

<b>Prüfbericht-Nr.:</b> <i>Test Report No.:</i>	<b>10048895 001</b>	<b>Auftrags-Nr.:</b> <i>Order No.:</i>	<b>114031713</b>	<b>Seite 1 von 18</b> <i>Page 1 of 18</i>
<b>Kunden-Referenz-Nr.:</b> <i>Client Reference No.:</i>	<b>N/A</b>	<b>Auftragsdatum:</b> <i>Order date:</i>	<b>26-Jan-2015</b>	
<b>Auftraggeber:</b> <i>Client:</i>	<b>N.V. Nederlandsche Apparatenfabriek Nedap, Parallelweg 2, NL-7141 DC, Groenlo, The Netherlands</b>			
<b>Prüfgegenstand:</b> <i>Test item:</i>	<b>Anti-Pilferage System with metal detection</b>			
<b>Bezeichnung / Typ-Nr.:</b> <i>Identification / Type No.:</i>	<b>ASSY FC180R RF+MD</b>			
<b>Auftrags-Inhalt:</b> <i>Order content:</i>	<b>FCC/IC Test Report for 127 kHz portion</b>			
<b>Prüfgrundlage:</b> <i>Test specification:</i>	<b>FCC 47CFR Part 15: Subpart C Section 15.209 RSS-210 (12-2010) 2.5.1</b>			
<b>Wareneingangsdatum:</b> <i>Date of receipt:</i>	<b>19-May-2015</b>			
<b>Prüfmuster-Nr.:</b> <i>Test sample No.:</i>	<b>A000168995-004 A000168995-004</b>			
<b>Prüfzeitraum:</b> <i>Testing period:</i>	<b>20-May-2015 - 21-May-2015</b>			
<b>Ort der Prüfung:</b> <i>Place of testing:</i>	<b>EMC Laboratory Taipei</b>			
<b>Prüflaboratorium:</b> <i>Testing laboratory:</i>	<b>TUV Rheinland Taiwan Ltd.</b>			
<b>Prüfergebnis*:</b> <i>Test result*:</i>	<b>Pass</b>			
<b>geprüft von / tested by:</b>		<b>kontrolliert von / reviewed by:</b>		
07-Jul-2015 Ryan W. T. Chen / Project Engineer		07-Jul-2015 Rene Charton / Senior Project Manager		
<i>Datum</i>	<i>Name / Stellung</i>	<i>Unterschrift</i>	<i>Datum</i>	<i>Name / Stellung</i>
<i>Date</i>	<i>Name / Position</i>	<i>Signature</i>	<i>Date</i>	<i>Name / Position</i>
<b>Sonstiges / Other:</b>				
<b>Zustand des Prüfgegenstandes bei Anlieferung:</b> <i>Condition of the test item at delivery:</i>		<b>Prüfmuster vollständig und unbeschädigt</b> <i>Test item complete and undamaged</i>		
* 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				
Dieser Prüfbericht bezieht sich nur auf das o.g. Prüfmuster und darf ohne Genehmigung der Prüfstelle nicht auszugsweise vervielfältigt werden. Dieser Bericht berechtigt nicht zur Verwendung eines Prüfzeichens. <i>This test report only relates to the a. m. test sample. Without permission of the test center this test report is not permitted to be duplicated in extracts. This test report does not entitle to carry any test mark.</i>				

## TEST SUMMARY

### **5.1.1 ANTENNA REQUIREMENT**

*RESULT: Passed*

### **5.1.2 FIELD STRENGTH OF FUNDAMENTAL**

*RESULT: Passed*

### **5.1.3 99% BANDWIDTH**

*RESULT: Passed*

### **5.1.4 SPURIOUS EMISSION**

*RESULT: Passed*

### **5.2.1 CONDUCTED EMISSIONS LINE AND NEUTRAL**

*RESULT: Passed*

## Contents

<b>1.</b>	<b>GENERAL REMARKS .....</b>	<b>4</b>
<b>1.1</b>	<b>COMPLEMENTARY MATERIALS.....</b>	<b>4</b>
<b>2.</b>	<b>TEST SITES .....</b>	<b>5</b>
<b>2.1</b>	<b>TEST FACILITIES .....</b>	<b>5</b>
<b>2.2</b>	<b>LIST OF TEST AND MEASUREMENT INSTRUMENTS.....</b>	<b>6</b>
<b>2.3</b>	<b>TRACEABILITY .....</b>	<b>7</b>
<b>2.4</b>	<b>CALIBRATION .....</b>	<b>7</b>
<b>2.5</b>	<b>MEASUREMENT UNCERTAINTY .....</b>	<b>7</b>
<b>3.</b>	<b>GENERAL PRODUCT INFORMATION.....</b>	<b>8</b>
<b>3.1</b>	<b>PRODUCT FUNCTION AND INTENDED USE .....</b>	<b>8</b>
<b>3.2</b>	<b>RATINGS AND SYSTEM DETAILS.....</b>	<b>9</b>
<b>3.3</b>	<b>INDEPENDENT OPERATION MODES.....</b>	<b>10</b>
<b>3.4</b>	<b>NOISE GENERATING AND NOISE SUPPRESSING PARTS .....</b>	<b>10</b>
<b>3.5</b>	<b>SUBMITTED DOCUMENTS.....</b>	<b>10</b>
<b>4.</b>	<b>TEST SET-UP AND OPERATION MODES.....</b>	<b>11</b>
<b>4.1</b>	<b>PRINCIPLE OF CONFIGURATION SELECTION .....</b>	<b>11</b>
<b>4.2</b>	<b>TEST OPERATION AND TEST SOFTWARE.....</b>	<b>11</b>
<b>4.3</b>	<b>SPECIAL ACCESSORIES AND AUXILIARY EQUIPMENT .....</b>	<b>11</b>
<b>4.4</b>	<b>COUNTERMEASURES TO ACHIEVE EMC COMPLIANCE.....</b>	<b>12</b>
<b>5.</b>	<b>TEST RESULTS .....</b>	<b>13</b>
<b>5.1</b>	<b>TRANSMITTER REQUIREMENT &amp; TEST SUITES .....</b>	<b>13</b>
5.1.1	<i>Antenna Requirement .....</i>	<i>13</i>
5.1.2	<i>Field strength of fundamental.....</i>	<i>14</i>
5.1.3	<i>99% Bandwidth .....</i>	<i>15</i>
5.1.4	<i>Spurious Emission .....</i>	<i>16</i>
<b>5.2</b>	<b>MAINS CONDUCTED EMISSIONS .....</b>	<b>17</b>
5.2.1	<i>Conducted Emissions Line and Neutral.....</i>	<i>17</i>
<b>6.</b>	<b>LIST OF TABLES .....</b>	<b>18</b>

## 1. General Remarks

### 1.1 Complementary Materials

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

**Appendix 1: Photo Documentation**

(File Name: 10048895APPENDIX P)

**Appendix D: Test Result of Radiated Emissions**

(File Name: 10048895APPENDIX D)

#### Test Specifications

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

**Table 1: Applied Standard and Test Levels**

<b>Radio</b>
FCC CFR47 Part 15: Subpart C Section 15. 209 ANSI C63.4:2014, ANSI C63.10:2013

## 2. Test Sites

### 2.1 Test Facilities

TUV Rheinland Taiwan Ltd.

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

FCC Registration No.: 365730  
IC Canada Registration No.: 9465A-1  
TAF Accredited NCC Test Lab. No.:0759  
TAF ISO17025 Certification effective periods: 2013-Jul-1st to 2016-Jun-30th



**Testing Laboratory**  
**0759**

## 2.2 List of Test and Measurement Instruments

**Table 2: List of Test and Measurement Equipment**

Kind of Equipment	Manufacturer	Type	S/N	Last Calibration	Next Calibration
EMI Test Receiver	R&S	ESR7	101062	31-Aug-14	30-Aug-15
Bilog Antenna	TESEQ	CBL6111D	29802	4-Jul-14	3-Jul-16
Spectrum Analyzer	R&S	FSV 40	100921	17-Dec-14	16-Dec-15
Spectrum Analyzer	Agilent	N9010A	MY53470241	1-Apr-15	30-Mar-16
Horn Antenna	ETS-Lindgren	3117	138160	12-Jan-15	11-Jan-17
Horn Antenna (18GHz~40GHz)	COM-POWER	AH840	101031	30-Oct-13	29-Oct-15
Preamplifier (30MHz -1GHz)	HP	8447F	2805A03335	23-Aug-14	22-Aug-15
Preamplifier (18 GHz -40 GHz)	COM-POWER	PAM-840	461257	26-Aug-14	25-Aug-15
Pre-Amplifier (1GHz~18GHz)	EM Electronics	EM30180	60558	4-Nov-14	3-Nov-15
Loop Antenna	Schwarzbeck	FMZB 1513	1513-076	22-Oct-14	21-Oct-15
EMI Test Receiver	R&S	ESCI7	100797	28-Dec-14	27-Dec-15
LISN (1 phase)	R&S	ENV216	101243	31-May-14	30-May-15
LISN	Rolf Heine	NNB-2/16Z	99080	26-Aug-14	25-Aug-15

## 2.3 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.

## 2.4 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 basis using in house standards or comparisons.

## 2.5 Measurement Uncertainty

The estimated combined standard uncertainty for radiated emissions and conducted emissions measurements are  $\pm 3$ dB.

**Table 3:** Emission Measurement Uncertainty

Parameter	Uncertainty
Radio Frequency	$\pm 1 \times 10^{-7}$
RF power, conducted	$\pm 1.5$ dB
Adjacent channel power	$\pm 3$ dB
Radiated emission of transmitter, valid up to 26 GHz	$\pm 6$ dB
Radiated emission of receiver, valid up to 26 GHz	$\pm 6$ dB
Temperature	$\pm 2$ °C
Humidity	$\pm 10$ %

## 3. General Product Information

### 3.1 Product Function and Intended Use

The EUT is an Electronic Article Surveillance System working in the 8 MHz Band. Additionally there is a metal detector that works at 127 kHz. This report relates to the 127 kHz portion of the device.

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	Anti-Pilferage System with metal detection
Type Designation	ASSY FC180R RF+MD
FCC ID	CGDFC180RRFMD
IC	1444A-FC180RRFMD

**Table 5: Technical Specification of EUT**

Item	Value
Operating Frequencies	127 kHz
Channel number	1
Operation Voltage	120V
Modulation	CW

### **3.3 Independent Operation Modes**

Basic operation modes are:

- A. Transmitting
  - 1. Low channel
  - 2. Middle channel
  - 3. High channel

### **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.

Both alarming and non-alarming have been evaluated, only the worst case situation is shown.

### 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
--	--	--	--

#### **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.

## 5. Test Results

### 5.1 Transmitter Requirement & Test Suites

#### 5.1.1 Antenna Requirement

**RESULT:** **Passed**

Standard : Part 15.203 and RSS-Gen 7.1.4  
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  
 RSS-210 (12-2010) 2.5.1

Basic standard : ANSI C63.10:2013

**Test setup**

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
127	<92.68	average	105.67	<12.68	25.67	--	Pass
127	92.68	peak	125.67	12.68	45.67	--	Pass

Remark: For details refer to Appendix D

### 5.1.3 99% Bandwidth

**RESULT:**
**Passed**

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

**Test setup**

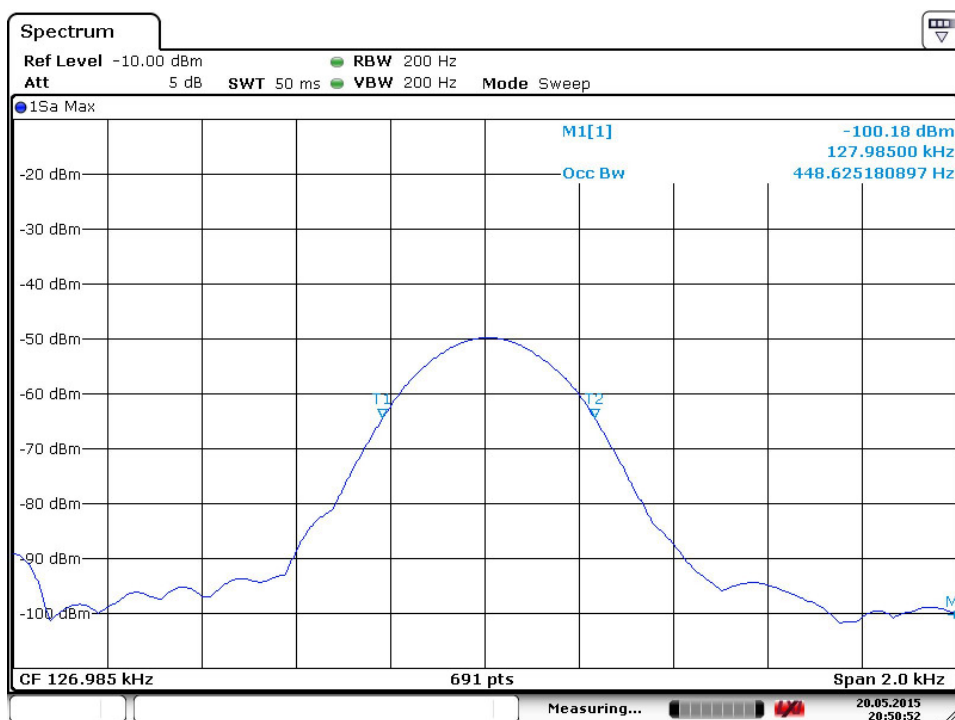
Operation Mode : A

Atmospheric pressure : 100-103 kPa

**Table 7: Test result of 99% Bandwidth**

Frequency	99% Bandwidth
127 kHz	448 Hz

### Test Plot of 99% BW



### 5.1.4 Spurious Emission

**RESULT:****Passed**

Test standard	:	FCC part 15. 209 RSS-Gen
Basic standard	:	ANSI C63.10: 2013
Limits	:	Radiated emissions which fall in the restricted bands, as defined in FCC 15.205(a) OR LP0002 must comply with the radiated emission limits specified in FCC 15.209(a) AND 2.8 Emission radiated outside the specified frequency bands must comply with the radiated emission limits specified in FCC 15.209(a) AND 2.8
Kind of test site	:	3m Semi-Anechoic Chamber

**Test setup**

Test Channel	:	Middle
Operation mode	:	A

Remark: Testing was carried out within frequency range 9kHz to more than 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  
RSS-Gen

Limits : Mains Conducted emissions as defined in  
LP0002: 2.3 , must comply with the mains  
conducted emission limits specified in LP0002:  
2.3

Kind of test site : Shielded Room

**Test setup**

Test Channel : Middle  
Operation mode : A

Remark: For details refer to Appendix D.

## 6. List of Tables

Table 1: Applied Standard and Test Levels .....	4
Table 2: List of Test and Measurement Equipment .....	6
Table 3: Emission Measurement Uncertainty.....	7
Table 4: Basic Information of EUT .....	9
Table 5: Technical Specification of EUT .....	9
Table 6: Field strength of fundamental, maximal level found.....	14