Prüfbericht-Nr.: *Test report no.:*	50344115 002	**Auftrags-Nr.:** *Order no.*:	238493504	Seite 1 von 20 *Page 1 of 20*
Kunden-Referenz-Nr.: *Client reference no.:*	N/A	**Auftragsdatum:** *Order date:*	2020-11-03	
Auftraggeber: *Client:*	Nedap N.V Parallelweg 2, 7141 DC Groenlo, The Netherlands			
Prüfgegenstand: *Test item:*	Nvite Reader			
Bezeichnung / Typ-Nr.: *Identification / Type no.:*	NVR2001			
Auftrags-Inhalt: *Order content*:	FCC/ISED Test Report for 120 kHz portion			
Prüfgrundlage: *Test specification:*	FCC 47CFR Part 15: Subpart C Section 15.203, 15.205, 15.207 and 15.209 ISED RSS-210 Issue 10, December 2019 ISED RSS-Gen, Issue 5, March 2019			
areneingangsdatum: *Date of sample receipt:*	2020-02-10			
Prüfmuster-Nr.: *Test sample no:*	A001063683-001- A001063683-002			
Prüfzeitraum: *Testing period:*	2020-02-12~2020-04-17			
Ort der Prüfung: *Place of testing:*	EMC/RF Laboratory Taipei			
Prüflaboratorium: *Testing laboratory:*	Taipei Testing laboratories			
Prüfergebnis*: *Test result*:*	Pass			

überprüft von: reviewed by:		**genehmigt von:** authorized by:	
Datum: 2020-11-17 *Date:*		**Datum:** 2020-11-17 *Date:*	
Stellung / *Position:*	R y a n C h e n Senior Project Engineer	**Stellung** / *Position:*	B r e n d a C h e n Senior Project Manager

Sonstiges / *Other:*	This report has been modified the description for the certification purpose. The test report No. 50344115 001 is replaced by this new test report No. 50344115 002. Test report No. 50344115 001 becomes invalid since 2020-11-04.

Zustand des Prüfgegenstandes bei Anlieferung: *Condition of the test item at delivery:*	Prüfmuster vollständig und unbeschädigt *Test item complete and undamaged*

* Legende:	1 = sehr gut	2 = gut	3 = befriedigend	4 = ausreichend	5 = mangelhaft
	P(ass) = entspricht o.g. Prüfgrundlage(n)		F(ail) = entspricht nicht o.g. Prüfgrundlage(n)	N/A = nicht anwendbar	N/T = nicht getestet
** Legend:*	*1 = very good*	*2 = good*	*3 = satisfactory*	*4 = sufficient*	*5 = poor*
	P(ass) = passed a.m. test specification(s)		*F(ail) = failed a.m. test specification(s)*	*N/A = not applicable*	*N/T = not tested*

TEST SUMMARY

5.1.1 ANTENNA REQUIREMENT
RESULT: Passed

5.1.2 FIELD STRENGTH OF FUNDAMENTAL
RESULT: Passed

5.1.3 20DB AND 99% BANDWIDTH
RESULT: Passed

5.1.4 SPURIOUS EMISSION
RESULT: Passed

5.2.1 CONDUCTED EMISSIONS LINE AND NEUTRAL
RESULT: Passed

Contents

HISTORY OF THIS TEST REPORT

Report No.	Description	Date Issued
50344115 001	Original Release	2020-07-01
50344115 002	Modified the description in section 2.2 and 4.2	2020-11-17

1. General Remarks

1.1 Complementary Materials

All attachments are integral parts of this test report. This applies especially to the following appendix:

Appendix P: EUT Photo Documentation
Appendix D: Test Result of Radiated Emissions
Appendix X: Photographs of the Test Set-Up

Test Specifications

The following standards were applied (in bold: product standards, otherwise: basic standards).

Table 1: Applied Standard and Test Levels

Radio
FCC 47CFR Part 15: Subpart C Section 15.203, 15.205, 15.207 and 15.209
ISED RSS-210 Issue 10, December 2019
ISED RSS-Gen, Issue 5, March 2019
ANSI C63.10: 2013

2. Test Sites

2.1 Test Laboratory

Taipei Testing laboratories

11F. No.758, Sec. 4, Bade Rd., Songshan Dist.
Taipei City 105
Taiwan (R.O.C.)

2.2 Test Facility

Taipei Testing laboratories

11F. No.758, Sec. 4, Bade Rd., Songshan Dist.
Taipei City 105
Taiwan (R.O.C.)

FCC Registration No.: TW3567
IC Canada Registration No.: 9465A
CABID: TW3567
TAF Accredited NCC Test Lab. No.: 3567
TAF ISO17025 Certification effective period: 6th-May-2019 to 05th-May-2022

2.3 List of Test and Measurement Instruments

Table 2: List of Test and Measurement Equipment

Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due Date
EMI Test Receiver	Rohde & Schwarz	ESR 7	101062	2019/10/15	2020/10/15
Spectrum Analyzer	Rohde & Schwarz	FSV-40	100921	2019/04/30	2020/04/30
Pre-Amplifier	Hewlett Packard	8447F	2805A03335	2019/09/11	2020/09/11
Pre-Amplifier	EM Electronics	EM01G18G	060558	2019/12/24	2020/12/24
Pre-Amplifier	EMC Instruments	EMC184045SE	980609(980408)	2019/06/14	2020/06/14
Bilog Antenna	TESEQ	CBL 6111D	29802	2019/09/10	2020/09/10
Horn Antenna	ETS-Lindgren	3117	00138160	2019/06/24	2020/06/24
Loop Antenna	Schwarzbeck	FMZB 1513	1513-076	2019/07/11	2020/07/11
Test Software	Audix	e3	Ver. 9	N/A	N/A
Spectrum Analyzer	R&S	FSV40	101512	2020/02/24	2021/02/23
Thermo Chamber	Giant Force	GHT-150-40-CP-SD	MAA1902-010	2020/3/10	2021/3/9
Signal Generator	R&S	SMB100A03	181335	2020/1/8	2021/1/7
Power Meter	Anritsu	ML2495A	1901008	2019/4/29	2020/4/28
Power Sensor	Anritsu	MA2411B	1725269	2019/4/29	2020/4/28

2.4 Traceability

All measurement equipment calibrations are traceable to NML(Taiwan)/NIST(USA) or where calibration is performed outside Taiwan, to equivalent nationally recognized standards organizations.

2.5 Calibration

Equipment requiring calibration is calibrated periodically by the manufacturer or according to manufacturer's specifications. Additionally all equipment is verified for proper performance on a regular basics using in house standards or comparisons.

2.6 Measurement Uncertainty

The estimated combined standard uncertainty for radiated emissions and conducted emissions measurements are ±3dB.

Table 3: Emission Measurement Uncertainty

Parameter	Uncertainty
Radio Frequency	± 1 x 10^{-7}
RF power, conducted	± 1.5 dB
Adjacent channel power	± 3 dB
Radiated emission of transmitter, valid up to 26 GHz	± 6 dB
Radiated emission of receiver, valid up to 26 GHz	± 6 dB
Temperature	± 2 ºC
Humidity	± 10 %

3. General Product Information

3.1 Product Function and Intended Use

The NVR2001 is a SRD system that reads access codes from Near Field Communication and Blue Tooth enabled mobile telephones or Access cards, operating on 13.56 MHz. Additionally, there is a 120 kHz Card reader implemented. The scope of this test report is the 120kHz inductive reader interface.
The NVR2001 contains Transmitter BT Module with FCC ID: T9JRN4020 IC: 6514A-RN4020

For details refer to the User Guide, Data Sheet and Circuit Diagram

3.2 Ratings and System Details

Table 4: Basic Information of EUT

Item	**EUT information**
Kind of Equipment	Nvite Reader
Type Designation	NVR2001
FCC ID	CGDNVR2001
IC ID	1444A-NVR2001

Table 5: Technical Specification of EUT

Item	Value
Operating Frequencies	125 kHz
Channel number	1
Operation Voltage	12~24V
Modulation	CW

3.3 Independent Operation Modes

Basic operation modes are:

A. Transmitting

3.4 Noise Generating and Noise Suppressing Parts

Refer to the Circuit Diagram.

3.5 Submitted Documents

- Circuit Diagram
- Instruction Manual
- Rating Label
- Technical Description

4. Test Set-up and Operation Modes

4.1 Principle of Configuration Selection

The equipment under test (EUT) was configured to measure its maximum emission level. The test modes were adapted accordingly in reference to the instructions for use.

4.2 Test Operation and Test Software

Setup for testing: Test samples are modified to continuous transmitter mode which makes it possible to transmit when power on.

Regarding magnetic loop antenna testing, the antenna was orientated as required by ANSI C63.10 clause 6.5.7 (6.4.6).

4.3 Special Accessories and Auxiliary Equipment

The product has been tested together with the following additional accessories:

Kind of Equipment	Manufacturer	Model Name	S/N
DC Power Supply	LOKO	DPS-5050	L8000045147

4.4 Countermeasures to achieve EMC Compliance

The test sample which has been tested contained the noise suppression parts as described in the Constructional Data Form or the Technical Construction File. No additional measures were employed to achieve compliance.

4.5 Test Setup Diagram

Diagram of Measurement Configuration for Radiation Test

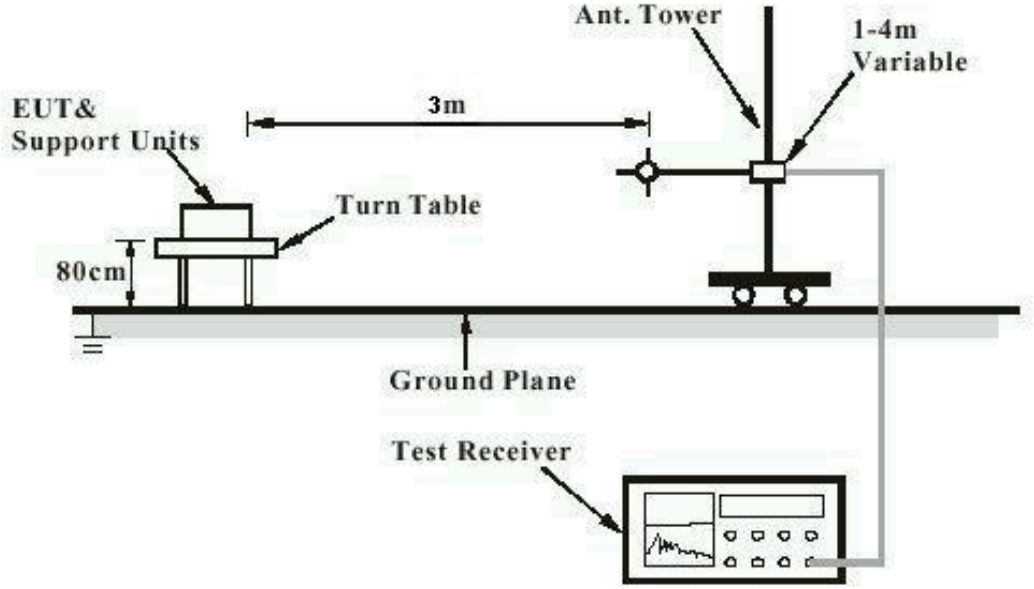
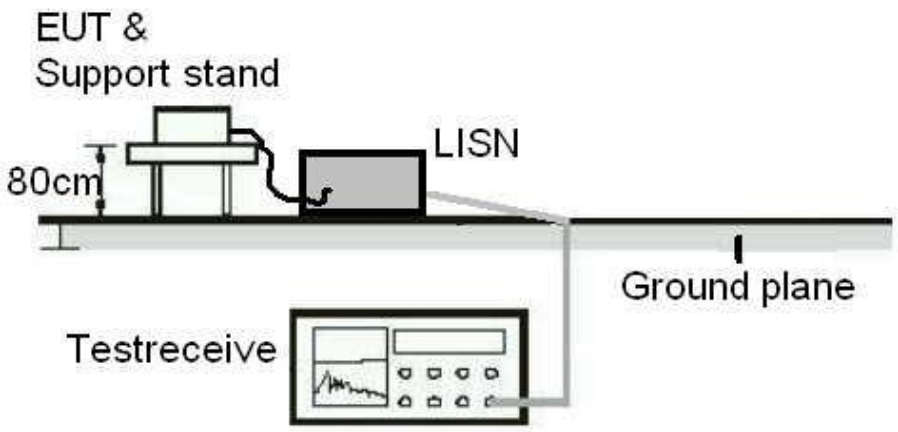


Diagram of Measurement Equipment Configuration for Mains Conduction Measurement (if applicable)



5. Test Results

5.1 Transmitter Requirement & Test Suites

5.1.1 Antenna Requirement

RESULT: **Passed**

Standard	:	Part 15.203 and ISED RSS-Gen 6.8
Requirement	:	use of approved antennas only

The antenna and the transmitter are one assembly with no possibility of replacement with a non-approved antenna by a normal the end-user. Therefore, the EUT is considered to comply with this provision.

Refer to EUT photo for details.

5.1.2 Field strength of fundamental

RESULT: **Passed**

Test standard : FCC Part 15.209
ISED RSS-210 (08-2016) 4.4
Basic standard : ANSI C63.10:2013

Test setup

Test Frequency : 125 kHz
Operation Mode : A

Atmospheric pressure : 100-103 kPa

Table 6: Field strength of fundamental, maximal level found

Frequency (kHz)	Level(3m) (dBuV/m)	Detector	Limit(3m) (dBuV/m)	Level(300m) (dBuV/m)	Limit(300m) (dBuV/m)	Remark	Result
120	62.22	peak	126.02	-17.78	46.02	--	Pass
120	61.68	average	106.02	-18.32	26.02	--	Pass

Remark: For details refer to Appendix D

Limits:

Frequency	**Electric Field Strength (µV/m)**	**Measurement Distance (m)**
9-490 kHz	2,400/F (F in kHz)	300
490-1,705 kHz	24,000/F (F in kHz)	30
1,705-30 MHz	30	30

9-90 kHz and 110-490 kHz: Average detector.

5.1.3 20dB and 99% Bandwidth

RESULT: **Passed**

Test standard : ISED RSS Gen
Basic standard : ANSI C63.10:2013

Test setup

Test Channel : 120kHz
Operation Mode : A
Ambient temperature : 22-26 °C
Relative humidity : 50-65 %
Atmospheric pressure : 100-103 kPa

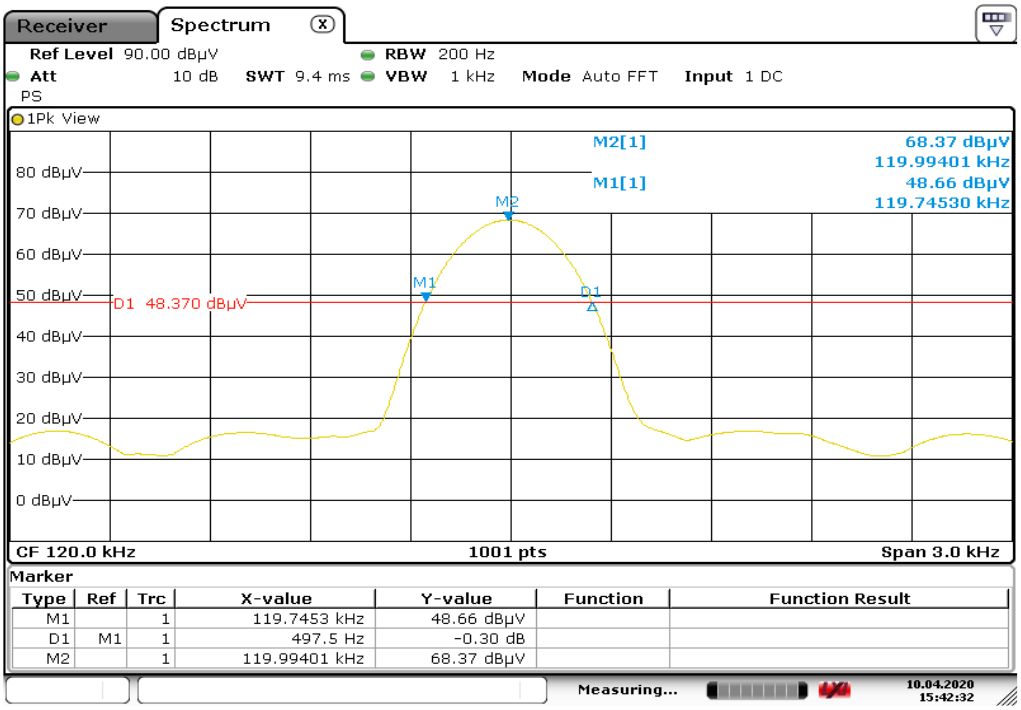
Table 7: Test result of 20dB Bandwidth

Frequency	20dB Bandwidth (kHz)
125 kHz	0.497

Table 8: Test result of 99% Bandwidth

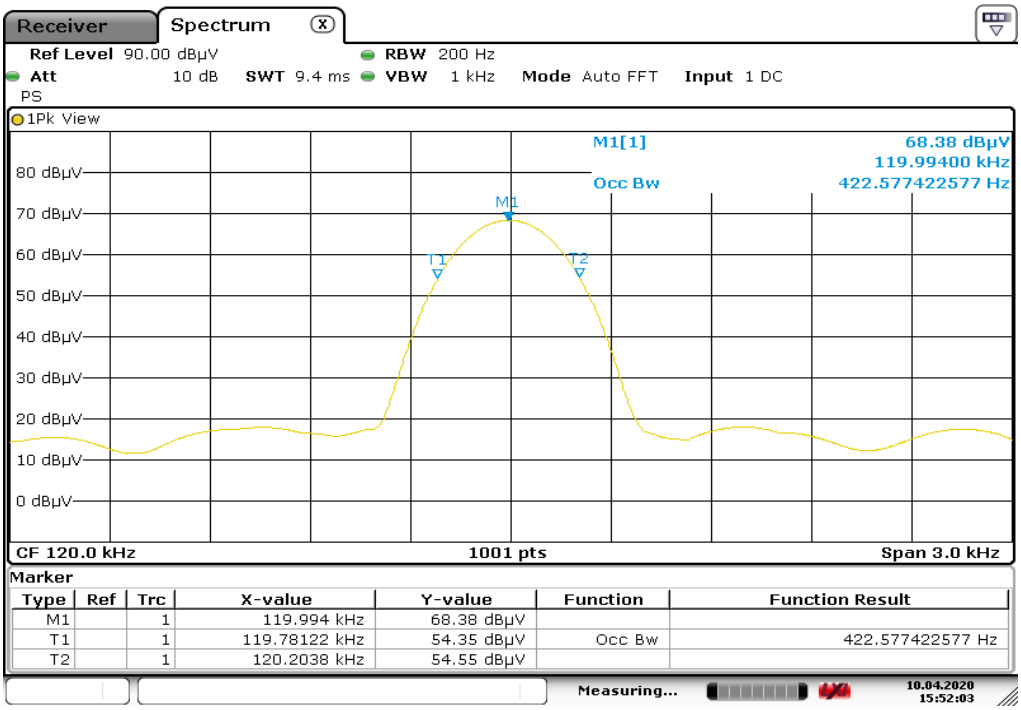
Frequency	99% Bandwidth (kHz)
125 kHz	0.422

Test Plot of 20dB BW



Date: 10.APR.2020 15:42:32

Test Plot of 99% BW



Date: 10.APR.2020 15:52:02

5.1.4 Spurious Emission

RESULT: **Passed**

Test standard	:	FCC part 15. 209 ISED RSS-Gen
Basic standard	:	ANSI C63.10: 2013
Limits	:	Radiated emissions must comply with the radiated emission limits specified in FCC 15.209(a) and ISED RSS-216(a)
Kind of test site	:	3m Semi-Anechoic Chamber

Test setup

Test Channel	:	125 kHz
Operation mode	:	A

Remark: Testing was carried out within frequency range 9kHz to the tenth harmonic.

For details refer to Appendix D.

5.2 Mains Conducted Emissions

5.2.1 Conducted Emissions Line and Neutral

RESULT: **Passed**

Test standard	:	FCC Part 15.207 FCC Part 15.107
Limits	:	Mains Conducted emissions as defined in Part 15.107(a), must comply with the mains conducted emission.
Kind of test site	:	Shielded Room

Test setup

Test Channel	:	120kHz
Operation mode	:	A

Remark: For details refer to Appendix D.

6. List of Tables