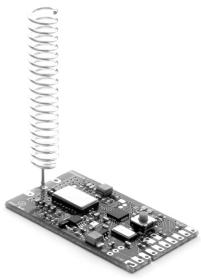
DM1810-434MR

433.92 MHz Transceiver Module

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

The DM1810-434MR 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 Cirronet's miniMESH™ network protocol, which provides add-on "plug- and-play" multicast mesh network routing. Radio communications range in an "open field" environment is typically 600 meters/hop. The DM1810-434MR combines RFM's very low current ASH radio technology with low power microcontroller technology to achieve long battery life. The DM1810-434MR 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	VOUT			3.0		Vdc
Regulated Power Supply Voltage Ripple					10	mV_{P-P}
Relative Humidity Range, Non-Condensing	RH		10		90	%

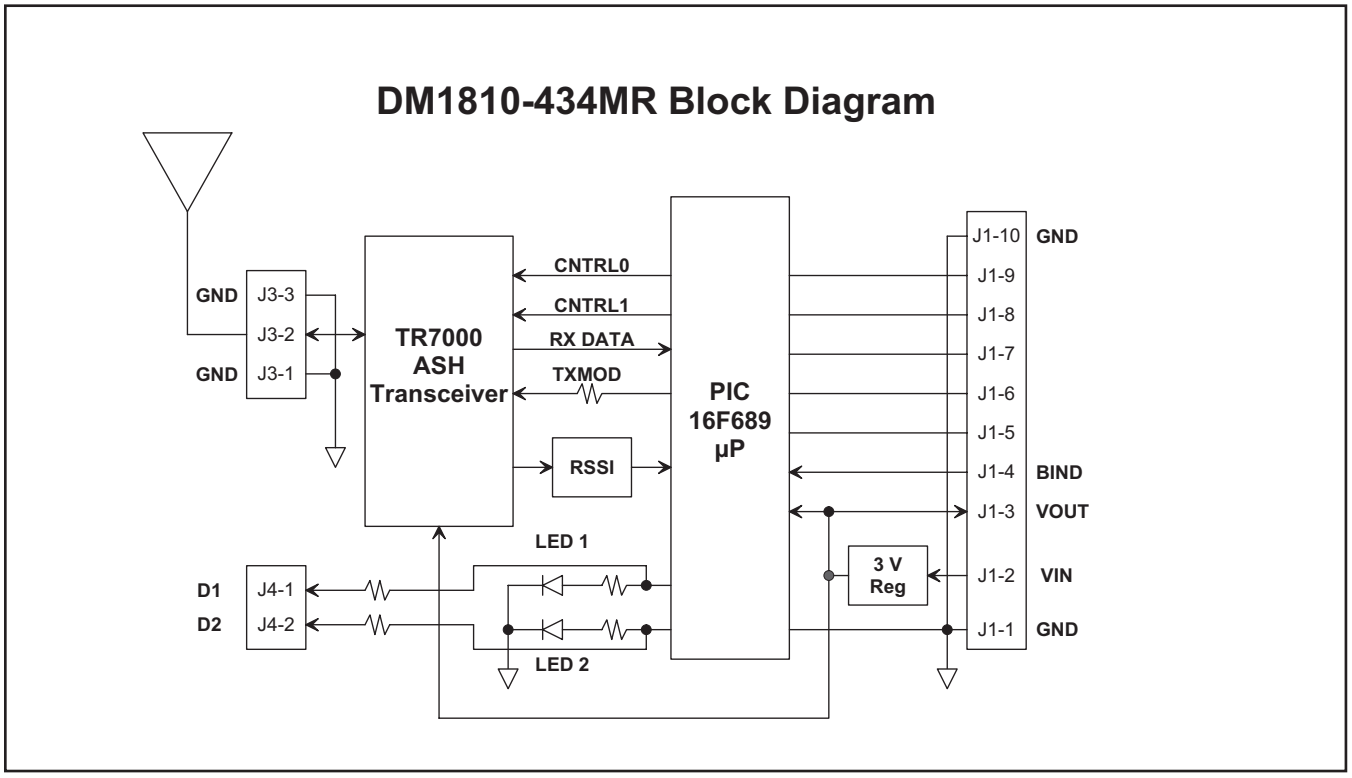


Figure 1

Theory of Operation

The major components of the DM1810-434MR 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 includes two LEDs that indicate the module's operating mode.

The DM1810-434MR firmware is based on Cirronet's miniMESH network protocol, which utilizes time-synchronized redundant routing to provide robust, deterministic packet delivery though 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 Cirronet's web site at www.Cirronet.com.

DM1810-434MR 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 I/O Pad Labels

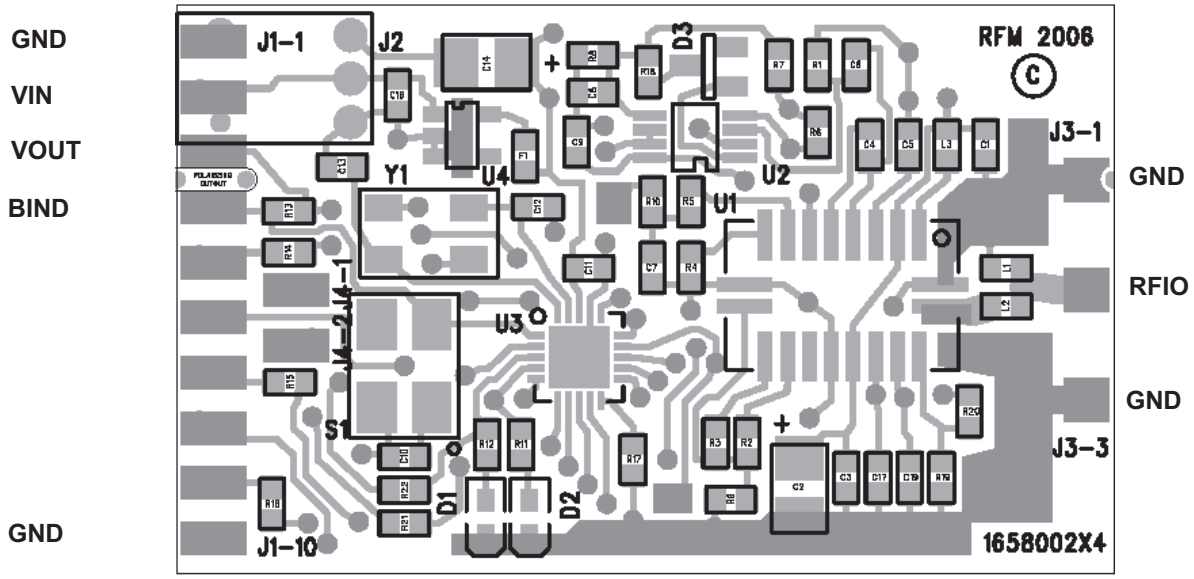
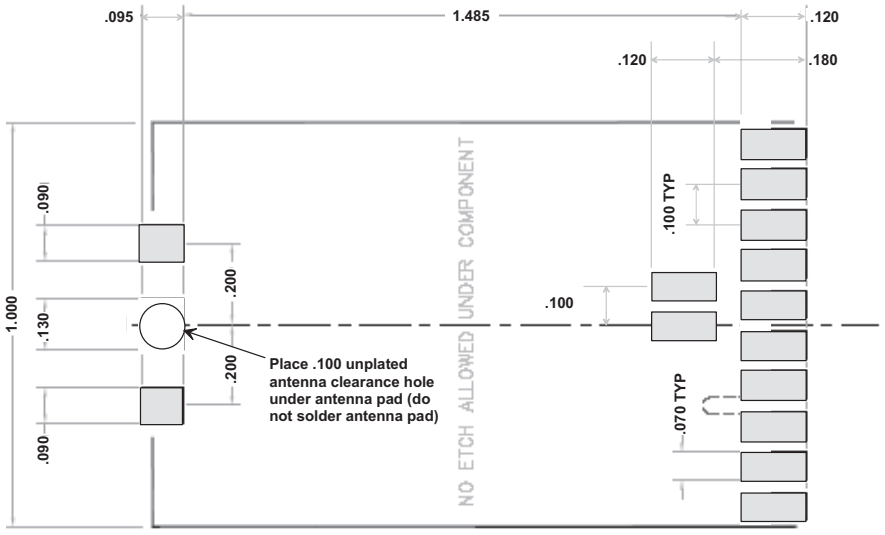


Figure 2

DM1810-434MR SMT Mounting Pattern



Dimensions in inches. PCB plus component height is .170 max; PCB plus antenna height is 2.15 max

Figure 3

Note: Specifications subject to change without notice.

file: dm1810_434r04.vp, 2007.12.15 rev