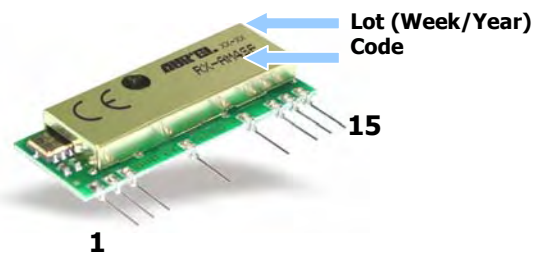
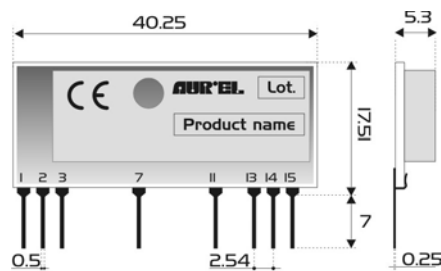


RX-AM4SF Receiver

The super-heterodyne receiver RX-AM4SF can provide a RSSI output indicating the amplitude of the received signal: this output can be used to create a field-strength meter capable to indicate the distance of the transmitting unit.

Furthermore the RX-AM4SF allows you to select the sensitivity level at which the module must operate: setting it in a low-sensitivity condition (- 90 dBm) the receiver provides at the RSSI output a proximity indication, that is not possible at high sensitivity due to the unavoidable saturation of the receiver; this feature can be useful when you intend to realize equipments for access control where, besides an identification code, you must also recognize the distance of the transmitter from the opening under control.

Pin-out



Connections

Pin 1	+V Preamp	Positive voltage supply +5V $\pm$ 5%.
Pin 2-7	Ground	GND
Pin 3	Antenna	Antenna input, impedance 50 ohm
Pin 15	+V	Positive voltage supply +5V $\pm$ 5%.
Pin 11	Gain	Sensitivity Level Selection: Logic level 0 : -109 dBm. Logic level 1 : -90 dBm.
Pin 13	RSSI output	Output RSSI proportional to the amplitude of the input signal.
Pin 14	Data output	Data output from the receiver.

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.

Technical Features

	Min	Typ	Max	Unit	Notes
Reception frequency		433.92		MHz	
Supply Voltage Vs	4.75	5	5.25	V	
Supply Current		6.5		mA	
RF Sensitivity	-108	-109	-111	dBm	See note 1
RF passing band at -3dB		600		KHz	
IF passing band at -3dB		300		KHz	
Interference rejection at ± 10 MHz				dB	
Output square wave		2	3	KHz	
Logic level "0"			gnd+0.4	V	See note 4
Logic level "1"	Vs-0,4V			V	See note 4
Spurious RF emission in antenna			-60	dBm	See note 2
Switch-on time			0,2	s	See note 3
Operating temperature range	-20		+80	°C	See Fig.5
Dimensions	40.13 x 17.5 x 5.5 mm				

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

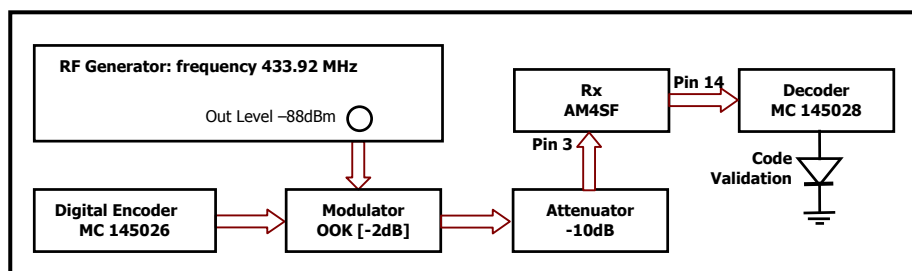
Note2: The RF emission measurement has been obtained by connecting the spectrum analyser directly to the RX pin 3.

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 10K Ω maximum load applied.

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

Fig. 1



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.

Pin.13 “RSSI” Output

In fig.2 it is reported grafically the behaviour of the voltage at the RSSI output in function of the power of the input signal, in High Gain mode (pin 11 at logic level 0). In fig 3 it is shown the equivalent diagram but in Low Gain mode (pin 11 at logic level 1).

Both the diagrams have been obtained experimentally applying at the RF input (pin 3) of the receiver a square wave AM-modulated, with a modulation index of 99%, drawn directly from a signal generator, and connecting a 10uF capacitor between the pin 11 and GND .

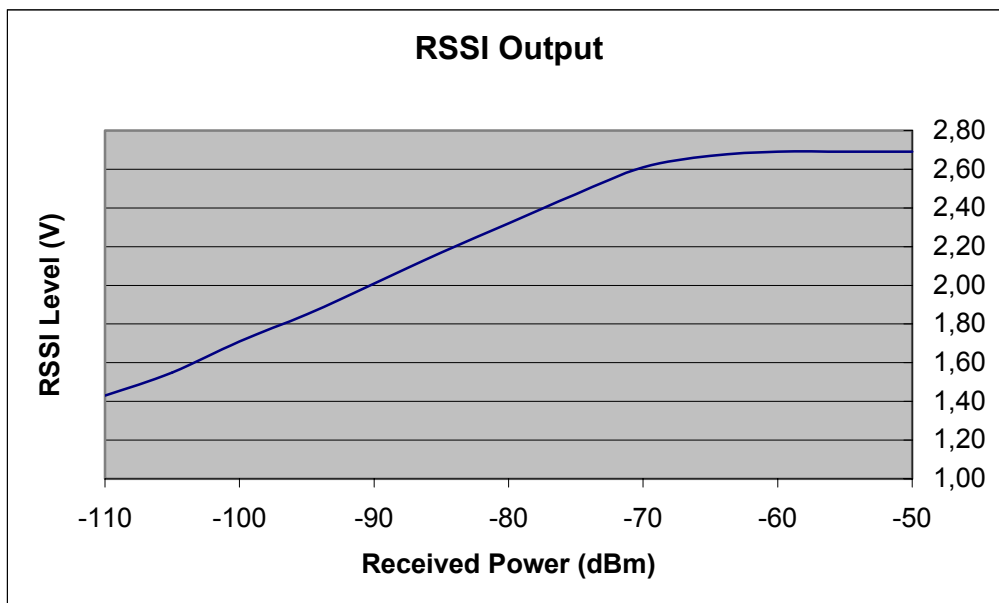


Fig. 2 : RSSI output with high gain

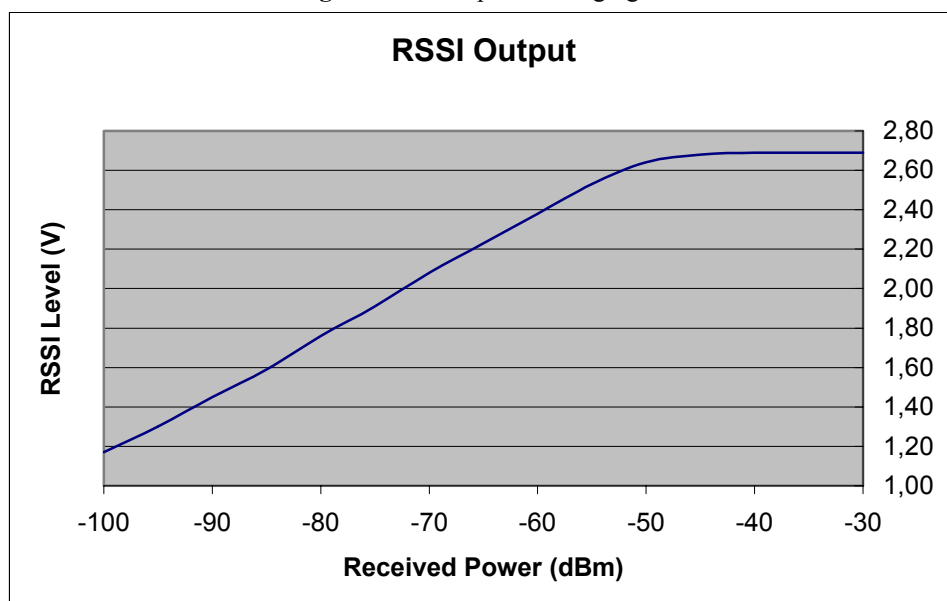


Fig. 3 : RSSI output with low gain

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.

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:

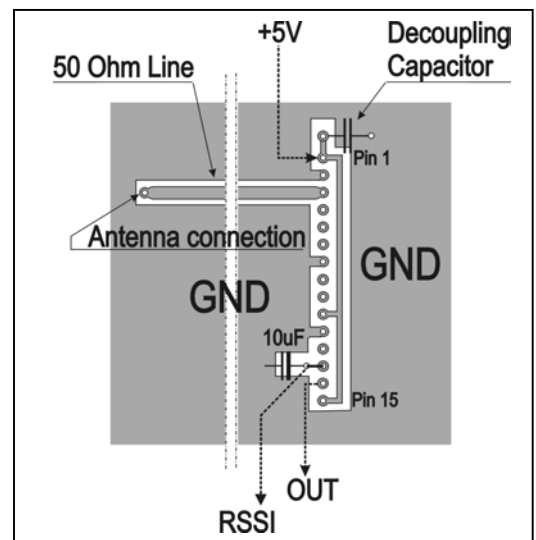
5 V dc supply:

1. The receiver must be supplied by a very low voltage source, safety protected against short circuits.
2. Maximum voltage variations allowed: $\pm 0,25$ 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.3 Suggested lay-out for the device correct usage



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.

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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 Ω coaxial cable. Be sure that the braid is welded to the ground in a close point.

Antenna

1. A **whip** antenna, 16,5 mm long and approximately 1 mm dia, 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.

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 Rules

The **RX-AM4SF** receiver is EEC certified and in particular it complies with the European set of Rules EN 300 220-3 for class 2, and EN 300 683 for 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 a.m. provision.

Reference curves

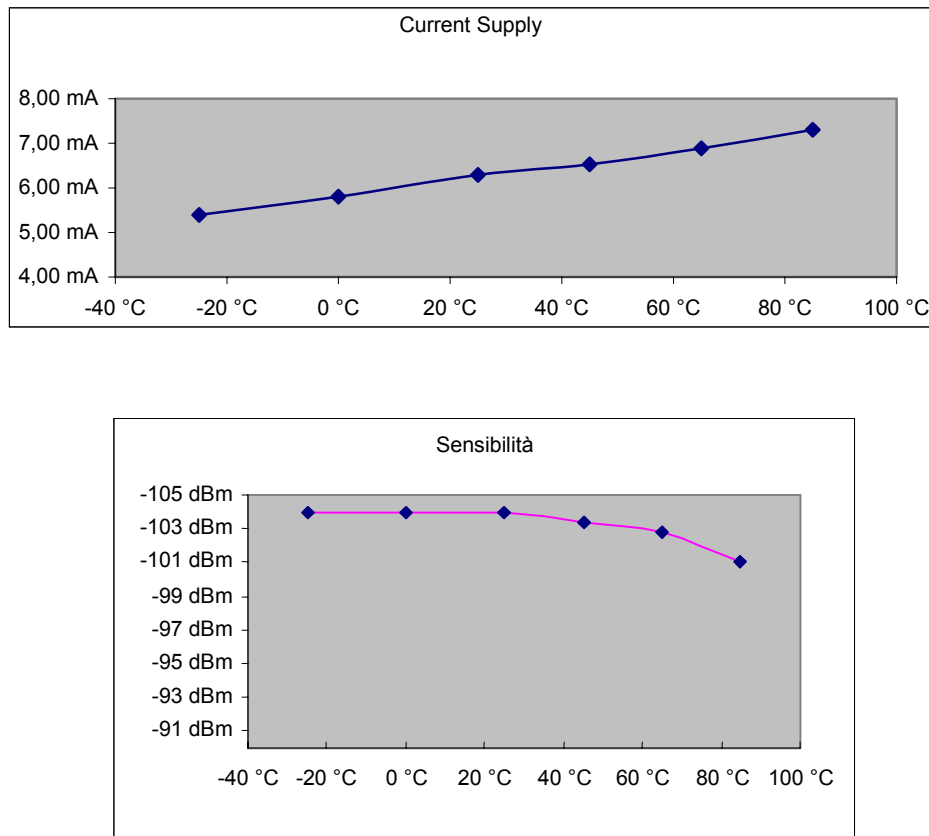


Fig. 5: Voltage Supply 5V, Frequency 433,92 MHz

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