



High power radio modules

PA + LNA + antenna diversity

for long range devices

IEEE 802.15.4 | 2.4 GHz

Applications

- range extender
- as end device | router | coordinator | gateway
- in 6LoWPAN | ZigBee | proprietary wireless sensor networks

- lighting applications
- alarm systems
- building + home automation
- smart metering
- industrial automation
- personal sensors | health care
- logistics | transportation

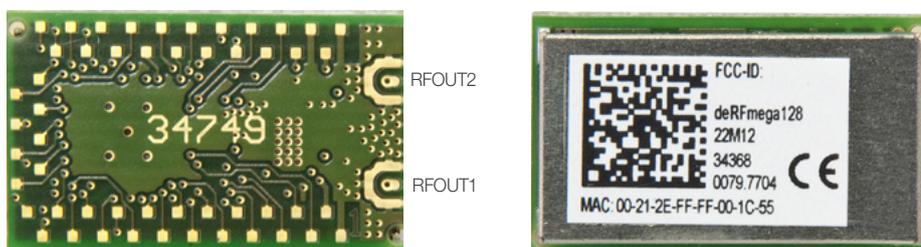


ZigBee®
Control your world

Front-end integrated radio modules

As integral part of the new series of dresden elektronik's extra small radio modules the deRFmega128-22M12 and deRFmega256-23M12 are extremely small front-end OEM radio modules which come with state-of-the-art technology. These power amplified versions have been especially designed as long range devices and offer an excellent solution for all IEEE 802.15.4 Wireless Personal Area Networks as well. The size of the SMT modules is only 21.5 mm by 13.2 mm and the footprint is pin compatible to all other OEM radio modules of dresden elektronik.

Both modules are based on Atmel's AVR SoC ATmega128RFA1, ATmega256RFR2 and a front-end which has an internal PA (power amplifier) for transmit and a LNA (low noise amplifier) for receive mode. The radio modules support antenna diversity by already offering two RF output pads for either two antennas or coaxial connectors. With antenna diversity activated, the transceiver automatically selects the antenna with the best link budget. All necessary RF parts and switches are integrated on the radio modules.



The two RF output pads enable customized single or diversity antenna designs, like PCB-antenna, chip-antenna, wire-antenna, external antenna or coaxial connector. Dresden elektronik provides antenna reference designs and comprehensive facilities for design, evaluation as well as certification of custom antennas.

The integrated PA can deliver a maximum transmit power of up to +20 dBm and the LNA extends the receiver sensitivity down to -105 dBm resulting in a huge link budget of almost 125 dB. Via the 59 solderable LGA pads at the radio module's bottom side you can access the various application interfaces of the MCU such as UART, SPI and TWI.

High processing power, a range of more than 500 meters (line-of-sight) and antenna diversity result in unchallenged radio performance for a wide range of applications. With a supply voltage range of 2.0 V up to 3.6 V and a sleep current of about 1 μ A the radio modules are perfect for battery driven applications, enabling battery life times of several years. The MCU resources also allow for larger mains powered devices like routers. Especially the deRFmega256-23M12 with its enlarged resources of 256 kb Flash and 32 kb RAM is suited for large stacks like ZigBee Smart Energy 2.0 and ZigBee Light Link.

The new modules are supported by the MAC stack, 6LoWPAN and ZigBee software (deCONZ) and have a 128-bit AES engine unit for data encryption. The advantages of free available AVR tool-chains are widely accepted.

For an easy evaluation of the OEM modules without the need of own designs all modules can also be ordered pre-soldered onto an adapter board that makes the OEM modules compatible to all dresden elektronik development platforms like deRFnode and deRFgateway.



PA radio module soldered on adapter board



Key Features

- small SMT modules: 21.5 mm x 13.2 mm x 3.0 mm
- Atmel's ATmega128RFA1, ATmega256RFR2 SoC combined with PA + LNA front-end
- two 2.4 GHz RF output pads
- antenna diversity support
- 2.4 GHz ISM frequency
- supported by MAC Stack, 6LoWPAN, ZigBee
- full compliant to FCC and ETSI/CE rules

Benefits

- minimal space requirement by compact design
- low power consumption, optimized for battery operation
- all CPU features accessible
- optimal solution for long range applications
- exceptional indoor range
- ideal for own antenna designs
- immediate integration of the module into own hardware developments
- comprehensive software examples and documentation

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