TLA-BAFC-R0M0E0 - Myriad X SoM PoE Vision Solution

1 Features

BW2099 SoM

- Intel Movidius Myriad X VPU ma2485-C0
- 16GB eMMC 5.1
- 128MB QSPI NOR Flash
- 32Kb I2C EEPROM
- USB3.1, gen2 10gbps
- PCIe x1 (ext. ref clk)
- 1x 4-Lane MIPI CSI-2 D-PHY
- 2x 2-Lane MIPI CSI-2 D-PHY
- QSPI, SDIO, UART, I2C
- Boot Modes Supported: NOR, eMMC, USB, Ethernet (EEPROM)

BW2098POE Baseboard

- IEEE802.3af 15W PoE (54V)
- 5.5mmx2.1mm barrel jack (5V)
- 1gbps Ethernet (RTL8111HS)
- PCIe ref clk for SoM
- 26pin FFC 4-Lane MIPI camera interface
- uSD card socket (SDIO)
- SoM reset button and BOOT switches
- Auxiliary connections to QSPI, UART, I2C
- Boot modes supported: USB, NOR, eMMC, SD-Card, EEPROM, SPI, and Ethernet

2 Applications

- Industrial automation
- Robotics and autonomy
- Security systems
- Remote intelligence

3 Description

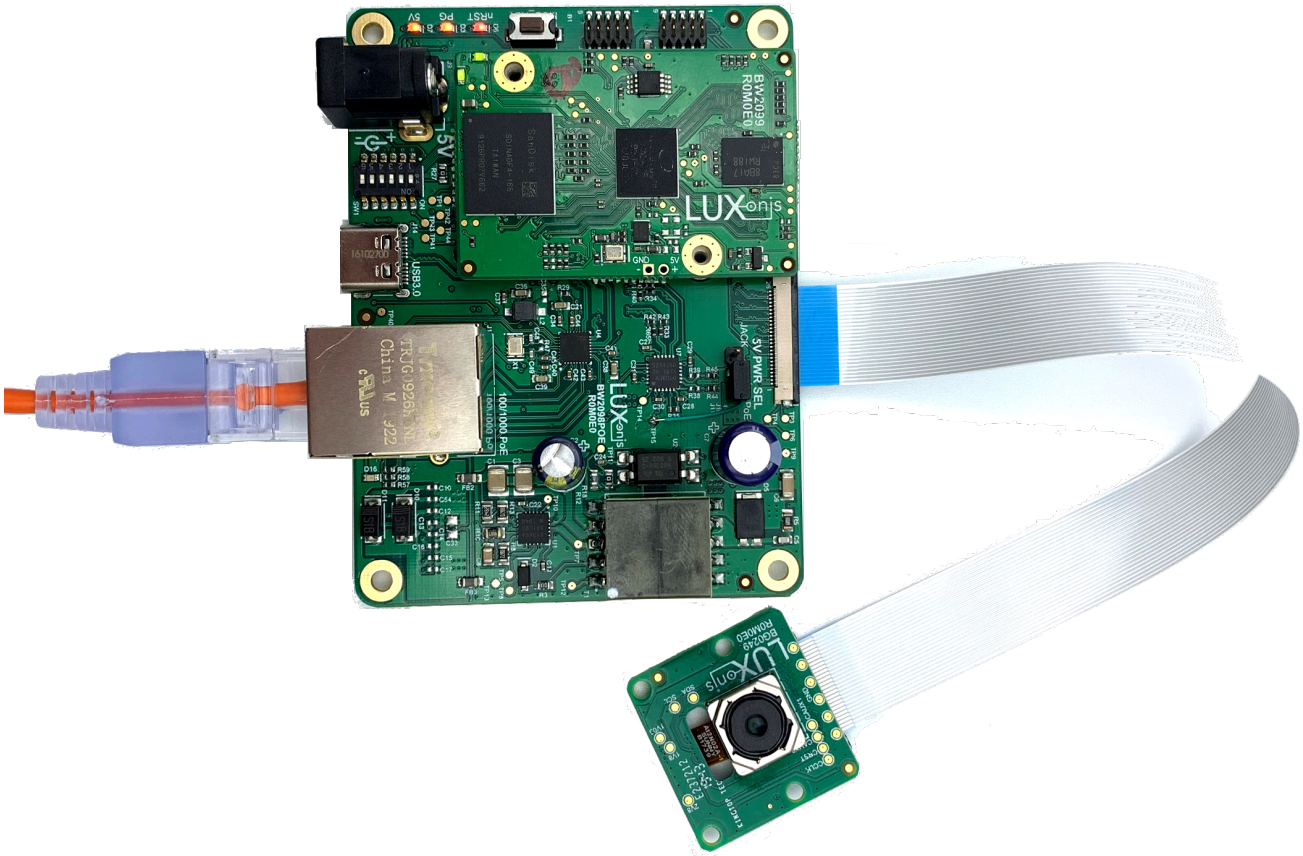
The Luxonis TLA-BAFC-R0M0E0 is an intelligent Edge/Embedded vision system driven by Intel Movidius Myriad X VPU (ma2485), consisting of a SoM (BW2099) and baseboard (BW2098POE). The system is powered by user selectable PoE (IEEE 802.3af Type 1 compliant) or 5V barrel jack (for convenience). A 4-lane MIPI interface allows input from the included Luxonis TLA-BAFB-R0M0E0 IMX378, 12MP camera module. The baseboard offers a USB 3.1, gen2 (10gbps), type-c connectivity along with 10/100/1000BASE-T Ethernet as the primary interfaces. Also broken out are QSPI, UART, and I2C on auxiliary connectors. An SDIO interface allows usage of microSD card.

The BW2099 SoM contains the ma2485 C0 VPU, along with 16GB eMMC 5.1, 128MB QSPI NOR flash, EEPROM, and on-board power regulation. QSPI, UART, I2C, and SDIO are broken out from the SoM and routed to the baseboard for use. The SoM interfaces with the baseboard through two 10-gbps-rated 100-pin DF40C-100DP-0.4V(51) connectors offering further expandability and flexibility. Boot switches on the baseboard allow the Myriad X VPU to boot from USB, NOR flash, eMMC, EEPROM, SPI and Ethernet (RTL8111HS driver in EEPROM).

Device Information

PART NUMBER	SIZE (W x L x H)[1]
TLA-BAFC-R0M0E0	60mm x 80mm x 24mm
BW2099	60mm x 80mm x 17.5mm
BW2098POE	30mm x 45mm 18mm

1) Including components and heatsink



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4 Electrical Characteristics

4.1 Absolute Maximum Ratings

SYMBOL	RATINGS	MIN	MAX	UNIT
V_{IN}	External input supply voltage range.[2]	3.6	5.5	V
$V_{I/O}$[3]	Input voltage SoM I/O	-0.3	2.0	V
V_{SDIO}	Input voltage, SDIO interface	-0.3	3.6	V
I_{OUT_CAM}	External output supply current range for camera (J6)		500	mA
$I_{I/O}$[3]	IO output current drive strength (SoM)		12	mA
T_J	Junction temperature.		105	C
T_{STG}	Storage temperature.	-30	150	C

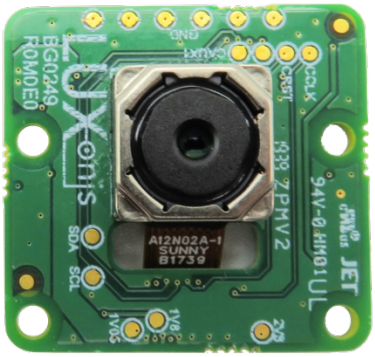
4.2 Recommended Operating Conditions

SYMBOL	RATINGS	MIN	TYP	MAX	UNIT
V_{IN}	External input supply voltage range.[2]	4.5	5.0	5.25	V
$V_{I/O}$	Input voltage range Myriad X GPIO	0		1.8	V
V_{SDIO}	Input voltage, SDIO interface	0		3.3	V
I_{OUT_CAM}	External output supply current range for camera			500	mA
P_Q	PoE quiescent power draw		0.90		W
P_{IDLE}	PoE idle power draw (Myriad X booted)		1.35		W
P_{INFR}	PoE inference power draw		3.35		W
T_A	Ambient operating temperature			50	°C
T_J	Junction temperature.			105	°C

1) Stresses beyond those listed under *Absolute Maximum Ratings* may cause permanent damage to the device. These are stress ratings only, which do not imply functional operation of the device at these or any other conditions beyond those indicated under *Recommended Operating Conditions*. Exposure to absolute-maximum-rated conditions for extended periods may affect device reliability.
2) Applies to 5.5mm x 2.1mm barrel jack only. Power by PoE dictated by compliance to IEEE 802.3af and/or 802.3at.
3) Applies to all baseboard I/O connectors J4, J5, J6, J8

5 Camera Compatibility

The TLA-BAFC-R0M0E0 includes Luxonis' TLA-BAFB-R0M0E0, 12MP/60Hz modular color camera based on the Sunny A12N02A with Sony IMX378 image sensor, pictured below:



Other cameras are compatible directly, including the Sunny A12N04A (also IMX378) or indirectly by use of a passive adapter board. For example the BW0253_R0M0E0 (here) supports every generation of Pi Camera to be used with the TLA-BAFC-R0M0E0, including:

- Raspberry Pi High Quality Camera (IMX477)
- Raspberry Pi v2 Camera (IMX219)
- Raspberry Pi v1 Camera (OV5645)

Additionally, the 26-pin FFC supports both 4-lane and 2-lane MIPI connections and is sufficient to work with the following supported image sensors with minimal modular carrier boards for the image sensor/camera module, similar to the TLA-BAFC-R0M0E0 for the IMX378, or through adapter boards such as the BW0253_R0M0E0 (here).

- IMX214 (Sunny module IMX214R0)
- IMX334 (Leopard Imaging LIIMX334)
- IMX477 (via RPi HQ Camera)
- OV9282 (Sunny TG161B)
- OV7750/OV7251 (Sunny MV200)
- IMX412 (Leopard Imaging IMX412_MIPI_INTL)
- SC2232H (BWA001-FFC)
- OV2735 (BWA002-FFC)
- OV5645 (BWA003-FFC)
- IMX390 (BWA004-FFC)
- SC5335 (BWA006-FFC)
- IMX363 (BWA007-FFC)
- SC8238 (BWA008-FFC)
- OV12895 (BWA009-FFC)
- IMX283 (BWA011-FFC)

Luxonis is well-equipped to write drivers and perform ISP tuning for other image sensors/modules not listed herein. Inquiries for new sensor/module support should be directed to support@luxonis.com.

6 Mechanical Information

The following information is the most current data available for the designated device. This data is subject to change without notice and without revision of this document.

6.1 BW2098POE Top View

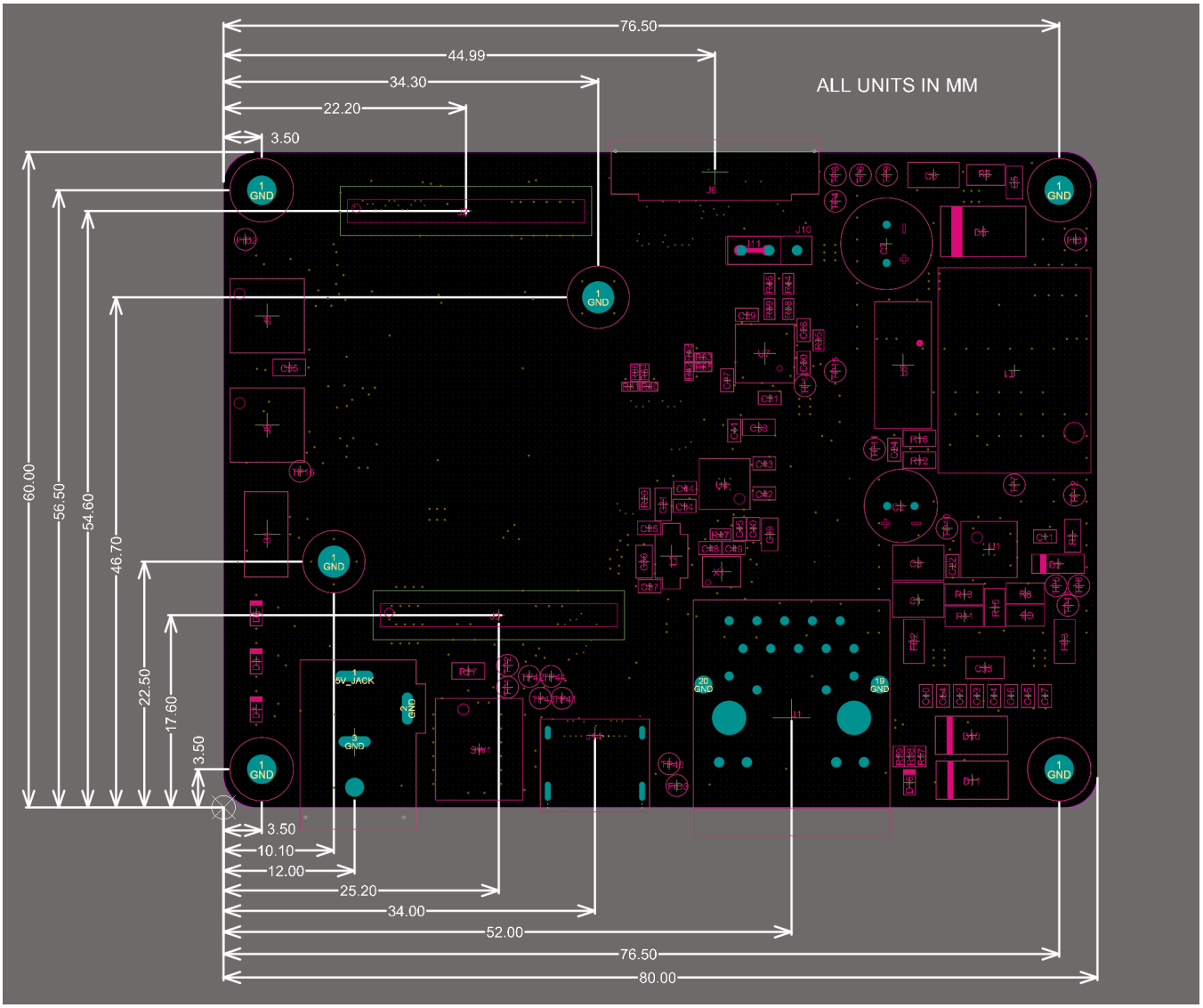


Figure 1 - BW2098POE_R0M0E0 Top View Dimensions

6.2 BW2098POE Bottom View (through board)

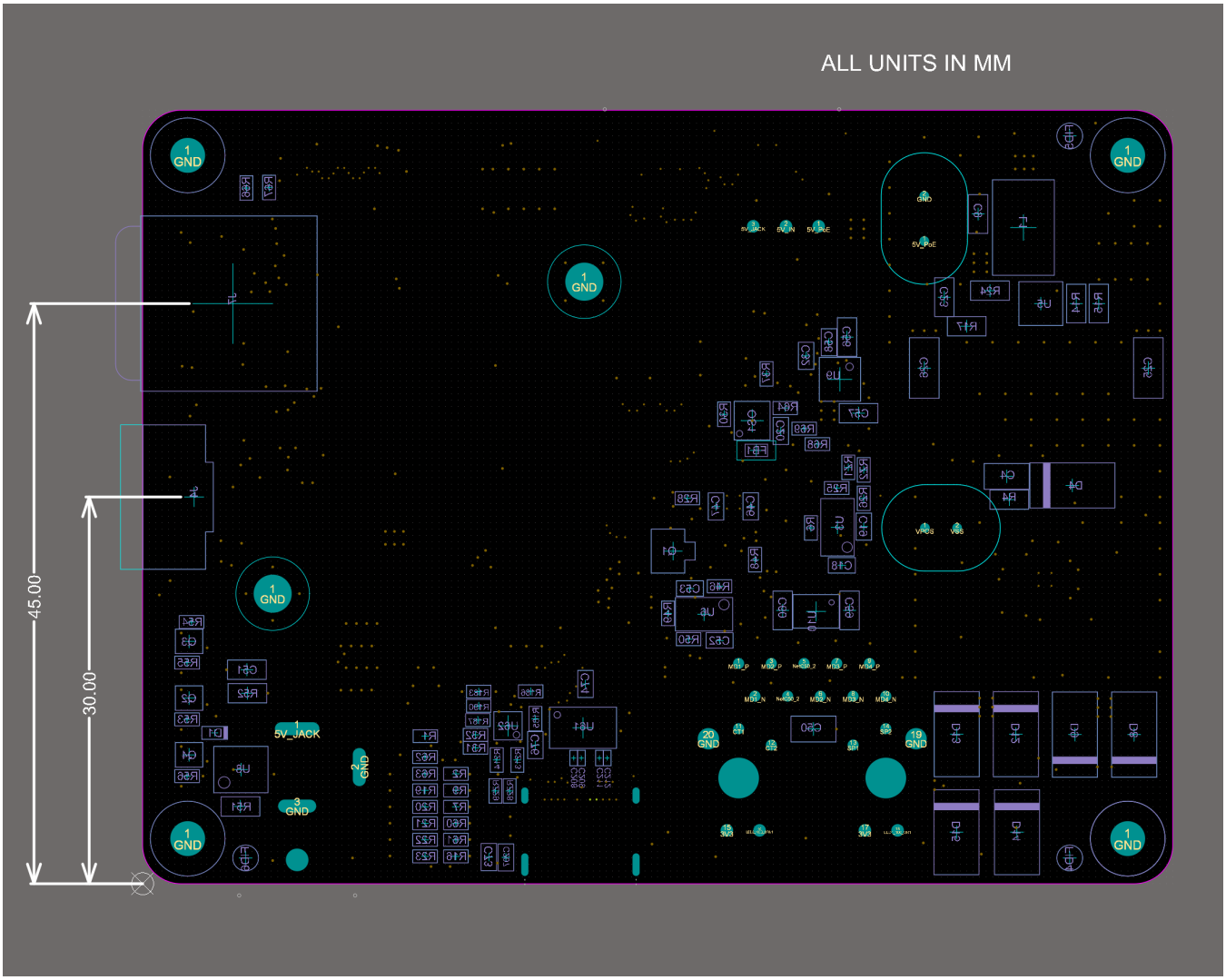


Figure 2 - BW2098POE_R0M0E0 Bottom View Dimensions

6.3 BW2099 Top View

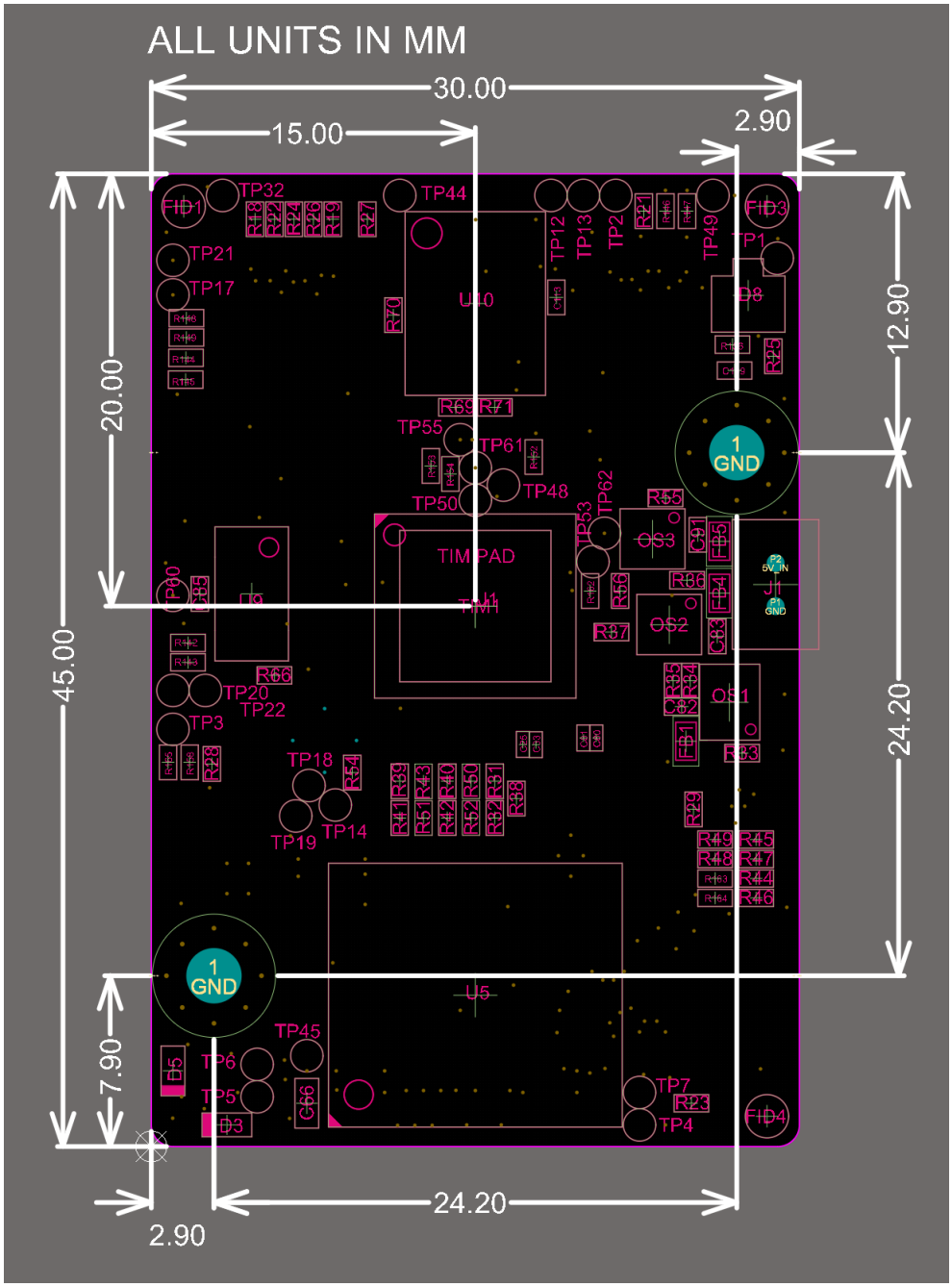


Figure 3 - BW2099_R0M0E0 Top View Dimensions

6.4 BW2099 Bottom View (through board)

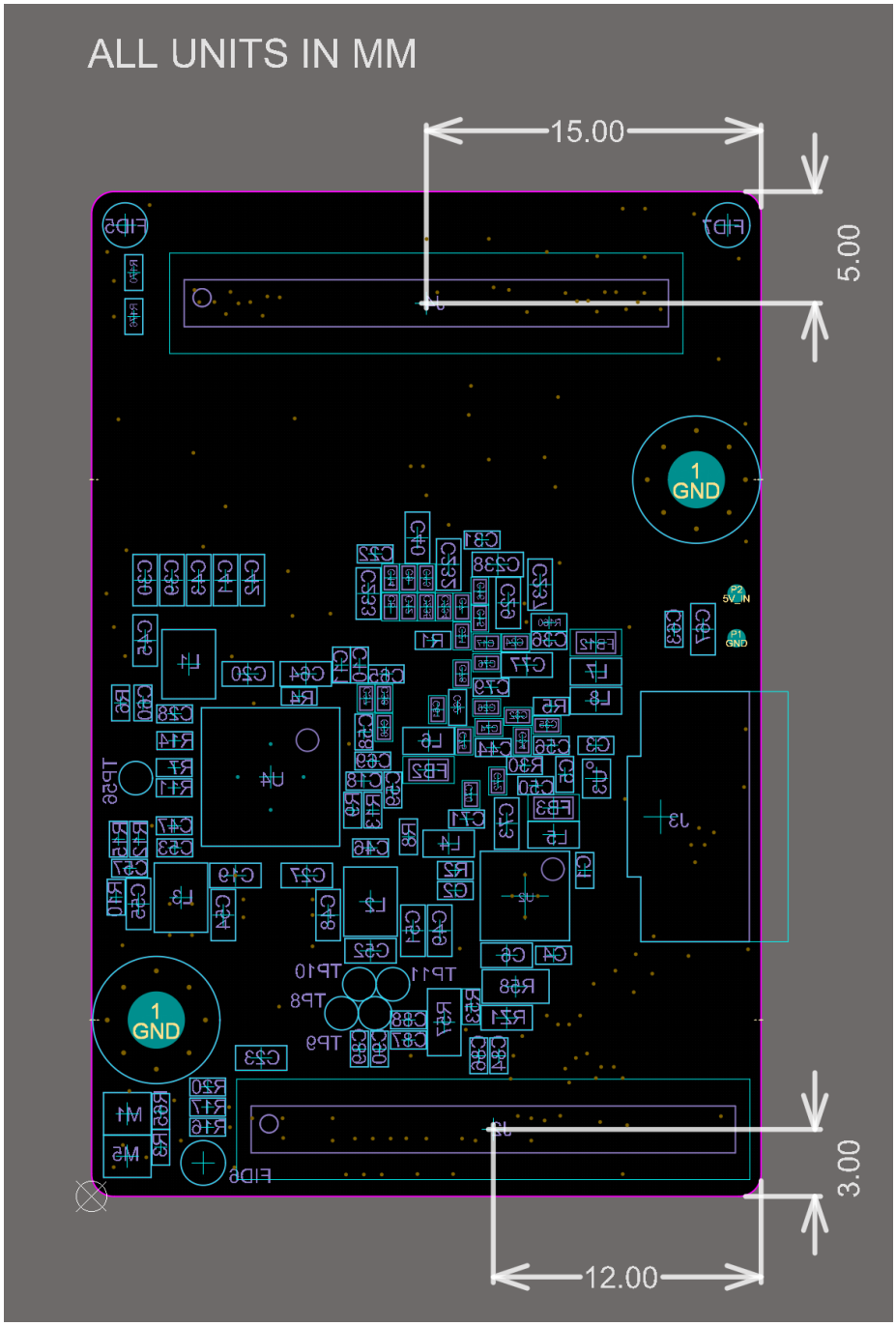


Figure 4 - BW2099 Bottom View Dimensions