

Product Bulletin

AR7W Wireless ADSL Router



The AR7W ADSL/Wireless Residential Gateway (RG) reference design features TI's market-proven ADSL and wireless local area networking (WLAN) technology in a complete, flexible design kit. With the AR7W, manufacturers can quickly migrate from stand-alone modem designs based on TI's TNETD7300A to the pin-compatible next-generation TNETD7200 and quickly bring to market full-featured ADSL RG with a 802.11b/g access point based on TI's high-performance G++™ WLAN technology. Since the TNETD7300A and TNETD7200 share a common operating system (Linux®) and development environment, software, test elements, drivers and some hardware components can be easily re-used in an AR7W-based wireless RG.

The major TI components in the AR7W include:

- The single-chip AR7 (TNETD7200) ADSL-Ethernet bridge/router device
- TNETW1350A Ethernet MAC/baseband processor
- TNETW3422M RF front end
- An optional TNETW3428 high-power secondary transceiver for 802.11b/g

The AR7W's NSP features the Linux OS and provides the underlying software needed for fast development with differentiated functionality. In addition, TI's G++ WLAN technology is optimized for reach, rate and robustness, providing twice the range for "whole house" coverage and 50 percent higher throughput rates over previous solutions. Because of its output transmit power of 23 dBm and its industry-leading receive sensitivity, the robustness of TI's G++ WLAN technology minimizes the effects of household microwaves, cordless phones and other possible sources of interference.

The AR7W is based on the interoperability, reliability and proven track record of TI's broadband technology, which provides high performance in a platform broadly deployed by service providers worldwide. In conjunction with TI's existing client adapter solutions for PC, mini-PCI and embedded applications, the AR7W provides manufacturers with a complete solution for wireless connectivity.

Flexible Configuration

To satisfy a broad range of market needs, the AR7W has two configurations.

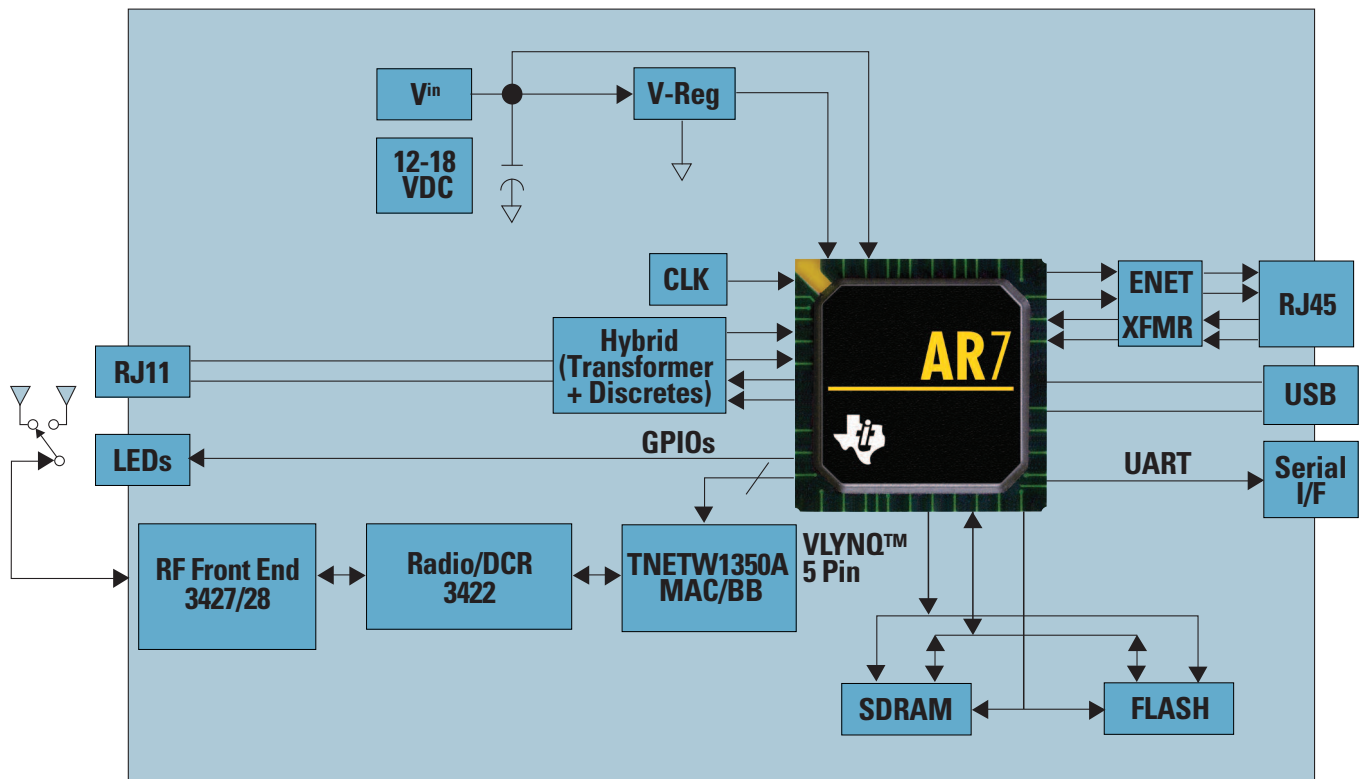
The **AR7W module** implements the 802.11b/g access point on a mini-

Key Features:

- Complete solution for an ADSL modem/router with a high-performance 802.11b/g wireless access point
- Network Support Package (NSP) with a full complement of capabilities, including Linux®
- Easy pin-compatible migration and software re-use from TNETD7300A-based modem/routers to wireless modem/routers based on next-generation TNETD7200
- Dynamic Adaptive Equalization™ improves carriers' service area coverage
- Optimized WLAN range, rate and robustness with TI's G++™ technology
- Compliant with all pertinent ADSL and 802.11 Wi-Fi® standards
- Comprehensive reference design includes schematics, layouts, Gerber files, configuration utilities, router software, drivers, documentation

PCI card plugged into the ADSL motherboard. With this approach, manufacturers have the competitive advantage of the AR7's software environment, including its roadmap to future upgrades, while maintaining the option to select a third-party supplier for the mezzanine card and WLAN radio. The AR7W design also gives manufacturers options for specifying the location of the mezzanine card to accommodate back panel and enclosure considerations.

The **AR7W integrated solution** places all components in a very small space on a motherboard. Because of the high level of integration,



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manufacturers can reduce the bill of materials (BOM) costs while bringing a highly cost-competitive wireless RG to the marketplace. In addition, the relatively low number of components in the AR7W's integrated configuration simplifies assembly and manufacture, and increases reliability.

High-Performance WLAN Connectivity

The Wi-Fi®-certified TNETW1350A is a single-chip media access controller (MAC) and spread spectrum baseband processor that reduces the AR7W's BOM costs while providing a flexible interface for additional features. Used with the industry-leading TNETW322 RF transceiver and TNETW3428 power amplifier for

802.11b/g, the TNETW1350A provides unrivaled price/performance in addition to its leading combination of reach, rate and robustness.

The highly integrated TNETW1350A is compliant with all current 802.11 standards, including 802.11i for security and 802.11e for quality of service (QoS). The device has two interfaces for high-performance VLYNQ™ channels as well as internal power conversion and regulation. Moreover, the TNETW1350a has no need for an external SAW (surface acoustic wave) filter. The TNETW1350a, through hardware-based accelerators for Advanced Encryption Standard (AES) MAC encryption, also supports next-generation WLAN security, including Wi-Fi Protected Access™-2 (WPA2) and WMM for multimedia.

Software Environment

Both AR7W configurations offer the same robust software environment, featuring a comprehensive NSP with extensive Linux OS and driver support, complete documentation, powerful development tools and application programming interfaces (APIs) for accelerated customization and market differentiation. The APIs give manufacturers the ability to quickly incorporate differentiating features to meet the demands of various market segments or geographic regions. In addition, NSP applications such as web-based management, content filtering and support for virtual private networks (VPNs) permit manufacturers to quickly customize these capabilities for further differentiation. Because

the AR7W's NSP is compatible with other AR7 platforms, code portability is ensured among different designs.

Proven ADSL Capabilities

The AR7W builds on the demonstrated interoperability, reliability and consumer acceptance of TI's AR7 family of ADSL technology to ensure end user satisfaction with broadband performance in the most demanding multi-user scenarios. The AR7 router helps service providers extend subscriber coverage and significantly improve data rates to more residences in a given service area. The AR7's unique Dynamic Adaptive Equalization™ technology

addresses line impairments such as ISI, FRI and bridge taps, giving service providers the assurance of an extended ADSL service area with robust broadband performance.

The AR7W design supports all ADSL standards, including G.992.1 (G.dmt) Annexes A,B,I,J, and ANSI T1.413, issue 2. The AR7W can be trained to support the higher downstream rates of ADSL and ADSL2+.

For More Information

To learn more about the AR7W residential gateway solution and TI's other ADSL and 802.11 WLAN products, contact your local TI field sales office or visit www.ti.com/broadband

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