APPENDIX F

: RF EXPOSURE EVALUATION

According to KDB 447498 D01 General RF Exposure Guidance v06.

1. SAR test exclusion threshold

For frequencies below 100 ㎒, the following may be considered for SAR test exclusion (also illustrated in Appendix C):

Appendix C

SAR Test Exclusion Thresholds for < 100 ㎒ and < 200 ㎜

Approximate SAR test exclusion power thresholds at selected frequencies and test separation distances are illustrated in the following table. The equation and threshold in 4.3.1 must be applied to determine SAR test exclusion.

㎒	< 50	50	60	70	80	90	100	110	120	130	140	150	160	170	180	190	㎜
100	237	474	481	487	494	501	507	514	521	527	534	541	547	554	561	567	
50	308	617	625	634	643	651	660	669	677	686	695	703	712	721	729	738	
10	474	948	961	975	988	1001	1015	1028	1041	1055	1068	1081	1095	1108	1121	1135	
1	1422	1442	1462	1482	1502	1522	1542	1562	1582	1602	1622	1642	1662	1682	1702	1422	㎽
0.1	948	1896	1923	1949	1976	2003	2029	2056	2083	2109	2136	2163	2189	2216	2243	2269	
0.05	1019	2039	2067	2096	2125	2153	2182	2211	2239	2268	2297	2325	2354	2383	2411	2440	
0.01	1185	2370	2403	2437	2470	2503	2537	2570	2603	2637	2670	2703	2737	2770	2803	2837	

The output power and operating frequency of the device are:

-. Test date: Dec. 18, 2023

Frequency [㎑]	Distance [㎜]	Element	Highest Emissions @10m [dB㎶/m]	EIRP [dBm]	EIRP [㎽]	Limit [㎽]
30 ~ 65	< 50	Element 1	78.52	-6.25	0.237	997.7
		Element 2	78.2	-6.57	0.220	
		Element 3	72.48	-12.29	0.059	
		Element 4	75.12	-9.65	0.108	
		Element 5	77.7	-7.07	0.196	

Aggregated maximum power = 0.237 + 0.220 + 0.059 + 0.108 + 0.196 = 0.821 ㎽

Note;
- EIRP (dB m) = E (dB㎶/m) + 20 log (10(m)) - 104.77

$$y_3 = \frac{(x_2 - x_3)y_1 + (x_3 - x_1)y_2}{x_2 - x_1}.$$

- The limit was calculated using interpolation derivations below.
Where;
x: frequency for ㎒
y: thresholds level for ㎽
- The general usage distance is more than 20 cm, but this product evaluated at 50 mm conservatively.

2. Output power into antenna & RF exposure evaluation distance

BT LE

Operating Frequency (MHz)	Prediction distance (cm)	Antenna Gain (dBi)	Power Density At 20 cm(mW/cm^2)	Limits (mW/cm^2)
2 402 ~ 2 480	20	1.50	0.0 016	1.0

WiFi(2.4 GHz)

Operating Frequency (MHz)	Prediction distance (cm)	Antenna Gain (dBi)	Power Density At 20 cm(mW/cm^2)	Limits (mW/cm^2)
2 412 ~ 2 462	20	1.50	0.0 281	1.0

Note:

- The power density Pd (5th column) at a distance of 20 cm calculated from the friis transmission formula is far below the limit of 1 mW/cm^2
- This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment.
- This equipment should be installed and operated with minimum 20 cm between the radiator and your body.
- The antenna gain of this transmitter is less than 6 dBi and must not be collocated or operating in conjunction with any other antenna or transmitter unless authorized to do so by the FCC.

Conclusion: No SAR is required.

3. Simultaneous transmission of RF Exposure test exclusion for worst case configuration.

RF Function	Power Density At 20 cm(mW/cm^2)	Limits (mW/cm^2)
Element	0.821	997.7
BT LE	0.0 016	1.0
WiFi(2.4 GHz)	0.0 281	1.0

Confirm the sum result of individual MPEs ratio is ≤ 1.0;
Magnetron + BT LE + WiFi(2.4 GHz): (0.821 / 997.7) + (0.0016 / 1.0) + (0.0281 / 1.0) = 0.031 ≤ 1.0

So, this device meets the KDB447498 D01 v06 section 7.2 requirement of “Simultaneous transmission MPE test exclusion”.