

## ABSTRACT

Radio wave technology is currently developing rapidly in the world. Radio Frequency Identification (RFID) is one technology that uses radio waves automatically to identify people or objects. RFID technology is the process of identifying wirelessly if previously it was known to use barcodes where the identification process was carried out in contact, but this RFID offers excellence as a form of improvement from the previous barcode usage.

RFID technology required specification such as, the antenna that has small dimension and practical specifications is required, a relatively simple material, relatively inexpensive production costs so that it can support good performance for RFID applications.

The design of *square spiral* antenna using *defected ground structure* (DGS) at UHF bands frequency with use *dumbbell-shaped* DGS and realized with *epoxy* FR-4 substrate which has a dielectric constant  $\epsilon_r = 4,3$  and thickness  $h = 1,6$  mm. Based on simulation results VSWR value at the frequency of 924 MHz is 1,249 and 27 MHz *bandwidth*. *Gain* antenna simulation result of -12,89 dBi. Based on the measurement process obtained VSWR value at the frequency 924 MHz is 1,502 and 37 MHz *bandwidth*. *Antenna gain* measured is -10,52 dBi, the resulting polarization is an ellips with an *omnidirectional* radiation pattern. Based on the measurement results from of the antenna parameters designed have not been such as gain, polarization, and radiation patterns so the antenna is not suitable for RFID reader application on the UHF band based on the specifications that have not been met.

**Keywords:** *Antenna, microstrip, UHF, square spiral, RFID, DGS*