

## Spartan Series

### 1.3 GHz FIPS Radio\*



The Spartan M13 Series offered by FreeWave Technologies is designed to meet the rigorous demands of government and defense users worldwide. The 1.3 GHz products are available as OEM board level radios that are extremely user programmable including FIPS 140-2 Level 2 encryption.

It is an affordable solution for UAV and UGV applications with serious size, weight and power constraints. The Spartan M13 Series shares the same features as other FreeWave radios that ensure reliable data transmission, such as 32-bit CRC error detection with automatic retransmission.

The FreeWave Spartan Series of wireless radios are designed to provide the performance, reliability and quality that our customers have come to know and expect in our products. The Spartan product family 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.

#### Key Features

**Max Speed:**

115.2 kbps maximum throughput

**Reliable:**

100% tested for performance from -40°C to +75°C

**Flexible:**

RS232 or Ethernet interfaces and user-programmable

**Long Range:**

Up to 97 km (60 miles) with clear line of sight

**Powerful Diagnostics:**

Includes received signal strength indicator

**Encryption:**

Certified by NIST for FIPS 140-2 Level 2

\* This device is regulated under the U.S. International Traffic in Arms Regulation (ITAR). These regulations control the Export and Import of the defense articles. The device 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.

Transmitter	
Frequency Range	1.350 to 1.390 GHz
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	-106 dBm @ 115 kbps for BER 10 <sup>-6</sup> -103 dBm @ 153 kbps for BER 10 <sup>-6</sup>
IF Selectivity	20 dB at fc +/- 230 kHz

Data Transmission	
Type	Frequency Hopping Spread Spectrum Options: TDMA, Super Epoch TDMA
Modulation	2 level GFSK
Data Throughput	115.2 and 80 kbps, user-selectable
Error Detection	32-bit CRC, retransmit on error
Data Encryption	FIPS 140-2 Level 2
Hopping Bands	7, user-selectable
Hopping Channels	1 to 112 (out of 172), user-selectable
Hopping Patterns	15 per band, 105 total, user-selectable
Protocol	<b>M13-NCF:</b> RS232 <b>M13-NPF:</b> IP
User Interface Rates	<b>M13-NCF:</b> 1.2 to 115.2 kbps <b>M13-NPF:</b> 10 Mbps/100 NBps

Power Requirements				
Operating Voltage	+4.75 VDC to +5.25 VDC			
Current Consumption	Voltage	Transmit	Receive	Idle
	+5 VDC	1200 mA	240 mA	135 mA

Interfaces	
Data Interface	<b>M13-NCF:</b> 14-pin dual row, right-angle header for power, data, and diagnostics 2 mm pin spacing  <b>M13-NPF:</b> Dual row, 10-pin male, 0.02 square posts, 2 mm centers
Diagnostics Interface	Serial, RS232 or TTL
RF Connector	MMCX or SSMC

General Information	
Operating Temperature	-40°C to +75°C (-40°F to +167°F)
Humidity	0 to 95%, non-condensing
Dimensions	<b>M13-NCF:</b> 106.7 L x 50.8 W x 14.1 H (mm) 4.20 L x 2.00 W x 0.56 H (in)  <b>M13-NPF:</b> 103.9 L x 50.8 W x 18.1 H (mm) 4.09 L x 2.00 W x 0.71 H (in)
Weight	<b>M13-NCF:</b> 66.6 g (0.15 lbs) <b>M13-NPF:</b> 66.9 g (0.15 lbs)

Certifications	
NIST	FIPS 140-2 Level 2

Information to Order	
Model Number	Description
M13-NCF	Serial board level
M13-NCF-CC	Conformal Coated M13-NCF
M13-NPF	Ethernet board level