

Mini Boule Tester: Bulk Lifetime Measurement System



The Mini Boule Tester allows for quick characterization of the true bulk lifetime of miniature silicon boules using the transient PCD measurement method.

Simple and accurate contactless measurement of true bulk lifetimes on miniature silicon boules.

Product Overview

The Sinton Instruments Mini Boule Tester offers a calibrated bulk-lifetime measurement on miniature silicon boules. The standard tool is designed to test the miniature boules that are generally pulled from polysilicon in order to evaluate the minority-carrier lifetime of the high purity silicon.

The tool uses the transient PCD decay lifetime measurement method along with silicon mobility models to calculate bulk lifetime in a quick measurement that can be performed by most operators. Each measurement provides a full minority-carrier lifetime curve, for a range of carrier densities, not just a single point with an ambiguous carrier density.

The tool is designed to measure minority-carrier lifetimes from 100 μ s to 20 ms with the elimination of minority-carrier trapping effects, and can be customized to fit many boule sizes.

System Capabilities

Primary application

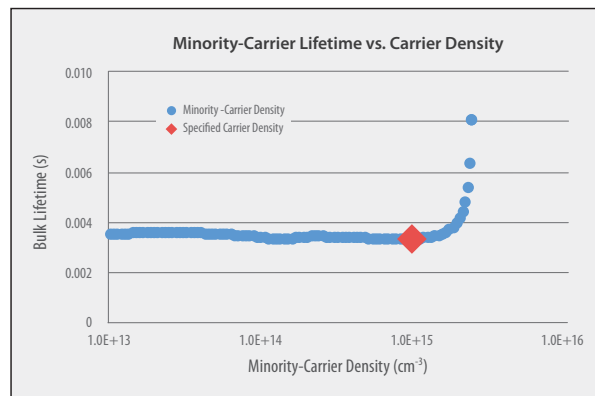
- Qualifying high-purity silicon mini boules with lifetimes in the 1–10 ms range

System features

- Standard and custom measurement sensors for various mini boule diameters
 - 14 mm and 18 mm standard
 - Custom sizes available
- Externally operated bias light for elimination of trapping effects

Parameters reported

- Bulk lifetime at a specified carrier density
- Lifetime vs. carrier density characteristic curve



Example 1. A transient measurement of a silicon miniature boule with a 3-ms bulk lifetime

Mini Boule Tester Specifications

Instrument Specifications

Available measurement

- Bulk lifetime

Lifetime measurement range

- 100 μ s to greater than 10 ms

Measurement (analysis modes)

- Transient PCD

Typical calibrated injection range

- 10^{13} – 10^{16} cm^{-3}

Sensor size

(miniature boule diameters accepted)

- 14 mm
- 18 mm
- Custom sizes available

Warranty

- One-year limited warranty on all parts and software

Facility Requirements

Ambient operating temperature

- 20°C–25°C

Power requirements

- Instrument: 40 W
- Computer with monitor: 200 W
- Light source: 60 W

Dimensions

- 22.5 cm x 28 cm x 57 cm (L x W x H)

Universal mains voltage

- 100–240 VAC 50/60 Hz

Special facilities requirements

- None

Mini Boule Tester System Components

- Mini Boule Tester, signal processing unit, signal cables, external bias light
- Programmable flashlamp with bandpass filter
- Windows PC with installed, configured software and monitor
- Sinton Instruments data acquisition and analysis software package
- High-resolution, high-speed data acquisition with simultaneous sampling and common-mode rejection

Purchasing Information

For a quote, please contact quotes@sintoninstruments.com

We are happy to accommodate custom requirements. Please inquire about a quote for your specific needs.

Quotes are valid for 60 days.

For our full product line, visit our website at: www.sintoninstruments.com

