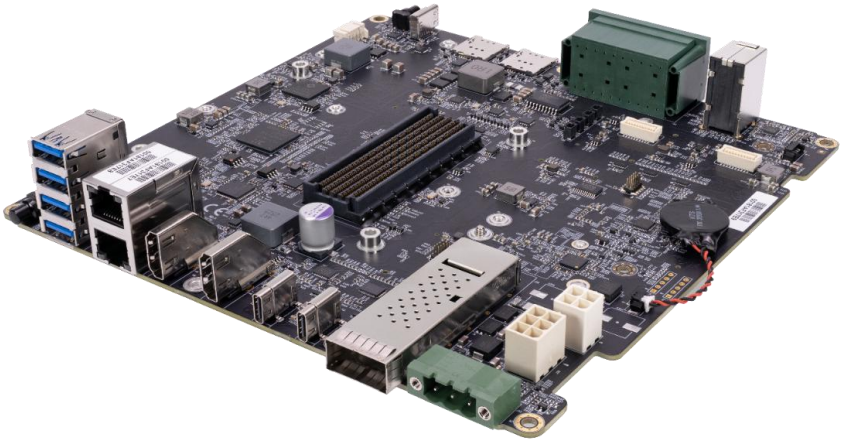
AVerMedia D331

Applies to NVIDIA Jetson T5000™/Jetson T4000™



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Preface

Disclaimer

The information contained in this user manual, including but not limited to any product specification, is subject to change without notice. AVerMedia assumes no liability for any damage incurred directly or indirectly from any technical or typographical errors or omissions contained herein or for discrepancies between the product and the user manual.

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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
V0.1	Jan 29, 2026	1st Released
V0.2	Feb 2, 2026	Remove Fan Module Power Adapter Power Cord wrong information
V1.0	Feb 13,2026	Update 2.0 Feature Description 9.0 Daughter board introduction
V1.1	Feb 23,2026	Error Fix Add OOB demo connection
V1.2	Mar 3,2026	Error Fix Add 2.17 2.18 pinout/pin definition
V1.3	Mar 5,2026	Error Fix
V1.4	Mar 25,2026	Product spec change 2.6 USB Type C Power Supply Connector
V1.5	Mar 26,2026	Error Fix
V1.6	Apr 21,2026	Error Fix
V1.7	May 12,2026	Error Fix P.11~P.12
V1.8	May 27, 2026	Updated SSD Storage Spec Gen5 → Gen4
V1.9	June 22, 2026	Updated as D331 B version
V2.0	July 6, 2026	Updated P.26 Table
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V2.2	Aug 20, 2026	Updated J38
V2.3	Aug 31, 2026	Updated J33

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Product Warranty

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ESD Warning

Electronic components and circuits are sensitive to Electrostatic Discharge (ESD). When handling any circuit board assemblies including 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 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 used or idle for a long time.
10. Disconnect the device from any AC supply before cleaning. While cleaning, use damp cloth instead of liquid or spray detergents.
11. Make sure the device is installed near a power outlet and easy for accessibility.
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 electrical shock.
15. The static electricity should be noted while installing any internal components. Consider using 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) The device is not working as expected or in a manner as described in this manual
16. The static electricity should be noted while installing any internal components. Consider to

1.0 Introduction

AVerMedia D331 is a high-performance carrier board designed to support the NVIDIA® Jetson Thor™ module industry platform. Built with a comprehensive set of I/O interfaces including dual GbE, QSFP for high-speed networking, multiple M.2 expansion slots, rich peripheral connectivity, and robust industrial-grade design, the D331 enables rapid development and deployment of AI-driven embedded IoT solutions.

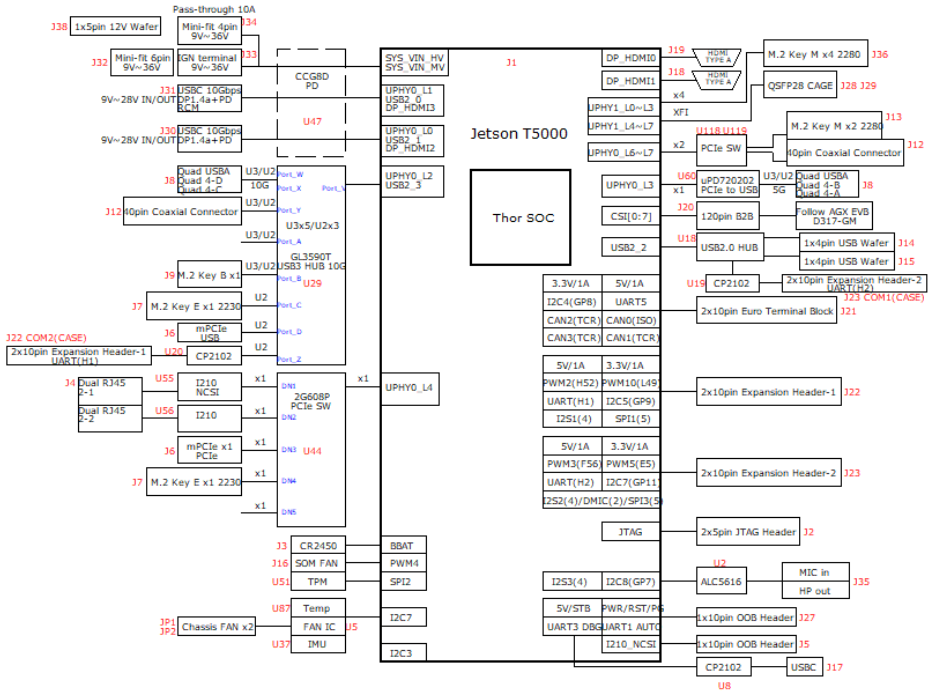
Equipped with a powerful NVIDIA Jetson T5000™/T4000™ system-on-module and a wide range of connectivity options such as HDMI, USB 3.2, CAN bus, PWM, and camera interfaces, the D331 carrier board delivers a flexible and scalable platform for demanding applications in autonomous mobile robotics (AMRs), smart security, smart inspection, and other edge computing use cases.

1.1 Product Specifications

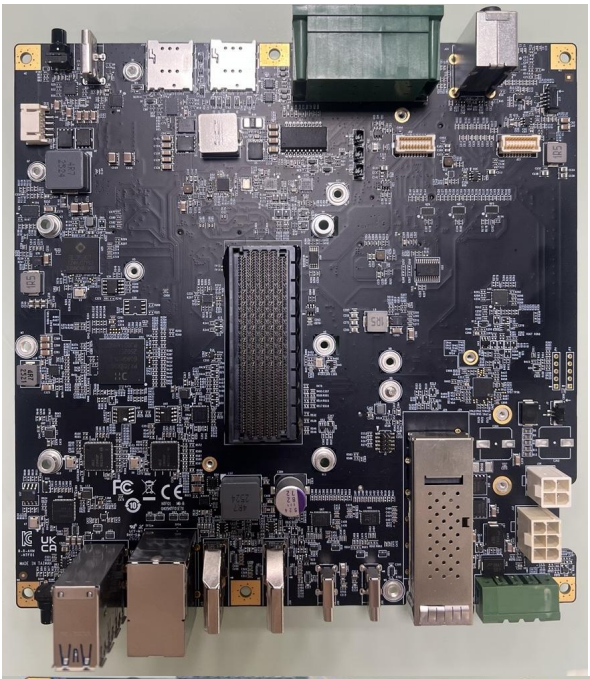
NVIDIA Jetson SoM	NVIDIA Jetson T5000™/Jetson T4000™
Networking	• 2x GbE RJ-45 (1 × port supports OOB NCSI for optional OOB module) • 1x QSFP (4× 10 GbE) • 1x M.2. key E 2230 for Wi-Fi 6 • 1x M.2 Key B 3042/3052 for 4G/5G
SIM Slot	• 2x SIM slots for 4G/5G module; dual SIM capability depends on the installed cellular module
Display Output	2 x HDMI output (3840 x 2160 at 60Hz)
Temperature	Operating temperature: -40 to 85°C (carrier board, W/O audio) Operating temperature: -25 to 85°C (carrier board, W/ audio) Operating temperature: -25 to 60°C (Box PC) Operating temperature: -25 to 50°C (Box PC with 8x POE Board) Storage temperature -40°C ~ 85°C Relative humidity 40 °C @ 95%, Non-Condensing
GMSL camera board	1x 120pin for GMSL camera board
USB	• 1x USB 3.2 Type-C for BSP install • 1x USB 3.2 Type-C (usage limitations apply; refer to User Manual for details) • 4x USB 3.2 Type-A (5Gbps x2 ; 10Gbps x2) • Optional 8x USB3.2 Type-A (via daughter board)
Storage	• 2x NVMe M.2 Key M 2280 -1x NVMe M.2 Key M 2280 x2 PCIe Gen4 (For Carrier Board SKU: 8xPoE, 8xUSB board, either one) -1x NVMe M.2 Key M 2280 x4 PCIe Gen4
Expansion Header	• 2x10 Euro Terminal Block 1x CAN-FD (Isolated 3KV), 3x CAN-FD with Transceiver, +5V output 1A, +3.3V output 1A,UART, I2C • 20pin expansion header-1: 1x5V(Maximum 1A), 1x3.3V(Maximum 1A) power Output, UARTH1, I2C, GPO(4), GPI(5), PWM(2) • 20pin expansion header-2: 1x5V(Maximum 1A), 1x3.3V(Maximum 1A) power Output, UARTH2, I2C, GPO(4), GPI(5), PWM(2) • 2x 5-pin JTAG connector • 1x 40pin coaxial connector for PCIe expansion (For Carrier Board SKU: Daughter board 8xPSE/8xUSB)
Power requirement	• Terminal block 3Pin & Mini-fit 6pin (Internal) • USB Type C Power Supply • 9~36V (Max rating) DC Input • ACC IN / IGN Control (ACC optional, via switch)
Thermal Solution	• 1x SOM FAN • 2x Chassis Fan (12V fan wafer)

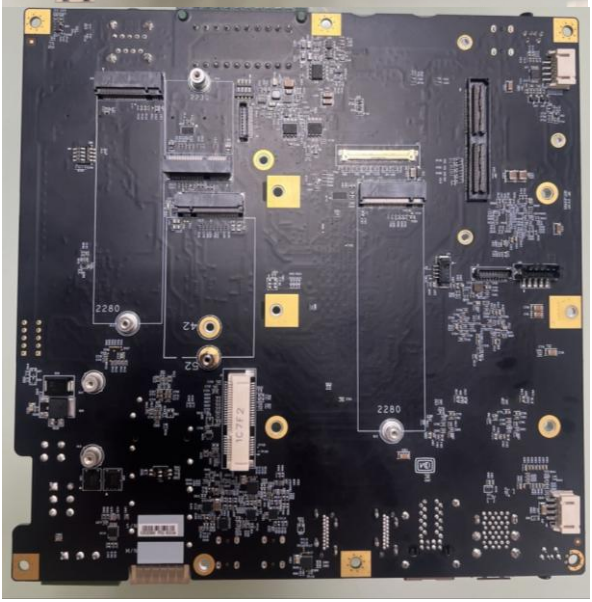
Buttons	Power and Recovery
RTC Battery	Support RTC Battery and Battery Life Monitoring by MCU
Dimensions	Carrier Board: W: 190mm x L: 190mm Devkit: W: 192.2mm x L: 195mm x H: 87mm Box PC: W: 211mm x L: 194mm x H: 115mm
Certifications	CE, FCC,VCCI, KC (TBA)
GPS	1x mPCIe for Optional Dual-RTK GNSS support (via daughter board)
Sensor	Temperature sensor for PCB top/bot Temperature measure
LED	1x system power，1x input power
MISC	• 1x Mini-fit 4Pin DC output for PSE expansion (Pass-through 10A) • 1x DC output wafer (9~12V) for GMSL • 1x USB-C for Debug_UART (Share with OOB) • DIP Switch for function control , AT/ATX Mode select, ACC Enable / Ignore ACC for Development (default)
Package	1x Carrier board or Devkit or Box PC 1x 240W Adapter (360W with 8x POE Board) 1x Power Cord (By region) 2x Terminal Block

1.2 Product Overview


Pass-through 10A
J38 1x5pin 12V Wafer
Mini-fit 4pin 9V~36V J34
J32 Mini-fit 6pin 9V~36V
IGN terminal 9V~36V J33
J31 USBC 10Gbps 9V~28V IN/OUT DP1.4a+PD BCM
J30 USBC 10Gbps 9V~28V IN/OUT DP1.4a+PD
CCG8D PD
U47
J8 Quad USBA Quad 4-D Quad 4-C
U3/U2 10G
J12 40pin Coaxial Connector
U3/U2
U3x5/U2x3
GL3590T USB3 HUB 10G
J9 M.2 Key B x1
U29
J7 M.2 Key E x1 2230
J6 mPCIe USB
J22 COM2(CASE)
2x10pin Expansion Header-1 UART(H1)
U20 CP2102
J4 Dual RJ45 2-1
U55 I210 NCSI
Dual RJ45 2-2
U56 I210
J6 mPCIe x1 PCIe
J7 M.2 Key E x1 2230
2G608P PCIe SW
U44
J3 CR2450
J16 SOM FAN
U51 TPM
U87 Temp
JP1 JP2 Chassis FAN x2
FAN IC J5
U37 IMU
SYS_VIN_HV
SYS_VIN_MV
J1
UPHY0_L1 USB2_0 DP_HDMI3
UPHY0_L0 USB2_1 DP_HDMI2
UPHY0_L2 USB2_3
UPHY0_L4
BBAT
PWM4
SPI2
I2C7
I2C3
Jetson T5000
Thor SOC
DP_HDMI0
DP_HDMI1
HDMI TYPE A
J19
J18
M.2 Key M x4 2280 J36
QSFP28 CAGE J28 J29
x4
XFI
UPHY1_L0~L3
UPHY1_L4~L7
UPHY0_L6~L7
x2
U118 U119
PCIe SW
M.2 Key M x2 2280 J13
40pin Coaxial Connector J12
UPHY0_L3
x1
U60 uPD720202 PCIe to USB
U3/U2 5G
Quad USBA Quad 4-B Quad 4-A J8
CSI[0:7]
J20 120pin B2B
Follow AGX EVB D317-GM
USB2_2
U18 USB2.0 HUB
1x4pin USB Wafer J14
1x4pin USB Wafer J15
U19 CP2102
2x10pin Expansion Header-2 UART(H2) J23 COM1(CASE)
3.3V/1A 5V/1A
I2C4(GP8) UART5
CAN2(TCR) CAN0(ISO)
CAN3(TCR) CAN1(TCR)
2x10pin Euro Terminal Block J21
5V/1A 3.3V/1A
PWM2(H52) PWM10(L49)
UART(H1) I2C5(GP9)
I2S1(4) SPI1(5)
2x10pin Expansion Header-1 J22
5V/1A 3.3V/1A
PWM3(F56) PWM5(E5)
UART(H2) I2C7(GP11)
I2S2(4)/DMIC(2)/SPI3(5)
2x10pin Expansion Header-2 J23
JTAG
2x5pin JTAG Header J2
U2
I2S3(4) I2C8(GP7)
ALC5616
MIC in
HP out
J35
5V/STB PWR/RST/PG
UART3 DBG UART1 AUTO
1x10pin OOB Header J27
I210_NCSI
1x10pin OOB Header J5
CP2102
USBC J17
U8

Front View and Back View of Carrier board





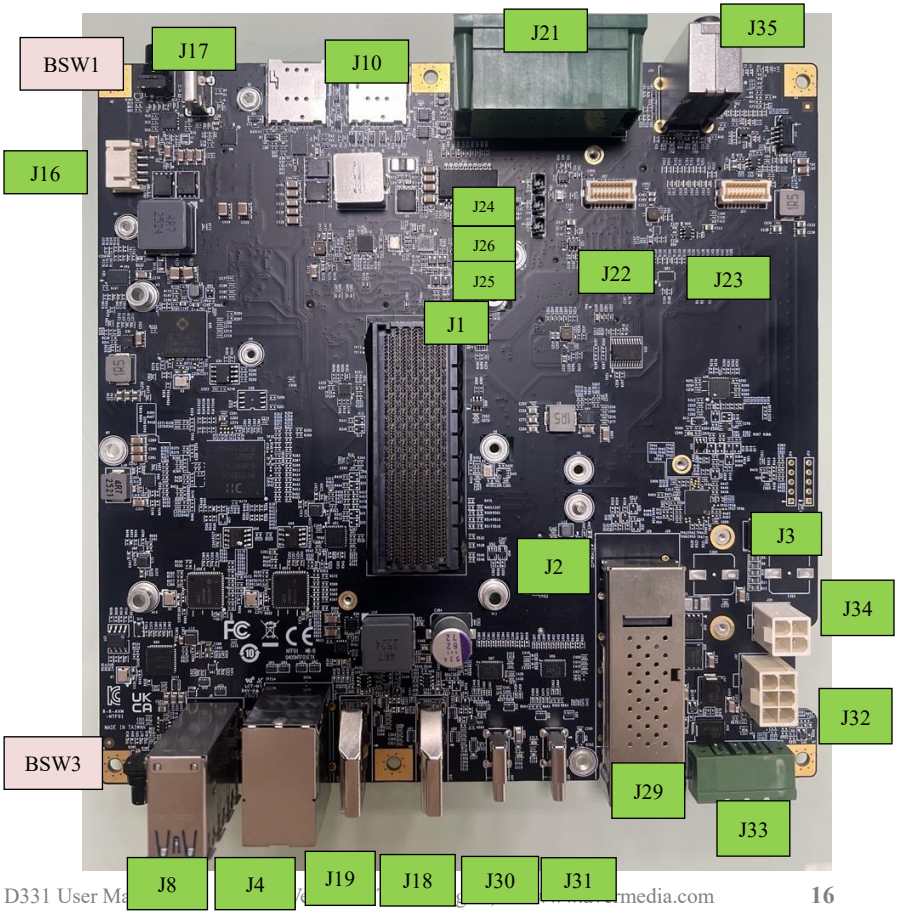
1.3 Connector Summary

J1	699-pin high-speed/high-density connector
J16	Fan Wafer
J3	External RTC Battery wafer
J18	HDMI output Type-A Vertical Side Connector (Female)
J19	HDMI output Type-A Vertical Side Connector (Female)
J31	USB 3.2 Gen2 Type C Connector (supports Nvidia Jetson flashing)
J30	USB Type C Power Supply Connector
J17	USB 2.0 Type C Connector (Debug UART)
J4	Gigabit Ethernet Connector w/LEDs
J10	Micro SIM card socket (Push-Push)
J21	2x10 Euro Terminal Block 1x CAN-FD
J22	20pin expansion header-1
J23	20pin expansion header-2
J29	QSFP
J32	Input Power – 4.2mm Pitch ATX Power 6P
J33	Input Power – Terminal block 3Pin
J34	Input Power – 4.2mm Pitch ATX Power 4P
J35	3.5mm audio Jack
J2	5 pin JTAG Header
J24	OOB board connector (Power)
J25	OOB board connector (Reset)
J26	OOB board connector (Recover)
BSW1	Recovery Button w/LEDs
BSW3	Power Button w/LEDs
J36	M.2 M-Key Socket
J8	USB 3.2 Gen2 Type A Connector
J7	M.2 E-Key Socket
J9	M.2 B-Key Socket
J6	Mini card socket
J27	OOB connector
J5	OOB NCSI connector
J14	4-pin USB wafer

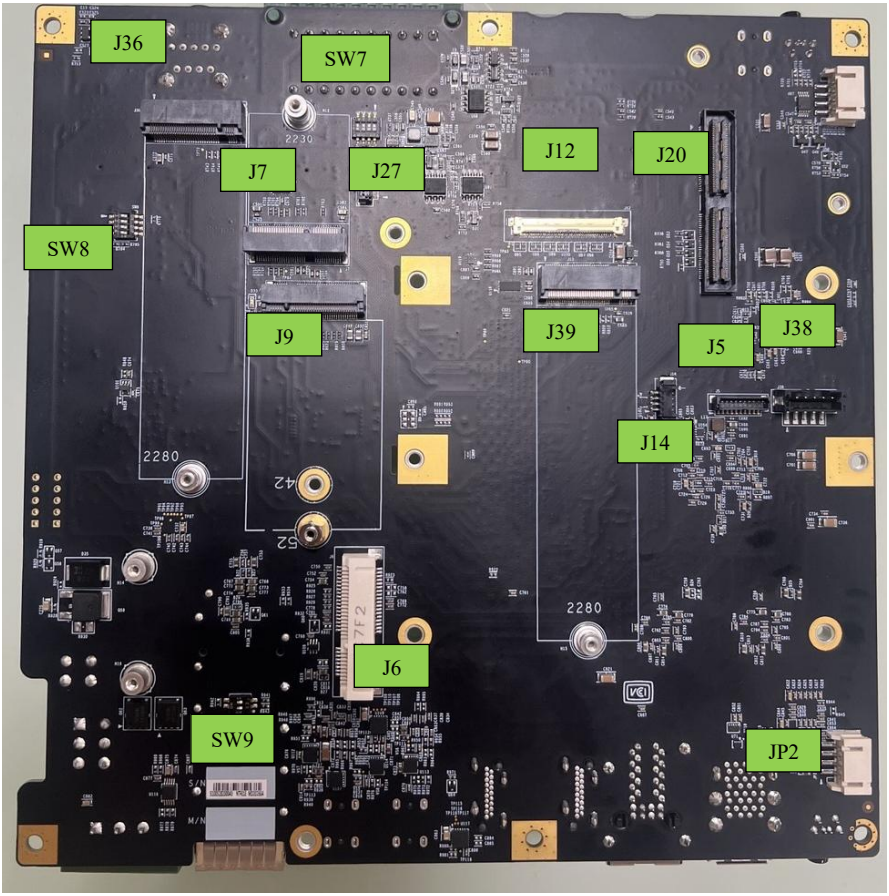
J38	5-pin 12V DC output wafer
J39	M.2 M-Key Socket
J20	120-pin high speed board to board connector (to Camera board)
J12	40-pin coaxial connector
JP1	Fan Wafer
JP2	Fan Wafer
SW7	Switch Button
SW8	Switch Button
SW9	Switch Button

1.4 Carrier Board Interface

Top View Interface



Buttom iew Interface



2.0 Feature Description

2.1 Jetson module Connector

Function	Provide connection with NVIDIA® Jetson™ AGX Thor™ module	
Location	J1	
Type Description	MOLEX 699pin socket	
Manufacturer and Part Number	MOLEX,203456-0003	
Mating Connector	MOLEX,203456-0003	
Pinout	Please refer to NVIDIA Jetson™ AGX Thor™ System-on-Module datasheet for pinout details.	
Remarks	https://developer.nvidia.com/ embedded/downloads	

2.2 Fan Power connector

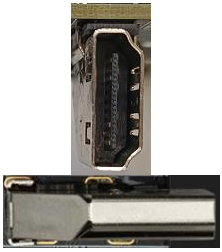
Function	Fan Power Connector	
Location	J16 / JP1 / JP2	
Type Description	WAFER_1*4PIN_2 ㎜_90°_SMD	
Manufacturer and Part Number	JOINT TECH 燦達 A2001WR-S-04PNLNT1T00R	
Mating Connector	JOINT TECH 燦達 A2001 Series Housing	
Pinout		
Remarks	None	

Pin #	Description
PIN 1	GND
PIN 2	+12V Power
PIN 3	FAN_TACH
PIN 4	FAN_PWM

2.3 RTC Battery Connector

Function	RTC battery for module	
Location	J3	
Type Description	1.25mm wire-to-board header	
Manufacturer and Part Number	宏致_ACES 50271-00201-001_BLACK	
Mating Connector	Molex, 51021-8602	
Pinout	Pin # / Description PIN1 / GND PIN2 / 3V Power	
Remarks	RTC Battery:, CR2032 3V	

2.4 HDMI OUTPUT

Function	HDMI output connector	
Location	J19/J18	
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	

2.5 USB 3.2 Gen2 Type C Connector (supports Nvidia Jetson flashing)

Function	BSP Installation as recovery mode	
Location	J31	
Type Description	USB3.2 Type-C female connector	
Manufacturer and Part Number	GM9-HF_JACK_建倚_SBC-240P-31HF-S277_-55+85℃	
Mating Connector	Any Standard Type-C interface cable or device.	
Pinout	Please refer to USB 3.2 Gen 2 standard.	
Remarks	J31 supports Nvidia Jetson flashing	

2.6 USB Type C Power Supply Connector

Function	USB Type -C power supply	
Location	J30	
Type Description	USB3.1 Type-C female connector	
Manufacturer and Part Number	GM9-HF_JACK_建倚_SBC-240P-31HF-S277_-55+85℃	
Mating Connector	Any Standard Type-C interface cable or device.	
Pinout	Please refer to USB 3.1 type- C standard	
Remarks	NONE	

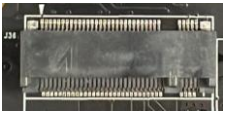
2.7 USB 2.0 Type C Connector (Debug UART)

Function	For dumping debug UART	
Location	J17	
Type Description	USB2 .0 Type-C female connector	
Manufacturer and Part Number	GM9-HF_JACK_建倚_SBC-240P-31HF-S277_-55+85℃	
Mating Connector	Any Standard Type-C interface cable or device.	
Pinout	Please refer to USB 2.0 standard.	
Remarks	None	

2.8 M.2 E key 2230

Function	M.2 E-Key for wifi module	
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	

2.9 M.2 M key 2280

Function	M.2 M-Key	
Location	J36/J39	
Type Description	SOCKET_M.2-M KEY _75PIN _90°_SMD	
Manufacturer and Part Number	宏致_ACES 51757-0750C-012_P0.5 ㎜-H5.5 ㎜	
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	J39 only support PCIe 2-Lane	

2.10 M.2 B key 3042/3052

Function	M.2 B-Key for 4G/5G module	
Location	J9	
Type Description	SOCKET_M.2-KEY B_75PIN_90°_SMD	
Manufacturer and Part Number	鴻海_Foxconn 2E0BC21-S85BB-7H_90°_ H8.5 ㎜	
Mating Connector	Any M.2 B key 2280 card standard interface device.	
Pinout	Please refer to M.2 B key card standard for the pinout details.	
Remarks	None	

2.11 Mini card socket

Function	Mini Card (PCIe) interface	
Location	J6	
Type Description	SOCKET_MINI PCIE_52PIN	
Manufacturer and Part Number	FOXCONN, AS0B221-S68Q 7H_H=6.8MM-062AL6	
Mating Connector	Any Mini Card standard interface device.	
Pinout	Please refer to Mini Card standard for the pinout details.	
Remarks	None	

2.12 Gigabit Ethernet Connector

Function	1Gb single-port Ethernet connector, used to connect to the host system.	
Location	J4	
Type Description	JACK_RJ45*2_TRANSFOMER+LED_90°_DIP	
Manufacturer and Part Number	鋐運_JDKA1S826-G/D1_1G-LED L(G)+R(G/Y)	
Mating Connector	Any standard 1Gb Ethernet mating connector can be applicable.	
Pinout	Comply with Ethernet standards.	
Remarks	None	

2.13QSFP Connector

Function	QSFP Connector	
Location	J29	
Type Description	OTHERS_CAGE_20.99*61.17 ㎜ _QSFP28-STYLE A	
Manufacturer and Part Number	GM9_OTHERS_湧德_PRESS FIT-90°-W/O LED & HEATSINK	
Mating Connector	Any standard QSFP mating connector can be applicable	
Pinout	N/A	
Remarks	None	

2.14 USB 3.2 Gen2 Type A Connector

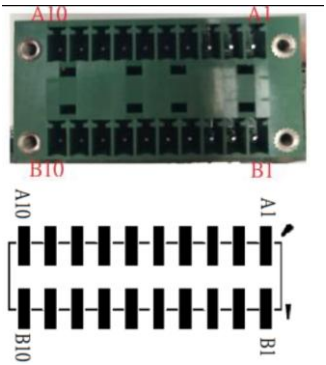
Function	General-purpose input/output	
Location	J8	
Type Description	USB 3.2 Gen2 Type A female connector	
Manufacturer and Part Number	GM9-HF_JACK_鴻海_UEA11123-QHD6-4H_-55+85℃	
Mating Connector	Any Standard Type-A interface cable or device.	
Pinout	Please refer to USB 3.2 standard.	
Note	None	

2.15 Micro SIM Card Slot

Function	Micro SIM Card	
Location	J10	
Type Description	SOCKET_MICRO SIM_8PIN_90°_SMD	
Manufacturer and Part Number	福軒_FG-0271AAAG06A_PUSH PUSH 1.42H	
Pinout	Refer to Micro SIM card standard Remark	
Note	*Push Push type *Inserting directing as below	

2.16 2x10 Euro Terminal Block 1x CAN-FD

Function	General-purpose input/output
Location	J21
Type Description	Expansion I/O Connector
Manufacturer and Part Number	ME252-35020-1
Mating Connector	2x10 Euro Terminal Block 1x CAN-FD



Pinout

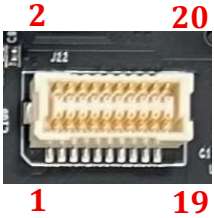
Address JP7	Pin Name	20-pin Index (Devkit Index)		Pin Name	Address JP7
	5V	A1	B1	3V3	
	GND	A2	B2	GND	
/dev/ttyAMA5	UART5_TX_3V3 J58(UF3_TXD)	A3	B3	I2C_GP8_DAT_3V3 (E60)	i2c-3
/dev/ttyAMA5	UART5_RX_3V3 H58(UF3_RXD)	A4	B4	I2C_GP8_CLK_3V3 (D61)	i2c-3
	ISO_GND	A5	B5	GND	
	CANL0_ISO	A6	B6	CANL2	
	CANH0_ISO	A7	B7	CANH2	
	GND	A8	B8	CANL3	
	CANL1	A9	B9	CANH3	
	CANH1	A10	B10	GND	

Note	None

2.17 2x10pin expansion header-1

Function	General-purpose input/output
Location	J22
Type Description	WAFER_2*10PIN_1 ㎜_180°_SMD
Manufacturer and Part Number	GM2_WAFER_JST_BM20B-SHLDS-G-TFT(LF)(SN)
Mating Connector	Any Standard interface cable or device.
Pinout	

Address JP7	Pin Name	20-pin Index (Devkit Index)		Pin Name	Address JP7
	3V3	1	2	5V	
	GND	3	4	GND	
i2c-9	I2C_GP9_DAT_3V3 (C53)	5	6	UART1_TX_3V3	GL3590 未動作
i2c-9	I2C_GP9_CLK_3V3 (A53)	7	8	UART1_RX_3V3	GL3590 未動作
chip 2 gpio 127	GPIO27_PWM2_3V3 PF.07 J22.9, PWM	9	10	GND	
chip 2 gpio 16	I2S7_LRCK_PWM10_3V3 GPIO3_PV.01 (devkit Usage: SFIO 3V3_DP_EN) J22.11, PWM	11	12	SPI1_SCK_3V3 GPIO3_PJ.07 J22.12, GPI	chip 2 gpio 71
chip 2 gpio 112	I2S1_SCLK_3V3 GPIO3_PR.02 J22.13, GPO High	13	14	SPI1_MISO_3V3 GPIO3_PK.00 J22.14 GPI	chip 2 gpio 72
chip 2 gpio 113	I2S1_SDOUT_3V3 GPIO3_PR.03 J22.15, GPO High	15	16	SPI1_MOSI_3V3 GPIO3_PK.01 J22.16, GPI	chip 2 gpio 73
chip 2 gpio 114	I2S1_SDIN_3V3 GPIO3_PR.04 J22.17, GPO High	17	18	SPI1_CS0_3V3 GPIO3_PK.02 J22.18, GPI	chip 2 gpio 74
chip 2 gpio 115	I2S1_LRCK_3V3 GPIO3_PR.05 J22.19, GPO High	19	20	SPI1_CS1_3V3 GPIO3_PK.03 J22.20, GPI	chip 2 gpio 75

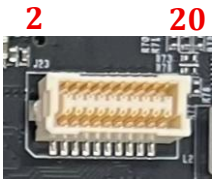


Remarks	

2.18 2x10pin expansion header-2

Function	General-purpose input/output
Location	J23
Type Description	WAFER_2*10PIN_1 ㎜_180°_SMD
Manufacturer and Part Number	GM2_WAFER_JST_BM20B-SHLDS-G-TFT(LF)(SN)
Mating Connector	Any Standard interface cable or device.
Pinout	

Address JP7	Pin Name	20-pin Index (Devkit Index)		Pin Name	Address JP7
	3V3	1	2	5V	
	GND	3	4	GND	
i2c-11	I2C_GP11_DAT_3V3 (E26)	5	6	UART2_TX_3V3	/dev/ttyUSB0
i2c-11	I2C_GP11_CLK_3V3 (E27)	7	8	UART2_RX_3V3	/dev/ttyUSB0
chip 2 gpio 128	GPIO36_PWM3_3V3 PG.00 J23.9, PWM	9	10	GND	
chip 2 gpio 14	GPIO44_PWM5_3V3 PU.07 J23.11, PWM	11	12	SPI3_SCK_3V3 GPIO3_PH.06 J23.12, GPI	chip 2 gpio 62
chip 2 gpio 21	I2S2_SCLK_3V3 GPIO3_PV.06 J23.13, GPO High	13	14	SPI3_MISO_3V3 GPIO3_PH.07 J23.14 GPI	chip 2 gpio 63
chip 2 gpio 22	I2S2_SDOUT_3V3 GPIO3_PV.07 J23.15, GPO High	15	16	SPI3_MOSI_3V3 GPIO3_PJ.00 J23.16, GPI	chip 2 gpio 64
chip 2 gpio 23	I2S2_SDIN_3V3 GPIO3_PW.00 J23.17, GPO High	17	18	SPI3_CS0_3V3 GPIO3_PJ.01 J23.18, GPI	chip 2 gpio 65
chip 2 gpio 24	I2S2_LRCK_3V3 GPIO3_PW.01 J23.19, GPO High	19	20	SPI3_CS1_3V3 GPIO3_PJ.02 J23.20, GPI	chip 2 gpio 66

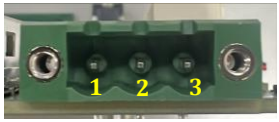


Remarks	

2.19 Terminal block 3Pin

Function	DC power input
Location	J33
Type Description	SOCKET_TERMINAL BLOCK_1*3PIN_90°_DIP
Manufacturer and Part Number	GM9_SOCKET_進聯_ME050-50803_GREEN-P5.08 ㎜-PIN L4.5 ㎜
Mating Connector	QSFP Connector
Pinout	

Pin Number	Description
1	ACC=>9~36V
2	GND
3	DC IN=>9~36V

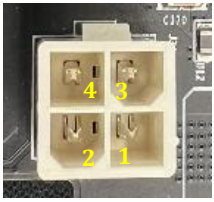


Remarks	None

2.20 Output Power – 4.2mm Pitch ATX Power 4P

Function	ATX 4P
Location	J34
Type Description	WAFER_2*2PIN_4.2 ㎜_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	9-36V Power
4	9-36V Power

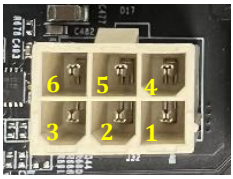


Remarks	None

2.21 Input Power – 4.2mm Pitch ATX Power 6P

Function	DC power input
Location	J32
Type Description	WAFER_2*3PIN_4.2 ㎜_180°_DIP-L3.5 ㎜
Manufacturer and Part Number	GM1-HF_WAFER_宏致_56973-0060N-001_ATX POWER-NATURAL
Mating Connector	Follow ATX 6pin power standard
Pinout	

Pin Number	Description
1	12-54V Power
2	12-54V Power
3	ACC
4	GND
5	GND
6	GND



Remarks	None

2.22 Board to board connector (to Camera board)

Function	Board to board connector
Location	J20
Type Description	WAFER_2*60PIN_0.5 ㎜_180°_SMD
Manufacturer and Part Number	SAMTEC QSH-060-01-L-D-A-K-TR BTB-RECEPTACLE
Mating Connector	SAMTEC QTH-060-03-H-A-D BTB-PLUG QTH-060-04-H-A-D BTB-PLUG
Pinout	Comply with NVIDIA Devkit pinout.
Remarks	None

2.23 40pin coaxial connector

Function	40pin coaxial connector for	

	daughter board	
Location	J12	
Type Description	WAFER_40PIN_0.5 ㎜ _90°_SMD	
Manufacturer and Part Number	I-PEX 20455-040E-12	
Mating Connector	I-PEX 20453-240T-03	
Pinout	Any Standard coaxial connector interface cable or device.	
Remark	NA	

2.24 OOB Board Connector #1 (for optional OOB board)

Function	OOB Board Connector (for NC-SI)	
Location	J5	
Type Description	WAFER_1*10PIN_1 ㎜_180°_SMD	
Manufacturer and Part Number	ACES 50228-01071-001	
Mating Connector	ACES 50233-010H0H0-001	

Pinout

PIN#	Description	Module Pin#	Type/ Dir
1	NC_SI_TXD0		Input, 3.3V
2	NC_SI_TXD1		Input, 3.3V
3	NC_SI_TX_EN		Input, 3.3V
4	GND		Ground
5	NC_SI_CLK_IN		Input, 3.3V
6	GND		Ground
7	NC_SI_RXD0		Output, 3.3V
8	NC_SI_RXD1		Output, 3.3V
9	N C_SI_CRS_DV		Output, 3.3V
10	GND		Ground

Remark	For optional OOB with NCSI board

2.25 OOB Board Connector #2 (for optional OOB board)

Function	OOB Board Connector(basic function)	
Location	J27	
Type Description	WAFER_1*10PIN_1 ㎜_180°_SMD	
Manufacturer and Part Number	ACES 50228-01071-001	
Mating Connector	ACES 50233-010H0H0-001	

Pinout

PIN#	Description	Module Pin#	Type/ Dir
1	GND		Ground
2			Input, 3.3V
3	UART3_RX (Debug OOB)		Input, 3.3V
4	UART3_TX (Debug OOB)		Ground
5	UART1_RX_3V3		Input, 3.3V
6	UART1_TX_3V3		Ground
7	+5V_SOM_PG		Output, 3.3V
8	RST_OOB		Output, 3.3V
9	POWER_BTN		Output, 3.3V
10	+5V_STANDBY		Ground

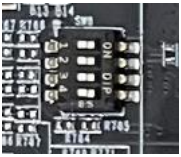
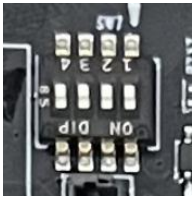
Remark	For optional OOB with NCSI board

2.26 OOB board connector (Power)

Function	Connector of OOB board	
Location	J24 J26 J25	
Type Description	WAFER_1*2PIN_1 ㎜_180°_SMD	
Manufacturer and Part Number	宏致 ACES 50228-00271-001_WTB	
Mating Connector	宏致 ACES 50233-002H0H0-001	
Pinout		
Remark	NA	

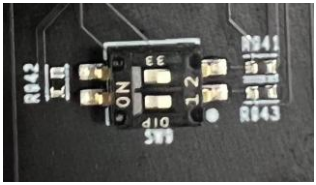
J24	Description
PIN 1	Power
PIN 2	GND
J26	**Description**
PIN 1	Reset
PIN 2	GND
J25	**Description**
PIN 1	Recovery
PIN 2	GND

2.27 Switch Button

Function	Switch Button	
Location	SW7，SW8	
Type Description	4 SPST DIP switch	
Manufacturer and Part Number	圜達 DIPTRONICS IN OFF-SWITCHING 0.025A/24VDC	

<table>
<tr><td>Pinout</td><td>
SW7
<table>
<tr><th>Pin #</th><th>Description</th></tr>
<tr><td>1</td><td>OFF=>CAN0 W/O Terminal
ON=> CAN0 W Terminal</td></tr>
<tr><td>2</td><td>OFF=>CAN1 W/O Terminal
ON=> CAN1 W Terminal</td></tr>
<tr><td>3</td><td>OFF=>CAN2 W/O Terminal
ON=> CAN2 W Terminal</td></tr>
<tr><td>4</td><td>OFF=>CAN3 W/O Terminal
ON=> CAN3 W Terminal</td></tr>
</table>
SW8
<table>
<tr><th>Pin #</th><th>Description</th></tr>
<tr><td>1</td><td>OFF=>Auto Power
ON=>Button Power</td></tr>
<tr><td>2</td><td>OFF=>FAN PWM
ON=>FAN Always</td></tr>
<tr><td>3</td><td>OFF=>Always Powser ON Disable
ON=> Always Powser ON Enable</td></tr>
<tr><td>4</td><td>OFF=>Ignore ACC for Development
ON=> ACC Enable</td></tr>
</table>
</td></tr>
<tr><td>Remark</td><td>NA</td></tr>
</table>

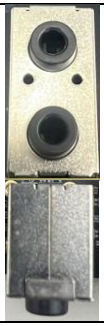
2.28 Switch Button

Function	Switch Button	
Location	SW9	
Type Description	SW_DIP_NDSVM-02Q-T-R_SMD4	
Manufacturer and Part Number	GM1-HF_SWITCH_冠泰_IN OFF-SWITCHING 0.025A/24VDC	
Pinout	SW9 Pin # / Description 1 / OFF=>PCIe x8 ON=> PCIe x 2 / OFF=>Mini Card set as GPS ON=> Mini Card set as PCIe	
Remark	None	

2.29 Power & Recovery Button

Function	Power & Recovery control button	
Location	BSW1, BSW3	
Type Description	Button	
Manufacturer and Part Number	冠泰 Champway 12VDC/0.05A-160G-H1.8 ㎜-BLACK	
Pinout	N/A	
Remark	None	

2.30 3.5 mm audio jack

Function	MIC in / Headphone output	
Location	J35	
Type Description	JACK_PHONE*2_D3.5-BLACK_90°_DIP	
Manufacturer and Part Number	GM1_JACK_京政_PJD-035-87HAB	
Top : MIC in	Top : MIC in	

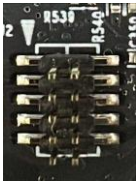
Buttom : Headphone out	Buttom : Headphone out
Remark	None

2.31 5-pin 12V DC wafer header

Function	**5-pin 12V DC**	1 2 3 4 5
Location	J38	
Type Description	WAFER_1*5PIN_2 ㎜_180°_SMD	
Manufacturer and Part Number	宏致_50310-0057N-001_WTB HEADER-H6.5 ㎜	
Pinout		
Remark	None	

Pin	Description
1/2	Power 12V/4A
3/4	GND
5	floating

2.32 10-pin JTAG Header

Function	**JTAG**	
Location	J2	
Type Description	HEADER_PIN_2*5PIN_1.27 ㎜ _180°_SMD	
Manufacturer and Part Number	冠泰_PH13-10VM1002CU8-06	
Pinout		

Pin	Description	Pin	Description
1	JTAG_TMS	2	+1.8V
3	JTAG_TCK	4	GND
5	JTAG_TDO	6	GND
7	JTAG_TDI	8	GND
9	RESET_IN	10	GND

Remark	None

Other Switches and Jumpers

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

3.0 Installation

- Check and ensure all external system power supplies are turned off.
- Connect the power cord to CB/devkit/Box PC DC in jack or ATX 4pin
- Connect the USB Type-C cable to CB/devkit/Box PC connector.
- Press and hold on the Recover button
- Plug in AC power

(Since the DCINJACK is slightly tight, be careful not to shake it when inserting the CB/devkit/Box PC)

3.1 BSP Setup Instructions

BSP (board support package) file: AVERMEDIA_JETPACK-R2.*.*.*.* _desktop.tar.gz for D331

If you want to get the BSP download link, please contact 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 AGX Thor 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 USB Type-C to USB cable, you can check kernel messages with `dmesg` command in the Linux PC.
Once you see similar messages as below, it 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 is required to extract BSP

$ sudo tar zxvf AVERMEDIA_JETPACK- R2.*.*.*.*_desktop.tar.gz

$ cd JetPack_*.**_desktop/Linux_for_Tegra

$ installation steps: refer to AVERMEDIA_JETPACK- R2.*.*.*.*_ReleaseNote.txt

4.0 Software

This section describes BSP's features for D331

1. Support optional M.2 WI-FI/Bluetooth modules (Intel® Wireless-AX210), the manager UI of AX210 WiFi/Bluetooth is located on the upper-right corner of Ubuntu desktop. It can be also controlled by nmcli/bluetoothctl in command line.

2. 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/r36.4.3/DeveloperGuide/SD/PlatformPowerAndPerformance/JetsonOrinNanoSeriesJetsonOrinNxSeriesAndJetsonAgxOrinSeries.html#supported-modes-and-power-efficiency for more information
$ sudo nvpmodel -m <x>
```

   RTC Battery

   The following command can get RTC battery voltage.

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

3. Fan Speed

   The following commands can get PWM fan information.

```
# get current speed setting of PWM Fan (0 ~ 255)
$ cat /sys/devices/platform/pwm-fan/hwmon/hwmon<x>/pwm1

# get Fan RPM value
```

```
$ cat /sys/class/hwmon/hwmon<y>/rpm

* Where <x> and <y> are dynamic hwmon indexes.
```

4. CAN Bus (removed to daughter board)

5. Camera (removed to daughter board)

6. GPIO usage

(1) Locate the GPIO Pin:

```
Use the gpiofind command to determine the pin's location in the system. For example,

to locate the SODIMM Pin 99, which corresponds to PX.04, execute:

$ sudo gpiofind PX.04

# This command will return the GPIO chip and offset. For example, it might return gpiochip0 118, indicating that PX.04 is at offset 118 on gpiochip0
```

(2) Set the GPIO Pin Voltage:

```
Set High Voltage: To set the pin to a high voltage (logic level 1), use the following command:

$ sudo gpioset --mode=wait 0 118=1
```

```
Set Low Voltage: To set the pin to a low voltage (logic level 0), use this command:

$ sudo gpioset --mode=wait 0 118=0
```

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

5.0 Force Recovery Mode

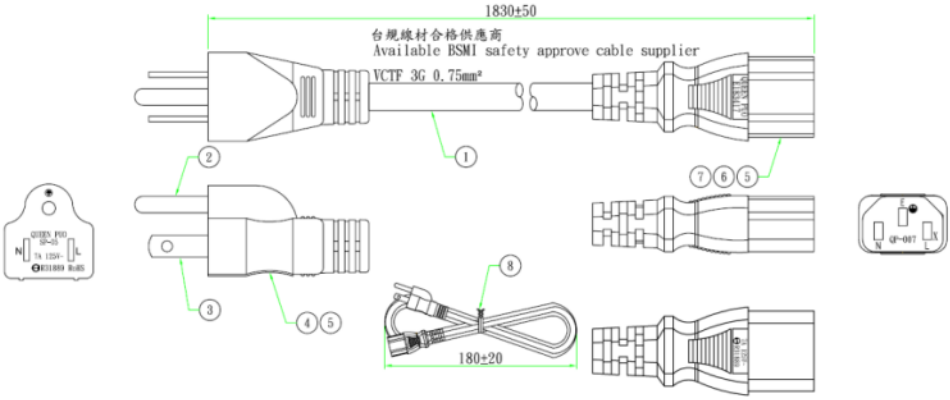
USB Type-C port (J31) of D331 can be used to re-program NVIDIA® Jetson AGX Thor by using the other host system running NVIDIA Jetpack, as the procedure described below.

1. Before you start
   - Please make sure to use a Linux host PC with Ubuntu 22.04 or 20.04 operating system.
   - Please use a native setup (no virtual machine) installation file in the following steps.
   - You will also need a high-quality standard USB Type C connector.
   - Download installation file from Avermedia.
2. Connect carrier board to host PC
3. Connect the system to the Linux host PC. Please use a USB Type C cable (J31 on the carrier board).
4. After connecting to the host PC powering up the system. The system will detect the host PC and automatically enter the flashing state (also called force recovery mode).
5. Check that the connection is established with the lsusb command. You should find one entry with Nvidia Corp. as highlighted below.
6. Flashing of system
   - Use the flash cmd script in the extracted bootloader folder to transfer the software into the Jetson compute module and flash it.
   - Please connect a monitor to the system. After the flashing process has completed the should automatically boot and show the Ubuntu desktop.
   - You now have a functioning system ready for your needs.

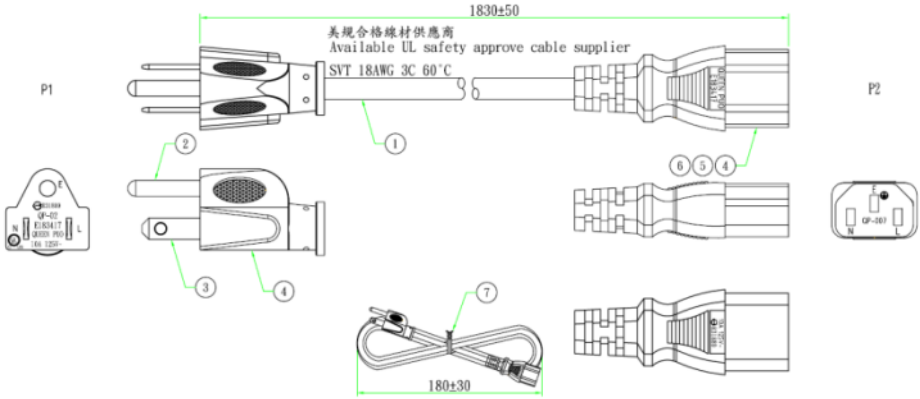
6.0 Accessory Drawings

6.1 Power Cord

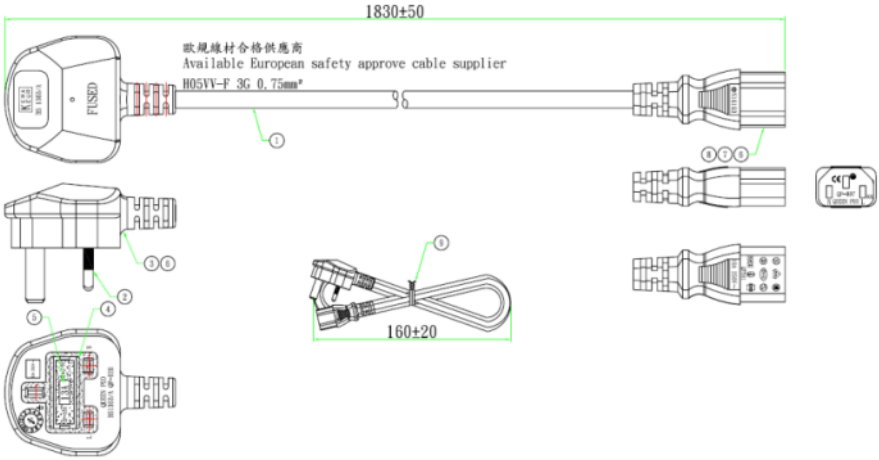
64APOWERBRX-IPD (TW version)



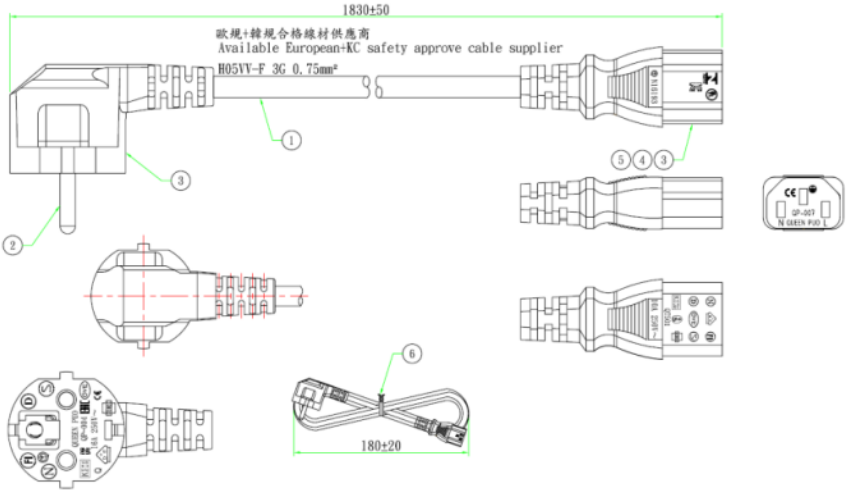
064APOWERBR2-IPD (US version)



064APOWERBRW-IPD (UK version)

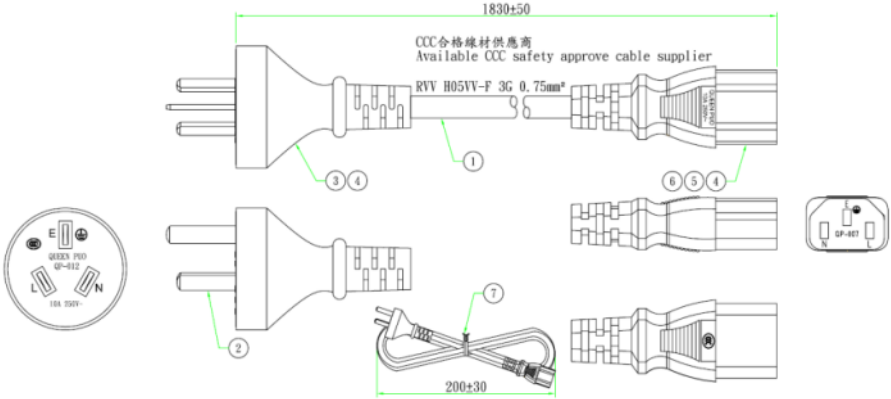


064APOWERBR5-IPD (EU version)



Dd

064APOWERBR4-IPD (CN version)

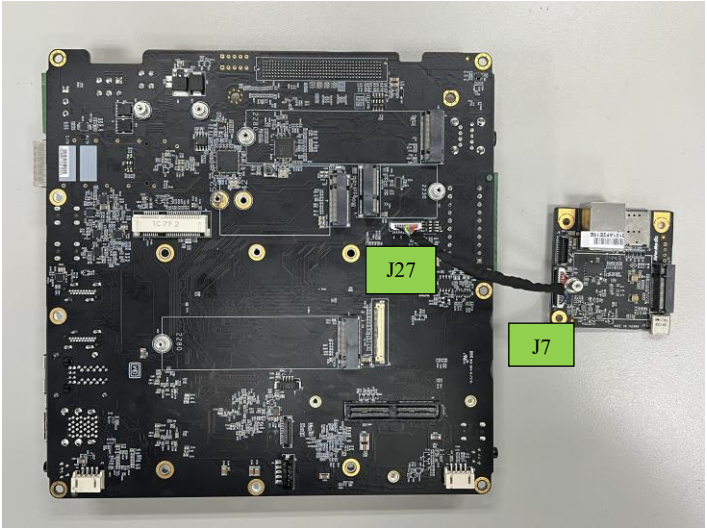


7.0 Daughter board introduction

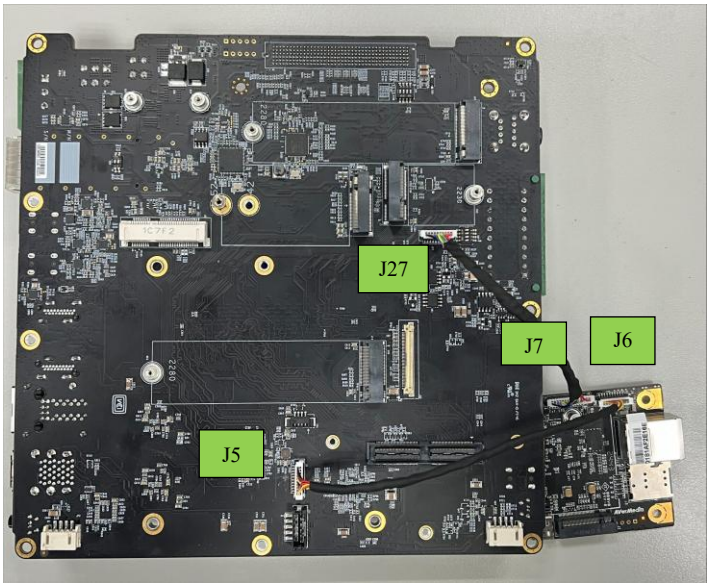
7.1 D331 + ERMI Module

Please refer to ERMI Module | Out-of-Band Management | AVerMedia

OOB demo connection

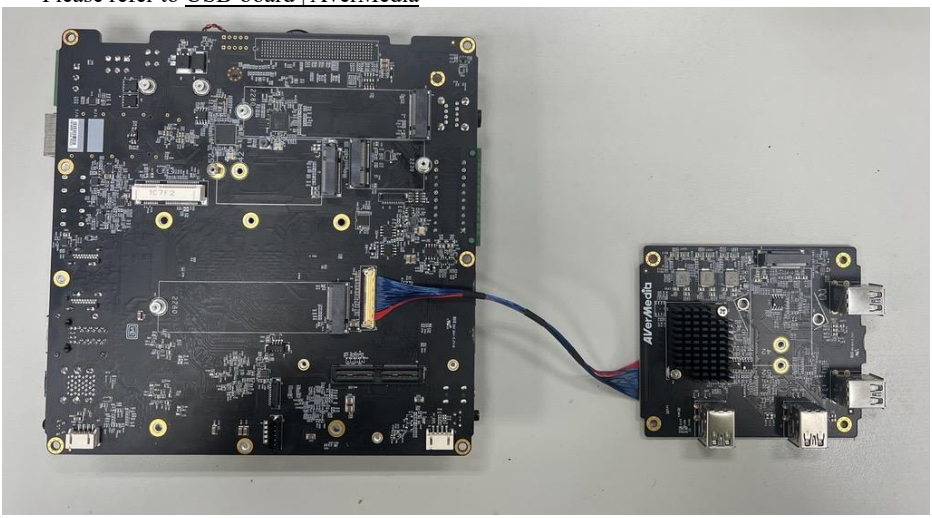


NCSI OOB demo connection



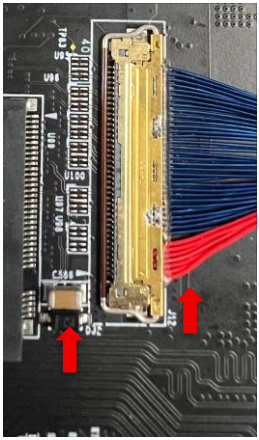
7.2 D331 + USB Daughter Board

Please refer to USB-board | AVerMedia

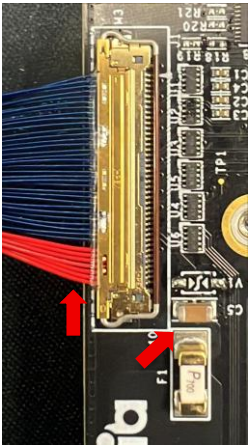


On D331, The red end of the cable must be aligned with the resistor indicated by the yellow arrow and properly connected.

On USB Daughter Board, The red end of the cable must be aligned with the resistor indicated by the yellow arrow and properly connected.



(On D331)

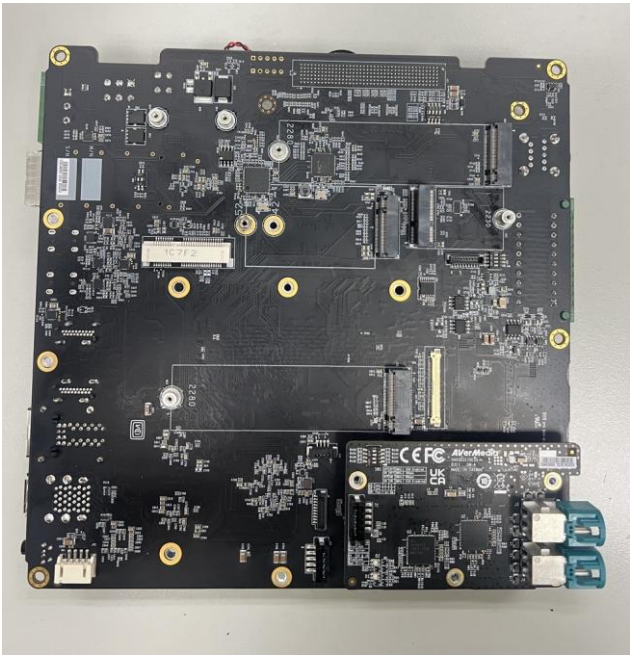


(On USB Daughter Board)

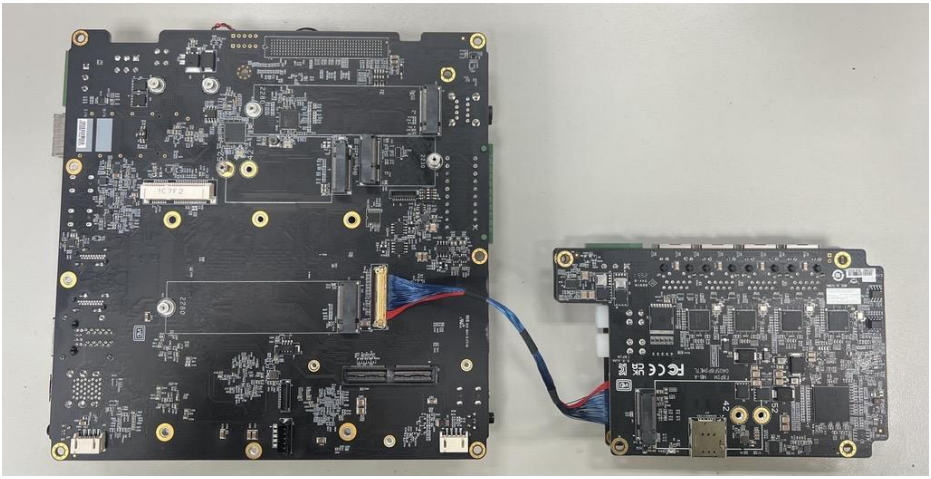
7.3 D331 + GMSL Daughter Board

Please refer to GMSL Board | AVerMedia

Connect GMSL Daughter Board with J20

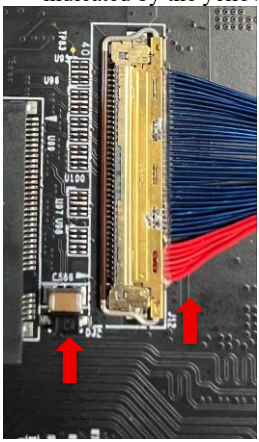


7.4 D331 + POE Daughter Board (TBD)

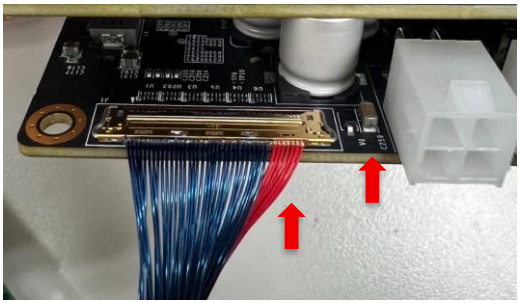


On D331, The red end of the cable must be aligned with the resistor indicated by the yellow arrow and properly connected.

On POE Daughter Board, The red end of the cable must be aligned with the resistor indicated by the yellow arrow and properly connected.



(On D331)



(On POE Daughter Board)

7.5 F1R4D Daughter Board

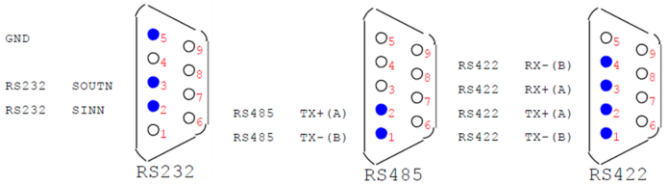
Function	Serial Port	
Location	CN1	
Type Description	JACK_D-SUB_9PIN(M)-BLACK_90°_DIP-L3.2 ㎜	
Manufacturer and Part Number	光桀 DBMRx002-09	
Mating Connector	N/A	
Pinout		

Pin #	Description
1	SPI1_CS1_GPI
2	SPI1_MOSI_GPI
3	I2S1_LRCK_GPO
4	I2S1_SDOUT_GPO
5	GND
6	SPI1_CS0_GPI
7	SPI1_MISO_GPI
8	I2S1_SDIN_GPO
9	I2S1_SCLK_GPO

Note	

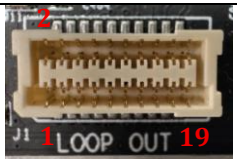
Function	DI/DO	
Location	CN2	
Type Description	JACK_D-SUB_9PIN(M)-BLACK_90°_DIP-L3.2 ㎜	
Manufacturer and Part Number	光桀 DBMRx002-09	
Mating Connector	N/A	
Pinout		

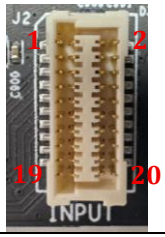
Pin #	Description
1	TX_N
2	TX_P
3	RX_P
4	RX_N
5	GND
6	NC
7	NC
8	NC
9	NC



Note	

Function	Pass-Through 20Pin for GPIOs
Location	J1 & J2
Type Description	WAFER_2*10PIN_1 ㎜_180°_SMD
Manufacturer and Part Number	JST BM20B-SHLDS-G-TFT(LF)(SN)
Mating Connector	N/A
Pinout	
Note	





Pin#	Description	Pin#	Description
1	+3V3_EXP2	2	+5V_EXP2
3	GND	4	GND
5	I2C_GP9_DAT_3V3	6	UARTH1_TX_3V3
7	I2C_GP9_CLK_3V3	8	UARTH1_RX_3V3
9	GPIO27_PWM2_3V3	10	GND
11	I2S7_LRCK_PWM10_3V3	12	SPI1_SCK_3V3
13	I2S1_SCLK_3V3	14	SPI1_MISO_3V3
15	I2S1_SDOUT_3V3	16	SPI1_MOSI_3V3
17	I2S1_SDIN_3V3	18	SPI1_CS0_3V3
19	I2S1_LRCK_3V3	20	SPI1_CS1_3V3