Users Manual

Manual AMB2300

Version 1.3

BlueNiceCom 4

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Table of contents

1 General

BlueNiceCom 4
Bluetooth-Modul with UART-interface and integrated Chip-antenna

- Bluetooth Class 2 module
- Bluetooth Specification 2.0 compatible
- Support of Bluetooth Audio
- Integrated profiles: SPP, GAP, SDAP
- Supported profiles: DUN, OBEX, HSP etc.
- UART interface
- Integrated chip antenna

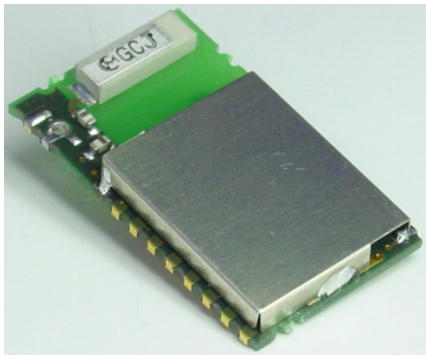


Abb. 1

AMBER wireless provides with the BlueNiceCom 4 a certified, qualified listed Bluetooth-module, based on LMX9830 from National Semiconductor. This compact and inexpensive Bluetooth-module is qualified for a serial data or audio transmission.
The module has an integrated chip-antenna and can be placed into a circuit like a SMD-part.

BlueNiceCom IV comes with an integrated firmware with the complete Bluetooth Stack (Bluetooth 2.0).
A Point-to-Point connection and a Point-to-Multipoint (Piconet) connection are supported by the firmware. Up to seven active links (Piconet) and one SCO-link (Audio) is possible.

The module can be integrated easily in a system. According to the application and the settings the BlueNiceCom 4 can work as a stand-alone-slave-module e.g. as a virtual cable replacement in combination with another commercial Bluetooth system.
A development environment AMB2300-EV is available.

2 Technical data

Voltage supply	2.9 to 3.3V
Current consumption	typ. 65mA
RF output	typ. 0dBm (Class 2)
Rx sensitivity	typ. –80dBm
Data rate UART	2,4 to 921,6 kbits/s
Operating temperature	-20°C to 70°C
Antenna	Integrated chip antenna Connection of an external antenna is possible
Dimension	27,5 x 16 x3,5mm
Miscellaneous	All further technical datas according to the LMX9830 module of National Semiconductor
Order number	AMB2300
Part code:	BlueNiceCom 4

2.1 Default settings

All parameter are stored at the internal EEPROM.
See datasheet LMX9830

Parameter	EEPROM Address	Default set ups	Notice
DeviceName length	0018	18	Device Name + NULL-Terminierung
DeviceName	0019 – 0040	<Variabel>	Device Name Consist of „ BNC4- “ and BD_ADDR

2.2 Pin assignment

2.2.1 Pinning

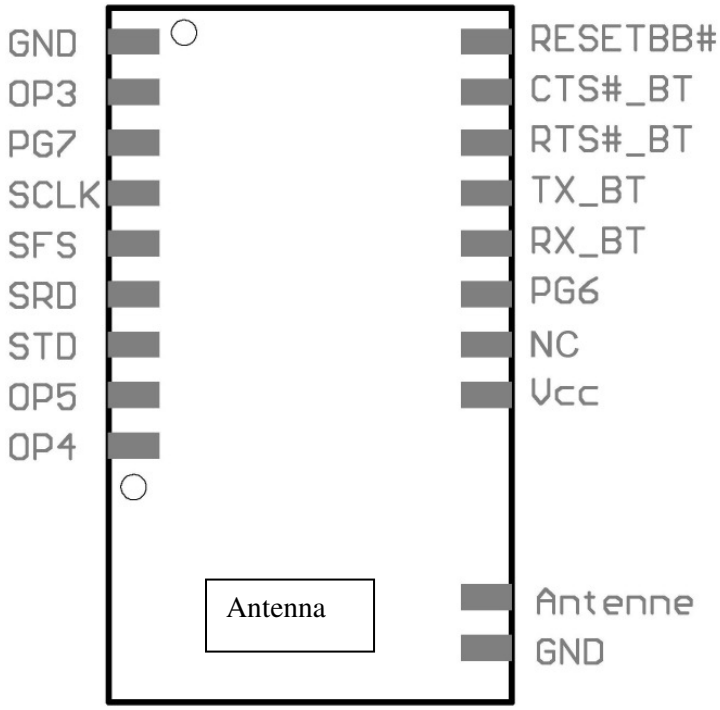


Figure. 2

2.2.2 Pinning table

Pin name	Typ[1]	Notice
GND	I	Ground
OP3	I	At start up configuration of the UART-data rate, otherwise internal use
PG7	I/O	GPIO (default setting as output, display a data exchange)
SCLK	I/O	Audio PCM Interface Clock
SFS	I/O	Audio PCM Interface Frame Synchronization
SRD	I	Audio PCM Interface Receive Data Input
STD	O	Audio PCM Interface Transmit Data Output
OP5	I	Configuration UART-data rate at Start up
OP4	I I/O	Configuration UART-data rate at Start up, otherwise GPIO
RESETBB#	I	Reset, internal Pull up, active low
CTS#_BT	I	Host Serial Port Clear To Send, active low [2] - see footnote 2
RTS#_BT	O	Host Serial Port Request To Send, active low [3] - see footnote 3
TX_BT	O	Host Serial Port Transmit Data
RX_BT	I	Host Serial Port Receive Data
PG6	I/O	GPIO (default setting as output, display a link connection)
NC	I	Not connected, no ground
Vcc	I	Power consumption, 2,9V to 3,6V
Antenna	O	Connection for external antenna[4] - see footnote 4
GND	O	

The signal level is equivalent to the power consumption (2,9V to 3,6V) of the BlueNiceCom 4 and has to be matched, if the Host system is working with a different signal level.

[1] I = Input, O = Output
[2] Connect with ground if not used
[3] Not connected if not used
[4] In as-delivered condition the antenna connection is internally not connected

OP3, OP4, OP5:

Configuration of the serial interface. Must be connected.

OP3	OP4	OP5	Function
0	1	0	Automatically baud rate-detection
1	0	0	Baud rate-adjustment is read from the EEPROM
1	0	1	9600 bps
1	1	0	115200 bps
1	1	1	921600 bps

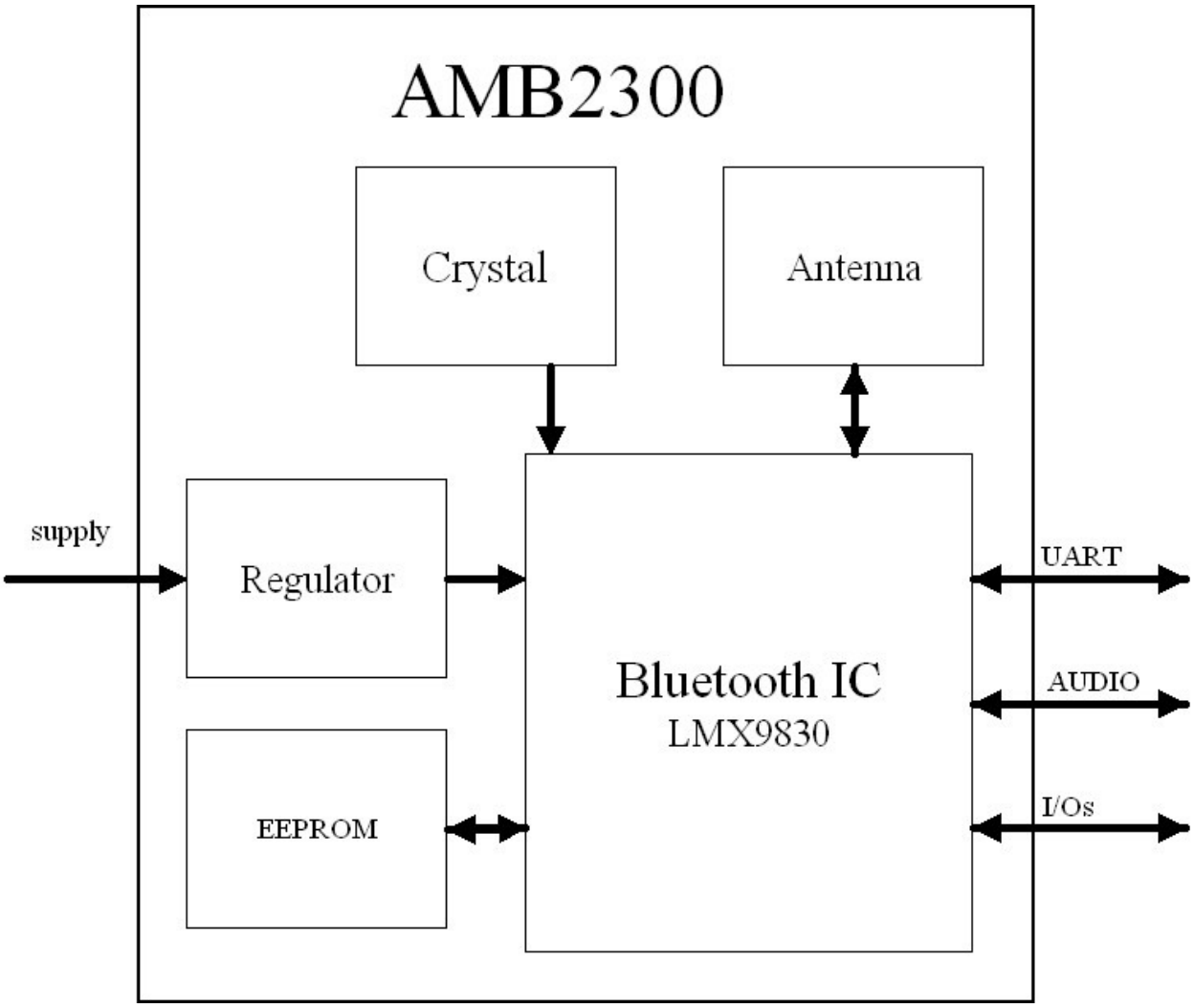
RX_BT, TX_BT, RTS#_BT, CTS#_BT:

2.2.3 Serial interface of the BlueNicecom 4.

The interface serves for communication with the BlueNiceCom4. The hardware handshake is used (RTS/CTS). If this should not be supported by the host system, RTS#_BT and CTS#_BT must be short circuit and/or CTS#_BT put on Low levels
This can lead however to overrun! We recommended therefore urgently to use handshake.

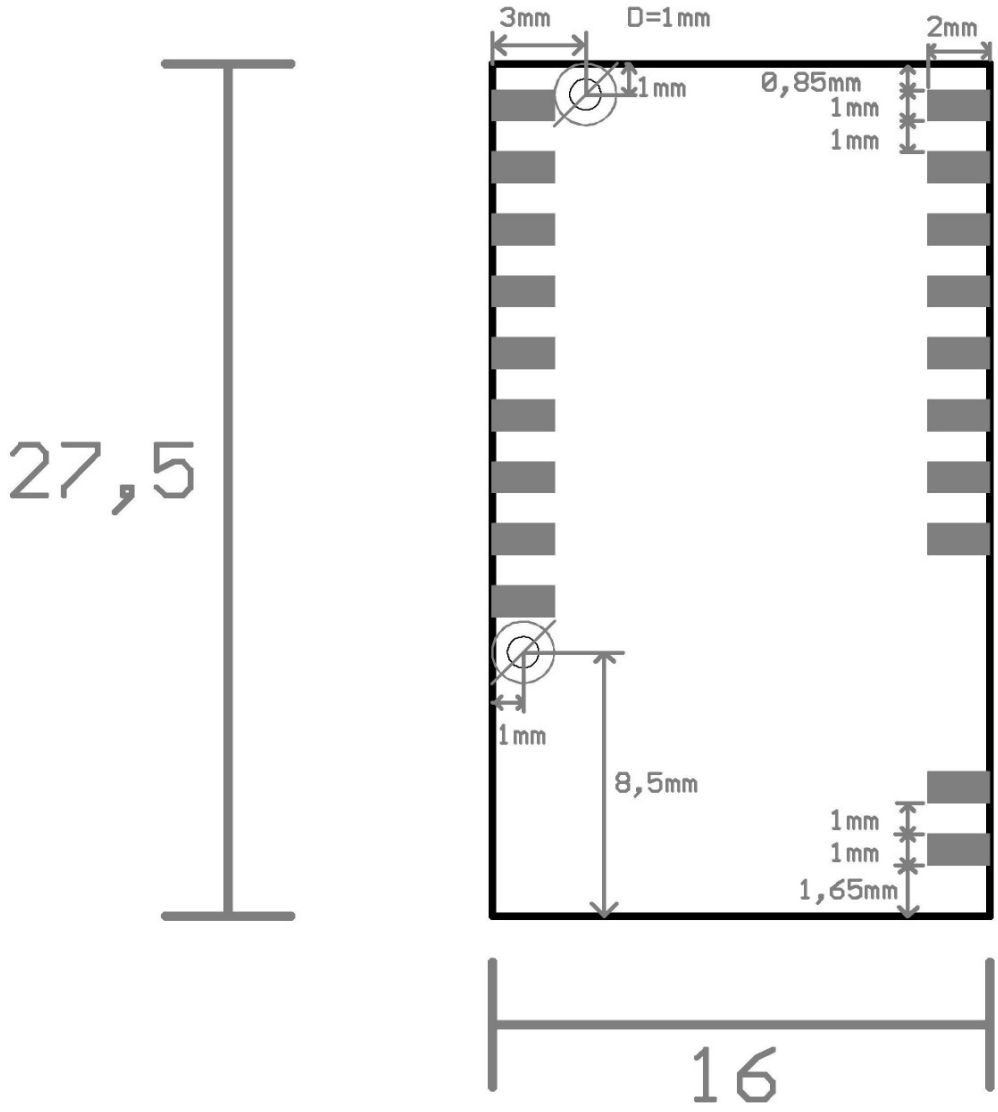
ResetBB#:	Internal Pull up, low active. No external circuit is necessary.
SCLK, SFS, SRD, STD:	Audio interface. If not used, Pins does not attached
PG6 , PG7:	I/O Ports. If not used, Pins does not attached
Vcc, Gnd	Power consumption

2.2.4 Block diagram



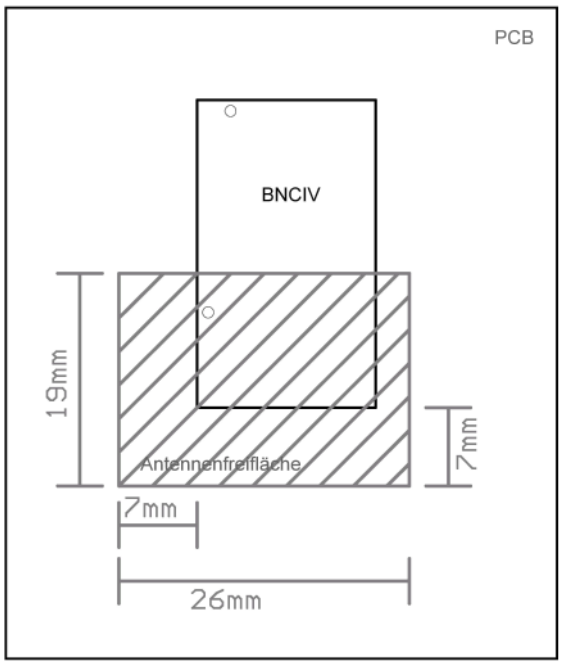
2.3 Dimension

BlueNiceCom IV has 1mm x 2mm soldering pads with a raster of 2mm to be solder direct on a motherboard



3 Details for Layout

To achieve the maximum of range no metal has to be near or under the antenna. The antenna should have a distance of 8mm to any ground, strip line or component. Most suitable is to place the antenna at the margin of the motherboard.
The figure shows the area which should be free of metal (ground, strip line, components, etc..).



The area off 12mm between the soldering pads on the bottom side should (e.g. with adhesive tape) additional isolated, if any strip line is under the module to avoid any short circuit.

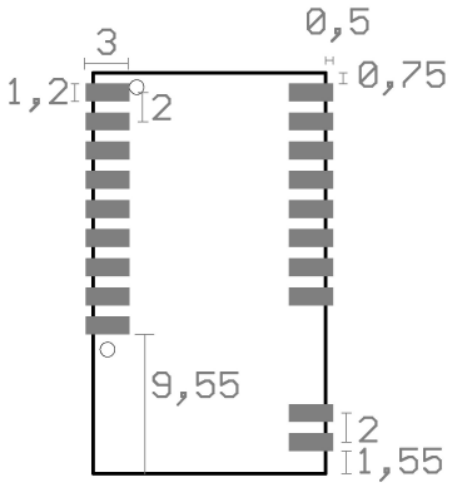
4 Soldering & Reflow

4.1 Description

- Reflow appropriate
- The temperature curve depends on the motherboard it´s character, like the number and conditioning of parts, etc. Please ask your manufactor.
- Depending on the limit values of the components following limits are not allowed to excess

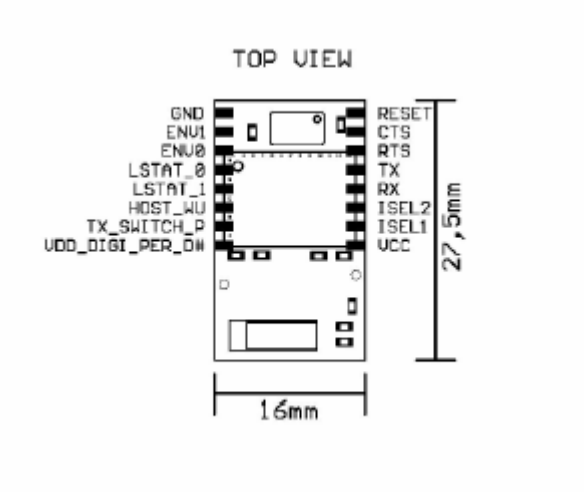
  260°C max. 40s (LMX)
  250°C max. 20s (Chip-antenna)
  200°C max. 120s (Chip-antenna)

4.2 Recommendation for Footprints

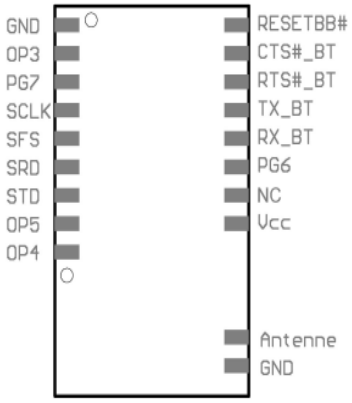


All dimensions in mm

5 Replace of BNC3 to BNC4



BNC3



BNC4

CTS, RTS, TX, RX,	no change (UART)
Vcc, GND	no change
Reset	At BNC4 no external connection necessary
ISEL2	PG6 (I/O) no connection necessary
ISEL1	N.C. Pin not connected!
ENV1	OP3 (Input) must be connected because of UART configuration
ENV0	PG7 (I/O) no connection necessary
LSTAT_0, LSTAT1	Audio interface, no connection necessary (PG6 fulfils function of LSTAT_1)
Host_WU	Audio interface, no connection necessary
TX_Switch_p	Audio interface, no connection necessary (PG7 fulfis these function now)
VDD_DIGI_PER_D	OP5 (Input) must be connected because of UART configuration
---	OP4 (Input) must be connected because of UART configuration

6 Minimum connection to run the BNC4

Vcc, GND	- Power consumption
RX, TX	- UART
RTS, CTS	- UART short circuit, danger of data overrun
OP3, OP4, OP5	- Configuration UART, connecting without pullup or puldown resistors

All other PIN´s doesn´t need to be connected.

7 Further documents

Data sheet LMX9830
Software User Guide
Simply Blue Commander (Windows Software)

8 External antenna

The AMB2300 can be operated also with an external antenna. In addition the red marked condenser (100pF 0603) must, as are changed above shown in its position. The lateral antenna connection is available then for a coaxial cable or a wire antenna.

These steps should accomplish attention, only persons with good HF knowledge, since this kind of connection can involve high error potential!
By these measures the warranty and the permission expire.

9 Declaration of Conformity

CE

DECLARATION OF CONFORMITY
Directive 1999/5/EG (R&TTE)

The manufacturer: AMBER wireless GmbH
Albin-Köbis-Straße 18
51147 Köln
Tel. ++49-2203-699-1950

declares on our sole responsibility, that the following product:

Type-designation: BlueNiceCom 4 (AMB2300)

Intended purpose: 2,4GHz-Bluetooth™ wireless data modem
Transfer of digital messages

complies with the appropriate essential requirements of article 3 of the R&TTE 1999/5/EG directive, if used for its intended purpose and that the following norms, standards or documents has been applied:

EN 300 328-1, -2 (2001-12)
EN 301 489-1, -17 (2002-04)
EN 50371 (2002)
EN 60950 (2001-12)

Köln, 23.2.2006
place and date of issue

Manufacturer/Authorized representative
Heinz Brych (General Manager)

10 Important notes

10.1 Compliance statement

USA
This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:
(1) This device may not cause harmful interference, and
(2) this device must accept any interference received, including interference that may cause undesired operation.
Usually this is followed by the following FCC caution:
Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

Canada
Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.
Usually this is followed by the following RSS caution:
Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

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