

US Tech Test Report:
FCC ID:
IC:
Test Report Number:
Issue Date:
Customer:
Model:

FCC Part 15 Certification/ RSS 247
O7P-341
10147A-341
24-0073
July 18, 2024
Inventek Systems
ISM4334X-M4G-L44 Module

MPE/SAR exclusion/RF Exposure Evaluation

Maximum Permissible Exposure to RF (MPE) CFR 15.247 (i), CFR 1.1310 (e)

The maximum exposure level to the public from the RF power of the EUT shall not exceed a power density, **S** as per the respective limits in Table 1 below, at a distance, d, of 5 cm (Mobile condition) from the EUT.

TABLE 1—LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm ²)	Averaging time (minutes)
Limits for General Population/Uncontrolled Exposure				
0.3-1.34	614	1.63	*100	30
1.34-30	824/f	2.19/f	*180/f ²	30
30-300	27.5	0.073	0.2	30
300-1,500			f/1500	30
1,500-100,000			1.0	30

f = frequency in MHz * = Plane-wave equivalent power density

MPE for 5250 – 5725 MHz:

Limit: 1.0 mW/cm²

Peak Power (dBm) = +8.90 dBm

Peak Power (Watts) = 0.00772 W

Gain of Transmit Antenna = +2.3 dBi = 1.698 numeric

d = Distance = 20 cm = 0.2 m

$$\begin{aligned} S &= (PG / 4\pi d^2) = EIRP / 4A = 0.00772(1.698) / 4\pi * 0.2 * 0.2 \\ &= 0.0131 / 0.5030 = 0.0261 \text{ W/m}^2 \\ &= (0.0261 \text{ W/m}^2) (1\text{m}^2/\text{W}) (0.1 \text{ mW/cm}^2) \\ &= 0.00261 \text{ mW/cm}^2 \end{aligned}$$

which is << less than S = 1 mW/cm²

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RF Exposure Evaluation – IC

According to RSS-102 (Issue 6), Section 6.6

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 EIRP of the device is equal to or less than $1.31 \times 10^{-2} \times f^{0.6834}$ in Watts (adjusted for tune up tolerance where applicable), where f = frequency in MHz

For 5250 – 5725 MHz band: Limit = $1.31 \times 10^{-2} \times 5500^{0.6834} = 4.71 \text{ (W/m}^2\text{)}$

EUT source-based time averaged (SBTA) = (output power + antenna gain * duty cycle)

Duty cycle = $1.75 \text{ mSec} / 11.0 \text{ mSec} = 16\%$

SBTA = $8.90 \text{ dBm} + 2.3 \text{ dBi} * (0.16) = 9.245 \text{ dBm} = \underline{8.40 \text{ mW}}$

$$\begin{aligned} S &= (PG / 4\pi d^2) = \text{EIRP} / 4A = 0.00840(1.698) / 4 * \pi * 0.2 * 0.2 \\ &= 0.0142 / 0.5030 = 0.0283 \text{ W/m}^2 \end{aligned}$$

Which is less than $S = 4.71 \text{ (W/m}^2\text{)}$

All calculations performed by:

Test Engineer: Gabriel Medina

Date: July 18, 2024

Signature: 