Narrow bandwidth optimization using a polymer microring resonator in a thulium-holmium fiber laser cavity

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Abstract

A thulium-holmium fiber (THDF) laser cavity has been demonstrated with a SU-8 polymer microring resonator (PMRR) in the cavity. The PMRR has a 500 mu m radius and fabricated using the lithography method, with the SU-8 polymer acting as a host material. The butt coupling method was used for the horizontal coupling of light from a ultra-high numerical aperture (UHNA) fiber to the polymer waveguide. Lasing in the cavity without the PMRR is obtained at a center wavelength of 1.910 mu m, 1.869 mu m when the PMMR is inserted into the cavity. A maximum power of -5 dBm was extracted from the laser oscillator, and the laser linewidth was measured to be degrees 26.6 kHz by radio-frequency spectrum analyzer analysis. The PMRR was able to generate an output with a free spectral range of 0.79 mu m at a frequency of 59.25 GHz.

Keywords

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