Sinton instruments

PRODUCT NOTE

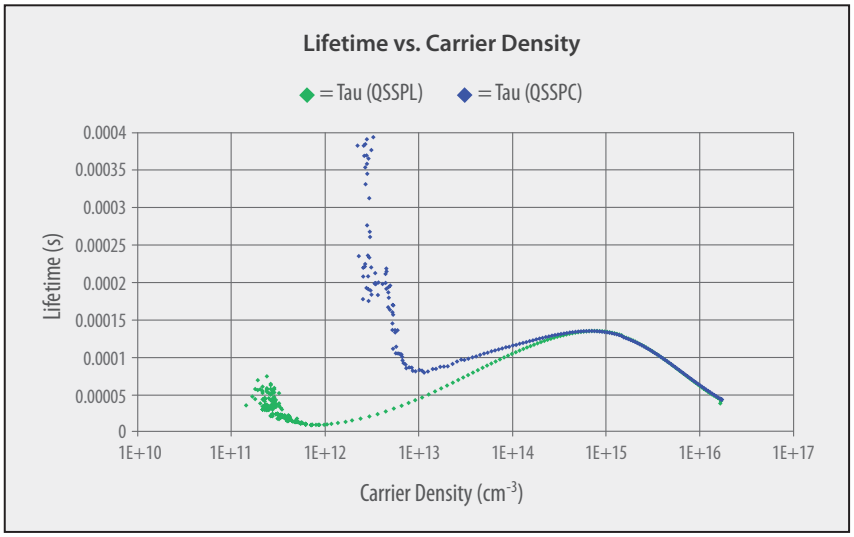
# WCT-120PL: Wafer Lifetime Measurement with Photoluminescence Detector


*The WCT-120PL is an affordable, tabletop silicon lifetime and wafer metrology system with added PL capabilities.*

**Measure the calibrated carrier-recombination lifetime of a silicon wafer using both the standard method and the photoluminescence method.**

## Product Overview

The WCT-120PL wafer lifetime measurement tool showcases the same unique measurement and analysis techniques as the WCT-120 with the added capability of a photoluminescence (PL) detector to measure the PL lifetime and doping of the sample under test. Both the Quasi-Steady-State -Photoconductance (QSSPC) lifetime measurement method and the Transient Photo-conductance Decay (PCD) lifetime measurement method are complemented with a calibrated PL lifetime measurement. The tool can also easily be used as a standard WCT-120.




*Sinton Instruments' WCT-120PL showcases a calibrated PL lifetime curve alongside a calibrated QSSPC lifetime curve yielding lifetime data over a wide range of carrier densities.*

## WCT -120PL System Capabilities

Primary application: Step-by-step monitoring and optimization of a fabrication process using the QSSPC or Transient lifetime measurement alongside a PL measurement

Other applications:

- Monitoring initial material quality
- Detecting heavy metal contamination during wafer processing
- Evaluating surface passivation and emitter dopant diffusion
- Evaluating process-induced shunting using the implied-Voc measurement
- Iteratively calculate substrate doping from QSSPL and QSSPC data

## Key Features

- Single-click identification of key characteristics of silicon wafers, including sheet resistance, lifetime, trap density, emitter saturation current density, and implied voltage
- Calibrated carrier-lifetime versus injection level results and calibrated PL lifetime versus injection level results

## WCT-120PL Specifications

### Instrument Specifications

**Available measurements**
- Lifetime
- Resistivity
- Emitter saturation current density
- Trap density
- Implied Voc
- PL lifetime
- PL doping

**Lifetime measurement range**
- 100 ns to greater than 10 ms

**Measurement (analysis) modes**
- QSSPC, transient, and generalized lifetime analysis

**Resistivity measurement range**
- 3–600 (undoped) Ohms/sq

**Available light bias range**
- 0–50 suns

**Typical calibrated injection range**
- $10^{11}$–$10^{17}$ $cm^{-3}$

**Available spectrum**
- White-light and IR illumination
- PL optimized spectrum

**Sensor area**
- 40-mm diameter

**Sample size, standard configuration**
- Standard diameter: 40–210 mm

**Wafer thickness range**
- 10–2000 µm (calibrated)
- Other thicknesses may be measured

**Warranty**
- One-year limited warranty on all parts and software

**Standards**
- Complies with SEMI Standard PV-13

CE

### Facility Requirements

**Ambient operating temperature**
- 20°C–25°C

**Power requirements**
- WCT-120: 40 W
- Computer with monitor: 200 W
- Light source: 60 W

**Dimensions**
- 22.5 cm W x 28 cm D x 57 cm H

**Universal mains voltage**
- 100–240 VAC 50/60 Hz

**Special facilities requirements**

None

## WCT-120PL System Components

- WCT-120PL instrument, signal processing unit, signal cables
- 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
- PL signal amplifier
- Dark box to prevent the effects of room light on the PL measurement

## Purchasing Information

For a quote, please contact:
quotes@sintoninstruments.com

Quotes are valid for 60 days. Please allow 10 weeks for delivery from date of purchase order.

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

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