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Bidirectional S - band continuous wave operation in a depressed-cladding erbium doped fiber amplifier (Article)

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Abstract

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In this paper we propose and characterize a bi-directional Depressed-Cladding Erbium Doped Fibre Amplifier (DC-EDFA) for Continuous Wave (CW) S - band operation. The system uses a Depressed-Cladding Erbium Doped Fibre (DC-EDF) as the gain medium and 3-port OCs to facilitate bi-directional transmission. The performances of gain and noise figure are first studied for the conventional DC-EDFA setup and are obtained at 20 dB and 4 dB respectively. Subsequently, the bidirectional DC-EDFA is tested and is found to have a similar gain 20 dB but with a slightly higher noise figure of 8.5 dB. The highest gain of 19 dB is obtained for the low input signals of -30 and -20 dBm, while higher input signals of -10 and 0 dB show lower gains due to the on-set of saturation effect in the gain medium. A high noise figure of between 8 and 9 dB is also seen, and increases to 19 dB nearing the cut-off wavelength. The bi-directional EDFA shows no loss in the gain but does show an increase in the noise figure as compared to uni-directional S - band DC-EDFAs.

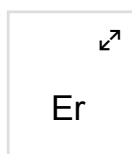
SciVal Topic Prominence

Topic: Thulium | Fiber Amplifiers | Noise Figure

Prominence percentile: 44.769

Chemistry database information

Substances



Author keywords

Erbium doped fiber amplifier S - band amplification

Indexed keywords

Engineering controlled terms:

Fibers Noise figure

Engineering uncontrolled terms

Bi-directional transmissions Continuous wave operation Continuous waves

Cutoff wavelengths Depressed cladding Erbium doped fibres

S - band amplification Saturation effects

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