

Opto-optical gain-clamped L-band Erbium-doped fiber amplifier with C-band control signal

ABSTRACT

We demonstrate an opto-optical gain-clamped L-band erbium-doped fiber amplifier by manipulating the C-band lasing wavelength as the control signal. The L-band gain-clamped value is achieved by tuning the control laser in the C-band wavelength range that propagates in the opposite direction to the L-band signal. Within the wavelength range of 1538 nm and 1560 nm, the L-band gain decreases linearly with the increment of the C-band lasing wavelength. The L-band gain dynamic range decreases with the increment of the cavity loss. By combining two different levels of cavity loss, the gain dynamic range of 10 dB from 11 dB to 21 dB is achieved with an average noise figure of less than 5.9 dB. The whole gain spectrum of the L-band can be used for multiple-channel amplification because the laser is created outside its signal band.

Keyword: Fiber laser; Fiber amplifiers; Optical amplifier; Band gains.