Ultrahigh-speed DAC for Optical Communications Systems

Overview
Digital coherent optical transmission schemes with advanced modulation formats, such as M-QAM*1 and OFDM*2, are promising techniques for constructing future beyond-100-Gbit/s/ch optical communications systems. In the transmitter for such systems, ultrahigh-speed DACs*3 are key components for generating complex modulated signals. NTT Laboratories have sophisticated ultrahigh-speed transistor, InP HBT*4, technology and circuit design techniques, and have succeeded in developing ultrahigh-speed 6-bit DACs for such systems of the future.

Features
- The first 6-bit DAC that can operate at a sampling rate above 30 GS/s
- Provides various modulated signals, such as M-QAM and OFDM
- Uses our in-house ultrahigh-speed transistor, InP HBT, technology
- Novel circuit design techniques for ultrahigh-speed and low-power operation
- Uses broadband packaging technique

Application scenarios
- Future ultrahigh-speed and large-capacity optical communications systems (e.g. beyond-100-Gbit/s/ch optical communications systems)
- Future ultrahigh-speed optical access systems
- Measurement tools (e.g. ultrahigh-speed arbitrary waveform generator)

*1 M-QAM: M-ary Quadrature Amplitude Modulation
*2 OFDM: Orthogonal Frequency Division Multiplexing
*3 DAC: Digital-to-Analog Converter
*4 InP HBT: Indium Phosphide Heterojunction Bipolar Transistor

Ultrahigh-speed DAC
- InP HBT
- DAC IC
- DAC module

Transmitter using DACs
- (e.g. 16-QAM signal generation)
- Adaptive to various modulation formats (M-QAM, OFDM, etc.)
- Utilization of various digital equalization techniques