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Effect of Loading Nickel Zinc Ferrite Thick Film to Performance of Microstrip Patch Antenna

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Abstract. The present work investigated the fabrication of nickel zinc ferrite thick (NZF) film layer as substrate inclusion to enhance the performance of microstrip patch antenna (MPA). In this paper, NZF nanopowder was mixed with organic vehicle which consists of linseed oil, m-xylene and α -terpineol. Then the mix was stirred at 150rpm for 3 hours at 40°C in order to obtain homogenous paste, followed by printing it onto FR4 substrate using the screen printing technique to form the YIG thick film layer before dried and later fired at 200°C. A patch antenna using silver paste was printed onto the NZF layer and was compared with another patch antenna which was been printed without the ferrite thick film layer. The results shown that the antenna with NZF thick film layer has return loss of -29.34dB, resonant frequency 5.64GHz, -10dB bandwidth of 0.48, which is significantly improved the performance of MPA compared to the antenna without the layer by 67.27%, 7.14%, and 84.61% respectively.

Keywords: Microstrip patch antenna, ferrite thick film, nickel zinc ferrite, organic vehicle