

Synapse RF220

Models RF220UF1, RF220SU, and RF220SU-EU

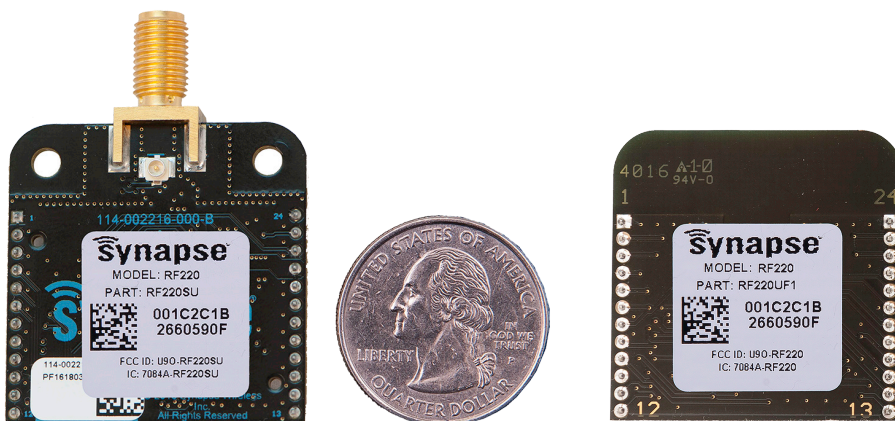
All the power of the SM220 in a modular form

The SNAP Module Model RF220 series is an IEEE 802.15.4, low-power, highly reliable solution for embedded wireless control and monitoring networks that require great range and low power.

When time to market is critical, the modular format of the RF220 makes prototyping and testing easy. Later, when the design is in the field, module swaps and upgrades are just as fast thanks to the common footprint.

The RF220 model 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 up to 2Mbps/sec in up to 15 channels of operation in the ISM 2.4GHz frequency band. This low-cost module enables a new generation of battery-driven systems with current consumptions as low as 390nA. The RF220 also includes a Skyworks SE2431L front-end module, which provides a power amplifier and LNA for increased range.

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 power consumption.



Product Highlights

- 20 GPIO with up to 7 A/D inputs
- 128k flash, 58.5k free for over-the-air uploaded user apps
- Two UART ports for control or transparent data
- Three low power modes
- Spread Spectrum (DSSS) technology
- Up to 2 Mbps radio data rate
- 2.4 GHz RF Frequency
- AES 128-bit encryption
- Options for Integrated on-board compact F, U,FL connector, or RP-SMA antennas
- Solder-able or socket-able
- 4K internal EEPROM
- 8 PWM outputs
- Supports over the air firmware upgrades.

6723 Odyssey Drive // Huntsville, AL 35806
(877) 982-7888 // Synapse-Wireless.com



RF220 Specifications*

| | | | | |
|---------------------------|-------------------------------------|--|--|--|
| Performance | Outdoor LOS Range | RF220UF1 | Up to 3 miles at 250 Kbps using a 5.5dBi antenna Up to .5 mile using on-board F antenna | |
| | | RF220SU/SU-EU | Up to 3 miles at 250 Kbps using a 5.5dBi antenna | |
| | Transmit Power Output | up to +20 dBm | | |
| | RF Data Rate | 250Kbps, 500Kbps, 1Mbps, 2Mbps | | |
| | Receiver Sensitivity | -103 dBm (1% PER, 250Kbps) | | |
| Power Requirements | Supply Voltage | 2.0 - 3.6 V | | |
| | Transmit Current (Typ@3.3V) | at +20 dBm: 150 mA at +6 dBm: 55 mA | | |
| | Idle/Receive On (Typ@3.3V) | 22mA | | |
| | Idle/Receive Off (Typ@3.3V) | 7.8 mA | | |
| | Sleep Mode Current (Typ@3.3V) | Timed Sleep: 1.27 μ A Untimed Sleep Mode : 390 nA | | |
| General | Frequency | ISM 2.4 GHz | | |
| | Spreading Method | Direct Sequence (DSSS) | | |
| | Modulation | O-QPSK | | |
| | Dimensions (PCB) | 33.86mm x 33.86mm | | |
| | Operating Temperature | -40 to 85 deg C. | | |
| | Antenna Options | RF220UF1 | U.FL and on-board compact F antenna | |
| | | RF220SU/SU-EU | U.FL and RP-SMA | |
| | Weight | RF220UF1 | 6 grams | |
| RF220SU/SU-EU | | 9 grams | | |
| Networking | Topology | SNAP | | |
| | Error Handling | Retries and Acknowledgement | | |
| | Number of Channels | 15 channels. To avoid exceeding FCC limits, channel 15 operates in a receive only state. | | |
| Available I/O | UARTS with optional HW Flow Control | 2 ports | | |
| | GPIO | 20 Total, 7 can be analog-in with 10bit ADC | | |
| Agency Approvals | FCC Part 15.247 | FCC ID: U9O-RF220 | | |
| | CE Certified | The RF220SU-EU is certified to EN300 328 Version 1.8.1 | | |
| | Industry Canada (IC) | 7084A-RF220 | | |

| Part No. | Antenna | Receive Amp | Power Amp |
|------------|-----------------------------|-------------|-----------|
| RF220UF1 | U.FL and compact Internal F | Yes | Yes |
| RF220SU | U.FL and RP-SMA | Yes | Yes |
| RF220SU-EU | U.FL and RP-SMA | Yes | Yes |

* at 23° C and 3.3V unless otherwise noted

More technical details are in the RF220 datasheets available from:

<https://developer.synapse-wireless.com/modules/rf220/>