CLAIMS

1. A prepreg comprising:

an at least partially cured resin impregnated reinforcing material portion; and

a free resin portion wherein the resin includes at least one high dielectric constant material, the free resin portion having a dielectric constant DK_W and the resin impregnated reinforcing material portion having a dielectric constant DK_{WR} wherein the high dielectric constant material is incorporated into the resin in an amount sufficient to match the DK_{WR} with the DK_W such that the DK_{WR} and DK_W differ by no more than (±) 15% and wherein the dielectric constant of the reinforcing material (Dk_R) is not the same as the DK_W.

2. The prepreg of claim 1 wherein the one or more high Dk materials each have a Dk of at least 500.

3. The prepreg of claim 1 wherein the one or more high Dk materials are particulate materials.

4. The prepreg of claim 3 wherein the one or more high Dk material particle size ranges from about 1 nm to about 40 microns.

5. The prepreg of claim 1 wherein the one or more high Dk materials are ferroelectric materials.

6. The prepreg of claim 5 wherein the ferroelectric materials are selected from the group consisting of strontium titanate, barium titanate, lead titanate, lead zirconate titanate, lead lanthanum zirconate titanate and combinations thereof.

7. The prepreg of claim 1 wherein the base resin is a thermoset or thermoplastic resin.

8. The prepreg of claim 1 wherein one or more high Dk materials are present in the composition in an amount ranging from about 2 to about 70 wt %.

9. The prepreg of claim 1 wherein the reinforcing material is selected from the group consisting of woven glass fabric, paper, felt, glass fibers and plastic sheets.

10. The prepreg of claim 9 wherein the reinforcing material is a low Dk woven glass fabric.

11. The prepreg of claim 10 wherein the low Dk woven glass fabric has a Dk ranging from about 3.5 to about 7.0.

12. The prepreg of claim 1 wherein the free resin is any resin that is at least 1 micron from any reinforcement surface.

13. The prepreg of claim 1 wherein the DK_{WR} and DK_{W} differ by no more than (±) 5%.

14. A prepreg of claim 1 wherein the resin composition comprises at least one base resin and from about 5 to about 60 wt % of particles of or more high Dk materials selected from the group consisting of strontium titanate, barium titanate, lead titanate, lead zirconate titanate, lead lanthanum zirconate titanate and combinations.

15. A laminate including a fully cured prepreg of claim 1.

16. The laminate of claim 15 including at least one copper layer.

17. A printed circuit board including as at least one layer, a fully cured prepreg of claim 1.

18. A prepreg comprising:

an at least partially cured resin impregnated reinforcing material portion; and

a free resin portion wherein the resin includes at least one high dielectric constant material, the free resin portion having a dielectric constant DK_{W} and the resin impregnated reinforcing material portion having a dielectric constant DK_{WR} wherein the high dielectric constant material is incorporated into the resin in an amount sufficient to match the DK_{WR} with the DK_{W} such that the DK_{WR} and DK_{W} differ by no more than (±) 15% wherein the reinforcing material has a Dk_{R} and wherein the Dk_{R} and the dielectric constant of the resin without the high dielectric constant material (Dk_{0}) differ by more than 30%.