Qualcomm® Wi-Fi Solutions for the IoE

Delivering a low-cost, high performance connectivity hub for devices of the IoE in a user programmable Linux/OpenWRT environment

Solution Highlights
The QCA4531 is a two stream (2x2) IEEE 802.11b/g/n programmable Linux OS access point/router single-band system-on-a-chip (SoC) for the Internet of Everything
- Provides a complete AllJoyn integration client and services implementation
- Uses Qualcomm’s industry-leading 802.11b/g/n single-band 2.4GHz Wi-Fi technology and advanced LAN and WLAN security features
- Integrates a 650MHz MIPS CPU for embedded applications plus a 1 + 4 port fast ethernet switch and other expansive hardware interfaces
- Embeds OpenWRT Linux OS and open source Wi-Fi drivers to simplify software development
- Includes a versatile DDR and SPI flash memory controller
- Integrated communications protocols
  - AllJoyn from the AllSeen Alliance

QCA4531 System Architecture

The QCA4531 is a low-cost turnkey solution that brings high-performance connectivity capabilities in a user-programmable Linux/ OpenWRT environment. OpenWRT offers a built-in package manager that allows packages to be installed directly from a software repository, greatly simplifying development. Benefiting from the extended range based on 2x2 11n, it is designed to serve as a feature-rich IoE node and as a hub to bridge between multiple protocols and ecosystems. The QCA4531 can function as an Access Point supporting up to 16 simultaneous devices, and is also power-optimized to enable appliances to meet international standards for energy efficiency. It supports the AllJoyn connectivity software framework and services, allowing devices to discover, connect and communicate directly with one another.

Qualcomm Wi-Fi solutions are products of Qualcomm Atheros, Inc. AllJoyn is a collaborative open source project of the AllSeen Alliance.
A low-power Linux connectivity hub for the Internet of Everything

QCA4531 Specifications

WLAN Technology 802.11b/g/n

Interfaces 1-DDR, 1-PCIE, 1-USB 2.0 Host, JTAC, 12-GPIO, 1-UART, 1-I2C, 1 + 4 Fast Ethernet Ports

Antennas 2-2.4GHz outputs

Frequency Band 2.4GHz

Channel Bandwidth 20 or 40MHz

Package Type 12 x 12mm dual row 156 pin halogen-free QFN

Module Size 44.3 x 33.5 x 6.2mm, 4 layer PCB (including PCB antenna and 2 - I-PEX connectors)

Operating Temperature Commercial -20˚ to +70° C
Industrial -20˚ to +85° C

Power Source 3.3V nominal

Throughput 2x2 802.11n - 190Mbps (TCP/IP)

MIPS 24Kc CPU Clock 650MHz

Default Memory 64MB DDR, 1GB NAND SPI flash, 1 x 4MB NOR flash

Operating System OpenWRT Embedded Linux

Key Features
- Full AllJoyn integration client and services implementation
- 802.11n 2x2 improves range and quality of service
- MIPS 24Kc CPU with 650MHz clock
- OpenWRT QSDK and open source ATH9K drivers
- USB 2.0 host interface
- DDR2 NAND SPI flash memory manager
- High speed UART
- 1 + 4 fast ethernet switch
- I/F enables MFI option
- Low cost system BOM
  - Integrated LNA and +20 dBm PA
  - QFN package and 4 Layer PCB design
  - 3.3V external power source
- Advanced power management
  - Client-mode optimized power save Wi-Fi functionality
  - Supports dynamic clocking and CPU off mode
- Commercial and Industrial temperature options
- 12 customizable GPIOs

Typical Applications
- Smart appliance connectivity modules
- IoT gateway/hubs
- Home automation and energy management “Smart Plug”
- AllJoyn always on router nodes
- Wi-Fi repeater/range extenders

Software Features
- Supports the AllJoyn connectivity frameworks and services, allowing devices to discover, connect and communicate directly with one another across multiple smart home ecosystems.
  - Control Panel Service Framework
  - Onboarding Service Framework
  - Notification Framework
  - Config Service
  - Security

Certified development kits, reference design platforms and production modules available at developer.qualcomm.com

Qualcomm Atheros is a wholly owned subsidiary of Qualcomm Technologies, Inc. and a leading provider of wireless and wired technologies for the mobile, networking, computing and consumer electronics markets. We're focused on inventing technologies that connect and empower people in ways that are elegant and accessible to all.

For more information, please visit us online @ qualcomm.com and qca.qualcomm.com

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QCA4531-10-19-15