THERMOREGULATED LASER TRANSMITTER APPLIANCE WITH EMBEDDED CONTROL

Description:

A solid state laser diode has a strong thermal dependence with its electrical and light variables. The irradiance of the light it generates depends on the temperature, being necessary to control the temperature of the laser diode itself, since it heats up when it emits light. In addition, as its temperature increases it requires more bias current to maintain the same irradiance level and excessive current consumption ages the diode. Therefore, it is necessary to keep the laser diode at a low and stable temperature. A symmetric flow thermoregulatory system that houses the laser diode capsule solves these problems. Thus, the present invention presents a thermoregulated laser transmitter apparatus with embedded control, comprising a laser diode with a sensor photodiode that is subjected to three control loops regulated by a microcontroller: - a thermal control loop in charge of keeping the temperature of the laser diode stable; - a light control loop in charge of keeping the irradiance of the laser beam emitted by the laser diode stable; - a modulation index control loop in charge of controlling the modulation depth of the laser beam. Applicable for optical laser communications.

Keywords:
Laser, Electronics, Telecommunications, Optics, Internet

Sectors:
ICT, Electronics

Areas:
Telecommunications, Electronics, Internet and Networks, Components

Advantages:

Among the advantages of the present invention are: • The ability to keep the diode in a stable thermal state. • The ability to maintain stable irradiance. • The electrical power supply schemes for the laser diode and the devices that make up the control and modulation units are highly stable and have very low noise. • The input modulating signal has the characteristics of a standard.

Uses and Applications:

This technology has its utility as a thermoregulated laser transmitter apparatus for the transmission of modulated laser beams within the field of high speed optical communications electronics industry.

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