## Description

Silicon Laboratories' Si4032/31/30 highly integrated, single chip wireless ISM transmitter is part of the EZRadioPRO™ family. The EZRadioPRO family includes a complete line of transmitters, receivers, and transceivers allowing the RF system designer to choose the optimal wireless part for their application.

The Si4032/31 offers advanced radio features including continuous frequency coverage from 240–930 MHz and adjustable output power of up to +20 dBm with the Si4032. The Si4030 offers frequency coverage from 900 to 960 MHz to support the Japanese frequency bands. The Si4032 delivers a maximum output power of +20 dBm programmable from +11 to +20 dBm in 3 dB steps. The Si4031/30 delivers a maximum output power of +13 dBm programmable from –8 to +13 dBm. The Si4032/31/30's high level of integration offers reduced BOM cost while simplifying the overall system design. The Si4032's Industry leading +20 dBm output power ensures extended range and improved link performance.

Additional system features such as an automatic wake-up timer, low battery detector, 64 byte TX FIFO and automatic packet handling reduce overall current consumption and allow the use of lower-cost system MCUs. An integrated temperature sensor, general purpose ADC, power-on-reset (POR), and GPIOs further reduce overall system cost and size.

The transmitter supports automated packet construction, allowing data to be streamed from the TX FIFO without external MCU support. The PA is single-ended to allow for easy antenna matching and low BOM cost. The digital transmit modulation and automatic PA power ramping ensure precise transmit modulation and reduced spectral splatter, ensuring compliance with FCC and ETSI regulations. The Si4030 is designed to ensure compliance with ARIB regulations. The Si4032/31/30 is designed to work with an MCU, 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.

## Features

- Frequency Range = 240–930 MHz
- FSK, GFSK, and OOK modulation
- Output Power Range
    - (Si4032) +20 dBm max configurable +11 to +20 dBm
    - (Si4031/30) +13 dBm max configurable –8 to +13 dBm
- Low Power Consumption
    - (Si4032) 80 mA @ +20 dBm
    - (Si4031/30) 28 mA @ +13 dBm
- Data Rate = 1 to 128 kbps
- Power Supply = 1.8 to 3.6 V
- Ultra low power shutdown mode
- Wake Up Timer
- Integrated 32 kHz RC or 32 kHz XTAL
- Automated packet handler
- TX 64 byte FIFO
- Low battery detector, temperature sensor, and 8-bit ADC
- –40 to +85 °C temperature range
- Frequency hopping capability
- On-chip crystal tuning
- 20-Pin QFN package
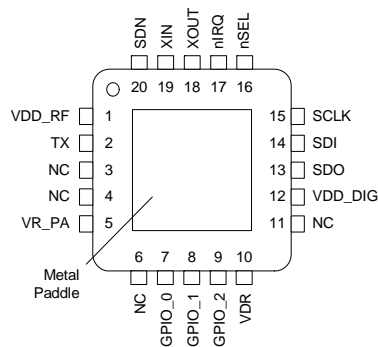- Power-on-reset (POR)

## Applications

- Remote control
- Home security and alarm
- Telemetry
- Toy control
- Remote meter reading
- Remote keyless entry
- Home automation
- Industrial control
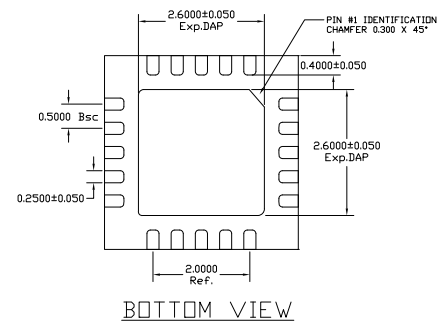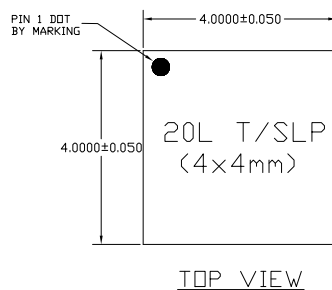- Sensor networks
- Health monitors
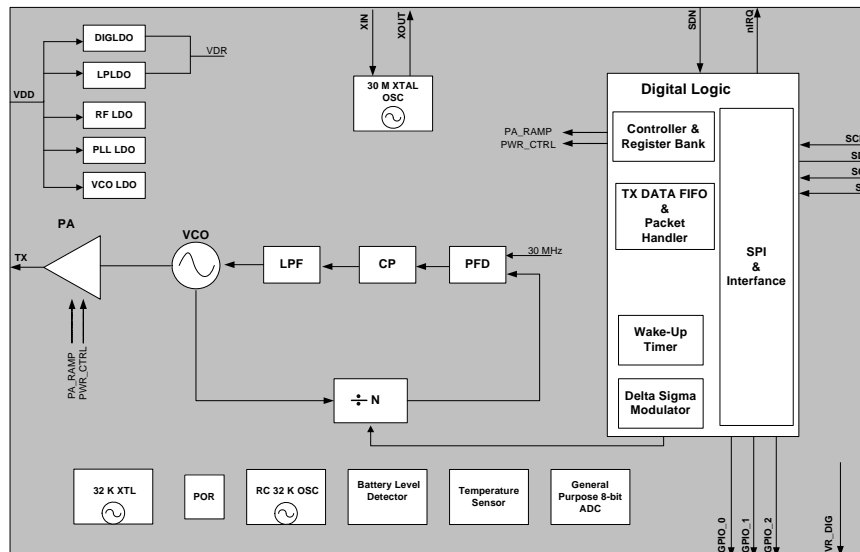
## Selected Electrical Specifications

| Parameter | Symbol | Test Condition | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| Supply Voltage Range | $V_{dd}$ | | 1.8 | 3.0 | 3.6 | V |
| Power Saving Modes | $I_{Shutdown}$ | RC Oscillator, Main Digital Regulator, and Low Power Digital Regulator OFF | — | 10 | — | nA |
| | $I_{Standby}$ | Register values retained, Main Digital Regulator and RC Oscillator OFF | — | 400 | — | nA |
| | $I_{Sleep}$ | RC Oscillator ON, Register values retained and Main Digital Regulator OFF | — | 800 | — | nA |
| TX Mode Current (Si4032) | $I_{TX\_+20}$ | txpow[2:0] = 011 (+20 dBm), VDD = 3.3 V | — | 80 | — | mA |
| | $I_{TX\_+11}$ | txpow[2:0] = 000 (+11 dBm), VDD = 3.3 V | — | 27 | — | mA |
| TX Mode Current (Si4030/31) | $I_{TX\_+13}$ | txpow[2:0] = 111 (+13 dBm), VDD = 3.3 V | — | 28 | — | mA |
| | $I_{TX\_+1}$ | txpow[2:0] = 100 (+1 dBm), VDD = 3.3 V | — | 16 | — | mA |
| Synthesizer Frequency Range (Si4032/31) | $F_{SYNTH-LB}$ | Low Band | 240 | — | 480 | MHz |
| | $F_{SYNTH-HB}$ | High Band | 480 | — | 930 | MHz |
| Synthesizer Frequency Range (Si4030) | $F_{SYNTH-HB}$ | High Band | 900 | — | 960 | MHz |
| Synthesizer Frequency Resolution | $F_{RES-LB}$ | Low Band | — | 156.25 | — | Hz |
| | $F_{RES-HB}$ | High Band | — | 312.5 | — | Hz |
| Synthesizer Settling Time | $t_{LOCK}$ | Measured from leaving Ready mode with XOSC running to any frequency including VCO Calibration | — | 200 | — | µs |
| FSK Modulation Data Rate | $DR_{FSK}$ | | 1 | — | 128 | kbps |
| OOK Modulation Data Rate | $DR_{OOK}$ | | 1.2 | — | 40 | kbps |
| Output Power Range (Si4032) | $P_{TX}$ | Power control by txpow[2:0] | +11 | — | +20 | dBm |
| Output Power Range (Si4031/30) | $P_{TX}$ | Power control by txpow[2:0] | –8 | — | +13 | dBm |
| TX RF Output Steps | $\Delta P_{RF\_OUT}$ | Controlled by txpow[2:0] Register | — | 3 | — | dB |
| Operating Ambient Temperature Range | $T_A$ | | –40 | | 85 | °C |

## Pin Assignments



## 20-pin QFN Package Information

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