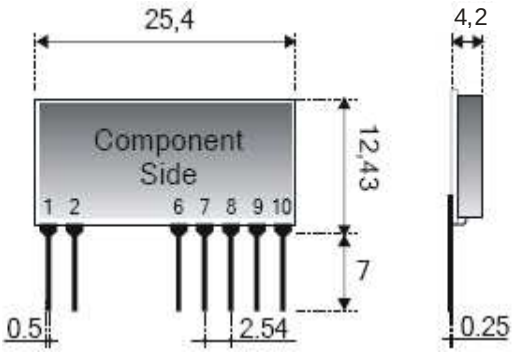
RX MID 3V

Super-Het, ASK receiver with small dimensions and high sensitivity. Provided with input SAW filter for enhanced immunity to electromagnetic helds. In compliance with European Normative

Pin-out



Device photo

Connections

Pin 1	**Antenna**	50Ω impedence, antenna connection
Pin 2-7	**Ground**	GND Connections: Internally connected to a single ground plate.
Pin 6	**Enable**	Receiver enable active when LOW. Internal Pull up.
Pin 8	**Out RSSI**	Output RSSI proportional to the amplitude of the input signal
Pin 9	**Data Out.**	Receiver digital output. Apply loads over 1 KΩ
Pin 10	**+V**	Connection to the positive pole of supply (+3V3 ±10%)

Technical Features

	Min	Typical	Max	Unity	Remarks
Working centre frequency		433.92		MHz	
Supply Voltage Vdd	3.0	3.3	3.6	V	
Absorbed current	5.80	6.0		mA	
Power down		0.5		uA	
RF sensitivity		-113	-114	dBm	See note 1
RF passband at –3dB		600		KHz	
IF passband at –3dB	300			KHz	
Output square wave	0.2	2.0	3.0	KHz	
Output low logic level			0.2 Vd	V	See note 4
Output high logic level	0.8 Vd			V	See note 4
RF spurious emissions in antenna			-60	dBm	See note 2
Switch-on time		5	8	msec	See note 3
Working temperature	-20		+80	°C	
Dimensions	25.4 x 12.43 x 4.2 mm				

Note1: *Values have been obtained by applying the test system as per Fig. 1.*
Note2: *The R.F. emission measure has been obtained by connecting the spectrum analyser directly to RX's 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 10KΩ maximum load applied.*

The declared technical features have been obtained by applying the following test system:

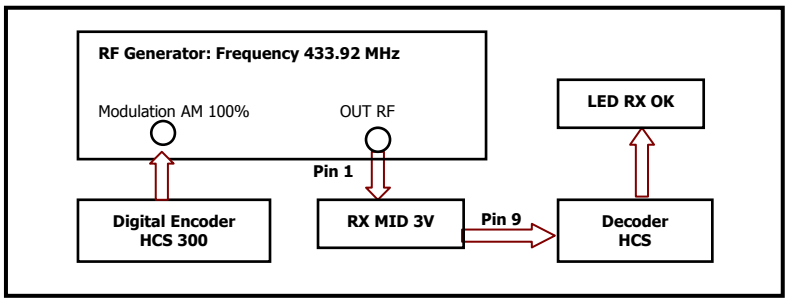


Fig. 1 – Measurement of sensitivity.

Enable pin

Pin 6 is used to set the receiver in power down mode, this allows a lower current consumption when the RF signal is not received. Typical current consumption in power-down mode is 0.5 uA.
Timing needed to have a correct signal reception, once out from the power down mode, is 5mS; while if device is powered for a first time, switch-on time is 50mS.
The module is on when enable pin is connected to GROUND, it's sufficient do not connect it to set the power-down mode.

Device usage

In order to obtain 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:

3,3 Vdc supply:

1. The receiver must be supplied by a very low voltage source, safety protected against short circuits.
2. Maximum voltage variations allowed: ± 0,30 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).

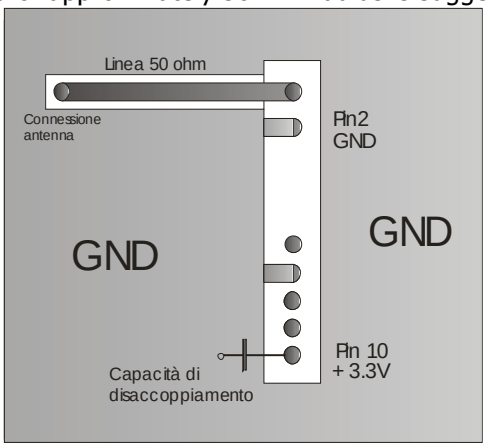


Fig.2 - Suggested lay-out for the device correct usage**.**

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 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 keep 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 **AUR°EL** (see related Data Sheet and 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, then 5 mm radius will suffice.

Reference Rules

RX MID 3V receiver is EEC certified and in particular it complies with the European Rules **EN 300 220-3 V2.12 in class 2,** and **EN 301 489 V1.4.1 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 source, safety protected against short circuits. The use of the receiver module is foreseen inside housings that assure the overcoming of the rule **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. rules.

"RSSI" Output pin 8

In fig 3 it is reported grafically the behaviour of the voltage at the RSSI output in function of the power of the input signal. Measure has been made with 20KHz deviation to the RF signal and square wave modulation 1KHz drawn directly from a signal generator with impedance probe of 10MOhm.

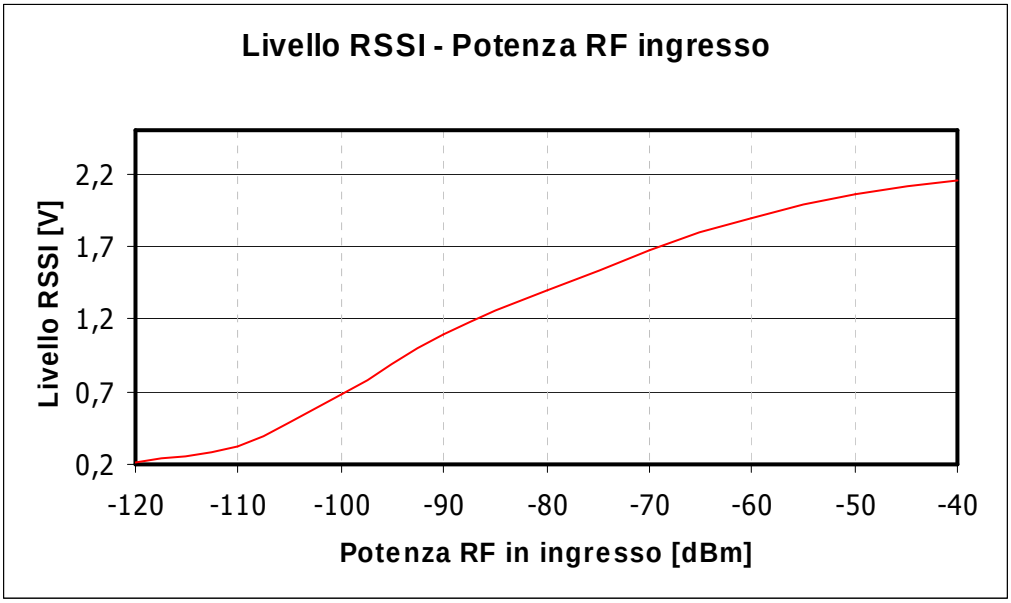


Fig. 3 - RSSI level according to RF power received

Reference curves

In fig 4 it is reported the behaviour of module supply current in function of Power supply

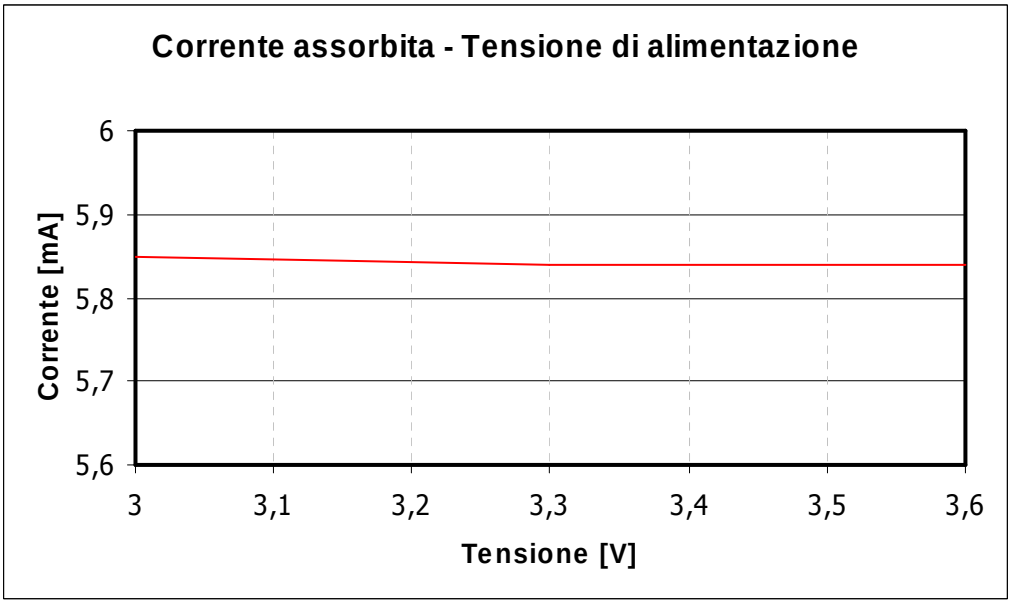


Fig. 4 – Supply current – power supply

In fig 5 it is reported the behaviour of receiver sensitivity in function of temperature. Values are referred to the nominal power supply of 3.3Volt, there are no difference with nominal power of 3.0Volt.

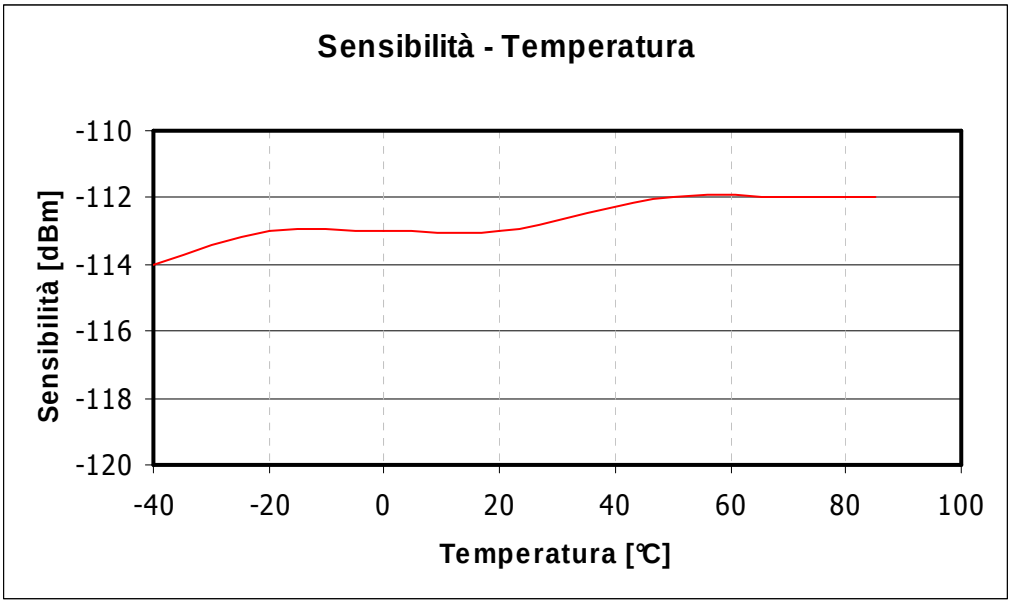


Fig. 5 – Sensitivity - temperature