

Radio On A Chip 860-928 MHz Frequency Agile With SPI Bus Interface

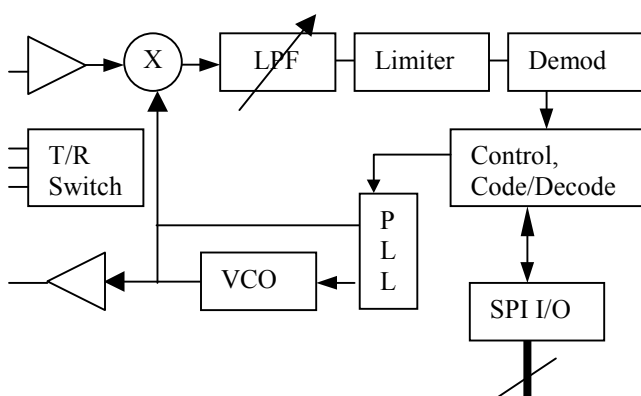
Features

- High Integration Minimizes System Cost
- Data Rates from 4 to 128.8 Kbits/Sec
- Direct Connection To Microprocessor
- Integrated Antenna Switch
- Adjustable detection bandwidths, data rates
- Adjustable gain, detection level/ hysteresis
- Low and high beta FSK detection modes
- Integrated Manchester coding/decoding
- 6 Prog. Power Levels, Freq. And Tx/Rx/Standby Modes
- Operates From Single 2.5V Power Supply
- Surface Mount Leadless Plastic Packaging

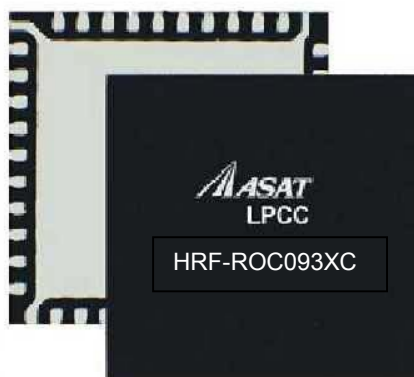
Description

The Honeywell HRF-ROC093XC is a half-duplex transceiver 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-ROC093XC 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.

Functional Schematic



Product Photo



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
Tx Output Power	Vdd = 2.5V	860– 928 MHz		+3		dBm
Data Rate, Tx / Rx	Continuous Data			128		Kbps
Channel Rejection	Adjacent Channels	Fc +/- 350KHz		60		dB
Max Detection BW	IQ Baseband FilterPassband			250		KHz
Control/Data I/O	Serial Peripheral Interface (SPI). Direct Connection To Microcontroller/Microprocessor			10		MHz

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 During Tx, Output Power Dependant (915 MHz)	16	26		mA
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
Input Leakage Current			2	nA

Absolute Maximum Ratings¹

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-ROC093XC Beyond Any Of These Parameters May Cause Permanent Damage.

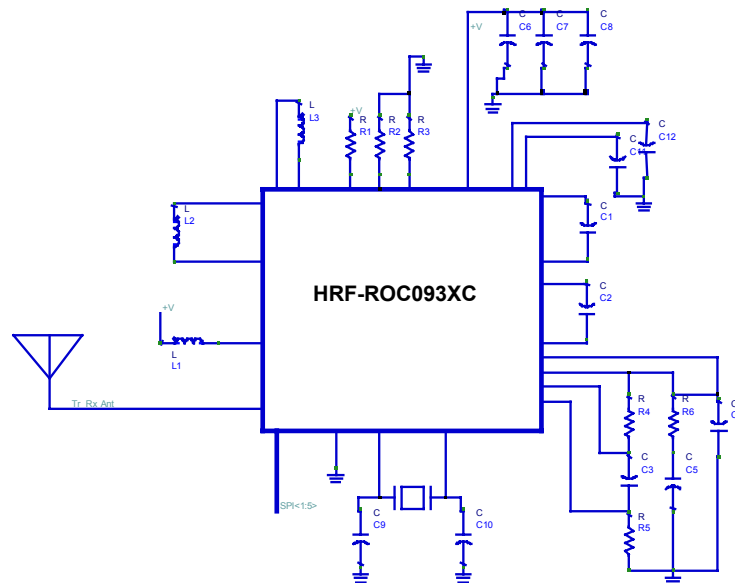
ESD Protection: The HRF-ROC093XC Contains reduced ESD Protection Circuitry for sensitive RF I/O. Precautions Should Be Taken During Handling/Assembly Until Protected By External Circuitry or Housings

HRF-ROC093XC

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Advance Information

Typical Application

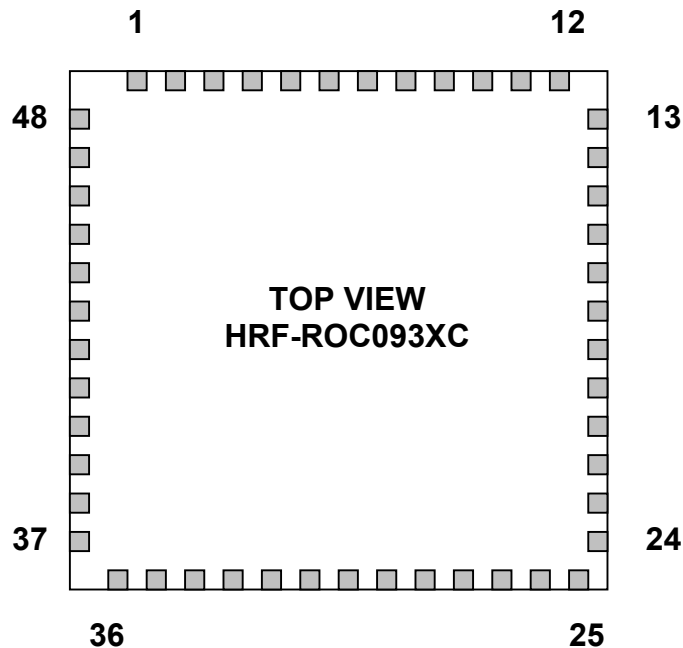


Package Outline

7mm x 7mm

48 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 provides a direct connection to the die for enhanced thermal dissipation. **Package shown not to scale.**

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2002 09325XC Published June 2002 Page 3

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Pin Configuration

HRF-ROC093XC 48 Pin LPCC™ (7 mm X 7 mm) Package Pin List

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

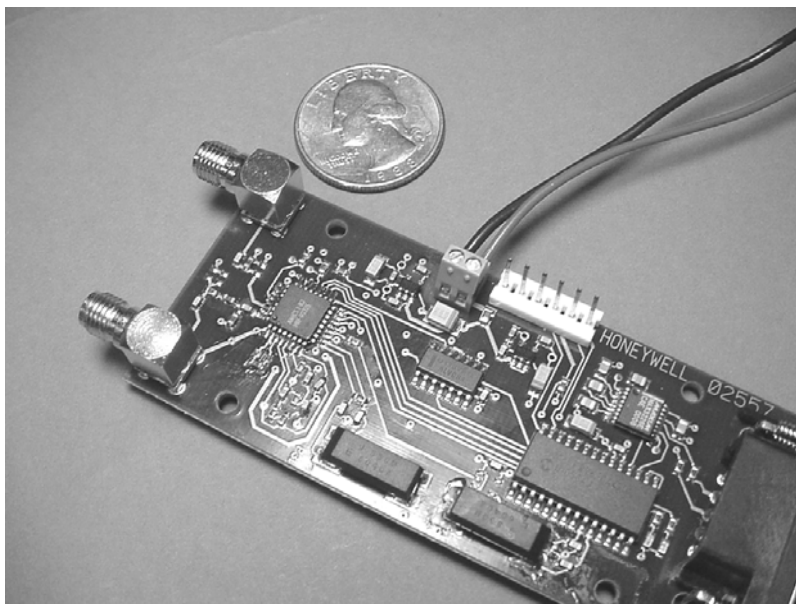
Name	Pin	Function	Name	Pin	Function
Sw_Ant	1	Antenna connection when T/R switch used	SPI_data_out	25	SPI serial data output
Switch Rx	2	Optional connection to LNA input	SPI_INT_out	26	SPI interrupt output
LNA Bias R	3	Bias resistor for LNA : ~ 16K	Tx_data_v	27	CMOS fifo monitor for board debug
LNA Input	4	LNA input	Rx_out_p	28	Async data output buffered, polarity selected, for board debug
Digital Gain Control	5	Vp, high gain ; gnd low gain	Vp	29	Digital positive supply
Vp	6	LNA supply	Vp	30	Digital positive supply
Vp	7	LNA supply	Hysterisis A	31	Four level widow select, 2 bit digital
Vp	8	Mixer supply	Hysterisis B	32	“ ”
I mixer bias	9	Sensitivity/IP3 adjust, 10K res to gnd	P_test_out	33	PLL N-counter output
Q mixer bias	10	Sensitivity/IP3 adjust	R_test_out	34	PLL R-counter out
I filter bw 1	11	Data bandwidth reduction	Crystal 2	35	reference crystal connection
I filter bw 2	12	“ ”	Crystal 1	36	reference crystal connection
Q filter bw 1	13	“ ”	Pdout	37	Phase detector charge pump output
Q filter bw 2	14	“ ”	Rext_PLL	38	PLL bias resistor
Vp	15	Analog electronics supply	Vp	39	Phase detector supply
Supply filtering	16	Common mode voltage filtering	Tx_mod data	40	Mod charge pump output
Raw data	17	Raw detected data / predetect data shaping	Modulation input 1	41	VCO varactor 1 input high deviation
Detection level	18	Detection level monitor/filtering	Modulation input 2	42	VCO varactor 2 input low deviation
Mixer_ref	19	Baseband ref voltage bypass	VCO_tank1	43	VCO external tank connection
Resetrn	20	Dig power-on reset	VCO_tank2	44	VCO external tank connection
SPI_data_in	21	SPI serial data input	PA_out – direct connection	45	PA output pin
Dig_data_in	22	Dig FIFO RX data, bypass RX demod	Vp	46	Positive supply for PA
SPI_SSN_in	23	SPI slave select	PA output AC coupled	47	PA_out thru 10pF series cap
SPI_CLK_in	24	SPI clock	T/R switch - PA	48	Optional connection to AC coupled PA output

HRF-ROC093XC

Honeywell

Advance Information

Engineering Evaluation Board



The engineering evaluation board provides for a RS232 connection using a PIC microcontroller as the interface between the HRF-ROC093XC 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-ROC093XC -B	Delivered In Chip Tubes
HRF-ROC093XC -T	Delivered On Tape And Reel ²
HRF-ROC093XC -E	Engineering Evaluation Board

Note 2: Contact Honeywell for details

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2002 09325XC Published June 2002 Page 5

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