Compact USB dongle for wireless peripherals

A single chip solution with the nRF24LU1+ OTP

The nRF24LU1+ OTP is a unique single chip solution for compact USB dongles for entry level wireless peripherals. By integrating an USB 2.0 compliant device controller, 8 bit application microcontroller and a nRF24L01+ compatible 2.4GHz RF transceiver it supports a wide range of application including PC peripherals, sports accessories and game peripherals.

With air data rate of up to 2 Mbps combined with full speed USB, supporting up to 12 Mbps, the nRF24LU1+ OTP meets the requirements of applications with stringent performance requirements such as wireless mouse, game controllers and media center remote controls with displays.

Block diagram

Highly integrated solution

Compact 5x5mm package, low cost external BOM

In addition to the main blocks the nRF24LU1+ OTP integrates other critical functionality, saving cost and board space. An internal voltage regulator enables the chip to be powered directly from the USB bus it does not require an external voltage regulator. With a fully integrated RF synthesizer and PLL for the USB no external loop filters, resonators or VCO varactor diodes is required.

Only 1 low cost ±60ppm 16MHz crystal plus passives for ESD protection, decoupling, antenna matching circuitry is required. nRF24LU1+ OTP, enables true single chip USB dongles (depicted dongle is part of the nRF24LU1+ development kit):

SUMMARY OF BENEFITS

• Compact USB dongle for wireless peripherals
• A low cost solution is enabled by high level of integration and a minimum number of low cost external components
• Power directly from USB power removing the need for external voltage regulator
• Complete development platform for reduced development cycles and risk

PRODUCT BRIEF

nRF24LU1+ OTP

nRF24LU1P-017Q32

Low cost ultra low power wireless System-on-chip OTP memory and USB

KEY FEATURES

• nRF24L01+ compatible RF transceiver
• Worldwide 2.4GHz ISM band operation
• Up to 2Mbps on air data rate
• Enhanced ShockBurst™ hardware link layer
• On air compatible with nRF24LE1, LU1, LU1+, L01+, L01, nRF2401A, 02, E1 and E2
• Low cost external ±60ppm 16MHz crystal
• Full speed USB 2.0 compliant device controller
• Up to 12 Mbps USB transfer rate
• 2 control, 10 bulk/interrupt and 2 ISO endpoints
• 512 bytes dedicated USB endpoint buffer RAM
• Software controlled on-chip pull-up resistor for D+
• Integrated PLL for full-speed USB operation
• On chip Voltage regulators, 4.0 to 5.25V supply range
• Enhanced 8-bit 8051 compatible microcontroller
• Reduced instruction cycle time
• 32-bit multiplication-division unit
• 16 kbyte on-chip OTP memory
• 1 kbyte on-chip OTP data memory
• 2 Kbyte SRAM
• 6 general purpose digital input/output pins
• Hardware SPI, 2 wire and UART
• 3 16-bit timers/counters
• AES encryption/decryption co-processor
• Supports nRFprobe and FS2 hardware debuggers (for flash development version)
• Compact 32-pin 5x5mm QFN package
• nRFgo compatible development kit

APPLICATIONS

Compact USB dongles for wireless peripherals:
• Mouse, keyboards, remotes
• Advanced Media center remote controls
• Game controllers
• Intelligent sports equipment
• Toys
A complete development platform
For firmware and hardware engineers
The nRF24LU1+ OTP is supported by a complete development platform enabling designers to easily develop hardware and firmware for the chip. The platform comprises three key elements: the nRFgo Starter Kit, the nRF24LU1+ Development Kit (flash version) and the nRFgo Flash/OTP Programming Adapter Kit.

The development kit for the nRF24LU1+ OTP is the same as for the nRF24LU1+ (flash version), documentation is available on how to develop firmware on the flash version that works on the nRF24LU1+ OTP. The nRFgo Flash/OTP Programming Adapter Kit is a plug-in for the nRFgo Starter Kit that enables both programming of blank un-mounted and mounted nRF24LU1+ OTP parts.

For more information
Please visit www.nordicsemi.com for the complete product specification and more information about this or any other ultra low power wireless products.

About Nordic Semiconductor ASA
Ultra low power RF silicon solutions
Nordic Semiconductor is fabless semiconductor company specializing in ULP short-range wireless communication. Nordic is a public company listed on the Norwegian stock exchange.

Nordic provides RF Silicon Solutions for ultra low power wireless including:
- Highly integrated RF silicon
- Sophisticated and flexible development tools
- Application specific communication software
- Complete reference designs

Worldwide office locations
Headquarter
Trondheim, Norway
Telephone: +47 72 89 89 00
www.nordicsemi.com


Disclaimer: This product brief contains an overview of the silicon feature set and operating parameters and should not be considered as the final specification. For current and complete product specifications, please refer to the product specification, available from Nordic Semiconductor. Specifications are subject to change without notice. Trademarks are property of their respective owners.

Related Products
- nRF6700
- nRF6704
- nRF24LE1-O17Qxx
- nRF24LU1P-FXXQ32
- nRFgo Starter Kit
- nRFgo Development Kit for nRF24LU1+ (flash based)
- nRFgo Flash/OTP programming Adapter Kit for nRF24LU1+ OTP
- 16kB/32kB flash variant of this chip
- Ultra low power wireless system on chip devices with flash memory

nRF24LU1+ OTP Product Brief revision 1.0