

Appendix A: FCC Part 1.1307, 1.1310, 2.1091, 2.1093; ISED RSS-102: RF Exposure

MPE Calculation

Using FCC 1.1310 Table 1B as guidance, the maximum permissible RF exposure for an uncontrolled environment is 0.6 mW/cm² for the frequencies used in this device (902 to 908 MHz). The worst-case power is used for the calculation below.

The actual power density for the EUT calculated as shown below.

$$S = (P \times G) / (4 \times \pi \times d^2)$$

where:

S = power density

P = transmitter conducted power in (W)

G = antenna numeric gain

d = distance to radiation center (m)

The worst-case maximum conducted power is 27.7 dBm (589 mW).

Per the manufacturer, tune up tolerance is +1 dB, therefor 28.7 dBm (741 mW) is used for the calculations below.

Duty cycle (from test report) = 3.8% (this is a per channel duty cycle)

7 channels occur in a 100 ms window

Therefore, duty cycle adjusted power = 197 mW, and is the power used for the power density calculations below.

FCC:

Frequency (MHz)	Antenna Gain (dBi)	Antenna Gain (numeric)	Conducted Power (mW)	Separation Distance (cm)	Calculated Power Density (mW/cm ²)	FCC Power Density Limit (mW/cm ²)
902 – 928	6	4.0	197	20	0.16	0.6

ISED:

Per RSS-102 Issue 5 Section 2.5.2, this device is exempt from RF exposure evaluation if the EIRP is equal to or less than the following:

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

$$\text{EIRP (adjusted for tune-up tolerance)} = 197 \text{ mW} \times 4.0 = 788 \text{ mW}$$

Limit at 902 MHz: 1.37 W, limit at 928 MHz: 1.40 W

Therefore, the device complies with the exemption limits of RSS-102 Issue 5 Section 2.5.2

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Client: Banner Engineering
Model Name: SX7023EXT
Standards: FCC Part 15.247; ISED RSS-247
IDs: UE3SX7023EXT; 7044A-SX7023EXT
Report #: 2021093

NOTICE:

FCC Radiation Exposure Statement

The calculated power density is below the limit. Nonetheless, the recommended separation distance for this equipment is 20 cm.