A DESIGN OF SLOTTED ELLIPTICAL ANTENNA FOR WIDEBAND APPLICATIONS

ADZNINA BT EBERAHIM

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Faculty Electrical Engineering
UNIVERSITI TEKNOLOGI MARA

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ABSTRACT

In choosing an antenna topology for wideband design, several factors must be taken into account including physical profile, compatibility, impedance bandwidth, radiation efficiency, and radiation pattern. In this paper, a slotted elliptical wideband antenna is presented. It originates from conventional ellipse shape and is realized by adding a slot for patch. The wideband behavior is due to the fact that the currents along the edges of the slots introduce an additional resonance, which, in conjunction with the resonance of the main patch, produce an overall wideband frequency response characteristic. The slots also appear to introduce a capacitive reactance which counteracts the inductive reactance of the feed. Thus, the bandwidth broadening comes from the patch and the slot, coupled together to form two resonances. The characteristic and performance of the slotted elliptical antenna was simulated by using the commercially available CST Microwave. This antenna is fed by 5 Ofl micro strip-line feed and was fabricated using FR4 with the dielectric constant, 6,-equal to 4.7, tangent delta electric, 5 is 0.019 and the height of the substrate, h is 1.6 mm. A Vector Network Analyzer (VNA) was used to analyze the prototype antenna. The measured return loss (Sn) of this proposed antenna is also presented as well. This antenna was a good choice since it exhibited a return loss less than -lOdB within wideband frequency range of 2.5 GHz to 6.5 GHz, voltage standing wave ratio (VSWR) less than 2, provided omnidirectional radiation pattern at 3.97 GHz, directional radiation pattern at 5.5 GHz and value of radiation efficiency is more than 70%. Furthermore, it was low-profile and compact antenna.

CHAPTER TITLE