



Highly integrated,
high-performance
power-efficient SoC

NXP® 88W8977 802.11n 1 x 1 Wi-Fi® Dual Band + Bluetooth® SoC

The NXP 88W8977 SoC is a highly integrated WLAN (2.4/5 GHz) and Bluetooth single-chip solution, specifically designed to support the speed, reliability and quality requirements of next-generation products.

PRODUCT 88W8977 OVERVIEW

The 88W8977 system-on-chip (SoC) provides both simultaneous and independent operation of the following:

- ▶ IEEE® 802.11n compliant, 1 x 1 spatial stream with data rates up to MCS 7 (150 Mbit/s)
- ▶ Bluetooth 4.2/5.0 features (includes Bluetooth Low Energy (LE))
- ▶ 3-way coexistence for WLAN, Bluetooth, and ZigBee® operation with NXP ZigBee solutions
- ▶ Indoor location and navigation (802.11 mc and Bluetooth LE angles)

Internal coexistence arbitration and a mobile wireless systems (MWS) serial transport interface provide the functionality for connecting an external long term evolution (LTE) or ZigBee device.

For security, the device supports high-performance 802.11i security standards through implementation of the Advanced Encryption Standard (AES)/Counter Mode CBC-MAC Protocol (CCMP), Wired Equivalent Privacy (WEP) with Temporal Key Integrity Protocol (TKIP), AES/Cipher-Based Message Authentication Code (CMAC), and WLAN authentication and privacy infrastructure (WAPI) security mechanisms.

For video, voice, and multimedia applications, 802.11e Quality of Service (QoS) is supported. The device also supports 802.11h dynamic frequency selection (DFS) for detecting radar pulses when operating in the 5 GHz range.

Generic interfaces include SDIO 3.0 and high-speed UART interfaces for connecting WLAN and Bluetooth technologies to the host processor. The device is available in QFN and eWLP package options.



GENERAL FEATURES

- ▶ Dual simultaneous and independent WLAN and Bluetooth (includes LE) operation
- ▶ Dynamic rapid channel switching (DRCS) for simultaneous and power-efficient operation in 2.4 GHz and 5 GHz bands
- ▶ Coexistence with cellular and other on-chip radios
- ▶ Low-power dissipation
- ▶ CMOS and low-swing sine wave input clock
- ▶ Digital audio interfaces (PCM/proprietary TDM)
- ▶ 26 MHz reference clock select
- ▶ Optional external 32.768 kHz CMOS-level sleep clock
- ▶ Power management with sleep clock
- ▶ Fully compatible with power management (PM) devices (external PM device required for power supply)
- ▶ On-chip LDO for 1.1 V generation from V18

- ▶ Sleep and standby modes for low-power operation
- ▶ One-time programmable (OTP) memory to eliminate need for external EEPROM

Packaging

- ▶ 68-pin QFN
- ▶ 74-bump eWLP

SoC Level

CPU

- ▶ Dual-core CPUs
- ▶ 160 MHz max CPU clock speed

Direct Memory Access (DMA)

- ▶ Independent 2-Channel DMA

Memory

- ▶ Internal SRAM for Tx frame queues/Rx data buffers
- ▶ Boot ROM

Test

- ▶ On-chip diagnostic information

APPLICATIONS

- ▶ IoT, mobiles, IP cameras, wearables and smart home applications

IEEE 802.11 STANDARDS

- ▶ 802.11 data rates of 1 and 2 Mbit/s
- ▶ 802.11b data rates of 5.5 and 11 Mbps
- ▶ 802.11a/g data rates 6, 9, 12, 18, 24, 36, 48, and 54 Mbit/s for multimedia content transmission
- ▶ 802.11g/b performance enhancements
- ▶ 802.11n with maximum data rates up to 72 Mbit/s (20 MHz channel), 150 Mbit/s (40 MHz channel)
- ▶ 802.11d international roaming
- ▶ 802.11e quality of service
- ▶ 802.11h transmit power control
- ▶ 802.11h DFS radar pulse detection
- ▶ 802.11i enhanced security
- ▶ 802.11k radio resource measurement
- ▶ 802.11mc precise indoor location and navigation
- ▶ 802.11n block acknowledgement extension
- ▶ 802.11r fast hand-off for AP roaming
- ▶ 802.11u Hotspot 2.0 (STA mode only)
- ▶ 802.11v TIM frame transmission/reception
- ▶ 802.11w protected management frames
- ▶ Fully supports clients (stations) implementing IEEE Power Save mode