

# STATEMENT ON EXPOSURE TO ELECTROMAGNETIC FIELDS

## EQUIPMENT

Type of equipment:	Gateway
Brand name:	IKEA
Type / Model:	E1526 Trådfri
Manufacturer:	IKEA of Sweden AB
By request of:	IKEA of Sweden AB

## STANDARDS

47 CFR § 1.1310, §2.1091  
KDB 447498 D01 v06  
EN 62311 (2008)  
1999/519/EC  
RSS-102 Issue 5

## LIMITS

### §1.1310 POWER DENSITY LIMIT

1500 – 100 000 MHz  $1.0 \text{ mW} / \text{cm}^2 = 10 \text{ W} / \text{m}^2$

### RSS-102 EXEMPTION LIMIT

at or above 300 MHz and below 6 GHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than  $1.31 \times 10^{-2} f^{0.6834}$  W (adjusted for tune-up tolerance), where  $f$  is in MHz;  
Limits are 2,71 W at 2450 MHz, 4,6 W at 5300 MHz, 4,8 W at 5700 MHz and 4,88 W at 5850 MHz

### RSS-102 POWER DENSITY LIMIT FOR UNCONTROLLED ENVIRONMENT

Between 300 MHz and 6 GHz and the source-based, time-averaged maximum Power density limit is  $0.02619 f^{0.6834}$   
Limits are  $5.42 \text{ W} / \text{m}^2$  at 2450 MHz,  $9.18 \text{ W} / \text{m}^2$  at 5300 MHz,  $9.66 \text{ W} / \text{m}^2$  at 5700 MHz and  $9.83 \text{ W} / \text{m}^2$  at 5850 MHz

**EN 62311 (2008)**1999/519/EC reference level for power density on frequency range of 2 – 300 GHz = 10 W / m<sup>2</sup>**EVALUATION**

Output power of transmitters

	Conducted	e.i.r.p
2.4 GHz ZigBee	11.6 dBm	11.8 dBm = 15.1 mW
2.4 GHz WLAN	16.5 dBm	17.9 dBm = 61.7 mW
UNII 1	13.0 dBm	13.7 dBm = 23.4 mW
UNII 2	11.7 dBm	12.4 dBm = 17.4 mW
UNII 3	12.0 dBm	12.7 dBm = 16.6 mW

A worst case calculation for power density:

$$S = \frac{dc \times EIRP}{4 \times \pi \times r^2}$$

dc = 1  
S = W / m<sup>2</sup>  
r = 20 cm

2.4 GHz ZigBee = 0.03 W / m<sup>2</sup>  
2.4 GHz WLAN = 0.13 W / m<sup>2</sup>  
UNII 1 WLAN = 0.05 W / m<sup>2</sup>  
UNII 2 WLAN = 0.03 W / m<sup>2</sup>  
UNII 3 WLAN = 0.03 W / m<sup>2</sup>

ZigBee and WLAN can transmit simultaneously.

Under simultaneous transmission conditions the sum of ratio of each transmitter to the corresponding limit shall be less than unity.

$$\sum_{i=1}^n \frac{S_i}{MPE_i} < 1$$

Sum of ZigBee + UNII 1 WLAN = 0.08 against §1.1310 limit and 0.11 against RSS-102 limit


Sum of ZigBee + UNII 2 WLAN = 0.06 against §1.1310 limit and 0.09 against RSS-102 limit

Sum of ZigBee + UNII 3 WLAN = 0.06 against §1.1310 limit and 0.09 against RSS-102 limit

The device fulfils all requirements without testing under both single and simultaneous transmission conditions.

Intertek Semko AB, Radio&amp; EMC

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