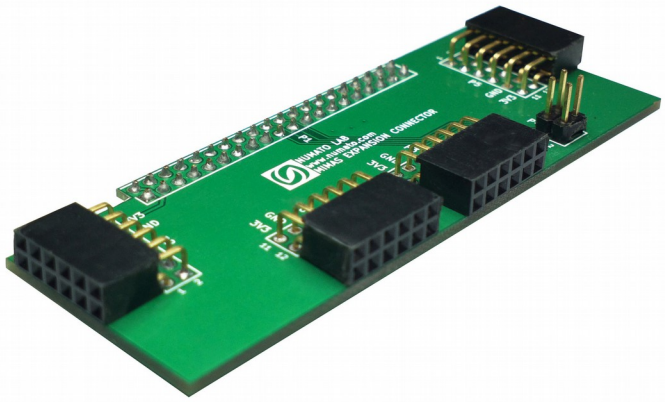

# IO Breakout Module For Mimas
# User Guide

NUMATO LAB

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Rev 9

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# Introduction

This board is an IO breakout solution for Mimas Sparta6 development board. This product allows Mimas IOs to be broken out in to smaller 2x6 headers that would facilitate easy attachment of other peripheral expansion modules. The board features four 2×6 expansion connector.

**Board features**

- Four 2x6 pin expansion connector
- Can be attached to either side of Mimas
- Dimension: 34.3mm X 88.1mm

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# How to use the module

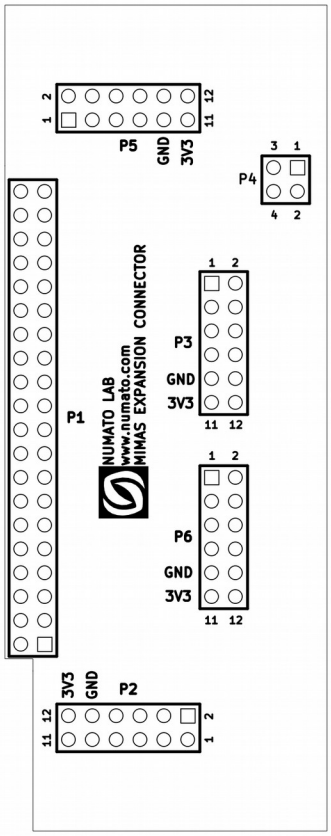
The following section describes how to use this module.

## Components/Tools required

Along with the module, you may need the items in the list below for easy and fast installation.

1. Mimas - Spartan6 FPGA Development Board.

## Connection Diagram




This diagram should be used as a reference only. For detailed information, see the schematics at the end of this document. Details of individual connectors are as below.

Install the module on the large header found on either side of Mimas.

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# Connection Details

## When Connected To Mimas Header P1

Breakout Header P5

| Breakout Header Pin No. | Spartan6 (TQG144) Pin No. | Pin Description | MIMAS Header Pin No. |
|---|---|---|---|
| 1 | 34 | IO_L1N_VREF_3 | 4 |
| 2 | 35 | IO_L1P_3 | 3 |
| 3 | 32 | IO_L2N_3 | 6 |
| 4 | 33 | IO_L2P_3 | 5 |
| 5 | 29 | IO_L36N_3 | 8 |
| 6 | 30 | IO_L36P_3 | 7 |
| 7 | 26 | IO_L37N_3 | 10 |
| 8 | 27 | IO_L37P_3 | 9 |
| 9 | NA | GND | NA |
| 10 | NA | GND | NA |
| 11 | NA | VCC3V3 | NA |
| 12 | NA | VCC3V3 | NA |

Breakout Header P3

| Breakout Header Pin No. | Spartan6 (TQG144) Pin No. | Pin Description | MIMAS Header Pin No. |
|---|---|---|---|
| 1 | 23 | IO_L41N_GCLK26_3 | 12 |
| 2 | 24 | IO_L41P_GCLK27_3 | 11 |
| 3 | 21 | IO_L42N_GCLK24_3 | 14 |
| 4 | 22 | IO_L42P_GCLK25_TRDY2_3 | 13 |
| 5 | 16 | IO_L43N_GCLK22_IRDY2_3 | 16 |
| 6 | 17 | IO_L43P_GCLK23_3 | 15 |
| 7 | 14 | IO_L44N_GCLK20_3 | 18 |
| 8 | 15 | IO_L44P_GCLK21_3 | 17 |
| 9 | NA | GND | NA |

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| | | | |
|---|---|---|---|
| 10 | NA | GND | NA |
| 11 | NA | VCC3V3 | NA |
| 12 | NA | VCC3V3 | NA |

Breakout Header P2

| Breakout Header Pin No. | Spartan6 (TQG144) Pin No. | Pin Description | MIMAS Header Pin No. |
|---|---|---|---|
| 1 | 140 | IO_L3P_0 | 31 |
| 2 | 139 | IO_L3N_0 | 32 |
| 3 | 137 | IO_L4N_0 | 34 |
| 4 | 138 | IO_L4P_0 | 33 |
| 5 | 133 | IO_L34N_GCLK18_0 | 36 |
| 6 | 134 | IO_L34P_GCLK19_0 | 35 |
| 7 | 131 | IO_L35N_GCLK16_0 | 38 |
| 8 | 132 | IO_L35P_GCLK17_0 | 37 |
| 9 | NA | GND | NA |
| 10 | NA | GND | NA |
| 11 | NA | VCC3V3 | NA |
| 12 | NA | VCC3V3 | NA |

Breakout Header P4

| Breakout Header Pin No. | Spartan6 (TQG144) Pin No. | Pin Description | MIMAS Header Pin No. |
|---|---|---|---|
| 1 | 10 | IO_L50P_3 | 21 |
| 2 | 9 | IO_L50N_3 | 22 |
| 3 | 12 | IO_L49P_3 | 19 |
| 4 | 11 | IO_L49N_3 | 20 |

Breakout Header P6

| Breakout Header Pin No. | Spartan6 (TQG144) Pin No. | Pin Description | MIMAS Header Pin No. |
|---|---|---|---|
| 1 | 7 | IO_L51N_3 | 24 |
| 2 | 8 | IO_L51P_3 | 23 |
| 3 | 5 | IO_L52N_3 | 26 |

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| | | | |
|---|---|---|---|
| 4 | 6 | IO_L52P_3 | 25 |
| 5 | 1 | IO_L83N_VREF_3 | 28 |
| 6 | 2 | IO_L83P_3 | 27 |
| 7 | 141 | IO_L2N_0 | 30 |
| 8 | 142 | IO_L2P_0 | 29 |
| 9 | NA | GND | NA |
| 10 | NA | GND | NA |
| 11 | NA | VCC3V3 | NA |
| 12 | NA | VCC3V3 | NA |

## When Connected To Mimas Header P2

Breakout Header P5

| Breakout Header Pin No. | Spartan6 (TQG144) Pin No. | Pin Description | MIMAS Header Pin No. |
|---|---|---|---|
| 1 | 104 | IO_L1N_VREF_1 | 37 |
| 2 | 105 | IO_L1P_1 | 38 |
| 3 | 101 | IO_L32N_1 | 35 |
| 4 | 102 | IO_L32P_1 | 36 |
| 5 | 99 | IO_L33N_1 | 33 |
| 6 | 100 | IO_L33P_1 | 34 |
| 7 | 97 | IO_L34N_1 | 31 |
| 8 | 98 | IO_L34P_1 | 32 |
| 9 | NA | GND | NA |
| 10 | NA | GND | NA |
| 11 | NA | VCC3V3 | NA |
| 12 | NA | VCC3V3 | NA |

Breakout Header P3

| Breakout Header Pin No. | Spartan6 (TQG144) Pin No. | Pin Description | MIMAS Header Pin No. |
|---|---|---|---|
| 1 | 94 | IO_L40N_GCLK10_1 | 29 |

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| | | | |
|---|---|---|---|
| 2 | 95 | IO_L40P_GCLK11_1 | 30 |
| 3 | 92 | IO_L41N_GCLK8_1 | 27 |
| 4 | 93 | IO_L41P_GCLK9_IRDY1_1 | 28 |
| 5 | 87 | IO_L42N_GCLK6_TRDY1_1 | 25 |
| 6 | 88 | IO_L42P_GCLK7_1 | 26 |
| 7 | 84 | IO_L43N_GCLK4_1 | 23 |
| 8 | 85 | IO_L43P_GCLK5_1 | 24 |
| 9 | NA | GND | NA |
| 10 | NA | GND | NA |
| 11 | NA | VCC3V3 | NA |
| 12 | NA | VCC3V3 | NA |

Breakout Header P2

| Breakout Header Pin No. | Spartan6 (TQG144) Pin No. | Pin Description | MIMAS Header Pin No. |
|---|---|---|---|
| 1 | 50 | IO_L31N_GCLK30_D15_2 | 9 |
| 2 | 51 | IO_L31P_GCLK31_D14_2 | 10 |
| 3 | 47 | IO_L48N_RDWR_B_VREF_2 | 7 |
| 4 | 48 | IO_L48P_D7_2 | 8 |
| 5 | 45 | IO_L49N_D4_2 | 5 |
| 6 | 46 | IO_L49P_D3_2 | 6 |
| 7 | 43 | IO_L62N_D6_2 | 3 |
| 8 | 44 | IO_L62P_D5_2 | 4 |
| 9 | NA | GND | NA |
| 10 | NA | GND | NA |
| 11 | NA | VCC3V3 | NA |
| 12 | NA | VCC3V3 | NA |

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Breakout Header P4

| Breakout Header Pin No. | Spartan6 (TQG144) Pin No. | Pin Description | MIMAS Header Pin No. |
|---|---|---|---|
| 1 | GND | NA | 20 |
| 2 | GND | NA | 19 |
| 3 | 83 | IO_L45P_1 | 22 |
| 4 | 82 | IO_L45N_1 | 21 |

Breakout Header P6

| Breakout Header Pin No. | Spartan6 (TQG144) Pin No. | Pin Description | MIMAS Header Pin No. |
|---|---|---|---|
| 1 | 80 | IO_L46N_1 | 17 |
| 2 | 81 | IO_L46P_1 | 18 |
| 3 | 78 | IO_L47N_1 | 15 |
| 4 | 79 | IO_L47P_1 | 16 |
| 5 | 74 | IO_L74N_DOUT_BUSY_1 | 13 |
| 6 | 75 | IO_L74P_AWAKE_1 | 14 |
| 7 | 55 | IO_L30N_GCLK0_USERCCLK_2 | 11 |
| 8 | 56 | IO_L30P_GCLK1_D13_2 | 12 |
| 9 | NA | GND | NA |
| 10 | NA | GND | NA |
| 11 | NA | VCC3V3 | NA |
| 12 | NA | VCC3V3 | NA |

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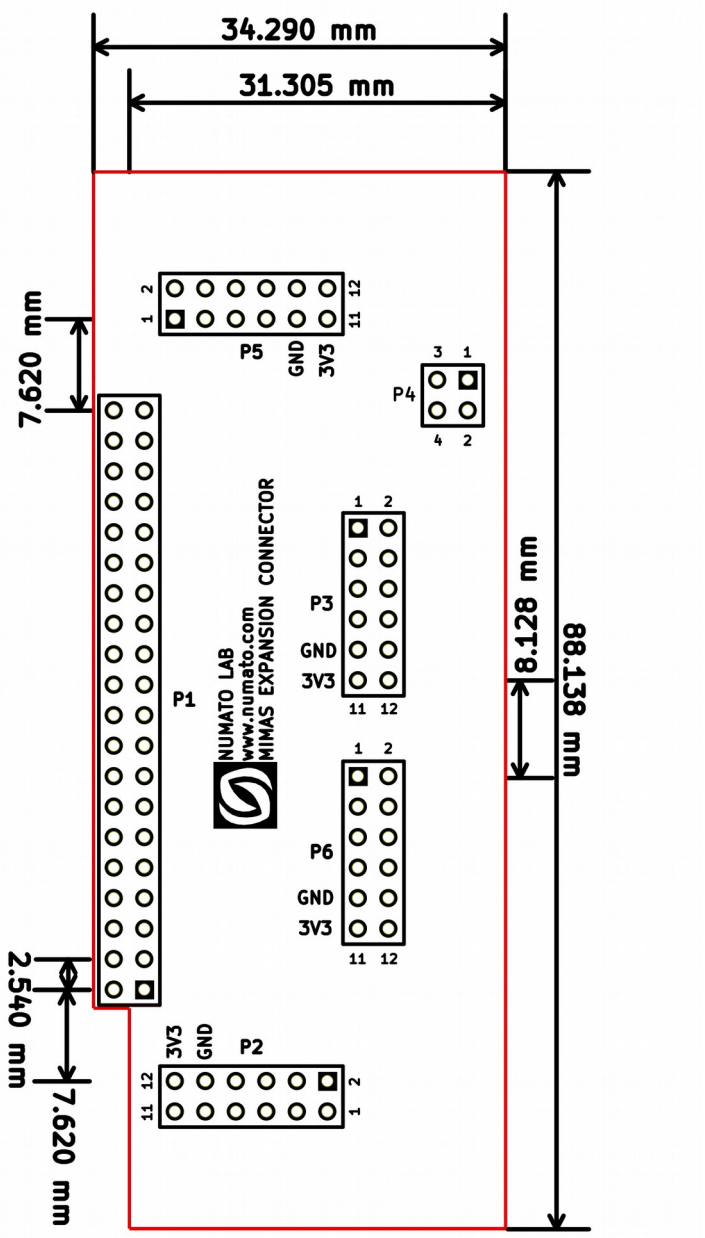
## Physical Dimensions




**L x W x H : 88.138 mm x 34.290 mm x 20 mm**

## Schematics

See next page.

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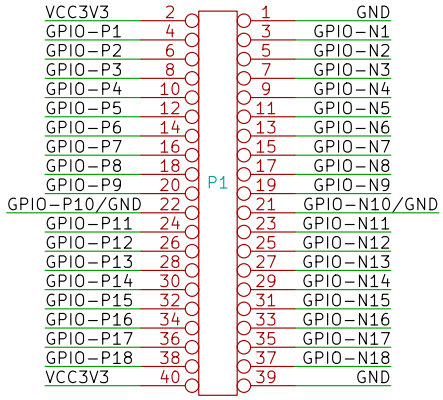
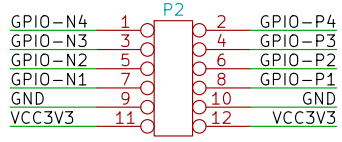
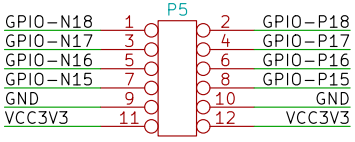
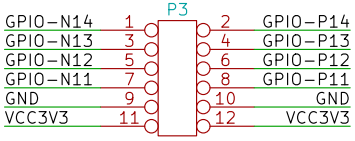
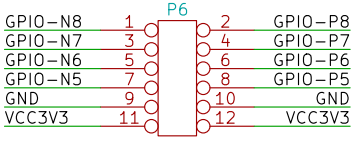
# EXPANSION CONNECTOR

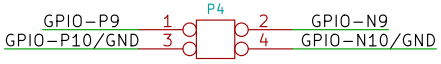
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File: MimasExpansionConnector.sch
Sheet: /

Title: MIMAS EXPANSION CONNECTOR

Size: A4 | Date: 17 feb 2014 | Rev:

KiCad E.D.A. | Id: 1/1