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REGULUS
AI Single Board Computer (SBC) Datasheet

Hardware Datasheet

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Document Revision History

Revision	Date	Description
Ver 1.0	Feb. 6, 2026	Initial Draft

List of Terms

List	Description
Note	All referenced brands, product names, service names and trademarks are property of their respective owners
SoM	System-on-Module

Table of Contents

1. Introduction

REGULUS AI Single Board Computer (SBC) is a complete, standalone AI system that operates independently of a separate host computer. While a standard chip or module requires external circuitry to function, this SBC provides everything needed to move an AI project from a desk prototype to a field-ready device.

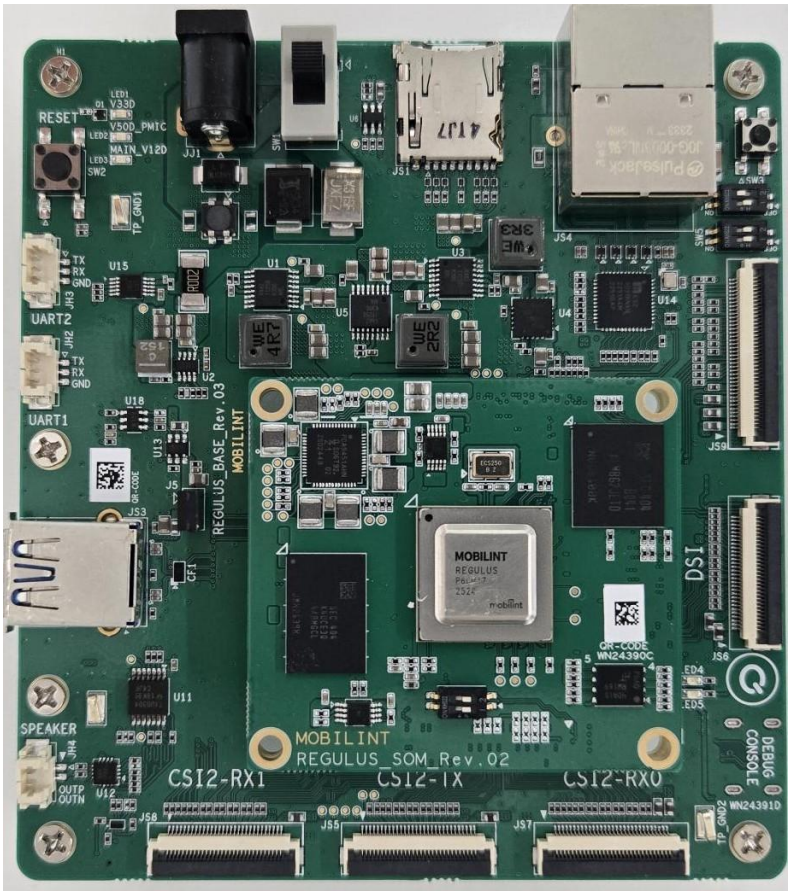

Figure 1오류! 지정한 스타일은 사용되지 않습니다.**-1** REGULUS AI Single Board Computer (SBC) – Top view

1.1. Overview

REGULUS AI SBC consists of two independent boards: REGULUS-SoM (system-on-module board) board and REGULUS-Carrier (carrier board).

MLM-1 SoM (shown in Figure 1-2) is a system-on-module (SOM) board consisting of REGULUS, the neural processing unit or NPU, and other configurations such as DRAM, eMMC, SPI.

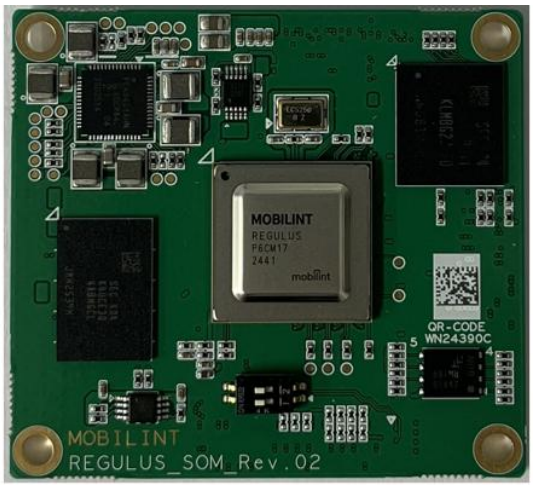

Figure 1-2. Board Overview – MLM-1 SoM

REGULUS-Carrier is the carrier board for MLM-1 SoM. It consists of communication interfaces for the operation of REGULUS. In this manual, the description of the base board is based on the "base-b" board.

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REGULUS, the AI system-on-chip, features a fully coherent core complex built on a quad-core ARM Cortex-A53 and an ARM Cortex-M0+ coprocessor, along with dedicated hardware blocks for image signal processing, video encoding/decoding, and deep learning acceleration, making it well-suited for real-time AI workloads on embedded systems.

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1.2. Features

The REGULUS AI SBC board contains various communication interfaces and features that assist the development of application programs using REGULUS. Refer to Table 1-1 for the full set of features available on the REGULUS AI SBC.

Table 1-1. Board Features

Feature	Description
Processor	REGULUS (NPU included)
DRAM Memory	8 GByte LPDDR4X
Mass Storage	32GByte eMMC v5.1
	256Mbit Dual/Quad SPI Flash
	microSD Card Socket
Camera	MIPI CSI2-RX 2CH

Feature	Description
	BT1120 1CH
ISP	**Control Scheme:** Frame by frame **Input Format for Display Input:** 8/10-bit YUV420, YUV422, YUV444, and RGB **Input/Output Image Size:** 128×32 to 3840×2160 **Input Format for C&M Frame Compression (CF10):** 8/10-bit C&M frame compression format **Input Format for Uncompressed Image:** 8/10-bit YUV420, YUV422, YUV444, and RGB - 2-plane for YUV420, YUV422, and YUV444 - 1-plane for YUV422, YUV444, and RGB **Output Format for Display Output:** 8/10-bit YUV420, YUV422, YUV444, and RGB **Output Format for AFBC:** Can be connected to stand-alone ARM AFBC module **Output Format for Uncompressed Image:** 8/10-bit YUV420, YUV422, YUV444, and RGB - 2-plane for YUV420, YUV422, and YUV444 - 1-plane for YUV422, YUV444, and RGB **Scaler:** Arbitrary scaling ratio from 1/8 to 8 with 128 phases - Horizontal/vertical scaling ratio is independent - Input and output pixels must be multiples of 4 **Color Space Converter:** - Supports YUV to RGB conversion - Supports RGB to YUV conversion

Feature	Description
	Direct I/F: Supports direct interface to reduce system bandwidth **AFBC Interface:** Output can be connected to ARM AFBC for YUV420/422/444 and RGB formats **Built-in Film Grain Noise for AV1:** CF10 input supports film grain noise for AV1
Multimedia	**Formats:** HEVC and H.264/AVC, up to 8-bit 4K @ 60fps **Encoders:** - H.265/HEVC Encoder ■ Main and Main Still Picture Profiles @ Level 5.1, High Tier - H.264/AVC Encoder ■ Baseline, Constrained Baseline, Main, and High Profiles @ Level 5.2 - MJPEG Encoder ■ Baseline and Extended Sequential ■ ISO/IEC 10918-1 JPEG compliant **Decoders:** - H.265/HEVC Decoder ■ Main and Main Still Picture Profiles @ Level 5.1, High Tier - H.264/AVC Decoder ■ Baseline, Constrained Baseline, Main, and High Profiles @ Level 5.2 - MJPEG Decoder ■ Baseline and Extended Sequential ■ ISO/IEC 10918-1 JPEG compliant
Display	MIPI CSI2-TX 1CH
	MIPI DSI
Ethernet	1Gbit/s Ethernet with RJ45 1CH

Feature	Description
USB	USB 3.1 Type A, C Connector
UART	Type C USB for UART0, 3-pin connector for UART1
Audio	I2S Interfaces, Speaker OUT & MIC
Debug Connector	JTAG 12Pin Connector
Power	DC +12V

The figures below illustrate the configuration of the MLM-1 SoM and the Carrier board.

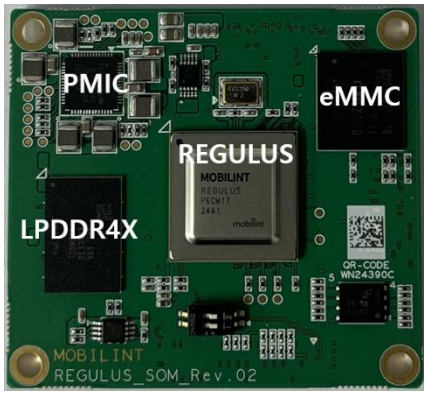

Figure 1-3. Configuration – MLM-1 SoM

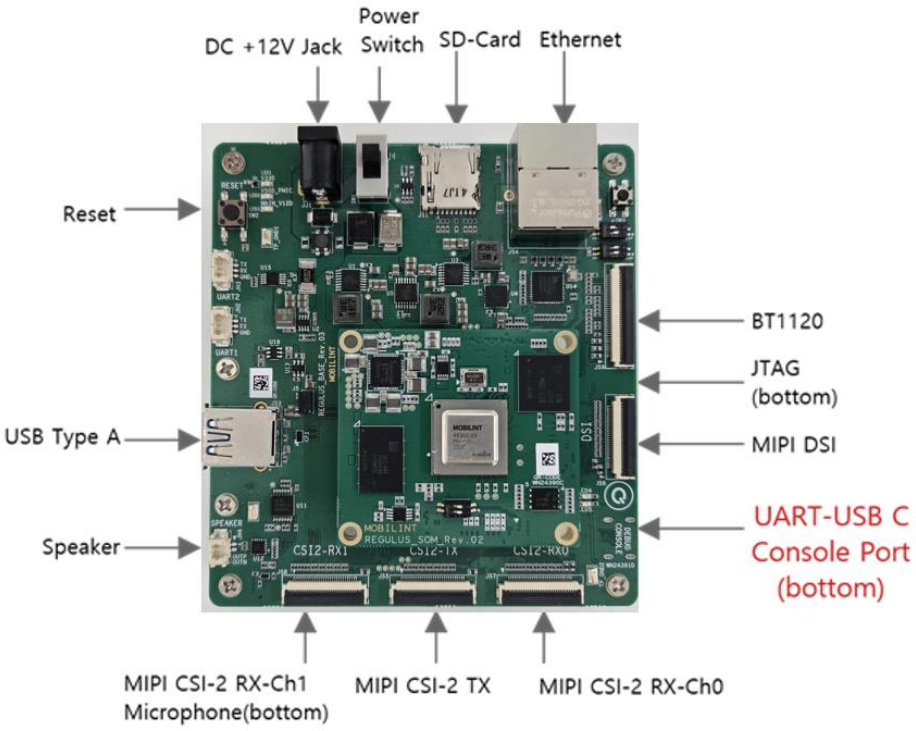

Figure 1-4. Carrier Board Configuration

2. Dimensions

The dimensions of REGULUS-powered MLM-1 SoM are 55 × 50 mm.

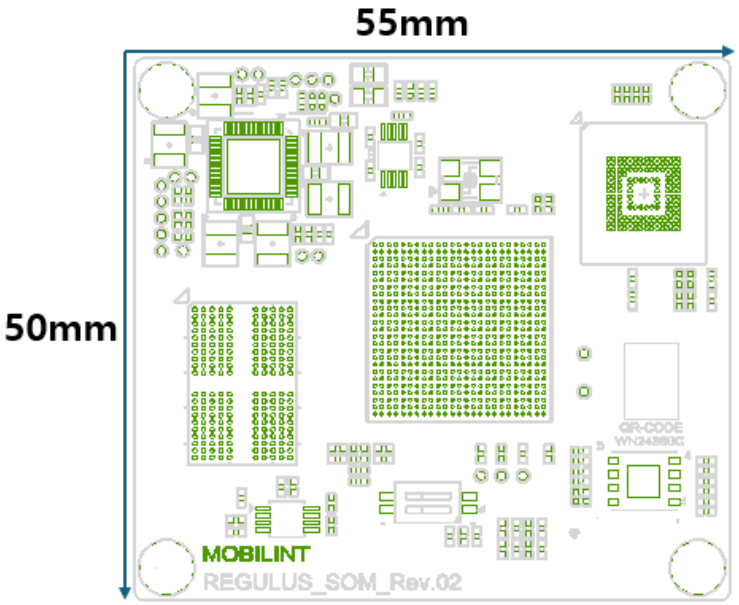

Figure 2-1. MLM-1 SoM dimension

3. Pin Map

MLM-1 SoM includes three 100-pin connectors, and the signal definitions for each connector are assigned according to the pin map below.

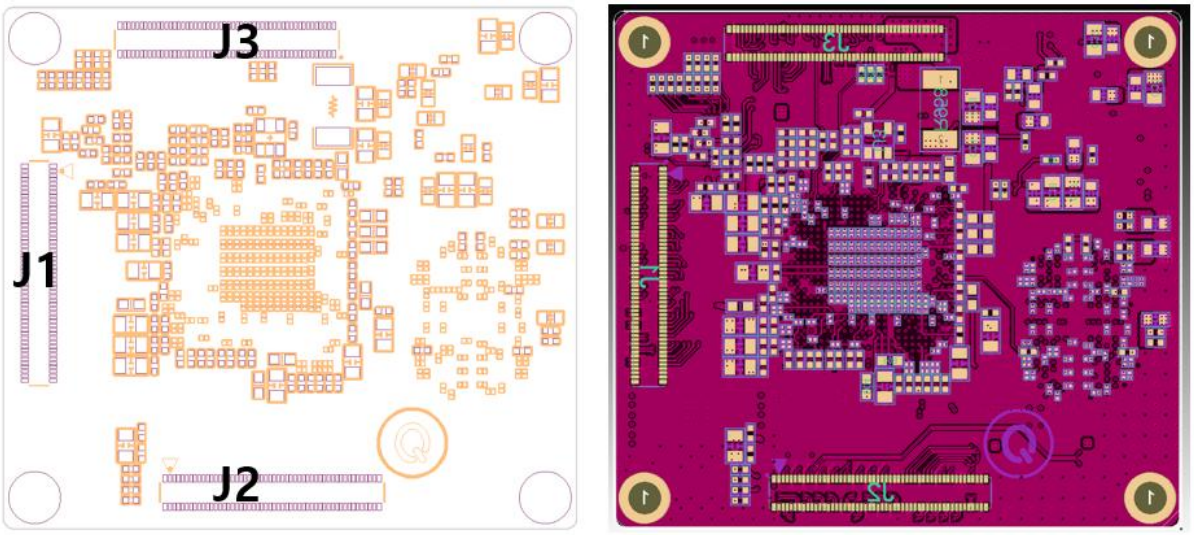

Figure 3-1. Development Configuration

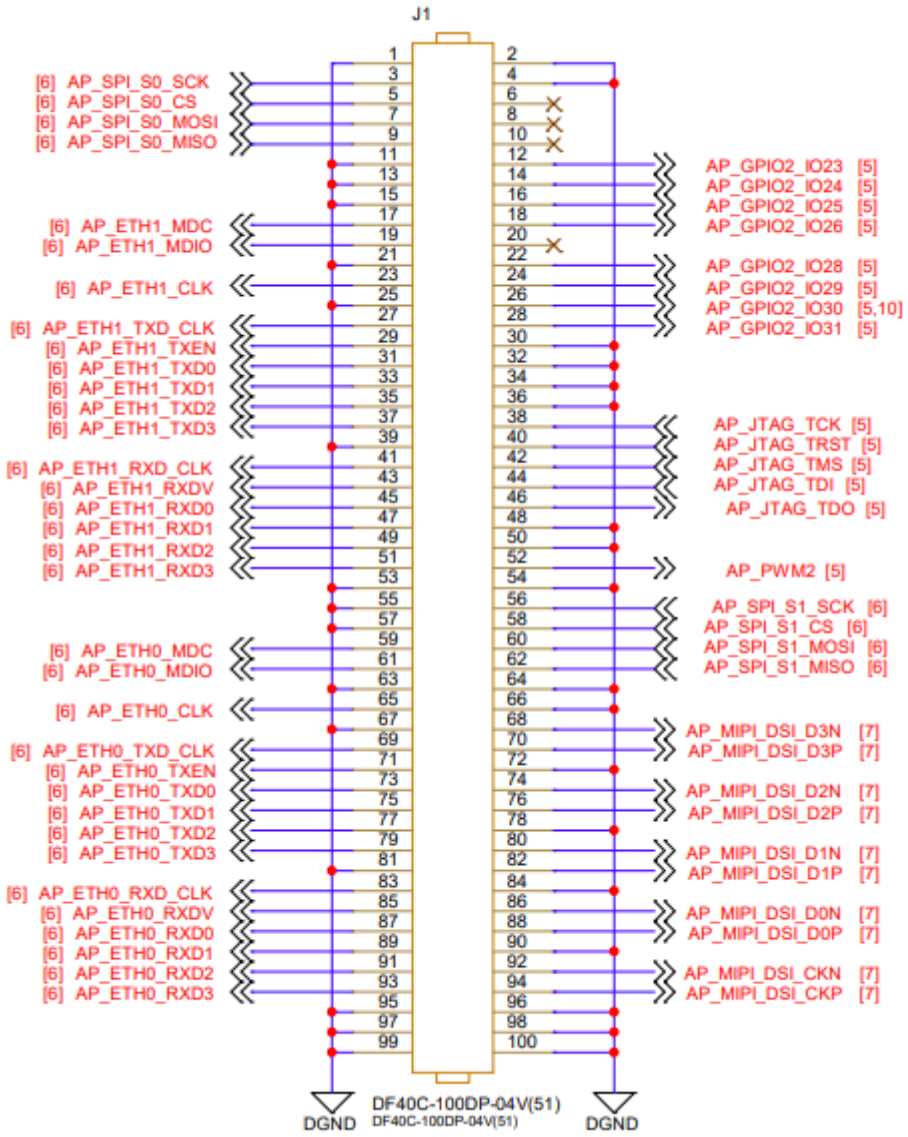

Figure 3-2. J1 pin configuration

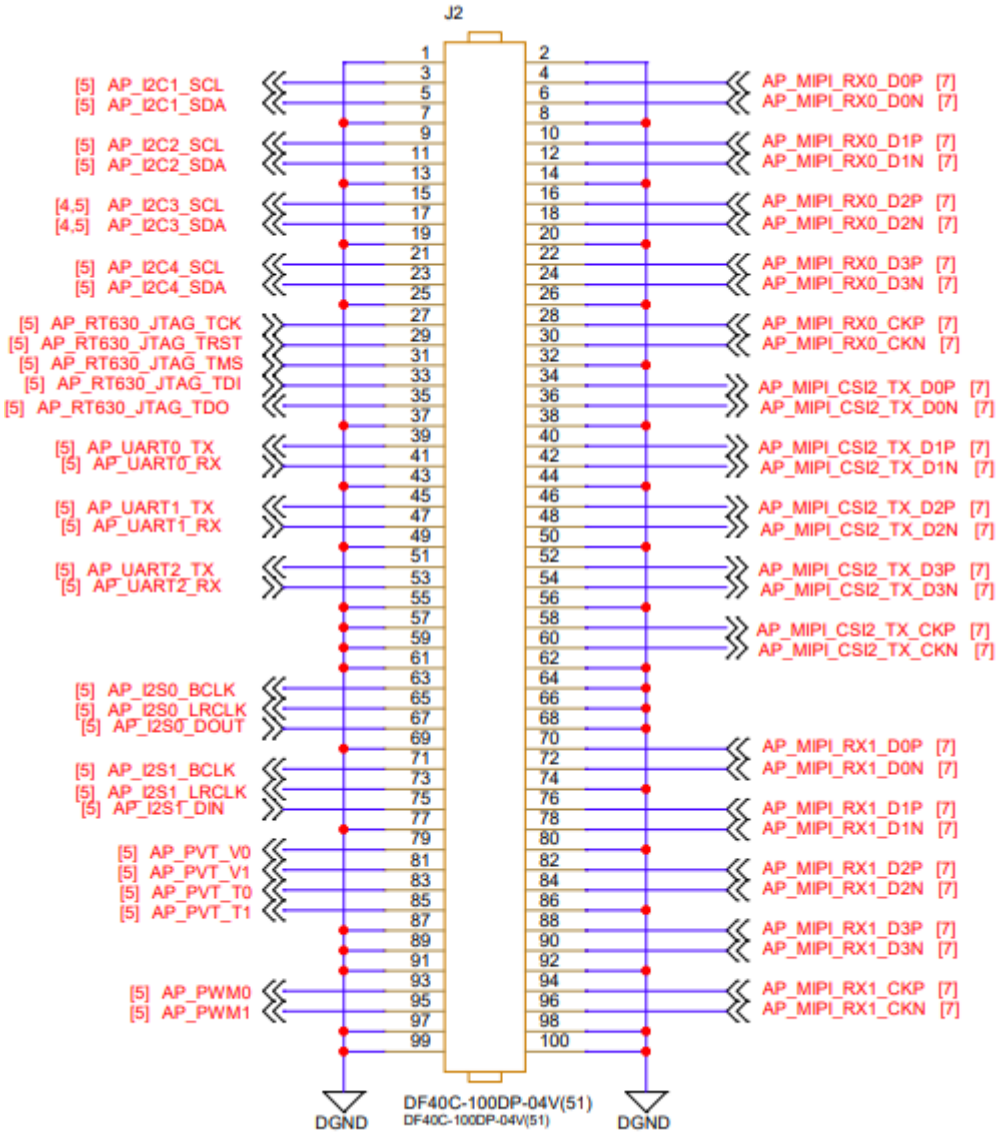

Figure 3-3. J2 pin configuration

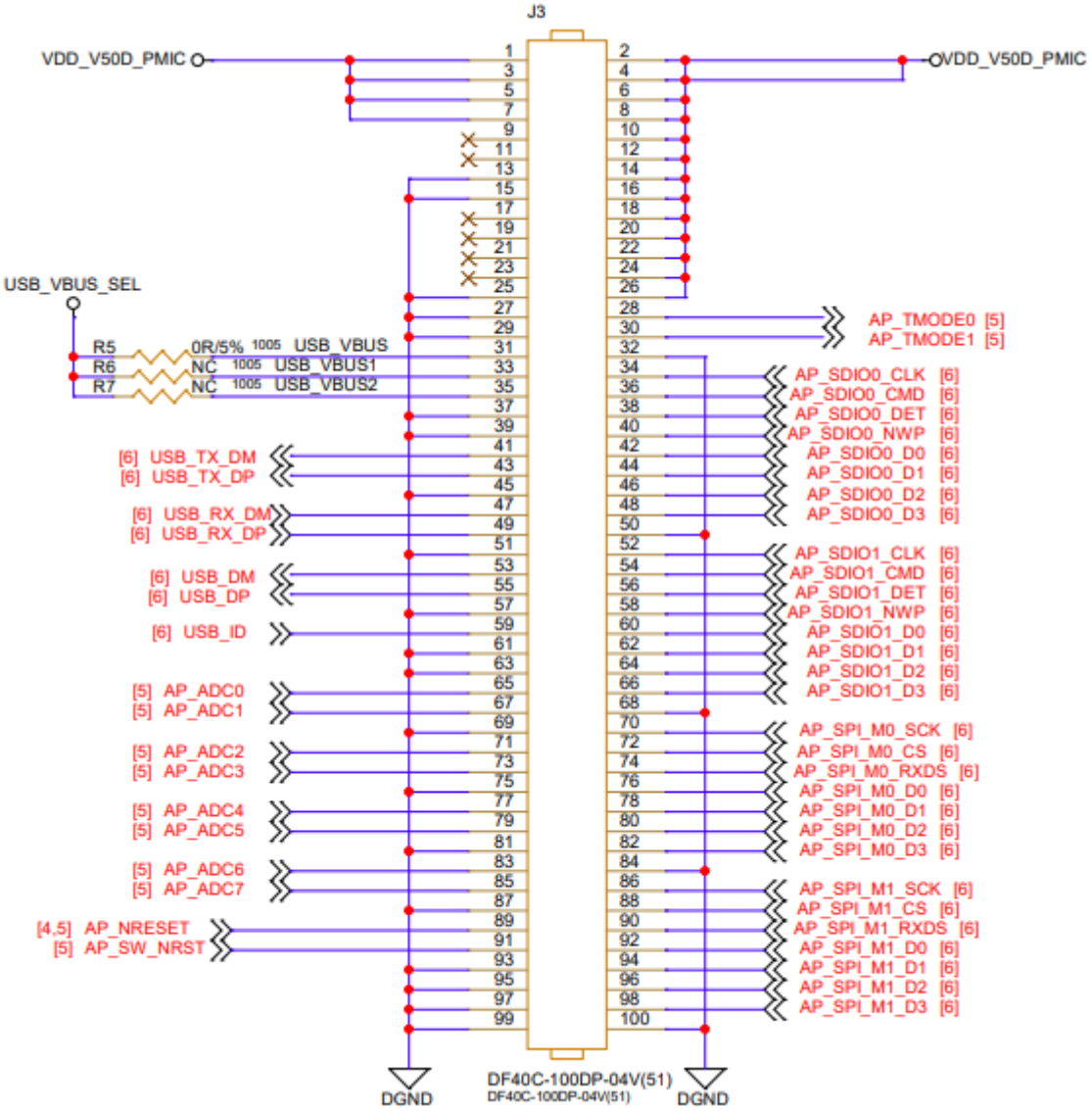

Figure 3-4. J3 pin configuration

4. Power Tree

The power tree for MLM-1 SoM and the base board comprising the EVK is shown in the following figure 3-1.

MLM-1 SoM requires only a 5 V input power supply.

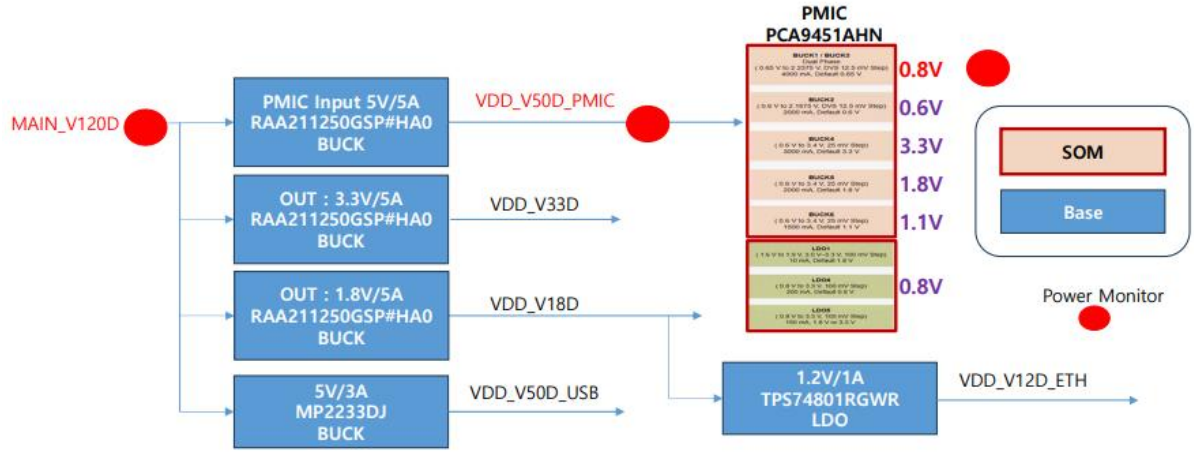

Figure 4-1. Power Tree (SoM+Carrier)

5. Use Case

REGULUS AI SBC comes with connective interfaces that facilitate communication between input signals and NPU-processed outputs. The board supports the following input types:

- MIPI Camera, USB Camera and IP Camera
- Serial Communication
- Ethernet
- Digital In
- Audio In

Figure 2- illustrates the process carried out on the REGULUS EVK board.

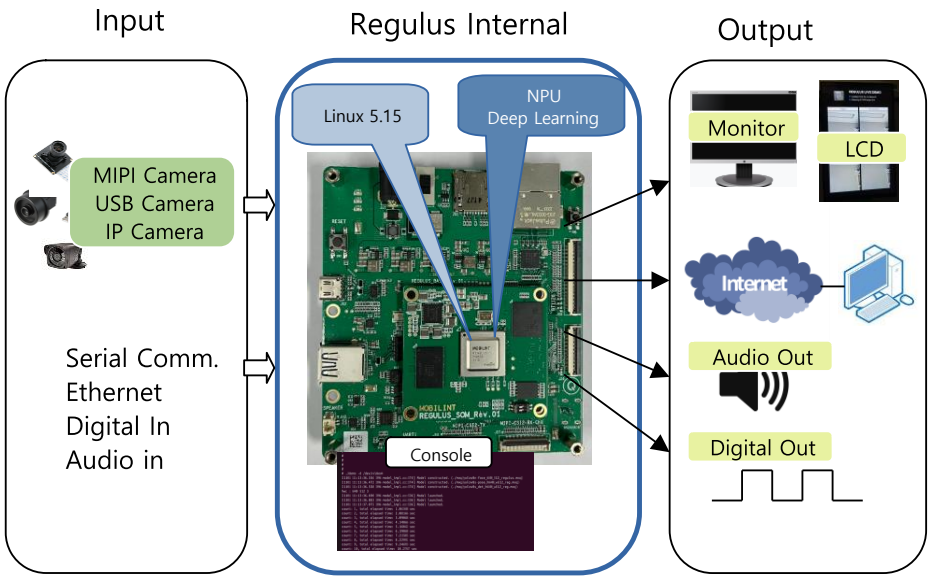

Figure 5-1. REGULUS Use Case

The input data can be sent to REGULUS, where the deep learning inference takes place. Upon processing the data, the output data or the inference results can be:

- Displayed on a video output device
- Released as audio or in digital format
- Transmitted to a remote server via Ethernet

NOTE: The released Linux kernel supports HDMI monitor as the video output device. If you use an LCD as the video output device, the Linux kernel must be changed, so please contact technical support.

6. Installation

6.1. Instructions

1. To connect the REGULUS AI SBC with a host PC, prepare a USB Type-A to Type-C cable, and plug it into the USB Type-C port on the bottom of the board.
2. Ensure the system is fully powered off before connecting the cable.
3. Connect the power cable.
4. Plug the other end of the USB Type-C cable into the host PC.
5. Turn on the power switch, and the board will boot immediately.
6. You can check its power status via the onboard LED.
7. Power on the host PC.

6.2. Important Notes Before Installation

1. The installation instructions above is for reference only. Actual installation may vary depending on the system environment.
2. Before installing the product, discharge any static electricity from your body by touching the metal frame inside the powered-off system.
3. Handle the product by its edges to avoid contact with circuitry.
4. Ensure that clothing or accessories do not come in contact with electronic components.

6.3. Warnings and Cautions

1. Do not connect or disconnect the product while the system is powered on.
2. Keep your hands, tools, or cables away from the board while it is in operation.
3. Do not disassemble or modify the product without proper guidance. This may result in product damage, electric shock, or other unexpected hazards.
4. Do not touch the product with wet hand(s) to prevent electric shock.
5. Operating the product in environments with high humidity or insufficient ventilation may reduce its lifespan.
6. Ensure that water or other liquids do not come in contact with the product, as this may cause serious damage.

6.4. Software Installation

REGULUS AI SBC comes preloaded with Linux OS, SDK qb driver, runtime, and other essential utilities. Mobilint SDK qb is available upon request through our official support channel, which also provides user guides and documentation.

- Support Channel: tech-support@mobilint.com

For a comprehensive guide and application notes for REGULUS AI SBC, refer to the following resources available in Mobilint's documentation page (docs.mobilint.com) and Download Center (dl.mobilint.com).

Type	Document Title	Available Languages
Compiler	qb Compiler Manual	English
Software Manual	REGULUS qb Software Manual	English
Hardware Manual	REGULUS Datasheet	English

Mobilint, Inc.

3F, Narakium Yeoksam B Building, 35 Seolleung-ro 93-gil, Gangnam-gu, Seoul, Republic of Korea (06151)

Corporate URL
www.mobilint.com

Contact
contact@mobilint.com
+82 2 6281 0489