

In this paper, a broadband upconversion image-reject mixer integrating a quadrature signal generator is presented. The polyphase networks (PPNs) are used to convert the single-ended local-oscillator input signal to quadrature signals. A pair of inductors is added to traditional PPN to enhance the return loss performance, while optimizing the image-reject ratio. A common-emitter transconductance using the feedforward technique is applied to a quadrature active Gilbert mixer to obtain relative high linearity, and the optimal solution for high-frequency applications is given and analyzed. An active differential to single totem-pole balun is applied as the output stage, which is well matched to load impedance and can provide medium output power. Measured results show excellent performance in the designed frequency from 400 MHz to 6 GHz.