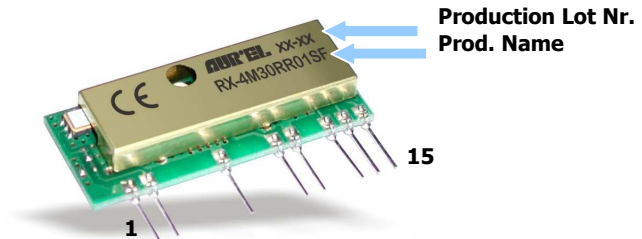
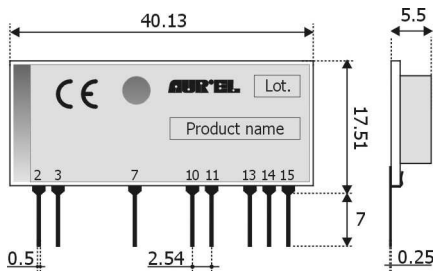


Receiver RX-4M30RR01SF

Low cost, low voltage, micro current receiver.
High sensitivity and high immunity to electromagnetic interfering fields.
Input SAW filter and full metallic shielding.
Frequency at 433.92Mhz, Suitable for OOK (AM) modulated signals.

Pin-out



Connections

Pin 2-7-11	Ground	Connections to GND. Internally connected to module GND plane
Pin 3	Antenna	Antenna Connection, 50Ω impedance
Pin 10-15	+V	Connection to Supply Voltage positive post
Pin 13	Test Point	Demodulated signal analog output. Used in testing. Normally left open. See further down for Squelch Level setting.
Pin 14	Data Out.	Receiver digital Output. Min. Load to be connected 10 KΩ

Technical Characteristics

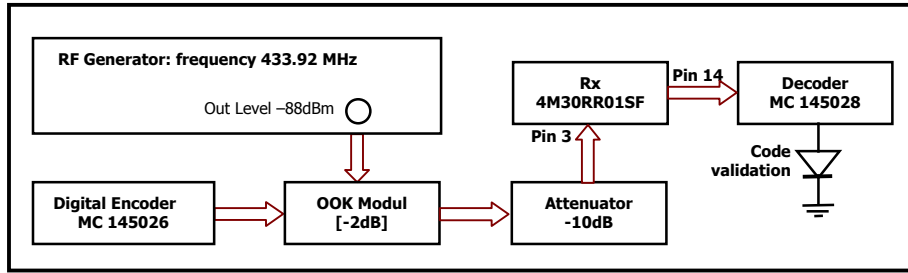
	Min	Typical	Max	Unit	Notes
Work center frequency		433.92		MHz	
Supply Voltage	2.75	3	3.25	V	
Current		0.07		mA	
RF sensitivity			-94	dBm	See Note 1
-3dB RF Pass band		600		KHz	
Interference rejection at ±10MHz		-80		dB	See Fig.4
Output square wave		2	3	KHz	
Output Pin Low level Voltage			Gnd+0.4	V	See Note 4
Output Pin High level Voltage	$V_s - 0.4$			V	See Note 4
Spurious RF emission from Antenna			-60	dBm	See Note 2
Turn on time			2	s	See Note 3
Work Temperature Range	-20		+80	°C	See Fig.5
Dimensions	40.13 x 17.5 x 5.5 mm				

Note1: Values obtained on a test system as per Fig.1 and no resistor RX connected (see Fig. 2).
Nota2: R.F emission measurement with direct connection of spectrum analyzer to Rx Pin 3.
Nota3: Time to have receiver at full performance, measured from Supply Voltage turn on.
Nota4: Measurements with a 10KΩ load.

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 characteristics measured in the following test set up:

Fig. 1



Squelch level setting

RX-4M30RR01SF AUREL receiver will show at exit pin a signal of random 1's and 0's due to electromagnetic noise received at antenna.

This is due to maximum sensitivity conditions, when Pin 13 is left disconnected.

Anyway, for those applications that do require a "cleaner" output, the receiver offers the possibility to connect a resistor (Rx, Value according following table) from T.P. point to GND.

Typical resistor value is according to following table:

Receiver	Sens.Loss (-1dB)	Sens.Loss (-3dB)
RX-4M25RR01SF	Rx = 10M	Rx = 5.6M

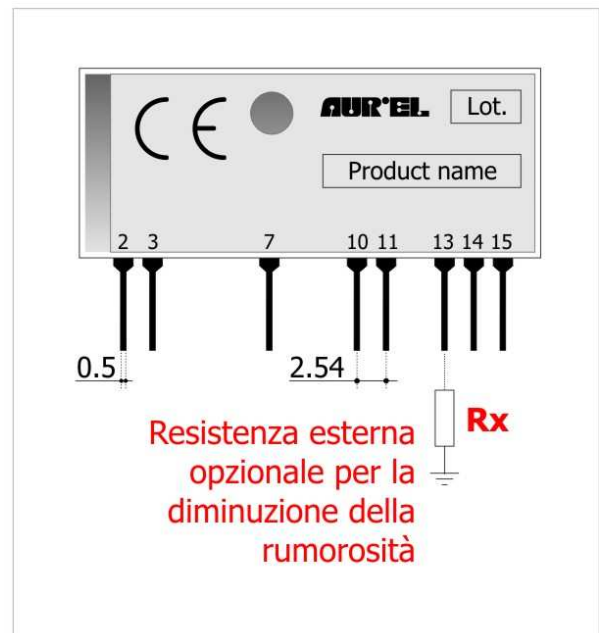
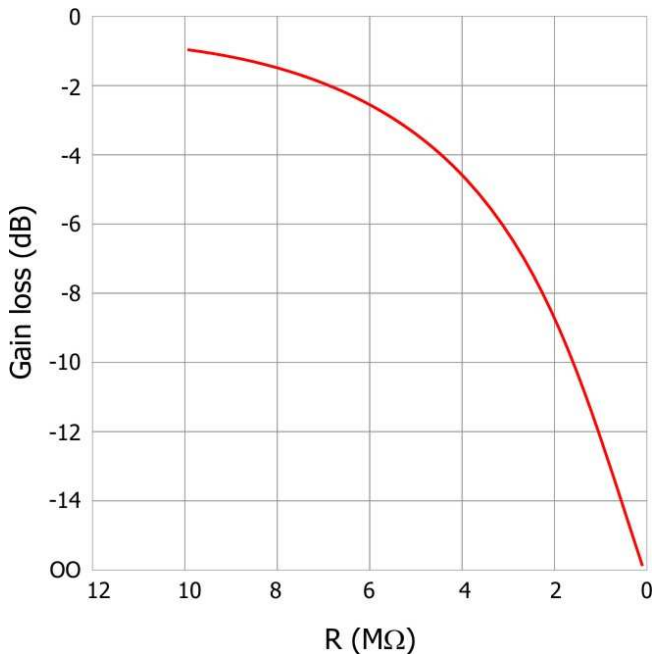


Fig. 2 Plot of Sensit.Loss vs RX (Rx = external resistor to decrease random output noise)

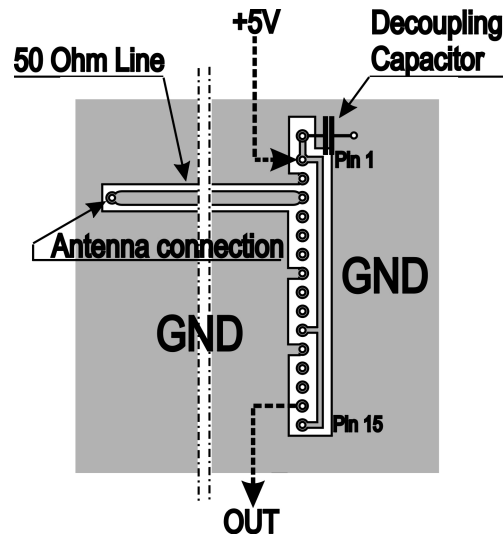
Le caratteristiche tecniche possono subire variazioni senza preavviso. La AUR'EL S.p.A non si assume la responsabilità di danni causati dall'uso improprio del dispositivo.

Sensitivity Loss of 1 dB is sufficient for most applications, even if it will leave some output noise; Sensitivity Loss of 3 dB will raise immunity to noise up to a rather flat output signal.

Usage of Receiver

Following are some design rules to be applied to PCB design to obtain the best performances and to keep Certification limits out of AUREL RF Modules.

This is the *typical lay out* of the solder side of a PCB suited for any receiver (Example with 5V Supply receiver);

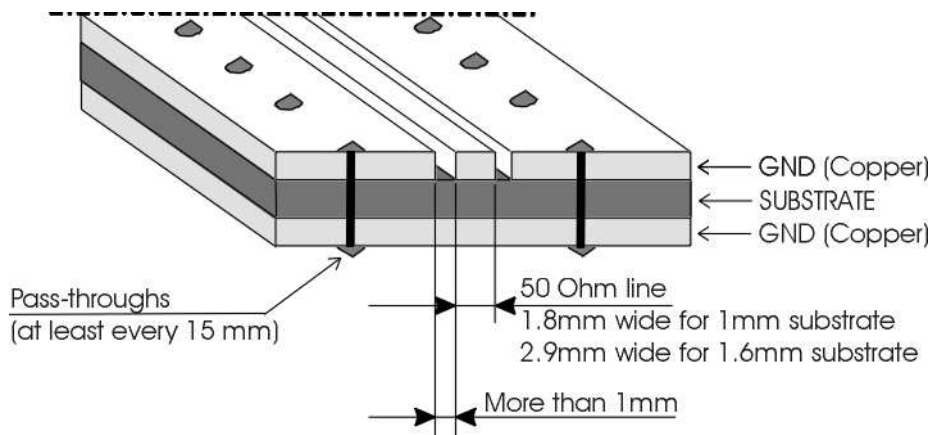


Supply:

1. Good filtered Dc, max. tolerance $\pm 10\%$
2. Use a decoupling ceramic capacitor (10 000 pF) directly on supply pin(s).

Ground:

1. Must cover all area around the module. Circuit should be etched on two side PCB, with sides connected every 15 mm (at least)
2. Ground must be present around the antenna output area



50 Ohm lines:

1. Should be as short as possible

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.

2. Wide 1.8 mm for FR4 PCBs (1 mm thick) and 2.9 mm for FR6 (1.6 mm thick). Distance from surrounding GND is more than 1 mm (2 mm is better).
3. On reverse side of PCB, should have a rather large GND area

Antenna connection:

1. Can be used to directly connect a radiating stylus (165 mm straight wire)
2. Can be used to connect the central conductor of a coaxial cable to remote antenna. The cable out braid must be connected to GND near the antenna connection.

Other components:

1. Keep Aurel module as far as possible from other circuit components (min. 5 mm)
2. Keep as far as possible microprocessor and clock circuitry. Apply GND shields
3. Do not install components around the 50 Ohm line(s). Keep at least 10 mm clearance
4. If antenna is directly connected to PCB antenna connection point (see above) keep a 50 mm radius area with no components, but adequate GND. If antenna connection point is used for coax cable connection, it is possible to move components up to 5 mm.

Reference Normative

RX-4M30RR01SF receiver meets the European Standard ETS 300-220 when supplied at 3V.

Receiver was also tested as per European Standard EN 60950 and it is to be used inside an insulated enclosure that support the same mentioned Standard.

Receiver must be supplied with a very low voltage source protected against short circuits.

Usage of receiver is foreseen in suitable enclosures that are compliant to Standard EN 61000. It is responsibility of module integrator to take care of proper antenna insulation, as the receiver RF entry point is not made to withstand the electrostatic discharges foreseen for Standard EN 61000-4-2 testing.