Docket #: S99-122

Erbium-Doped Materials with Extremely Broad Bandwidths

In a method of amplifying optical input signals over a wide bandwidth, the optical input signals are applied to an optical waveguide made from a rare-earth-doped amorphous yttrium aluminum oxide material (e.g., erbium-doped yttrium aluminum oxide material). The optical input signals include optical signals having wavelengths shorter than 1,520 nanometers and optical signals having wavelengths longer than 1,610 nanometers. Preferably, the wavelengths range from as short as approximately 1,480 nanometers to as long as approximately 1,650 nanometers. Pump light is applied to the optical waveguide to cause the waveguide to provide optical gain to the optical input signals. The optical gain causes the optical signals to be amplified within the waveguide to provide amplified optical signals over the extended range from approximately 1,480 nanometers to approximately 1,650 nanometers, including, in particular, optical signals having wavelengths shorter than 1,520 nanometers and optical signals having wavelengths longer than 1,610 nanometers. Alternatively, the wavelengths of the optical input signals may be in the range from approximately 1,480 nanometers to approximately 1,565 nanometers. As a further alternative, the wavelengths of the optical input signals may be in the range from approximately 1,565 nanometers to approximately 1,650 nanometers.

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Patents

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