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ELECTRICAL THROUGH WAFER INTERCONNECT (ETWI)

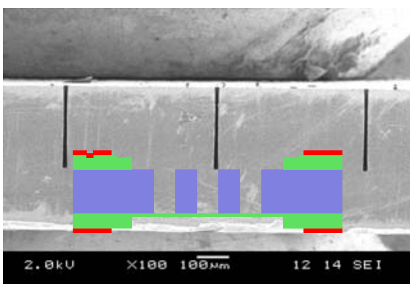
INTRODUCTION

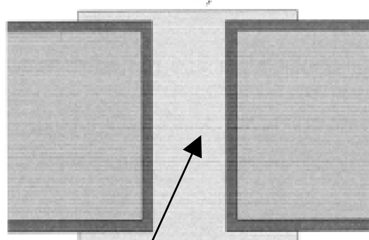
For certain applications shifting the electrical contacts to the back-side of the wafer is very beneficial. Such connection of devices between both sides of a substrate is a critical component for micro electromechanical systems (MEMS) and integrated circuits (IC).

Now LioniX has developed a CMOS compatible technology solution. Previously demonstrated ETWI are very difficult to integrate with standard semiconductor fabrication processes, not compatible with released sensors, do not permit extensive processing on both sides of the wafer, and are in general very application specific.

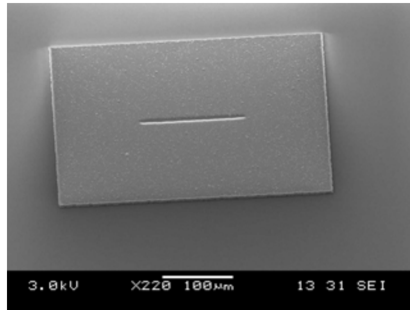
ETWI TECHNOLOGY

Typical cross sections of the ETWI are shown in the pictures below.





Poly-Si



The above picture shows a top view of a poly-Si bondpad of a closed ETWI. The ETWI technology for silicon substrates can be broadly integrated with MEMS and IC processes. This interconnect is a passively insulated electrical, through-wafer, poly-Silicon filled trench, with a 12 micron width, 4-10 Ohm resistance, and about 1,0 pF capacitance. Plasma etching from both sides of the wafer is used to achieve a high-aspect ratio via (25:1 through 300 micron wafer). The process is compatible with standard lithography, standard wafer handling, subsequent high-temperature processing, and was demonstrated to be compatible with the freestanding membrane sensing technology. These ETWI are appropriate for integration with devices with impedances much greater than the ETWI, such as piezo-resistive and capacitive sensor arrays.

REFERENCE

Eugene M. Chow, e.a., JOURNAL OF MICROELECTROMECHANICAL SYSTEMS, VOL. 11, NO. 6, DECEMBER 2002

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LIONIX MISSION STATEMENT

LioniX is a leading provider in development and small to high volume production of leveraging and innovative products based on microsystem technology and MEMS. Our core technologies are integrated

FOR WHOM WE WORK

Our customers operate in telecom, industrial process control, life sciences and space markets and include OEM's, multinationals, VC start-up companies as well as research institutions from around the world.

OUR BUSINESS FORMULA

LioniX offers design for manufacturing and horizontal integration by partnering with MEMS/MST foundries and suppliers of complementary technologies. Cooperations are based on subcontracting, licensing of IP or joint ventures.

TECHNOLOGY

IPR

LioniX has an IPR agreement on technology with the world-renowned MESA+ institute and is rapidly building up a firm IPR position in its core competences integrated optics and microfluidics.

Facilities

LioniX uses state-of-the-art facilities of MESA+ Institute, as well as privat facilities for our core technologies.

Our processes are performed on 100 mm silicon, borosilicate, quartz and other substrates.

- CVD deposition
- PECVD silicon-oxynitrides
- LPCVD Silicon-rich-nitride
- LPCVD Silicon-nitride
- LPCVD polysilicon