

**Product Bulletin**

# TNETD4000C Four-Line Central Office ADSL Chipset

Texas Instruments, the company that pioneered asymmetric digital subscriber line (ADSL) technology, is again redefining industry expectations with the new TNETD4000C chipset. This central office (CO) ADSL chipset builds on the family's groundbreaking multi-line DSP architecture. Utilizing TI's industry-leading DSP and analog technology, the '4000C chipset allows designers to implement four ADSL modems using a single DSP-based transceiver. This powerful silicon foundation enables some dramatic advantages for CO original equipment manufacturers (OEMs) looking for leading-edge, highly programmable ADSL solutions. The chipset, which includes all of

the silicon necessary to implement any combination of four full-rate and/or G.lite ADSL modems, provides designers with the following advanced features:

**Industry's Highest Port Densities**

For CO applications such as digital subscriber line access multiplexers (DSLAMs), digital loop carriers (DLCs) and central office line card architectures, density is everything, and the '4000C chipset delivers. With only 3.5 square inches of board space required for each modem—roughly a 50-percent reduction in board space over current competitive ADSL chipset implementations—designers have access to the industry's highest port density

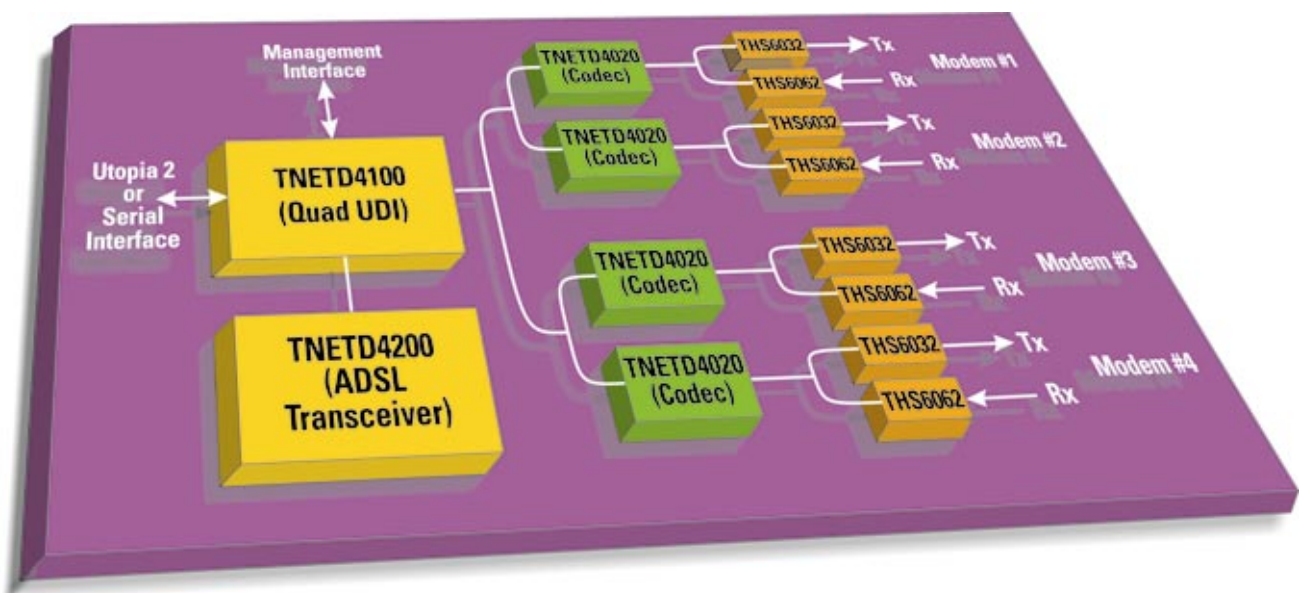
chipset architecture. This highly integrated multi-line architecture also enables overall power savings, with a full-rate power consumption of only 1.0 watt per modem (excluding line driver/receiver).

**Complete, Highly Integrated Solution**

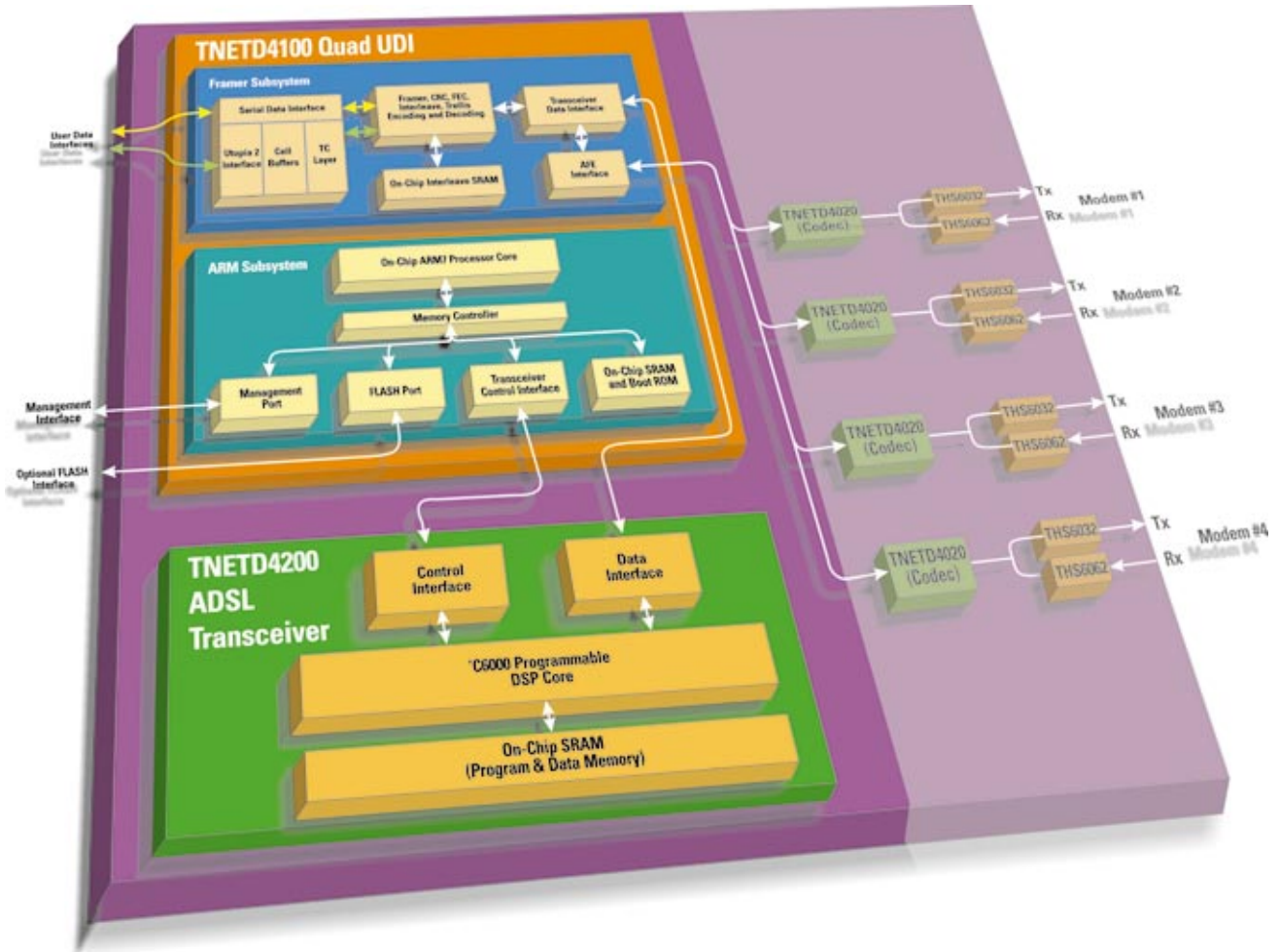
Many competitive ADSL solutions require additional silicon for full implementation, but not the TNETD4000C. The TNETD4000C includes all the necessary silicon for four ADSL modems, requiring only additional passive components such as capacitors, inductors and resistors. The solution further promotes board-space savings and simplified design with high levels of integration,

**Key Benefits**

- Complete chipset solution for four central office ADSL modems
- Industry's first multi-line architecture to support both full-rate and G.lite
- Supports industry's highest port densities: 1.0 Watt per modem excluding line driver/receiver; 3.5 square inches per modem
- Based on TMS320C6000 DSP technology for maximum programmability
- Proven interoperability
- Powered by Amati™ technology



TNETD4000C ATU-C Chipset



TNETD4100 and TNETD4200 Functional Diagram

including an on-chip management system (ARM7 microcontroller and associated memory), on-chip interleave memory and a highly integrated analog front end design.

In addition, TI further advances system design by providing development kits that include evaluation boards, complete documentation and detailed reference designs with schematics, gerber files, test routines and design notes.

#### Maximum Programmability

TI is far and away the leader in the programmable DSP market,

and this leadership shows in the '4000C chipset. Based on TI's 2,000-MIPS TMS320C6000 core DSP technology, the chipset offers maximum programmability to give designers a powerful yet extremely flexible implementation. This programmability is extremely important as the ADSL market continues to evolve and system designers must quickly adapt to rapidly changing ADSL requirements.

#### Proven Interoperability

Higher performance doesn't mean anything without the assurance

of interoperability. The '4000C chipset has proven interoperability with the leading manufacturers of ADSL equipment, giving designers the assurance that systems they design in the lab will work in the real world, multi-vendor environment.

#### Comprehensive In-house Hardware and Software Expertise

The '4000C chipset delivers an unparalleled combination of programmable silicon and software expertise. Amati Communications, which Texas Instruments purchased in 1997, pioneered the development of DMT-based ADSL, and as such, has over seven years of standard-compliant DMT experience.

What does this mean to designers? A comprehensive resource for all of their design challenges and the reassurance that TI has the best and brightest DSL experts working to support modem designs.

#### TNETD4000C Chipset Components

(1x) TNETD4100	Quad Universal Digital Interface
(1x) TNETD4200	ADSL Transceiver
(4x) TNETD4020	Codec
(4x) THS6032	Class-G Line Driver
(4x) THS6062	Line Receiver

The TNETD4000C chipset provides all the silicon necessary to implement four ADSL modems.

### Standard Compliant

The TNETD4000C provides a single design that supports all standard-compliant implementations of ADSL, including ITU G.992.1 Annex A (G.dmt—ADSL over POTS), G.992.1 Annex B (ADSL over ISDN), G.992.2 (G.lite), G.994.1 (G.hs), G.997.1 (G.ploam), and ANSI T1.413 issue 2.

### For More Information

Leading-edge hardware and software, proven interoperability and support from one of the industry's superior suppliers—all combine to make TI's TNETD4000C chipset a powerful choice for next-generation CO ADSL systems. If you would like to learn more about how TI can give you the tools for a winning design, please contact your local TI field sales office.

Or, you'll find more information on the web at:

<http://www.ti.com/sc/access>

### Leading-edge Chipset

TI's TNETD4000C chipset provides a powerful combination of integration, programmability and performance. Devices within the chipset include:

#### TNETD4100—Quad Universal Digital Interface

The Quad Universal Digital Interface (Quad UDI) provides the user data interfaces (either serial or Utopia 2) for each of the four ADSL modems. The Quad UDI has on-chip interleaved memory exceeding T1.413 issue 2 and G.992.x requirements for each of the four modems and an on-chip management system (ARM7 microcontroller and associated memory).

#### TNETD4200—ADSL Transceiver

The TNETD4200 is based on TI's industry-leading, 2000 MIPS 'C6000 DSP technology. It performs the ADSL DMT modulation/de-modulation for each of the four modems. In addition, all ADSL initialization and training sequences for the four modems are handled independently and simultaneously by the ADSL transceiver.

#### TNETD4020—Codec

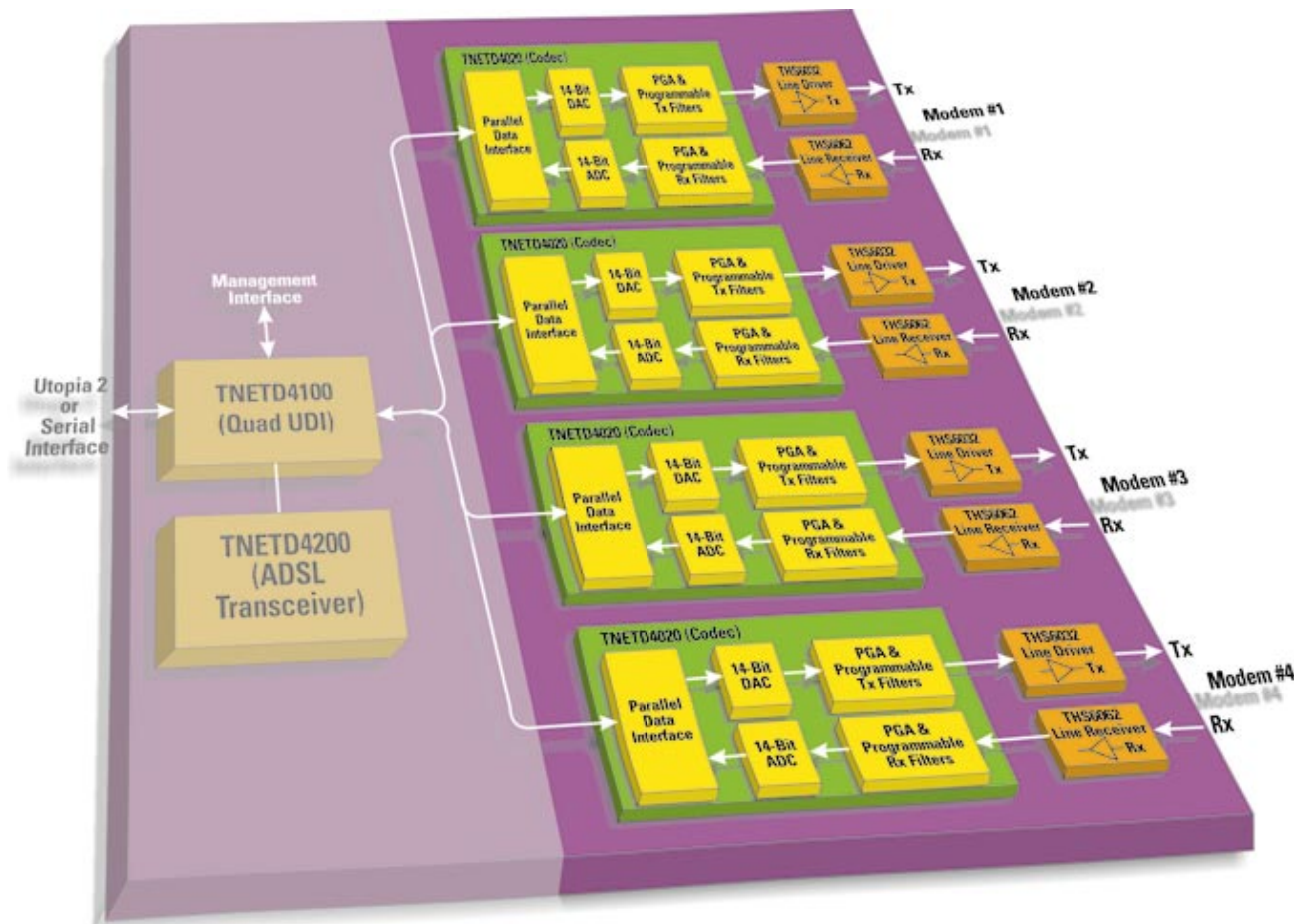
The TNETD4020 is a high performance CO ADSL codec (coder/decoder). The '4020 provides the analog-to-digital and digital-to-analog conversions, along with associated filtering required for standard-compliant G.lite or full-rate ADSL designs.

#### THS6032—Line Driver

The THS6032 is an ultra low-power, differential line driver designed for CO ADSL applications. The THS6032 has a unique Class-G architecture that enables the device to be powered from both low voltage and high voltage power supplies. This unique architecture achieves substantial power savings over traditional line driver architectures.

#### THS6062—Line Receiver

The THS6062 is a high-speed, differential line receiver designed for low noise, low distortion ADSL applications.




Analog Front End (AFE) Functional Diagram



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