

Abstract

SEMICONDUCTOR DEVICE AND METHOD OF INTEGRATING BALUN AND RF COUPLER ON A COMMON SUBSTRATE

A semiconductor die has an RF coupler and balun integrated on a common substrate. The RF coupler includes first and second conductive traces formed in close proximity. The RF coupler further includes a resistor. The balun includes a primary coil and two secondary coils. A first capacitor is coupled between first and second terminals of the semiconductor die. A second capacitor is coupled between a third terminal of the semiconductor die and a ground terminal. A third capacitor is coupled between a fourth terminal of the semiconductor die and the ground terminal. A fourth capacitor is coupled between the high side and low side of the primary coil. The integration of the RF coupler and balun on the common substrate offers flexible coupling strength and signal directivity, and further improves electrical performance due to short lead lengths, reduces form factor, and increases manufacturing yield.

(Figure 5)