



Proximity & Light Module

BMS33M332 User Guide

Revision: V1.00 Date: May 22, 2023

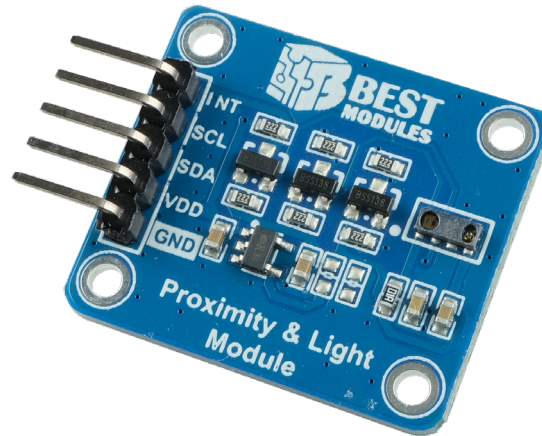
www.bestmodulescorp.com

Contents

| | |
|--|----------|
| Introduction | 3 |
| Features | 3 |
| Block Diagram | 4 |
| Pin Description | 4 |
| Technical Specification | 5 |
| Recommended Operating Conditions | 5 |
| Timing Specification | 5 |
| Hardware Overview | 6 |
| Power Supply | 6 |
| Sensor STK3337-X | 7 |
| Communication Interface | 7 |
| Application Circuits | 8 |
| Dimensions | 9 |

Introduction

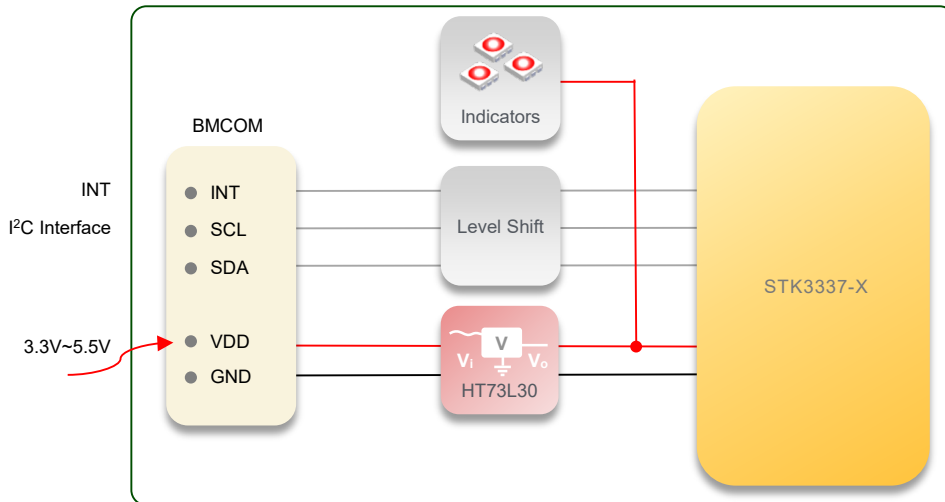
The BMS33M332 is a proximity sensing and ambient light detection module from Best Modules, which is developed by using sensor STK3337-X. The module integrates ambient light sensor, proximity sensor and infrared LED. It provides not only ambient light sensing to allow the backlight/display brightness control, but also infrared sensing to allow the proximity estimation featured. The module has a level shift circuit to support wide voltage applications. The module can use the BMCOM interface, which can read the ambient light value and obtain the proximity sensing status through the I²C communication mode. The module can be applied to smartphones, displays or smart home appliances, etc.



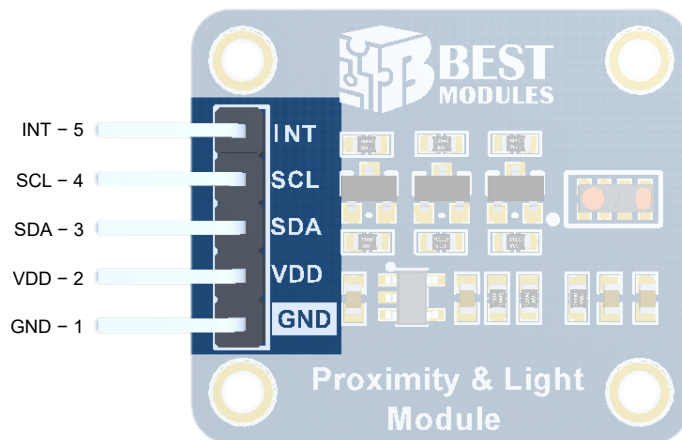
Features

- Operating voltage: 3.3V~5.5V
- Sensor: STK3337-X
 - ◆ Integrated ambient and infrared light to digital converter with built-in IR LED
 - ◆ 3rd generation ambient light sensor which closes to the human-eye response and suppresses the IR part
 - ◆ Excellent temperature compensation: -40°C~85°C
 - ◆ Proximity Sensor (PS): 16-bit digital data format
 - ◆ Ambient Light Sensor (ALS): 16-bit digital data format
- Flexible level shift circuit
- Communication interface:
 - ◆ BMCOM×1 (INT, SCL, SDA, VDD, GND)
 - ◆ Communication mode: I²C (address: 0x47)
- Provides support for Arduino Lib applications
- Module size: 26.8mm×23.3mm×7.4mm

Block Diagram



Pin Description



BMCOM Pin:

| Pin | Function | Description |
|-----|----------|---|
| 1 | GND | Negative power supply, ground |
| 2 | VDD | Positive power supply |
| 3 | SDA | I ² C data line |
| 4 | SCL | I ² C clock line |
| 5 | INT | Interrupt pin, I/O for interrupt alarming |

Technical Specification

Recommended Operating Conditions

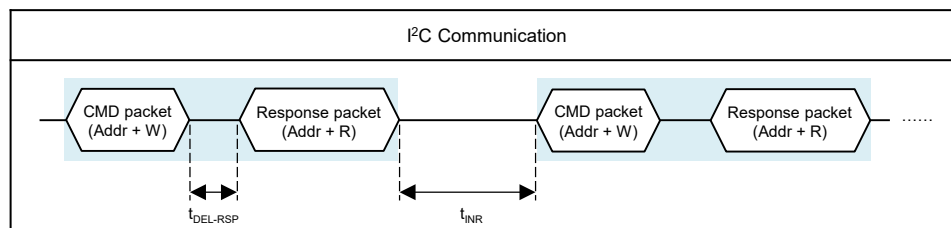
Ta=25°C

| Symbol | Parameter | Condition | Min. | Typ. | Max. | Unit |
|-----------------|--------------------------------------|-----------|-------|------|-------|--------|
| V _{DD} | Operating Voltage | — | 3.3 | 5.0 | 5.5 | V |
| | Full Scale ALS Counts | — | — | — | 65535 | counts |
| | Full Scale PS Counts | — | — | — | 65535 | counts |
| | Integrated LED Drive Current | — | 3.125 | | 150 | mA |
| | ALS Peak Sensitivity Wavelength | — | — | 500 | — | nm |
| | PS High Sensitivity Wavelength Range | — | 800 | — | 1000 | nm |

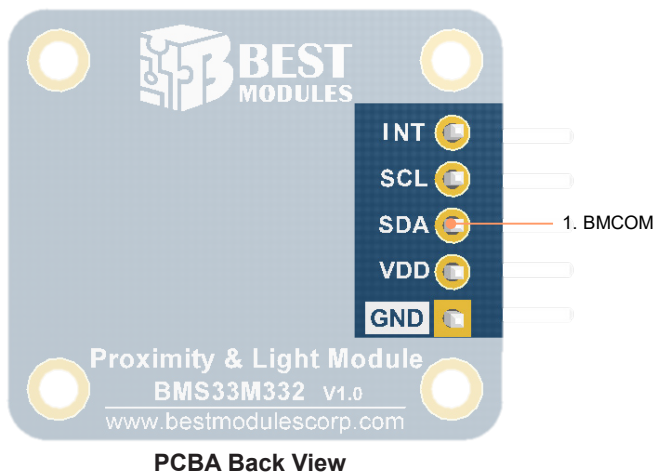
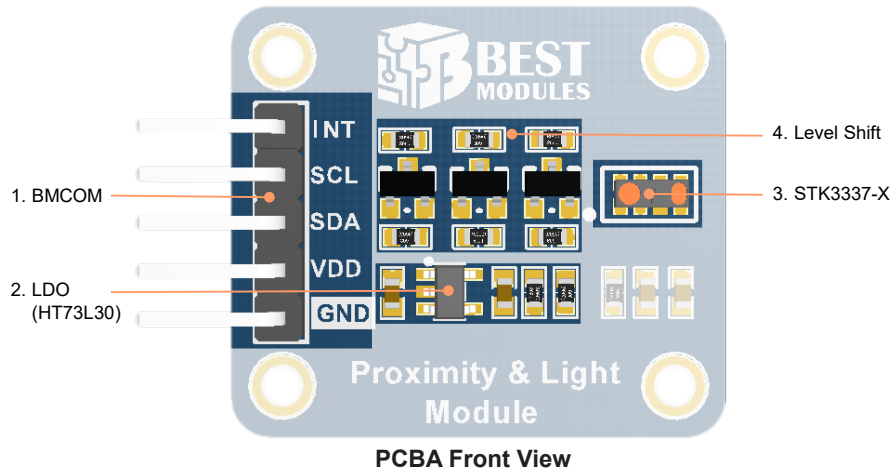
Timing Specification

Ta=25°C

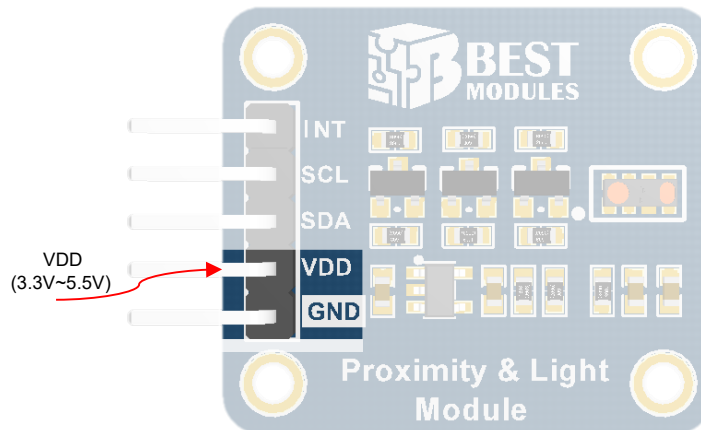
| Symbol | Parameter | Condition | Min. | Typ. | Max. | Unit |
|----------------------|---------------------|---------------------|------|------|------|------|
| t _{DEL-RSP} | Response Delay Time | V _{DD} =5V | 30 | — | — | μs |
| t _{INR} | Interval Time | V _{DD} =5V | 1.3 | — | — | μs |



Hardware Overview



Power Supply



- BCOM Pin: Enter 3.3V to 5.5V through VDD

Sensor STK3337-X

- Sensor STK3337-X
 - ◆ Integrated ambient light sensor, proximity sensor and infrared LED
 - ◆ 3rd generation ambient light sensor which closes to the human-eye response and suppresses the IR part
 - ◆ Excellent temperature compensation: -40°C~85°C
- Features of ambient light sensor (ALS):
 - ◆ 16-bit digital data format
 - ◆ Flexible interrupt settings
 - Interrupt while out-of- window
 - Persistence time: 1/2/4/8 times
 - ◆ Clear channels for different light source compensation
- Features of proximity sensor (PS):
 - ◆ 16-bit digital data format
 - ◆ Flexible interrupt settings
 - Multiple interrupt modes to meet application requirements
 - Interrupt while threshold is exceeded
 - Intelligent persistence to speed up the response time: 1/2/4/16 times
 - ◆ Low noise design
 - ◆ High ambient light suppression

Communication Interface

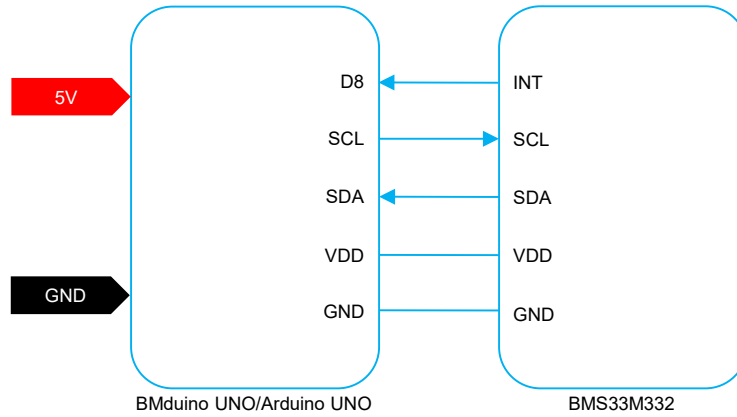
- Communication mode: I²C
- I²C address: 0x47
I²C Address Format:



Note: R/W=1: Read direction
R/W=0: Write direction

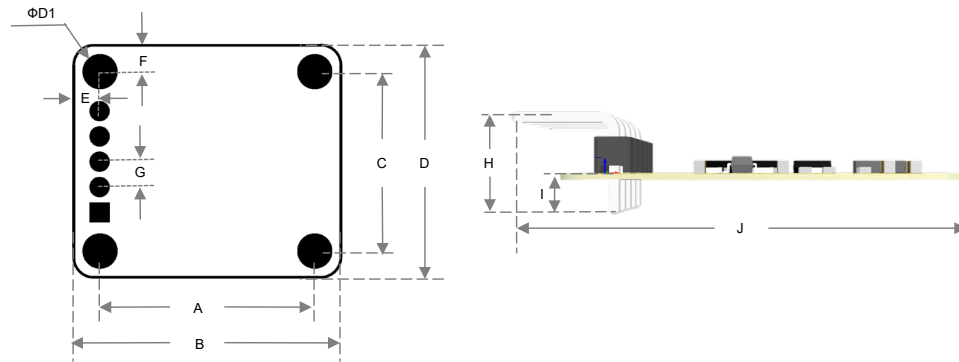
- I²C Communication rate: ≤400kHz
- Communication logic reference voltage: 3.3V~5.5V
- The SCL/SDA/INT pin of module with 2.2kΩ pull-up resistor
- Communication protocol:
 - ◆ Refer to the STK3337-X datasheet

Application Circuits



Wiring Diagram

Dimensions



Dimension Information

| No. | Unit | mm | inch |
|-----|------|-------|-------|
| A | | 21.52 | 0.847 |
| B | | 26.80 | 1.055 |
| C | | 18.00 | 0.709 |
| D | | 23.30 | 0.917 |
| E | | 2.76 | 0.109 |
| F | | 2.80 | 0.110 |
| G | | 2.54 | 0.1 |
| H | | 7.4 | 0.291 |
| I | | 1.4 | 0.055 |
| J | | 31.50 | 1.240 |
| D1 | | 2.2 | 0.087 |

Dimension List

Copyright© 2023 by BEST MODULES CORP. All Rights Reserved.

The information provided in this document has been produced with reasonable care and attention before publication, however, BEST MODULES does not guarantee that the information is completely accurate. The information contained in this publication is provided for reference only and may be superseded by updates. BEST MODULES disclaims any expressed, implied or statutory warranties, including but not limited to suitability for commercialization, satisfactory quality, specifications, characteristics, functions, fitness for a particular purpose, and non-infringement of any third-party's rights. BEST MODULES disclaims all liability arising from the information and its application. In addition, BEST MODULES does not recommend the use of BEST MODULES' products where there is a risk of personal hazard due to malfunction or other reasons. BEST MODULES hereby declares that it does not authorize the use of these products in life-saving, life-sustaining or safety critical components. Any use of BEST MODULES' products in life-saving/sustaining or safety applications is entirely at the buyer's risk, and the buyer agrees to defend, indemnify and hold BEST MODULES harmless from any damages, claims, suits, or expenses resulting from such use. The information provided in this document, including but not limited to the content, data, examples, materials, graphs, and trademarks, is the intellectual property of BEST MODULES (and its licensors, where applicable) and is protected by copyright law and other intellectual property laws. No license, express or implied, to any intellectual property right, is granted by BEST MODULES herein. BEST MODULES reserves the right to revise the information described in the document at any time without prior notice. For the latest information, please contact us.