

**“Design of an unbiased microwave circulator using a magnetic nanowired substrate”, p.67-72**

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**Abstract** – In this paper, we present the design of a planar unbiased microwave circulator operating at K-band. Using a composite substrate combining a polymer membrane with an array of ferromagnetic nanowires yields a nonreciprocal behavior similar to that obtained with ferrites but without requiring any biasing DC magnetic field. This is a tremendous advantage compared to existing commercial solutions for such devices. A model has been developed for the whole circulator, and is validated by measurements on a first prototype. It is used as a design tool for optimizing the performances of future prototypes: the sensitivity to various technological parameters allows to identify the most crucial ones for a planar integration.