Antenna Spec
CS-412 Solid State Tilt Sensor

Rev 1, 03/16/2025

Each of these sub GHz devices, use a short wire antenna exhibiting a loop type structure and characteristics. The antenna is not accessible or changeable by the user. No modifications can be made to the radiating mechanism (antenna or tuning elements) by the user.
Peak antenna gain is estimated by extracting the Gain (G_T) from the Friis transmission equation.

$$\frac{P_R}{P_T} = \frac{\lambda^2 G_T G_R}{(4\pi R)^2}$$

Assuming polarization match (linearly polarized) and no mismatch loss (tuned) in the direction of peak antenna gain at 1m separation. At each sub GHz operational frequency, the peak antenna gain is estimated as in the table here. Parametric values for each component of the formula above are listed.

Freq (MHz)	G_R (dBi)	R (m)	P_T (dBm)	P_R (dBm)	**G_T (dBi)**
345	6.39	1	11.25	23.4	**-17.8**