All optical 2R-regeneration based on the integration of semiconductor optical amplifiers and electroabsorbers in a single waveguide is experimentally demonstrated. Static transfer functions of concatenated structures show strong improvements of the nonlinearity. An extinction ratio improvement > 4.5 dB has been obtained under dynamics operation. For optical signal-to-noise ratio values above 17 dB, improvement in BER is observed. A receiver sensitivity improvement > 2 dB at BER of 10⁻⁹ was found for 10 Gb/s operation.