

## **Design and Analysis of a Multi- Band Mono-pole Patch Antenna for Vehicular Applications<sup>1</sup>**

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### **Abstract**

**This paper presents the design and Analysis of a Multi-Band compact planar Mono Pole Patch Antenna which is proposed for Vehicular applications and suitable for cellular telecommunications. Utilization of this unique geometry multi band operation is achieved with a single feed. By using a folded circle shape antenna with a quarter-wavelength diameter at the lowest frequency of the first band and by cutting the edges of antenna a multi-band operation can be achieved. The electromagnetic software HFSS is used to design and optimize the structure of the proposed antenna which can operate in the frequency bands :**

**( 800 – 1100) MHz and ( 1700 – 2200) MHz**

**This covers GSM, DCS, PCS, and UMTS standards with a VSWR less than dB Good agreement between the simulated and measured results are found . Handset-, multi band-, monopole- , planar-, micro-strip-, patch-, compact Antennas – Mobile communication Antennas – vehicle Antenna - HFSS**

<sup>1</sup> For the paper in Arabic see pages (237-254).

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