

**RF Exposure Analysis – SAR Test Exemption – IGGI Fabric Steamer****FCC ID: 2A2EQIGGI600**

The IGGI Fabric Steamer equipment operates in the 2408-2480MHz frequency band

**The following FCC Rule Parts are applicable:**

Part 2.1093 – Radiofrequency radiation exposure evaluation: portable devices

Part 1.1307(b)(3)(i)(C) - SAR test exemption (ii)

Part 1.1307(b)(3)(i)(B) - SAR test exemption (iii)

**For model the IGGI Fabric Steamer**

Operating Frequency: 2402-2480MHz

Tx Power: +6.0dBm (Specified in Operational Description)

Antenna gain +5.3dBi

EIRP = +11.3dbm

ERP = 11.3-2.15 = +9.15dBm

Minimum separation distance to be considered (d) = 18mm (0.018m)

(See Antenna Position document)

**Evaluation**

From Part 2.1093(c)(1). RF exemption applies if the maximum transmitted power is less than the maximum of the following three criteria:

- i) Less than 1 mw Blanket exemption.  $P_{TH} = 0.001 \text{ W}$  – (IGGI Fabric Steamer is not compliant)
- ii) determination of exemption under the MPE-based §1.1307(b)(3)(i)(C), if i) not met
- iii) determination of exemption under the SAR-based §1.1307(b)(3)(i)(B) if both i) and ii) are not met;

Determination of threshold power ( $P_{TH}$ ) under the MPE-based §1.1307(b)(3)(i)(C)

This is only applicable at a separation distance greater than  $\lambda/2\pi$

**For the IGGI Fabric Steamer**

2.4GHz operation -  $\lambda/2\pi = 0.02\text{m}$

The IGGI Fabric Steamer separation distance equals 0.018m (see Antenna Position document), therefore this clause is not applicable.

Determination of threshold power ( $P_{TH}$ ) under §1.1307(b)(3)(i)(B) as the transmitter power threshold for SAR test exemption:

$$P_{th} (\text{mW}) = \begin{cases} ERP_{20 \text{ cm}}(d/20 \text{ cm})^x & d \leq 20 \text{ cm} \\ ERP_{20 \text{ cm}} & 20 \text{ cm} < d \leq 40 \text{ cm} \end{cases}$$

Where

$$x = -\log_{10} \left( \frac{60}{ERP_{20 \text{ cm}} \sqrt{f}} \right) \text{ and } f \text{ is in GHz;}$$

and

$$ERP_{20 \text{ cm}} (\text{mW}) = \begin{cases} 2040f & 0.3 \text{ GHz} \leq f < 1.5 \text{ GHz} \\ 3060 & 1.5 \text{ GHz} \leq f \leq 6 \text{ GHz} \end{cases}$$

$d$  = the separation distance (cm);

For the IGGI Fabric Steamer @ 2.4GHz Operation:

From §1.1307(b)(3)(B) :

$$ERP_{20 \text{ cm}} = 3060 \text{ mW}$$

$$\begin{aligned} x &= -\log_{10} (60/(3060 \sqrt{2.402})) \\ &= -\log_{10} (0.0125) = 1.902 \end{aligned}$$

$$\text{Threshold Power } P_{th} = ERP_{20 \text{ cm}} (d/20 \text{ cm})^x$$

$$= 3060 (1.8/20)^{1.902}$$

$$= 31.38 \text{ mW (14.96 dBm)}$$

( $P_{th}$  = tx power ERP or conducted time averaged, whichever is greater)

For the IGGI Fabric steamer usage, 10gm extremity applies, so this threshold power can be increased by a factor of 2.5 (KDB447498 Do1 V07 Draft Section 2.1.1.

$$\text{ie : } P_{th} = 31.38 \times 2.5 = 78.45 \text{ mW (18.95 dBm)}$$

The IGGI Fabric Steamer max. transmitter power @ 2.4GHz = +9.15dBm ERP (< 18.95dBm  $P_{th}$ ) so the IGGI Fabric Steamer is therefore exempt from evaluation in accordance with §1.1307(b)(3).



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