

## MM2 Series

MM2-MR, 900 MHz  
Series ISM



The FreeWave MM2-MR radio has been designed to provide the performance, reliability, and quality that our customers have come to know and expect in our products in a MM2 “Mega Mini” form factor for applications where space is at a premium. The MM2-MR has all of the functionality of the larger footprint FGR2 Series of radios.

All radios are designed, manufactured, and tested in Boulder, CO.

\* FreeWave Technologies, Inc. manages technology subject to the U.S. Export Administration Regulations (EAR) and the Wassenaar Arrangement. All transactions must undergo a compliance check to ensure that none of the parties to an order are listed on the U.S. Bureau of Industry and Security's Entity List.

### Key Features

**Improved Low Signal Performance:** RISC-based signal demodulation with matched filter

**Versatile:** A single radio can operate as a Gateway, Endpoint, Repeater, or Endpoint/ Repeater

**Unparalleled Signal Performance:** GaAs FET RF front end with multistage SAW filtering has an unmatched combination of overload immunity and sensitivity

**Selectable Speeds:** 115.2 kbps to 153.6 kbps

**Secure:** Proprietary Spread Spectrum technology prevents detection and unauthorized access; 128-bit or 256-bit AES encryption available\*

**Size & Performance:** Smallest data radio with the highest performance available

**Noise Immunity:** Superior performance in noise congested environments

**Reliable:** 100% tested for performance from -40°C to +85°C

### Transmitter

Frequency Range	902 to 928 MHz
Output Power	Up to 1 W
Range	Up to 97 km (60 miles) with clear line of sight
Channel Spacing	230 kHz
RF Data Rate	115.2 or 153.6 kbps, user-selectable

### Receiver

Sensitivity	-107 dBm @ 115.2 kbps for BER 10 <sup>-4</sup> -102 dBm @ 153.6 kbps BER 10 <sup>-4</sup>
IF Selectivity	40 dB at fc +/- 230 kHz
RF Selectivity	50 dB at 896 MHz, 935 MHz
Dynamic Range	+10 dBm 3rd order intercept point at input connector

### Data Transmission

Type	Frequency Hopping Spread Spectrum Options: TDMA, Super Epoch TDMA
Modulation	2 level GFSK
Data Throughput	115.2 kbps and 153.6 kbps
Error Detection	32-bit CRC, retransmit on error
Data Encryption	Options: AES 128 / 256-bit encryption
Hopping Zones	16 zones, user-selectable
Hopping Bands	7, user-selectable
Hopping Channels	50 to 112, user-selectable
Hopping Patterns	15 per band, 105 total, user-selectable
Protocol	RS232 / RS485 or TTL

### Power Requirements

Operating Voltage	+6.5 VDC to +30 VDC			
Current Consumption	Voltage	Transmit	Receive	Idle
	+6.5 VDC	900 mA	100 mA	42 mA
	+12 VDC	515 mA	60 mA	24 mA
	+30 VDC	320 mA	32 mA	13 mA

### Interfaces

Data Interface	10-pin header for power, data, and diagnostics 2.5 mm pin spacing RS232 or TTL 1200 bps to 230.4 kbps
Diagnostics Interface	Serial, RS232 or TTL
RF Connector	MMCX (right angle)

### General Information

Operating Temperature	-40°C to +85°C (-40°F to +185°F)
Humidity	0 to 95%, non-condensing
Dimensions	69.9 L x 61.0 W x 10.2 H (mm) 2.75 L x 2.4 W x 0.4 H (in)
Weight	14 g (0.03 lbs)

### Information to Order

Model Number	Description
MM2-MR-R	MMCX Connector
MM2-MR-R-U	MMCX Connector, Class I, Division 2
MM2-MR-SR	SSMC Connector
MM2-MR-T	MMCX Connector, TTL
MM2-MR-T-U	MMCX Connector, TTL, Class I, Division 2