

Synapse SM200P81 RF Engine

Synapse's **SM200P81 RF Engine**[®] is a reliable, IEEE802.15.4, surface-mount module reaching data rates up to 2Mbps. This small, low-powered, 2.4 GHz transmitter-receiver module can have a range of up to 1,500 ft and power consumption as low as 0.250 μ A. The SM200P81 RF Engine comes pre-loaded with the Synapse SNAP[®] mesh network operating system and provides interoperability with other SNAP RF Engines.



SM200P81 Features:

- 33 GPIO and up to 8 A/D inputs
- Two UART ports for control or transparent data
- Low power modes: 1.6mA with internal timer running
- 128k flash, 60k free for over-the-air uploaded user apps
- Spread spectrum (DSSS) technology surmounts noisy environments
- Small form factor surface mount
- Up to 2 Mbps Data Rate

For more information call or visit:

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



Synapse SM200P81 RF Engine

Part Selection

Part No.	Antenna	Receive Amp	Power Amp
SM200P81	Chip	Yes	Yes

SM200P81 Specifications

Performance	Indoor Range	Up to 100 ft.
		Up to 1,500 ft.
	Outdoor LOS Range	RF200PF1: Up to 2.5 miles at 250Kbps
	Transmit Power Output	3dBm
	RF Data Rate	250Kbps, 500Kbps, 1Mbps, 2Mbps
	Receiver Sensitivity	-100dBm (1%PER)
Power Requirements	Supply Voltage	2.0 – 3.4V
	Transmit Current (Typ)	<20mA
	Receive Current (Typ)	<20mA
	Sleep Current (Typ)	1.6mA timed
	Frequency	ISM 2.4 GHz
	Spreading Method	Direct Sequence
Comorol	Modulation	O-QPSK
General	Dimensions	19.00mm X 29.80mm
	Operating Temperature	-40 to 85 deg C.
	Antenna Options	Chip
Networking	Topology	Mesh (SNAP)
	Number of Channels	16
Available I/O	UARTS with HW Flow Control	2 ports – 8 total I/O
Available I/O	GPIO	33 Total, 8 with 10-bit ADC
Agency	FCC Part 15.247	Yes, Class B
Approvals	Industry Canada (IC)	Yes

PWM

Eight pins can optionally be used as Pulse Width Modulation (PWM) outputs, as shown in the following table.

ATmega128RFA1	Pad
PB4 PCINT4 OC2	E3
PB5 PCINT5 OC1A	D1
PB6 PCINT6 OC1B	D2
PB7 PCINT7 OC0A/OC1C	D3
PE3 AINO OC3A	B2
PE4 INT4 OC3B	C3
PE5 INT5 OC3C	B3
PG5 OC0B	G5

SM200P81 Module Pin Assignments

Pin #	Pin Name	Pin #	Pin Name
A1	GND	E1	PB2_MOSI_PDI_PCINT2
A2	VCC	E2	PB3_MISO_PDO_PCINT3
A3	VCC	E3	PB4_OC2A_PCINT4
A4	PF0_ADC0	E4	NC
A5	PF2_ADC2_DIG2	E5	NC
A6	PF4_ADC4_TCK	E6	NC
A7	PF6_ADC6_TDO	E7	NC
A8	GND	E8	RF OUT (Special Order)
B1	PE2_XCK0_AIN0	F1	PB0_SSN_PCINT0
B2	PE3_OC3A_AIN1	F2	PB1_SCK_PCINT1
B3	PE5_OC3C_INT5	F3	PD1_SDA_INT1
B4	PF1_ADC1	F4	PD0_SCL_INT0
B5	PG1_DIG1	F5	NC
B6	PF5_ADC5_TMS	F6	NC
B7	PF7_ADC7_TDI	F7	NC
B8	GND	F8	GND
C1	PE0_RXD0_PCINT8	G1	CLKI
C2	PE1_TXD0	G2	PD7_T0
C3	PE4_OC3B_INT4	G3	PD4_ICP1
C4	PE6_T3_INT6	G4	PD2_RXD1_INT2
C5	PE7_ICP3_INT7_CLK0	G5	PG5_OC0B
C6	NC	G6	NC
C7	NC	G7	NC
C8	GND	G8	GND
D1	PB5_OC1A_PCINT5	H1	GND
D2	PB6_OC1B_PCINT6	H2	PD6_T1
D3	PB7_OC0A_OC1C_PCINT7	H3	PD5_XCK1
D4	NC	H4	PD3_TXD1_INT3
D5	NC	H5	RESET#
D6	NC	H6	TST
D7	NC	H7	NC
D8	GND	H8	GND

Please refer to the SNAP User's Guide for the I/O pin-mappings used by the SNAP-OS.

More technical details are in SNAP Hardware Technical Manual, Synapse Customer Forum: forums.synapse-wireless.com