AVerAI NO111B/NX211B Box PC

Designed for NVIDIA® Jetson Nano(Version B01)/ Xavier NX modules

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Technical Support: Professional User

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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 1.0	Dec 17, 2020	1st Released

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Limited Product Warranty

AVerMedia provides the one-year 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.

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ESD Warning

Electronic components and circuits are sensitive to Electrostatic Discharge (ESD). When handling any circuit board assemblies including AVerMedia AVerAI 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.

1.0 Introduction

AVerMedia AVerAI NO111B/ NX211B includes three fully featured carrier boards and one associated Box PC's which is all developed for NVIDIA® Jetson Nano(Version B01)/ Xavier NX modules. AVerAI NO111B/ NX211B provides not only the access to a great list of latest interfaces on NVIDIA® Jetson Nano(Version B01)/ Xavier NX modules but also one RJ-45 interface and one RTC battery as the function enrichment.

NO111B/ NX211B provides one 4Kp60 HDMI video output, two USB 3.0 ports, one GbE RJ-45 port, 20-pin GPIO expansion, and one Micro-B USB 2.0 port for recovery.

Operating with NVIDIA® Jetson Nano(Version B01)/ Xavier NX modules and the rich I/O functions, AVerAI NO111B/ NX211B is the perfect choice in building a compact, high performance AI edge computing platform for the intelligent video analytics applications.

1.1 Product Specifications

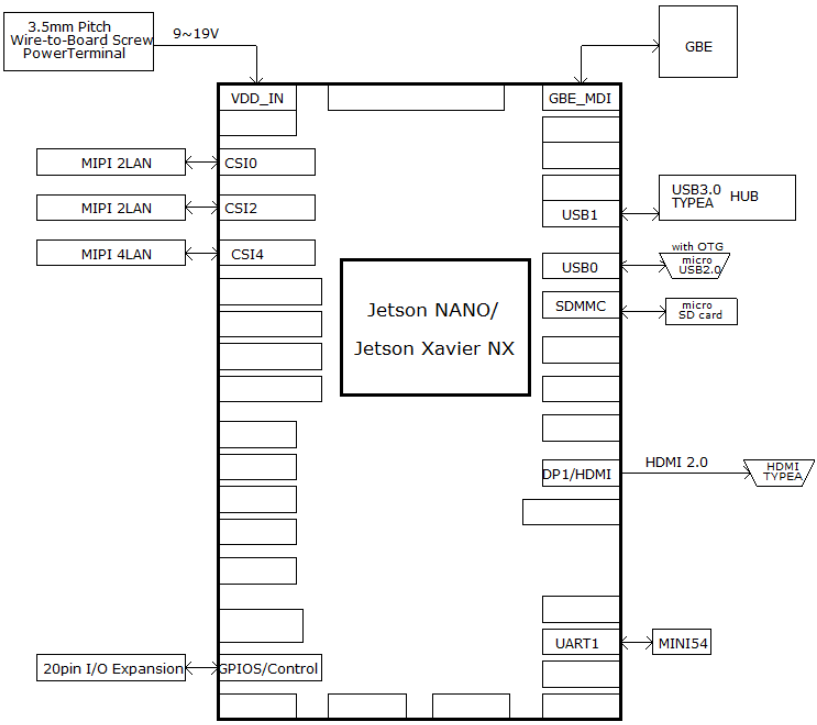
Model	NO111B/ NX211B
Compatibility	NVIDIA® Jetson Nano(Version B01) for NO111B NVIDIA® Jetson Xavier NX for NX211B
Networking	1x GbE RJ-45
Display Output	3840 x 2160 at 60Hz
Temperature	Operating temperature 0℃~60℃ Storage temperature -40℃ ~ 85℃ Relative humidity 40 ℃ @ 95%, Non-Condensing
MIPI Camera Inputs (internal I/O)	-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 2x USB 3.0 Type-A
Storage	1x micro-SD card slot
GPIO Expansion (internal I/O)	20 pin: 2x I2C, 1x UART, 9x GPIOs
Input Power	12V/5A ; 9V~19V is recommended.
Buttons	Power and Recovery
RTC Battery	Support RTC battery and Battery Life Monitoring by MCU
Dimension/ Weight	W: 91.4mm x L: 76.6mm x H: 70mm (3.60” x 3.02” x 2.76”) Weight: 495g
Accessory	12V/5A adapter and power cord
Certifications	CE, FCC, KC

1.2 OPTION ACCESSORY

Item	NO111B/ NX211B	NO111B/ NX211B
NVIDIA® Jetson	NVIDIA® Jetson Nano(Version B01) for NO111B NVIDIA® Jetson Xavier NX for NX211B	
Power cord	EU/JP/TW/US/CN/UK	
MIPI Camera (internal I/O)	● For 15 pin MIPI connector ■ raspberry pi camera v2 ■ Manufacturer: APPRO.PHO 1. B-04: IMX179(8M)MIPI, 1080P(30fps) 2. C-04: IMX290(2M)MIPI, 1080P(30fps) 3. C-05: IMX290(2M)+ISP(YUV), 1080P(30fps) ● For 36 pin MIPI connector ■ Manufacturer: APPRO.PHO 1. B-03: IMX334(4K) MIPI, 4K(30fps) 2. 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 Front View and Three-Quarter View of NO111B/ NX211B BoxPC


AVerMedia
POWERED BY
NVIDIA.
MICRO SD
USB 3.0
HDMI OUT


RECOVERY
POWER
SYSTEM
POWER

2.4 Connector Summary

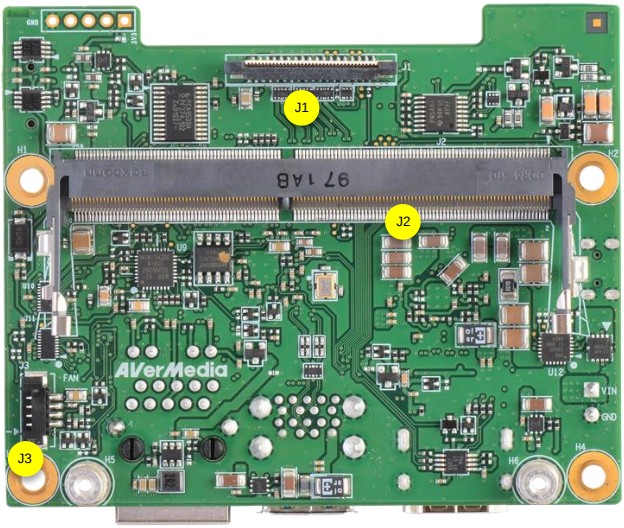
PCB Code	Designation	Description
NO111B/NX 211B	J1	4 Lane MIPI CSI-2 camera connector
	J2	SO-DIMM socket for NVIDIA® Jetson / NX module
	J3	Fan Power connector
	J4	2 Lane MIPI CSI-2 camera connector
	J5	2 Lane MIPI CSI-2 camera connector
	J6	RTC battery connector
	J7	USB 2.0 Micro-B
	J8	20-pin GPIO expansion
	J9	N/A
	J10	Gigabit Ethernet connector
	J11	USB 3.1 Gen 1 Type-A connectors
	J12	HDMI 2.0 connector
	J13	Micro SD card slot

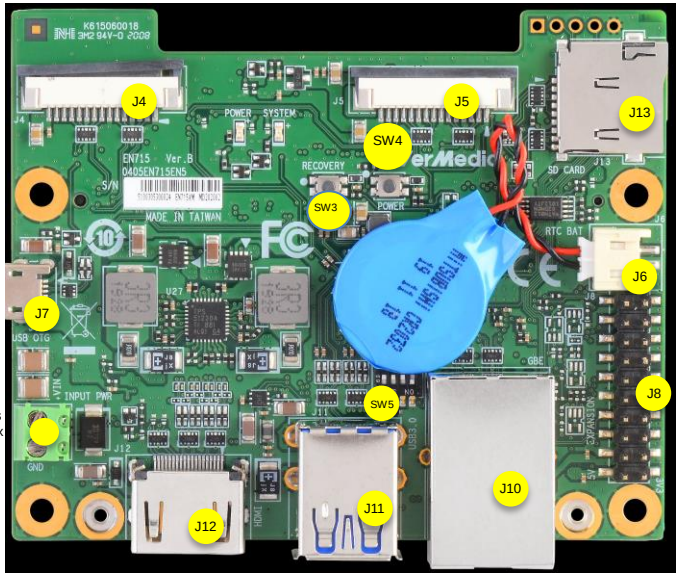
2.5 Switch Summary

Designation	Description
SW3	RECOVERY button
SW4	POWER on button
SW5	Fan PWM controller/Auto Power on

3.0 Feature Description

3.1 Connector and Switch Locations





This connector is removed for box PC ->

3.2 SerDes (V-by-One® HS)

Function	MIPI camera module connector	
Location	J1	
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#	Description	PIN#	Description
PIN 1	+5V MIPI	PIN 19	GND
PIN 2	+5V MIPI	PIN 20	CSI4_D2_P
PIN 3	+1V8	PIN 21	CSI4_D3_N
PIN 4	+3.3V MIPI	PIN 22	GND
PIN 5	+3.3V MIPI	PIN 23	N/A
PIN 6	+3.3V MIPI	PIN 24	N/A
PIN 7	GND	PIN 25	N/A
PIN 8	CSI4_D0_P	PIN 26	MIPI4_PWDN
PIN 9	CSI4_D0_N	PIN 27	CSI4_I2C_SDA
PIN 10	GND	PIN 28	CSI4_I2C_SCL
PIN 11	CSI_4_CLK_P	PIN 29	GND
PIN 12	CSI_CLK_N	PIN 30	N/A
PIN 13	GND	PIN 31	N/A
PIN 14	GND	PIN 32	N/A
PIN 15	CSI4_D1_N	PIN 33	N/A
PIN 16	GND	PIN 34	GND
PIN 17	CSI4_D2_P	PIN 35	CAM4_MCLK
PIN 18	CSI4_D3_P	PIN 36	GND

3.3 Jetson Nano Connector

Function	Provide connection with NVIDIA® Jetson Nano /Xavier NX modules	
Location	J2	
Type Description	SOCKET_DDR4 SO-DIMM_260PIN_90°	
Manufacturer and Part Number	Foxconn ASAA826-EASB0-7H	
Mating Connector	NVIDIA® Jetson Nano(Version B01) /	
Pinout	Please refer to NVIDIA Jetson Nano System-on-Module datasheet for pinout details.	
Remarks	https://developer.nvidia.com/ embedded/downloads	

3.4 Fan Power connector

Function	Fan Power Connector	
Location	J3	
Type Description	WAFER_1*4PIN_1.25㎜_90°	
Manufacturer and Part Number	ACES 50271-0040N-001_BLACK	
Pinout	Pin # / Description PIN 1 / GND PIN 2 / Power +5V PIN 3 / FAN_TACH PIN 4 / FAN_PWM	
Remarks	None	

3.5 MIPI CSI-2 DPHY Lanes

Function	MIPI camera module connector
Location	J4 , J5
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)

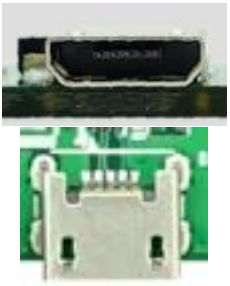
Pinout

PIN#	Description	PIN#	Description
PIN 1	GND	PIN 9	CSI2_CLK_P
PIN 2	CSI2_D0_N	PIN 10	GND
PIN 3	CSI2_D0_P	PIN 11	MIPI2_PWDN
PIN 4	GND	PIN 12	CAM2_MCLK
PIN 5	CSI2_D1_N	PIN 13	CSI2_I2C_SCL
PIN 6	CSI2_D1_P	PIN 14	CSI2_I2C_SDA
PIN 7	GND	PIN 15	+3V3_MIPI
PIN 8	CSI2_CLK_N		

3.6 RTC Battery Connector

Function	RTC battery for module	 
Location	J6	
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	

3.7 OTG/USB Micro-Type Connector

Function	OTG programming recovery	
Location	J7	
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	

3.8 20-Pin GPIO expansion

Function	General-purpose input/output）
Location	J8
Type Description	2x I2C, 1x UART, 9x GPIOs
Manufacturer and Part Number	光榮_PHPME006-100ARRH
Mating Connector	20-Pin GPIO expansion

Pinout

NO111B

Address	Pin Name	20-Pin Index		Pin Name	Address
	+3V3	1	2	+5V	
	GND	3	4	GND	
/dev/i2c-1	I2C1_SDA	5	6	UART2_TXD_3V3	Debug Console /dev/ttyS0
	I2C1_SCL	7	8	UART2_RXD_3V3	
/dev/i2c-0	I2C0_SDA	9	10	GND	
	I2C0_SCL	11	12	SPI1_SCK	gpio14
gpio79	I2S0_SCLK	13	14	SPI1_MISO	gpio13
gpio78	I2S0_DOUT	15	16	SPI1_MOSI	gpio12
gpio77	I2S0_DIN	17	18	SPI1_CS0	gpio15
gpio76	I2S0_FS	19	20	SPI1_CS1	gpio232

NX211B

Address	Pin Name	20-pin index		Pin Name	Address
	+3V3	1	2	+5V	
	GND	3	4	GND	
/dev/i2c-8	I2C1_SDA	5	6	UART2_TXD	/dev/ttyTCU0 Debug Console
	I2C1_SCL	7	8	UART2_RXD	
/dev/i2c-1	I2C0_SDA	9	10	GND	
	I2C0_SCL	11	12	SPI1_SCK	gpio480 Bidirection
gpio445 Bidirection	I2S0_SCLK	13	14	SPI1_MISO	gpio481 Bidirection
gpio446 Bidirection	I2S0_DOUT	15	16	SPI1_MOSI	gpio482 Bidirection
gpio447 Bidirection	I2S0_DIN	17	18	SPI1_CS0	gpio483 Bidirection
gpio448 Bidirection	I2S0_FS	19	20	SPI1_CS1	gpio484 Bidirection

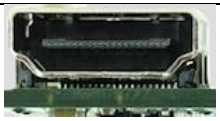
3.9 Gigabit Ethernet Connector

Function	1Gb Ethernet connector, used to connect to the host system.	
Location	J10	
Type Description	RJ45 8P8C single-port with LED	
Manufacturer and Part Number	Champway, 8188D-B514-00200	
Mating Connector	Any RJ45 plug with Cat5, Cat5e, Cat6 type cabling.	
Pinout	Comply with Ethernet standards.	
Remarks	None	

3.10 USB 3.1 Gen 1 Type-A Connector #1 and #2

Function	USB 3.1 Gen 1 Type-A connector #1 & #2	
Location	J11	
Type Description	Dual-port USB 3.1 Gen 1 Type-A female connector	
Manufacturer and Part Number	Foxconn, UEA1112C-4HK1-4H	
Mating Connector	Any USB 3.1 standard Type-A interface cable or device.	
Pinout	Please refer to USB 3.1 Gen 1 standard.	
Remarks	None	

3.11 HDMI OUTPUT

Function	HDMI output connector	 
Location	J12: HDMI	
Type Description	HDMI Type-A female connector	
Manufacturer and Part Number	Compupack, ACNHM220028-001	
Mating Connector	Any HDMI standard Type-A interface cable or device.	
Pinout	Please refer to HDMI standard.	
Remarks	None	

3.12 Optional Function Selection

Function	Fan PWM controller/Auto Power on	
Location	SW5	
Type Description	4 SPST DIP switch	
Manufacturer and Part Number	DIPTRONICS IN OFF-SWITCHING 0.025A/24VDC	
Pinout		

SW	Description	ON
S1	Fan PWM controller	Fan always on
S2	N/A	N/A
S3	Auto power on	Auto power on disabled
S4	Test mode off	Test mode on (for factory use)

Remark	Default S1 on

3.13 Micro SD Card Slot

Function	Micro SD Card	
Location	J13	
Type Description	SOCKET_MICRO SD CARD_9PIN_90°_SMD	
Manufacturer and Part Number	Fullglory, FG-0011BAAS09A	
Pinout	Refer to MicroSD card standard	
Remark	None	

3.14 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 OTG 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: EN715-R1.0.*.tar.gz for NO111B
BSP (board support package) file: EN715-NX-R1.0.*.tar.gz for NX211B
https://www.avermedia.com/professional/download/en715#parentHorizontalTab2

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 Nano/Xavier 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 EN715-R1.0.*.tar.gz

(file: EN715-R1.0.*.tar.gz for NO111B/ file: EN715-NX-R1.0.*.tar.gz for NX211B)

$ cd JetPack_*.**/Linux_for_Tegra

$ **sudo** ./flash.sh Jetson-nano-emmc mmcblk0p1

(For the Xavier NX module:

$ **sudo** ./flash.sh Jetson-xavier-nx-devkit-emmc mmcblk0p1)

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

5.0 Software

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

6.0 Force Recovery Mode

USB 3.l/OTG port of NO111B/NX211B can be used to re-program NVIDIA® Jetson NANO /Xavier 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 OTG USB port to the other host system which will be used to re-program the new system file into NVIDIA® Jetson Nano/ Xavier 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® Jetson Nano/Xavier NX will show up on the USB list of the host system as a new NVIDIA target device.
6. After the system software is updated successfully, please ensure to power off the system. A clean power-on will then revert OTG port back to the host mode.

7.0 Power Consumption

Item Description	Power Consumption
Theoretical Maximum System Power Consumption	● Maximum power consumption of NO111B is about 14W ● Maximum power consumption of NX211B is about 18.5W The condition is connected to HDMI and RJ45 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® Jetson Nano /Xavier NX.

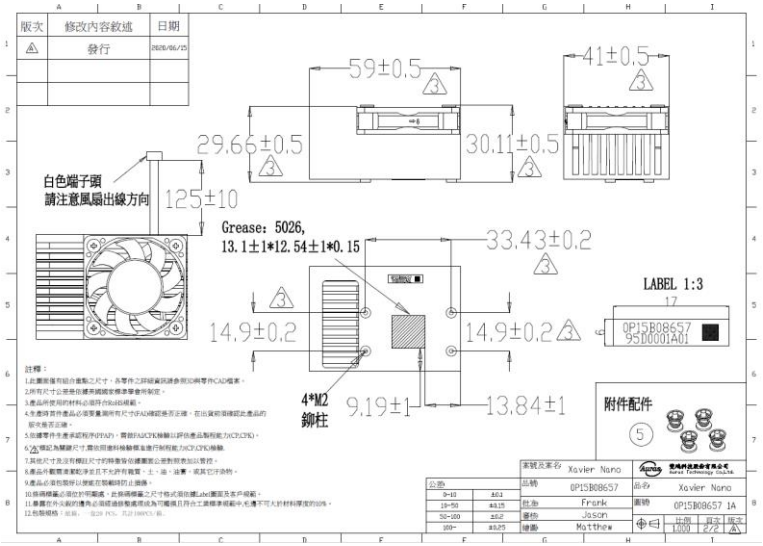
8.0 Accessory Drawings

8.1 Fan Module/ Adapter/ Power Cord

Fan Module for NANO

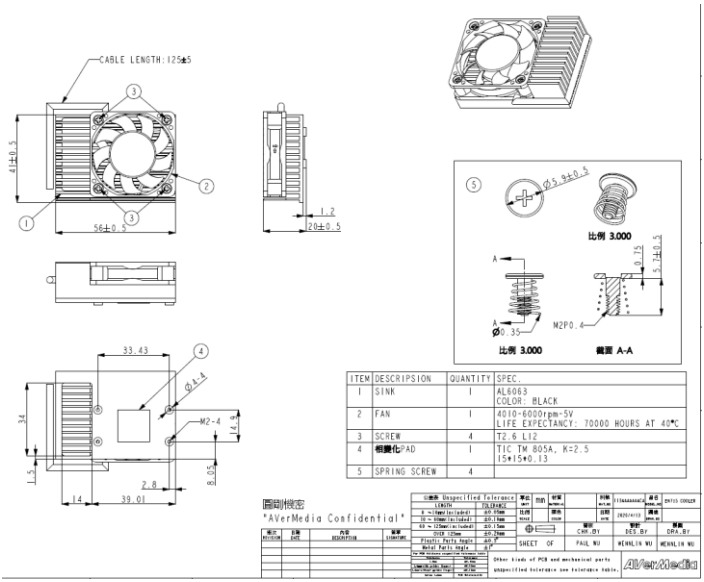
Vendor A：

- Rated Voltage: 5V
- Operating Voltage Range: 4V~5.5V
- Rated Speed: 6000RPM±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



Vendor B：

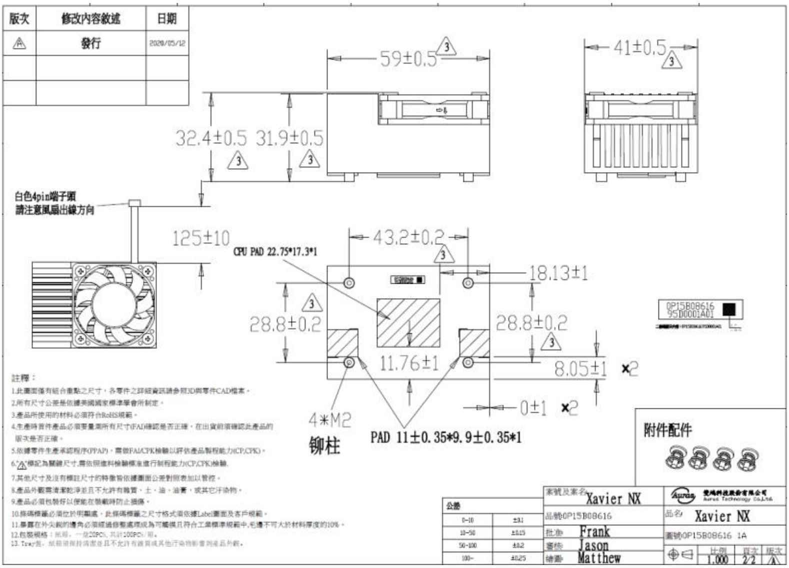
- Rated Voltage: 5V
- Operating Voltage Range: 4V~5.5V
- Rated Speed: 6000RPM±10%
  (Testing Speed After Continuous 3 Minute Operation At Ambient Temperature Of 25℃)
- Life Expectancy: 70,000hours at 40℃ (WITH 15~65% RH)
- Bearing Type: Two Ball



ITEM	DESCRIPSION	QUANTITY	SPEC.
1	SINK	1	AL6063 COLOR: BLACK
2	FAN	1	4010-6000rpm-5V LIFE EXPECTANCY: 70000 HOURS AT 40℃
3	SCREW	4	T2.6 L12
4	導熱化PAD	1	TIC TM 805A, K=2.5 15*15*0.13
5	SPRING SCREW	4	

Fan Module for NX

- Rated Voltage: 5V
- Operating Voltage Range: 4V~5.5V
- Rated Speed: 6000RPM±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


版次
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發行
2020/05/12
59±0.5
41±0.5
32.4±0.5
31.9±0.5
白色4pin端子頭
請注意風扇出線方向
125±10
CPU PAD 22.75*17.3*1
43.2±0.2
18.13±1
28.8±0.2
28.8±0.2
11.76±1
8.05±1
×2
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×2
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铆柱
PAD 11±0.35*9.9±0.35*1
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附件配件
註釋：
公差
案號及案名 Xavier NX
品號0P15B08616
品名 Xavier NX
批准 Frank
審核 Jason
繪圖 Matthew
圖號0P15B08616 1A
比例 1.000
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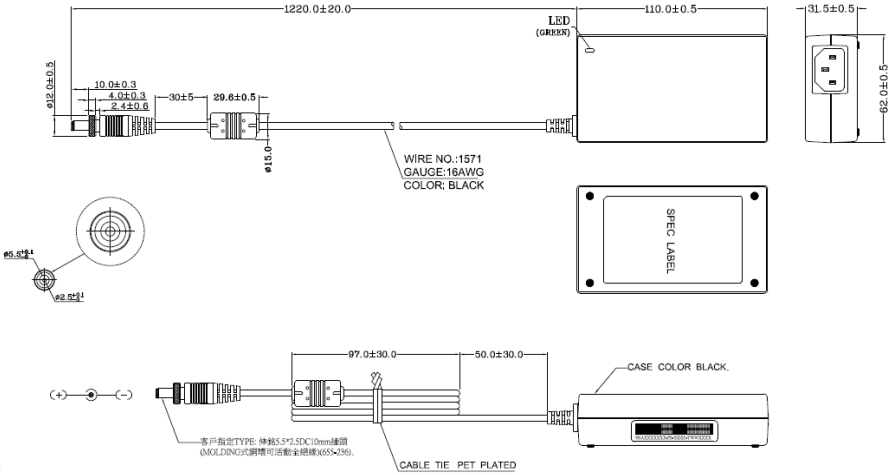
版次

Power Adapter 04131HGOUANK



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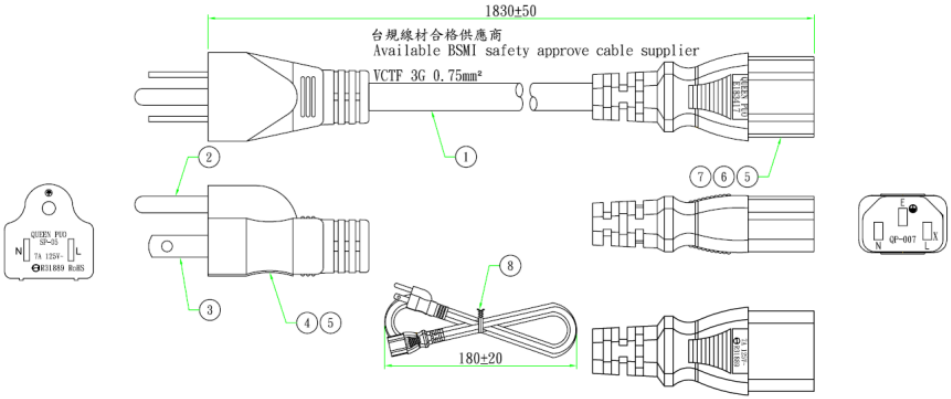

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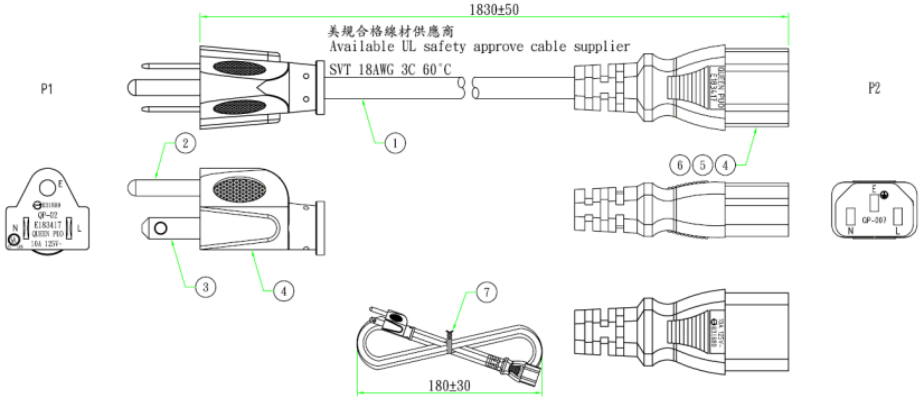

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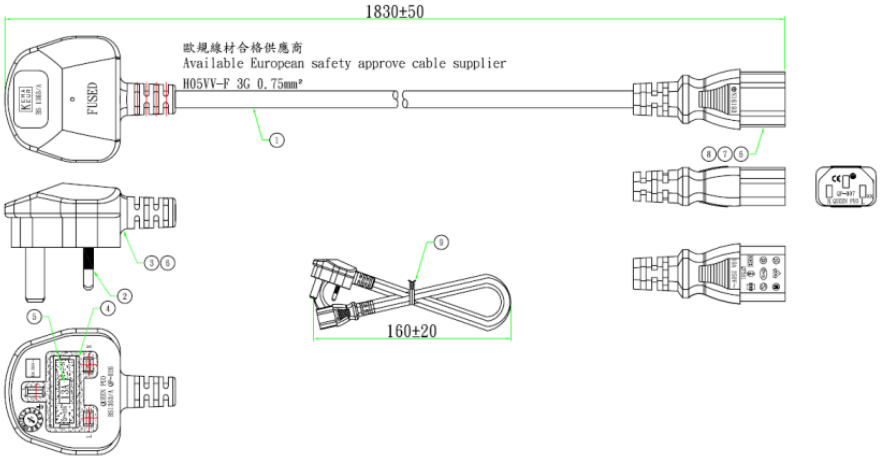
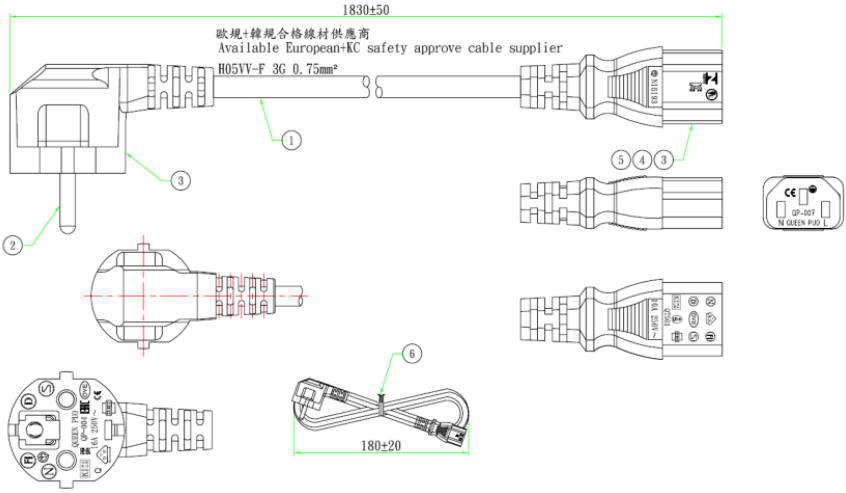
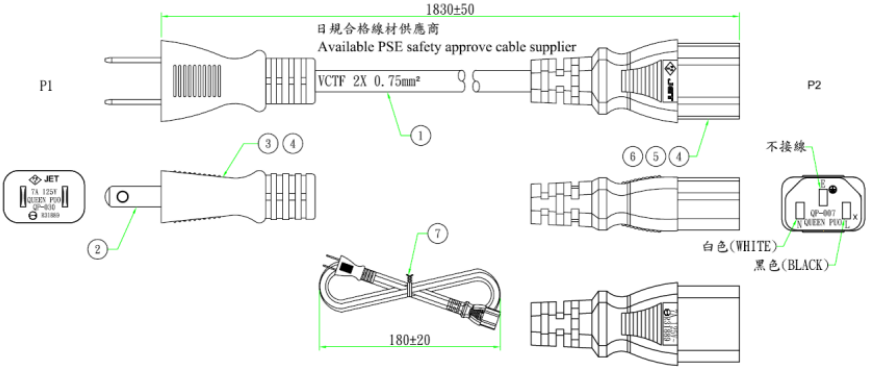


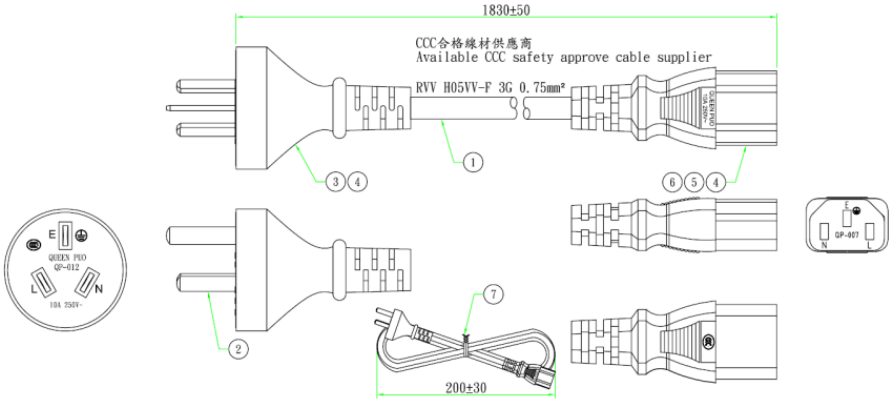
064APOWERBR5-IPD (EU version)



064APOWERBSL (JP version)

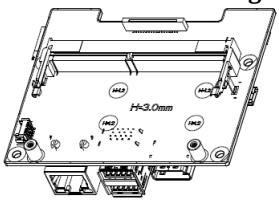


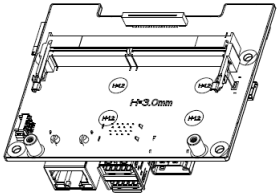
064APOWERBR4-IPD (CN version)

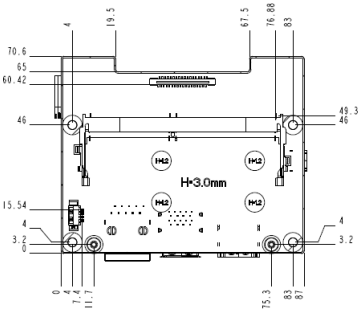


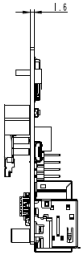
9.0 Dimension Drawings and Assembly Drawings

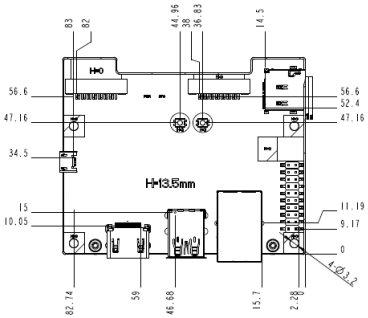
9.1 Dimension Drawings of carrier board



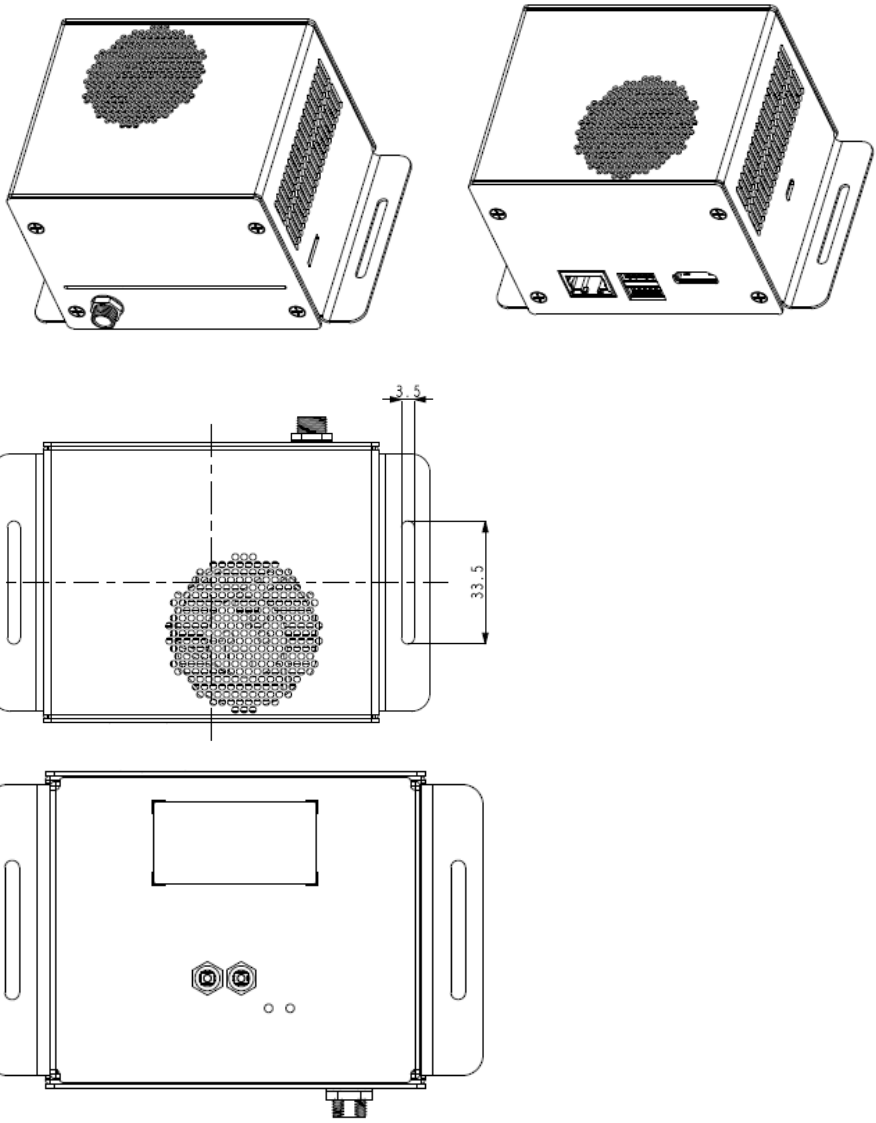


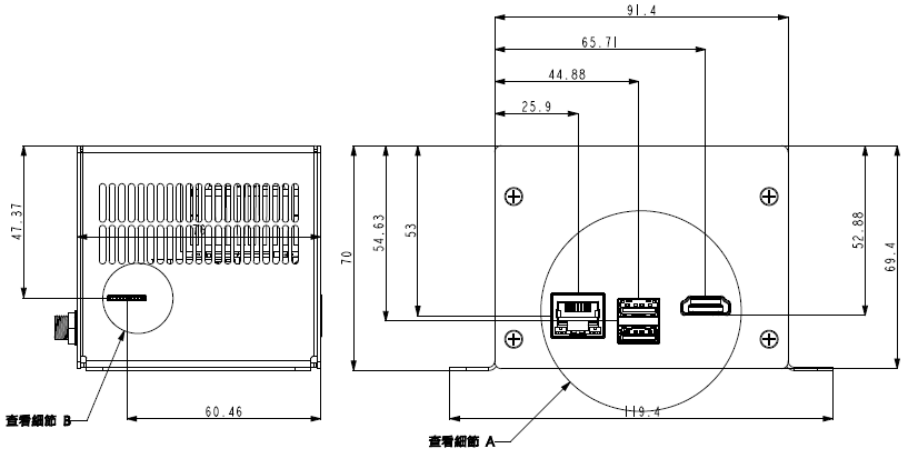


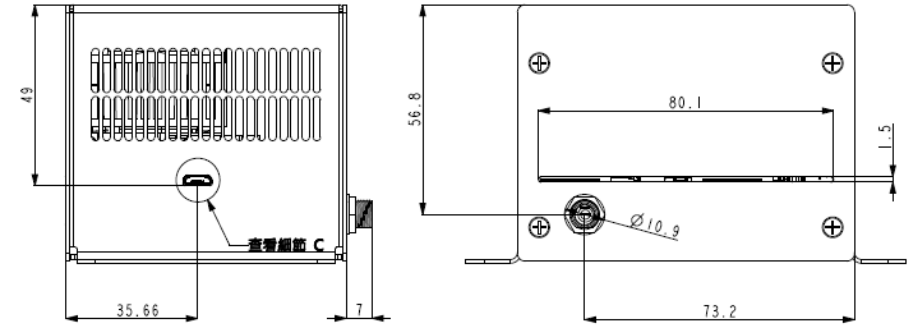


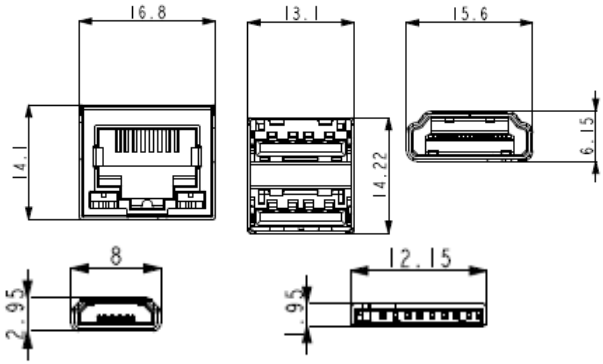


9.2 Dimension Drawing of NO111B/ NX211B Box PC




91.4
65.71
44.88
25.9
47.37
70
54.63
53
52.88
69.4
60.46
119.4
查看細節 B
查看細節 A


49
56.8
80.1
1.5
Ø10.9
查看細節 C
35.66
7
73.2


16.8
13.1
15.6
14.1
14.22
6.15
8
12.15
2.95
1.95