Safety Human Exposure

FCC-ID: VLJ-MBP85

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:

2.4GHz FHSS: 19.00 dBm

2.4GHz Wi-Fi 802.11b/g/n: 23.00 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 2.4GHz FHSS and 0.0 dBi 2.4GHz Wi-Fi 802.11b/g/n), the RF power density can be calculated as below:

For 2.4GHz FHSS: $\mathbf{S_{(mW/cm^2)} = PG/4\pi R^2 =}$ 0.016 mW/cm^2

For 2.4GHz Wi-Fi 802.11b/g/n: $\mathbf{S_{(mW/cm^2)} = PG/4\pi R^2 =}$ 0.040 mW/cm^2

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

1.0 mW/cm^2

For Simultaneous transmitting of 2.4GHz FHSS and 2.4GHz Wi-Fi 802.11b/g/n:

According to 865664D02 2.2 d) 1):

The sum of the ratios of the spatially averaged results to the applicable frequency dependent MPE limits = 0.016/1 + 0.040/1 = 0.056< 1

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- **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 2.4GHz FHSS: 2.679 W
- RF exposure evaluation exempted power for 2.4GHz Wi-Fi 802.11b/g/n: 2.684 W

The nominal maximum conducted output power specified:

2.4GHz FHSS: 19.00 dBm

2.4GHz Wi-Fi 802.11b/g/n: 23.00 dBm

Antenna Gain: 0.0 dBi for 2.4GHz FHSS

Antenna Gain: 0.0 dBi for 2.4GHz Wi-Fi 802.11b/g/n

The Max. e.i.r.p. for 2.4GHz FHSS: 19.00 dBm = 0.079 W

The Max. e.i.r.p. for 2.4GHz Wi-Fi 802.11b/g/n: 23.00 dBm = 0.200 W

The sum of the MPE ratios for all simultaneous transmitting antennas: 0.079 + 0.200 = 0.279 < 1

Both e.i.r.p. for the 2.4GHz FHSS and 2.4GHz Wi-Fi 802.11b/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."