CLAIMS

1. A thermal interface system, comprising:

a first device, wherein the first device has a first surface extending in a first direction;

a thermal interface material (TIM) assembly configured to be adhered to the first device to facilitate a transfer of heat to or from the first device, the TIM assembly being aligned with the first surface in a second direction and including:

a first TIM having a first elasticity and configured to be adhered to the first surface; and

a second TIM having a second elasticity,

wherein an innermost surface of the first TIM surrounds an outermost surface of the second TIM such that the first TIM confines the second TIM to maintain the uniformity and consistency of the second TIM, and

wherein the first elasticity is between 10% and 50% greater than the second elasticity, and

wherein a shore hardness of the first TIM is between 30% and 80% of a shore hardness of the second TIM; and

a first wettable layer provided on the first surface between the second TIM and the first surface, wherein the first TIM is not wettable to the first surface.

2. The thermal interface system of claim 1, wherein the first TIM includes a material configured to expand and contract with the second TIM.

3. The thermal interface system of claim 1, wherein the first TIM surrounds the second TIM in the first direction to be in a plane parallel to the first surface, and the first TIM does not overlap with the second TIM in the second direction.

4. The thermal interface system of claim 1, wherein the first device includes an integrated circuit package.

5. The thermal interface system of claim 1, further comprising a second device including a cold rail configured to absorb heat from the first device, wherein the TIM assembly is provided between the first and second devices.

6. The thermal interface system of claim 1, further comprising a second device configured to exchange heat with the first device, wherein the TIM assembly is provided between, in the second direction, the first device and the second device to facilitate heat exchange, wherein one of the first or the second device includes a thermal device configured to absorb heat from the other of the first or the second device.

7. The thermal interface system of claim 1, wherein the first surface includes a step, and the first TIM is provided in the step.

8. The thermal interface system of claim 1, wherein the first surface includes a recess, and the second TIM is provided in the recess.

9. The thermal interface system of claim 1, further comprising a thermal device, wherein the thermal device has a second surface including a recess, and the first TIM is provided in the recess.

10. The thermal interface system of claim 1, further comprising a thermal device, wherein the thermal device has a second surface including a step, and the second TIM is provided in the step.

11. The thermal interface system of claim 1, further comprising:

a second device having a second surface, wherein the TIM assembly is provided between the first device and the second device; and

a second wettable layer provided on the second surface between the second TIM and the second surface.

12. A thermal interface system, comprising:

a first device having a first surface extending in a first direction;

a TIM assembly configured to be adhered to the first surface, the TIM assembly being configured to facilitate a transfer of heat from the first device, the TIM assembly being aligned with the first surface in a second direction and including:

a primary TIM having a first side facing the first surface and a second side opposite the first side;

a first wettable layer provided at the first side or the second side of the primary TIM, wherein the first wettable layer is wettable to the primary TIM, and the primary TIM is not wettable to the first surface; and

an outer TIM including an innermost surface that laterally surrounds an outermost surface of the primary TIM such that the outer TIM confines the primary TIM to maintain the uniformity and consistency of the primary TIM, wherein an elasticity of the outer TIM is between 10% and 50% greater than the primary TIM, and wherein a shore hardness of the outer TIM is between 30% and 80% of a shore hardness of the primary TIM.

13. The thermal interface system of claim 12, wherein the first wettable layer does not align, in the second direction, with the outer TIM so as to directly contact the first device.

14. The thermal interface system of claim 12, further comprising:

a second device configured to exchange heat with the first device, the TIM assembly being provided between, in the second direction, the first and second devices; and

a second wettable layer, wherein:

the first wettable layer is provided between the first device and the first side of the primary TIM, and

the second wettable layer is provided between the second device and the second side of the primary TIM.

15. A thermal interface system, comprising:

a first device having a first surface extending in a first direction, the first device including an integrated circuit (IC) package;

a first thermal interface material (TIM) provided on the first surface and defining an inner space above, in a second direction, the first surface, wherein:

the inner space extends in the first direction in a plane parallel to the first surface,

the first TIM includes a room temperature vulcanizing (RTV) material being configured to facilitate a transfer of heat from the first device, and

the first TIM has a first shore hardness in a range of 0 to 60 A; and

a second thermal interface material (TIM) provided on the first surface,

wherein an innermost surface of the first TIM surrounds an outermost surface of the second TIM,

wherein the first shore hardness of the first TIM is between 30% and 80% of a second shore hardness of the second TIM,

wherein an elasticity of the first TIM is between 10% and 50% greater than the second TIM, and

wherein the first TIM is not wettable to the first surface.

16. A method of manufacturing the thermal interface system of claim 15, comprising:

overmolding the first TIM on the first surface during a molding process of the first device to define the inner space within the first TIM.

17. The thermal interface system of claim 15, wherein the first surface includes a step, and the first TIM is provided in the step.

18. The thermal interface system of claim 15, wherein the first surface includes a recess, and the second TIM is provided in the recess.