FREEWAVE

MM2 Series

900 MHz OEM Radio

The FreeWave MM2 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 MM2 has all of the functionality of the larger footprint FGR2 Series of radios.

The MM2 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.

Only the MM2-T-RX can receive from other MM2 and FGR2 radios while operating as an endpoint in a point to point or point to multipoint network.

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: Frequency Hopping Spread Spectrum (FHSS) technology prevents detection and unauthorized access

Optional: 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

Available Options: TDMA, Super Epoch TDMA, and 128-, 192-, and 256-bit AES encryption

Transmitter

Frequency Range	902 to 928 MHz
Output Power	Up to 1 W
Range	Up to 32 km (20 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^{-4} -103 dBm @ 153.6 kbps for BER 10^{-4}
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: AES 128-, 192-, 256-bit 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	+3.5 VDC (+/-5%) +5.0 VDC (+/-5%)			
Current Consumption	**Voltage**	**Transmit**	**Receive**	**Idle**
LV Versions	+3.5 VDC	1175 mA	125 mA	13 mA
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
MM2-LV-T	Board level, 3.5V
MM2-LV-T-LF	Board level, 3.5V, RoHS
MM2-LV-T-U	Board level, 3.5V, UL Class I, Division 2
MM2-T	Board level, 5.0V
MM2-T-LF	Board level, 5.0V, RoHS
MM2-T-RX	Board level, 5.0V, Rcv Only
MM2-T-U	Board level, 5.0V, UL Class I, Division 2

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