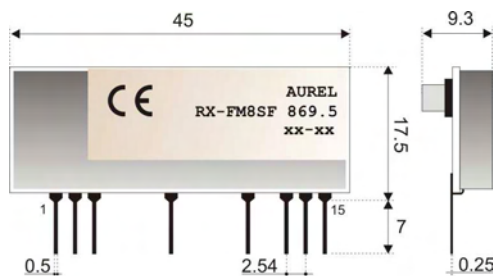


## RX-FM8SF 869,50 MHz

The super-heterodyne FM receiver RX-FM4SF with High sensitivity and selectivity. It is equipped by front-end SAW filter that allows an High noise immunity.

Used in association with TX 869 BOOST transmitter obtains a complete system with an High budget –link, useful to taking advantage from the best transmitter technical features

### Pin-out



### Connections

<b>Pin 2-7-11</b>	<b>Ground</b>	GND connections. Connected to the same ground plane.
<b>Pin 3</b>	<b>Antenna</b>	Antenna input, impedance 50 ohm
<b>Pin 13</b>	<b>Test Point</b>	Used for testing
<b>Pin 14</b>	<b>Data Out</b>	Data output from the receiver. Loads higher than 22 K $\Omega$
<b>Pin 1-15</b>	<b>+V</b>	Positive voltage supply +5V $\pm$ 5%.

### Technical Features

	Min	Typ	Max	Unit	Notes
<b>Reception frequency</b>		869.50		MHz	
<b>Supply Voltage Vdd</b>	4.5	5.0	5.5	V	
<b>Supply Current</b>		7		mA	
<b>RF Sensitivity</b>		-111		dBm	See note 1
<b>RF passing band at -3dB</b>		600		KHz	
<b>IF passing band at -3dB</b>		70		KHz	
<b>Output square wave</b>	0.1	7.0	8.0	KHz	
<b>Logic level "0"</b>			0.1	V	See note 4
<b>Logic level "1"</b>		0.8 Vd		V	See note 4
<b>Spurious RF emission in antenna</b>			-60	dBm	See note 2
<b>Switch-on time</b>			0.2	sec	See note 3
<b>Operating temperature range</b>	-20		+80	$^{\circ}$ C	
<b>Dimension</b>	45 x 17.5 x 9.3 mm				

**Note1:** Values have been obtained by applying the test system as Fig.1, with a square wave 99% as modulation index

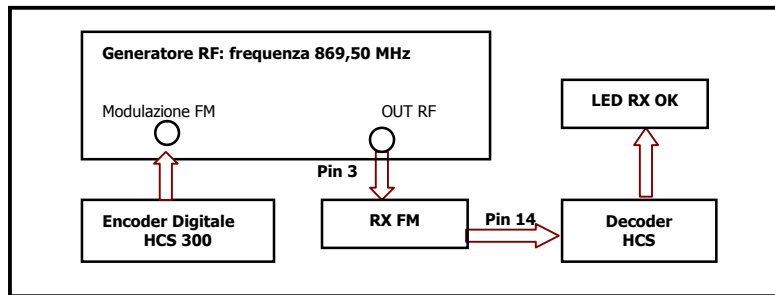
**Note2:** The RF emission measurement has been obtained by connecting the spectrum analyser directly to the RX pin 14

**Note3:** By switch on time is meant the time required by the receiver to acquire the declared characteristics from the very moment the power supply is applied.

**Note4:** Values obtained with 22K $\Omega$  maximum load applied.

Le caratteristiche tecniche possono subire variazioni senza preavviso. La AUREL S.p.A non si assume la responsabilità di danni causati dall'uso improprio del dispositivo.

The declared technical characteristics have been obtained by using the following test system:



**Fig. 1** – Sensitività plot measurement.

## Device usage

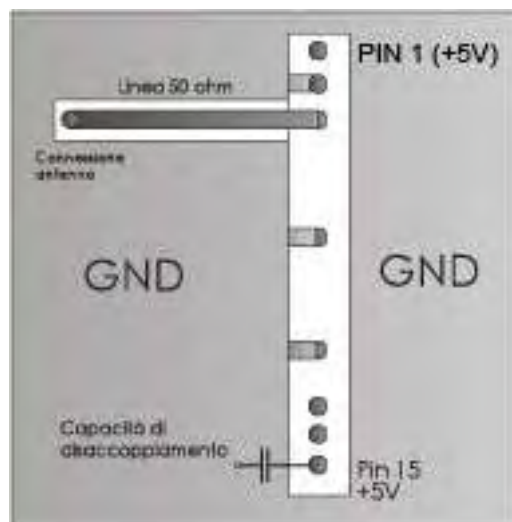
In order to take advantage of the performances described in the technical specifications and to comply with the operating conditions which characterize the Certification, the receiver has to be fitted on a printed circuit, considering what follows:

### 5 V dc supply:

1. The receiver must be supplied by a very low voltage source, safety protected against short circuits.
2. Maximum voltage variations allowed:  $\pm 0,50$  V.
3. De-coupling, next to the receiver, by means of a minimum 100.000 pF. ceramic capacitor

### Ground:

1. It must surround at the best the welding area of the receiver. The circuit must be double layer, with throughout vias to the ground planes, approximately each 15 mm.
2. It must be properly dimensioned, specially in the antenna connection area, in case a radiating whip antenna is fitted in it (an area of approximately 50 mm radius is suggested.)



**Fig. 2** - Suggested lay-out for the device correct usage

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## 50 Ohm line:

1. It must be the shortest as possible.
2. 1,8 mm wide for 1 mm thick FR4 printed circuits and 2,9 mm wide for 1,6 mm thick FR4 printed circuits. On the same side, it must be kept 2 mm away from the ground circuit.
3. On the opposite side a ground circuit area must be present.

## Antenna connection:

1. It may be utilized as the direct connection point for the radiating whip antenna.
2. It can bear the connection of the central wire of a 50  $\Omega$  coaxial cable. Be sure that the braid is welded to the ground in a close point.
- 3.

## Antenna

1. A **whip** antenna 8,5 cm long and approximately 1 mm diameter, brass or copper wire made, must be connected to the RF input of the receiver.
2. The antenna body must be kept straight as much as possible and it must be free from other circuits or metal parts (5 cm minimum suggested distance.)
3. It can be utilized both vertically or horizontally, provided that the connection point between antenna and receiver input, is surrounded by a good ground plane.

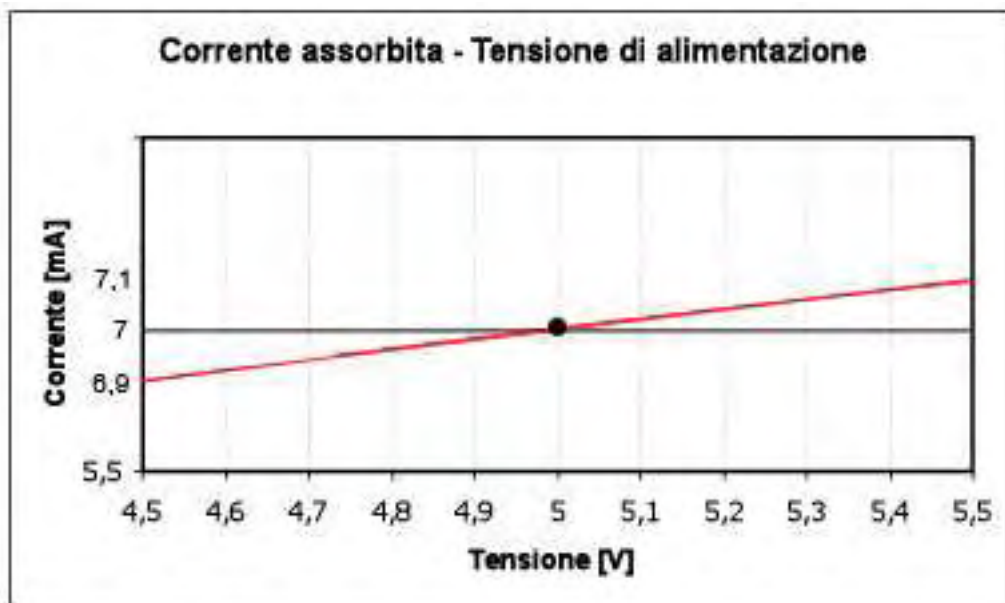
**N.B:** As an alternative to the a.m. antenna it is possible to utilize the whip model manufactured by Aurel (see related Data Sheet ed Application Notes).  
By fitting whips too different from the described ones, the EEC Certification is not assured

## Other components:

1. Keep the receiver separate from all other components of the circuit (more than 5 mm).
2. Keep particularly far away and shielded all microprocessors and their clock circuits.
3. Do not fit components around the 50 Ohm line. At least keep them at 5 mm distance.
4. If the Antenna Connection is directly used for a radiating whip connection, keep at least a 5 cm radius free area. In case of coaxial cable connection 5 mm radius will suffice.

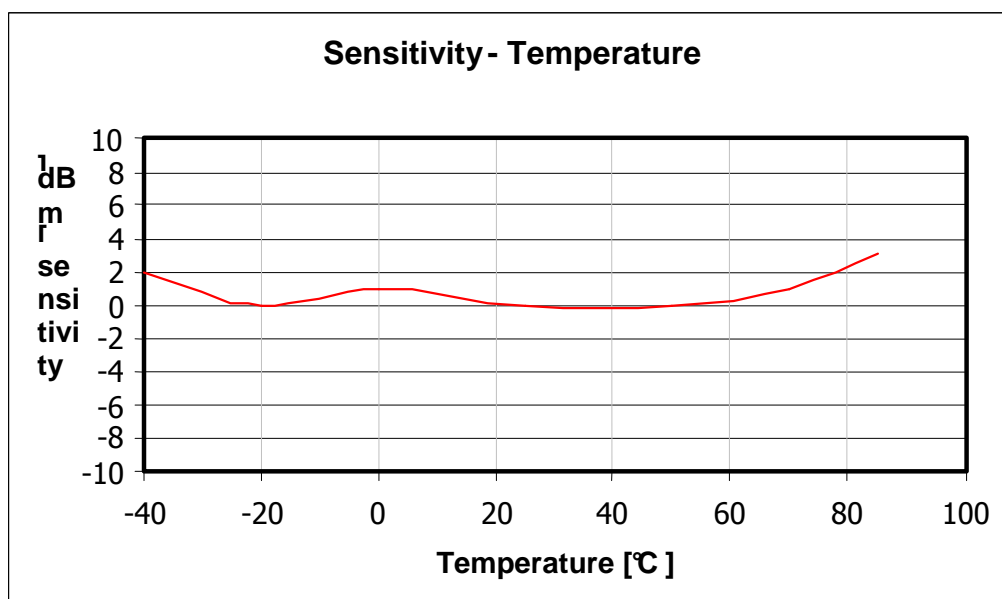
## Reference curves

In fig. 3 it's displayed the diagram of current consumption on reception versus the voltage supply.  
Temperature of 25°C



**Fig. 3** – Current consumption versus voltage supply

In fig.4 it's displayed the receiver sensitivity versus temperature.



**Fig. 4** – Sensitivity versus temperature

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## Reference Rules

**RX FM8SF 869,50** receiver is EEC certified and in particular it complies with the European set of Rules **EN 300 220-3 V2.1.2 in class 2, ed EN 301 489 V1.4.1 in class 1.**

The equipment has been tested according to rule EN 60950 and it can be utilized inside a special insulated housing that assures the compliance with the above mentioned rule. The receiver must be supplied by a very low voltage safety source protected against short circuits. The use of the receiver module is foreseen inside housings that assure the overcoming of the provision EN 61000-4-2 not directly applicable to the module itself. In particular, it is at the user's care the insulation of the external antenna connection, and of the antenna itself since the RF output of the receiver is not built to directly bear the electrostatic charges foreseen by the above mentioned provision.

Le caratteristiche tecniche possono subire variazioni senza preavviso. La AUR°EL S.p.A non si assume la responsabilità di danni causati dall'uso improprio del dispositivo.