

**ABSTRACT:**

Erbium-doped fiber amplifier with flat gain over 30 nm bandwidth is demonstrated using flexible selective band methods. The band optical amplifier was designed to cater 44 wavelength division multiplexing channels which were separated into bands of 4 nm. Without using any gain flattening filter, the gain of optical amplifier was maintained at 19 dB with a maximum gain variation of less than 1.6 dB even though the input signal power was varied from -19 to -6 dBm. The amplifier was able to maintain 1 dB gain flatness with 83% chance for any selective bands of 4 nm within the wavelength range from 1530 to 1565 nm. This feature is very attractive to support band optical networks.