CTP laser diode temperature is high

Overview

An article by Photonoics explains that a laser diode operating at 10 °C higher than rated will half the life of the diode and will actually stop functioning at 100°C. Like most mechanical equipment, routine maintenance helps extend the longevity of laser diodes. The combination leaves them susceptible to surges, which can lead to rapid failure. In other words, if the current is raised to increase the output optical power, a point is reached. However, due to semiconductor manufacturing tolerances, a standard off-the-shelf laser diode typically has a center wavelength tolerance of ±3 nm or even ±10 nm. Therefore, it specifies the largest current that must not be exceeded even for a moment. The laser threshold will increase exponentially with temperature as exp (T/T0), where T is the laser temperature and T0 is the "characteristic temperature" of. The higher temperature leads to an increase of temporary thermal recombination centers within the semiconductor but there are also non-reversible transformations caused by high temperature.

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