

RF Integrated Module

WITECH MD915N25-1AM

915 MHz - Narrow Band - 25 mW

Core 1 - Footprint A - Microstrip Antenna

Rev 1.0 02/13



Witech MD915N25-1AM is a 915 MHz, narrow band 25 mW fully integrated (hardware/firmware) RF module with antenna, specially suited for OEM integrators who wish a high optimized and completely designed RF platform with true low power and long range features, achieving the fastest time to market and the lowest development risk. The module includes a medium size, high performance microstrip antenna with a very homogenous radiation pattern. 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

- Fully Integrated RF Module (Hardware/Firmware)
- License Free 915 MHz ISM Band
- Narrow Band for Extreme Link-Budget
- Ultra Low Power Consumption
- Long Range: ≈ 2000 m (line-of-sight)
- Fastest Time to Market, Lowest Development Risk
- Multiple I/O Interfaces and Assembly Options

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: 3 to 6 V
- Internal Ultra Low Power Regulator Included
- 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: 40 x 55 x 7.65 mm
- Weight: 8 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:

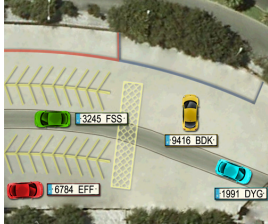
- WITECH LINK STACK API
- WITECH ULP-NET STACK API
- WITECH METERING STACK API
- WITECH RTLS STACK API
- WITECH DOMO STACK API

- 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 Domestic 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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Internal CPU: Witech Core 1

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

Assembly Options and Accessories

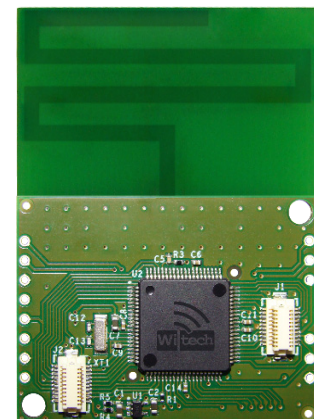
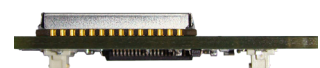
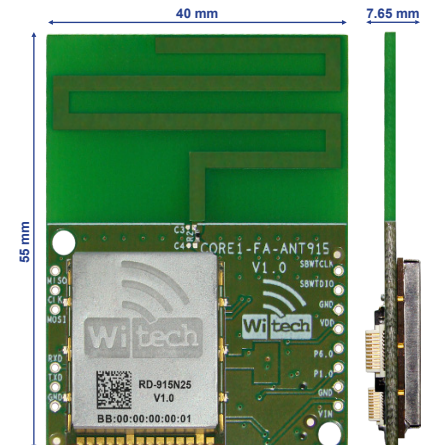
- SMD Assembly Option (Full Interface)
 - 40 (2 x 20) pins Interface (HIROSE DF-12 Series)
 - 3 Stacking Heights: 3.5, 4 or 5 mm
 - Vin, 3V, GND and 34 Input/Output Ports
- Through-Hole Assembly Option (Basic Interface)
 - 14 (8+3+3) pins Interface (2.54 mm)
 - Standard 2.54 mm Cables, Headers and Sockets
 - Vin, 3V, GND, SBW, 8 E/S (UART, SPI, I2C, ADC, INT)



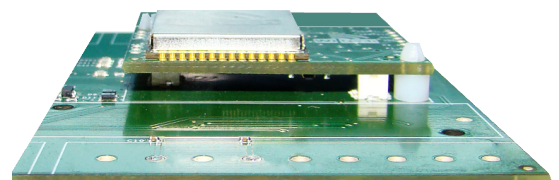
Matting Connectors (3 Stacking Heights)



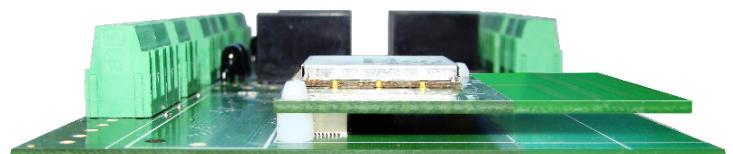
Plastic Support Spacers



Note: All Images on this Page are Actual Size



SMD Assembly Example, With Stackers (Back View)



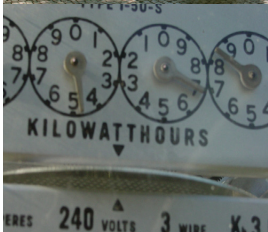
SMD Assembly Example, With Stackers (Lateral View)

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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 Cutt 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

