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# Pathfinder P1600-DK Datasheet

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This datasheet describes the P1600-DK embedded applications development kit platform, for vision and machine learning solutions. It consists of a carrier board exposing most of the interfaces available in a Pathfinder P1600 System on Module (SoM) with all the necessary circuitry, to enable testing of various communication and computational features the Blaize P1600 series of SoCs.

## Features

- Blaize Pathfinder P1600 System on Module
- Power Supply
- X2 MIPI CSI-2 HD Cameras
- Ethernet Cable
- Carrier Board Jumpers and assembly hardware
- HDMI cable
- Weight (Carrier + SoM): 360 grams (12 ¾ oz)
- Carrier Board
- USB Serial Console Cable
- SD Card
- 4-lane PCIe Cable
- DSI to HDMI adapter
- Dimensions (Carrier+SoM): 152.5mm x 130mm (w x h)
- Certification: CE, FCC, TELEC, ROHS, EMC

## Applications

- Smart Retail
- Smart City
- Smart Manufacturing
- Robotics
- Industrial Automation
- Security
- Smart Vision
- Edge Inference
- Internet of Things



Figure 1 - P1600-DK Developer Kit

## Table of Contents

|                                                   |    |
|---------------------------------------------------|----|
| 1. Product Contents .....                         | 3  |
| 2. Connecting and Powering Up .....               | 4  |
| 3. Carrier Board Interfaces .....                 | 4  |
| 3.1. LEDs .....                                   | 7  |
| 3.2. Jumpers .....                                | 8  |
| 3.2.1. Jumper Identification .....                | 8  |
| 3.2.2. Default Jumper Setting .....               | 8  |
| 4. Header Pinouts .....                           | 8  |
| 5. Raspberry Pi Interface Connector .....         | 12 |
| 6. M.2 Connector .....                            | 13 |
| 7. Environmental Conditions .....                 | 14 |
| 8. P1600 SoM and CB2 Certifications .....         | 15 |
| 9. Shock and Vibration Standards (SoM) .....      | 15 |
| 10. Product Support and Further Information ..... | 16 |
| 10.1. Revision History .....                      | 16 |
| 10.2. Further Information .....                   | 16 |

## List of Figures

|                                                            |   |
|------------------------------------------------------------|---|
| Figure 1 - P1600-DK Developer Kit .....                    | 2 |
| Figure 2 - CB2 Connectors and Switches - Top View .....    | 4 |
| Figure 3 - CB2 Connectors and Switches - Bottom View ..... | 6 |

## List of Tables

|                                                           |    |
|-----------------------------------------------------------|----|
| Table 1 - P1600-DK Product Contents .....                 | 3  |
| Table 2 - CB2 Connectors and Switches - Top View .....    | 5  |
| Table 3 - CB2 Connectors and Switches - Bottom View ..... | 6  |
| Table 4 - LED Identification .....                        | 7  |
| Table 5 - Jumpers on CB2 .....                            | 8  |
| Table 6 - Default Jumper Setting - J24 .....              | 8  |
| Table 7 - Default Jumper Settings - CSI Rx Cameras .....  | 8  |
| Table 8 - CAN0 Pinouts .....                              | 8  |
| Table 9 - SPI0 Header .....                               | 9  |
| Table 10 - JTAG0 Header .....                             | 9  |
| Table 11 - CSI0 Header .....                              | 9  |
| Table 12 - CSI1 Header .....                              | 10 |
| Table 13 - CSI2 Header .....                              | 10 |
| Table 14 - CSI3 Header .....                              | 11 |
| Table 15 - CSI4 Header .....                              | 11 |
| Table 16 - MICIN HPOUT Header .....                       | 12 |
| Table 17 - USB0 Header .....                              | 12 |
| Table 18 - SD Header .....                                | 12 |
| Table 19 - Raspberry Pi Interface Connector .....         | 12 |
| Table 20 - M.2 Interface Connector .....                  | 13 |
| Table 21 - CB2 Environmental Conditions .....             | 14 |
| Table 22 - SoM Commercial Environmental Conditions .....  | 14 |
| Table 23 - Certifications .....                           | 15 |
| Table 24 - Shock and Vibration Standards .....            | 15 |
| Table 25 - Revision History .....                         | 16 |

## 1. Product Contents

The P1600-DK includes a combination of the following items.

*Table 1 - P1600-DK Product Contents*

| Quantity | Item                 | Description                                                                                                                                                                                                                   |
|----------|----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1        | Pathfinder P1600-DK  | Whole kit part number 900-00002-02                                                                                                                                                                                            |
| 1        | BLZP1600-S-4G-NS-C-2 | 4GB non-secured SoM, 900-00008-01                                                                                                                                                                                             |
| 1        | Heatsink + Fan       | SoM Fansink Assembly, 820-00002                                                                                                                                                                                               |
| 1        | Carrier Board CB2    | SoM Carrier Board. 830-00013-01 Stand-offs and feet.<br>SoM/Heatsink/SoMCB2 fully assembled                                                                                                                                   |
| 1        | Power Supply         | Power Cord localized per Country:<br>Cord Type B (US, MEX, CAN, JP), IEC 320-C13 to NEMA 5-15P<br>Cord Type F (EUROPE, RUSSIA), IEC 320-C13 to CEE7/7<br>Cord Type G (GRB, IRL, MAL, MAS, SIN), IEC 320-C13 to UK Plug BS1363 |
| 1        | Serial Cable         | Micro-USB Serial cable                                                                                                                                                                                                        |
| 1        | SD Card              | 16GB Micro-SD, with latest eSDK root filesystem and features.<br>Preprogrammed with the most current eSDK version at time of shipment.                                                                                        |
| 5        | Jumpers              | Bag with jumpers to set optional configurations on the carrier board                                                                                                                                                          |
| 1        | Ethernet Cable       | Cat 5e                                                                                                                                                                                                                        |

| Quantity | Item                 | Description                                                                                                                   |
|----------|----------------------|-------------------------------------------------------------------------------------------------------------------------------|
| 2        | CSI-2 FHD MIPI       | CSI Cameras, JAL-OV8865-A898B V2.4                                                                                            |
| 1        | HDMI Cable + Adapter | Mezzanine board with HDMI output. Each adapter is modified with a resistor being replaced with a diode to prevent back-power. |

## 2. Connecting and Powering Up

The details about Powering Up, Installation and Safety Guidance can be found in Pathfinder P1600-DK Quick Start Guide document.

## 3. Carrier Board Interfaces

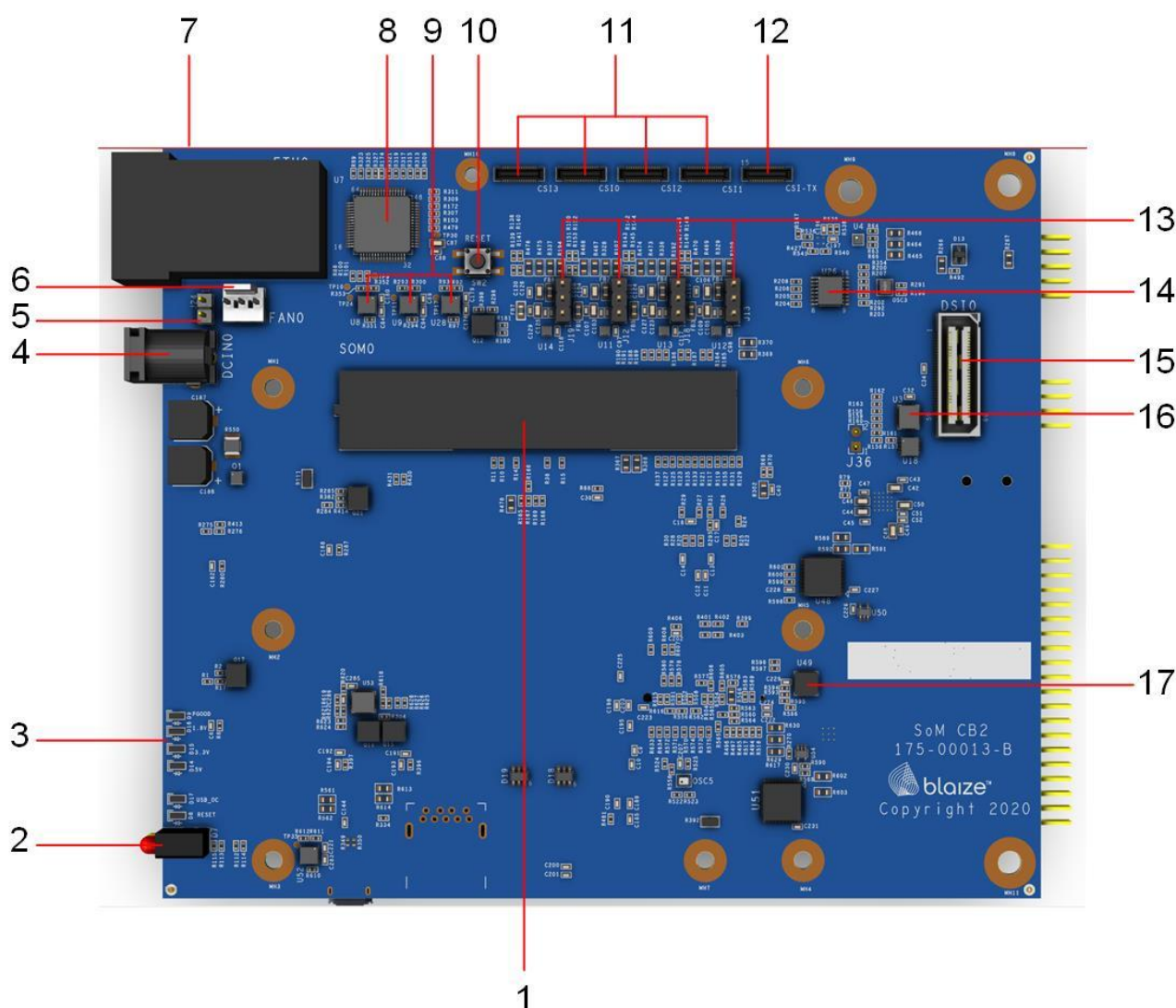


Figure 2 - CB2 Connectors and Switches - Top View

Table 2 - CB2 Connectors and Switches - Top View

| Label | Component                  | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|-------|----------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1     | SoM0                       | System-on-Module connector                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| 2     | D7                         | Temperature and Fan Alert LED                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| 3     | D8, D17, D14, D15, D16, D9 | LED section: Reset LED, USB over current LED, 5V power supply, 3.3 V power supply, 1.8 V power supply, SoM Power Good indicator LED respectively                                                                                                                                                                                                                                                                                                                           |
| 4     | DCIN0                      | 12 V DC power supply input connector                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| 5     | J24                        | When shorted, the fan runs continuously without any control from SoM                                                                                                                                                                                                                                                                                                                                                                                                       |
| 6     | FAN0                       | 5 V fan connector                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| 7     | ETH0                       | RJ45 Ethernet connector                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 8     | U7                         | Ethernet Transceiver                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| 9     | U28, U8, U9                | Power Supply for Ethernet Controller                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| 10    | SW2                        | Reset Switch                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| 11    | CSI0, CSI1, CSI2, CSI3     | MIPI CSI Camera In<br>Compatible cameras: KLT OmniVision OV8865, OV5647                                                                                                                                                                                                                                                                                                                                                                                                    |
| 12    | CSI4                       | MIPI CSI Camera Out                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 13    | J12, J13, J18, and J19     | Selection between 1.2 V and 1.8 V input to CSI0, CSI1, CSI2, and CSI3 respectively.<br>- Connect pins 1 and 2 for 1.2 V<br>- Connect pins 2 and 3 for 1.8 V                                                                                                                                                                                                                                                                                                                |
| 14    | U26                        | Clock Buffer                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| 15    | DSI0                       | MIPI DSI display interface Compatible interfaces:<br><a href="https://www.st.com/en/development-tools/b-lcdad-hdmi1.html">https://www.st.com/en/development-tools/b-lcdad-hdmi1.html</a><br><a href="https://www.st.com/b/en/development-tools/b-lcdad-rpi1.html">https://www.st.com/b/en/development-tools/b-lcdad-rpi1.html</a><br><a href="https://www.st.com/b/en/development-tools/b-lcd40-dsi1.html">https://www.st.com/b/en/development-tools/b-lcd40-dsi1.html</a> |
| 16    | U3                         | DSI Signal Level Converter                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| 17    | U49                        | M.2 GPIO Expander                                                                                                                                                                                                                                                                                                                                                                                                                                                          |

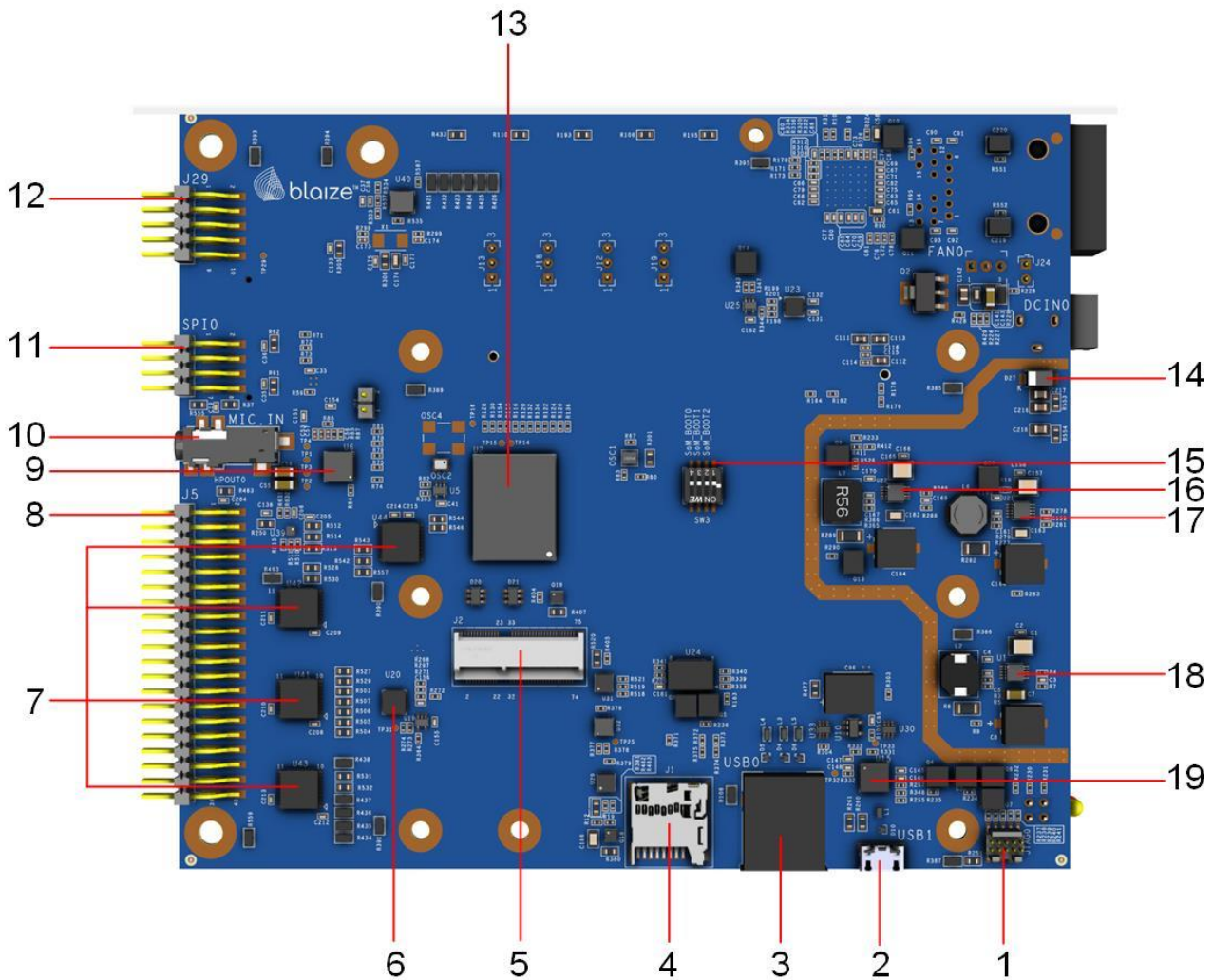


Figure 3 - CB2 Connectors and Switches - Bottom View

Table 3 - CB2 Connectors and Switches - Bottom View

| Label | Component          | Description                                                                                            |
|-------|--------------------|--------------------------------------------------------------------------------------------------------|
| 1     | JTAG               | JTAG Debug Connector                                                                                   |
| 2     | USB1               | Micro USB B receptacle for UART interface                                                              |
| 3     | USB0               | USB Type A receptacle supporting Super Speed Mode                                                      |
| 4     | J1                 | Micro SD card connector                                                                                |
| 5     | J2                 | M.2 E Key Connector having WiFi / BT module interfaced on SDIO supporting Embedded Artists WiFi Module |
| 6     | U20                | 16-bit I2C I/O expander                                                                                |
| 7     | U41, U42, U43, U44 | Raspberry Pi I/O level converters                                                                      |
| 8     | J5                 | 40-pin Raspberry Pi interface connector                                                                |
| 9     | U6                 | Low-power audio codec                                                                                  |
| 10    | HPOUT              | Audio Jack                                                                                             |
| 11    | SPI0               | SOM SPI Interface Header                                                                               |

| Label  | Component | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |        |        |          |   |   |          |   |           |    |   |           |     |   |           |    |        |        |          |   |   |          |   |           |     |   |           |    |   |           |     |
|--------|-----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|--------|----------|---|---|----------|---|-----------|----|---|-----------|-----|---|-----------|----|--------|--------|----------|---|---|----------|---|-----------|-----|---|-----------|----|---|-----------|-----|
| 12     | J29       | CAN interface header                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |        |        |          |   |   |          |   |           |    |   |           |     |   |           |    |        |        |          |   |   |          |   |           |     |   |           |    |   |           |     |
| 13     | U2        | eMMC memory (8 GB)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |        |        |          |   |   |          |   |           |    |   |           |     |   |           |    |        |        |          |   |   |          |   |           |     |   |           |    |   |           |     |
| 14     | D27       | Transient voltage suppressor diode                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |        |        |          |   |   |          |   |           |    |   |           |     |   |           |    |        |        |          |   |   |          |   |           |     |   |           |    |   |           |     |
| 15     | SW3       | <p>Boot mode select switch for SoM P1600.</p> <table> <tr> <th>Switch</th><th>Signal</th><th>Position</th></tr> <tr> <td>1</td><td>-</td><td>Not used</td></tr> <tr> <td>2</td><td>SOM_BOOT2</td><td>On</td></tr> <tr> <td>3</td><td>SOM_BOOT1</td><td>Off</td></tr> <tr> <td>4</td><td>SOM_BOOT0</td><td>On</td></tr> </table> <p>Boot mode select switch for SoM P1000.</p> <table> <tr> <th>Switch</th><th>Signal</th><th>Position</th></tr> <tr> <td>1</td><td>-</td><td>Not used</td></tr> <tr> <td>2</td><td>SOM_BOOT2</td><td>Off</td></tr> <tr> <td>3</td><td>SOM_BOOT1</td><td>On</td></tr> <tr> <td>4</td><td>SOM_BOOT0</td><td>Off</td></tr> </table> | Switch | Signal | Position | 1 | - | Not used | 2 | SOM_BOOT2 | On | 3 | SOM_BOOT1 | Off | 4 | SOM_BOOT0 | On | Switch | Signal | Position | 1 | - | Not used | 2 | SOM_BOOT2 | Off | 3 | SOM_BOOT1 | On | 4 | SOM_BOOT0 | Off |
| Switch | Signal    | Position                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |        |        |          |   |   |          |   |           |    |   |           |     |   |           |    |        |        |          |   |   |          |   |           |     |   |           |    |   |           |     |
| 1      | -         | Not used                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |        |        |          |   |   |          |   |           |    |   |           |     |   |           |    |        |        |          |   |   |          |   |           |     |   |           |    |   |           |     |
| 2      | SOM_BOOT2 | On                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |        |        |          |   |   |          |   |           |    |   |           |     |   |           |    |        |        |          |   |   |          |   |           |     |   |           |    |   |           |     |
| 3      | SOM_BOOT1 | Off                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |        |        |          |   |   |          |   |           |    |   |           |     |   |           |    |        |        |          |   |   |          |   |           |     |   |           |    |   |           |     |
| 4      | SOM_BOOT0 | On                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |        |        |          |   |   |          |   |           |    |   |           |     |   |           |    |        |        |          |   |   |          |   |           |     |   |           |    |   |           |     |
| Switch | Signal    | Position                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |        |        |          |   |   |          |   |           |    |   |           |     |   |           |    |        |        |          |   |   |          |   |           |     |   |           |    |   |           |     |
| 1      | -         | Not used                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |        |        |          |   |   |          |   |           |    |   |           |     |   |           |    |        |        |          |   |   |          |   |           |     |   |           |    |   |           |     |
| 2      | SOM_BOOT2 | Off                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |        |        |          |   |   |          |   |           |    |   |           |     |   |           |    |        |        |          |   |   |          |   |           |     |   |           |    |   |           |     |
| 3      | SOM_BOOT1 | On                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |        |        |          |   |   |          |   |           |    |   |           |     |   |           |    |        |        |          |   |   |          |   |           |     |   |           |    |   |           |     |
| 4      | SOM_BOOT0 | Off                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |        |        |          |   |   |          |   |           |    |   |           |     |   |           |    |        |        |          |   |   |          |   |           |     |   |           |    |   |           |     |
| 16     | U22       | 12 V to 1.8 V switching regulator                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |        |        |          |   |   |          |   |           |    |   |           |     |   |           |    |        |        |          |   |   |          |   |           |     |   |           |    |   |           |     |
| 17     | U21       | 12 V to 3.3 V switching regulator                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |        |        |          |   |   |          |   |           |    |   |           |     |   |           |    |        |        |          |   |   |          |   |           |     |   |           |    |   |           |     |
| 18     | U1        | 12 V to 5 V switching regulator                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |        |        |          |   |   |          |   |           |    |   |           |     |   |           |    |        |        |          |   |   |          |   |           |     |   |           |    |   |           |     |
| 19     | U15       | FTDI USB to Serial Port Driver                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |        |        |          |   |   |          |   |           |    |   |           |     |   |           |    |        |        |          |   |   |          |   |           |     |   |           |    |   |           |     |

### 3.1. LEDs

Table 4 - LED Identification

| Label | Color      | Description                                                                 |
|-------|------------|-----------------------------------------------------------------------------|
| D7    | Red/Yellow | Temperature/Fan Warning<br>Red: Over temperature<br>Yellow: Fan not running |
| D8    | Yellow     | Reset LED                                                                   |
| D17   | Red        | USB over current warning LED                                                |
| D14   | Green      | 5 V power rail live                                                         |
| D15   | Green      | 3.3 V power rail live                                                       |
| D16   | Green      | 1.8 V power rail live                                                       |
| D9    | Green      | SoM Power Good indicator LED                                                |

## 3.2. Jumpers

### 3.2.1. Jumper Identification

Jumpers are shown on the Figure 2 with the label no.13

*Table 5 - Jumpers on CB2*

| Jumper | Description                                                          |
|--------|----------------------------------------------------------------------|
| J24    | When shorted, the fan runs continuously without any control from SoM |
| J19    | Selection between 1.2 V and 1.8 V in CSI3                            |
| J12    | Selection between 1.2 V and 1.8 V in CSI0                            |
| J18    | Selection between the 1.2V and 1.8V in CSI2                          |
| J13    | Selection between 1.2 V and 1.8 V in CSI1                            |

### 3.2.2. Default Jumper Setting

The tables below describe the default jumper settings for J24 and CSI Rx cameras respectively. All settings must be completed before powering on the CB2 board.

For more information about operating modes and alternative configurations, refer to the *Blaize Embedded SDK User Manual*.

*Table 6 - Default Jumper Setting - J24*

| Jumper | SoM Mounted                                                      |
|--------|------------------------------------------------------------------|
| J24    | Not mounted. Allows the SoM to control the fan speed through PWM |

*Table 7 - Default Jumper Settings - CSI Rx Cameras*

| Jumper | OV8865               | OV5647 |
|--------|----------------------|--------|
| J12    | Connect pins 1 and 2 | Open   |
| J13    | Connect pins 1 and 2 | Open   |
| J18    | Connect pins 1 and 2 | Open   |
| J19    | Connect pins 1 and 2 | Open   |

## 4. Header Pinouts

*Table 8 - CAN0 Pinouts*

| Pin # | Function | Pin # | Function |
|-------|----------|-------|----------|
| 1     | CANL     | 6     | NC       |
| 2     | NC       | 7     | NC       |

| Pin # | Function | Pin # | Function        |
|-------|----------|-------|-----------------|
| 3     | NC       | 8     | CANH            |
| 4     | GND      | 9     | NC              |
| 5     | Reserved | 10    | CAN0 Test Point |

*Table 9 - SPI0 Header*

| Pin # | Function           | Pin # | Function             |
|-------|--------------------|-------|----------------------|
| 1     | SPI_SCLK           | 5     | GND                  |
| 2     | SPI_CS Chip Select | 6     | SPI_DOUT Data Output |
| 3     | GND                | 7     | VDD_1V8 or VDD_3V3   |
| 4     | SPI_DIN Data Input | 8     | GND                  |

*Table 10 - JTAG0 Header*

| Pin # | Function     | Pin # | Function   |
|-------|--------------|-------|------------|
| 1     | 1.8 V Supply | 6     | JTAG_TDO   |
| 2     | JTAG_TMS     | 7     | GND        |
| 3     | GND          | 8     | JTAG_TDI   |
| 4     | JTAG_TCK     | 9     | GND        |
| 5     | GND          | 10    | JTAG_TRSTN |

*Table 11 - CSI0 Header*

| Pin # | Function                 | Pin # | Function            |
|-------|--------------------------|-------|---------------------|
| 1     | GND                      | 16    | CSI0 Data3 Positive |
| 2     | 2.85 V Power Supply      | 17    | CSI0 Data3 Negative |
| 3     | 1.2 V/1.8 V Power Supply | 18    | GND                 |
| 4     | 1.8 V Power Supply       | 19    | CSI0 Data2 Positive |
| 5     | 5 V Power Supply         | 20    | CSI0 Data2 Negative |
| 6     | GND                      | 21    | GND                 |
| 7     | 2.85 V Power Supply      | 22    | CSI0 Data1 Positive |
| 8     | GND                      | 23    | CSI0 Data1 Negative |
| 9     | I2C0 Serial Data         | 24    | GND                 |
| 10    | I2C0 Serial Clock        | 25    | CSI0 Clock Positive |
| 11    | CSI0 Reset               | 26    | CSI0 Clock Negative |
| 12    | CSI0 PWRDN               | 27    | GND                 |
| 13    | GND                      | 28    | CSI0 Data0 Positive |
| 14    | 25 MHz Reference Clock   | 29    | CSI0 Data0 Negative |

| Pin # | Function | Pin # | Function |
|-------|----------|-------|----------|
| 15    | GND      | 30    | GND      |

Table 12 - CSI1 Header

| Pin # | Function                 | Pin # | Function            |
|-------|--------------------------|-------|---------------------|
| 1     | GND                      | 16    | CSI1 Data3 Positive |
| 2     | 2.85 V Power Supply      | 17    | CSI1 Data3 Negative |
| 3     | 1.2 V/1.8 V Power Supply | 18    | GND                 |
| 4     | 1.8 V Power Supply       | 19    | CSI1 Data2 Positive |
| 5     | 5 V Power Supply         | 20    | CSI1 Data2 Negative |
| 6     | GND                      | 21    | GND                 |
| 7     | 2.85 V Power Supply      | 22    | CSI1 Data1 Positive |
| 8     | GND                      | 23    | CSI1 Data1 Negative |
| 9     | I2C1 Serial Data         | 24    | GND                 |
| 10    | I2C1 Serial Clock        | 25    | CSI1 Clock Positive |
| 11    | CSI1 Reset               | 26    | CSI1 Clock Negative |
| 12    | CSI1 PWRDN               | 27    | GND                 |
| 13    | GND                      | 28    | CSI1 Data0 Positive |
| 14    | 25 MHz Reference Clock   | 29    | CSI1 Data0 Negative |
| 15    | GND                      | 30    | GND                 |

Table 13 - CSI2 Header

| Pin # | Function                 | Pin # | Function            |
|-------|--------------------------|-------|---------------------|
| 1     | GND                      | 16    | CSI2 Data3 Positive |
| 2     | 2.85 V Power Supply      | 17    | CSI2 Data3 Negative |
| 3     | 1.2 V/1.8 V Power Supply | 18    | GND                 |
| 4     | 1.8 V Power Supply       | 19    | CSI2 Data2 Positive |
| 5     | 5 V Power Supply         | 20    | CSI2 Data2 Negative |
| 6     | GND                      | 21    | GND                 |
| 7     | 2.85 V Power Supply      | 22    | CSI2 Data1 Positive |
| 8     | GND                      | 23    | CSI2 Data1 Negative |
| 9     | I2C2 Serial Data         | 24    | GND                 |
| 10    | I2C2 Serial Clock        | 25    | CSI2 Clock Positive |
| 11    | CSI2 Reset               | 26    | CSI2 Clock Negative |
| 12    | CSI2 PWRDN               | 27    | GND                 |
| 13    | GND                      | 28    | CSI2 Data0 Positive |
| 14    | 25 MHz Reference Clock   | 29    | CSI2 Data0 Negative |

| Pin # | Function | Pin # | Function |
|-------|----------|-------|----------|
| 15    | GND      | 30    | GND      |

Table 14 - CSI3 Header

| Pin # | Function                 | Pin # | Function            |
|-------|--------------------------|-------|---------------------|
| 1     | GND                      | 16    | CSI3 Data3 Positive |
| 2     | 2.85 V Power Supply      | 17    | CSI3 Data3 Negative |
| 3     | 1.2 V/1.8 V Power Supply | 18    | GND                 |
| 4     | 1.8 V Power Supply       | 19    | CSI3 Data2 Positive |
| 5     | 5 V Power Supply         | 20    | CSI3 Data2 Negative |
| 6     | GND                      | 21    | GND                 |
| 7     | 2.85 V Power Supply      | 22    | CSI3 Data1 Positive |
| 8     | GND                      | 23    | CSI3 Data1 Negative |
| 9     | I2C3 Serial Data         | 24    | GND                 |
| 10    | I2C3 Serial Clock        | 25    | CSI3 Clock Positive |
| 11    | CSI3 Reset               | 26    | CSI3 Clock Negative |
| 12    | CSI3 PWRDN               | 27    | GND                 |
| 13    | GND                      | 28    | CSI3 Data0 Positive |
| 14    | 25 MHz Reference Clock   | 29    | CSI3 Data0 Negative |
| 15    | GND                      | 30    | GND                 |

Table 15 - CSI4 Header

| Pin # | Function          | Pin # | Function            |
|-------|-------------------|-------|---------------------|
| 1     | GND               | 16    | CSID DATA3 Positive |
| 2     | SPIS Clock        | 17    | CSID DATA3 Negative |
| 3     | SPIS Data Output  | 18    | GND                 |
| 4     | SPIS Data Input   | 19    | CSID DATA2 Positive |
| 5     | 5 V Power supply  | 20    | CSID DATA2 Negative |
| 6     | GND               | 21    | GND                 |
| 7     | SPIS Chip Select  | 22    | CSID DATA1 Positive |
| 8     | GND               | 23    | CSID DATA1 Negative |
| 9     | I2C0 Serial Data  | 24    | GND                 |
| 10    | I2C0 Serial Clock | 25    | CSID Clock Positive |
| 11    | NC                | 26    | CSID Clock Negative |
| 12    | NC                | 27    | GND                 |
| 13    | GND               | 28    | CSID DATA0 Positive |
| 14    | NC                | 29    | CSID DATA0 Negative |
| 15    | GND               | 30    | GND                 |

Table 16 - MICIN HPOUT Header

| Pin # | Function                  | Pin # | Function |
|-------|---------------------------|-------|----------|
| 1     | Microphone Input          | 4     | GND      |
| 2     | Head Phone Output - Left  | 5     | NC       |
| 3     | Head Phone Output - Right | 6     | NC       |

Table 17 - USB0 Header

| Pin # | Function                      | Pin # | Function                         |
|-------|-------------------------------|-------|----------------------------------|
| 1     | 5 V Power Supply              | 7     | GND                              |
| 2     | Data Negative                 | 8     | Super Speed Transmitter Negative |
| 3     | Data Positive                 | 9     | Super Speed Transmitter Positive |
| 4     | GND                           | 10    | Shield                           |
| 5     | Super Speed Receiver Negative | 11    | Shield                           |
| 6     | Super Speed Receiver Positive | -     |                                  |

Table 18 - SD Header

| Pin # | Function           | Pin # | Function           |
|-------|--------------------|-------|--------------------|
| 1     | Data 2             | 6     | GND                |
| 2     | Data 3             | 7     | Data 0             |
| 3     | Command Pin        | 8     | Data 1             |
| 4     | 3.3 V Power Supply | 9     | Card Detect        |
| 5     | Clock Input        | 10    | Card Detect Ground |

## 5. Raspberry Pi Interface Connector

Table 19 - Raspberry Pi Interface Connector

| Pin # | Function           | Pin # | Function       |
|-------|--------------------|-------|----------------|
| 1     | 3.3 V Power Supply | 21    | QSPI SIN1      |
| 2     | 5 V Power Supply   | 22    | GPIOEXP_GPIO11 |
| 3     | I2C0 SDA           | 23    | QSPI SCLK      |
| 4     | 5 V Power Supply   | 24    | QSPI CS1       |
| 5     | I2C0 SCL           | 25    | GND            |
| 6     | GND                | 26    | QSPI CS2       |
| 7     | GPIOEXP_GPIO0      | 27    | GPIOEXP_GPIO4  |
| 8     | UART1 SIN          | 28    | GPIOEXP_GPIO12 |
| 9     | GND                | 29    | GPIOEXP_GPIO5  |

| Pin # | Function           | Pin # | Function       |
|-------|--------------------|-------|----------------|
| 10    | UART1 SOUT         | 30    | GND            |
| 11    | GPIOEXP_GPIO1      | 31    | GPIOEXP_GPIO6  |
| 12    | I2S SYCLK          | 32    | GPIOEXP_GPIO13 |
| 13    | GPIOEXP_GPIO2      | 33    | GPIOEXP_GPIO7  |
| 14    | GND                | 34    | GND            |
| 15    | GPIOEXP_GPIO3      | 35    | I2S WS Rx Tx   |
| 16    | GPIOEXP_GPIO9      | 36    | GPIOEXP_GPIO14 |
| 17    | 3.3 V Power Supply | 37    | GPIOEXP_GPIO8  |
| 18    | GPIOEXP_GPIO10     | 38    | I2S SDI        |
| 19    | QSPI SIN0          | 39    | GND            |
| 20    | GND                | 40    | I2S DSO        |

## 6. M.2 Connector

Table 20 - M.2 Interface Connector

| Pin # | Function      | Pin # | Function                        |
|-------|---------------|-------|---------------------------------|
| 1     | GND           | 2     | 3.3V                            |
| 3     | NC            | 4     | 3.3V                            |
| 5     | NC            | 6     | NC                              |
| 7     | GND           | 8     | SOM_I2S_SCK_RX / SOM_I2S_SCK_TX |
| 9     | SOM_SDIO1_CLK | 10    | SOM_I2S_WS_RX / SOM_I2S_WS_Tx   |
| 11    | SDIO1_CMD     | 12    | SOM_I2S_SDO                     |
| 13    | SDIO1_DATA0   | 14    | SOM_I2S_SDI                     |
| 15    | SDIO1_DATA1   | 16    | NC                              |
| 17    | SDIO1_DATA2   | 18    | GND                             |
| 19    | SDIO1_DATA3   | 20    | UART_WAKE#                      |
| 21    | SDIO1_WAKE#   | 22    | M2_UART1_SOUT                   |
| 23    | SDIO_RESET#   | 24    | NC                              |
| 25    | NC            | 26    | NC                              |
| 27    | NC            | 28    | NC                              |
| 29    | NC            | 30    | NC                              |
| 31    | NC            | 32    | M2_UART1_SIN                    |
| 33    | GND           | 34    | M2_UART1_RTS_N                  |
| 35    | NC            | 36    | M2_UART1_CTS_N                  |
| 37    | NC            | 38    | 1.8V / 3.3V                     |
| 39    | GND           | 40    | 1.8V / 3.3V                     |

| Pin # | Function  | Pin # | Function     |
|-------|-----------|-------|--------------|
| 41    | NC        | 42    | 1.8V / 3.3V  |
| 43    | NC        | 44    | COEX3        |
| 45    | GND       | 46    | COEX_RXD     |
| 47    | NC        | 48    | COEX_TXD     |
| 49    | NC        | 50    | SUSCLK_32KHz |
| 51    | GND       | 52    | NC           |
| 53    | NC        | 54    | W_DISABLE2#  |
| 55    | NC        | 56    | W_DISABLE1#  |
| 57    | GND       | 58    | M2_I2C0_SDA  |
| 59    | NC        | 60    | M2_I2C0_SCL  |
| 61    | BT_GPIO_3 | 62    | NC           |
| 63    | GND       | 64    | NC           |
| 65    | BT_GPIO_4 | 66    | UIM_SWP      |
| 67    | BT_GPIO_5 | 68    | NC           |
| 69    | GND       | 70    | NC           |
| 71    | NC        | 72    | 3.3V         |
| 73    | NC        | 74    | 3.3V         |
| 75    | GND       | -     |              |

## 7. Environmental Conditions

*Table 21 - CB2 Environmental Conditions*

| Condition             | Range                                   |
|-----------------------|-----------------------------------------|
| Operating temperature | 0°C to 50°C                             |
| Storage temperature   | 5°C to 40°C                             |
| Operating voltage     | 9 V DC $\pm 10\%$ or 12 V DC $\pm 10\%$ |
| Humidity              | 20% to 70%                              |

*Table 22 - SoM Commercial Environmental Conditions*

| Condition             | Range                     |
|-----------------------|---------------------------|
| Operating temperature | 0°C to 70°C               |
| Storage temperature   | -20°C to 80°C             |
| Operating voltage     | +5V to +12V $\pm 10\%$ DC |
| Humidity              | 20% to 70%                |

## 8. P1600 SoM and CB2 Certifications

EMI filtering is provided on all low speed interfaces to the SoM and all off board interfaces. EMI protection is provided on all off-board interfaces.

All headers will have ESD protection.

### EMC Standards

- CE Mark (Europe)
  - RoHS – Restriction of hazardous Substances
  - EN 55032:2015/A11:202004/11/2020 - EMC of multimedia equipment (Emissions)
  - EN 55035:201706/08/2019 - EMC of multimedia equipment (Immunity)
- AS/NZS CISPR 32:2015 AMD 1:2020 (Australia / New Zealand)
- FCC (US/Canada) - Emissions only
  - FCC CFR 47 Part 15 Subpart B
  - ICES-003 Issue 6
  - A NSI C63.4-2014
- VCCI (Japan)- Emissions only
  - VCCI-CISPR 32:2016
- Korea
  - KN32 (Emissions)
  - KN35 (Immunity)

Table 23 - Certifications

| Region      | Certification                |
|-------------|------------------------------|
| U.S.        | FCC part 15 of the FCC rules |
| Europe      | CE                           |
| Asia, Japan | TELEC (MIC)                  |

## 9. Shock and Vibration Standards (SoM)

Table 24 - Shock and Vibration Standards

| Test      | Type                   | Standard                                                               |
|-----------|------------------------|------------------------------------------------------------------------|
| Vibration | Sine non operational   | IEC60068-2-6 0.75G, 10-500 Hz, 1 sweep/axis, 3 axes total, operational |
| Vibration | Sine operational       | IEC60068-2-6 0.25G, 10-500 Hz, 1 sweep/axis, 3 axes total, operational |
| Vibration | Random non operational | IEC60068-2-64 10-500 Hz, 2 Grms, 1 hour/axis, non-operational          |

| Test      | Type                             | Standard                                                              |
|-----------|----------------------------------|-----------------------------------------------------------------------|
| Vibration | Random operational               | IEC60068-2-64 10-500 Hz,1 Grms,15 mins/axis, non-operational          |
| Shock     | Mechanical shock operational     | IEC60068-2-27 40G, half sine, 1 shock/axis, 3 axes total, operational |
| Shock     | Mechanical shock non-operational | Tested to 90G otherwise as per JESD22-B110                            |

## 10. Product Support and Further Information

### 10.1. Revision History

*Table 25 - Revision History*

| Revision | Date        | Changes / Comments |
|----------|-------------|--------------------|
| 1.0      | 03-Mar-2022 | First release      |

### 10.2. Further Information

Product technical support is provided via the Blaize Customer Portal. For support resources such as Documentation, Downloads, and Forums, go to <https://www.blaize.com/support/>

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