

Fixtures for quality assurance of STS silicon sensors and STS-XYTER ASIC *

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To assure the functionality of the silicon microstrip sensors and the quality of bond contacts of the microcables on the STS-XYTER-chip, fixtures are needed, that preferably allow on one hand for non-destructive handling and measurements as well as easy and fast procedures on the other. Several companies were asked for proposals and aps Solutions GmbH had the most promising one: test sockets with Pogo Pins for contacting. *Pogo Pin* is a registered trademark of a US company (*WinWay Technologies*); they are also called spring loaded contacts. Formed like a cylinder, it contains two peaked, spring-loaded pins that make secure contacts with two electronic circuits. For the Pogo Pins different combinations on tip shapes, structures, materials and plating are available so that the particular application may be optimized.

Test socket for the silicon sensors

The challenge for the different quality measurements of the double-sided sensors is the need for simultaneous biasing contacts from bottom and top side. This problem can be solved with a fixture that consists of a bottom and a top socket. Both sockets include a Pogo Pin to which the bias voltage is applied via a small pcb. The bias pads on the sensor have a comfortable size of $400\ \mu\text{m} \times 150\ \mu\text{m}$ to facilitate contacting. With the help of a wafer prober equipped with a movable chuck, the strips may then be stepped through for investigation by means of a probe card. The schematical layout of the fixture and its installation on a wafer prober are shown in Figs. 1 and 2.

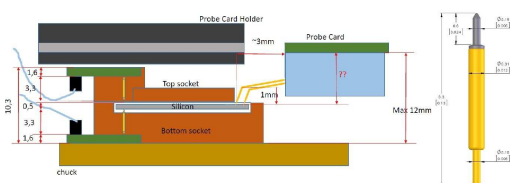


Figure 1: Draft design of the sensor test socket.

Test socket for the STS-XYTER-chip

Each trace line of the microcables that connect the silicon microstrip sensor to the STS-XYTER-readout-chips has to be TAB-bonded onto the pads of the sensors on one side and on the chip on the other. These contacts should be checked before applying the protective glob-top because TAB-bonds without contact may be rebonded. The quality

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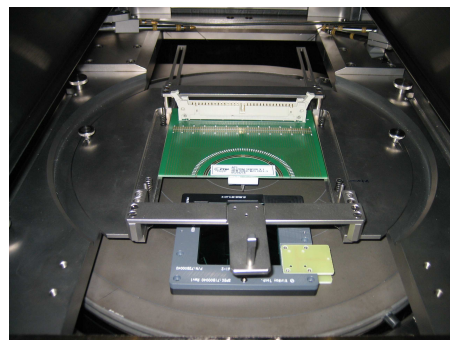


Figure 2: Test socket and probe card on wafer prober.

check can be put into practice by taking the chip into operation, a minimal set of essential connectivity has been elaborated with the chip designers towards this end. A probe card, that is typically chosen as a good solution for operating a chip without wirebonding, cannot be used for this test because it only works in combination with a wafer prober that assures alignment and positioning. The STS-module (STS-XYTER + microcable + sensor) would need to be placed on the chuck of the prober, inhibitive because of the module size and the fragility of the module. Therefore working with a test socket with Pogo Pins is an appropriate solution. The chip by itself is placed into the socket that will have an opening for the microcable. Several requirements regarding the test pad size, pitch and general arrangement and balance of connections across the chip have to be taken into account. Proposals for the pad layout of the STS-XYTER are under development with consultation of *aps Solutions GmbH*. Continuative tasks for the execution of tests are the development of a modified STS-XYTER board and suitable software.

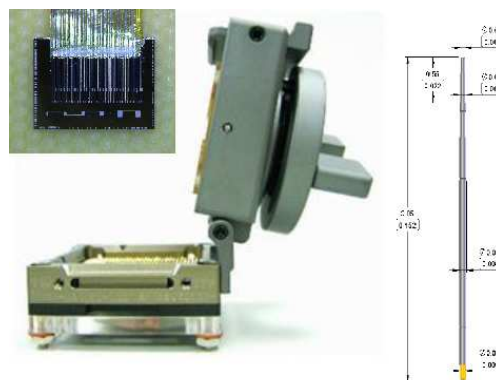


Figure 3: Test socket for ASICs.