TITLE: Optimized Triple-Band h-Shaped Slot Microstrip Antenna Array Based Wireless Mobile Charger

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ABSTRACT:

This paper proposes a novel design of a triple frequency band passive communication receiver for wireless chargers for smart wireless devices, wearables and other wireless devices powered with lithium-ion batteries. The design of this receiver includes triple frequency band h-shaped slot microstrip two-element antenna array; Radio Frequency (RF) matching circuit; and passive Voltage Doubler Rectifier (VDR) circuits. The said antenna design uses 900 MHz, 1800 MHz, and 2400 MHz frequency bands. This design aims to have comparatively similar charging rate as existing wireless chargers. Therefore, the proposed antenna is the major part of the design, because it should receive more power from the three RF signal sources to achieve target charging rate. Also, in the receiver design, a (Duroid 6010) substrate with a relative permittivity 10.7 is used. Such a receiver consists of an RF matching circuit, RF multistage VDR, and a DC load circuit that would produce a 3.7 V at the output. In order to minimize the power dissipation in the rectifier circuit and consequently increase efficiency, a zero bias Schottky diode is used. Finally, the simulation results indicated that the number of VDR stages and the value of load resistance are the two major factors affecting the output of the proposed wireless charger