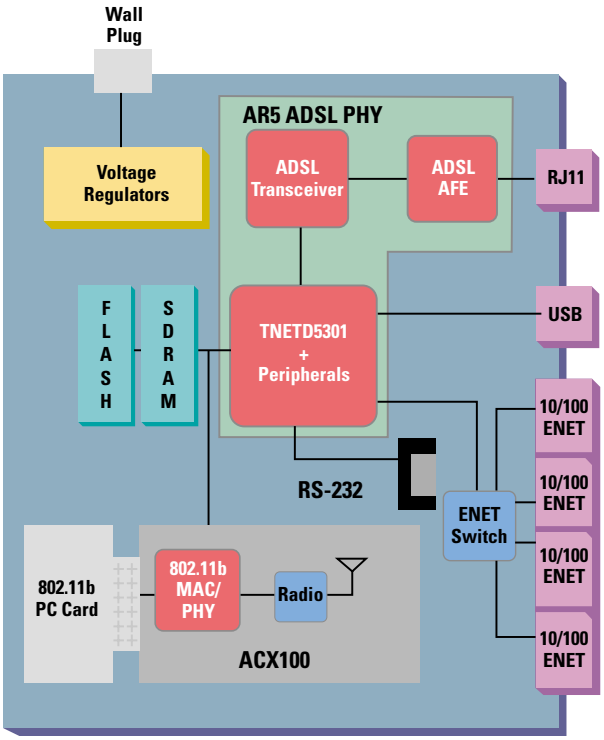
Product Brief

AR5W Wireless ADSL Router Chipset



AR5W Chipset Block Diagram

Key Features:

- Fully integrated hardware and software solution for wireless ADSL routers providing best in class performance
- Wi-Fi compliant 802.11b operation optimized for quick and cost efficient deployment
- Field proven interoperability worldwide
- Linux®-based software stack enabling addition of functional blocks by manufacturer for increased system differentiation
- WPA (Wi-Fi Protected Access) provides enhanced encryption beyond WEP

The AR5W Wireless Asymmetric Digital Subscriber Line (ADSL) router chipset integrates a single-chip 802.11b + MAC (media access controller) and baseband processor, with an ADSL analog front-end (AFE), DSL transceiver and communications processor to provide manufacturers with a proven, high-performance platform for global deployments. The AR5W also includes the AR5 Network Support Package (NSP). This optimized software stack, when combined with the AR5W reference design, provides a complete hardware and software solution for wireless ADSL routing.

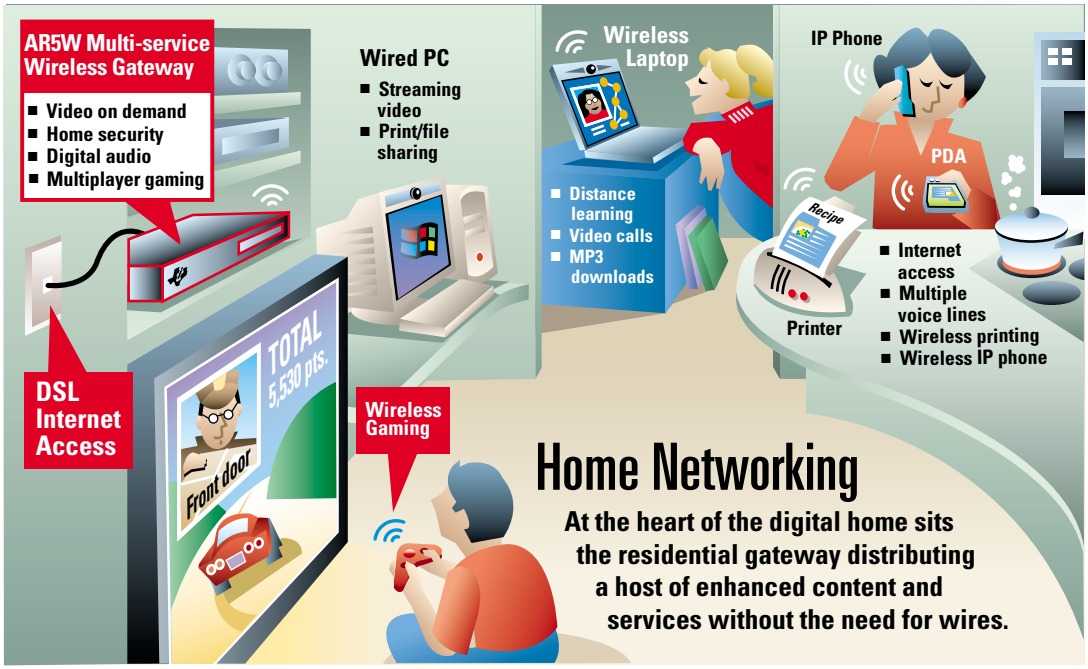
AR5W is a high-speed data transfer only solution with 4-Ethernet ports and an optional USB interface targeting the low cost, home, SOHO and SME router markets requiring high-speed wireless access. Based on TI's AR5W platform, these routers allow users to wirelessly network multiple PCs and handheld Internet devices, manage multiple Internet accounts and have increased access to entertainment and business services.

The AR5W is based on field hardened chips broadly deployed worldwide, with proven interoperability in large markets including the United States, Germany and China. The chipset complies with Wi-Fi Alliance specifications as well as DSL Forum TR-048 test specification, working with all commonly deployed DSLAMs. Based on an open platform, the AR5W provides versatility to manufacturers wanting to customize the solution in order to tailor and add features that users want, while offering an increased return on investment.

Enhanced Wi-Fi Performance

The ACX100 single-chip wireless local area network (WLAN) MAC and baseband processor combines high-performance with robust functionality. Direct host and radio interfaces allow the ACX100 to provide a complete high-speed wireless networking solution.

The ACX100 supports Barker, CCK and PBCC™ modes to provide up to 22 Mbps operation, offering greater range and throughput. By optimizing the 802.11b (CCK) operation, TI provides up to 30% throughput improvement at greater distances. When using TI's PBCC modulation scheme for 802.11b+ the ACX100 offers full compatibility with existing 802.11b devices. Through the use of superior multi-path technology, improved performance is achieved by advanced receiver technology, thereby achieving better performance and reach in noisy environments.



ADSL Communications Processor and Two-Chip PHY

The ADSL router chipset (AR5) offers Integrated Silicon and Software Solutions (ISSS) that enable OEMs to develop products quickly and cost-efficiently, while also adding intellectual property for product differentiation. The AR5 consists of three chips–a communications processor and a two-chip physical layer (PHY). The ADSL communications processor is based on the TNETD5301 DSL Communications Processor, which integrates a MIPS™ R-4000 32-bit Reduced Instruction Set Computing (RISC) core, Asynchronous Transfer Mode (ATM) segmentation and reassembly (SAR) performed in hardware and a number of key interfaces for home networking.

A superior architecture gives best-in-class routing performance for fast packet delivery. ATM support is provided by a dedicated hardware function for SAR with firmware quality of service (QoS) support and 8 PVC (Permanent Virtual Circuit) capabilities to enable simultaneous multiple service connections. A variety of interfaces provide networking versatility, including connection to wired and wireless Ethernet, Universal Serial Bus (USB), and other WLAN endpoints.

AR5W Network Support Package (NSP)

The NSP is a complete software package designed forEthernet/USB/802.11b combination modems with an optimized software architecture easily configured for high-volume deployments. The NSP provides all the network protocols, bridging, routing and management features needed to quickly and easily design feature-rich customer premises wireless ADSL modems. The NSP integrates 802.11 software drivers as well as WLAN utilities for debug, system test and personal profile configuration. Developed by Telogy™ Software, the NSP takes advantage of TI's software core competencies to offer a field proven and highly interoperable solution to modem manufacturers worldwide.

The NSP provides an open platform based on the Linux Kernel 2.4.17 operating system (OS) from Monta Vista. A variety of OS development tools support the NSP, enabling OEMs to easily integrate new code blocks on top of the existing NSP for additional router functionality.

Combined with the ADSL transceiver, AFE and ACX100, the NSP running on the ADSL communications processor provides a complete router solution with proven worldwide interoperability.

In-Depth Design Support

The AR5W can be evaluated as a complete ADSL Wireless LAN Router Reference Design. Included in the Hardware Design Kit (HDK) is the ADSL Ethernet router and 802.11b Access Point (AP) schematics and Gerber files along with diagnostic software, a hardware design manual and application notes. Also included is the NSP and Platform Support Package (PSP). USB and 10/100 Ethernet ports, with an optional four port Ethernet switch, are included in the design as well as a PC cardbased 802.11b+ module for complete wireless LAN

functionality. The AR5W provides best-in-class performance for wireless ADSL routers and gives OEMs a a well suited design match for all service needs worldwide. TI will license hardware and software to approved customers along with a comprehensive, renewable maintenance and support package.

TI Products

In addition to the four chips of the AR5W chipset, TI offers a variety of other products for ADSL routers. These include optimized power management solutions such as complete plug-in modules tailored for the AR5 chipset as well as discrete power devices for flexibility.

To learn more about the AR5W Wireless ADSL Router chipset and TI's other leadership WLAN and DSL products, contact your local TI field sales office or visit: www.ti.com/broadband. Find out how the high performance and flexibility of TI's AR5W Wireless ADSL Router Chipset can enhance your next wireless ADSL router design.

AR5W Chipset Components

TNETD5301 Communications Processor

- AAL5 ATM hardware with QoS
- Supports shared and arbitrated Utopia and Xbus interfaces for TI DSL and cable modem solutions
- High-throughput memory interface
- USB function controller
- 1x media-independent interface for Ethernet PHY and/or HPNA MAC/PHY

TNETD5100 ADSL Transceiver

- Programmable TMS320C6200™ DSP core
- Glueless 32-bit external memory interface to synchronous and asynchronous devices
- Glueless interface to TNETD5014 AFE

TNETD5014 ADSL Codec and Line Driver/Receiver

- Complete AFE integrates 14-bit ADC and DAC, line driver/receiver, TX/RX filter, programmable gain amplifiers and equalizer
- Supports both full-rate G.dmt (ITU G.992.1) Annex A, ANSI T1.413i2 and G.lite (ITU G.992.2) ADSL transmission
- Coexists with Bluetooth™, Wireless Ethernet (802.11b) and HPNA devices
- Low power consumption

TNETW1100 (ACX100) 802.11 Single-Chip MAC and Baseband Processor

- Support for 1,2,5,11 and 22 Mbps operation
- 32-bit CardBus, generic 16-bit, PCI and mPCI host interfaces
- Supports bus mastering in CardBus/PCI modes
- No external RAM/Flash required
- DMA allows data in host memory to be stored in non-contiguous memory buffers
- Antenna diversity actively selects the best antenna for greatest signal strength

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