

Dual-Port Multiband MSA for Airborne Vehicular Applications

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Abstract

This paper presents the design of a dual-port microstrip patch antenna for telemetry (2.2 GHz) and GPS (1.5 GHz) applications. The proposed antenna is suggested to be used in a low-altitude space rocket or satellite. Any data collected from the rocket would be sent to the base telemetry station through the 2.2 GHz frequency band. The GPS band would be used to monitor the location of the spacecraft and to collect the information of its trajectory. CST Microwave Design Studio software has been used to simulate the design of the said antenna. The analysis of return loss, VSWR, gain, and radiation pattern was carried out. The proposed antenna shows return loss of -19.23 dB at 2.2 GHz and -20.31 dB at 1.5 GHz (both are orthogonally polarized to each other) which implies good results. The impedance matching is good at the desired frequencies with VSWR < 2 , respectively. The overall simulation results show that the antenna worked well at the desired two frequencies, hence making the antenna suitable for use. This antenna is implemented on FR4 epoxy dielectric substrate with relative permittivity $\epsilon_r = 4.3$ and thickness of the substrate (h) = 1.6 mm.

Keywords

Dual-port microstrip patch antenna Orthogonal polarization Telemetry GPS

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