



Certification Exhibit

FCC ID: 2AVE9-TRKR01

FCC Rule Part: 47 CFR Part 2.1091

Project Number: 72154363

Manufacturer: Swarm Technologies, Inc.

Product: Tracker

Model: TRKR01

RF Exposure

General Information:

Applicant: Swarm Technologies, Inc.
Device Category: Mobile
Environment: General Population/Uncontrolled Exposure

Technical Information (VHF Radio):

Antenna Type: ¼ Wave Whip (PulseLarsen, P/N: NMOQ), ½ Wave Whip (PulseLarsen, P/N: WB VHF)
Antenna Gain: 2 dBi (PulseLarsen, P/N: NMOQ), 2 dBi (PulseLarsen, P/N: WB VHF)
Maximum Transmitter Conducted Power: 27.80 dBm, 602.56 mW
Maximum System EIRP: 29.80 dBm, 954.99 mW
Exposure Conditions: Greater than 25 centimeters

Technical Information (WiFi Radio):

Antenna Type: Ceramic Chip Antenna
Antenna Gain: 1 dBi
Maximum Transmitter Conducted Power: 14.70 dBm, 29.53 mW
Maximum System EIRP: 15.70 dBm, 37.17 mW
Exposure Conditions: Greater than 25 centimeters

Technical Information (Bluetooth Classic Radio):

Antenna Type: Ceramic Chip Antenna
Antenna Gain: 1 dBi
Maximum Transmitter Conducted Power: 8.5 dBm, 7.08 mW
Maximum System EIRP: 9.5 dBm, 8.91 mW
Exposure Conditions: Greater than 25 centimeters

Technical Information (Bluetooth Low Energy Radio):

Antenna Type: Ceramic Chip Antenna
Antenna Gain: 1 dBi
Maximum Transmitter Conducted Power: 5.8 dBm, 3.80 mW
Maximum System EIRP: 6.8 dBm, 4.79 mW
Exposure Conditions: Greater than 25 centimeters

MPE Calculation

The Power Density (mW/cm²) is calculated as follows:

$$S = \frac{PG}{4\pi R^2}$$

Where:

S = power density (in appropriate units, e.g. mW/cm²)

P = power input to the antenna (in appropriate units, e.g., mW)

G = power gain of the antenna in the direction of interest relative to an isotropic radiator

R = distance to the center of radiation of the antenna (appropriate units, e.g., cm)

Table 1: MPE Calculation

Technology	Transmit Frequency (MHz)	Radio Power (dBm)	Power Density Limit (mW/cm ²)	Radio Power (mW)	Antenna Gain (dBi)	Antenna Gain (mW eq.)	Distance (cm)	Power Density (mW/cm ²)
VHF	148.0039	27.8	0.20	602.56	2	1.585	25	0.1216
WiFi	2437	14.702	1.00	29.53	1	1.259	25	0.005
Bluetooth Classic	2480	8.5	1.00	7.08	1	1.259	25	0.001
Bluetooth Low Energy	2480	5.8	1.00	3.80	1	1.259	25	0.001

Table 2: Simultaneous Transmissions Calculations

Technology	Transmit Frequency (MHz)	Power Density Limit (mW/m ²)	Power Density (mW/m ²)	MPE Ratio to Limit (%)	Sum of MPE Ratios (%)	Limit (%)
VHF	148.0039	0.20	0.1216	60.80	61.27	100
WiFi	2437	1.00	0.005	0.47		
VHF	148.0039	0.20	0.1216	60.80	60.91	100
Bluetooth Classic	2480	1.00	0.001	0.11		
VHF	148.0039	0.20	0.1216	60.80	60.86	100
Bluetooth Low Energy	2480	1.00	0.001	0.06		