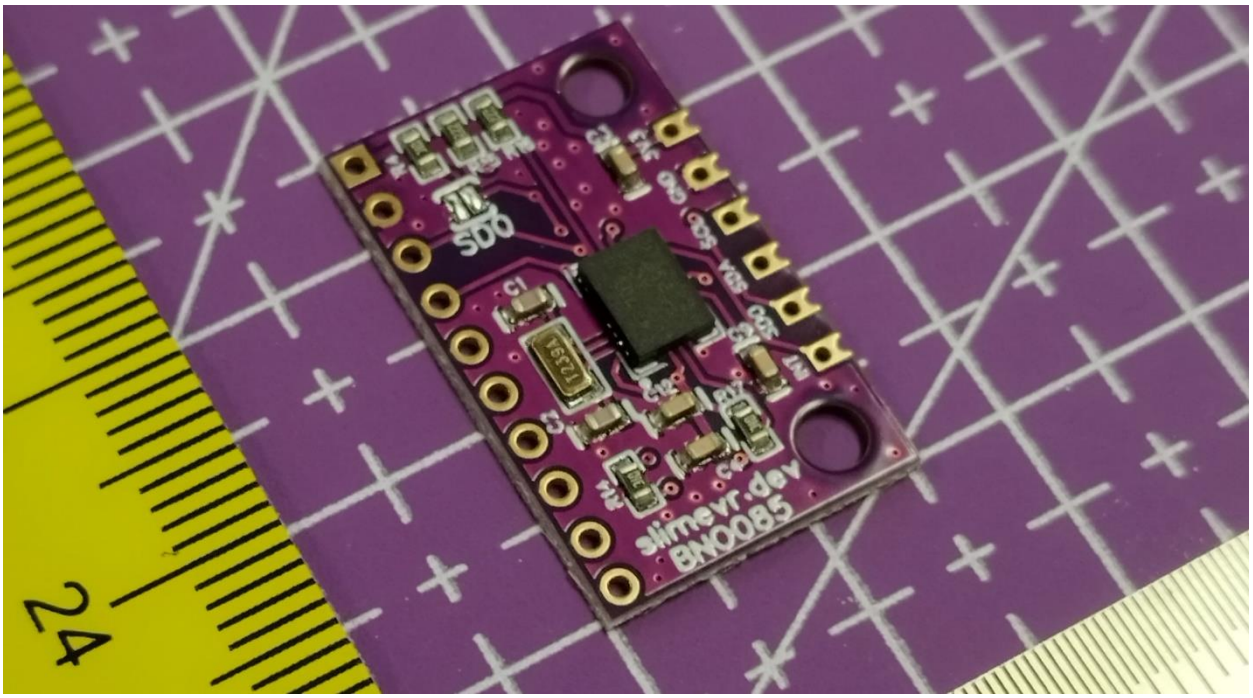
9-DoF Orientation IMU Fusion Breakout Board – BNO085

Revision: R2.2

Last updated: 2023-10-19



Small package with a lot inside!

Overview

BNO085 by CEVA is a 9-DoF orientation inertial measurement unit with integrated fusion algorithms that are very easy to integrate and use without the need to create or program your own fusion algorithms on the host. In addition, using CEVA's expertise in IMU fusion, it bolsters performance, stability, and level of drift unmatched at its price point.

SlimeVR IMU Breakout Board with BNO085 is made to be compatible with wide-spread IMU breakout boards to allow easy integration into existing and new projects.

The board features castellated contacts on the other side of the through-hole pins as an alternative method to connect it to the host device.

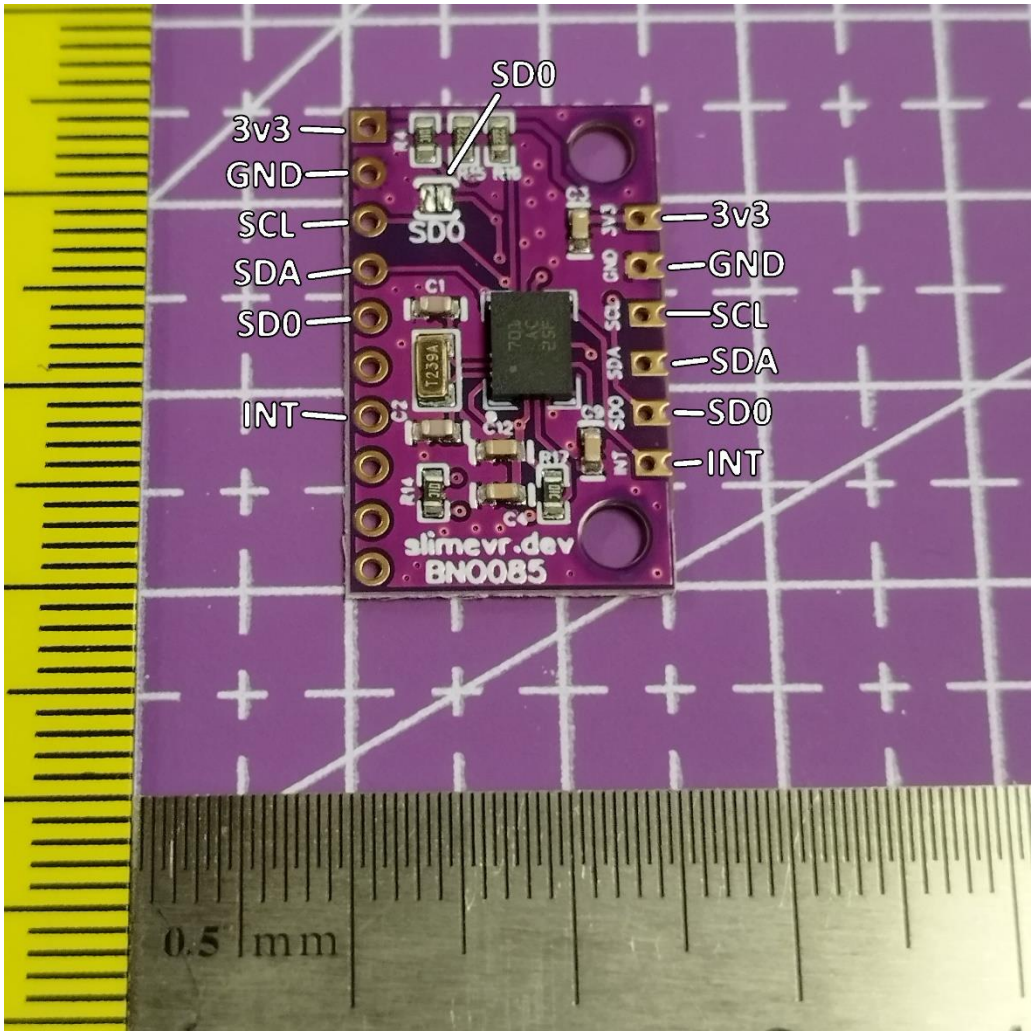
The breakout only supports I^2C interface. SPI and UART pins are not wired to BNO085 and can't be used.

Board dimensions (W x H): 15.5 mm x 25.4 mm, board thickness: 0.8 mm.

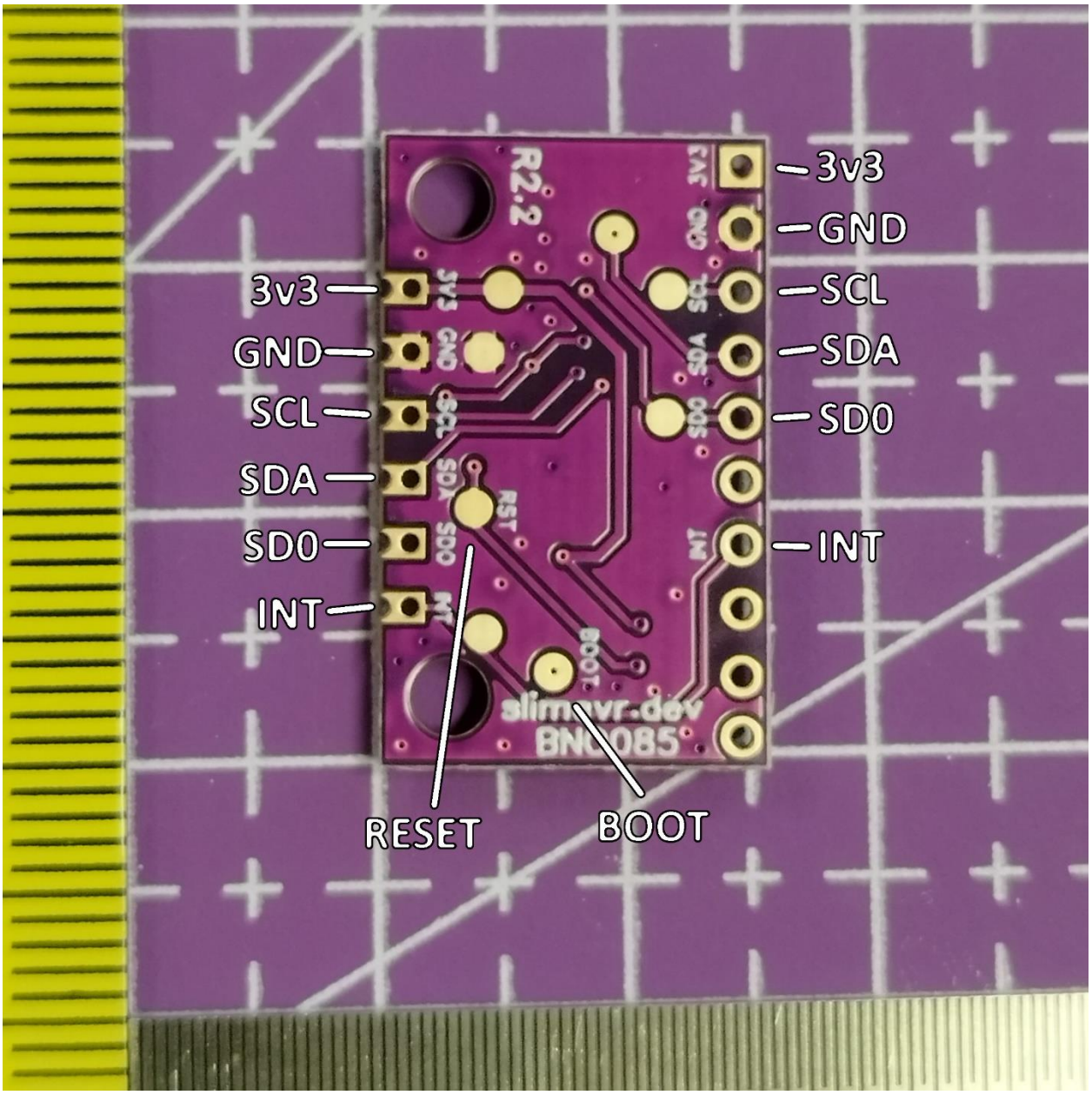
Pinout

- **3V3 / VCC** – power pin. The voltage range should be in the range for BNO085 – **2.4-3.6V**. The breakout board doesn't have its own power regulator!
- **GND** – common ground for power and logic.
- **SCL** – I²C clock pin. Connect to your microcontroller's I²C clock line. The pin accepts only 3V3 logic level and has a pull-up resistor of 2.4Kohm.
- **SDA** – I²C data pin. Connect to your microcontroller's I²C data line. The pin accepts only 3V3 logic level and has a pull-up resistor of 2.4Kohm.
- **SD0** – I²C address select pin. Pulled high via 10Kohm resistor. Pull low to change BNO085's I²C address from 0x4B to 0x4A.
- **INT** – interrupt pin. Pulled low by BNO085 when new data is available. Connect to your microcontroller's GPIO for optimal performance.

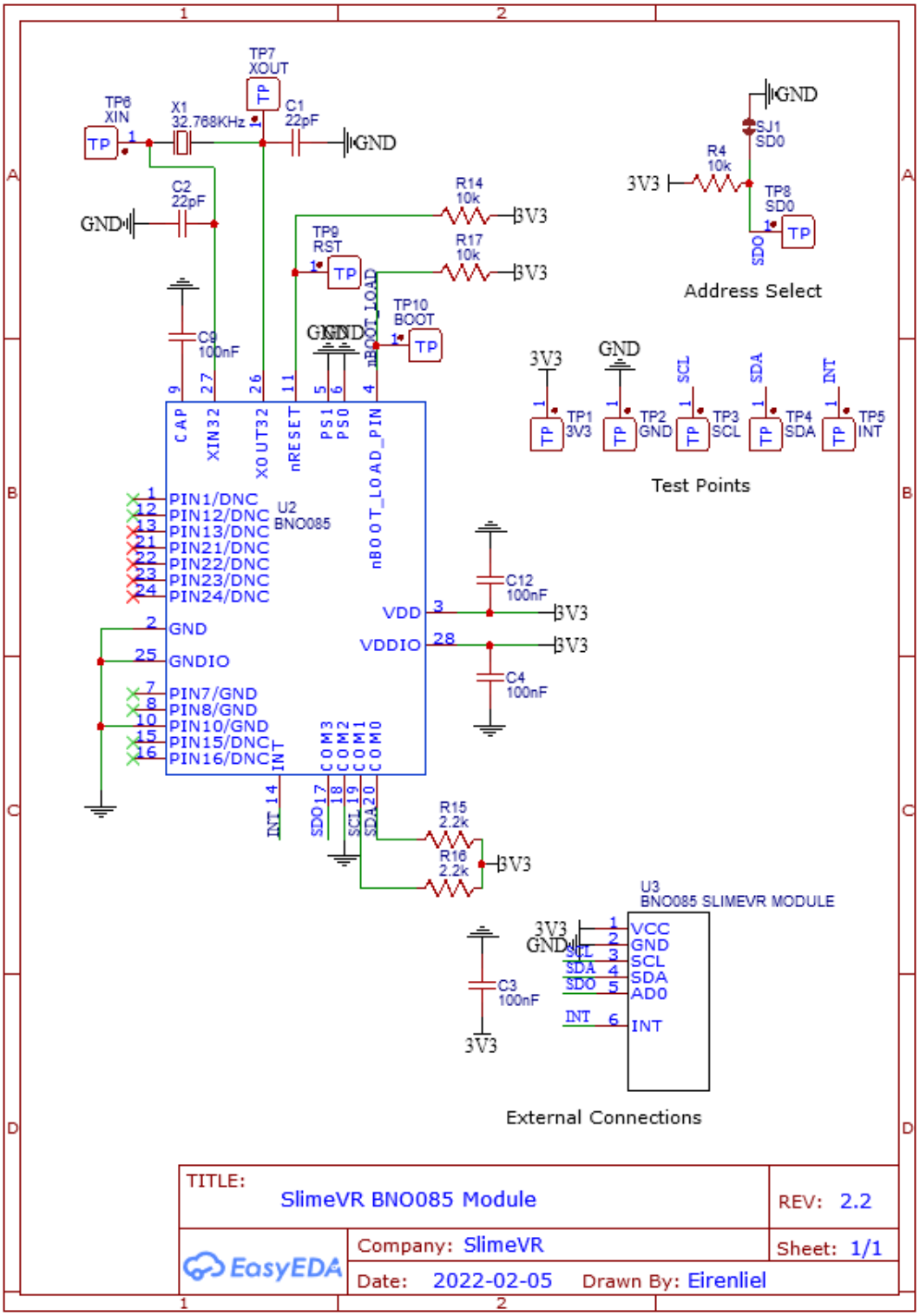
Front View



Bottom View


R2.2
3v3
GND
SCL
SDA
SD0
INT
RST
BOOT
slimevr.dev
BNO085
3v3
GND
SCL
SDA
SD0
INT
RESET
BOOT

Schematic


TP7
XOUT
TP6
XIN
X1
32.768KHz
C1
22pF
GND
C2
22pF
R14
10k
3V3
TP9
RST
R17
10k
TP10
BOOT
C9
100nF
CAP
XIN32
XOUT32
nRESET
PS1
PS0
nBOOT_LOAD_PIN
U2
BNO085
PIN1/DNC
PIN12/DNC
PIN13/DNC
PIN21/DNC
PIN22/DNC
PIN23/DNC
PIN24/DNC
GND
GNDIO
PIN7/GND
PIN8/GND
PIN10/GND
PIN15/DNC
PIN16/DNC
INT
COM3
COM2
COM1
COM0
SDO
SCL
SDA
VDD
VDDIO
C12
100nF
C4
100nF
R15
2.2k
R16
2.2k
SJ1
SD0
R4
10k
TP8
SD0
Address Select
TP1
3V3
TP2
GND
TP3
SCL
TP4
SDA
TP5
INT
Test Points
U3
BNO085 SLIMEVR MODULE
VCC
GND
SCL
SDA
ADO
INT
C3
100nF
External Connections
TITLE:
SlimeVR BNO085 Module
REV: 2.2
Company: SlimeVR
Sheet: 1/1
EasyEDA
Date: 2022-02-05
Drawn By: Eirenliel

Links

- Schematic: https://oshwlab.com/slimevr/imu-breakout-board-bno085-rev-2-2
- BNO085 datasheet: BNO08X Datasheet - BNO080_085-Datasheet.pdf
- BNO08X Arduino Library by Adafruit: https://github.com/adafruit/Adafruit_BNO08x
- BNO08X Arduino Library by Sparkfun: https://github.com/sparkfun/SparkFun_BNO080_Arduino_Library

Compliance

The product is compliant with the following directives:

- **RoHS Directive 2011/65/EU** EN IEC 63000:2018
- **UK S.I. No. 3032, RoHS Regulations 2012** EN IEC 63000:2018

Designed in The Netherlands, manufactured in Europe.