

MM2 Series

MM2-M13 1.3 GHz Radio



MM2-M13-C

OVERVIEW

FreeWave Technologies' military products are designed to meet the rigorous demands of military and government users worldwide. This user-configurable 1.3 GHz product is available as an OEM board level radio. It is used in applications ranging from UAVs to UGVs, and more. FreeWave military products share the same features as our other radios that assure accurate data transmission, such as 32 bit CRC error detection with automatic retransmission and more.

The FreeWave MM2 Series of radios has been designed to provide the performance, reliability, and quality that our customers have come to know and expect in our products. The MM2 combines high performance with a small size making it ideal for applications where space is at a premium.

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

MODEL	DIMENSIONS	OPTIONS
MM2-M13-C	2" L x 2" W x 0.3"	RS232/RS485
MM2-M13-T	2" L X 2 " W x 0.3" H	TTL

APPLICATIONS



Government & Defense

KEY FEATURES

- **High Speed:** 115.2 kbps maximum throughput
- **Long Range:** Up to 40 miles with clear Line of Sight (LOS)
- **Error-free Communications:** 32 bit CRC with automatic retransmission
- Input voltage range is +8 to +30 VDC at full RF output power. Receive current is less than 75 mA @ 12 VDC. Sleep mode only consumes 5 mA @ 12 VDC
- Diagnostics port allows real-time local diagnostics and setup menu access
- Diagnostics include signal level in dBm and transmit current
- RS232/RS485 or TTL interface
- Superior performance in noise congested environments
- **Reliable:** 100% tested for performance from -40° C to +75° C

MM2-M13 1.3 GHz Radio Specifications

Preliminary

TRANSMITTER	Frequency Range	1.350 to 1.390 MHz			
	RF Data Rate	153 kbps or 115 kbps, User Selectable			
	Output Power	5 mW to 1 W			
	Data Link Range	40 miles			
	Modulation	2-level GFSK			
	Occupied Bandwidth	230 kHz			
	Hopping Channels	1 to 112 (out of 172), User Selectable			
	Hopping Bands	7, User Selectable			
	Hopping Patterns	15 per Band, 105 Total, User Selectable			
	RF Connector	MMCX			
RECEIVER	Sensitivity	-106 dBm @ BER 10 ⁻⁴			
	Selectivity	-20 dB at fc ± 230 kHz			
	System Gain	136 dB			
DATA TRANSMISSION	Error Detection	32 bit CRC, Retransmit on error			
	Link Throughput	115.2 kbps			
	Data Encryption	FHSS Technology			
	Protocol	RS232/RS485 or TTL			
DIAGNOSTICS	Connector	Dual Row 14 pin Header, 2mm pin spacing			
POWER REQUIREMENTS	Operating Voltage	+8 to +30 VDC r +5 VDC (-LV models only)			
	Typical Current (mA)	Mode	+5 VDC	+12 VDC	+30 VDC
		Transmit	1000 mA	500 mA	200 mA
		Receive	120 mA	75 mA	40 mA
		Idle	30 mA	20 mA	9 mA
	Sleep	8 mA	5 mA	2 mA	
GENERAL INFORMATION	Operating Temperature	-40° C to +75° C (-40° F to +167° F)			
	Humidity	0 to 95% non-condensing			
	Dimensions	2" L x 2" W x 0.3" H in (50.8 mm x 50.8 mm 7.6 mm)			
	Weight	0.74 oz (21 g)			

* These devices are regulated under the U.S. International Traffic in Arms Regulation (ITAR). These regulations control the Export and Import of the defense articles. These devices may only be sold or transferred to a non-U.S. party (in the U.S. or abroad) after authorization is obtained from the U.S. Department of State. Customer (a) agrees to comply with ITAR regulations and (b) shall be responsible for obtaining all necessary U.S. Government authorizations required to ensure compliance with these and other applicable U.S. Laws. Please contact FreeWave for export control information for specific products.

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