AVerMedia D131L series【Preliminary】

Applies to NVIDIA® Jetson Orin™ NX/ Orin™ NANO　Module

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Preface

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Technical Support

If you experience the difficulty after reading this manual and/or using the product, please contact the reseller from which you purchased the product. In most cases, the reseller can help you with the product installation and the difficulty you encountered.

In case the reseller is not able to resolve your problem, our highly capable global technical support team can certainly assist you. Our technical support section is available 24 hours a day and 7 days a week through our website, with the click here. For more contact information, you may find it in the section of AVerMedia Global Offices.

Contact Enquiry

For more information of our products, pricing, and order placement, please fill in our inquiry form here, we will contact you within 24 hours.

Download User Manual

Please click the link here to download the file of this user manual from AVerMedia website.

Revision History

Revision	Date	Updates
Version 0.1	May 24, 2023	1st Released
Version 0.2	June 17, 2023	● Update product spec ● Add Dip swtich information

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Limited Product Warranty

AVerMedia provides product warranty. Should this product, in AVerMedia's opinion, fail to be in the good working order during the warranty period, AVerMedia will, at its option, repair or replace it at no charge, provided that the product has not been subjected to abuse, misuse, accident, disaster, or non-AVerMedia authorized modification or repair.

You may obtain the warranty service by delivering this product to an authorized AVerMedia business partner or to AVerMedia along with the proof of purchase. Product returned to AVerMedia must be pre-authorized by AVerMedia with an RMA (Return Material Authorization) number marked on the outside of the package and sent prepaid, insured, and packaged for the safe shipment. AVerMedia will return the product by prepaid shipment service.

It is not recommended to disassemble the box PC, which will impact the warranty. The limited product warranty is only valid over the serviceable life of the product. This is defined as the period during which all components are available. Should the product prove to be irreparable, AVerMedia reserves the right to substitute an equivalent product if available or to retract the product warranty if no replacement is available.

The above product warranty is the only warranty authorized by AVerMedia. Under no circumstances will AVerMedia be liable in any way for any damages, including any lost profits, lost savings, or other incidental or consequential damages arising out of the use of, or inability to use, such product.

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ESD Warning

Electronic components and circuits are sensitive to Electrostatic Discharge (ESD). When handling any circuit board assemblies including AVerMedia AVerMedia products, it is highly recommended that ESD safety precautions can be observed. ESD safe best practices can include, but are not limited to the following ones.

1. Leave the circuit board in the antistatic package until it is ready to be installed.
2. Use a grounded wrist strap when handling the circuit board. At a minimum, you need to touch a grounded metal object to dissipate any static charge, which may be present on you.
3. Avoid handling the circuit board in the carpeted areas.
4. Handle the board by the edges and avoid the contact with the components.
5. Only handle the circuit boards in ESD safe areas, which may include ESD floor and/or table mats, wrist strap stations, and ESD safe lab coats.

Safety Precaution:

1. All cautions and warnings on the device should be noted.
2. For safety consideration, do NOT open the device if not a qualified service stuff.
3. Place the device on a solid surface during installation to prevent falls.
4. Keep the device away from humidity.
5. Do NOT leave this device in an un-controlled environment with temperatures beyond the device's permitted storage temperature to avoid damage.
6. All adaptors and cables supplied by AVerMedia are verified. Do NOT use any others not supplied by AVerMedia to avoid any malfunction or fires.
7. Make sure the power source matches the power rating of the device.
8. Place the power cord where people cannot step on it. Do not put anything on the power cord.
9. Always completely disconnect the power while the device is not usage or idle for a long time.
10. Disconnect the device from any AC supply before cleaning. While cleaning, use a damp cloth instead of liquid or spray detergents.
11. Make sure the device is installed near a power outlet and easy for accessible.

12. Do not cover the openings on the device to ensure optimal heat dissipation.
13. Watch out the heatsink or heat spreader of the device when the system is running.
14. Never pour any liquid into the openings. This could cause fire or electric shock.
15. The static electricity should be noted while installing any internal components. Consider to use a grounding wrist strap and put all electronic parts in static-shielded containers.

If the following situations occur, please contact our service personnel:

(1) The device is dropped or damaged

(2) Damaged power cord or plug

(3) Exposure to moisture

(4) Liquid intrusion into the device

(5) Any obvious signs of damage displayed on the device

(6) Device is not working as expected or in a manner as described in this manual

1.0 Introduction

AVerMedia AVerMedia D131L includes fully featured carrier board which is all developed for NVIDIA® Jetson Orin™ NX / Orin™ Nano modules. AVerMedia D131L provides not only the access to a great list of latest interfaces on NVIDIA® Jetson Orin™ NX/ Orin™ Nano modules but also 1 x GbE RJ-45 (Option PoE) & 40-pin expansion header as the function enrichment.

D131L provides one HDMI video output, four USB 3.2 ports, one GbE RJ-45 port (Option POE), 40-pin expansion header , and one Micro-B USB 2.0 port for recovery.

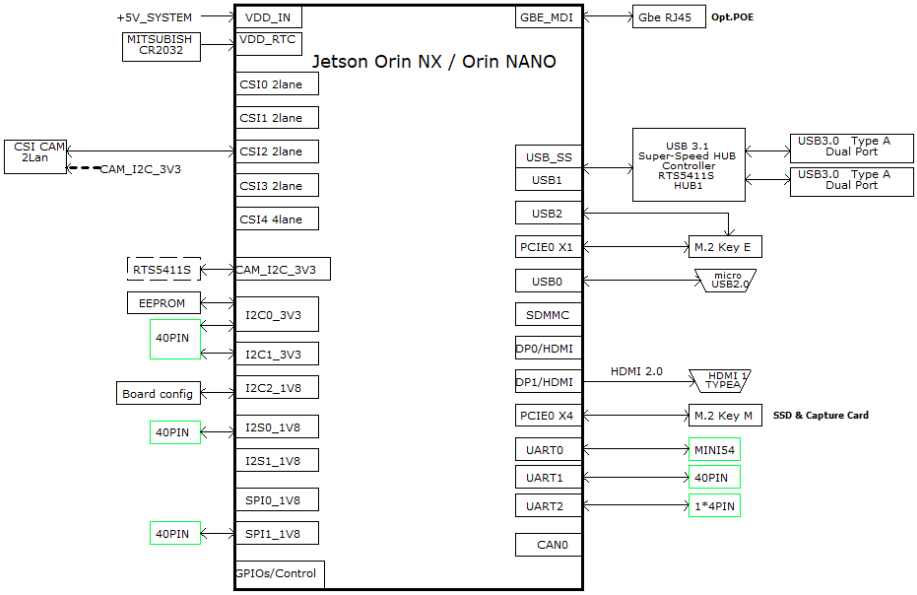
Operating with NVIDIA® BSP and the rich I/O functions, AVerMedia D131L is the perfect choice in building a compact, high performance AI edge computing platform for the intelligent video analytics applications.

1.1 Product Specifications

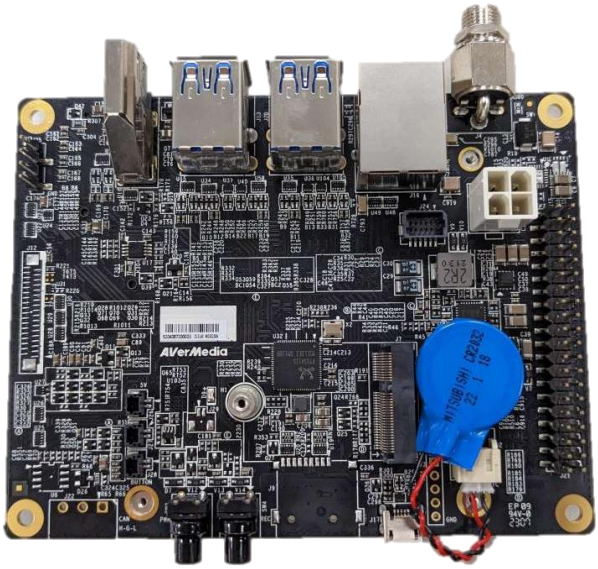
Model	D131L	
Type	Carrier board	
BSP	Applied to NVIDIA BSP directly	
NVIDIA GPU SoC Module Compatibility	NVIDIA® Jetson Orin™ NX/ Orin™ NANO module	
Networking	1x GbE RJ-45 (PoE option) 1xM.2. key E 2230 for Wi-Fi (AC9260)	
Display Output	1x HDMI 3840 x 2160 at 60Hz for Orin NX, 3840 x 2160 at 30Hz for Orin Nano	
Temperature	Operating temperature 0°C~70°C Option 0°C~60°C (PSE 802.3 AF) Storage temperature -40°C ~ 85°C Relative humidity 40 °C @ 95%, Non-Condensing	
MIPI Camera Inputs	1x 2 lane MIPI CSI-2, 15 pin FPC 1mm Pitch Connector	
USB	1x USB 2.0 Micro-B for recovery 4x USB3.2 Gen1 (5G) type A	
Storage	1x M.2 key M 2280 for SSD	
Expansion Header	40-pin: 1x UART, 2x SPI, 2x 12C, 1x I2S, 6x GPIOs, 1xDip Switch button	
Power requirement	Voltage	DC 9~24V
	Current	DC IN Jack on board: 7A~2.6A
		ATX 4pin: 7A~2.6A
Power adapter/Power Cord	12V/5A adapter and US/JP/EU/UK/TW/AU/CN power cord (optional)	
Fan Module	Heat sink with fan (optional)	
Buttons	Power and Recovery	
RTC Battery	Support RTC battery and Battery Life Monitoring by MCU	
PCB/Electronics Mechanical Info	113mm (W) x 105mm (L) x 28.53mm (H) Weight: 95 g	
Certifications	CE, FCC,KC	
Remark	**MIPI Camera Inputs :** In the default support for D131L is raspberry v2(imx219), and about the MIPI Camera supported for Orin NX/ Orin Nano, please refer to https://developer.nvidia.com/embedded /jetson-partner-supported-cameras?t1 supported-jetson-products=Orin+nx	

2.0 Product Overview

2.1 Block Diagram



2.2 Front View and Back View of Carrier board



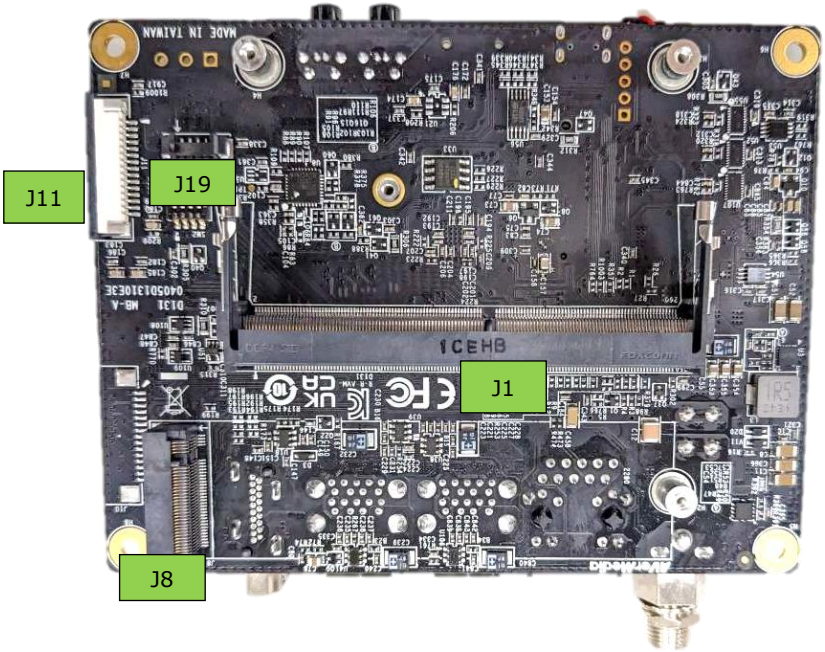
2.3 Connector Summary

J1	SO-DIMM 260-pin 90° SMD Socket(H-9.2mm) for Jetson Orin™ NX/ Orin™ Nano SOM
J2	External RTC Battery wafer
J4	DC power Jack with Lock
J6	HDMI output Type-A Vertical Side Connector (Female)
J7	M.2 E-Key Socket
J8	M.2 M-Key Socket
J11	FPC connector for 2-lane MIPI CSI-2
J13	USB 3.2 Gen1 Dual Port Type A Connector
J20	USB 3.2 Gen1 Dual Port Type A Connector
J16	RJ45 1Gb Ethernet connector (POE support optional)
J17	USB 2.0 Micro B Connector
J19	Fan Wafer
J21	40-pin Expansion
J23	Input Power – 4.2mm Pitch 90° ATX Power 4P
J24	PSE Board Connector (Maximum 15W)
J25	Debug Port
J26	OOB Board Connector (5V)
J27	OOB Board Connector (Reset)
J28	OOB Board Connector (Power)
SW2	Dip Switch Button
SW3	Power Button w/LEDs
SW4	Recovery Button w/LEDs

2.4 Carrier Board Interface

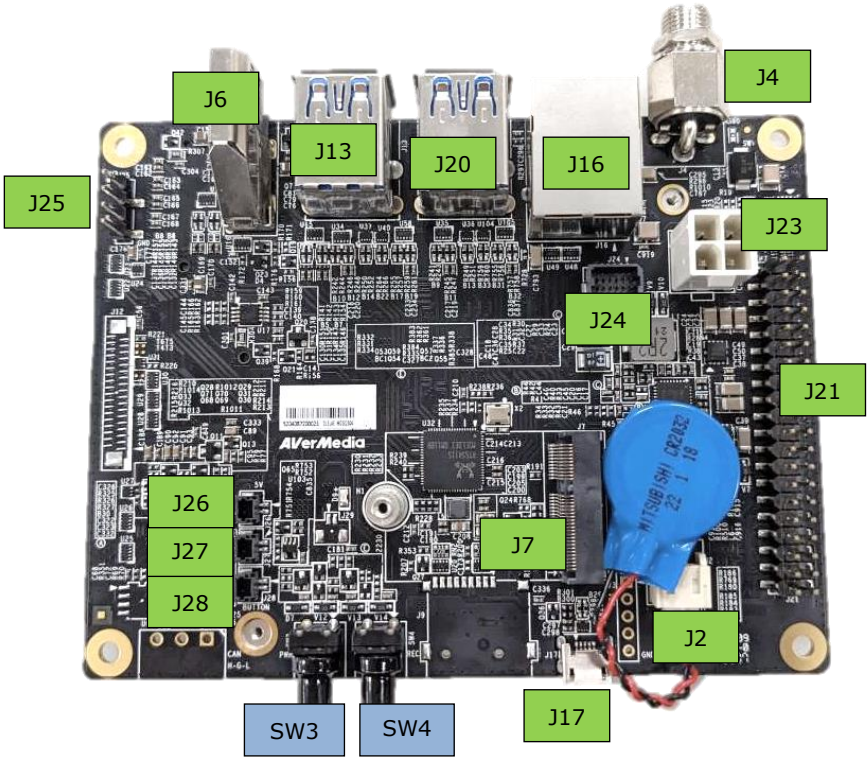
Top View Interface

J1	SO-DIMM 260-pin 90° SMD Socket(H-9.2mm) for Jetson Orin™ NX/ Orin™ Nano SOM
J8	M.2 M-Key Socket
J11	FPC connector for 2-lane MIPI CSI-2
J19	Fan Wafer



Bottom View Interface

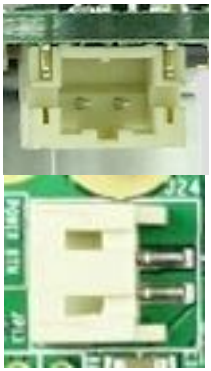
J2	External RTC Battery wafer
J4	DC power Jack with Lock
J6	HDMI output Type-A Vertical Side Connector (Female)
J7	M.2 E-Key Socket
J13	USB 3.2 Gen1 Dual Port Type A Connector
J16	RJ45 1Gb Ethernet connector (POE support optional)
J17	USB 2.0 Micro B Connector
J20	USB 3.2 Gen1 Dual Port Type A Connector
J21	40-pin Expansion
J23	Input Power – 4.2mm Pitch 90° ATX Power 4P
J24	PSE Board Connector (Maximum 15W)
J25	Debug Port
J26	OOB Board Connector (5V)
J27	OOB Board Connector (Reset)
J28	OOB Board Connector (Power)
SW3	Power Button w/LEDs
SW4	Recovery Button w/LEDs



3.1 Jetson module Connector

Function	Provide connection with NVIDIA® Jetson Orin™ NX module	
Location	J1	
Type Description	SOCKET_DDR4 SO-DIMM_260PIN_90°	
Manufacturer and Part Number	Foxconn ASAA826-EASB0-7H	
Mating Connector	NVIDIA® Jetson Orin™ NX	
Pinout	Please refer to NVIDIA Jetson System-on-Module datasheet for pinout details.	
Remarks	https://developer.nvidia.com/embedded/downloads	

3.2 RTC Battery Connector

Function	RTC battery for module	
Location	J2	
Type Description	2.0mm wire-to-board header 02P type	
Manufacturer and Part Number	Pinrex, 721-94-02TWR9	
Mating Connector	Tyu, TU2001HNO-02	
Pinout	Pin # / Description PIN1 / 3V Power PIN2 / GND	
Remarks	RTC Battery: MITSUBISHI, CR2032 3V	

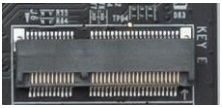
3.3 DC POWER JACK

Function	DC Power input with lock	
Location	J4	
Type Description	JACK_DC POWER_D2.5 ㎜_90°_DIP include nut and washer	
Manufacturer and Part Number	京政 JKCR DCD-020-105B	
Mating Connector	伸銘 SMCTS OD 5.5*2.5 mm DC 10mm (655-236)	
Pinout	Pin Number: Center — Power; Outer ring — GND	
Remarks	NA	

3.4 HDMI OUTPUT

Function	HDMI output connector	
Location	J6	
Type Description	HDMI Type-A female connector	
Manufacturer and Part Number	捷湧 EDL TECHNOLOGY CO. HM-FVD480B	
Mating Connector	Any HDMI standard Type-A interface cable or device.	
Pinout	Please refer to HDMI standard.	
Remarks	NA	

3.5 M.2 E key 2230

Function	M.2 E key	
Location	J7	
Type Description	SOCKET_M.2-KEY E_75PIN_90°_SMD	
Manufacturer and Part Number	宏致_ACES 51748-07502-005_P0.5 ㎜-H8.5 ㎜	
Mating Connector	Any M.2 E key 2230 card standard interface device.	

Pinout	Please refer to M.2 E key card standard for the pinout details.	
Remarks	None	

3.6 M.2 M key 2280

Function	M.2 M key	
Location	J8	
Type Description	SOCKET_M.2-KEY M_75PIN_90°_SMD	
Manufacturer and Part Number	鴻海_FOXCONN 2E0BC21-S85BM-7H_P0.5 ㎜-H8.5 ㎜	
Mating Connector	Any M.2 M key 2280 card standard interface device.	
Pinout	Please refer to M.2 M key card standard for the pinout details.	
Remarks	None	

3.8 MIPI CSI-2 DPHY Lanes

Function	MIPI camera module connector	
Location	J11	
Type Description	WAFER_15PIN_1 ㎜_90°	
Manufacturer and Part Number	CHAMPWAY AFA07-S15FCA-HF_FPC ZIF-LOWER	
Mating Connector	2 Lane MIPI CSI-2 camera connector (15Pin)	

Pinout

J11

PIN#	Description	PIN#	Description
Pin1	GND	Pin9	CSI2_CLK_P
Pin2	CSI2_D0_N	Pin10	GND
Pin3	CSI2_D0_P	Pin11	CAM1_PWDN
Pin4	GND	Pin12	CAM1_MCLK

	Pin5	CSI2_D1_N	Pin13	I2C_CAM1_SCL	
	Pin6	CSI2_D1_P	Pin14	I2C_CAM1_SDA	
	Pin7	GND	Pin15	+3V3_MIPI	
	Pin8	CSI2_CLK_N			
Remarks	In the default support for D131L is raspberry v2(imx219), and about the MIPI Camera supported for Orin NX/ Orin Nano, please refer to https://developer.nvidia.com/embedded/jetson-partner-supported-cameras?t1_supported-jetson-products=Orin+nx				

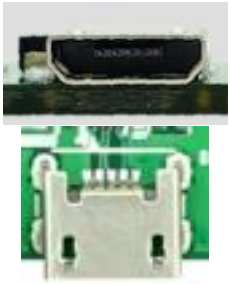
3.9 USB 3.2 Gen 1 Type-A Connector #1 , #2, #3

Function	USB 3.2 Gen 1 Type-A connector #1 #2 #3	
Location	J13, J20	
Type Description	Dual-port USB 3.2 Gen 1 Type-A female connector	
Manufacturer and Part Number	Champway, CU3B-AFR15U-096H	
Mating Connector	Any USB 3.2 standard Type-A interface cable or device.	
Pinout	Please refer to USB 3.2 Gen 1 standard.	
Remarks	None	

3.10 Gigabit Ethernet Connector

Function	1Gb single-port Ethernet connector, used to connect to the host system.	
Location	J16	
Type Description	RJ45 with integrated magnetics	
Manufacturer and Part Number	MJ45-111QC4A-GY-S307	
Mating Connector	Any standard 1Gb Ethernet mating connector can be applicable.	
Pinout	Comply with Ethernet standards.	
Remarks	PSE Option.	

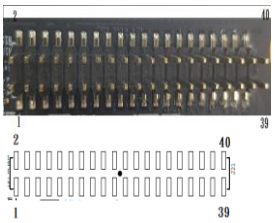
3.11 Jetson platform/ USB 2.0 Micro B Connector

Function	BSP Installation as recovery mode	
Location	J17	
Type Description	USB micro-type B female connector	
Manufacturer and Part Number	Fullglory, FG-MCB-111440	
Mating Connector	Any USB standard Micro-type interface cable or device.	
Pinout	Please refer to USB Micro-type standard.	
Remarks	None	

3.12 Fan Power connector

Function	Fan Power Connector	
Location	J19	
Type Description	WAFER_1*4PIN_1.25㎜_90°	
Manufacturer and Part Number	ACES 50271-0040N-001_BLACK	
Mating Connector	ACES 50276-004H0H0-001	
Pinout	Pin # / Description PIN 1 / GND PIN 2 / +5V Power PIN 3 / FAN_TACH PIN 4 / FAN_PWM	
Remarks	None	

3.13 40-Pin GPIO expansion

Function	General-purpose input/output	
Location	J21	
Type Description	Expansion I/O Connector	
Manufacturer and Part Number	212-92-20GBEL	
Mating Connector	40-Pin GPIO expansion	
Pinout	D131L+Orin NX	

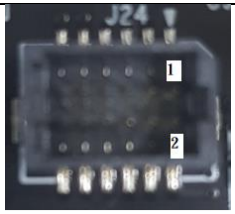
Address	Pin Name	40-pin Index		Pin Name	Address
	3V3 VDC	1	2	5V VDC	
/dev/i2c-7 Bidirection	I2C1_SDA	3	4	5V VDC	
/dev/i2c-7 input	I2C1_SCL	5	6	GND	
gpio492 Bidirection	GPIO09_LS	7	8	UART1_TXD_LS	/dev/ttyTHS4 Input
	GND	9	10	UART1_RXD_LS	/dev/ttyTHS4 Output
gpio460 Input	UART1_RTS_LS	11	12	I2S0_SCLK_LS	gpio398 Bidirection
gpio470 Input	SPI1_SCK_LS	13	14	GND	
gpio433 Bidirection	GPIO12_LS	15	16	SPI1_CS1_LS	gpio474 Input
	GND	17	18	SPI1_CS0_LS	gpio473 Input
gpio483 Input	SPI0_MOSI_LS	19	20	GND	
gpio482 Output	SPI0_MISO_LS	21	22	SPI1_MISO_LS	gpio471 Output
gpio481 Bidirection	SPI0_SCK_LS	23	24	SPI0_CS0_LS	gpio484 Input
	GND	25	26	SPI0_CS1_LS	gpio485 Input
/dev/i2c-1 Bidirection	I2C0_ID_SDA	27	28	I2C0_ID_SCL	/dev/i2c-1 Input
gpio453 Bidirection	GPIO01_LS	29	30	GND	
gpio454 Bidirection	GPIO11_LS	31	32	GPIO07_LS	gpio389 Bidirection
gpio391 Bidirection	GPIO13_LS	33	34	GND	
gpio401	I2S0_LRCK_LS	35	36	UART1_CTS_LS	gpio461 Output
gpio472 Input	SPI1_MOSI_LS	37	38	I2S0_SDIN_LS	gpio400 Input
	GND	39	40	I2S0_SDOUT_LS	gpio399 Output

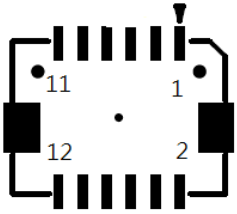
3.14 ATX 4P

Function	ATX 4P
Location	J23
Type Description	WAFER_2*2PIN_4.2 ㎜_90°_DIP
Manufacturer and Part Number	福軒 Fullglory FPWD-42R2-04NAT
Mating Connector	Follow ATX 4pin power standard
Pinout	Pin Number / Description 1 / GND 2 / GND 3 / 9-24V Power 4 / 9-24V Power
Remarks	None

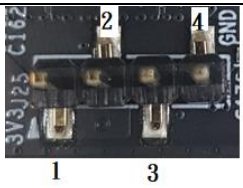
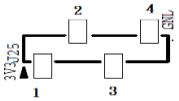
3.15 PSE Board Connector.

Function	PSE Board Connector.
Location	J24
Type Description	WAFER_2*6PIN_1 ㎜_180°_SMD
Manufacturer and Part Number	ACES 50238-01241-001
Pinout	PIN# / Description / PIN# / Description Pin1 / PWR_IN / Pin2 / GND Pin3 / PWR_IN / Pin4 / GND Pin5 / 54V / Pin6 / SYS_RST* Pin7 / 54V / Pin8 / I2C1_SCL * Pin9 / PortN_OUT0 / Pin10 / I2C1_SDA Pin11 / POE_P0 / Pin12 / 3V3
Remarks	NA

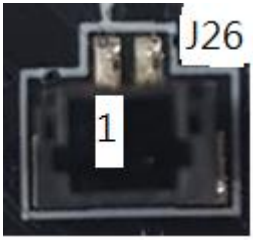


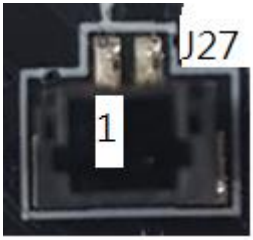


3.16 Debug Port

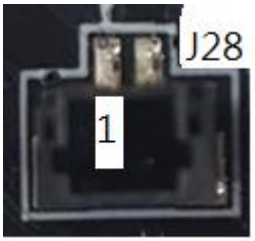
Function	Debug	
Location	J25	
Type Description	1*4PIN_2.54㎜_180°_SMD	
Manufacturer and Part Number	ACES 60240-00471-001	
Pinout	Pin # / Description PIN1 / 3V3 Power PIN2 / UART_TXD PIN3 / UART_RXD PIN4 / GND	
Remarks		

3.17 **OOB Board Connector.**

Function	OOB Board Connector (5V)	
Location	J26	
Type Description	WAFER_1*2PIN_1㎜_180°_SMD	
Manufacturer and Part Number	ACES 50228-00271-001	
Pinout	Pin # / Description PIN1 / 5V PIN2 / GND	
Remarks		

Function	OOB Board Connector (Reset)	
Location	J27	
Type Description	WAFER_1*2PIN_1㎜_180°_SMD	
Manufacturer and Part Number	ACES 50228-00271-001	
Pinout	Pin # / Description PIN1 / SYS_RST*_AI PIN2 / GND	
Remarks		

Function	OOB Board Connector (Power)
Location	J28
Type Description	WAFER_1*2PIN_1 ㎜_180°_SMD
Manufacturer and Part Number	ACES 50228-00271-001
Pinout	Pin # / Description PIN1 / BUTTON_ON PIN2 / GND
Remarks	



3.18 Dip Switch button

Function	Fan PWM controller/Auto Power on
Location	SW2
Type Description	4 SPST DIP switch
Manufacturer and Part Number	DIPTRONICS IN OFF-SWITCHING 0.025A/24VDC
Pinout	See table below
Remark	

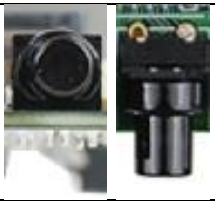
Location	Description	OFF	ON
1	Power On Mode Automatically restart after shutdown	X	Always Power On
2	CAN0_Terminal	W/O Terminal	With Terminal
3	Power-Up / Start-up Control	AT Mode (Automatic Start up En)	X
	When DC Plug In	X	ATX Mode (Power Button Press Required)
4	PWM Fan Control	FAN Always ON	SW Controlled

3.18 Power control button

Function	Power control button
Location	SW3
Type Description	Button

Manufacturer and Part Number	Champway LS67AK-NBR-A-R2KA9	
Pinout	N/A	
Remark	None	

3.19 Force recovery Button

Function	Force recovery	
Location	SW4	
Type Description	Button	
Manufacturer and Part Number	Champway LS67AK-NBR-A-R2KA9	
Pinout	N/A	
Remark	None	

4.0 Installation

Please refer to Nvidia official website to download the BSP and flash to Target.

There are 2 ways to download& flash.

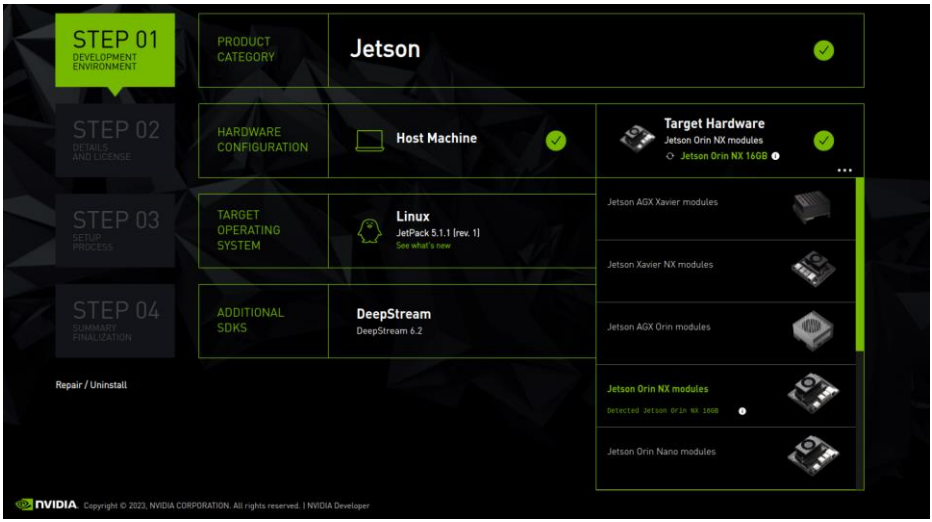
1. **SDK Manager**
2. **Visit and download BSP/ROOTFS from Nvidia official website**

SDK Manager

Please refer to the NVIDIA DEVELOPER to download https://docs.nvidia.com/sdk-manager/download-run-sdkm/index.html and SDK Manager install ready.

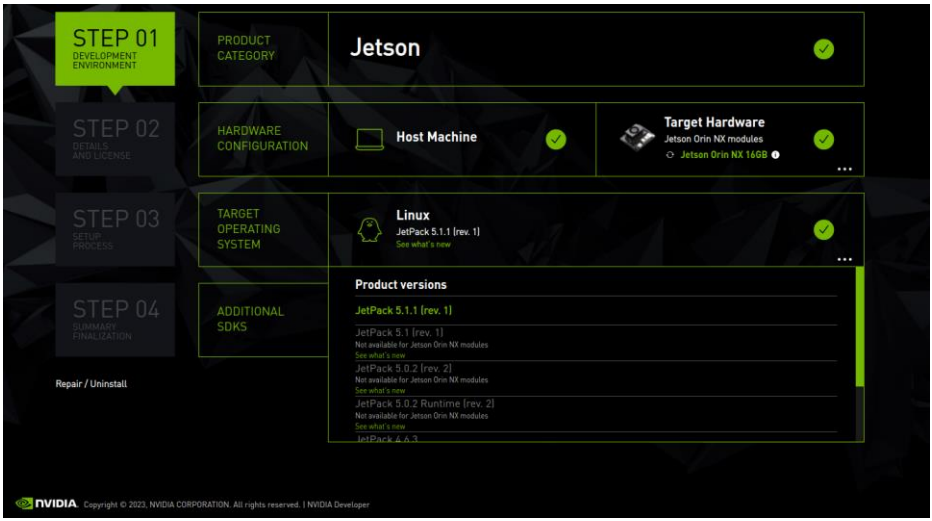
After prepare SDK Manager, please follow up to install Jetson Software with SDK Manager

https://docs.nvidia.com/sdk-manager/install-with-sdkm-jetson/index.html

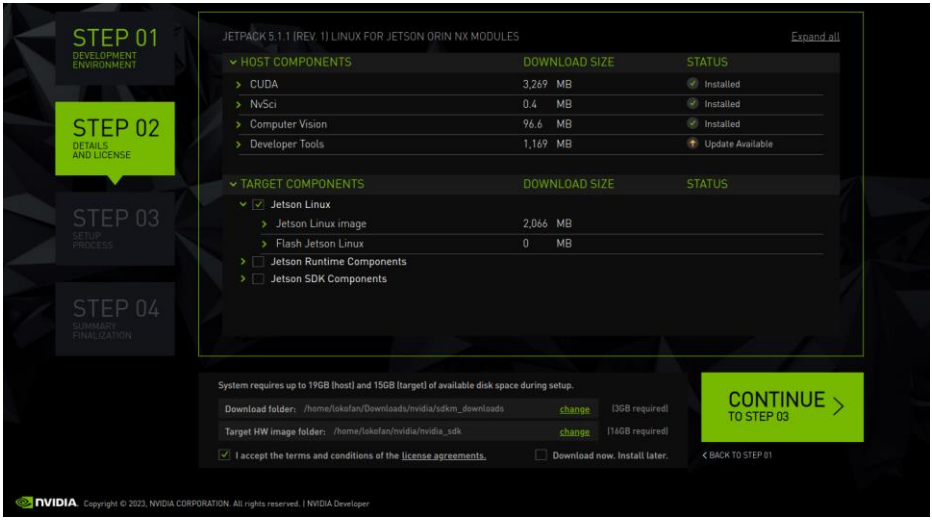


If a Jetson device is connected SDK Manager will auto-select it in the **Target Hardware** drop-down list. If your device is not automatically detected, click **Refresh**. You can hover over the message to display the detailed information of the detected hardware.

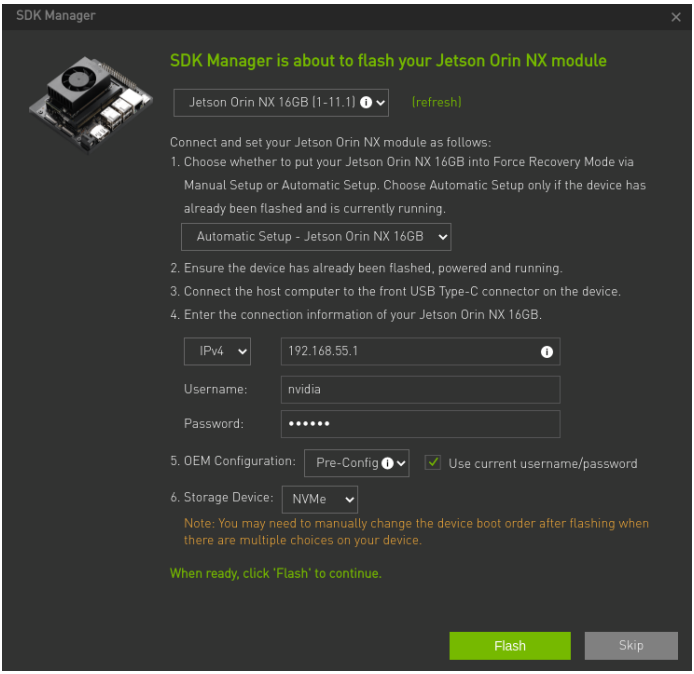
From the Target Operating System panel, select the operating system and JetPack version.

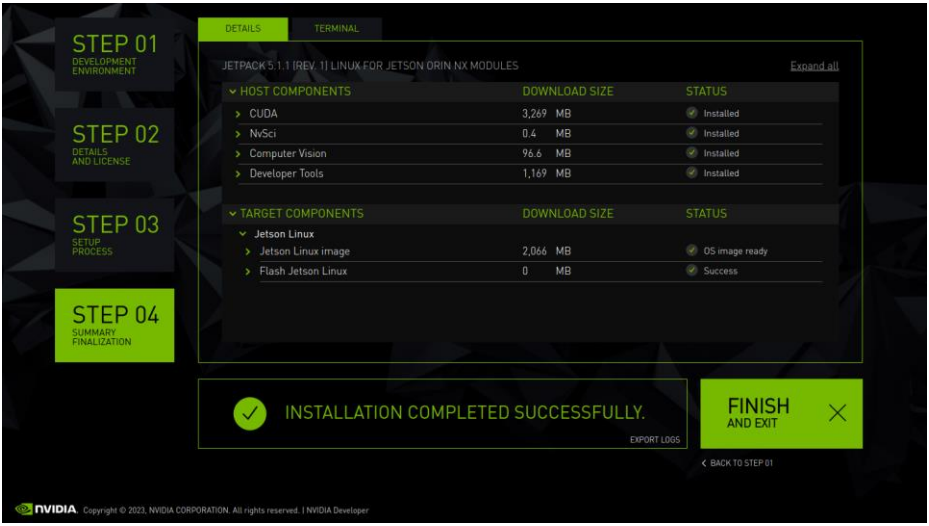


Select Target Components




STEP 01
DEVELOPMENT ENVIRONMENT
STEP 02
DETAILS AND LICENSE
STEP 03
SETUP PROCESS
STEP 04
SUMMARY FINALIZATION
DETAILS
TERMINAL
JETPACK 5.1.1 [REV. 1] LINUX FOR JETSON ORIN NX MODULES
Expand all
HOST COMPONENTS
DOWNLOAD SIZE
STATUS
CUDA 3,269 MB Installed
NvSci 0.4 MB Installed
Computer Vision 96.6 MB Installed
Developer Tools 1,169 MB Downloading - 85%
TARGET COMPONENTS
DOWNLOAD SIZE
STATUS
Jetson Linux
Jetson Linux image 2,066 MB Downloading - 14%
Flash Jetson Linux 0 MB Flash Pending
Downloading: 70.68% (11.12MB/s)
Installing: 63.33%
Download folder: /home/lokofan/Downloads/nvidia/sdkm_downloads
PAUSE FOR A BIT
NVIDIA. Copyright © 2023, NVIDIA CORPORATION. All rights reserved. | NVIDIA Developer


SDK Manager
SDK Manager is about to flash your Jetson Orin NX module
Jetson Orin NX 16GB [1-11.1]
[refresh]
Connect and set your Jetson Orin NX module as follows:
1. Choose whether to put your Jetson Orin NX 16GB into Force Recovery Mode via Manual Setup or Automatic Setup. Choose Automatic Setup only if the device has already been flashed and is currently running.
Automatic Setup - Jetson Orin NX 16GB
2. Ensure the device has already been flashed, powered and running.
3. Connect the host computer to the front USB Type-C connector on the device.
4. Enter the connection information of your Jetson Orin NX 16GB.
IPv4
192.168.55.1
Username: nvidia
Password: ••••••
5. OEM Configuration: Pre-Config
Use current username/password
6. Storage Device: NVMe
Note: You may need to manually change the device boot order after flashing when there are multiple choices on your device.
When ready, click 'Flash' to continue.
Flash
Skip



Flashing complete, the Target will boot up and set up to new automatically.

Visit and Download BSP/ROOTFS from Nvidia official Website

https://developer.nvidia.com/embedded-computing

So far, the latest version is **JetPack 5.1.1 (rev.1)**, NVIDIA Jetson Linux **35.3.1**

Downloads and Links

	Jetson Orin modules and developer kit	Jetson Xavier modules and developer kits
DRIVERS	Driver Package (BSP)	
	Sample Root Filesystem	

https://developer.nvidia.com/embedded/jetson-linux-r3531

DRIVERS	
Driver Package (BSP)	https://developer.nvidia.com/downloads/embedded/l4t/r35_release_v3.1/release/jetson_linux_r35.3.1_aarch64.tbz2/
Sample Root Filesystem	https://developer.nvidia.com/downloads/embedded/l4t/r35_release_v3.1/release/tegra_linux_sample-root-filesystem_r35.3.1_aarch64.tbz2/

Ex my side download to ~/Downloads/nvidia/sdkm_downloads/, please check your own side.

After Download **Driver Package (BSP)** and **Sample Root Filesystem**, follow below Steps to prepare the BSP and reflash:

1.Create a folder "NV_sources_JP5.1.1", move the downloaded sources under there

```
$ mkdir NV_sources_JP5.1.1
$ cd NV_sources_JP5.1.1
$ mv ~/Downloads/nvidia/sdkm_downloads/Jetson_Linux_R35.3.1_aarch64.tbz2 .
$ mv ~/Downloads/nvidia/sdkm_downloads/Tegra_Linux_Sample-Root-Filesystem_R35.3.1_aarch64.tbz2 .
```

2.Unzip the sources,

```
$ sudo tar xjvf Jetson_Linux_R35.3.1_aarch64.tbz2
```

```
$ cd Linux_for_Tegra/rootfs/
$ sudo tar xjvf ../../ Tegra_Linux_Sample-Root-Filesystem_R35.3.1_aarch64.tbz2
$ cd ..
$ sudo ./apply_binaries.sh
```

3.BSP reflash procedure

*EX. device is **Jetson Orin NX + D131L(NVMe)***

Let the JETSON Orin NX initiate recovery mode.

You have to keep pressing “Recovery” button and then power on the NVIDIA Jetson board to initiate recovery mode.

When connecting a NVIDIA Jetson board to a Linux PC via a MicroUSB to USB cable, you can check **lsusb** status, that should has this item ensure in the recovery mode.

$ lsusb

Bus 001 Device 039: ID 0955:7323 NVIDIA Corp. APX

At first time, create default login username/password of the BSP is **nvidia/nvidia**

```
$ sudo ./tools/l4t_create_default_user.sh -u nvidia -p nvidia -a -n tegra-ubuntu
--accept-license


#flash command

$ sudo ./tools/kernel_flash/l4t_initrd_flash.sh --external-device nvme0n1p1 -c
tools/kernel_flash/flash_l4t_external.xml -p "-c
bootloader/t186ref/cfg/flash_t234_qspi.xml" --showlogs --network usb0
p3509-a02+p3767-0000 internal
```

5.0 Software

This section describes BSP's features for D131L

1. Power Mode

   Power mode can be modified by the UI on the upper-right corner of Ubuntu or the following commands.

```
# get current power mode
$ sudo nvpmodel -q
# setup power mode
# where <x> is power mode number, please refer to
https://docs.nvidia.com/jetson/archives/r35.2.1/DeveloperGuide/index.html#page/Tegra%20Linux%20Driver%20Package%20Development%20Guide/clock_power_setup.html# for more information
$ sudo nvpmodel -m <x>
```

   * Current default power mode: D131L: MODE 15W DESKTOP (2)

2. MIPI CSI Camera

   There is 1x 2-lane MIPI CSI camera supported on D131L, for current supported products type is

   * Raspberry pi v2 IMX219 (2-lane)

   About the MIPI Camera supported for Orin NX/ Orin Nano, please refer to https://developer.nvidia.com/embedded/jetson-partner-supported-cameras?t1_supported-jetson-products=Orin+nx

   Test Command:

> Raspberry pi v2 (imx219) :

No	width	height	framerate
0	3264	2464	21
1	3264	1848	28
2	1920	1080	30
3	1640	1232	30
4	1280	720	60

```
$ gst-launch-1.0 nvarguscamerasrc sensor-id=0 sensor-mode=0 !
'video/x-raw(memory:NVMM), width=(int)3280, height=(int)2464,
format=(string)NV12, framerate=(fraction)21/1' ! nvvidconv ! xvimagesink sync=false
-e

        $ gst-launch-1.0 nvarguscamerasrc sensor-id=0 sensor-mode=1 !
'video/x-raw(memory:NVMM), width=(int)3280, height=(int)1848,
format=(string)NV12, framerate=(fraction)28/1' ! nvvidconv ! xvimagesink sync=false
-e

        $ gst-launch-1.0 nvarguscamerasrc sensor-id=0 sensor-mode=2 !
```

```
'video/x-raw(memory:NVMM), width=(int)1920, height=(int)1080,
format=(string)NV12, framerate=(fraction)30/1' ! nvvidconv ! xvimagesink sync=false
-e

        $ gst-launch-1.0 nvarguscamerasrc sensor-id=0 sensor-mode=3 !
'video/x-raw(memory:NVMM), width=(int)1640, height=(int)1232,
format=(string)NV12, framerate=(fraction)30/1' ! nvvidconv ! xvimagesink sync=false
-e

        $ gst-launch-1.0 nvarguscamerasrc sensor-id=0 sensor-mode=4 !
'video/x-raw(memory:NVMM), width=(int)1280, height=(int)720,
format=(string)NV12, framerate=(fraction)60/1' ! nvvidconv ! xvimagesink sync=false
-e
```

3. GPIO usage EX: gpio**492** (**PAC.06**)
(1) check status to know the gpio index

```
$ sudo su

$ cat /sys/kernel/debug/gpio | grep 492

gpio-492 (PAC.06                )
```

(2) Export

```
$ echo 492 > /sys/class/gpio/export

#check status

$ cat /sys/kernel/debug/gpio | grep 492

gpio-492 (PAC.06                |sysfs                ) in    lo
```

(3) direction: Output

```
$ sudo su

# INPUT: in, OUTPUT:out
$ echo out > /sys/class/gpio/PAC.06/direction
#check status

$cat /sys/kernel/debug/gpio | grep 492

gpio-492 (PAC.06                |sysfs                ) out lo
```

(4) Value: low -> high

```
# HIGH:1 LOW:0
```

```
$echo 1 > /sys/class/gpio/PAC.06/value

#check status

$cat /sys/kernel/debug/gpio | grep 492

gpio-492 (PAC.06                |sysfs                ) out hi
```

(5) Disable

```
$ echo 492 >/sys/class/gpio/unexport

$ cat /sys/kernel/debug/gpio | grep 492

gpio-492 (PAC.06                )
```

4. **Force Recovery Mode**

USB 3.l/ Jetson platform port of D131L can be used to re-program NVIDIA® Jetson Orin NX by using the other host system running NVIDIA Jetpack, as the procedure described below.

1. Power off the system. Ensure the system power must be completely OFF, instead of staying in the suspend mode or the sleep mode.
2. Connect a USB cable from Jetson platform USB port to the other host system which will be used to re-program the new system file into NVIDIA® Jetson Orin NX.
3. Press and hold down Force Recovery Button and then power on the carrier board.
4. After three seconds, release Force Recovery Button.
5. NVIDIA® Orin NX will show up on the USB list of the host system as a new NVIDIA target device.

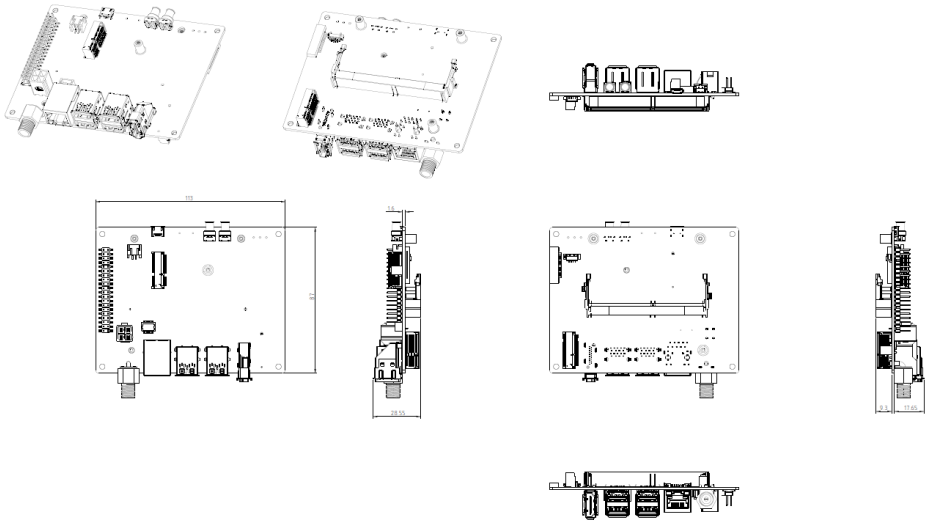
After the system software is updated successfully, please ensure to power off the system. A clean power-on will then revert Jetson platform port back to the host mode.

6.0 Power Consumption

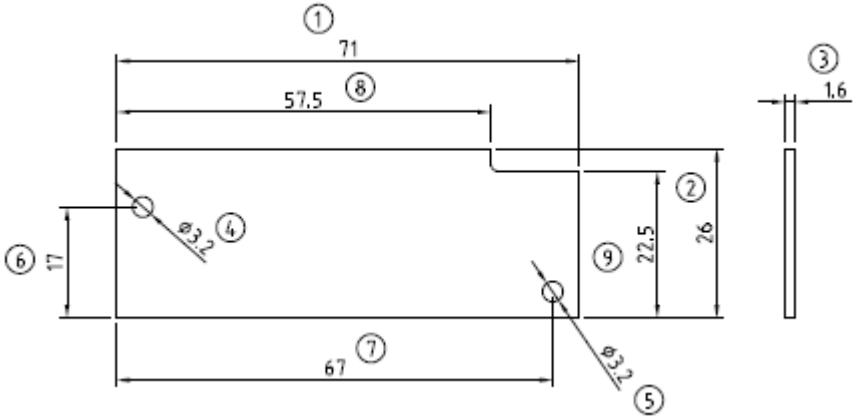
Item Description	Power Consumption
Theoretical Maximum System Power Consumption	● D131L Power Consumption: TBD The condition is connected to USB3.2*4,USB*1,MIPI 2 lane*1, SSD 256G*1,Wifi 9260*1, HDMI*1, with CPU/ GPU full loading. (maximum power consumption up to 60W based on adapter)
Typical System Power Consumption	The power consumption under the normal operating mode is depending on the application software running with NVIDIA® Orin™ NX/Orin Nano

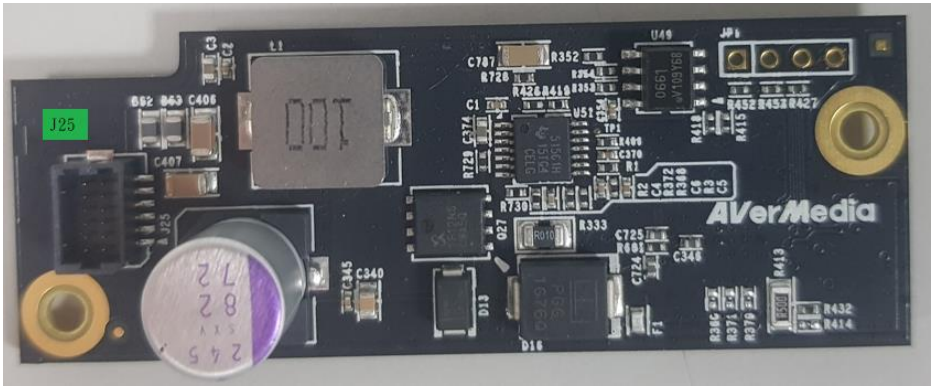
6.0 Dimension Drawings

6.1Dimension Drawings of carrier board



6.2 Dimension Drawing of PSE Board



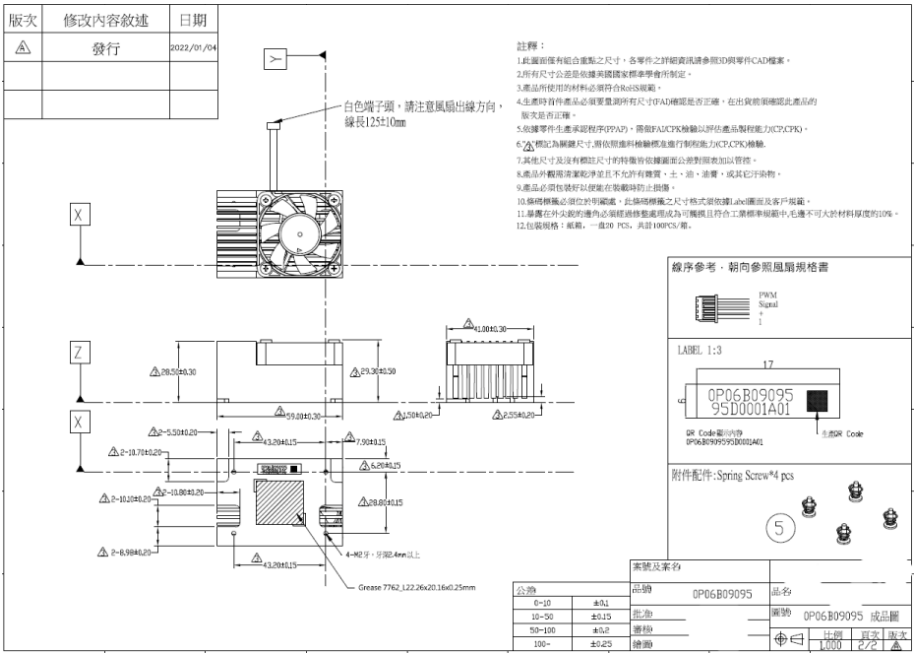


7.0 Accessory Drawings

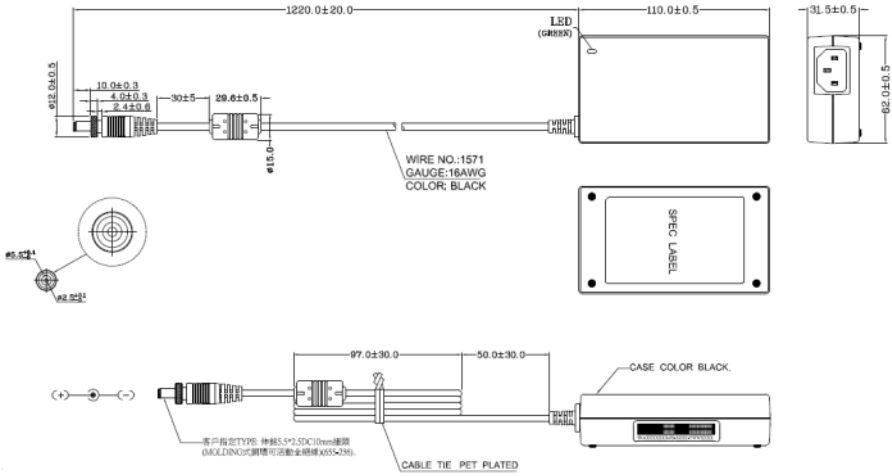
7.1 Fan Module/ Adapter/ Power Cord

Fan Module for Orin NX/Orin Nano

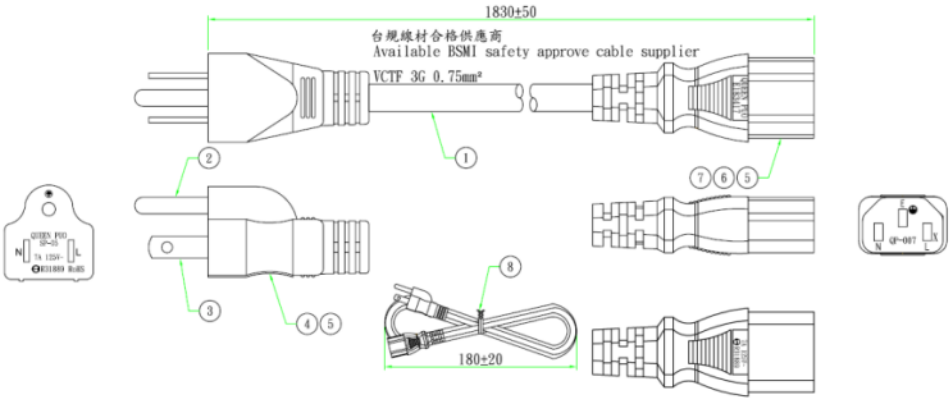
- Rated Voltage: 5V
- Operating Voltage Range: 3.5V~5.5V
- Rated Speed: 7000RPM±10%
  (Testing Speed After Continuous 3 Minute Operation At Ambient Temperature Of 25℃)
- Life Expectancy: 70,000hours at 40°C (WITH 15~65% RH)
- Bearing Type: Two Ball



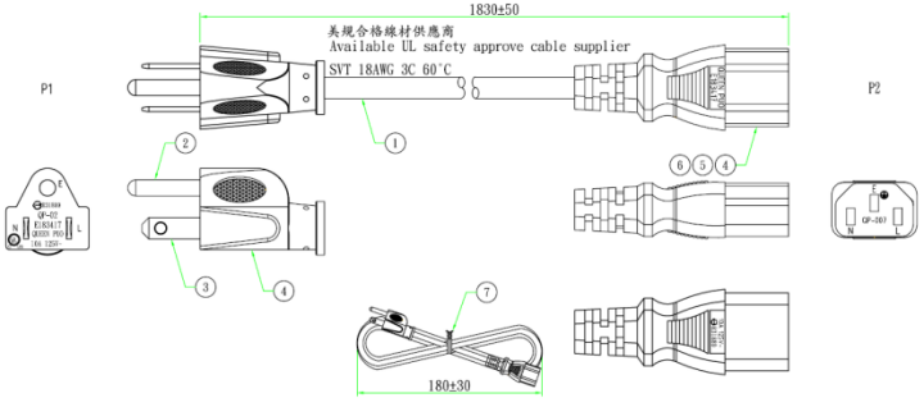
Power Adapter 04131HGOUANK



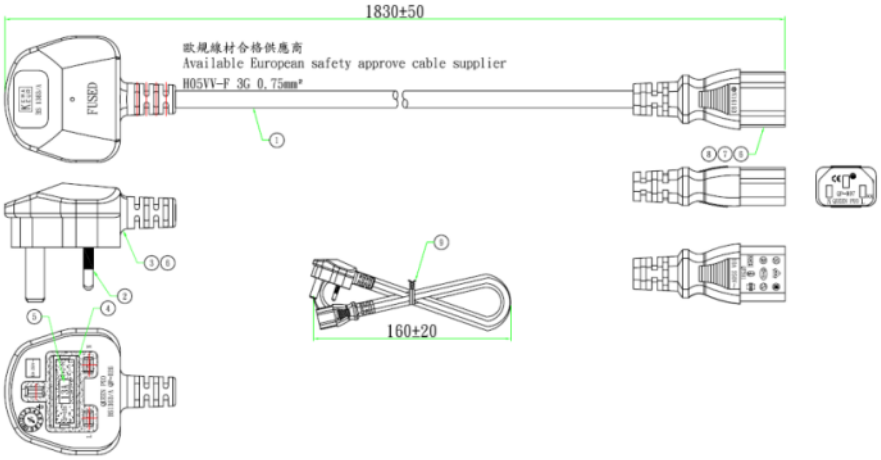
064APOWERBRX-IPD (TW version)



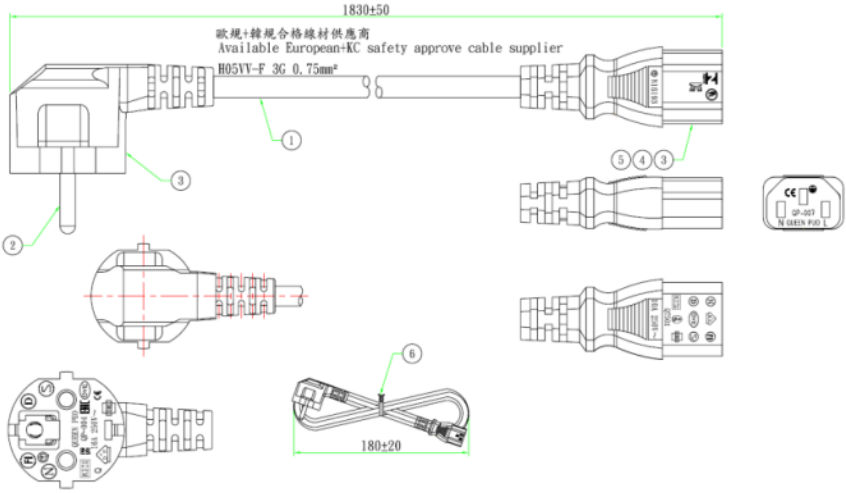
064APOWERBR2-IPD (US version)



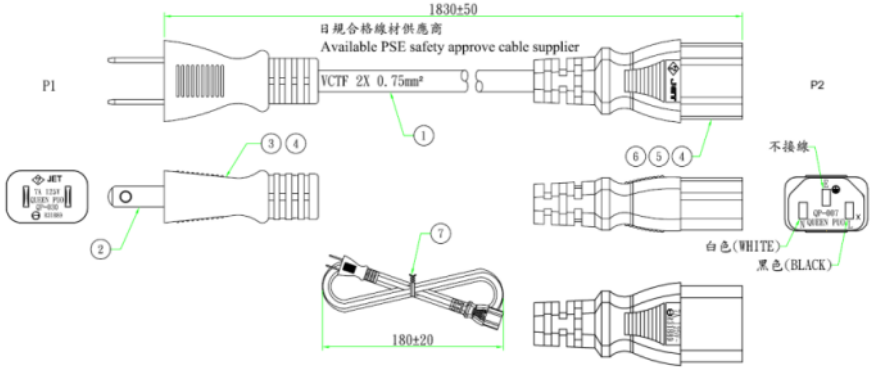
064APOWERBRW-IPD (UK version)



064APOWERBR5-IPD (EU version)



064APOWERBSL (JP version)



064APOWERBR4-IPD (CN version)