

RADIO MODULE

MXR-1203

UHF FM/FSK TRANSCEIVER MODULE

PRELIMINARY

DATA SHEET

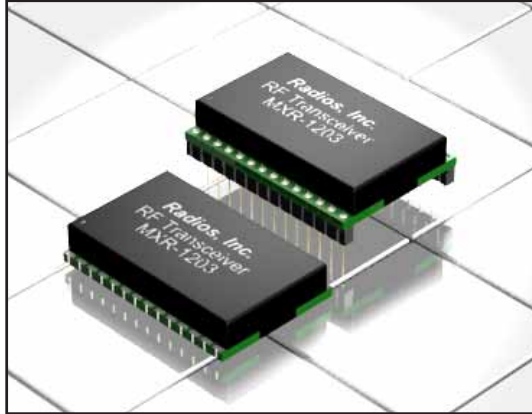
Radios, Inc.

May 23, 2005 Preliminary Data Sheet

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The MXR-1203 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-1203 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
- High serial data rate: 156K
- Fast enable time

PRODUCT ORDER INFORMATION

Part Number	Description
MXR-1203-433(T)(S)	433 MHz FM/FSK Transceiver Module
MXR-1203-868(T)(S)	868 MHz FM/FSK Transceiver Module
MXR-1203-915(T)(S)	915 MHz FM/FSK Transceiver Module

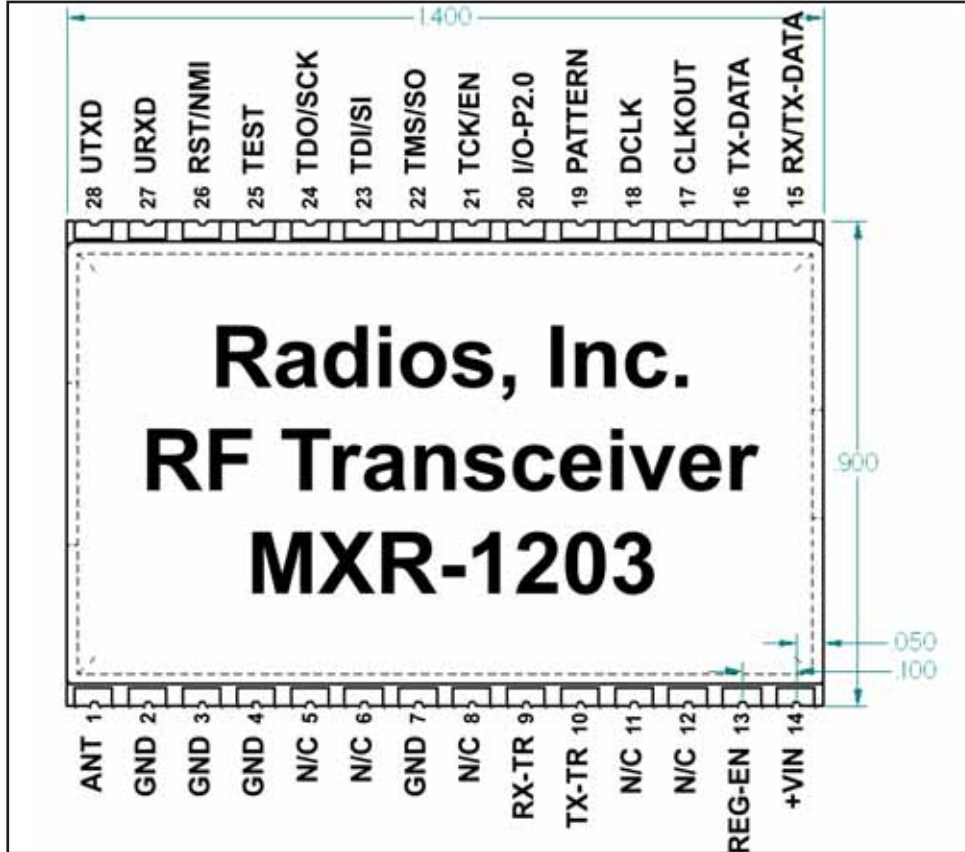
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Mechanical and Pin Diagram



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	TX-DATA	Transmitter Input Data
Pin 3	Gnd	Ground	Pin 17	CLKOUT	Clock Output Pin
Pin 4	Gnd	Ground	Pin 18	DCLK	Transmitter or Receiver Clock
Pin 5	N/C	No Connect	Pin 19	PATTERN	Pattern Recognition Output
Pin 6	N/C	No Connect	Pin 20	I/O-P2.0	Input or Output Pin
Pin 7	Gnd	Ground	Pin 21	TCK/EN	SPI Enable Pin
Pin 8	N/C	No Connect	Pin 22	TMS/SO	SPI Data Output Pin
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	N/C	No Connect	Pin 25	TEST	Selects Test Mode for JTAG
Pin 12	N/C	No Connect	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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Electrical Limits

Sym	Parameters	Min	Typ	Max	Unit	Notes
Absolute Maximum Ratings						
VDD	Supply Voltage	2.7		16	V	
	Receiver Input Level			-5	dBm	
	Storage Temperature Range	-40		85	°C	
V _{EN}	Enable Input Voltage	-20		+20	V	
			2		kV	
Operating Ratings						
V _{EN}	Enable Input Voltage	0		TBD	V	
	Load capacitance on digital ports			25	pF	
TA	Ambient operating temperature	-40		70	°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	17	mA
Supply current in transmitter mode	@ 5 dBm		33	40	mA
	@ 15 dBm		62	75	mA
Quiescent Current	V _{EN} ≤ 0.4V (shutdown)				µA
	V _{EN} ≤ 0.18V (shutdown)				µA
RF sensitivity, Note 1 Δf = 200 kHz, BBW = 600 kHz	BF = 4.8 kbit/s Mode A		-114	-111	dBm
	BF = 4.8 kbit/s Mode B		-101	-98	dBm
	BF = 32.7 kbit/s Mode A		-109	-106	dBm
	BF = 32.7 kbit/s Mode B		-96	-93	dBm
	BF = 152.3 kbit/s Mode A		-101	-98	dBm
	BF = 152.3 kbit/s Mode B		-89	-86	dBm
RF sensitivity with Barker Coding/decoding enabled, Note 1	BF = 1154 bit/s Mode A		-113	-110	dBm
	BF = 1154 bit/s Mode B		-100	-97	dBm
Frequency deviation	Programmable	1		255	kHz
Co-channel rejection		-13	-10		dBc
Input intercept point, Note 1	Mode A	-43	-40		dBm
	Mode B	-28	-25		dBm
Baseband filter bandwidth DSB			200		kHz
	Programmable, Note 2		600		kHz
Adjacent channel rejection	Funw = FLO + 650 kHz Pw = -108dBm, Mode A, Note 1	45	48		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

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Electrical Characteristics - CONT.

Synthesizer frequency range	Programmable Each with its own external components	433 868 902		435 870 928	MHz MHz MHz
Transmitter wake-up time	From oscillator enabled		150	250	µs
Receiver Baseband wake-up time	From oscillator enabled		0.5	0.8	ms
RSSI wake-up time	From receiver enabled			1	ms
RSSI measurement time			0.5		ms
Crystal oscillator wake-up time	Fundamental 3rd overtone		0.3 2.5	0.5	ms ms
FEI wake-up time				2/BR	ms
Time for synchronization of the barker decoder	Input power of -106 dBm, data rate = 1154 bits/s, chip rate = 12.7 kcps, from RX enabled		5		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 Mode A, Note 1	Low range High range		-100 -95 -90 -85 -80 -75		dBm dBm dBm dBm dBm dBm
Spurious emissions in RX mode			-55	-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. Mode A: High sensitivity mode; Mode B: High linearity mode.

Note 2. An intermediate bandwidth of 300 kHz can also be selected by using additional setting.

Note 3. Exceeding the absolute maximum rating may damage the device.

Note 4. The device is not guaranteed to function outside its operating rating.

Note 5. Devices are ESD sensitive. Handling precautions recommended. Human body model, 1.5k in series with 100pF.

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