

ABSTRACT

Nano satellite is a small satellite that have 1U dimension which is less than 10kg and has dimension 10cmx10cmx10cm. Nano satellite in space or called space segments are orbited in LEO orbits (Low Earth Orbits) without using a pilot or direct controller. We must think about how to control the satellite orbiting in space from earth or called the ground segment. Magnet torque is one of the active controllers of a satellite. By utilizing the earth's magnetic field and the magnetic force present on the body or satellite bus, satellite control can be done to maintain the position and altitude of the satellite to remain in orbit.

To create a magnet torque we need analysis of physical counting on materials and shapes. Also the required measurement of magnetic field parameters that can be used on satellites. A Magnet torque consists of a ferromagnetic core cylindrical that is twisted by a conductor cable. Magnet torque design with microstrip model. For control pole of magnet torque H-Bridge designed with the arrangement of transistors that can reverse current on the magnetic core.

This torque magnet test is done by compared the measurement results and the design specifications between duroid substrate and fr-4, in designing the magnet torque this time will use the material substrate duroid roger and done some optimization. From the measurement results, it is known that the magnet torque using duroid substrate material and has been optimized dimensions and windings produce a maximum magnetic field of 1.49 mT and maximum torque of $32,78 \times 10^{-6}$ Nm by using power 5W. In its application the minimum required torque control are 1×10^{-6} Nm so that power consumption of magnet torque designed for the nano satellite needs are 0.35W

Keywords: *nano satellite, duroid, magnet torque, microstrip, active control*