

User Manual

**Nvidia Jetson Series Carrier board
Aetina AN810**

Document Change History

| Version | Date | Description | Authors |
|---------|------------|---|------------|
| V1.0 | 2020/08/28 | Initial Release. | Stany Tsai |
| V1.1 | 2020/9/2 | Correct CN2 pin-define and description. | Stany Tsai |
| V1.2 | 2020/9/21 | Correct component's description. | Stany Tsai |

1. Introduction

Support for NVIDIA® Jetson Xavier™ NX. You can quickly emulate the functionality of your desired end product for software development and hardware verification.

To build a functional prototype of your target system you will need:

- NVIDIA® Jetson Xavier™ NX module (Aetina's P/N: NSO-MD-XNX)
- Carrier board (Aetina's P/N: AN810)
- Power adaptor 12~19V DC

1.1 Features

- Specifically designed for high performance and low-power envelope AI computing
- Extended temperature range -40°C to 85°C (Motherboard Only)
- Suitable for general robotics, Drone, UAV, industrial inspection, medical imaging and deep learning

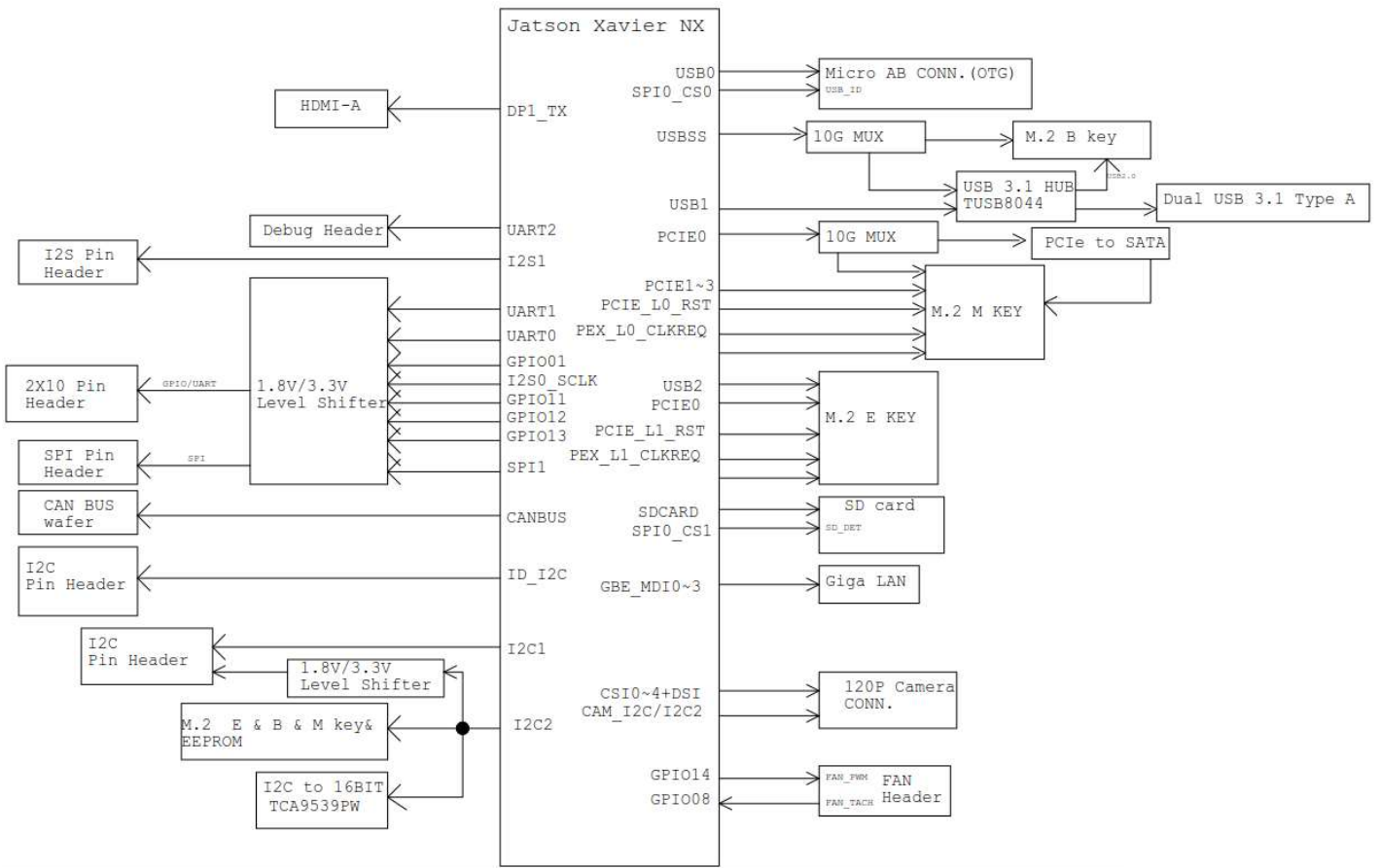
1.2 Board

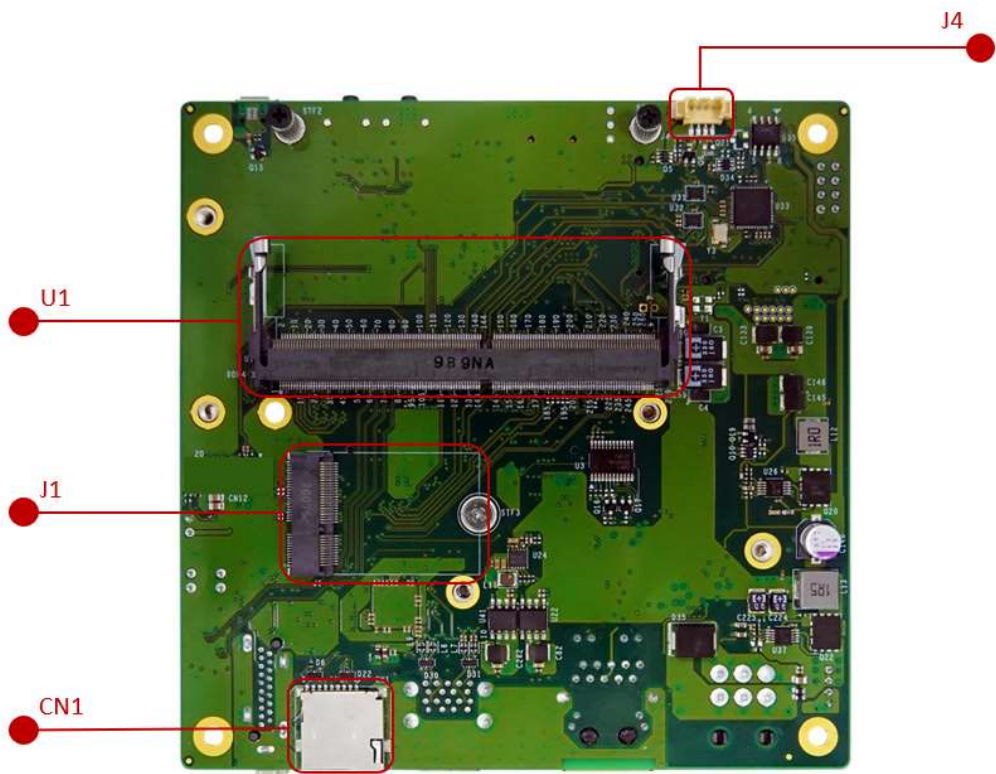
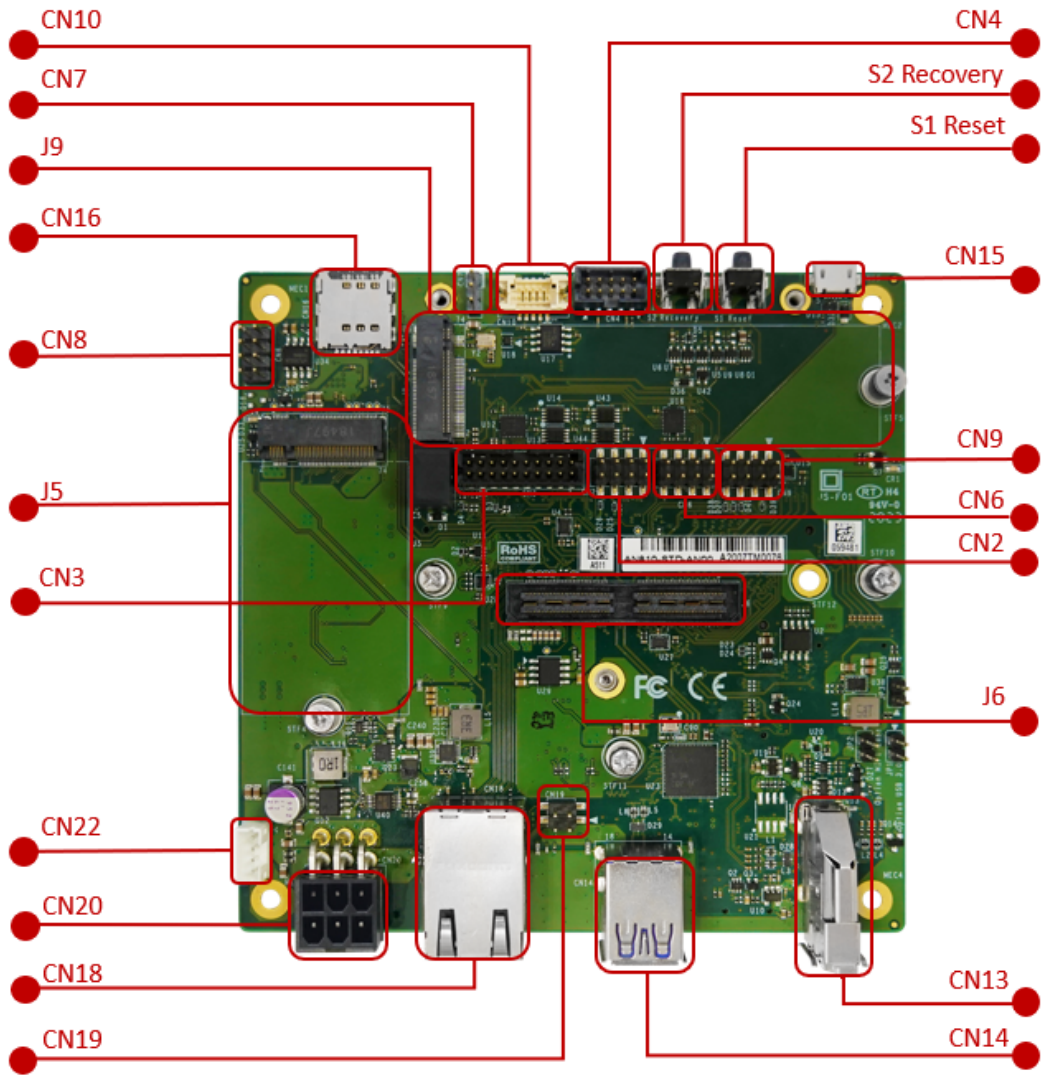
- 8-layer printed circuit board(PCB)
- Physical dimension: 120mm x 120mm

2. Board Specification

| Specification | AN810 Description |
|-----------------------|---|
| Module Compatibility | - NVIDIA® Jetson Xavier™ |
| GPU | - 384-core NVIDIA Volta™ GPU with 48 Tensor Cores |
| CPU | - 6-core NVIDIA Carmel ARM®v8.2 64-bit CPU 6MB L2 + 4MB L3 |
| Dimension | - 120mm x 120mm |
| Display | - 1 x HDMI |
| Ethernet | - 1 x Gigabit Ethernet |
| USB | - 2 x USB3.2 Gen1 Type A - 1 x USB2.0 Micro AB(OTG Only) |
| SD CARD | - 1x Micro SD CARD Slot |
| SIM | - 1x SIM Slot |
| Expansion | - 1x M.2 M Key 2280(PCIe x4 / SATA) - 1x M.2 E Key 2230(USB2.0/PCIe x1) - 1x M.2 B Key 3050(USB3.2 Gen2/USB2.0) |
| | - 1x 120 Pin Board to board connector for MIPI CSI-II |
| UART | - 2 x UART |
| SPI | - 1 x SPI |
| I2C | - 3 x I2C |
| GPIO | - 5 x GPIO |
| CAN Bus | - 1 x CAN Bus |
| Input Power | - 12-19V DC input |
| Operating Temperature | - -40°C to + 85°C (Motherboard Only) |
| Storage Temperature | - -40°C to + 85°C |
| Warranty | - 14 Months |

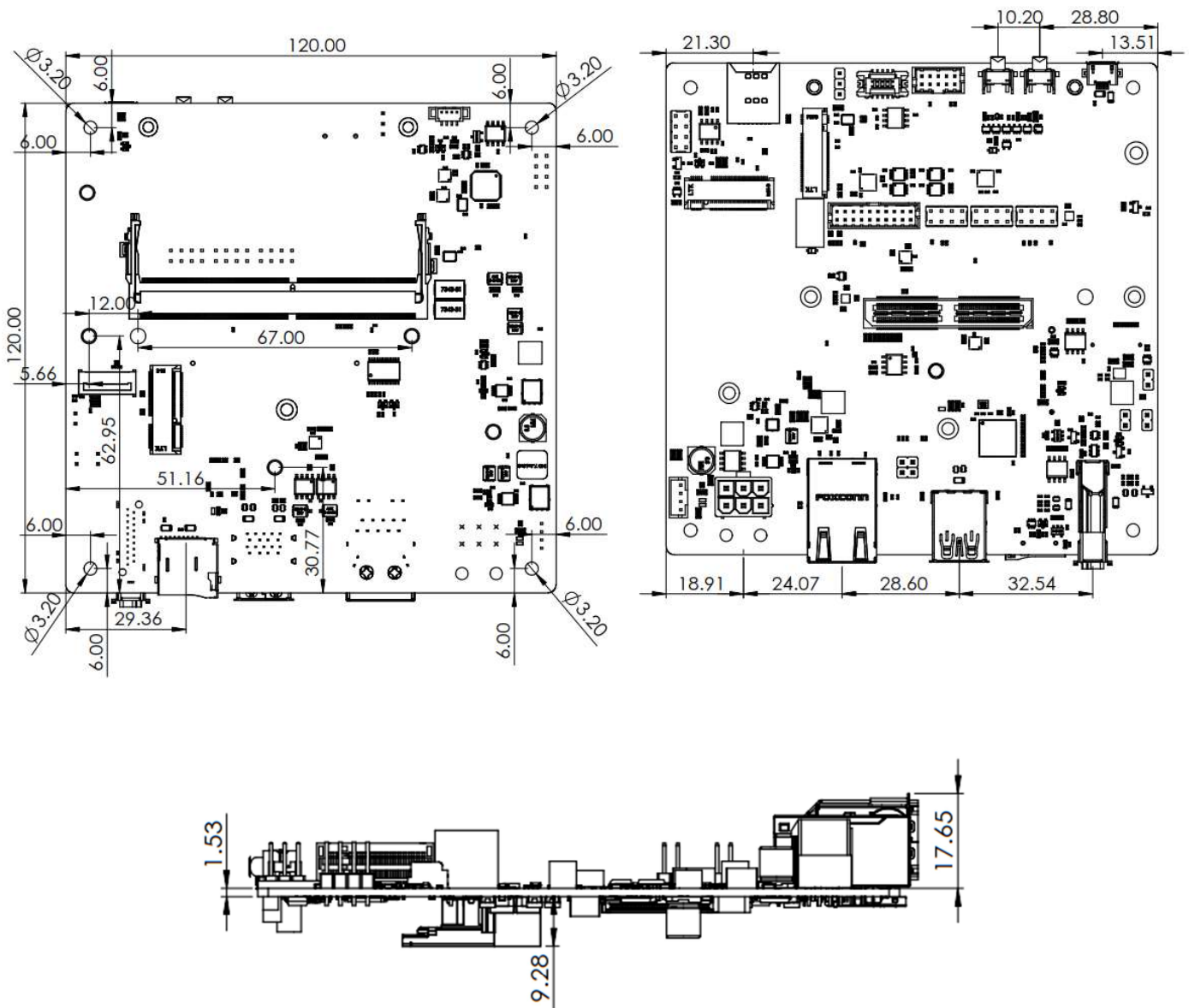
3. Block Diagram





| | |
|------|---|
| CN10 | CAN Bus Connector. |
| CN7 | Debug UART. |
| J9 | M.2 2280 M Key, support PCIe/mSATA function device. |
| J5 | M.2 3050 B Key, support 4G/5G function device. |
| CN16 | SIM Card Socket. |
| CN8 | Support I2S function. |
| CN3 | Support GPIO, 2x UART function. |
| CN22 | For DC output function device. |
| CN20 | 6 pins connector for Power input. |
| CN18 | RJ45 x1, support 10/100/1000M Ethernet |
| CN19 | For PSE power Input. |
| CN4 | Front Panel function. |
| S2 | Recovery button. |
| S1 | Reset button. |
| CN15 | Micro USB AB, OTG function only. |
| CN9 | Support I2C function. |
| CN6 | Support SPI function. |
| CN2 | I2C/Auto Power on switch |
| J6 | 120 pin board to board connector for MIPI CSI-2 |
| CN13 | HDMI 2.0b Type A |
| CN14 | USB3.2 Gen1 Type A x2 (Downgrade to USB2.0 when install J5) |
| U1 | 260pin SO-DIMM |
| J1 | M.2 2230 E Key, support PCIe/USB2.0 function device |
| CN1 | Micro SD device. |
| J4 | FAN power header(5V). |

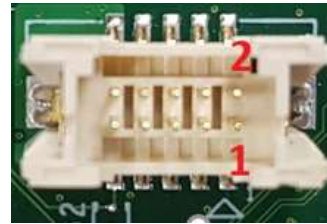
3.2 Mechanical Dimensions



4. Connectors and Pin-outs

4.1 CN10 : CAN Bus

| Pin | Define | Pin | Define |
|-----|--------|-----|--------|
| 1 | CAN0H | 2 | NC |
| 3 | CAN0L | 4 | NC |
| 5 | NC | 6 | NC |
| 7 | NC | 8 | NC |
| 9 | NC | 10 | GND |



4.2 CN7 : Debug UART

| Pin | Define |
|-----|---------------|
| 1 | UART2_RXD_3V3 |
| 2 | UART2_TXD_3V3 |
| 3 | GND |



4.3 CN8 : I2S

| Pin | Define | Pin | Define |
|-----|-------------|-----|------------|
| 1 | AUD_MCLK01 | 2 | I2S1_LRCLK |
| 3 | I2S1_SDOUT | 4 | I2S1_SDIN |
| 5 | SYS_RST_IN# | 6 | NC |
| 7 | I2S1_CLK | 8 | GND |



4.4 CN3 : UART and GPIO

| Pin | Define | Pin | Define |
|-----|-------------------|-----|-------------------|
| 1 | UART1_RXD_HDR_3V3 | 2 | UART0_RXD_HDR_3V3 |
| 3 | UART1_TXD_HDR_3V3 | 4 | UART0_TXD_HDR_3V3 |
| 5 | UART1_RTS_HDR_3V3 | 6 | UART0_RTS_HDR_3V3 |
| 7 | UART1_CTS_HDR_3V3 | 8 | UART0_CTS_HDR_3V3 |
| 9 | GND0 | 10 | GND1 |
| 11 | GPIO_1 | 12 | GND2 |
| 13 | GPIO_2 | 14 | GND3 |
| 15 | GPIO_3 | 16 | GND4 |
| 17 | GPIO_4 | 18 | GND5 |
| 19 | GPIO_5 | 20 | GND6 |



4.5 CN22 : DC-Output

| Pin | Define |
|-----|--------|
| 1 | DC-Out |
| 2 | DC-Out |
| 3 | GND |
| 4 | GND |



4.6 CN20 : Power input

| Pin | Define |
|-----|-----------|
| 1 | VDD_INPUT |
| 2 | VDD_INPUT |
| 3 | VDD_INPUT |
| 4 | GND |
| 5 | GND |
| 6 | GND |



4.7 CN19 : PSE power Input

| Pin | Define | Pin | Define |
|-----|--------|-----|--------|
| 1 | PSE1+ | 2 | PSE2+ |
| 3 | PSE1- | 4 | PSE2- |



4.8 CN4 : Front Panel

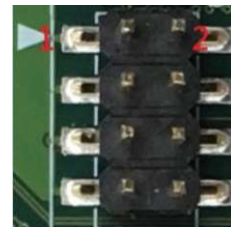
| Pin | Define | Pin | Define |
|-----|---------------|-----|---------|
| 1 | Power ON | 2 | GND0 |
| 3 | Reset | 4 | GND1 |
| 5 | Recovery | 6 | GND2 |
| 7 | NC | 8 | GND3 |
| 9 | LED_POWER_3V3 | 10 | EXT_LED |



*** In order to boot up the system, please quickly short-circuit Pin1 and Pin2.**

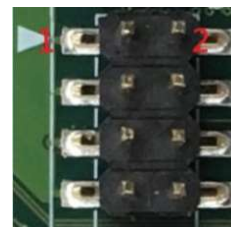
4.9 CN9 : I2C

| Pin | Define | Pin | Define |
|-----|---------|-----|-----------|
| 1 | VDD_3V3 | 2 | I2C_SDA_2 |
| 3 | GND | 4 | I2C_CLK_2 |
| 5 | VDD_3V3 | 6 | I2C1_SDA |
| 7 | GND | 8 | I2C1_SCL |



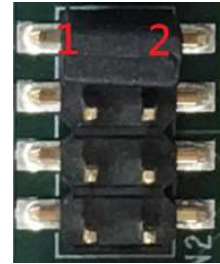
4.10 CN6 : SPI

| Pin | Define | Pin | Define |
|-----|---------------|-----|---------------|
| 1 | SPI1_SCK_3V3 | 2 | NC |
| 3 | SPI1_MISO_3V3 | 4 | SPI1_MOSI_3V3 |
| 5 | SPI1_CS0_3V3 | 6 | SPI1_CS1_3V3 |
| 7 | VDD_3V3 | 8 | GND |



4.11 CN2 : I2C/Auto Power on switch

| Pin | Define | Pin | Define |
|-----|---------------|-----|------------|
| 1 | LATCH_SET_BUT | 2 | LATCH_SET |
| 3 | VDD_3V3 | 4 | NC |
| 5 | VDD_3V3 | 6 | ID_I2C_SDA |
| 7 | GND | 8 | ID_I2C_SCL |



Remove Jumper from Pin1 and Pin2 can enable Auto power on function.

4.12 J4 : FAN Power Header

| Pin | Define |
|-----|----------------|
| 1 | FAN_PWM |
| 2 | FAN_TACH |
| 3 | FAN_PWR_VDD 5V |
| 4 | GND |



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