

## MM3 Series

900 MHz OEM Radio



The FreeWave MM3 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 compact form factor for applications where space is at a premium. The MM3 has all of the functionality of the larger footprint FGR3 Series of radios.

The MM3 radio is an OEM module available in a variety of configurations and 3.5 or 5.0 VDC versions. Each of these can be ordered as RoHS or UL Class I, Division 2 compliant.

GaAs FET RF front end with multistage SAW filtering has an unmatched combination of overload immunity and sensitivity for unparalleled signal performance.

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

### Key Features

**Versatility:** Gateway, Endpoint, Repeater or simultaneous Endpoint and Repeater function in a single radio

**Long Range:** 32 km (20 miles) with clear line of sight with the ability to extend through Repeaters

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

**Secure:** Using Frequency Hopping Spread Spectrum (FHSS) technology; available with 128-, 192-, and 256-bit AES encryption

**Error Free Communications:** 32-bit CRC with automatic retransmissions

**Low Power Consumption:** Ideal for solar, battery, and DC applications

**Industrial Grade:** Operating temperature 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	230.4 kHz
RF Data Rate	115.2 or 153.6 kbps, user-selectable

Receiver	
Sensitivity	-108 dBm @ 115.2 kbps for BER 10 <sup>-4</sup> -103 dBm @ 153.6 kbps for 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	80 or 115.2 kbps
Error Detection	32-bit CRC, retransmit on error
Data Encryption	Options: 128-, 192-, 256-bit AES encryption
Hopping Zones	16 zones, user-selectable
Hopping Bands	7, user-selectable
Hopping Channels	50 to 110, user-selectable
Hopping Patterns	15 per band, 105 total, user-selectable
Protocol	TTL

Power Requirements				
Operating Voltage	+5.0 VDC (+/-5%)			
Current Consumption	Voltage	Transmit	Receive	Idle
T Versions	+ 5.0 VDC	855 mA	90 mA	21 mA

Interfaces	
Data Interface	14-pin straight, dual row header for power, data, and diagnostics 2 mm pin spacing
Diagnostics Interface	TTL Serial
RF Connector	MMCX

General Information	
Operating Temperature	-40°C to +85°C (-40°F to +185°F)
Humidity	0 to 95%, non-condensing
Dimensions	50.8 L x 35.6 W x 9.6 H (mm) 2 L x 1.4 W x 0.38 H (in)
Weight	15 g (0.3 lbs)

Information to Order	
Model Number	Description
MM3-T	Board level, 5.0V
MM3-T-U	Board level, 5.0V, UL Class I, Division 2