

Doodle Labs 802.11AX (Wi-Fi 6) Industrial Wi-Fi Transceiver (Preliminary)

Features

Best in class features include:

- 4x4 MIMO, WiFi6E (Tri-band operation)
- 2.4 and 5/6 GHz operation
- 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 1024 QAM (4SS) and 4096 QAM(2SS)
- Data rates of up to 4804 Mbps in 802.11ax 160 MHz channels in 5GHz and 6GHz mode
- Data rates of up to 1147 Mbps in 802.11ax 40 MHz channels in 2.4GHz mode
- Integrated LNA for best-in-class Rx sensitivity to pick up low energy signals from mobile phones.
- Up to 28 dBm of RF power to get the largest possible area coverage.
- Performs both AP and STA functionality with 4 spatial streams.
- High interference immunity for Wi-Fi congested environments.
- Extended temperature range from -40C to +85C
- Electrical Stress Protection on antenna ports for outdoor operation
- Long product life cycle to meet the needs of Industrial IoT applications.
- High band isolation to support tri-band operation.
- Modular FCC, CE and IC certifications to expedite system integration (Planned)
- Hardware "RF Kill" feature to meet the FAA requirement for airborne applications
- SMT mountable PCIe 3.0 compliant digital interface
- M.2 Key E design, mini PCIe option with M.2 to mini PCIe adapter.



11AX Transceiver Specifications

Technical Specifications	
Radio Configuration	<ul style="list-style-type: none">• Up to 4x4 MIMO• Up to 160-MHz Channel bandwidth• Up to 4804 Mbps (5/6 GHz) and 1147 Mbps (2.4 GHz)
Frequency Bands	<ul style="list-style-type: none">• 2.4 GHz: 2.412 - 2.472 GHz• 5 GHz: 5.15 - 5.95 GHz• 6E: 5.925 - 7.125 GHz
Chipset	Qualcomm QCN9074
Data Rate	<ul style="list-style-type: none">• 802.11b : 11 Mbps• 802.11g : 54 Mbps• 802.11a : 54 Mbps• 802.11n : MCS0~31• 802.11ac :MCS0~9 (up to 4 spatial streams)• 802.11ax : HE0~11 (up to 4 spatial streams)
Modulation	<ul style="list-style-type: none">• 802.11b : DBPSK, DQPSK, BSPK, QPSK• 802.11g : OFDM (BPSK, QPSK, 16-QAM, 64-QAM)• 802.11a : OFDM (BPSK, QPSK, 16-QAM, 64-QAM)• 802.11n : OFDM (BPSK, QPSK, 16-QAM, 64-QAM)• 802.11ac : OFDM (BPSK, QPSK, 16-QAM, 64-QAM, 256-QAM)• 802.11ax : OFDMA (BPSK, QPSK, DBPSK, DQPSK, 16-QAM, 64-QAM, 256-QAM, 1024-QAM, 4096-QAM)
Software Support	Open Source ath11k Linux Driver
Host Interface	PCI Express 3.0 dual-lane interface (M.2 Key E / Mini PCIe) Board mountable interface (option)
Operating Voltage	3.3-V PCIE, 5-V External (optional for low-current PCIE)
Power consumption	10-W max power @ 4x4 MIMO
RF Connectors	U.FL or MMCX (option)

RF Transmit Power	22 dBm per antenna at MCS0 (28 dBm total)
Temp Range	-40 to +85°C
Humidity	0% - 95% (Non-condensing)
Dimensions	60 x 21.95 x 5.5 mm (PCIe standards compliant)
Module weight (g)	13.4 grams (top cover only) 17.0 grams (top + bottom cover)
RF Hardware Disable	'RF Kill' feature for FAA compliance
Quality Standards Compliance	<ul style="list-style-type: none"> • Extreme Reliability, IPC Class 2 standard with Class 3 options • Compliant to MIL-STD-810H, Qualified for high shock/vibration environments
Optional Hardware	<ul style="list-style-type: none"> • Mini PCIe to M.2 Key E adapter • 5mm Heatsink • 10mm Heatsink
Lifecycle	Extended lifespan
Interference Immunity	High Q filters on 2.4 GHz RF ports for immunity against high power cellular transmissions
Security	<ul style="list-style-type: none"> • 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

Mechanical Drawings (Preliminary)

