

MPE Calculation / RF Exposure

Product: RFID Reader Module

Applicant: Apulse Co.,Ltd

Model: Air11

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FCC ID: 2BR2ZAIR11

The FCC requires that the calculated MPE be equal to or less than a given limit dependent on frequency at a distance of 20 cm from the device to the body of the user. According to §2.1091, §2.1093 and §1.1307(b), systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess of the Commission's guidelines.

Frequency Range (MHz)	E-field Strength (V/m)	B-Field Strength (A/m)	Power density (mW/cm ²)	Averaging time (min)
(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
<u>300-1,500</u>	<u>=</u>	<u>=</u>	<u>f/1500</u>	<u>30</u>
1,500-100,000	-	-	1.0	30

Classification The antenna of this product is at least 20 cm away from the body of the user. So this product is classified as mobile device.

$$S = \text{EIRP} / 4 \pi R^2$$

Where S = Power density
EIRP = Effective Isotropically Radiated Power
R = distance to the centre of radiation of the antenna

Values S = 1.0 mW/cm² for General population uncontrolled exposure (FCC Part 1.1310 Radiofrequency radiation exposure limits $S = f/1500$, $f = 902.75 \text{ (MHz)} / 1500 = 0.60$))
S = 0.60 mW/cm²
ERP = 19.54 dBm
R = 20 cm

Calculation ERP = 89.95 mW
 $S = 89.95 / 12.56 \times (20)^2$
 $S = 89.95 / 5024$
S = 0.003 89 mW/cm²

Conclusion This confirms compliance to the required radio frequency radiation exposure limit of 0.60 mW/cm² at 20 cm operation.