

Wireless Transparent Modules

32001548

OOK/ASK 433.92 MHz SUPERHETERODYNE RECEIVER

Datasheet



Overview

Low cost, OOK/ASK Superheterodyne receiver in the 434 MHz SRD Band, manufactured in SMT technology on printed circuit board.

Typical applications are remote control system, security systems, data transmission, industrial controls and home automation.

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1. Product Features

Mechanical highlights:

- ✓ Compact dimensions
(26 mm x 15.50 mm)

RF performances:

- ✓ -108 dBm Sensitivity
- ✓ Category 1.5 Receiver

Low power characteristics:

- ✓ 7 mA current consumption

Additional features:

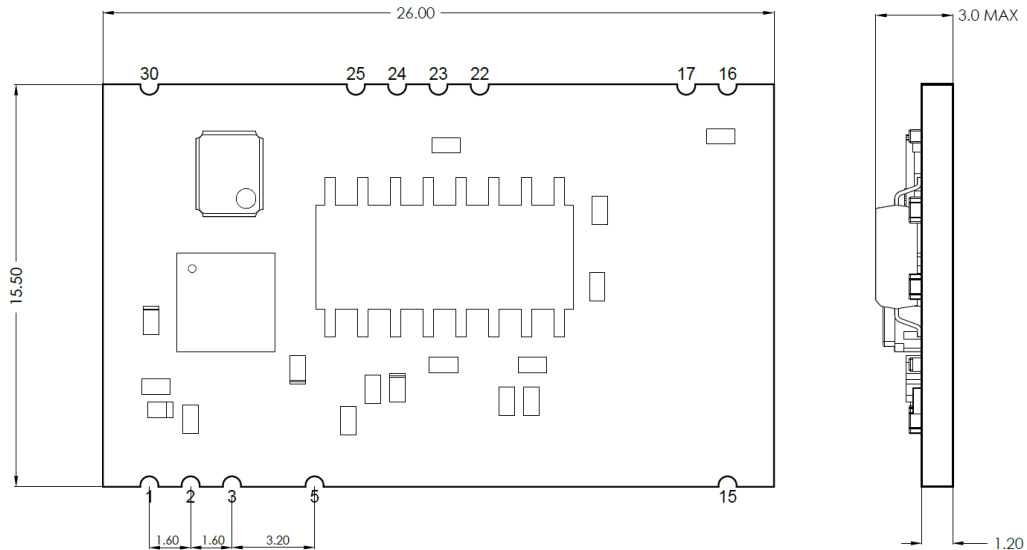
- ✓ SMT package

Suitable for all HCS, HT12 encodings and similar.

RF front-end filter assures great immunity to out-of-band interferers.

CATEGORY 1.5 RECEIVER developed according to ETSI EN 300 220 European Standard.
The module meets with the Radio Equipment Directive (RED) 2014/53/EU.

2. Mechanical Dimensions



ALL DIMENSIONS ARE IN MILLIMETERS

GENERAL TOLERANCE +/-0.1mm

3. Pin Definition

Pin	Name	Type
1	GND	S
2	RF Input (50 Ω)	RF
3	GND	S
5	NC	NC
15	GND	S
16	GND	S
17	VDD	S
22	NC	NC
23	DATA Out	O
24	VDD	S
25	NC	NC
30	GND	S

LEGEND: S = Power supply, O = Output, I = Input, RF = Antenna port, NC = Do Not Connect

4. Electrical Characteristics

4.1. Absolute Maximum Ratings

Parameter	Max.	Unit
Supply Voltage (VDD)	5.5	V
Storage Temperature	-40 to 100	°C
Operating Temperature	-40 to 85	°C
Operating Relative Humidity	0 to 85	%
Max radio frequency input, pin 2	10	dBm

4.2. Operating Condition

Note: All parameters measured with RF input (pin 2) connected to a 50-Ω impedance signal source or load, VDD @ 5 V.

4.3. ELECTRICAL CHARACTERISTICS @ 25 °C

Parameter	Min.	Typ.	Max.	Unit	Notes
Supply Voltage (VDD)	4.0	5.0	5.5	V	
RX Current consumption	-	6.7	7.2	mA	1
RF input impedance	-	50	80	Ω	
Operating Band	433.050	-	434.790	MHz	2
Operating frequency	-	433.920	-	MHz	2
Frequency error	-	100	-	ppm	
Sensitivity @ 2400 bit/s	-	-107	-	dBm	3
Sensitivity @ 4800 bit/s	-	-108	-	dBm	3
-3 dB RF Bandwidth	-	550	600	kHz	4
Blocking	-17	-	11	dBm	5
Unwanted spurious emission	-	-	-57	dBm	6
Data Rate	2400	-	4800	bit/s	
V _{low} on I/O pin	0.05	-	0.1	V	
V _{high} on I/O pin	VDD – 0.1	-	VDD	V	
Output load on pin 23	8	50	-	kΩ	7

4.4. TIMINGS @ 25 °C

Parameter	Min.	Typ.	Max.	Unit	Notes
Start-up time	-	8	-	ms	8
Settling time	-	340	-	μs	9
Duty Cycle	53	-	57	%	10
Jitter	50	-	70	μs	3, 11
Delay	60	-	70	μs	12
Rise Time	-	7	-	μs	3

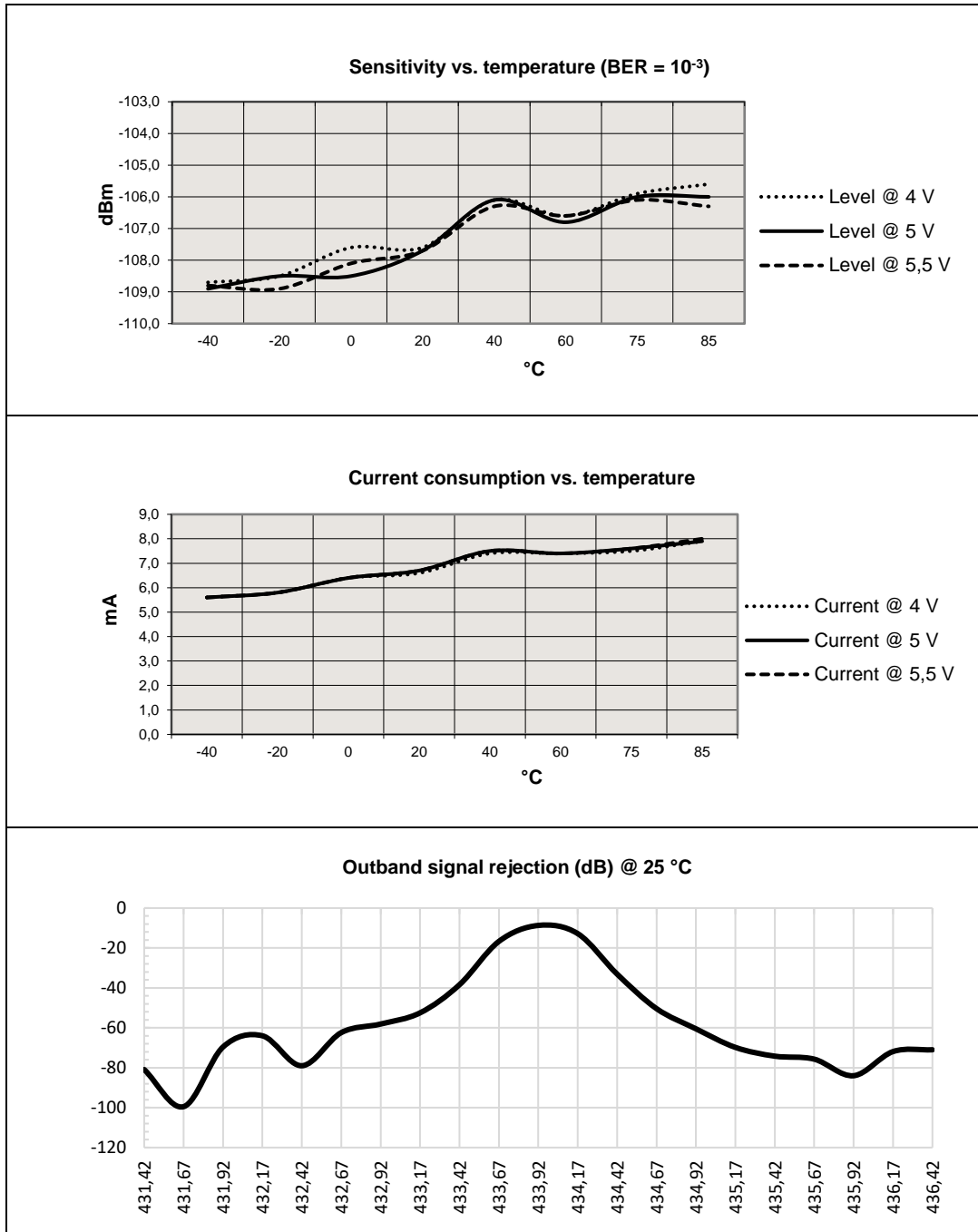
4.5. Notes:

- 1) RX Current consumption measured @ 5 V, RF input -107 dBm pseudo-random bit sequence code NRZ (mod. depth 100%), 4800 bit/s, BER ≤ 10⁻³.
- 2) Operating band as per REC ERC 7003, Annex 1, Frequency Bands g1, g2, g3; ETSI EN 300 220-2, Frequency Bands H, I, J.
- 3) Test signal pseudo-random bit sequence code NRZ (mod. depth 100%), BER ≤ 10⁻³.
- 4) Response at -3 dB sensitivity.
- 5) Measured as per ETSI EN 300 220-1, 5.18 *Blocking*.
- 6) Measured as per ETSI EN 300 200-1, 5.9 *Unwanted emissions in the spurious domain*.
- 7) Output as source @ 0.8 VDD: 260 μA; output as sink @ 0.2 VDD: 600 μA.
- 8) Time between power on and valid data reception.
- 9) Time for valid data reception.
- 10) Test signal 2400 Hz square wave @ -50 dBm.
- 11) Measured at maximum usable sensitivity.
- 12) Delay between the demodulated signal and the RF modulation.

5. Temperature Range Curves

Note: All parameters measured with RF input (pin 2) connected to a 50 Ω impedance signal source or load.

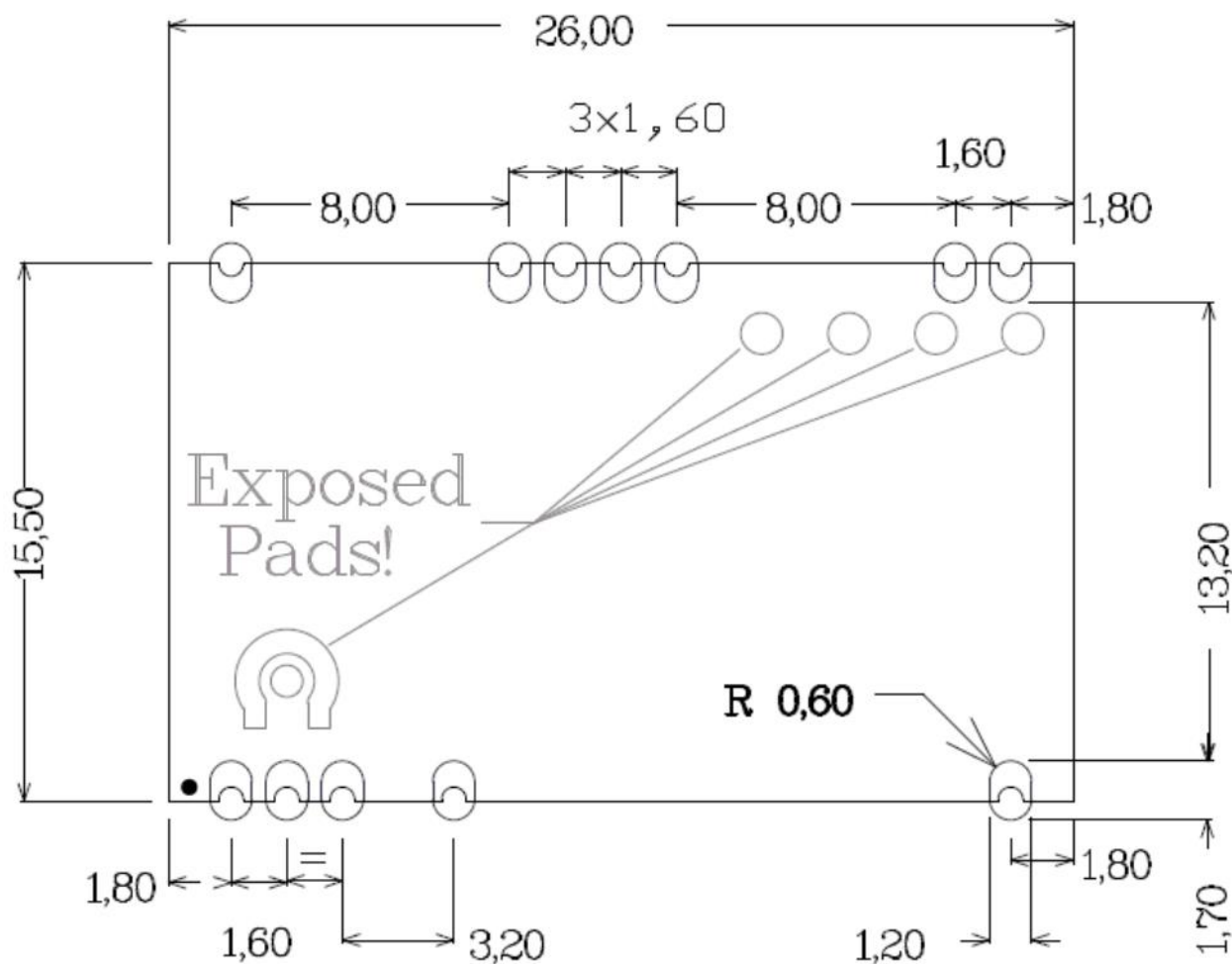
5.1. Receiver



6. Soldering pad pattern

The finished surface on the printed circuit board pads should be made of Nickel/Gold.

The recommended soldering pad layout on the host board for the Wireless Transparent Module Series is shown in the diagram below:

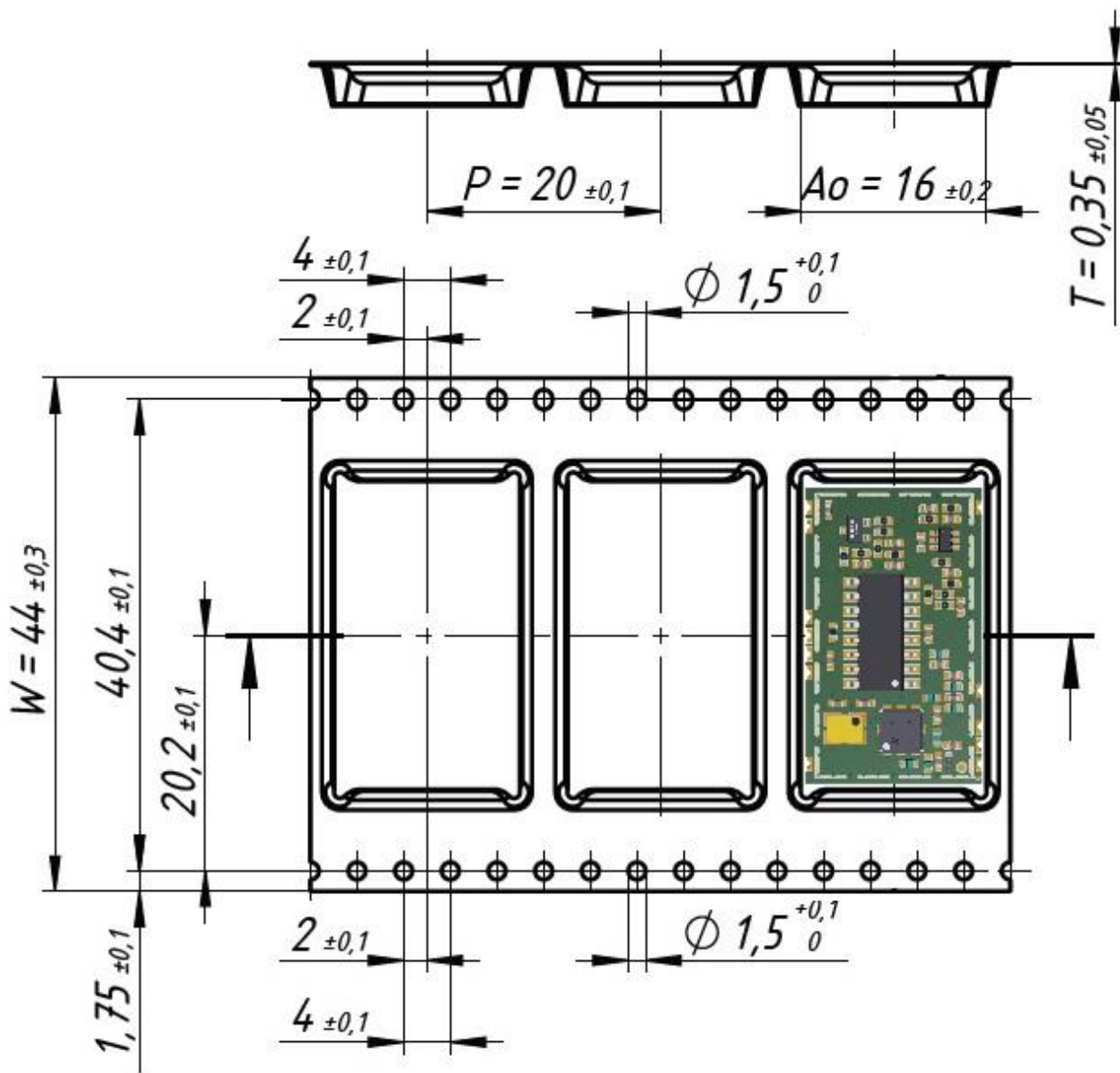


Top view. All dimensions in millimeters. General tolerances ± 0.1 mm.

Neither via-holes nor wires are allowed on the PCB upper layer in area occupied by the module.

7. Packaging informations

Modules are delivered in Tape & Reel packaging of 250 pcs.



8. Application Notes

Title	Description	Document
Frame Structure for Radio Communication	Data encoding techniques	AN_RF_001.pdf
PCB Layout Guidelines	Hints how to make for a good RF design	AN_RF_002.pdf
Manufacturing Process Information for Wireless Transparent Modules	Tape& Reel Specification, Reflow soldering information	AN_MNF003_rev0.1.pdf

9. Regulatory Approvals

Title	Description	Document
Declaration of Conformity	Declaration of the conformity with the essential requirements of the European Directive 2014/53/EU	-

10. Revision History

Revision	Date	Description
0.0	27.05.2022	Draft
0.1	30.05.2022	Added module footprint
0.2	27.10.2022	Added RH in Absolute Maximum Ratings; added Frequency Error; Sensitivity value referred to the bit rate; added Timings; added Outband Signal Rejection curve; updated Notes. Applied new document format.
0.3	22.11.2022	- Added Soldering pad pattern. - Added Manufacturing Process Information in Application Notes. - Added packaging informations.