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PIN-Diode Based Slotted Reconfigurable Multiband Antenna Array for Vehicular Communication

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Abstract : In this paper, a patch antenna array design is proposed for vehicular communication. The antenna consists of 2-element patch array. The antenna array is operating at multiple frequency bands. The multiband operation is achieved by use of slots at proper locations at the patch. The array is made reconfigurable by use of two PIN-diodes. The antenna is simulated and measured in four states of diodes i.e. ON-ON, ON-OFF, OFF-ON, and OFF-OFF. In ON-ON state of diodes, the resonant frequencies are 4.62-4.96, 6.50-6.75, 6.90-7.01, 7.34-8.22, 8.89-9.09 GHz. In ON-OFF state of diodes, the measured resonant frequencies are 4.63-4.93, 6.50-6.70 and 7.81-7.91 GHz. In OFF-ON states of diodes the resonant frequencies are 1.24-1.46, 3.40-3.75, 5.07-5.25 and 6.90-7.20 GHz and in the OFF-OFF state of diodes 4.49-4.75 and 5.61-5.98 GHz. The maximum bandwidth of the proposed antenna is 16.29%. The peak gain of the antenna is 3.4 dB at 5.9 GHz, which makes it suitable for vehicular communication.

Keywords : antenna, array, reconfigurable, vehicular
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