CLAIMS

1. An apparatus comprising: a substrate; a first inductor integrated into the substrate, the first inductor including a plurality of first inductor windings in a first metal layer and a second metal layer; a second inductor integrated into the substrate, the second inductor including a first spiral in a third metal layer, the first spiral located at least partially inside the plurality of first inductor windings, wherein the second inductor is perpendicular to the first inductor, wherein the first inductor includes a plurality of first interconnects and a plurality of second interconnects for coupling the first inductor windings in the first metal layer to the first inductor windings in the second metal layer, wherein the second inductor includes a third side and a fourth side, wherein the third side and fourth side of the second inductor are bound by the plurality of first interconnects and the plurality of second interconnects of the first inductor, wherein each of the plurality of first inductor windings of the first inductor crosses the first spiral of the second inductor at least at two locations between the third side and the fourth side of the second inductor, wherein each one of the plurality of first interconnects and each one of the plurality of second interconnects includes a plurality of stacked vias and pads, wherein the first inductor and second inductor are not electrically coupled together, and wherein the number of the plurality of first inductor windings and the number of the plurality of stacked vias and pads depend on the amount of desired inductance.

2. The apparatus of claim 1, wherein the third metal layer is located between the first metal layer and the second metal layer.

3. The apparatus of claim 1, further comprising: wherein the first inductor is configured to generate a first magnetic field in a first direction; wherein the second inductor is configured to generate a second magnetic field in a second direction, wherein the second direction is different from the first direction.

4. The apparatus of claim 3, wherein the second magnetic field is generated from the second inductor.

5. The apparatus of claim 4, wherein the first magnetic field is generated from the plurality of first inductor windings.

6. The apparatus of claim 5, wherein the first direction of the first magnetic field and the second direction of the second magnetic field are perpendicular to each other.

7. The apparatus of claim 1, wherein a first side and a second side of the second inductor are not bounded by the first inductor.

8. The apparatus of claim 1, wherein the first inductor windings include a plurality of first segments and a plurality of second segments, the first spiral located between the plurality of first segments and the plurality of second segments.

9. The apparatus of claim 1, wherein a first side of the second inductor is perpendicular to the plurality of first interconnects and the plurality of second interconnects.

10. The apparatus of claim 8, further comprising: wherein the second inductor includes a second spiral on a fourth metal layer and a third spiral on a fifth metal layer, the second spiral and the third spiral located between the plurality of first segments and the plurality of second segments of the first inductor.

11. The apparatus of claim 10, wherein the fourth metal layer and the fifth metal layer are located between the first metal layer and the second metal layer.

12. The apparatus of claim 10, wherein a plurality of third interconnects is coupled to the first spiral, the first spiral is coupled to a plurality of fifth interconnects, the plurality of fifth interconnects couples the first spiral to the second spiral, the second spiral is coupled to the plurality of fourth interconnects, the plurality of fourth interconnects couples the second spiral to the third spiral, the third spiral is coupled to the plurality of fifth interconnects.

13. The apparatus of claim 10, wherein the stacked vias and pads configured to provide space for the first spiral, second spiral, and third spiral to be located between the plurality of first segments and the plurality of second segments.

14. The apparatus of claim 1, wherein the substrate including the first inductor and

second inductor is part of a duplexer circuit.

15. The apparatus of claim 1, wherein the apparatus is incorporated into a device selected from a group consisting of a music player, a video player, an entertainment unit, a navigation device, a communications device, a mobile device, a mobile phone, a smart phone, a personal digital assistant, a fixed location terminal or server, a tablet computer, a wearable computing device, and a laptop computer.