



RF Front-End for OEM

WITECH RD915N25

915 MHz - Narrow Band - 25 mW

Rev 1.0 02/13

Witech RD915N25 is a 915 MHz, narrow band 25 mW radio Front-End specially suited for OEM integrators whose wireless designs have specific size requirements, but who wish to benefit from a high optimized platform with true low power and long range features. In this solution the Witech Stack and Custom Application are run in a separate microcontroller, giving OEMs integrators complete flexibility. This narrow band solution is specially designed for applications requiring ultra-high sensitivity for extreme link-budget, like ultra low power ad-hoc networks with extensive coverage.

General Features

- RF Front End for OEM Integration
- License Free 915 MHz ISM Band
- Narrow Band for Extreme Link-Budget
- Ultra Low Power
- Long Range: ≈ 2000 m (line-of-sight)
- Easy and Flexible Hardware Integration
- External CPU for Application and Protocol Stack
- External Interface: SPI/GPIO

RF Performance

- Output Frequency Range: 902-928 MHz
- Channel Spacing: 12.5, 25, 50 KHz
- Output Power Range: -20 to 13 dBm
- Antenna Port Connection: SMD 50 Ω
- Modulations: GFSK, RCFSK
- Radio Data Rates: 0.1 to 25.0 Kbps
- Sensitivity (BER < 10^{-3})
 - 130 dBm (0.1 Kbps)
 - 121 dBm (1.0 Kbps)
 - 114 dBm (9.6 Kbps)
 - 113 dBm (25.0 Kbps)
- Frequency Stability 2.5 ppm (Temp Compensated)
- Compliant with FCC Standard (Parts 15, 90, 95)

Power Supply and Consumptions

- Voltage Range: 2.8 to 3.6 V
- Consumptions:
 - Standby 5 μ A
 - Peak TX 43 mA
 - Peak RX 26 mA
 - Average <60 μ A (RX 1 sec latency, 9.6 Kbps)

Temperature Range

- Storage Temperature: -40 $^{\circ}$ to 85 $^{\circ}$ C
- Operating Temperature: -30 $^{\circ}$ to 75 $^{\circ}$ C

Dimensions

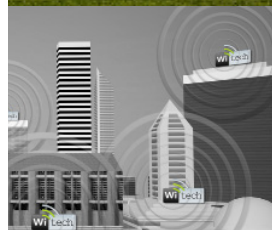
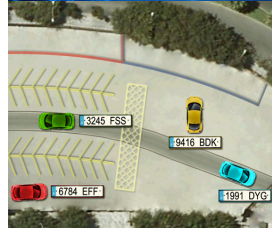
- Size: 21 x 24.25 x 3 mm
- Weight: 3 g

Firmware Stack Options

- Firmware Stack Options Suited for Different Applications Types
 - WITECH LINK STACK
 - WITECH ULP-NET STACK
 - WITECH METERING STACK
 - WITECH RTLS STACK
 - WITECH DOMO STACK
- Wireless Link/Network Bootloader (WLBOOT/ WNBOOT) Included for Complete Remote Firmware Update (Witech Stack and Application)
- Complete and Easy to Use Witech APIs in C Programming Language for all Stack Options:
 - WITECH LINK STACK API
 - WITECH ULP-NET STACK API
 - WITECH METERING STACK API
 - WITECH RTLS STACK API
 - WITECH DOMO STACK API
- For Every Stack, same API for Two Integration Scenarios:
 - Local Integration on Witech CPU
 - External Integration in a Second CPU (USB/ Serial interface). Cross-Platform Libraries for:
 - Low Level Integration (ARM, MIPS, MSP430, AVR, COLDFIRE, ...)
 - High Level Integration (Windows, Windows CE/Mobile, Linux, ...)

Applications

- Automatic Meter Reading Networks (AMR) for water, electricity and gas.
- General Purpose Ad-hoc Sensor Networks
- Wireless Domotic Systems
- Industrial Control
- Solar Panel Monitoring Networks
- Marinas Dock Pedestals
- Real Time Location Systems (RTLS)
- Indoor Navigation and Access Control
- Healthcare and Wellness Networks
- Weather Stations
- Watering and Irrigation Control Networks

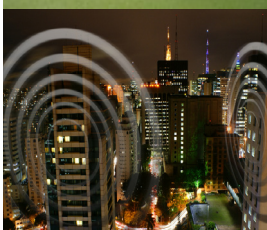


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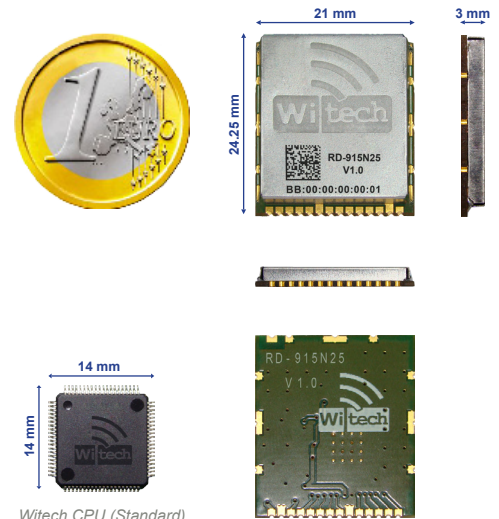
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External CPU: Standard Option

- Flash based Ultra Low Power Microcontroller
- 16-Bit RISC Architecture
- 2.2V to 3.6V Operation
- Max Frequency: 25 MHz
- Ultra Low Power Consumption:
 - 0.1 μ A RAM retention
 - 2.5 μ A RTC operative
 - 165 μ A/MIPS in active state
- Wake-up from Standby Mode < 5 μ s
- Flash Options: up to 256 KBytes
- RAM Options: 16 KBytes
- Integrated LDO, Monitoring and Brownout
- Integrated Peripherals
 - 3 16-Bit Timers, 15 Cap/Comp Channels
 - Up to 4 Serial Modules (UART/SPI/I2C/IRDA)
 - RTC
 - ADC (12-Bit, 16 Channels)
 - DMA (3 Channels)
 - Hardware Multiplier (32-Bit)
 - External Interrupt Inputs (up to 16)
 - Embedded Emulation Module (JTAG/SBW)



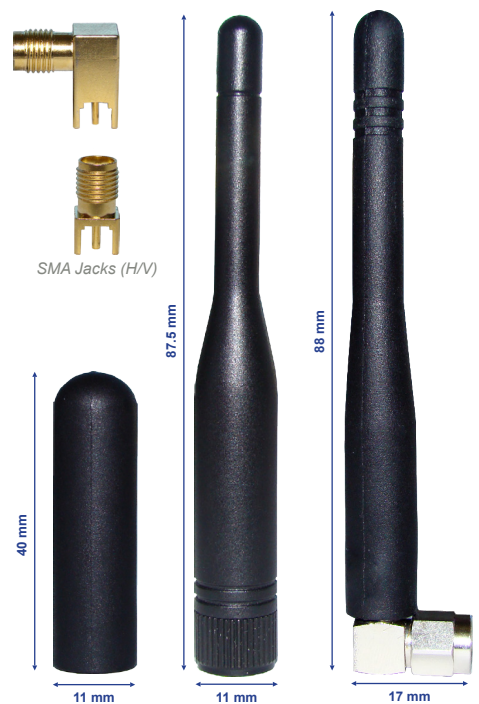
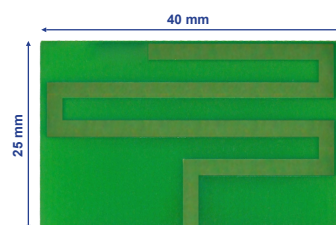
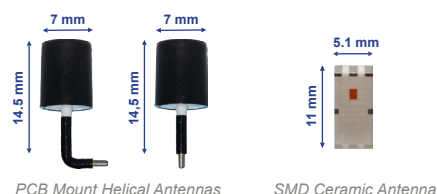
Support for Witech Devices

- HW Design Support (PCB, Antenna, ...)
- FW/SW Design Support
 - HW Abstraction Layers (CPU and Peripherals)
 - Libraries for Peripherals and Basic Utilities
 - Tutorials and Examples

Note: All Images on this Page are Actual Size

Antenna Options Examples

- SMA Plug Whip-Style Antennas
 - SMA Jack in PCB
 - $\lambda/4$ Monopoles and Helical
 - Connection Length Extension with Coaxial Cable
- PCB Direct Soldered Antennas:
 - Through Hole Helical Antennas
 - SMD Ceramic Antenna

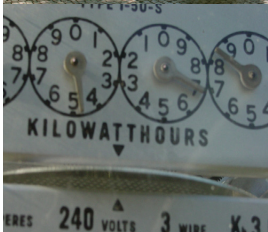


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Witech Link Stack

- Data Interleaving, Data Whitening
- Forward Error Correction (FEC/BCH)
- Automatic Frequency Control (AFC)
- Frequency Hopping Spread Spectrum (FHSS)
- Encryption (AES 128)
- Quality of Service Management (RSSI)
- Output Power Control, Power Amplifier Ramping
- Automatic Sensitivity Control
- Communications Features
 - Point to point, Multicast, Broadcast, Muthop
 - Asynchronous/Synchronous
 - Connection-Based/Connection-Less
 - ACK/NACK
 - CS/LBT (Carrier Sense/Listen Before Talk)

Witech ULP-NET Stack

- Witech Link Stack + ULP-NET Layer
- True Ultra Low Power Ad-hoc Network
- Star, Tree or Mesh Network
- Full Mesh or Partial Mesh (Centralized)
- Dynamic Topology and Routing
- No different logical Devices (Planning Exempt, all Nodes are Routers and Endpoints)

Witech Metering Stack

- Witech ULP-NET Stack + Metering Application Layer
- Fast Time to Market Solution for Complex Ultra Low Power Metering Network Systems
- Multiple Meter Interface Options:
 - Pulse Meters (up to 4 Meters per Node)
 - Bus Meters (Modbus, M-bus, Cbus, ...)
 - Serial (UART/SPI/I2C) for General Purpose
- Powerful Programming of Meter Readings
- Automatic Leak Detection, Anomalous Consumptions, Special Monitoring intervals, ...
- Remote Actuation Features: Supply Cut off, Alarms Signaling, Redundancy Management
- Prepaid Management, Simple and Mixed

Witech RTLS Stack

- Witech ULP-NET Stack + RTLS Application Layer
- Fast Time to Market Solution for Complex Ultra Low Power Real Time Location Network Systems
- Types of devices: Active Tags, Beacon nodes and Dongle Nodes
- Optimal Solution for Indoor Location and Navigation
- High Level Utilities for Access Control

Witech DOMO Stack

- Witech ULP-NET Stack + DOMO Application Layer
- Fast Time to Market Solution for Complex Ultra Low Power Domotic Network Systems
- Types of devices: General purpose Analog and Digital Input/Output Devices, and Specific Devices (Light Control, Climate Control, Shutter and Blind Control, Dongle, ...)
- High Level Utilities: Scenarios, Programming, ReStart, ...

FIRMWARE STACK OPTIONS

