User Manual

Nvidia Jetson Series Carrier board
Aetina AN110

Document Change History

Version	Date	Description	Authors
V1	2020/02/18	Initial Release.	Eric Chu

1. Introduction

Aetina AN110 is an exquisite carrier board for the Nvidia Jetson Nano module, the small and low-power AI computer. As the most modest intelligent platform for the Nvidia series, this carrier board is only the size of 87 x 67 mm, will just right for edge AI computing needed nowadays. Empower Nvidia Jetson Nano's potential abilities and delivers 472 GFLOPS of computing performance with as low as 5W (10W max).
To build a functional prototype of your target system you will need:

- Nvidia Jetson Nano module
  (Aetina's P/N: NSO-MD-NANO)
- Carrier board
  (Aetina's P/N: AN110-STD-AN00)
- Power adaptor 12 DC/5A

1.1 Features

- Specifically designed for high performance and low-power envelope AI computing Additional driver to support Embedded peripheral modules for multiple I/O expansion capability.
- On-board 1x HDMI Type A, 1x RJ-45 for GbE, 2x USB3.0 Type A, 1x RS232, 2x UART, 5x GPIO, 1x eDP, 1x SPI, 1x I2C, 1x DC-in 12V and 2x FFC connectors to support MIPI CSI camera (1x 15pin for 2 Lanes /1x 36pin for 4 Lanes)
- Extended temperature range -25°C to 80°C
- Suitable for general robotics, UAV, industrial inspection, medical imaging, and deep learning.

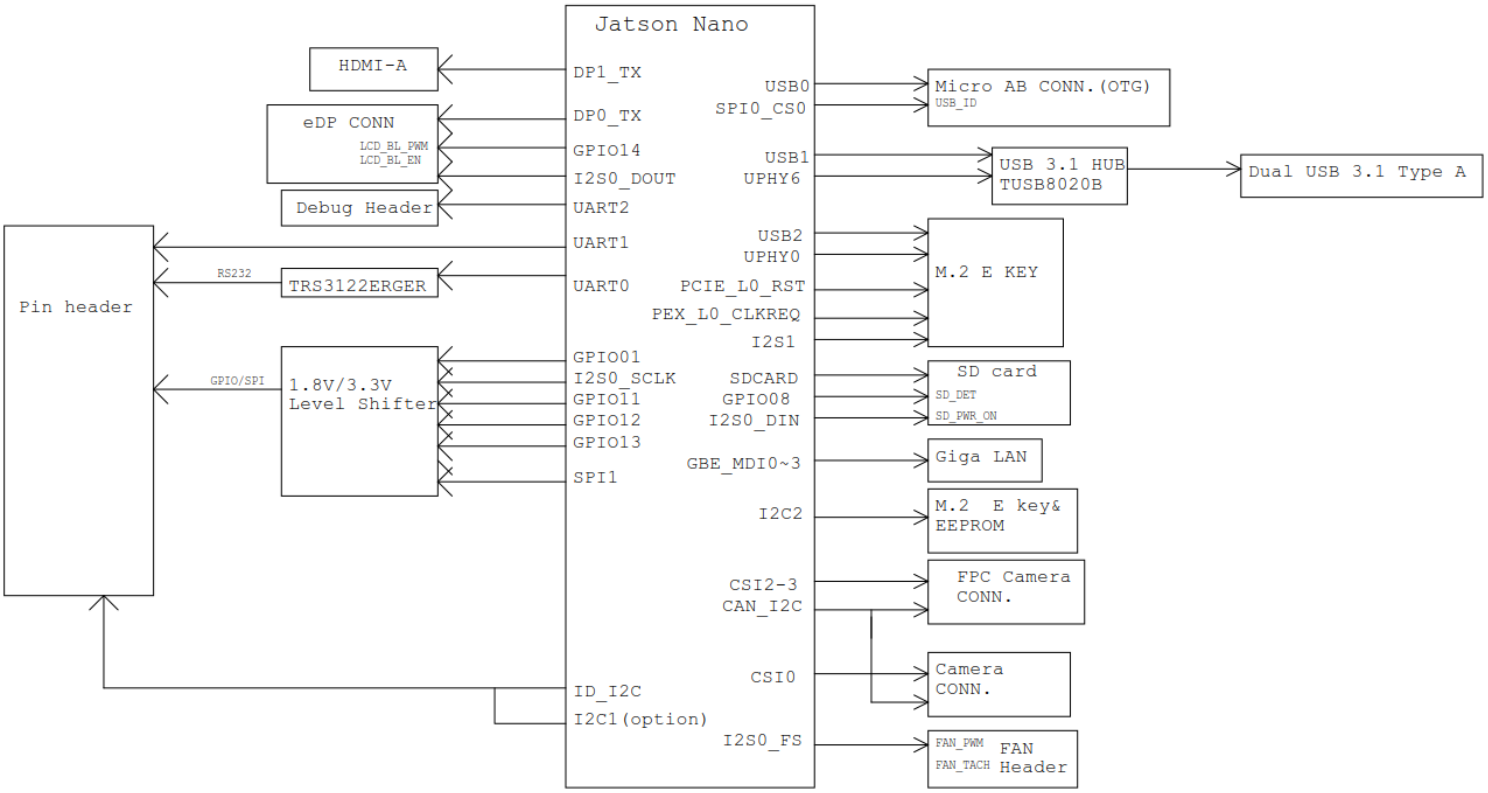
1.2 Board

- 8-layer printed circuit board (PCB)
- Physical dimensions: 87mm x 67mm

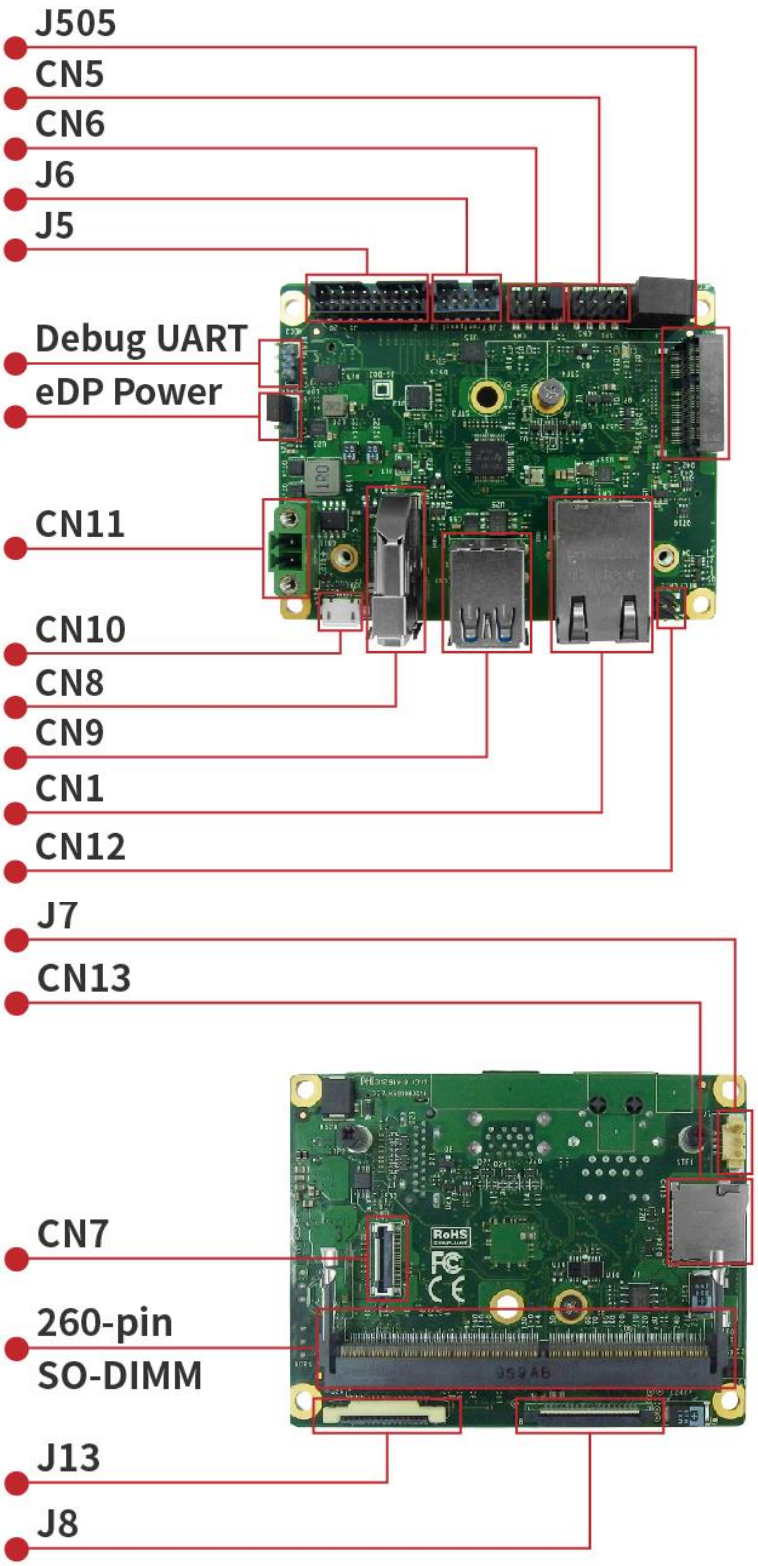
2. Board Specification

Specification	AN110 Description
Module Compatibility	Nvidia Jetson Nano/ Xavier NX
Dimension	87mm x 67mm
Display	- 1 x HDMI - 1 x eDP
Audio	- HDMI Integrated
Ethernet	- 1 x Gigabit Ethernet(10/100/1000)
USB	- 2 x USB3.2 Gen1 Type A - 1 x USB OTG Micro AB
SD CARD	- 1 x Micro SD CARD Slot
M.2	- 1 x M.2 E Key 2230
UART	- 2 x UART
RS232	- 1 x RS232
I2C	- 1 x I2C
GPIO	- 5 x GPIO
SPI	- 1x SPI
Input Power	- 12V/5A DC input
Operating Temperature	- -25°C to + 80°C
Storage Temperature	- -40°C to + 85°C
Warranty	- 14 Months

3. Block Diagram

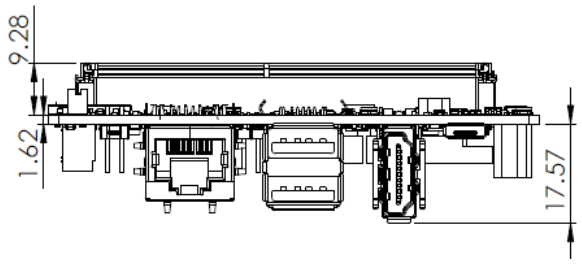


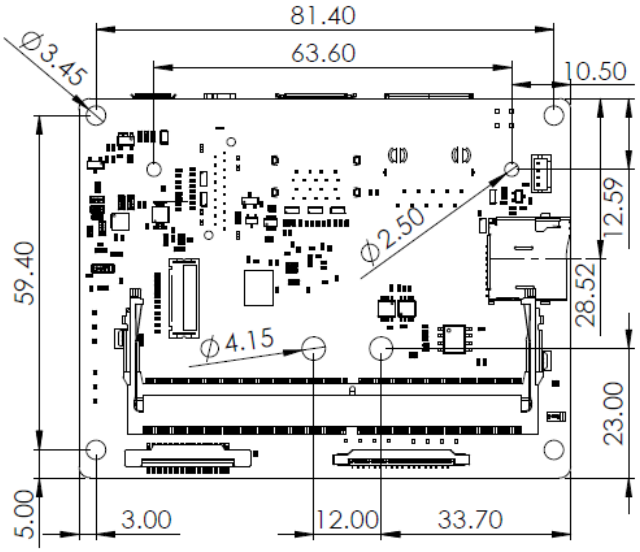
3.1 Board Placement

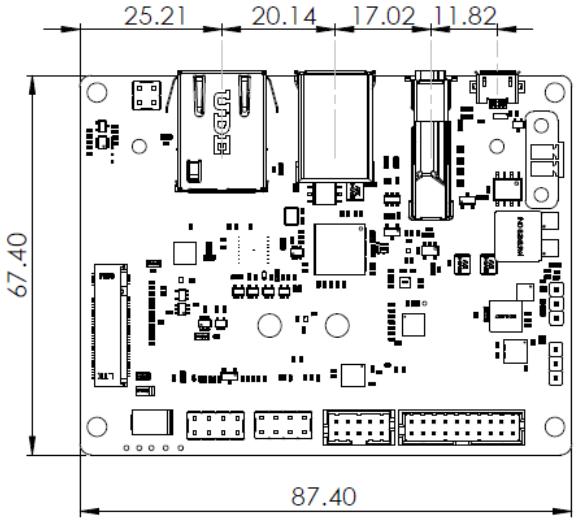


U26	260-pin SO-DIMM. Compatible with Jetson Nano/ Xavier NX module
CN7	eDP
CN8	HDMI 2.0b Type A
CN9	USB3.2 Gen1 Type A x2
CN10	USB2.0 OTG Micro-AB x1
CN11	Euroblock connector for Power Input
J505	M.2 2230 E Key
J13	FFC 15 pins for MIPI CSI-II 2LANES
J8	FFC 36 pins for MIPI CSI-II 4LANES
CN1	RJ45
CN2	Debug UART
CN5	SPI 3.3V
CN6	I2C/AC OK
J6	Front panel
J5	UART/RS-232/GPIO
CN14	eDP Power selection
J7	Fan Header 5V
CN12	PSE Power input

3.2 Mechanical Dimensions



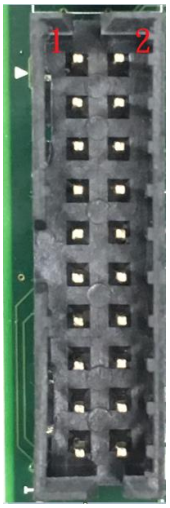




4. Connectors and Pin-outs

4.1 J5 – UART/RS232/GPIO

Pin Define	PIN	PIN	Pin Define
UART0_RXD_HDR_3V3	1	2	RS232_RXD
UART0_TXD_HDR_3V3	3	4	RS232_TXD
UART0_RTS_HDR_3V3	5	6	RS232_RTS
UART0_CTS_HDR_3V3	7	8	RS232_CTS
GND0	9	10	GND1
GPIO_1	11	12	GND2
GPIO_2	13	14	GND3
GPIO_3	15	16	GND4
GPIO_4	17	18	GND5
GPIO_5	19	20	GND6



* **GPIO Pin define.**

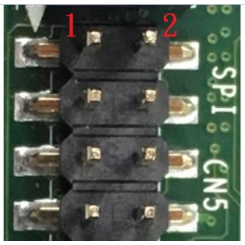
H/W	Sysfs GPIO(Nano)
GPIO_1	GPIO149
GPIO_2	GPIO79
GPIO_3	GPIO200
GPIO_4	GPIO194
GPIO_5	GPIO

4.2 J6 – Front Panel

Pin Define	PIN	PIN	Pin Define
Power On	1	2	GND0
Reset	3	4	GND1
Recovery	5	6	GND2
Sleep	7	8	GND3
LED+	9	10	LED-

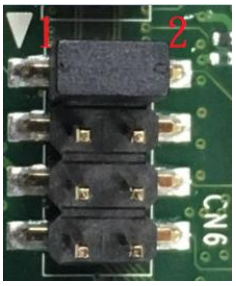
4.3 CN5 - SPI

Pin Define	PIN	PIN	Pin Define
SPI1_SCK_3V3	1	2	N/A
SPI1_MISO_3V3	3	4	SPI1_MOSI_3V3
SPI1_CS0_3V3	5	6	SPI1_CS1_3V3
VDD_3V3	7	8	GND



4.4 CN6 – I2C/AC OK

Pin Define	PIN	PIN	Pin Define
AC OK	1	2	GND
SOC_LED+	3	4	GND
+3V3	5	6	I2C_DAT_3V3
GND	7	8	I2C_CLK_3V3



4.5 CN12 – PSE Power Input

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

4.6 J7 – FAN Connector

PIN	Pin Define
1	GND
2	VDD_5V
3	FAN_TACH_CON
4	FAN_PWM_Q

4.7 CN2 – Debug UART

PIN	Pin Define
1	UART2_RXD_3V3
2	UART2_TXD_3V3
3	GND

4.8 J8 – FFC 36pin MIPI CSI-II 4Lanes connector

Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal
1	VDD_5V	11	CSI_A_CLK_P	21	CSI_A_D3_N	31	SPI_EN_A
2	VDD_5V	12	CSI_A_CLK_N	22	GND	32	SPI_MOSI
3	VDD_1V8	13	GND	23	VSYNC	33	SPI_SCK
4	VDD_3V3	14	CSI_A_D1_P	24	HSYNC	34	GND
5	VDD_3V3	15	CSI_A_D1_N	25	MASTER_SLAVE	35	CAM1_MCLK
6	VDD_3V3	16	GND	26	CAM_A_RST	36	GND
7	GND	17	CSI_A_D2_P	27	CAM_A_I2C_SDA		
8	CSI_A_D0_P	18	CSI_A_D2_N	28	CAM_A_I2C_SCL		
9	CSI_A_D0_N	19	GND	29	GND		
10	GND	20	CSI_A_D3_P	30	SPI_MISO		

4.9 J13 – FFC 15pin MIPI CSI-II 2Lanes connector

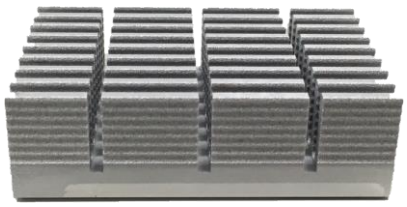
Pin	Signal	Pin	Signal	Pin	Signal
1	GND	11	CSI0_D1_P	21	CAM0_PWDN
2	NC	12	NC	22	NC
3	CSI0_D0_N	13	GND	23	CAM0_MCLK
4	NC	14	NC	24	NC
5	CSI0_D0_P	15	CSI0_CLK_N	25	CAM_A_I2C_SCL
6	NC	16	NC	26	NC
7	GND	17	CSI0_CLK_P	27	CAM_A_I2C_SDA
8	NC	18	NC	28	NC
9	CSI0_D1_N	19	GND	29	VDD_3V3
10	NC	20	NC	30	NC

5. Accessary (Optional)

Product name	Description
7W8000000040	US Power Cord SVT 18AWG Cable 1800mm Black 105 ˚C
7W8000000050	EU Power Cord H05VV-F 0.75mm2/3G SL-6+SL-3 Cable 1800mm Black
9Z3BC0000020	100-240V 60W 12V 5A Adapter
9Z2XX3314010	Passive Heat Sink

9Z3BC0000020

9Z2XX3314010



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