Use of 3D Printed Antennas for RF Energy Harvesting Purposes

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Abstract

RF Energy harvesting using 3D printed materials is a growing application both in commercial and military applications. RF energy harvesting is the use of indirect or scattered energy to enable wireless charging of low power devices such as batteries for radios, GPS devices or any other sensors. The military is interested in keeping these devices light weight and energy efficient as the devices that they need to carry can add on additional weight of up to 15 pounds. This paper will focus on the effects of using different 3D printed materials and fabrication techniques to create a planar antenna at 1 GHz. Both patch and slot type of antennas will be investigated. The dimensional length and width and proximity of the lines created with the different 3D processes will be investigated as they directly impact the functionality of each antenna and its related circuitry. The planarity of the 3D printed surface will also be addressed as part of this investigation.