CLAIMS

[Claim 1]

A semiconductor device inspection system comprising:

a light generating unit for generating light to be irradiated a semiconductor device serving as a device under test;

a light detection unit for detecting the light reflected by the semiconductor device and outputting a detection signal when the light generated from the light generating unit is irradiated to the semiconductor device;

an operating signal application unit for applying the operating signal that operates the semiconductor device to the semiconductor device;

a first electricity measurement unit to which the detection signal is input;

a second electricity measurement unit to which the detection signal and the operating signal are selectively input; and

a switching unit having a first signal terminal electrically coupled to the light detection unit, a second signal terminal electrically coupled to the operating signal application unit, and a connection section having one end electrically coupled to the second electricity measurement unit,

wherein the switching unit inputs the detection signal to the second electricity measurement unit by connecting the other end of the connection section to the first signal terminal, and inputs the operating signal to the second electricity measurement unit by connecting the other end of the connection section to the second signal terminal.

[Claim 2]

The semiconductor device inspection system according to claim 1, further comprising a signal attenuation unit installed between the first electricity measurement unit and the first signal terminal and for attenuating an electrical signal flowing in a direction from the first signal terminal toward the first electricity measurement unit.

[Claim 3]

The semiconductor device inspection system according to claim 2, wherein the signal attenuation unit comprises an amplifier for amplifying an electrical signal from the light detection unit toward the first signal terminal, and attenuating an electrical signal from the first signal terminal toward the first electricity measurement unit.

[Claim 4]

The semiconductor device inspection system according to claim 2, wherein the signal attenuation unit comprises an amplifier for amplifying an electrical signal from the light detection unit toward the first signal terminal, and an attenuator for attenuating an electrical signal from the light detection unit toward the first signal terminal and an electrical signal from the first signal terminal toward the first electricity measurement unit.

[Claim 5]

The semiconductor device inspection system according to claim 2, wherein the signal attenuation unit comprises an electrical resistor electrically coupled to the ground,

the switching unit comprises an attenuation switching unit electrically coupled to the electrical resistor, and

the switching unit electrically couples the attenuation switching unit to the first signal terminal when the other end of the connection section is connected to the second signal terminal.

[Claim 6]

The semiconductor device inspection system according to claim 2, wherein the signal attenuation unit comprises an electrical resistor electrically coupled to the ground,

the switching unit further has a third signal terminal electrically coupled to the electrical resistor, a fourth signal terminal electrically coupled to the light detection unit, and an intermediate connection section having one end electrically coupled to the first signal terminal, and

the switching unit connects the intermediate connection section to the fourth signal terminal when the other end of the connection section is connected to the first signal terminal, and connects the intermediate connection section to the third signal terminal when the other end of the connection section is connected to the second signal terminal.

[Claim 7]

The semiconductor device inspection system according to any one of claims 1 to 6, wherein the first electricity measurement unit and the second electricity measurement unit comprise a first spectrum analysis unit and a second spectrum analysis unit for measuring amplitudes of components of a complex wave.

[Claim 8]

The semiconductor device inspection system according to claim

7, further comprising a signal synchronization unit for synchronizing a frequency and a phase of a base signal that operates the first spectrum analysis unit with a frequency and a phase of a base signal that operates the second spectrum analysis unit when the switching unit connects the other end to the second signal terminal.

[Claim 9]

The semiconductor device inspection system according to any one of claims 1 to 6, wherein the first electricity measurement unit comprises a spectrum analysis unit for measuring amplitudes of components of a complex wave, and the second electricity measurement unit comprises a lock-in amplification unit.

[Claim 10]

A semiconductor device inspection method comprising:

a light generation step of generating light irradiated to a semiconductor device serving as a device under test;

a light detection step of detecting the light reflected by the semiconductor device and outputting the detection signal when the light generated in the light generation step is irradiated to the semiconductor device;

an operating signal application step of applying an operating signal that operates the semiconductor device to the semiconductor device;

a first measurement step of inputting the detection signal to a first electricity measurement unit; and

a second measurement step of selectively inputting the detection signal and the operating signal to a second electricity measurement unit.

[Claim 11]

The semiconductor device inspection method according to claim 10, wherein, in the second measurement step, the operating signal is input to the second electricity measurement unit after the detection signal is input to the second electricity measurement unit.

[Claim 12]

The semiconductor device inspection method according to claim 10, wherein, in the second measurement step, the detection signal is input to the second electricity measurement unit after the operating signal is input to the second electricity measurement unit.

CLAIMS

[Claim 1]

A semiconductor device inspection system comprising:

a light generating unit for generating light to be irradiated a semiconductor device serving as a device under test;

a light detection unit for detecting the light reflected by the semiconductor device and outputting a detection signal when the light generated from the light generating unit is irradiated to the semiconductor device;

an operating signal application unit for applying the operating signal that operates the semiconductor device to the semiconductor device;

a first electricity measurement unit to which the detection signal is input;

a second electricity measurement unit to which the detection signal and a reference signal are selectively input; and

a switching unit having a first signal terminal electrically coupled to the light detection unit, a second signal terminal electrically coupled to the operating signal application unit, and a connection section having one end electrically coupled to the second electricity measurement unit,

wherein the switching unit inputs the detection signal to the second electricity measurement unit by connecting the other end of the connection section to the first signal terminal, and inputs the reference signal to the second electricity measurement unit by connecting the other end of the connection section to the second signal terminal.

[Claim 2]

The semiconductor device inspection system according to claim 1, further comprising a signal attenuation unit installed between the first electricity measurement unit and the first signal terminal and for attenuating an electrical signal flowing in a direction from the first signal terminal toward the first electricity measurement unit.

[Claim 3]

The semiconductor device inspection system according to claim 2, wherein the signal attenuation unit comprises an amplifier for amplifying an electrical signal from the light detection unit toward the first signal terminal, and attenuating an electrical signal from the first signal terminal toward the first electricity measurement unit.

[Claim 4]

The semiconductor device inspection system according to claim 2, wherein the signal attenuation unit comprises an amplifier for amplifying an electrical signal from the light detection unit toward the first signal terminal, and an attenuator for attenuating an electrical signal from the light detection unit toward the first signal terminal and an electrical signal from the first signal terminal toward the first electricity measurement unit.

[Claim 5]

The semiconductor device inspection system according to claim 2, wherein the signal attenuation unit comprises an electrical resistor electrically

coupled to the ground,

the switching unit comprises an attenuation switching unit electrically coupled to the electrical resistor, and

the switching unit electrically couples the attenuation switching unit to the first signal terminal when the other end of the connection section is connected to the second signal terminal.

[Claim 6]

The semiconductor device inspection system according to claim 2, wherein the signal attenuation unit comprises an electrical resistor electrically coupled to the ground,

the switching unit further has a third signal terminal electrically coupled to the electrical resistor, a fourth signal terminal electrically coupled to the light detection unit, and an intermediate connection section having one end electrically coupled to the first signal terminal, and

the switching unit connects the intermediate connection section to the fourth signal terminal when the other end of the connection section is connected to the first signal terminal, and connects the intermediate connection section to the third signal terminal when the other end of the connection section is connected to the second signal terminal.

[Claim 7]

The semiconductor device inspection system according to any one of claims 1 to 6, wherein the first electricity measurement unit and the second

electricity measurement unit comprise a first spectrum analysis unit and a second spectrum analysis unit for measuring amplitudes of components of a complex wave.

[Claim 8]

The semiconductor device inspection system according to claim 7, further comprising a signal synchronization unit for synchronizing a frequency and a phase of a base signal that operates the first spectrum analysis unit with a frequency and a phase of a base signal that operates the second spectrum analysis unit when the switching unit connects the other end to the second signal terminal.

[Claim 9]

The semiconductor device inspection system according to any one of claims 1 to 6, wherein the first electricity measurement unit comprises a spectrum analysis unit for measuring amplitudes of components of a complex wave, and the second electricity measurement unit comprises a lock-in amplification unit.

[Claim 10]

A semiconductor device inspection method comprising:

a light generation step of generating light irradiated to a semiconductor device serving as a device under test;

a light detection step of detecting the light reflected by the semiconductor device and outputting the detection signal when the light generated in the light

generation step is irradiated to the semiconductor device;

an operating signal application step of applying an operating signal that operates the semiconductor device to the semiconductor device;

a first measurement step of inputting the detection signal to a first electricity measurement unit; and

a second measurement step of selectively inputting the detection signal and the reference signal to a second electricity measurement unit.

[Claim 11]

The semiconductor device inspection method according to claim 10, wherein, in the second measurement step, the reference signal is input to the second electricity measurement unit after the detection signal is input to the second electricity measurement unit.

[Claim 12]

The semiconductor device inspection method according to claim 10, wherein, in the second measurement step, the detection signal is input to the second electricity measurement unit after the reference signal is input to the second electricity measurement unit.