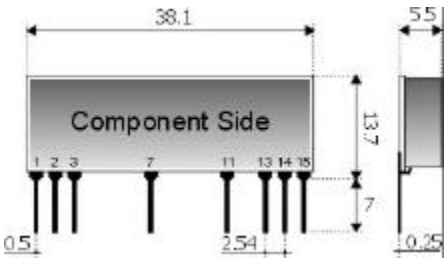
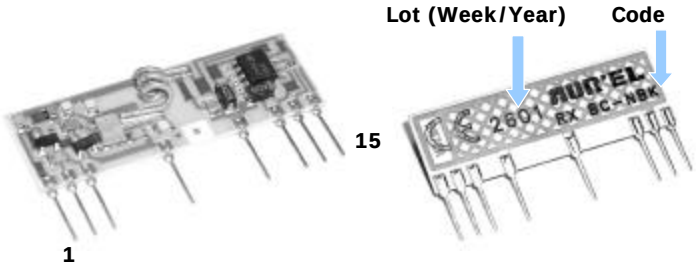
BC-NBK Receiver

Digital RF receiver, thick-film technology, with high sensitivity, low consumption and low antenna radiation.

Pin-out





Connections

Pin 2-7-11	**Ground**	GND Connections: Internally connected to a single ground plate.
Pin 3	**Antenna**	50Ω impedence, antenna connection
Pin 1-15	**+V**	Connection to the positive pole of supply (+5V ±10%)
Pin 13	**Test Point**	Analog output of the demodulated signal. By connecting an oscillograph, the entity and quality of the received RF signal can be seen.
Pin 14	**Data Out.**	Receiver digital output. Apply loads over 1 KΩ

Technical Features

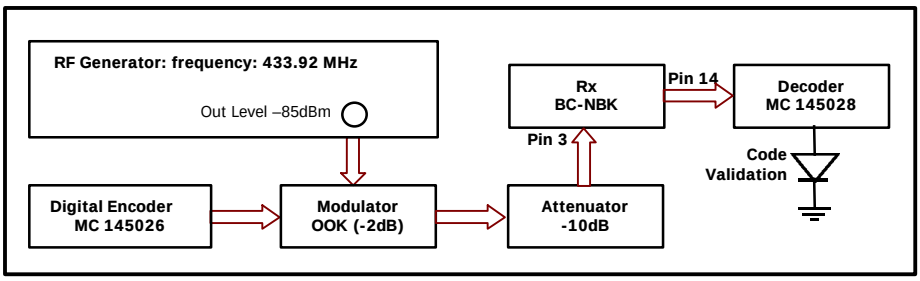
	Min	Typical	Max	Unity	Remarks
Working centre frequency		433.92		MHz	
Voltage supply	4.5	5	5.5	V	
Absorbed current		2,7	3	mA	
RF sensitivity		-97		dBm	See note 1
RF passband at –3dB		2.4		MHz	
Output square wave		2		KHz	
Output low logic level			0.1	V	See note 4
Output high logic level	3.8			V	See note 4
RF spurious emissions in antenna		-65	-60	dBm	See note 2
Switch-on time			2	s	See note 3
Working temperature	-20		+80	°C	See Fig. 5
Dimensions	38.1 x 13.7 x 5.5 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 10KW maximum load applied.*

BC-NBK module was previously BZT approved by mean of Test Report obtained c/o the laboratory:
ISPT LAB RADIO – viale Europa 190, 00144 Roma.

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

Fig. 1



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:

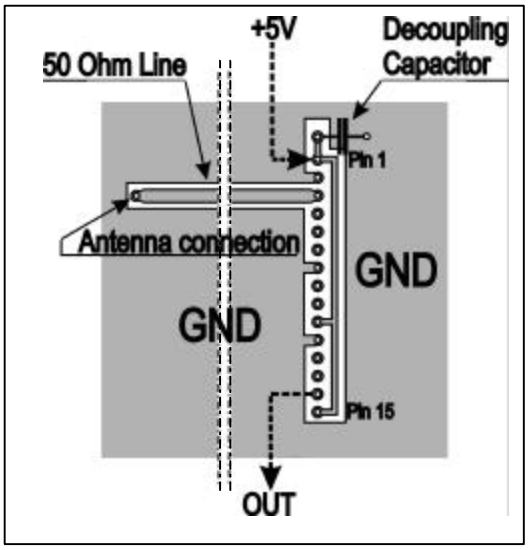
5 V dc supply:

1. The receiver must be supplied by a very low voltage source, safety protected against short circuits.
2. Maximum voltage variations allowed: ± 0,5 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.

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.

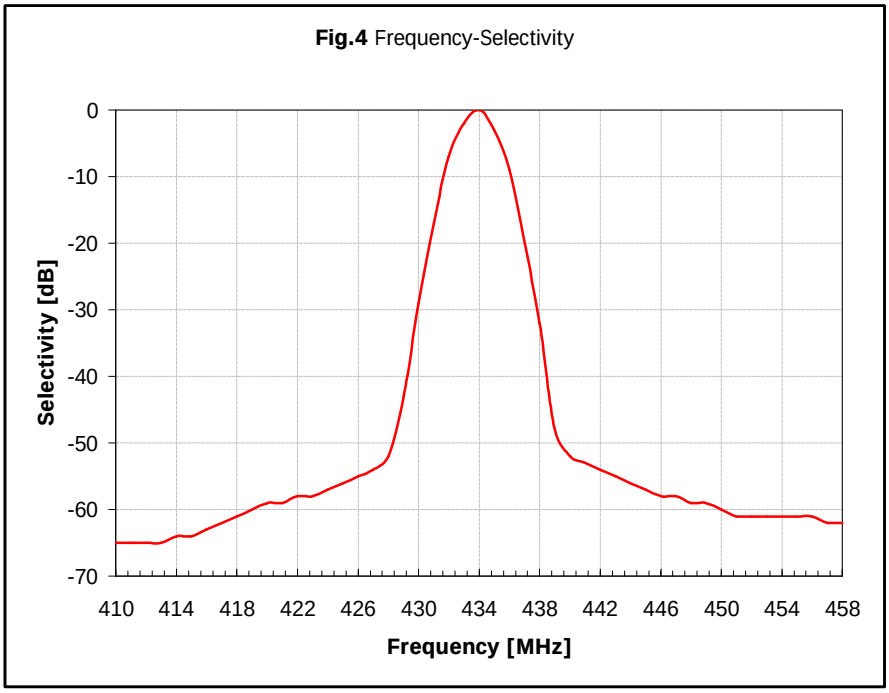
Other components:

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.
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, then 5 mm radius will suffice.

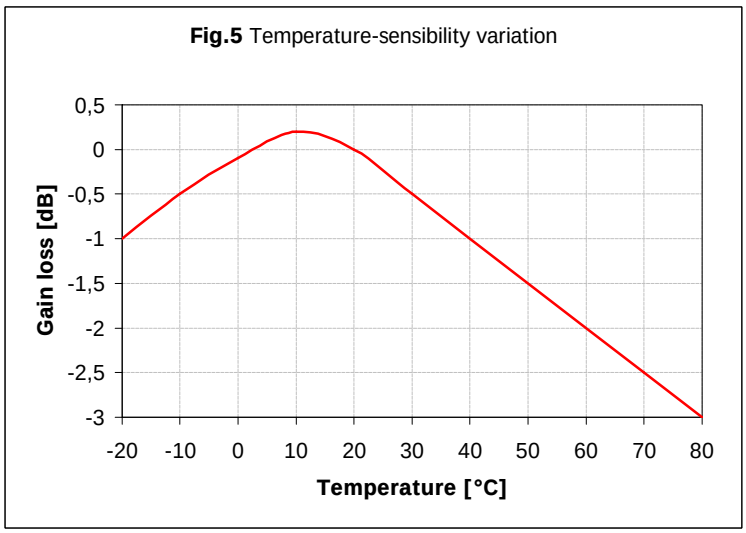
Reference Rules

The **BC-NBK** receiver is EEC certified and in particular it complies with the European Rules **EN 300 220-3,** and **EN 301 489-3 for class 3.** 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.

Reference curves



The curve has been obtained by the test system shown in Fig.1



5V supply, RF input 433,92MHz, -95dBm