CLAIMS

1. A system comprising:

a ground plane including a cutout;

an alternating current (AC) capacitor pad configured to establish a bi-directional data channel, the AC capacitor pad being positioned in the cutout of the ground plane; and

a power over data line (PoDL) pad connected to a plurality of inductors and a DC power source, the PoDL pad being positioned in the cutout of the ground plane and being in series with the AC capacitor pad.

2. The system of claim 1, further comprising the DC power source.

3. The system of claim 1, further comprising a cable connecting the AC capacitor pad and the PoDL pad in series, the cutout of the ground plane being located between a first end of the cable and a second end of the cable.

4. The system of claim 3, further comprising one or more computing devices at the first end of the cable, the one or more computing devices being configured to transmit data at a rate of 4Gbps or greater along the bi-directional data channel.

5. The system of claim 4, wherein the one or more computing devices are a serializer.

6. The system of claim 3, further comprising one or more computing devices at the second end of the cable, the one or more computing devices being configured to process data received via the bi-directional data channel.

7. The system of claim 6, wherein the one or more computing devices are a deserializer.

8. The system of claim 3, wherein the cutout has a size wherein an impedance at the AC capacitor pad and the PoDL pad within the cutout match or closely match an impedance at a point of the cable that is between the first end of the cable and the cutout.

9. The system of claim 3, wherein the cutout has a size wherein an impedance at the AC capacitor pad and the PoDL pad within the cutout match or closely match an impedance at a point of the cable that is between the cut out and the second end of the cable.

10. The system of claim 1, further comprising a camera system configured to collect an image and transmit the image via the AC capacitor pad.

11. The system of claim 10, further comprising a vehicle, and wherein the camera system is mounted on the vehicle.

12. The system of claim 1, further comprising a lidar system configured to collect location information and transmit the location information via the AC capacitor pad.

13. The system of claim 12, further comprising a vehicle, and where the lidar system is mounted on the vehicle.

14. The system of claim 1, further comprising a layer beneath the ground plane, wherein the AC capacitor pad and the PoDL pad are positioned on the layer within the cutout of the ground plane.

15. A method of manufacturing comprising:

forming a cutout in a ground plane;

positioning in the cutout an alternating current (AC) capacitor pad configured to establish a bi-directional data channel; and

positioning, in the cutout, a power over data line (PoDL) pad in series with the AC capacitor pad on a cable and in connection with a plurality of inductors and a DC power source.

16. The method of claim 15, further comprising connecting a first end of the cable to a first computing device and a second end of the cable to a second computing device, wherein the cutout is positioned between the first end and the second end of the cable.

17. The method of claim 16, wherein the first computing device are a serializer.

18. The method of claim 16, wherein the second computing device are a deserializer.

19. The method of claim 16, wherein the cutout has a size wherein an impedance at the AC capacitor pad and the PoDL pad within the cutout match or closely match an impedance at a point of the cable that is between the first end of the cable and the cutout.

20. The method of claim 16, wherein the cutout has a size wherein an impedance at the AC capacitor pad and the PoDL pad within the cutout match or closely match an impedance at a point of the cable that is between the cutout and the second end of the cable.