

Beam intensity analysis - 14th May 2008 – the Moon Society, Inc

An alternate approximation for power density at the face of the antenna is to spread the total transmitter power (1 watt) across the radiating area of the antenna (17.78 cm x 17.78 cm = 316 cm²).

This produces an estimate of 3.16 mw/cm² at the face of the antenna.

By comparison, the previous analysis method produced 1.81 mw/cm².

This spreadsheet shows the results from both methods at various distances.

In both cases, the estimated power density is below the controlled exposure limit of 5mw/cm² at any position.

The power density falls below the uncontrolled limit of 1 mw/cm² beyond 4.5 inches for the estimate based on antenna patterns and beyond 7.69 inches for the estimate based on antenna size.

For a transmit power of 1 watt:

Distance (Inches)	Distance (Meters)	Estimate from antenna pattern		Estimate from antenna dimensions	
		Power Density (W/m ²)	Power Density (milliW/cm ²)	Power Density (W/m ²)	Power Density (milliW/cm ²)
0.00	0.000	18.1	1.807	31.6	3.163
4.00	0.102	10.6	1.059	16.0	1.602
4.50	0.114	10.0	1.000	14.9	1.493
7.69	0.195	7.2	0.716	10.0	1.000
8.00	0.203	7.0	0.695	9.7	0.965
12.00	0.305	4.9	0.491	6.4	0.645
16.00	0.406	3.7	0.365	4.6	0.461
H =	7.000	inches =	0.178 meters		
W =	7.000	inches =	0.178 meters		
Ra =	9.873	inches =	0.251 meters from power density spread over antenna area		
Ra =	13.062	inches =	0.332 meters from horizontal beam pattern		
Ra =	13.062	inches =	0.332 meters from vertical beam pattern		
Ra =	9.873	inches =	0.251 meters effective Ra = min of the above 3 estimates		