RF Exposure Evaluation

PRODUCT DESCRIPTIION

Transmit Frequency Band:	156.025MHz – 157.425MHz
Maximum Output Power:	22W(43.42dBm)
Maximum Antenna Gain:	9dBi
Device Category:	☐ Portable (< 20cm separation) ☒ Fixed (> 20cm separation) ☐ Others:
Exposure Environment:	☐ Occupational / Controlled exposure ☒ General Population / Uncontrolled exposure
Evaluation Applied:	☒ MPE Evaluation ☐ SAR Evaluation

APPLICABLE STANDARD

FCC part 2.1091; KDB447498 v05r02;

LIMIT

FCC Part 1.1310(e):

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm^2)	Averaging time (minutes)
(A) Limits for Occupational/Controlled Exposure				
0.3-3.0	614	1.63	*100	6
3.0-30	1842/f	4.89/f	$*900/f^2$	6
30-300	61.4	0.163	1.0	6
300-1,500			f/300	6
1,500-100,000			5	6
(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 CALCULATION

The minimum separation distance is calculated as follows:

$S=PG/4\pi R^2$

Where: S=power density

P=power input to antenna

G=power gain of the antenna in the direction of interest relative to an isotropic radiator

R=distance to the center of radiation of the antenna

FCC: The limit for general uncontrolled exposure environment 30-300MHz is 0.2mW/cm^2.

Typical use qualifies for a maximum duty cycle factor 50%, Averaging time 30 minutes for FCC.

FCC: P=22000mW*(15/30) =11000mW, G=10^(9/10)=7.943, S=0.2mW/cm^2

Safely distance R=((GP)/(4π))^(0.5) =((11000*7.943)/(4*π*0.2))^(0.5)=186.5cm

CONCLUSION

If presumed the gain of the antenna is 9 dBi, the separation distance is at least 1.9 m from body and the antenna, so meet RF Exposure requirement.