

Calculation of Power Density on Antenna Panel Surface

- In our case, the Tx power is:
 - $P_{out}/PA = 23.6\text{dBm max} = 0.23\text{W}$
 - Number of PAs = 16
 - Total power during Transmit = $35.6\text{dBm} = 3.7\text{W}$
 - For a 67% Tx duty cycle, the average Tx power = $33.9\text{dBm} = 2.4\text{W}$
- The antenna area is:
 - Antenna size is 10.5 inches x 18.2 inches.
 - Area = $191\text{ in}^2 = 1233\text{ cm}^2$
- The antenna and feed losses are 2.1dB (from PA output to antenna element)
 - The effective average transmit power at the elements is $31.8\text{dBm} = 1.5\text{W}$
- The power density on the antenna panel surface using $S=4*P/A$ is:
 - Power density = 4.89mW/cm^2
 - The calculation uses the $S=4*P/A$ equation to compute the power density on the surface of an aperture antenna as given in OET Bulletin 65.
 - The power density is below the FCC limit for occupational/controlled exposure on the antenna panel surface.