

## Phase Shifter with Frequency Adaptive Control Circuit

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**Abstract :** This study introduces an innovative design for an RF phase shifter that can maintain a consistent phase shift across a broad spectrum of frequencies. The proposed design integrates an adaptive control system into a reflective-type phase shifter, typically showing frequency-related variations. Adjusting the DC voltage according to the frequency ensures a more reliable phase shift across the frequency span of operation. In contrast, conventional frequency-dependent reflective-type phase shifters may exhibit significant fluctuations in phase shifts exceeding 60 degrees in the same bandwidth. The proposed phase shifter is configured to deliver a 90-degree operation with an expected deviation of around 15 degrees. The fabrication of the phase shifter and adaptive control circuit has been verified through experimentation, with the measured outcomes aligning with the simulation results.

**Keywords :** phase shifter, adaptive control, varactors, electronic circuits.

**Conference Title :** ICECECE 2024 : International Conference on Electrical, Computer, Electronics and Communication Engineering

**Conference Location :** Arizona, United States

**Conference Dates :** March 04-05, 2024