CLAIMS

1. An apparatus, comprising:

an electronic component comprising at least one circuit;

a shielding material, coupled to the electronic component, forming a protective shield over or partially surrounding said at least one circuit;

wherein the protective shield comprises at least one layer formed of a composite material, wherein said at least one layer is disposed on the electronic component to form the protective shield protecting the electronic component from radiation; and

wherein the composite material comprises a polymer composite comprising an arrangement of carbon material to increase the emissivity of the composite material; and/or

wherein the composite material comprises a thermal conductive coating disposed over said at least one layer facing towards the electronic component, and/or the composite material comprises a thermal reflective coating disposed over said at least one layer facing away from the electronic component.

2. The apparatus of claim 1, wherein the shielding material is directly disposed onto a surface of the electronic component forming direct contact with the electronic component, and/or wherein the shielding material is situated in a proximity of the electronic component forming proximal contact, wherein the direct contact is formed via the thermal conductive coating of said at least one layer facing towards the electronic component or wherein the proximal contact is formed via the thermal conductive coating of said at least one layer facing towards the electronic component.

3. The apparatus of claim 1 or claim 2, wherein the polymer composite is made from at least one of: a hydrogen rich thermoplastic polymer, high density polyethylene, medium-density polyethylene, atactic polypropylene, syndiotactic polypropylene, or isotactic polypropylene, wherein the polymer composite is doped with at least one compound or metal, and wherein:

said at least one compound is boron or lithium; or

said at least one metal is a metal or a metal oxide.

4. The apparatus of claim 3, wherein said at least one metal is a metal or a metal oxide, wherein the metal or the metal oxide is dispersed in a matrix composition or in a layered structure, wherein the matrix composition or the layered structure is part of the hydrogen rich thermoplastic polymer, high density polyethylene, medium-density polyethylene, or any form of polypropylene, and wherein the metal or metal oxide has an atomic number (Z), wherein (Z) is 13, or is from 22 to 30, or is from 72 to 79.

5. The apparatus of any preceding claim, wherein the shielding material has a thickness less than or equal to 20 mm, optionally wherein the thickness is between 1 mm to 20 mm.

6. The apparatus of any preceding claim, wherein the thermal conductive coating comprises a carbon black mixture, a black color paint, a type of vacuum coating, a type of high emissivity foil, or a type of physical vapor deposition coating, wherein the thermal conductive coating is applied using a method for applying a type of paint or mixture, the vacuum coating, the high emissivity foil, or the physical vapor deposition coating.

7. The apparatus of claim 6, wherein the carbon black is mixed with the composite material to form the carbon black mixture with high emissivity or is applied to the arrangement of carbon material of the composite material to form a mixture with high emissivity, wherein the carbon black mixture is 0.1 - 5 % w/w forming a mixture with high emissivity and reflectivity.

8. The apparatus of any preceding claim, wherein the thermal reflective coating is a type of paint coating or a layer of metal that is deposited to the composite material as nano or micro particles, wherein the type of paint coating is color white in order to minimize the emissivity and increase reflectivity or wherein the layer of metal comprises aluminum or another high reflective metal.

9. The apparatus of any preceding claim, wherein the shielding material is produced using one or more of: additive manufacturing, compression molding, injection molding, compression molding, 3D-compression molding, or thermoforming, wherein the shielding material is a type of conformal shielding or spot shielding, and wherein the composite material further comprises one or more of: boron, boron-based compound, lithium, lithium-based compound, Carbon Black, aluminum, aluminum-based compound, and one or more paint types, optionally wherein the one or more of: boron, boron-based compound, lithium, lithium-based compound, Carbon Black, aluminum, aluminum-based compound, and one or more paint types, each is of 0.1-20 % w/w, preferably 0.1-10% w/w, more preferably 0.1-5% w/w.

10. The apparatus of any preceding claim, wherein the protective shield further comprises at least one layer that is configured to protect the electronic component from electromagnetic interference, and wherein the at least one layer that is configured to protect the electronic component from electromagnetic interference is either:

the layer formed of a composite material; or

a further layer of the protective shield that is separate to the layer formed of a composite material.

11. The apparatus of claim 10, wherein the at least one layer that is configured to protect the electronic component from electromagnetic interference comprises at least one of a metal, carbon and graphene.

12. An apparatus for radiation shielding, comprising:

a shielding material configured to form a protective shield over or partially surround at least one circuit of an entity in space;

wherein the protective shield comprises at least one layer formed of a composite material, wherein said at least one layer is configured to be disposed on the at least one circuit to form the protective shield protecting the at least one circuit from radiation; and

wherein the composite material comprises a polymer composite of an arrangement of carbon material to increase the emissivity of the composite material; and/or

wherein the composite material comprises a thermal conductive coating configured to be disposed over said at least one layer facing towards the at least one circuit, and/or the composite material comprises a thermal reflective coating configured to be disposed over said at least one layer facing away from the at least one circuit.

13. A system comprising one or more circuitry, wherein the system is configured to apply said apparatus based on claim 10 onto said one or more circuitry using a vacuum coating, a high emissivity foil, or a physical vapor deposition coating.

14. A method for providing an apparatus according to any of claims 1 to 11, the method comprising:

forming a shielding material using one or more of: additive manufacturing, compression molding, injection molding, compression molding, 3D-compression molding, and thermoforming; and

applying the shielding material directly disposed onto a surface of an electronic component; or

applying the shielding material proximal to an electronic component.

15. The method of applying an apparatus according to claim 12, the method comprising:

applying the shielding material directly disposed onto a surface of an electronic component; or

applying the shielding material proximal to an electronic component; and

wherein said applying shielding material comprises a method for applying a paint coating, vacuum coating, a high emissivity foil, or a physical vapor deposition coating to the electronic component.