HRF-ROC094XR

Honeywell

Advance Information

FSK Receiver On A Chip
2400 MHz
Frequency Agile
With SPI Bus Interface

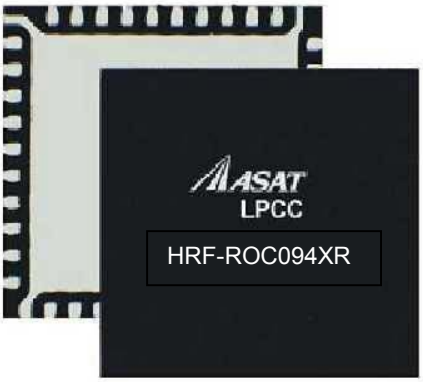
Features

- High Level of Integration Minimizes System Cost
- Data Rates over 128.8 Kbits/Sec
- Direct Connection To Microprocessor
- Adjustable detection bandwidths, data rates
- Adjustable gain, detection level/ hysterisis
- Low and high beta FSK detection modes
- Integrated Manchester decoding
- Programmable Power, Frequency And Rx/Standby Modes
- Operates From Single 2.5V Power Supply
- Surface Mount Leadless Plastic Packaging

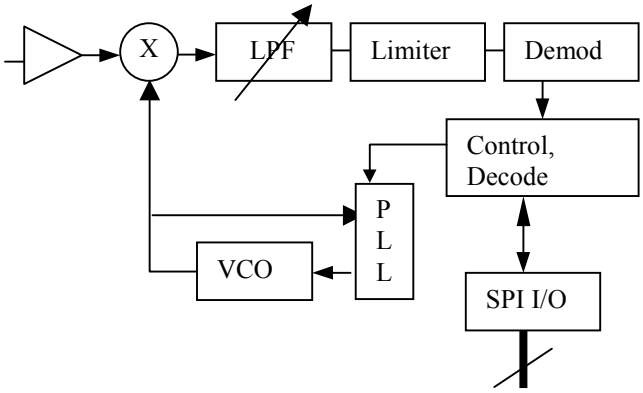
Description

The Honeywell HRF-ROC094XR is a single asic receiver for use in digital data applications. Direct microprocessor connection for control and data transfer, eliminate the need for additional ICs, while integrated data decoding reduces the instruction set requirements on the microprocessor. The HRF-ROC094XR is ideally suited for use in battery powered wireless applications in conjunction with microprocessors for data communication. Adjustable data rates, filter bandwidths and detection levels allow the IC to be used in a wide variety of high sensitivity / high EMI environments.

Product Photo



Functional Schematic



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RF Electrical Specifications @ + 25°C

Parameter	Test Condition	Frequency	Minimum	Typical	Maximum	Units
Rx Sensitivity		2400-2500 MHz		-95		dBm
1db Compression	Vdd =2.5 V	2400-2500 MHz		-30		dBm
Input IP3	Vdd = 2.5 V	2400-2500 MHz		-15		dBm
Data Rate, Tx / Rx	Continuous Packetized Data			128		Kbps
Channel Rejection	Adjacent Channels	Fc +/- 350KHz		60		dB
Max Detection BW*	IQ Baseband Filter Passband			250		KHz
Control/Data I/O	Serial Peripheral Interface (SPI). Direct Connection To Microcontroller/Microprocessor			10		MHz

*Bandwidth reduction possible with off chip elements

DC Electrical Specifications @ + 25°C

Parameter	Minimum	Typical	Maximum	Units
V_{DD} Power Supply Voltage	2.4	2.5	2.6	V
Power Supply Current (I_{DD}) During Rx (2450MHz)	22	28		mA
Standby Current Consumption		<1		uA
CMOS Logic Level (0)	0		0.7	V
CMOS Logic Level (1)	1.7		V_{DD}	V

Absolute Maximum Ratings[1]

Parameter	Absolute Maximum	Units
Maximum Input Power	-	-
V_{DD}	+ 2.8	V
ESD Voltage (Human Body Model)	200	V
Operating Temperature	- 40 to + 85	Degrees C
Storage Temperature	- 40 to + 150	Degrees C

(Note 1) Operation Of The HRF-ROC094XR Beyond Any Of These Parameters May Cause Permanent Damage.

ESD Protection: The HRF-ROC094XR Contains reduced ESD Protection Circuitry for sensitive RF I/O. Precautions Should Be Taken During Handling/Assembly Until Protected By External Circuitry or Housings

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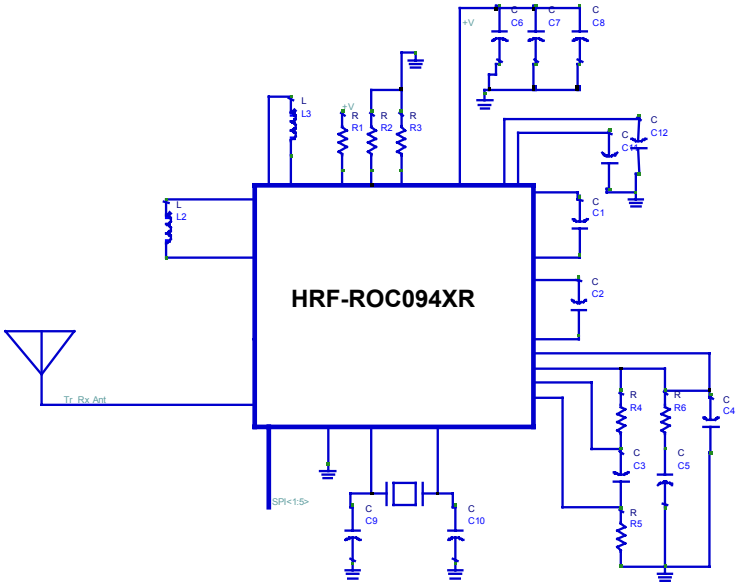
Typical Application

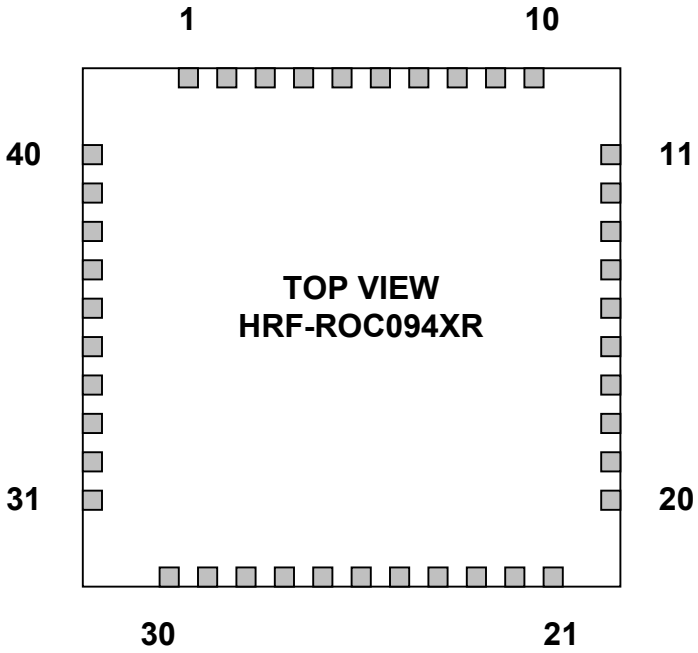


Package Outline

6mm x 6mm

40 pin Leadless

Plastic Chip Carrier



Low inductance RF/DC ground connection required below part as bottom ground pad is used for all device grounding. Additionally, this connection prodvides a direct connection to the die for enhanced thermal dissipation. ***Package shown not to scale***.

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Pin Configuration

HRF ROC094XR 40 Pin LPCC™ (6 mm X 6 mm) Package Pin List

* RF/Digital ground is provided through backside slug pad.

Name	Pin	Function	Name	Pin	Function
LNA Input	1	LNA input / LNA Match	SPI_CLK_in	21	SPI clock input
Dig. gain desense	2	Low is high gain, High is low gain	SPI_data_out	22	SPI serial data output
Vp	3	LNA positive supply	SPI_INT_out	23	SPI interrupt output
Vp	4	LNA positive supply	Tx_data_v	24	CMOS fifo monitor for board debug
Vp	5	Mixer positive supply	Rx_out_p	25	Async data output buffered, polarity selected for board debug
I mixer bias adj	6	Senitivity/IP3 tradeoff	Vp	26	Digital positive supply
Q mix bias adj	7	" "	Hysterisis A	27	4 level, 2 bit digital control of detection level hysteresis
I filter bw	8	bw reduction adjustment	Hysterisis B	28	" "
I filter bw	9	" "	P_test_out	29	Pll N-counter output comp freq
Q filter bw	10	" "	R_test_out	30	Pll R-counter output comp freq
Q filter bw	11	" "	Crystal 1	31	Reference crystal connection
Vp	12	Analog electronics supply	Crystal 2	32	Reference crystal connection
Supply filter	13	Common mode voltage bypass	Pdout	33	Phase detector charge pump output
Raw data	14	Raw detected data / predetect data shaping	Rext_PLL	34	PLL bias resistor
Detection trig lev	15	Monitor/filtering of ref level	Vp	35	Phase detector power supply
Mixer ref	16	Baseband ref voltage bypass	Varactor	36	VCO Tuning varactor input
Resetn	17	Dig power-on reset	VCO_state	37	Pull up to Vp
SPI_data_in	18	SPI serial data input	VP	38	VCO positive supply
Dig_data_in	19	Dig FIFO RX data, bypass RX demod	NC	39	
SPI_SSN_in	20	SPI slave select	LNA Bias R	40	Bias resistor for LNA : ~ 16K

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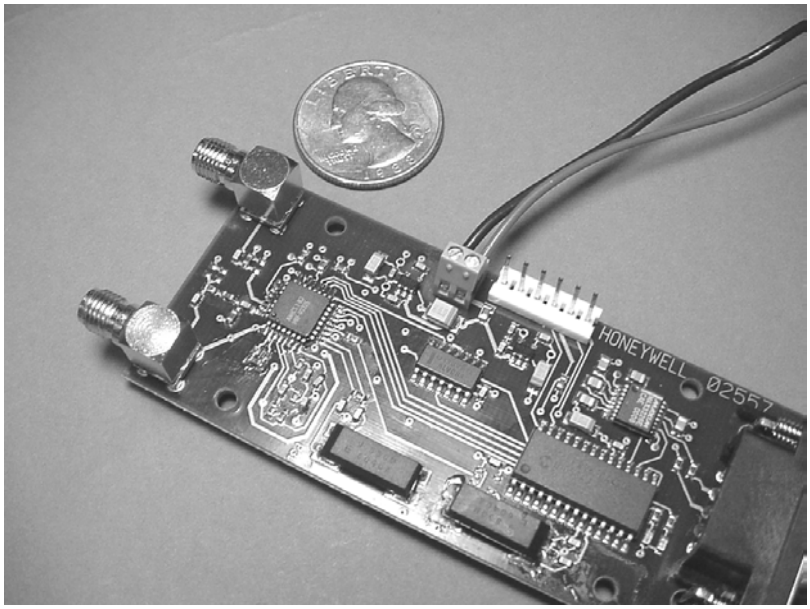
Engineering Evaluation Board



The engineering evaluation board provides for a RS232 connection using a PIC microcontroller as the interface between the HRF-ROC094XR and the RS232 port. Using the software provided and a PC, control of test data, operating frequency, power levels and all internal registers is available for early product development/prototyping. The board operates from a single +6 to +9 volt supply and provides separate RF Rx ports.

Ordering Information

Ordering Number	Product
HRF-ROC094XR -B	Delivered In Chip Tubes
HRF-ROC094XR -T	Delivered On Tape And Reel[2]
HRF-ROC094XR -E	Engineering Evaluation Board

Note 2: Contact Honeywell for details

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