

PRODUCT NOTE

UNIFORM HIGH PURITY SILICON (UHPS) FOR SILICON DRIFT DETECTORS

- Ultra-homogeneous HPS substrate for x-ray, particle and optical detectors

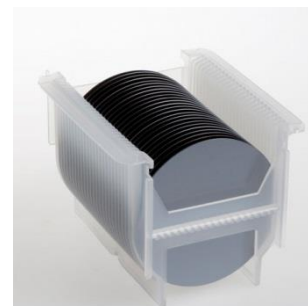
Silicon drift detectors have found their use in many high-end areas of modern life. They track, detect and identify particles e.g. in space science, crystallography and in the medical industry where high precision measurement is required. They thus aid us obtain a better fundamental understanding of the universe and contribute to improved healthcare.

Silicon drift detectors measure the energy of an incoming photon by the amount of ionization it produces in the detector material. Detectors in use are fully depleted and therefore very low leakage currents can only be achieved by using very high purity silicon. Preferred silicon is fully depleted high resistivity float zone silicon, characterised by its high purity and the absence of dislocations, defects, and impurities.

As the overall technological development is progressing and maturing, the use of silicon drift detectors is becoming more widespread. This in turn makes designers push the limits of material performance in a steady quest for more optimised detectors that will allow for higher energy resolution and shorter shaping times.

To address this need for improved product properties, Topsil has designed a unique uniform high purity silicon substrate (UHPS) with tight resistivity tolerance performing up to unprecedented level. The substrate targets high resolution x-ray, particle and optical detectors.

The substrate is developed on the grounds of years of experience in high performance float zone substrates and state-of-the-art wafer polishing equipment. The silicon has very homogeneous distribution and is available as 100 and 150 mm wafers.



The substrate suitable for detectors is characterised by:

- Crystal perfectness
- Optimised resistivity variation
- Precise doping uniformity
- Precise resistivity control

Typical parameters are listed below. Other parameters are available upon request:

Growth method	High Purity Float Zone Silicon
Product range	4,000-10,000 Ωcm
Resistivity tolerance	<20%
Minority carrier lifetime	>1000 μs
Diameter	100 and 150 mm
Type and Dopant	N (Phosphorous)
Wafer thickness	300-1300 μm
Wafer surface finish	Single side polished/double side polished

Topsil applies four point probe measurement. Wafers are packaged according to semi grade.

CONTACT

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Topsil Semiconductor Materials A/S

Topsil is a world leading supplier of ultrapure silicon to the global semiconductor industry. Engaging in long term relations with customers, Topsil focuses on premium quality, an efficient production process and a safe delivery of products.

Silicon is used in electronic components to aid conversion and control of electrical power. Topsil provides ultrapure silicon mainly for the most demanding purposes, based on extensive knowledge and significant investments in new technology, facilities and equipment.

Headquartered in Copenhagen Cleantech Park, Topsil spans production sites in Denmark and Poland and sales locations in Europe, Asia and the US. Topsil is publicly listed at the Nasdaq OMX Copenhagen stock exchange and was founded in 1959.

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