

High-isolation Multi-antenna System

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High-isolation antennas are an essential element for simultaneous operation in multi-standard wireless communications. New antenna configuration is proposed to provide high isolation in close proximity. This innovative antenna configuration achieves 40 dB isolation at 5 mm separation. This new high-isolation antenna technology could be a major stepping stone for the success of mobile platforms requiring multi-standard wireless communications.

The high isolation between antennas in such a close proximity was achieved by employing three predominant features. They are the incorporation of complementary antenna pairs (for example electric dipole and magnetic dipole antenna), orthogonal polarization, and minimum pattern overlap between the antennas. The three features cooperate constructively to achieve high isolation between antennas in close proximity. The antennas are physically located in very close proximity, but electrically they are isolated efficiently in terms of polarization and radiation patterns. A high-isolation antenna pair consisting of a sleeve dipole antenna and a slot antenna was modeled and prototyped to prove the high-isolation design concept. These two antennas were placed at a physical separation of 5 mm and the isolation characteristics measured. The antennas achieved an isolation of more than 40 dB in the 5 GHz WLAN band. Each of the paired antennas performs as well in the operating band as the antenna in free space. A conventional antenna configuration in a laptop computer was also tested to compare the data and it exhibited only 25~30 dB isolation at 250 mm separation. This new high isolation antenna designed using innovative electromagnetic concept and theory radically improved isolation performance. The design technique and the measured results of the high-isolation antenna will be presented and discussed in detail at the conference.

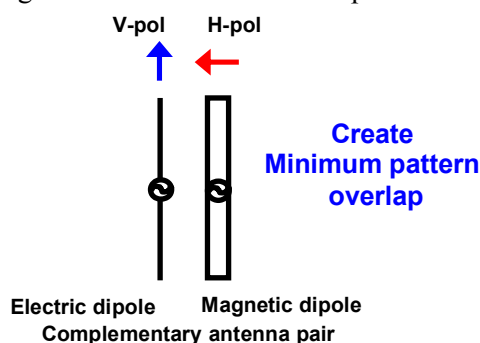


Fig. 1 Conceptual high-isolation antenna pair

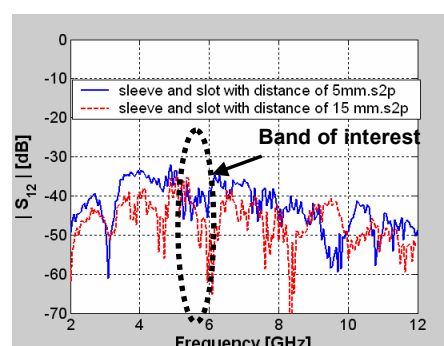


Fig. 2 Measured isolation