CLAIMS

1. A radio-frequency (RF) structure comprising:

a substrate comprising a semiconductor device layer disposed on an insulating layer;

formed in or on the semiconductor device layer, a semiconductor device structure of an integrated RF device; and

disposed above the semiconductor device layer, at least one metallization structure to carry an RF signal to or from the integrated RF device,

wherein the semiconductor device layer is patterned to form a plurality of disconnected semiconductor islands, the disconnected semiconductor islands extending at least over a region that at least partially surrounds the at least one metallization structure.

2. The RF structure of claim 1, wherein the disconnected semiconductor islands extend at least over a region that fully surrounds the at least one metallization structure.

3. The RF structure of claim 1, wherein the disconnected semiconductor islands extend over the semiconductor device layer except in regions including and immediately surrounding the semiconductor device structure.

4. The RF structure of claim 1, wherein the plurality of disconnected semiconductor islands are formed between channels etched into the semiconductor device layer.

5. The RF structure of claim 4, wherein the channels form a rectangular grid.

6. The RF structure of claim 4, wherein the channels triangulate the patterned region.

7. The RF structure of claim 4, wherein the channels have a width of between 0.5 μm and 2 μm.

8. The RF structure of claim 1, wherein the disconnected islands are non-uniform in size, increasing in size with greater distance from an edge of the at least one metallization structure.

9. The RF structure of claim 1, wherein the semiconductor islands have dimensions of between about 1 μm and about 50 μm.

10. The RF structure of claim 1, wherein the at least one metallization structure comprises at least one of device metallization, electrodes, contact traces, or bonding pads.

11. The RF structure of claim 1, wherein the semiconductor device structure comprises at least one of a semiconductor device structure formed in the semiconductor device layer or a semiconductor device structure disposed above the semiconductor device layer.

12. The RF structure of claim 1, wherein the integrated RF device is a photonic device.

13. The RF structure of claim 1, wherein the integrated RF device comprises at least one of a laser diode, an optical modulator, a photodetector, or an optical switch.