An Improved 1-18 GHz Double Ridged Horn Antenna with a Uniform Radiation Pattern

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Abstract

1-18 GHz double ridged horn antenna (DRHA) is designed to improve a well-known radiation pattern deterioration problem at frequencies above 12 GHz. The designed antenna maintains a single main lobe in the direction of the horn axis. In addition, it is shown that the modifications implemented in the shape of the ridges cause better voltage standing wave ratio (VSWR) over the whole frequency band. The antenna is modeled using commercial 3D electromagnetic (EM) simulation software CST Microwave Studio. The simulation results show that the antenna has low side lobe level with a VSWR less than 2.3 (typical 1.5) over the entire frequency band. The method outlined in the paper can be used to design double ridged horn antenna to be used as a test antenna in EMC applications and antenna measurements.