PCPartner®

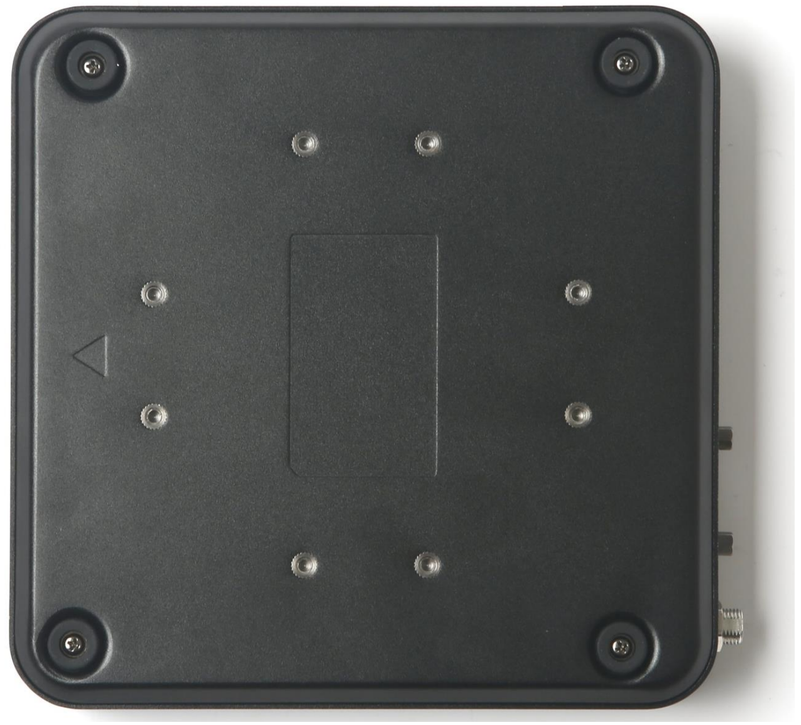
C442N7
Jetson Orin Nano Embedded AI Edge Computer
Product Brief (Preliminary) V2

Created: April 19, 2023
Last updated: April 25, 2023
PM: L.M. Wong

Document Update

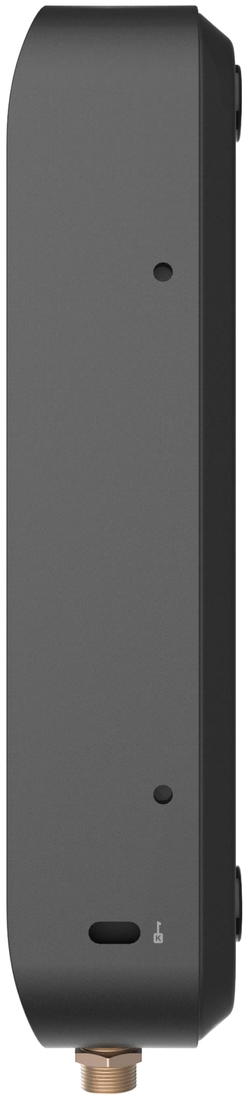
- Version 2:
  - Corrected block diagram (swapped UART1 & 2)
  - Updated operating temperature range
  - Specified PCP P/N for M.2 NVMe SSD module and WIFI module
  - Added 3D rendered drawing
  - PCB version 004
- Version 1: Initial draft (Support RS285/RS232 dual mode, WI-FI 6E)

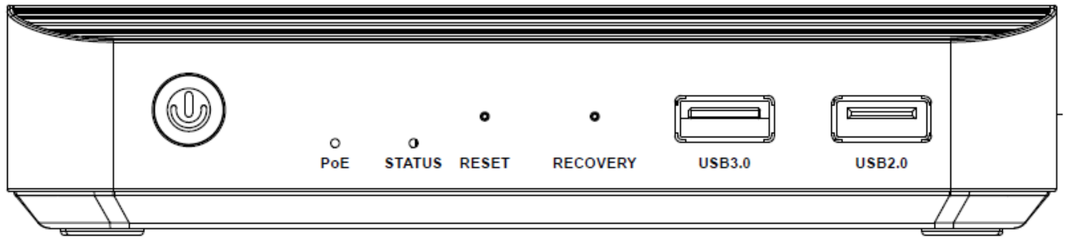
1. SYSTEM OUTLOOK

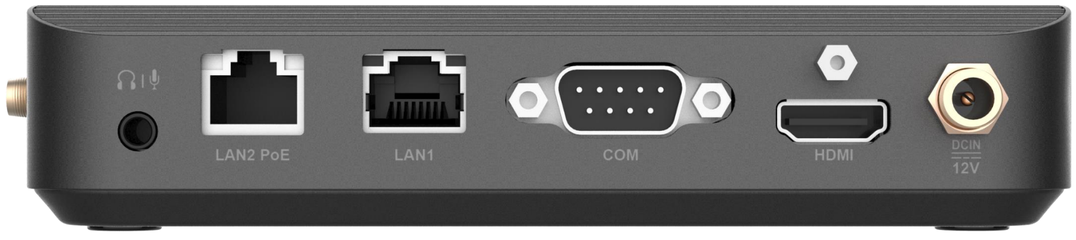


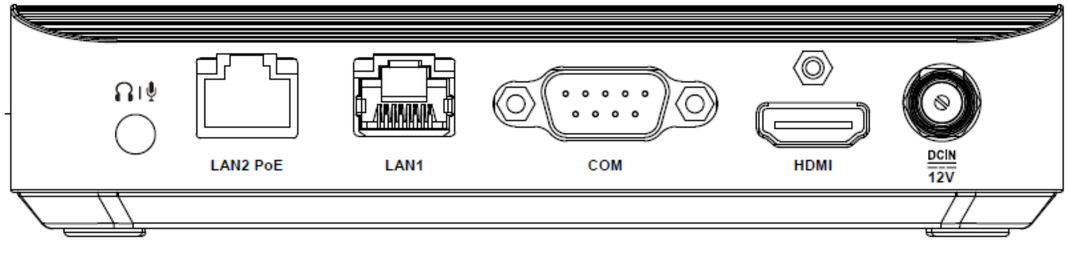
- Dimension unit: mm

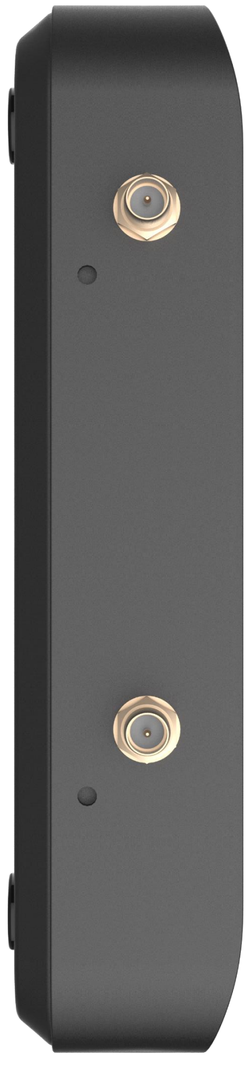
1. SYSTEM OUTLOOK



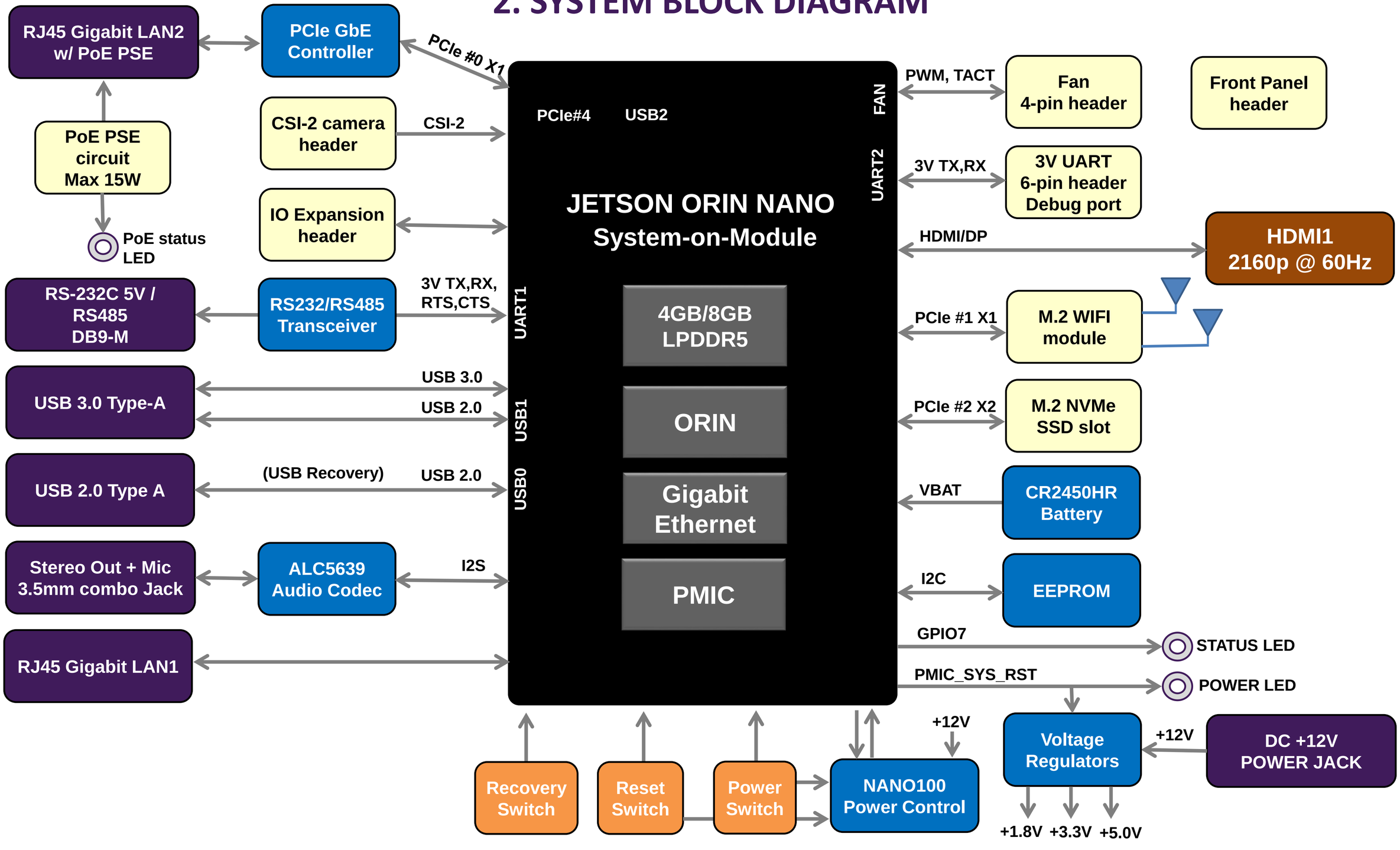








2. SYSTEM BLOCK DIAGRAM



3. TECHNICAL SPECIFICATION

- Based on **NVIDIA Jetson Orin Nano 4GB/8GB** module
- M.2 2280 NVMe PCIex2 slot. Pre-installed Phison 256GB SSD flash drive (PCP P/N 251-10102-0000F)
- 1 x HDMI 2.0 display output with locking screw
- 1 x USB 3.0 Type-A host port. 1 x USB 2.0 Type-A host port (support Jetson Force Recovery Mode)
- 1 x RS-232C/RS-485 dual mode serial port in DB-9M connector (TX, RX, RTS, CTS signals at 5V RS232 level)
- Intel Wi-Fi 6E AX210NGW 802.11ax tri-band Wi-Fi module (PCP P/N 251-15001-0200F)
- LAN1: Gigabit Ethernet based on Realtek RTL8119I-CG on Jetson module
- LAN2 PoE PSE: Gigabit Ethernet based on Realtek RTL8119I-CG on motherboard
    - 802.3af (802.3at Type 1) based on T.I. TPS23861 + MOSFET
    - Maximum continuous output power: 15.4W
    - Supported power classes: Class 1, 2, 3
    - Supported cabling: Category 5
    - Supported modes: Mode A, Mode B
- [OPTION] 3.5mm stereo line-out & mono microphone combo jack
- Switches: Power push button, Reset tact switch (pin hole), Jetson Force Recovery tact switch (pin hole)
- LED indicators: Power, PoE, Status (User GPIO)
- Real-time clock battery: CR2450HR 3V 550mAh coin battery
- Power Input: 12VDC jack with locking screw. Max power consumption 35W (estimation) incl USB full loading. Bundle 60W 12V AC adapter
- Passive cooling case with mounting holes on both sides and Kensington lock hole. Dimension: 146.8mm (W) x 146.8mm (D) x 31.1mm (H)
- Operating temperature range: -20°C – +45°C. Humidity 5 – 95% non-condensing
- FCC, CE, UL certified (pending). RoHS compliant
- Software: PC Partner Jetson Linux (L4T) patch, Splitter firmware update tool

3. TECHNICAL SPECIFICATION

- Use Condition:
  - Duty cycle: 24 x 7
  - Indoor use
- Function not supported
  - Jetson Orin Nano, Jetson Orin NX: Do NOT support on-board and on-module eMMC flash storage
- Packing List:
  - Main unit x 1
  - Tri-band WIFI antenna x 2
  - Universal AC Adapter x 1. Output DC12V x 5A output with locking screw
  - AC power cord for US region (1.2M) x 1
  - AC power cord for EU region (1.2M) x 1

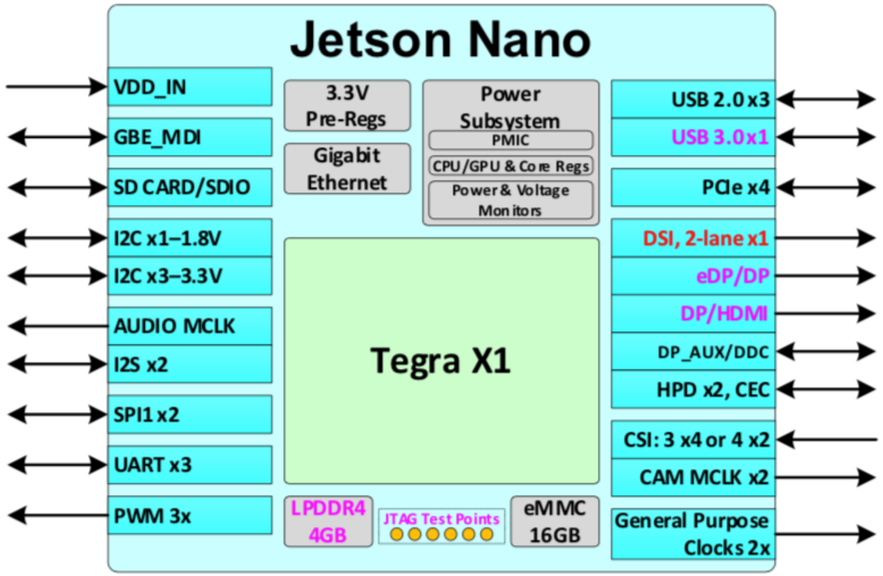
4. ORDERING INFORMATION

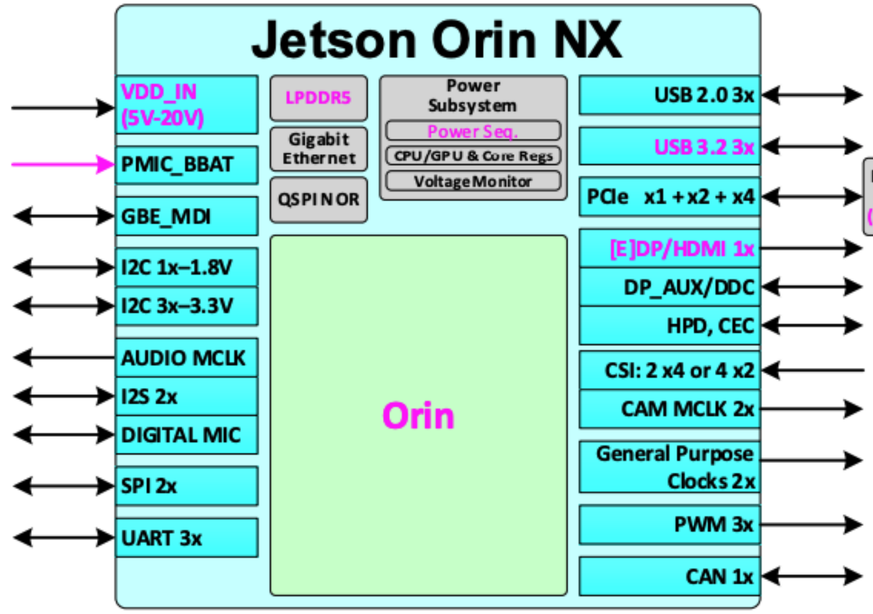
SKU	BOM	Description
EMB-C442N7-BC-A1	250-4B442-004EB (tentative)	EMBEDDED JETSON ORIN NANO SYSTEM, 4GB LPDDR5, M.2 NVMe 256GB, AX210 WIFI, HDMI, GbE, PoE PSE, RS232C/RS485, CR2450HR BATT, US/EU PLUGS, OEM BOX Device identification: ▪HWID: 250-4B442-004EB ▪Jetson firmware version: *t.b.d.*
EMB-C442N7-BC-B1	250-4B442-104EB (tentative)	EMBEDDED JETSON ORIN NANO SYSTEM, 8GB LPDDR5, M.2 NVMe 256GB, AX210 WIFI, HDMI, GbE, PoE PSE, RS232C/RS485, CR2450HR BATT, US/EU PLUGS, OEM BOX Device identification: ▪HWID: 250-4B442-104EB ▪Jetson firmware version: *t.b.d.*

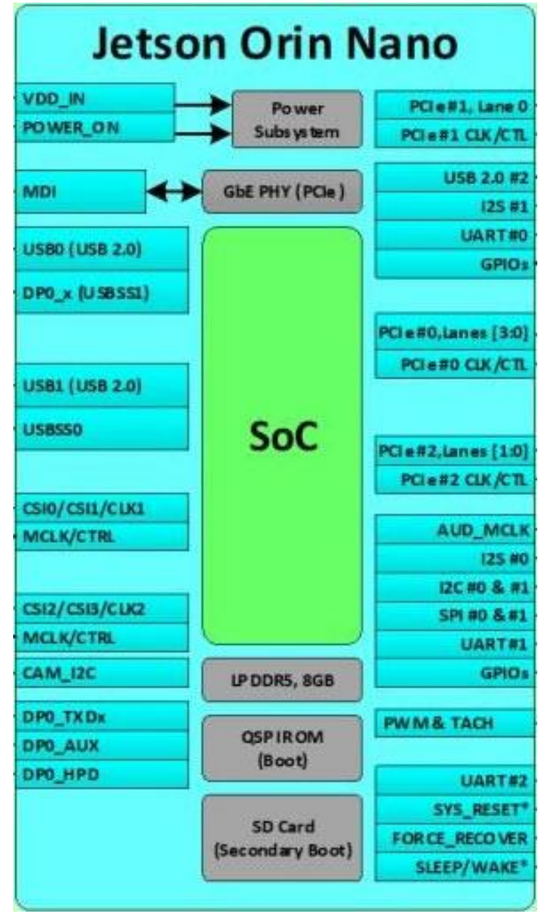
5. BACKUP - JETSON NANO, TX2, XAVIER NX, ORIN NX, ORIN NANO BLOCK DIAGRAM

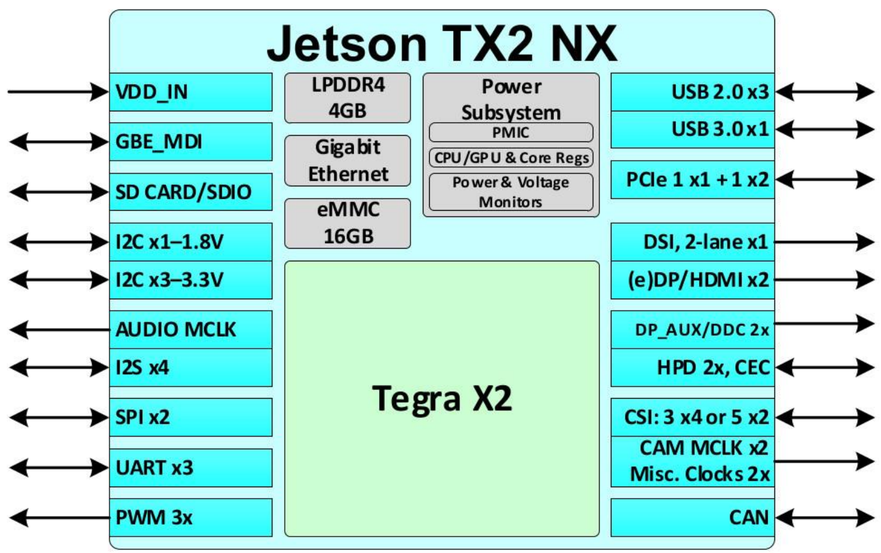
The interfaces or blocks that are supported only by one of the modules is highlighted in red.

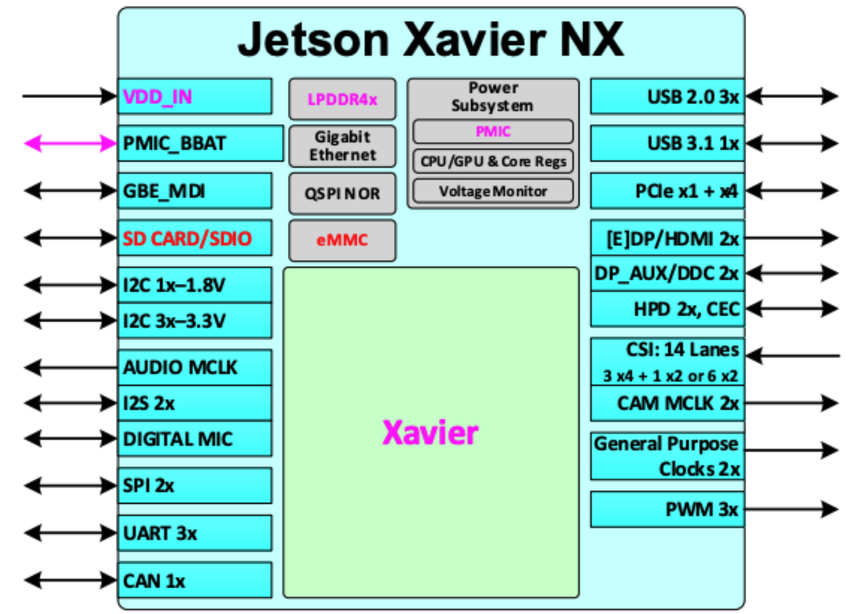
The interface types that are supported on both modules but where the number of lanes and instances, voltage level, or access is different are highlighted in magenta.











5. BACKUP - JETSON NANO vs JETSON ORIN NX PINOUT DIFFERENCE

Jetson Nano pinout

Signal Name	Pin # Top Odd	Pin # Bottom Even	Signal Name
GND	1	2	GND
CSI1_D0_N	3	4	CSI0_D0_N
CSI1_D0_P	5	6	CSI0_D0_P
GND	7	8	GND
RSVD	9	10	CSI0_CLK_N
RSVD	11	12	CSI0_CLK_P
GND	13	14	GND
CSI1_D1_N	15	16	CSI0_D1_N
CSI1_D1_P	17	18	CSI0_D1_P
GND	19	20	GND
CSI3_D0_N	21	22	CSI2_D0_N
CSI3_D0_P	23	24	CSI2_D0_P
GND	25	26	GND
CSI3_CLK_N	27	28	CSI2_CLK_N
CSI3_CLK_P	29	30	CSI2_CLK_P
GND	31	32	GND
CSI3_D1_N	33	34	CSI2_D1_N
CSI3_D1_P	35	36	CSI2_D1_P
GND	37	38	GND
DP0_TXD0_N	39	40	CSI4_D2_N
DP0_TXD0_P	41	42	CSI4_D2_P
GND	43	44	GND
DP0_TXD1_N	45	46	CSI4_D0_N
DP0_TXD1_P	47	48	CSI4_D0_P
GND	49	50	GND
DP0_TXD2_N	51	52	CSI4_CLK_N
DP0_TXD2_P	53	54	CSI4_CLK_P
GND	55	56	GND
DP0_TXD3_N	57	58	CSI4_D1_N
DP0_TXD3_P	59	60	CSI4_D1_P
GND	61	62	GND
DP1_TXD0_N	63	64	CSI4_D3_N
DP1_TXD0_P	65	66	CSI4_D3_P
GND	67	68	GND
DP1_TXD1_N	69	70	DSI_D0_N
DP1_TXD1_P	71	72	DSI_D0_P
GND	73	74	GND
DP1_TXD2_N	75	76	DSI_CLK_N
DP1_TXD2_P	77	78	DSI_CLK_P
GND	79	80	GND
DP1_TXD3_N	81	82	DSI_D1_N
DP1_TXD3_P	83	84	DSI_D1_P
GND	85	86	GND
GPIO0	87	88	DP0_HPD
SPI0_MOSI	89	90	DP0_AUX_N
SPI0_SCK	91	92	DP0_AUX_P
SPI0_MISO	93	94	HDMI_CEC
SPI0_CS0*	95	96	DP1_HPD
SPI0_CS1*	97	98	DP1_AUX_N
UART0_TXD	99	100	DP1_AUX_P
UART0_RXD	101	102	GND
UART0_RTS*	103	104	SPI1_MOSI
UART0_CTS*	105	106	SPI1_SCK
GND	107	108	SPI1_MISO
USB0_D_N	109	110	SPI1_CS0*
USB0_D_P	111	112	SPI1_CS1*
GND	113	114	CAM0_PWDN
USB1_D_N	115	116	CAM0_MCLK
USB1_D_P	117	118	GPIO01
GND	119	120	CAM1_PWDN
USB2_D_N	121	122	CAM1_MCLK
USB2_D_P	123	124	GPIO02
GND	125	126	GPIO03
GPIO04	127	128	GPIO05
GND	129	130	GPIO06
PCIE0_RX0_N	131	132	GND

Signal Name	Pin # Top Odd	Pin # Bottom Even	Signal Name
PCIE0_RX0_P	133	134	PCIE0_TX0_N
GND	135	136	PCIE0_TX0_P
PCIE0_RX1_N	137	138	GND
PCIE0_RX1_P	139	140	PCIE0_TX1_N
GND	141	142	PCIE0_TX1_P
RSVD	143	144	GND
KEY	KEY	KEY	KEY
RSVD	145	146	GND
GND	147	148	PCIE0_TX2_N
PCIE0_RX2_N	149	150	PCIE0_TX2_P
PCIE0_RX2_P	151	152	GND
GND	153	154	PCIE0_TX3_N
PCIE0_RX3_N	155	156	PCIE0_TX3_P
PCIE0_RX3_P	157	158	GND
GND	159	160	PCIE0_CLK_N
USBSS_RX_N	161	162	PCIE0_CLK_P
USBSS_RX_P	163	164	GND
GND	165	166	USBSS_TX_N
RSVD	167	168	USBSS_TX_P
RSVD	169	170	GND
GND	171	172	RSVD
RSVD	173	174	RSVD
RSVD	175	176	GND
GND	177	178	MOD_SLEEP*
PCIE_WAKE*	179	180	PCIE0_CLKREQ*
PCIE0_RST*	181	182	RSVD
RSVD	183	184	GBE_MDI0_N
I2C0_SCL	185	186	GBE_MDI0_P
I2C0_SDA	187	188	GBE_LED_LINK
I2C1_SCL	189	190	GBE_MDI1_N
I2C1_SDA	191	192	GBE_MDI1_P
I2S0_DOUT	193	194	GBE_LED_ACT
I2S0_DIN	195	196	GBE_MDI2_N
I2S0_FS	197	198	GBE_MDI2_P
I2S0_SCLK	199	200	GND
GND	201	202	GBE_MDI3_N
UART1_TXD	203	204	GBE_MDI3_P
UART1_RXD	205	206	GPIO07
UART1_RTS*	207	208	GPIO08
UART1_CTS*	209	210	CLK_32K_OUT
GPIO09	211	212	GPIO10
CAM_I2C_SCL	213	214	FORCE_RECOVERY*
CAM_I2C_SDA	215	216	GPIO11
GND	217	218	GPIO12
SDMMC_DAT0	219	220	I2S1_DOUT
SDMMC_DAT1	221	222	I2S1_DIN
SDMMC_DAT2	223	224	I2S1_FS
SDMMC_DAT3	225	226	I2S1_SCLK
SDMMC_CMD	227	228	GPIO13
SDMMC_CLK	229	230	GPIO14
GND	231	232	I2C2_SCL
SHUTDOWN_REQ*	233	234	I2C2_SDA
PMIC_BBAT	235	236	UART2_TXD
POWER_EN	237	238	UART2_RXD
SYS_RESET*	239	240	SLEEP/WAKE*
GND	241	242	GND
GND	243	244	GND
GND	245	246	GND
GND	247	248	GND
GND	249	250	GND
VDD_IN	251	252	VDD_IN
VDD_IN	253	254	VDD_IN
VDD_IN	255	256	VDD_IN
VDD_IN	257	258	VDD_IN
VDD_IN	259	260	VDD_IN

Jetson Orin NX pinout difference (blue color)

DP0_TXD0_N	USBSS1_RX_N	39		40	CSI4_D2_N	PCIE2_RX0_N
DP0_TXD0_P	USBSS1_RX_P	41		42	CSI4_D2_P	PCIE2_RX0_P
GND	GND	43		44	GND	GND
DP0_TXD1_N	USBSS1_TX_N	45		46	CSI4_D0_N	PCIE2_TX0_N
DP0_TXD1_P	USBSS1_TX_P	47		48	CSI4_D0_P	PCIE2_TX0_P
GND	GND	49		50	GND	GND
DP0_TXD2_N	USBSS2_RX_N	51		52	CSI4_CLK_N	PCIE2_CLK_N
DP0_TXD2_P	USBSS2_RX_P	53		54	CSI4_CLK_P	PCIE2_CLK_P
GND	GND	55		56	GND	GND
DP0_TXD3_N	USBSS2_TX_N	57		58	CSI4_D1_N	PCIE2_RX1_N (PCIE3_RX0_N)
DP0_TXD3_P	USBSS2_TX_P	59		60	CSI4_D1_P	PCIE2_RX1_P (PCIE3_RX0_P)

GND	MODULE_ID	217	64	CSI4_D3_N	PCIE2_TX1_N (PCIE3_TX0_N)
SDMMC_DAT0	PCIE2_RST*	219			
SDMMC_DAT1	PCIE2_CLKREQ*	221	66	CSI4_D3_P	PCIE2_TX1_P (PCIE3_TX0_P)
SDMMC_DAT2	PCIE3_RST*	223			
SDMMC_DAT3	PCIE3_CLKREQ*	225	68	GND	GND
SDMMC_CMD	PCIE3_CLK_N	227	70	DSI_D0_N	RSVD
SDMMC_CLK	PCIE3_CLK_P	229	72	DSI_D0_P	RSVD
			74	GND	GND
			76	DSI_CLK_N	RSVD
			78	DSI_CLK_P	RSVD
			80	GND	GND
			82	DSI_D1_N	RSVD
			84	DSI_D1_P	RSVD
			86	GND	GND
			88	DP0_HPD	RSVD
			90	DP0_AUX_N	RSVD
			92	DP0_AUX_P	RSVD

5. BACKUP - JETSON MODULE OPN, PRODUCT LIFE CYCLE, AI PERFORMANCE

Jetson Module	Ordering P/N	Available through	AI Performance	MSRP (USD)
Jetson AGX Orin 64GB	900-13701-0050-000	January 2028	275 TOPS	1599
Jetson AGX Orin 32GB	900-13701-0040-000	January 2028	200 TOPS	899
Jetson Orin NX 16GB	900-13767-0000-000	January 2028	100 TOPS	599
Jetson Orin NX 8GB	900-13767-0010-000	January 2028	70 TOPS	399
Jetson Orin Nano 8GB	900-13767-0030-000	January 2028	40 TOPS	299
Jetson Orin Nano 4GB	900-13767-0040-000	January 2028	20 TOPS	199
Jetson AGX Xavier 64GB	900-82888-0050-000	January 2025	32 TOPS	1299
Jetson AGX Xavier	900-82888-0040-000	January 2025	32 TOPS	899
Jetson AGX Xavier Industrial	900-82888-0080-000	July 2031	30 TOPS	1249
Jetson Xavier NX 16GB	900-83668-0030-000	January 2026	21 TOPS. 2x NVDLA	499
Jetson Xavier NX	900-83668-0000-000	January 2026	21 TOPS. 2x NVDLA	399
Jetson Nano	900-13448-0020-000	January 2027	472 GFLOPS	99
Jetson TX2 NX	900-13636-0010-000	February 2026	1.33 TFLOPS	149
Jetson TX2	900-83310-0001-000	January 2025	1.33 TFLOPS	399
Jetson TX2i	900-83489-0000-000	April 2028	1.26 TFLOPS	749

6. DISCLAIMER