Claims

1. An integral electrical contact pin for electrically connecting a test terminal of tester load board with an IC terminal of an IC device, the contact pin comprising:

   a resilient upper cantilever arm having a free end and an opposing connecting end;

   an upper pin tip located at the free end of the upper cantilever arm for contacting the IC terminal of the IC device;

   a lower cantilever arm having a free end and an opposing connecting end, the lower cantilever arm extending essentially in a same horizontal direction relative to the upper cantilever arm, arranged below and spaced apart from the upper cantilever arm;

   a lower pin tip extending downwardly from a bottom major surface of the lower cantilever arm for contacting a test terminal of the tester load board; and

   a back portion commonly connecting the connecting end of the upper cantilever arm to the connecting end of the lower cantilever arm;

   whereby the free end of the upper cantilever arm is movable between a default first position where the free end of the upper cantilever arm and the free end of the lower cantilever arm are spaced apart and a second position where a lower surface of the free end of the upper cantilever arm moves in a vertical direction to be in contact with an upper surface of the free end of the lower cantilever arm, and

   wherein in the second position, the free ends of the upper and lower cantilever arms form an electrical contact such that parallel conduction paths are formed between the upper pin tip and the lower pin tip through both the upper and lower cantilevers.

2. The integral electrical contact pin of claim 1 whereby the free end of the upper cantilever arm is elastically biased from the default first position to the second position in response to an external load applied onto the upper pin tip.

3. The integral electrical contact pin of claim 1 or 2 whereby the free end of the upper cantilever arm at its default first position is spaced apart from the free end of the lower cantilever arm between the distance of 0.14mm to 0.16mm.

4. The integral electrical contact pin according to any one of claims 1 to 3 whereby the upper cantilever arm, the lower cantilever arm and the back forms essentially a “C” shape.

5. The integral electrical contact pin according to any one of claims 1 to 4 adapted for test height at 2mm and below.

6. The integral electrical contact pin accordingly to any one of claims 1 to 5, whereby the upper pin tip defines a width W_T and is less than the width W_B of the main body of the contact pin.

7. The integral electrical contact pin according claim 1, further comprising a bracket arm, the bracket arm extending in the opposite horizontal direction relative to the vertical plane from the upper and lower cantilever arms, the bracket arm and back portion defining a receiving channel.

8. The integral electrical contact pin accordingly claim 7, whereby the bracket arm is a “L” shape extension from the back portion of the integral electrical contact pin.

9. A test socket assembly, comprising:

a socket housing having a lower surface generally in engagement with a surface of a tester load board, said housing further having an upper surface, generally parallel to, spaced from, and facing oppositely from said lower surface, at least one socket cavity formed in said housing extending through said socket housing between said lower surface and said upper surface, the socket cavity having at least one socket slot and the socket cavity having a roof section on the upper surface; and

at least one integral electrical contact pin according to any one of claims 1 to 6 sized to fit within the socket slot, the integral electrical contact pin further comprising a protrusion located on the free end of the upper cantilever arm

whereby when the integral electrical contact pin is mounted within the socket slot, the free end of the upper cantilever arm is in a third position, in between the first default

position and the second position due to the protrusion on the upper cantilever arm engaging with the roof section of the socket slot.

10. The test socket assembly according to claim 9 whereby the free end of the upper cantilever arm at its third position is spaced apart from the lower cantilever arm between the distance of 0.115mm to 0.135mm.

11. The test socket assembly according to claims 9 or 10, the socket cavity further comprises a retaining wall of defined width L_{RW} planar to and horizontally displaced from a side wall of the socket cavity transverse to the socket slot, the retaining wall extending from the upper surface of the socket housing into the socket cavity and terminating a distance before the lower surface of the socket housing and the channel defined by the bracket arm of the integral electrical contact pin is adapted to receive the retaining wall of the socket cavity when the integral electrical contact pin is mounted within the socket slot.

12. The test socket assembly according to claim 11, whereby the width L_{RW} of the retaining wall is greater than width of the channel defined by the bracket arm and the back portion of the integral electrical contact pin such that the retaining wall is gripped by the integral electrical contact pin when said contact pin is mounted in the socket housing.

13. The test socket assembly according to claim 12, whereby the difference between the width of the retaining wall L_{RW} and the width of the channel defined by the bracket arm and the back portion of the integral electrical contact pin is between 0.01mm to 0.02mm.

14. The test socket assembly according to claim 13, whereby during test condition, resilient upper cantilever arm is biased to the second position and the back portion of the integral electrical contact pin disengages from the retaining wall.

15. The test socket assembly according any one of claims 11 to 14, whereby the upper pin tip of the integral electrical contact pin has a wiping length of less than 0.10mm.

16. The test socket assembly according any one of claims 11 to 15, whereby the upper pin tip of the integral electrical contact pin has a wiping length between 0.06mm to 0.07 mm.