Synaptics SYN4381

The Synaptics SYN4381 is a 16 nm ultra-low power system-on-chip (SoC) containing a 1×1 IEEE 802.11ax-compliant wireless local area network (WLAN) radio, Bluetooth™ (BT) 5.3 radio, and IEEE 802.15.4 support.

The WLAN host interface is PCIe v3.0 compliant and runs at Gen2 speeds. The BT host interface is a high-speed 4-wire high-speed universal asynchronous receiver/transmitter (UART).

Wireless LAN Key Features

- IEEE 802.11ax compliant.

- Radio support for the 2.4 GHz and 5 GHz/6 GHz bands.

- PHY rate up to 600 Mbps during single-band operation.

- 20/40/80 MHz channels for the 5 GHz/6 GHz radio, and 20/40 MHz channels for the 2.4 GHz radio.

- IEEE 802.11a/b/g/n/ac legacy compatibility.

- 20/40/80 MHz channels with 1024-QAM modulation and an optional short guard interval (SGI).

- On-chip power amplifiers and low-noise amplifiers (LNAs) for three bands and support for external LNAs.

- Supports two antennas with one dedicated to BT and one to a wireless local area network (WLAN).

- Supports a multipoint external coexistence interface to optimize bandwidth utilization with collocated wireless technologies such as long-term evolution (LTE) and global positioning system (GPS).

- A shared BT and WLAN receive signal path that eliminates the need for an external power splitter while maintaining excellent sensitivity for both BT and WLAN.

- PCIe mode complies with PCI Express base specification revision 3.0 for ×1 lane and power management running at Gen2 speeds.

- Supports a standard SDIO v3.0 (4-bit and 1-bit) host interface that is backward compatible with SDIO v2.0.

- Integrated Arm processor runs at 400 MHz with 1.5 MB of SRAM and 1.8 MB of ROM.

- Secure boot capable.

Features and Benefits

Bluetooth™ Key Features

- BT Core Specification Version 5.3, including the following support:
  - Low energy (LE) isochronous channels
  - LE power controls
  - LE enhanced connection updates
  - LE channel classification
  - LE audio

- High-accuracy distance measurement (HADM)

- Host controller interface (HCI) encryption key size control.

- Supports extended synchronous connections (eSCO), for enhanced voice quality by allowing for retransmission of dropped packets.

- Supports multiple simultaneous advanced audio distribution profiles (A2DP) for stereo sound.

- Adaptive frequency hopping (AFH) to reduce radio frequency interference.

- Interface support: host controller interface (HCI) using a UART interface and pulse-code modulation (PCM) for audio data.

- Advertise data information (ADI) in periodic advertising

- Multi-profile application framework (MPAF)

- USB HID emulation (UHE)

- Integrated Arm processor running at 160 MHz with 1.6 MB of RAM and 2 MB of ROM

- Pulse-width modulation (PWM) channels

- ADC and keyscan

- Bluetooth Class 1 or Class 2 TX operation

Wireless LAN Interfaces

- Host interface options:
  - PCIe (gen2)
  - SDIO 3.0
  - USB 2.0 (only WLCSP and FCFBGA)

- Fast UART

- JTAG (for debug)

Bluetooth Interfaces

- High-speed UART for HCI

- Peripheral UART

- PCM and I2S for audio data

- I2C master and slave

- Serial peripheral interface (SPI) for external flash

Synaptics SYN4381 Triple Combo™

Product Brief

Trademarks

Notice