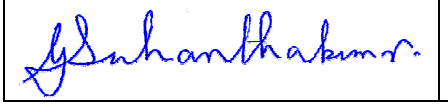
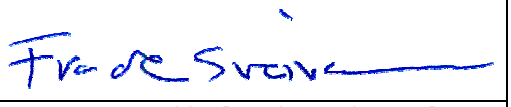
Report No. 3-273436

Test Report

Product	ID Reader Walk by
Name and address of the applicant	DeLaval Gustav Delavals veg 15, SE-147021 Tumba, Sweden
Name and address of the manufacturer	BioControl AS Gautestadveien 75, N-1890 Rakkestad,Norway
Model	94066382
Rating	12Vac
Trademark	DeLaval
Serial number	/
Additional information	131.072 kHz & 134.2 kHz RFID
Tested according to	**FCC Part 15.209** Digital Transmission Systems **Industry Canada RSS-210, Issue 8** Low Power Licence-Exempt Radiocommunications Devices
Order number	273436
Tested in period	2014.11.21 - 2014.11.29
Issue date	2015.12.22
Name and address of the testing laboratory	Nemko 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 Sveiensen]

Template version: B

CONTENTS

1 INFORMATION

1.1 Test Item

Name :	ID Reader Walk by
FCC ID :	UCS940663
IC :	6576A-940663
Model/version :	94066382
Serial number :	-
Hardware identity and/or version:	-
Software identity and/or version :	-
Frequency Range :	131.072 – 134.2 kHz
Operating frequency :	131.072 kHz & 134.2 kHz
Type of Modulation :	Unmodulated CW signal
Output Power:	0.00079 W (Average, Radiated)
User Frequency Adjustment :	None
Type of Power Supply :	12Vac 60Hz (Input voltage to stepdown transformer is 120Vac/60Hz)
Antenna Connector :	No (integral loop antenna)
Antenna Diversity Supported :	No

Description of Test Item

The test item is a RFID reader/transmitter that transmit a field with frequency either 131.1 kHz or 134.2 kHz. The reader is a transponder reader that is a part of a system and is controlled by a controller unit called alpro. The alpro can by commanded to change between 131.1 kHz and 134.2 kHz. The transmitted signal is an unmodulated CW signal.

1.2 Test Environment

1.2.1 Normal test condition

Temperature:	20 - 23 °C
Relative humidity:	40 - 50 %
Normal test voltage:	120V AC

The values are the limit registered during the test period.

1.3 Test Engineer(s)

G.Suhanthakumar

1.4 Test Equipment

See list of test equipment in clause 4.

2 TEST REPORT SUMMARY

2.1 General

All measurements are tracable to national standards.

The tests were conducted for the purpose of demonstrating compliance with FCC CFR 47 Part 15, paragraph 15.209, Industry Canada RSS-210 Issue 8 and RSS-GEN Issue 4.

Radiated tests were conducted in accordance with ANSI C63.4-2014. The radiated tests were made in a semi-anechoic chamber at measuring distances of 3m and 10m.

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

☒ New Submission
☐ Class II Permissive Change
DCD Equipment Code

☒ Production Unit
☐ Pre-production Unit
☐ 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”.

2.2 Test Summary

Name of test	FCC Part 15 reference	RSS-210 Issue 8 reference	Result
Power Line Conducted Emission	15.107(a) 15.207(a)	8.8 (RSS-GEN)	Pass
Spurious Emissions (Radiated)	15.31 15.33 15.35 15.209(a)(d)	A8.5	Pass

2.3 Description of modification for Modification Filing

Not applicable.

2.4 Comments

All ports were populated during spurious emission measurements.

2.5 Family List Rational

Not Applicable.

3 TEST RESULTS

3.1 Power Line Conducted Emissions

FCC §15.207(a)

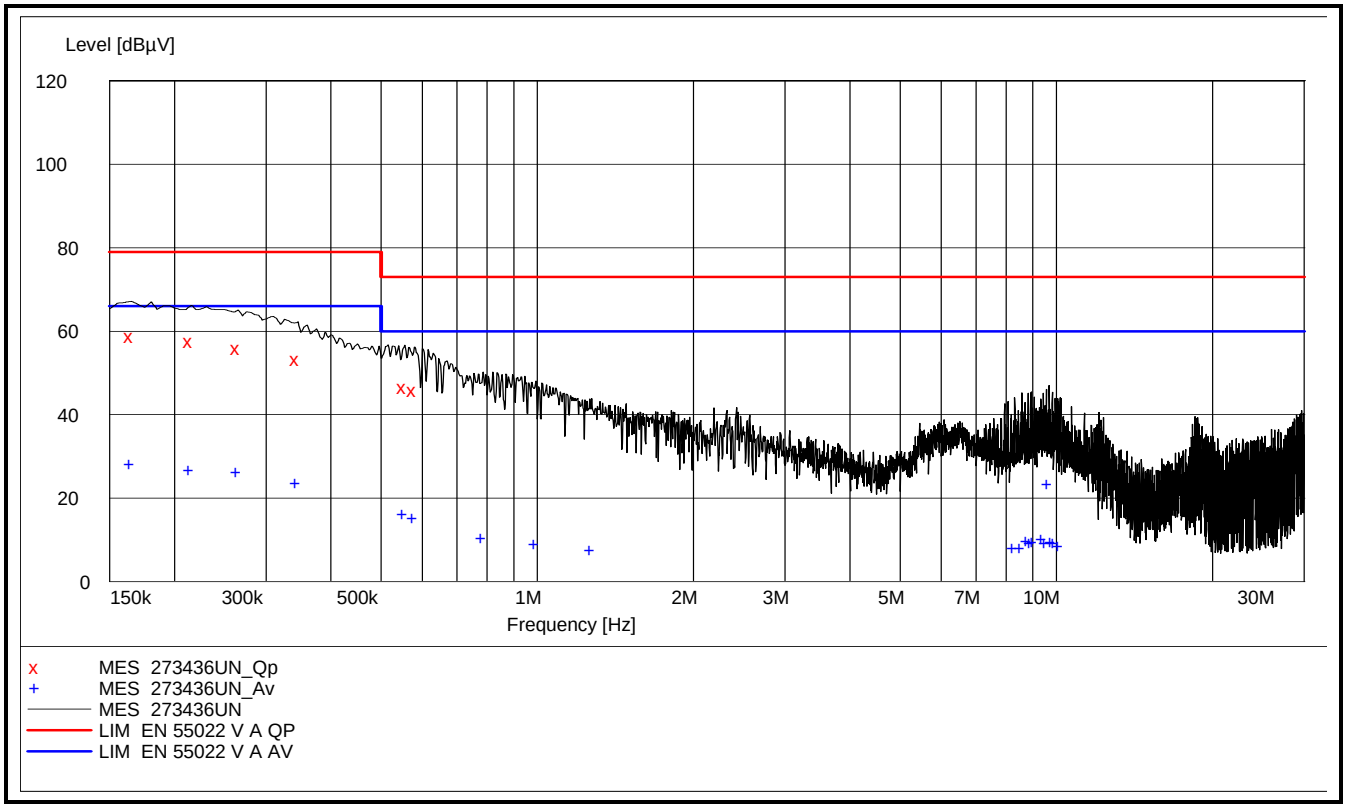
Test Performed By: G.Suhanthakumar	Date of Test: 2014.11.21

Measurement procedure: **ANSI C63.4-2014 using 50 µH/50 ohms LISN.**

Test Results: **Complies**

Measurement Data:

120V 60Hz:



Note: This preview is a merged result of all peak detector measurements carried out on this product. This preview includes measurements on all lines, but shows only the worst level at each frequency. Any quasi-peak or average detector measurements are carried out at the "worst case" wire. ("x" = quasi-peak / "+" = average. Measurement data are presented below)

Quasi Peak Detector Data

Frequency [MHz]	Level [dBuV]	Af [dB]	Limit [dBuV]	Margin [dB]	Det	Position	Verdict [Pass/Fail]
0.165000	58.90	10.70	79.00	20.10	QP	N	Pass
0.215000	57.50	10.70	79.00	21.50	QP	N	Pass
0.265000	56.00	10.60	79.00	23.00	QP	N	Pass
0.345000	53.40	10.40	79.00	25.60	QP	L1	Pass
0.555000	46.70	10.20	73.00	26.30	QP	L1	Pass
0.580000	46.00	10.20	73.00	27.00	QP	L1	Pass

Average Detector Data

Frequency [MHz]	Level [dBuV]	Af [dB]	Limit [dBuV]	Margin [dB]	Det	Position	Verdict [Pass/Fail]
0.165000	28.20	10.70	66.00	37.80	AV	N	Pass
0.215000	26.80	10.70	66.00	39.20	AV	N	Pass
0.265000	26.30	10.60	66.00	39.70	AV	N	Pass
0.345000	23.50	10.40	66.00	42.50	AV	L1	Pass
0.555000	16.20	10.20	60.00	43.80	AV	L1	Pass
0.580000	15.20	10.20	60.00	44.80	AV	L1	Pass
0.785000	10.50	10.20	60.00	49.50	AV	N	Pass
0.995000	9.10	10.40	60.00	50.90	AV	L1	Pass
1.270000	7.40	10.40	60.00	52.60	AV	N	Pass
8.310000	8.00	10.60	60.00	52.00	AV	N	Pass
8.565000	7.90	10.60	60.00	52.10	AV	N	Pass
8.815000	9.80	10.60	60.00	50.20	AV	N	Pass
8.940000	9.20	10.60	60.00	50.80	AV	N	Pass
9.065000	9.60	10.60	60.00	50.40	AV	N	Pass
9.435000	10.30	10.60	60.00	49.70	AV	N	Pass
9.560000	9.20	10.60	60.00	50.80	AV	N	Pass
9.685000	23.40	10.60	60.00	36.60	AV	N	Pass
9.810000	9.50	10.60	60.00	50.50	AV	N	Pass
9.935000	9.40	10.60	60.00	50.60	AV	N	Pass
10.185000	8.60	10.70	60.00	51.40	AV	N	Pass

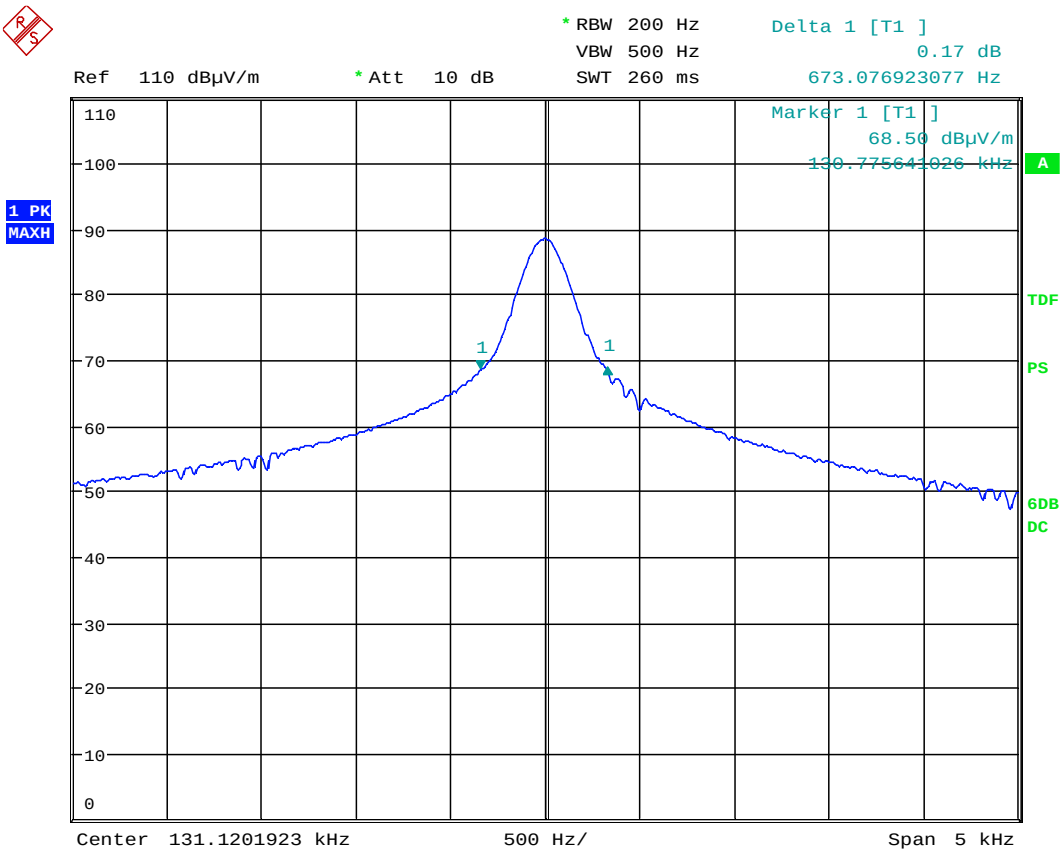
3.2 20 dB Bandwidth

Test Performed By: G.Suhanthakumar	Date of Test: 2014.11.29

Measurement Data:

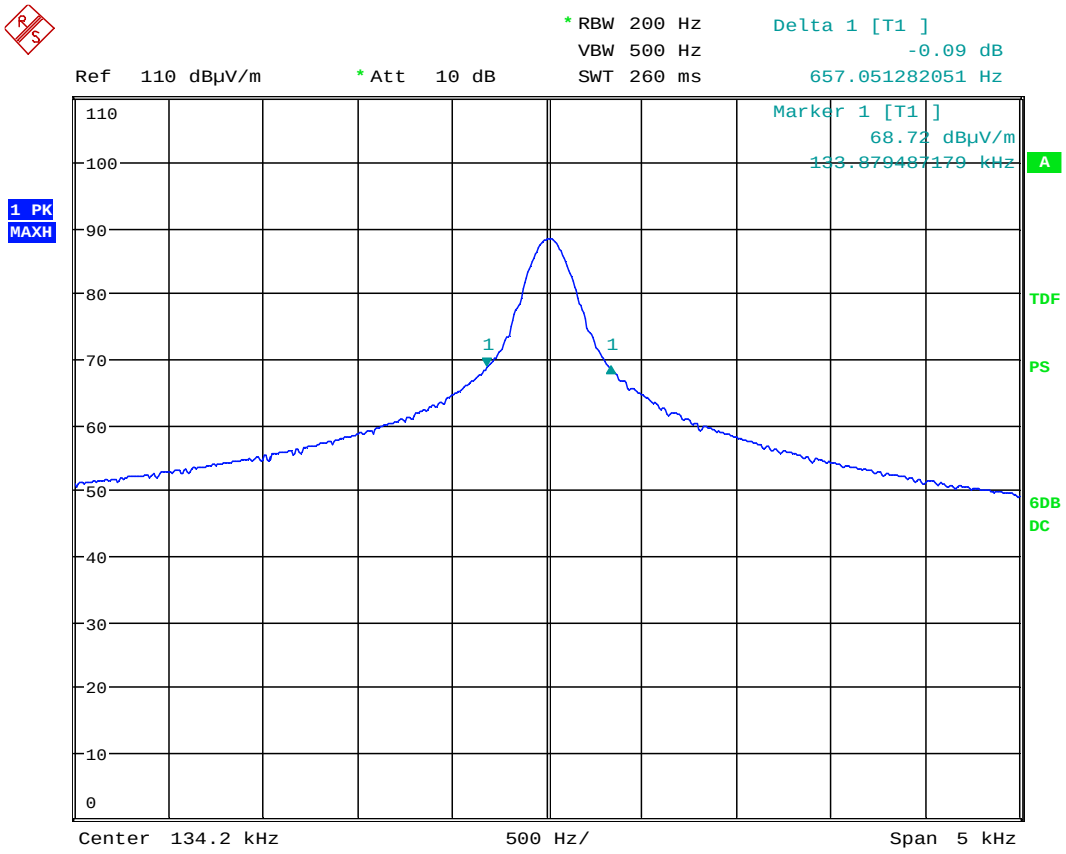
Measured 20 dB Bandwidth (Hz)	
131.1kHz	**134.2kHz**
673	657

Requirements: No requirements. Reported for information only.



Date: 29.NOV.2014 08:53:56

20 dB Bandwidth at 131.1 kHz



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20 dB Bandwidth at 134.2 kHz

3.3 Spurious Emissions (Radiated)

Para. No.: 15.31, 15.33, 15.35, 15.209 (a) (d)

Test Performed By: G.Suhanthakumar	**Date of Test: 2014.11.21 – 2014.11.29**

Test Results: Complies

Measurement Data:

Radiated emissions 9kHz - 30 MHz.

Detector: Average

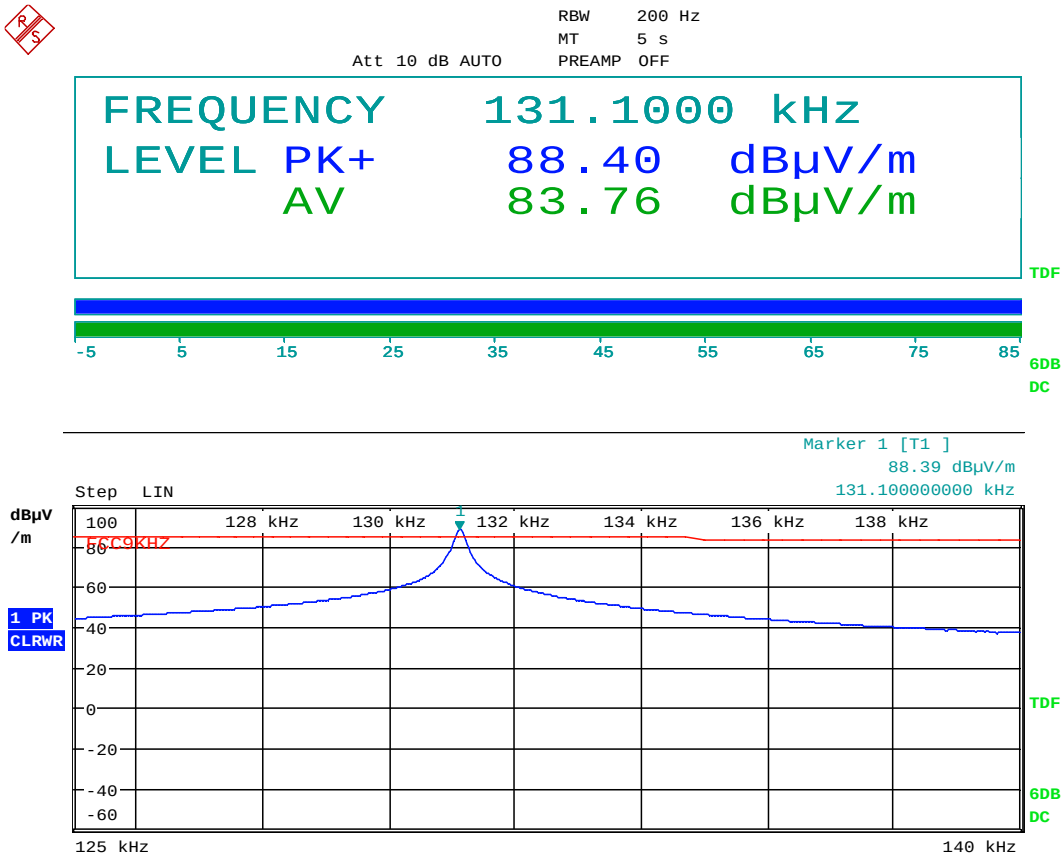
Measuring distance 10m

Frequency kHz	Channel kHz	Measured Field Strength @10m (dBµV/m)	Detector	Limit @10m dBµV/m	Margin dB
131.1	131	83.76	AV	84.33	0.57
134.2	134.2	83.76	AV	84.13	0.37

The limit line in the graph is corrected for 10m distance.

Antenna factor, amplifier gain and cable loss are included in Spectrum Analyzer “Transducer factor”.

See attached graphs.



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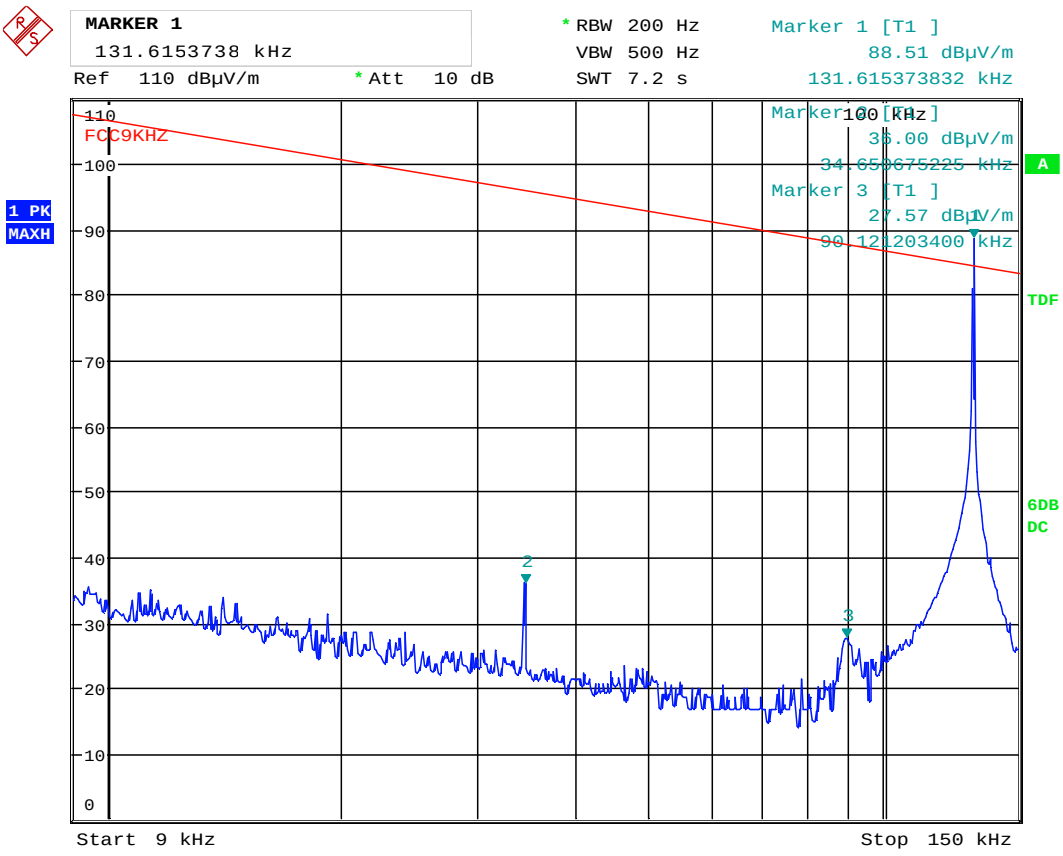
Average detector – 131.1/134.2kHzkHz @10m



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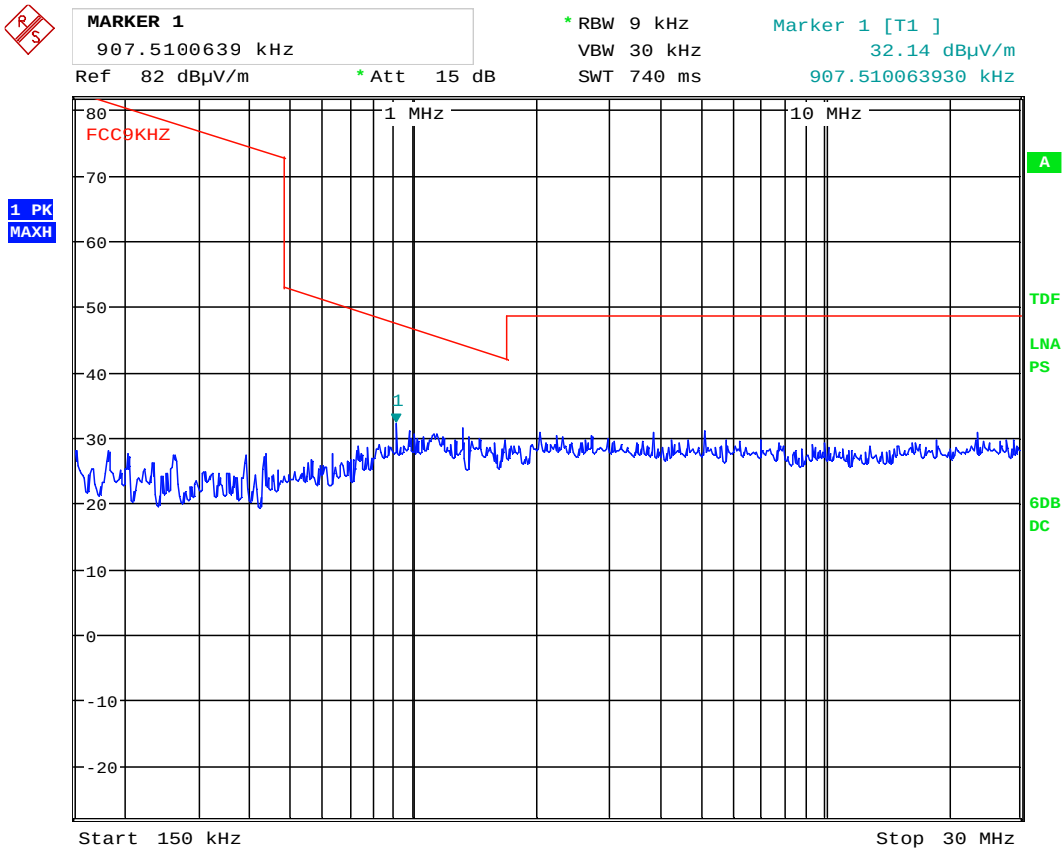
131kHz; Radiated Emissions, 9 kHz – 150kHz @10m – Peak scan



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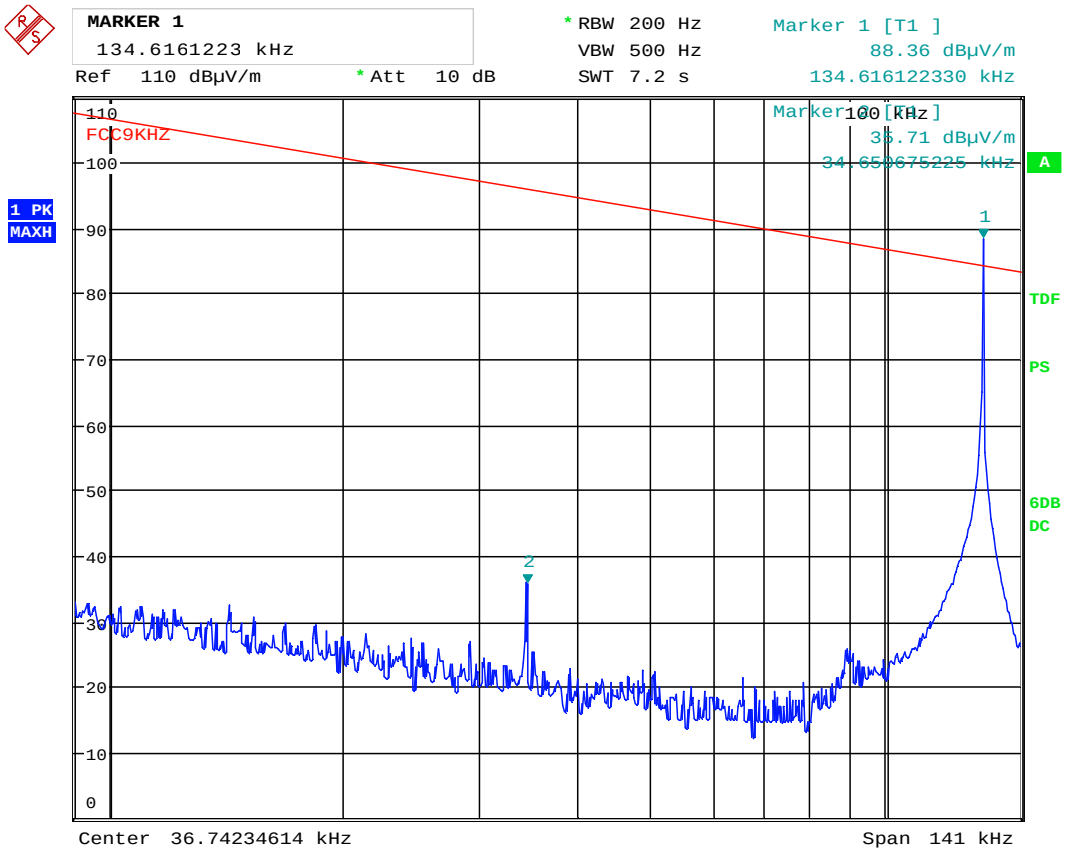
131kHz ; Radiated Emissions, 0.15 - 30MHz @10m – Peak scan



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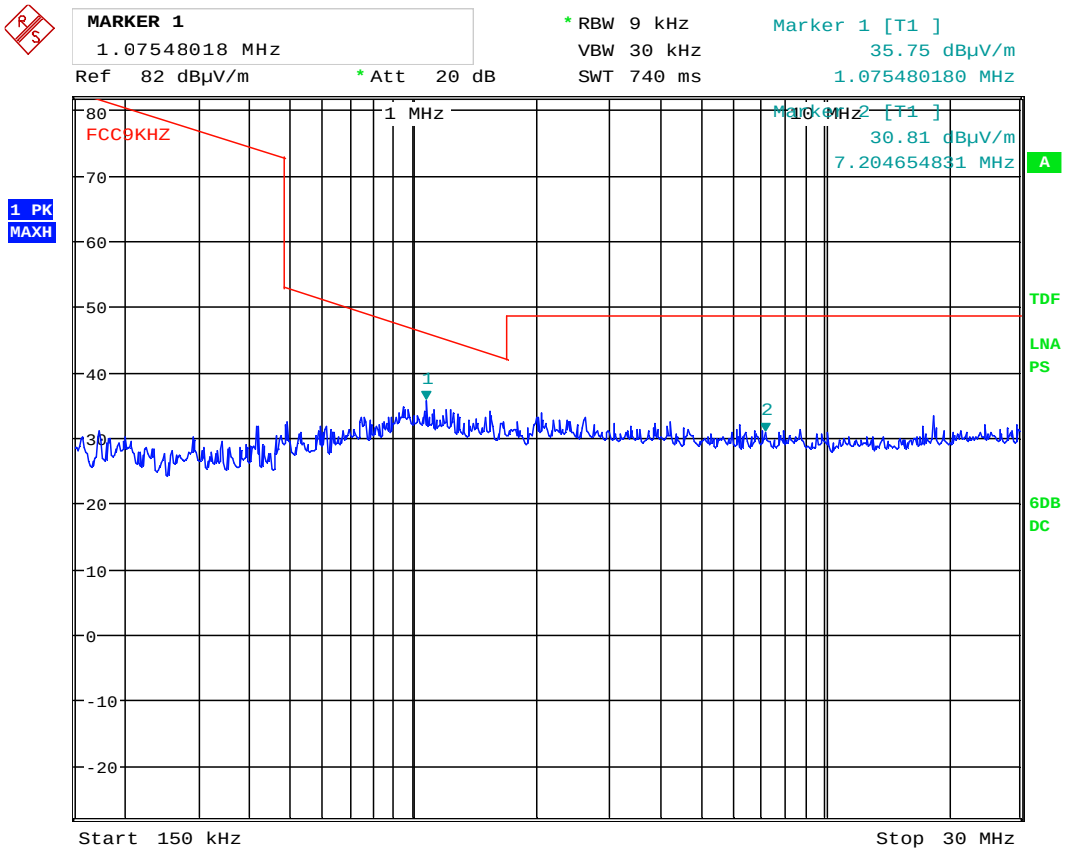
134.2kHz; Radiated Emissions, 9 kHz – 150kHz @10m – Peak scan



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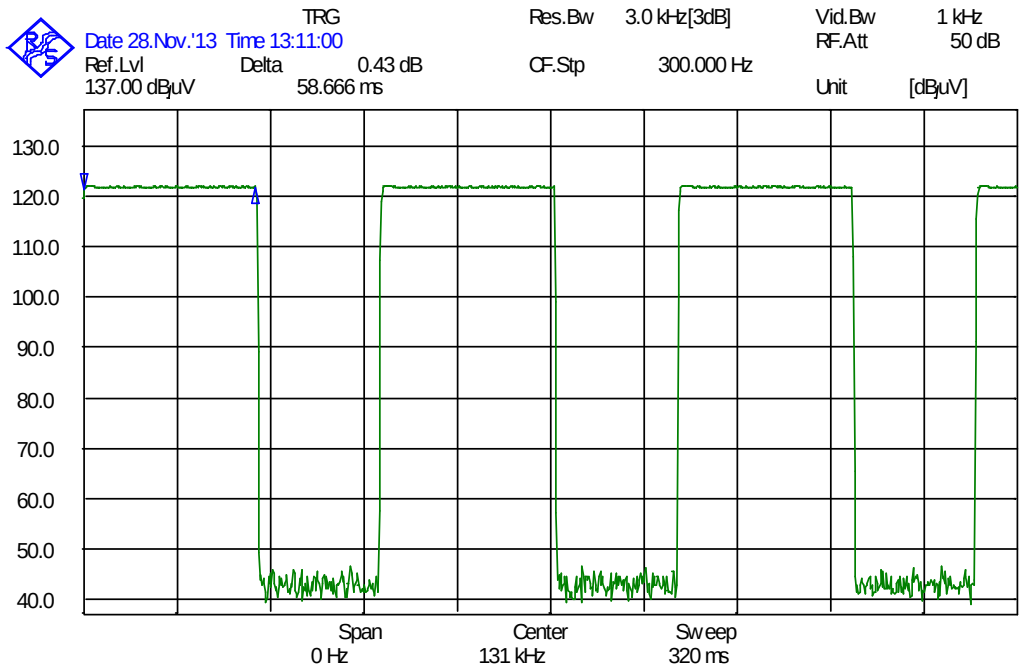
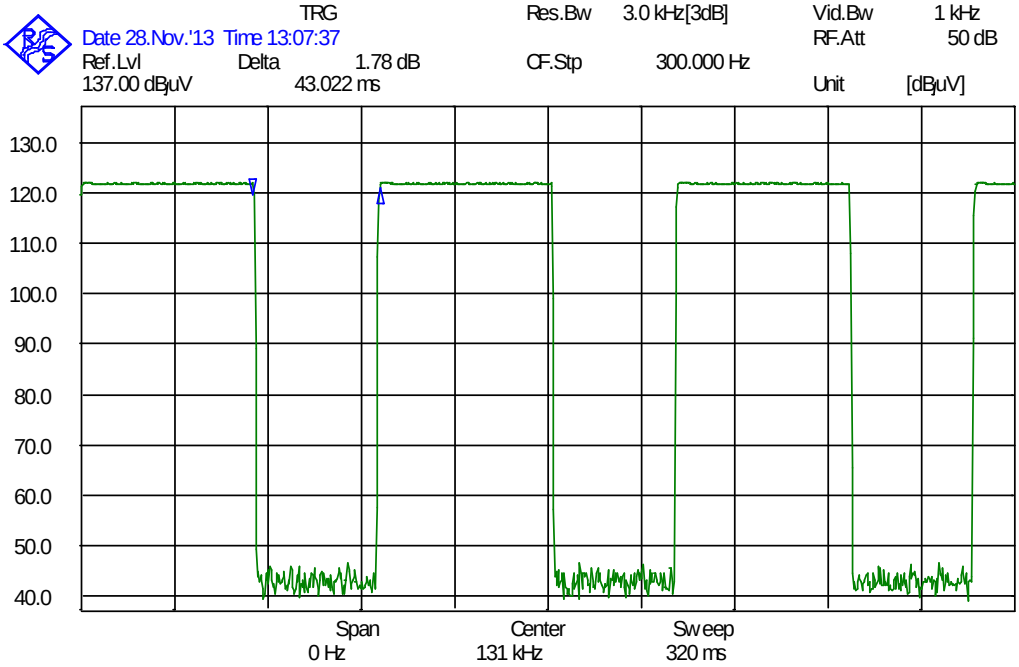
134.2kHz; Radiated Emissions, 0.15 - 30MHz @10m – Peak scan



Duty cycle ON time with transponder



Duty cycle OFF time with transponder

Radiated emission 30 – 1000 MHz.

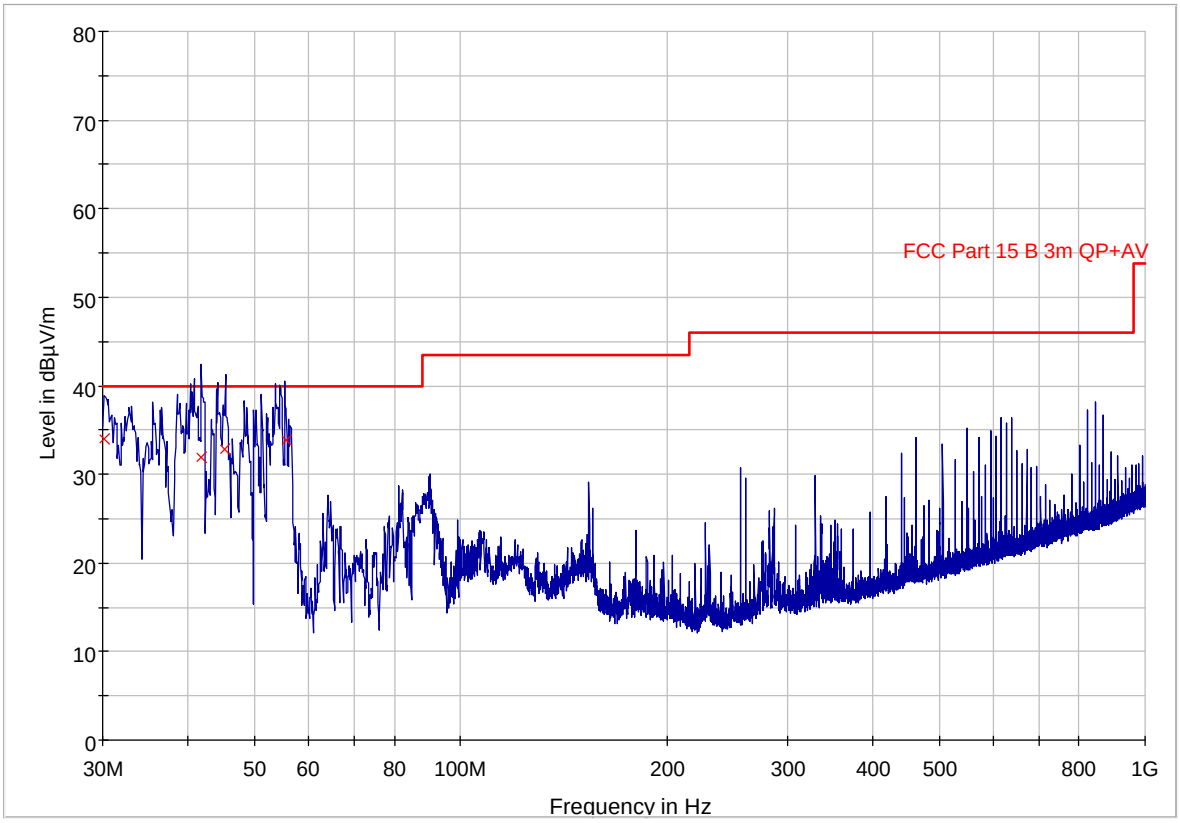
Detector: Peak

Measuring distance at 3m.

All values are below the limit even when measured with Peak Detector.

Antenna factor, amplifier gain and cable loss are included in Spectrum Analyzer “Transducer factor”.

See attached graphs.



Radiated Emissions, 30 – 1000 MHz, VP and HP, @3m

Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)	Comment
30.187279	34.0	1000.0	120.000	170.0	V	27.0	-2.0	6.0	40.0	
41.685100	31.9	1000.0	120.000	195.0	V	63.0	-10.1	8.1	40.0	
45.186500	32.8	1000.0	120.000	100.0	V	101.0	-11.3	7.2	40.0	
55.558200	33.9	1000.0	120.000	100.0	V	274.0	-14.5	6.1	40.0	

Radiated Emissions, 1-6 GHz

1-6 GHz measured at a distance of 3 m

All values are below the average limit even when measured with Peak Detector.

Peak detector

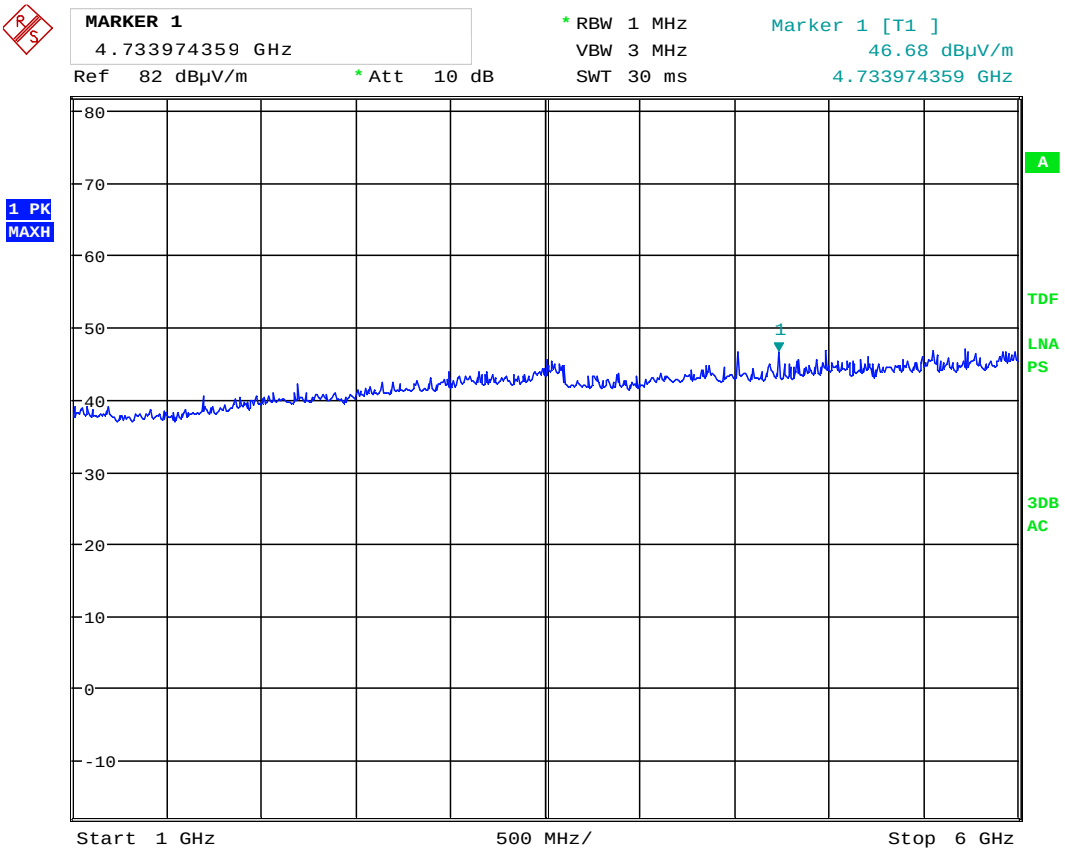
Frequency GHz	Field Strength @3m dBµV/m	Detector	Limit dBµV/m	Margin dB
4.73	46.7	Pk	74	27.3
5.41	47.3	Pk	74	26.7

Average detector

Frequency GHz	Field Strength @3m dBµV/m	Detector	Limit dBµV/m	Margin dB
4.73	-	Av	54	-
5.41	-	Av	54	-

Antenna factor, amplifier gain and cable loss are included in Spectrum Analyzer “Transducer factor”.

See attached graphs.



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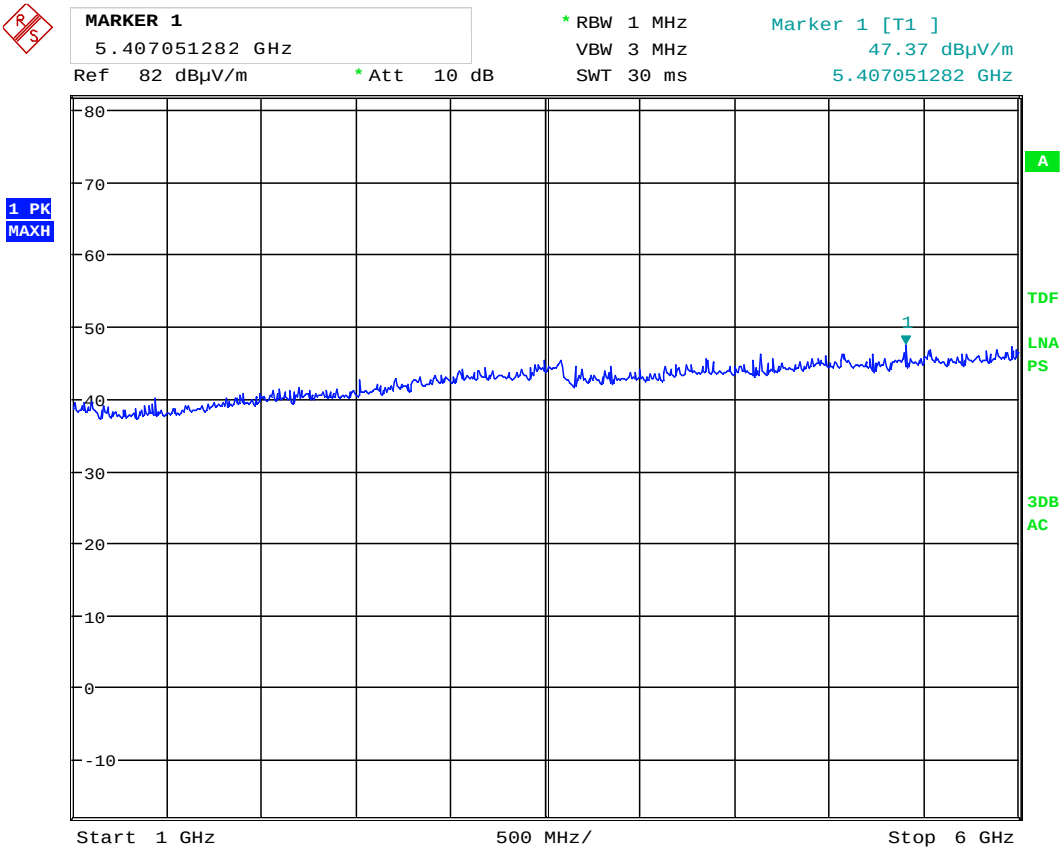
HP: 1 - 6GHz



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VP: 1 – 6GHz

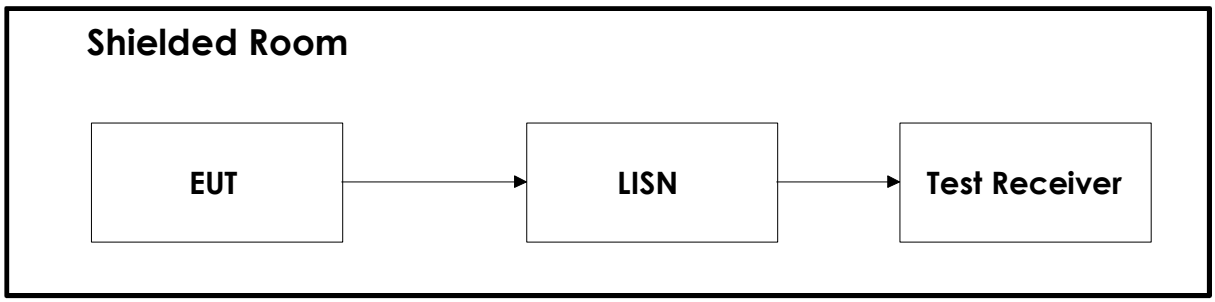
4 LIST OF TEST EQUIPMENT

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.

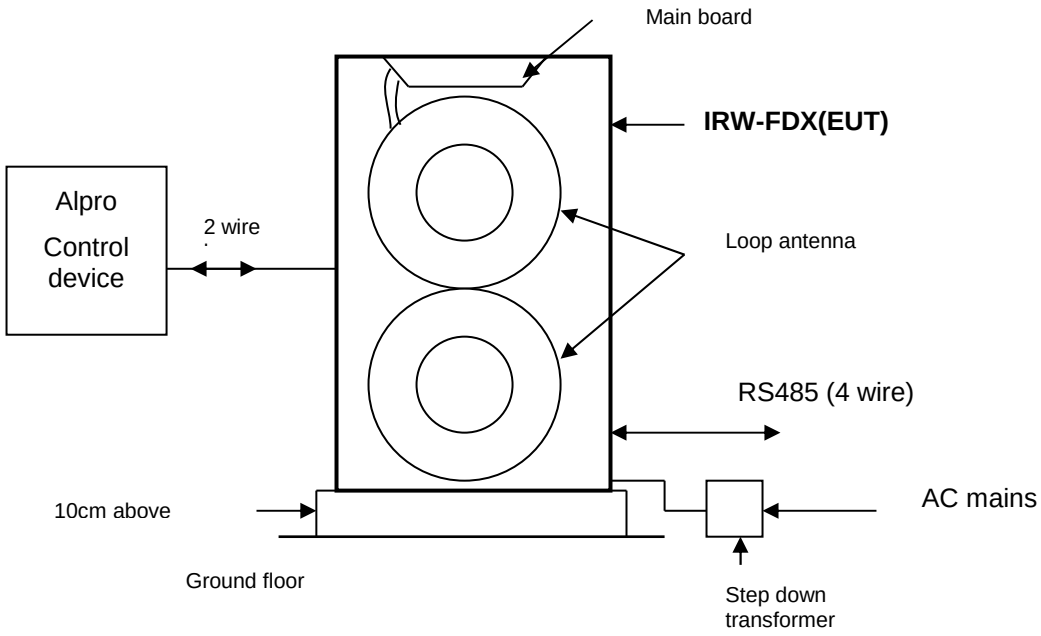
No.	Instrument/ ancillary	Type of instrument/ ancillary	Manufacturer	Ref. no.	Cal. Date	Cal. Due
1.	ESU40	EMI Receiver	Rohde & Schwarz	LR1639	2014.11	2015.11
2.	HFH2-Z2	Loop antenna	Rohde & Schwarz	LR1660	2014.10	2017.10
3.	3115	Antenna horn	EMCO	LR 1330	2010.08	2017.08
4.	JB3	Antenna Bilog	Sunol Sciences Inc.	N-4525	2013.12	2014.12
5.	8449B	Pre-amplifier	Hewlett Packard	LR 1322	2014.11	2015.11
6.	LNA6900	Pre-amplifier	Teseq	LR 1593	2014.07	2015.07
7.	Model 87 V	Multimeter	Fluke	LR 1597	2014.10	2015.10
8.	C10001ix	Power analyser	California Instruments	LR 1549	Calb4use	
9.	FSA	Spectrum Analyzer	Rohde & Schwarz	LT 5486	2012.11	2015.11
10	FSA	Spectrum Analyzer	Rohde & Schwarz	LT 5487	2012.11	2015.11

5 BLOCK DIAGRAM

5.1 Power Line Conducted Emission



5.2 Test Setup Radiated Emission



Revision history

Version	Date	Comment	Sign
1.0	2015.11.10	TCB review	FS
1.1	2015.12.22	Minor corrections	FS