Process for fabricating superconducting circuitry on both sides of an ultra-thin silicon (Si) layer.

Fabrication procedure which enables fabrication of superconducting circuitry on both sides of an ultra-thin silicon wafer.

A new fabrication methodology that addresses the need for a thin, and double-sided circuitry board capable of low crosstalk between sensors and low loss in transmission lines.

BENEFITS

- Superconducting circuitry on both sides of an ultrathin silicon wafer
- Ultra-low loss transmission lines and ultra-low crosstalk
THE TECHNOLOGY

This fabrication method allows for a minimalistic silicon wafer to be used as a circuit board while reducing space and increasing efficiency by depositing superconducting material on both sides. Due to the thin nature of the silicon wafer, an additional backing handle wafer is required during the fabrication of this circuitry to allow for deposition of metal thin film on a hot substrate on one side of the wafer. In addition, a metallic and polymeric sacrificial layer is used to protect the silicon substrate and superconducting metallic layers during removal of the unwanted silicon, buried oxide, and epoxy layers. This process introduces the fabrication methodology required to realize the ultra-low loss transmission lines and ultra-low crosstalk between superconducting sensors.

APPLICATIONS

The technology has several potential applications:
- Computer hardware
- Sensors and THz receivers

PUBLICATIONS

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