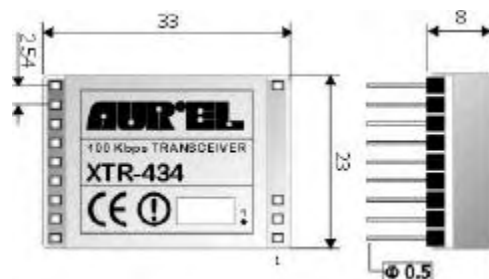
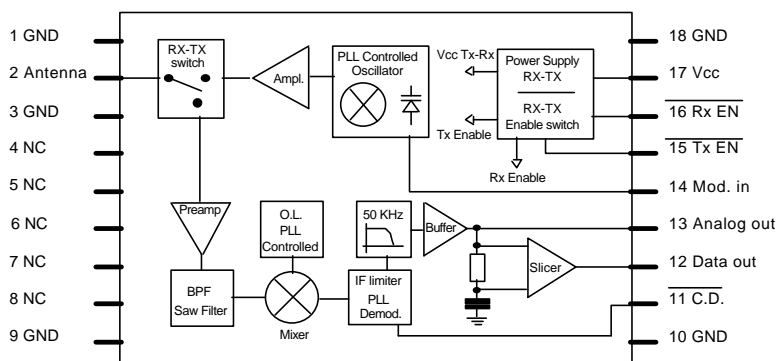


Transceiver mod. XTR-434

Miniaturized data transceiver module, **100Kbps** maximum speed, 433,92 MHz operating frequency.

Pin-Out and Block diagram

Dimensions



Connections

Pin 1-3	<u>RF GND</u>	RF circuit GND
Pin 2	<u>Antenna</u>	50Ω impedance antenna connection
Pin 5-9-10-18	<u>GND</u>	Connections to GND. Internally connected also to the module's shield.
Pin 11	<u>CD</u>	Carrier Detect. With enabled receiver, a low signal (voltage level 0V), indicates that the receiver detects an RF carrier. The line activates with an RF signal of about -101dBm applied to pin 2 (antenna). High impedance output available only for loads under CMOS logic.
Pin 12	<u>RXD</u>	Receiver data output. Load impedance allowed: over 1KΩ but less than 1nF loads.
Pin 13	<u>AF</u>	Filtered and buffered output representing the analogic output of the FM detector. Load impedance allowed: over 2KΩ but less than 100pF.
Pin 14	<u>TXD</u>	Input to transmitter; accepts serial data in TTL logic (0 ÷ 5V) with a 10KΩ load impedance.
Pin 15	<u>TX ENABLE</u>	Active when low, (voltage level 0V), enables the transmitter circuit. Pull-up line to Vcc with 100KΩ resistance, 1mA required current
Pin 16	<u>RX ENABLE</u>	Active when low, (voltage level 0V), enables the receiver circuit. Pull-up line to Vcc with 100KΩ resistance, 1mA required current.
Pin 17	<u>Vcc</u>	Connection to the positive pole of the supply voltage (+5V ± 10%)

The technical tests and reports have been carried out and obtained by the laboratories :

PRIMA RICERCA & SVILUPPO – via Campagna, 58 – 22020 Gaggino Faloppio (CO).

Technical features are subject to change without notice.

AUR°EL S.p.A does not assume responsibilities for any damage caused by the device's misuse.

Technical features

Characteristics	Min	Typical	Max	Unity	Remarks
Voltage supply	4,5	5	5,5	Vdc	
Absorbed current (TX ON)	22	26	32	mA	
Absorbed current (RX ON)		10	12	mA	
Absorbed current (TX/RX OFF)			100	nA	
RX Section					
Reception frequency		433.92		MHz	
RF sensitivity, 1ppm BER		-100	-102	dBm	See note 1
IF passband		150		KHz	
Interferences rejection at ± 20 MHz		-100		dBm	See Fig. 1
RF spurious emissions in antenna		absent			See note 2
Output square wave	2,5		50	KHz	See note 4
Output low logic level		0,1		V	See note 4
Output high logic level		4		V	See note 4
Carrier Detect (CD) threshold		-100		dBm	See note 1
TX Section					
Transmission frequency		433.92		MHz	
Modulation passband	2,5	50	55	KHz	
FM deviation		± 25		KHz	
TX output power		10		dBm	
Antenna impedance		50		Ω	
Switch-on time			1	ms	See note 3
Working temperature	-10		+55	$^{\circ}\text{C}$	See Fig. 2
Dimensions	33 x 23 x 8 mm				

Note1: Values have been obtained by test system at -100 dBm, ± 25 KHz FM deviation, as per Fig. 3 and with a 40 KHz modulating frequency.

Note2: The R.F. emission measure has been obtained by connecting the spectrum analyser directly to the XTR module pin 2.

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

Note4: Values obtained with a 10K Ω load applied.

TX/RX Enabling

Pin 15 (TX ENABLE) and 16 (RX ENABLE) can acquire the following status:

Pin 15 TX ENABLE	Pin 16 RX ENABLE	Functions
1	1	Disabled module
1	0	Enabled receiver
0	1	Enabled transmitter
0	0	Not to be used condition

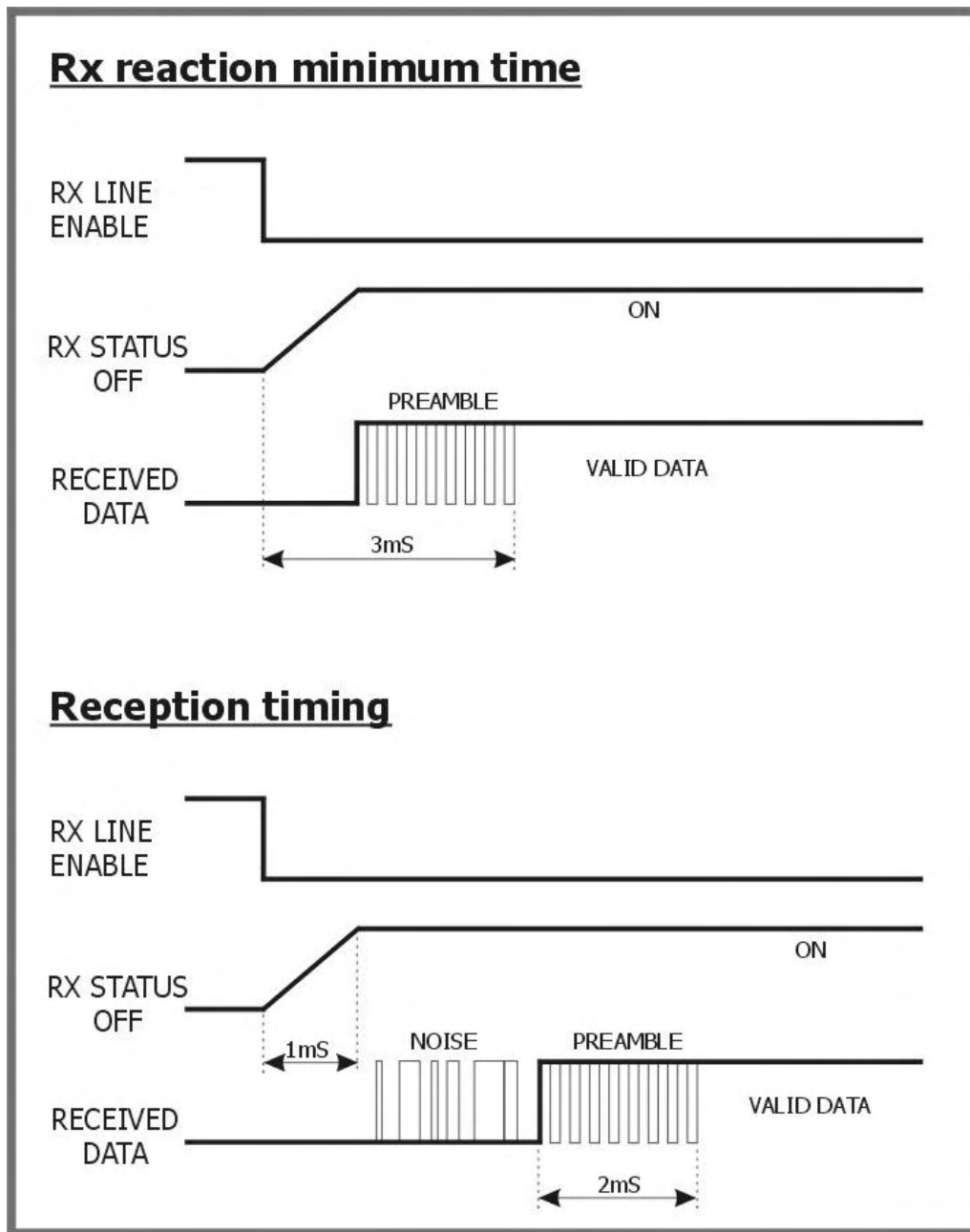
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Considerations over the TX/RX serial data

Pulse amplitude time: the circuit characteristics (passband in base band and AC couplings) determine the length of the time between each two consecutive level transitions on the line of the serial signal. For the correct operation of the XTR-434, such time must be comprised between 10 μ s and 200 μ s.

Settling time of the Data Slicer requires, that for 2 ms before the data themselves, a preamble, composed by a square wave, is transmitted in order to consider reliable the data coming out from the RXD line.

Bit ON/Bit OFF relation: the Data Slicer is optimized for a 50:50 duty cycle, calculated over a period of 2 ms. It will continue to operate, even with bigger distortion and less tolerance to interferences, till a 30:70 or 70:30 duty cycle.



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Device Usage

To take advantage of the performances detailed in the Technical Specifications, and in order to comply with the operating conditions which characterize the Certification, the transmitter must be fitted on a printed circuit considering the followings:

5 V dc supply:

1. The transceiver must be supplied by a very low voltage source, safety protected against short circuits.
2. Maximum voltage variations allowed: $\pm 0,5$ V
3. De-coupling, next to the transmitter, by means of a minimum 100.000 pF ceramic capacitor.

Reference Curves

Fig.1 Frequency-Selectivity curve

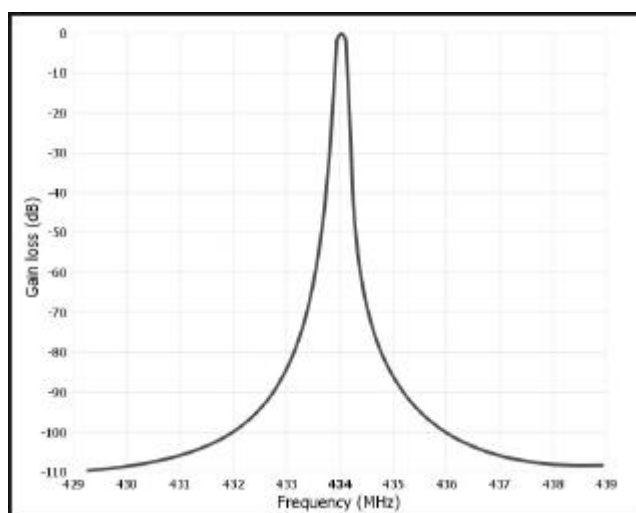
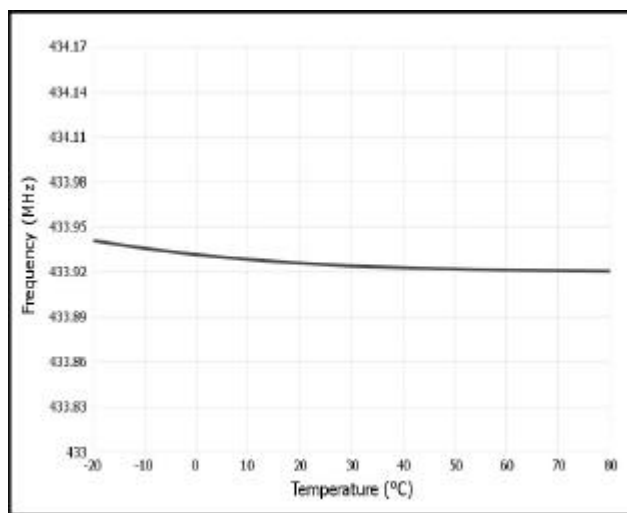


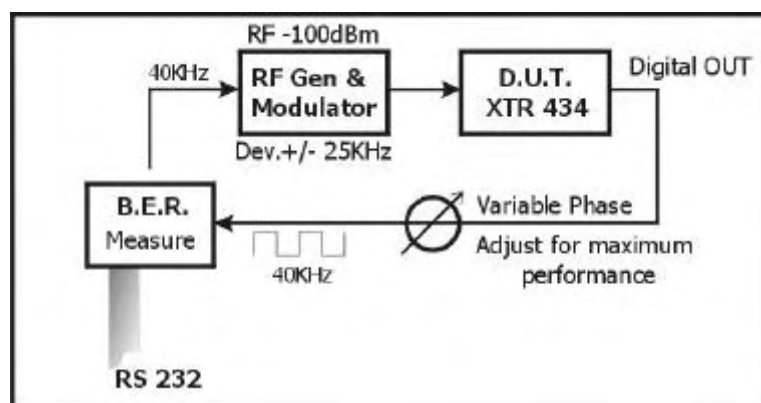
Fig.2 Temperature-frequency variation curve



The curve has been obtained by the test system shown in Fig.3.

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

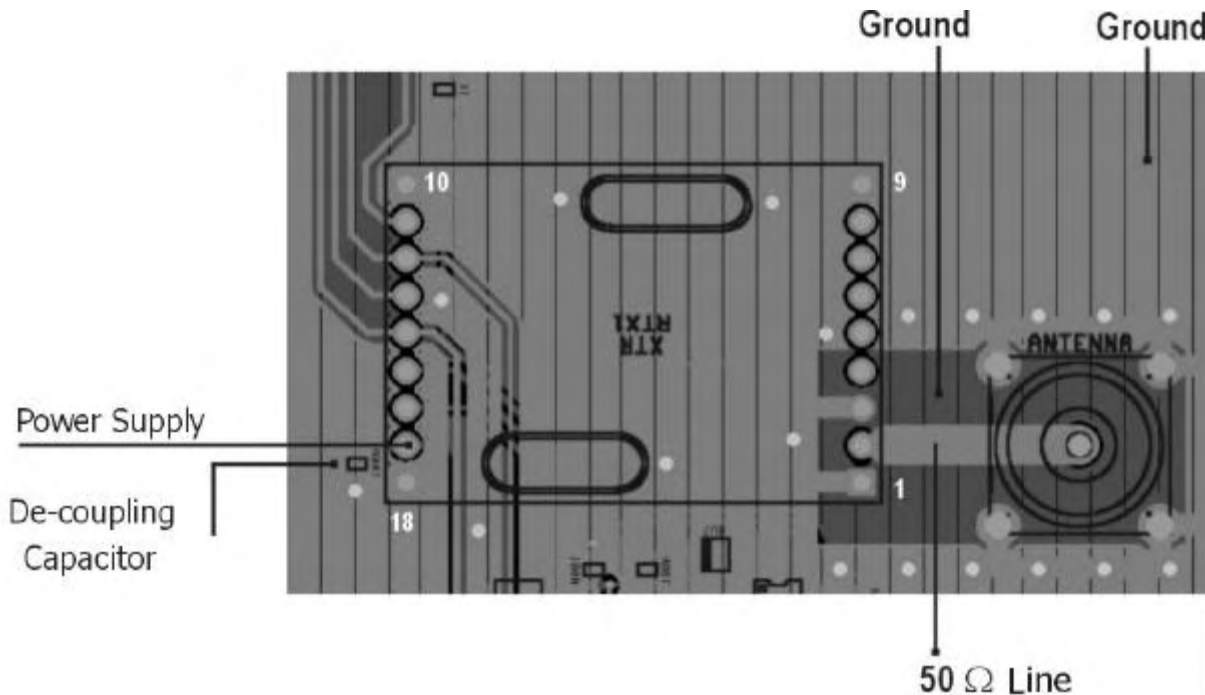
Fig.3



Technical features are subject to change without notice.
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Ground:

1. It must surround at the best the welding area of the module. 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.)



50 Ohm Line (connection between antenna and pin 2):

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:

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 transceiver.

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.)

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 and Application Notes).

By fitting whips too different from the described ones the CE Certification is not assured.

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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 Rules

The **XTR-434** transceiver is CE 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.

CEPT 70-03 Recommendation

In order to comply with such rule, the maximum hourly duty cycle of the device must be the 10% (i.e.: 6 min. per hour).

The utilisation of such device inside any national territory is subject to the Postal Code and Telecommunications rules in force. In Italy is art. 334 and subsequents.