

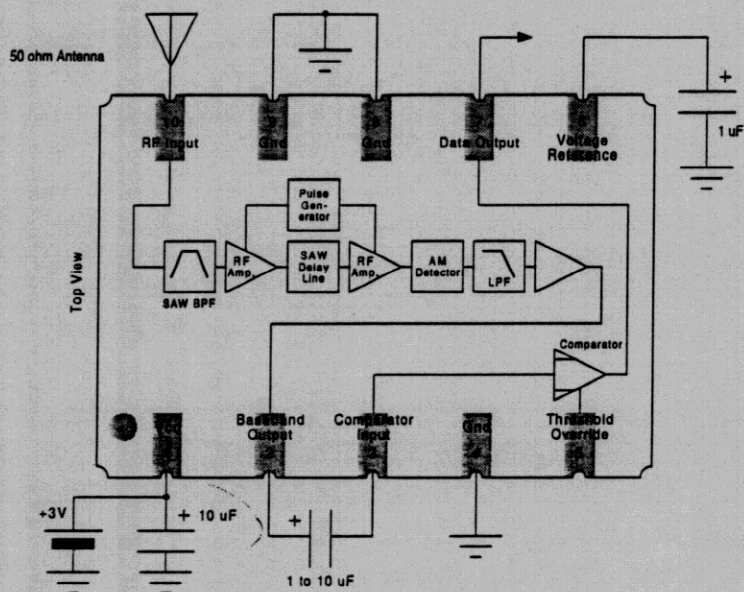
FCC requirements § 2.1033 (b)(4), (5)

**BLOCK DIAGRAM
CIRCUIT DESCRIPTION
PCB DRAWINGS**

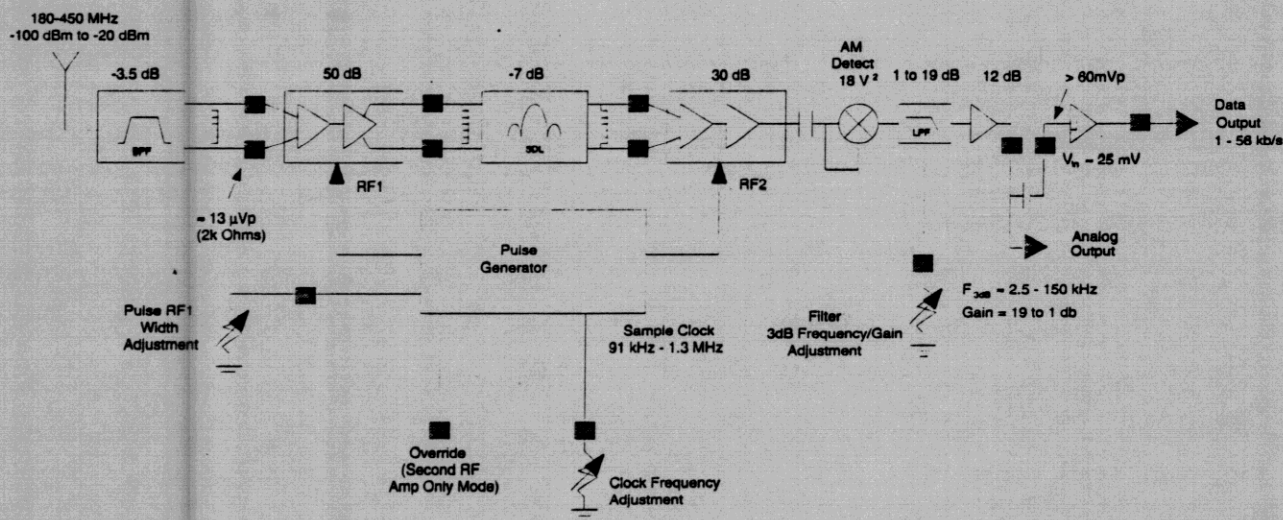
This page is followed by the Exercitor™ 21 receiver (RX2020 ASH receiver) block diagram, the RX2020 receiver description, typical antenna description and PCB drawings on 4 pages.

The RX Series SMT Hybrid ASH Receivers

Functional Block Diagram and Electrical Connections



Detailed Block Diagram



- Ideal for 916.5 MHz, 3 V Data Receivers in the USA and Canada
- Passive Design with No RF Oscillation
- Baseband Data Rate of 20 kb/s
- Simple to Apply with Low External Parts Count
- Rugged, Surface-Mount Package with 130 mm² 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 of -80 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 2.5 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 and digital data links operating in the USA under FCC Part 15.249 and in Canada under DOC RSS-210.

Absolute Maximum Ratings

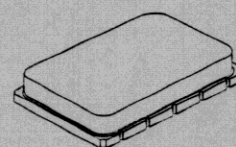
Rating	Value	Units
Incident RF Power	+10	dBm
Power Supply Voltage (V _{CC} to Ground) (Observe ESD Precautions)	-0.3 to +4.0	VDC
ESD (100 pF, 1.5 kΩ)	Terminals 2, 3, or 7 to Ground All Other Terminals to Ground	±2000 ±300 V
Case Temperature ¹	-45 to +100	°C

Electrical Characteristics

Characteristic	Sym	Notes	Minimum	Typical	Maximum	Units
Operating Radio Frequency	f _C	2, 3	916.50 Nominal			MHz
Received Carrier Modulation Type		4, 5	Pulse Modulation (OOK)			
RF Band	Sensitivity			-80		dBm
	Operating Signal Strength				-10	
	Channel Width	6	f _C ±200			kHz
	Noise Equivalent Bandwidth	NEB		48		
	Input Impedance	Z _{IN}	50 Nominal			Ω
Interference Rejection	Half-Frequency Spurious	7		80		dB
	f _C ±1 MHz			15		
Sequencing (Sampling)	Sample Duration	8		700		ns
	Sample Repetition Rate			625		kHz
Baseband	Data Rate	9			20	kb/s
	3 dB Bandwidth		24			kHz
Comparator Threshold	Default (Terminal 5 NC)	10		25		mV
	Override (Terminal 5 LOW)			0		
Digital Output	CMOS Load Capacitance				10	pF
	Output HIGH Voltage	V _{OH}	V _{CC} - 0.2		V _{CC}	V
	Output LOW Voltage	V _{OL}	0.0		0.2	
	Rise Time	t _R		3		μs
	Fall Time	t _F		3		
Power Supply	Operating Voltage	V _{CC}	2.7	3.0	3.5	VDC
	Current at 25°C and 3.0 V	I _{CC}		2.5	3.0	mA
Operating Ambient Temperature	T _A	1	-40		+85	°C
Lid Symbolization (In Addition to Date Code)			RFM RX2020			

RX2020

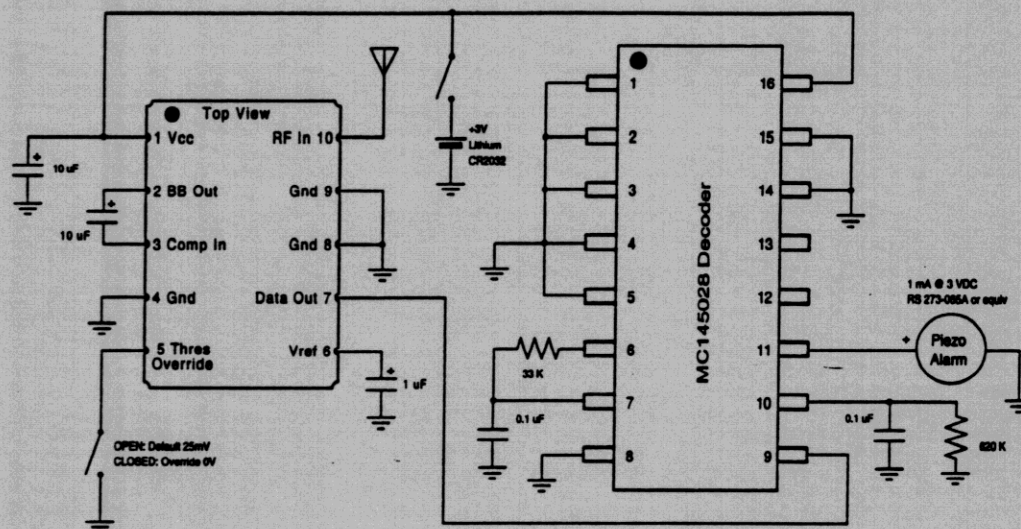
916.5 MHz ASH Receiver



SM-10 Case

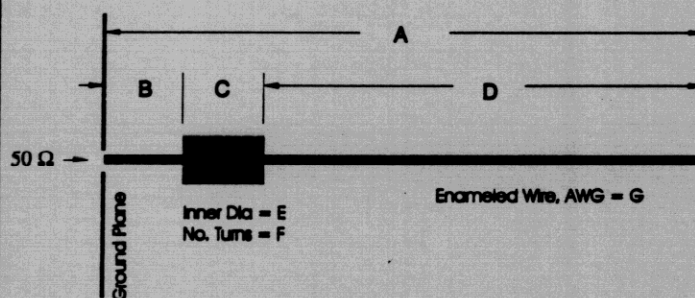
The RX Series SMT Hybrid ASH Receivers

Demonstration Circuit

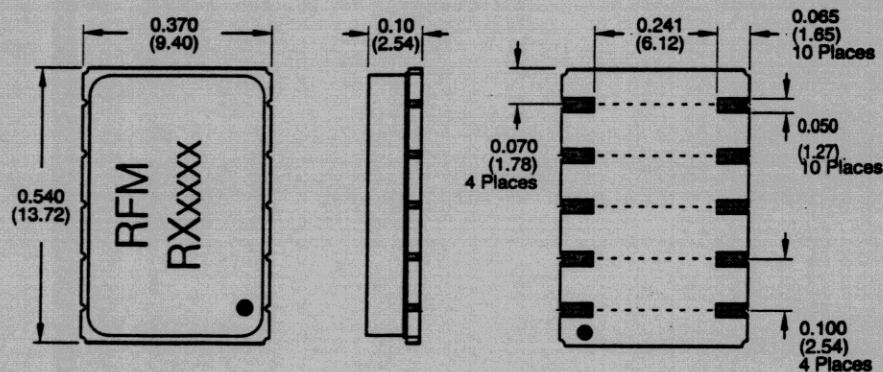


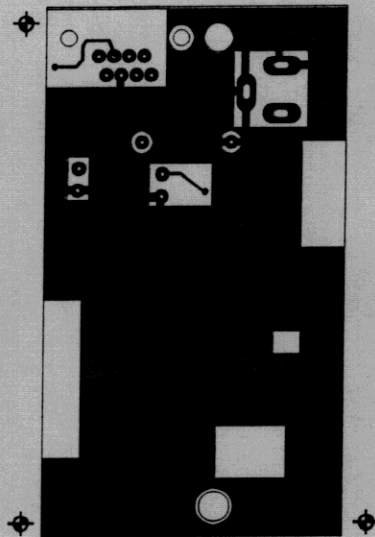
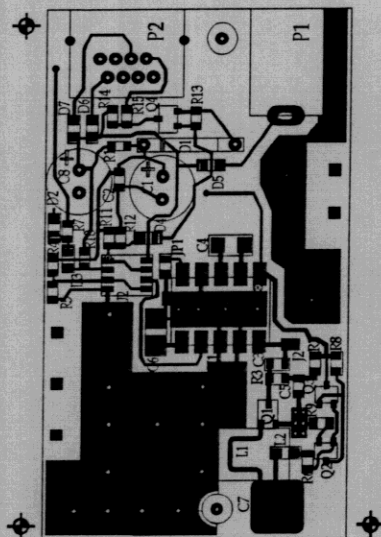
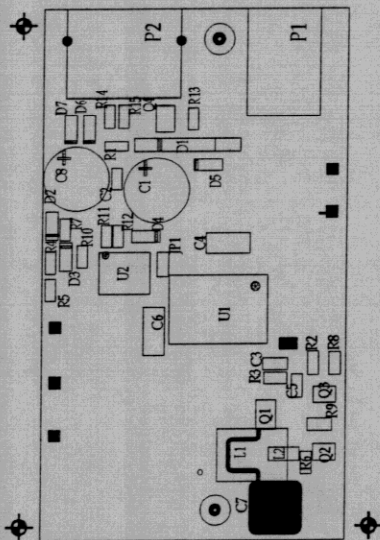
Typical Antennas

Dimension	Units	Frequency (MHz)			
		303.825	418.0	433.92	916.5
A	Inches	5.35	3.9	3.55	1.58
	Millimeters	136	99	90	40
B	Inches	1.4	0.6	0.6	0.4
	Millimeters	36	15	15	10.2
C	Inches	0.25	0.6	0.55	0.18
	Millimeters	6	15	14	4.4
D	Inches	3.7	2.7	2.4	1.0
	Millimeters	94	69	61	25.4
E	Inches	0.375	0.1	0.1	0.1
	Millimeters	10	3	3	3
F	Number of Turns	4 T	16 T	15 T	7 T
G	AWG	#20	#22	#22	#24



Case Design





Components placing - Print Side .

<i>Keytron Electronics & Technologies Ltd.</i>						Project / Customer		Exercitor 21	
		DRAWN BY	DATE		TITLE				
		DESIGNED BY			Receiver Adapter 916MHz -PCB Drawing				
		DESIGN ACTIVITY			SIZE A4	FSCM NO.	DWG NO. / FILE NAME		EXR7101.skd
		CUSTOMER			SCALE	1mm = 1mm		DATE	SHEET
								12-AUG-97	1 of 2