

**TEST REPORT CONCERNING THE COMPLIANCE
OF AN INTEL[®] WIRELESS GIGABIT SINK
W13100 LINK, BRAND INTEL, MODEL 13100NGW
(INCLUDING 13100NGW LC) WITH THE
STANDARD:
47 CFR PART 15: 2009 AND ICES-003: 2012
(CLASS B CERTIFICATION)**

FCC listed : 90828
Industry Canada : 2932G-2
R&TTE, LVD, EMC Notified Body : 1856

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

Telephone: +31 594 505005
Telefax: +31 594 504804

E-mail: info@nl.tuv.com
Web: www.tuv.com/nl

MEASUREMENT/TECHNICAL REPORT

Intel ® Wireless Gigabit Sink W13100, brand Intel, model 13100NGW including 13100NGW LC

**FCC ID: PD913100NG (EUT), PD917265NG (AUX)
 IC ID: 1000M-13100NG (EUT), 1000M-17265NG (AUX)**

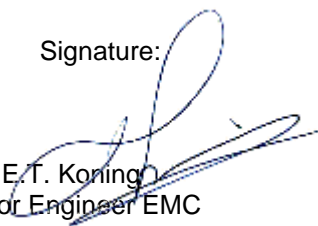
September 25, 2014

This report concerns: Original grant/certification Class 2 change Class B Certification			
Equipment type: Intel ® Wireless Gigabit Sink W13100			
Deferred grant requested per 47 CFR 0.457(d)(1)(ii) ?	Yes	No	n.a.
Report prepared by:	Name	: K.F. van der Molen	
	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: 2013, ICES-003: 2012 and the measurement procedures of ANSI C63.4-2009. 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: September 30, 2014

Signature:



Ties E.T. Koning
Senior Engineer EMC

Description of test item

Test items : Intel ® Wireless Gigabit Sink W13100 Link
Manufacturer : Intel Mobile Communications S.A.
Brand : Intel
Models/Versions : 13100NGW including 13100NGW LC
Serial #/ID : See Clause 1.1. of this Report.
Receipt date : September 17, 2014

Applicant information

Applicant's representative : Mr. S.C. Hackett
Company : Intel Mobile Communications
Address : 100 Center Point Circle, Suite 200
Postal code : Columbia, South Carolina
City : 29310
PO-box : ---
Postal code : ---
City : ---
Country : United States of America
Telephone number : + 1 803-216-2344
Telefax number : + 1 803-216-2676
Email Address : Steven.c.hackett@intel.com

Test(s) performed

Location : Leek
Test(s) started : September 17, 2014
Test(s) completed : September 23, 2014
Purpose of test(s) : Compliance with relevant standards

Test specification(s) : 47 CFR Part 15: 2013 and ICES-003: 2012

Test engineer(s) : K.F. van der Molen

Report written by : K.F. van der Molen 

Report date : September 25, 2014

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The test results relate only to the item(s) tested.

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1 General information.

1.1 Description of EUT.

The Intel ® Wireless Gigabit Sink W13100 Link, brand Intel, model 13100NGW including 13100NGW LC, will be referred to as EUT (tested in Dock Station) for the purpose of this test report. The version 13100NGW LC is using less channels for shipment to China and is further identical

Photo: Dock Station (EUT): See 1.1. of Photoreport 14060902.EMC.P02

Photo (EUT): 13100NGW and 13100NGW LC back side: see 1.2. of Photoreport 14060902.EMC.P02

Photo (EUT): 13100NGW and 13100NGW LC front side: see 1.2. of Photoreport 14060902.EMC.P02

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

1.2.1 General.

Not applicable

1.2.2 Description of test configuration.

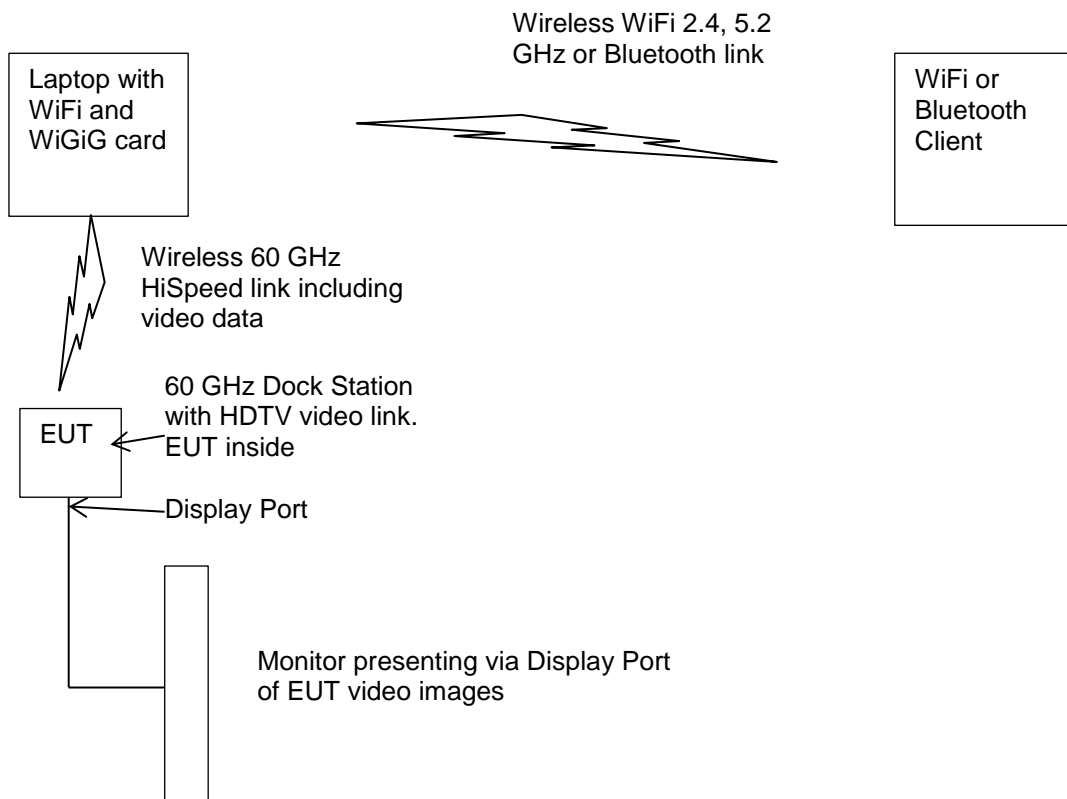
Test item EUT *) : Intel ® Wireless Gigabit Sink W13100
 Manufacturer : Intel Mobile Communications S.A.
 Brand : Intel
 Model : 13100NGW including 13100NGW LC
 Voltage input rating : 120 V / 60 Hz via power supply
 Current input rating : n.a.

The EUT consists of the following parts:

- 1 Laptop brand Intel, model Ultrabook, model WSBUB-SDS **)
- 1 Monitor brand HP, model LA 2405xM
- 1 Laptop brand Dell, Model Latitude E5420

*) Tested as built-in system. Dock Station has only one output enabled: The Display Port connection

**) with built-in WiFi and antenna at rear side



1.2.3 Description of tested input and output ports.

Number	Terminal	From	To	Length
1	Mains	Supply	EUT	< 3 m
2	Display Port	EUT	(Video) Monitor	< 3 m

Table 1

1.3 Test methodology.

The test methodology used is based on the requirements of 47 CFR Part 15 2013, sections 15.107 and 15.109 (Class A and B digital devices, Certification) and ICES-003: 2012

The test methods, which have been used, are based on ANSI C63.4: 2009.

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 have reviewed the technical characteristics of the test facilities at TÜV Rheinland Nederland B.V. , located in Leek, 9351 VT Eiberkamp 10, The Netherlands, and has found these test facilities to be in compliance with the requirements of 47 CFR Part 15 and ICES-003:2012

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 : 120 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). Meaning: Building-up a link at 2.4, 5.2 GHz or Bluetooth to an access point and maintaining this link and transport maximum data and building-up a 60 GHz link where via the EUT Display Port video is presented on a monitor

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: 2009.

2.2 EUT mode of operation.

Operation mode 1: Active. The EUT is in operational function

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.

2.5 Product Labeling and other required texts

(3) All other devices shall bear the following statement in a conspicuous location on the device:
This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

2.6 Block diagram of the EUT.

The block diagram is available at Intel Mobile Communications S.A.

2.7 Schematics of the EUT.

The schematics are available at Intel Mobile Communications S.A.

2.8 Part list of the EUT.

The part list is available at Intel Mobile Communications S.A.

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

Measured results and limits			
Frequency (MHz)	Vertical Polarization (dB μ V/m)	Horizontal Polarization (dB μ V/m)	Limits (dB μ V/m)
30-88	<20.0	<20.0	39.5
88-216	<20.0	<20.0	43.5
216-960	<20.0	<20.0	46.0
> 960	<20.0	<20.0	54.0
38.8	20.9	10.6	39.5
76.72	32.8	23.7	39.5
77.16	33.4	25.9	39.5
100.88	32.6	20.5	43.5
146.7	28.3	21.5	43.5
250.56	35.0	35.5	46.0
255.68	36.7	35.9	46.0
304.0	33.5	28.6	46.0
302.88	32.9	28.5	46.0
347.16	33.0	37.2	46.0
529.04	28.1	30.2	46.0
531.48	29.6	32.6	46.0

Table 2 Results Radiated emission

Radiated emissions of the EUT. The results of the radiated emission tests, carried out in accordance with 47 CFR Part 15: 2013 section 15.109 (Class B digital devices, Certification) and ICES-003: 2012 with the EUT operating in mode switched to generate maximum levels. Maximum level recorded of the total system being the laptop with the 17265NGW inside and the Dock Station with the EUT inside.

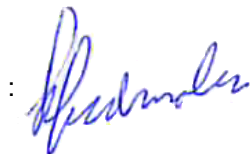
Notes:

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

1. Measurement uncertainty is ± 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

: September 25, 2014

2.10 Radiated field strength measurements (1 GHz – 40 GHz, E-field)

Measured results and limits Vertical Polarization				
Frequency (MHz)	Peak (dB μ V/m)	Average (dB μ V/m)	Limits (dB μ V/m)	
			Peak	Average
1060.0	59.1	44.8	70.0	50.0
1340.0	46.7	40.1	70.0	50.0
1810.0	49.1	37.5	70.0	50.0
2190.0	52.8	45.2	70.0	50.0
2690.0	49.5	43.1	70.0	50.0
3000.0	44.5	37.5	70.0	50.0
3590.0	45.1	32.3	70.0	50.0
10181.0	52.8	40.9	74.0	54.0
11717.0	56.3	45.9	74.0	54.0
12463.0	61.1	50.7	74.0	54.0
14208.0	57.8	46.8	74.0	54.0
17952.0	64.6	53.7	74.0	54.0
> 18 GHz:				
No levels recorded				

Table 3 Results Radiated emission

Radiated emissions of the EUT. The results of the radiated emission tests, carried out in accordance with 47 CFR Part 15: 2013 (Class B digital devices, Certification) and ICES-003: 2012 with the EUT operating in mode switched to generate maximum levels. Maximum level recorded of the total system being the laptop with the 17265NGW inside and the Dock Station with the EUT inside.

Notes:

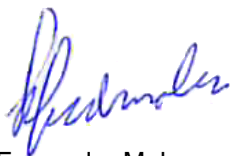
Field strength values of radiated emissions at frequencies not listed in the table above are more than 20 dB below the applicable limit.

Measurement uncertainty is ± 5.0 dB

The reported field strength values are the worst case values at the indicated frequency.

Test engineer

Signature :



Name :

K.F. van der Molen

Date :

September 25, 2014

Measured results and limits Horizontal Polarization				
Frequency (MHz)	Peak (dBµV/m)	Average (dBµV/m)	Limits (dBµV/m)	
			Peak	Average
1060.0	51.07	44.1	70.0	50.0
1140.0	47.8	36.6	70.0	50.0
1408.0	44.8	34.6	70.0	50.0
1810.0	45.4	37.8	70.0	50.0
2190.0	51.8	40.3	70.0	50.0
2690.0	49.6	46.2	70.0	50.0
3728.0	47.6	35.3	70.0	50.0
4080.0	46.1	35.1	70.0	50.0
10152.0	54.2	41.3	74.0	54.0
10976.0	65.1	53.1	74.0	54.0
11448.0	58.6	42.5	74.0	54.0
13800.0	57.1	46.9	74.0	54.0
26040.0	52.2	46.3	74.0	54.0
> 26 GHz:				
No levels recorded				

Table 4 Results Radiated emission

Radiated emissions of the EUT. The results of the radiated emission tests, carried out in accordance with 47 CFR Part 15: 2013 (Class B digital devices, Certification) and ICES-003: 2012 with the EUT operating in mode switched to generate maximum levels. Maximum level recorded of the total system being the laptop with the 17265NGW inside and the Dock Stations with the EUT inside.

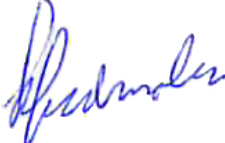
Notes:

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

The reported field strength values are the worst case values at the indicated frequency.

Test engineer

Signature : 

Name : K.F. van der Molen

Date : September 25, 2014

Photo: Set-up RF Radiated emission upto 1 GHz see 1.4. of Photoreport 14060902.EMC.P02

Photo: Set-up RF Radiated emission > 1 GHz see 1.5. of Photoreport 14060902.EMC.P02

3 Conducted emission data (From Dock Station).

Measured values and limits (QP)			
Frequency (MHz)	Results Line (dB μ V)	Results Neutral (dB μ V)	Limits (dB μ V)
0.15-0.5	< 20.0	< 20.0	66.0-56.0
0.5-5.0	< 20.0	< 20.0	56.0
5.0-30.0	< 20.0	< 20.0	60.0
0.150	48.0	47.1	66.0
0.181	45.9	44.8	64.4
0.541	40.0	38.1	56.0
2.065	29.0	29.0	56.0
4.361	22.6	22.1	56.0
21.811	26.8	28.6	60.0

Table 5

Conducted emission measurements. The results of the conducted emission tests, carried out in accordance with 47 CFR Part 15: 2013 section 15.109 (Class B digital devices, Certification) and ICES-003: 2012, at the AC mains connection terminals which were connected to the EUT, are depicted in table 3. 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 ± 3.5 dB
2. The resolution bandwidth used was 9 kHz.

Measured values and limits (AV)			
Frequency (MHz)	Results Line (dB μ V)	Results Neutral (dB μ V)	Limits (dB μ V)
0.15-0.5	< 20.0	< 20.0	56.0-46.0
0.5-5.0	< 20.0	< 20.0	46.0
5.0-30.0	< 20.0	< 20.0	50.0
0.150	38.6	37.7	56.0
0.181	32.2	30.8	54.4
0.541	35.2	33.6	46.0
2.065	22.4	22.6	46.0
4.361	13.6	13.7	46.0
21.811	15.8	16.9	50.0


Table 6

Conducted emission measurements. The results of the conducted emission tests, carried out in accordance with 47 CFR Part 15: 2013 section 15.109 (Class B digital devices, Certification) and ICES-003: 2012, at the AC mains connection terminals which were connected to the EUT, are depicted in table 3. 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:

3. Measurement uncertainty is ± 3.5 dB
4. The resolution bandwidth used was 9 kHz.

Test engineer

Signature : 

Name : K.F. van der Molen

Date : September 25, 2014

Photo: Set-up Conducted emission > 1 GHz see 1.6. of Photoreport 14060902.EMC.P02

4 List of utilized test equipment.

Inventory number	Description	Brand	Model	Calibration information	
				Calibration date	Calibration due date
99608	Controller (mast)	EMCS	DOC202	n.a	n.a
99609	Antenna mast	EMCS	AP-4702C	n.a	n.a
99699	Measuring receiver	R&S	ESCI	March 3, 2014	March 3, 2015
99877	Biconilog antenna	Teseq	CBL6111D	June 11, 2014	June 11, 2015
99858	Low att coax cable	Gigalink	APGXXXX	January 1, 2014	January 1, 2015
99861	Turntable & controller	Maturo	SCU	n.a	n.a
99847	S-AR (FCC, IC and CE-EU)	Siepel	3 m	January 1, 2014	January 1, 2017
12512	Artificial mains network	EMCO	3725/2	January 18, 2014	January 18, 2015
13313	Impulse limiter	R&S	ESH3Z2.357...	January 3, 2014	January 3, 2015
15667	EMI test receiver	R&S	ESCS 30	September 24, 2013	September 24, 2014
99115	Probe	R&S	TK9416	April 13, 2014	April 13, 2015
99161	Variac 250V 6A	RFT	LTS006	n.a.	n.a.
99318	Digital multimeter	HP	34401A	September 27, 2013	September 2014
99606	Setup Radiated emission > 1 GHz, including 99714, 99710, 99174	Includes EMCS Controller, Power supply, Turntable control	RFS06S, B&K	August 30, 2014	August 30, 2015
99538	Spectrum Analyzer	R&S	FSP40	November 11, 2013	November 11, 2014
12484	Gainhorn	Emco	3115	April 14, 2014	April 14, 2015
99541	Gainhorn	Emco	3160-09	April 14, 2014	April 14, 2015
99542	Gainhorn	Emco	3160-10	April 14, 2014	April 14, 2015
99735	Cable RF > 1 GHz (99606)	H&S	Sucotest 18/Sucoflex102	April 22, 2014	April 22, 2015
99855	Temperature-Humiditymeter	Extech	SD500	March 12, 2014	March 12, 2015