CLAIMS

1. A surface mount coupling capacitor comprising:

a main body containing a first set of alternating dielectric layers and internal electrode layers and a second set of alternating dielectric layers and internal electrode layers,

each set of alternating dielectric layers and internal electrode layers containing a first internal electrode layer and a second internal electrode layer wherein the first set is spaced apart from the second set in a longitudinal direction,

each internal electrode layer including a top edge, a bottom edge opposite the top edge, and two side edges extending between the top edge and the bottom edge that define a main body of the internal electrode layer,

external terminals electrically connected to the internal electrode layers wherein the external terminals are formed on a top surface of the coupling capacitor and a bottom surface of the coupling capacitor opposing the top surface of the coupling capacitor, wherein a pitch of the external terminals of the coupling capacitor is from about 0.1 mm to about 2 mm,

wherein the capacitor exhibits an insertion loss of 0.25 dB or less;

wherein the coupling capacitor further includes at least four side surfaces extending between the top surface and the bottom surface, wherein the side surfaces do not include an external terminal.

2. The multilayer coupling capacitor according to claim 1, wherein the capacitor provides an impedance differential of 100 Ω ± 10%.

3. The multilayer coupling capacitor according to claim 1, wherein at least one of the first internal electrode layer or the second internal electrode layer electrically contacts the external terminal on the top surface of the coupling capacitor and the other internal electrode layer electrically contacts the external terminal on the bottom surface of the coupling capacitor opposing the top surface of the coupling capacitor.

4. The multilayer coupling capacitor according to claim 1, wherein at least one lateral edge of the first internal electrode layer is substantially aligned with at least one lateral edge of the second internal electrode layer.

5. The multilayer coupling capacitor according to claim 1, wherein both lateral edges of the first internal electrode layer are substantially aligned with both lateral edges of the second internal electrode layer.

6. The multilayer coupling capacitor according to claim 1, wherein the dielectric layers comprise a ceramic.

7. The multilayer coupling capacitor according to claim 6, wherein the ceramic comprises a titanate.

8. The multilayer coupling capacitor according to claim 1, wherein the internal electrode layers comprise a conductive metal.

9. The multilayer coupling capacitor according to claim 8, wherein the conductive metal comprises nickel or an alloy thereof.

10. The multilayer coupling capacitor according to claim 1, wherein the external terminals are electroplated layers.

11. The multilayer coupling capacitor according to claim 1, wherein the external terminals are electroless plated layers.

12. The multilayer coupling capacitor according to claim 1, wherein the external terminals comprise a conductive metal.

13. The multilayer coupling capacitor according to claim 12, wherein the conductive metal comprises silver, gold, palladium, platinum, tin, nickel, chrome, titanium, tungsten, or combinations or alloys thereof.

14. The multilayer coupling capacitor according to claim 12, wherein the conductive metal comprises copper or an alloy thereof.

15. A circuit board containing the coupling capacitor of claim 1.

16. A communications device containing the coupling capacitor of claim 1.

17. The communications device of claim 16, wherein the device includes an Ethernet system, a wireless network router, a fiber optic communications system, or a storage device.

18. A circuit board comprising:

a surface mount coupling capacitor comprising a main body containing a first set of alternating dielectric layers and internal electrode layers and a second set of alternating dielectric layers and internal electrode layers wherein the first set is spaced apart from the second set in a longitudinal direction, the coupling capacitor further comprising external terminals on a top surface of the coupling capacitor and external terminals on a bottom surface of the coupling capacitor opposing the top surface of the coupling capacitor~~,~~

wherein the external terminals on the top surface or the bottom surface of the coupling capacitor opposing the top surface are electrically connected to a surface

of the circuit board and wherein a pitch of the external terminals of the coupling capacitor is from about 0.1 mm to about 2 mm;

wherein the coupling capacitor further includes at least four side surfaces extending between the top surface and the bottom surface, wherein the side surfaces do not include an external terminal.

19. The circuit board of claim 18, wherein the board further comprises an integrated circuit package.

20. The circuit board of claim 19, wherein the coupling capacitor is positioned between the circuit board and the integrated circuit package in a vertical direction such that the circuit board, the coupling capacitor, and the integrated circuit package are present in a stacked arrangement.

21. The circuit board of claim 19, wherein the coupling capacitor is directly connected to the circuit board and the integrated circuit package.

22. The circuit board of claim 18, wherein the coupling capacitor comprises

a main body containing a first set of alternating dielectric layers and internal electrode layers and a second set of alternating dielectric layers and internal electrode layers,

each set of alternating dielectric layers and internal electrode layers containing a first internal electrode layer and a second internal electrode layer,

each internal electrode layer including a top edge, a bottom edge opposite the top edge, and two side edges extending between the top edge and the bottom edge that define a main body of the internal electrode layer.

23. The circuit board of claim 22, wherein at least one of the first internal electrode layer or the second internal electrode layer electrically contacts an external terminal on the top surface of the coupling capacitor and the other internal electrode layer electrically contacts an external terminal on the bottom surface of the coupling capacitor opposing the top surface of the coupling capacitor.

24. The circuit board of claim 22, wherein a pitch between the first internal electrode layer of the first set and the second internal electrode layer of the second set is the same as the pitch of the external terminals on the top surface of the coupling capacitor or the bottom surface of the coupling capacitor opposing the top surface of the coupling capacitor.

25. The circuit board of claim 22, wherein the first internal electrode layer and the second internal electrode layer are interleaved in an opposed relation and a dielectric layer is positioned between the first internal electrode layer and the second internal electrode layer.

26. The circuit board of claim 18, wherein the capacitor provides an impedance differential of 100 Ω ± 10%.

27. The circuit board of claim 18, wherein the capacitor exhibits an insertion loss of 0.25 dB or less.

28. A communications device comprising the circuit board of claim 18.

29. The communications device of claim 28, wherein the device includes an Ethernet system, a wireless network router, a fiber optic communications system, or a storage device.

30. The circuit board of claim 18, wherein the first set is spaced apart from the second set in a direction that spans across the length of the capacitor.