

RF Exposure Analysis – SAR Test Exemption – PROTECT Receiver
FCC ID: 2AT9A-R0002NA

The PROTECT receiver contains a transmitter in the 900MHz ISM band

The following FCC Rule Parts are applicable:

Part 2.1091 – Radiofrequency radiation exposure evaluation: mobile devices

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

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

For PROTECT receiver

Operating Frequency: 921MHz

Tx Power: +8.25dBm max. conducted

Antenna gain +5dBi

EIRP = 13.25dBm

ERP = EIRP-2.15dBm = 11.1dBm (12.9mW)

Minimum separation distance (R) = 20cm (0.20m)

Evaluation

From Part 2.1091(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. $P_{TH} = 0.001 \text{ W}$ – (PROTECT receiver 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;

ii) 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 PROTECT receiver

At 920MHz operation: $\lambda/2\pi = 0.052\text{m}$

The PROTECT receiver separation distance equals 0.20m therefore §1.1307(b)(3)(i)(C), is applicable.

From §1.1307(b)(3)(i)(C), Table 1:

Threshold ERP $P_{TH(920MHz)} = 0.0128 * R^2 f$ watts
(R = metres, f = MHz)

For 921MHz operation:

$$P_{TH} = 0.0128 \times 0.2^2 \times 920 \\ = 0.47W$$

ie: Threshold Power $P_{TH} = 472mW$ ERP

The PROTECT receiver max. transmitter power @ 921MHz = 12.9mW, so the PROTECT receiver is therefore exempt from MPE evaluation in accordance with §1.1307(b)(3)(i)(C).