Preliminary

RFM®

DM1800-916MR	

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

916.50 MHz Transceiver Module

The DM1800-916MR is the 916.5 MHz router module in the DM1800 family of RF transceivers. The DM1800 family is designed for adding embedded wireless connectivity to a wide range of monitoring and control systems. This module is compatible with RFM'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 200 meters/hop. The DM1800-916MR combines RFM's very low current ASH radio technology with low power microcontroller technology to achieve long battery life. The DM1800-916MB is certified for operation under FCC 15.249 regulations.

Absolute Maximum Ratings

Rating	Value	Units
All Input/Output Pins Except VIN	-0.3 to +3.3	V
Non-Operating Ambient Temperature Range	-50 to +100	^{o}C

Electrical Characteristics

Characteristic	Sym	Notes	Minimum	Typical	Maximum	Units
Operating Frequency	f_O		916.30		916.70	MHz
Modulation Type				OOK		
RF Encoded Data Transmission Rate				4.8		kb/s
Average Receiver Input Current, No External Power Supply Load	I_R			4		mA
Receiver Input Signal for 10^{-3} BER, 25 ^{o}C				-98		dBm
Peak Transmitter Input Current, No External Power Supply Load	I_{TP}				13.5	mA
Peak Transmitter Output Power	P_O				1	mW
Digital In Logic High			2.4			V
Digital In Logic Low					.45	V
Power Supply Input Voltage Range, -40 to +85 ^{o}C	VIN		2.6		14	V
Power Supply Input Voltage Range, 0 to +85 ^{o}C	VIN		3.1		14	V
Regulated Power Supply Output Voltage, VIN 3.1 to 14 V	VOUT			3.0		Vdc
Regulated Power Supply Voltage Ripple					10	mV_{P-P}

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DM1800-916MR Block Diagram

Figure 1

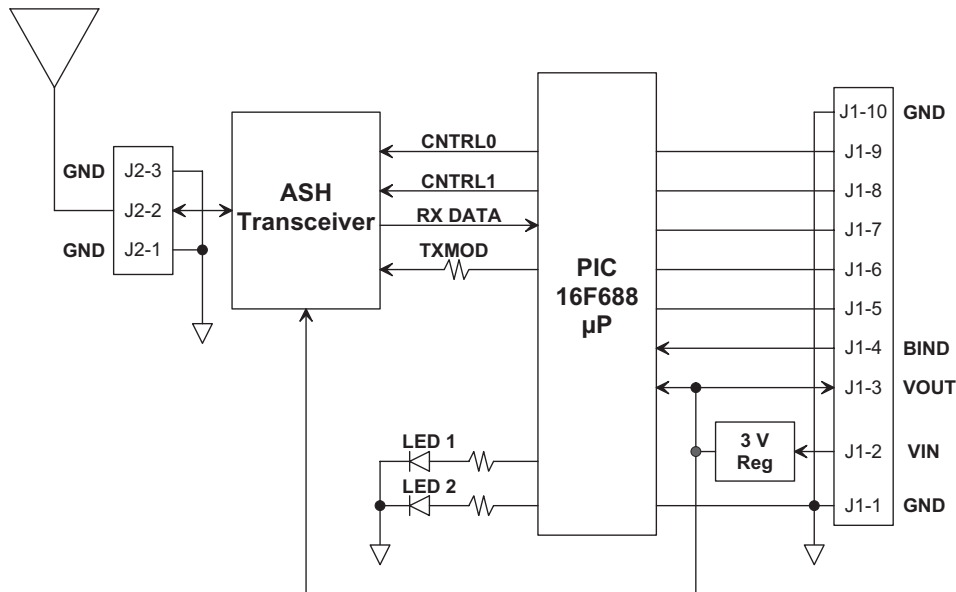### Theory of Operation

The major components of the DM1800-916MR include an RFM TR1000 ASH transceiver and a Microchip PIC16F688 microcontroller. The TR1000 operates on a frequency of 916.50 MHz, at a nominal output power of 1 mW. The DM1800 includes two LEDs that indicate the module's operating mode.

The DM1800-916MR is compatible with RFM's miniMESH™ network protocol, which provides add-on "plug-and-play" mesh network routing to improve communication range and robustness.

DM1800-916MR FCC Certification

The DM1800-916MR hardware has been certified for operation under FCC Part 15 Rules, Section 15.249. This certification applies only when a DM1800-916MR is equipped with one of the following RFM antennas:

helical antenna, RFM part number 500-1195-003
helical antenna, RFM part number 500-1195-103

WARNING: the DM1800-916MR must be re-certified if used with any antennas other than the two listed above. Contact RFM for further information if your application requires a special antenna configuration.

FCC Notices and Labels

This device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

A clearly visible label is required on the outside of the user's (OEM) enclosure stating that this product contains a DM1800-916MR transceiver assembly, FCC ID: TE6-DM1800.

WARNING: This device operates under Part 15 of the FCC rules. Any modification to this device, not expressly authorized by RF Monolithics, Inc., may void the user's authority to operate this device.

DM1800-916MR 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 14 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 14 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.
J1-10	GND	This pad is a signal and power supply ground.
J2-1	GND	This pad is a ground for the antenna port.
J2-2	ANT	This pad is the antenna port.
J2-3	GND	This pad is a ground for the antenna port.

DM1800-916MR I/O Pad Labels

GND

SERIAL TX

SERIAL RX

DIGITAL OUT

ANALOG IN

DIGITAL IN

BIND

VOUT

VIN

GND

GND

RFIO

GND

Figure 2

DM1800-916MR SMT Mounting Pattern

.095   1.535   .080

.090

1.000   .200

-.130   .200

.090

.100 TYP

.070 TYP   .050

NO ETCH ALLOWED UNDER COMPONENT

**Dimensions in inches. PCB plus component height is .170 max;
PCB plus antenna height is 1.15 max**

Figure 3

Note: Specifications subject to change without notice.