

Description

The Si4313 is a single-ended universal ISM receiver for cost-sensitive applications featuring technology developed for the EZRadio® product family.

The Si4313 offers a simple, single-ended radio implementation over the 240–960 MHz frequency range. A receive sensitivity of up to –118 dBm allows for the creation of communication links with an extended range. The Si4313 offers excellent receiver performance in cost-sensitive radio applications.

The Si4313 provides designers with advanced features to enable low system power consumption by offloading a number of RF-related activities from the system MCU allowing for extended MCU sleep periods. Additional features, such as an automatic wake-up timer, 64-byte RX FIFO, and a preamble detection circuit, are available.

The Si4313's digital receive architecture features an ADC and DSP based modem that performs the radio demodulation and filtering for increased performance.

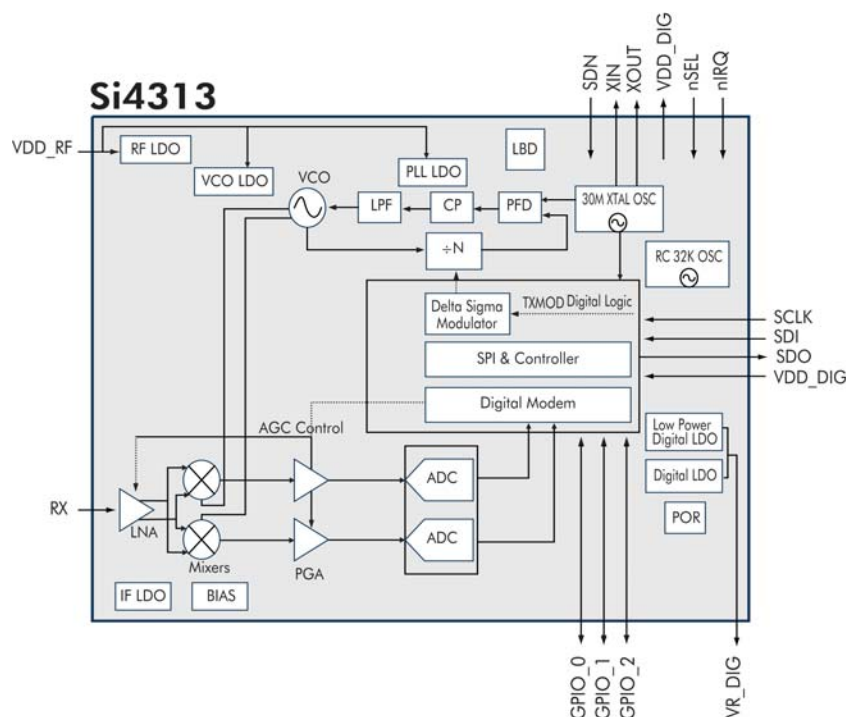
The Si4313 is designed to work with a microcontroller, crystal, and a few passives to create a very low-cost system. Voltage regulators are integrated on-chip, which allows for a wide range of operating supply voltage conditions from +1.8 to +3.6 V. A standard 4-pin SPI bus is used to communicate with the microcontroller. Three configurable general-purpose I/Os are also available. Minimal antenna matching is required allowing the use of a single ac coupling capacitor which simplifies the system design and lowers the solution cost.

Features

- Frequency range = 240–960 MHz
- Sensitivity = –118 dBm
- Low power consumption
- Data rate = 0.2 to 128 kbps
- FSK, GFSK, and OOK modulation schemes
- Power supply = 1.8 to 3.6 V
- Ultra low power shutdown mode
- Digital RSSI
- Wake-up timer
- Auto Frequency Calibration (AFC)
- Clear channel assessment
- Programmable RX BW
2.6–620 kHz
- Preamble detector
- RX 64 byte FIFO
- –40 to +85 °C temperature range
- Integrated voltage regulators
- Frequency hopping capability
- On-chip crystal tuning
- 20-pin QFN package
- Low BOM
- Single capacitor matching network
- Power-On-Reset (POR)
- Single-ended antenna configuration

Applications

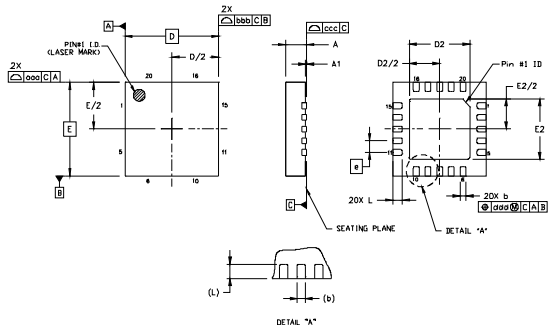
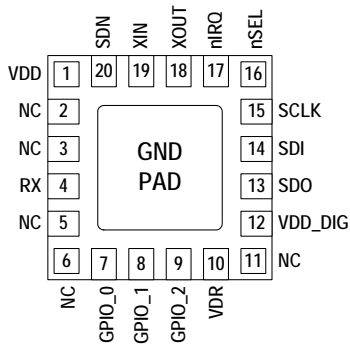
- Remote control
- Weather station
- Personal data logging
- Health monitors



Selected Electrical Specifications

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Supply Voltage Range	V_{DD}		1.8	3.0	3.6	V
Power Saving Modes	$I_{SHUT-DOWN}$	RC Oscillator, Main Digital Regulator, and Low Power Digital Regulator OFF	—	15	50	nA
	$I_{STANDBY}$	Low Power Digital Regulator ON (Register values retained) and Main Digital Regulator, and RC Oscillator OFF	—	450	800	nA
	I_{SLEEP}	RC Oscillator and Low Power Digital Regulator ON (Register values retained) and Main Digital Regulator OFF	—	1	—	μ A
RX Mode Current	I_{RX}		—	18.5	—	mA
Synthesizer Frequency Range	$F_{SYNTH-LB}$	Low Band	240	—	480	MHz
	$F_{SYNTH-HB}$	High Band	480	—	960	MHz
Synthesizer Frequency Resolution	F_{RES-LB}	Low Band	—	156.25	—	Hz
	F_{RES-HB}	High Band	—	312.5	—	Hz
RX Sensitivity	P_{RX_2}	(BER < 0.1%) (2 kbps, GFSK, BT = 0.5, $\Delta f = \pm 5$ kHz)	—	-118	—	dBm
RX Bandwidth	BW		2.6	—	620	kHz
RSSI Resolution	RES_{RSSI}		—	± 0.5	—	dB
Blocking at 1 MHz offset	$1M_{BLOCK}$	Desired Ref Signal 3 dB above sensitivity. Interferer and desired modulated with 40 kbps $\Delta F = 20$ kHz GFSK with BT = 0.5	—	-52	—	dB
Blocking at 4 MHz offset	$4M_{BLOCK}$		—	-56	—	dB
Blocking at 8 MHz offset	$8M_{BLOCK}$		—	-63	—	dB
Image Rejection	Im_{REJ}	IF = 937 kHz	—	-30	—	dB

Pin Package



Symbol	Min	Nom	Max
A	0.80	0.85	0.90
A1	0.00	0.02	0.05
b	0.18	0.25	0.30
D	4.00 BSC		
D2	2.55	2.60	2.65
e	0.50 BSC		
E	4.00 BSC		

Symbol	Min	Nom	Max
E2	2.50	2.60	2.70
L	0.30	0.40	0.50
aaa	—	—	0.10
bbb	—	—	0.10
ccc	—	—	0.08
ddd	—	—	0.10
eee	—	—	0.10

Notes:

1. All dimensions are shown in millimeters (mm) unless otherwise noted.
2. Dimensioning and tolerancing per ASME Y14.5M-1994.
3. This drawing conforms to JEDEC Solid State Outline MO-220, variation VGGD-8.
4. Recommended card reflow profile is per the JEDEC/IPC J-STD-020C specification for Small Body Components.