nRF52820 Product Specification

NORDIC®
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Contents

1. nRF52820 Product Specification

This Product Specification contains functional descriptions, register tables, and electrical specifications, and is organized into chapters based on the modules and peripherals that are available in this IC.

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- nRF52820 Product Specification v1.3
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Note: The HTML rendition of the Product Specification corresponds to the latest version only. All versions are available as PDF files.

Features:

- Bluetooth® 5.1, IEEE 802.15.4-2006, 2.4 GHz transceiver
  - -95 dBm sensitivity in 1 Mbps Bluetooth Low Energy mode
  - -103 dBm sensitivity in 125 kbps Bluetooth low energy mode (long range)
  - -20 to +8 dBm TX power, configurable in 4 dB steps
  - On-air compatible with nRF52, nRF51, nRF24L, and nRF24AP Series devices
  - Supported data rates:
    - Bluetooth 5.1 – 2 Mbps, 1 Mbps, 500 kbps, and 125 kbps
    - IEEE 802.15.4-2006 – 250 kbps
    - Proprietary 2.4 GHz – 2 Mbps, 1 Mbps
  - Angle-of-arrival (AoA) and angle-of-departure (AoD) direction finding using Bluetooth
  - Single-ended antenna output (on-chip balun)
  - 128-bit AES/ECB/CCM/AAR co-processor (on-the-fly packet encryption)
  - 4.9 mA peak current in TX (0 dBm)
  - 4.7 mA peak current in RX
  - RSSI (1 dB resolution)
- Arm® Cortex®-M4 32-bit processor, 64 MHz
  - 144 EEMBC CoreMark® score running from flash memory
  - 33 µA/MHz running CoreMark from flash memory
  - 33 µA/MHz running CoreMark from RAM
  - Serial wire debug (SWD)
- Flexible power management
  - 1.7 V to 5.5 V supply voltage range
- 256 kB flash and 32 kB RAM
- Advanced on-chip interfaces
  - USB 2.0 full speed (12 Mbps) controller
  - Programmable peripheral interconnect (PPI)
  - 18 general purpose I/O pins
  - EasyDMA automated data transfer between memory and peripherals
- Nordic SoftDevice ready with support for concurrent multiprotocol
- 64 level comparator
- Temperature sensor
- Four 32-bit timer with Counter mode
- Up to two SPI masters/slaves with EasyDMA
- Up to two I^2C compatible two-wire master/slave
- UART (CTS/RTS) with EasyDMA
- Quadrature decoder (QDEC)
- Two real-time counters (RTC)
- Single crystal operation
- Operating temperature from -40°C to 105°C
- Package variants
  - QFN40 package, 5 x 5 mm
  - WLCSP package, 2.531 x 2.531 mm

Features:	
• On-chip DC/DC and LDO regulators with automated low current modes • Automated peripheral power management • Fast wake-up using 64 MHz internal oscillator • 0.3 µA at 3 V in System OFF mode, no RAM retention • 1.2 µA at 3 V in System ON mode, no RAM retention, wake on RTC	

Applications:	

• Advanced computer peripherals and I/O devices
  • Mouse
  • Keyboard
  • Multi-touch trackpad
	• Internet of things (IoT)
	  • Smart home sensors and controllers
	  • Industrial IoT sensors and controllers
	• Interactive entertainment devices
	  • Remote controls
	  • Gaming controllers

Revision history

About this document This document is organized into chapters that are based on the modules and peripherals available in the IC.

Block diagram This block diagram illustrates the overall system. Arrows with white heads indicate signals that share physical pins with other signals.

Recommended operating conditions The operating conditions are the physical parameters that the chip can operate within.

Absolute maximum ratings

Ordering information This chapter contains information on device marking, ordering codes, and container sizes.

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