

As per Operational Description, the radio has two modes of operation and these are considered independently for EMF/SAR:

Basestation mode EMF

The handset is connected to a laptop using a serial lead, and whilst a separation distance of 20cm would be reasonable, it cannot be guaranteed, however the device is not body worn in this mode to Extremity SAR limits are applied

Duty Cycle – from section 9.3.6 of test report

On time = 0.387 ms

Transmissions on channel every 890.2 ms

89 channels

The transmitter “on” time is $89 \times 0.387\text{ms} = 34.44\text{ ms}$ every 890.2 ms

The duty cycle = $\frac{34.44\text{ ms}}{890.2\text{ ms}} = 3.87\%$

FCC

The Communicator is exempt from SAR evaluation as its output power meets the exclusion limits stated in FCC part 2.1093 and the general SAR test exclusion requirements detailed in KDB 447498 D01 V06, which states:

b) For 100 MHz to 6 GHz and test separation distances $\leq 50\text{ mm}$, the 1-g and 10-g SAR test exclusion thresholds are determined by the following:

$[(\text{max. power of channel, including tune-up tolerance, mW}) / (\text{min. test separation distance, mm})] \cdot [f(\text{GHz})] \leq 3.0$ for 1-g SAR, and ≤ 7.5 for 10-g extremity SAR where

- $f(\text{GHz})$ is the RF channel transmit frequency in GHz
- Power and distance are rounded to the nearest mW and mm before calculation
- The result is rounded to one decimal place for comparison

The device operates in the 2400 – 2483.5 MHz band with minimum separation distance of $< 5\text{mm}$, so 5mm is used for the calculation.

Maximum power = 217mW, but it transmits with a duty cycle of 3.87%:

Calculation is: $\frac{217.0 \times 0.0387}{5} \times \sqrt{2.4} = 2.6$

2.6 is less than 7.5 , so no SAR testing is required, and EMF limits are met

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According to clause 2.5.1, SAR evaluation is required is the transmit power exceeds the levels in table 1 for the relevant separation distance.

- The handset is tethered to a laptop or computer by a serial lead, but if we take the worst case separation distance as 10 mm, this gives a limb SAR limit of 17.5 mW for 2450 MHz (2.5 x 7 mW body)

The antenna gain is 2.15 dBi, which is 1.64 (linear) and gives maximum radiated power of $217 \times 1.64 = 356\text{ mW EIRP}$

356 mW EIRP with duty cycle of 3.87% is 13.8 mW which is less than 17.5 mW, so the Communicator is below the exemption limit and complies without further assessment.

Handset mode

Duty cycle

As per section 9.3.6 of the report, the On time = 0.387 ms, but as per Operational Description, there are an absolute maximum 10 transmissions per second

The transmitter “on” time is $10 \times 0.387\text{ms} = 3.87 \text{ ms}$ every 1000 ms

The duty cycle = $\frac{3.87 \text{ ms}}{1000 \text{ ms}} = 0.387\%$

FCC

The Communicator is exempt from SAR evaluation as its output power meets the exclusion limits stated in FCC part 2.1093 and the general SAR test exclusion requirements detailed in KDB 447498 D01 V06, which states:

b) For 100 MHz to 6 GHz and test separation distances $\leq 50 \text{ mm}$, the 1-g and 10-g SAR test exclusion thresholds are determined by the following:

$[(\text{max. power of channel, including tune-up tolerance, mW}) / (\text{min. test separation distance, mm})] \cdot [f(\text{GHz})] \leq 3.0$ for 1-g SAR, and ≤ 7.5 for 10-g extremity SAR where

- $f(\text{GHz})$ is the RF channel transmit frequency in GHz
- Power and distance are rounded to the nearest mW and mm before calculation
- The result is rounded to one decimal place for comparison

The device operates in the 2400 – 2483.5 MHz band with minimum separation distance of $< 5\text{mm}$, so 5mm is used for the calculation.

Maximum power = 217mW, but it transmits with a duty cycle of 0.387%:

Calculation is:

$$\frac{217.0 \times 0.00387}{5} \times \sqrt{2.4} = 0.26\text{mW}$$

0.26 is less than 3.0, so no SAR testing is required and EMF limits are met under all conditions of operation

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According to clause 2.5.1, SAR evaluation is required is the transmit power exceeds the levels in table 1 for the relevant separation distance.

- The worst case separation distance is 5mm, which for 2450 MHz gives 4mw

356 mW EIRP with duty cycle of 0.387% is 1.38 mW which is less than 4 mW, so the Communicator is below the exemption limit and complies without further assessment.