Abstract

In electronically scanned antenna array, the antenna beam-steering in the desired direction without physically repositioning the antenna can be made possible by use of phase shifters,
which can be implemented in the transmit receive path of the antenna. For Stratospheric Tropospheric (ST) Radar, the six bit digital phase shifter using lumped components equivalent of transmission line has been designed and implemented. This phase shifter is designed to achieve proper beam-positioning, 360° azimuthal angle and ±15° elevation angle. This phase shifter is a part of transmit-receive (TR) module which is associated with each antenna in the circular array of 576 Yagi-Uda antennas. The results of this design are obtained in terms of insertion loss, return loss, phase error and verified computationally using Matlab and simulations in ADS (Advanced Design System) software. The six bit digital phase shifter has been fabricated using FR4 substrate and the results are measured in Vector Network Analyzer (VNA) for all possible combinations of phase shifts at 212MHz frequency.

References


Index Terms

Computer Science  Integrated Circuit
Keywords
Phase Shifter  St Radar  Lumped Networks