

CLAIMS

1. A printed circuit board (PCB), comprising:
 - a set of stacked metallization layers separated by a set of stacked electrical-insulating layers, respectively, wherein the set of stacked metallization layers includes upper metallization layer, lower metallization layer, and intermediate metallization layer;
 - a via electrically coupled to the upper metallization layer, the intermediate metallization layer, and the lower metallization layer; and
 - an electromagnetic absorbing material coupled to the via.
2. The PCB of claim 1, wherein the upper metallization layer, a portion of the via between the upper metallization layer and the intermediate metallization layer, and the intermediate metallization layer are configured to route a data signal between a signal-in and a signal-out.
3. The PCB of claim 1, wherein the electromagnetic absorbing material is configured to reduce an intensity of a reflected signal resulting from the data signal propagating downward along a stub of the via and reflecting off the lower metallization layer.
4. The PCB of claim 3, wherein the electromagnetic absorbing material is attached to the lower metallization layer directly underneath the stub.
5. The PCB of claim 3, wherein the electromagnetic absorbing material is attached to a dielectric material situated between the lower metallization layer and the electromagnetic absorbing material directly underneath the stub, wherein a dielectric constant of the dielectric material is between a dielectric constant of the stacked electrical insulating layers and a dielectric constant of the electromagnetic absorbing material.
6. The PCB of claim 3, wherein the electromagnetic absorbing material is attached coaxially around a portion of the stub.

7. The PCB of claim 6, further comprising a second electromagnetic material attached to the lower metallization layer directly underneath the stub.

8. The PCB of claim 6, further comprising a second electromagnetic absorbing material attached to a dielectric material situated between the lower metallization layer and the second electromagnetic absorbing material directly underneath the stub, wherein a dielectric constant of the dielectric material is between a dielectric constant of the stacked electrical insulating layers and a dielectric constant of the electromagnetic absorbing material.

9. The PCB of claim 1, further comprising a ground plane associated with the upper and intermediate metallization layers, wherein the electromagnetic absorbing material is coupled to the ground plane.

10. The PCB of claim 1, wherein the electromagnetic absorbing material has a material loss factor greater than a material loss factor of the stacked electrical insulating layers for at least a portion of a frequency spectrum of the data signal.

11. The PCB of claim 1, wherein the electromagnetic absorbing material has a dielectric constant less than a dielectric constant of the stacked electrical insulating layers for at least a portion of a frequency spectrum of the data signal.

12. The PCB of claim 1, wherein the electromagnetic absorbing material comprises urethane, silicone, or epoxy.

13. A method of manufacturing a printed circuit board (PCB), comprising:
forming a set of stacked metallization layers separated by a set of stacked electrical-insulating layers, respectively, wherein the set of stacked metallization layers includes upper metallization layer, lower metallization layer, and intermediate metallization layer;

forming a via electrically coupled to the upper metallization layer, the intermediate metallization layer, and the lower metallization layer, wherein the upper metallization layer, a portion of the via between the upper metallization layer and the

intermediate metallization layer, and the intermediate metallization layer are configured to route a data signal between a signal-in and a signal-out; and

forming an electromagnetic absorbing material configured to reduce an intensity of a reflected signal resulting from the data signal propagating downward along a stub of the via and reflecting off the lower metallization layer.

14. The method of claim 13, wherein forming the electromagnetic absorbing material comprises attaching the electromagnetic absorbing material to the lower metallization layer directly underneath the stub.

15. The method of claim 13, further comprising attaching a dielectric material to the lower metallization layer directly underneath the stub, wherein forming the electromagnetic absorbing material comprising attaching the electromagnetic absorbing material to the dielectric material directly underneath the stub, wherein a dielectric constant of the dielectric material is between a dielectric constant of the stacked electrical insulating layers and a dielectric constant of the electromagnetic absorbing material.

16. The method of claim 13, wherein forming the electromagnetic absorbing material comprises attaching the electromagnetic absorbing material coaxially around a portion of the stub.

17. The method of claim 16, further comprising attaching a second electromagnetic material to the lower metallization layer directly underneath the stub.

18. The method of claim 16, further comprising:

attaching a dielectric material to the lower metallization layer directly underneath the stub; and

attaching a second electromagnetic absorbing material to the dielectric material situated directly underneath the stub, wherein a dielectric constant of the dielectric material is between a dielectric constant of the stacked electrical insulating layers and a dielectric constant of the electromagnetic absorbing material.

19. The method of claim 13, further comprising coupling the electromagnetic absorbing material to a ground plane associated with the upper and intermediate metallization layers.

20. The method of claim 13, wherein forming the electromagnetic absorbing material comprises selecting a material that has a material loss factor greater than a material loss factor of the stacked electrical insulating layers for at least a portion of a frequency spectrum of the data signal.

21. The method of claim 13, wherein forming the electromagnetic absorbing material comprises selecting a material that has a dielectric constant less than a dielectric constant of the stacked electrical insulating layers for at least a portion of a frequency spectrum of the data signal.

22. The method of claim 13, wherein forming the electromagnetic absorbing material comprises spraying electromagnetic absorbing material over the lower metallization layer.

23. The method of claim 13, wherein the electromagnetic absorbing material comprises urethane, silicone, or epoxy.

24. An apparatus, comprising:

a first device configured to generate a data signal;

a second device configured to receive the data signal; and

a printed circuit board (PCB), comprising:

a set of stacked metallization layers separated by a set of stacked electrical-insulating layers, respectively, wherein the set of stacked metallization layers includes upper metallization layer, lower metallization layer, and intermediate metallization layer;

a via electrically coupled to the upper metallization layer, the intermediate metallization layer, and the lower metallization layer, wherein the upper metallization layer, a portion of the via between the upper metallization layer and the

intermediate metallization layer, and the intermediate metallization layer are configured to route the data signal from the first device to the second device; and

an electromagnetic absorbing material configured to reduce an intensity of a reflected signal resulting from the data signal propagating downward along a stub of the via and reflecting off the lower metallization layer.

25. The apparatus of claim 24, wherein the electromagnetic absorbing material comprises a polystyrene material.