PRODUCT SUMMARY

Single chip ANT ultra low power wireless solution
The 8-channel nRF24AP2™

The 8-channel nRF24AP2 is a advanced ultra low power (ULP) single chip ANT solution. It is ideal for battery-powered wireless sensors hubs such as watches and bike-computers and gym machines.

### Ultra low power wireless sensor networks
Embedded ANT protocol

The 8-channel nRF24AP2 includes a fully embedded, enhanced ANT protocol stack. It is designed for ULP operation, ease of use, efficiency and scalability. ANT provides a full communication stack implementation equivalent to Physical, Network and Transport OSI layers. It offers reliable data communication, flexible and adaptive network operation and interference immunity.

Advanced network topologies

The 8-channel nRF24AP2 supports up to 8 channels, and can easily participate in a wide range of different network topologies with other ANT-enabled devices – including peer-to-peer, star, tree and practical mesh.

Supported network topologies

Peer to Peer

Complex Networks

Star

Tree
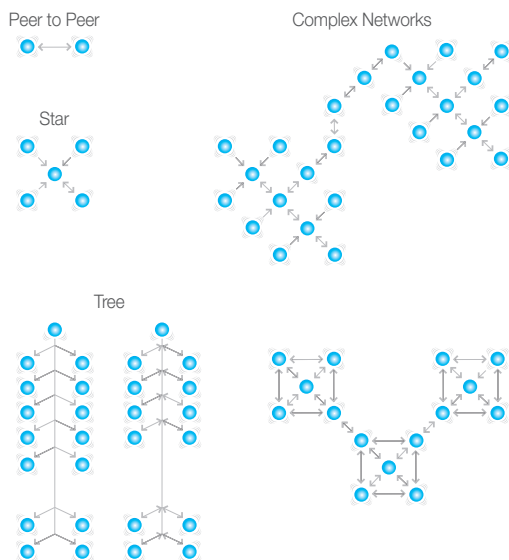
Communication modes and message intervals

The 8-channel nRF24AP2 provides three different communication modes:
- Broadcast
- Acknowledged
- Burst

Broadcast is a one-way, node-to-multi-nodes communication where the receiving node provides no acknowledgment. This mode is ideal for applications where newest data is of more importance than the occasional loss of data. In *Acknowledged* messaging mode the receiver sends an *acknowledgement* of received data. This mode is ideal for applications requiring 100% data integrity. *Burst* mode meets the requirements of applications requiring higher data throughput. It provides up to 20kbps acknowledged data transmission.

The 8-channel nRF24AP2 provides programmable message rates from 0.5 to 190Hz.

NORDIC
SEMICONDUCTOR

RF Silicon	Software	Reference Design	Development Tools

PRODUCT BRIEF

8-channel nRF24AP2

nRF24AP2-8CH

Single chip 8-channel ANT™ ultra low power wireless solution

KEY FEATURES

- Advanced ultra low power 8-channel ANT solution
- Based on nRF24L01+ 2.4GHz transceiver core technology
- Worldwide 2.4GHz ISM band operation
- 1 Mbps on-air data rate
- Fully embedded enhanced ANT ultra low power wireless network protocol stack
- Supports up to 8 channels
- Scanning channel - for low latency applications
- High density node support – up to 300 nodes in close proximity
- Improved channel search – less impact on active channels
- Channel ID management – improves pairing efficiency
- Improved transmission power control, available on a per channel basis
- Frequency agility mode – further improved co-existence performance
- As low as 14µA average current consumption
- 17mA max peak current
- Coin cell (watch) battery operation
- Supports simple to complex network topologies including: peer-to-peer, star, tree and practical mesh networks
- Broadcast, Acknowledged and Burst message types
- Supports both public and private (i.e. managed) networks
- Supports ANT+ implementations providing multivendor interoperability
- Simple synchronous/asynchronous serial host interface
- Supports low cost, simple host microcontrollers
- Message rate from 0.5 to 190Hz
- Burst transfer rate up to 20kbps
- Low cost external ±60ppm 16MHz crystal
- On-chip ultra low power 32kHz crystal oscillator
- 1.9 to 3.6V supply voltage
- RoHS compliant 5x5mm 32-pin QFN package

APPLICATIONS

- Sports and fitness hubs
- Healthcare and wellness hubs
- Industrial and home automation
- Active RFID

Enhanced ANT core implementation

New features, lower power and higher performance

The 8-channel nRF24AP2 includes an enhanced ANT core stack implementation offering new features, lower power and improved performance compared to the previous generation solution – the nRF24AP1. The most important new features are: *Scanning channel* to support lower latency; *High density node support* for up to 300 nodes at 1Hz in close proximity; *Improved channel search* that has less impact on active channels; *Channel ID management* that offers improved pairing efficiency; *Improved transmission power control* offering TX power control on a per channel basis; and a *Frequency agility mode* that improves co-existence performance in noisy RF environments.

Multivendor interoperability

8-channel nRF24AP2 is ANT+ ready

The 8-channel nRF24AP2 is fully ANT+ compatible. ANT+ is a set of device profiles and technology specified by the ANT+ Alliance that sits on top of the ANT core stack. The device profiles specify data formats, channel parameters and network keys enabling vendors to make products that are interoperable with products from other vendors. With millions of systems already shipped, ANT+ is becoming a *de-facto* standard for ultra low power (ULP) wireless. For a complete listing of device profiles and more information about the ANT+ Alliance and ANT+ technology please visit: www.thisisant.com.

For more information

Please visit www.nordicsemi.com for the complete product specification and more information about this or any other ULP wireless product from Nordic. For more information about ANT, ANT+ and the ANT+ Alliance please visit: www.thisisant.com.

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

TRONDHEIM - NORWAY
OSLO - NORWAY
SAN JOSE - USA
SEOUL - KOREA
TOKYO - JAPAN
HONG KONG - CHINA

SPECIFICATIONS

Frequency band	2.4GHz ISM (2.40000 – 2.4835GHz)
On-air data rate	1 Mbps
Modulation	GFSK
Channel bandwidth	1 MHz
RF channels	126
Output power	Programmable up to 0dBm
External crystal	16MHz ±60ppm
Hardware Link layer	Enhanced ShockBurst™
Protocol Stack	Enhanced ANT core protocol stack
Max number of channels	8
Frequency handling	Single frequency or frequency agility
Communication modes	1. Broadcast
	2. Acknowledged
	3. Burst
Message rate	Configurable 0.5 to 190Hz
Burst mode max throughput	20kbps
Supported network topologies	Peer-to-peer
	Star
	Tree
	Practical mesh
Max number of nodes in shared channel	2^{16}
Peak current consumption	17mA (maximum)
Average current consumption	As low as 14uA
Host interface	Asynchronous and synchronous serial interface
Oscillators	16MHz crystal oscillator
	32kHz crystal oscillator
Voltage regulator	On-chip 1.9 to 3.6V operation
Package options	RoHS compliant
	32-pin 5x5mm QFN

Related Products

nRF24AP2-1CH	1-channel nRF24AP2
nRF24AP1	Previous generation 4-channel solution

Visit **www.nordicsemi.com** for Nordic Semiconductor sales offices and distributors worldwide.