ABR200
Integration Manual



V14/05/26

© Copyright 2026 by Allflex

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, electronic, mechanical, photocopying, recording or otherwise, without prior written permission of Allflex.

Allflex reserves the right to make changes to any and all parts of this documentation without obligation to notify any person or entity of such changes.

May 2026

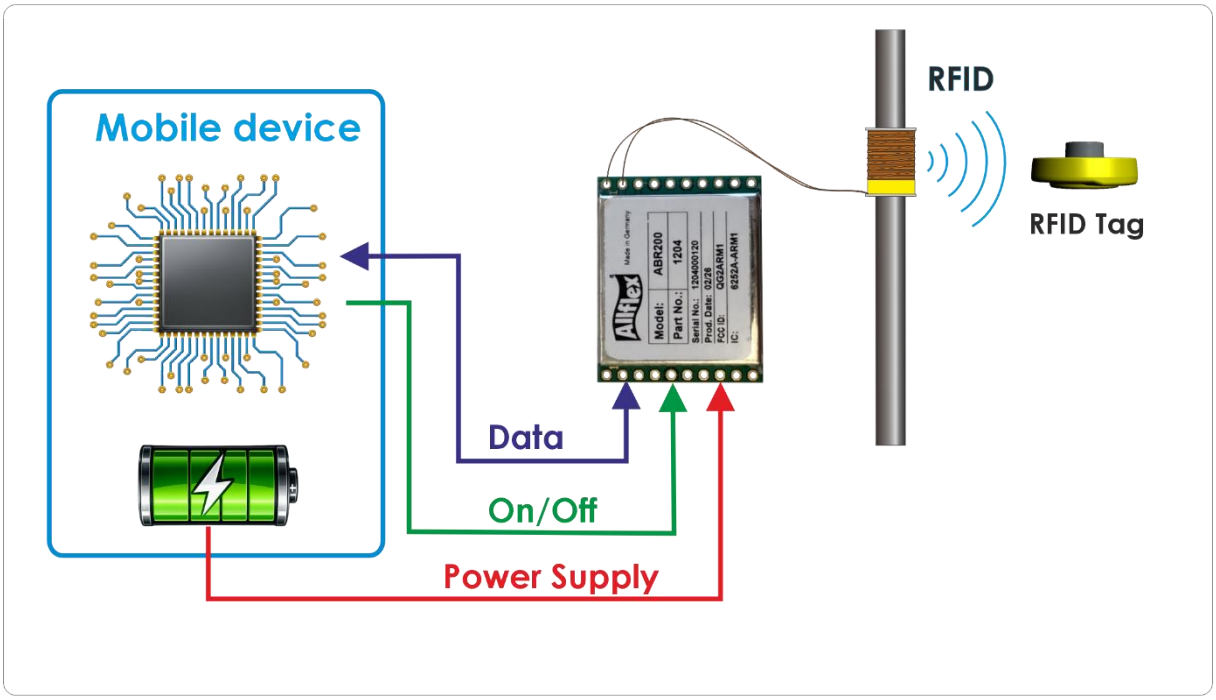
Allflex
Dahlkampsanger 2
30890 Barsinghausen
Germany
Phone +49 (0) 51 05 582573-10
Fax +49 (0) 51 05 582573-17
E-Mail: techcenter@msd.com
www.allflex.global

Contents

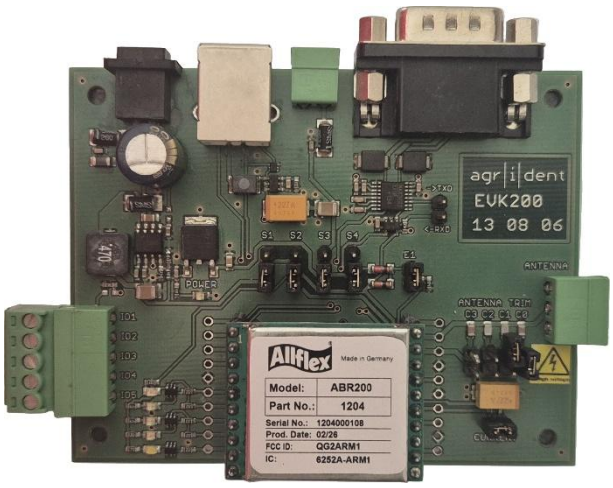
1 Introduction 4
2 Pinout 5
3 Power supply options 6
3.1 Power supply 2.5V - 4.5V 6
3.2 Power supply 5.0V 7
3.3 Power supply from 5V USB 7
3.4 ENABLE pin 7
4 Current Consumption 8
4.1 Current consumption for 2.5V - 4.5V input voltage 8
4.1.1 RF-on 8
4.1.2 RF-off 10
4.1.3 ENABLE pin low 11
4.2 Current consumption for 5.0V input voltage 11
5 Interface options 12
5.1 UART interface 12
5.2 USB interface 13
6 GPIOs 14
7 Connecting an Antenna 15
8 Mechanical Dimensions 16
9 Mounting the ABR200 17
10 Regulatory information 17

1 Introduction

The ABR200 is a low frequency ISO11784/11785 compliant OEM RFID reader module working on 134.2kHz. It was designed for integration into handheld devices. The ABR200 is not intended to be used as a stationary reader. For stationary reader applications the ASR650 is available.



The optionally available evaluation board EVK200 makes it easier for customers to get started with both hardware and software development. The evaluation provides different power supply options for the ABR200, and it can directly connect the reader module to a PC using either the USB- or the UART interface (UART to RS232 on EVK200). Details are explained in the separate EVK200 manual.

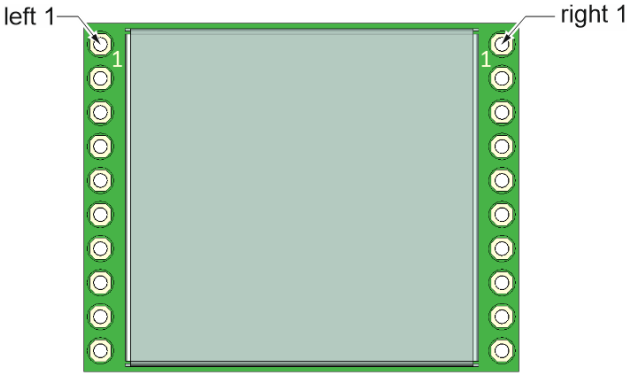


EVK200 evaluation board with ABR200

2 Pinout

The ABR200 features two 10-pad THT pad arrays (2.54 mm pitch), one on each short side. There are markings on each side that indicate the position of pin 1.

The picture on the left is a drawing that is used in this document to explain details. Just for comparison there is a photo of the ABR200 on the right.







Always pay attention to the '1' markings on the circuit board and don't rely solely on the label. Even though it's very unlikely, the label could have been applied upside down.

The pin assignment in the table below.

	Left	Right
1	USB-DP	Ant-1
2	USB-DM	Ant-2 (CP)
3	UART-RXD	Ant-3 (CP)
4	UART-TXD	GND
5	GND	ENABLE
6	GPIO1	GND
7	GPIO2	5V-IN
8	GPIO3	5V-OUT
9	GPIO4	GND
10	GPIO5	$+V_{BAT}$

3 Power Supply Options

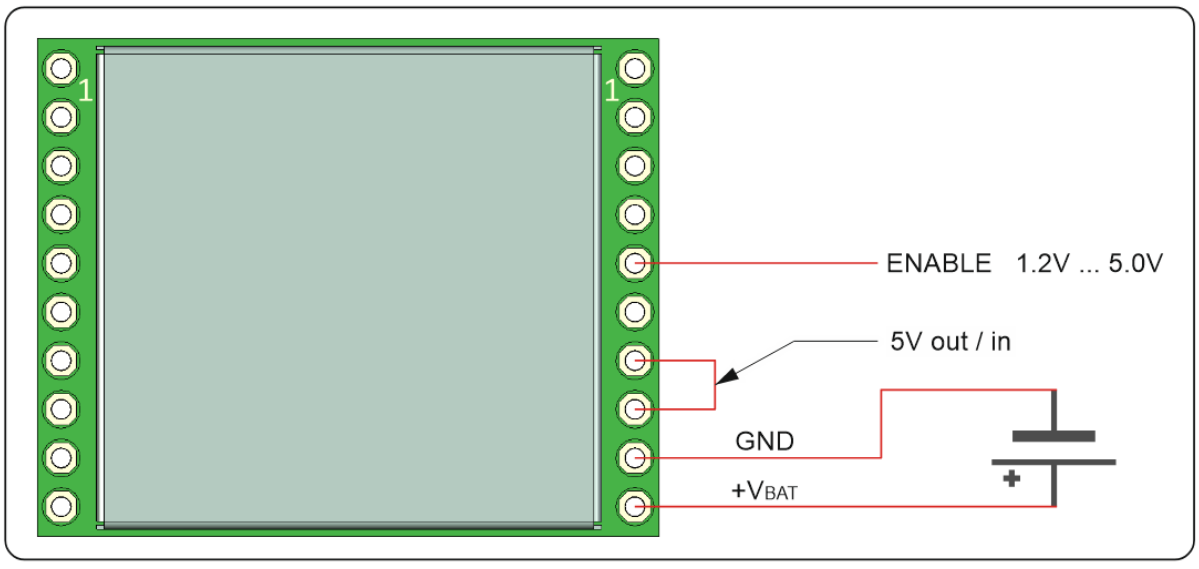
The ABR200 offers two different power supply options:

- 2.5 - 4.5V DC, e.g. from a single cell Li-Ion battery pack or 3 NiMH cells in series
- 5V DC from a voltage regulator

In both cases the power supply should be stabilized as good as possible. Ripple and noise should be reduced to a minimum, otherwise the reading performance can be reduced.
If the power supply is a switch mode regulator, the switching frequency should be as high as possible. The ABR200 offers the possibility to synchronize external converters with a multiple of its RF frequency via GPIO 5, which should avoid EMI problems in such cases.
Basically, a battery is the cleanest possible power source - there is no ripple and no noise. The ABR200s on-board boost converter does not cause any performance problems as it is synchronized with the RF field.

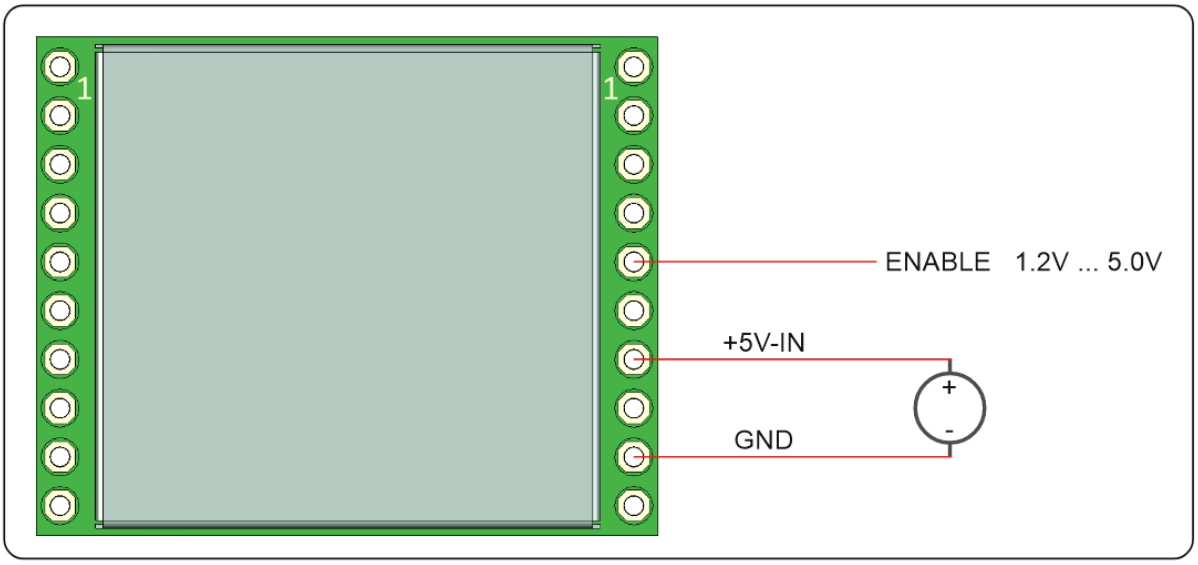
3.1 Power supply 2.5V - 4.5V

This option must be used if the ABR200 is to be connected directly to a battery, such as a single-cell Li-Ion battery. In this case, the reader's integrated boost converter generates the 5.0 V required for some module components from the input voltage.
The battery is connected to pin 10 of the right pad array with (V+) and to pin 9 with (V-). Pins 8 (5V-OUT) and 9 (5V-IN) must be connected.
To activate the modules power supply, Pin 5 of the right pad array (ENABLE) must be driven higher than 1.2V.



3.2 Power supply 5.0V

For applications where the ABR200 is to be supplied directly with 5.0V, the on-board boost regulator is not used. In this case, 5.0V is connected directly to the +5V-IN pin of the module.
$+V_{BAT}$ and 5V-OUT are not used here and should be left open.
To activate the modules power supply, Pin 5 of the right pad array (ENABLE) must be driven higher than 1.2V.



3.3 Power supply from 5V USB

The power supply from 5V USB is also possible, but generally not recommended. The connection works in the same way as shown in chapter 3.2 but the 5V comes from the USB host.
The reason why the power supply from USB is not recommended is that it can be 'noisy'. Furthermore, the USB specification allows voltage drops of several hundred millivolts when a certain amount of current is drawn, which can lead to suboptimal filter performance for the transmitter. Ultimately, powering the transmitter via USB can lead to reduced reading performance, primarily for FDX.

3.4 ENABLE pin

The module's power supply is activated by driving the 'ENABLE' pin higher than 1.2V but it must not be higher than 5.0V. The maximum voltage to keep the power supply disabled is 0.3V. This applies to both power supply options: 2.5-4.5V and 5.0V.

The ENABLE line has an on-board pull-down resistor of 1MΩ to prevent floating levels.

4 Current Consumption

Regarding power consumption, there are basically 3 different operating modes:

1. ENABLE is high and RF is on - the module is operating and the RF field is activated.
2. ENABLE is high and RF is off - the module is operating but the RF field is deactivated.
3. ENABLE is low - the modules power supply is switched off.

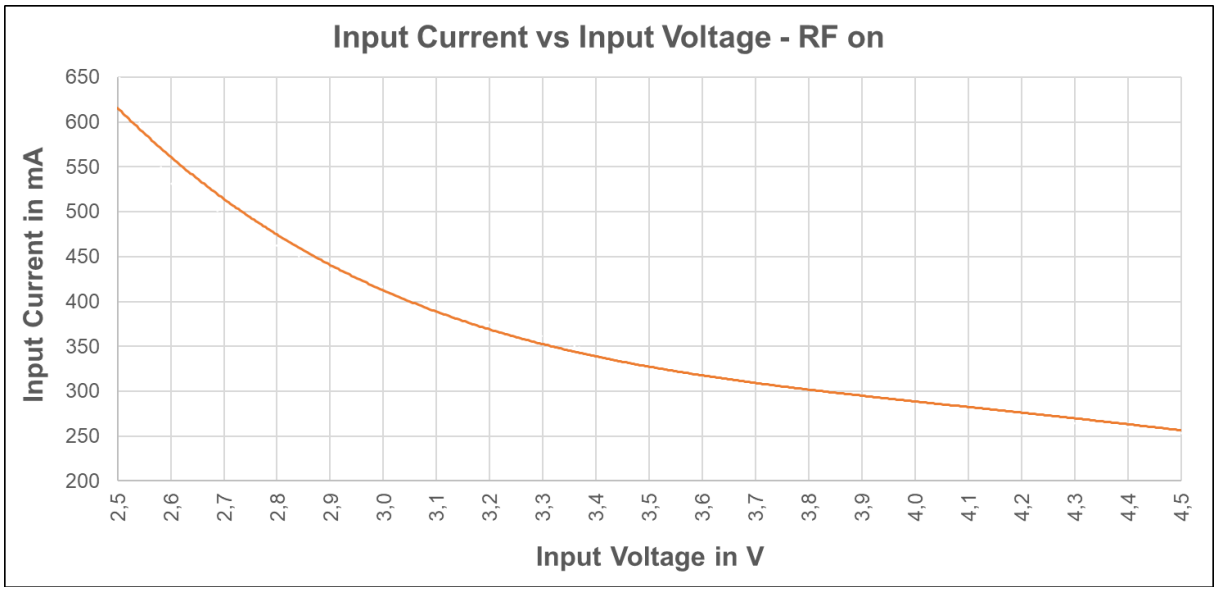


The current consumption with RF-on also depends on antenna tuning and antenna type. The values in this document apply for the 100mm ferrite rod antenna that was optimally tuned to resonance and without any metal close to the antenna. For antennas with lower Q factor, the power consumption is smaller.

4.1 Current consumption for 2.5V - 4.5V input voltage

For applications where the ABR200 is to be powered from a battery, the module's integrated boost converter must be used. The converter can generate an output voltage of 5.0V from input voltages between 2.5V and 4.5V. The lower the input voltage, the higher the current input.

4.1.1 RF-on

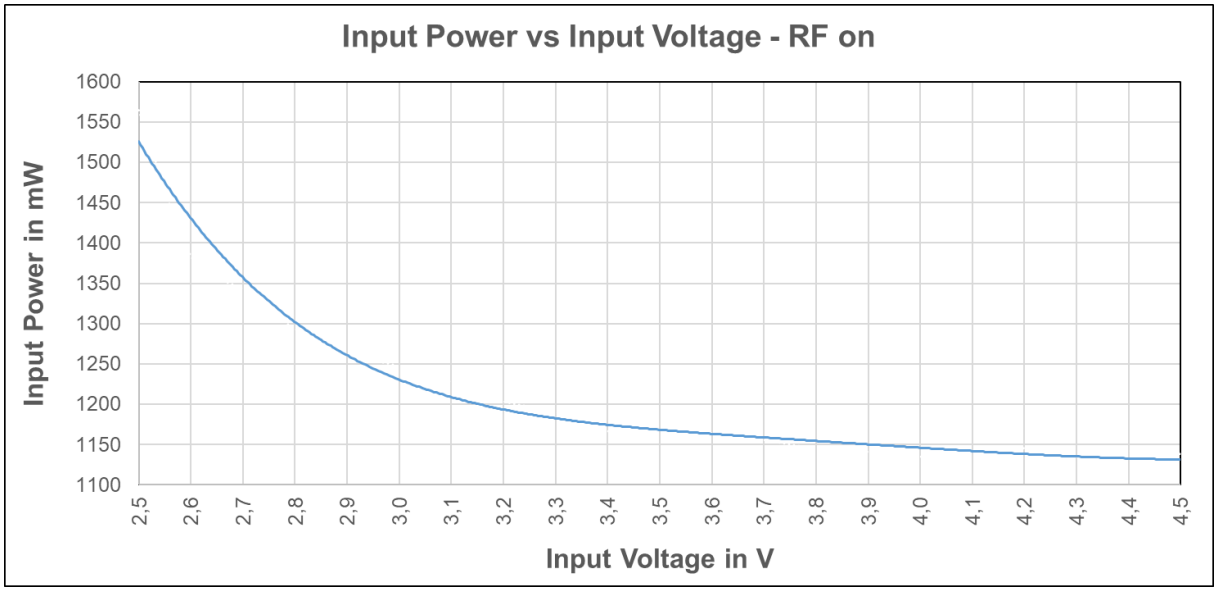


The diagram shows the current draw as a function of the input voltage; in other words: the current drawn from the battery as a function of the battery voltage. As one can see, the current is higher than 600 mA at an input voltage of 2.5 volts, which corresponds to a power consumption of more than 1.5 W.

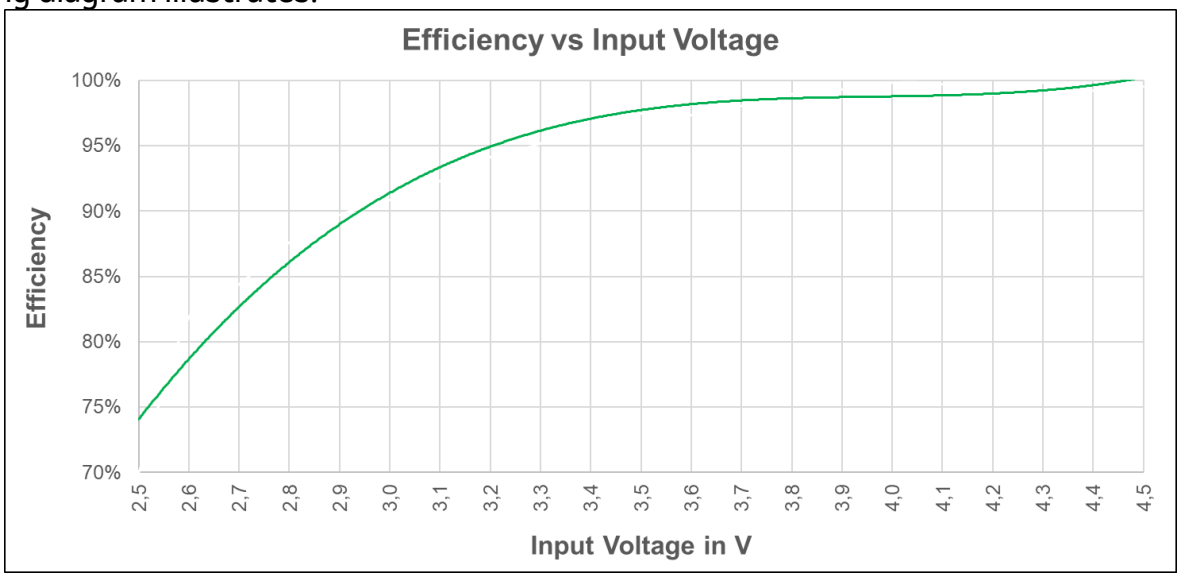
The following table shows exact values for the current consumption over the permissible input voltage range in 500mV steps:

Voltage	2,5V	3,0V	3,5V	4,0V	4,5V
Current	610mA	416mA	332mA	284mA	253mA

The next diagram shows the input power depending on the input voltage.



Power consumption decreases with increasing input voltage. This is related to the efficiency of the switching regulator as a function of the input voltage, as the following diagram illustrates.

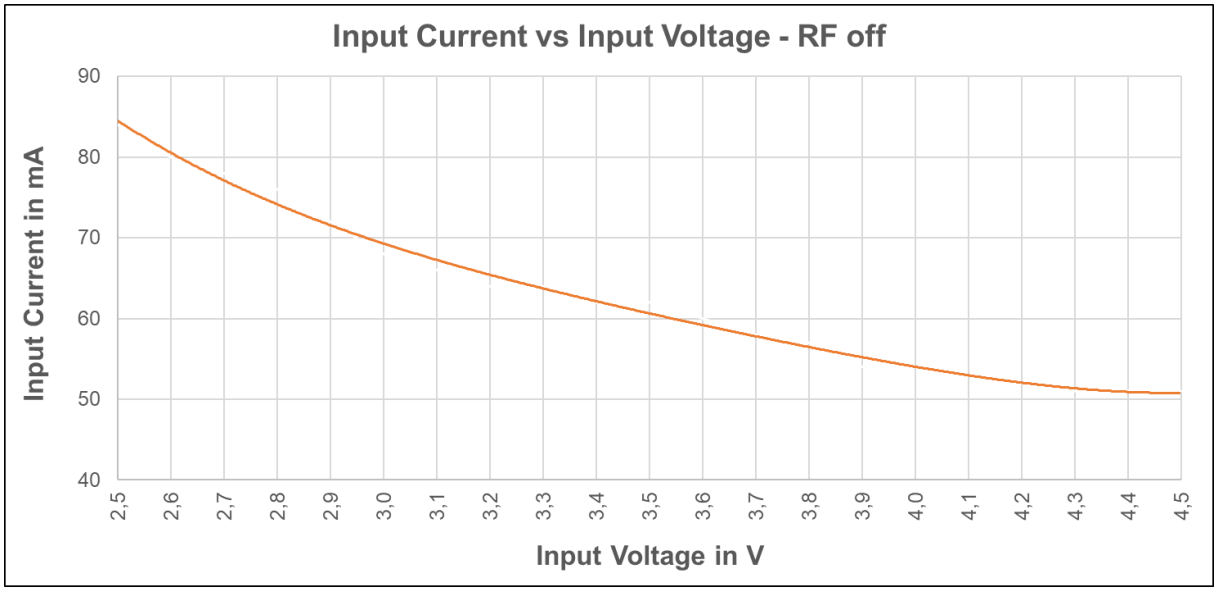


The efficiency of the boost converter is better at higher input voltages. Below 3V, the efficiency drops below 90%, and at 2.5V it is already below 75%.

Many single-cell rechargeable lithium-ion batteries have a discharge cut-off voltage of 2.5 V, but it is strongly recommended not to discharge them below 3.0 V to extend the battery's lifespan. The voltage declines more rapidly toward the end of the discharge, leaving little usable capacity while placing additional stress on the cell.

4.1.2 RF-off

When the RF field is not activated, the power consumption is much lower. The following diagram shows the input current as a function of input voltage with deactivated RF field.



4.1.3 ENABLE pin low

When using the ABR200s integrated boost converter, the current consumption is lower than 4µA when the ENABLE pin is low.

4.2 Current consumption for 5.0V input voltage

Since the voltage is constant with the 5.0V supply option, the current consumption is also constant in the respective operating mode.
When the ENABLE pin is high and the RF field is activated, the current consumption is 230mA. Keep in mind that this applies for the 100mm ferrite antenna, without any metal close to the antenna and optimally tuned.
With ENABLE high but the RF field switched off, the current consumption is 40mA.
If the ENABLE pin is low, the current consumption of the module is less than 1µA.

5 Interface Options

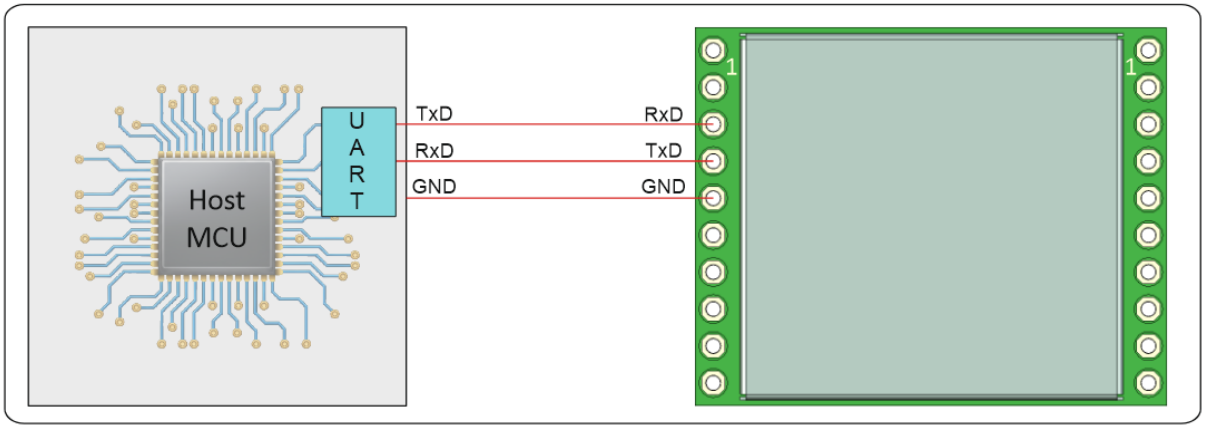
The ABR200 has two different interface options: UART and USB. Both function independently of each other and can therefore theoretically be used simultaneously.

5.1 UART interface

The module's UART interface operates at 3.3V, but the RxD line is 5V tolerant. The TxD line always transmits at 3.3V. Therefore, level shifters may be required if the host device's UART interface only operates at 5V (i.e., it is not 3.3V tolerant).

The ABR200s UART interface uses the following parameters:

- 9600bps to 115200bps (configurable, default is 9600bps)
- 1 start bit
- 8 data bits
- no parity
- 1 stop bit



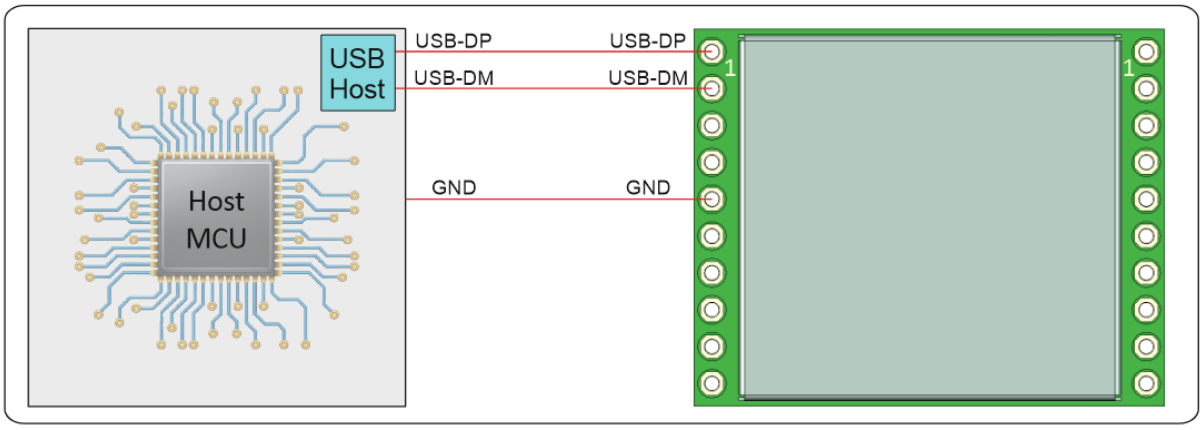
Keep in mind that RxD and TxD need to be crossed. Where one device transmits data, the other device receives data.
The TxD line contains a 1KΩ resistor on the ABR200 for current limiting to protect its microcontroller.
The RxD line contains a pull-up resistor to 3.3V and a diode in series on the ABR200. This ensures that the RxD level at the reader microcontroller cannot exceed 3.3V – even if another device uses 5V UART level.



Ensure that the host controller uses the same baud rate as the ABR200 - otherwise communication will not work.

5.2 USB interface

The USB interface of the ABR200 is integrated into its microcontroller - there is no additional chip, like FTDI. The interface uses USB-CDC (Communications Device Class). The USB data line uses 3.3V levels.



For USB the baud rate setting does not matter since the devices negotiate the connection speed automatically.

For desktop computers, Allflex provides a USB driver. This can be used for testing the ABR200 with the evaluation kit, for example. For Android devices, a suitable driver should be available here:
https://code.google.com/p/usb-serial-for-android/.

6 GPIOs

The ABR200 has five GPIOs. The table below explains the current GPIO usage.

GPIO	Input / Output	Function	Description
1	Output	Read	indicates a successful tag read
2	Output	RF-On	indicates that the RF-field is activated
3	Output	Power	indicates that the module power is switched on
4	RFU	RFU	reserved for future use
5	Output	PWM_Out	PWM output for synchronizing external switch-mode regulators; frequency can be configured (multiples of RF frequency)

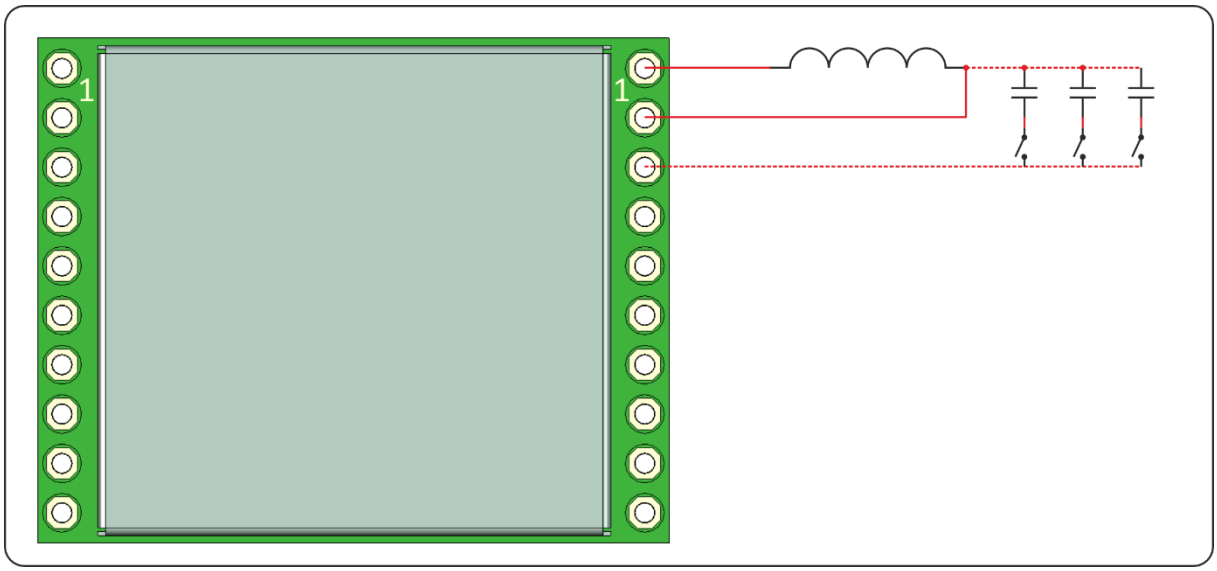
The GPIOs operate at a 3.3V level and have 1k series resistors for current limiting and thus for the protection of the microcontroller.

If LEDs are to be used for status indication, additional transistors are required on the host side - the GPIOs themselves cannot drive LEDs.

If certain GPIOs are not in use, leave these pins open.

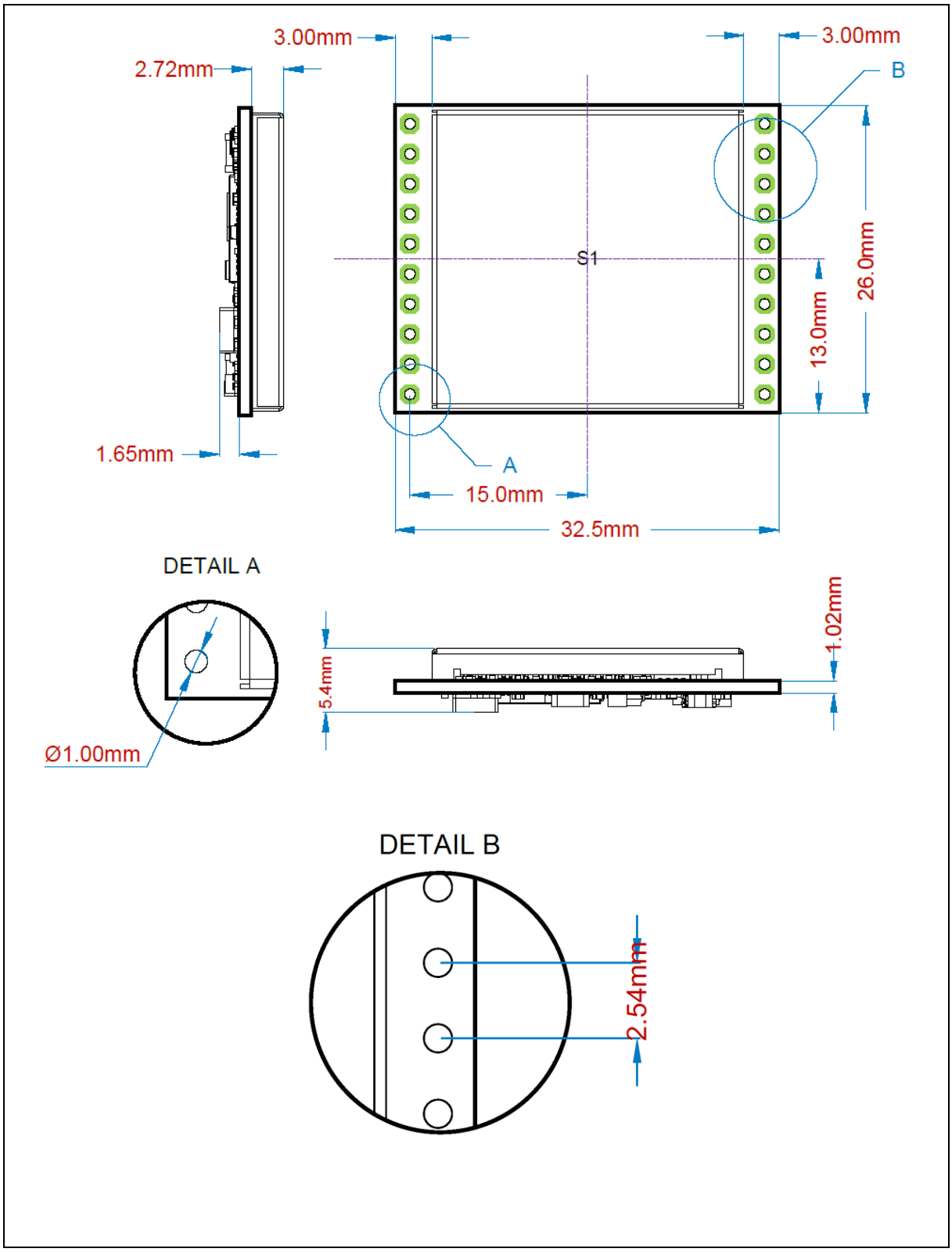
7 Connecting an Antenna

The antenna is connected between pins 1 and 2 of the right pad array as shown below.



The ABR200 is factory tuned for antennas with an inductance of 275µH. Antennas with a higher inductance cannot be used, as this would require reducing the resonant circuit capacitance on the module.
When using ferrite antennas, antenna tuning is achieved by moving the coil along the ferrite rod. If this is not possible - maybe because the ferrite antenna is potted or an air coil antenna is used - the inductance must be lower than 275µH. This allows tuning to resonance by adding more tuning capacitance between pins 2 and 3. These additional tuning capacitors can be soldered to the host PCB during its production or set later via jumpers, as shown in the figure.
To achieve optimal reading performance, it is always necessary to tune the antenna circuit to resonance. This is the case when the antenna voltage is at the maximum possible.

8 Mechanical Dimensions



Length	32.5mm
Width	26.0mm
Height	5.4mm

9 Mounting the ABR200

The ABR200 is soldered directly onto the host PCB. No additional mechanical fixings are required.

10 Regulatory information

FCC and IC

OEM Responsibilities to comply with FCC and Industry Canada Regulations
The ABR200 Module has been certified for integration into products only by OEM integrators under the following conditions:

1. The antenna(s) must be installed such that a minimum separation distance of 20 cm is maintained between the radiator (antenna) and all persons at all times.
2. The transmitter module must not be co-located or operating in conjunction with any other antenna or transmitter.

As long as the two conditions above are met, further transmitter testing will not be required. However, the OEM integrator is still responsible for testing their end-product for any additional compliance requirements required with this module installed (for example, digital device emissions, PC peripheral requirements, etc.).

IMPORTANT NOTE: In the event that these conditions cannot be met (for certain configurations or
co-location with another transmitter), then the FCC and Industry Canada authorizations are no longer considered valid, and the FCC ID and IC Certification Number cannot be used on the final product. In these circumstances, the OEM integrator will be responsible for re-evaluating the end product (including the transmitter) and obtaining a separate FCC and Industry Canada authorization.

Labeling of end product:

The final end-product must be labeled clearly visible with the following "Contains FCC ID: QG2ARM1" and "Contains IC: 6252A-ARM1"

This device complies with Part 15 of the FCC Rules.

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.

L'utilisation de ce dispositif est autorisée seulement aux deux conditions suivantes:

(1) il ne doit pas produire de brouillage, et
(2) l'utilisateur du dispositif doit être prêt à accepter tout brouillage radioélectrique reçu, même si ce brouillage est susceptible de compromettre le fonctionnement du dispositif

CE Declaration of Conformity – European Union

Hereby, Agrident declares that the ABR200, if used according to the instructions, is in compliance with the essential requirements and other relevant provisions of the Radio Equipment Directive (RED) 2014/53/EU. For use in all countries of the EU.

The complete EU Declaration of Conformity is available at the Internet address https://www.allflex.global/

In case of alteration of the product not agreed to by us, this declaration will lose its validity.

The following antenna is approved to be used with this device:

- 275µH 100mm ferrite rod antenna

ISO 11784 & 11785

This device complies with the standards set by the International Standardization Organization. Specifically, with standards:

11784: Radio frequency identification of animals - Code Structure

11785: Radio frequency identification of animals - Technical Concept.

.

Waste of Electrical and Electronic Equipment

1. **Recycling –** Sort and recycle materials to reduce waste and conserve resources.
2. **Chemical Waste –** Electronic equipment can contain hazardous chemicals that must be appropriately managed and precious metals that can be recycled and reused. Chemical waste should always be disposed of separately and never placed in a household trash receptacle.
3. **Disposal –** Follow the national and local legislation in your country when disposing of equipment. Only hand over waste materials to waste-disposal experts.
4. **WEEE Statement –** Applicable Waste Electrical and Electronic Equipment (WEEE) regulations aim to minimize the environmental impact of electrical and electronic goods by increasing reuse and recycling and reducing the amount of WEEE sent to landfills. The symbol on this product or its packaging signifies that it must be disposed of separately from ordinary household waste at its end of life. Be aware that it is your responsibility to dispose of electronic equipment at recycling centers to conserve natural resources. Each country should have its own collection centers for recycling electrical and electronic equipment. For information about your recycling drop-off area, please contact your local authority responsible for electrical and electronic equipment waste management, your city office, or your household waste disposal service.

