



1 APPENDIX I radio frequency exposure

LIMIT

According to §15.407(f), U-NII devices are subject to the radio frequency radiation exposure requirements specified in §§ 1.1307(b), 2.1091 and 2.1093 of this chapter, as appropriate. All equipment shall be considered to operate in a "general population/uncontrolled" environment. Applications for equipment authorization of devices operating under this section must contain a statement confirming compliance with these requirements for both fundamental emissions and unwanted emissions. Technical information showing the basis for this statement must be submitted to the Commission upon request.

EUT Specification

EUT	USB/MIDI Keytar Controller with Wireless
Frequency band (Operating)	<input checked="" type="checkbox"/> ZigBee: 2.402GHz ~ 2.478GHz <input type="checkbox"/> Others: _____
Device category	<input checked="" type="checkbox"/> Portable (<20cm separation) <input type="checkbox"/> Mobile (>20cm separation) <input type="checkbox"/> Others: _____
Exposure classification	General Population/Uncontrolled exposure ($S=1mW/cm^2$)
Antenna diversity	<input checked="" type="checkbox"/> Single antenna <input type="checkbox"/> Multiple antennas <input type="checkbox"/> Tx diversity <input type="checkbox"/> Rx diversity <input type="checkbox"/> Tx/Rx diversity
Max. output power	ZigBee: 4.49dBm (2.812mW)
Antenna gain (Max)	3.3 dBi (Numeric gain: 2.138)
Evaluation applied	<input type="checkbox"/> MPE Evaluation <input type="checkbox"/> SAR Evaluation* <input checked="" type="checkbox"/> N/A

Remark:

1. The maximum output power is 4.49 dBm (2.812mW) at 2444MHz (with 2.138 numeric antenna gain.)
2. For mobile or fixed location transmitters, no SAR consideration applied. The maximum power density is $1.0 mW/cm^2$ even if the calculation indicates that the power density would be larger.



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RESULT

According to KDB447498 D01: The 1-g and 10-g SAR test exclusion thresholds for 100 MHz to 6 GHz at *test separation distances* ≤ 50 mm are determined by:

$[(\text{max. power of channel, including tune-up tolerance, mW})/(\text{min. test separation distance, mm})] \cdot [\sqrt{f(\text{GHz})}] \leq 3.0$ for 1-g SAR and ≤ 7.5 for 10-g extremity SAR, ²⁴ where

- $f(\text{GHz})$ is the RF channel transmit frequency in GHz
- Power and distance are rounded to the nearest mW and mm before calculation²⁵
- The result is rounded to one decimal place for comparison
- 3.0 and 7.5 are referred to as the numeric thresholds in the step 2 below
- If the test separation distance (antenna-user) is < 5 mm, 5mm is used for excluded SAR

calculation

	Wireless Interface	Bluetooth
	Tune-up Maximum power (dBm)	4.49
	Tune-up Maximum rated power (mW)	2.812
Body	Antenna to user (mm)	5
	Frequency(GHz)	2.444
	Test result	0.879
	SAR exclusion threshold	3

Per KDB 447498 D01v05r01 exclusion thresholds is $0.879 < 3$, RF exposure evaluation is not required.

END OF REPORT