

問1

1. A reference voltage generating circuit comprising:

a first resistance (10) having one end supplied with a first electric potential, and another end connected to an output terminal of a reference voltage;

a second resistance (11) having one end supplied with a second electric potential, and another end connected to the output terminal;

a first bipolar transistor (15) of a first polarity having a collector supplied with the first electric potential, and an emitter connected to the output terminal;

a second bipolar transistor (16) of a second polarity having a collector supplied with the second electric potential, and an emitter connected to the output terminal, the second polarity being different from the first polarity;

a first bias generating circuit (17,18) configured to generate a first DC bias voltage and to supply the first DC bias voltage to a base of the first bipolar transistor; and

a second bias generating circuit (19,20) configured to generate a second DC bias voltage and to supply the second DC bias voltage to a base of the second bipolar transistor.

2. The reference voltage generating circuit according to claim 1, wherein

the first DC bias voltage has a value less than the reference voltage and not less than a voltage obtained by subtracting a base-emitter forward voltage of the first bipolar transistor from the reference voltage, and

the second DC bias voltage has a value more than the reference voltage and lower than a voltage obtained by adding a base-emitter forward voltage of the second bipolar transistor to the reference voltage.

問2

OCT (Optical Coherence Tomography), which uses the phenomenon of interference of light beams such as laser beams to form a cross-sectional image of an object to be measured, is now attracting attention. Applications of OCT are expected to be developed in the medical field or in the biochemistry field, because it is non-invasive to the human body. For example, in the field of ophthalmology, devices for forming cross-sectional images of the fundus, cornea, and the like have already been put into practical use.

Patent Literature 1 discloses a device that employs OCT. In this device, a measuring arm scans an object using a rotary scanning mirror (galvanometer mirror). A reference arm is equipped with a reference mirror. Provided at an outlet of the device is an interference meter that analyzes the intensity of interference light of the light beams from the measuring arm and the reference arm by using a spectrometer. Furthermore, the reference arm is configured to change the phase of the reference light to discrete values in a step-like manner.

The device disclosed in Patent Literature 1 utilizes a "Fourier Domain OCT" method. The device irradiates the object to be measured with a low-coherence light beam, generates interference light by overlapping the reflected light and the reference light, obtains a spectral intensity distribution of this interference light and subjects it to a Fourier transform, thereby the form in the depth direction (Z direction) of the object to be measured being transformed into an image.

問3

A remote communication device is connected to a monitoring unit using any suitable network, such as a cellular network and the Internet. It is needless to say that the network includes, as other alternatives, public switched telephone networks, radio links, cable connections, short message services, and so forth.

The remote monitoring device asks the subject to identify himself or herself and then gives him or her instructions to carry out a particular monitoring or measurement procedure. The subject is told how to perform the measurement and how to convey the result to the monitoring device.

A typical example of the monitoring unit is a remote monitoring unit, and it may be disposed at the hospital side of the network connection. However, this is simply by way of example and the processing task carried out by the monitoring unit may be carried out at any convenient point between a patient and a medical professional. Typically, when the patient connects using a digital device, various processing tasks may be carried out at the user, between the user and a remote unit. In other embodiments, the user connects manually over a telephone, in which case processing is typically carried out at a site remote from the patient.