

Multicasting Characteristics of All-Optical Triode Based on Negative Feedback Semiconductor Optical Amplifiers

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Abstract : We introduced an all-optical multi-casting characteristics with wavelength conversion based on a novel all-optical triode using negative feedback semiconductor optical amplifier. This study was demonstrated with a transfer speed of 10 Gb/s to a non-return zero 231-1 pseudorandom bit sequence system. This multi-wavelength converter device can simultaneously provide three channels of output signal with the support of non-inverted and inverted conversion. We studied that an all-optical multi-casting and wavelength conversion accomplishing cross gain modulation is effective in a semiconductor optical amplifier which is effective to provide an inverted conversion thus negative feedback. The relationship of received power of back to back signal and output signals with wavelength 1535 nm, 1540 nm, 1545 nm, 1550 nm, and 1555 nm with bit error rate was investigated. It was reported that the output signal wavelengths were successfully converted and modulated with a power penalty of less than 8.7 dB, which the highest is 8.6 dB while the lowest is 4.4 dB. It was proved that all-optical multi-casting and wavelength conversion using an optical triode with a negative feedback by three channels at the same time at a speed of 10 Gb/s is a promising device for the new wavelength conversion technology.

Keywords : cross gain modulation, multicasting, negative feedback optical amplifier, semiconductor optical amplifier

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