REPORT ON EXPOSURE TO ELECTROMAGNETIC FIELDS

No. 1720278STO-003, Ed. 1

EQUIPMENT

Equipment:	Remote Control
Type/Model:	E1743 TRÅDFRI
Additional type/model*:	E1766 TRÅDFRI
Manufacturer:	IKEA of Sweden AB
Tested by request of:	IKEA of Sweden AB

*See opinions and interpretations clause 2.2

SUMMARY

Based on the assessment in this statement, the equipment is determined to **comply** with the requirements according to the following standards:

EN 62479 (2010)
CFR 47 Part 2 §2.1093
RSS-102 Issue 5
Radiocommunications (Electromagnetic Radiation – Human Exposure) Standard 2014
NZS 2772.1:1999

Date of issue: 2018-03-26

Tested by: Daniel Nilsson

Approved by: Stefan Andersson

Revision History

Edition	Date	Description	Changes
1	2018-03-26	First release	

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1 CLIENT INFORMATION

This assessment has been done by request of:

Company	IKEA of Sweden AB Box 702 343 81 Älmhult Sweden
Name of contact	M. Mauritzon HFB10 Lighting

2 EQUIPMENT

2.1 Identification of the equipment

Equipment:	Remote control
Type/Model:	E1743 TRÅDFRI
Additional model:	E1766 TRÅDFRI
Brand name:	IKEA
Manufacturer:	IKEA of Sweden
Transmitter frequency range:	2405 - 2480 MHz
Measured output power to antenna*:	4.2 dBm
Declared output power to antenna:	4.2 dBm
Antenna gain:	2.44 dBi
Measured duty cycle*:	25.7 %
Separation distance:	< 5 mm
Handheld or portable:	☒ Yes ☐ No
Exposure conditions:	☐ Controlled environment (occupational) ☒ Uncontrolled environment (general population)
Region of body:	☐ Head or trunk ☒ Limbs

*Reference for measurement: Test report 1720278STO-002 Ed. 1

2.2 Opinions and interpretations

The following type is also included as an additional type in this test report:

E1766 TRÅDFRI

The difference as compared to the tested type is (according to the manufacturer):

The embossed symbols on the top of the EUT are different.

The difference is considered not to imply different radio-characteristics when compared to the tested type. Therefore, this type is not tested, but considered to have the same radio-characteristics as the tested type.

3 TEST SPECIFICATIONS

3.1 Standards

EN 62479 (2010): Assessment of the compliance of low power electronic and electrical equipment with the basic restrictions related to human exposure to electromagnetic fields (10 MHz to 300 GHz)

CFR 47: Code of Federal Regulations Title 47: Telecommunications

RSS-102: Radio Frequency (RF) Exposure Compliance of Radiocommunication Apparatus (All Frequency Bands)

Radiocommunications (Electromagnetic Radiation – Human Exposure) Standard 2014

NZS 2772.1:1999 Radiofrequency fields – Maximum exposure levels – 3 kHz to 300 GH

3.2 Additions, deviations and exclusions from standards

No additions, deviations or exclusions have been made from standards.

4 TEST SUMMARY

The test has been carried out at the Intertek Semko AB premises in Kista, Sweden.
The results in this report apply only to sample tested:

Test	Result
RF Exposure, single transmitter	PASS
RF Exposure, multiple simultaneous transmitters	NA[1]

1. EUT only has a single transmitter

5 RF EXPOSURE, SINGLE TRANSMITTER

Result:	PASS

5.1 Calculations

EIRP: $+4.2\,dBm\ +\ (2.44)\,dB\ =\ +\,6.64\,dBm$

Conversion dBm to W:

Conducted: $1\,mW\ *\ 10^{\left(4.2\frac{dBm}{10}\right)}\ =\ 2.63\,mW$

EIRP: $1\,mW\ *\ 10^{\left(6.6\ 4\frac{dBm}{10}\right)}\ =\ 4.61\,mW$

Time averaged maximum power:

Conducted: $2.63\,mW\ *\ 0.257\ =\ 0.68\,mW$

EIRP: $4.61\,mW\ *\ 0.257\ =\ 1.18\,mW$

Low power exclusion limit:

KDB447498 D01 v06: $\frac{1.11\,mW}{5\,mm} * \sqrt{2.48\,GHz} = 0.35$

5.2 Results

Standard	Reference for limit	Value	Unit	Limit	Result
EN 62479	EN 62479	0.68	mW	< 20	PASS
47 CFR 2.1093	KDB 447498	0.35	NA	< 3	PASS
RSS-102	RSS-102	0.68	mW	< 4	PASS
Radiocommunications (Electromagnetic Radiation – Human Exposure) Standard 2014	Radiation Protection Standard for Maximum Exposure Levels to Radiofrequency Fields – 3 kHz to 300 GHz	0.68	mW	< 20	PASS
NZS 2772.1:1999	NZS 2772.1:1999	0.68	mW	< 20	PASS

5.3 Limits

Reference: EN 62479 Annex A, Table A.1 – Example values of SAR-based P_{max} for some cases described by ICNIRP, IEEE Std C95.1-1999 and IEEE Std C95.1-2005

Guideline / standard	SAR limit, SAR_{max} W/kg	Averaging mass, m g	P_{max} mW	Exposure tier	Region of body
ICNIRP	2	10	20	General public	Head and trunk
	4	10	40	General public	Limbs
	10	10	100	Occupational	Head and trunk
	20	10	200	Occupational	Limbs
IEE Std C96.1-1999	1,6	1	1,6	Uncontrolled environment	Head, trunk, arms, legs
	4	10	40	Uncontrolled environment	Hands, wrists, feet and ankles
	8	1	8	Controlled environment	Head, trunk, arms, legs
	20	10	200	Controlled environment	Hands, wrists, feet and ankles
IEEE Std C95.1-2005	2	10	20	Action level	Body except extremities and pinnae
	4	10	40	Action level	Extremities and pinnae
	10	10	100	Controlled environment	Body except extremities and pinnae
	20	10	200	Controlled environment	Extremities and pinnae

Reference: KDB 447498 D01 General RF Exposure Guidance v06

Section 4.3.1, 1) The 1-g and 10-g SAR test exclusion thresholds for 100 MHz to 6 GHz at test separation distances ≤ 50 mm are determined by:

[(max. power of channel, including tune-up tolerance, mW)/(min. test separation distance, mm)] · [√f(GHz)] ≤ 3.0 for 1-g SAR and ≤ 7.5 for 10-g extremity SAR

The test exclusions are applicable only when the minimum test separation distance is ≤ 50 mm and for transmission frequencies between 100 MHz and 6 GHz.

Reference: RSS-102 – Radio Frequency (RF) Exposure Compliance of Radiocommunication Apparatus (All Frequency Bands)

Section 2.5.1, Table 1: SAR evaluation – Exemptions limits for routine evaluation based on frequency and separation distance

	Exemptions limits				
Frequency	**At separation distance of ≤5 mm**	**At separation distance of 10 mm**	**At separation distance of 15 mm**	**At separation distance of 20 mm**	**At separation distance of 25 mm**
≤300	71 mW	101 mW	132 mW	162 mW	193 mW
450	52 mW	70 mW	88 mW	106 mW	123 mW
835	17 mW	30 mW	42 mW	55 mW	67 mW
1900	7 mW	10 mW	18 mW	34 mW	60 mW
2450	4 mW	7 mW	15 mW	30 mW	52 mW
3500	2 mW	6 mW	16 mW	32 mW	55 mW
5800	1 mW	6 mW	15 mW	27 mW	41 mW

	Exemptions limits				
Frequency	**At separation distance of 30 mm**	**At separation distance of 35 mm**	**At separation distance of 40 mm**	**At separation distance of 45 mm**	**At separation distance of ≥50 mm**
≤300	223 mW	254 mW	284 mW	315 mW	345 mW
450	141 mW	159 mW	177 mW	195 mW	213 mW
835	80 mW	92 mW	105 mW	117 mW	130 mW
1900	99 mW	153 mW	225 mW	316 mW	431 mW
2450	83 mW	123 mW	173 mW	235 mW	309 mW
3500	86 mW	124 mW	170 mW	225 mW	290 mW
5800	56 mW	71 mW	85 mW	97 mW	106 mW

Reference: Radiation Protection Standard for Maximum Exposure Levels to Radiofrequency Fields – 3 kHz to 300 GHz, Table S1: Summary of compliance provisions for mobile or portable transmitting equipment.

Equipment parameters	Test exemption	Spatial peak SAR [Table 2 Occupational]	Spatial peak SAR [Table 2 General Public]	Field measurement [Tables 7 & 8 Occupational or evaluation using S5.2.3]	Field measurement [Tables 7 & 8 General Public or evaluation using S5.3.3]
Aware user exposure					
Mean power < 100 mW	X				
Mean power < alternative low-power exclusion level of IEC 62479 for SAR_{max} = 10 W/kg	X				
Mean power > 100 mW & separation > 20 cm				X	
Otherwise		X			
General public exposure					
Mean power < 20 mW	X				
Mean power < alternative low-power exclusion level of IEC 62479 for SAR_{max} = 2 W/kg	X				
Mean power > 20 mW & separation > 20 cm					X
Otherwise			X		

Reference: NZS 2772.1:1999

Section 3.7.3: In some circumstances an RF exposure evaluation may not be required. This is the case with low-power devices whose nominal average RF radiated power does not exceed 20 mW and which do not produce exceptionally high instantaneous fields.