

RF EXPOSURE ANALYSIS

EQUIPMENT

Type of equipment: Low power voice communication radio
Type / Model: Spirocom BT
Brand name: Spirocom
Manufacturer: Interspiro AB
By request of: Interspiro AB

Operating frequencies: 902 – 928 MHz and 2400 – 2483.5 MHz

REQUIREMENT

CFR 47 §1.1310
RSS-102 issue 5 (2015)

OUTPUT POWER

Declared maximum output power is:

Operating frequencies [MHz]	FCC identification	Maximum declared power [mW]	Average power* [mW]
902 – 928	YDFSCM30605	79.43	7.9
2400 – 2483.5	SSSBC127-X	5.14	0.5

NOTE: *Maximum “talk time” (duty cycle) is 10 % according to the manufacturer.

CALCULATIONS

Standalone transmitter:

Standalone transmitter calculations are based on 1-g SAR test exclusion threshold and 5 mm test separation distance, for each frequency band. 915 MHz and 2450 MHz have been used as frequencies in the calculations.

The following formula, as described in section 4.3.1(a) in FCC KDB 447498 D01 General RF Exposure Guidance v06, is used to determine the SAR value.

$$\frac{\text{max power of channel, including tune – up tolerance, mW}}{\text{min. test separation distance, mm}} * \sqrt{f_{\text{(GHz)}}}$$

This, for the 915 MHz radio, gives:

$$\frac{8}{5} * \sqrt{0.915} = 1.530$$

And for the 2450 MHz radio gives:

$$\frac{0.5}{5} * \sqrt{2.450} = 0.156$$

Simultaneous transmitter:

Simultaneous transmitter calculations are based on 1-g SAR test exclusion threshold and 5 mm test separation distance, for each frequency band. 915 MHz and 2450 MHz have been used as frequencies in the calculations.

The following formula, as described in section 4.3.2(b) in FCC KDB 447498 D01 General RF Exposure Guidance v06, is used to determine the SAR value.

$$\frac{\text{max power of channel, including tune – up tolerance, mW}}{\text{min. test separation distance, mm}} * \sqrt{\frac{f_{\text{(GHz)}}}{7.5}}$$

This, for the 915 MHz radio, gives:

$$\frac{8}{5} * \sqrt{\frac{0.915}{7.5}} = 0.560$$

And for the 2450 MHz radio gives:

$$\frac{0.5}{5} * \sqrt{\frac{2.450}{7.5}} = 0.057$$

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LIMITS & EVALUATIONS:

Standard	Reference for limit	Limit	Unit	Value	Result
CFR 47 §1.1310	KDB 447498 D01	3	NA	1.5	PASS
RSS-102 issue 5 (2015)	RSS-102 issue 5 (2015) ¹	17	mW	7.9	PASS

Table 1, standalone transmitter, 915 MHz radio

¹Section 2.5.1, table 1, based on a separation distance of 5 mm and frequency of 835 MHz.

Standard	Reference for limit	Limit	Unit	Value	Result
CFR 47 §1.1310	KDB 447498 D01	3	NA	0.156	PASS
RSS-102 issue 5 (2015)	RSS-102 issue 5 (2015) ¹	4	mW	0.5	PASS

Table 2, standalone transmitter, 2450 MHz radio

¹Section 2.5.1, table 1, based on a separation distance of 5 mm and frequency of 2450 MHz.

Standard	Reference for limit	Limit	Unit	Value	Result
CFR 47 §1.1310	KDB 447498 D01	1.6	NA	0.6 ²	PASS
RSS-102 issue 5 (2015)	KDB 447498 D01 ¹	1.6	W/kg	0.6 ²	PASS

Table 3, simultaneous transmitter, 915 MHz and 2450 MHz

¹Section 3.1.2 in RSS-102 issue 5 (2015) states that "...other recognized methods – such as the procedures published by the FCC proven to provide a conservative estimate of the SAR value – can also be used" for devices containing multiple transmitters.

²Sum of both individual SAR values

Summary:

All requirements are fulfilled for SAR test exclusion.

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