CLAIMS

1. A stretchable interconnect structure for electrically connecting electronic devices, the stretchable interconnect structure comprising:

an electrically conductive wire having a 3-dimensional helical form, the electrically conductive wire being embedded in a substrate made from an elastic material; and

an adhesive coating on the electrically conductive wire forming an interface between the surface of the electrically conductive wire and the elastic material.

2. The stretchable interconnect structure of claim 1, wherein a maximum geometrical strain limit substantially without non-elastic deformation of the stretchable interconnect is greater than a maximum geometrical strain limit without non-elastic deformation of the electrically conductive wire having the 3-dimensional helical form without being embedded in the elastic material.

3. The stretchable interconnect structure of claim 2,. wherein the maximum geometrical strain limit without non-elastic deformation of the stretchable interconnect structure is about 80%

4. The stretchable interconnect structure of claim 2, wherein the maximum geometrical strain limit without non-elastic deformation of the stretchable interconnect structure is about 140%.

5. The stretchable interconnect structure of claim 2, wherein the maximum geometrical strain limit without non-elastic deformation of the stretchable interconnect structure is about 170%.

6. The stretchable interconnect structure of any one of claims 1 to 5, wherein the electrically conductive wire is enameled.

7. The stretchable interconnect structure of claim 6, wherein the electrically conductive wire comprises a polymeric insulation layer.

8. The stretchable interconnect structure of any one of claims 1 to 7, further comprising at least a first electronic device connected at one end of the stretchable interconnect structure.

9. The stretchable interconnect structure of claim 8, wherein the first electronic device is embedded in the substrate.

10. The stretchable interconnect structure of any one of claims 1 to 9, exhibiting a conductivity of the order of 10^5S/cm.

11. The stretchable interconnect structure of claim 10, wherein the conductivity is substantially constant across an elastic stretchability range of the stretchable interconnect structure.

12. A method of fabricating a stretchable interconnect structure for electrically connecting electronic devices, the method comprising the steps of:

providing an electrically conductive wire having a 3-dimensional helical form; and

embedding the electrically conductive wire in a substrate made from an elastic material;

wherein an adhesive coating is provided on the electrically conductive wire prior to embedding into the substrate for forming an interface between the surface of the electrically conductive wire and the elastic material.

13. The method of claim 12, wherein the electrically conductive wire is enameled.

14. The method of claim 13, wherein the electrically conductive wire comprises a polymeric insulation layer.

15. The method of any one of claims 12 to 14, further comprising connecting at least a first electronic device at one end of the embedded electrically conductive wire.

16. The method of claim 15, comprising embedding the first electronic device in the substrate.