



# FGR Series

## FGR09CS / CA / TS 900 MHz Industrial Radio

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### Overview:

The FreeWave board level 900 MHz radios are deployed in applications where communication can only be achieved with a FreeWave radio. The radios provide unmatched performance and versatility in a small footprint that is ideal for OEM applications.

These radios offer cost effective solutions that allow customers to incorporate wireless communications into such applications as municipal systems, traffic systems, factory automation monitoring, SCADA and more. FCC Part 15 approval on the board level and enclosure, these radios have flexibility for use in any application worldwide. All radios are designed, manufactured and tested in Boulder, Colorado.

### Features:

- Separate diagnostic port: Real time remote diagnostic and setup, transparent to network communications.
- Wide input voltage range: 6.5 to 30 VDC.
- Synthesized waveform transmit data - reduces out of band modulation products.
- Backward compatible: 100% compatible with all existing 900 MHz FreeWave radios.
- Repeater and simultaneous Slave and Repeater function all in a single radio.
- UL Approved
- Versatile: A single radio can operate simultaneously as a Slave and Repeater.
- High Noise Immunity: Superior Performance in noise congested environments.
- Secure: Proprietary spread spectrum technology prevents detection and unauthorized access.
- High Speed: 115.2 Kbps continuous throughput.
- Error Free Communications: 32 bit CRC with automatic retransmission.
- Industrial Grade Specifications: 100 % tested for RF performance from -40°C to +75°C.



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## FGR09CS / CA / TS 900 MHz Industrial Radio Technical Specifications

Transmitter				
Frequency Range	902-928 MHz (FHSS)			
Output Power	5 mW to 1 watt			
Range - Line of Sight	60 miles			
Modulation	2 level GFSK, 115.2 Kbps or 153.6 Kbps			
Occupied Bandwidth	230 kHz			
Hopping Patterns	15 per Band, 105 total, user selectable			
Hopping Channels	50 to 112, user selectable			
Hopping Bands	7, user selectable			
Frequency Zones	16 Zones, 7 Channels per zone			
RF Connector	Type SMA, TNC-Enclosed version only (Female connectors), No RF			
Receiver				
Sensitivity	-108 dBm for BER 1x10 <sup>-6</sup> , -110 dBm for BER 1x10 <sup>-4</sup>			
IF Selectivity	20 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				
Error Detection	32 bit CRC, Retransmit on error			
Data Encryption	AES 128 bit encryption* and proprietary spread spectrum technology			
Link Throughput*	115.2 Kbps Standard Speed; 80 Kbps Low Speed <i>*Uncompressed, measured assuming 75% frequency availability.</i>			
Data Interface	Serial			
Protocol	RS232 / 485 / 422, 1200 Baud to 115.2 KBaud			
Data Connector	Board Level: 10-pin header with locking ramp, 0.1 inch spacing, power/data connector Enclosed (ruggedized): DB9			
Diagnostics				
Connector	Board Level: Separate 20-pin PCB header   Enclosed (ruggedized): 3-pin PCB header.			
Power Requirements				
Operating Voltage	6.5 to 30 VDC			
Current	<b>Mode</b>	<b>6.5 VDC</b>	<b>12 VDC</b>	<b>30 VDC</b>
	<b>Transmit</b>	1 A	500 mA	200 mA
	<b>Receive</b>	152 mA	86 mA	43 mA
	<b>Idle</b>	40 mA	21 mA	12 mA
	<b>Sleep</b>	8 mA	6 mA	3 mA
General Information				
Operating Temperature Range	-40 °C to +75 °C (-40° F to +167° F)			
Dimensions	Board Level: 136mm L x 62mm W x 14mm H   Enclosed: 173mm L x 107mm W x 35mm H			
Weight	Board Level: 60 g   Enclosed: 590 g			
Humidity	0 to 95% non-condensing			

\*Contact your FreeWave reseller or sales rep for implementation details.

FreeWave Radios Require Professional Installation. Specifications may change at any time without notice. ©2010 FreeWave Technologies, Inc.



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