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3.6-GHz Eight-Antenna MIMO Array for Mobile Terminal Applications

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ABSTRACT

This paper studies an eight-antenna multiple input and multiple output (MIMO) array owning a wide bandwidth to cover the 3.6-GHz (3400 – 3800 MHz) band for modern mobile terminal applications. The developed eight-antenna array consists of two four-antenna sub-arrays having slight different physical dimensions. The antenna elements are all based on the stepped impedance resonator (SIR) structure, which are positioned along the two long borderlines of the ground plane in the mobile terminal. A wider bandwidth can be realized by properly choosing the electrical length ratio and impedance ratio of the SIR structure, and the system performance can be consequently improved. The measured results of the fabricated prototype show that the value of the return loss is larger than 10 dB and the value of the inter-element isolation is more than 11.7 dB within the entire 3.6-GHz band. Furthermore, the envelop correlation coefficient (ECC) between arbitrary two antenna elements is smaller than 0.1 for the developed eight-antenna MIMO array. Design details of the MIMO array as well as the simulated and experimental results will be given and discussed.

Key words: multiple input and multiple output (MIMO) array, eight-antenna array, wide bandwidth, mobile terminal.

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