AVerMedia D131 series【Preliminary】

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

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Preface

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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

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Revision History

Revision	Date	Updates
Version 0.1	March, 6, 2023	1st Released
Version 0.2	June, 13, 2023	1. Add Dip switch information 2. Update ATX 4pin photo 3. Update product spec 4. Add Bottom View Interface 5. Add Micro SD slot memo
Version 0.3	June, 27, 2023	Update hardware modification of Raspberry pi v3 (imx477) for compatibility with NVIDIA Jetson Platforms.
Version 0.4	July, 11, 2023	Add OOB information into spec
Version 0.5	July, 31, 2023	Add GPIO command for JetPack5.x

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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.

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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 D131 includes fully featured carrier board which is all developed for NVIDIA® Jetson Orin™ NX / Orin™ Nano modules. AVerMedia D131 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.

D131 provides one HDMI video output, four USB 3.1 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® Jetson Orin™ NX/ Orin™ Nano modules and the rich I/O functions, AVerMedia D131 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	D131	
Type	Carrier board	
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	
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	2x 2 lane MIPI CSI-2, 15 pin FPC 1mm Pitch Connector 1x 4 lane MIPI CSI-2, 36 pin FPC 0.5mm 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 1xCAN (3-pin terminal block) 1xDip Switch button 1x OOB supported by Allxon	
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	

*** D131 have one mSD slot, but NVIDIA Orin NX/Orin Nano doesn't support mSD function. It's SOM limitation**

Model	D131OXB	
Type	Engineering kit	
NVIDIA GPU SoC Module Compatibility	NVIDIA® Jetson Orin™ NX 8G/16G module	
Networking	1x GbE RJ-45 (PoE optional) 1xM.2. key E 2230 for Wi-Fi	
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	2x 2 lane MIPI CSI-2, 15 pin FPC 1mm Pitch Connector 1x 4 lane MIPI CSI-2, 36 pin FPC 0.5mm 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 (256G installed)	
Expansion Header	40-pin: 1x UART, 2x SPI, 2x 12C, 1x I2S, 6xGPIOs 1xCAN (3-pin terminal block) 1xDip Switch button 1x OOB supported by Allxon	
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	
Buttons	Power and Recovery	
RTC Battery	Support RTC battery and Battery Life Monitoring by MCU	
PCB/Electronics Mechanical Info	157mm(W) x 105mm(L) x 85mm(H) with stand	
Certifications	CE, FCC,KC	

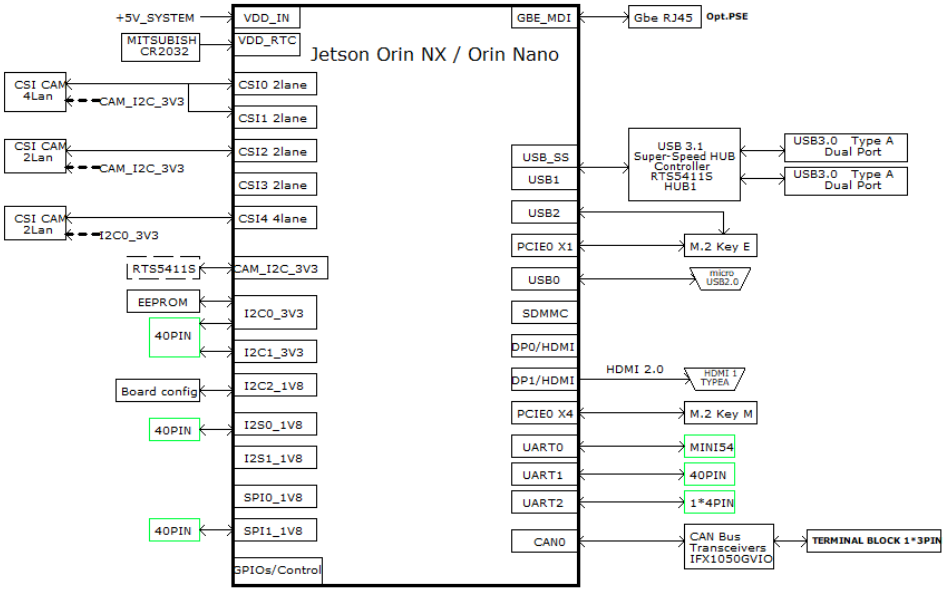
*** D131 have one mSD slot, but NVIDIA Orin NX/Orin Nano doesn't support mSD function. It's SOM limitation**

1.2 Option Accessory

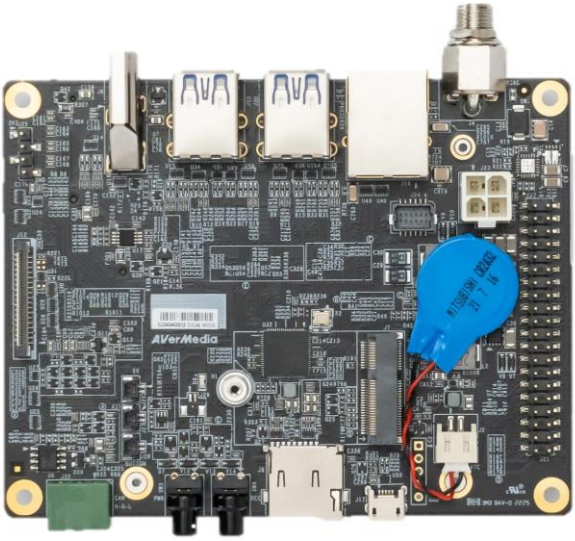
Item	D131/D131OXB
NVIDIA® Jetson	NVIDIA® Jetson Orin™ NX for D131OXB
Power adapter/Power Cord	12V/5A adapter and US/JP/EU/UK/TW/AU/CN power cord (optional)
MIPI Camera (internal I/O)	● For 15 pin MIPI connector 1. raspberry pi camera v2 2. Manufacturer: APPRO.PHO ■ B-04: IMX179(8M)MIPI, 1080P(30fps) ■ C-04: IMX290(2M)MIPI, 1080P(30fps) ■ C-05: IMX290(2M)+ISP(YUV), 1080P(30fps) ● For 36 pin MIPI connector 1. Manufacturer: APPRO.PHO ■ B-03: IMX334(4K) MIPI, 4K(30fps) ■ A-06: IMX334(4K) V-by-One® HS x1,4K(30fps)

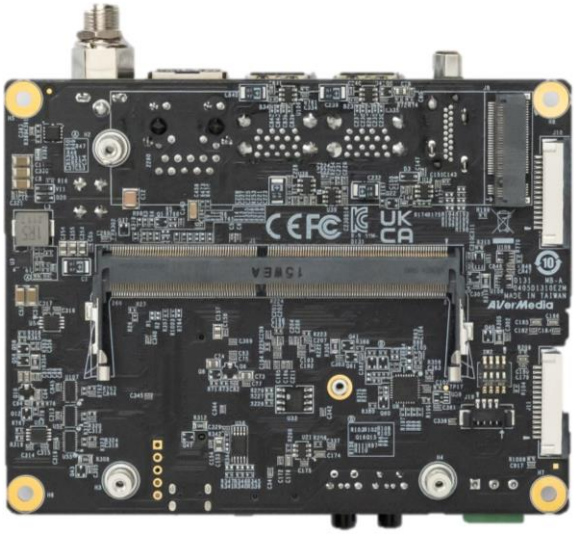
2.0 Product Overview

2.1 Block Diagram



2.2 Front View and Back View of Carrier board





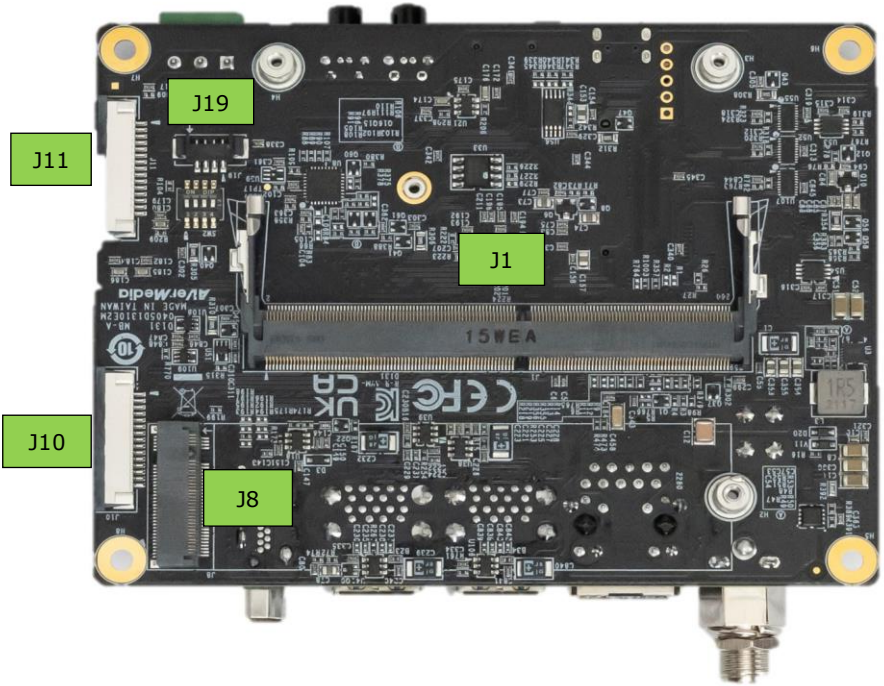
2.3 Connector Summary

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
J10	FPC connector for 2-lane MIPI CSI-2
J11	FPC connector for 2-lane MIPI CSI-2
J12	FPC connector for 4-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
J22	CAN bus 3-pin terminal block with transceiver
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

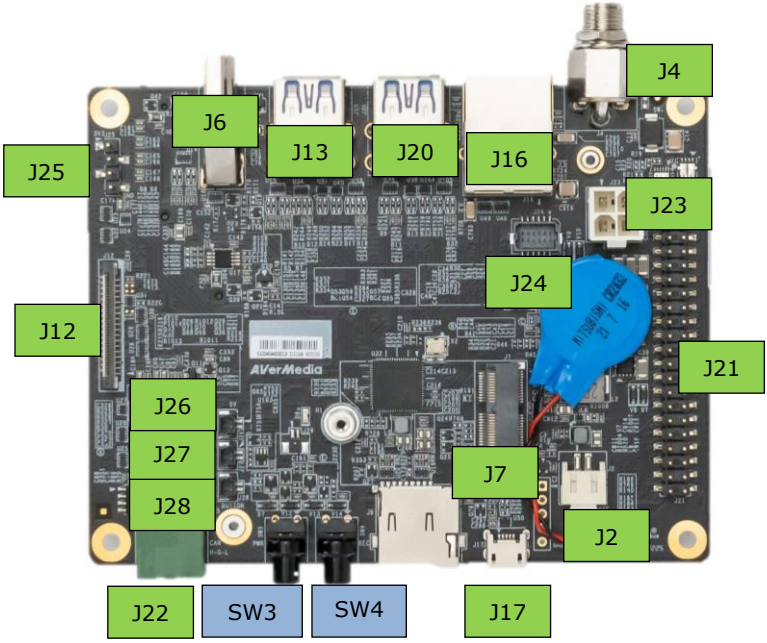
Top View Interface

J1	SO-DIMM 260-pin 90° SMD Socket(H-9.2mm) for Jetson Orin™ NX/ Orin™ Nano SOM
J8	M.2 M-Key Socket
J10	FPC connector for 2-lane MIPI CSI-2
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
J12	FPC connector for 4-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
J21	40-pin Expansion
J22	CAN bus 3-pin terminal block with transceiver
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



3.0 Feature Description

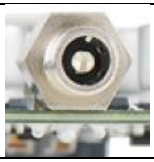
3.1 Jetson module Connector

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	

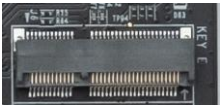
Manufacturer and Part Number	京政 JKCR DCD-020-105B
Mating Connector	伸銘 SMCTS OD 5.5*2.5 mm DC 10mm (655-236)
Pinout	Pin Number: Center — Description: Power Pin Number: Outer ring — Description: GND
Remarks	NA

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	None

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	J10 , 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

J10

PIN#	Description	PIN#	Description
Pin1	GND	Pin9	CSI3_CLK_P
Pin2	CSI3_D0_N	Pin10	GND
Pin3	CSI3_D0_P	Pin11	CAM0_PWDN
Pin4	GND	Pin12	CAM0_MCLK
Pin5	CSI3_D1_N	Pin13	I2C_CAM0_SCL
Pin6	CSI3_D1_P	Pin14	I2C_CAM0_SDA
Pin7	GND	Pin15	+3V3_MIPI
Pin8	CSI3_CLK_N		

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			

3.9 SerDes (V-by-One® HS)

Function	MIPI camera module connector
Location	J12
Type Description	WAFER_1*36PIN_0.5 ㎜_180°
Manufacturer and Part Number	PINREX 979-44-93610A_ZIF FPC
Mating Connector	4 Lane MIPI CSI-2 camera connector (36PIN)

PIN OUT

Pin Number	Signal	Pin Number	Signal
1	5V	19	GND
2	5V	20	CSI1_D1_P
3	1.8V	21	CSI1_D1_N
4	3.3V	22	GND
5	3.3V	23	N/A
6	3.3V	24	N/A
7	GND	25	N/A
8	CSI0_D0_P	26	MIPI4_PWDN
9	CSI0_D0_N	27	I2C0_ID_SDA
10	GND	28	I2C0_ID_SCL
11	CSI0_CLK_P	29	GND
12	CSI0_CLK_N	30	N/A
13	GND	31	N/A
14	CSI0_D1_P	32	N/A
15	CSI0_D1_N	33	N/A
16	GND	34	GND
17	CSI1_D0_P	35	CAM4_MCLK
18	CSI1_D0_N	36	GND

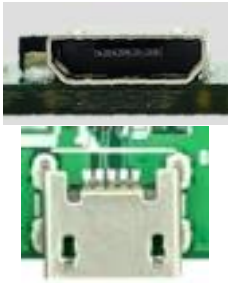
3.10 USB 3.2 Gen 1 Type-A Connector #1 , #2, #3

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	

3.11 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.	

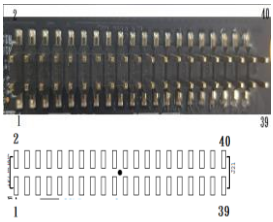
3.12 Jetson platform/ USB 2.0 Micro B Connector

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	

3.13 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	

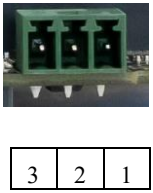
3.14 40-Pin GPIO expansion

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	D131+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

3.15 CAN Bus 3-pin terminal block with transceiver

Function	CAN Bus 3-pin terminal block with transceiver
Location	J22
Type Description	TERMINAL BLOCK_1*3PIN
Manufacturer and Part Number	進聯 DECA, ME030-38103T, GREEN-P3.81 ㎜
Mating Connector	進聯 DECA, MC420-38103Z
Pinout	Pin # / Description 1 / CANH 2 / GND 3 / CANL
Remarks	None

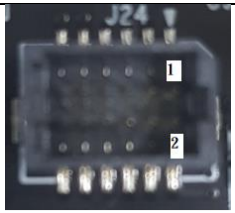


3.16 ATX 4P

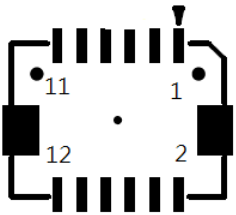
Function	ATX 4P
Location	J23
Type Description	WAFER_2*2PIN_4.2 ㎜_90°_DIP
Manufacturer and Part Number	福軒 Fullglory FPWD-42R2-04NAT
Mating Connector	Follow ATX 4pin power standard
Pinout	Pin Number / Description 1 / GND 2 / GND 3 / 9-24V Power 4 / 9-24V Power
Remarks	None

3.17 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	
Remarks	NA

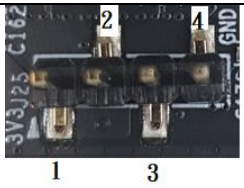


PIN#	Description	PIN#	Description
Pin1	PWR_IN	Pin2	GND
Pin3	PWR_IN	Pin4	GND
Pin5	54V	Pin6	SYS_RST*
Pin7	54V	Pin8	I2C1_SCL *
Pin9	PortN_OUT0	Pin10	I2C1_SDA
Pin11	POE_P0	Pin12	3V3

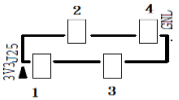


3.18 Debug Port

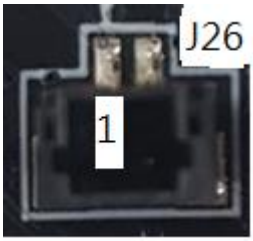
Function	Debug
Location	J25
Type Description	1*4PIN_2.54 ㎜_180°_SMD
Manufacturer and Part Number	ACES 60240-00471-001
Pinout	
Remarks	

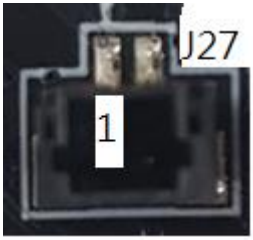


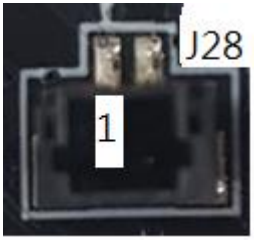
Pin #	Description
PIN1	3V3 Power
PIN2	UART_TXD
PIN3	UART_RXD
PIN4	GND



3.19 **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		

3.20 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

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

Remark	

3.21 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

3.22 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	

Other Switches and Jumpers

Other switches and jumpers listed on the boards but not mentioned in this manual are reserved for the internal use by AVerMedia. They are not open to the client application.

4.0 Installation

1. Check and ensure all the external system power supplies are turned off.
2. Install the Micro USB2.0 cable to Jetson platform connector.
3. Press and hold on the Recover button.
4. Connect the power cord to the box PC.

4.1 BSP Setup Instructions

BSP (board support package) file: D131OX-R2.0.*.tar.gz for D131OX
If you want to get the BSP download link, Please contact with AVerMedia FAE.

Default login username/password of the BSP is nvidia/nvidia

If you have difficulties to access the BSP download link, please visit AVerMedia website at https://www.avermedia.com/professional/download, or contact technical support at https://www.avermedia.com/professional/technical_support or e-mail us at eusupport@avermedia.com for further assistance.

BSP Installation steps for NVIDIA Jetson board: (Important Note: Please backup your personal files before re-flashing BSP)
After you download the BSP file and put the file in a Linux PC, please refer to the steps below to re-flash BSP.

1. 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 kernel messages with `dmesg` command in the Linux PC.
Once you see these messages in the kernel messages, this means that the NVIDIA Jetson board is in the recovery mode.
[24685.229129] usb 1-7: Product: APX
[24685.229132] usb 1-7: Manufacturer: NVIDIA Corp

2. Using the commands below in the Linux PC to start re-flashing BSP.

$ sudo tar zxvf D131OX-R2.*.*.tar.gz

(file: D131OX-R2.*.*.tar.gz for D131OXB)

$ cd JetPack_*.**/Linux_for_Tegra

$ sudo ./install.sh

The BSP is support flash to default nvme ssd or external USB dungle.

You can select whitch one you want to flash after launching the install script.

Note: sudo is required to re-flash the BSP..

5.0 Software

This section describes BSP's features for D131OXB

1. Support optional M.2 WI-FI/Bluetooth modules (Intel® Wireless-AC 9260), the manager UI of AC9260 WiFi/Bluetooth is located on the upper-right corner of Ubuntu desktop. It can be also controlled by nmcli/hcitool in command line.

2. Support SD slot (D131OX is not support SD card slot.)

3. 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:

   D131OX: MODE 15W DESKTOP (2)

4. RTC Battery
   The following command can get RTC battery voltage.

```
$ sudo avt_tool -a | grep -oP "AIN5.*\[\K[^\]]*"
```

5. Fan Speed

The following commands can get PWM fan information.

```
# get Fan RPM value
$ cat /sys/devices/platform/gpio_tachometer/hwmon/hwomn1/gpiotach_rpm
```

6. CAN Bus

There are one CAN Bus for D131OXB, see the following command for usage.

(1) Enable and setup CAN Bus

```
# 1. Enable CAN Bus
$ sudo modprobe can
$ sudo modprobe can-raw
$ sudo modprobe mttcan
# 2. Setup CAN Bus
$ sudo ip link set can0 type can bitrate 500000 dbitrate 2000000 berr-reporting on fd
on restart-ms 100
$ sudo ip link set can0 up
```

(2) Receive and Send

```
# Receive
$ candump can0

# Send
$ cansend can0 <can_frame>
```

* where:

<can_frame> is CAN Bus frame message, see `cansend --help` for more detail.

7. MIPI CSI Camera

There are 2x 2-lane and 1x 4-lane MIPI CSI camera supported on D131OXB, for current supported products type are listing as below:

* IMX219 (2-lane)
* IMX477 (2-lane): IMX477 requires a hardware modification in order to work with Jetson Platforms. Please refer to https://developer.ridgerun.com/wiki/index.php/Raspberry_Pi_HQ_camera_IMX477_Linux_driver_for_Jetson#Compatibility_with_NVIDIA.C2.AEJetson.E2.84.A2_Platforms
* IMX179 (2-lane)
* IMX290 (2-lane)
* IMX290ISP (2-lane)
* IMX334 (4-lane)
* IMX334THCV (4-lane)

Test Command:

> Raspberry pi v2 :

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)3264, height=(int)2464,
format=(string)NV12, framerate=(fraction)21/1' ! nvvidconv ! xvimagesink -e
$ gst-launch-1.0 nvarguscamerasrc sensor-id=0 sensor-mode=1 !
'video/x-raw(memory:NVMM), width=(int)3264, height=(int)1848,
format=(string)NV12, framerate=(fraction)28/1' ! nvvidconv ! xvimagesink -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 -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 -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 -e
```

Multiple:

```
$ gst-launch-1.0 nvarguscamerasrc sensor-id=0 sensor-mode=0 !
'video/x-raw(memory:NVMM), width=(int)3264, height=(int)2464,
format=(string)NV12, framerate=(fraction)21/1' ! nvvidconv ! xvimagesink -e &
gst-launch-1.0 nvarguscamerasrc sensor-id=1 sensor-mode=0 !
'video/x-raw(memory:NVMM), width=(int)3264, height=(int)2464,
format=(string)NV12, framerate=(fraction)21/1' ! nvvidconv ! xvimagesink -e &
```

> Raspberry pi v3 (imx477):

No	width	height	framerate
0	4032	3040	30
1	1920	1080	60

$ gst-launch-1.0 nvarguscamerasrc sensor-id=0 ! "video/x-raw(memory:NVMM),width=4032,height=3040,framerate=30/1" ! nvvidconv ! xvimagesink -e

$ gst-launch-1.0 nvarguscamerasrc sensor-id=0 ! "video/x-raw(memory:NVMM),width=1920,height=1080,framerate=60/1" ! nvvidconv ! xvimagesink -e

Multiple:

$ gst-launch-1.0 nvarguscamerasrc sensor-id=0 ! "video/x-raw(memory:NVMM),width=1920,height=1080,framerate=60/1" ! nvvidconv ! xvimagesink -e & gst-launch-1.0 nvarguscamerasrc sensor-id=1 ! "video/x-raw(memory:NVMM),width=1920,height=1080,framerate=60/1" ! nvvidconv ! xvimagesink -e &

> IMX179 :

No	width	height	framerate
0	3280	2464	15
1	1920	1080	30
2	3280	1698	30
3	2096	1084	30
4	1640	1232	30
5	820	616	30
6	820	616	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)15/1' ! nvvidconv ! xvimagesink -e

$ gst-launch-1.0 nvarguscamerasrc sensor-id=0 sensor-mode=1 ! 'video/x-raw(memory:NVMM), width=(int)1920, height=(int)1080, format=(string)NV12, framerate=(fraction)30/1' ! nvvidconv ! xvimagesink -e

$ gst-launch-1.0 nvarguscamerasrc sensor-id=0 sensor-mode=2 ! 'video/x-raw(memory:NVMM), width=(int)3280, height=(int)1698, format=(string)NV12, framerate=(fraction)30/1' ! nvvidconv ! xvimagesink -e

$ gst-launch-1.0 nvarguscamerasrc sensor-id=0 sensor-mode=3 ! 'video/x-raw(memory:NVMM), width=(int)2096, height=(int)1084, format=(string)NV12, framerate=(fraction)30/1' ! nvvidconv ! xvimagesink -e

$ gst-launch-1.0 nvarguscamerasrc sensor-id=0 sensor-mode=4 ! 'video/x-raw(memory:NVMM), width=(int)1640, height=(int)1232, format=(string)NV12, framerate=(fraction)30/1' ! nvvidconv ! xvimagesink -e

$ gst-launch-1.0 nvarguscamerasrc sensor-id=0 sensor-mode=5 ! 'video/x-raw(memory:NVMM), width=(int)820, height=(int)616, format=(string)NV12, framerate=(fraction)30/1' ! nvvidconv ! xvimagesink -e

$ gst-launch-1.0 nvarguscamerasrc sensor-id=0 sensor-mode=6 ! 'video/x-raw(memory:NVMM), width=(int)820, height=(int)616, format=(string)NV12, framerate=(fraction)60/1' ! nvvidconv ! xvimagesink -e

Control Focus:

$ v4l2-ctl -d /dev/video2 --set-ctrl=focus_manual=1

$ v4l2-ctl -d /dev/video2 --set-ctrl=focus_manual=1024

> IMX290 :

No	width	height	framerate
0	1948	1096	30
1	1948	1096	60

$ gst-launch-1.0 nvarguscamerasrc sensor-id=0 sensor-mode=0 ! 'video/x-raw(memory:NVMM), width=(int)1948, height=(int)1096, format=(string)NV12, framerate=(fraction)30/1' ! nvvidconv ! xvimagesink -e

$ gst-launch-1.0 nvarguscamerasrc sensor-id=0 sensor-mode=1 ! 'video/x-raw(memory:NVMM), width=(int)1948, height=(int)1096, format=(string)NV12, framerate=(fraction)60/1' ! nvvidconv ! xvimagesink -e

> IMX290ISP :

No	width	height	framerate
0	1920	1080	25/30/50/60
1	1280	960	25/30/50/60
2	1280	720	25/30/50/60
0	800	600	25/30/50/60
1	640	480	25/30/50/60
2	640	360	25/30/50/60

$ gst-launch-1.0 v4l2src io-mode=4 device=/dev/video0 do-timestamp=true ! 'video/x-raw, width=1920, height=1080, framerate=30/1, format=UYVY' ! xvimagesink sync=false

$ gst-launch-1.0 v4l2src io-mode=4 device=/dev/video0 do-timestamp=true ! 'video/x-raw, width=1280, height=720, framerate=30/1, format=UYVY' ! xvimagesink sync=false

$ gst-launch-1.0 v4l2src io-mode=4 device=/dev/video0 do-timestamp=true ! 'video/x-raw, width=1280, height=960, framerate=30/1, format=UYVY' ! xvimagesink sync=false

$ gst-launch-1.0 v4l2src io-mode=4 device=/dev/video0 do-timestamp=true ! 'video/x-raw, width=1920, height=1080, framerate=60/1, format=UYVY' ! xvimagesink sync=false

$ gst-launch-1.0 v4l2src io-mode=4 device=/dev/video0 do-timestamp=true ! 'video/x-raw, width=1280, height=720, framerate=60/1, format=UYVY' ! xvimagesink sync=false

$ gst-launch-1.0 v4l2src io-mode=4 device=/dev/video0 do-timestamp=true ! 'video/x-raw, width=1280, height=960, framerate=60/1, format=UYVY' ! xvimagesink sync=false

> IMX334 :

```
No   width   height  framerate
0  3864    2180       30
1  3864    2180       60
2  1944    1090       30
3  1944    1090       60
```

```
$ gst-launch-1.0 nvarguscamerasrc sensor-id=0 sensor-mode=0 !
'video/x-raw(memory:NVMM), width=(int)3864, height=(int)2180,
format=(string)NV12, framerate=(fraction)30/1' ! nvvidconv ! xvimagesink -e
$ gst-launch-1.0 nvarguscamerasrc sensor-id=0 sensor-mode=1 !
'video/x-raw(memory:NVMM), width=(int)3864, height=(int)2180,
format=(string)NV12, framerate=(fraction)60/1' ! nvvidconv ! xvimagesink -e
$ gst-launch-1.0 nvarguscamerasrc sensor-id=0 sensor-mode=2 !
'video/x-raw(memory:NVMM), width=(int)1944, height=(int)1090,
format=(string)NV12, framerate=(fraction)30/1' ! nvvidconv   top=5 bottom=1085
left=12 right=1932 ! xvimagesink -e
$ gst-launch-1.0 nvarguscamerasrc sensor-id=0 sensor-mode=3 !
'video/x-raw(memory:NVMM), width=(int)1944, height=(int)1090,
format=(string)NV12, framerate=(fraction)60/1' ! nvvidconv   top=5 bottom=1085
left=12 right=1932 ! xvimagesink -e
```

> IMX334 V-by-One (imx334thcv):

```
No   width   height  framerate
0  3864    2180       30
1  1944    1090       30
2  1944    1090       60
```

```
$ gst-launch-1.0 nvarguscamerasrc sensor-id=0 sensor-mode=0 !
'video/x-raw(memory:NVMM), width=(int)3864, height=(int)2180,
format=(string)NV12, framerate=(fraction)30/1' ! nvvidconv ! xvimagesink -e
$ gst-launch-1.0 nvarguscamerasrc sensor-id=0 sensor-mode=1 !
'video/x-raw(memory:NVMM), width=(int)1944, height=(int)1090,
format=(string)NV12, framerate=(fraction)30/1' ! nvvidconv   top=5 bottom=1085
left=12 right=1932 ! xvimagesink -e
$ gst-launch-1.0 nvarguscamerasrc sensor-id=0 sensor-mode=2 !
'video/x-raw(memory:NVMM), width=(int)1944, height=(int)1090,
format=(string)NV12, framerate=(fraction)60/1' ! nvvidconv   top=5 bottom=1085
left=12 right=1932 ! xvimagesink -e
```

8. GPIO usage

➢ For JetPack4.x

(1) Output: (e.g. gpio232)

```
$ sudo su
```

```
$ gpio_id=232
$ echo $gpio_id > /sys/class/gpio/export
$ echo out > /sys/class/gpio/gpio$gpio_id/direction
$ echo 1 > /sys/class/gpio/gpio$gpio_id/value     # HIGH
$ echo 0 > /sys/class/gpio/gpio$gpio_id/value     # LOW
```

(2) Input

```
$ sudo su
$ gpio_id=232
$ echo $gpio_id > /sys/class/gpio/export
$ echo in > /sys/class/gpio/gpio$gpio_id/direction
$ cat /sys/class/gpio/gpio$gpio_id/value        # 1: HIGH,   0: LOW
```

(3) Disable

```
$ sudo su
$ gpio_id=232
$ echo $gpio_id >/sys/class/gpio/unexport
```

- For JetPack5.x

(1) Output: (e.g. gpio 492)

```
$ sudo su

$ gpio_id=492
      $ sudo cat /sys/kernel/debug/gpio | grep ${gpio_id}
      # output:
       gpio-492 (PX.04             )
      $ gpio_index=PX.04
      $ echo ${gpio_id} > /sys/class/gpio/export
      $ echo out > /sys/class/gpio/${gpio_index}/direction
      $ echo 1 > /sys/class/gpio/${gpio_index}/value     # HIGH
      $ echo 0 > /sys/class/gpio/${gpio_index}/value     # LOW
```

(2) Input

```
$ sudo su
      $ gpio_id=492
      $ sudo cat /sys/kernel/debug/gpio | grep ${gpio_id}
      # output:
       gpio-492 (PX.04             )
      $ gpio_index=PX.04
```

```
$ echo ${gpio_id} > /sys/class/gpio/export
$ echo in > /sys/class/gpio/${gpio_index}/direction
$ cat /sys/class/gpio/${gpio_index}/value      # 1: HIGH,   0: LOW
```

(3) Disable

```
$ sudo su
$ gpio_id=492
$ echo ${gpio_id} >/sys/class/gpio/unexport
```

For L4T (Linux for Tegra) BSP support and the other software support associated with NVIDIA® Jetson Orin NX, please visit AVerMedia website to contact our technical support function. (https://www.avermedia.com/tw/support/contact)

9. **Force Recovery Mode**

USB 3.l/ Jetson platform port of D131OXB 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.

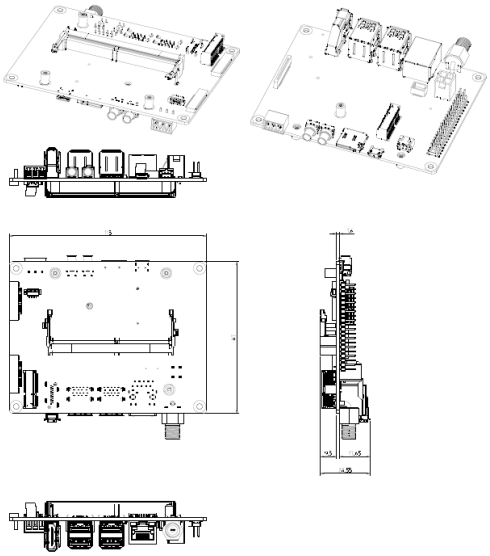
After the system software is updated successfully, please ensure to power off the system. A clean power-on will then revert Jetson platform port back to the host mode

10. Power Consumption

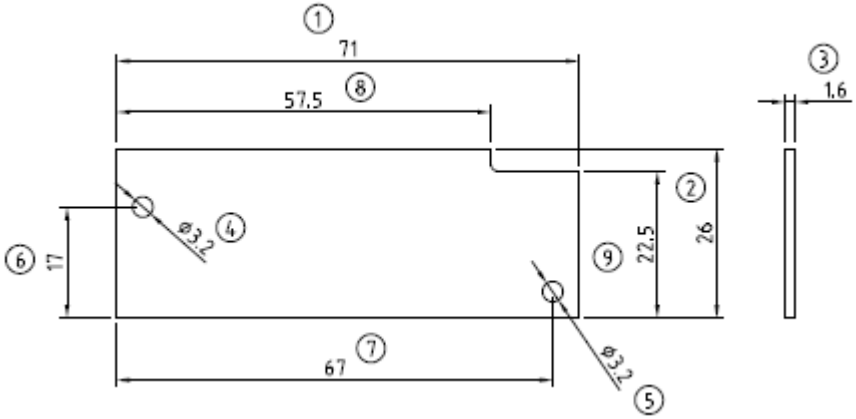
Item Description	Power Consumption
Theoretical Maximum System Power Consumption	● D131OXB Power Consumption: TBD The condition is connected to USB3.2*4,USB*1,MIPI 2 lane*2, 4 lane *1, SSD 256G*1,Wifi 9260*1, HDMI*1, with CPU/ GPU full loading. (maximum power consumption up to 60W based on adapter)
Typical System Power Consumption	The power consumption under the normal operating mode is depending on the application software running with NVIDIA® Orin™ NX

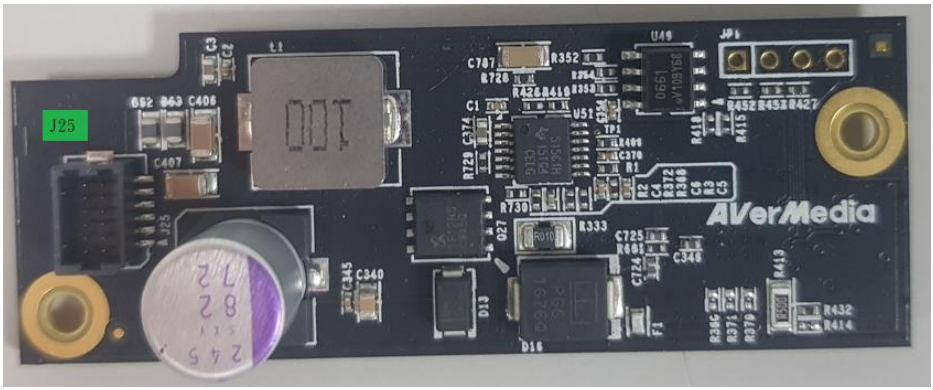
6.0 Dimension Drawings

6.1Dimension Drawings of carrier board



6.2 Dimension Drawing of PSE Board



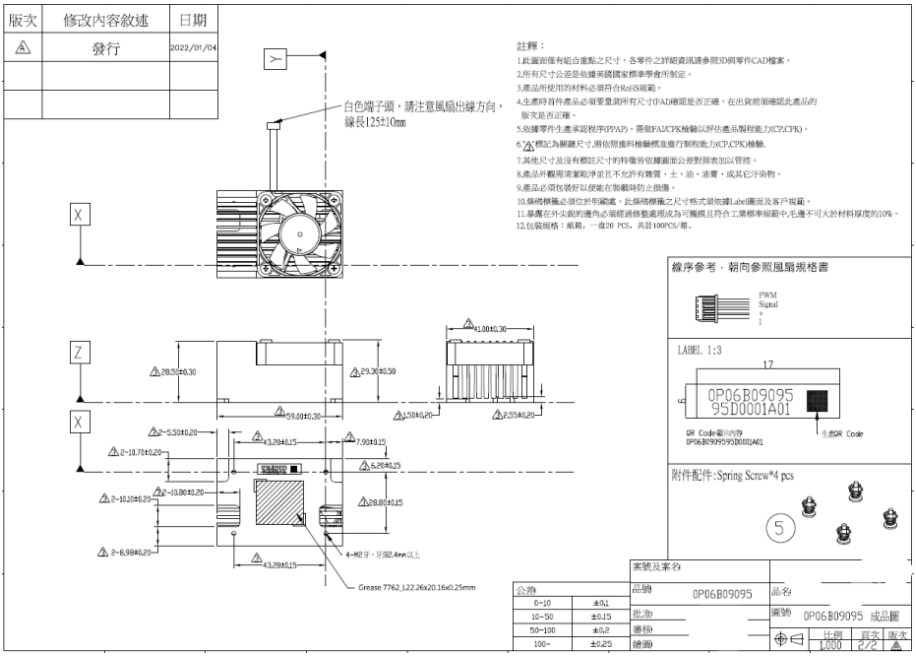


7.0 Accessory Drawings

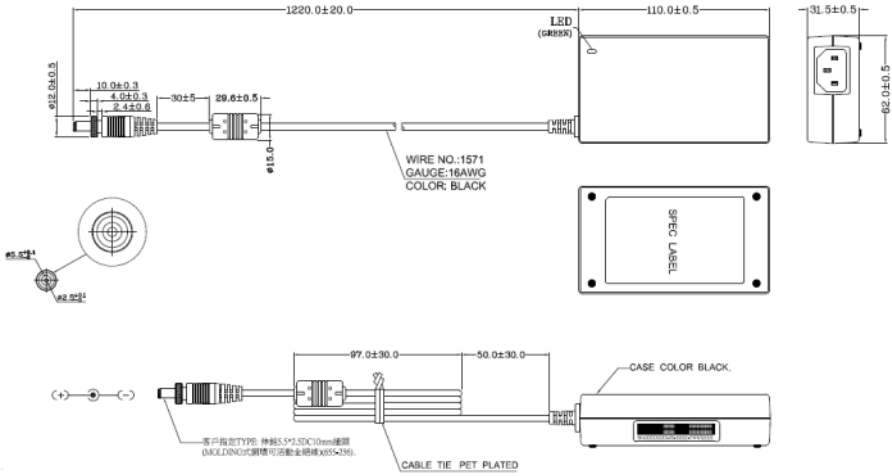
7.1 Fan Module/ Adapter/ Power Cord

Fan Module for Orin NX

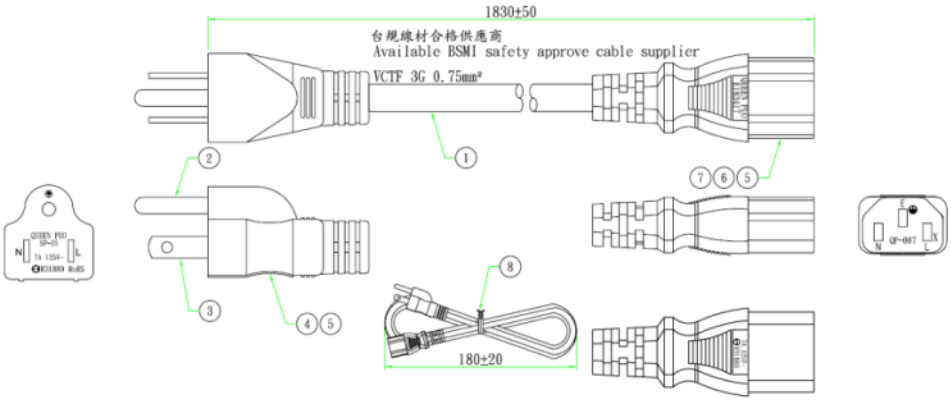
- Rated Voltage: 5V
- Operating Voltage Range: 3.5V~5.5V
- Rated Speed: 7000RPM±10%
  (Testing Speed After Continuous 3 Minute Operation At Ambient Temperature Of 25℃)
- Life Expectancy: 70,000hours at 40℃ (WITH 15~65% RH)
- Bearing Type: Two Ball



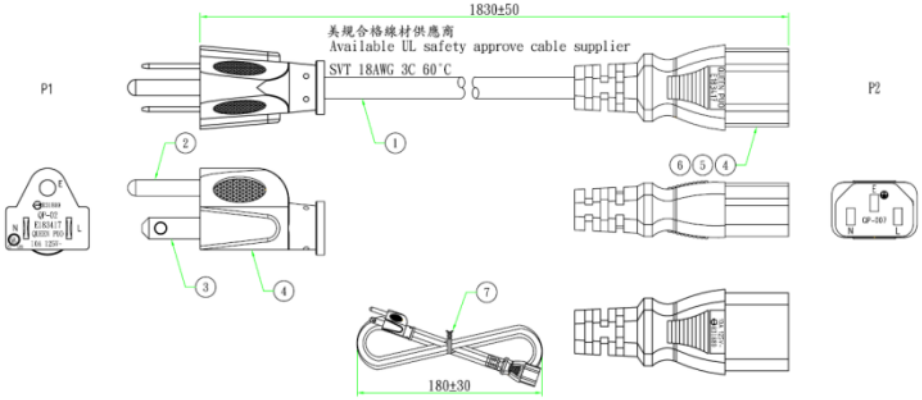
Power Adapter 04131HGOUANK



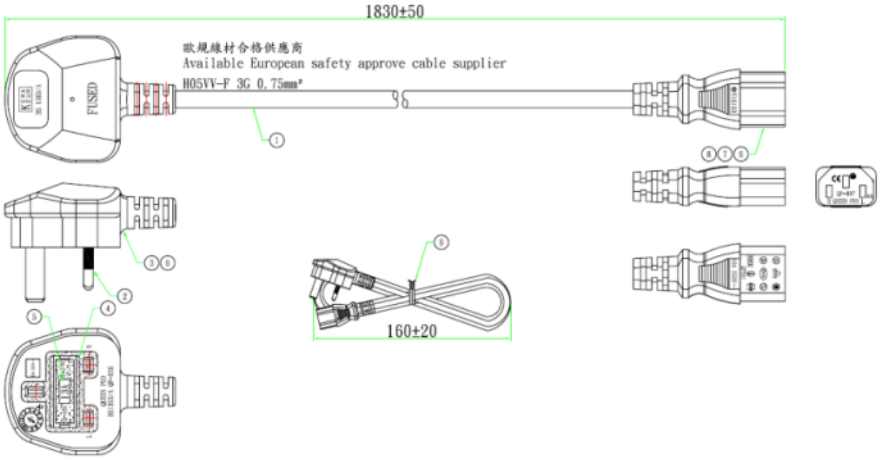
064APOWERBRX-IPD (TW version)



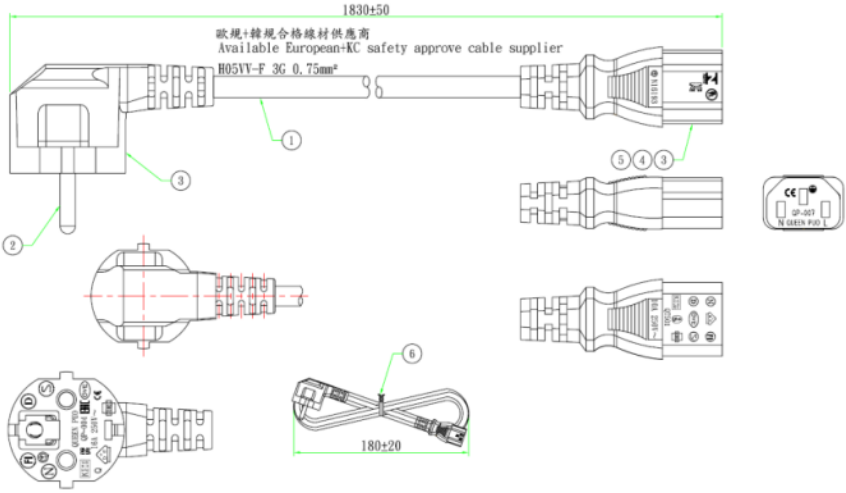
064APOWERBR2-IPD (US version)



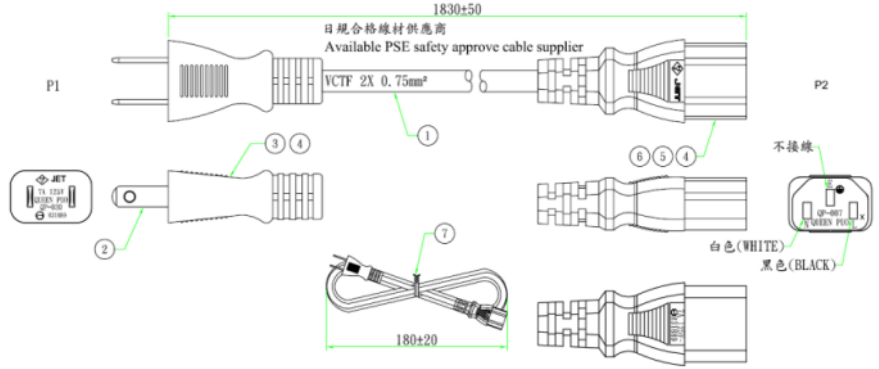
064APOWERBRW-IPD (UK version)



064APOWERBR5-IPD (EU version)



064APOWERBSL (JP version)



064APOWERBR4-IPD (CN version)