CLAIMS

1. A method for preventing void formation in a solder joint formed between two metallic surfaces, said method comprising:

forming (410) at least one slit (218) in a layer of solder to form a slit solder layer (214);

positioning (440) said slit solder layer between two metallic surfaces;

heating (450) said slit solder layer to form said solder joint;

wherein said at least one slit forms an outgas alley in said slit solder layer to prevent said void formation in said solder joint.

2. The method of claim 1, further comprising depositing a flux layer on each of said two metallic surfaces prior to heating said slit solder layer.

3. The method of claim 1 wherein said slit solder layer comprises a solder selected from the group consisting of a low melting point solder, a medium melting point solder, and a high melting point solder.

4. The method of claim 1 wherein said slit solder layer has a thickness (116) of approximately 12 millimeters.

5. The method of claim 1 wherein a first of said two metallic surfaces comprises a surface of a metallization layer (502) formed on a semiconductor die (552) and a second of said two metallic surfaces comprises a surface on a heat spreader (506).

6. A method for preventing void formation in a solder joint formed between two metallic surfaces, said method comprising:

forming (410) at least one slit (218) in a layer of solder to form a slit solder layer (214);

positioning (440) said slit solder layer between said two metallic surfaces;

heating (450) and concurrently applying (450) external pressure to said slit solder layer to form said solder joint;

wherein said at least one slit forms an outgas alley in said slit solder layer to prevent said void formation in said solder joint.

7. The method of claim 6, further comprising depositing a flux layer on each of said two metallic surfaces.

8. The method of claim 6 wherein said slit solder layer comprises a solder selected from the group consisting of a low melting point solder, a medium melting point solder, and a high melting point solder.

9. The method of claim 6 wherein said slit solder layer has a thickness (116) of approximately 12 millimeters.

10. The method of claim 6 wherein said external pressure is utilized to control a thickness of said solder joint.

CLAIMS

1. A method for preventing void formation in a solder joint formed between two metallic surfaces, said method comprising:

forming at least one slit by etching completely through a thickness of a layer of solder to form a slit solder layer, wherein said slit solder layer is partitioned by one or more slits into two or more discrete pieces;

positioning said slit solder layer between two metallic surfaces;

heating said slit solder layer to form said solder joint;

wherein said one or more slits forms an outgas alley that is configured to prevent gases from penetrating into said solder joint to prevent said void formation in said solder joint.

2. The method of claim 1, further comprising depositing a flux layer on each of said two metallic surfaces prior to heating said slit solder layer.

3. The method of claim 2 wherein said flux layer comprises an active flux.

4. The method of claim 1 wherein said slit solder layer comprises a solder selected from the group consisting of a low melting point solder, a medium melting point solder, and a high melting point solder.

5. The method of claim 1 wherein said slit solder layer has a thickness of approximately 12 millimeters.

6. The method of claim 1 wherein a first of said two metallic surfaces comprises a surface of a metallization layer formed on a semiconductor die and a second of said two metallic surfaces comprises a surface on a heat spreader.

7. The method of claim 1 wherein said at least one slit comprises four slits.

8. A method for preventing void formation in a solder joint formed between two metallic surfaces, said method comprising:

forming at least one slit by etching completely through a thickness of a layer of solder to form a slit solder layer, wherein said slit solder layer is partitioned by one or more slits into two or more discrete pieces;

positioning said slit solder layer between said two metallic surfaces;

heating and concurrently applying external pressure to said slit solder layer to form said solder joint;

wherein said one or more slits forms an outgas alley that is configured to prevent gases from penetrating into said solder joint to prevent said void formation in said solder joint.

9. The method of claim 8, further comprising depositing a flux layer on each of said two metallic surfaces.

10. The method of claim 9 wherein said flux layer comprises an active flux.

11. The method of claim 8 wherein said slit solder layer comprises a solder selected from the group consisting of a low melting point solder, a medium melting point solder, and a high melting point solder.

12. The method of claim 8 wherein said slit solder layer has a thickness of approximately 12 millimeters.

13. The method of claim 8 wherein said external pressure is utilized to control a thickness of said solder joint.

14. The method of claim 8 wherein said two metallic surfaces comprise respective surfaces of a heat spreader and a metallization layer on a semiconductor die.

15. A method for preventing void formation in a solder joint formed between a heat spreader and a semiconductor die, said method comprising:

forming at least one slit by etching completely through a thickness of a layer of solder to form a slit solder layer, wherein said slit solder layer is partitioned by one or more slits into two or more discrete pieces;

positioning said slit solder layer between a metal layer formed on said semiconductor die and said heat spreader;

heating said slit solder layer so as to form said solder joint between said heat spreader and said semiconductor die;

wherein said one or more slits forms an outgas alley that is configured to prevent gases from penetrating into said solder joint to prevent said void formation in said solder joint.

16. The method of claim 15 further comprising applying external pressure to said semiconductor die and said heat spreader concurrently with said heating so as to control a width of said solder joint.

17. The method of claim 15 wherein said slit solder layer has a thickness of approximately 12 millimeters.

18. The method of claim 15, wherein said semiconductor die is situated on a circuit board.

19. The method of claim 15, wherein said slit solder layer comprises a solder selected from the group consisting of a low melting point solder, a medium melting point solder, and a high melting point solder.

20. The method of claim 15, wherein said semiconductor die is utilized in a circuit board.

21. A solder joint formed in accordance with any one of the preceding claims.

22. An electronic system having a solder joint formed in accordance with any one of claim 1-20 between two metallic surfaces.