



Figure 1-1 QCN9024 high-level block diagram

1.1 Features

NOTE: The features listed in this document show the chip hardware capability. Supported software features can be found in software documentation.

General

- 4x4/160 MHz 11ax PCIe Radio
- Tri-band: 2.4 GHz, 5 GHz, 6 GHz full band support
- Package: 11.1 x 12 FCBGA, 0.65mm ball pitch

WLAN

- Dual-synthesizer WLAN radio up to 160 MHz bandwidth support
- Supports 20/40 MHz in 2.4 GHz
- Supports 20/40/80/160 MHz in 5 GHz
- Supports 20/40/80/160 MHz in 6 GHz
- Supports up to 256 simultaneously connected clients
- DL/UL MU-MIMO, up to 4 users per PPDU
- DL/UL MU-OFDMA, up to 16 users per PPDU
- TxBF, MU-MIMO, MU-OFDMA/TxBF, ML, STBC
- Dynamic frequency selection (DFS) and Agile DFS (dynamic switching between 4 and 3+1)
- Spectral Analysis (SA) and Agile Spectral Analysis (aSA) for all bands (dynamic switching between 4 and 3+1)
- PTA (3-wire) and WCI/MCI (2-wire) coexistence
- Supports up to 4096 QAM in all antenna and BW configurations, except for 4x4/160 that supports 1024 QAM
- Data rates of up to 688.2 Mbps for 20 MHz and 1376.4 Mbps for 40 MHz channel in 2.4 GHz mode

- Multi-user multiple input multiple output (MU-MIMO) for 802.11ac/ax
- 802.11 ac/ax explicit transmit beamforming (TxBF)
- 802.11 ac/ax beamformee for STA mode
- Spatial reuse through BSS color, OBSS-PD, SRG and SRP
- TCP and UDP checksum offload
- Dynamic bandwidth switching
- Maximum likelihood (ML) decoding
- Supports low-density parity check (LDPC), maximal ratio combining (MRC), Space Time Block Code (STBC)
- AMSDU and AMPDU frame aggregation
 - A-MSDU: No limit on the number of MSDUs aggregated, only limited by maximum A-MSDU size, which is approximately 11kB
 - A-MPDU: Maximum of 256 MPDU per PPDU
- 802.11e-compatible bursting
- Digital Pre-Distortion (DPD)
- Locationing (RSSI and RTT-based, 802.11REVmc compliant)
- Supports monitor mode
- Supports PSD Boost through UL OFDMA

Supported Standards

- IEEE 802.11a/b/g/n/ac/ax
- IEEE 802.11d, h, i, j, k, r, u, v, and w

CPU/Memory

- Integrated CPU with SRAM memory
- On-chip OTP memory

RF Interfaces

- Four interfaces to external 2.4 GHz PAs
- Four interfaces to external PAs operating in the range from 5.150 GHz to 7.125 GHz
- Four interfaces to external LNAs for all bands
- Four PDET interfaces for Front End feedback control signals
- RFSAT and BBSAT; RFSAT improves AACI and ACI performance and BBSAT enables quick AGC
- MIPI interface for Front End Control

Security

- AES-CCMP at 128/256 bits
- AES-GCMP at 128/256 bits
- WEP, TKIP hardware encryption
- WAPI-2 hardware encryption
- WPA/WPA2-Personal/WPA2-Enterprise and WPA3 Personal