


TEST REPORT

LABORATORY MEASUREMENTS

Pursuant to 47 CFR Part 15 [10-01-20 Edition] and ANSI C63.4:2014

Report No.:	21070914HKG-001
Applicant:	IKEA of Sweden AB Box 702, SE-343 81 Älmhult, SWEDEN
Equipment Under Test (EUT):	
Product Description:	Class III Lighting Chain
Model:	J2114 Utsund
Brand Name:	
Equipment Type:	Class B Digital Device / Unintentional Radiator
Sample Receipt Date:	July 16, 2021
Test Conducted Date:	July 16, 2021 to July 29, 2021
Issue Date:	July 30, 2021
Test Site Location:	1. For Radiated Emission Test: LG1/F, 78 Tat Chee Avenue, Kowloon, Hong Kong SAR, China. 2. For Conducted Emission Test: Workshop No. 3, G/F., World-Wide Industrial Centre, 43-47 Shan Mei Street, Fo Tan, Sha Tin, N.T., Hong Kong SAR, China.
Conclusion:	Test was conducted by client submitted sample. The submitted sample as received complied with the 47 CFR Part 15 requirement.

Prepared and Checked by:

Approved by:

Signed on File
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TEST REPORT

TABLE OF CONTENTS

1 GENERAL INFORMATION3

1.1 Client Information.....3

1.2 General Description3

1.3 Details of EUT.....3

1.4 Description of Peripherals3

1.5 Decision Rule.....3

2 TEST SUMMARY4

3 TEST SPECIFICATIONS5

3.1 Standards5

3.2 Definition of Device Classification5

3.3 EUT Operation Condition.....5

4 CONDUCTED EMISSION MEASUREMENTS6

4.1 Operating Environment6

4.2 Test Setup and Procedure6

4.3 Test Equipment.....7

4.4 Conducted Emission Limits.....7

4.5 Conducted Emission Test Data8

5 RADIATED EMISSION MEASUREMENTS10

5.1 Operating Environment10

5.2 Test Setup and Procedure10

5.3 Test Equipment.....11

5.4 Radiated Emission Limits11

5.5 Field Strength Calculation.....12

5.6 Radiated Emission Test Data13

TEST REPORT

1. GENERAL INFORMATION

1.1 Client Information

Applicant: IKEA of Sweden AB

1.2 General Description of EUT

Product Description: Class III Lighting Chain
Model No.: J2114 Utsund
Serial No.: Not Labelled

1.3 Details of EUT

Rated Voltage: 100-120VAC 50/60Hz
Cables: Not Applicable

For more detail features, please refer to user's Manual.

1.4 Description of Peripherals

Description	Remark
AC/DC adaptor (Model: ICPSL24-2-IL-1; Input: 100-120VAC 50/60Hz; Output: 24VDC 83mA)	Provided by Applicant

1.5 Decision Rule

Decision Rule for compliance: For FCC/IC standard, the measured value must be within the limits of applicable standard without accounting for the measurement uncertainty. For EN/IEC/HKTA/HKTC standard, conformity rules will be used as per standard directly excepted EN/IEC 61000-3-2, EN/IEC 61000-3-3, HKTA1004, HKCA1008, HKTA1019, HKTA1020, HKTA1041 and HKTA1044. For these excepted or not mentioned standards, Cl 4.2.2 of ILAC-G8:09/2019 decision rules will be reference and guard band will be equal to our measurement uncertainty with 95% confidence level (k=2). In case, the measured value is within guard band region, undetermined decision will be used.

TEST REPORT

2. TEST SUMMARY

Test	Standard	Class	Result
Conducted Emission	Section 15.107 of 47 CFR Part 15	Class B	Pass
Radiated Emission	Section 15.109 of 47 CFR Part 15	Class B	Pass

Remark:

The EUT has been tested/evaluated and pass the 47 CFR Part 15 without modification.

The production units are required to conform to the initial sample as received when the units are placed on the market.

Enclosed please find the FCC Labelling and Instruction Manual Requirements.

For all external photos and setup photos, please refer to the 21070914HKG-001 Annex document.

TEST REPORT

3. TEST SPECIFICATIONS

3.1 Standards

Both conducted and radiated emission tests were performed according to the procedures in ANSI C63.4:2014. Test results are in compliance with the requirements of 47 CFR Part 15 [10-01-20 Edition].

The EUT setup configuration please refers to the photo of test configuration in item.

3.2 Definition of Device Classification

Unintentional radiator:

A device which is not intended to emit RF energy by radiation or induction.

Class A Digital Device:

A digital device which is marketed for use in commercial or business environment.

Class B Digital Device:

A digital device which is marketed for use by the general public or in a residential environment.

Note:

A manufacturer may also qualify a device intended to be marketed in a commercial, business or industrial environment as a Class B digital device, and in fact is encouraged to do so, provided the device complies with the technical specifications for a Class B Digital Device. In the event that a particular type of device has been found to repeatedly cause harmful interference to radio communications, the Commission may classify such a digital device as a Class B Digital Device, Regardless of its intended use.

3.3 EUT Operation Condition

The EUT was powered by 100-120VAC 50/60Hz and was running in accordance with the manufacturer's operation manual.

TEST REPORT

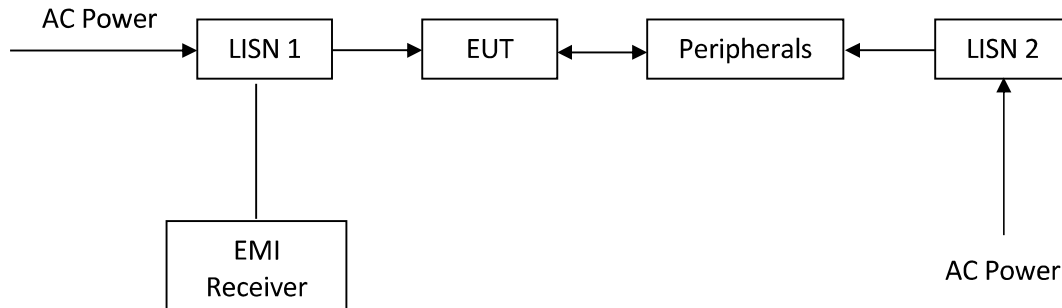
4. CONDUCTED EMISSION MEASUREMENTS (SECTION 15.107 OF 47 CFR PART 15)

4.1 Operating Environment

Temperature: 25°C ± 10°C

Test Voltage: 120VAC

4.2 Test Setup and Procedure



The EUT along with its peripherals were placed on a 1.0m (W) × 1.5m (L) and 0.8m in height wooden table and the EUT was adjusted to maintain a 0.4 meter space from a vertical reference plane. The EUT was connected to power mains through a line impedance stabilization network (LISN), which provided 50 ohm coupling impedance for measuring instrument and the chassis ground was bounded to the horizontal ground plane of shielded room. The excess power cable between the EUT and the LISN was bundled.

All connecting cables of EUT and peripherals were moved to find the maximum emission.

TEST REPORT

4.3 Test Equipment

Equipment No.	Equipment	Manufacturer	Model No.	Serial No.
EW-3095	EMI Test Receiver	R&S	ESCI	101430
EW-2501	Artificial Mains Network	R&S	ENV-216	100483

4.4 Conducted Emission Limits

Frequency (MHz)	Maximum RF Line Voltage			
	Class A (dB μ V)		Class B (dB μ V)	
	Q.P.	Ave.	Q.P.	Ave.
0.15~0.50	79	66	66~56	56~46
0.50~5.00	73	60	56	46
5.00~30.0	73	60	60	50

Note: Uncertainty: ± 3.46 dB at a Level of Confidence of 95%

TEST REPORT

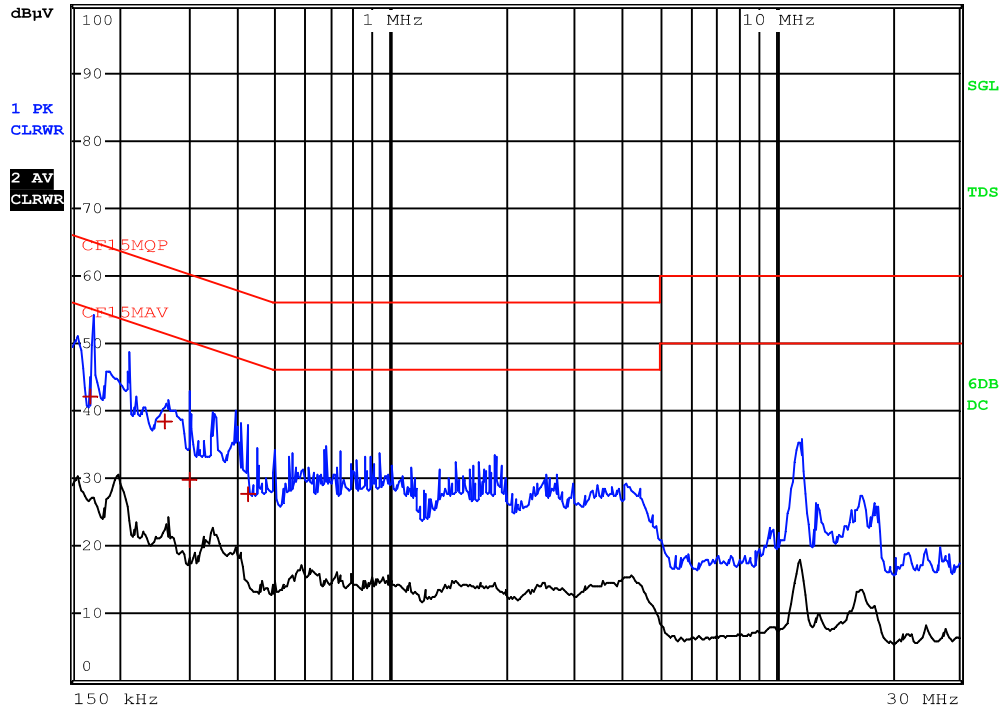
4.5 Conducted Emission Test Data

Phase: Live / Neutral
Model No.: J2114 Utsund
Worst Case: Light On



REW 9 kHz
MT 1 s

Att 10 dB AUTO PREAMP OFF



21070914HKG-001

Date: 20.JUL.2021 16:34:22

TEST REPORT

4.5 Conducted Emission Test Data

Phase: Live / Neutral
Model No.: J2114 Utsund
Worst Case: Light On

EDIT PEAK LIST (Final Measurement Results)					
TRACE		FREQUENCY	LEVEL dB μ V		DELTA LIMIT dB
Trace1:	CF15MQP				
Trace2:	CF15MAV				
Trace3:	---				
1	Quasi Peak	168 kHz	42.01	L1	-23.04
1	Quasi Peak	262.5 kHz	38.39	N	-22.95
1	Quasi Peak	298.5 kHz	29.78	N	-30.49
1	Quasi Peak	424.5 kHz	27.73	L1	-29.63

21070914HKG-001

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TEST REPORT

5. RADIATED EMISSION MEASUREMENTS (SECTION 15.109 OF 47 CFR PART 15)

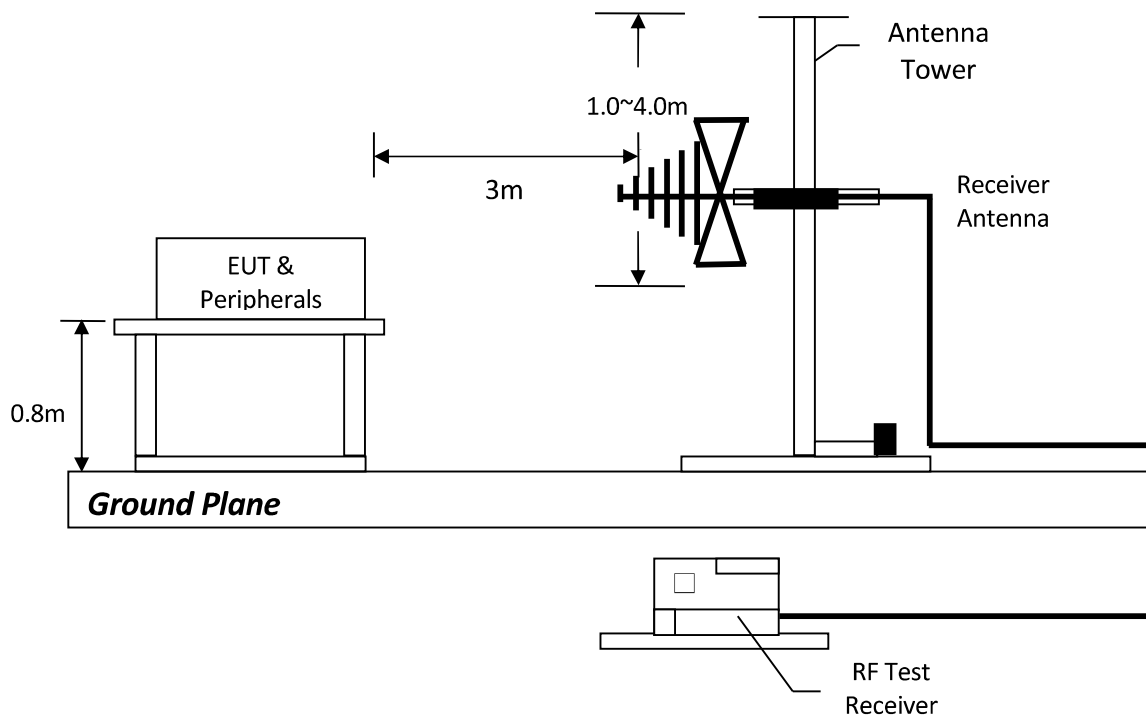
5.1 Operating Environment

Temperature: 25°C ± 10°C Test Voltage: 120VAC

5.2 Test Setup and Procedure

The figure below shows the test setup, which is utilized to make these measurements.

The frequency spectrum from 30MHz to 1000MHz was investigated.



The equipment under test was placed on the top of rotation table 0.8 meter above ground plane.

The table was 360 degrees to determine the position of the highest radiation.

EUT is set 3 meters from the EMI receiving antenna, which is mounted on a variable height mast. The antenna height is varied between one meter and four meters above ground to find the maximum value of the field strength. Both horizontal polarization and vertical polarization of the antenna are set to make the measurement. The bandwidth was setting on the EMI meter 120kHz.

The levels are quasi peak value readings. The frequency spectrum from 30MHz to 1000MHz was investigated.

TEST REPORT

5.3 Test Equipment

Equipment No.	Equipment	Manufacturer	Model No.	Serial No.
EMC701	Multi-functional Anechoic Chamber (NSA)	Albatross	Nil	B83117-C1634-T161
EMC701	Multi-functional Anechoic Chamber (SVSWR)	Albatross	Nil	B83117-C1634-T161
EMC700	Low-loss RF and Microwave Coaxial cable–12m	Huber+Suhner	SF118/11N/11N /12000MM	800018/118
EMC567	Test Receiver	R & S	ESU26	100050
EMC576	Bi-conical Antenna	R & S	HK116	100241
EMC039	Log Periodic Antenna	R & S	HL223	841516/017
EMC586	Double-Ridged Waveguide Horn	EMCO	3117	00094998
EMC660	Microwave Preamplifier	COM-POWER Corporation	PAM-118A	551091

5.4 Radiated Emission Limits

According to Section 15.109 of 47 CFR Part 15, except for Class A digital device, the field strength of radiated emission from unintentional radiators at a distance of 3 meters shall not exceed the following values:

Class B Radiated Emission Limits:

Frequency (MHz)	Field Strength (dB μ V/m)
30-88	40.0
88-216	43.5
216-960	46.0
Above 960	54.0

TEST REPORT

5.5 Field Strength Calculation

The field strength is calculated by adding the reading on the Spectrum Analyzer to the factors associated with preamplifiers (if any), antennas, cables, pulse desensitization and average factors (when specified limit is in average and measurements are made with peak detectors). A sample calculation is included below.

$$FS = RA + \text{Corr.}(\text{AF \& CF})$$

Where FS = Field Strength in dB μ V/m

RA = Receiver Amplitude (including preamplifier) in dB μ V

CF = Cable Attenuation Factor in dB

AF = Antenna Factor in dB

Corr. = Cable Attenuation Factor + Antenna Factor in dB

In the radiated emission table which follows, the reading shown on the data table may reflect the preamplifier gain. An example of the calculations, where the reading does not reflect the preamplifier gain, follows:

$$FS = RA + \text{Corr.}$$

Example

Assume a receiver reading of 23.0 dB μ V is obtained. The Corr. factor of 9 dB is added. The net field strength for comparison to the appropriate emission limit is 32.0 dB μ V/m. This value in dB μ V/m is converted to its corresponding level in μ V/m.

$$RA = 23.0 \text{ dB}\mu\text{V}$$

$$\text{Corr.} = 9 \text{ dB}$$

$$FS = 23 + 9 = 32.0 \text{ dB}\mu\text{V/m}$$

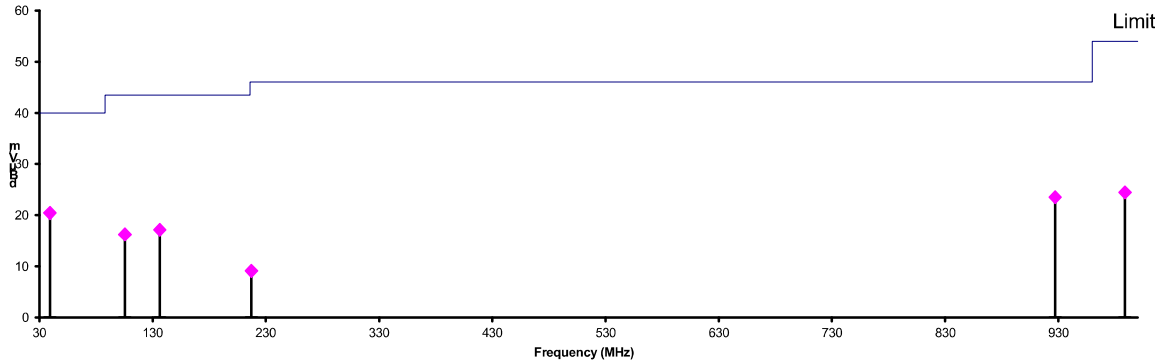
$$\text{Level in } \mu\text{V/m} = \text{Common Antilogarithm } [(32.0 \text{ dB}\mu\text{V/m})/20] = 39.8 \mu\text{V/m}$$

TEST REPORT

5.6 Radiated Emission Test Data

Pursuant to Section 15.109 of 47 CFR Part 15: Emissions Requirement

Polarity: Horizontal / Vertical
Model No.: J2114 Utsund
Worst Case: Light On



Polarization	Frequency (MHz)	Corr. Factor (dB)	Net at 3m (dB μ V/m)	Limit at 3m (dB μ V/m)	Margin (dB)
V	39.282	11.4	20.5	40.0	-19.5
V	105.412	10.7	16.2	43.5	-27.3
V	136.420	12.3	17.2	43.5	-26.3
V	217.280	11.7	9.1	46.0	-36.9
V	927.200	24.3	23.5	46.0	-22.5
V	988.800	25.0	24.5	54.0	-29.5

- Notes:
1. Quasi-Peak Detector Data
 2. Negative sign (-) in the margin column signify levels below the limit.
 3. Frequency range scanned: 30 MHz to 1000 MHz.
 4. Only emissions significantly above equipment noise floor are reported.
 5. Uncertainty: ± 6.1 dB at a Level of Confidence of 95%.
 6. The correction factor included cable loss + antenna factor.