

CLAIMS

[Claim 1] A method for acquiring a comparative image of a measured image measured from a semiconductor device and a reference measured image measured from a reference semiconductor device, the method comprising:

acquiring the measured image measured from the semiconductor device and a first pattern image showing a pattern of the semiconductor device corresponding to the measured image;

acquiring the reference measured image measured from the reference semiconductor device being the semiconductor device or a semiconductor device different from the semiconductor device and a second pattern image showing a pattern of the reference semiconductor device corresponding to the reference measured image;

acquiring matching information indicating a correlation of the first pattern image and the second pattern image based on the first pattern image and the second pattern image, wherein the matching information is obtained by adjusting an image size of at least either one of the first pattern image and the second pattern image based on a ratio of a first size of visual field indicating a range on the semiconductor device of the first pattern image to a second size of visual field indicating a range on the reference semiconductor device of the second pattern image; and

determining a difference of the measured image and the reference measured image based on the matching information to acquire the comparative image.

[Claim 2] The method according to claim 1, wherein
the acquiring matching information step comprises
extracting first shape information from the first pattern image,
extracting second shape information from the second pattern
5 image, and
acquiring the matching information based on the first shape
information and the second shape information.

[Claim 3] The method according to any one of claims 1 or 2,
10 wherein

the matching information is at least one of positional
information, rotational information, and magnification information
indicating a correlation of the first pattern image and the second pattern
image.

[Claim 4] The method according to any one of claims 1 to 3,
15 wherein

the measured image and the reference measured image are at
least one of a thermal emission image, a photo emission image, an
electrical quantity change image, an photoinduced current image, a
pass/fail information image, a phase image, an amplitude image, and an
20 In-phase/Quadrature image of the semiconductor device.

[Claim 5] A system for acquiring a comparative image of a
measured image measured from a semiconductor device and a reference
measured image measured from a reference semiconductor device, the
25 system comprising:

a storage configured to store the measured image measured from the semiconductor device, a first pattern image showing a pattern of the semiconductor device corresponding to the measured image, the reference measured image measured from the reference semiconductor device being the semiconductor device or a semiconductor device different from the semiconductor device, and a second pattern image showing a pattern of the reference semiconductor device corresponding to the reference measured image;

an image analyzer configured to acquire matching information indicating a correlation of the first pattern image and the second pattern image based on the first pattern image and the second pattern image, wherein the matching information is obtained by adjusting an image size of at least either one of the first pattern image and the second pattern image based on a ratio of a first size of visual field indicating a range on the semiconductor device of the first pattern image to a second size of visual field indicating a range on the reference semiconductor device of the second pattern image; and

an image processor configured to determine a difference of the measured image and the reference measured image based on the matching information to acquire a comparative image.

[Claim 6] A non-transitory storage medium storing an image processing program for acquiring a comparative image of a measured image measured from a semiconductor device and a reference measured image measured from a reference semiconductor device, the image processing program causing a computer to function as: an image

analyzer configured to, based on a first pattern image showing a pattern of the semiconductor device, corresponding to the measured image measured from the semiconductor device and a second pattern image showing a pattern of the reference semiconductor device being the semiconductor device or a semiconductor device different from the semiconductor device, corresponding to the reference measured image measured from the reference semiconductor device, acquire matching information indicating a correlation of the first pattern image and the second pattern image, wherein the matching information is obtained by adjusting an image size of at least either one of the first pattern image and the second pattern image based on a ratio of a first size of visual field indicating a range on the semiconductor device of the first pattern image to a second size of visual field indicating a range on the reference semiconductor device of the second pattern image; and an image processor configured to determine a difference of the measured image and the reference measured image based on the matching information to acquire a comparative image.

[Claim 7] A method for acquiring a comparative image of a measured image measured from a semiconductor device and a reference measured image measured from a reference semiconductor device, the method comprising:

acquiring the measured image measured from the semiconductor device;

acquiring the reference measured image measured from the reference semiconductor device being the semiconductor device or a

semiconductor device different from the semiconductor device;

extracting first shape information from the measured image
based on contrast of the measured image;

extracting second shape information from the reference
measured image;

acquiring matching information indicating a correlation of the
measured image and the reference measured image based on the first
shape information and the second shape information; and

determining a difference of the measured image and the
reference measured image based on the matching information to acquire
the comparative image.

[Claim 8] The method according to claim 7, wherein

the comparative image is an image including an absolute value
of a value obtained by subtraction.

[Claim 9] The method according to claim 7, wherein

the comparative image is an image including a value obtained
by subtraction.

[Claim 10] The method according to claims 8 to 9, wherein

the acquiring matching information step comprises
adjusting an image size of at least either one of the measured
image and the reference measured image based on a ratio of a first size
of visual field indicating a range on the semiconductor device of the
measured image to a second size of visual field indicating a range on the

reference semiconductor device of the reference measured image.

[Claim 11] The method according to claims 8 to 10, wherein

the matching information is at least one of positional information, rotational information, and magnification information indicating a correlation of the measured image and the reference measured image.

[Claim 12] The method according to claims 8 to 11, wherein

the measured image and the reference measured image are at least one of a thermal emission image, a photo emission image, an electrical quantity change image, an photoinduced current image, a pass/fail information image, a phase image, an amplitude image, and an In-phase/Quadrature image of the semiconductor device.

[Claim 13] A system for acquiring a comparative image of a measured image measured from a semiconductor device and a reference measured image measured from a reference semiconductor device, the system comprising:

a storage configured to store the measured image measured from the semiconductor device and the reference measured image measured from the reference semiconductor device being the semiconductor device or a semiconductor device different from the semiconductor device;

an image analyzer configured to extract first shape information based on contrast of the measured image, extract second shape information from the reference measured image, and acquire matching

information indicating a correlation of the measured image and the reference measured image based on the first shape information and the second shape information; and

an image processor configured to determine a difference of the measured image and the reference measured image based on the matching information to acquire the comparative image;

wherein the extracting of second shape information comprises extracting the second shape information based on contrast of the reference measured image.

[Claim 14] A non-transitory storage medium storing an image processing program for acquiring a comparative image of a measured image measured from a semiconductor device and a reference measured image measured from a reference semiconductor device, the image processing program causing a computer to function as: an image analyzer configured to extract first shape information from the measured image based on contrast of the measured image measured from the semiconductor device, extract second shape information based on contrast of the reference measured image measured from the reference semiconductor device being the semiconductor device or a semiconductor device different from the semiconductor device, and acquire matching information indicating a correlation of the measured image and the reference measured image based on the first shape information and the second shape information; and an image processor configured to determine a difference of the measured image and the reference measured image based on the matching information to acquire

a comparative image.

[Claim 15] A method for acquiring a comparative image of a measured image measured from a semiconductor device and a reference measured image measured from a reference semiconductor device, the method comprising:

acquiring the measured image measured from the semiconductor device;

acquiring the reference measured image measured from the reference semiconductor device being the semiconductor device or a semiconductor device different from the semiconductor device;

extracting first shape information from the measured image;

extracting second shape information from the reference measured image based on contrast of the reference measured image;

acquiring matching information indicating a correlation of the measured image and the reference measured image based on the first shape information and the second shape information; and

determining a difference of the measured image and the reference measured image based on the matching information to acquire the comparative image.

[Claim 16] A system for acquiring a comparative image of a measured image measured from a semiconductor device and a reference measured image measured from a reference semiconductor device, the system comprising:

a storage configured to store the measured image measured from the semiconductor device and the reference measured image measured

from the reference semiconductor device being the semiconductor device or a semiconductor device different from the semiconductor device;

an image analyzer configured to extract first shape information from the measured image, extract second shape information based on contrast of the reference measured image, and acquire matching information indicating a correlation of the measured image and the reference measured image based on the first shape information and the second shape information; and

an image processor configured to determine a difference of the measured image and the reference measured image based on the matching information to acquire the comparative image.

[Claim 17] An image processing program for acquiring a comparative image of a measured image measured from a semiconductor device and a reference measured image measured from a reference semiconductor device, the image processing program causing

a computer to function as:

an image analyzer configured to extract first shape information from the measured image measured from the semiconductor device, extract second shape information based on contrast of the reference measured image measured from the reference semiconductor device being the semiconductor device or a semiconductor device different from the semiconductor device, and acquire matching information indicating a correlation of the measured image and the reference measured image based on the first shape information and the second

shape information; and

an image processor configured to determine a difference of the measured image and the reference measured image based on the matching information to acquire a comparative image.