

SPACE COMMUNICATIONS AND NAVIGATION SYMPOSIUM (B2)  
Fixed and Broadcast Communications (5)

Author: Mr. Wang Xiaofei  
The First Academy of China Aerospace Science and Technology Corporation, China,  
wangxiaofei0202@tom.com

DESIGN OF A BROADBAND OMNI-DIRECTIONAL ANTENNA UNDER THE THICK DIELECTRIC  
MATERIAL LAYER

**Abstract**

According to the thick dielectric material layer boundary, this paper designed a new broadband L-band omni-directional antenna. Since the antenna is not allowed to protrude from the outer surface of the carrier, it is usually concave within the metal shell. Because of the harsh thermal environment, the surface is covered by thick dielectric material for insulation protection, causing the deterioration in the horizontal pattern and the reduction of the bandwidth. As a result, appropriate measures are carried out to eliminate these adverse effects to meet the requirements. Based on the combination of Antenna design and Radome design, the antenna achieved omni-directional pattern and high gain in the wide frequency range. It could meet the high demand of carrier transmitting electromagnetic waves in the horizontal direction. Through modeling and simulation, a reasonable design size was obtained. Antenna prototype was tested and the results satisfied the design requirements.