Abstracts

40-Gb/s optical receiver IC chipset - including a transimpedance amplifier, a differential amplifier, and a decision circuit - using GaAs-based HBT technology

Y. Amamiya, Y. Suzuki, M. Kawanaka, K. Hosoya, Z. Yamazaki, M. Mamada, H. Takahashi, S. Wada, T. Kato, Y. Ikenaga, S. Tanaka, T. Takeuchi and H. Hida. "40-Gb/s optical receiver IC chipset - including a transimpedance amplifier, a differential amplifier, and a decision circuit - using GaAs-based HBT technology." 2002 MTT-S International Microwave Symposium Digest 02.1 (2002 Vol. I [MWSYM]): 87-90 vol.1.

GaAs-based HBTs with an InGaP emitter were used to develop key components of a 40-Gb/s optical receiver: a transimpedance amplifier, a differential main amplifier, and a decision circuit. The frequency response of the transimpedance amplifier was flattened by inserting an RC series circuit at the input stage. As a result, the transimpedance amplifier module produced a well-opened 43-Gb/s eye diagram with 400 mVp-p dynamic range. The differential main amplifier and the decision circuit produced 43-Gb/s eye diagrams with a large dynamic range of 700 mVp-p, which is the first 40-Gb/s demonstration using GaAs-based HBTs. These three ICs are thus applicable to a 40-Gb/s optical receiver.

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