

*RADIO MODULE*

**MXR-1205**

**UHF FM/FSK TRANSCEIVER MODULE**

PRELIMINARY

**DATA SHEET**

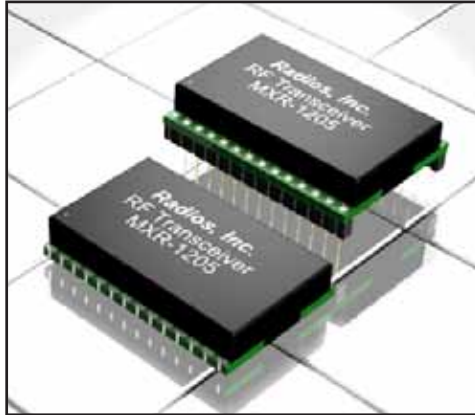
***Radios, Inc.***

May 23, 2005 Preliminary Data Sheet

# MXR-1205

## UHF FM/FSK TRANSCEIVER MODULE

The MXR-1205 is a Frequency Shift Keyed (FSK) UHF high performance, short and long range, half duplex, digital transceiver operating at the 902-928 MHz band. This integrated modularized transceiver is primarily intended for use in part 15.249 systems. An external antenna is the only component required therefore the transceiver is easily integrated with other applications. The transceiver is cost effective, reliable and small in size making it ideal for high volume OEM applications. It has extensive internal filtering making harmonic emissions easy to control. It is a highly reliable wireless link that is SAW resonator stabilized. There is voltage regulation and its output power is easy to control. It has zero IF architecture with selectable addressing. The MXR-1205 is a well designed transceiver suitable for a variety of RF applications.



### Typical Applications:

- Remote controls
- Garage openers / Gate controls
- Keyless entry
- Lighting control
- Home / Industrial automation
- Continuous / Periodic data transfer
- Wireless networking
- Remote access
- Remote monitoring / telemetry
- Medical monitoring / call systems
- Guard patrol / lone worker protection
- Domestic / Commercial security
- Automated resource management
- Picture / Antique protection alarms
- Fire / Security alarms
- Long-range RFID
- Automated meter reading

- Wireless headsets
- Audio signal transfer
- General wire elimination
- On-site paging
- Asset tracking

### Key Features:

- Low cost
- Commonly employed RKE frequencies
- Wide operating temperature range
- Easily integrated
- Low power consumption
- 3V operation
- Simple serial programming interface
- Small size
- Up to 1000 meter range
- Exceptional sensitivity
- Fast enable time

### PRODUCT ORDER INFORMATION

Part Number	Description
MXR-1205-433(T)(S)	433 MHz FM/FSK Transceiver Module
MXR-1205-868(T)(S)	868 MHz FM/FSK Transceiver Module
MXR-1205-915(T)(S)	915 MHz FM/FSK Transceiver Module

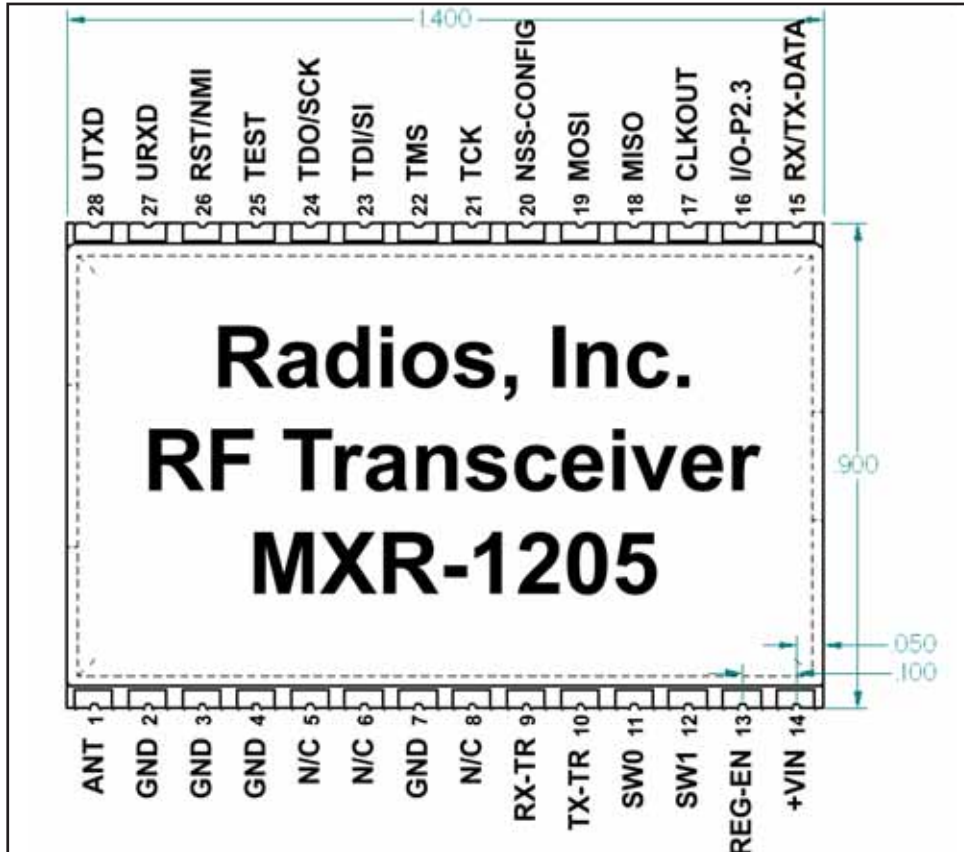
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## UHF FM/FSK TRANSCEIVER MODULE

### Mechanical and Pin Diagram



### Pin Description

Pin Num	Pin Name	Description	Pin Num	Pin Name	Description
Pin 1	Ant	RF Input	Pin 15	RX/TX-DATA	Transmit or Receive Data Pin
Pin 2	Gnd	Ground	Pin 16	I/O-P2.3	Input or Output Pin
Pin 3	Gnd	Ground	Pin 17	CLKOUT	Clock Output Pin
Pin 4	Gnd	Ground	Pin 18	MISO	SPI Master In, Slave Out
Pin 5	N/C	No Connect	Pin 19	MOSI	SPI Master Out, Slave In
Pin 6	N/C	No Connect	Pin 20	NSS-CONFIG	SPI Select Configuration Pin
Pin 7	Gnd	Ground	Pin 21	TCK	Input for Programming and Test
Pin 8	N/C	No Connect	Pin 22	TMS	Input for Programming and Test
Pin 9	RX-TR	Receive TR Switch	Pin 23	TDI/SI	SPI Data Input Pin
Pin 10	TX-TR	Transmit TR Switch	Pin 24	TDO/SCK	SPI Input Clock
Pin 11	SW0	Mode Select	Pin 25	TEST	Selects Test Mode for JTAG
Pin 12	SW1	Mode Select	Pin 26	RST/NMI	Reset/Nonmaskable Interrupt Input
Pin 13	REG-EN	Regulator Enable	Pin 27	URXD	Receive UART Pin
Pin 14	+VIN	Positive Supply Pin	Pin 28	UTXD	Transmit UART Pin

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## UHF FM/FSK TRANSCEIVER MODULE

### Electrical Limits

Sym	Parameters	Min	Typ	Max	Unit	Notes
<b>Absolute Maximum Ratings</b>						
VDD	Supply Voltage	2.7		16	V	
	Receiver Input Level			-5	dBm	
	Storage Temperature Range	-40		85	°C	
V <sub>EN</sub>	Enable Input Voltage	-20		+20	V	
			2		kV	
<b>Operating Ratings</b>						
V <sub>EN</sub>	Enable Input Voltage	0		TBD	V	
	Load capacitance on digital ports			25	pF	
TA	Ambient operating temperature	-40		85	°C	

### Electrical Characteristics

This device is ESD sensitive. Do not operate or store near strong electrostatic fields. Use appropriate ESD precautions. All voltages are with respect to Ground.

Parameters	Test Conditions	Min	Typ	Max	Unit
Supply current in sleep mode			0.2	1	µA
Supply current in standby mode	Quartz oscillator (39 MHz) enabled		0.85	1.1	mA
Supply current in receiver mode			14	16.5	mA
Supply current in transmitter mode	RFOP = 5 dBm		33	40	mA
	RFOP = 15 dBm		62	75	mA
Quiescent Current	V <sub>EN</sub> <= 0.4V (shutdown)		0.01	1	µA
	V <sub>EN</sub> <= 0.18V (shutdown)			5	µA
RF sensitivity	Mode A		-116	-113	dBm
	Mode B		-102	-99	dBm
Frequency deviation	Programmable	1		255	kHz
Co-channel rejection		-13	-10		dBc
Input intercept point (from LNA input to baseband filter output)	Mode A	-37	-33		dBm
	Mode B	-21	-18		dBm
Baseband filter bandwidth DSB	Programmable		10		kHz
			20		kHz
			40		kHz
			200		kHz
Adjacent channel rejection ratio Pw = -107dBm, Mode A	Funw = FLO + 25 kHz single tone	17	20		dBc
	Funw = FLO + 50 kHz single tone	35			dBc
Bit rate	Programmable	1.2		152.3	kbits/s
RF output power (Programmable)	RFOP1	-3	0		dBm
	RFOP2	2	5		dBm
	RFOP3	7	10		dBm
	RFOP4	12	15		dBm
Transmitter adjacent channel power (measured at 25 kHz offset)	Pre-filter enabled (RFOP3 mode), measurement conditions as defined by EN 300 220-1 V1.3.1			-37	dBm
Synthesizer frequency range	Programmable	433		435	MHz
		863		870	MHz
		902		928	MHz

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### Electrical Characteristics - CONT.

Receiver wake-up time	Quartz oscillator enabled		700	850	µs
Transmitter wake-up time	Quartz oscillator enabled		250	350	µs
Frequency synthesizer wakeup time	Quartz oscillator enabled		200	250	µs
Receiver wake-up time	Frequency synthesizer enabled		500	600	µs
Transmitter wake-up time	Frequency synthesizer enabled		100	150	µs
Receiver recovery time when switching between 2 channels	Between 2 channels at 1 MHz from each other		TBD	TBD	µs
Transmitter recovery time when switching between 2 channels	Between 2 channels at 1 MHz from each other		150	250	µs
RSSI wake-up time	From receiver enabled			1.5	ms
Crystal oscillator wake-up time	Fundamental		1	2	ms
	3rd overtone		7		ms
FEI wake-up time	Receiver enabled		2/BR		ms
Crystal oscillator frequency	Fundamental or 3rd overtone		39		MHz
Frequency synthesizer step	Exact step is XTAL / 77 824		500		Hz
RSSI equivalent input thresholds	Low range		-110		dBm
			-105		dBm
			-100		dBm
	High range		-95		dBm
			-90		dBm
			-85		dBm
Spurious emissions in RX mode		-65	-50	dBm	
Digital input level high	% VDD	75		%	
Digital input level low	% VDD		25	%	
Digital output level high	% VDD	75		%	
Digital output level low	% VDD		25	%	

**Note 1.** Exceeding the absolute maximum rating may damage the device.

**Note 2.** The device is not guaranteed to function outside its operating rating.

**Note 3.** Devices are ESD sensitive. Handling precautions recommended. Human body model, 1.5k in series with 100pF.

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### **UHF FM/FSK TRANSCEIVER MODULE**

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Radios Inc. is committed to providing its customers with excellent technical support and the resources necessary to assist its customers with their product development. Customers have several options to obtain assistance. First, any questions or concerns can be e-mailed to Radios Inc. at [information@radiosinc.com](mailto:information@radiosinc.com). We monitor our e-mail daily, and will respond to all questions promptly. Additionally, to speak directly to a technical support representative, customers may call Radios Inc. at 215-362-1899.

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### **Editorial Information:**

	(Date)
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