HRF-ROC093XR

FSK Receiver On A Chip
860-928 MHz
## Frequency Agile
With SPI Bus Interface

Features

- High Level of Integration Minimizes System Cost
- Data Rates from 4 to 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 Frequency And Rx/Standby Modes
- Operates From Single 2.5V Power Supply
- Surface Mount Leadless Plastic Packaging

Description

The Honeywell HRF-ROC093XR is a single chip receiver for use in digital data applications. Direct microprocessor connection for control and data transfer, eliminate the need for additional ICs, while integrated data code/decode reduces the instruction set requirements on the microprocessor. The HRF-ROC093XR 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

HRF-ROC093XR
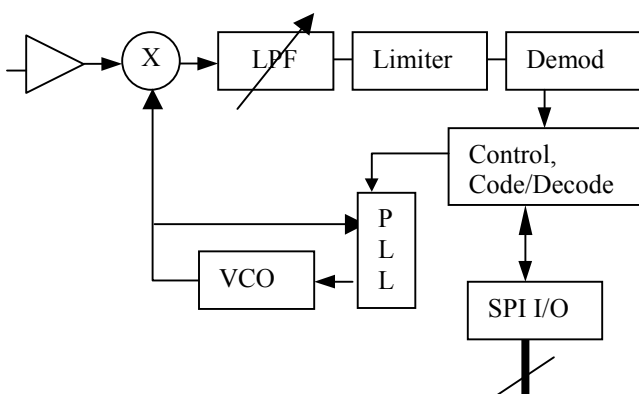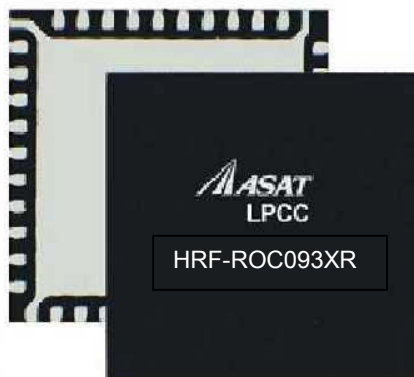
RF Electrical Specifications @ + 25°C

Parameter	Test Condition	Frequency	Minimum	Typical	Maximum	Units
Rx Sensitivity		860– 928 MHz		-95		dBm
1db Compression	Vdd = 2.5V	860– 928 MHz		-30		dBm
Input IP3	Vdd = 2.5V	860– 928 MHz		-5		dBm
Data Rate, Tx / Rx	Continuous Packeted 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

* Adjustable bandwidth reduction using 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 (915MHz)	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

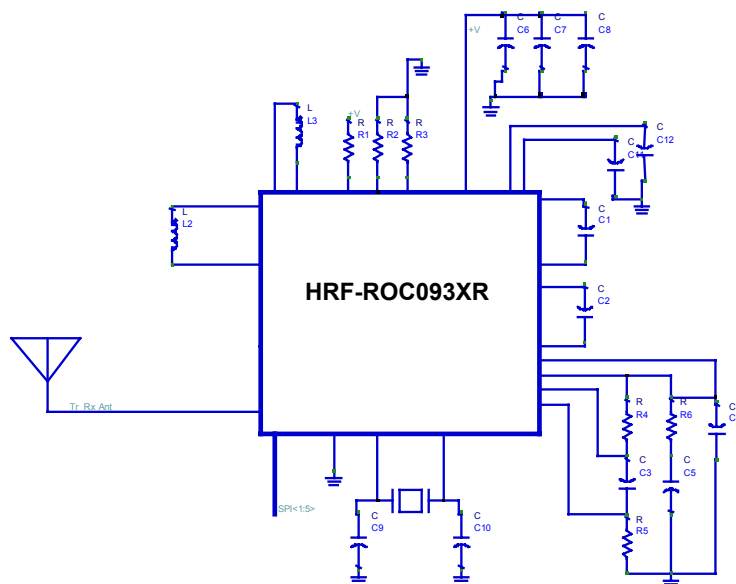(Note 1) Operation Of The HRF-ROC093XR Beyond Any Of These Parameters May Cause Permanent Damage.

ESD Protection: The HRF-ROC093XR Contains reduced ESD Protection Circuitry for sensitive RF I/O. Precautions Should Be Taken During Handling/Assembly Until Protected By External Circuitry or Housings

Web Site: **www.mysoiservices.com**
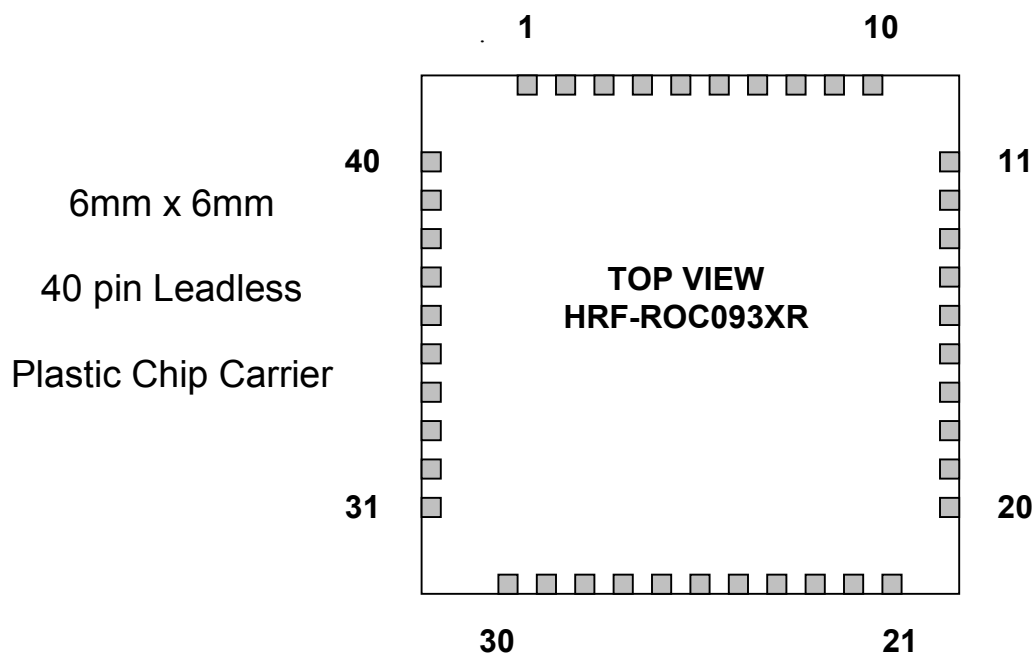**Email:**   **mysoiservices@honeywell.com**

2002 09325XR   **Published June 2002**   **Page 2**

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HRF-ROC093XR

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*.

HRF-ROC093XR

Pin Configuration

HRF-ROC093XR 40Pin LPCC™ (6 mm X 6 mm) Package Pin List
* RF/Digital ground is provided through backside slug pad.

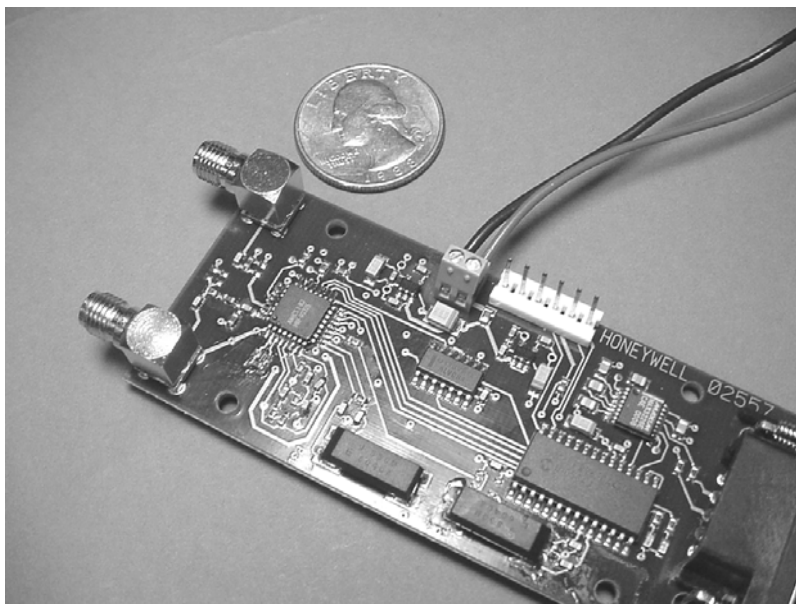| Name	Pin #	Function	Name	Pin #	Function
LNA Bias R	1	Bias resistor for LNA : ~ 16K	SPI_SSN_in	21	SPI slave select
LNA Input	2	LNA input	SPI_CLK_in	22	SPI clock
Digital Gain Control	3	Vp, high gain ; gnd low gain	SPI_data_out	23	SPI serial data output
Vp	4	LNA supply	SPI_INT_out	24	SPI interrupt output
Vp	5	LNA supply	Rx_out_p	25	Async data output buffered, polarity selected, for board debug
Vp	6	Mixer supply	Vp	26	Digital positive supply
I mixer bias	7	Sensitivity/IP3 adjust, 10K res to gnd	Hysterisis A	27	Four level widow select, 2 bit digital
Q mixer bias	8	Sensitivity/IP3 adjust	Hysterisis B	28	" "
I filter bw 1	9	Data bandwidth reduction	P_test_out	29	Pll N-counter output
I filter bw 2	10	""	R_test_out	30	Pll R-counter out
Q filter bw 1	11	""	Crystal 2	31	reference crystal connection
Q filter bw 2	12	""	Crystal 1	32	reference crystal connection
Vp	13	Analog electronics supply	Pdout	33	Phase detector charge pump output
Supply filtering	14	Common mode voltage filtering	Rext_PLL	34	PLL bias resistor
Raw data	15	Raw detected data / predetect data shaping	Vp	35	Phase detector supply
Detection level	16	Detection level monitor/filtering	varactor	36	VCO varactor for freq tuning
Mixer_ref	17	Baseband ref voltage bypass	VCO_tank 1	37	VCO external tank connection
Resetn	18	Dig power-on reset	VCO_tank 2	38	VCO external tank connection
SPI_data_in	19	SPI serial data input	NC	39	
Dig_data_in	20	Dig FIFO RX data	NC	40	

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2002 09325XR   Published June 2002   Page 4

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Advance Information

Engineering Evaluation Board

The engineering evaluation board provides for a RS232 connection using a PIC microcontroller as the interface between the HRF-ROC093XR 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/Tx ports.

Ordering Information

Ordering Number	Product
HRF-ROC093XR -B	Delivered In Chip Tubes
HRF-ROC093XR -T	Delivered On Tape And Reel[2]
HRF-ROC093XR -E	Engineering Evaluation Board

Note 2:   Contact Honeywell for details

Honeywell reserves the right to make changes to improve reliability, function or design. Honeywell does not assume any liability arising out of the application or use of any product or circuit described herein; neither does it convey any license under its patent rights nor the rights of others.

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2002 09325XR   Published June 2002   Page 5

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