

Abstract

SEMICONDUCTOR DEVICE AND METHOD OF FORMING RF FEM WITH LC FILTER AND IPD FILTER OVER SUBSTRATE

A semiconductor device has a substrate and RF FEM formed over the substrate. The RF FEM includes an LC low-pass filter having an input coupled for receiving a transmit signal. A Tx/Rx switch has a first terminal coupled to an output of the LC filter. A diplexer has a first terminal coupled to a second terminal of the Tx/Rx switch and a second terminal for providing an RF signal. An IPD band-pass filter has an input coupled to a third terminal of the Tx/Rx switch and an output providing a receive signal. The LC filter includes conductive traces wound to exhibit inductive and mutual inductive properties and capacitors coupled to the conductive traces. The IPD filter includes conductive traces wound to exhibit inductive and mutual inductive properties and capacitors coupled to the conductive traces. The RF FEM substrate can be stacked over a semiconductor package containing an RF transceiver.

(Fig.9)