CLAIMS:

1. An integrated circuit (IC) package comprising:

a flexible substrate;

a plurality of dies coupled with the flexible substrate;

a first encapsulation material, having a first rigidity, disposed on the flexible substrate at locations on the flexible substrate to at least partially encapsulate each die of the plurality dies;

a second encapsulation material, having a second rigidity, disposed on the flexible substrate, wherein the second rigidity and the first rigidity are different from one another; and

electrical routing features that electrically couple at least a first die of the plurality of dies with a second die of the plurality of dies, wherein the electrical routing features are at least partially encapsulated by the second encapsulation material.

2. The IC package of claim 1, wherein the second rigidity is less than the first rigidity.

3. The IC package of claim 1, wherein the second encapsulation material at least partially encapsulates the first encapsulation material.

4. The IC package of claim 1, wherein the first encapsulation material and the second encapsulation material are disposed on a same side of the flexible substrate.

5. The IC package of claim 1, wherein the first encapsulation material is disposed on a first side of the flexible substrate and the second encapsulation material is disposed on a second side of the flexible substrate, and wherein the first side of the flexible substrate is disposed opposite the second side of the flexible substrate.

6. The IC package of claim 1, further comprising a third encapsulation material, having a third rigidity, disposed on the flexible substrate, wherein the first rigidity, the second rigidity, and the third rigidity are all different from one another.

7. The IC package of claim 1, further comprising one or more interconnect structures disposed in the first encapsulation material and/or the second encapsulation material, wherein the one or more interconnect structures are electrically coupled with one or more dies of the plurality of dies via electrical routing features.

8. The IC package of claim 1, further comprising a flexible display physically and electrically coupled with one or more interconnect structures, wherein the electrical routing features are to route electrical signals between one or more dies and the flexible display.

9. An assembly comprising:

a wearable article; and

a wearable device, coupled with the wearable article, wherein the wearable device includes the IC package of claim 1.

10. The assembly of claim 9, wherein the wearable article is selected from a group consisting of: a shoe, an orthotic insert, a shirt, shorts, pants, watch, bracelet, necklace, belt, or jewelry.

11. The assembly of claim 9, wherein the wearable article is a shoe or an orthotic insert that further includes:

a power generation module to produce electrical power in response to an application of mechanical force thereon; and

a power control module, coupled with the power generation module and the plurality of dies of the IC package, to deliver the electrical power produced by the power generation module to the plurality of dies of the IC package at operational power levels respectively associated with the each of the plurality of dies.

12. The assembly of claim 9, wherein the plurality of dies include one or more processors, one or more memory modules coupled with the one or more processors, a global positioning sensor (GPS) coupled with the processor, and a wireless communication chip coupled with the processor.

13. The assembly of claim 12, wherein the one or more memory modules store a plurality of instructions, wherein the plurality of instructions, in response to execution by the one or more processors, cause the wearable device to establish a wireless data connection with a computing device via the wireless communication chip.

14. The assembly of claim 13, wherein the instructions further cause the processor to send data to the computing device indicating that the wearable device is farther away from the computing device than a predetermined threshold.

15. The assembly of claim 14, wherein the data also indicates a location of the wearable device.

16. The assembly of claim 15, wherein the wearable device further comprises a camera, coupled with the one or more processors.

17. The assembly of claim 16, wherein the wearable article is a shoe, and wherein the camera is disposed in a toe of the shoe.

18. The assembly of claim 13, wherein the wearable device further comprises a light source coupled with the one or more processors.

19. The assembly of claim 18, wherein the wearable article is a shoe, and wherein the light source is disposed in an exterior surface of the shoe.

20. The assembly of claim 19, wherein the instructions are further to cause the light source to illuminate:

in response to detection that the wearable device is farther away from the computing device than a predetermined threshold; or

in response to receipt of data from the computing device to cause the light source to illuminate.

21. A method of assembling an IC package comprising:

coupling a plurality of dies with a flexible substrate;

depositing a first encapsulation material, having a first rigidity, on the flexible substrate at locations on the flexible substrate to at least partially encapsulate each die of the plurality dies;

depositing a second encapsulation material, having a second rigidity, on the flexible substrate, wherein the second rigidity and the first rigidity are different from one another; and

providing electrical routing features that electrically couple at least a first die of the plurality of dies with a second die of the plurality of dies, wherein providing electrical routing features includes at least partially encapsulating the electrical routing features by the second encapsulation material.

22. The method of claim 21, wherein the second rigidity is less than the first rigidity.

23. The method of claim 21, wherein depositing the first encapsulation material comprises depositing the first encapsulation on a first side of the flexible substrate, and wherein depositing the second encapsulation material further comprises depositing the second encapsulation on the first side of the flexible substrate.

24. The method of claim 21, wherein depositing the first encapsulation material further comprises depositing the first encapsulation material on a first side of the flexible substrate and depositing the second encapsulation material further comprises depositing the second encapsulation material on a second side of the flexible substrate, and wherein the first side of the flexible substrate is disposed opposite the second side of the flexible substrate.