

1. RF Exposure Requirements

1.1 General Information

Client Information

Applicant: Turnils North America
Address of applicant: 1750 Satellite Blvd, Suite 100, Buford GA 30518

Manufacturer: The same as Applicant
Address of manufacturer: The same as Applicant

General Description of EUT:

Product Name: Bridge for Motorization
Trade Name: /
Model No.: USB Bridge WiFi and RF
Adding Model(s): /
Rated Voltage: DC 5V
Power Adaptor : /
FCC ID: 2AU29AMPBWUSBV2
Equipment Type: Portable device

Technical Characteristics of EUT:

Frequency Range: 433.92 MHz
Max. Field Strength: 433.92MHz: 89.9dBuV/m(3m)
Data Rate: /
Modulation: FSK
Antenna Type: Integral Antenna
Antenna Gain: 0.79dBi

1.2 RF Exposure Exemption

According to the KDB 447498 D01 v06 section 4.3.1, for 100 MHz to 6 GHz and test separation distances ≤ 50 mm, the 1-g and 10-g SAR test exclusion thresholds are determined by the following:

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

- f(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

When standalone SAR test exclusion applies to an antenna that transmits simultaneously with other antennas, the standalone SAR must be estimated according to following to determine simultaneous transmission SAR exclusion:

$(\text{max. power of channel, including tune-up tolerance, mW})/(\text{min. test separation distance, mm}) \cdot [\sqrt{f(\text{GHz})}/x]$
W/kg for test separation distances ≤ 50 mm;

Where $x = 7.5$ for 1-g SAR, and $x = 18.75$ for 10-g SAR.

Calculation Result:

Radio Access Technology	Prediction Frequency	Min. test separation distance	Max. Field Strength	Output Power	Tune-Up Power		Result	Limit
	(MHz)	(mm)	(dBuV/m)	(dBm)	(dBm)	(mW)		
SRD	433.92	5	89.9	-6.15	-6.00	0.25	0.1	3

Note: Output Power = $E - 104.8 + 20 \log D - \text{Antenna Gain}$

Prediction Frequency	Tune-Up Power	Min. test separation distance	X	1-g SAR	Limit
(MHz)	(mW)	(mm)		(W/kg)	(W/kg)
433.92	0.25	5	7.5	0.004	1.6

Mode for Simultaneous Multi-band Transmission:

Radio Access Technology	Wi-Fi SAR	SRD SAR	Simultaneous	Limit	Result
	(W/kg)	(W/kg)	(W/kg)	(W/kg)	Pass/Fail
Wi-Fi + SRD	0.229	0.004	0.233	1.6	Pass

Note:

For Wi-Fi & Bluetooth Internet of Things Module (FCC ID: 2AC7Z-ESPC3WROOM; the issue date: 07/05/2023)

1-g SAR Body Test Result: Wi-Fi is 0.229 W/kg; Bluetooth is 0.150 W/kg.

Bluetooth and Wi-Fi can't transmit at the same time. So the worst case is Wi-Fi + SRD.

Result: Pass