

Product Brief

BCM6776

Quad-Core CPU, Dual-Band 2+4 802.11bn Wi-Fi 8 SoC for High-performance Ethernet Router and Mesh Network Markets

Overview

The Broadcom® BCM6776 is a highly integrated System-on-a-Chip (SoC) designed to power the next generation of Wi-Fi 8 (802.11bn) residential gateways, retail routers, and extenders.

The BCM6776 is designed specifically for the high-performance Ethernet router and mesh network markets. By integrating a powerful network processor with a quad-core CPU complex, this SoC eliminates the need for an external host processor, significantly reducing BOM costs and PCB footprint.

It supports dual-band WLAN operation (2.4 GHz and 5 GHz), including integrated internal power amplifiers and third generation DPD FEMs, and can be expanded to tri-band or quad-band configurations with an external radio like the BCM6718.

Coupled with a versatile memory controller, the BCM6776 integrates multi-gigabit performance into a compact, power-efficient form factor, enabling the next generation of residential connectivity.

Wi-Fi 8 Flagship SoC

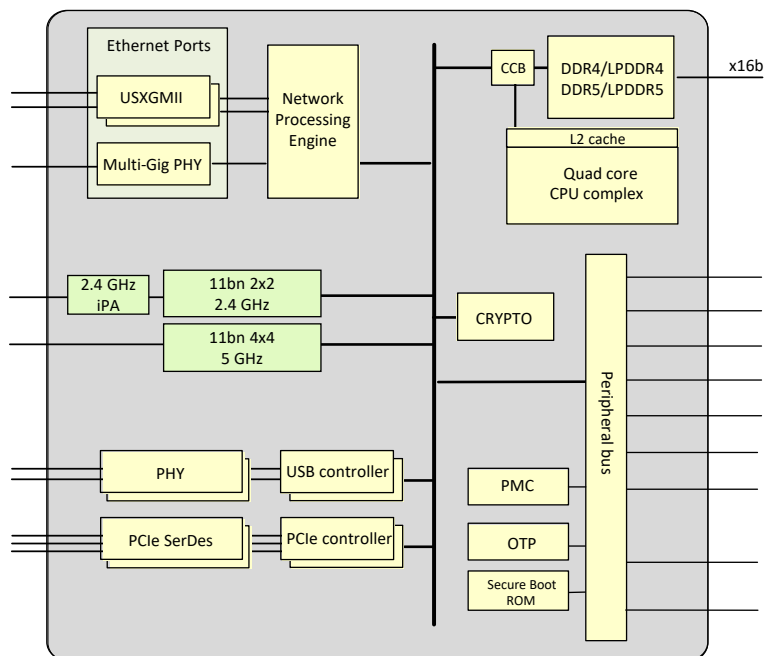
- 6-stream, dual-band 802.11bn UHR
- 2x2 2.4 GHz (40 MHz) + 4x4 5 GHz (160 MHz)
- Integrated Quad-Core CPU complex
- Dedicated network processing engine
- DDR4, LPDDR4, DDR5, LPDDR5 support
- Integrated 2.4 GHz Power Amplifiers (iPA)
- Third generation digital pre-distortion FEM support
- Dual PCIe Gen3 to enable tri-band functionality
- Integrated multi-gig PHY

Applications

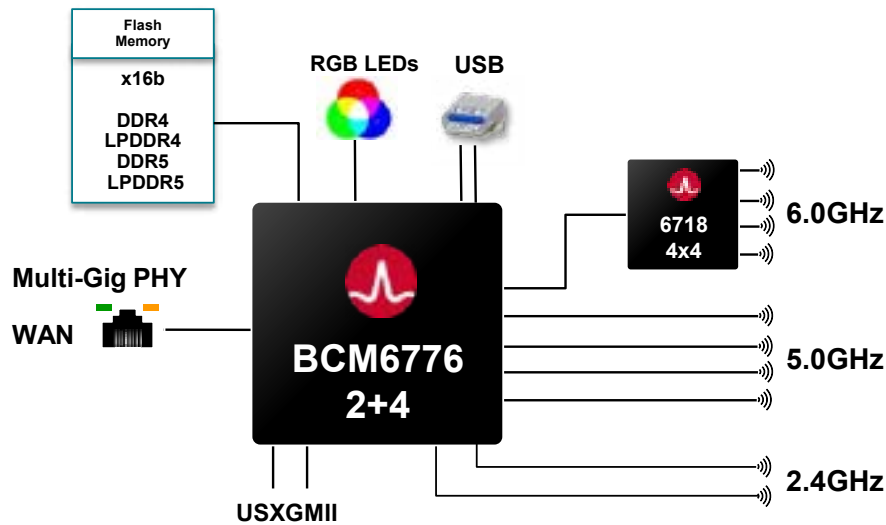
- Residential Wi-Fi access points, routers and repeaters
- Service provider gateways
- Mesh networks



BCM6776 Block Diagram



Typical Wi-Fi 8 Triband Extender Platform



BCM6776 Specifications	
Parameter	Details
Wi-Fi Standards	IEEE 802.11bn (Wi-Fi 8) IEEE 802.11be (Wi-Fi 7) IEEE 802.11a/b/g/n/ac/ax (Wi-Fi 6/6E/legacy)
Spatial Streams	Dual Radio: 2x2 (2.4 GHz) + 4x4 (5 GHz). Total 6 streams
Spectral Bands	20/40 MHz (2.4 GHz), 20/40/80/160 MHz (5 GHz)
Modulation	Up to 4096-QAM (for UHR/Wi-Fi 8 operation)
Multi-Link Operation (MLO)	Supported on all bands
OFDMA and MU-MIMO	Supported in both uplink and downlink direction
Wireless Security	Hardware-accelerated WPA3 (including 192-bit mode) and Secure Boot with PQC (Post-Quantum Cryptography) support
Operating Temperature	0°C to 70°C (commercial temperature)

Ordering Information	
Part Number	Description
BCM6776A0KFEBG	2x2 2.4 GHz + 4x4 5 GHz Wi-Fi8 (802.11bn) Up to 40 MHz for 2.4 GHz and up to 160 MHz for 5 GHz bandwidth