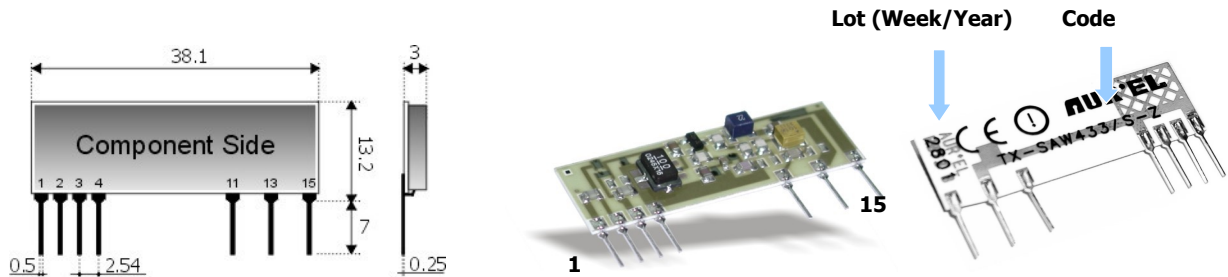


# TX-SAW/433 s-Z RFM Transmitter

SAW Transmitter module with external antenna, for utilisations with ON-OFF modulation of a RF carrier with digital data.

## Pin-out



## Connections

<b>Pin 1-4-13</b>	<b>Ground</b>	GND Connections. To be externally connected to a single ground plate. (see fig. 3)
<b>Pin 2</b>	<b>Input Mod.</b>	TTL 0÷5V type data input with a minimum 5K $\Omega$ resistance. Connection utilized only if the supply to pin 15 is +12V $\pm$ 10% (see fig. 2)
<b>Pin 3</b>	<b>Input Mod.</b>	TTL 0÷5V type data input with a minimum 5K $\Omega$ resistance. Connection utilized only if the supply to pin 15 is +5V $\pm$ 10% (see fig. 2)
<b>Pin 11</b>	<b>RF output</b>	RF output with a characteristic impedance of 50 $\Omega$
<b>Pin 15</b>	<b>+V</b>	Connection to the positive pole of the +5V $\pm$ 10% supply

## Max voltage values allowed

Description	Max	Unity	Remarks
<b>Voltage supply (Vs) to pin 15</b>	13,5	V	

## Technical features [ETS 300 200]

Description	Min	Typical	Max	Unity	Remarks
<b>Working frequency centre</b>	433.82	433.92	434.02	MHz	See notes 1 and 2
<b>Voltage supply (Vs)</b>	4.5	5	5.5	V	
<b>Absorbed current</b>		4		mA	
<b>RF output power (E.R.P.)</b>			+10	dBm	See note 1
<b>Output impedance pin 11</b>		50		$\Omega$	
<b>RF spurious emissions</b>		-50		dBm	See note 1
<b>Modulation frequency</b>			4	kHz	
<b>Input high logic level</b>	4.5	5	5.5	V	
<b>Input low logic level</b>	0		0.2	V	
<b>Working temperature</b>	-20		+80	$^{\circ}$ C	See fig. 5
<b>Working temperature [ETS 300 200]</b>	-20		+55	$^{\circ}$ C	See fig. 5
<b>Dimensions</b>	38.1 x 13.2 x 3 mm				See Pin-out

Technical features are subject to change without notice. AUREL S.p.A does not feel responsible for any damage caused by the device's misuse.

**Note1:** Values have been obtained by applying the test system shown in Fig. 1 and maximum 5,5 V power supply.

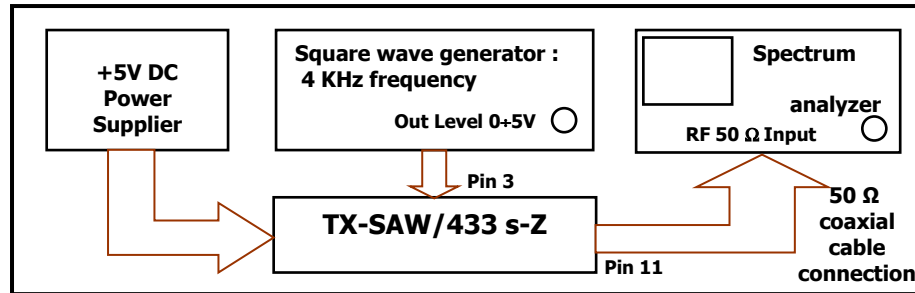
**Note2:** The minimum and maximum showed values are determined by the device's construction tolerance.

To define the working frequency of the device, add to these values the deviation caused by the thermal variations (see fig. 3).

**Note3:** To keep the parameters within the limits established by the rules in force, (see para. "Reference Rules"), it is recommended to supply the circuit with not more than 5,5V and to comply with all the recommendations specified in para "Device usage".

**Messrs AUR<sup>°</sup>EL declines all responsibilities in case the a.m. recommendations are disregarded.**

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



## 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 transmitter has to be mounted on a printed circuit, and keep into consideration what follows:

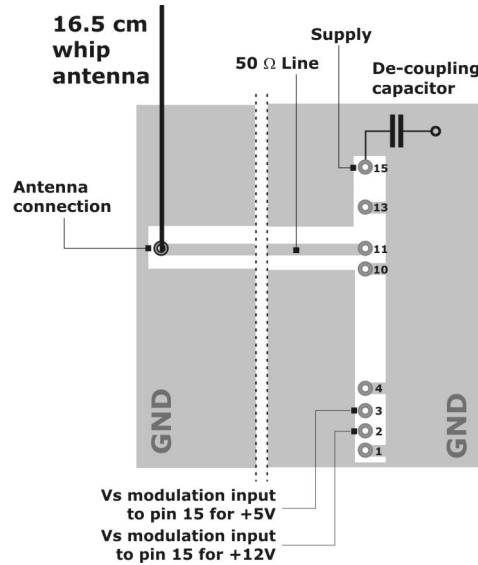
### 5V dc supply

1. The transmitter must be supplied by a very low voltage source, safely 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.

### Ground

1. It must surround at the best the welding area of the transmitter. The circuit must be double layer, with throughout vias to the ground planes, approximately each 15 mm.
2. It must be properly dimensioned, especially in the antenna connection area, in case a radiating whip antenna is fitted in it (an area of approximately 50 mm radius is suggested).

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## 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. It must be kept 2 mm away from the ground circuit on the same side.
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 cm long and approximately 1 mm dia, brass or copper wire made, must be connected to the RF output of the transmitter (pin 11), (see fig. 2).
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 either vertically or horizontally, provided that a good ground plane surrounds the connection point between antenna and transmitter output.

**N.B.:** As an alternative to the a.m. antenna it is possible to fit 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 transmitter 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.

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3. Do not fit components around the 50 Ohm line. Keep them at least at 5 mm distance.
4. If the Antenna Connection is directly used for a radiating whip connection, keep at least 5 cm radius free area. In case a 50  $\Omega$  impedance coaxial cable is connected, then 5 mm radius will suffice.

## Reference Rules

The **TX-SAW/433 s-Z** transmitter complies with the EU Rules **ETS 300-220**, with a 5,5V max. supply. The equipment has been tested according to rule **EN 60950** and it can be utilized inside a special insulated housing that assures its compliance with the above mentioned rule. The transmitter must be supplied by a very low voltage source, safely protected against short circuits.

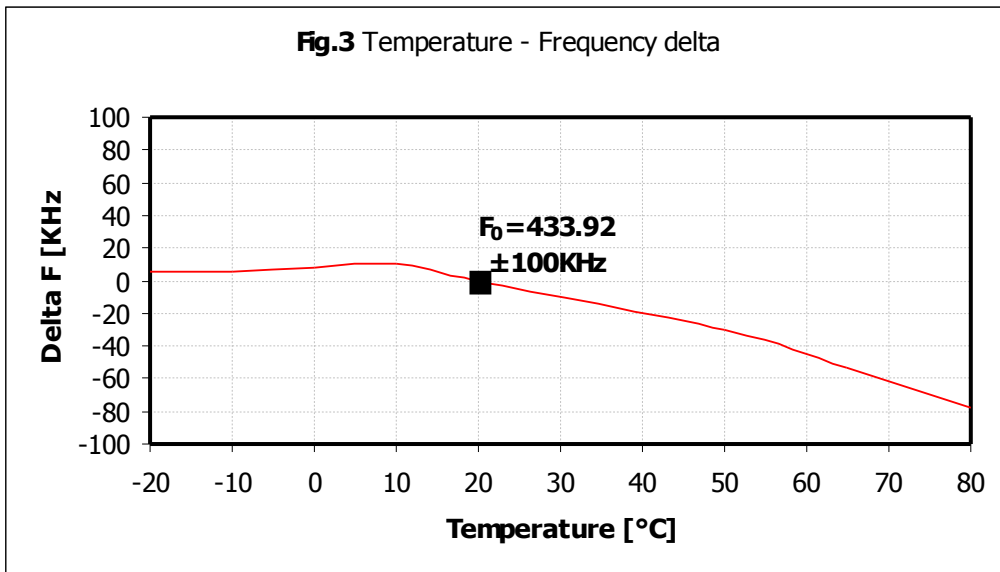
The use of the transmitter module is foreseen inside housings that assure the overcoming of the rules **EN 61000** not directly applicable to the module itself. In particular, it is left at the User's care, the insulation of the external antenna connection, and of the antenna itself, since the RF output of the transmitter is not built to directly bear the electrostatic charges foreseen by the **EN 61000-4-2** rules.

## CEPT 70-03 Recommendation

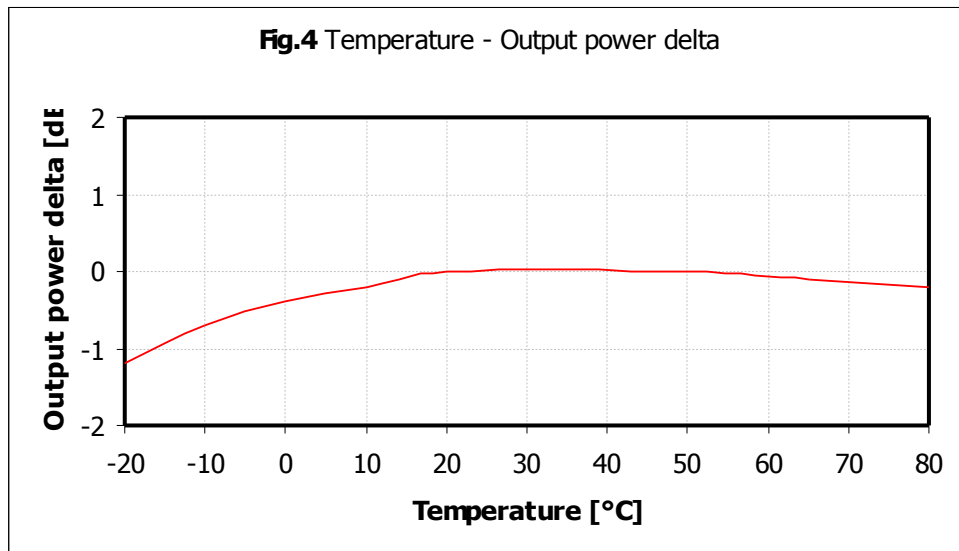
In order to comply with such rule, the device must be used only for a 10% of an hourly duty-cycle, (that means 6 minutes of utilisation over 60). The device utilisation inside the italian territory is governed by the *Codice Postale* and *Telecomunicazioni* rules in force (art. no. 334 and subsequents).

**BTX-SAW/433 s-Z** module was previously BZT approved by mean of Test Report obtained c/o the laboratory: **SENTON GmbH** - Äussere Frühlingstrasse 45 D – 94315 STRAUBIN

**Reference curves**



The curve has been obtained by the testing system shown in Fig.1.  
**5V Power supply**



The curve has been obtained by the testing system shown in Fig.1  
**5V supply, RF output 433,92MHz, ±100 kHz, output power 8dBm ±2dB**

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