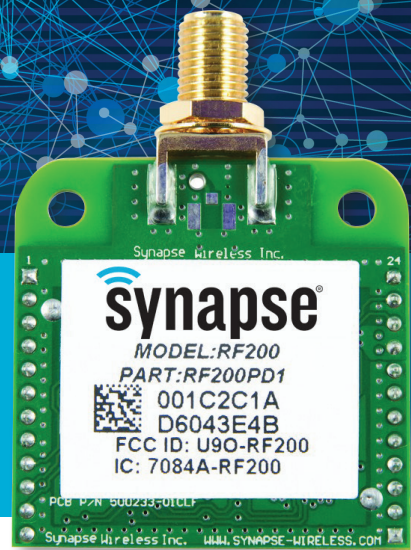


Synapse RF200PD1 Engine



The **Synapse RF200PD1** module is an IEEE 802.15.4, low power, highly-reliable solution to embedded wireless control and monitoring network needs that require high data rates. The RF200PD1 embeds Synapse's SNAP OS, the industry's first Internet-enabled, wireless mesh network operating system, into the Atmel ATmega128RFA1 single-chip AVR® microcontroller with an integrated transceiver that delivers a radio data rate up to 2Mbps/sec. These low-cost modules can have a range of up to three miles and power consumption as low as 0.6 μ A to enable a new generation of battery-driven systems.

SNAP's on-board Python interpreter provides for rapid application development and over-the-air programming, while Atmel's low-power RF single-chip design saves board space and lowers the overall Bill of Materials and power consumption. The RF200PD1 is approved as an FCC Part 15 unlicensed modular transmitter. The modules provide up to 16 channels of operation in the ISM 2.4GHz frequency band. The RF200PD1 module contains both a power amplifier for transmission and a low noise amplifier in the receive path for extended range.

- 20 GPIO, and up to 8 A/D inputs
- Two UART ports for control or transparent data
- Low power modes: 1.6 μ A with internal timer running
- 128k flash, 60k free for over-the-air uploaded user apps
- FCC and IC certified
- Socket-able or solder-able
- Up to 3 miles LOS range
- 250 kbps to 2 Mbps Radio Data Rate
- 2.4 GHz RF Frequency
- Spread Spectrum (DSSS) technology
- Receive Amplifier (7 dBm)
- Transmit amplifier (15 dBm)
- RPSMA antenna connector
- SNAP Network Operating system

For more information call or visit:

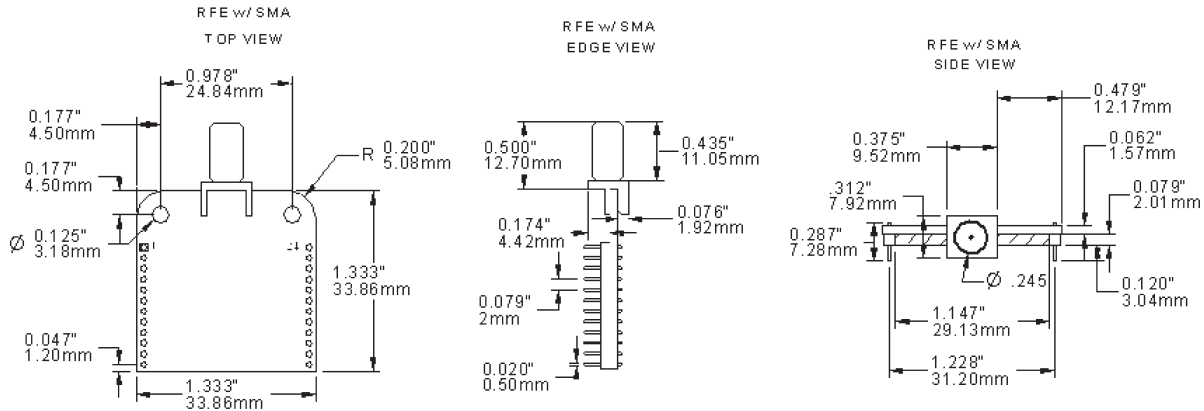
(877) 982-7888 // synapse-wireless.com

Proven Solutions for the
Internet of Everything

The Synapse logo features a blue Wi-Fi symbol above the word "synapse" in a bold, black, sans-serif font. The word "synapse" is lowercase, with a registered trademark symbol (®) to its upper right.

Synapse RF200PD1 Engine

Physical Dimensions



Part Selection

Part No.	Antenna	Receive Amp	Power Amp
RF200PD1	External*	Yes	Yes

*External antenna sold separately. Ask your sales representative.

Specifications

Performance	Indoor Range	Up to 1000 ft. (** 200 ft.)
	Outdoor LOS Range	RF200PD1: Up to 3 miles at 250Kbps
		RF200PF1: Up to 2.5 miles at 250Kbps
	Transmit Power Output	15 dBm
	RF Data Rate	250Kbps, 500Kbps, 1Mbps, 2Mbps
	Receiver Sensitivity	-103 dBm (1% PER)
Power Requirements	Supply Voltage	2.0 – 3.6V
	Transmit Current (Typ@3.3V)	80 mA
	Idle/Receive Current (Typ@3.3V)	20 mA
	Power-down Current (Typ@3.3V)	1.6 μ A timed 0.6 μ A untimed
General	Frequency	ISM 2.4 GHz
	Spreading Method	Direct Sequence (DSSS)
	Modulation	O-QPSK
	Dimensions	1.333" x 1.333"
	Operating Temperature	-40 to 85 deg C.
	Antenna Options	RF200PD1: External RPSMA RF200PF1: F- antenna
Networking	Topology	SNAP
	Error Handling	Retries and acknowledgement
	Number of Channels	16
Available I/O	UARTS with HW Flow Control	2 ports – 8 total I/O
	GPIO	20 total, 7 can be analog-in with 10 bit ADC
Agency Approvals	FCC Part 15.247	FCC ID: U90-RF200
	Industry Canada (IC)	IC: 7084A-RF200
		CE available as a custom part. Call for details.

RF200PD1 Module Pin Assignments

Pin	Name	Description
1	GND	Power Supply
2	GPIO0/OC0A/OC1C/PCINT7/PB7	GPIO_0, PWM, or Interrupt
3	GPIO1/OC1B/PCINT6/PB6	GPIO_1, PWM, or Interrupt
4	GPIO2/OC1A/PCINT5/PB5	GPIO_2, PWM, or Interrupt
5	GPIO3/RXD0/PCINT8/PE0	GPIO_3, Interrupt, or UART0 Data Input
6	GPIO4/TXD0/PE1	GPIO_4, UART0 Data Output
7	GPIO5/OC3B/INT4/PE4	GPIO_5, PWM, Interrupt, or UART0 CTS Output
8	GPIO6/OC3C/INT5/PE5	GPIO_6, PWM, Interrupt, or UART0 RTS Input
9	GPIO7/RXD1/INT2/PD2	GPIO_7, Interrupt, or UART1 Data Input
10	GPIO8/TXD1/INT3/PD3	GPIO_8, Interrupt, or UART1 Data Output
11	GPIO9/ICP1/PD4	GPIO_9, or UART1 CTS Output
12	GPIO10/ICP3/INT7/CLK0	GPIO_10, Interrupt, Clock Output, or UART1 RTS Input
13	GPIO11/ADC0/PF0	GPIO_11, or Analog In
14	GPIO12/ADC1/PF1	GPIO_12, SPI MOSI, or Analog In
15	GPIO13/ADC2/DIG2/PF2	GPIO_13, SPI SCLK, Antenna Diversity, or Analog In
16	GPIO14/XCK0/AIN0/PE2	GPIO_14, SPI MISO, USART CLK, Analog Comparator, or Analog In
17	GPIO15/ADC4/TCK/PF4	GPIO_15, JTAG TCK, or Analog In
18	GPIO16/ADC5/TMS/PF5	GPIO_16, JTAG TMS, or Analog In
19	GPIO17/ADC6/TDO/PF6	GPIO_17, JTAG TDO, I2C SDA, or Analog In
20	GPIO18/ADC7/TDI/PF7	GPIO_18, JTAG TDI, I2C SCL, or Analog In
21	VCC	Power Supply
22	GPIO19/OC3A/AIN1/PE3	GPIO_19, PWM, Analog Comparator
23	RESET	Module Reset, Active Low
24	GND	Power Supply