We report the rotational spectra of alaninamide and two $^{15}$N labeled isotopomers. The derived rotational constants of the most abundant isotopomer are $A = 4931.924 (2)$ MHz, $B = 3114.594 (2)$ MHz, and $C = 2297.252 (2)$ MHz. Fifty-two hyperfine components associated with 3 $a$-type and 3 $b$-type transitions were fit yielding quadrupole coupling constants of $\chi_{aa} = 1.603 (4)$ MHz and $\chi_{bb} = 0.643 (6)$ MHz for the amino nitrogen and $\chi_{aa} = 1.379 (5)$ MHz and $\chi_{bb} = 0.570 (6)$ MHz for the amide nitrogen. A preliminary Kraitchman calculation indicates a nitrogen-to-nitrogen distance of 2.803 Å, suggesting that the experimentally determined conformer contains an intramolecular hydrogen bond from the amide nitrogen to the amino nitrogen.