What is Claimed:

1. An electrical connector comprising:

a connector housing;

an array of electrical contacts supported by the connector housing, the array of electrical contacts including at least two rows of electrical contacts that are spaced from each other and extend along a first direction, and at least two columns of electrical contacts that are spaced from each other and extend along a second direction that is substantially perpendicular to the first direction, each of the at least two rows of electrical contacts intersecting each of the at least two columns of electrical contacts; and

an alignment member that is disposed in the array of electrical contacts such that the alignment member is disposed between the least two rows of electrical contacts and further disposed between the at least two columns of electrical contacts.

2. The electrical connector as recited in claim 1, wherein the alignment member is disposed at substantially a geometric center of the array of electrical contacts.

3. The electrical connector as recited in claim 1, wherein the alignment member comprises a post that extends outward with respect to the connector housing along a third direction that is substantially perpendicular to both the first direction and the second direction.

4. The electrical connector as recited in claim 3, wherein the alignment member further comprises a receptacle that is disposed adjacent to the post.

5. The electrical connector as recited in claim 4, wherein the receptacle is spaced from, and aligned with, the post along the second direction.

6. The electrical connector as recited in claim 5, wherein each electrical contact of the array of electrical contacts includes a mating end and an opposed mounting end, and a fusible element disposed at the mounting end.

7. The electrical connector as recited in claim 1, wherein the connector housing includes a housing body that defines an outer perimeter and the connector housing further includes a second alignment member that protrudes from the housing body along a portion of the perimeter.

8. The electrical connector as recited in claim 1, wherein 1) the connector housing includes a housing body and a plurality of retention apertures that extend through the housing body in a transverse direction so as to define respective pluralities of first and second retention ribs spaced from each other along a dimension along a direction perpendicular to the transverse direction, 2) the electrical contacts are press-fit into respective ones of the retention apertures, and 3) each of the first and second retention ribs has a height along the transverse direction between 0.02mm and 0.15mm.

9. The electrical connector as recited in claim 8, wherein the height of one of the first and second retention ribs is 0.04mm and the height of the other of the first and second retention ribs is 0.08mm.

10. An electrical connector assembly comprising:

a first electrical connector having a first connector housing, a first array of electrical contacts supported by the first connector housing, and a first alignment member that defines an outer perimeter and is disposed in the first array of electrical contacts such that the outer perimeter of the first alignment member is substantially surrounded by respective electrical contacts of the first array of electrical contacts; and

a second electrical connector configured to be mated to the first electrical connector, the second electrical connector having a second connector housing, a second array of electrical contacts supported by the second connector housing, and a second alignment member that defines an outer perimeter and is disposed in the second array of electrical contacts such that the outer perimeter of the second alignment member is substantially surrounded by respective electrical contacts of the second array of electrical contacts, the second alignment member configured to mate with the first alignment member of the first electrical connector so as to substantially align the first and second arrays of electrical contacts relative to each other as the first and second electrical connectors are mated to each other.

11. The electrical connector assembly as recited in claim 10, wherein the electrical contacts of the first array do not mate with the electrical contacts of the second array unless the first and second alignment members are aligned with each other.

12. The electrical connector assembly as recited in claim 10, wherein the first alignment member comprises a first post and a first receptacle disposed adjacent the first post and the

second alignment member comprises a second post and a second receptacle disposed adjacent the second post, the first post received in the second receptacle and the second post received in the first receptacle when the first electrical connector is mated to the second electrical connector.

13. The electrical connector assembly as recited in claim 10, wherein the first alignment member is disposed substantially at a geometric center of the first array of electrical contacts and the second alignment member is disposed substantially at a geometric center of the second array of electrical contacts.

14. The electrical connector assembly as recited in claim 10, each electrical contact of the first array of electrical contacts includes a mating end and an opposed mounting end supporting a fusible element and each electrical contact of the second array of electrical contacts includes a mating end and an opposed mounting end supporting a fusible element.

15. The electrical connector assembly as recited in claim 14, wherein when the first and second electrical connectors are mated to each other each fusible element of the first array of electrical contacts is spaced from a corresponding fusible element of the second array of electrical contacts a distance of between 1 mm and 4 mm.

16. The electrical connector assembly as recited in claim 15, wherein the distance is approximately 2 mm.

17. The electrical connector assembly as recited in claim 10, wherein the first and second electrical connectors are substantially identical with respect to each other.

18. The electrical connector as recited in claim 10, wherein 1) each of the connector housings includes a housing body and a plurality of retention apertures that extend through the housing body in a transverse direction so as to define respective pluralities of first and second retention ribs spaced from each other along a dimension along a direction perpendicular to the transverse direction, 2) the electrical contacts are press-fit into respective ones of the retention apertures, and 3) each of the first and second retention ribs has a height along the transverse direction between 0.02mm and 0.15mm.

19. The electrical connector as recited in claim 18, wherein the height of one of the first and second retention ribs is 0.04mm and the height of the other of the first and second retention ribs is 0.08mm.

20. An electrical connector comprising:

an electrically insulative connector housing; and

an array of gender-neutral electrical contacts supported by the connector housing so as to define a mounting end configured to mount onto a substrate and a mating end that is disposed opposite the mounting end, each of the electrical contacts of the array of electrical contacts defining first and second opposed broadsides and first and second opposed edges, the broadsides longer than the edges, the array of electrical contacts defining a plurality of rows that are spaced along a column direction and a plurality of columns that are spaced along a row direction, such that edges of adjacent ones of the electrical contacts of each row face each other, and the broadsides of adjacent ones of the electrical contacts of each column face each other;

wherein each of the mating ends are curved so as to define a curvature, and the electrical contacts define first, second, and third electrical contacts that are aligned along the column direction, such that the second electrical contact is adjacent and disposed between the first and third electrical contacts, the curvature of the mating ends of the first and second electrical contacts face each other, and the curvature of the mating ends of the second and third electrical contacts face away from each other, such a first distance is defined along the column direction from the mating end of the first electrical contact to the mating end of the second electrical contact, and a second distance is defined along the column direction from the mating end of the second electrical contact to the mating end of the third electrical contact, and the first distance is less than the second distance.

21. The electrical connector as recited in claim 20, wherein each mounting end carries a fusible element.

22. The electrical connector as recited in claim 20, wherein the mating end of the first electrical contact is concave with respect to the second electrical contact.

23. The electrical connector as recited in claim 22, wherein the mating end of the second electrical contact is concave with respect to the first electrical contact.

24. The electrical connector as recited in claim 20, wherein each of the first, second, and third electrical contacts is configured to mate with a respective one electrical contact shaped substantially identical to the first, second, and third electrical contacts, respectively.

25. The electrical connector as recited in claim 20, wherein the array of electrical contacts defines an open pinfield.

26. The electrical connector as recited in claim 20, wherein curvature of the electrical contacts alternates in direction from contact to adjacent contact of each column,

27. The electrical connector as recited in claim 20, wherein a line extending through the mating ends of the electrical contacts of each column along the column direction passes through the curvature of each electrical contact in the respective column without passing through the connector housing.

28. The electrical connector as recited in claim 20, wherein a line that extends through the mating end of each electrical contact in one of the columns passes only through air between the curvatures of adjacent ones of the electrical contacts.

29. The electrical connector as recited in claim 20, wherein 1) the connector housing includes a housing body and a plurality of retention apertures that extend through the housing body in a transverse direction so as to define respective pluralities of first and second retention ribs spaced from each other along a dimension along a direction perpendicular to the transverse direction, 2) the electrical contacts disposed in the respective ones of the retention apertures such that the first and second broadsides are press-fit against respective ones of the first and second retention ribs, and 3) each of the first and second retention ribs has a height along the transverse direction between 0.02mm and 0.15mm.

30. The electrical connector as recited in claim 29, wherein the height of one of the first and second retention ribs is 0.04mm, and the height of the other of the first and second retention ribs is 0.08mm.

31. An electrical connector comprising:

a connector housing;

an array of electrical contacts supported by the connector housing, the array of electrical contacts including at least two rows of electrical contacts that are spaced from each other and extend along a first direction, and at least two columns of electrical contacts that are spaced from each other and extend along a second direction that is substantially perpendicular to the first direction, each of the at least two rows of electrical contacts intersecting each of the at least two columns of electrical contacts; and

each of the electrical contacts define a mating end and a mounting end, wherein the mating end of each of the electrical contacts is configured to mate with a complementary mating end of an electrical contact of a complementary electrical connector when the electrical connectors are mated, so as to define a stack height in a range between approximately 1mm and approximately 4mm.

32. The electrical connector of claim 31, wherein the stack height is approximately 3mm.

33. The electrical connector of claim 31, further comprising solder balls fused to each of the electrical contacts at the respective mounting ends.

34. The electrical connector of claim 33, wherein the stack height is defined by opposed outermost ends of the solder balls of the electrical connector and the complementary electrical connector, respectively.

35. The electrical connector of claim 33, wherein the solder balls at the mounting ends are all coplanar with each other.

36. The electrical connector of claim 35, wherein the solder balls at least partially reside in a recessed region of the connector housing.

37. The electrical connector of claim 36, wherein the stack height is in a range between approximately 1.5mm and approximately 2.5mm.

38. The electrical connector of claim 31, wherein the electrical contacts only touch the connector housing at two locations and each of the two locations defines a contact area of .001 square millimeters to .015 square millimeters.

39. The electrical connector of any one of claims claim 31 to 38, wherein the mating end of each of the electrical contacts comprises a plug, the mating end of the complementary electrical contacts each comprises a receptacle that receives one of the plugs.

40. The electrical connector as recited in any one of claims 31 to 38, wherein the mating end of each of the electrical contacts comprises a receptacle defined by a pair of spring arms, and each complementary mating end comprises a plug that is received by one of the receptacles.

41. An electrical connector comprising:

a connector housing; and

a plurality of electrical contacts supported by the connector housing;

wherein the electrical contacts only touch the connector housing at two locations and each of the two locations defines a contact area of .001 square millimeters to .015 square millimeters.

42. The electrical connector as recited in claim 41, wherein the connector housing defines an inner end and an outer end spaced from each other along a transverse direction, the electrical contacts define 1) first and second opposed broadsides spaced from each other along a longitudinal direction that is perpendicular to the transverse direction, 2) first and second opposed edges spaced from each other along a lateral direction that is perpendicular to both the transverse direction and the longitudinal direction, and the broadsides are longer than the edges in a plane defined by the longitudinal and lateral directions.

43. The electrical connector as recited in claim 42, wherein the electrical contacts each have a thickness along the longitudinal direction of 0.1mm.

44. The electrical connector as recited in any one of claims 42 to 43, wherein each of the locations defines a contact height dimension along the transverse direction of from 0.01mm to 0.15mm.

45. The electrical connector as recited in claim 44, wherein the contact height dimension of each location is 0.06mm.

46. The electrical connector as recited in claim 41, wherein the electrical contacts define two retention wings, and the two locations are defined by respective abutments between the retention wings and the connector housing.

47. The electrical connector as recited in claim 46, wherein the retention wings are each defined by a 0.6mm radius.

48. An electrical assembly comprising:

a first electrical connector including:

a first connector housing;

a first array of first electrical contacts supported by the first connector housing, the first array of first electrical contacts including at least two rows of first electrical contacts that are spaced from each other and extend along a first direction, and at least two columns of first electrical contacts that are spaced from each other and extend along a second direction that is substantially perpendicular to the first direction, each of the at least two rows of electrical contacts intersecting each of the at least two columns of first electrical contacts;

each of the first electrical contacts defines a mating end and a mounting end, wherein the mating end of each of the electrical contacts is a receptacle defined by a pair of spaced spring arms; and

a second electrical connector including:

a second connector housing;

a second array of second electrical contacts supported by the second connector housing, the second array of second electrical contacts including at least two rows of second electrical contacts that are spaced from each other and extend along a first direction, and at least two columns of second electrical contacts that are spaced from each other and extend along a second direction that is substantially perpendicular to the first direction, each of the at least two rows of second electrical contacts intersecting each of the at least two columns of second electrical contacts;

each of the second electrical contacts defines a mating end and a mounting end, wherein the mating end of each of the electrical contacts is a plug that is configured to be received between the spring arms of a complementary one of the second electrical contacts, such that the electrical assembly defines a stack height in a range between approximately 1mm and approximately 4mm.

49. The electrical assembly of claim 48, wherein the stack height is approximately 2mm.

50. The electrical assembly of claim 49, wherein each of the electrical connectors further comprises solder balls fused to each of the electrical contacts at the respective mounting ends.

51. The electrical assembly of claim 50, wherein the solder balls are reflowed onto the electrical contacts at the respective mounting ends while the contacts are supported by the connector housing.

52. The electrical assembly of claim 51, wherein the solder balls at the mounting ends of each electrical connector are all coplanar with each other.

53. The electrical assembly of claim 52, wherein the solder balls at the mounting ends of first electrical connector are coplanar with each other in a first plane, and the solder balls at the mounting ends of the second electrical connector are coplanar with each other in a second plane, and the first plane is parallel with the second plane.

54. The electrical assembly of claim 50, wherein the solder balls at least partially reside in a recessed region of the connector housing.

55. An electrical connector comprising:

a connector housing including a housing body and a plurality of retention cavities that extend through the housing body, each retention cavity defined by at least one inner wall of the housing body, each retention cavity defining cross-sectional dimension along a select direction;

an array of electrical contacts supported by the connector housing, the array of electrical contacts including at least two rows of electrical contacts that are spaced from each other and extend along a first direction, and at least two columns of electrical contacts that are spaced from each other and extend along a second direction that is substantially perpendicular to the first direction, each of the at least two rows of electrical contacts intersecting each of the at least two columns of electrical contacts; and

each of the electrical contacts define a mating end, a mounting end opposite the mating end, a respective solder ball fused to each of the electrical contacts at the respective mounting ends, and a lead portion that extends between the mating end and the mounting end,

wherein each of the electrical contacts further includes a pair of retention wings that project out from opposite sides of the lead portion to respective free distal tips that are spaced from each other a distance along the select direction that is greater than the cross-sectional

dimension such that the free distal tips are press-fit into respective ones of the retention cavity, and the lead portion is spaced from the at least one inner wall along a second direction that is perpendicular to the select direction from one of the retention wings to the other of the retention wings.

56. The electrical connector of claim 55, wherein the mating end of each of the electrical contacts is a receptacle defined by a pair of spring arms that are configured to receive a plug mating end of an electrical contact of a complementary electrical connector when the electrical connectors are mated with each other, thereby defining a stack height that is in a range between approximately 1mm and approximately 4mm.

57. The electrical connector of claim 55, wherein the mating end of each of the electrical contacts is a planar blade configured to be received by a pair of spring arms that are of an electrical contact of a complementary electrical connector when the electrical connectors are mated with each other, thereby defining a stack height that is in a range between approximately 1mm and approximately 4mm.

58. The electrical connector of claim 55, wherein each electrical contact defines a pair of edges spaced from each other along the select direction, and a pair of opposed broadsides spaced from each other along the second direction that is perpendicular with respect to the first direction, such that the broadsides are longer than the edges along an intersection of the electrical contact and a plane that is oriented substantially orthogonal to the electrical contact at the intersection.

59. The electrical connector of claim 58, wherein each of the broadsides is continuous from one of the retention wings to the other of the retention wings.

60. The electrical connector of claim 59, wherein the electrical contacts are devoid of enclosed apertures that extends through the contact body from one broadside to the other broadside.

61. The electrical connector of claim 55, wherein the mating end of each of the electrical contacts is a receptacle defined by a pair of spring arms that are configured to receive a plug mating end of an electrical contact of a complementary electrical connector, and each of the broadsides is further continuous from each of the spring arms to the respective mounting end.

62. The electrical connector of claim 61, wherein the electrical contacts are devoid of enclosed apertures that extends through the contact body from one broadside to the other broadside.

## CLAIMS

1. An electrical connector comprising:

a connector housing;

an array of electrical contacts supported by the connector housing, the array of electrical contacts including at least two rows of electrical contacts that are spaced from each other and extend along a first direction, and at least two columns of electrical contacts that are spaced from each other and extend along a second direction that is substantially perpendicular to the first direction, each of the at least two rows of electrical contacts intersecting each of the at least two columns of electrical contacts; and

each of the electrical contacts define a mating end and a mounting end, wherein the mating end of each of the electrical contacts comprises a receptacle defined by a pair of spring arms, the mating end of each of the electrical contacts is configured to mate with a complementary mating end of a plug electrical contact of a complementary electrical connector when the electrical connectors are mated, so as to define a stack height in a range between approximately 1 mm and approximately 3 mm.

2. The electrical connector of claim 1, further comprising solder balls fused to each of the electrical contacts at the respective mounting ends.

3. The electrical connector of claim 2, wherein the stack height is defined by opposed outermost ends of the solder balls of the electrical connector and the complementary electrical connector, respectively.

4. The electrical connector of claim 2, wherein the solder balls at the mounting ends are all coplanar with each other.

5. The electrical connector of claim 4, wherein the solder balls at least partially reside in a recessed region of the connector housing.

6. The electrical connector of claim 5, wherein the stack height is in a range between approximately 1.5 mm and approximately 2.5 mm.

7. The electrical connector of claim 1, wherein the electrical contacts only touch the connector housing at two locations and each of the two locations defines a contact area of 0.001 square millimeters to 0.015 square millimeters.

8. An electrical assembly comprising:

a first electrical connector including:

a first connector housing;

a first array of first electrical contacts supported by the first connector housing, the first array of first electrical contacts including at least two rows of first electrical contacts that are spaced from each other and extend along a first direction, and at least two columns of first electrical contacts that are spaced from each other and extend along a second direction that is substantially perpendicular to the first direction, each of the at least two rows of electrical contacts intersecting each of the at least two columns of first electrical contacts;

each of the first electrical contacts defines a mating end and a mounting end, wherein the mating end of each of the electrical contacts is a receptacle defined by a pair of spaced spring arms; and

a second electrical connector including:

a second connector housing;

a second array of second electrical contacts supported by the second connector housing, the second array of second electrical contacts including at least two rows of second electrical contacts that are spaced from each other and extend along a first direction, and at least two columns of second electrical contacts that are spaced from each other and extend along a second direction that is substantially perpendicular to the first direction, each of the at least two rows of second electrical contacts intersecting each of the at least two columns of second electrical contacts;

each of the second electrical contacts defines a mating end and a mounting end, wherein the mating end of each of the electrical contacts is a plug that is configured to be received between the spring arms of a complementary one of the second electrical contacts, such that the electrical assembly defines a stack height in a range between approximately 1 mm and approximately 3 mm.

9. The electrical assembly of claim 8, wherein the stack height is approximately 2 mm.

10. The electrical assembly of claim 9, wherein each of the electrical connectors further comprises solder balls fused to each of the electrical contacts at the respective mounting ends.

11. The electrical assembly of claim 10, wherein the solder balls are reflowed onto the electrical contacts at the respective mounting ends while the contacts are supported by the connector housing.

12. The electrical assembly of claim 11, wherein the solder balls at the mounting ends of each electrical connector are all coplanar with each other.

13. The electrical assembly of claim 12, wherein the solder balls at the mounting ends of first electrical connector are coplanar with each other in a first plane, and the solder balls at the mounting ends of the second electrical connector are coplanar with each other in a second plane, and the first plane is parallel with the second plane.

14. The electrical assembly of claim 10, wherein the solder balls at least partially reside in a recessed region of the connector housing.