CLAIMS

1. A substrate heat-treating apparatus, comprising:

a process chamber in which a flat substrate to be heat-treated is placed; and

a beam irradiating module comprising a plurality of vertical cavity surface emitting laser (VCSEL) devices, and configured to irradiate a laser beam to the flat substrate,

wherein the beam irradiating module is configured such that a supply current is controlled to allow optical outputs of the VCSEL devices to become the same,

wherein the VCSEL devices are supplied with the supply currents which differ from each other, respectively,

wherein a correlation between a supply current and an optical output is set in advance for each VCSEL device,

wherein the correlation of the VCSEL device is set as an equation,

wherein each of the VCSEL devices is supplied with a supply current for the required optical output depending on the correlation.

2. The substrate heat-treating apparatus of claim 1, wherein the process chamber comprises a beam irradiating plate placed below the flat substrate, an infrared-ray transmitting plate placed above the flat substrate, a side wall in which the flat substrate is seated, an external housing in which the infrared-ray transmitting plate and an upper plate are placed above the flat substrate in the side wall, and an internal housing above which the beam irradiating plate is placed, the internal housing being placed below the flat substrate within the external housing, and wherein the beam irradiating module is placed below the beam irradiating plate within the internal housing.

3. The substrate heat-treating apparatus of claim 2, wherein the infrared-ray transmitting plate is formed from transparent quartz.

4. The substrate heat-treating apparatus of claim 2, wherein the process chamber further comprises a substrate support supporting a peripheral portion of the flat substrate, the substrate heat-treating apparatus using the VCSEL device further comprises a substrate rotating module supporting and rotating the substrate support.

5. The substrate heat-treating apparatus of claim 4, wherein the substrate rotating module comprises an inner rotating means having a ring shape in which N poles and S poles are alternately arranged in a circumferential direction and being coupled to a lower portion of the substrate support within the chamber lower space, and an outer rotating means placed outside the external housing to face the inner rotating means and configured to generate a magnetic force to rotate the inner rotating means.