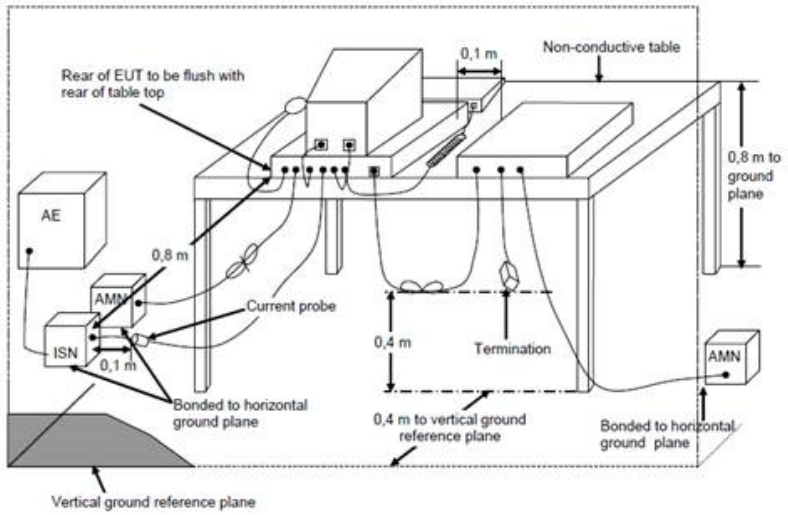
2 Test configuration of the Equipment Under Test

2.1 Test mode

The EUT was tested under normal operating mode. No test mode was used.

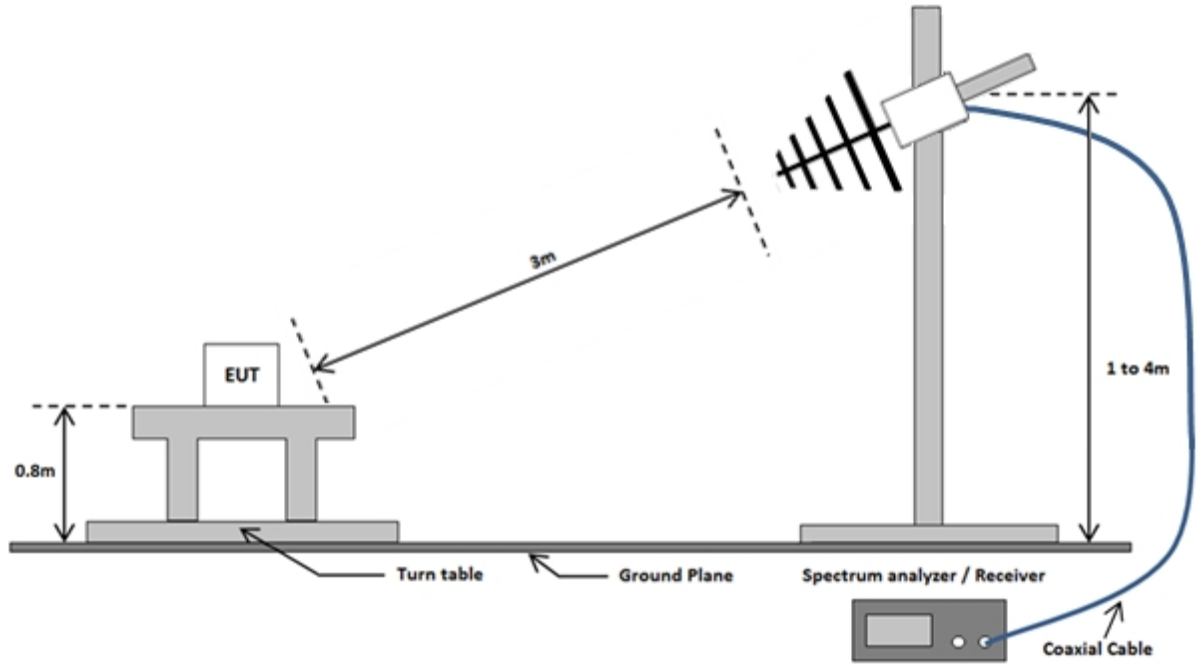
2.2 Conducted Test setup

Emissions test at AC mains

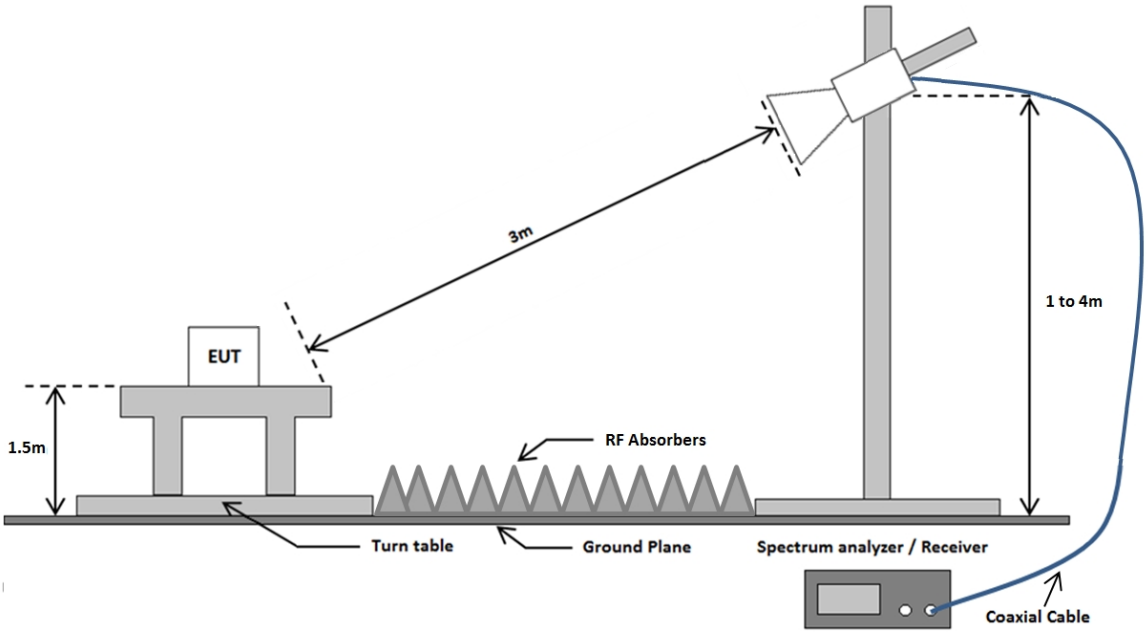


2.3 Radiated Test setup

Radiated emissions test setup 30 MHz - 1 GHz



Radiated emissions test setup above 1 GHz



2.4 Equipment used in the test configuration

Description	Manufacturer	Model	ID	Used at Par.
Spectrum Analyzer	Rohde & Schwarz	FSV	TE 01269	3.1
EMI receiver	Rohde & Schwarz	ESCI	TE 11128	3.2
Biconilog Antenna	Chase	CBL6112A	TE 00967	3.1
Horn Antenna	EMCO The Electro – Mechanics Co	3115	TE 00531	3.1
SAC Chamber	Comtest Engineering BV	-	TE 00861	3.1
Artificial Mains Network (AMN)	Rohde & Schwarz	ESH3-Z5	TE 00208	3.2
Pulse limiter	Rohde & Schwarz	ESH3-Z2	TE 00756	3.2
Pre- amp	Miteq	AFS42-041001800-28-10p-42	TE 11132	3.1
Universal Communication tester	Rohde & Schwarz	CMW500	TE 01286	All
Measurement Software	D.A.R.E Instruments	Radimation 2016 2.8	--	All

2.5 Sample calculation

Field Strength Measurement example:

Frequency (GHz)	Polarization	Height(m)	Peak (dBµV/m)
7,236	Horizontal	2	52.5

The following relation applies:

E (dBµV/m) = U(dBµV) + AF (dB/m) – G (dB) + CL (dB)

Where:

E = Electric field strength
U = Measuring receiver voltage
AF = Antenna factor
G = Gain of the pre-amplifier
CL = Cable loss

(52.5 = 48.12 + 36.1 - 37.42 + 5.7)

3 Test results

3.1 Radiated Spurious Emissions Measurement

3.1.1 Limit

The emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

15.209

Frequency (MHz)	Field strength (µV/m)	Measurement distance(m)
0.009 – 0.490	2400/F(kHz)	300
0.490 – 1.705	24000/F(kHz)	30
1.705 - 30	30	30
30 -88	100	3
88 - 216	150	3
216-960	200	3
Above 960	500	3

3.1.2 Measurement instruments

The measurement instruments are listed in chapter 2.4 of this report.

3.1.3 Test setup

The test setup is as shown in chapter 2.3 of this report.

3.1.4 Test procedure

The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9–90 kHz, 110–490 kHz and above 1000 MHz.
Radiated emission limits in these three bands are based on measurements employing an average detector.

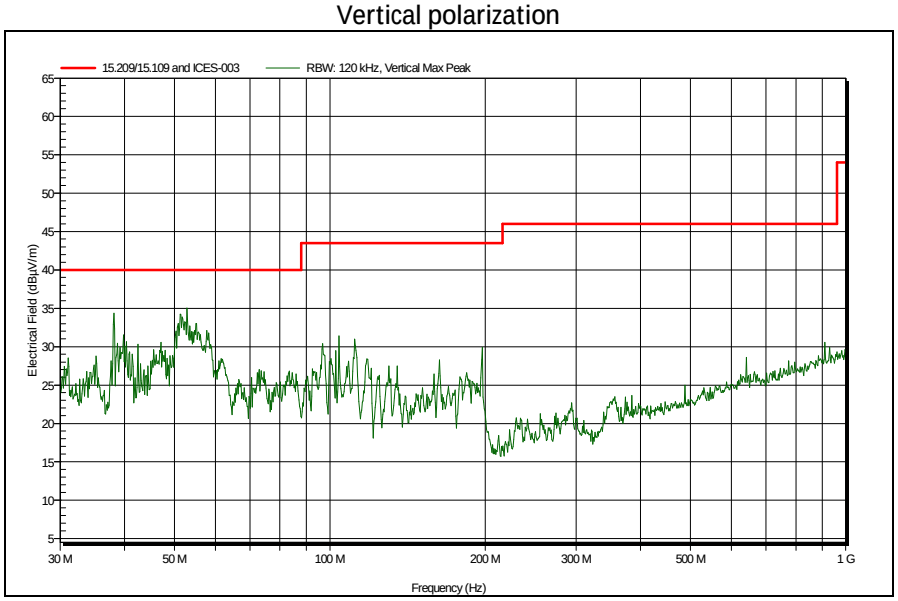
3.1.5 Notes

- In the frequency range of 1 – 18 GHz the green trace is measured using a peak detector and the red trace is measured using an average detector. The top limit line represent the peak limit and the bottom limit represents the average limit.

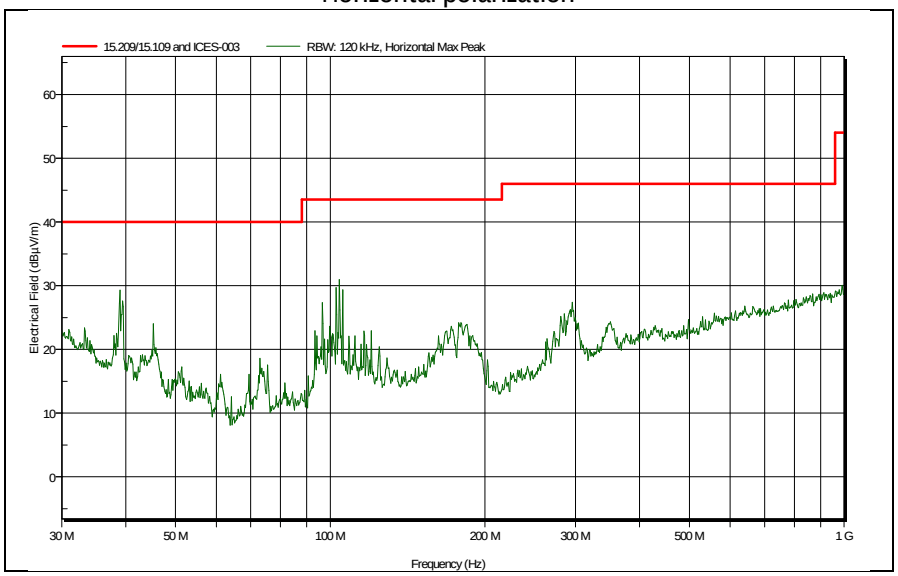
3.1.6 Plots of the Radiated Spurious Emissions Measurement

30 – 1000 MHz

Vertical polarization

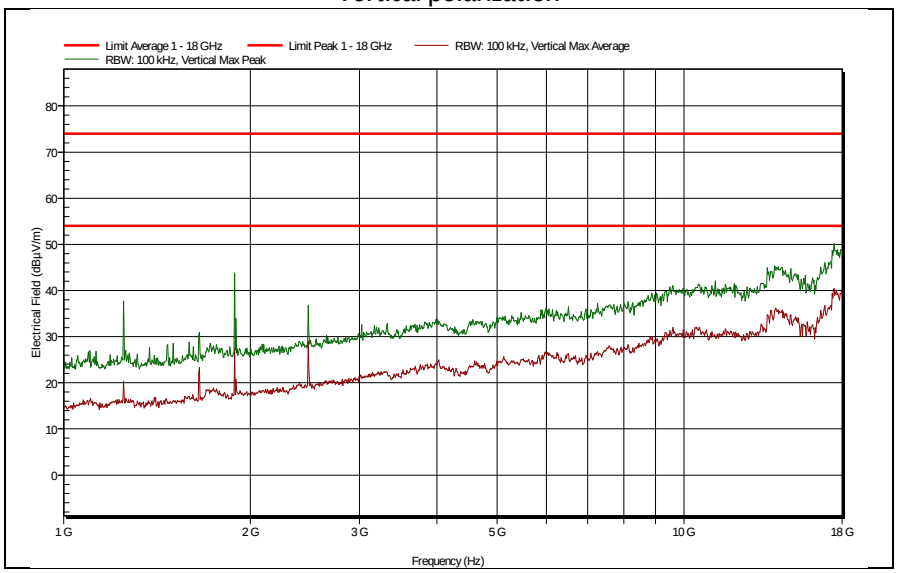


Horizontal polarization

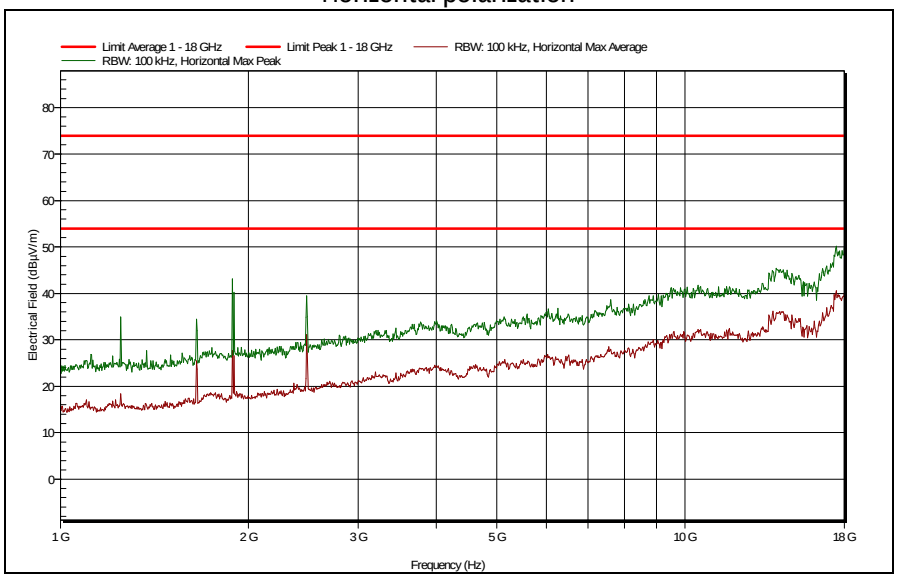


1 – 18 GHz

Vertical polarization



Horizontal polarization



3.1.7 Measurement Uncertainty

Measurement uncertainty Radiated emissions below 1 GHz

Horizontal polarization	
30 – 200 MHz	4.5 dB
200 – 1000 MHz	3.6 dB
Vertical polarization	
30 – 200 MHz	5.4 dB
200 – 1000 MHz	4.6 dB

Measurement uncertainty Radiated emissions above 1 GHz

1000- 18000 MHZ	5.7 dB

3.2 AC conducted mains measurement

3.2.1 Limit

According to 15.207 (c)

an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 kHz to 30 MHz, shall not exceed the limits in the following table.

Frequency of emission (MHz)	Conducted limit (dBµV)	
	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.

3.2.2 Measurement instruments

The measurement instruments are listed in chapter 2.4 of this report.

3.2.3 Test setup

The test setup is as shown in chapter 2.3 of this report.

3.2.4 Test procedure

According to ANSI C63.4: 2014, section 13.3.

3.2.5 Test results and plots of the AC conducted mains measurement

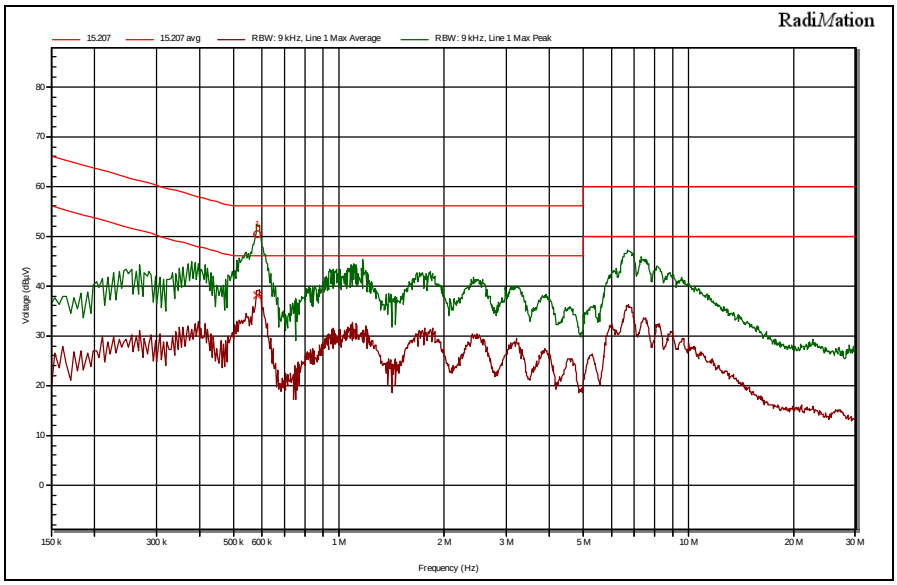
See next page.

3.2.6 Measurement uncertainty

+/- 3.6 dB.

3.2.7 Plots of the AC conducted spurious measurement

Phase

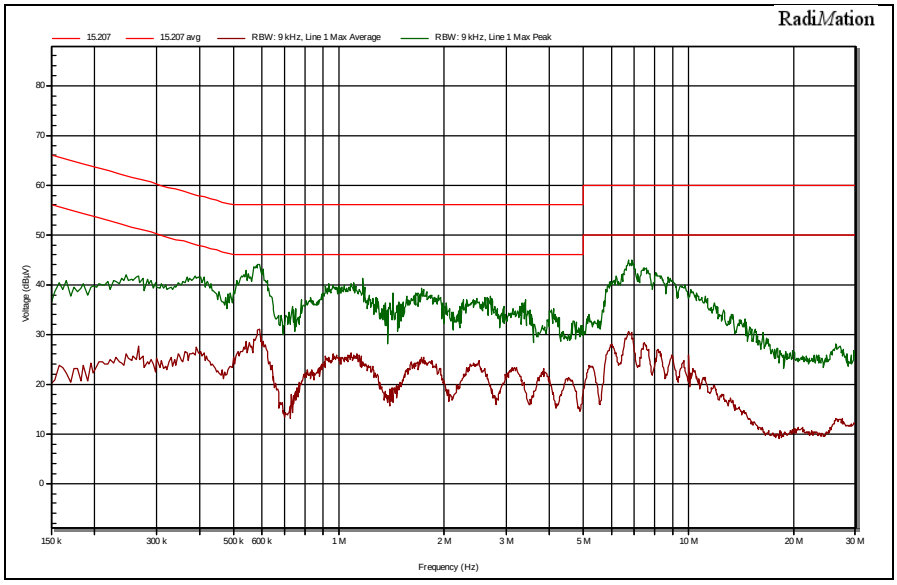


Measured peaks Average

Frequency	Average	Average Limit	Average Difference
586 kHz	38 dBµV	46 dBµV	-8,0 dB

Note: peak value is already below the Quasi peak limit so no quasi peak measurement was performed

Neutral



Note: peak value is already below the Quasi peak limit so no quasi peak measurement was performed