Test report no. : 197773-5

Item tested : LCU 6333

Type of equipment : RFID Transceiver Module

FCC ID : Y7V-LCU6333

Client : ASSA ABLOY Hospitality AS

FCC Part 15.225
13.110 – 14.010 MHz Band

RSS-210, Issue 8 and RSS-GEN, Issue 3
Low-Power Licence-exempt Radiocommunications devices
13.110 – 14.010 MHz Band

29 September 2014

Authorized by : .....
Frode Sveinsen
Technical Verificator

Nemko AS, Gaustadalléen 30, P.O.Box 73 Blindern, NO-0314 Oslo Norway **T** +47 22 96 03 30 **F** +47 22 96 05 50 Enterprise number NO974404532
Visiting address: Nemko Kjeller, Instituttveien 6, P.O.Box 96, NO-2027 Kjeller Norway **T** +47 64 84 57 00 **F** +47 64 84 57 05

CONTENTS

1 GENERAL INFORMATION

1.1 Testhouse Info

Name :	Nemko AS
Address :	Nemko Kjeller Instituttveien 6, Box 96 NO-2027 Kjeller, NORWAY
Telephone :	+47 64 84 57 00
Fax :	+47 64 84 57 05
Email:	comlab@nemko.no
FCC test firm :	994405
IC OATS :	2040D-1
Total Number of Pages:	18

1.2 Client Information

Name :	ASSA ABLOY Hospitality AS
Address :	Sophus Lies Vei, Postboks 511 Høyden 1522 Moss, Norway

Contact:

Name :	Bjørn Kolstad
E-mail :	bkolstad@vcegroup.com

1.3 Manufacturer (if other than client)

-“-

2 Test Information

2.1 Test Item

Name :	VingCard Elsafe
Model/version :	LCU 6333
FCC ID :	Y7V-LCU6333
Industry Canada ID :	9514A-LCU6333
Serial number :	/
Hardware identity and/or version:	/
Software identity and/or version :	/
Operating frequency:	13.56 MHz
Tuneable Bands :	None
Number of Channels :	1
Operating Modes :	Transmitter
Type of Modulation :	ISO 14443-A (Amplitude Shift Keying)
User Frequency Adjustment :	None
Type of Power Supply :	Battery 4.5V DC
Antenna Connector :	Integral
Number of Antennas :	1

Description of Tested Device(s)

The tested EUT is a RFID transceiver Module. The EUT supports several RFID standards, ISO 14443-A, ISO 14443-B and ISO 15693. On a higher level it supports MIFARE communication and encryption.

The transceiver's oscillator is controlled by a 13.56MHz crystal.

2.2 Test Environment

2.2.1 Normal test condition

Temperature:	20.6 – 23.7 °C
Relative humidity:	28.5 – 43.1 %
Normal test voltage:	4.5V DC (Battery)

The values are the limit registered during the test period.

2.3 Test Period

Item received date:	2012-04-14
Test period :	from 2012-04-14 to 2012-05-23

3 TEST REPORT SUMMARY

3.1 General

All measurements are traceable to national standards.

The tests were conducted for the purpose of demonstrating compliance with FCC CFR 47 Part 15, paragraph 15.225 and Industry Canada RSS-210 Issue 8.

Radiated tests were conducted in accordance with ANSI C63.4-2003. The radiated tests were made in a semi-anechoic chamber at measuring distances of 3m and 10m.

☒ New Submission ☒ Production Unit

☐ Class II Permissive Change ☐ Pre-production Unit

DXT Equipment Code ☐ Family Listing

THIS TEST REPORT RELATES ONLY TO THE ITEM (S) TESTED.

Deviations from, additions to, or exclusions from the test specifications are described in "Summary of Test Data".

TEST REPORT #: 197773-5

TESTED BY: G.Suhanthakumar. DATE: 2014-05-21

G.Suhanthakumar, Test engineer

3.2 Test Summary

Name of test	FCC Part 15 reference	RSS210 Issue 8 & RSS Gen Issue 3	Result
Supply Voltage Variations	15.225(e)	4.5	Complies [1]
Transmitter frequency stability	15.225(e)	A2.6	Complies
20 dB bandwidth	15.215(c)	-	Complies
Peak Power Output	15.225(a)	A2.6	Complies
Emission mask	15.225(a)(b)(c)(d)	A.2.6	Complies
Spurious Emissions (Radiated)	15.225 (d) 209	A2.6	Complies
Receiver Spurious Emissions (Radiated)	N/A	6 (RSS-GEN)	NA [3]

[1] The power is taken from battery.

[2] integral antenna

[3] Not Implemented

RSS Gen issue 3 covers section 7 & 6

RSS 210 issue 8 covers section A2.9

3.3 Description of modification for Modification Filing

Not applicable.

3.4 Comments

The radiated measurements are tested on three axis.

All measurements are performed using new battery.

3.5 Family List Rationale

Not Applicable.

4 TEST RESULTS

4.1 Transmitter Frequency Stability

Para. No.: 15.225(e)/A2.6

Test Performed By: G.Suhanthakumar	**Date of Test: 22.05.2012**

Measurement Data:

Test Data:

Test Condition	Frequency (13.56000MHz)	Frequency Tolerance (%)
50°C, 4.5Vdc	13.56000	0
40°C, 4.5Vdc	13.56000	0
30°C, 4.5Vdc	13.56000	0
20°C, 4.5Vdc	13.56000	0
10°C, 4.5Vdc	13.56000	0
0°C, 4.5Vdc	13.56000	0
-10°C, 4.5Vdc	13.56000	0
-20°C, 4.5Vdc	13.56000	0
-30°C, 4.5Vdc	13.56050	+0.0037
Maximum frequency Tolerance (%)	+0.0037	

Requirement 15.255(e):

The frequency tolerance of the carrier signal shall be less than ±0.01% (± 100ppm).

4.2 20 dB Bandwidth

Para. No.: RSS-Gen

Test Performed By: G.Suhanthakumar	**Date of Test: 03.05.2012**

Test Results: Complies

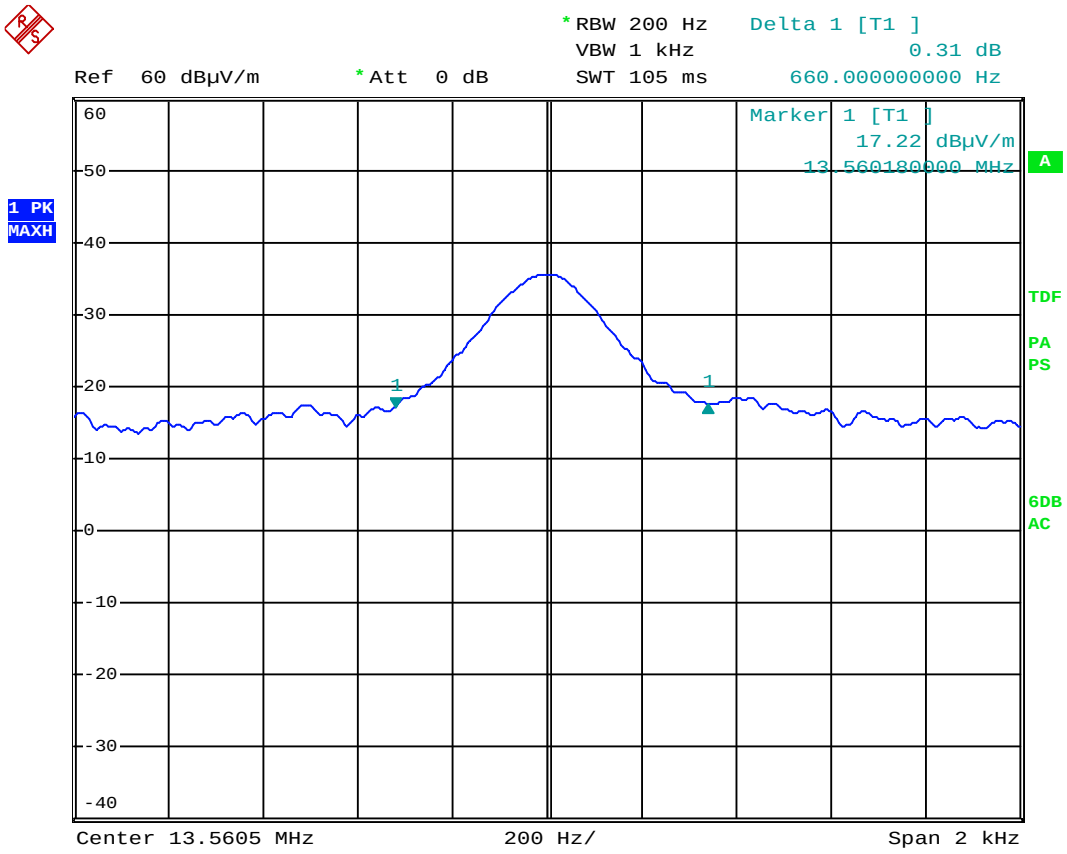
Measurement Data:

20 dB Bandwidth (Hz)		
-	**13.56MHz**	**-**
-	660	-

Performed using new battery.

Requirements:

For information only



Date: 3.MAY.2012 09:05:17

13.56MHz – 20 dB bandwidth – 660Hz

4.3 Maximum Field strength

Para. No.: 15.225 (a)/A.2,6

Test Performed By: G.Suhanthakumar	**Date of Test: 23.05.2012**

Test Results: Complies

Measurement Data:

Maximum Field strength

RF channel	**13.56MHz**
Measured value (dBµV/m) @30m*	15.0

***Measured @10m and corrected for distance**

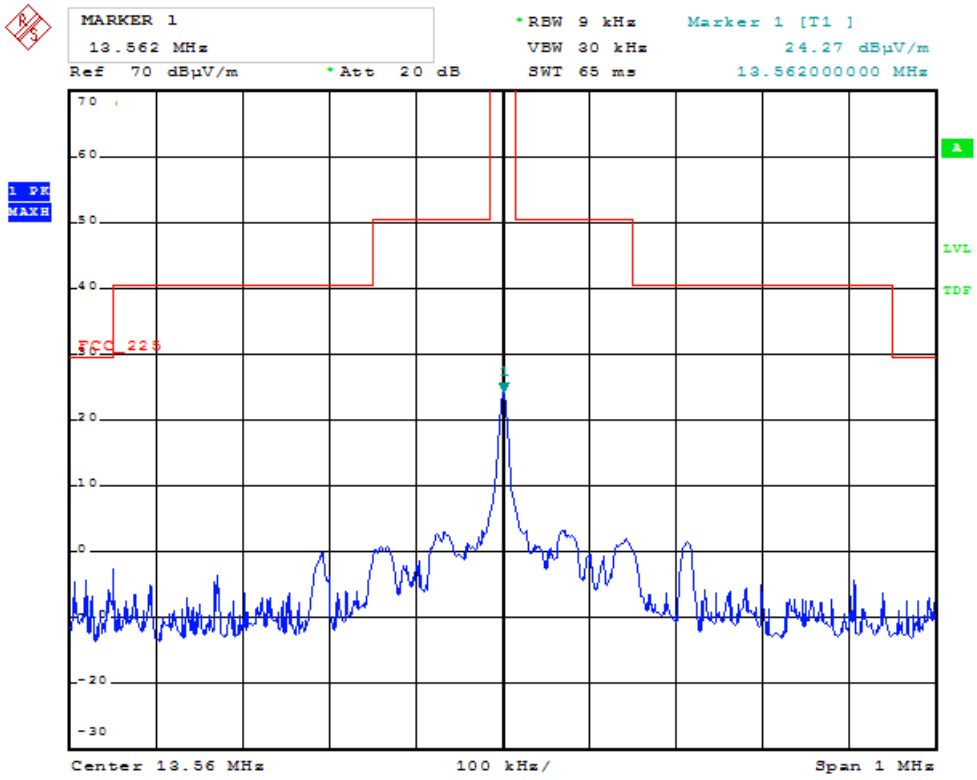
Detachable antenna?	☐ Yes	☒ No
If detachable, is the antenna connector non-standard?	☐ Yes	☐ No

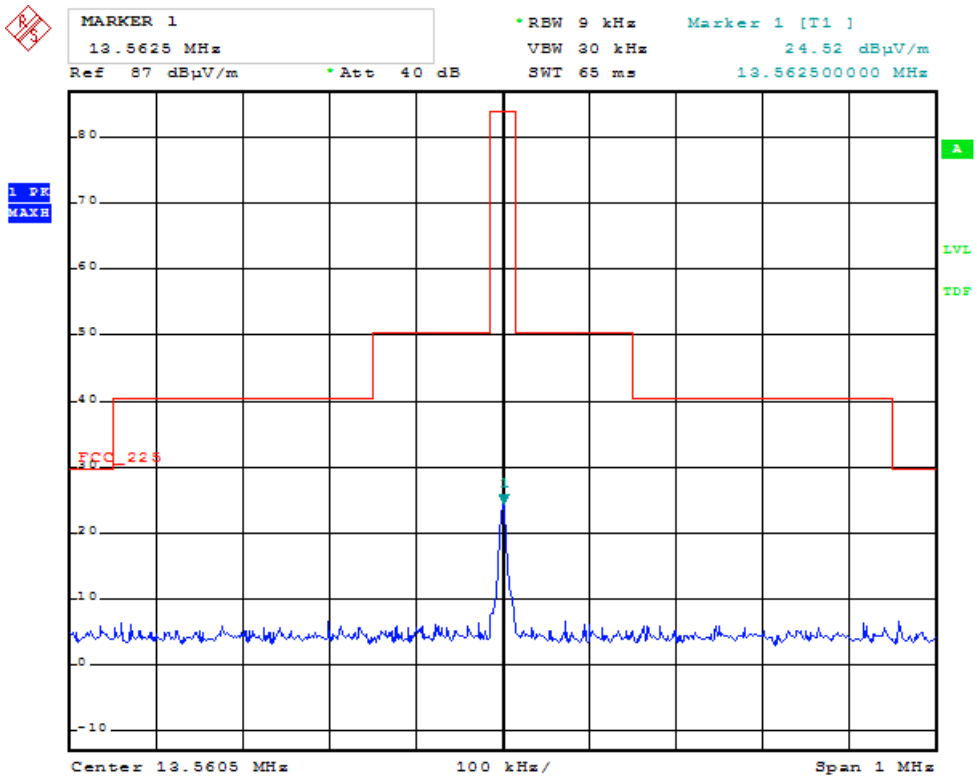
Reversed SMA connector

Performed using new battery.

Requirements:

The maximum peak output power shall be ≤ 84dBµV/m @30m





Maximum field strength and emission mask

4.4 Spurious Emissions (Radiated)

Para. No.: 15.225/A2.6

Test Performed By: G.Suhanthakumar	**Date of Test: 03.05.2012**

Test Results: Complies

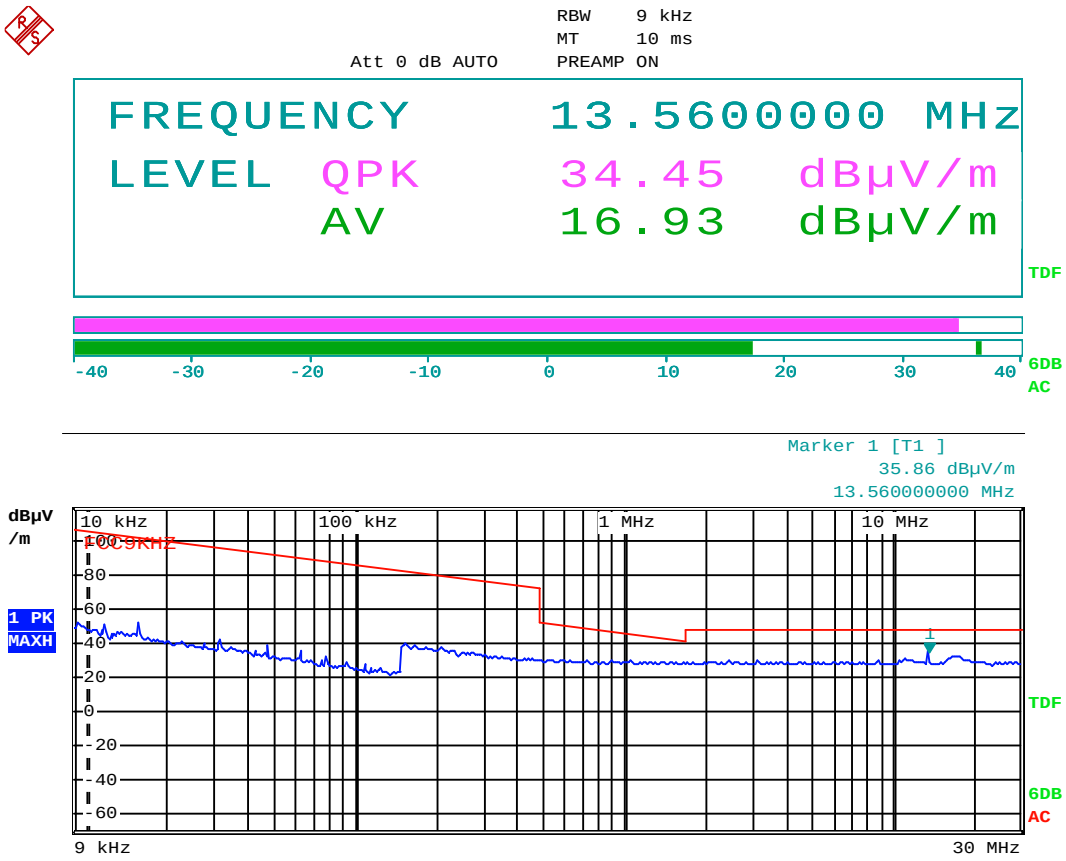
Measurement Data:

Radiated emissions 9kHz - 30 MHz.

Detector: Quasi-Peak

Measuring distance 10 m.

Frequency	Operational condition	Field strength	Measuring distance	Limit FCC15.209	Margin
MHz		dBµV/m	m	dBµV/m	dB
-	TX on	-	10	-	-



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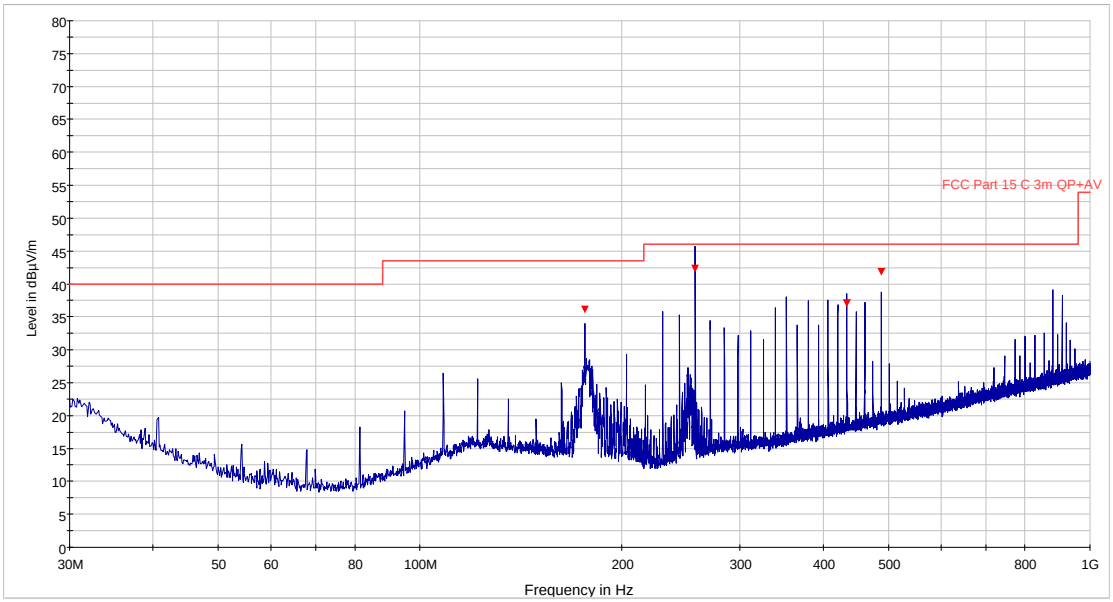
9kHz - 30MHz

Radiated emissions 30 – 1000 MHz.

Detector: Peak

Measuring distance 3 m.



Frequency MHz	QuasiPeak dBµV/m	Meas. Time ms	Bandwidth kHz	Height cm	Polarization	Azimuth deg	Corr. dB	Margin dB	Limit dBµV/m
176.252565	36.1	1000.0	120.000	128.0	H	105.0	-10.7	7.4	43.5
257.627920	42.4	1000.0	120.000	100.0	H	94.0	-10.3	3.6	46.0
433.921404	37.1	1000.0	120.000	236.0	H	2.0	-5.8	8.9	46.0
488.179304	41.8	1000.0	120.000	196.0	H	4.0	-4.6	4.2	46.0

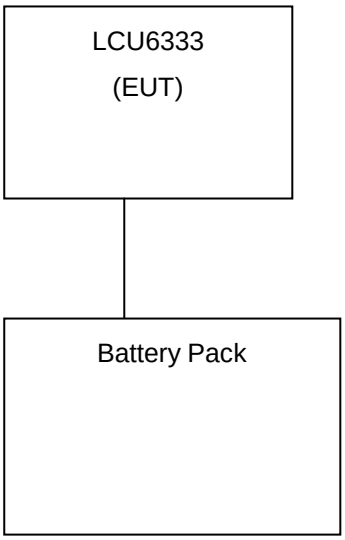
5 LIST OF TEST EQUIPMENT

To facilitate inclusion on each page of the test equipment used for related tests, each item of test equipment and ancillaries are identified (numbered) by the Test Laboratory.

No.	Model number	Description	Manufacturer	Ref. no.	Cal. date	Cal. Due
1.	ESCI	EMI Receiver	Rohde & Schwarz	N 4259	2011.12.21	2012.12.21
2.	LNA6900	Amplifier, preamp	Testseq	LR 1593	2011.11.24	2013.11.24
3.	JB3	Antenna Bilog	Sunol Sciences	N-4525	2011.09.09	2012.09.09
4.	HFH2-Z2	Rohde & Schwarz	Rohde & Schwarz	LR 285	2011.10.08	2013.10.08
5.	FSP	Spectrum analyser	Rohde & Schwarz	LR 1551	2011.04.05	2013.04.05
6.	87V	Multimeter,Digital	Fluke	LR 1597	2011.11.02	2012.11.02

6 BLOCK DIAGRAM

6.1 System set up for radiated measurements



Test equipment: 1,2,3,4,5,6

6.2 Test Site Radiated Emission