

**TEST REPORT CONCERNING THE COMPLIANCE OF
AN INTEL® DUAL-BAND WIRELESS
COMMUNICATION CARD,
BRAND INTEL, MODEL 9260NGW
WITH 47 CFR PART 15-SUBPART B (10-1-15 Edition)
AND THE
REQUIREMENTS OF INDUSTRY CANADA:
ICES-003 (ISSUE 6, JUNE 2016).**

**17060701.f01
July 10, 2017**

FCC listed : 90828
Industry Canada : 2932G-2

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MEASUREMENT/TECHNICAL REPORT

Intel Mobile Communication SAS (France) Models: 9260NGW

This report concerns: Verification

Equipment type: Intel® Dual Band Wireless communication card

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The data taken for this test and report herein was done in accordance with 47 CFR Part 15, Subpart B (10-1-16 edition), ICES-003 (Issue 6, August 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: July 11, 2017

Signature:



A.J.K. Hut
EMC Engineer TÜV Rheinland Nederland B.V.

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 item	:	Intel® Dual-Band Wireless Communication Card
Manufacturer	:	Intel Mobile Communications SAS
Brand	:	Intel
Models	:	9260NGW
Serial number	:	---

Applicant information

Applicant's representative:	Mrs. L. Peignot
Company	: Intel Mobile Communications SAS
Address	: Le Navigator B / 505 route des Lucioles / CS 70293
Postal code	: 06905
City	: Sophia Antipolis Cedex
Country	: France

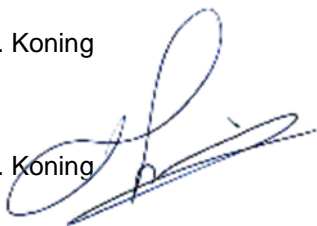
Test(s) performed

Location	:	Leek
Test(s) started	:	July 3, 2017
Test(s) completed	:	July 11, 2017
Purpose of test(s)	:	Verification

Test specification(s)	:	47 CFR Part 15, subpart B (10-1-16 Edition) and ICES-003 (ISSUE 6, AUGUST 2016)
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Test engineer(s)	:	T.E.T. Koning
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Report written by	:	T.E.T. Koning
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Report date	:	July 11, 2017
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The test results relate only to the item(s) tested.

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1 General information.

1.1 Product description.

1.1.1 Introduction.

The EUT is a Dual band wireless communicationcard with WiFi and Bluetooth

The content of this report and measurement results have not been changed other than the way of presenting the data.

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

1.2.1 General.

None issued

1.3 Tested system details.

Details and an overview of the system and all of its components, as it has been tested, may be found below.

Test item (EUT1)	:	Intel® Dual Band Wireless communication card with WiFi, and Bluetooth
Manufacturer	:	Intel Mobile Communication SAS
Brand mark	:	Intel
Model	:	9260NGW
Serial number	:	---
Remark	:	Tested inside notebook AUX1

Test item (AUX 1)	:	Laptop
Manufacturer	:	Dell Laptop
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	:	--

1.3.1 Description of input/output ports

Number	Terminal	From	To	Remarks
1	Mains	Mains (power supply)	AUX1	Used for powering/charging AUX1
2	Mains	Mains (power supply)	EUT1	--
3	Mains	Mains	AUX2	--

Table 1: Interconnection between EUT and auxiliary equipment

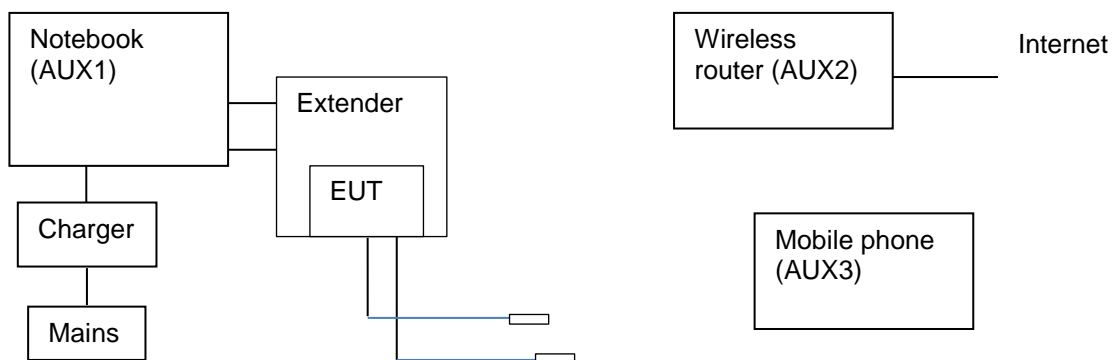


Figure 1. Set-up during testing

The extender is connected to AUX1 with 2 blue flatcables and 1 USB cable (Bluetooth). On the extender the EUT is powered and controlled and the EUT can communicate. For Wifi on 2.4 GHz and 5 GHz a connection with internet was made via a wireless router for live video streaming during all testing. The mobile phone was used to enable Bluetooth transport to and from the EUT



Photo 1: EUT

1.4 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, August 2016			
15.107(a)	Section 6.1 Table 2	AC Power Line Conducted emissions	12 – 15	Pass
15.109(a)	Section 6.2.1 Table 5	Radiated emissions	10 – 11	Pass

Table 2: testspecifications

Testmethods: ANSI C63.4-2014

Note: see end of the report for setup photographs.

1.5 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 and 15.109 and ICES-003 Issue 6 (august 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.

To calculate the field strength level from these results to the appropriate distance at which the limit is specified, the appropriate extrapolation factor is used.

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.

1.6 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.

The description of the test facilities has been filed to Industry Canada under registration number 2932G-2. The facility has been added to the list of laboratories performing these test services for the public on a fee basis.

1.7 Test conditions.

Normal test conditions:

Temperature (*)	: +15°C to +35°C
Relative humidity(*)	: 20 % to 75 %
Supply voltage	: 120Vac
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.

Testing where performed while EUT was operating in normal operating mode

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 equipment.

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

2.5 Product Labelling

The product labeling information is available in the technical documentation package.

2.6 Block diagram of the EUT.

The block diagram is available in the technical documentation package.

2.7 Schematics of the EUT.

The schematics are available in the technical documentation package.

2.8 Part list of the EUT.

The part list is available in the technical documentation package.

3 Radiated emission data.

RESULT: PASS

Date of testing: July 7, 2017 – July 10, 2017
Frequency range: 30MHz - 6000MHz

Requirements:

FCC 15.109(a) and IC ICES-003 section 6.2

Except for Class A digital devices, the field strength of radiated emissions from an unintentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (MHz)	Field strength (µV/m)	Field strength (dBµV/m)	Measurement distance (meters)
30-88	100	40.0	3
88-216	150	43.5	3
216-960	200	46.0	3
Above 960	500	54.0	3

Test procedure:

ANSI C63.4-2014.

The EUT was placed on a nonconductive turntable 0.8m above the ground plane. Before final measurements of radiated emissions were performed, the EUT was scanned to determine its emission spectrum profile. The physical arrangement of the test system, the associated cabling and the EUT orientation (X, Y, Z) were varied in order to ensure that maximum emission amplitudes were attained.

The spectrum was examined from 30 MHz to 1 GHz. Final radiated emission measurements were made at 3m distance.

At each frequency where a spurious emission was found, the EUT was rotated 360° and the antenna was raised and lowered from 1 to 4m in order to determine the emission's maximum level. Measurements were taken using both horizontal and vertical antenna polarizations.

The highest emission amplitudes relative to the appropriate limit were recorded in this report. Field strength values of radiated emissions at frequencies not listed in the tables are more than 20 dB below the applicable limit.

3.1 Radiated emissions data (30 MHz – 1 GHz).

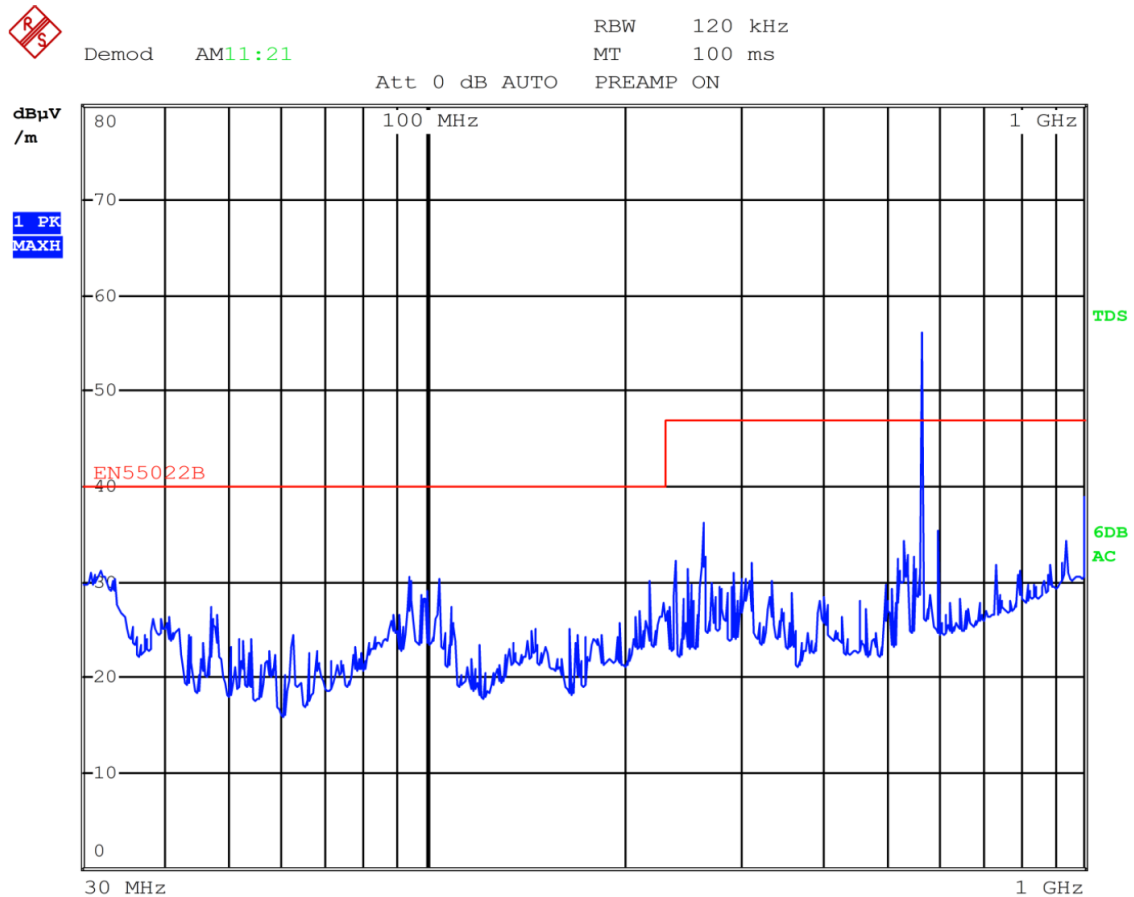
Results and limits						
Frequency (MHz)	Result (dB μ V/m)	Antenna polarization	Limit (dB μ V/m)	Margin	Height (cm)	Angle (deg)
32.58	14.3	Horizontal	40.0	25.7	99.6	325.7
32.59	28.6	Vertical	40.0	11.4	99.6	155.0
94.37	29.4	Vertical	40.0	10.6	128.4	178.7
152.89	20.5	Vertical	40.0	19.5	99.6	182.3
157.94	18.5	Vertical	40.0	21.5	100.1	214.0

Table 3 Radiated emissions of the EUT

The results of the radiated emission tests, carried out in accordance with 47 CFR Part 15 section 15.109 and ICES-003/ ANSI C63-4: 2014 are depicted in Table 1. The system is tested as in whole, so with all equipment as shown in Figure.1 in place and functioning. Being the worst case situation.

Notes:

1. Field strength values of radiated emissions at frequencies not listed in the table above are more than 20 dB below the applicable limit.
2. Measurement uncertainty is ± 5.0 dB
3. The reported field strength values are the worst case values at the indicated frequency. The EUT was varied in 3 positions, the antenna was varied in horizontal and vertical orientations and also in height (between 1m and 4m).
4. A Quasi-peak detector was used with a resolution bandwidth of 120 kHz.
5. The EUT was tested in in normal operation mode. Worst case values have been noted.



Plot 1. Radiated emission 9260NGW maximum levels 2.4, 5 GHz and BT mode of the EUT upto 1 GHz

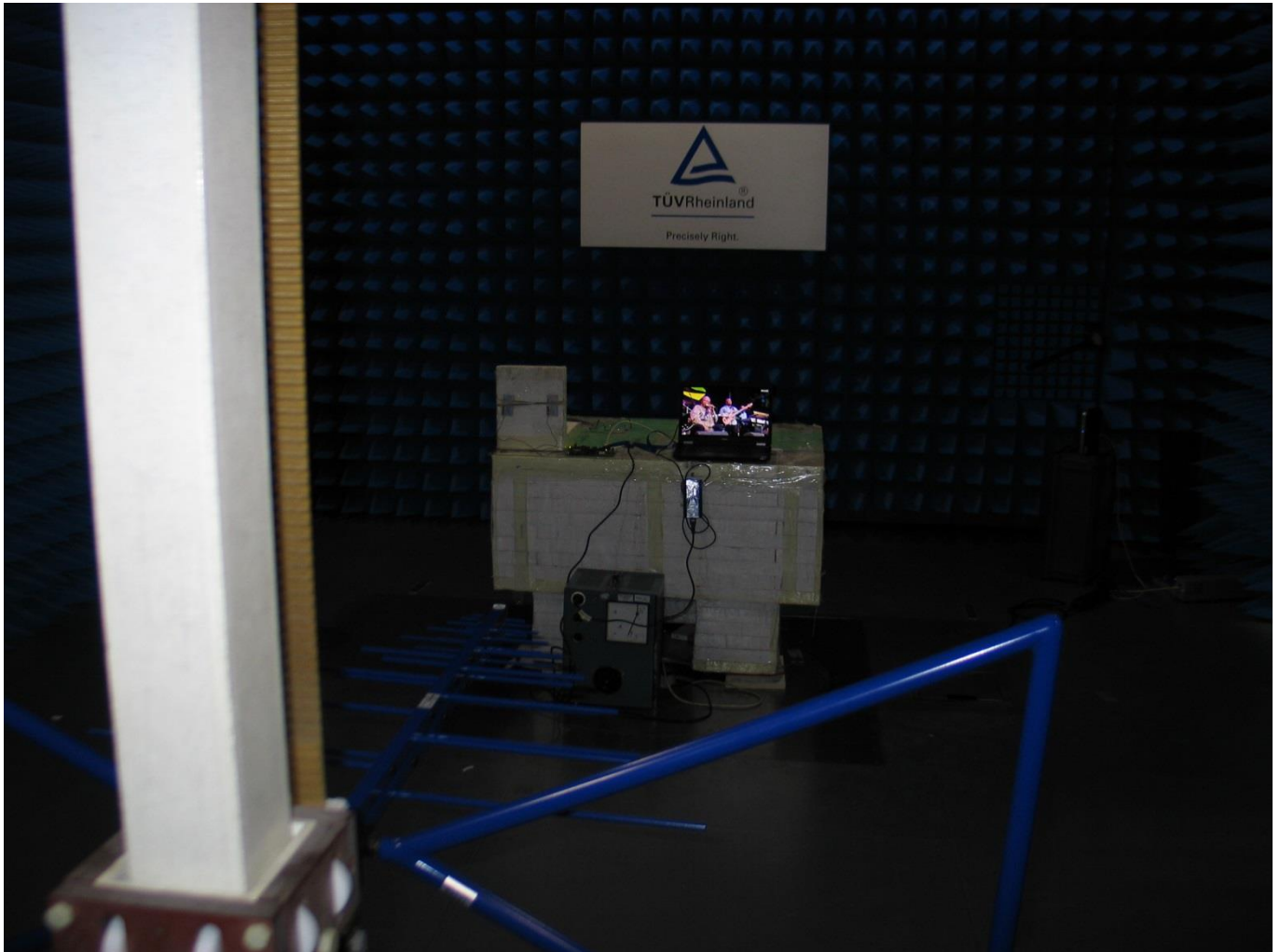


Photo 2. Set-up during radiated emission

3.1.1 Results 1000-6000 MHz

Measured results and limits			
Frequency (MHz)	Vertical Polarization (dB μ V/m) Average	Horizontal Polarization (dB μ V/m) Average	Limits (dB μ V/m) Average
1000.0-3000.0	< 30.0	< 25.0	50.0
3000.0-6000.0	< 35.0	< 35.0	54.0
Except for:			
1418.0	26.3	<<	50.0
1893.0	35.1	35.0	50.0
1994.0	30.0	28.9	50.0
2133.0	26.8	<<	50.0
2344.0	31.1	31.2	50.0
2556.0	30.0	28.7	50.0
2625.0	29.6	29.2	50.0
4926.0	< 35.0	< 30.0	54.0

Table 4: Results Radiated Emission 1000-6000 MHz Average

Measured results and limits			
Frequency (MHz)	Vertical Polarization (dB μ V/m) Peak	Horizontal Polarization (dB μ V/m) Peak	Limits (dB μ V/m) Peak
1000.0-3000.0	< 30.0	< 30.0	70.0
3000.0-6000.0	< 35.0	< 35.0	74.0
Except for:			
1418.0	41.1	<<	70.0
1893.0	46.7	46.0	70.0
1994.0	40.1	45.1	70.0
2133.0	44.5	<<	70.0
2344.0	44.0	44.6	70.0
2556.0	45.2	43.1	70.0
2625.0	47.2	43.7	70.0
4926.0	46.3	45.5	74.4

Table 5: Results Radiated Emission 1000-6000 MHz Peak

The results of the measurements, carried out in conformity with the standard 47 CFR Part 15 section 15.109 and ICES-003/ ANSI C63-4: 2014 are depicted in Table 1, concerning radiated field strength levels (electric component), emitted by the EUT in the configuration and operation mode(s) as stated in this test report, are depicted in table 8 and 9. Highest levels recorded between 2.4 GHz, 5 GHz and BT settings of the EUT

Notes:

Field strength values of radiated emissions at frequencies not listed in the table above are more than 20 dB below the applicable limit.

Measurement uncertainty is ± 5.0 dB

A Quasi-peak detector was used with a resolution bandwidth of 120 kHz.

The EUT was tested in in normal operation mode. Worst case values have been noted.

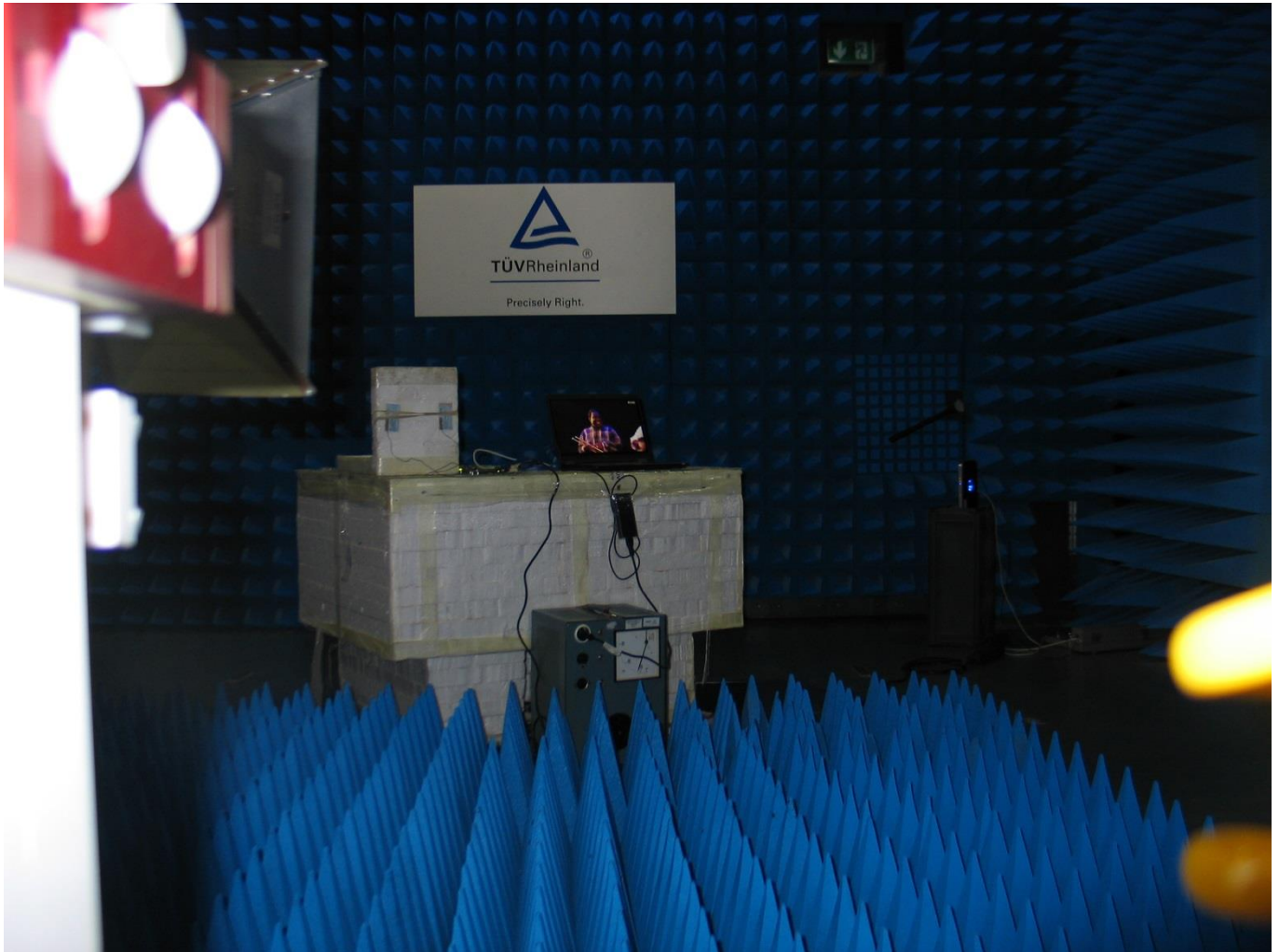


Photo 3. Set-up during radiated emission > 1GHz

4 AC Power-line Conducted emission data.

RESULT: Pass.

Date of testing:

July 7, 2017 – July 11, 2017

Requirements:

Except when the requirements applicable to a given device state otherwise, for any license-exempt radio communication device equipped to operate from the public utility AC power supply, either directly or indirectly, the radio frequency voltage that is conducted back onto the AC power lines in the frequency range of 0.15 MHz to 30 MHz shall not exceed the limits shown in the following table. The tighter limit applies at the frequency range boundaries.

Frequency of Emission (MHz)	Conducted Limit (dBµV) Quasi-Peak	Conducted Limit (dBµV) Average
0.15 – 0.5	66 to 56*	56 to 46*
0.5 – 5	56	46
5 - 30	46	50

*Decreases with the logarithm of the frequency.

Test procedure:

ANSI C63.4-2014.

Each phase and neutral of the AC power line were measured with respect to ground. Measurements were performed using a 50 µH / 50 Ω LISN. The frequency range from 150kHz to 30MHz was searched. The six highest EUT emissions relative to the limit were noted. The EUT is placed on a non-conductive table 0.8m above the ground plane. The EUT was positioned at least 80cm from the LISN. The power cable was routed over the non-conductive plate to the LISN.

4.1.1 Testresults

Frequency (MHz)	Measurement results L1 (dBµV)		Measurement results /Neutral (dBµV)		Limits (dBµV)		Verdict (Pass/Fail)
	QP	AV	QP	AV	QP	AV	
0.15	47.6	42.4	47.2	42.0	66.0	56.0	Pass
0.255	38.0	31.7	38.6	26.5	61.8	51.8	Pass
0.4	31.0	22.0	33.0	25.0	57.9	46.9	Pass
3.25	37.2	31.4	32.8	27.0	56.0	46.0	Pass

Table 6

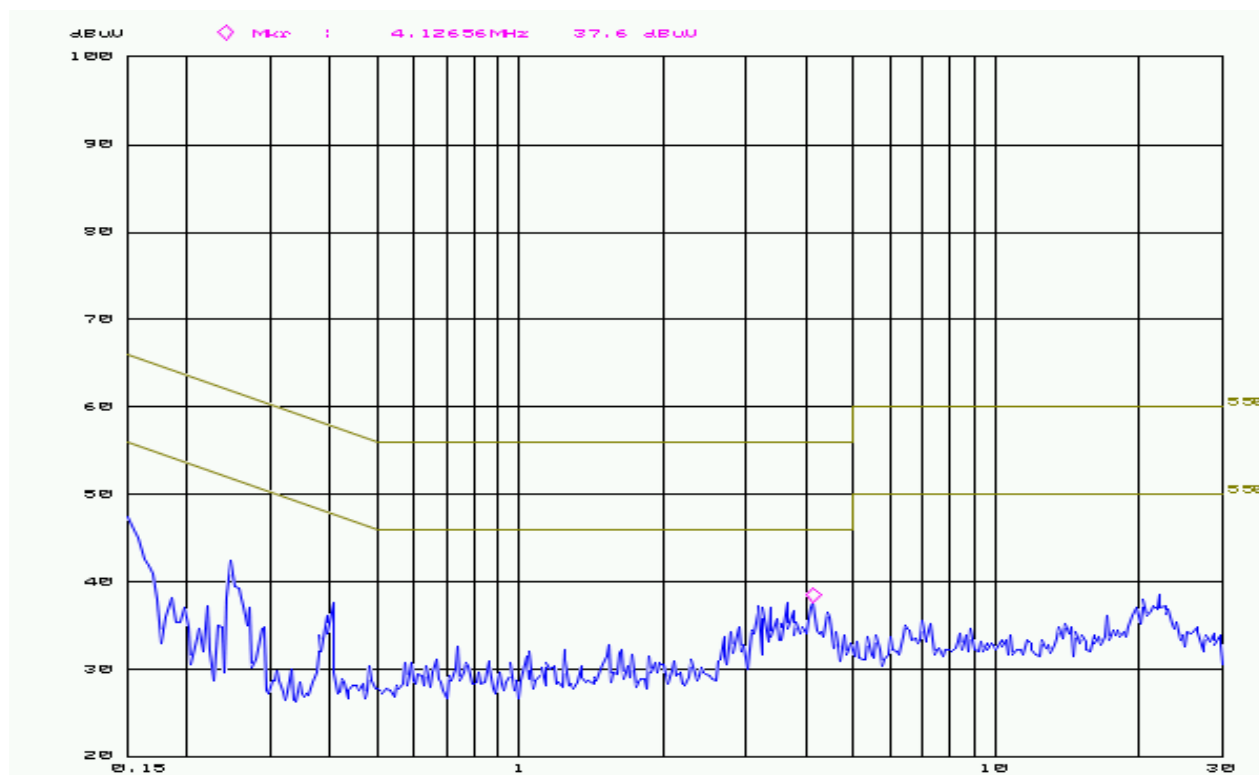
The results of the conducted emission tests, carried out in accordance with 47 CFR Part 15 section 15.107(a) and ICES-003/ANSI C63-4: 2014 Section 6.1 Table 2 Class B, at the 120 Volts/ 60 Hz AC mains connection terminals of the EUT, are depicted in the table above.

Notes:

The resolution bandwidth used was 9 kHz.

Tested in the normal operation mode. Worst case values noted.

Plots are provided on the next pages.



Plot 2. Conducted emission 9260NGW, max levels recorded



Photo 4. Conducted emission 9260NGW, max levels recorded

5 List of utilized test equipment.

Kind of Equipment	Manufacturer	Model Name	Inventory number	Calibration date (mm/yyyy)	Calibration due date (mm/yyyy)
For Radiated Emissions					
Measurement Receiver	Rohde & Schwarz	ESCI	A00314	03/2017	03/2018
RF Cable S-AR	Gigalink	APG0500	A00447	01/2017	01/2018
Controller	Maturo	SCU/088/8090811	A00450	N/A	N/A
Controller	EMCS	DOC202	A00255-257	N/A	N/A
spectrum Analyser	R&S	FSV	A00337	06/2017	06/2018
Antenna Cable	Hubert & Suhner	SucoFlex 102	A00339/A00343	01/2017	01/2018
Antenna (Horn)	Emco	3115	A00008	04/2017	04/2018
Preselector/preamplifier	EMCS	RF06S	A00255		
Test facility	Comtest	FCC listed: 90828 IC: 2932G-2	A00235	NA	NA
Antenna mast	EMCS	AP-4702C	A00258	N/A	N/A
Temperature-Humiditymeter	Extech	SD500	A00444	06/2017	06/2018
Biconilog Testantenna	Teseq	CBL 6111D	A00466	10/2016	10/2017
For AC Power Line					
	Conducted	Emissions			
Variac	RFT	LSS020	A00171	NA	NA
LISN	EMCO	3625/2	A00022	01/2017	01/2018
Measurement Receiver	Rohde & Schwarz	ESCS	A01980	06/2017	06/2018
Shielded room for Conducted emissions	--	--	A00437	NA	NA
Temperature-Humiditymeter	Extech	SD500	A00444	06/2017	06/2018

NA= Not Applicable

Conformance of the used measurement and test equipment with the requirements of ISO/IEC 17025:2005 has been confirmed before testing.