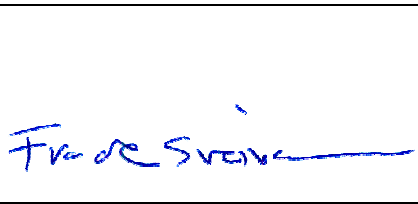


Test Report

Product	Maritime VHF Base Station Receiver
Name and address of the applicant	Jotron AS Østbyveien 1, 3280 Tjodalyng, Norway
Name and address of the manufacturer	Same as above
Model	RA-7203C
Rating	120V AC
Trademark	Jotron
Serial number	00468
Additional information	Maritime VHF Receiver
Tested according to	FCC Part 15, subpart B Other Class B Digital Device Industry Canada RSS-310, Issue 2 Low Power Licence-exempt Radiocommunications Devices Industry Canada ICES-003, Issue 5 Information Technology Equipment (ITE)
Order number	244647
Tested in period	2014.02.05 to 2014.02.07
Issue date	2014.02.11
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 [Frode Sveinsen]  Approved by [Jan G Eriksen]	
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1 INFORMATION

1.1 Tested Item

Name :	JOTRON
Model name :	RA-7203C
FCC ID :	RA9RA-7203C
Industry Canada ID :	2131A-TA7650C
FCC / IC Class	B
Serial number :	00468
Hardware identity and/or version:	/
Software identity and/or version :	/
Frequency Range :	156.000 – 162.500 MHz
Antenna Connector :	50 Ohm N connector
Power Supply :	120 V AC (Mains)

Description of Tested Devices

The EUT is a VHF base station receiver for communication in the maritime VHF frequency bands.

Labeling

The Device must be labeled with the two-part warning statement:

“This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.”

Canada:

The device must be labeled according to RSS-310 clause 2.2 with the words: **“Canada 310”**.

1.2 Test Environment

Temperature:	20.4 – 21.1 °C
Relative humidity:	40 – 44 %
Normal test voltage:	120 V AC

The values are the limit registered during the test period.

The EUT was powered from a regulated AC power source during all tests.

1.3 Test Engineer(s)

Frode Sveinsen

1.4 Test Equipment

See list of test equipment in clause 6.

1.5 Other Comments

All tests were performed with all ports populated and operating.

2 TEST REPORT SUMMARY

2.1 General

All measurements are traceable to national standards.

All tests were performed in accordance with ANSI C63.4-2003 where applicable. Radiated emissions are made in a 10m semi-anechoic chamber. A description of the test facility is on file with FCC and Industry Canada.

☒ New Submission

☒ Production Unit

☐ Class II Permissive Change

☐ Pre-production Unit

CXX 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".

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2.2 Test Summary

Name of test	FCC CFR 47 Paragraph #	IC RSS-310 Paragraph #	ICES-003 Paragraph #	Verdict
Power Line Conducted Emission	15.107(a) 15.207(a)	N/A	5.2 / 5.3	Complies
Spurious Emissions (Radiated)	15.109(a)	3.1 (RSS-GEN 7.2.3)	5.4 / 5.5	Complies

3 TEST RESULTS

3.1 Power Line Conducted Emissions

Para. No.: 15.107 (a)

Test Performed By: Thomas Dangle	Date of Test: 7-Feb-2014
----------------------------------	--------------------------

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

Test Results: Complies

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

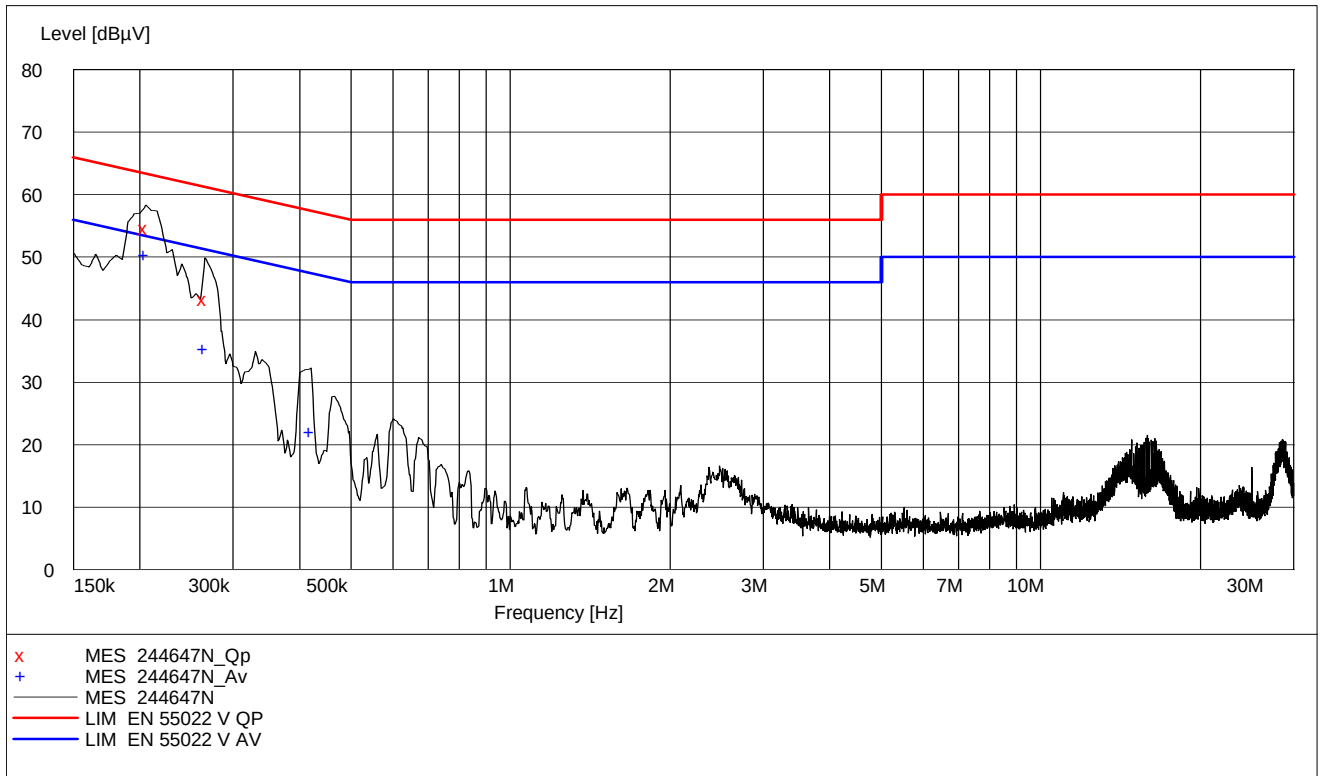
Highest measured value (L1 and N):

RA-7203C Standby Mode:

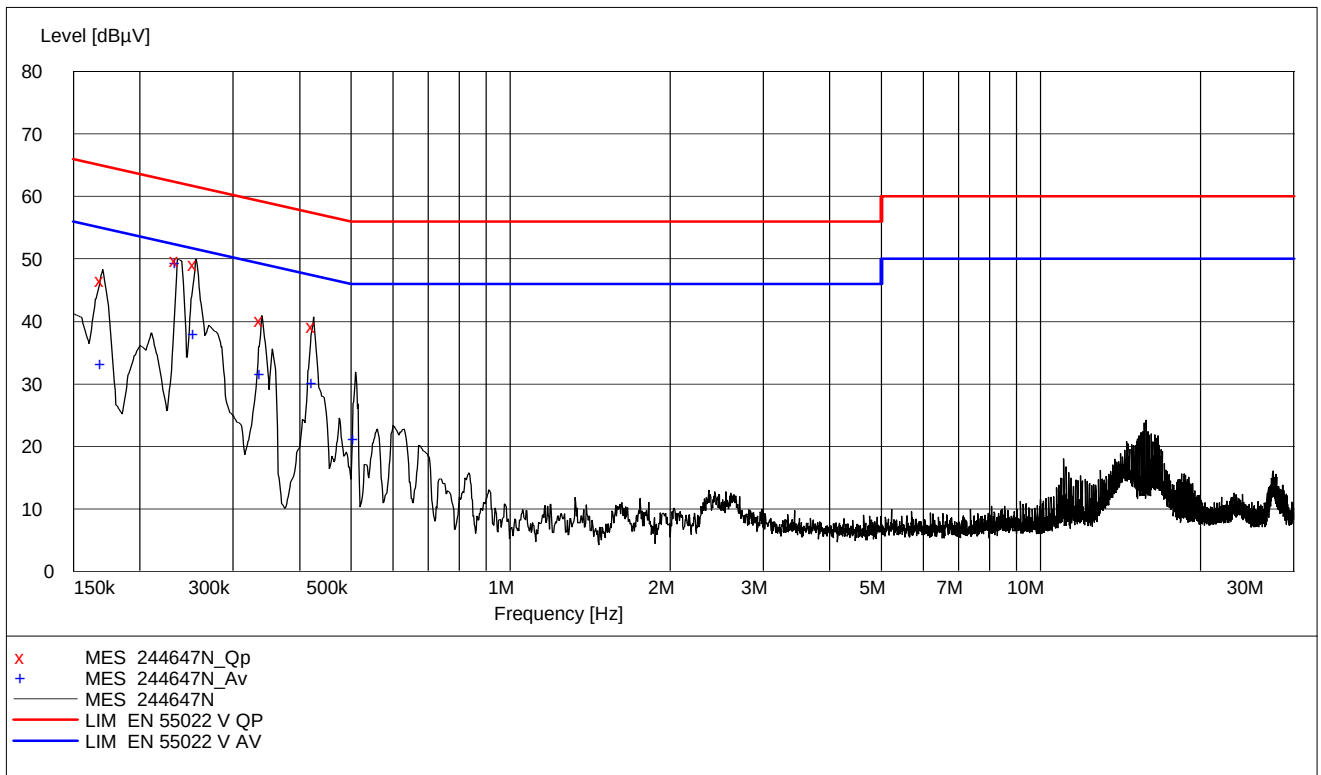
Frequency [MHz]	Level [dBuV]	Af [dB]	Limit [dBuV]	Margin [dB]	Det	Position	Verdict [Pass/Fail]
0.205000	54.60	10.10	63.40	8.80	QP	N	Pass
0.265000	43.30	10.10	61.30	18.00	QP	N	Pass
0.205000	50.30	10.10	53.40	3.10	AV	N	Pass
0.265000	35.20	10.10	51.30	16.10	AV	N	Pass
0.420000	22.00	10.20	47.40	25.40	AV	L1	Pass

TA-7650C and RA-7203C Standby Mode:

Frequency [MHz]	Level [dBuV]	Af [dB]	Limit [dBuV]	Margin [dB]	Det	Position	Verdict [Pass/Fail]
0.170000	46.70	10.10	65.00	18.30	QP	L1	Pass
0.235000	49.80	10.10	62.30	12.50	QP	N	Pass
0.255000	49.20	10.10	61.60	12.40	QP	N	Pass
0.340000	40.20	10.20	59.20	19.00	QP	L1	Pass
0.425000	39.30	10.20	57.30	18.00	QP	N	Pass
0.170000	33.10	10.10	55.00	21.90	AV	L1	Pass
0.235000	49.30	10.10	52.30	3.00	AV	N	Pass
0.255000	38.00	10.10	51.60	13.60	AV	N	Pass
0.340000	31.60	10.20	49.20	17.60	AV	L1	Pass
0.425000	30.20	10.20	47.30	17.10	AV	N	Pass
0.510000	21.10	10.20	46.00	24.90	AV	N	Pass



RA-7203C Standby Mode



TA-7650C and RA-7203C Standby Mode

3.2 Spurious Emissions (Radiated)

Measurement Procedure:

FCC 15.109

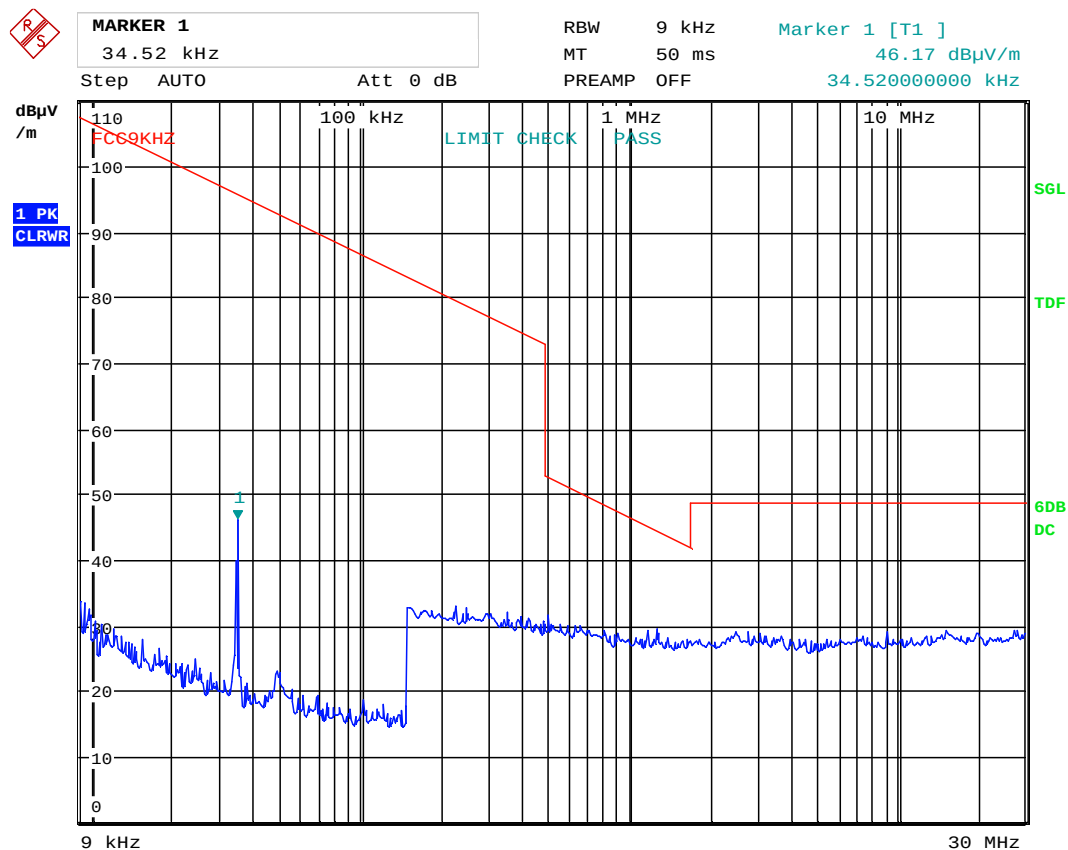
Test Results:

Radiated emission 9 kHz-30 MHz.

Measuring distance 10 m, measured with Peak detector.

No component detected, see attached graph.

Limit is converted to 10m using 40 dB/decade according to 15.31 (f) (2).



Date: 5.FEB.2014 14:52:51

Radiated Emissions 30 - 1000 MHz.

Detector: Quasi-Peak

Measuring distance: 3m

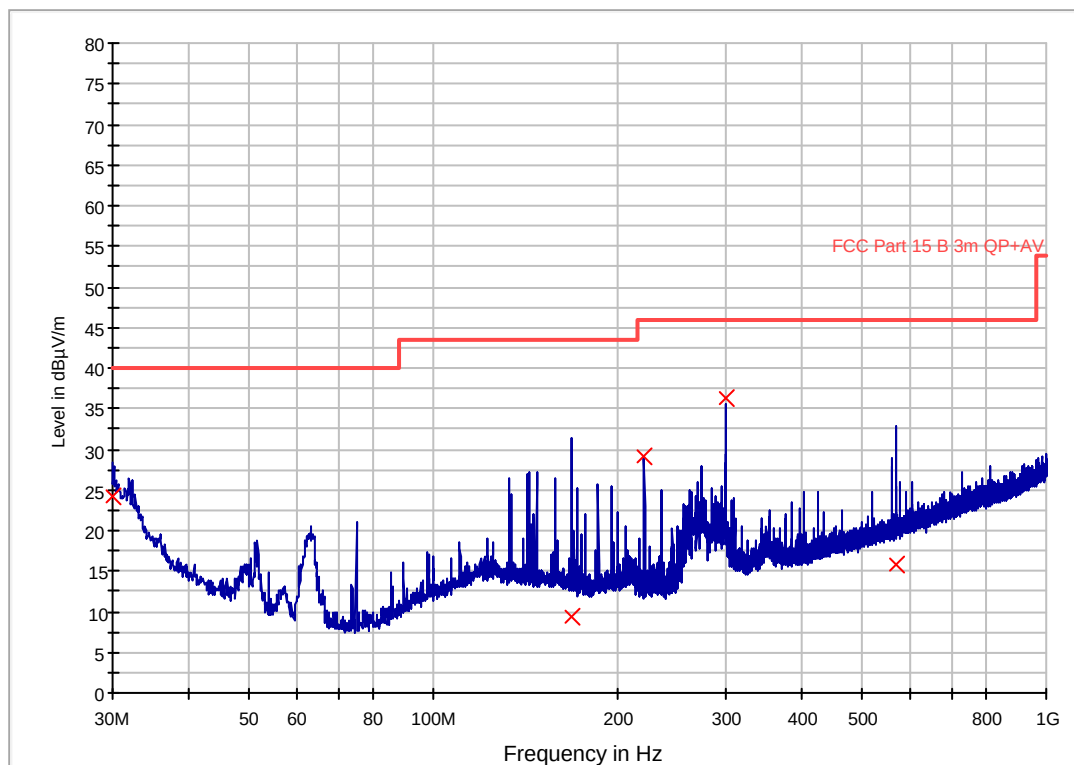
The EUT were rotated 360 degrees and the antenna height varied between 1 and 4 m on all found frequencies.

Frequency (MHz)	QuasiPeak (dBμV/m)	Bandwidth (kHz)	Polarization	Margin (dB)	Limit (dBμV/m)	Comment
30.001260	24.1	120.000	V	15.9	40.0	
167.753320	9.3	120.000	H	34.2	43.5	
221.184093	29.1	120.000	H	16.9	46.0	
299.521780	36.3	120.000	H	9.7	46.0	
569.317867	15.8	120.000	H	30.2	46.0	

Limits:

Spurious Frequency MHz	Field Strength dBμV/m @3m
30-88	40
88-216	43.5
216-960	46
Above 960	54 ¹

FCC Pt15 Class B 30-1000M 3m

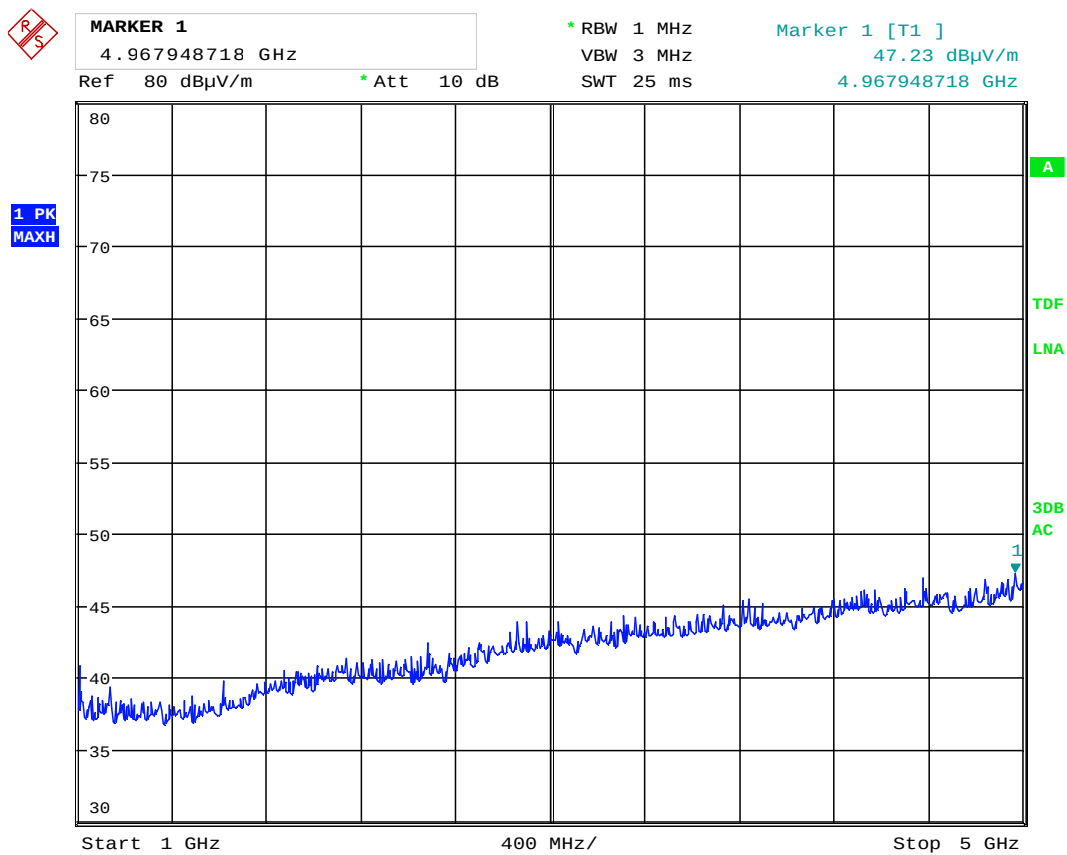


Radiated Emissions 1000 - 5000 MHz.

Detector: Peak

Measuring distance 3 m

No emissions found.



Date: 5.FEB.2014 13:21:16

Radiated Emissions, VP, 1000 -5000 MHz



MARKER 1

4.493589744 GHz

Ref 80 dBμV/m

* Att 10 dB

* RBW 1 MHz

VBW 3 MHz

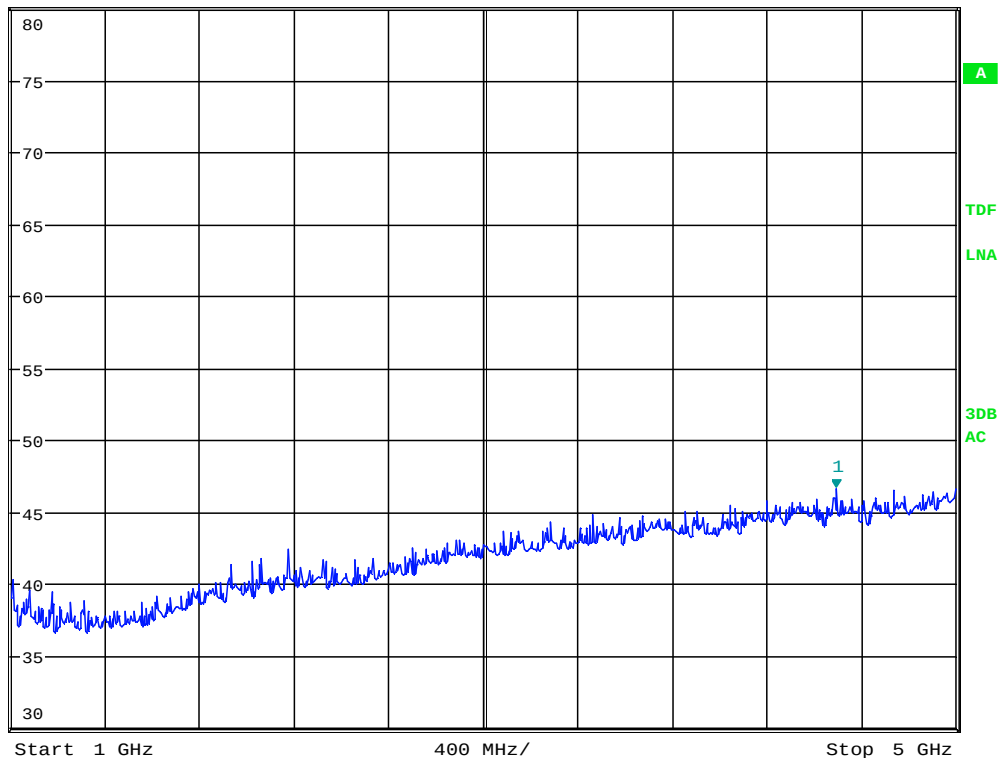
SWT 25 ms

Marker 1 [T1]

46.69 dBμV/m

4.493589744 GHz

1 PK
MAXH

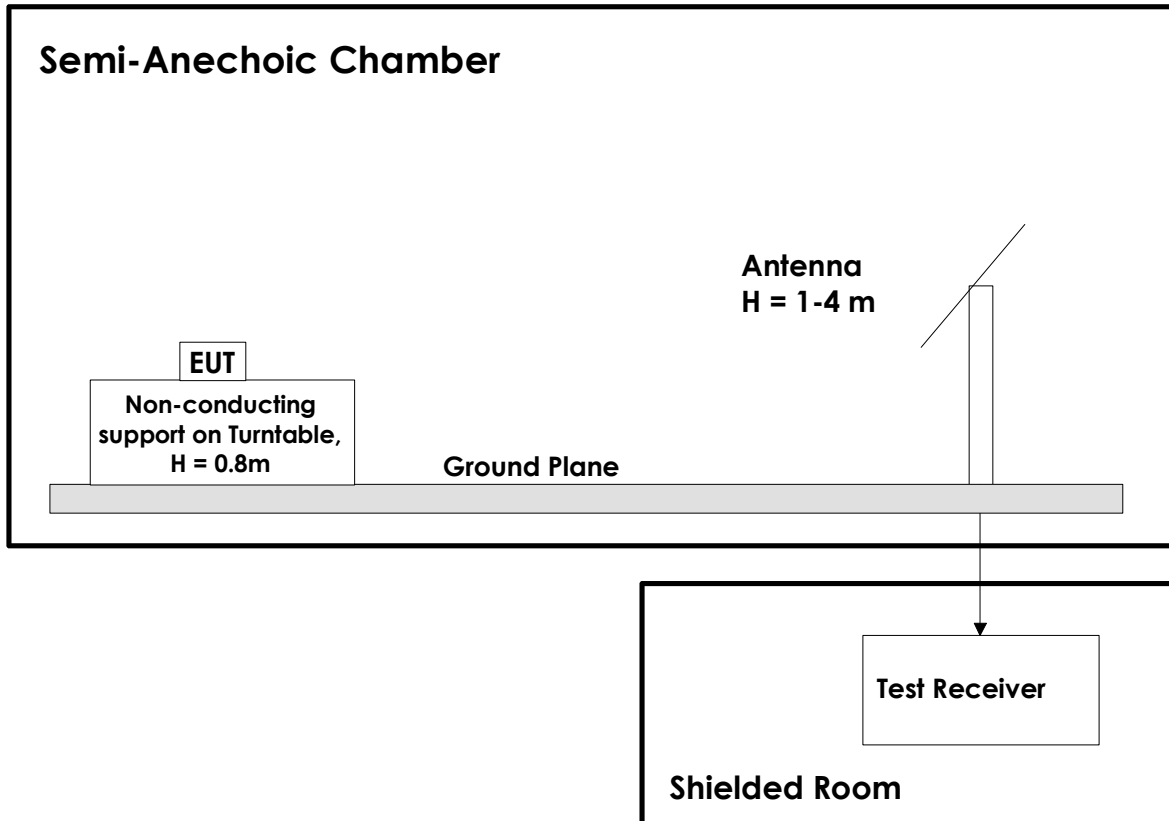


Date: 5.FEB.2014 13:38:15

Radiated Emissions, VP, 1000 -5000 MHz

4 Test Setups

4.1 Radiated Emissions Test

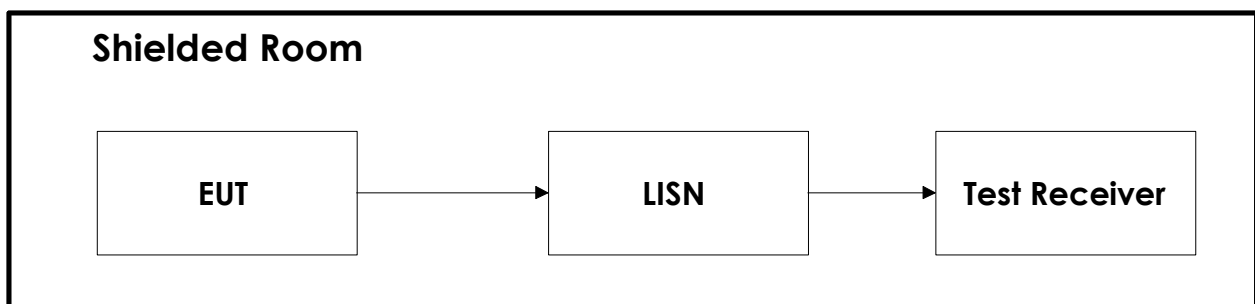


Test equipment: 6, 11, 12, 13, 15

Test Set-Up 1

This test setup is used for all radiated emissions tests. For frequencies below 30 MHz the measuring distance is 10m, for all other frequencies it is 3m or 1m. Emissions above 1 GHz are measured with a Spectrum Analyzer and Horn Antenna and with the preamplifier after the antenna. For measurements above 18 GHz the test receiver is moved inside the anechoic chamber and located next to the antenna to minimize the cable loss.

4.2 Power Line Conducted Emissions Test



Test equipment: 2, 4, 5, 7, 10

Test Set-Up 2

5 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	ESU40	Measuring Receiver	Rohde & Schwarz	LR 1639	2013.09.24	2014.09.24
2	ESHS10	EMI receiver	Rohde & Schwarz	N3528	2013.09.09	2014.09.09
3	ESH3-Z5	Two Line V-Network	Rohde & Schwarz	N3403	2013.09	2014.09
4	ESH3-Z2	Pulse Limiter	Rohde & Schwarz	LR 1074	2012.04.24	2014.04.24
5	6812B	AC Power Source	Agilent	LR 1515	2013.10.28	2014.10.28
6	JB3	BiLog Antenna	Sunol Sciences	N-4525	2011.09.07	2014.09.07
7	LNA6900	Preamplifier	Teseq	LR 1593	Cal b4 use	
8	3115	Horn Antenna	EMCO	LR 1330	2010.08.05	2015.08.05
9	8449B	Pre-amplifier	Hewlett Packard	LR 1322	2013.09	2014.09
10	HFH2-Z2	Loop Antenna	Rohde & Schwarz	LR 285	2010.11	2015.11
11	HZ-12	Substitution Dipoles	Rohde & Schwarz	LR 1332	2013.11.15	2015.11.15
12	HZ-13	Substitution Dipoles	Rohde & Schwarz	LR 1334	2013.11.15	2015.11.15
13	Model 87 V	Multimeter	Fluke	LR 1599	2012.10.29	2014.10.29