

Report on the FCC and IC Testing of the
Paxton Access Ltd
Keyless Door Handle, Model: Net2 Paxlock
In accordance with FCC 47 CFR Part 15C,
Industry Canada RSS-210 and
Industry Canada RSS-GEN



Product Service

Choose certainty.
Add value.

Prepared for: Paxton Access Ltd
Paxton House
Home Farm Road
Brighton
BN1 9HU
United Kingdom

FCC ID: USE900120
IC: 10217A-900120

COMMERCIAL-IN-CONFIDENCE

Date: March 2018
Document Number: 75939957-05 | Issue: 02

RESPONSIBLE FOR	NAME	DATE	SIGNATURE
Project Management	Natalie Bennett	07 March 2018	
Authorised Signatory	Matthew Russell	07 March 2018	

Signatures in this approval box have checked this document in line with the requirements of TÜV SÜD Product Service document control rules.

ENGINEERING STATEMENT

The measurements shown in this report were made in accordance with the procedures described on test pages. All reported testing was carried out on a sample equipment to demonstrate limited compliance with FCC 47 CFR Part 15C, Industry Canada RSS-210 and Industry Canada RSS-GEN. The sample tested was found to comply with the requirements defined in the applied rules.

RESPONSIBLE FOR	NAME	DATE	SIGNATURE
Testing	Nandhini Mathivanan	07 March 2018	
Testing	Graeme Lawler	07 March 2018	

FCC Accreditation
90987 Octagon House, Fareham Test Laboratory

Industry Canada Accreditation
IC2932B-1 Octagon House, Fareham Test Laboratory

EXECUTIVE SUMMARY

A sample of this product was tested and found to be compliant with FCC 47 CFR Part 15C: 2017, Industry Canada RSS-210 Issue 09 (08-2016) and Industry Canada RSS-GEN: Issue 04 (11-2014).

	DISCLAIMER AND COPYRIGHT This non-binding report has been prepared by TÜV SÜD Product Service with all reasonable skill and care. The document is confidential to the potential Client and TÜV SÜD Product Service. No part of this document may be reproduced without the prior written approval of TÜV SÜD Product Service. © 2018 TÜV SÜD Product Service.
	ACCREDITATION Our UKAS Accreditation does not cover opinions and interpretations and any expressed are outside the scope of our UKAS Accreditation. Results of tests not covered by our UKAS Accreditation Schedule are marked NUA (Not UKAS Accredited).

TÜV SÜD Product Service
is a trading name of TÜV SÜD Ltd
Registered in Scotland at East Kilbride,
Glasgow G75 0QF, United Kingdom
Registered number: SC215164

TUV SUD Ltd is a
TUV SUD Group Company

Phone: +44 (0) 1489 558100
Fax: +44 (0) 1489 558101
www.tuv-sud.co.uk

TÜV SÜD Product Service
Octagon House
Concorde Way
Fareham
Hampshire PO15 5RL
United Kingdom



Contents

1	Report Summary	2
1.1	Report Modification Record.....	2
1.2	Introduction.....	2
1.3	Brief Summary of Results	3
1.4	Application Form	4
1.5	Product Information	7
1.6	Deviations from the Standard.....	7
1.7	EUT Modification Record	7
1.8	Test Location.....	8
2	Test Details	9
2.1	20 dB Bandwidth	9
2.2	Field Strength of any Emission	12
2.3	Frequency Tolerance Under Temperature Variations.....	18
2.4	Field Strength of any Emission	20
3	Measurement Uncertainty	27



1 Report Summary

1.1 Report Modification Record

Alterations and additions to this report will be issued to the holders of each copy in the form of a complete document.

Issue	Description of Change	Date of Issue
1	First Issue	05 March 2018
2	To amend the Declaration of Build Status	07 March 2018

Table 1

1.2 Introduction

Applicant	Paxton Access Ltd
Manufacturer	Paxton Access Ltd
Model Number(s)	Net2 Paxlock
Serial Number(s)	Sample Number 5
Hardware Version(s)	Not Applicable
Software Version(s)	1.09
Number of Samples Tested	1
Test Specification/Issue/Date	FCC 47 CFR Part 15C: 2017 Industry Canada RSS-210: Issue 09 (08-2016) Industry Canada RSS-GEN: Issue 04 (11-2014)
Order Number	PO 168327
Date	03-August-2017
Date of Receipt of EUT	10-January-2018
Start of Test	14-January-2018
Finish of Test	21-February-2018
Name of Engineer(s)	Nandhini Mathivanan and Graeme Lawler
Related Document(s)	ANSI C63.10 (2013)



1.3 Brief Summary of Results

A brief summary of the tests carried out in accordance with FCC 47 CFR Part 15C, Industry Canada RSS-210 and Industry Canada RSS-GEN is shown below.

Section	Specification Clause			Test Description	Result	Comments/Base Standard
	FCC Part 15C	RSS-210	RSS-GEN			
Configuration and Mode: 125 kHz RFID Transceiver						
2.4	15.209	4.3	6.13	Field Strength of any Emission	Pass	ANSI C63.10
Configuration and Mode: 13.56 MHz RFID Transceiver						
2.1	15.215 (c)	N/A	6.6	20 dB Bandwidth	Pass	ANSI C63.10
2.2	15.225 (a)(b)(c)(d)	B.6	6.13	Field Strength of any Emission	Pass	ANSI C63.10
2.3	15.225 (e)	B.6	6.11	Frequency Tolerance Under Temperature Variations	Pass	ANSI C63.10

Table 2



1.4 Application Form

EQUIPMENT DESCRIPTION	
Model Name/Number	Net2 PaxLock & Net2 ANSI PaxLock
Part Number	900-140WT - Net2 ANSI PaxLock - Mortise, Galaxy, white 900-140BL - Net2 ANSI PaxLock - Mortise, Galaxy, black 900-150WT - Net2 ANSI PaxLock - Mortise, Eclipse, white 900-150BL - Net2 ANSI PaxLock - Mortise, Eclipse, black 900-120WT - Net2 PaxLock - Latch, Galaxy, white 900-120BL - Net2 PaxLock - Latch, Galaxy, black 900-130WT - Net2 PaxLock - Latch, Eclipse, white 900-130BL - Net2 PaxLock - Latch, Eclipse, black
Hardware Version	N/A
Software Version	1.09
Technical Description (Please provide a brief description of the intended use of the equipment)	<p>Net2 Paxlock is the battery powered smart electronic lock providing both access control and reader functions. The unit combines a 125kHz and 13.56 MHz proximity reader, a wireless interface 2.4GHz and a locking mechanism.</p> <p>PaxLock is a complete standalone system, there's nothing to wire together and no mains connection is required. The unit is powered by four replaceable AA batteries.</p> <p>The purpose of the equipment is to receive validated user input via a radio signal from a passive proximity token (card or keyfob) and then provide a digital output to the internal locking mechanism for access control. An event of this process is then transmitted to the PC through the wireless interface and stored as an archive. User's access rights are configured at the PC and the PaxLock unit is then updated as required using the same wireless method.</p>

EXTREME TEMPERATURE RANGE (over which equipment is to be type tested)	
Category I (General) -20°C to +55°C	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Category II (Portable) -10°C to +55°C	<input type="checkbox"/> Yes <input type="checkbox"/> No
Category III (Equipment for normal indoor use) 0°C to +55°C	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No

TYPE OF EQUIPMENT			
<input checked="" type="checkbox"/> Fixed Station	<input type="checkbox"/> Transmitter	<input checked="" type="checkbox"/> Simplex	<input checked="" type="checkbox"/> Integral Antenna
	<input type="checkbox"/> Receiver	<input type="checkbox"/> Duplex	<input type="checkbox"/> Single Antenna
<input type="checkbox"/> Mobile Station	<input checked="" type="checkbox"/> Transceiver		<input type="checkbox"/> Two Antenna Connector
	<input type="checkbox"/> Battery Charger		<input type="checkbox"/> Multiple Antenna Connectors No.
<input type="checkbox"/> Portable Station			
<input type="checkbox"/> Transponder (Tag)	<input type="checkbox"/> Active	<input type="checkbox"/> Passive	



TRANSMITTER TECHNICAL CHARACTERISTICS		
Product Class :	1	(See EN 300 330 Subclause B.2.)
ANTENNA CHARACTERISTICS		
For Class 1 Equipments - Average area for the loop	<0.05	m ² (See Note 1)
For Class 2 and 3 Equipments - Maximum current in the loop		Amps
FREQUENCY CHARACTERISTICS		
Transmitter frequency alignment range (See Note 2)	125 kHz & 13.56 MHz	MHz
Transmitter channel switching frequency range (See Note 3)	to	MHz
CHANNEL SEPARATION - (if applicable)	Single Channel	
State the maximum number of channels over which the equipment can operate -		

Notes

- (1) The Area of the loop is the physical area and does not take into account the number of turns.
- (2) The alignment range is the frequency range over which the receiver or the transmitter can be programmed and/or realigned to operate, without any physical change to components other than programmable read only memories or crystals (for the receiver or transmitter).
- (3) The switching range is the maximum frequency range over which the receiver or the transmitter can be operated without reprogramming or realignment.

TRANSMITTER RF CARRIER CHARACTERISTICS			
MAXIMUM RATED TRANSMITTER OUTPUT			
Watts At transmitter permanent external RF output connector (for class 2 or 3 equipment)			
or			
Mifare 19.8dBu A/M at 10M	dB(μA/m)	Field strength at 10 m (for class equipment with integral antenna)	
HiTag 15.7dBu A/M at 10M			
or			
	dB(μA/m)	Field strength at 10 m (for class 4 equipment with integral antenna)	
MINIMUM RATED TRANSMITTER OUTPUT			
Watts At transmitter permanent external RF output connector (for class 2 or 3 equipment)			
or			
	dB(μA/m)	Field strength at 10 m (for class equipment with integral antenna)	
or			
	dB(μA/m)	Field strength at 10 m (for class 4 equipment with integral antenna)	
Transmit Power Control Range	dB	Transmit Power Control Step	dB

TRANSMITTER - MODULATION			
Amplitude	<input checked="" type="checkbox"/>	Other	<input type="checkbox"/>
Frequency	<input type="checkbox"/>	Details :	
Phase	<input type="checkbox"/>		



POWER SOURCE			
<input type="checkbox"/>	AC mains	State voltage	
	AC supply frequency (Hz)		
	VAC		
	Max Current		
	Hz		
<input type="checkbox"/>	Single phase	<input type="checkbox"/>	Three phase
And / Or			
<input type="checkbox"/>	External DC supply		
	Nominal voltage	V	Max Current A
	Extreme upper voltage	V	
	Extreme lower voltage	V	
Battery			
<input type="checkbox"/>	Nickel Cadmium	<input type="checkbox"/>	Lead acid (Vehicle regulated)
<input checked="" type="checkbox"/>	Alkaline	<input type="checkbox"/>	Leclanche
<input type="checkbox"/>	Lithium	<input type="checkbox"/>	Other Details :
6	Volts nominal.		
End point voltage as quoted by equipment manufacturer		2.8	V

AUTOMATIC EQUIPMENT SWITCH OFF	
If the equipment is designed to automatically switch off at a predetermined voltage level which is higher or lower in value than the battery minimum and minimum calculated values this shall be clearly stated.	
<input type="checkbox"/>	Applies V cut-off voltage
<input checked="" type="checkbox"/>	Does not apply

FREQUENCY IDENTIFICATION			
Each equipment, whether one or more submitted for tests shall carry clear identification (such as a serial number), together with the frequency identification displayed on the equipment.			
Equipment identification e.g. serial number	Channel No. (if applicable)	Transmit Nominal Frequency (MHz)	Receive Nominal Frequency (MHz)

I hereby declare that the information supplied is correct and complete.

Name: Kevin Feeney Position held: Compliance Engineer
 Date: 09.01.2018



1.5 Product Information

1.5.1 Technical Description

Net2 Paxlock is the battery powered smart electronic lock providing both access control and reader functions. The unit combines a 125kHz and 13.56 MHz proximity reader, a wireless interface 2.4GHz and a locking mechanism.

PaxLock is a complete standalone system, there's nothing to wire together and no mains connection is required. The unit is powered by four replaceable AA batteries. The purpose of the equipment is to receive validated user input via a radio signal from a passive proximity token (card or keyfob) and then provide a digital output to the internal locking mechanism for access control. An event of this process is then transmitted to the PC through the wireless interface and stored as an archive. User's access rights are configured at the PC and the PaxLock unit is then updated as required using the same wireless method.

1.6 Deviations from the Standard

No deviations from the applicable test standard were made during testing.

1.7 EUT Modification Record

The table below details modifications made to the EUT during the test programme. The modifications incorporated during each test are recorded on the appropriate test pages.

Modification State	Description of Modification still fitted to EUT	Modification Fitted By	Date Modification Fitted
Serial Number: Sample Number 5			
0	As supplied by the customer	Not Applicable	Not Applicable

Table 3



1.8 Test Location

TÜV SÜD Product Service conducted the following tests at our Fareham Test Laboratory.

Test Name	Name of Engineer(s)	Accreditation
Configuration and Mode: 125 kHz RFID Transceiver		
Field Strength of any Emission	Graeme Lawler	UKAS
Configuration and Mode: 13.56 MHz RFID Transceiver		
20 dB Bandwidth	Nandhini Mathivanan	UKAS
Field Strength of any Emission	Graeme Lawler	UKAS
Frequency Tolerance Under Temperature Variations	Nandhini Mathivanan	UKAS

Table 4

Office Address:

Octagon House
Concorde Way
Segensworth North
Fareham
Hampshire
PO15 5RL
United Kingdom



2 Test Details

2.1 20 dB Bandwidth

2.1.1 Specification Reference

FCC 47 CFR Part 15C, Clause 15.215 (c)
Industry Canada RSS-GEN, Clause 6.6

2.1.2 Equipment Under Test and Modification State

Net2 Paxlock, S/N: Sample Number 5 - Modification State 0

2.1.3 Date of Test

20-February-2018

2.1.4 Test Method

The test was performed in accordance with ANSI C63.10, clause 6.9.2.

2.1.5 Environmental Conditions

Ambient Temperature 21.1 °C
Relative Humidity 32.0 %

2.1.6 Test Results

13.56 MHz RFID Transceiver

Frequency (MHz)	20 dB Bandwidth (Hz)	99% Occupied Bandwidth (Hz)	F _{LOWER} (MHz)	F _{UPPER} (MHz)
13.56	1618	5336	13.559	13.562

Table 5

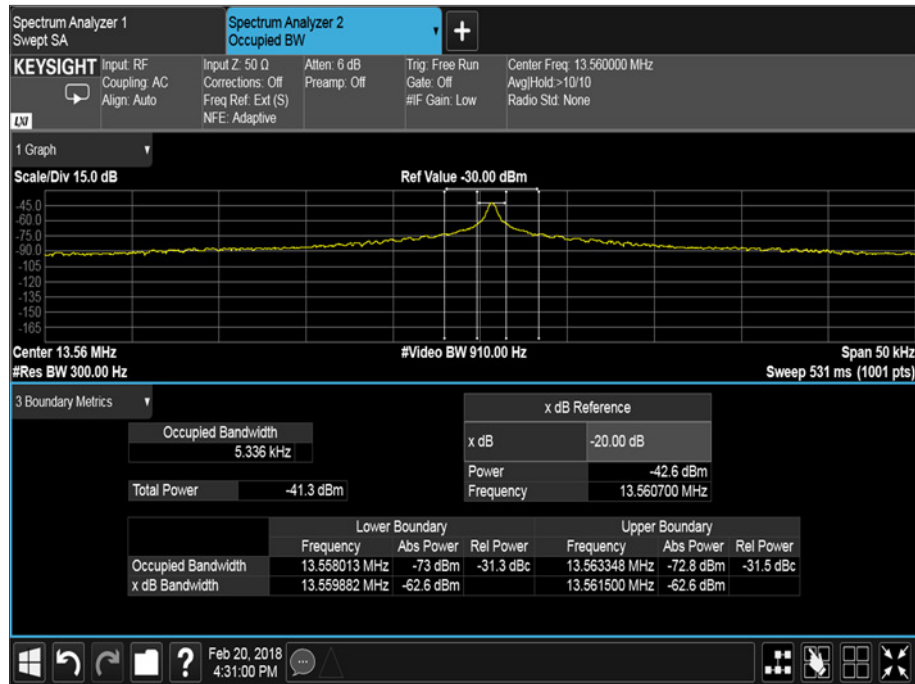


Figure 1 - 20 dB and 99% Occupied Bandwidth

FCC 47 CFR Part 15, Limit Clause 15.215 (c)

The 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated.

Industry Canada RSS 210 and Industry Canada RSS GEN, Limit Clause

None specified.



2.1.7 Test Location and Test Equipment Used

This test was carried out in RF Laboratory 1.

Instrument	Manufacturer	Type No	TE No	Calibration Period (months)	Calibration Due
Multimeter	White Gold	WG022	190	12	24-Nov-2018
Dual Power Supply Unit	Hewlett Packard	6253A	271	-	O/P Mon
Attenuator (30dB, 25W)	Weinschel	46-30-34	2776	12	16-Feb-2018
Hygrometer	Rotronic	I-1000	3220	12	30-Aug-2018
Loop Antenna	ETS-Lindgren	7604	4134	24	27-Oct-2018
2 metre SMA Cable	Florida Labs	SMS-235SP-78.8-SMS	4518	12	19-Sep-2018
EXA	Keysight Technologies	N9010B	4968	12	21-Dec-2018

Table 6

O/P Mon – Output Monitored using calibrated equipment.



2.2 Field Strength of any Emission

2.2.1 Specification Reference

FCC 47 CFR Part 15C, Clause 15.225 (a)(b)(c)(d),
Industry Canada RSS-210, Clause B.6
Industry Canada RSS-GEN, Clause 6.13

2.2.2 Equipment Under Test and Modification State

Net2 Paxlock, S/N: Sample Number 5 - Modification State 0

2.2.3 Date of Test

15-January-2018

2.2.4 Test Method

The test was performed in accordance with ANSI C63.10, clause 6.3, 6.4 and 6.5.

Pre-scan measurements were made at a distance of 3 m as shown by the plots below using a peak detector. Final emission measurements were then made using a Quasi-Peak detector and recorded in the tables below. The limit lines shown on the plot were extrapolated from either 300 m or 30 m to the measurement distance of 3 m in accordance with ANSI C63.10 Clause 6.4.4.2.

The EUT was tested using new, fully charged batteries supplied by the manufacturer.

2.2.5 Environmental Conditions

Ambient Temperature 18.5 °C
Relative Humidity 38.0 %

2.2.6 Test Results

13.56 MHz RFID Transceiver, Carrier Results

Frequency (MHz)	Quasi-Peak Level (dB μ V/m) at 3m	Quasi-Peak Level (dB μ V/m) at 30m	Quasi-Peak Level (μ V/m) at 3m	Quasi-Peak Level (μ V/m) at 30m
13.56	49.77	28.38	307.96	26.24

Table 7

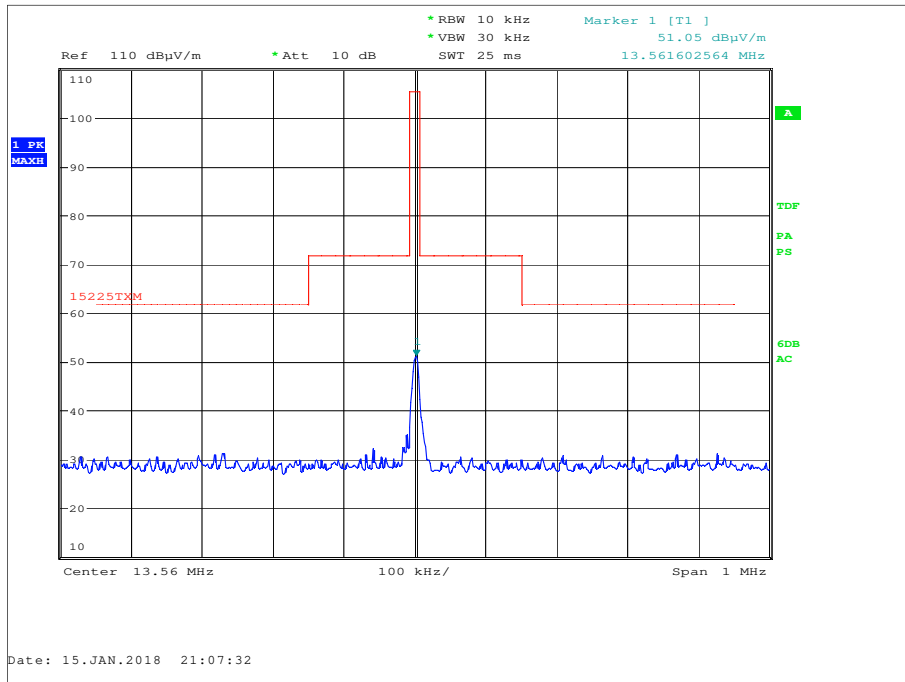


Figure 2 - Plot of the Fundamental - 13.56 MHz

Frequency MHz	Quasi-Peak Level (dBµV/m) at 3 m	Quasi-Peak Level (dBµV/m) at 30 m	Quasi-Peak Level (µV/m) at 3 m	Quasi-Peak Level (µV/m) at 30 m
*				

Table 8 - Emissions Results - 9 kHz to 30 MHz

No emissions were detected within 10 dB of the limit.

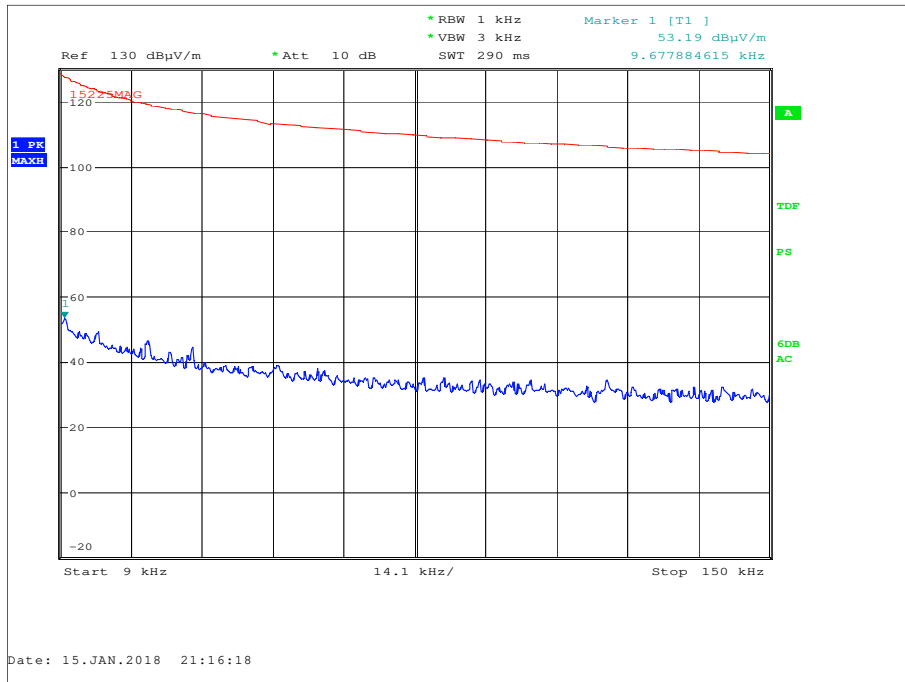


Figure 3 - 9 kHz to 150 kHz

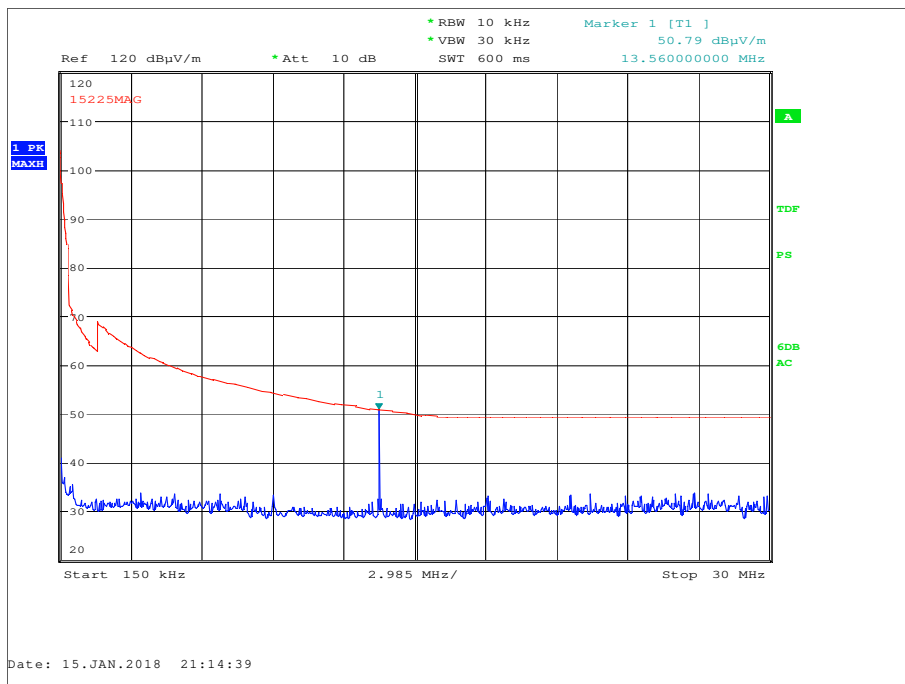


Figure 4 - 150 kHz to 30 MHz



Frequency (MHz)	QP Level (dBuV/m)	QP Limit (dBuV/m)	QP Margin (dBuV/m)	Angle(Deg)	Height(m)	Polarity
30.182	30.4	40.0	-9.6	60	1.00	Horizontal
31.951	29.5	40.0	-10.5	298	1.00	Horizontal
34.177	28.6	40.0	-11.4	0	1.00	Horizontal
777.816	32.4	46.0	-13.6	359	1.00	Horizontal
835.130	32.6	46.0	-13.4	98	3.50	Horizontal
960.000	33.8	46.0	-12.2	360	1.00	Horizontal

Table 9 - Emissions Results – 30 MHz to 1 GHz

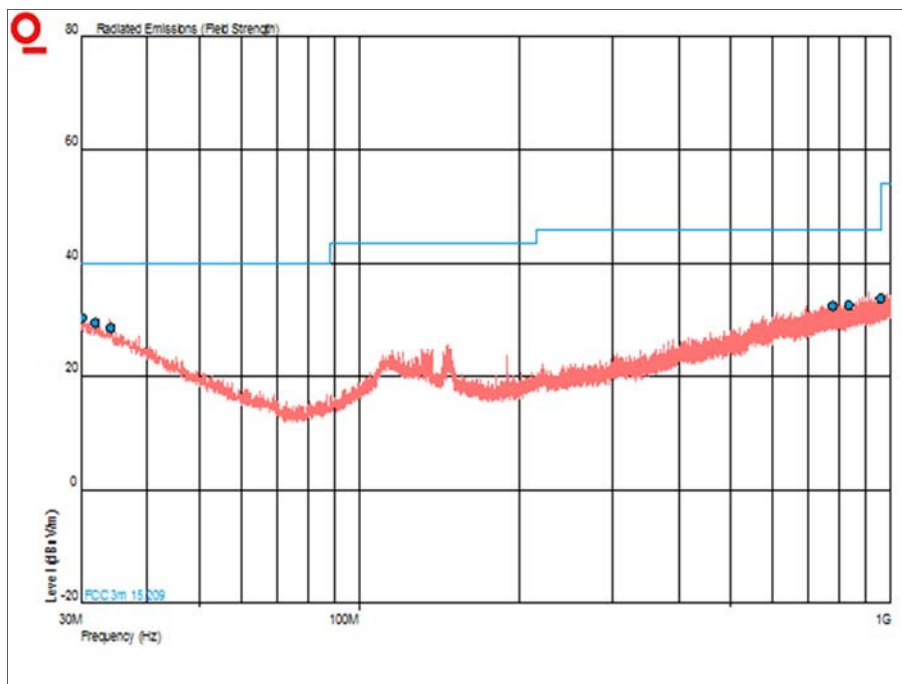


Figure 5 - 30MHz to 1 GHz

FCC 47 CFR Part 15, Limit Clause 15.225 (a)(b)(c)(d)

(a) The field strength of any emissions within the band 13.553–13.567 MHz shall not exceed 15,848 microvolts/meter at 30 m.

(b) Within the bands 13.410–13.553 MHz and 13.567–13.710 MHz, the field strength of any emissions shall not exceed 334 microvolts/meter at 30 m.

(c) Within the bands 13.110–13.410 MHz and 13.710–14.010 MHz the field strength of any emissions shall not exceed 106 microvolts/meter at 30 m.

(d) The field strength of any emissions appearing outside of the 13.110–14.010 MHz band shall not exceed the general radiated emission limits in § 15.209.



FCC 47 CFR Part 15, Limit Clause 15.209

Frequency (MHz)	Field Strength ($\mu\text{V/m}$)	Measurement Distance (m)
0.009 to 0.490	2400/F (kHz)	300
0.490 to 1.705	24000/F (kHz)	30
1705 to 30	30	30
30 to 88	100**	3
88 to 216	150**	3
216 to 960	200**	3
Above 960	500	5

Table 10 - FCC Radiated Emission Limit

Industry Canada RSS-210, Limit Clause B.6

The field strength of any emission shall not exceed the following limits:

- (a) 15.848 mW/m (84 dB $\mu\text{V/m}$) at 30 m, within the band 13.553 – 13.567 MHz.
- (b) 334 $\mu\text{V/m}$ (50.5 dB $\mu\text{V/m}$) at 30 m, withing the bands 13.410 – 13.553 MHz and 13.567 – 13.710 MHz.
- (c) 106 $\mu\text{V/m}$ (40.5 dB $\mu\text{V/m}$) at 30 m, within the bands 13.110 – 13.410 MHz and 13.710 – 14.010 MHz.
- (d) RSS-GEN general field strength limits for frequencies outside the band 13.110 – 14.010 MHz.

Industry Canada RSS-GEN, Limit Clause

Frequency	Electric Field Strength ($\mu\text{V/m}$)	Magnetic Field Strength (H-Field) ($\mu\text{A/m}$)	Measurement Distance (m)
9 - 490 kHz	2,400/F (F in kHz)	2,400/377F (F in kHz)	300
490 - 1,705 kHz	24,000/F (F in kHz)	24,000/377F (F in kHz)	30
1,705 kHz - 30 MHz	30	N/A	30

Table 11 - Industry Canada Radiated Emission Limit - Less than 30 MHz

Frequency (MHz)	Field Strength ($\mu\text{V/m}$ at 3 m)
30 - 88	100
88 - 216	150
216 - 960	200
> 960	500

Table 12 - Industry Canada Radiated Emission Limit - 30 MHz to 1 GHz



2.2.7 Test Location and Test Equipment Used

This test was carried out in EMC Chamber 5.

Instrument	Manufacturer	Type No	TE No	Calibration Period (months)	Calibration Due
Antenna (Bilog)	Schaffner	CBL6143	287	24	18-Apr-2018
Antenna (Active Loop, 9kHz-30MHz)	Rohde & Schwarz	HFH2-Z2	333	24	09-Dec-2018
Antenna (Dish/Tripod/Adaptor, 1GHz-18GHz)	Rohde & Schwarz	AC-008	334	-	TU
Screened Room (5)	Rainford	Rainford	1545	36	20-Jan-2018
Turntable Controller	Inn-Co GmbH	CO 1000	1606	-	TU
Comb Generator	Schaffner	RSG1000	3034	-	TU
Cable (N-N, 8m)	Rhophase	NPS-2302-8000-NPS	3248	12	02-May-2018
EMI Test Receiver	Rohde & Schwarz	ESU40	3506	12	22-Nov-2018
Tilt Antenna Mast	matur GmbH	TAM 4.0-P	3916	-	TU
Mast Controller	matur GmbH	NCD	3917	-	TU
Hygropalm Temperature and Humidity Meter	Rotronic	HP21	4410	12	04-May-2018
Cable (Rx, Km-Km 2m)	Scott Cables	KPS-1501-2000-KPS	4526	6	22-May-2018

Table 13

TU - Traceability Unscheduled



2.3 Frequency Tolerance Under Temperature Variations

2.3.1 Specification Reference

FCC 47 CFR Part 15C, Clause 15.225 (e)
 Industry Canada RSS-210, Clause B.6
 Industry Canada RSS-GEN, Clause 6.11

2.3.2 Equipment Under Test and Modification State

Net2 Paxlock, S/N: Sample Number 5 - Modification State 0

2.3.3 Date of Test

19-February-2018 to 21-February-2018

2.3.4 Test Method

This test was performed in accordance with ANSI C63.10, clause 6.8. A spectrum analyser was configured to display the entire fundamental and a single marker on the peak trace of the spectrum analyser was used to record the frequency.

2.3.5 Environmental Conditions

Ambient Temperature 21.8 °C
 Relative Humidity 27.2 %

2.3.6 Test Results

13.56 MHz RFID Transceiver

Temperature	Voltage	Measured Frequency (MHz)	Frequency Deviation (%)	Frequency Error (ppm)
-30.0 °C	6.0 V DC	13.5606804	0.00502	50.1769
-20.0 °C	6.0 V DC	13.5606900	0.00509	50.8849
-10.0 °C	6.0 V DC	13.5608100	0.00597	59.7345
0.0 °C	6.0 V DC	13.5605960	0.00440	43.9528
+10.0 °C	6.0 V DC	13.5608000	0.00590	58.9970
+20.0 °C	6.0 V DC	13.5607584	0.00559	55.9292
+30.0 °C	6.0 V DC	13.5607040	0.00519	51.9174
+40.0 °C	6.0 V DC	13.5607120	0.00525	52.5073
+50.0 °C	6.0 V DC	13.5605960	0.00440	43.9528

Table 14 - Frequency Tolerance Under Temperature Variation

Temperature	Voltage	Measured Frequency (MHz)	Frequency Deviation (%)	Frequency Error (ppm)
+20.0 °C	5.1 V DC	13.5606832	0.00504	50.3834
+20.0 °C	6.0 V DC	13.5607584	0.00559	55.9292
+20.0 °C	6.9 V DC	13.5606900	0.00509	50.8849

Table 15 - Frequency Tolerance Under Voltage Variation



FCC 47 CFR Part 15, Limit Clause 15.225 (e)

The frequency tolerance of the carrier signal shall be maintained within $\pm 0.01\%$ of the operating frequency.

Industry Canada RSS-210, Limit Clause B.6

Carrier frequency stability shall be maintained to $\pm 0.01\%$ (± 100 ppm).

2.3.7 Test Location and Test Equipment Used

This test was carried out in RF Laboratory 1.

Instrument	Manufacturer	Type No	TE No	Calibration Period (months)	Calibration Due
Multimeter	White Gold	WG022	190	12	24-Nov-2018
Dual Power Supply Unit	Hewlett Packard	6253A	271	-	O/P Mon
Thermocouple Thermometer	Fluke	51	3172	12	29-Nov-2018
Hygrometer	Rotronic	I-1000	3220	12	30-Aug-2018
Loop Antenna	ETS-Lindgren	7604	4134	24	27-Oct-2018
2 metre SMA Cable	Florida Labs	SMS-235SP-78.8-SMS	4518	12	19-Sep-2018
Climatic Chamber	Aralab	FitoTerm 300E45	4823	-	O/P Mon
EXA	Keysight Technologies	N9010B	4968	12	21-Dec-2018

Table 16

O/P Mon – Output Monitored using calibrated equipment



2.4 Field Strength of any Emission

2.4.1 Specification Reference

FCC 47 CFR Part 15C, Clause 15.209
Industry Canada RSS-210, Clause 4.3
Industry Canada RSS-GEN, Clause 6.13

2.4.2 Equipment Under Test and Modification State

Net2 Paxlock, S/N: Sample Number 5 - Modification State 0

2.4.3 Date of Test

14-January-2018

2.4.4 Test Method

This test was performed in accordance with ANSI C63.10, clause 6.3, 6.4 and 6.5. and Industry Canada RSS-Gen clause 6.13.

Measurements were made at a distance of 3 m. The limit lines shown on the plot were extrapolated from either 300 m or 30 m to the measurement distance of 3 m in accordance with ANSI C63.10 Clause 6.4.4.2.

For any emissions detected within 20 dB of the limit, a final measurement was made and recorded in the table below. The detector used for these measurements was a quasi-peak detector except for emissions within the bands 9 kHz to 90 kHz and 110 kHz to 490 kHz where a CISPR average detector was used.

2.4.5 Environmental Conditions

Ambient Temperature 18.2°C
Relative Humidity 33.0%

2.4.6 Test Results

125 kHz RFID Transceiver

Frequency	Fundamental Field Strength (dBuV/m)	Limit (dBuV/m)
125.010 kHz	60.20	105.66

Table 17 - Fundamental Emission Field Strength

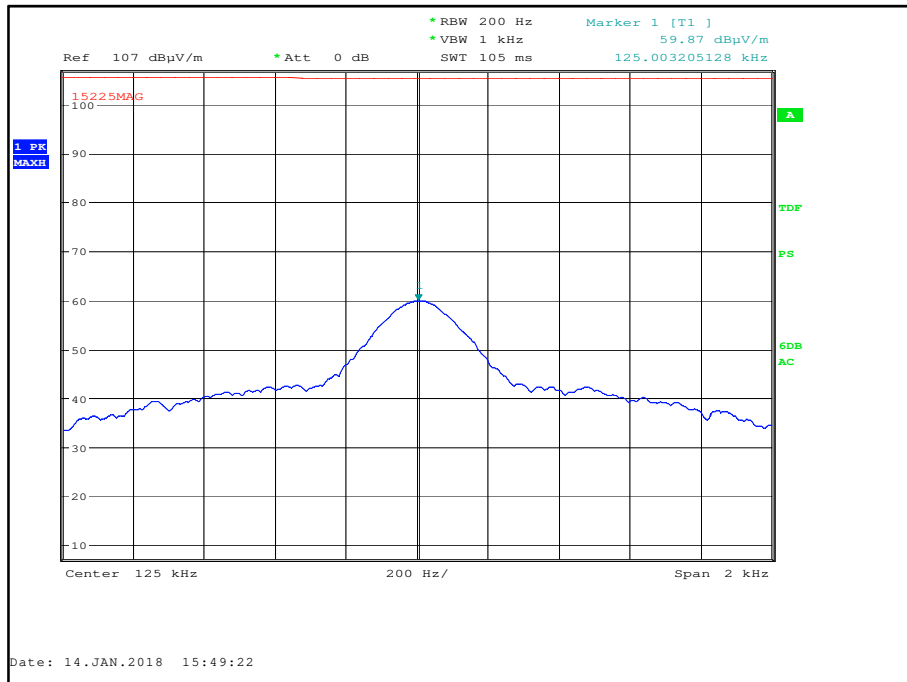


Figure 6 - Plot of the Fundamental Emission



Frequency (MHz)	Results at Measurement Distance			Results at Limit Distance		
	Level (µV/m)	Distance	Detector	Level (µV/m)	Distance	Detector
*						

Table 18 - Emissions Results - 9 kHz to 30 MHz

*No emissions were detected within 10 dB of the limit.

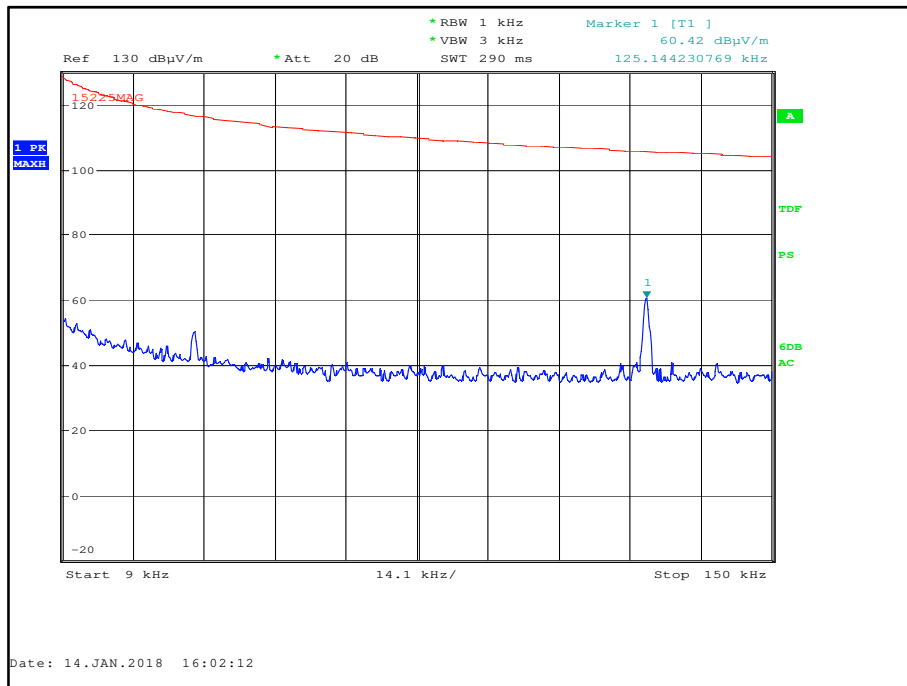


Figure 7 - 9 kHz to 150 kHz

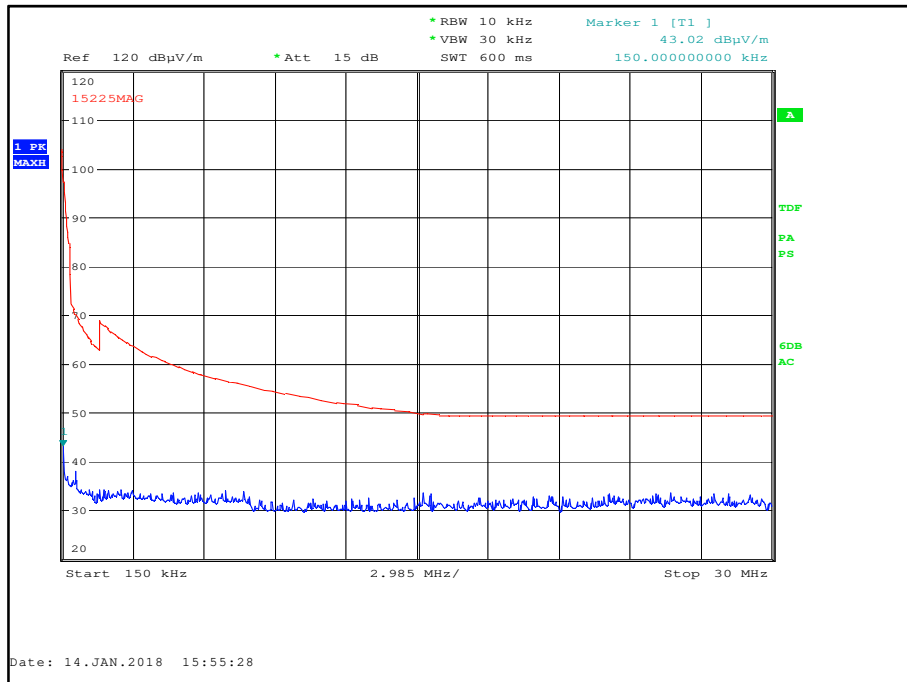


Figure 8 - 150 kHz to 30 MHz



Frequency (MHz)	QP Level (dBuV/m)	QP Limit (dBuV/m)	QP Margin (dBuV/m)	Angle(Deg)	Height(m)	Polarity
30.362	30.1	40.0	-9.9	360	1.00	Horizontal
32.509	29.1	40.0	-10.9	0	1.16	Horizontal
33.357	29.8	40.0	-10.2	25	1.00	Horizontal
818.371	32.3	46.0	-13.7	135	1.00	Horizontal
905.612	33.2	46.0	-12.8	160	1.00	Horizontal
960.000	33.7	46.0	-12.3	288	1.00	Horizontal

Table 19 - Emissions Results - 30 MHz to 1 GHz

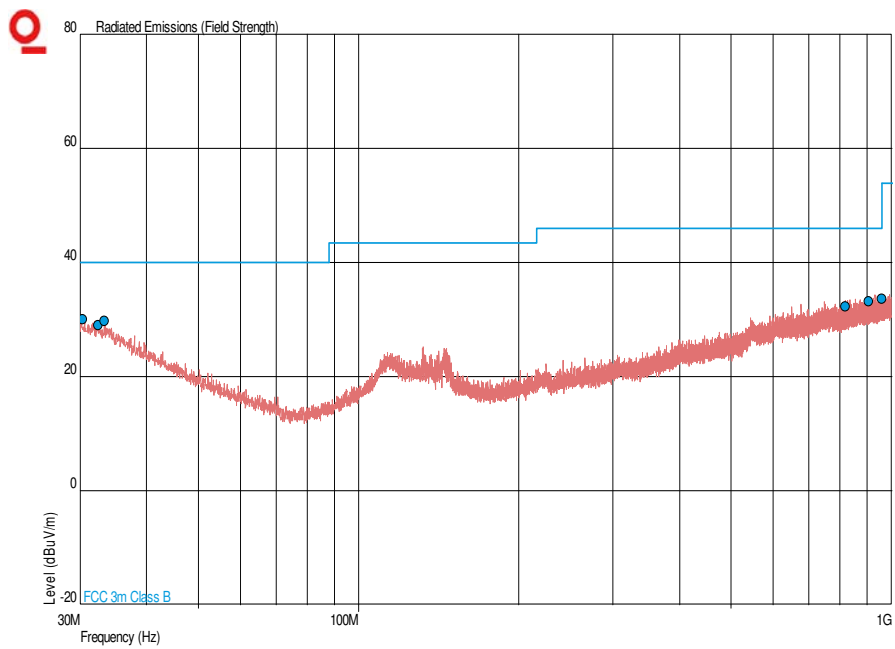


Figure 9 - 30 MHz to 1 GHz



FCC 47 CFR Part 15, Limit Clause 15.209

Frequency (MHz)	Field Strength ($\mu\text{V/m}$)	Measurement Distance (m)
0.009 to 0.490	2400/F (kHz)	300
0.490 to 1.705	24000/F (kHz)	30
1705 to 30	30	30
30 to 88	100**	3
88 to 216	150**	3
216 to 960	200**	3
Above 960	500	3

Table 20 - FCC Limit

NOTE: The level of any unwanted emissions from an intentional radiator operating under these general provisions shall not exceed the level of the fundamental emission.

Industry Canada RSS-210, Limit Clause 4.4

Under no circumstance shall the level of any unwanted emissions exceed the level of the fundamental emissions.

Industry Canada RSS-Gen, Limit Clause 8.9

Frequency (MHz)	Field Strength ($\mu\text{V/m}$)	Measurement Distance (m)
0.009 to 0.490	2400/F (kHz)	300
0.490 to 1.705	24000/F (kHz)	30
1705 to 30	30	30

Table 21 - IC Limit, Below 30 MHz

Frequency (MHz)	Field Strength ($\mu\text{V/m}$ at 3 metres)
30 to 88	100
88 to 216	150
216 to 960	200
Above 960	500

Table 22 - IC Limit, Above 30 MHz



2.4.7 Test Location and Test Equipment Used

This test was carried out in EMC Chamber 5

Instrument	Manufacturer	Type No	TE No	Calibration Period (months)	Calibration Due
Antenna (Bilog)	Schaffner	CBL6143	287	24	18-Apr-2018
Antenna (Active Loop, 9kHz-30MHz)	Rohde & Schwarz	HFH2-Z2	333	24	09-Dec-2018
Antenna (Dish/Tripod/Adaptor, 1GHz-18GHz)	Rohde & Schwarz	AC-008	334	-	TU
Screened Room (5)	Rainford	Rainford	1545	36	20-Jan-2018
Turntable Controller	Inn-Co GmbH	CO 1000	1606	-	TU
Comb Generator	Schaffner	RSG1000	3034	-	TU
Cable (N-N, 8m)	Rhophase	NPS-2302-8000-NPS	3248	12	02-May-2018
EMI Test Receiver	Rohde & Schwarz	ESU40	3506	12	22-Nov-2018
Tilt Antenna Mast	matur GmbH	TAM 4.0-P	3916	-	TU
Mast Controller	matur GmbH	NCD	3917	-	TU
Hygropalm Temperature and Humidity Meter	Rotronic	HP21	4410	12	04-May-2018
Cable (Rx, Km-Km 2m)	Scott Cables	KPS-1501-2000-KPS	4526	6	22-May-2018

Table 23

TU - Traceability Unscheduled



3 Measurement Uncertainty

For a 95% confidence level, the measurement uncertainties for defined systems are:

Test Name	Measurement Uncertainty
20 dB Bandwidth	± 476.36 Hz
Field Strength of any Emission	9 kHz to 30 MHz: ± 3.4 dB 30 MHz to 1 GHz: ± 5.2 dB
Frequency Tolerance Under Temperature Variations	± 837.567 Hz

Table 24