

US Tech Test Report:
FCC ID:
IC:
Test Report Number:
Issue Date:
Customer:
Model:

FCC Part 15 Certification/ RSS 247
2AJ3810242
22055-10242
24-0352
January 29, 2025
YARDARM TECHNOLOGIES, INC
YHA-020

Maximum Public Exposure to RF (MPE) CFR 15.247 (i), CFR 1.1310 (e)

Portable Device Compliance

For compliance as a portable device the maximum exposure level to the public from the RF power of the EUT shall not exceed a power density S as per the respective limits at a distance of 0.5 cm from the EUT. The results are presented herein.

TABLE 1—LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm ²)	Averaging time (minutes)
(B) Limits for General Population/Uncontrolled Exposure				
0.3-1.34	614	1.63	*100	30
1.34-30	824/f	2.19/f	*180/f ²	30
30-300	27.5	0.073	0.2	30
300-1,500			f/1500	30
1,500-100,000			1.0	30

f = frequency in MHz * = Plane-wave equivalent power density

MPE for Bluetooth Radio

Limit = 1 mW/cm²

Peak Power (dBm) = 4.35

Peak Power (watts) = 0.0027

Gain of transmit Antenna (dBi) = -2.6 = 0.55 (numeric)

d = Distance = 0.5 cm = 0.005 m

$$\begin{aligned} S &= (PG/4\pi d^2) = \text{EIRP}/4A = 0.0027(0.55)/4*\pi*0.005*0.005 \\ &= 0.0015/0.000314 = 4.78 \text{ W/m}^2 \\ &= (4.78 \text{ W/m}^2) (1\text{m}^2/\text{W}) (0.1 \text{ mW/cm}^2) \\ &= 0.478 \text{ mW/cm}^2 \text{ which is } \ll \text{ less than } 1 \text{ mW/cm}^2 \end{aligned}$$

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SAR Exclusion:

General SAR test exclusion per KDB 447498 D01 V06 section 4.3

Test exclusion conditions are based on source-based time averaged maximum conducted output power of the RF channel, adjusted for tune-up tolerance, and the minimum test separation distance required for the exposure conditions.

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:

$$[(\text{max. power of channel mW}) / (\text{min. test separation distance, mm})] * [(\sqrt{f_{\text{GHz}}})]$$

Where the result must be ≤ 3.0 for 1-g SAR and ≤ 7.0 for 10-g SAR

EUT source based time averaged (SBTA) = (output power + antenna gain * duty cycle)

$$\text{SBTA} = 4.35 \text{ dBm} + (-2.6 \text{ dBi}) * (1.0) = 1.75 \text{ dBm} = 1.49 \text{ mW}$$

$$1.49 \text{ mW}/50 \text{ mm} * (\sqrt{2.440 \text{ GHz}}) = 0.047 \ll 3.0 \text{ for 1-g SAR and } \leq 7.0 \text{ for 10-g SAR}$$

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CANADA RSS-102 (Issue 6), Exemption Limits Compliance:

Field Reference Level (FRL) Exposure exemption limits (RSS-102, 6.3)

Devices operating at or below the applicable output power levels (adjusted for tune-up tolerance) specified in table 11, based on the separation distance, are exempt from SAR evaluation. The separation distance, defined as the distance between the user and/or bystander and the antenna and/or radiating element of the device or the outer surface of the device, shall be less than or equal to 20 cm for these exemption limits to apply.

Table 11: Power limits for exemption from routine SAR evaluation based on the separation distance

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

Separation distance is 0.5 cm (5 mm)
Limit = 3 mWatts

Compliance:

EUT max EIRP = 4.35 dBm – 4.75 dBd (-2.6 dBi-2.15) = -0.4 dBm or 0.912 mWatts << 3 mWatts

Conclusion: Based on the RF Exposure evaluation performed in this exhibit, the Equipment under Test is deemed to meet the requirement for Portable use configurations.