Product Bulletin

Central Office ADSL Chipset

Providing End-to-End Solutions for High-Speed Communications

Key Benefits

- Fifth-generation ANSI T1.413 Issue 2 compliant modem chipset
- Industry's first multi-line central office architecture
- Highly programmable architecture
- Ultra-high-performance, echo-cancellation based architecture

With more than 100 times the performance of today's analog modem technology, Asymmetric Digital Subscriber Line (ADSL) is revolutionizing the remote access industry. ADSL is a new broadband communications technology that allows telephone companies to deliver multi-megabit communication performance directly to the home. And best of all, ADSL delivers this high-speed performance over existing copper telephone infrastructure—all while allowing traditional voice services to coexist without interruption. ADSL technology is enabling the delivery of high bandwidth, multimedia rich applications like streaming video, video conferencing, interactive tele-gaming and ultra-fast Internet access.

As the first in a new generation of DSL solutions, TI's TNETD2000C central office chipset provides designers with a highly programmable, high-performance solution for the ADSL central office market.

TI also offers the TNETD2000P and TNETD2000R client-side ADSL chipsets, providing designers with end-to-end ADSL solutions. The chipsets utilize TI's revolutionary 1600 Millions of Instructions Per Second (MIPS) TMS320C6x technology and world-class mixed-signal expertise to provide the industry's most powerful and most programmable ADSL solutions. As the market evolves, TI will add to these initial offerings with solutions tailored to meet the needs of specific DSL market segments. For instance, TI will leverage its existing networking expertise by customizing the ADSL chipset architecture with networking specific peripherals. Key peripheral technologies include 10/100 Ethernet, 1394, USB, ATM, HDLC and PCI.

TI's position in the DSL market has also been greatly strengthened by the recent purchase of Amati Communications, the world leader in DSL technology. Largely recognized as the DSL pioneer, Amati brings to Texas Instruments four previous generations of ADSL modem expertise and extensive real-world field trial experience. By leveraging this experience and expertise, TI is in a unique position to deliver the world's most cost-effective, high-performance DSL solutions.

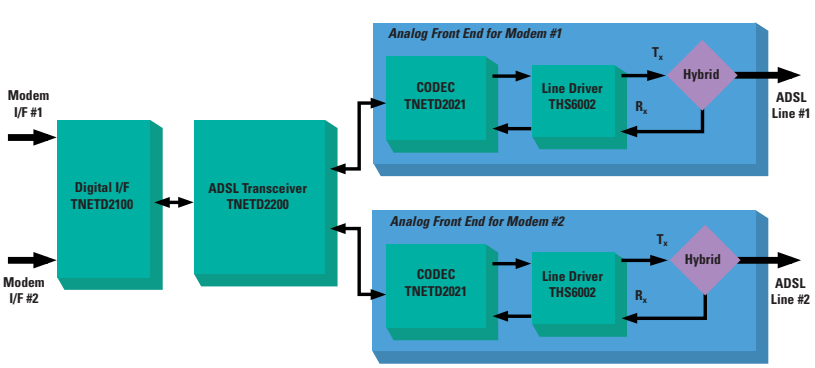
The Architecture

At the heart of the TNETD2000C's architecture is the power of 'C6x DSP technology. This technology provides an incredible amount of processing power for DSL modem implementations, and TI has harnessed it in developing two extremely high-performance yet highly programmable chipsets. Some of the more advanced features of the architecture include:

Highly Programmable Architecture— The fully programmable 'C6x-based ADSL transceiver facilitates quick and easy software upgrades, code updates and even future standard implementations such as the upcoming G.Lite splitterless standard.

High-performance Architecture— Leveraging the raw processing power of 'C6x technology, the TNETD2000C chipset offers the industry's highest throughput, longest reach and most robust ADSL modem performance. The chipset also benefits from Amati's four previous ADSL modem generations and more than 20 real-world field trials. TI adds to the inherent performance of its chipset architecture by implementing echo cancellation to separate the upstream and downstream channels. This greatly improves the overall performance of the modem. And for interoperability, the chipset will also work with existing Frequency Division Multiplex-based (FDM) products.

Multi-line Architecture— Once again taking advantage of the processing power of the 'C6x-based ADSL transceiver, the TNETD2000C is the first and only chipset on the market that can support multiple ADSL lines via a single transceiver. This increases port densities, lowers power consumption and reduces cost-per-line.



TNETD2000C Central-Office Chipset

Programmable Management Interface—
The fully programmable management interface supports flexible network management by providing access to configuration, performance, statistics and control information. This interface is provided in C-compliant source code that runs on an external microcontroller or host processor. By providing the source code for this interface, end customers can completely customize the management code base to suit their particular application.

The Chipset Devices

The TNETD2000C consists of four devices and the necessary software (both datapump and management interface software) to implement a fully compliant ANSI T1.413 Issue 2 ADSL modem. TI's central office ADSL chipset offers designers everything they need to take end products from concept to production, saving both design time and money by giving OEMs a single resource for all of their design requirements. The four devices include:

- TNETD2100 Digital Interface—Programmable serial interfaces provide simple and clean standards-compliant data interfaces to the chipset. In order to support asynchronous transfer mode (ATM) implementations, each serial interface features a Byte mark pin. The TNETD2100 is packaged in a 208-pin PQFP.
- TNETD2200 ADSL Transceiver—Based on the high-performance TMS320C6x DSP technology, the completely programmable ADSL transceiver provides the necessary computationally intensive digital signal processing required for MIPS-intensive ADSL modem operation. The TNETD2200 is packaged in a 352-pin BGA.
- TNETD2021 Codec—The TNETD2021 central office codec is a high precision mixed-signal device that provides the analog-to-digital (A/D) and digital-to-analog (D/A) conversions and associated filtering required for ANSI T1.413 Issue 2 modems. The TNETD2021 is available in a 100-pin TQFP.
- THS6002 Line Driver—The THS6002 provides the high-speed line drivers and the receive circuitry required to drive the ADSL line. The device is available in TI's patented PowerPad™ package, reducing the size of the device and greatly improving its thermal dissipation characteristics. The THS6002 is packaged in a 20-pin Flatpack.

Benefits for Central Office Applications

The TNETD2000C ADSL chipset addresses critical central office design concerns, including standards compliance, programmability, low power and increased port density. The chipset is fully ANSI standard T1.413 Issue 2-compliant, assuring telecommunications manufacturers that their designs will be fully compatible with complementary ADSL equipment. And as these standards evolve, the programmability of the TNETD2000C chipset ensures that the designs will stay standard-compliant and interoperable as well. TI achieves increased port density, lower power consumption and reduced cost-per-line by leveraging the multi-line architecture of the ADSL transceiver. Using this inherent performance advantage, the transceiver has the raw computational power required to implement multiple lines of full-rate ADSL.

Currently, both the Digital Interface and ADSL transceiver support up to two full-rate ADSL lines. As the core 'C6x technology becomes even faster, the transceiver will support more full-rate ADSL lines, further increasing port densities while continuing to reduce power consumption and cost-per-line. The next-generation ADSL chipset will be able to support four full-rate ADSL lines. In addition to full-rate implementations, the ADSL transceiver can support between two to three times as many less computationally intensive G.Lite lines as full-rate lines. For instance, the same ADSL transceiver that supports two full-rate lines can support between four to six G.Lite lines. The exact number of G.Lite lines supported depends on the final form of the G.Lite standard.

Central Office ADSL EVM

Designers can begin building tomorrow's remote access applications today with TI's central office ADSL Evaluation Module (EVM). The kit gives designers everything they need to fully evaluate the simplicity and power of TI's ADSL solutions.

For More Information

DSL represents more than a new technology. It is a fundamental new approach to remote access communications that uses existing infrastructure to deliver incredible new bandwidth and incredible new applications. For this constantly changing environment, TI offers the industry's most powerful and flexible solutions. If you would like more information on the TNETD2000C central office ADSL chipset, please call your local TI field sales office. Or, you'll find more information at:

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

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