

## **Section 2:**

### **Executive Summary of the Project**

Mobile and wireless communication systems utilize various frequency bands in the UHF region ranging from approximately 0.3 – 3GHz. For example, the 800-900MHz and 1.8GHz bands, which are used by most cellular mobile systems, [1]. In any case, one of the major problems is measuring the received signal strength (RSS) of various sub frequencies. The RSS should be high enough within the cell and the cell edge strength should be according to the specifications. If the cell edge strength is too high, the adjacent channel and co-channel interference degrades the signals in surrounding cells. In addition, excessive RF power may cause health hazards. However, very low power levels may limit the functionality of mobile and wireless equipment.

The aim of this project is to design a wideband RF energy/power meter which can be fabricated mainly in Sri Lanka. The initial prototype constructed for the 300 – 1300MHz (UHF) spectrum, consists of three main modules, a signal acquisition and energy estimation module, a microwave up/down converter and a precision light weight wide band antenna. During the project period, the following modules have been successfully fabricated and tested.

Microwave circuit for up-converting UHF to 2.7GHz with image rejection.

Microwave circuit for down-converting from 2.7GHz to 63MHz

RF circuit for down-converting from 63MHz to 1MHz

2.3GHz micro-strip filter

USB signal reader and Display

5MHz digital clock

Wide band loop antenna

Frequency auto-scanner

1MHz high gain amplifier

5v, 12v and 18v regulated power supplies

The completion of this project ascertains that wideband microwave circuits & antennas and high speed digital circuits can be developed in the DEEE laboratory at the University of Peradeniya.

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