Abstract

Transceiver is device which is widely used to transmit and receive data signals over long distance worldwide. It consists of electronic and photonic components such as lasers, transimpedance amplifier, electronic drivers, and heat spreaders etc. When transceiver operates, it converts electrical signals into optical signals and transmit through transmitter. Other part of transceiver is receiver that receives transmitted optical signals and convert them back into electrical signals. During its operation, transceivers heat up due to active electronic and photonic components. Overall temperature of this device increases and affects its working efficiency and reduces its data transfer rate.

In this research work the temperature of active components within transceiver have been reduced using thermal simulations. For this purpose, transfer of heat by means of heat conduction is considered to transfer heat from source to heat sink. Due to high sensitivity of photonic components, thermal issues arise within layered structure of transceiver. These thermal issues and cross heating effect are observed and managed through thickness of thermal interface material. The decrease in the thickness of thermal interface material from 50 microns to 5 microns, reduces the temperature of laser from 388K to 317K. The thermal effects arising in electronic drivers and transimpedance amplifier are also reduced through this method. Some useful results are obtained in this research work and temperature of device has been reduced up to great extent.