

Test report no. : 241590-1

Item tested : SC14SPNODE SF/SC14CVMDECT SF01

Type of equipment : UPCS Base Station

FCC ID : Y82-SC14D

Client : Dialog Semiconductor B.V.

FCC Part 15, subpart D

Isochronous UPCS Device
1920 - 1930 MHz

Industry Canada RSS-213, Issue 2

2 GHz Licence-exempt Personal
Communications Service Devices
(LE-PCS)

28 August 2013

Authorized by :

G. Suhanthakumar
Technical Vericator

CONTENTS

1	GENERAL INFORMATION	3
1.1	Testhouse Info	3
1.2	Client Information	3
1.3	Manufacturer (if other than client).....	3
2	TEST INFORMATION	4
2.1	Tested Item.....	4
2.2	Description of Tested Device.....	4
2.3	Exposure Evaluation.....	4
2.4	Test Environment	5
2.5	Test Period	5
2.6	Test Engineer(s)	5
2.7	Test Equipment	5
2.8	Other Comments	5
3	TEST REPORT SUMMARY	6
3.1	General.....	6
3.2	Test Summary	7
4	TEST RESULTS.....	8
4.1	Power Line Conducted Emissions.....	8
4.2	Coordination with fixed microwave	10
4.3	Digital Modulation Techniques	10
4.4	Channel Frequencies	10
4.5	Automatic Discontinuation of Transmission	11
4.6	Peak Power Output	12
5	TEST SETUPS	15
5.1	Power Line Conducted Emissions Test.....	15
5.2	Radiated Emissions Test, Fully Anechoic Chamber.....	15
6	TEST EQUIPMENT USED	16

1 GENERAL INFORMATION

1.1 Testhouse Info

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Address : Nemko Kjeller
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N-2007 Kjeller, NORWAY
Telephone : +47 64 84 57 00
Fax : +47 64 84 57 05
E-mail: comlab@nemko.com
FCC test firm registration # : 994405
IC OATS registration # : 2040D-1
Total Number of Pages: 16

1.2 Client Information

Name : Dialog Semiconductor BV.
Address : Het Zuiderkruis 53, 5215MV, 's-Hertogenbosch, The Netherlands

Contact:

Name : Frank van den Dungen
Telephone : +31 73 64 08 249
E-mail : frank.van.den.dungen@diasemi.com

1.3 Manufacturer (if other than client)

Same as client.

2 Test Information

2.1 Tested Item

Name :	Dialog Semiconductor
Model name :	SC14SPNODE SF SC14CVMDECT SF01
FCC ID :	Y82-SC14D
Industry Canada ID :	9576A-SC14D
Serial number :	/
Hardware identity and/or version:	SF01 + REV1
Software identity and/or version :	8814
Tested to IC Radio Standard (RSS) :	RSS-213 Issue 2, RSS-GEN Issue 3
Test Site IC Reg. Number :	IC 2040D-1
Frequency Range :	1921.536 – 1928.448 MHz
Number of Channels :	5 RF Channels, 5x12 = 60 TDMA Duplex Channels
Type of Modulation :	Digital (Gaussian Frequency Shift Keying)
Conducted Output Power :	100 mW (Peak)
Antenna Connector :	None
Number of Antennas :	2 (Internal PCB Antennas)
Antenna Diversity Supported :	Yes

2.2 Description of Tested Device

The EUT is a DECT ULE module and is designed to operate as a base station, it is then a responding device as defined in ANSI C63.17 and is designed to operate together with a DECT Portable Part (e.g. a handset or headset), which is then the initiating device. The EUT may also be used as a DECT Portable Part.

2.3 Exposure Evaluation

The EUT is defined as a mobile or fixed device and should be used at least 20 cm from any persons.

2.4 Test Environment

Temperature:	24 – 26 °C
Relative humidity:	36 – 42 %
Normal test voltage:	5.0 V DC (USB) 120 V, 60 Hz (AC Adaptor)

All tests were performed with the EUT powered from USB.

Power Line Conducted Emissions were tested with an AC Adaptor.

The values are the limit registered during the test period.

2.5 Test Period

Item received date: 2013-07-19

Test period : from 2013-07-22 to 2013-07-23

2.6 Test Engineer(s)

Frode Sveinsen / Jan G. Eriksen

2.7 Test Equipment

See list of test equipment in clause 6.

2.8 Other Comments

This test report covers only Power Line Conducted Emissions and Antenna Gain on the new Antenna. All other tests are covered by Nemko test report no. 220131-4 (FCC ID: Y82-SC14S).

The EUT covered by this test report is identical to “FCC ID: Y82-SC14S” except that the version covered by this report has an add-on PCB with an extra antenna.

Both versions may be used as either Fixed Part or Portable Part, but the version covered here (FCC ID: Y82-SC14D) may not be used in applications where it is defined as a Portable Device since the SAR report does not cover the extra antenna.

3 TEST REPORT SUMMARY

3.1 General

All measurements are traceable to national standards.

The tests were conducted on a sample of the equipment for the purpose of demonstrating compliance with FCC CFR47 Part 15D for Isochronous UPCS Devices and Industry Canada RSS-213 Issue 2 / RSS-GEN Issue 3.

All tests were conducted in accordance with ANSI C63.4-2009 and ANSI C63.17-2006. Antenna Gain tests were made in a 3m fully-anechoic chamber.

A description of the test facility is on file with the FCC and Industry Canada.

☒ New Submission

☒ Production Unit

☐ Class II Permissive Change

☐ Pre-production Unit

PUB 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".**



TEST REPORT NO: 241590-1

TESTED BY : 

Frode Sveinsen, Chief Engineer

DATE: 25 July 2013

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3.2 Test Summary

Name of test	FCC CFR 47 Paragraph #	IC RSS-213 Paragraph #	Verdict
Coordination with fixed microwave	15.307(b)	N/A	Complies
Digital Modulation Techniques	15.319(b)	6.1	Complies
Channel Frequencies	15.303	1	Complies
Power Line Conducted Emissions	15.107(a) 15.207(a)	6.3 RSS-GEN 7.2.2	Complies
Output Power and Antenna Gain	15.319(c)(e), 15.31(e)	6.5 and 4.1(e)	Complies
Automatic discontinuation of transmission	15.319(f)	4.3.4(a)	Complies

¹ The client declares that the tested equipment does not implement this provision

² Not required if the Conducted Out-of-Band Emissions test is Passed

4 TEST RESULTS

4.1 Power Line Conducted Emissions

Para. No.: 15.207 (a)

Test Performed By: Jan G. Eriksen

Date of Test: 23 Jul 2013

Measurement procedure: ANSI C63.4-2009 using 50 μ H/50 ohms LISN.

Test Results: Complies

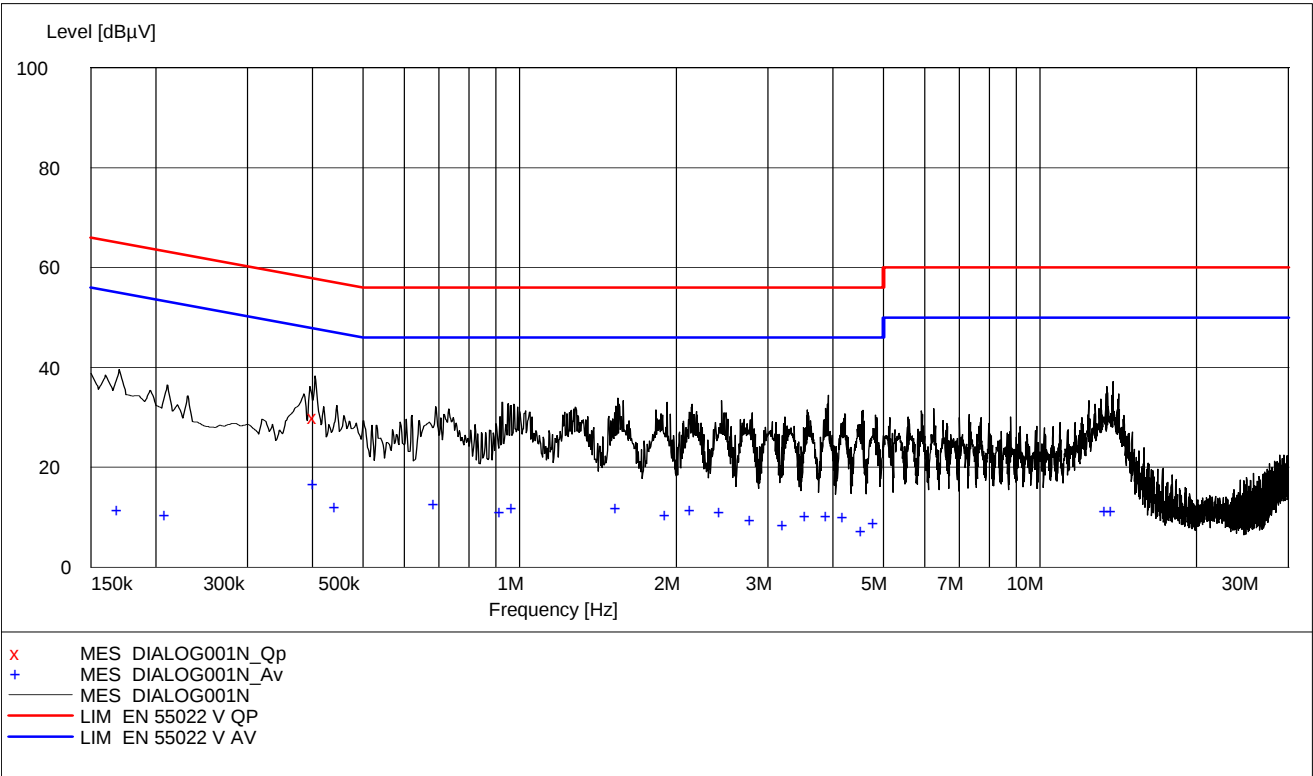
Measurement Data: See attached graph, (Peak detector).

Highest measured value (L1 and N):

Transmitting:

Frequency [MHz]	Level [dBuV]	Af [dB]	Limit [dBuV]	Margin [dB]	Det	Position	Verdict [Pass/Fail]
0.405000	30.00	10.20	57.80	27.80	QP	N	Pass
0.170000	11.40	10.10	55.00	43.60	AV	L1	Pass
0.210000	10.60	10.10	53.20	42.60	AV	L1	Pass
0.405000	16.60	10.20	47.80	31.20	AV	N	Pass
0.445000	12.10	10.20	47.00	34.90	AV	N	Pass
0.690000	12.70	10.20	46.00	33.30	AV	N	Pass
0.925000	11.00	10.20	46.00	35.00	AV	N	Pass
0.975000	11.80	10.20	46.00	34.20	AV	N	Pass
1.545000	11.80	10.20	46.00	34.20	AV	N	Pass
1.920000	10.50	10.20	46.00	35.50	AV	N	Pass
2.145000	11.40	10.30	46.00	34.60	AV	N	Pass
2.445000	11.10	10.30	46.00	34.90	AV	N	Pass
2.795000	9.40	10.30	46.00	36.60	AV	N	Pass
3.235000	8.50	10.30	46.00	37.50	AV	N	Pass
3.570000	10.40	10.30	46.00	35.60	AV	N	Pass
3.915000	10.30	10.40	46.00	35.70	AV	N	Pass
4.215000	10.10	10.40	46.00	35.90	AV	N	Pass
4.565000	7.40	10.40	46.00	38.60	AV	N	Pass
4.825000	8.90	10.40	46.00	37.10	AV	N	Pass
13.450000	11.30	10.70	50.00	38.70	AV	N	Pass
13.815000	11.30	10.80	50.00	38.70	AV	N	Pass

Tested with AC Adaptor Model: SW4310, 120 V AC, 60 Hz.



EUT Transmitting

4.2 Coordination with fixed microwave

The affidavit from UTAM, Inc. is included in the documentation supplied by the applicant:

☒ Yes

☐ No

Requirement, FCC 15.307 (b):

Each application for certification of equipment operating under the provisions of this Subpart must be accompanied by an affidavit from UTAM, Inc. certifying that the applicant is a participating member of UTAM, Inc. In the event a grantee fails to fulfill the obligations attendant to participation in UTAM, Inc., the Commission may invoke administrative sanctions as necessary to preclude continued marketing and installation of devices covered by the grant of certification, including but not limited to revoking certification.

4.3 Digital Modulation Techniques

The EUT uses Multi Carrier / Time Division Multiple Access / Time Division Duplex and Digital GFSK modulation. For further details see the operational description provided by the applicant.

Requirement, FCC 15.319(b):

All transmissions must use only digital modulation techniques.

4.4 Channel Frequencies

UPCS CHANNEL	FREQUENCY (MHz)
Upper Band Edge	1930.000
0 (Highest)	1928.448
1	1926.720
2	1924.992
3	1923.264
4 (Lowest)	1921.536
Lower Band Edge	1920.000

Requirement: FCC 15.303

Within 1920 -1930 MHz band for isochronous devices.

4.5 Automatic Discontinuation of Transmission

Does the EUT transmit Control and Signaling Information ¹ ?	☒ YES ☐ NO
TYPE OF EUT ¹ :	☐ INITIATING DEVICE ☒ RESPONDING DEVICE

The following tests simulate the reaction of the EUT in case of either absence of information to transmit or operational failure after a connection with the companion device is established.

Number	Test	EUT Reaction	Verdict
		Operating Mode	
1	Power removed from the EUT	A	Pass
2	EUT Switch Off	N/A	Pass
3	Hook-On by EUT	N/A	Pass
4	Hook-On by companion device	B	Pass
5	Power Removed from Companion Device	B	Pass
6	Companion Device Switch Off	B	Pass

- A - Connection breakdown, Cease of all transmissions
 B - Connection breakdown, EUT transmits control and signaling information
 C - Connection breakdown, Companion Device transmits control and signaling information
 N/A - Not Applicable (the EUT does not have an on/off switch and cannot perform Hook-On)

Requirements, FCC 15.319(f)

The device shall automatically discontinue transmission in case of either absence of information to transmit or operational failure. These provisions are not intended to preclude transmission of control and signaling information or use of repetitive codes used by certain digital technologies to complete frame or burst intervals.

4.6 Peak Power Output

Test Method:

ANSI C63.17, clause 6.1.2.

Test Results: Complies

Measurement Data:

Maximum Conducted Output Power

Channel No.	Frequency (MHz)	Maximum Conducted Output Power (dBm)	Maximum Radiated Output Power (dBm)	Maximum Antenna Gain (dBi)
4	1921.536	20.0	19.9	-0.1
2	1924.992	20.0	20.0	0.0
0	1928.448	20.0	20.0	0.0

Substitution:

Frequency MHz	Measured value dBm	Subst. Gen. (incl. corr.) dBm	Attenuator and Cable dB	Gain Subst. Antenna dB	Result dBm
1921.536	19.0	25.6	-14.0	8.3	19.9
1924.992	18.9	25.7	-14.0	8.3	20.0
1928.448	18.9	25.7	-14.0	8.3	20.0

Result = Subst.Gen. + Attenuator + Cable + Antenna Gain

The values for Conducted Output Power are from Nemko test report no. 220131-4.

Limit:

Conducted: $100 \mu\text{W} \times \text{SQRT}(B)$ where B is the measured Emission Bandwidth in Hz

FCC 15.319(c)(e): 20.8 dBm (120 mW)

RSS-213, Issue 2: 20.4 dBm (110 mW)

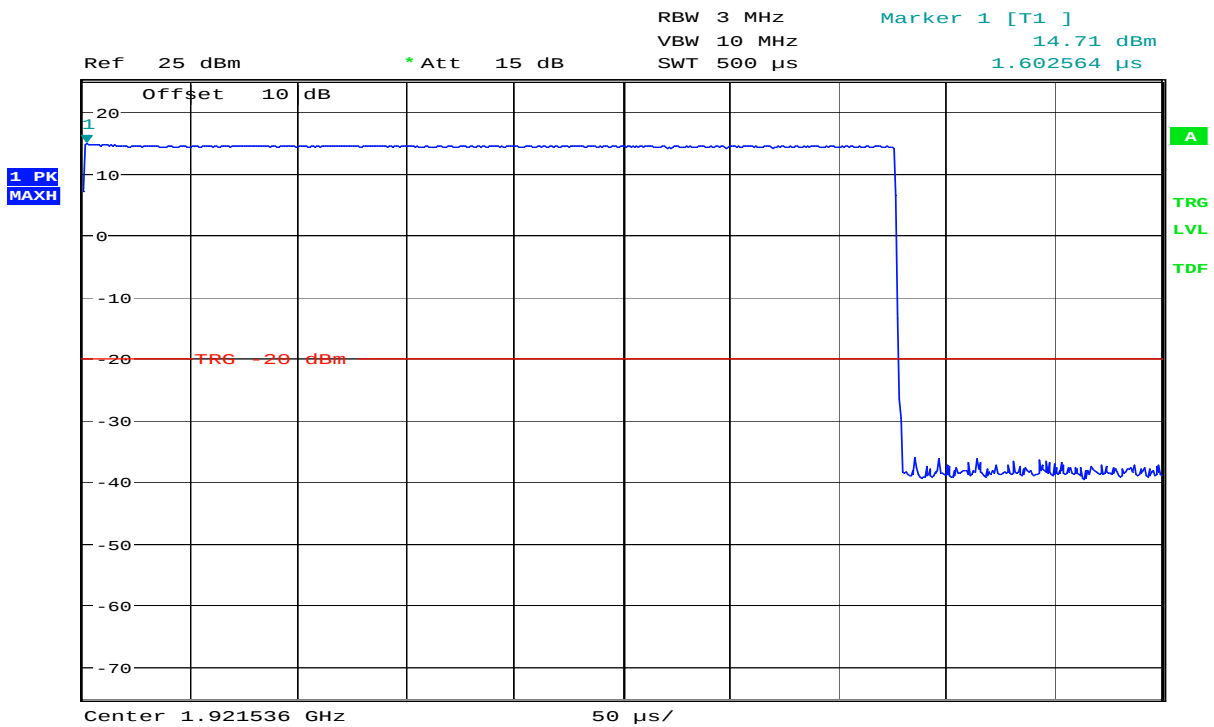
The antenna gain is below 3 dBi, no reduction in transmit power is necessary.

Requirements, FCC 15.319(c)(e), RSS-213, Issue 2

Peak transmit power shall not exceed 100 microwatts multiplied by the square root of the emission bandwidth in Hertz.

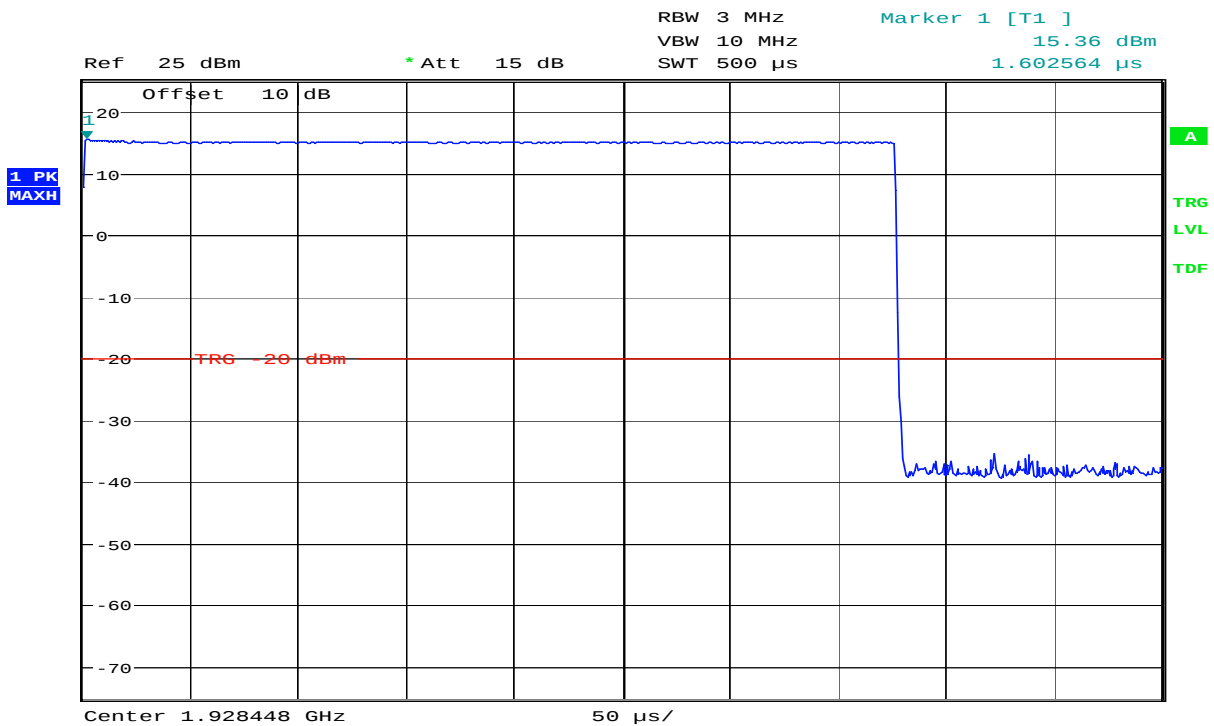
The peak transmit power shall be reduced by the amount in decibels that the maximum directional gain of the antenna exceeds 3 dBi.

Radiated Peak Output Power



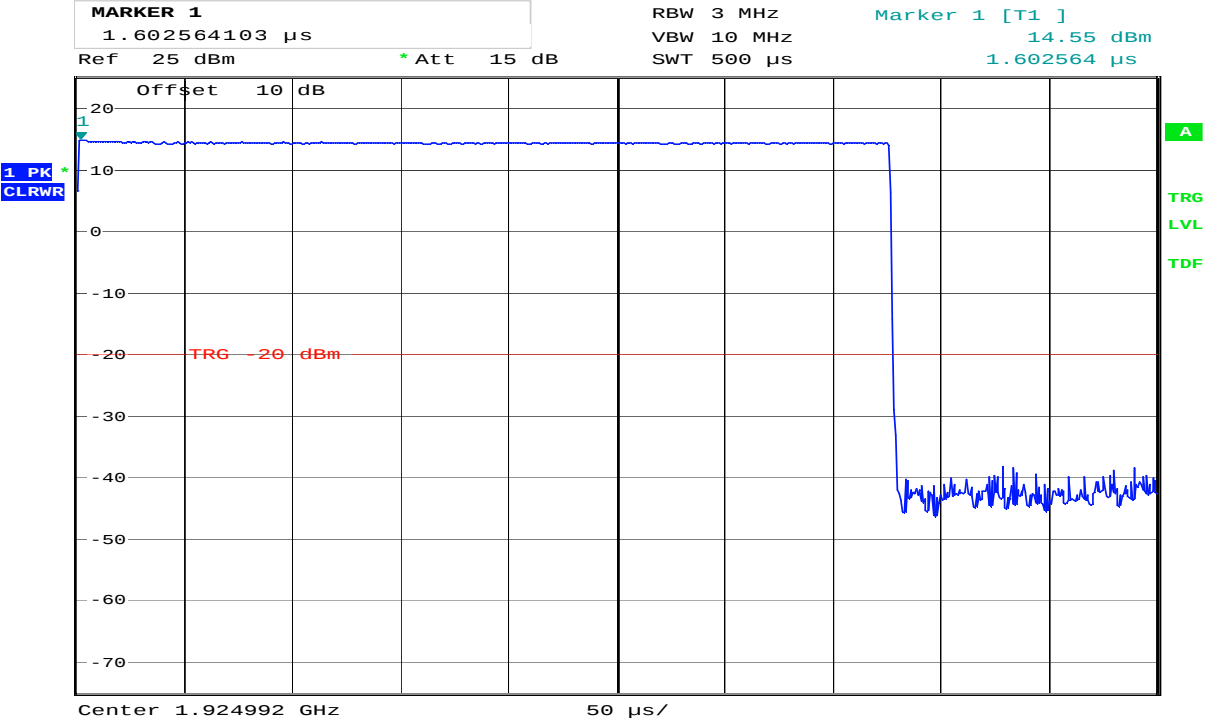
Date: 30.NOV.2012 14:55:27

Lower Channel (Max: EUT H, HP)



Date: 30.NOV.2012 14:41:30

Upper Channel (Max: EUT H, HP)

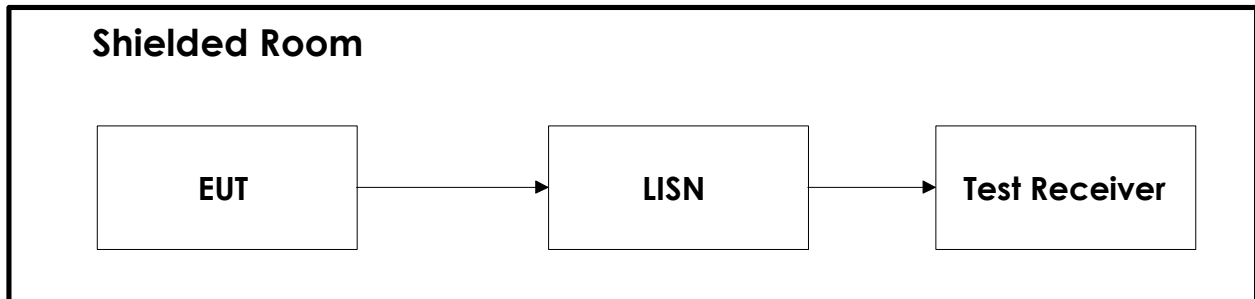


Date: 30.NOV.2012 15:01:11

Middle Channel (Max: EUT H, HP)

5 Test Setups

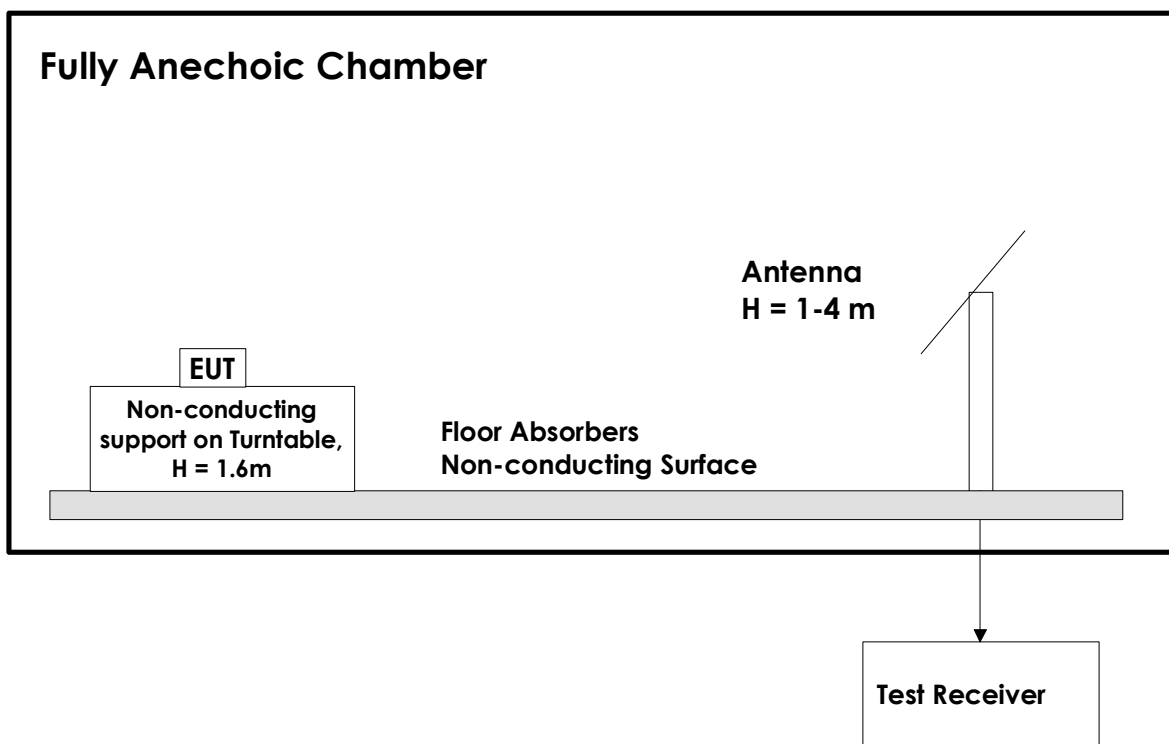
5.1 Power Line Conducted Emissions Test



Test equipment: 8, 17, 19, 22, 27

Test Set-Up 5

5.2 Radiated Emissions Test, Fully Anechoic Chamber



Test equipment: 1, 16, 19, 21, 26, 29, 30

Test Set-Up 7

This test setup is used for measuring radiated output power. The measurements are performed in a 3m Fully Anechoic Chamber with a Spectrum Analyzer and Horn Antenna, a preamplifier may be used after the antenna. The measuring distance is 3m.

6 Test Equipment Used

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 Testhouse.

No.	Model number	Description	Manufacturer	Ref. no.	Cal. date	Cal. Due
1	FSU26	Spectrum Analyzer	Rohde & Schwarz	LR 1504	2011.11.03	2013.11.03
8	ESHS10	Measuring Receiver	Rohde & Schwarz	N- 3528	2012-07	2013-07
16	3115	Double Ridged Horn Antenna	EMCO	LR 1226	N/A	
17	ESH3-Z5	Two Line V-Network	Rohde & Schwarz	LR 1076	2011.11.03	2013.11.03
19	6812B	AC Power Source	Agilent	LR 1515	N/A	
21	JS4	Pre-Amplifier	Miteq	LR 1552	2012.09	2013.09
22	Model 87 V	Multimeter	Fluke	N-4669	2012.09.05	2013.09.05
26	NRP-Z81	Wideband Power Sensor	Rohde & Schwarz	LR 1644	2013.04.05	2014.04.05
27	ESH3-Z2	Pulse Limiter	Rohde & Schwarz	LR 285	2012.04.24	2014.04.24
29	Model 7200	Signal generator	Gigatronics	LR 1188	2012.10.31	2014.10.31
30	3115	Double Ridged Horn Antenna	EMCO	LR 1330	2010.08.05	2015.08.05