

# AP0102ATSL00XUGAH3-GEVB

## AP0102AT Evaluation Board User's Manual



ON Semiconductor®

[www.onsemi.com](http://www.onsemi.com)

### EVAL BOARD USER'S MANUAL

#### Evaluation Board Overview

The evaluation boards are designed to demonstrate the features of ON Semiconductor's image sensors products. This headboard is intended to plug directly into the Demo 3 system. Test points and jumpers on the board provide access to the clock, I/Os, and other miscellaneous signals.

#### Features

- Clock Input
  - ♦ Default – 27 MHz Crystal Oscillator
  - ♦ Optional Demo 3 Controlled MCLK
- Two Wire Serial Interface
  - ♦ Selectable Base Address
- Parallel Interface
- HiSPi (High Speed Serial Pixel) Interface
- ROHS Compliant

#### Block Diagram



Figure 1. AP0102AT Evaluation Board

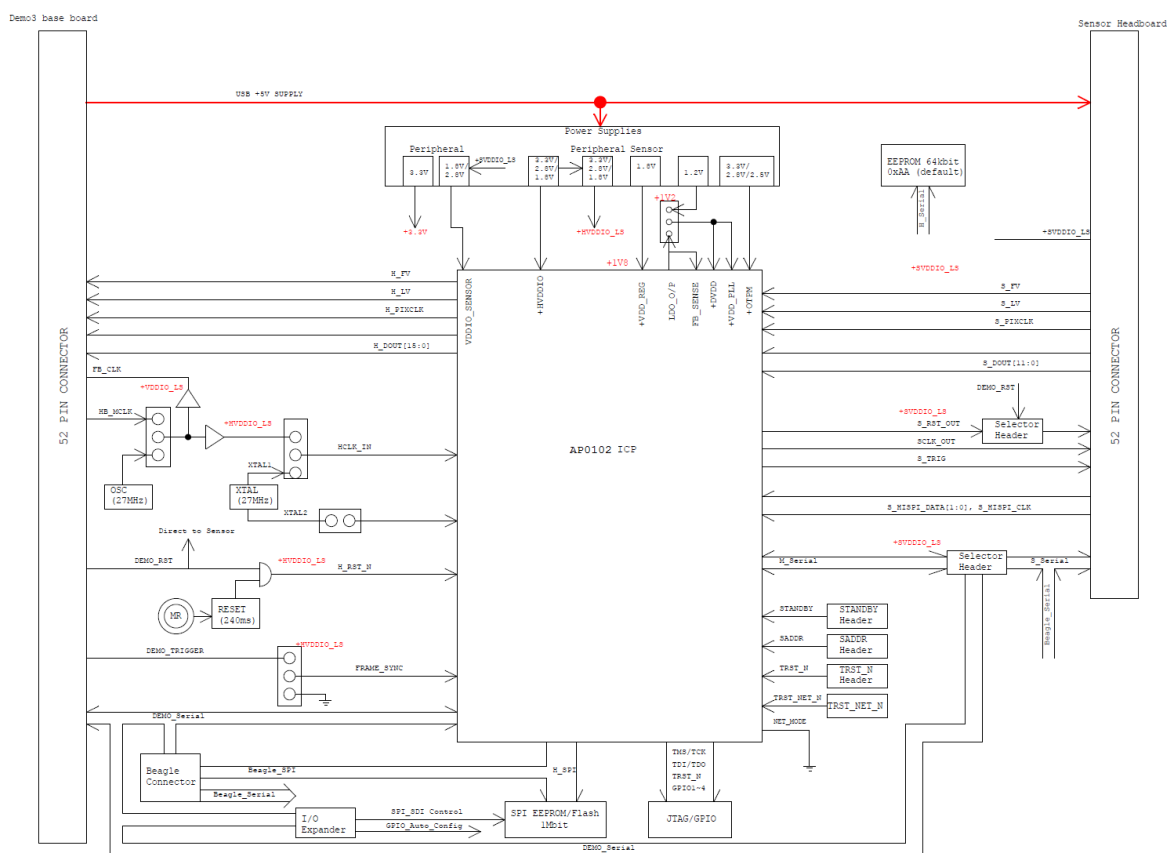


Figure 2. Block Diagram of AP0102ATSL00XUGAH3-GEVB

Top View

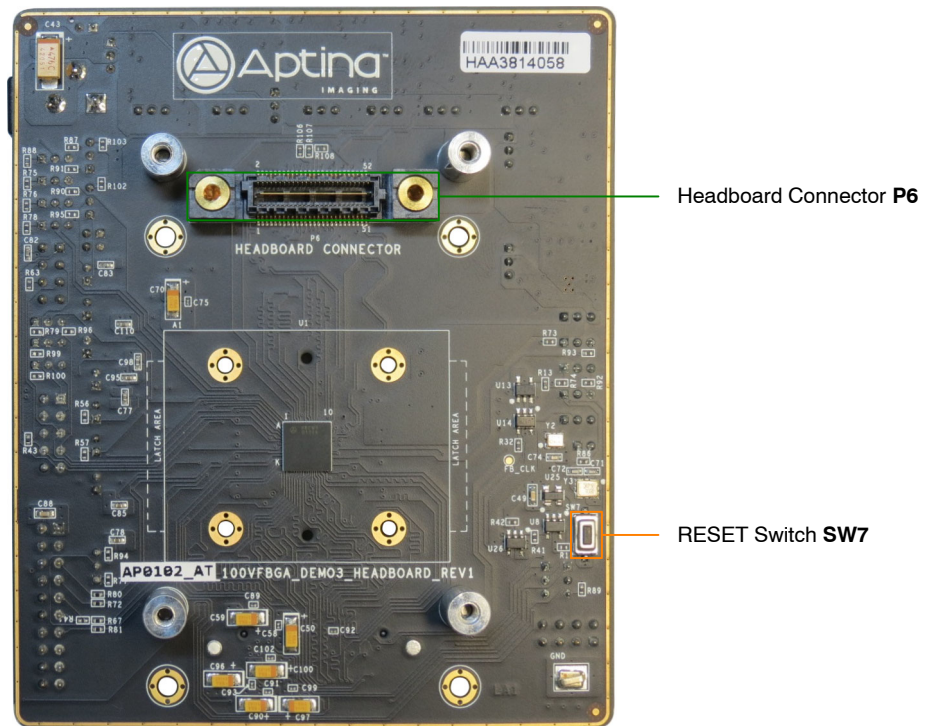


Figure 3. Top View of the Board – Default Jumpers

Bottom View

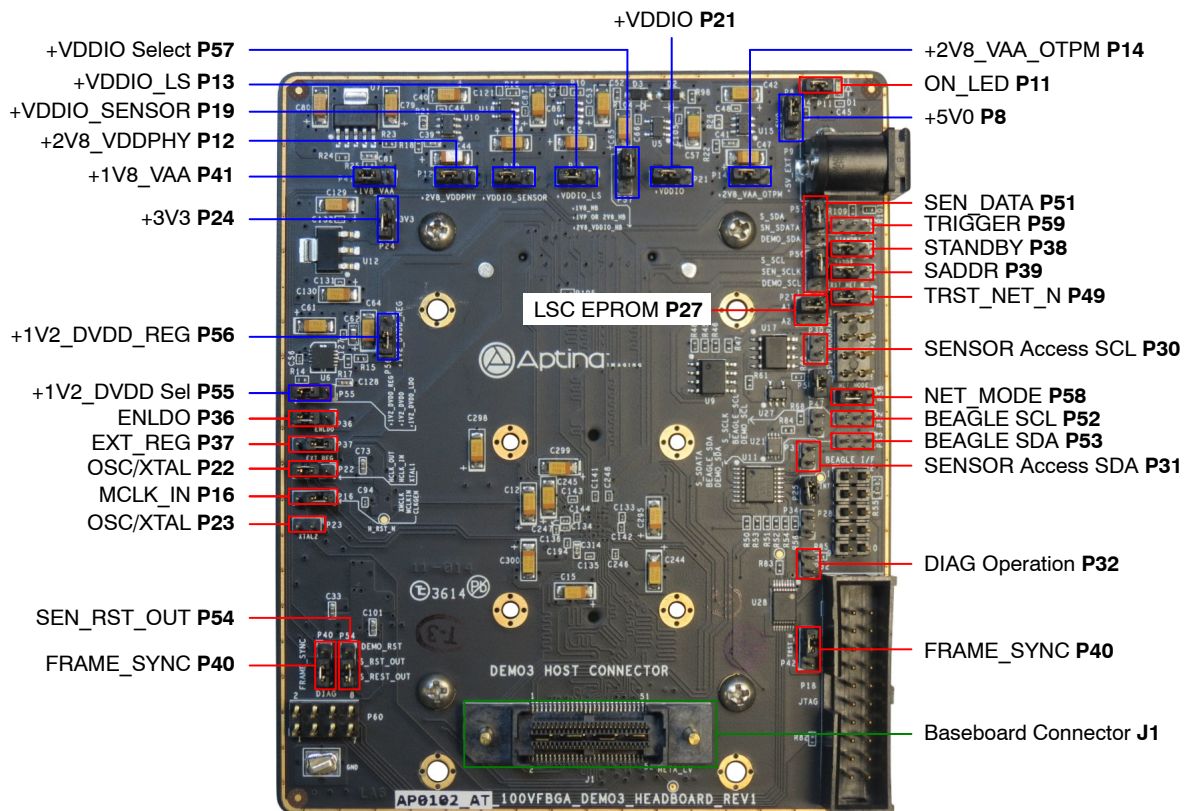
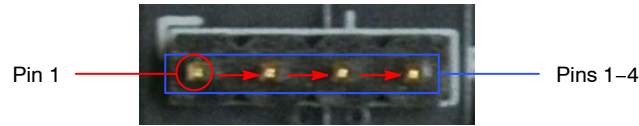


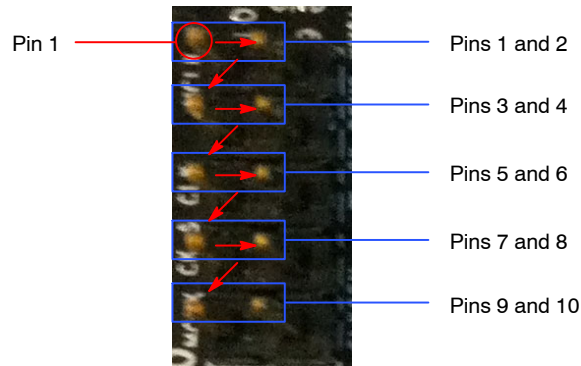
Figure 4. Bottom View of the Board – Connectors

### Jumper Pin Locations

The jumpers on headboards start with Pin 1 on the leftmost side of the pin. Grouped jumpers increase in pin size with each jumper added.



**Figure 5. Pin Locations for a Single Jumper. Pin 1 is Located at the Leftmost Side and Increases as it Moves to the Right**



**Figure 6. Pin Locations and Assignments of Grouped Jumpers. Pin 1 is Located at the Top-Left Corner and Increases in a Zigzag Fashion Shown in the Picture**

### Jumper/Header Functions & Default Positions

**Table 1. JUMPERS AND HEADERS**

| Jumper/Header No. | Jumper/Header Name | Pins                          | Description  |
|-------------------|--------------------|-------------------------------|--|
| P5, P47           | EEPROM Mode        | P5 Closed, P47 Open (Default) | Set to Host Mode during Power On                       |
|                   |                    | P5 Open, P47 Open             | Set to Flash Mode during Power On                      |
|                   |                    | P47 Closed                    | Set to Auto-Config Mode during Power On                |
| P8                | +5V0               | 2-3 (Default)                 | Using On-Board +5V0 Power Supply                       |
|                   |                    | 1-2                           | Using +5V0 Supply from External Power Adapter          |
| P11               | ON_LED             | 1-2 (Default)                 | Connects to On-Board to Indicate "Power On"            |
| P12               | +2V8_VDDPHY        | 2-3 (Default)                 | Using On-Board +2V8_VDDPHY_ADJ Power Supply            |
|                   |                    | 1-2                           | Using +2V8_VDDIO_HB Power Supply from Demo 3 Baseboard |
| P13               | +VDDIO_LS          | 2-3 (Default)                 | Using On-Board Power Supply                            |
|                   |                    | 1-2                           | Using +1V8_HB Power Supply from Demo 3 Baseboard       |
| P14               | +2V8_VAA_OTPM      | 2-3 (Default)                 | Using On-Board +2V8_VAA_OTPM_ADJ Power Supply          |
|                   |                    | 1-2                           | Using +2V8_VAA_HB Power Supply from Demo 3 Baseboard   |
| P16               | MCLK_IN            | 1-2 (Default)                 | Connects to On-Board Oscillator                        |
|                   |                    | 2-3                           | Connects to XMCLK                                      |
| P19               | +VDDIO_SENSOR      | 2-3 (Default)                 | Using On-Board Power Supply                            |
|                   |                    | 1-2                           | Using +1V8_HB Power Supply from Demo 3 Baseboard       |

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**Table 1. JUMPERS AND HEADERS** (continued)

| Jumper/Header No. | Jumper/Header Name   | Pins                              | Description   |
|-------------------|----------------------|-----------------------------------|---|
| P21               | +VDDIO               | 2–3 (Default)                     | Using On-Board Power Supply                                 |
|                   |                      | 1–2                               | Using +1V8_HB or +2V8_HB Power Supply from Demo 3 Baseboard |
| P22, P23          | OSC/XTAL Select      | P22 2–3,<br>P23 Open (Default)    | Oscillator/Demo Clock Selected                              |
|                   |                      | P22 1–2,<br>P23 Closed            | On-Board Crystal Selected                                   |
| P24               | +3V3                 | 2–3 (Default)                     | Using On-Board Power Supply                                 |
|                   |                      | 1–2                               | Using +3V3_HB Power Supply from Demo 3 Baseboard            |
| P25, P34          | I/O Expander Address | P25 Closed,<br>P34 Open (Default) | I/O Expander Address Set to 0x48                            |
|                   |                      | P25 Open,<br>P34 Open             | I/O Expander Address Set to 0x4C                            |
|                   |                      | P25 Open,<br>P34 Closed           | I/O Expander Address Set to 0x44                            |
|                   |                      | P25 Closed,<br>P34 Closed         | I/O Expander Address Set to 0x40                            |
| P27               | LSC EEPROM           | 1–2 Closed,<br>3–4 Open (Default) | EEPROM Address Set to 0xA8                                  |
|                   |                      | 1–2 Open,<br>3–4 Open             | EEPROM Address Set to 0xAC                                  |
|                   |                      | 1–2 Open,<br>3–4 Closed           | EEPROM Address Set to 0xA4                                  |
|                   |                      | 1–2 Closed,<br>3–4 Closed         | EEPROM Address Set to 0xA0                                  |
| P30               | Sensor Access SCL    | Open (Default)                    | Beagle Serial No Access to Demo 3 & Sensor                  |
|                   |                      | 1–2                               | Beagle Serial Access to Demo 3 & Sensor                     |
| P31               | Sensor Access SDA    | Open (Default)                    | Beagle Serial No Access to Demo 3 & Sensor                  |
|                   |                      | 1–2                               | Beagle Serial Access to Demo 3 & Sensor                     |
| P32               | Diag Operation       | Open (Default)                    | Disable Diag Operation                                      |
|                   |                      | 1–2                               | Enable Diag Operation                                       |
| P36               | ENLDO                | 2–3 (Default)                     | Internal Regulator Not Enabled                              |
|                   |                      | 1–2                               | Regulator Enable  |
| P37               | EXT_REG              | 1–2 (Default)                     | Select External Regulator                                   |
|                   |                      | 2–3                               | Select Internal Regulator                                   |
| P38               | STANDBY              | 2–3 (Default)                     | Active Mode   |
|                   |                      | 1–2                               | Standby Mode  |
| P39               | SADDR                | 2–3 (Default)                     | I <sup>2</sup> C Address Set to 0x90                        |
|                   |                      | 1–2                               | I <sup>2</sup> C Address Set to 0xBA                        |
| P40               | FRAME_SYNC           | 2–3 (Default)                     | GND   |
|                   |                      | 1–2                               | Connect to Demo 3 Trigger                                   |
| P41               | +1V8_VAA             | 2–3 (Default)                     | Using On-Board +1V8_VAA Power Supply                        |
|                   |                      | 1–2                               | Using +1V8_HB Power Supply from Demo 3 Baseboard            |
| P42               | TRST_N               | 2–3 (Default)                     | Normal Mode   |
|                   |                      | 1–2                               | Test Mode for Image System Processor                        |
| P49               | TRST_NET_N           | 2–3 (Default)                     | Normal Mode   |
|                   |                      | 1–2                               | Test Mode for Image Agent Processor                         |
| P50               | SEN_SCLK             | 2–3 (Default)                     | AP0102 Serial Control                                       |
|                   |                      | 1–2                               | Demo 3 Serial Control                                       |

**Table 1. JUMPERS AND HEADERS** (continued)

| Jumper/Header No. | Jumper/Header Name  | Pins           | Description   |
|-------------------|---------------------|----------------|---|
| P51               | SEN_SDATA           | Open (Default) | AP0102 Serial Control                                   |
|                   |                     | 1-2            | Demo 3 Serial Control                                   |
| P52               | BEAGLE_SCL          | 1-2            | Demo 3 Accessed   |
|                   |                     | 2-3            | Sensor Accessed   |
| P53               | BEAGLE_SDA          | 1-2            | Demo 3 Accessed   |
|                   |                     | 2-3            | Sensor Accessed   |
| P54               | SEN_RST_OUT         | 2-3 (Default)  | AP0102 Reset  |
|                   |                     | 1-2            | Demo 3 Reset  |
| P55               | +1V2_DVDD Selection | 2-3 (Default)  | Using On-Board Regulator +1V2 Power Supply              |
|                   |                     | 1-2            | Using +1V2 Internal Power Supply                        |
| P56               | +1V2_DVDD_REG       | 2-3 (Default)  | Using On-Board +1V2_DVDD_ADJ Power Supply               |
|                   |                     | 1-2            | Using +1V2_HB Power Supply from Demo 3 Baseboard        |
| P57               | +VDDIO Selection    | 1-2 (Default)  | Using +1V8_HB Supply for +VDDIO                         |
|                   |                     | 2-3            | Using +2V8_HB Supply for +VDDIO                         |
| P58               | NET_MODE            | 2-3 (Default)  | I <sup>2</sup> C to Image Co-Processor                  |
|                   |                     | 1-2            | I <sup>2</sup> C to Agent Co-Processor                  |
| P59               | TRIGGER             | 2-3            | Connect to GND  |
|                   |                     | 1-2            | Connect to +VDDIO                                       |
|                   |                     | Open (Default) | Control from Demo 3 Baseboard                           |
| SW7               | RESET               | N/A            | When Pushed, 240 ms Reset Signal will be Sent to AP0102 |

#### Interfacing to ON Semiconductor Demo 3 Baseboard

The ON Semiconductor Demo 3 baseboard has a similar 52-pin connector which mates with J1 of the headboard.

The four mounting holes secure the baseboard and the headboard with spacers and screws.

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