

sCT9001

SiPh Wafer Test System

Version 1.3



Product Description

Semright Instruments sCT9001 fully automatic silicon photonics wafer test system is provided with high test accuracy, good test stability and flexible expandability, which is suitable for laboratory verification and mass production testing.

Key Features

The silicon photonics test system provided by Semright Instruments can meet the chip photoelectric performance test and measurement of the customer's wafer-level chip, and its detailed functions are as follows:

- It supports fully automatic and semi-automatic loading and unloading of wafers;
- It supports 8-inch and 6-inch wafers;
- It supports test temperature range from room temperature to 150°C (other temperatures can be customized);
- It supports optical-optical test, photoelectric test and electrical-electrical parameter test;
- It supports DC and AC tests;
- It supports grating vertical coupling;
- It supports rapid replacement of different types of pin cards for different types of chips;
- The software supports the increase in the customer database and MES functions;

Technical Specification

High accuracy probe station:

- Wafer loading mode supports fully automatic mode and semi-automatic mode operation, which is suitable for laboratory verification and mass production;
- The fully closed-loop high-accuracy motion control system is provided with automatic accuracy

compensation function and its positioning accuracy is up to 3μm;

- The special mechanism design and calibration system can make the wafer on chuck have better planarity and better perpendicularity in Z direction of probe;
- A high-definition zooming CCD configured on the system can make the power on PAD clearly visible and display low-magnification and high-magnification multi-view screens at the same time;
- The built-in integrated shock-proof design is adopted which can isolate the external vibration and ensure a good test stability;

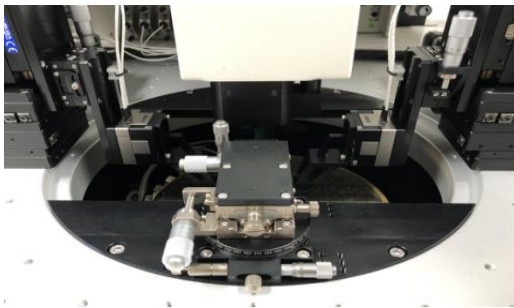
| Type | Specification | Indicators |
|----------------|-------------------------------|-------------|
| Chuck X&Y Axis | Stroke | 240mm*250mm |
| | Resolution | 0.2 μm |
| | Positioning accuracy | ≤±3 μm |
| | Repeated positioning accuracy | ≤1 μm |
| | Perpendicularity | ≤4 μm |
| | Maximum speed | >70 mm/s |
| Chuck Z Axis | Stroke | 15 mm |
| | Resolution | ≤1 μm |
| | Repeated positioning accuracy | ≤3 μm |
| | Flatness | ≤10 μm |
| Chuck θ Axis | Stroke | ±7.5° |
| | Resolution | 0.0015° |
| | Repeated positioning accuracy | ≤0.0075° |

Coupling test module:

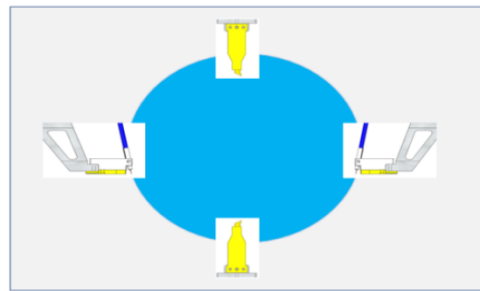
- The coupling test module includes coupling optical probe, DC probe and RF probe;
- The optical probe supports single-channel coupling and dual-channel coupling;
- The optical probe is provided with a high-precision altimeter to ensure the consistency of the height from the incident fiber end face to the chip surface between different chips;
- The optical fiber coupling module is composed of a three-dimensional lead screw motor matched with a three-dimensional high-precision piezoelectric ceramic module to ensure the

optical coupling efficiency and the optical coupling repeatability;

- The standard high-precision coupling controller configured on the system which can help the system realize the functions of fully closed-loop control and hardware synchronization improve the coupling accuracy and coupling speed;
- The design of the probe card holder is more convenient for the replacement of the probe card, which is convenient to quickly replace the probe card for different products or different test items;



Coupling test module



Optical probe and electrical probe layout

Specification

| Type | Specification | Indicators |
|-----------------------------------|-------------------------------|------------|
| Coarse positioning of X&Y&Z axis | Stroke | 20 mm |
| | Resolution | 0.1 μm |
| | Repeated positioning accuracy | ±0.3 μm |
| | Maximum speed | 20 mm/s |
| Precise positioning of X&Y&Z axes | Stroke | 100 μm |
| | Resolution | 4 nm |
| | Repeated positioning accuracy | 30 nm |
| | Maximum speed | 10 Hz |

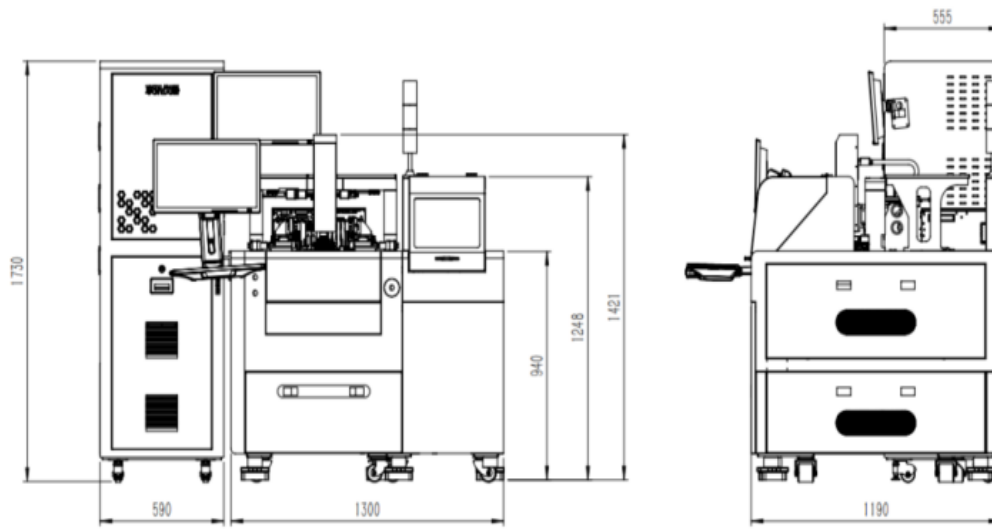
Test parameters

| Parameters Type | Test parameters | Parameters Indicators | Definitions |
|-----------------|----------------------|-----------------------|---|
| O/O | Waveguide Loss | dB/cm | Waveguide transmission loss |
| | Coupling Strength | % | Coupling efficiency, the ratio of the optical power received by the DUT to the incident optical power |
| O/E | PD Responsivity | A/W | PD responsivity, the efficiency of PD detector converting the received light into current |
| | Modulator ER | dB | Static extinction ratio, the ratio of the maximum value to the minimum value of the optical power absorbed by the modulator under different bias voltages |
| E/E | PD Dark Current | nA | PD dark current, the feedback current measured by increasing the bias voltage to the PD under no-light conditions |
| | Heat Resistance | Ω | Thermal impedance |
| | Modulator Resistance | Ω | Modulator resistance |

System Specification

| No. | Specification | Indicators |
|-----|------------------------------------|---|
| 1 | Supporting wafer size | 4 inches to 8 inches |
| 2 | Temperature range | RT~150 °C |
| 3 | Temperature uniformity | <±0.5 °C |
| 4 | 25°C~150°C | <15 mins |
| 5 | 150°C~25°C | <20 mins |
| 6 | Loading and unloading method | Automatic and manual |
| 7 | Test type | DC test, which can be upgraded to support AC |
| 8 | Test item | O/O,O/E,E/E |
| 9 | Wafer Map Function | It can be edited, can automatically generate Map and display each Die coordinate |
| 10 | Sub-Bin function | It supports sub-Bin function, can distinguish test results by multiple colors and display the number and proportion of different colors |
| 11 | Automatic needle clearing function | Support |
| 12 | CCD auto-focus function | Support |
| 13 | Camera monitoring screen | Support low-magnification and high-magnification multi-view screens |
| 14 | EMI shielding | >20 dB@1 KHz-1 MHz |
| 15 | Spectral noise basement | ≤150 dBVrms/rtHz(≤1 MHz) |
| 16 | System AC noise | ≤15 mVp-p(≤1 GHz) |

Equipment size



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*This information is subject to change without notice.