FCC/ISED SAR exclusion report

1. Product information

FCC ID	JAKNR-G5
Product	Nozzle reader
Model No.	Universal reader
Power supply	Battery, 3.6 VDC
Antenna type	PCB
Antenna gain	2.0 dBi (max.)
Assigned frequency range	2400.0-2483.5 MHz 10.0 kHz 121/0 kHz
Operating frequency range	2401.0-2478.0 MHz 10.0 kHz 121/0 kHz
Transmit power (conducted)	1.0 dBm -29.6 dBm -24.2 dBm
Modulation bandwidth	296 kHz
Bit rate	N/A
SAR exclusion considerations	A worst-case test separation distance of 20mm
Date	7 November 2024

2. Evaluation Method and Limit

FCC, Part 1, Subpart I, Section 1.1310(e)(1), KDB447498 D01 V06 , Section 4.3.1 and Appendix A ,RSS-102, Issue 5, Section 2.5.1

According to KDB447498 D01 General RF Exposure Guidance v06 Section 4.3.1, the standalone SAR test exclusion considerations are: “Unless specifically required by the published RF exposure KDB procedures, standalone 1-g head or body and 10-g extremity SAR evaluation for general population exposure conditions, by measurement or numerical

simulation, is not required when the corresponding SAR Test Exclusion Threshold condition, listed below, is satisfied.

The minimum test separation distance is determined by the smallest distance from the antenna and radiating structures or outer surface of the device, according to the host form factor, exposure conditions and platform requirements, to any part of the body or extremity of a user or bystander (see 5) of section 4.1)."

For SAR exclusion evaluation we take the following E.U.T values (example):

Max. power (conducted) = 1.17mW=0.001W 0.0019 0.0001

Antenna gain = 2.0 dBi = 1.5 numeric

EIRP = Max. power (conducted)+ Antenna gain=3.17dBm=2mW=0.002W 0.0019+1.5

Minimum distance from human body: 2cm=0.02m

FCC Test Limit

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:

[(max. power of channel, including tune-up tolerance, mW)/(min. test separation distance, mm)] *·[√f(GHz)] ≤ 3.0 for 1-g SAR and ≤ 7.5 for 10-g extremity SAR.

ISED Test Limit

Frequency (MHz)	≤ 5 mm (mW)	10 mm (mW)	15 mm (mW)	20 mm (mW)	25 mm (mW)	30 mm (mW)	35 mm (mW)	40 mm (mW)	45 mm (mW)	> 50 mm (mW)
≤ 300	45	116	139	163	189	216	246	280	319	362
450	32	71	87	104	124	147	175	208	248	296
835	21	32	41	54	72	96	129	172	228	298
1900	6	10	18	33	57	92	138	194	257	323
2450	3	7	16	32	56	89	128	170	209	245
3500	2	6	15	29	50	72	94	114	134	158
5800	1	5	13	23	32	41	54	74	102	128

3. Test Results

FCC

Frequency	Calculation	FCC limit	Verdict
2401.0 MHz	[(max. power of channel, including tune-up tolerance, mW)/(min. test separation distance, mm)] *[√f(GHz)]= [(1.17)/(20)]*[√2.4]=0.09	≤ 7.5 for 10-g extremity SAR	Pass
121.0 kHz	1.9/20*√0.000121=0.0010	≤ 7.5 for 10-g extremity SAR	Pass
10.0 kHz	3.5/20*√0.00001=0.0005	≤ 7.5 for 10-g extremity SAR	Pass

ISED

Frequency	EIPR (mW)	ISED limit (max separation of 20mm) (mW)	Verdict
2401.0 MHz	1.17	<163	Pass
121.0 kHz	0.0014	<163	Pass
10.0 kHz	0.0032	<163	Pass

4. Conclusion

The measurement results comply with the Limit per FCC, Part 1, Subpart I, Section 1.1310(e)(1), RSS 102, Issue 5, Section 2.5.2 (table 4) requirements and KDB447498 D01 V06 (October 23, 2015)

End of Report