

**TEST REPORT CONCERNING THE COMPLIANCE  
OF AN INTEL<sup>®</sup> DUAL BAND WIRELESS CARD  
MODEL 9560D2W, WITH THE STANDARDS:  
47 CFR PART 15-SUBPART B (10-1-16)**

FCC listed : 90828  
Industry Canada : 2932G-2

**TUV Rheinland Nederland B.V.**  
**P.O. Box 37**  
**9350 AA Leek (NL)**  
**Eiberkamp 10**  
**9351 VT Leek (NL)**

Telephone: +31 (0)88 888 7 888

E-mail: [info@nl.tuv.com](mailto:info@nl.tuv.com)  
Web: [www.tuv.com/nl](http://www.tuv.com/nl)

**MEASUREMENT/TECHNICAL REPORT**

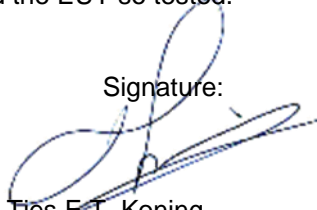
**Intel Dual Band Wireless card 9560D2W**

November 6, 2017

This report concerns: Verification	
Equipment type:	Intel Dual Band Wireless card 9560D2W
Report prepared by:	
Name	: W. Brouwer
Company name	: TÜV Rheinland Nederland B.V.
Address	: Eiberkamp 10
Postal code/city	: 9351 VT Leek
Mailing address	: P.O. Box 37
Postal code/city	: 9350 AA Leek
Country	: The Netherlands
Telephone number	: + 31 594 505 005
Telefax number	: + 31 594 504 804
E-mail	: info@nl.tuv.com/nl

The data taken for this test and report herein was done in accordance with 47 CFR Part 15: 2016 and the measurement procedures of ANSI C63.4-2014. TÜV Rheinland Nederland B.V. at Leek, The Netherlands, certifies that the data is accurate and contains a true representation of the emission profile of the Equipment under Test (EUT) on the date of the test as noted in the test report. I have reviewed the test report and find it to be an accurate description of the test(s) performed and the EUT so tested.

Date: November 6, 2017

Signature:  
  
Ties E.T. Koning  
Senior Engineer EMC

## Summary



The device under test does:

- fulfill the general approval requirements as identified in this test report
- not fulfill the general approval requirements as identified in this test report

## Description of test item

Test items	:	Intel Dual Band Wireless card
Manufacturer	:	Intel Mobile Communications SAS
Brand	:	Intel
Model/Version	:	9560D2W
Serial number	:	---
Receipt date	:	October 9, 2017
Applicant's representative	:	Mrs. L. Peignot
Company	:	Intel Mobile Communications SAS
Address	:	Le Navigator B / 505 route des Lucioles / CS 70293
City	:	06905 Sophia Antipolis Cedex
Country	:	France
Telephone number	:	+33 (0)4 93 00 14 14
Telefax number	:	+33 (0)4 93 00 14 01

## Test(s) performed

Location	:	Leek
Test(s) started	:	October 11, 2017
Test(s) completed	:	November 2, 2017
Purpose of test(s)	:	Compliance with relevant standards
Test specification(s)	:	47 CFR PART 15-SUBPART B (10-1-16)
Test engineer(s)	:	K.F. van der Molen / W. Brouwer 
Report written by	:	W. Brouwer 
Report date	:	November 6, 2017

This report shall not be reproduced, except in full, without the written permission of TÜV Rheinland Nederland B.V.  
The test results relate only to the item(s) tested.

**Table of contents**

1	General information.....	5
1.1	Description of EUT.....	5
1.2	Related submittal(s) and/or Grant(s).....	6
1.2.1	General.....	6
1.2.2	Description of test configuration.....	6
1.2.3	Description of tested input and output ports.....	6
1.3	Test methodology.....	7
1.4	Test facility.....	8
1.5	Test conditions.....	8
2	System test configuration.....	8
2.1	Justification.....	8
2.2	EUT mode of operation.....	8
2.3	Special accessories.....	8
2.4	Equipment modifications.....	8
3	Radiated field strength measurements (30 MHz – 1 GHz, E-field).....	9
4	Radiated field strength measurements (1 GHz – 29 GHz, E-field).....	12
5	Conducted emission AC Power Line (to AUX1).....	15
7.	List of utilized test equipment.....	18

## 1 General information.

### 1.1 Description of EUT.

The Intel® Dual band wireless card, Model 9560D2W will be referred to as EUT for the purpose of this test report.



Photo 1: photo of the EUT

## 1.2 Related submittal(s) and/or Grant(s).

### 1.2.1 General.

Not applicable

### 1.2.2 Description of test configuration.

Test item (EUT) : Intel® Dual Band Wireless card with WiFi, Bluetooth  
 Manufacturer : Intel Mobile Communication SAS  
 Brand mark : Intel  
 Model : 9560D2W  
 Serial number : ---  
 Remark : Tested via laptop AUX1 and Extender Aux1a

Test item (AUX 1) : Laptop  
 Manufacturer : Dell  
 Brand mark : Dell  
 Model : Latitude E5470  
 Serial number : n.a.  
 Remark : Powered by AC adapter PDU-90W CN0JCF3V

Test item (AUX2) : Wireless Router  
 Manufacturer : Netgear  
 Brand mark : Netgear  
 Model : WNDR3300  
 Serial number : 1TR2837100A88  
 Remark : --

Test item (AUX3) : Mobile phone with Bluetooth  
 Manufacturer : Samsung  
 Brand mark : Samsung  
 Model : Galaxy J7  
 Serial number : --  
 Remark : --

### 1.2.3 Description of tested input and output ports.

Number	Terminal	From	To	Remarks
1	Mains	Mains (power supply)	AUX1a	Used for powering/charging AUX1a

Table 1

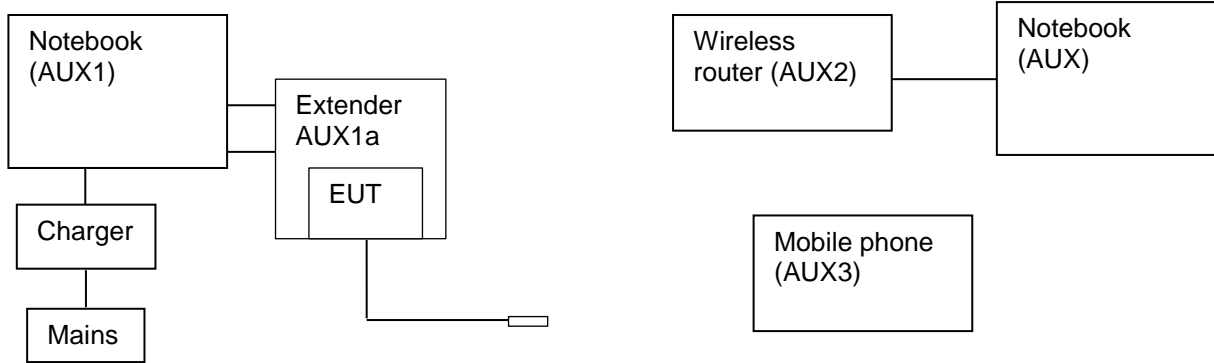


Figure 1: Basic test setup and connections

### Test Summary

The EUT was tested in accordance with the specifications given in the table below.

Test Standard		Description	Page	Pass / Fail
47 CFR Part 15 Subpart B (10-1-15 Edition)	ICES-003 Issue 6, January 2016			
15.107(a)	Section 6.1 Table 2	AC power Lines Conducted emissions	13 – 16	Pass
15.109(a)	Section 6.2.1 Table 5	Radiated emissions	10 – 12	Pass

Table 2 : test specifications

### 1.3 Test methodology.

The test methodology used is based on the requirements of 47 CFR Part 15, Subpart B (10-1-16 Edition), sections 15.107, 15.109 and ICES-003 Issue 6 (January 2016) Sections 6.1 and 6.2

The test methods, which have been used, are based on ANSI C63.4: 2014.

Radiated emission tests above 30 MHz were performed at a measurement distance of 3 meters.

The receivers are switching automatically to the right bandwidth in accordance with CISPR 16. This is implemented in the receiver. The antenna factors are programmed in the test receiver. The receiver automatically calculates the appropriate correction factor for the utilized antenna and also the appropriate antenna factor for the cable loss. The total correction is automatically added to the measured value.

## 1.4 Test facility.

The Federal Communications Commission and Industry Canada has reviewed the technical characteristics of the test facilities at TÜV Rheinland Nederland B.V., located in Leek, 9351VT Eiberkamp 10, The Netherlands, and has found these test facilities to be in compliance with the requirements of 47 CFR Part 15, section 2.948.

The description of the test facilities has been filed at the Office of the Federal Communications Commission under registration number 90828. The facility has been added to the list of laboratories performing these test services for the public on a fee basis.

## 1.5 Test conditions.

Normal test conditions:

Temperature (\*) : 18 - 23 °C  
Relative humidity(\*) : 30 % to 50 %  
Supply voltage : 115 V AC/60 Hz to the Power Supply  
Air pressure : 950 – 1050 hPa

When it was impracticable to carry out the tests under these conditions, a note to this effect stating the ambient temperature and relative humidity during the tests are stated separately.

## 2 System test configuration.

### 2.1 Justification.

The system was configured for testing in a typical fashion (as a customer would normally use it).

The justification and manipulation of cables and equipment in order to simulate a worst-case behavior of the test setup has been carried out as prescribed in ANSI C63.4: 2014.

### 2.2 EUT mode of operation.

Operation mode 1: WiFi 2.4 GHz  
Operation mode 2: WiFi 5 GHz  
Operation mode 3: Bluetooth

### 2.3 Special accessories.

No special accessories are used and/or needed to achieve compliance.

### 2.4 Equipment modifications.

No modifications have been made to the tested equipment in order to achieve compliance.



### 3 Radiated field strength measurements (30 MHz – 1 GHz, E-field)

#### Limits

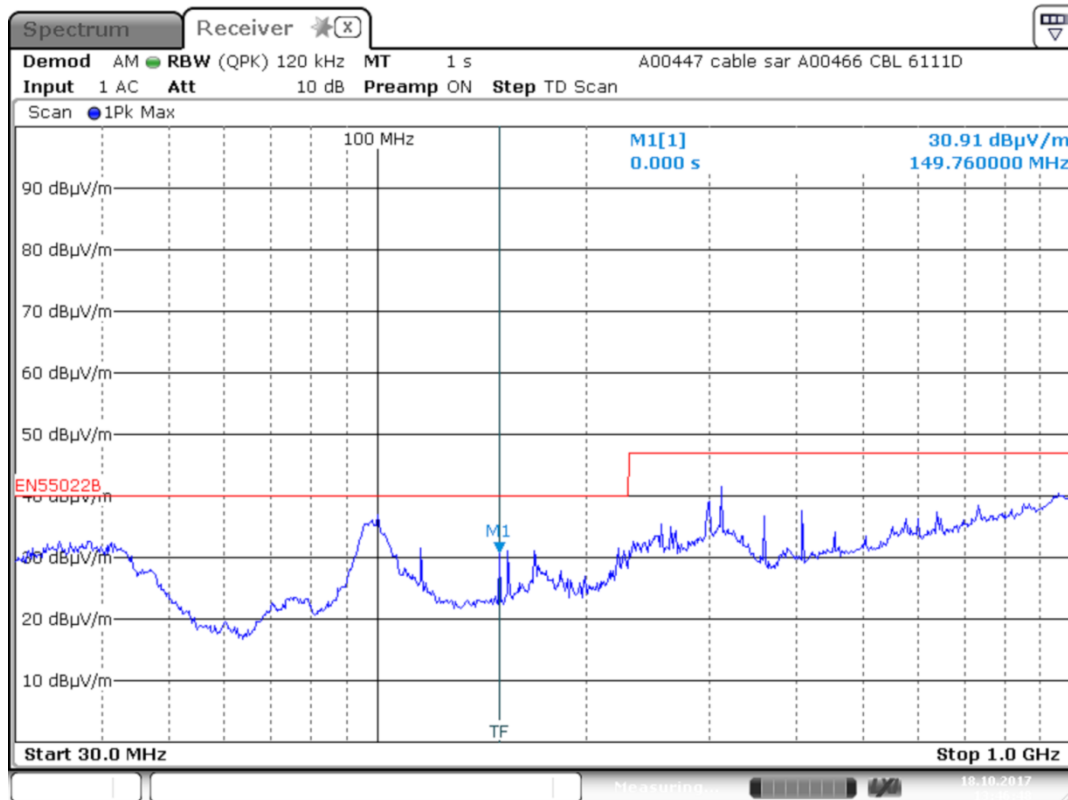
Frequency (MHz)	Limit (dB $\mu$ V/m)
30-88	49.0
88-216	53.5
216-950	56.5
> 950	59.5

#### 3.1 Results 2.4 GHz mode

Results and limits						
Frequency (MHz)	Result (dB $\mu$ V/m)	Antenna polarization	Limit (dB $\mu$ V/m)	Margin	Height (cm)	Angle (deg)
35.09	26.0	Vertical	49.0	23.0	99.7	284.6
99.64	33.8	Vertical	53.5	19.7	99.7	64.0
115.20	29.7	Vertical	53.5	23.8	100.1	271.6
153.92	27.7	Horizontal	53.5	25.8	152.6	296.1
312.00	35.7	Vertical	56.5	20.8	178.7	156.5

Table 3 Results Radiated emission 2.4 GHz mode

Radiated Emissions of the EUT. The results of the radiated emission tests, carried out in accordance with 47 CFR Part 15: 2016 section 15.109 (Class B digital devices, verification) with the EUT operating in mode switched to generate maximum levels. Maximum level recorded of the total system in Table 3.



Date: 18.OCT.2017 13:46:49

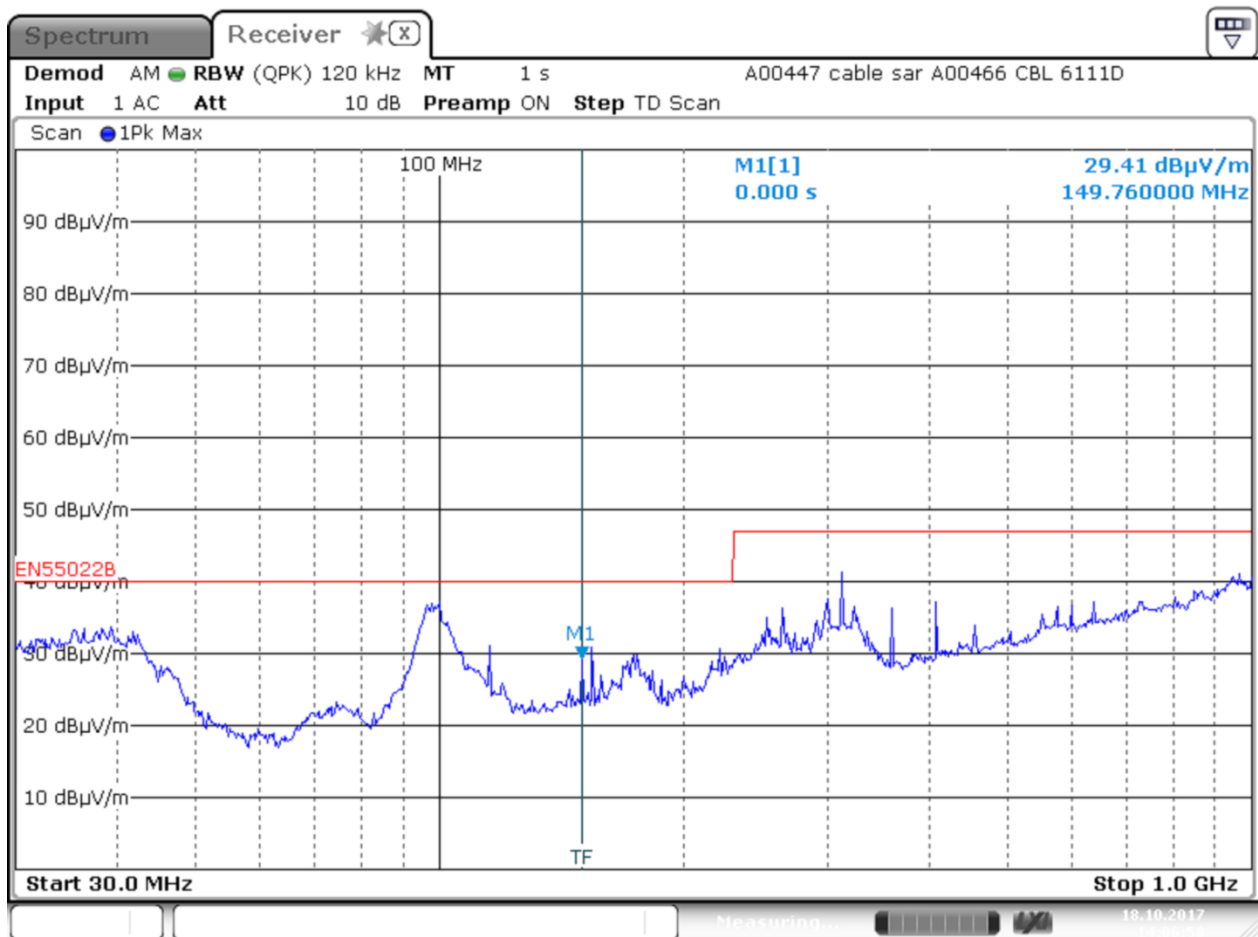
Plot 1: Pre-scan plot with peak detector. Radiated emissions from 30 MHz to 1 GHz in 2.4GHz mode

### 3.2 Results 5 GHz + BT mode

Results and limits						
Frequency (MHz)	Result (dB $\mu$ V/m)	Antenna polarization	Limit (dB $\mu$ V/m)	Margin	Height (cm)	Angle (deg)
39.32	26.8	Vertical	49.0	22.2	99.7	218.9
99.89	33.6	Vertical	53.5	19.9	99.7	76.7
153.92	23.5	Horizontal	53.5	30.0	100.1	359.7
312.00	40.1	Horizontal	56.5	16.4	99.7	90.6

Table 4 Results Radiated emission 5 GHz + BT mode

Radiated emissions of the EUT. The results of the radiated emission tests, carried out in accordance with 47 CFR Part 15: 2016 section 15.109 (Class B digital devices, verification) with the EUT operating in mode switched to generate maximum levels. Maximum level recorded of the total system in Table 4.



Date: 18.OCT.2017 14:06:58


Plot 2: Pre-scan plot with peak detector. Radiated emissions from 30 MHz to 1 GHz in 5 GHz + BT mode

**Notes:**

Field strength values of radiated emissions at frequencies not listed in the table above are more than 30 dB below the applicable limit.

1. Measurement uncertainty is  $\pm 5.0$  dB
2. The reported field strength values are the worst case values at the indicated frequency. The receiving antenna was varied in horizontal and vertical orientations and also in height (between 1m and 4m).
3. A Quasi-Peak detector was used with a resolution bandwidth of 120 kHz.

Test engineer

Signature : 

Name : K.F. van der Molen

Date : October 18, 2017

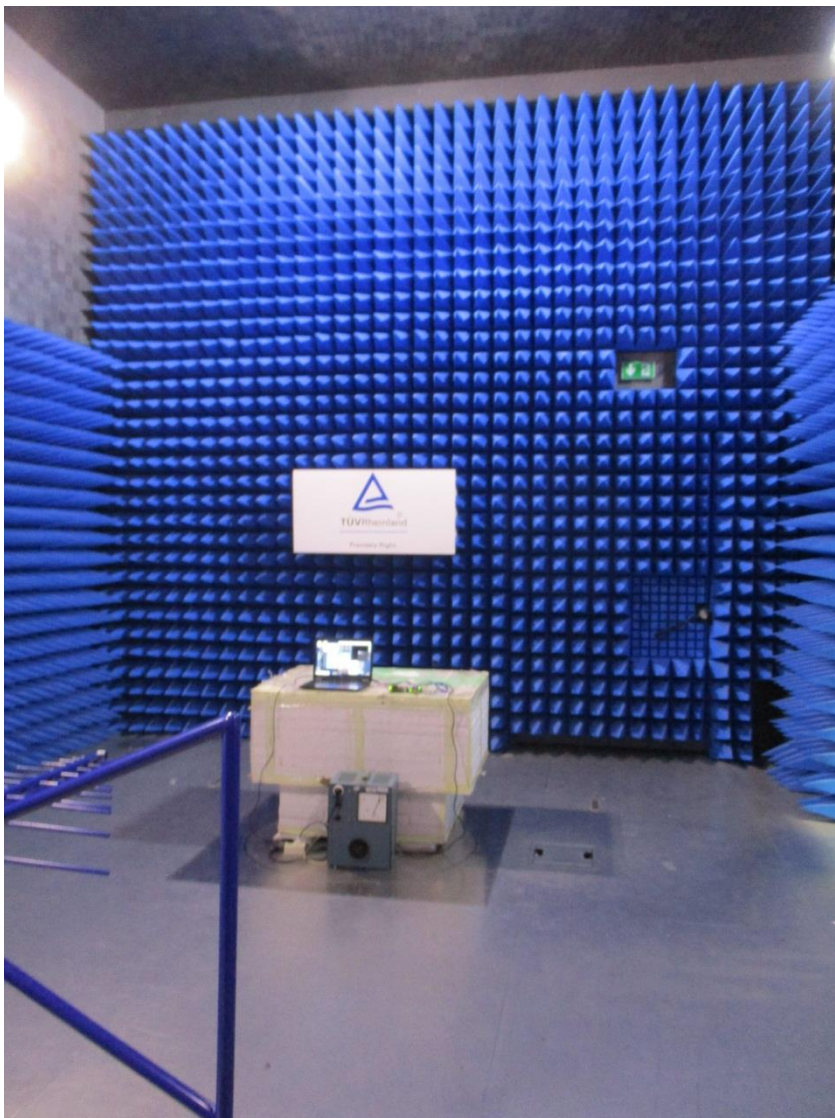


Photo 2: Test Set-up RF Radiated emission 30MHz-1GHz

#### 4 Radiated field strength measurements (1 GHz – 29 GHz, E-field) ( $f_x = 5.8 \text{ GHz}$ )

Measured Peak results and limits 2.4 GHz mode			
Frequency (MHz)	Vertical Polarization (dB $\mu$ V/m)	Horizontal Polarization (dB $\mu$ V/m)	Limits (FCC15.35) (dB $\mu$ V/m)
1000-18000	<25.0	<25.0	74.0
Except for:			
6515	53.5	53.2	74.0
11468	59.0	59.1	74.0
14047	56.7	57.2	74.0
17892	63.6	62.4	74.0
Measured Average results and limits 2.4 GHz mode			
Frequency (MHz)	Vertical Polarization (dB $\mu$ V/m)	Horizontal Polarization (dB $\mu$ V/m)	Limits (FCC15.35) (dB $\mu$ V/m)
1000-18000	<25.0	<25.0	54.0
Except for:			
1191	42.3	37.8	54.0
6515	40.1	40.0	54.0
11468	46.2	46.4	54.0
14047	44.0	43.8	54.0
17892	48.7	48.2	54.0

Table 5 Results Radiated emission 2.4 GHz mode

Measured Peak results and limits 5 GHz + BT mode			
Frequency (MHz)	Vertical Polarization (dB $\mu$ V/m)	Horizontal Polarization (dB $\mu$ V/m)	Limits (FCC15.35) (dB $\mu$ V/m)
1000-29000	<25.0	<25.0	74.0
Except for:			
1019	40.3	43.5	74.0
1191	45.8	43.6	74.0
5892	63.1	62.1	74.0
11429	58.3	59.1	74.0
14226	56.7	57.6	74.0
17792	53.0	62.2	74.0
18359	53.1	53.2	74.0
18718	52.0	52.1	74.0
20768	52.9	54.8	74.0
21287	53.5	54.1	74.0
21767	54.4	53.7	74.0
22432	53.1	52.8	74.0
Measured Average results and limits 5 GHz + BT mode			
Frequency (MHz)	Vertical Polarization (dB $\mu$ V/m)	Horizontal Polarization (dB $\mu$ V/m)	Limits (FCC15.35) (dB $\mu$ V/m)
1000-29000	<25.0	<25.0	54.0
Except for:			
1019	27.3	30.5	54.0
1191	42.3	37.8	54.0
5892	48.7	48.6	54.0
11429	46.3	49.8	54.0
14226	44.9	44.7	54.0
17792	50.3	49.5	54.0
18359	39.5	39.5	54.0
18718	38.9	38.9	54.0
20768	41.4	41.0	54.0
21287	40.5	40.5	54.0
21767	40.4	40.5	54.0
22432	40.2	40.2	54.0

Table 6 Results Radiated emission 5 GHz + BT mode

Radiated emissions >1GHz of the EUT. The results of the radiated emission tests, carried out in accordance with 47 CFR Part 15: 2016 section 15.109 and 15.35 (Class B digital devices, verification) with the EUT operating in mode switched to generate maximum levels. Maximum level recorded of the total system in tables 5 and 6.

Notes:

Field strength values of radiated emissions at frequencies not listed in the table above are more than 25 dB below the applicable limit.

1. Measurement uncertainty is +/- 5.1 dB
2. The reported field strength values are the worst case values at the indicated frequency. The receiving antenna was varied in horizontal and vertical orientations and also in height (between 1m and 2m).
3. A Peak/Average detector was used with a resolution bandwidth of 1MHz.

Test engineer

Signature :



Name

: W. Brouwer

Date

: November 2, 2017

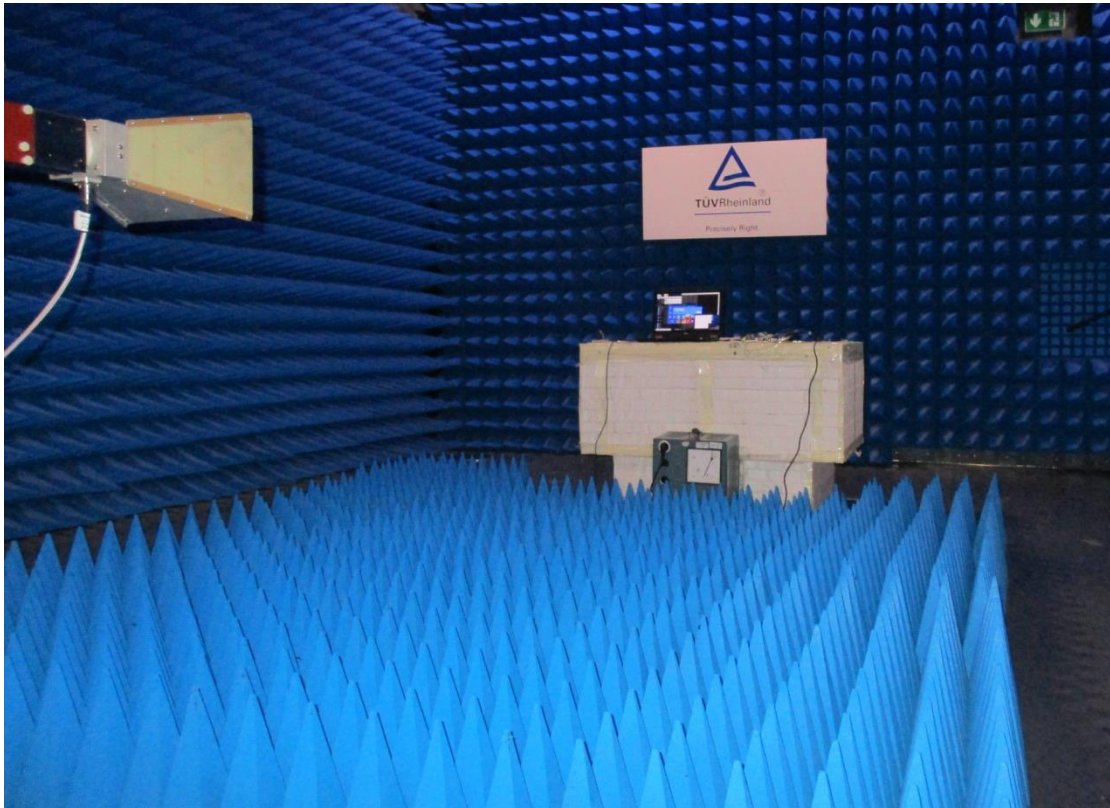


Photo 3: Test Set-up RF Radiated emission 1GHz – 18 GHz

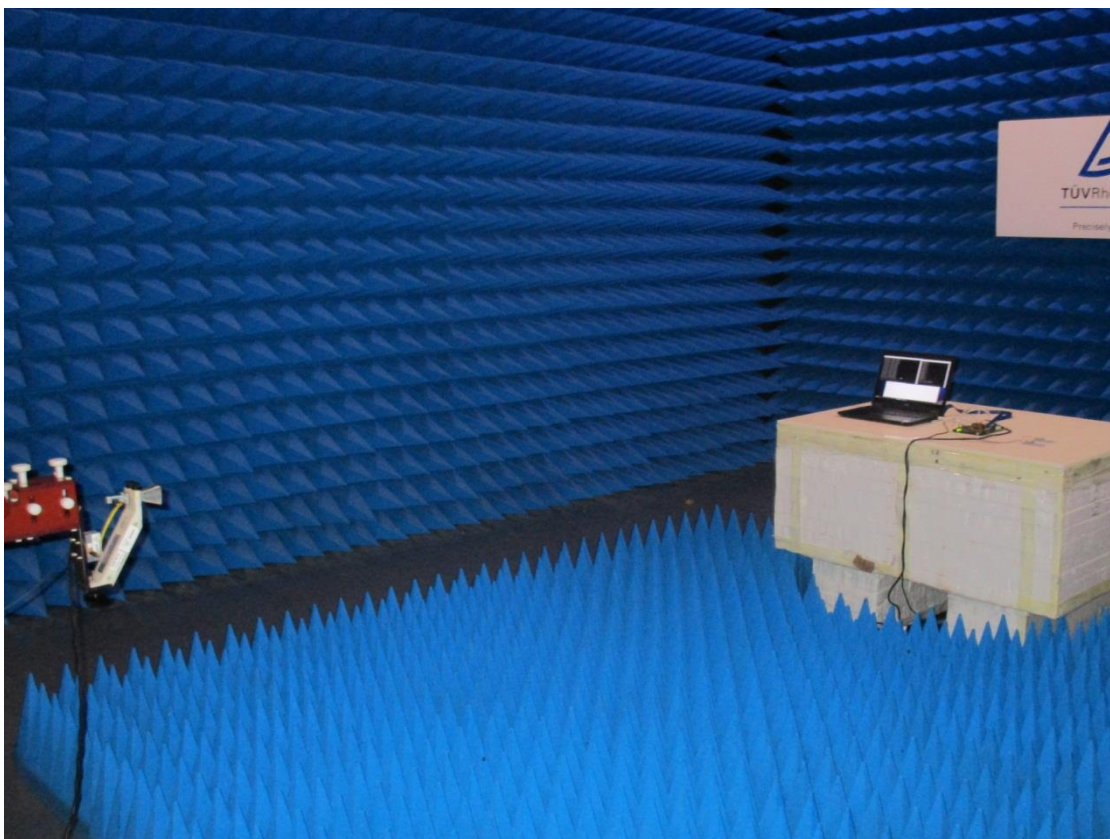


Photo 4: Test Set-up RF Radiated emission 18GHz – 29GHz

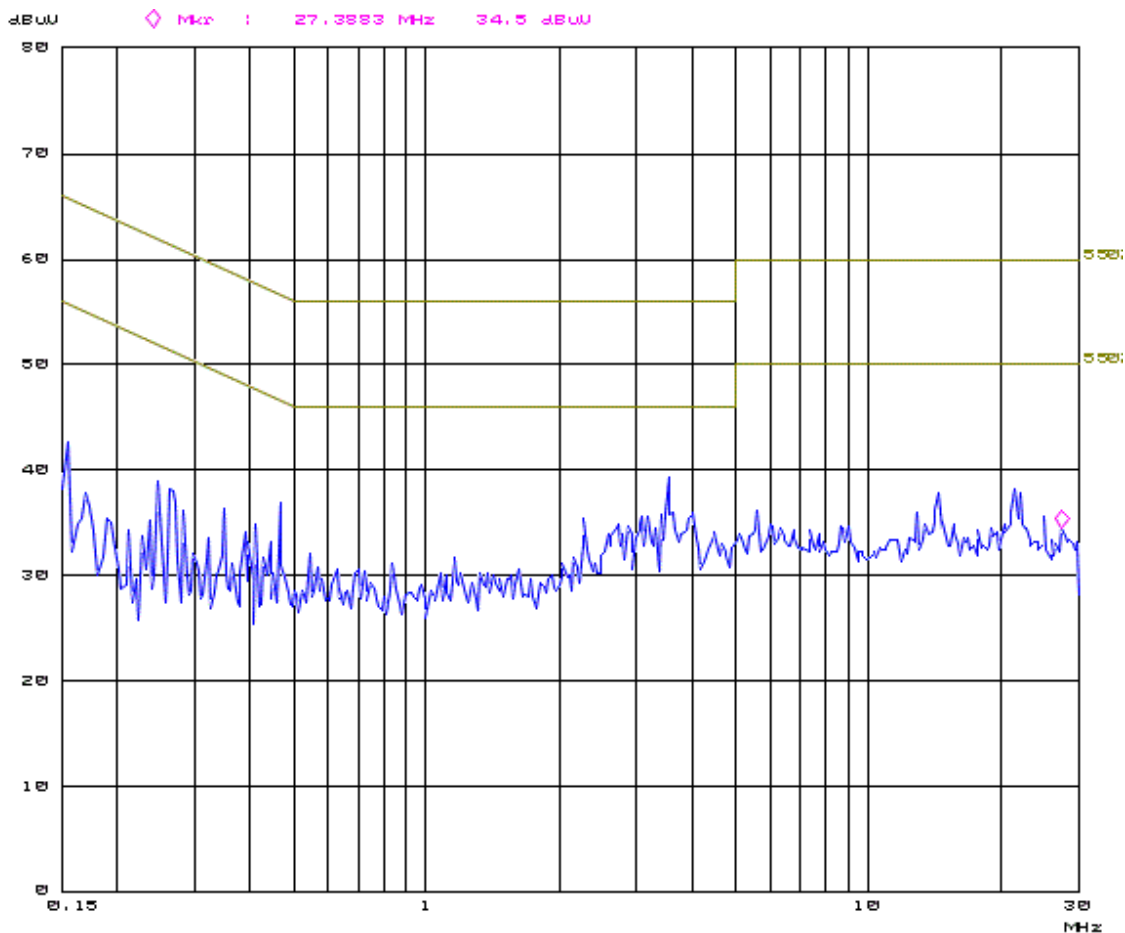
## 5 Conducted emission AC Power Line (to AUX1)

Results and limits Neutral 2.4 GHz mode						
Frequency (MHz)	Quasi peak detector			Average detector		
	Result	Limit	Margin	Result	Limit	Margin
0.35	30.9	59.0	28.1	22.1	49.0	26.9
0.41	28.6	57.7	29.0	17.9	47.7	29.7
0.47	31.7	56.5	24.8	19.5	46.5	27.1
2.27	28.2	56.0	27.8	21.6	46.0	24.4
3.54	37.0	56.0	19.0	31.7	46.0	14.4
21.47	24.5	60.0	35.5	15.6	50.0	34.4

Results and limits L1 2.4 GHz mode						
Frequency (MHz)	Quasi peak detector			Average detector		
	Result	Limit	Margin	Result	Limit	Margin
0.35	31.9	59.0	27.1	21.9	49.0	27.0
0.41	28.9	57.7	28.8	18.2	47.7	29.5
0.47	31.4	56.5	25.1	18.5	46.5	28.0
2.27	23.2	56.0	32.8	17.6	46.0	28.4
3.54	33.2	56.0	22.8	28.5	46.0	17.5
21.47	28.2	60.0	31.8	18.8	50.0	31.2

Table 7



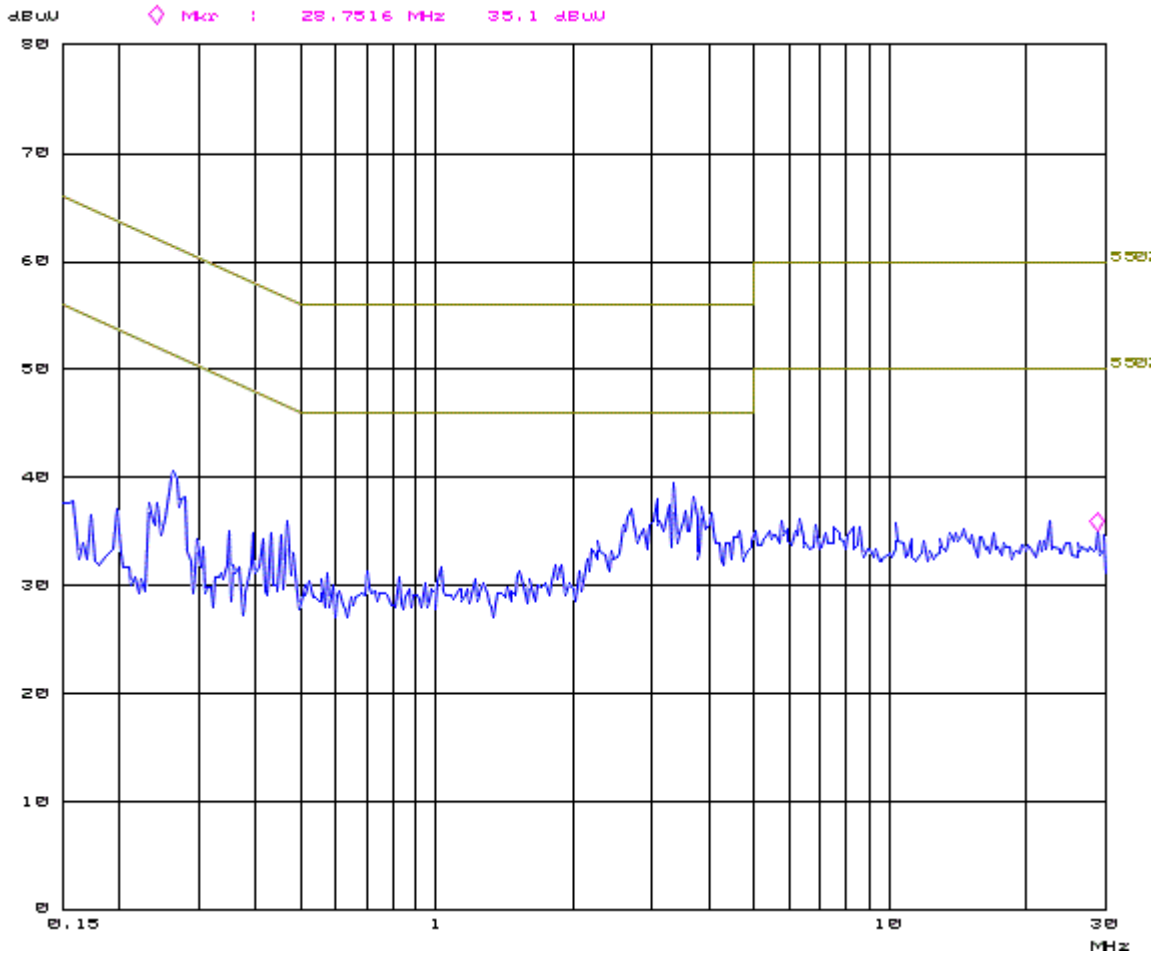
Plot 3: Pre-scan plot with Peak detector Conducted Emissions from 0.15 MHz to 30MHz in 2.4 GHz mode

Results and limits Neutral 5 GHz + BT mode						
Frequency (MHz)	Quasi peak detector			Average detector		
	Result	Limit	Margin	Result	Limit	Margin
0.26	40.0	61.4	21.5	29.1	51.4	22.3
0.39	33.0	58.1	25.1	27.4	48.1	20.7
0.47	33.1	56.5	23.4	21.1	46.5	25.4
2.69	31.7	56.0	24.3	27.0	46.0	19.0
3.35	30.1	56.0	25.9	25.2	46.0	20.8
3.69	30.3	56.0	25.7	23.6	46.0	22.5

Results and limits L1 5 GHz + BT mode						
Frequency (MHz)	Quasi peak detector			Average detector		
	Result	Limit	Margin	Result	Limit	Margin
0.26	40.2	61.4	21.2	29.9	51.4	21.5
0.39	31.9	58.1	26.2	23.9	48.1	24.2
0.47	32.5	56.5	24.0	20.6	46.5	25.9
2.69	28.4	56.0	27.6	23.1	46.0	22.9
3.35	26.4	56.0	29.6	21.5	46.0	24.5
3.69	28.5	56.0	27.5	21.3	46.0	24.7

Table 8



Plot 4: Pre-scan plot with Peak detector Conducted Emissions from 0.15 MHz to 30MHz in 5 GHz + BT mode



Conducted emission measurements. The results of the conducted emission tests, carried out in accordance with 47 CFR Part 15: 2016 section 15.109 (Class B digital devices, verification), at the AC mains connection terminals which were connected to the EUT, are depicted in table 7 and 8. Maximum values recorded. The system is tested as in whole, so with all equipment in place and functioning. Being the worst case situation. Maximum results are reported.

**Notes:**

1. Measurement uncertainty is  $\pm 3.5$  dB
2. The resolution bandwidth used was 9 kHz.

Test engineer

Signature :



Name : K.F. van der Molen

Date : October 12, 2017

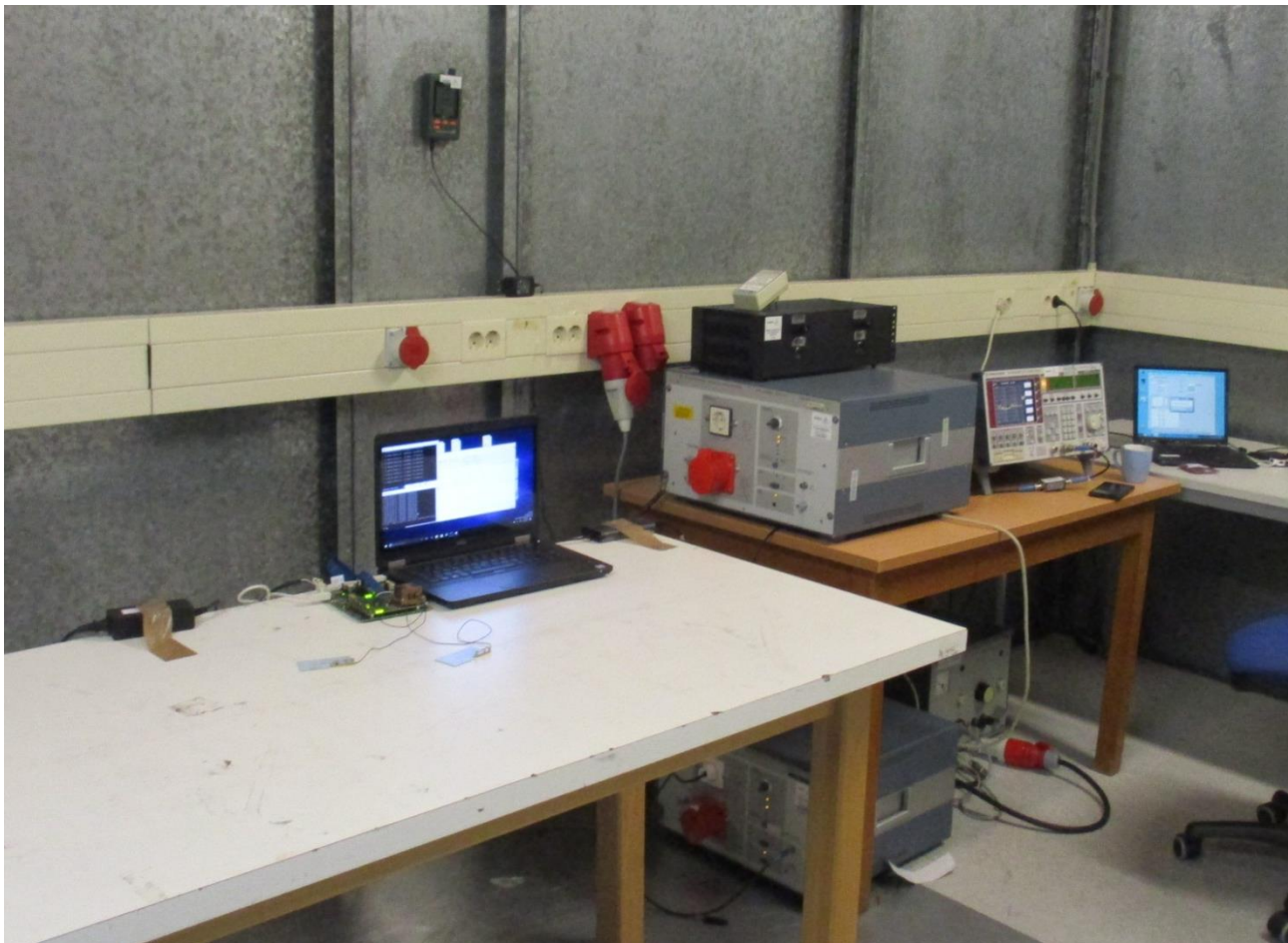


Photo 5: Test Set-up Conducted emission 0.15 MHz to 30Mhz

## 7. List of utilized test equipment.

Inventory number	Description	Brand	Model
A00257	Controller (mast)	EMCS	DOC202
A00258	Antenna mast	EMCS	AP-4702C
A00257	Antenna mast	EMCS	DOC202
A01982	Measuring receiver	R&S	ESR
A00466	Biconilog antenna	TeSeq	CBL6111D
A00209	Gainhorn Antenna 18 – 26.5 GHz	EMCO	3160-09
A00378	Pre-amplifier	EMCS	99779
A00447	Low att coax cable	Gigalink	APG0500
A00339	Low att coax cable	Huber + Suhner	Sucotest 18/Sucoflex 102
A00343	Low att coax cable	Huber + Suhner	Sucotest 18/Sucoflex 102
A00450	Turntable & controller	Maturo	SCU
A00436	S-AR	Siepel	-
A00019	Artificial mains network 3-phase	R&S	ESH2-Z5
A00051	Impulse limiter	R&S	ESH3Z2.357...
A00726	EMI test receiver	R&S	ESCS 30
A00008	Gainhorn Antenna	EMCO	3115
A00337	Spectrum Analyzer 9KHz – 30GHz	R&S	FSV30
A00255	Pre-selector	EMCS	RFS06S
A00442	Temperature-Humiditymeter	Extech	SD500