



- **Network Router**
- **Compatible with RFM miniMESH™ Network Protocol**
- **3 V, Very Low Current Operation**
- **Ready-to-Use OEM Module**

The DM1810-434MR-V is the 433.92 MHz router module in the DM1810 family of RF transceivers. The DM1810 family is designed for adding wireless mesh connectivity to a wide range of monitoring and control systems. This module is compatible with RFM miniMESH™ network protocol, which provides “plug-and-play” multicast mesh network routing. Radio communications range in an “open field” environment is typically 600 meters/hop. The DM1810-434MR-V combines RFM's very low current ASH radio technology with low power microcontroller technology to achieve long battery life. The DM1810-434MR-V is certified for operation under ETSI I-ETS 300 220 regulations.

Absolute Maximum Ratings

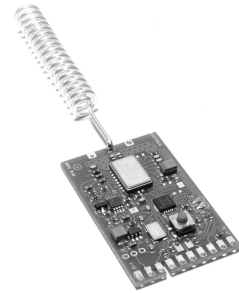
| Rating | Value | Units |
|---|--------------|-------|
| All Input/Output Pins Except VIN | -0.3 to +3.3 | V |
| Non-Operating Ambient Temperature Range | -40 to 85 | °C |

Electrical Characteristics

| Characteristic | Sym | Notes | Minimum | Typical | Maximum | Units |
|---|-----------------|-------|---------|---------|---------|-------------------|
| Operating Frequency | f _O | | 433.72 | | 434.12 | MHz |
| Modulation Type | | | OOK | | | |
| RF Encoded Data Transmission Rate | | | | 4.8 | | kb/s |
| Average Receive Input Current, No External Power Supply Load | I _R | | | 5.5 | | mA |
| Receiver Input Signal for 10 ⁻³ BER, 25 °C | | | | -101.5 | | dBm |
| Average Transmit Input Current, No External Power Supply Load | I _{TA} | | | 15.75 | | mA |
| Peak Transmit Input Current, No External Power Supply Load | I _{TP} | | | | 28.5 | mA |
| Peak Transmitter Output Power | P _O | | | 10 | | mW |
| Bind Input Logic High | | | 2.4 | | | V |
| Bind Input Logic Low | | | | | 0.45 | V |
| Average Sleep Input Current, No External Power Supply Load | I _{SA} | | | 60 | | µA |
| Power Supply Input Voltage Range, -40 to +85 °C | VIN | | 3.1 | | 10 | V |
| Power Supply Input Voltage Range, 0 to +85 °C | VIN | | 2.6 | | 10 | V |
| Regulated Power Supply Output Voltage, VIN 3.1 to 10 V | VOU | | | 3.0 | | Vdc |
| Regulated Power Supply Voltage Ripple | | | | | 10 | mV _{P-P} |
| Relative Humidity Range, Non-Condensing | RH | | 10 | | 90 | % |

DM1810-434MR-V

433.92 MHz Transceiver Module



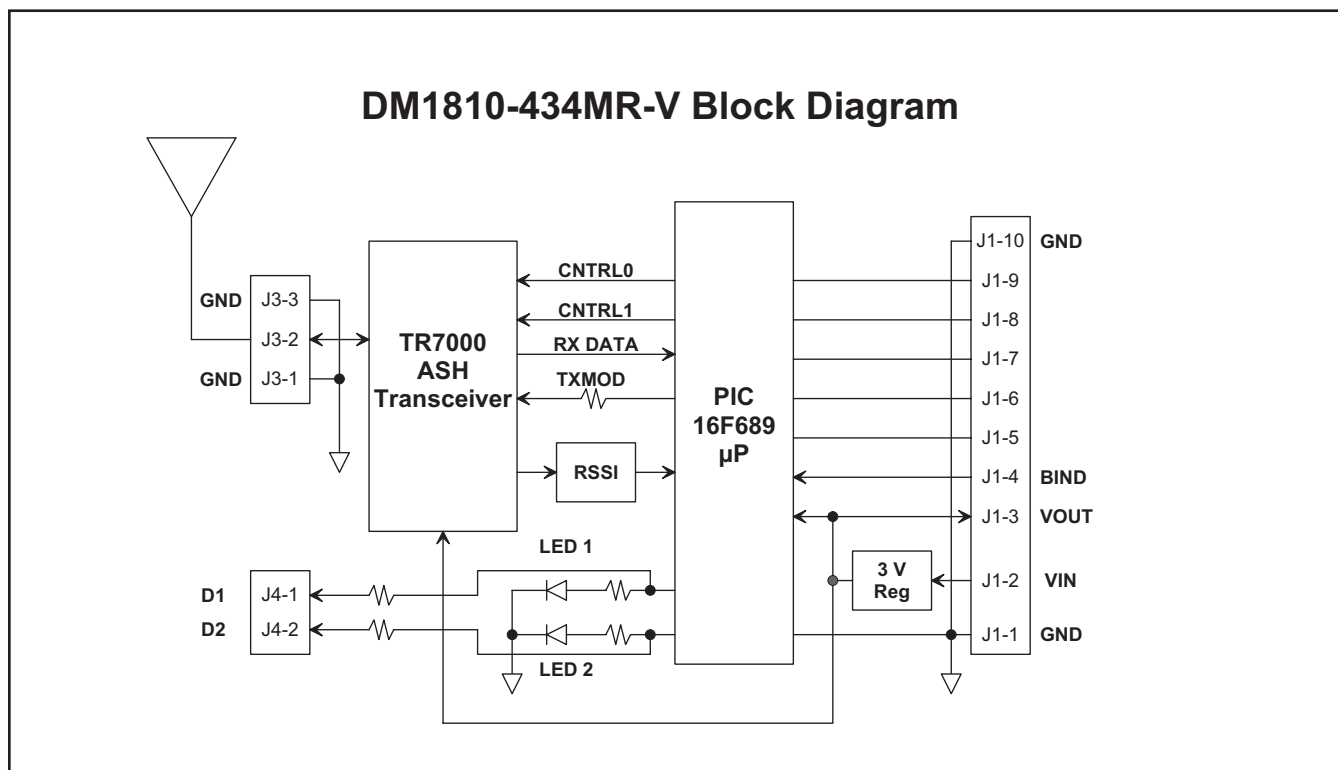


Figure 1

Theory of Operation

The major components of the DM1810-434MR-V include an RFM TR7000 ASH transceiver and a Microchip PIC16F689 microcontroller. The TR7000 operates on a frequency of 433.92 MHz, at a nominal output power of 10 mW. The DM1810-434MR-V includes two LEDs that indicate the module's operating mode.

The DM1810-434MR-V firmware is based on RFM's miniMESH network protocol, which utilizes time-synchronized redundant routing to provide robust, deterministic packet delivery through a network with up to 15 routers.

Network configuration and maintenance features are built into the miniMESH protocol, simplifying commissioning and operating logistics. The firmware also includes several sleep cycling methods for extended battery life operation.

Please refer to the *DM1810 User's Guide* and the *AN1810 series Application Notes* for installation and application programming information. See the RFM web site at www.RFM.com.

DM1810-434MR-V I/O Pad Descriptions

| Pin | Name | Description |
|-------|------|---|
| J1-1 | GND | This pad is a signal and power supply ground. |
| J1-2 | VIN | This is the power supply input pad. The allowed input voltage range is 2.6 to 10 V. |
| J1-3 | VOUT | VOUT tracks 50 to 100 mV below VIN when VIN is in the range of 2.6 to 3.1 V. When VIN is in the range of 3.1 to 10 V, VOUT is regulated at 3.0 Vdc. Up to 10 mA can be supplied from this pad for powering external circuits such as thermistor-resistor networks. External circuitry must not impress more than 10 mV _{p-p} ripple on the regulated output voltage. |
| J1-4 | BIND | This pad is connected to a logic input on the microcontroller, and is configured with a weak pull-up. When this pin is momentarily grounded to J1-1 or J1-10, the module is placed into the bind mode, allowing this module to be associated with other modules to form a network. |
| J1-5 | - | This pad is unused in router operation. Leave this pad electrically unconnected. |
| J1-6 | - | This pad is unused in router operation. Leave this pad electrically unconnected. |
| J1-7 | - | This pad is unused in router operation. Leave this pad electrically unconnected. |
| J1-8 | - | This pad is unused in router operation. Leave this pad electrically unconnected. |
| J1-9 | - | This pad is unused in router operation. Leave this pad electrically unconnected. |
| J1-10 | GND | This pad is a signal and power supply ground. |
| J3-1 | GND | This pad is a ground for the antenna port. |
| J3-2 | ANT | This pad is the antenna port. |
| J3-3 | GND | This pad is a ground for the antenna port. |
| J4-1 | D1 | This pad is the LED 1 signal. |
| J4-2 | D2 | This pad is the LED 2 signal. |



CAUTION: Electrostatic Sensitive Device. Observe precautions when handling.

DM1810-434MR-V SMT Mounting Pattern

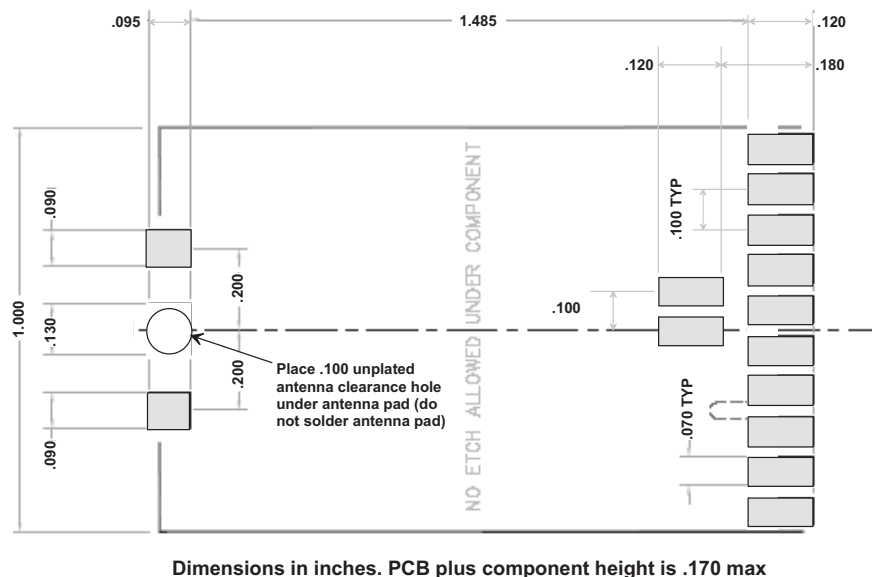
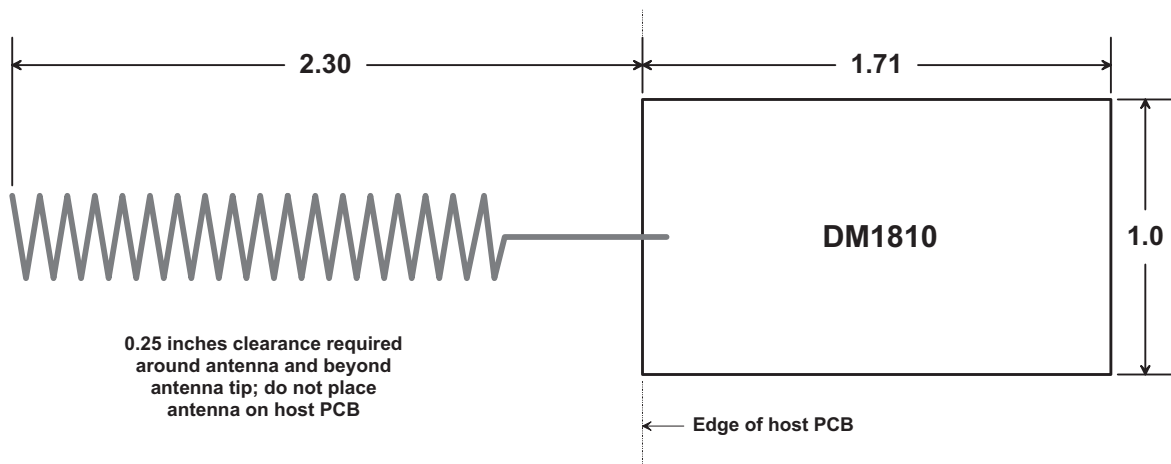


Figure 3

DM1810-434MR-V Antenna Detail



Dimensions in inches.

Figure 4

Note: Specifications subject to change without notice.

Mouser Electronics

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