

# Safety Human Exposure

## 1.1 Radio Frequency Exposure Compliance

### 1.1.1 Electromagnetic Fields

RESULT:

Pass

#### Test Specification

Test item	:	System Controller
Identification / Type No.	:	EL-SC-300
FCC ID	:	EF400222
IC:	:	1078A-00222
HVIN	:	EL-SC-300S
Test standard	:	CFR47 FCC Part 2: Section 2.1091 CFR47 FCC Part 1: Section 1.1310 FCC KDB Publication 447498 v06 FCC KDB Publication 865664 D01 v01r04 FCC KDB Publication 865664 D02 v01r02 RSS-102 Issue 5 February 2021

#### ➤ FCC requirements

**FCC requirement:** Systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess limit for maximum permissible exposure. In accordance with 47 CFR FCC Part 2 Subpart J, section 2.1091 this device has been defined as a mobile device whereby a distance of 20cm normally can be maintained between the user and the device.

#### MPE Calculation Method according to KDB 447498 v06

Power Density:  $S_{(mW/cm^2)} = PG/4\pi R^2$  or  $EIRP/4\pi R^2$

Where:

S = power density (mW/cm<sup>2</sup>)

P = power input to the antenna (mW)

G = power gain of the antenna in the direction of interest relative to an isotropic radiator

R = distance to the center of radiation of the antenna (cm)

#### The nominal maximum conducted output power specified:

2.4GHz Wi-Fi: 23.73 dBm; 5GHz Wi-Fi: 13.35 dBm

From the peak RF output power, the minimum mobile separation distance, d=20 cm, as well as the antenna gain (3.00 dBi 2.4GHz Wi-Fi & 5GHz Wi-Fi), the RF power density can be calculated as below:

For 2.4GHz Wi-Fi:  $S_{(mW/cm^2)} = PG/4\pi R^2 = 0.094$  mW/cm<sup>2</sup>

For 5GHz Wi-Fi:  $S_{(mW/cm^2)} = PG/4\pi R^2 = 0.009$  mW/cm<sup>2</sup>

#### Limits for Maximum Permissible Exposure (MPE) according to FCC Part 1.1310:

1.0 mW/cm<sup>2</sup>

➤ **IC requirements:** The EUT shall comply with the requirement of RSS-102 section 2.5.2.

**Exemption from Routine Evaluation Limits – RF Exposure Evaluation**

RF exposure evaluation is required if the separation distance between the user and/or bystander and the device's radiating element is greater than 20 cm, except when the device operates as follows:

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  $0.02619 \times f^{0.6834}$  W (adjusted for tune-up tolerance), where  $f$  is in MHz;

- RF exposure evaluation exempted power for 2.4GHz Wi-Fi: 5.366 W
- RF exposure evaluation exempted power for 5GHz Wi-Fi: 9.047 W

**The nominal maximum conducted output power specified:**

2.4GHz Wi-Fi: 23.73 dBm; 5GHz Wi-Fi: 13.35 dBm

Antenna Gain: 3.00 dBi for 2.4GHz Wi-Fi & 5GHz Wi-Fi

The Max. e.i.r.p. for 2.4GHz Wi-Fi: 26.73 dBm = 0.471 W

The Max. e.i.r.p. for 5GHz Wi-Fi: 16.35 dBm = 0.043 W

Both e.i.r.p. for 2.4GHz Wi-Fi & 5GHz Wi-Fi are less than the RF exposure evaluation exempted power. So RF exposure evaluation is not required.

**“RF Radiation Exposure Statement Caution: This Transmitter must be installed to provide a separation distance of at least 20 cm from all persons.”**