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High Gain Planar Array Antenna For X Band Radar Applications

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In this paper, a high gain planar array antenna is introduced. The proposed antenna is a 8x4 microstrip antenna operating in X-Band at 9.4 GHz. The antenna has been designed to introduce 15 degrees HPBW and 30 degrees HPBW in both azimuth and elevation planes. The proposed antenna has been designed and performance is examined using full wave electromagnetic simulations and experimental measurements. The design and development also focus on different type antenna such as rectangular and circular patch antennas. Microstrip antennas have the attractive features of low profile and light weight. However the antennas may be too large for practical applications at the lower microwave frequency range and may offer only a few percentage of bandwidth. A parallel or corporate feed configuration is used to build up the arrays. In parallel feed, the patch elements were fed in parallel with the transmission lines. The transmission lines are divided into two branches according to the number of patch elements. The objective of this project is to develop the antenna that has high gain, directivity and efficiency. Many factors are considered such as operating frequencies, bandwidth requirements and directivity , all of which affect its efficiency. The analysis on performance will be based on the obtained result especially in radiation pattern, bandwidth and return loss.