Si4010

Crystal-less SoC RF Transmitter

Single Coin-cell Battery Transmitter
- Supply voltage: 1.8 to 3.6 V
- Standby current < 10 nA
- Crystal-less operation:
  - ±150 ppm 0 to +70°C
  - ±250 ppm –40 to +85°C
- Temperature range –40 to +85 °C
- Automotive grade available
- 10P MSOP/14P SOIC
- Pb free/RoHS compliant

RF Transmitter
- Frequency range: 27–960 MHz
- +10 dBm output power, adjustable
- Automatic antenna tuning
- Symbol rate up to 100 kBaud
- FSK/OOK modulation
- Manchester, NRZ, 4/5 encoder

Analog Peripherals
- LDO regulator with POR circuit
- Integrated temperature sensor
- Low battery detector

High-Speed 8051 µC Core
- Pipeline instruction architecture
- 70% of instructions in 1 or 2 clocks
- Up to 24 MIPs with 24 MHz clock

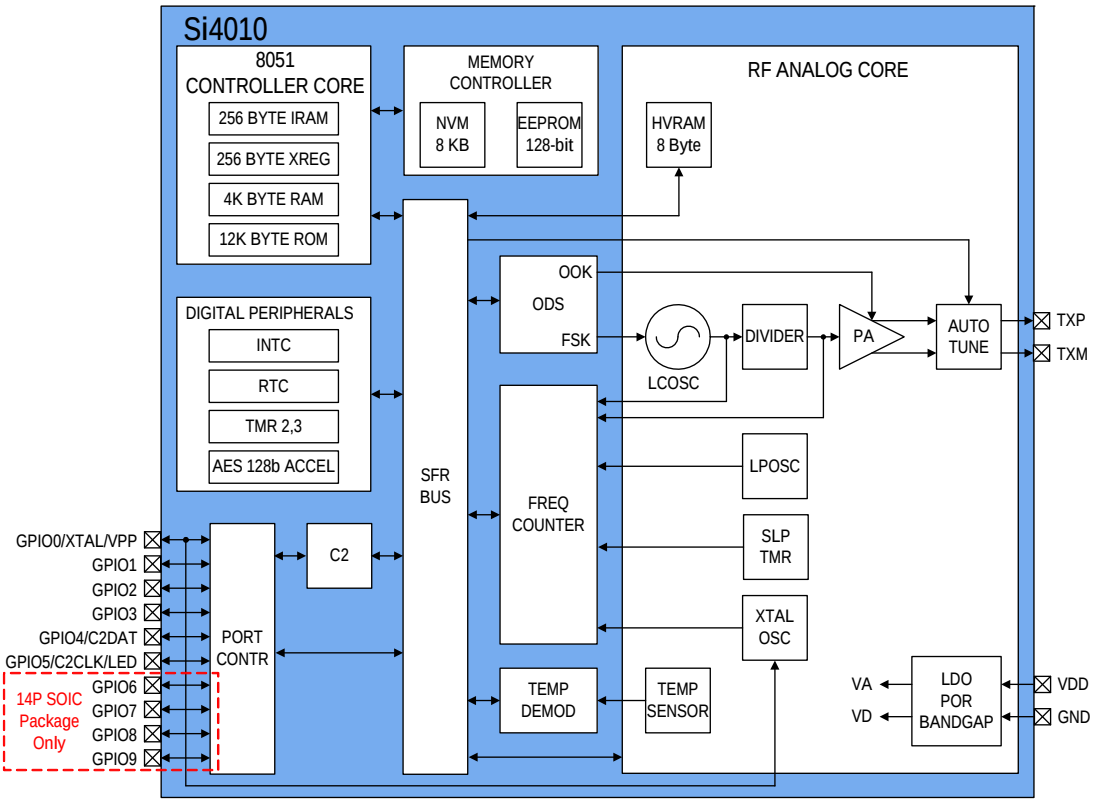
Memory
- 4 kB RAM/8K NVM
- 128 bit EEPROM
- 256 byte of internal data RAM
- 256 byte of external data RAM (XREG)
- 12 kB ROM embedded functions
- 8 byte low leakage RAM (preserved in standby)

Digital Peripherals
- 128 bit AES Accelerator
- 4/8 GPIO with wake-up functionality
- 1 LED driver
- Data serializer
- High-speed frequency counter
- RTC, Timers 2, 3
- On-chip debugging—C2

Clock Sources
- High-speed crystal-less VCO
- Programmable low-power osc-LPOSC
- Ultra low-power sleep timer
- Optional crystal input for tigher tolerances

Minimal External BOM
- Only one external component required

Applications
- Garage and gate door openers
- Home automation and security
- Remote keyless entry



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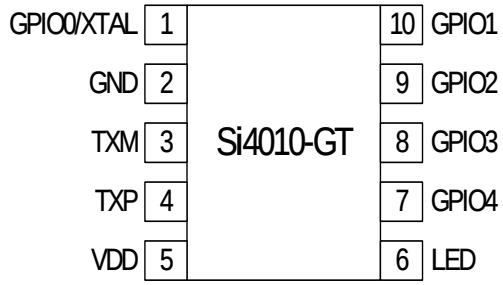
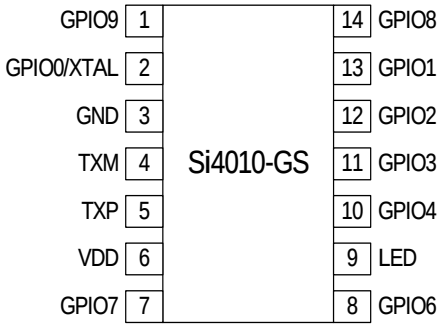
Selected Electrical Specifications

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Supply Voltage	V_{DD}		1.8	—	3.6	V
Supply Current	I_{VDD}	+10 dBm output, OOK, Manchester	—	14.2	—	mA
		+6.5 dBm output, OOK, Manchester	—	11.3	—	mA
		+10 dBm, FSK	—	19.8	—	mA
		+6.5 dBm output, FSK	—	14.1	—	mA
Sleep Timer Mode	I_{ST}	Only sleep timer is enabled	—	700	—	nA
Standby Current	I_{SB}	All GPIO floating or held high	—	10	—	nA
Frequency Range	F_{RF}		27		960	MHz
Frequency Noise (rms)		Allen deviation measured across 1ms interval	—	0.3	—	ppm
Frequency Tuning Time			—	5	—	ms
Carrier Frequency Accuracy		27 MHz ≤ F_{RF} ≤ 960 MHz 0°C ≤ T_A ≤ 70° C	–150	—	+150	ppm
		27 MHz ≤ F_{RF} ≤ 960 MHz –40°C ≤ T_A ≤ 85° C	–250	—	+250	ppm
		Error contribution using optional crystal input	–10	—	+10	ppm
Transmit Power		Maximum programmed transmit power	—	10	—	dBm
		Minimum programmed transmit power	—	–13	—	dBm
		Power variation vs temp and supply, with optimum load and V_{dd} > 2.2V	–1.0	—	+0.5	dB
		Power variation vs temp and supply, with optimum load and V_{dd} > 1.8V	–2.5	—	+0.5	dB
		Step size from –13 to +6.5 dBm	—	0.25	—	dB
PA Edge Ramp Rate Programmable Range		OOK mode	0.34	—	10.7	µs
Data Rate		FSK	0.1	—	100	kBaud
		OOK (Manchester)	0.1	—	50	kBaud

10-pin MSOP Package



14-pin SOIC Package



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