



EMC TEST REPORT

No. 131200068SHA-001

Applicant : IKEA of Sweden AB
P.O. Box 702, S-343 81 Älmhult, SWEDEN

Manufacturer : IKEA of Sweden AB
P.O. Box 702, S-343 81 Älmhult, SWEDEN

Product Name : Remote controller

Type/Model : E1205 ANSLUTA

SUMMARY

The equipment complies with the requirements according to the following standard(s):

47CFR Part 15 (2013): Radio Frequency Devices

ANSIC63.4 (2003): American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz

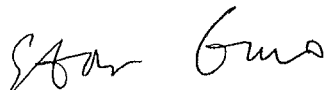
RSS-210 Issue 8 (December 2010): Low-power Licence-exempt Radiocommunication Devices (All Frequency Bands): Category I Equipment

RSS-Gen Issue 3 (December 2010): General Requirements and Information for the Certification of Radiocommunication Equipment

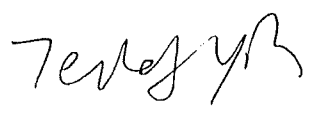
RSS-310 Issue 3 (December 2010): Licence-exempt Radio Apparatus (All Frequency Bands): Category II Equipment

Date of issue: March 20, 2014

Prepared by:


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FCC ID: FHO-E1205
IC: 10912A-E1205

Description of Test Facility

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1. General Information

1.1 Applicant Information

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Manufacturer: IKEA of Sweden AB
P.O. Box 702, S-343 81 Älmhult, SWEDEN

Sample received date : January 10, 2014
Date of test : January 10-February 25, 2014

1.2 Identification of the EUT

Equipment: Remote controller

Type/model: E1205 ANSLUTA

FCC ID: FHO-E1205

IC: 10912A-E1205

1.3 Technical specification

Operation Frequency Band: 2436.27 MHz

Modulation: FSK

Antenna Designation: Omnidirectional antenna

Gain of Antenna: 0dBi

Rating: 2x1.5VDC LR03 AAA

Description of EUT: There is one model only.
The EUT transmits RF signal to control the working condition of the corresponding receiver.

Channel Description: There is one channel only

1.4 Mode of operation during the test / Test peripherals used

Within this test report, EUT was tested with modulation and tested under its rating voltage and frequency.

For the EUT is handheld device, it was set up and tested in three axes (X, Y and Z). The three axes were tested one by one while the test receiver worked as “max hold” continuously and the highest reading among the whole test procedure was recorded.

2. Test Specification

2.1 Instrument list

Equipment	Type	Manu.	Internal no.	Cal. Date	Due date
Test Receiver	ESIB 26	R&S	EC 3045	2013-10-21	2014-10-20
Semi-anechoic chamber	-	Albatross project	EC 3048	2013-5-21	2014-5-20
Bilog Antenna	CBL 6112D	TESEQ	EC 4206	2013-5-16	2014-5-15
Horn antenna	HF 906	R&S	EC 3049	2013-5-13	2014-5-12
Pre-amplifier	Pre-amp 18	R&S	EC 3222	2013-4-12	2014-4-11
Test Receiver	ESCS 30	R&S	EC 2107	2013-10-21	2014-10-20
A.M.N.	ESH2-Z5	R&S	EC 3119	2013-1-10	2015-1-9
A.M.N.	ESH3-Z5	R&S	EC 2109	2013-1-10	2015-1-9
High Pass Filter	WHKX 1.0/15G- 10SS	Wainwright	EC4297-1	2013-2-8	2015-2-7
High Pass Filter	WHKX 2.8/18G- 12SS	Wainwright	EC4297-2	2013-2-8	2015-2-7
High Pass Filter	WHKX 7.0/1.8G- 8SS	Wainwright	EC4297-3	2013-2-8	2015-2-7
Band Reject Filter	WRCGV 2400/2483- 2390/2493- 35/10SS	Wainwright	EC4297-4	2013-2-8	2015-2-7

2.2 Test Standard

47CFR Part 15 (2013)

ANSI C63.4 (2003)

RSS-210 Issue 8 (December 2010)

RSS-Gen Issue 3 (December 2010)

2.3 Test Summary

This report applies to tested sample only. This report shall not be reproduced in part without written approval of Intertek Testing Service Shanghai Limited.

TEST ITEM	FCC REFERANCE	IC REFERANCE	RESULT
Radiated emission	15.249 & 15.205	RSS-210 Issue 8 Annex A2.9 & Clause 2.2	Pass
Assigned bandwidth (20dB bandwidth)	15.215(c)	-	Pass
Occupied bandwidth	-	RSS-Gen Issue 3 Clause 4.6.1	Pass
Power line conducted emission	15.207	RSS-Gen Issue 3 Clause 7.2.4	NA

2.4 Data rate VS power

The data rate of EUT is fixed and cannot be adjusted.

3. Radiated emission

Test result: **PASS**

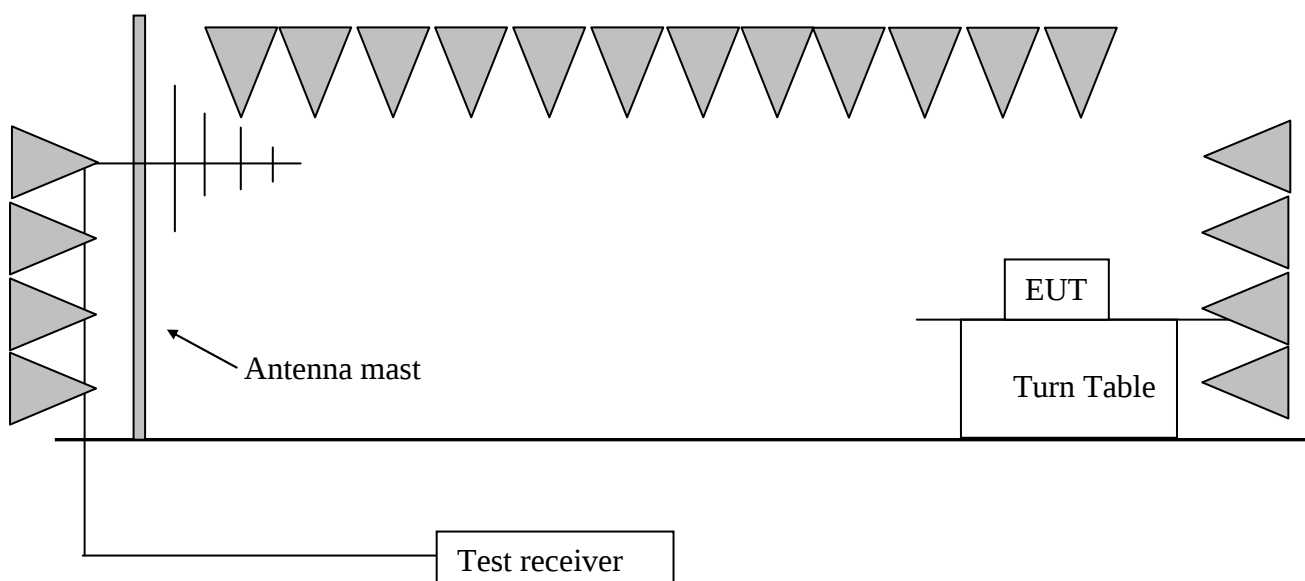
3.1 Test limit

Fundamental Frequency (MHz)	Fundamental limit (dBuV/m)	Harmonic limit (dBuV/m)
☐ 902 - 928	94	54
☒ 2400 - 2483.5	94	54
☐ 5725 - 5875	94	54
☐ 24000 - 24250	108	68

The radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) showed as below:

Frequency (MHz)	Field Strength (dBuV/m)	Measurement Distance (m)
30 - 88	40.0	3
88 - 216	43.5	3
216 - 960	46.0	3
Above 960	54.0	3

3.2 Test Configuration



3.3 Test procedure and test setup

The measurement was applied in a semi-anechoic chamber. While testing for spurious emission higher than 1GHz, if applied, the pre-amplifier would be equipped just at the output terminal of the antenna.

The EUT and simulators were placed on a 0.8m high wooden turntable above the horizontal metal ground plane. The turn table rotated 360 degrees to determine the position of the maximum emission level. The EUT was set 3 meters away from the receiving antenna which was mounted on an antenna mast. The antenna moved up and down between from 1meter to 4 meters to find out the maximum emission level.

The radiated emission was measured using the Spectrum Analyzer with the resolutions bandwidth set as:

RBW = 100kHz, VBW = 300kHz (30MHz~1GHz for PK)

RBW = 1MHz, VBW = 3MHz (>1GHz for PK);

RBW = 1MHz, VBW = 10Hz (>1GHz for AV);

3.4 Test protocol

Radiated emission

CH	Antenna	Frequency (MHz)	Correct Factor (dB/m)	Corrected Reading (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
	V	2436.27	-3.80	87.95	114.00	26.05	PK
	V	2436.27	-	78.35	94.00	15.65	PK
	V	4713.63	-3.77	49.37	74.00	24.63	PK
	V	4713.63	-3.77	30.94	54.00	23.06	AV
	V	4849.70	-3.52	50.80	74.00	23.20	PK
	V	4849.70	-	41.20	54.00	12.80	PK
	V	5265.93	-2.54	53.83	74.00	20.17	PK
	V	5265.93	-2.54	29.26	54.00	24.74	AV

- Remark: 1. For fundamental emission test, no pre-amplifier is employed.
 2. Correct Factor = Antenna Factor + Cable Loss (-Amplifier, is employed)
 3. Corrected Reading = Original Receiver Reading + Correct Factor
 4. Margin = limit – Corrected Reading
 5. If the PK reading is lower than AV limit, the AV test can be elided.
 6. The shaded data is the fundamental emission.
 7. Both emissions on “horizontal” and “vertical” axes were assessed and the worse test data was listed in this report.
 8. For fundamental and harmonic emission test, AV = PEAK+ PDCF,
 PDCF= $20\log(T \text{ max on time}/100\text{ms}) = -9.60\text{dB}$

Example: Assuming Antenna Factor = 30.20dB/m, Cable Loss = 2.00dB,
 Gain of Preamplifier = 32.00dB, Original Receiver Reading = 10dBuV.
 Then Correct Factor = $30.20 + 2.00 - 32.00 = 0.20\text{dB/m}$; Corrected Reading = $10\text{dBuV} + 0.20\text{dB/m} = 10.20\text{dBuV/m}$
 Assuming limit = 54dBuV/m, Corrected Reading = 10.20dBuV/m, then Margin = $54 - 10.20 = 43.80\text{dBuV/m}$

4. Assigned bandwidth (20dB bandwidth)

Test result: PASS

4.1 Limit

Intentional radiators must be designed to ensure that the 20 dB bandwidth of the emission is contained within the allocated frequency band as clause 3.1 shows.

If frequency stability is not specified in the regulations, it is recommended that the fundamental emission be kept within at least the central 80% of the permitted band in order to minimize the possibility of out-of-band operation.

4.2 Test Configuration

See clause 3.2.

4.3 Test procedure and test setup

The 20dB Bandwidth per FCC §15.215(c) is measured using the Spectrum Analyzer.

4.4 Test protocol

80% of permitted band (MHz)	Test Value	Result
2408.35 ~ 2475.15	2435.82 ~ 2436.61	Pass

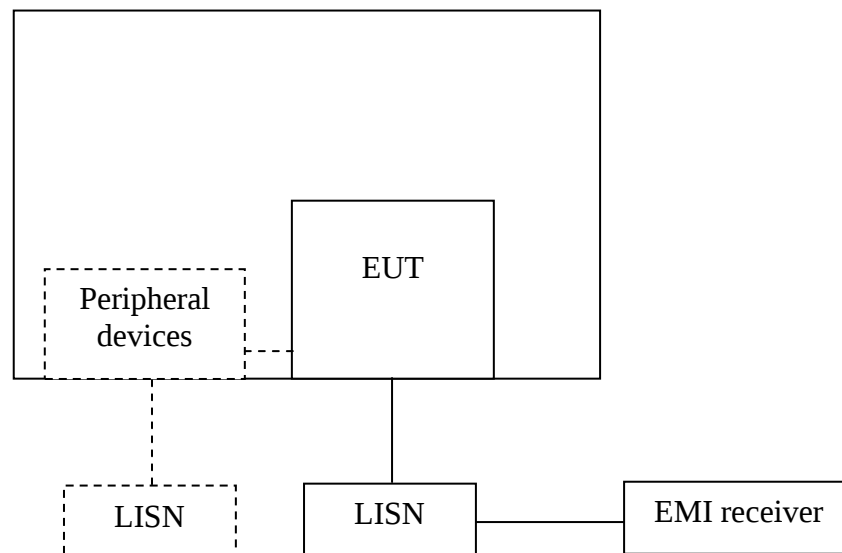
5. Power line conducted emission

Test result: NA

5.1 Limit

Frequency of Emission (MHz)	Conducted Limit (dBuV)	
	QP	AV
0.15-0.5	66 to 56*	56 to 46 *
0.5-5	56	46
5-30	60	50
* Decreases with the logarithm of the frequency.		

5.2 Test configuration



- ☐ For table top equipment, wooden support is 0.8m height table
- ☐ For floor standing equipment, wooden support is 0.1m height rack.

5.3 Test procedure and test set up

The EUT are connected to the main power through a line impedance stabilization network (LISN). This provides a 50Ω/50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN that provides a 50Ω/50uH coupling impedance with 50Ω termination.

Both sides (Line and Neutral) of AC line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.4 on conducted measurement. The bandwidth of the test receiver is set at 9 kHz.

5.4 Test protocol

Frequency	Correct Factor (dB)	Corrected Reading (dBuV)		Limit (dBuV)		Margin (dB)	
		QP	AV	QP	AV	QP	AV
Remark: 1. Correction Factor (dB) = LISN Factor (dB) + Cable Loss (dB). 2. Margin (dB) = Limit - Corrected Reading.							

6. Occupied Bandwidth

Test Status: Tested

6.1 Test limit

None

6.2 Test Configuration

See clause 3.2.

6.3 Test procedure and test setup

The occupied bandwidth per RSS-Gen Issue 3 Clause 4.6.1 was measured using the Spectrum Analyzer.

6.4 Test protocol

Temperature : 22 °C
Relative Humidity : 43 %

Channel	Occupied Bandwidth (MHz)	Max. reading (MHz)
	1.2325	1.2325