



## How to test

### Low Loop Wire-Bond-Connections with Tweezers

#### Problem

In order to achieve further miniaturisation of electrical devices, manufacturer try to reduce loop high or integrate IC's into the PCB. Doing this, common bond test methods have to be adapted. Having ultra low loops standard test with pull hocks may fail because the tool doesn't fit under the loop. Further on proper force measurement on flat loops is almost impossible due to unfavourable wire angles.

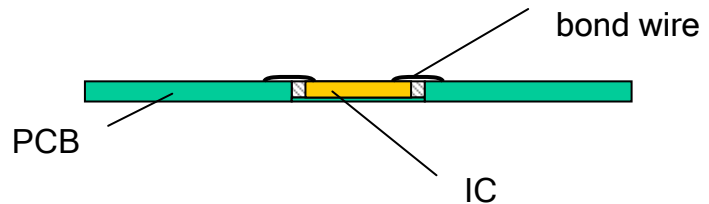


Fig. 1: ultra low loops on embedded IC

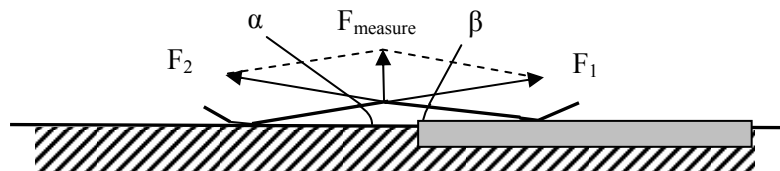


Fig. 2: geometry on ultra low loops

Figure 2 demonstrates the problems trying to perform a standard pull test.

1. Since loops are flat, there is no space for the tool.
2. The loop angles  $\alpha$  and  $\beta$  are difficult to measure.
3. Since  $F_{measure} = F_1 \cdot \sin(\alpha) + F_2 \cdot \sin(\beta)$  measuring errors on  $\alpha$  and  $\beta$  will cause big systematic errors.

#### Alternative test method

One alternative test method may be to cut off the loop and to test each side of the loop individual. Doing this the bond wire has to be caught by special designed test tweezers. Test direction can be changed to horizontal and the problems described above will be solved.

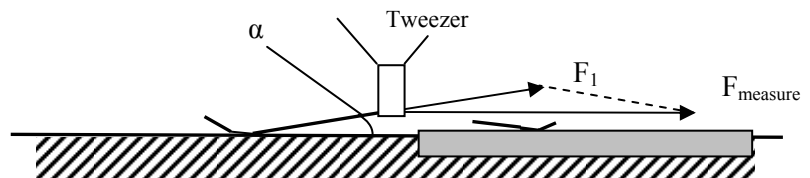


Fig. 3: testing ultra low loops with test tweezers

Relating to Fig. 3 the resulting load at the wire has to be calculated as:

$$F_1 = 2 \cdot F_{measure} \cdot \cos(\alpha)$$

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