A 7-13 GHz low-noise tuned optical front-end amplifier for heterodyne transmission system application

The authors present a 7-13 GHz low-noise bandpass tuned optical front-end amplifier, showing 46±1 dBΩ transimpedance, and a noise spectral density of about 12 pA/√Hz. This is the first time such a flat response and such low noise were obtained simultaneously at these frequencies, without any further equalization. A new lay-out technique enabled close monitoring of each manufacturing step, and excellent agreement between the measurements and simulations was observed. The front-end was used in an optical 2.5 Gb/s coherent CPFSK continuous phase frequency shift keying system experiment, resulting in a sensitivity of -41.7 dBm at a bit error rate of 10-9.

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