




Test Report

Product	RFID Card Reader	
Name and address of the applicant	Ascom Sweden AB Grimbodalen 2, P.O. Box 8783, Goteborg, SE-40276, Sweden	
Name and address of the manufacturer	Ascom Sweden AB Grimbodalen 2, P.O. Box 8783, Goteborg, SE-40276, Sweden	
Model	NICR	
Rating	24 V DC	
Trademark	Ascom	
Serial number	/	
Additional information	/	
Tested according to	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	
Order number	244847	
Tested in period	2013-09-24 – 2013-10-08	
Issue date	2013-10-14	
Name and address of the testing laboratory	 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.		

Template version: B

Nemko Norway

 Nemko AS, Instituttveien 6, P.O. Box 96 Kjeller, 2027 Kjeller, Norway
 TEL +47 22 96 03 30 FAX +47 22 96 05 50 EMAIL info@nemko.com
 ENTERPRISE NUMBER NO974404532

nemko.com/no

CONTENTS

Test Report	1
1 TEST INFORMATION	3
1.1 Test item	3
1.2 Test environment	4
1.3 Test period.....	4
2 TEST REPORT SUMMARY	5
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
3 TEST RESULTS	7
3.1 Power Line Conducted Emissions	7
3.2 Occupied Bandwidth.....	9
3.3 Peak power output.....	11
3.4 Spurious emissions (radiated)	13
3.5 Transmitter Frequency Stability	16
4 LIST OF TEST EQUIPMENT	17
5 BLOCK DIAGRAM	18
5.1 System set up for radiated measurements	18
5.2 Test site radiated emission	19
5.3 Power Line Conducted Emission.....	19
5.4 Test Site Radiated Emission.....	19

1 TEST INFORMATION

1.1 Test item

Name :	Ascom
Model/version :	NICR-G0N NICR-W0N
FCC ID:	BXZNICR
IC ID:	3724B-NICR
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 24Vdc via Auxilary device
Antenna Type :	Integral loop antenna

Description of Tested Device(s)

The Card Reader Module (NICR) is a single switch module suitable for use in the teleCARE IP system. It is an RFID device operating at a frequency of 13.56 MHz for use with contactless smartcards.

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 ¹
Antenna Requirement	15.203	7.1.4 (RSS-GEN)	NA ²
Power-line Conducted Emission	15.207(c)	7.2.2 (RSS-GEN)	Complies ¹
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

¹ EUT is powered 24Vdc via auxiliary device.

² 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

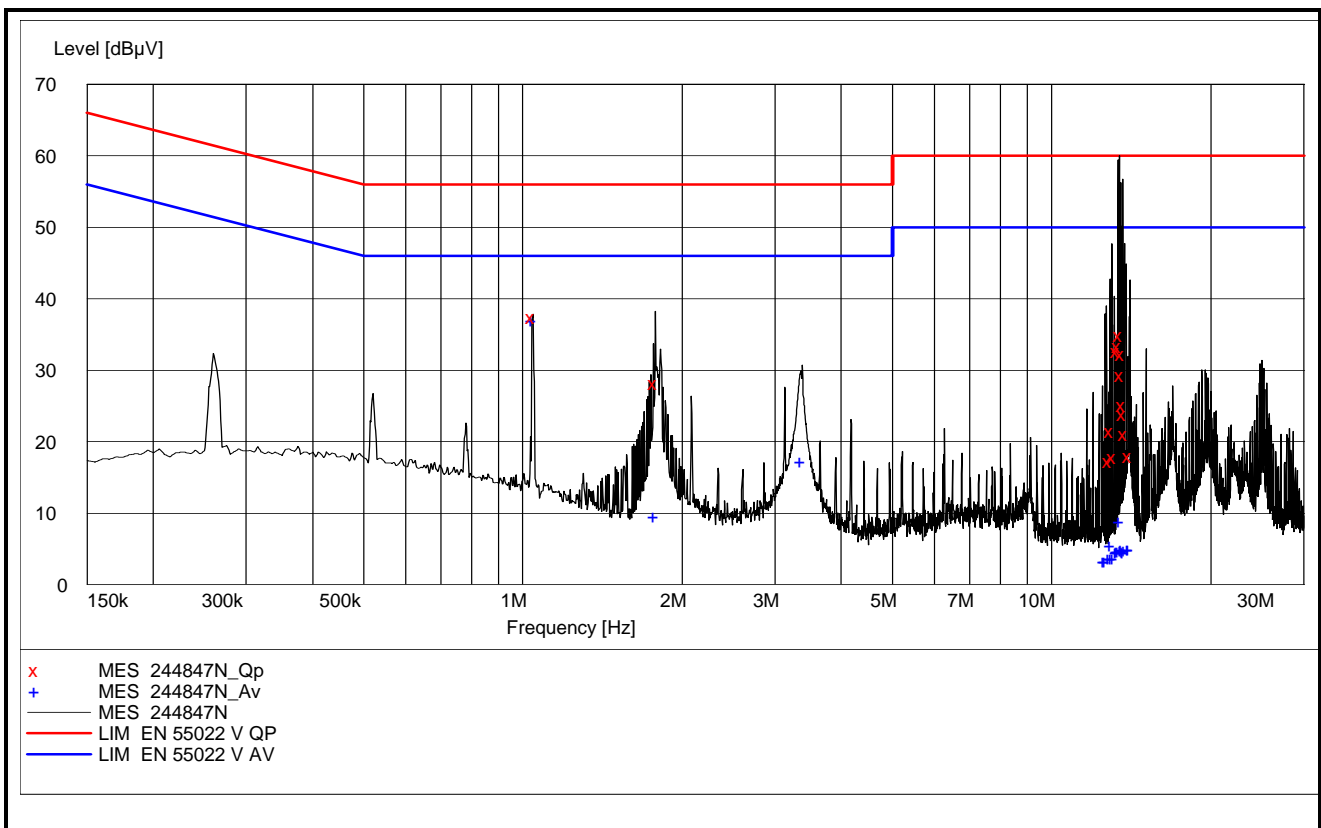
Para. No.: 15.207 (a)

The EUT is powered 24Vdc via auxiliary equipment.

Test Performed By: G.Suwanthakumar	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	37.50	10.20	56.00	18.50	QP	N	Pass
1.780000	28.20	10.20	56.00	27.80	QP	N	Pass
12.925000	17.30	10.70	60.00	42.70	QP	N	Pass
13.005000	21.50	10.70	60.00	38.50	QP	L1	Pass
13.125000	17.90	10.70	60.00	42.10	QP	N	NA*
13.350000	32.60	10.70	60.00	27.40	QP	N	NA*
13.425000	33.40	10.70	60.00	26.60	QP	L1	NA*
13.535000	34.90	10.80	60.00	25.10	QP	L1	NA*
13.610000	29.40	10.80	60.00	30.60	QP	N	NA*
13.630000	32.30	10.80	60.00	27.70	QP	L1	NA*
13.715000	25.20	10.80	60.00	34.80	QP	N	NA*
13.735000	23.80	10.80	60.00	36.20	QP	L1	NA*
13.835000	21.10	10.80	60.00	38.90	QP	N	NA*
14.065000	18.00	10.80	60.00	42.00	QP	L1	NA*

NA*: Assinged 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	37.00	10.20	46.00	9.00	AV	N	Pass
1.780000	9.60	10.20	46.00	36.40	AV	N	Pass
3.380000	17.30	10.30	46.00	28.70	AV	N	Pass
12.630000	3.30	10.70	50.00	46.70	AV	N	Pass
12.705000	3.30	10.70	50.00	46.70	AV	L1	Pass
12.925000	3.70	10.70	50.00	46.30	AV	N	Pass
13.005000	5.50	10.70	50.00	44.50	AV	L1	Pass
13.030000	3.70	10.70	50.00	46.30	AV	N	Pass
13.125000	3.70	10.70	50.00	46.30	AV	N	NA*
13.340000	4.50	10.70	50.00	45.50	AV	L1	NA*
13.350000	4.70	10.70	50.00	45.30	AV	N	NA*
13.425000	4.70	10.70	50.00	45.30	AV	L1	NA*
13.535000	9.00	10.80	50.00	41.00	AV	L1	NA*
13.610000	4.80	10.80	50.00	45.20	AV	N	NA*
13.630000	4.90	10.80	50.00	45.10	AV	L1	NA*
13.715000	4.70	10.80	50.00	45.30	AV	N	NA*
13.735000	4.50	10.80	50.00	45.50	AV	L1	NA*
13.835000	4.80	10.80	50.00	45.20	AV	N	NA*
14.045000	5.00	10.80	50.00	45.00	AV	N	Pass
14.065000	5.00	10.80	50.00	45.00	AV	L1	Pass

NA*: Assinged 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
------------------------------------	---------------------------

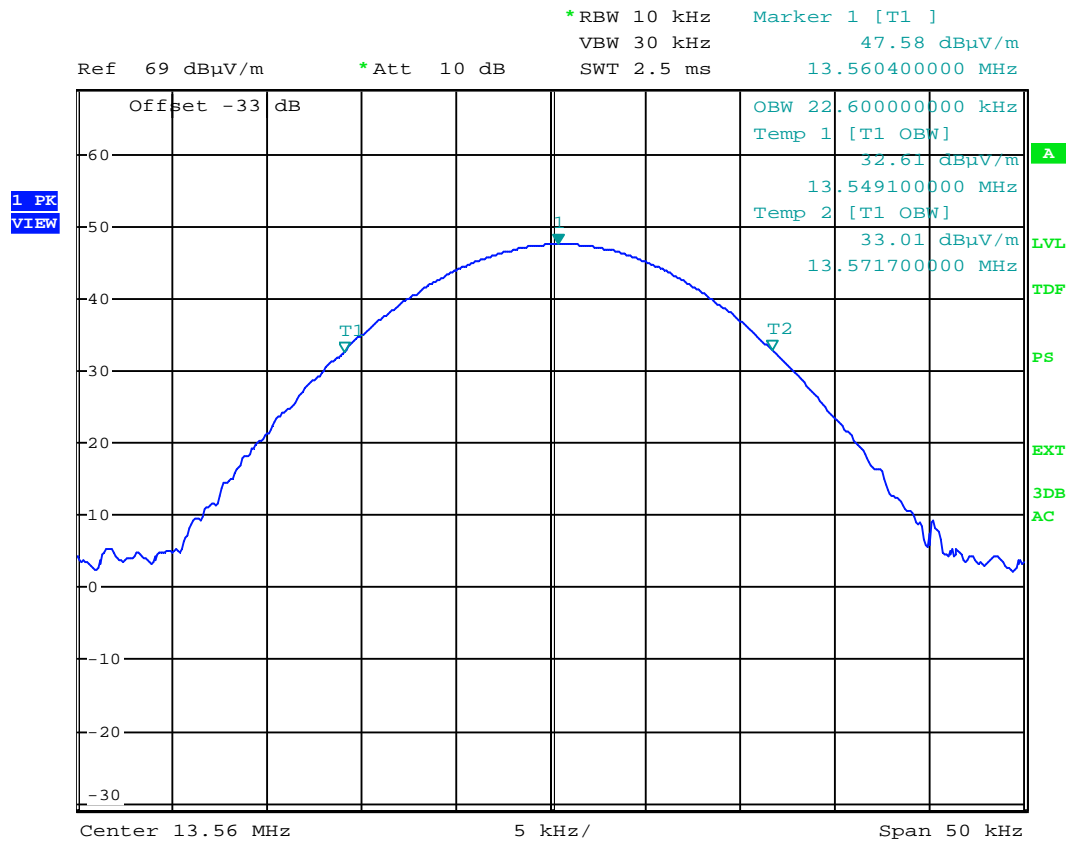
Test Results: Complies

Measurement Data:

OBW (kHz)
13.56MHz
22.6

Requirements:

For information only



Date: 4.OCT.2013 08:19:58

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 μ V/m)	43.53

Radiated measurements are performed at 10 m distance.

Detachable antenna?

Yes No

If detachable, is the antenna connector non-standard?

Yes No

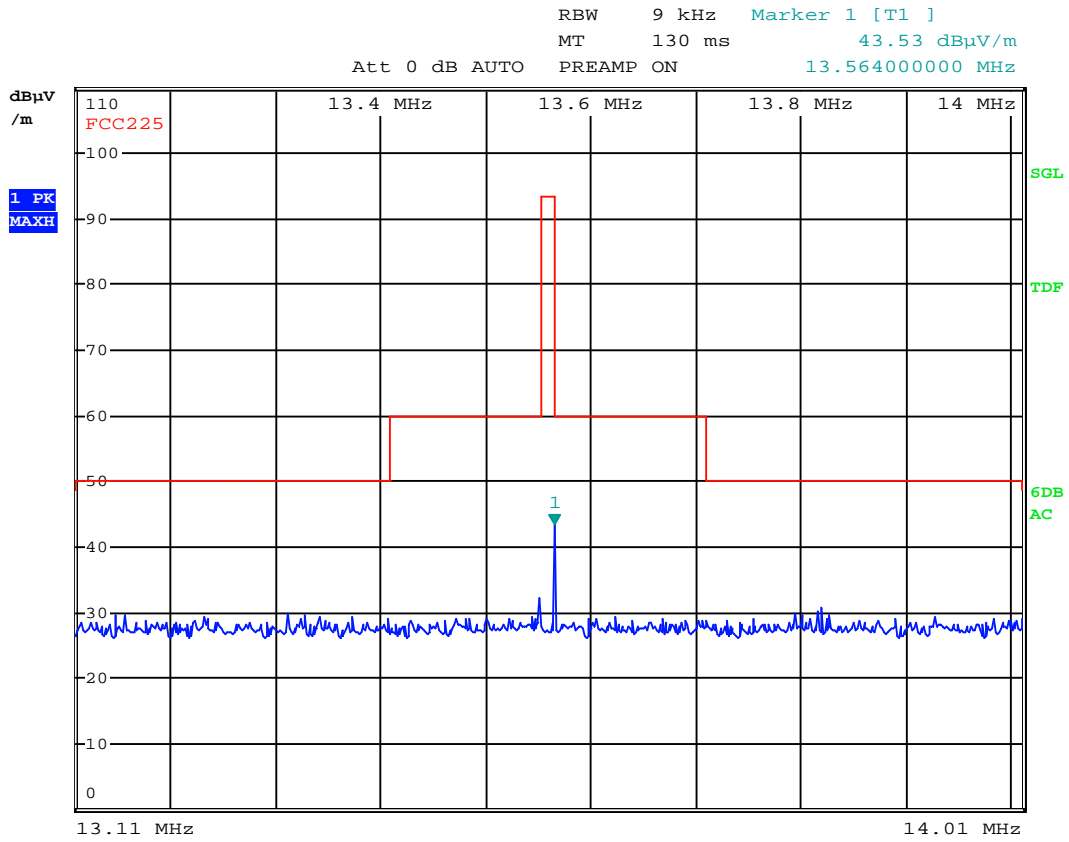
Integral loop antenna

Requirements:

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

(b) 334 microvolts/m (50.5 dB μ 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 μ V/m)

(c) 106 microvolts/m (40.5 dB μ 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 μ V/m)



Date: 25.SEP.2013 15:37:24

Field strength at transverse 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 μ V/m	dB	dB μ V/m	dB
0.0356	20	43.14	-	95.8	52.7

The maximum is observed in transverse polarization

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

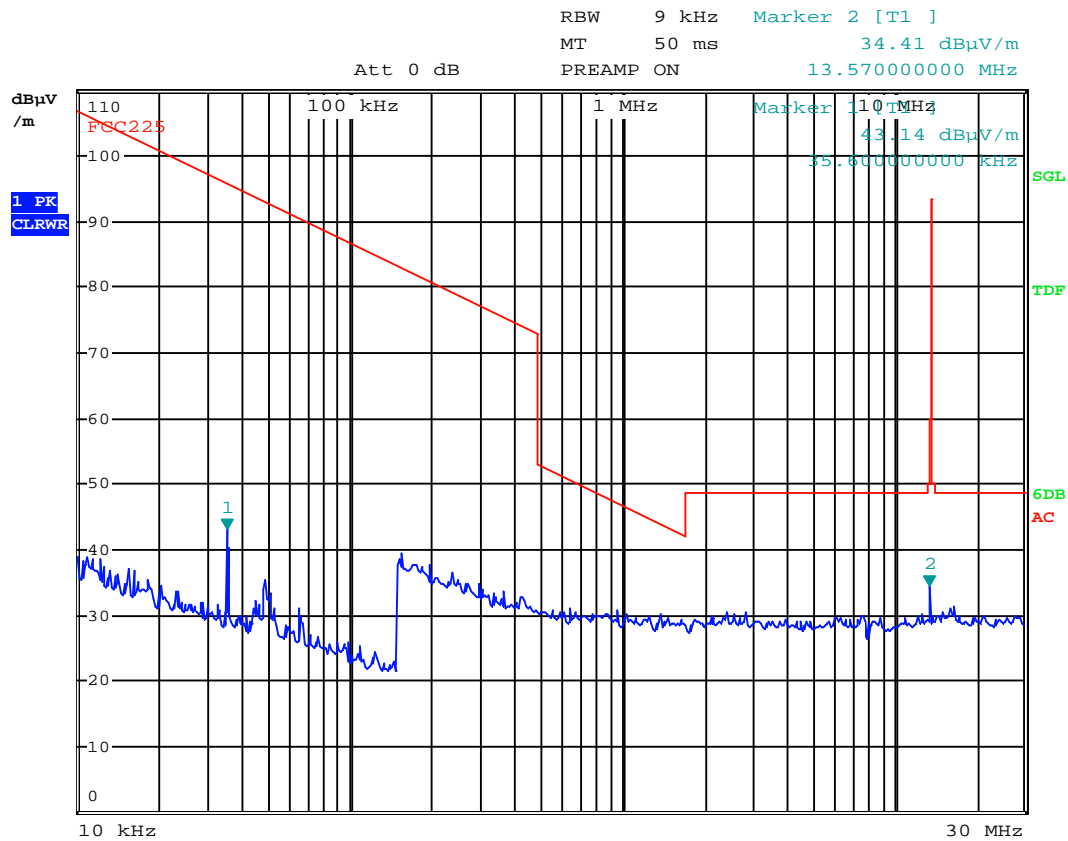
Requirement:

(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 15:47:15

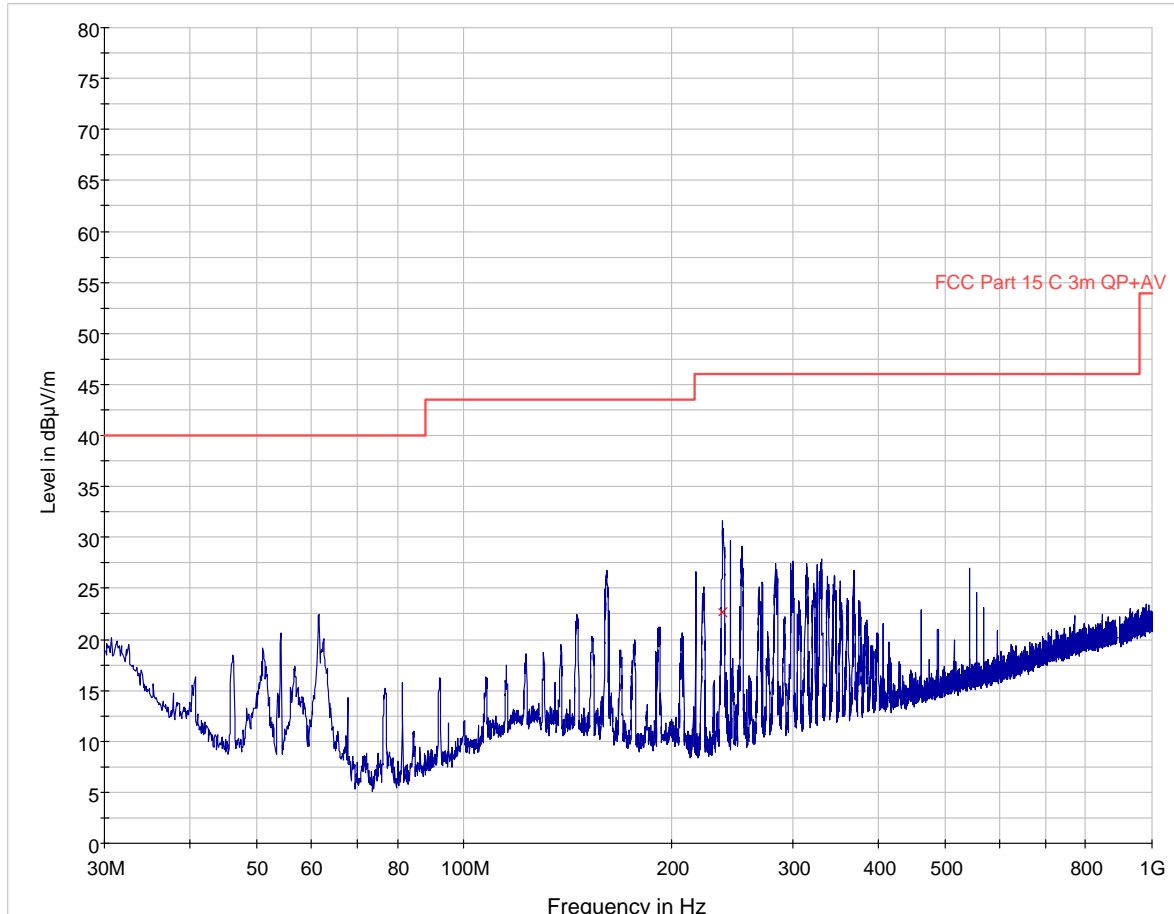
Radiated emissions 30 – 1000 MHz.

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

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	13.560286	0.0021
+40 ° C	13.56	13.560414	0.0031
+30 ° C	13.56	13.560434	0.0032
+20 ° C	13.56	13.560446	0.0033
+10 ° C	13.56	13.560446	0.0033
+0 ° C	13.56	13.560470	0.0035
-10 ° C	13.56	13.560330	0.0024
-20 ° C	13.56	13.560442	0.0033

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.

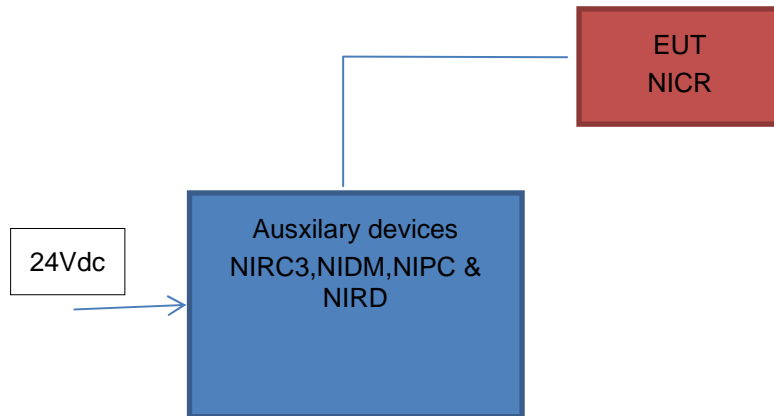
4 LIST OF TEST EQUIPMENT

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

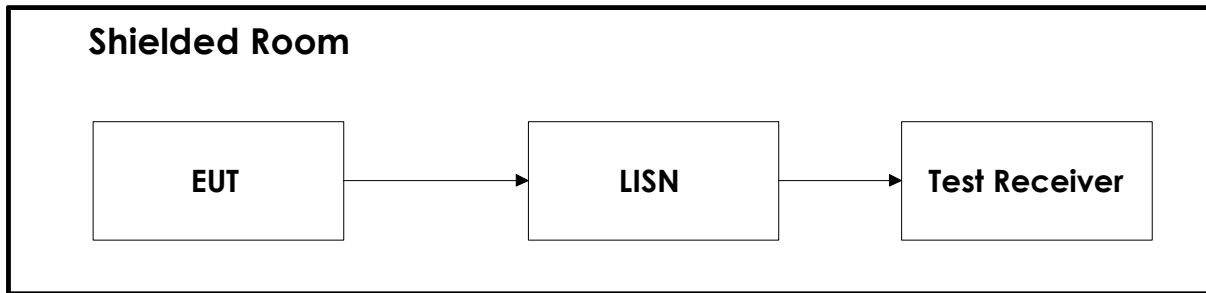
5.1 System set up for radiated measurements



Test equipment: 1- 12

5.2 Test site radiated emission

5.3 Power Line Conducted Emission



5.4 Test Site Radiated Emission

