

Single-stage gain-clamped L-band EDFA with C-band ASE self-oscillation in ring cavity

ABSTRACT

We demonstrate single-stage gain-clamped L-band Er³⁺-doped fiber amplifier (EDFA) utilizing self-oscillation modes as the control light. The amplifier structure exploits the characteristics of C/L-band coupler to isolate between lasing modes and L-band signal. The self-lasing cavity modes are obtained without any tunable bandpass filter in the loop and generated from the amplified spontaneous emission in the C-band region. The amplifier configuration has lower noise figures as opposed to a dual-stage partially gain-clamped amplifier. The gain and noise figure fluctuations are less than ± 0.4 dB in the gain clamping region. The transient analysis confirms that the maximum power excursion is less than 0.3 dB for 10-dB add/drop.

Keyword: optical fiber amplifier, Erbium, gain-clamped