CLAIMS

[Claim 1]

An apparatus for inspecting a semiconductor device which is an object to be inspected based on a result signal which is output in accordance with input of a test pattern signal to the semiconductor device, the apparatus comprising:

an ultrasonic transducer, disposed to face the semiconductor device, which generates ultrasonic waves;

a stage configured to move a relative position of the semiconductor device and the ultrasonic transducer;

a stimulation condition controller configured to control a condition of stimulation by the ultrasonic waves applied to the semiconductor device; and

an analyzer configured to generate a measurement image based on the result signal indicating pass/fail information generated in accordance with a test signal which is output from the semiconductor device in which the test pattern signal is input.

[Claim 2]

The apparatus according to claim 1,

wherein the stimulation condition controller includes a signal generator configured to output a driving signal for driving the ultrasonic transducer to the ultrasonic transducer.

[Claim 3]

The apparatus according to claim 2,

wherein the signal generator controls at least one of a frequency, the number of pulses, a pulse interval, and a pulse intensity of the ultrasonic waves by controlling the driving signal.

[Claim 4]

The apparatus according to any one of claims 1 to 3,

wherein the stimulation condition controller includes a stage controller configured to control movement of the stage.

[Claim 5]

The apparatus according to claim 4,

wherein the stage controller controls at least one of a movement speed, a movement interval, and a movement distance of the stage.

[Claim 6]

The apparatus according to any one of claims 1 to 5, further comprising a reflected wave detector configured to detect reflected waves of the ultrasonic waves reflected from the semiconductor device,

wherein the analyzer generates a reflection image based on a detection signal from the reflected wave detector.

[Claim 7]

The apparatus according to claim 6,

wherein the analyzer generates a superimposed image having the measurement image and the reflection image superimposed on each

other.

[Claim 8]

The apparatus according to any one of claims 1 to 7,

wherein the ultrasonic transducer includes an array transducer.

[Claim 9]

A method for inspecting a semiconductor device which is an object to be inspected, the method comprising:

inputting a test pattern signal to the semiconductor device;

controlling a condition of stimulation by an ultrasonic waves applied to the semiconductor device;

generating the ultrasonic waves based on the condition and scanning the semiconductor device with the ultrasonic waves; and

generating a measurement image based on a result signal indicating pass/fail information generated in accordance with a test signal which is output from the semiconductor device in accordance with input of the test pattern signal.

[Claim 10]

The method according to claim 9,

wherein the controlling includes generating a driving signal for driving and controlling an ultrasonic transducer that generates the ultrasonic waves.

[Claim 11]

The method according to claim 10,

wherein the generating the driving signal includes controlling at least one of a frequency, the number of pulses, a pulse interval, and a pulse intensity of the ultrasonic waves by controlling the driving signal.

[Claim 12]

The method according to any one of claims 9 to 11,

wherein the controlling the condition of stimulation by the ultrasonic waves includes controlling movement of a position of irradiation of the semiconductor device with the ultrasonic waves.

[Claim 13]

The method according to claim 12,

wherein the controlling the movement includes controlling at least one of a movement speed, a movement interval, and a movement distance of the position of irradiation of the semiconductor device with the ultrasonic waves.

[Claim 14]

The method according to any one of claims 9 to 13, further comprising detecting reflected waves of the ultrasonic waves reflected from the semiconductor device to generate a detection signal, and generating a reflection image based on the detection signal.

[Claim 15]

The method according to claim 14, further comprising

generating a superimposed image having the measurement image and the reflection image superimposed on each other.