UPGRADING BANDWIDTH OF CONVENTIONAL RECTANGULAR PATCH ANTENNA USING METAMATERIAL

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ABSTRACT

This project proposed the use of a unit metamaterial in constructing the rectangular patch antenna. It is done by implementing the unit metamaterial as the substrate and cover of the antenna. The newly created antenna should be operating at X-band frequency which is from 8GHz to 12GHz. These designs can reduce the size of the antenna while maintaining or provide better performance in terms of the return loss, bandwidth, gain and directivity. The unit metamaterial is realized by having the Symmetrical Ring structure with a combination of several materials such as Copper and Flame Retardant 4 (FR-4). Lots of effort has been put into conversion of the S-data into the electromagnetic properties. It is to verify the metamaterial itself whether to exhibits negative permittivity. The metamaterial antenna is surely good news for the telecommunication industries as antenna can now be produced at smaller size without compromising the performance. This metamaterial antenna has positive future in helping the telecommunication industries to move one step further in enhancing the technology thus providing satisfaction to the customers.

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