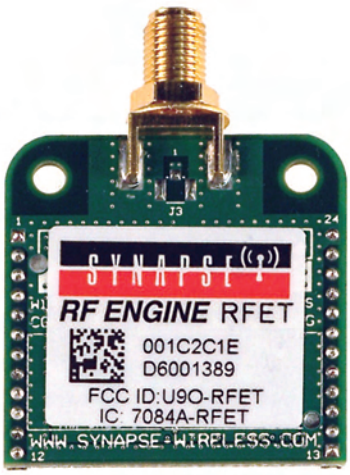
Wireless Technology to Control and Monitor Anything from Anywhere™

SYNAPSE RF Engine

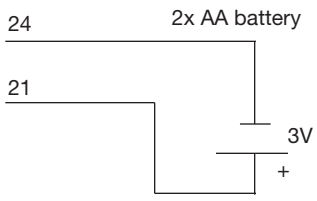
IEEE 802.15.4 RF Modules

The Synapse RF Engine™ is the all-in-one solution to your embedded wireless control and monitoring needs. Just apply power and you're instantly connected in a SNAP® mesh network. Typical applications include a wireless serial port, sensor monitoring, actuator control, or an intelligent embedded controller.

The Synapse RF Engine offers unmatched performance in a 2.4GHz IEEE 802.15.4 module. Combined with SNAP firmware, it is *the* off-the-shelf solution to bring your application to market quickly.



- SNAP – Instant-ON mesh network stack
- Powerful, reliable wireless connection in 2.4GHz licence-free band
- Spread spectrum (DSSS) technology surmounts noisy environments
- Optional, Transmit amplifier (18 dBm) for best-in-class range
- Multiple antenna choices
  - · SMA connector (reverse-polarity) for external antenna
  - · Embedded "F" antenna
- Receive amplifier (10 dBm) standard
- Up to 3-mile range
- Low power modes, down to 2.5 µA with internal timer running
- Nineteen available general purpose I/Os including:
  - · Up to eight analog inputs with 10-bit ADC
  - · Two UART ports for control or transparent data
- 60k flash, with 20k free for over-the-air uploaded user apps
- FCC Certified on all 16 channels



Typical Application Circuit:
Mesh Router

Available with AES-128 encryption for secure applications.

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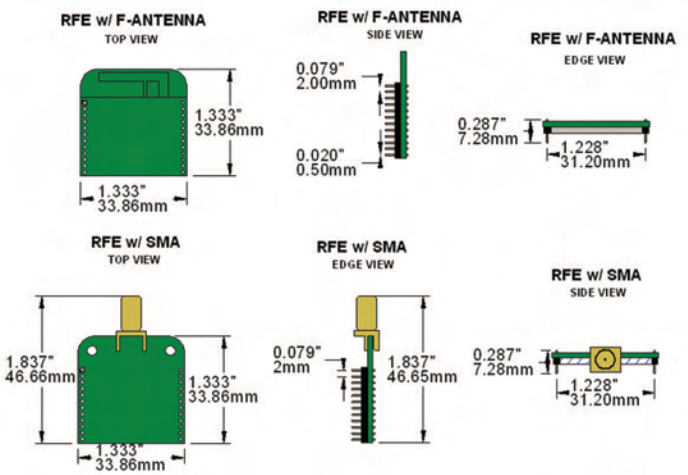
Physical Dimensions



Specifications

Performance	Indoor Range	Up to 1000 ft. (** 200 ft.)
	Outdoor LOS Range	Up to 3.0 miles (** up to 3000 ft.)
	Transmit Power Output	18 dBm (** 0 dBm)
	RF Data Rate	250,000 bps
	Receiver Sensitivity	-102 dBm (1% PER)
Power Requirements	Supply Voltage	2.7 – 3.4V
	Transmit Current (Typ)	110 mA (** 40 mA)
	Receive Current (Typ)	65 mA
	Idle Current (Typ)	15 mA
	Sleep Current (Typ)	2.5 µA
General	Frequency	ISM 2.4 GHz
	Spreading Method	Direct Sequence
	Modulation	O-QPSK
	Dimensions	1.333" x 1.333"
	Operating Temperature	-40 to 85 deg C.
	Antenna Options	Integrated F, External RPSMA
Networking	Topology	SNAP or ZigBee
	Number of Channels	16
Available I/O	UARTS with HW Flow Control	2 ports – 8 total I/O
	GPIO	19 total, 8 can be analog in with 10-bit ADC
Agency Approvals	FCC Part 15.247	Yes, Class B
	Industry Canada (IC)	Yes

*** RFE with receive only amp specs, all other specs apply to all RF Engines*

For more technical details, see SNAP Hardware Technical Manual on the SYNAPSE Customer Forum: forums.synapse-wireless.com

Part Selection

Part No.	Antenna	Receive Amp	Power Amp
RF100PD6	External *	Yes	Yes
RF100PC6	F type	Yes	Yes
RF100P86	F type	Yes	No

** External antenna sold separately - ask your sales representative*

Pinout

Pin No.	Name	Direction	Description
1	GND	-	Power Supply/Return
2	GPIO0_TPM1CH2	Bidirectional	GPI/O, or Timer1 Channel 2 (PWM)
3	GPIO1_KBI0	Bidirectional	GPI/O, Keyboard In
4	GPIO2_KBI1	Bidirectional	GPI/O, Keyboard In
5	GPIO3_RX_UART0	Input	UART0 Data In
6	GPIO4_TX_UART0	Output	UART0 Data Out
7	GPIO5_KBI4_CTS0	Bidirectional	GPI/O, Keyboard In, or UART0 CTS
8	GPIO6_KBI5_RTS0	Bidirectional	GPI/O, Keyboard In, or UART0 RTS
9	GPIO7_RX_UART1	Input	UART1 Data In
10	GPIO8_TX_UART1	Output	UART1 Data Out
11	GPIO9_KBI6_CTS1	Bidirectional	GPI/O, Keyboard In, or UART1_CTS
12	GPIO10_KBI7_RTS1	Bidirectional	GPI/O, Keyboard In, or UART1_RTS
13	GPIO11_AD7	Bidirectional	GPI/O, or Analog In
14	GPIO12_AD6	Bidirectional	GPI/O, or Analog In
15	GPIO13_AD5	Bidirectional	GPI/O, or Analog In
16	GPIO14_AD4	Bidirectional	GPI/O, or Analog In
17	GPIO15_AD3	Bidirectional	GPI/O, or Analog In
18	GPIO16_AD2	Bidirectional	GPI/O, or Analog In
19	GPIO17_AD1	Bidirectional	GPI/O, or Analog In
20	GPIO18_AD0	Bidirectional	GPI/O, or Analog In
21	VCC	-	Power Supply
22	Reserved	-	-
23	RESET_L	Bidirectional	Module Reset, Active Low
24	GND	-	Power Supply/Return

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