

# RX1300

## 418.0 MHz ASH Receiver



- Ideal for 418.0 MHz, 3 V Data Receivers in the UK and the USA*
- High-Sensitivity Passive Design with No RF Oscillation*
- Baseband Data Rate of 2400 b/s*
- Simple to Apply with External Parts Count*
- Rugged, Surface-Mount Package with 130 mm<sup>2</sup> Footprint*

This amplifier-sequenced hybrid (ASH) receiver is based on several leading-edge technologies that allow outstanding performance in a small and simple-to-apply module. Two surface-acoustic-wave (SAW) devices are employed. Front-end filtering by a low-loss coupled-resonator SAW filter provides excellent selectivity.

Typical sensitivity better than -100 dBm is achieved with no RF oscillating or regenerative circuits. This results in virtually no RF spurious emissions. A low-loss SAW delay line provides the time delay necessary to sequence the two RF amplifiers. Time sequencing of the RF gain eliminates the need for frequency conversion prior to AM detection. This receiver is designed to operate from a 3 V lithium battery with typically 1.1 mA current. For system design flexibility, the baseband output is accessible, and the comparator threshold can be changed externally between two settings. Typical applications include unlicensed wireless remote-controls, security and data-transmission devices operating in the United Kingdom under DTI MPT 1340 and in the USA under FCC Part 15.



SM-10 Case

### Electrical Characteristics

Characteristic	Sym	Notes	Minimum	Typical	Maximum	Units
Operating Radio Frequency	$f_C$	2, 3	418.0 Nominal		MHz	
Received Carrier Modulation Type RF Band		4, 5	Pulse Modulation (OOK)			
			-100	-10	-10	dBm
			$f_C \pm 200$	50 Nominal	50	
					kHz	
Input Impedance	$Z_{IN}$	6	50 Nominal		W	
Interference Rejection	Half-Frequency Spurious $f_C \pm 1$ MHz		7	105		dB
Sequencing (Sampling)	Sample Duration Sample Repetition Rate	8		20		
Baseband	Data Rate 3 dB Bandwidth	9	700	2.4	ns	kb/s
Comparitor Threshold	Default (Terminal 5 NC) Override (Terminal 5 LOW)	10		12	250	
Digital Output	CMOS Load Capacitance Output HIGH Voltage Output LOW Voltage Rise Time Fall Time	11	0	0	10	$\mu$ s
Power Supply	Operating Voltage Current at 25C and 3.0 V			$V_{CC}$ -0.2	$V_{CC}$	V
Operating Ambient Temperature	$T_A$			0.0	0.2	
Lid Symbolization (in addition to Lot and/or Date Codes)	RFM RX1300					

# The RX Series SMT Hybrid ASH Receivers



**CAUTION: Electrostatic Sensitive Device. Observe precautions for handling.**

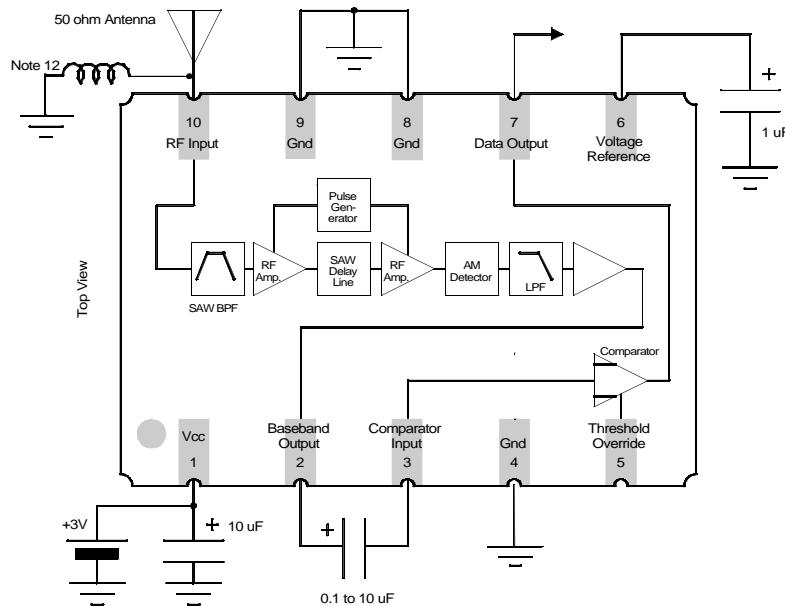
## Notes:

1. Unless noted otherwise, specifications apply over the entire specified operating temperature and voltage ranges.
2. One or more of the following United States patents apply: 4,454,488; 4,616,197; 4,749,964; 4,902,925. Other patents are pending.
3. Typically, equipment utilizing this device requires emissions testing and government approval, which is the responsibility of the equipment manufacturer.
4. The design, manufacturing process, and specifications of this device are subject to change without notice.
5. A variety of on-off-keyed (OOK) pulse modulation schemes are possible since digital decoding is an external function (not included in the ASH receiver).
6. These parameters apply over the absolute minimum operating passband which is referenced to  $f_C$ .
7. With interfering signal matched to the receiver modulation and code. See "Typical Modulated Interference Rejection" for a more detailed view.
8. Sample repetition rates greater than 1 MHz are available in custom versions. Contact RFM for details.
9. Baseband bandwidths and data rates are available to 140 kHz and 56 kHz, respectively, in custom versions. Contact RFM for details.
10. The default comparator threshold (with terminal 5 not connected) is optimized for low duty-cycle, or "bursty" data and eliminates noise output when there is no RF signal. The override threshold (with terminal 5 connected to ground) is optimized for continuous data.
11. The ASH receiver is designed to drive a single CMOS load
12. For ESD protection..

## Absolute Maximum Ratings

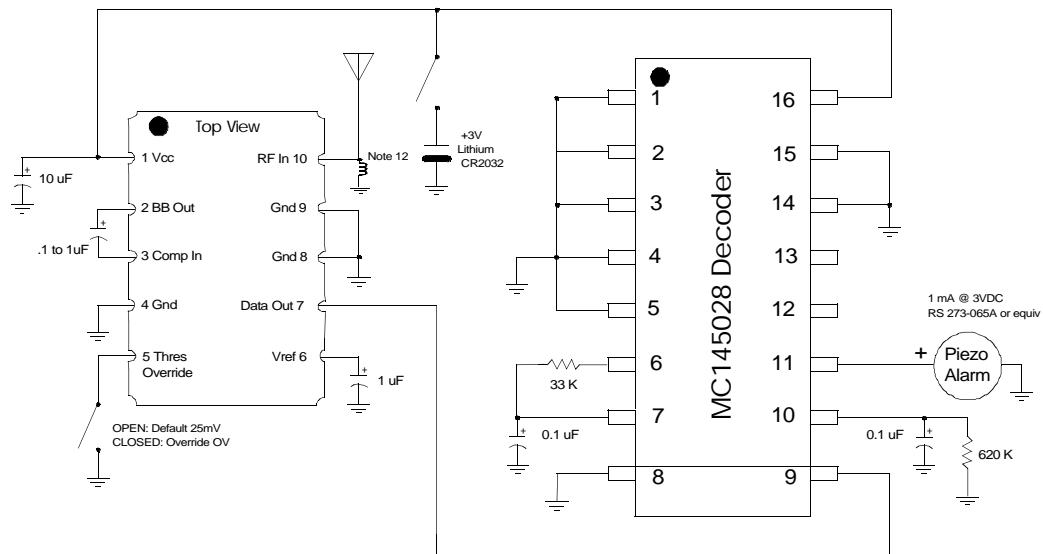
Rating	Value	Units
Incident RF Power	+10	dBm
Power Supply Voltage ( $V_{CC}$ to Ground) (Observe ESD Precautions)	-0.3 to +4.0	VDC
ESD (100 pF, 1.5 kW)	$\pm 2000$	V
	$\pm 300$	
Case Temperature <sup>1</sup>	-40 to +100	°C

## Block Diagram and Electrical Connections



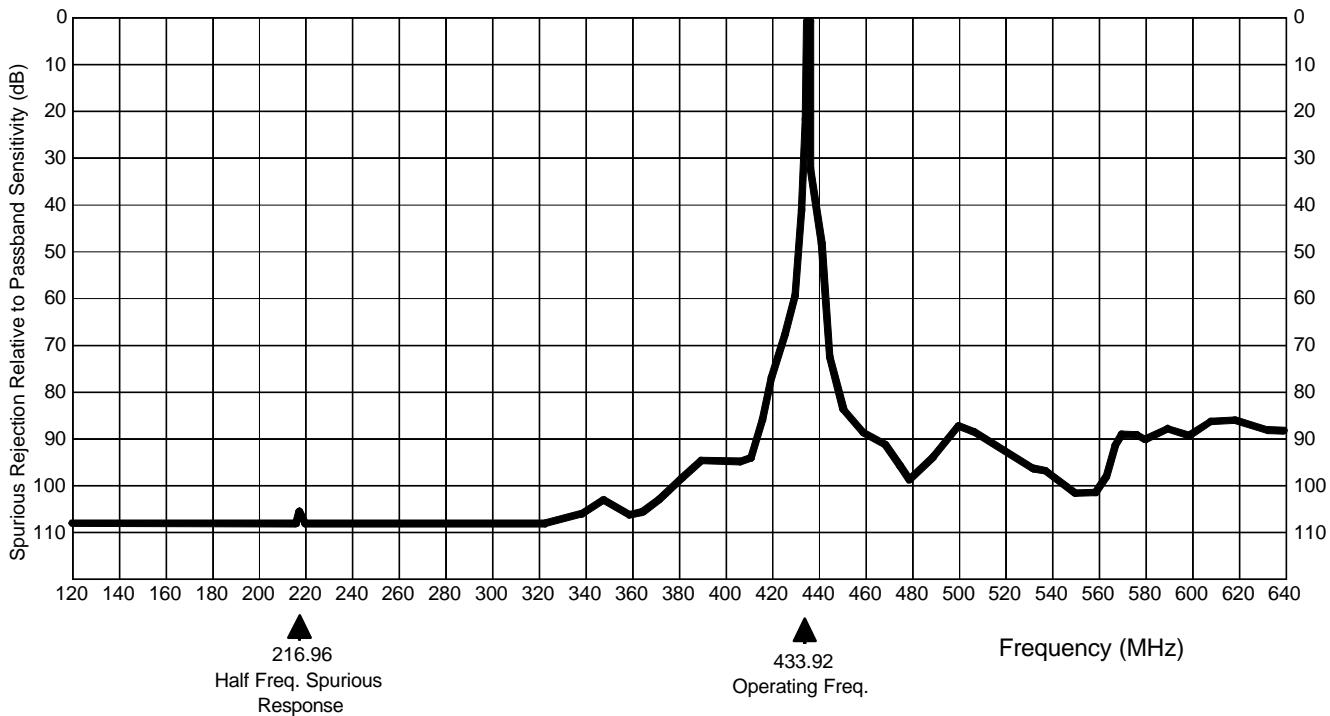
# ***The RX Series SMT Hybrid ASH Receivers***

## Demonstration Circuit



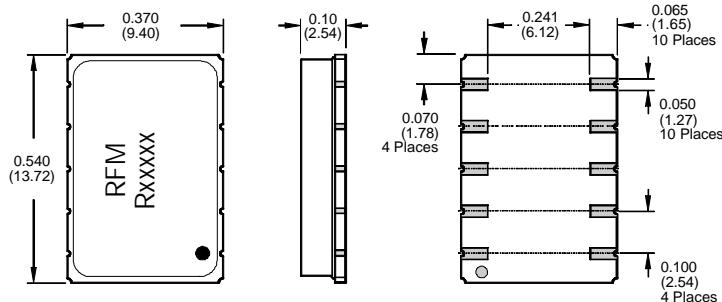
## Typical Modulated Interference Rejection (433.92 MHz RX1000 Shown)

This plot is for an interfacing signal modulated with the receiver's modulation and code. Continuous wave (CW) or signals with other modulation or codes typically result in significantly better rejection performance.

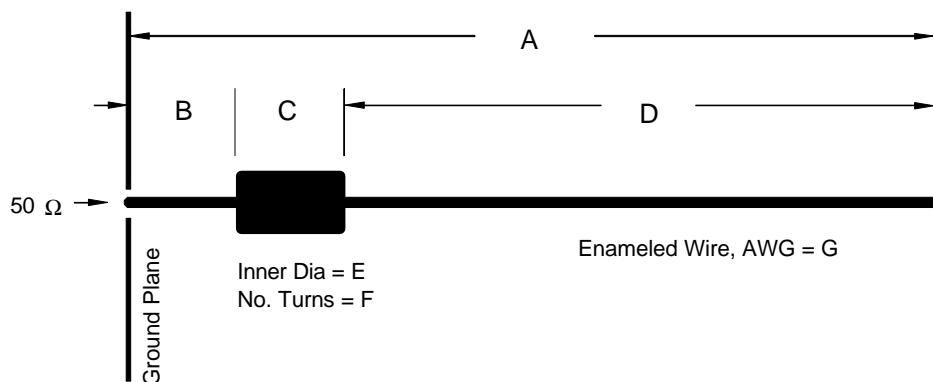


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## Case Design



## Typical Antennas



Dimensions	Units	Frequency			
		303.825	418.0	433.92	916.5
A	Inches	5.35	3.9	3.55	1.58
	Millimeters	135.89	99.06	90.17	40.13
B	Inches	1.0	0.6	0.6	0.4
	Millimeters	25.4	15.24	15.24	10.16
C	Inches	0.25	0.6	0.55	0.18
	Millimeters	6.35	15.24	13.97	4.57
D	Inches	3.7	2.7	2.4	1.0
	Millimeters	93.98	68.58	60.96	25.4
E	Inches	0.375	0.1	0.1	0.1
	Millimeters	9.53	2.54	2.54	2.54
F	Number of Turns	4T	16T	15T	7T
G	AWG	#20	#22	#22	#24