Optically Transparent High Gain Loop Antenna

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Nowadays, the Ubiquitous systems without the constraints of the time and the space have received a lot of attention (H. t., Y. t., T. k. and K. S., MWP 2010, 331-334). It is to enable people to work inside the home and to have a convenient life. In addition, the development environments of wireless communication device provide the realization about the better developed environment. In this study, we introduce an optically transparent high gain antenna combined with a glass and a frequency selective surface (FSS).

In this paper, we provide an optically transparent high gain loop antenna. The proposed antenna consists of two layers and has the advantage that can be watched transparently by minimizing the conductor area. The square loop antenna is designed on one layer and it works at 1.8 GHz. The other layer has the FSS and operates as reflector in a particular frequency. Especially, the distance between two layers is decided at quarter-wavelength for high directivity. It is expected that the outgoing wave radiated from the antenna in the opposite directions to the FSS and the reflected wave from the FSS will add in phase. For this reason, the peak gain of the proposed antenna using the FSS reflector is increased.

The picture of the fabricated antenna prototype is shown in Fig. 1, where the radiated loop on top layer and FSS on bottom layer are positioned on the grass. The distance between two layers is 28 *mm* and it corresponds to quarter-wavelength. Fig. 2 shows the measured radiation patterns with the single loop antenna and the proposed antenna on XZ plane at 1.8 GHz. It is observed that the peak gain is increased from 0.68 dBi to 6.38 dBi.

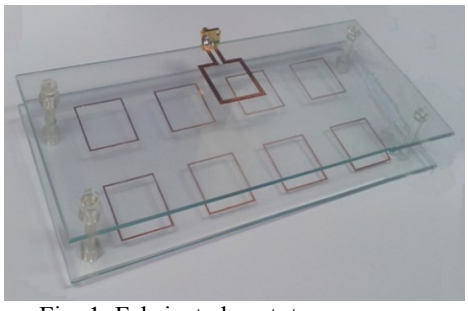

Fig. 1. Fabricated prototype.

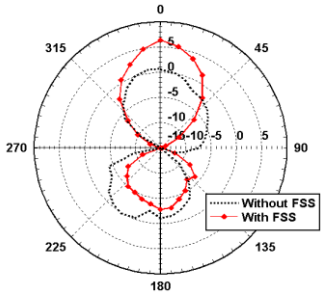

Fig. 2. Measured Radiation pattern.

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