Design and Development of UHF RFID Reader Antenna for Livestock Monitoring

M. H. Ariff[1], I. Ismarani[2] and N. Shamsuddin[3]

[1] Faculty of Electrical Engineering, Universiti Malaysia Pahang, Pekan, Malaysia. Email: hisyam@ump.edu.my
[2] Faculty of Electrical Engineering, Universiti Teknologi MARA, Shah Alam, Malaysia. Email: ismarani@salam.uitm.edu.my
[3] Standards and Industrial Research Institute of Malaysia, Kuala Lumpur, Malaysia. Email: naishah@sirim.my

***Abstract*—This paper presents a circularly polarized E shaped microstrip single layer patch antenna with parasitic element for the reader of the UHF RFID livestock monitoring system. The antenna is designed to operate at a frequency of 919 MHz to 923 MHz allocated for UHF RFID systems in Malaysia. The antenna simulation is analyzed using CST Studio Suite 2013 based on Finite Integral Techniques (FIT). In order to ensure the design is in good performance, all of the antenna parameters are optimized using Quasi Newton Method. The result show that this antenna is able to operate from 919 MHz to 923 MHz frequency bandwidth with optimum frequency at 918 MHz. Furthermore the result of antenna parameter such as radiation pattern, bandwidth, gain, return loss and voltage standing wave ratio are also discussed. The proposed antenna is lightweight, low profile, simple structure and easy fabrication.**

***Keywords*—Microstrip Antenna, Frequency, Return Loss (S_{11}), Livestock, Computer Simulation Technology.**