RADIO MODULE

MXR-722

FSK/FM/ASK TRANSCEIVER MODULE

Supports the follow parts:

MXR-722

DATA SHEET

Radios, Inc.

May 2, 2006 Preliminary Data Sheet

MXR-722

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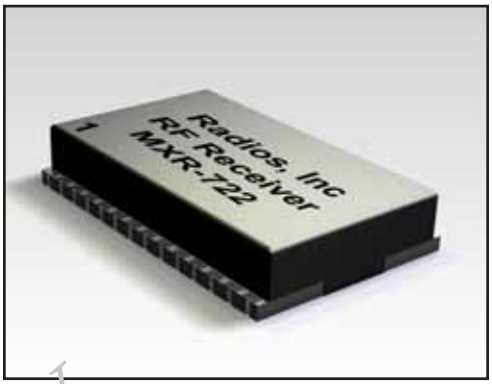

The MXR-722 is an FSK/FM/ASK transceiver designed to operate in low-power multi-channel programmable or single-channel stand-alone, half-duplex data transmission systems. It can be used for ISM, SRD, or any other application operating in the frequency range of 300 MHz to 930 MHz.

The MXR-722 consists of a low-noise amplifier (LNA), mixer, IF amplifier, peak detector, phase-frequency detector (PFD), charge pump (CP), and power amplifier (PA).

Key Features

- PLL-stabilized RF VCO (LO)
- FSK for digital data and FM reception for analog signal transmission
- Low current consumption in active mode and very low standby current
- ASK detection with or without peak detector
- RSSI allows signal strength indication and ASK detection
- Automatic PA turn-on after PLL lock
- ASK modulation achieved by PA on/off keying
- Power supply range: 2.5V - 16V
- Maximum data rate: 40 kbit/s NRZ
- Frequency range: 300 - 930 MHz in programmable user mode

Typical Applications

- Low-power telemetry
- Alarm and security systems
- Garage door openers
- Home automation
- Remote keyless entry
- Tire pressure monitoring system
- Intelligent remote control
- General bi-directional half duplex digital data transmission or analog signal transmission

PRODUCT ORDER INFORMATION	
Part Number	Description
MXR-722(D)(S)	TH7122 FSK/FM/ASK Module Transceiver

Contact Information	
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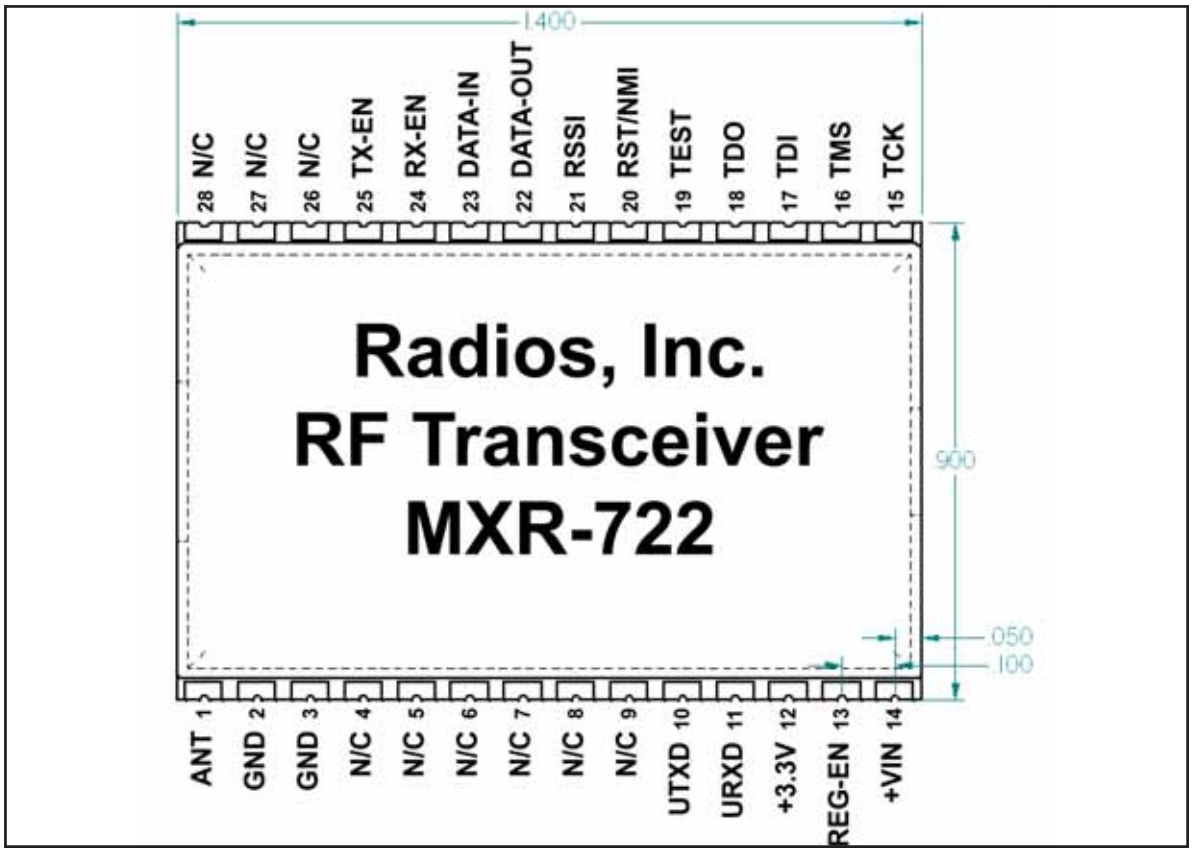
Mechanical and Pin Diagram



Pin Description

Pin Num	Pin Name	Description	Pin Num	Pin Name	Description
Pin 1	Ant	RF Input/Output	Pin 15	TCK	Test Clock
Pin 2	Gnd	Ground	Pin 16	TMS	Test Mode
Pin 3	Gnd	Ground	Pin 17	TDI	Test Data Input
Pin 4	N/C	No Connect	Pin 18	TDO	Test Data Output
Pin 5	N/C	No Connect	Pin 19	TEST	Selects Test Mode
Pin 6	N/C	No Connect	Pin 20	RST/NMI	Reset/Nonmaskable Interrupt Input
Pin 7	N/C	No Connect	Pin 21	RSSI	RSSI Output
Pin 8	N/C	No Connect	Pin 22	DATA-OUT	OA Output
Pin 9	N/C	No Connect	Pin 23	DATA-IN	ASK/FSK Modulation Data Input
Pin 10	UTXD	UART Transmit Data Out	Pin 24	RX-EN	Receive Enable Input
Pin 11	URXD	UART Receive Data In	Pin 25	TX-EN	Transmit Enable Input
Pin 12	+3.3V	Regulated Output	Pin 26	N/C	No Connect
Pin 13	REG-EN	Regulator Enable	Pin 27	N/C	No Connect
Pin 14	+VIN	Positive Supply Pin	Pin 28	N/C	No Connect

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Electrical Limits

Sym	Parameters	Min	Typ	Max	Unit	Notes
	Absolute Maximum Ratings					
VDD	Supply Voltage	-20		20	V	
	Storage Temperature Range	-40		125	°C	
	Lead Temperature		260		°C	
V_{EN}	Enable Input Voltage	-20		+20	V	
	Operating Ratings					
	Supply Voltage	2.5		16	V	
V_{EN}	Enable Input Voltage	0		TBD	V	
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
Operating Conditions					
Input Low Voltage	DATA-IN, RX-EN, TX-EN pins			0.3VCC	V
Input High Voltage	DATA-IN, RX-EN, TX-EN pins	0.7VCC			V
Transmit Frequency Range		300		930	MHz
Receive Frequency Range		300		930	MHz
VCO Frequency		300		930	MHz
IF Range	Receive Freq - VCO Freq	0.4		22	MHz
RO Frequency		3		12	MHz
PFD Working Frequency		0.01		1	MHz
Frequency Deviation	at FSK or FM	±8		±80	kHz
FSK Data Rate	NRZ			40	kbit/s
ASK Data Rate	NRZ			40	kbit/s
FM Bandwidth				10	kHz
VCO Gain	433.92 MHz	14		23	MHz
	868.3 MHz	28		55	MHz
DC Characteristics					
Standby Current	standby mode		50	100	nA
Idle Current	Note 4		0.3		mA
	< 500 MHz, Note 5		3.5		mA
	> 500 MHz, Note 5		6.3		mA
Receive Supply Current - ASK	< 500 MHz, Mode = receive		6.1		mA
	> 500 MHz, Mode = receive		8.9		mA
Receive Supply Current - FSK	< 500 MHz, Mode = receive		6.7		mA
	> 500 MHz, Mode = receive		9.5		mA
Transmit Supply Current @ Pmax-20dB	< 500 MHz, Mode = transmit, TXPOWER=00		11.5		mA
	> 500 MHz, Mode = transmit, TXPOWER=00		15.5		mA
Transmit Supply Current @ Pmax-12dB	< 500 MHz, Mode = transmit, TXPOWER=01		12.2		mA
	> 500 MHz, Mode = transmit, TXPOWER=01		16.4		mA
Transmit Supply Current @ Pmax-6dB	< 500 MHz, Mode = transmit, TXPOWER=10		14		mA
	> 500 MHz, Mode = transmit, TXPOWER=10		17.5		mA
Transmit Supply Current @ Pmax	< 500 MHz, Mode = transmit, TXPOWER=11		20		mA
	> 500 MHz, Mode = transmit, TXPOWER=11		24		mA

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Electrical Characteristics - CONT.

PLL Synthesizer Timings					
Channel Switching Time - Wide Band	Bpll = 20kHz, Icp = 260 µA		200		µS
Channel Switching Time - Wide Band	Bpll = 20kHz, Icp = 260 µA		500		µS
TX - RX Switching Time	IF = 10.7MHz		1		mS
AC System Characteristics of Receiver					
Input Sensitivity - ASK	433.92MHz, Note 6		-96		dBm
	868.3MHz, Note 6		-96		dBm
Input Sensitivity - FSK	433.92MHz, Note 6		-87		dBm
	868.3MHz, Note 6		-87		dBm
Maximum Input Signal - ASK	433.92MHz, Note 6		-10		dBm
	868.3MHz, Note 6		-10		dBm
Maximum Input Signal - FSK	433.92MHz, Note 6		-10		dBm
	868.3MHz, Note 6		-10		dBm
Start-up Time - ASK	from standby to receive mode		1	1.5	mS
Start-up Time - FSK	from standby to receive mode		1	1.5	mS
Spurious Emission	referred to receiver input		-54		dBm
AC System Characteristics of Transmitter					
Output Power @ Pmax - 20dB	433.92MHz, TXPOWER = 00		-10		dBm
	868.3MHz, TXPOWER = 00		-14		dBm
Output Power @ Pmax - 12dB	433.92MHz, TXPOWER = 01		-2		dBm
	868.3MHz, TXPOWER = 01		-6		dBm
Output Power @ Pmax - 6dB	433.92MHz, TXPOWER = 10		3		dBm
	868.3MHz, TXPOWER = 10		-1		dBm
Output Power @ Pmax	433.92MHz, TXPOWER = 11		10		dBm
	868.3MHz, TXPOWER = 11		8		dBm
FSK Deviation		±8	±25	±80	kHz
FM Deviation			±6		kHz
Modulation Frequency FM				10	kHz
PLL Reference Spurious Emission				-40	dBm
Harmonic Emission				-36	dBm
Start-up Time	from standby to transmit mode		1	1.5	mS
ENABLE Input					
Enable Input Logic-Low Voltage(V_{IL})	regulator shutdown			0.4	V
				0.18	V
Enable Input Logic-High Voltage(V_{IH})	regulator enabled	2.0			V
Enable Input Current	V_{IL} </= 0.4V		0.01	-1	µA
	V_{IL} </= 0.18V			-2	µA
	V_{IH} = 2.0V	2	5	20	µA
	V_{IH} = 2.0V			25	µA

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.

Note 4. Mode = idle; IDLESEL = 0

Note 5. Mode = idle; IDLESEL = 1

Note 6. Bif = 150kHz, Fm = 2kHz, BER <= 3 * 10^(-3)

Product Warranty and Disclaimer Information:

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	(Date)
Last Updated	May 2, 2006PRELIMINARY