6 Safety Human Exposure

6.1 Radio Frequency Exposure Compliance

6.1.1 Electromagnetic Fields

RESULT: **Pass**

Test Specification

Test standard : CFR47 FCC Part 2: Section 2.1091
CFR47 FCC Part 1: Section 1.1310
FCC KDB Publication 447498 D01 v06
FCC KDB Publication 865664 D01 v01r04
FCC KDB Publication 865664 D02 v01r02
RSS-102 Issue 5 March 2015

➢ **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 865664 D01

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

Where:

S = power density (mW/cm^2)

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:

General 2.4GHz: 14.00 dBm

Wi-Fi 802.11 b/g/n: 19.00 dBm

From the peak RF output power, the minimum mobile separation distance, d=20 cm, as well as the antenna gain (Max. 0.0 dBi for General 2.4GHz, 0.0 dBi for Wi-Fi 802.11 b/g/n), the RF power density can be calculated as below:

For General 2.4GHz: $\mathbf{S_{(mW/cm^2)}= PG/4\pi R^2 =}$ 0.005 mW/cm^2

For Wi-Fi 802.11 b/g/n: $\mathbf{S_{(mW/cm^2)}= PG/4\pi R^2 =}$ 0.016 mW/cm^2

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

1.0 mW/cm^2

- **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 $1.31 \times 10^{-2}\ f^{0.6834}$ W (adjusted for tune-up tolerance), where f is in MHz;

- RF exposure evaluation exempted power for General 2.4GHz: 2.670 W
- RF exposure evaluation exempted power for Wi-Fi 802.11 b/g/n: 2.684 W

The nominal maximum conducted output power specified:

General 2.4GHz: 14.00 dBm

Wi-Fi 802.11 b/g/n: 19.00 dBm

Antenna Gain: 0.0 dBi for General 2.4GHz

Antenna Gain: 0.0 dBi for Wi-Fi 802.11 b/g/n

The Max. e.i.r.p. for General 2.4GHz: 14.00 dBm = 0.025 W

The Max. e.i.r.p. for Wi-Fi 802.11 b/g/n: 19.00 dBm = 0.079 W

Both e.i.r.p. for General 2.4GHz and Wi-Fi 802.11 b/g/n 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."