




## Test Report

<b>Product</b>	RFID Room Display	
<b>Name and address of the applicant</b>	Ascom Sweden AB Grimbodalen 2, P.O. Box 8783, Goteborg, SE-40276, Sweden	
<b>Name and address of the manufacturer</b>	Ascom Sweden AB Grimbodalen 2, P.O. Box 8783, Goteborg, SE-40276, Sweden	
<b>Model</b>	NIRD	
<b>Rating</b>	24 V DC	
<b>Trademark</b>	Ascom	
<b>Serial number</b>	/	
<b>Additional information</b>	/	
<b>Tested according to</b>	FCC Part 15.225 Low Power Transmitter 13.110 - 14.010 MHz Band RSS-210, Issue 8 Low-Power Licence-exempt Radiocommunications devices 13.110 - 14.010 MHz Band	
<b>Order number</b>	244847	
<b>Tested in period</b>	2013-09-24 to 2013-10-08	
<b>Issue date</b>	2013-10-14	
<b>Name and address of the testing laboratory</b>	  Instituttveien 6 Kjeller, Norway	FCC No: 994405 IC OATS: 2040D-1  TEL: (+47) 22 96 03 30 FAX: (+47) 22 96 05 50
	 Prepared by [G.Suhanthakumar]	 Approved by [Frode Sveinsen]
This report shall not be reproduced except in full without the written approval of Nemko. Opinions and interpretations expressed within this report are not part of the current accreditation. This report was originally distributed electronically with digital signatures. For more information contact Nemko.		

## CONTENTS

<b>Test Report</b> .....	<b>1</b>
<b>1 TEST INFORMATION</b> .....	<b>3</b>
1.1 Test item .....	3
1.2 Test environment .....	4
1.3 Test period.....	4
<b>2 TEST REPORT SUMMARY</b> .....	<b>5</b>
2.1 General.....	5
2.2 Test summary .....	6
2.3 Description of modification for modification filing .....	6
2.4 Comments .....	6
2.5 Family list rationale .....	6
<b>3 TEST RESULTS</b> .....	<b>7</b>
3.1 Power Line Conducted Emissions .....	7
3.2 Occupied Bandwidth.....	10
3.3 Peak power output.....	12
3.4 Spurious emissions (radiated) .....	14
3.5 Transmitter Frequency Stability .....	17
<b>4 LIST OF TEST EQUIPMENT</b> .....	<b>18</b>
<b>5 BLOCK DIAGRAM</b> .....	<b>19</b>
5.1 System set up for radiated measurements .....	19
5.2 Test site radiated emission .....	20
5.3 Power Line Conducted Emission.....	20
5.4 Test Site Radiated Emission.....	20

## 1 TEST INFORMATION

### 1.1 Test item

Name :	Ascom
Model/version :	NIRD-GAA NIRD-WAA
FCC ID:	BXZNIRD
IC ID:	3724B-NIRD
Serial number :	-
Hardware identity and/or version:	-
Software identity and/or version :	-
Operating frequency:	13.56 MHz
Assigned frequency band :	13.553 – 13.567 MHz
Tuneable Bands :	None
Number of Channels :	One
Operating Modes :	TX & RX
Type of Modulation :	FSK
User Frequency Adjustment :	None
Rated Output Power :	N/A
Type of Power Supply :	External power 24 V DC via Auxiliary device
Antenna Type :	Integral loop antenna

#### Description of Tested Device(s)

The teleCARE IP Room Display (NIRD) combines a doorside module, a room display and an RFID card reader in a wall mounted module which is suitable for patient rooms and staff rooms.

## 1.2 Test environment

### 1.2.1 Normal test condition

Temperature:	20.6 – 23.3 °C
Relative humidity:	33 – 47 %
Normal test voltage:	24 V DC

The values are the limit registered during the test period.

## 1.3 Test period

Item received date:	2013-09-24
Test period :	from 2013-09-24 to 2013-10-08

## 2 TEST REPORT SUMMARY

### 2.1 General

All measurements are traceable to national standards.

The tests were conducted for the purpose of demonstrating compliance with FCC CFR 47 Part 15.225 and Industry Canada RSS-210, Issue 8 and RSS-GEN, Issue 3.

Radiated tests were conducted in accordance with ANSI C63.4-2003 and ANSI C63.10-2009. The radiated tests were made in a semi-anechoic chamber at measuring distances of 3 and 10 meters.

New Submission

Production Unit

Class II Permissive Change

Pre-production Unit

**DXT** Equipment Code

Family Listing



#### **THIS TEST REPORT APPLIES ONLY TO THE ITEM(S) AND CONFIGURATIONS TESTED.**

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

Nemko Group authorizes the above named company to reproduce this report provided it is reproduced in its entirety and for use by the company's employees only. Any reproduction of parts of this report requires approval in writing from Nemko Group.

Any use which a third party makes of this report, or any reliance on or decisions to be made based on it, are the responsibility of such third parties. Nemko Group accepts no responsibility for damages suffered by any third party as a result of decisions made or actions based on this report.

## 2.2 Test summary

Name of test	FCC Part 15 reference	RSS-210 Issue 8 & RSS-GEN Issue 3	Result
Supply Voltage Variations	15.31(e)	N/A	Complies <sup>1</sup>
Antenna Requirement	15.203	7.1.4 (RSS-GEN)	NA <sup>2</sup>
Power-line Conducted Emission	15.207(c)	7.2.2 (RSS-GEN)	Complies <sup>1</sup>
Occupied Bandwidth	N/A	4.6.1 (RSS-GEN)	-
Peak Power Output	15.225(a)	A2.6	Complies
Band Emissions	15.225(b)(c)	A.2.6(b)(c)	Complies
Spurious Emissions (Radiated)	15.225 (d) 15.209	A2.6(d) 4.9 (RSS-GEN)	Complies
Frequency stability	15.225(e)	A2.6	Complies

<sup>1</sup> EUT is powered 24Vdc via auxiliary device.

<sup>2</sup> Integral loop antenna

RSS Gen issue 3 covers section 7 & 6

RSS 210 issue 8 covers section A2.9

## 2.3 Description of modification for modification filing

Not applicable.

## 2.4 Comments

And the output level is set to maximum in the software.

## 2.5 Family list rationale

Not Applicable.

### 3 TEST RESULTS

#### 3.1 Power Line Conducted Emissions

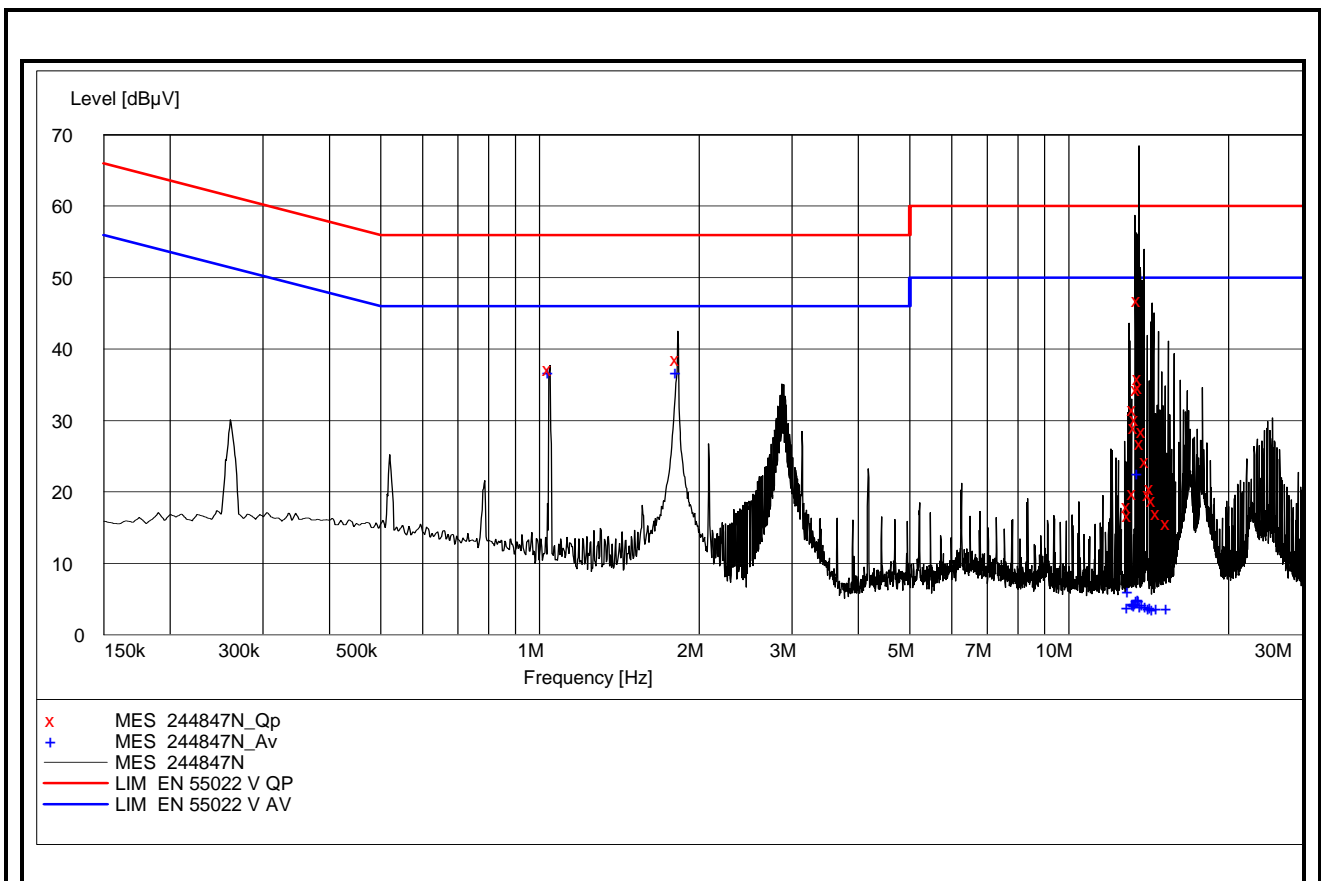
Para. No.: 15.207 (a)

The EUT is powered 24Vdc via auxiliary equipment.

Test Performed By: G.Suhanthakumar	Date of Test: 08 Oct. 2013
------------------------------------	----------------------------

Measurement procedure: ANSI C63.4-2003 using 50 µH/50 ohms LISN.  
 Test Results: Complies  
 Measurement Data: See attached graph, (Peak detector).

Øltronix Power supply unit model B32-10R is used for 24Vdc



Assigned band 13.110 - 14.010 MHz Band

Frequency [MHz]	Level [dBuV]	Af [dB]	Limit [dBuV]	Margin [dB]	Det	Position	Verdict [Pass/Fail]
1.045000	37.20	10.20	56.00	18.80	QP	N	Pass
1.820000	38.60	10.20	56.00	17.40	QP	N	Pass
13.000000	18.10	10.70	60.00	41.90	QP	L1	Pass
13.015000	16.80	10.70	60.00	43.20	QP	N	NA*
13.315000	19.90	10.70	60.00	40.10	QP	L1	NA*
13.345000	31.70	10.70	60.00	28.30	QP	N	NA*
13.415000	29.10	10.70	60.00	30.90	QP	L1	NA*
13.445000	30.20	10.70	60.00	29.80	QP	N	NA*
13.525000	34.40	10.80	60.00	25.60	QP	L1	NA*
13.550000	46.80	10.80	60.00	13.20	QP	N	NA*
13.625000	36.00	10.80	60.00	24.00	QP	L1	NA*
13.655000	34.70	10.80	60.00	25.30	QP	N	NA*
13.745000	26.90	10.80	60.00	33.10	QP	N	NA*
13.850000	28.50	10.80	60.00	31.50	QP	N	NA*
14.050000	24.30	10.80	60.00	35.70	QP	L1	NA*
14.275000	19.70	10.80	60.00	40.30	QP	N	Pass
14.340000	20.60	10.80	60.00	39.40	QP	L1	Pass
14.475000	18.90	10.80	60.00	41.10	QP	N	Pass
14.770000	17.10	10.80	60.00	42.90	QP	L1	Pass
15.390000	15.70	10.80	60.00	44.30	QP	L1	Pass

NA\*: Assigned band 13.110 - 14.010 MHz Band

N: Positive, L1:Negative



Frequency [MHz]	Level [dBuV]	Af [dB]	Limit [dBuV]	Margin [dB]	Det	Position	Verdict [Pass/Fail]
1.045000	36.80	10.20	46.00	9.20	AV	N	Pass
1.820000	36.80	10.20	46.00	9.20	AV	N	Pass
13.000000	3.90	10.70	50.00	46.10	AV	L1	Pass
13.015000	6.10	10.70	50.00	43.90	AV	N	NA*
13.315000	4.40	10.70	50.00	45.60	AV	L1	NA*
13.345000	4.30	10.70	50.00	45.70	AV	N	NA*
13.415000	4.20	10.70	50.00	45.80	AV	L1	NA*
13.445000	4.50	10.70	50.00	45.50	AV	N	NA*
13.525000	4.80	10.80	50.00	45.20	AV	L1	NA*
13.550000	22.70	10.80	50.00	27.30	AV	N	NA*
13.625000	5.00	10.80	50.00	45.00	AV	L1	NA*
13.655000	4.80	10.80	50.00	45.20	AV	N	NA*
13.745000	4.00	10.80	50.00	46.00	AV	N	NA*
13.850000	4.30	10.80	50.00	45.70	AV	N	NA*
14.050000	4.00	10.80	50.00	46.00	AV	L1	NA*
14.275000	3.80	10.80	50.00	46.20	AV	N	Pass
14.340000	3.90	10.80	50.00	46.10	AV	L1	Pass
14.475000	3.60	10.80	50.00	46.40	AV	N	Pass
14.770000	3.70	10.80	50.00	46.30	AV	L1	Pass
15.390000	3.80	10.80	50.00	46.20	AV	L1	Pass

NA\*: Assigned band 13.110 - 14.010 MHz Band

N: Positive, L1:Negative

### 3.2 Occupied Bandwidth

Para. No.: RSS-Gen

Test Performed By: G.Suhandhakumar	Date of Test: 04-Oct-2013
------------------------------------	---------------------------

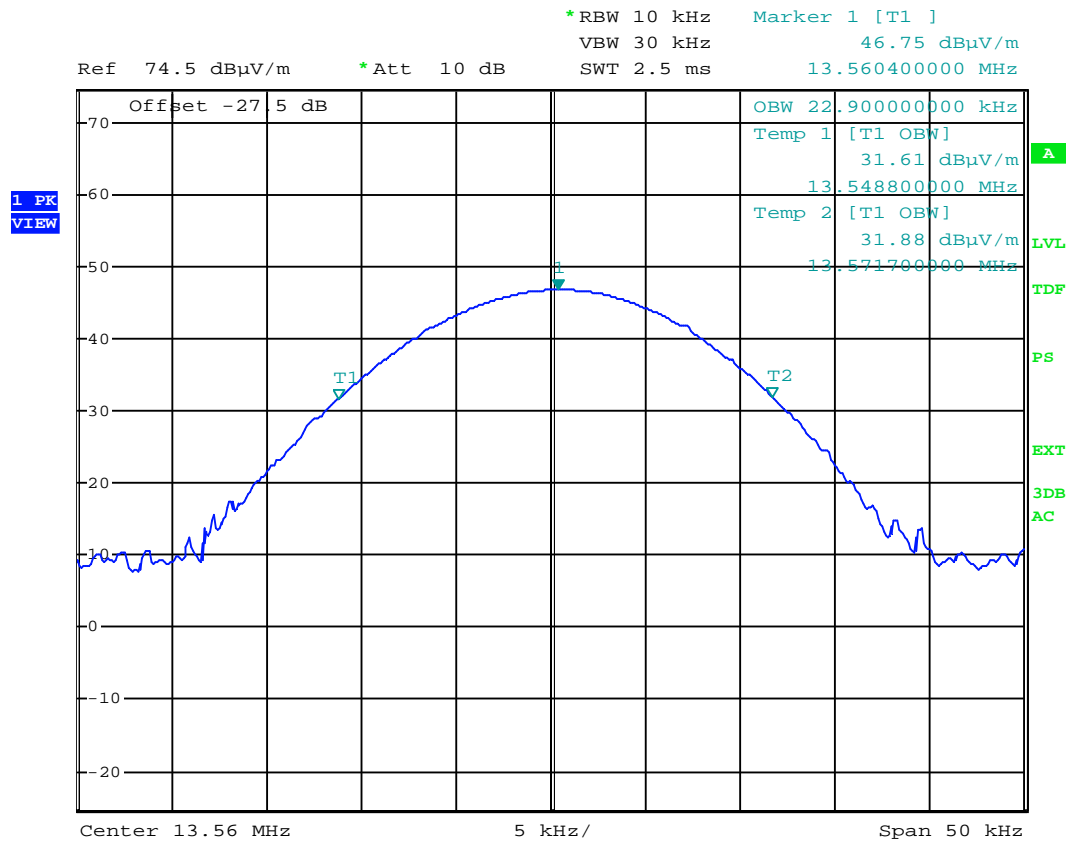
Test Results: Complies

Measurement Data:

OBW (kHz)
13.56MHz
22.9

Requirements:

For information only



Date: 4.OCT.2013 08:17:41

**13.56MHz – OBW – 22.6kHz**

### 3.3 Peak power output

Para. No.: 15.225 (a) / A2.9

Test Performed By: G.Suhanthakumar	Date of Test: 25 Sept 2013
------------------------------------	----------------------------

**Test Results: Complies**

**Measurement data:**

**Maximum field strength**

RF channel	13.56MHz
Measured value (dB $\mu$ V/m)	46.06

Radiated measurements are performed at 10 m distance.

Detachable antenna?

Yes  No

If detachable, is the antenna connector non-standard?

Yes  No

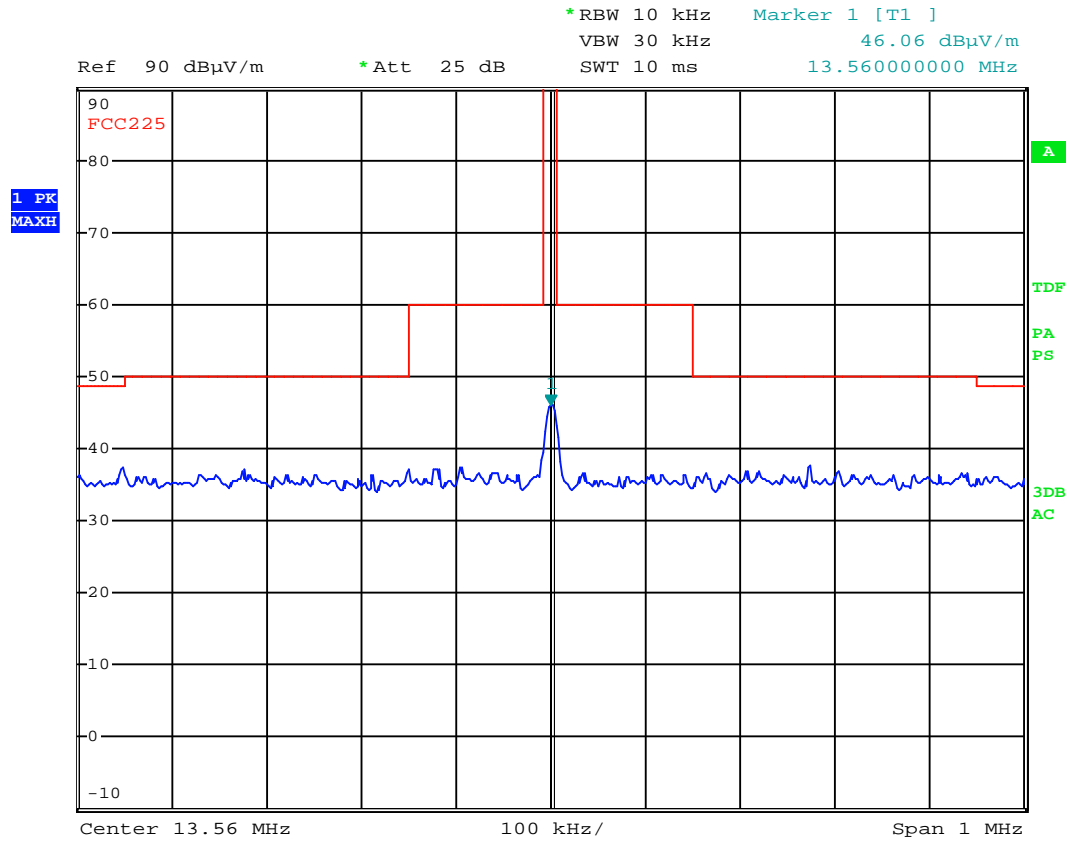
Integral loop antenna

**Requirements:**

The maximum field strength within band 13.553 – 13.567MHz at 30 meters shall be  $\leq$  83.99 dB $\mu$ V/m (at 10 meters  $\leq$  93.49 dB $\mu$ V/m)

(b) 334 microvolts/m (50.5 dB $\mu$ V/m) at 30 m, within the bands 13.410-13.553 MHz and 13.567-13.710 MHz. (at 10 meters  $\leq$  60 dB $\mu$ V/m)

(c) 106 microvolts/m (40.5 dB $\mu$ V/m) at 30 m, within the bands 13.110-13.410 MHz and 13.710-14.010 MHz. (at 10 meters  $\leq$  50 dB $\mu$ V/m)



Date: 25.SEP.2013 16:11:37

Field strength at Longitudinal polarization – 13.56MHz

### 3.4 Spurious emissions (radiated)

Para. No.: 15.209 / 15.225 (b,c,d) / A2.6 / 4.9

Test Performed By: G.Suhanthakumar	Date of Test: 25 Sept.2013
------------------------------------	----------------------------

**Test Results: Complies**

**Measurement Data:**

**Radiated Emissions with loop antenna, 9kHz – 30MHz**

9kHz -30MHz measured at a distance of 10m.

**Measured with Peak Detector:**

Frequency	Dist. corr. factor	Field strength, Peak	Duty cycle corr. factor	Limit	Margin
MHz	dB	dB $\mu$ V/m	dB	dB $\mu$ V/m	dB
0.0356	20	43.18	-	95.8	52.6

The maximum is observed in transverse polarization

Antenna factor, amplifier gain and cable loss are included in spectrum analyzer "Transducer factor".

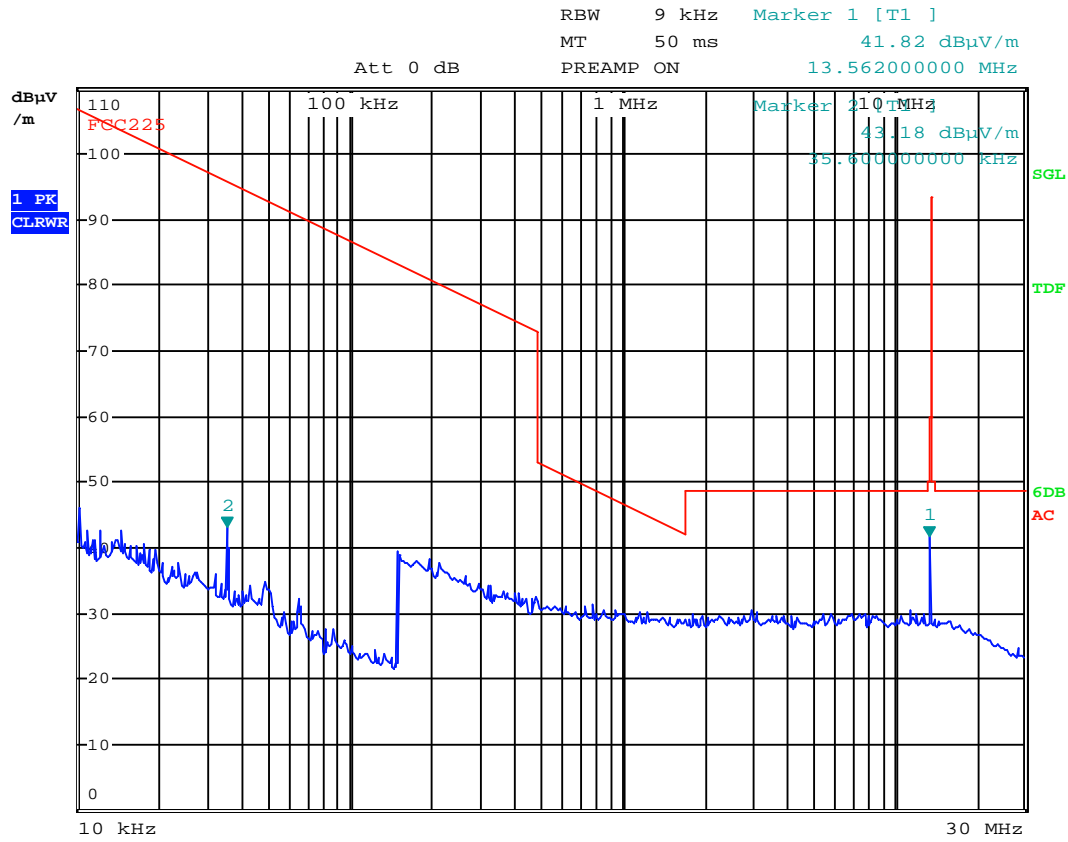
**Requirement:**

(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.

**Radiated emissions 9kHz – 30 MHz.**

Detector: Peak

Measuring distance 10 m.



Date: 25.SEP.2013 14:07:19

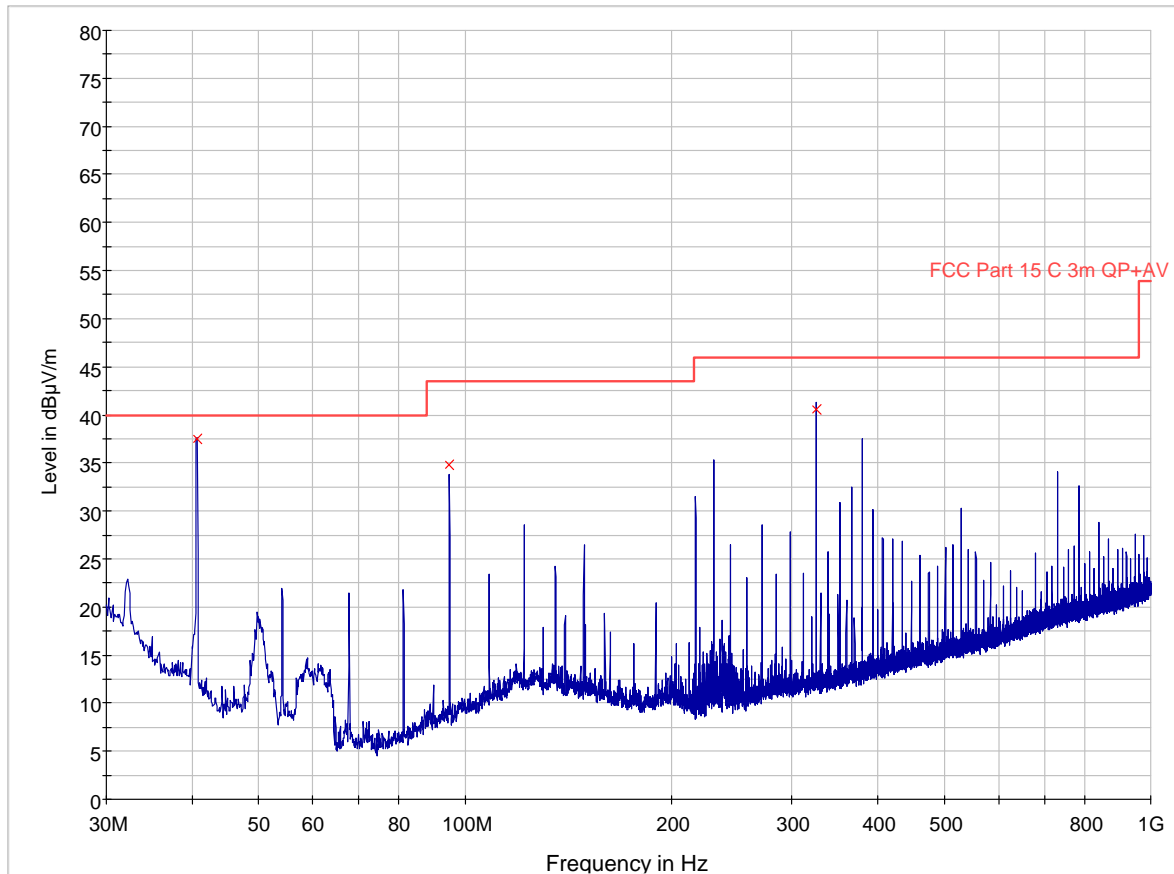
**Radiated emissions 30 – 1000 MHz.**

Detector: Peak

Measuring distance 3 m.

The graph shows peak scan and highest values. Since there is no spurious emission found thus no QP values are measured.

**FCC Pt15 Class C 30-1000 MHz 3m**



**30 - 1000MHz**

Frequency (MHz)	QuasiPeak (dBµV/m)	Bandwidth (kHz)	Margin (dB)	Limit (dBµV/m)	Comment
40.680962	37.5	120.000	2.5	40.0	
94.922205	34.9	120.000	8.6	43.5	
325.447321	40.6	120.000	5.4	46.0	



### 3.5 Transmitter Frequency Stability

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

Test Performed By: G.Suhandhakumar	Date of Test: 04-Oct-2013
------------------------------------	---------------------------

**Measurement Data:**

Temperature	Given Frequency (MHz)	Measured value (MHz)	Deviation (%)
+50 ° C	13.56	13.560402	0.0030
+40 ° C	13.56	13.560294	0.0022
+30 ° C	13.56	13.560314	0.0023
+20 ° C	13.56	13.56032	0.0024
+10 ° C	13.56	13.560326	0.0024
+0 ° C	13.56	13.560342	0.0025
-10 ° C	13.56	13.560462	0.0034
-20 ° C	13.56	13.560302	0.0022

**Requirement:**

(e) The frequency tolerance of the carrier signal shall be maintained within  $\pm 0.01\%$  of the operating frequency over a temperature variation of -20 degrees to +50 degrees C at normal supply voltage.

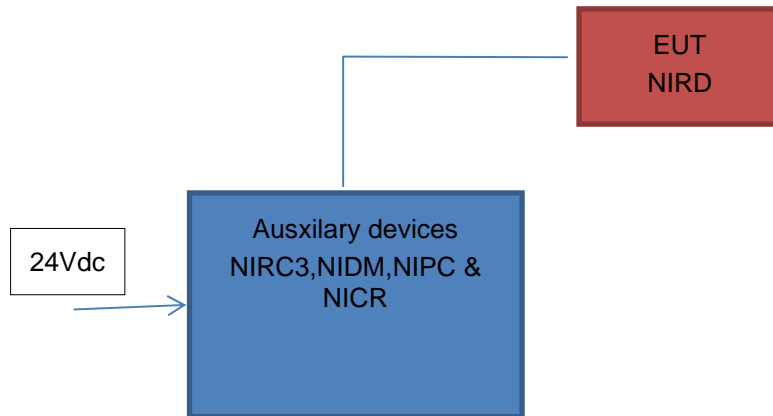
## 4 LIST OF TEST EQUIPMENT

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	N4259	2013.03.21	2014.03.21
2.	6810.17A	Attenuator	Suhner	LR 1185	2011.10.18	2013.10.18
3.	87V	Multimeter, Digital	Fluke	LR1599	2012.12.15	2014.12.15
4.	HFH2-Z2	Antenna loop	Rohde and Schwarz	LR 285	2010.10.08	2013.10.08
5.	10855A	Amplifier	Hewlett Packard	LR 1445	2012.09.20	2014.09.20
6.	LNA6900	Amplifier, low noise	Teseq	LR1593	2011.11.24	2013.11.24
7.	JB3	Antenna ,Bilog	Sunol Sciences	N4525	2012.10.11	2013.10.11
8.	ESH3-75	2 line V network	Rohde & Schwarz	LR1076	2011.11.04	2013.11.04
9.	ES-H3-Z2	Puls Limiter	Rohde & Schwarz	LR1074	2012.04.24	2014.04.24
10.	ESHS10	EMI Receiver	Rohde & Schwarz	N3528	2013.09.09	2014.09.09
11.	B32-10R2177	DC Power Supply	Oltronix	LR1021	Cal b4 use	
12.	FA210A1010 003030	Microwave cable	Rosenberger	LR1566	Cal b4 use	

## 5 BLOCK DIAGRAM

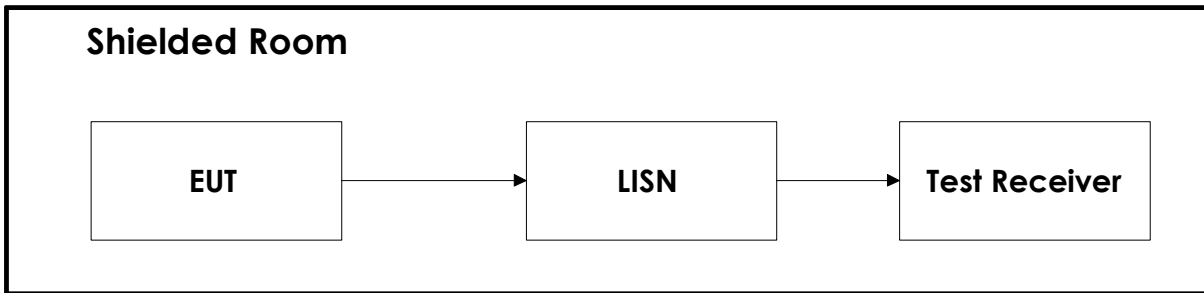
### 5.1 System set up for radiated measurements



*Test equipment: 1- 12*

## 5.2 Test site radiated emission

## 5.3 Power Line Conducted Emission



## 5.4 Test Site Radiated Emission

