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Preface

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A 2x1 Coplanar Monopole Antenna Structure for Wireless RF Energy Harvesting

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Abstract. The objective of this paper is to design an efcient wireless energy harvesting (WEH) system to eliminate the problem to continuous charging of a battery operated electronics devices. Most of the devices are battery operated so charging of a battery time to time is serious issue. This WEH system receives the Radio Frequency (RF) and Microwave frequency signals present in the atmosphere and converting it into DC signal so that it can stores in Capacitor or charges a battery for utilize the power. For this RFenergy harvesting purposes 21 antenna array structure of the coplanar monopole antenna is presented. This structure shows the gain of 10.2 dBi and 83% efciency. This structure is designed for resonating on multiple bands (Radio, GSM, ISM, and UWB). It is useful for this application because it covers almost all useful bands in the maximum capturing area. The antenna can be connected directly to an RF-DC converter module and it uses about 60% of the total PCB area. And RF to DC convertor circuit can be implemented in that remaining 40% area on the same substrate so it eliminates the need of port connectors and impedance matching circuit between them. This design is worked in receiving mode only when used for energy harvesting purposes. This may be useful for the biomedical and satellite applications.

Keywords- Energy Harvesting System, Monopole Antenna, RF-DCConverter, Coplaner Antenna, Wilkinson Power Divider

1. INTRODUCTION

In the Field of energy harvesting the RF energy harvesting is the new and interesting era of the researchers because RF spectrum is free to use and easily available everywhere. The basic building blocks for the harvester for RF ranges are composed of three segments 1) RF receiv-ing antenna 2) Rectifying & amp; Booster circuits 3) Impedance matching circuits. Antenna designing is the important part of the harvesting circuit. The antenna may be designed for any band of RF For UWB band designing Coplanar antenna is suitable option. M. Yazdi et al. Presented an UWB planar antenna with band rejection characteristics [2]. For particular band rejection di erent variations in patch dimensions were investigated [3]-[5]. Parasitic patch is also one solution for band rejection [5]-[7].

The authors have already designed a compact coplanar monopole antenna [8] which is capable to resonant on multi bands e.g. Radio , GSM,. ISM and UWB band (900MHz-3.1GHz and 5.6GHz- 9.6GHz) with band rejection for WLAN(3.1GHz - 5.6GHz) bands.

This paper presents the extension of that work by array arrangement of that coplanar monopole