



## RX-9H50 AM Superhet Receiver Module, 916.5MHz

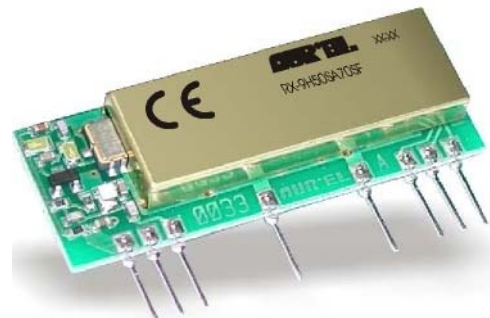
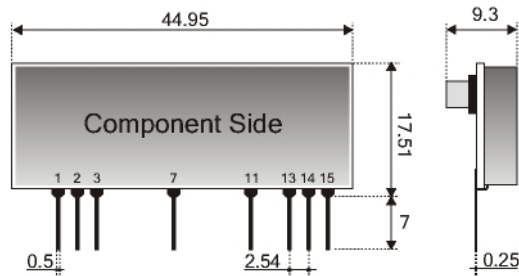
The RX-9H50 super-het AM receiver features SAW front end filtering, RFI/EMI shielding and excellent sensitivity for maximum range. The receiver is suitable for use with the AT-MT1-916.5 miniature transmitter modules and the TX-9H50 transmitter module

### Features

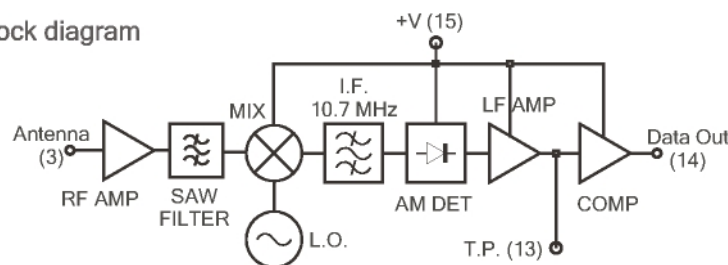
- Crystal Controlled LO
- 5Vdc Operation
- High sensitivity: -107dBm
- SAW front end filter
- Operating frequency: 916.5MHz
- Fully Shielded
- Low current: 7mA

### Typical Applications

- Security Systems
- Remote switching applications
- Paging systems
- Remote control
- Remote Monitoring
- Serial Data links



Block diagram



### Pin Designation

Pin Number	Function	Description
Pin 1	+V pre-amp	5V $\pm$ 0.25V positive supply voltage
Pin 2,7,11	Ground	Ground connections: internally connected to a single ground plane.
Pin 3	Antenna	50 ohm antenna connection
Pin 13	Test Point	Analog output of the demodulated signal. By connecting an oscilloscope here, one can inspect the quality of the received signal.
Pin 14	Data Out	Receiver digital output. Apply loads over 10K ohms.
Pin 15	+5Vdc	5V $\pm$ 0.25V positive supply voltage

## Electrical Characteristics

Characteristics	Min.	Typ.	Max.	Unit
Supply Voltage	4.75	5	5.25	Vdc
Supply Current		7		mA
Receive Frequency		916.5		MHz
RF Sensitivity	-105	-107	-109	dBm
RF Bandwidth -3dB		600		KHz
IF Bandwidth - 3dB		300		KHz
Square Wave Output			3	KHz
Output High Voltage		$V_{supply}-1$		V
Output Low Voltage			GND	V
Antenna RF Emission			-80	dBm
Switch-on Time			0.2	s
Operating Temperature Range	-20		+80	°C

### Device usage

In order to meet the above technical characteristics, the module should be designed onto a PC board and the following should be taken into consideration:

#### 5Vdc Supply:

1. The receiver power must be supplied by a stable voltage regulator with input and output filter capacitors as recommended by the chosen regulator type.
2. Maximum voltage variations allowed:  $\pm 0,25$  V.
3. De-couple the supply inputs right at the receiver with 0.1uF capacitors.

#### Ground:

1. The PC board should be flood filled with a ground plane on at least one side, and the ground plane should surround the solder pads for the pins of the receiver. Ground planes on both sides of the boards should be connected with multiple via's space approx. 15mm apart.

## 50 Ohm line:

If the antenna connection to the PCB is a distance away from the module, a 50ohm stripline must be used:

1. Stripline should be as short as possible.
2. Use a 1,8 mm wide trace for 1 mm thick FR4 printed circuits boards and 2,9 mm wide for 1,6 mm thick FR4 printed circuit boards.
3. On the same side, the trace must be kept 2 mm away from the ground plane.
4. On the opposite side of the pc board a ground circuit area must be present above the stripline trace.

## Antenna connection:

1. Antenna, such as a whip or wire, may connected directly to the board or a 50Ω RF connector may be used.
2. For off-board antenna connection, 50Ω coaxial cable can be used as the antenna feed. Ensure that the shield (braid) of the cable is soldered to the ground plane

## Antenna

1. A whip antenna, 78 mm long and approximately 1 mm dia, of brass or copper wire, must be connected to the RF input of the receiver.
2. The antenna body must be keep as straight as possible and must be free from other circuits or metal parts (5 cm minimum suggested distance.) Keep as much free space around the antenna as possible.
3. The whip antenna may be vertical or horizontal, provided the connection point between antenna and receiver input, is surrounded by a good ground plane.

## Suggested Layout

