AI Drone Solution

Jetson Series
CDS500



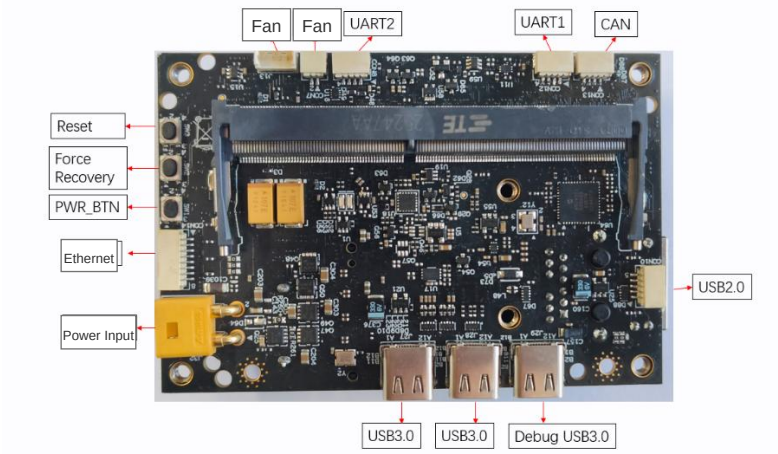
Features

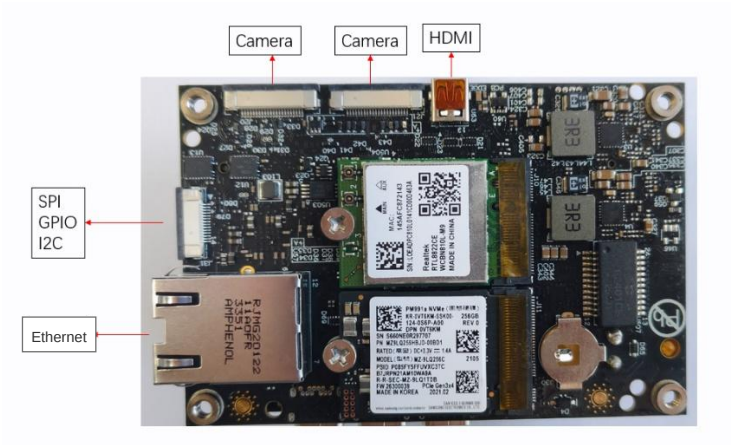
- Jetson Orin NX 16GB/8GB;Nano 8GB/4GB
- Display: 1 x Micro HDMI
- USB: 3 x USB 3.2, 1 x USB 2.0
- Ethernet: 2 x 10/100/1000 Mbps
- CAN: 2 x CAN 2.0
- Power: DC 9-19 V

Specifications

Product	CDS-516	CDS-508	CDS-506	CDS-504
Module	Orin NX 16GB	Orin NX 8GB	Orin Nano 8GB	Orin Nano 4GB
AI Performance	157 TOPS	117 TOPS	67 TOPS	34 TOPS
GPU	1024 NVIDIA® CUDA® cores | 32 Tensor cores			512 NVIDIA® CUDA® cores | 16 Tensor cores
GPU Max Frequency	1173 MHz		1020 MHz	
CPU	8-core Cortex A78AE ARMv8.2 (64-bit) 2MB L2 + 4MB L3	6 core Cortex A78AE ARMv8.2 (64-bit) 1.5MB L2 + 4MB L3		
CPU Max Frequency	2 GHz		1.7 GHz	
DLA	2x NVDLA v2 (614 MHz)	1x NVDLA v2 (610 MHz)	-	
VA	1x PVA v2		-	
Memory	16 GB 128-bit LPDDR5 DRAM 102.4 GB/s	8 GB 128-bit LPDDR5 DRAM 102.4 GB/s	8 GB 128-bit LPDDR5 DRAM 102.4 GB/s	4 GB 64-bit LPDDR5 DRAM 51.2 GB/s
Storage	2230 M.2 NVMe SSD			
Display	1 x Micro HDMI			
Camera Input	2 x 22 pin MIPI (4 Lanes CSI)			
USB	3 x USB 3.2 Type C, 1 x USB 2.0			
Ethernet	1 x 100/1000 Mbps (RJ45), 1 x 100/1000Mbps (1.0mm x 8), 5 G / Wi-Fi 5, BT			
M.2	M.2 2230			
UART	2 x UART (LVTTL)			
CAN	1 x CAN 2.0			
FAN	1 x 4 Wires + 1 x 2 Wires			
Other Features	14 PIN Expansion Header (1 x I2C, 10 x GPIO)			
Operating Temperature	-20℃ - 80℃			
Operating Humidity	5% - 90%			
Power	XT30APW-M, DC 9 ~ 19 V			
Dimensions	90 mm (L) x 60 mm (W) x 42 mm (H), including module heatsink			

Layout





Connector Definitions

Camera Expansion Connector

Camera connectors J20 and J21 use Molex 54548-2272. J20 supports CSI 1 x 2 lane; J21 supports CSI 1 x 2 lane or 1 x 4 lane. Both provide I2C, GPIO control, and 3.3 V power. CSI signals support:

Pin	Signal	Module Pin	Description	Signal Type
1	VDD_3V3	-	+3.3V	Power
2	I2C_SDA	215	Camera I2C 2.2 kΩ pull-ups on module	Bidir, 3.3V
3	I2C_SCL	213		Output 3.3V
4	GND	–	Ground	Ground
5	MCLK	116	Camera #0 Primary Clock	Output 1.8V
6	PWDN	114	Camera #0 Power-down	Output 1.8V
7	GND	–	Ground	Ground
8	CSI0_D1_P	18	CSI 0 Data 1	Input
9	CSI0_D1_N	16		
10	GND	–	Ground	Ground
11	CSI0_D0_P	6	CSI 0 Data 0	Input
12	CSI0_D0_N	4		
13	GND	–	Ground	Ground
14	CSI_CLK_P	11	CSI 0 CLK	Input
15	CSI_CLK_N	9		

16	GND	–	Ground	Ground
17	CSI1_D1_P	17	CSI 1 Data 1	Input
18	CSI1_D1_N	15		
19	GND	–	Ground	Ground
20	CSI1_D0_P	5	CSI 1 Data 0	Input
21	CSI1_D0_N	3		
22	GND	–	Ground	Ground

GPIO Connector

CON10 USB 2.0

CON10 is a USB 2.0 host connector, WAFER-SH1.0-5PWB. Pinout shown below.

Pin	Signal	Module Pin	Description	Signal Type
1	USB_5V	-	+5V	Power
2	DN	115	USB 2.0 Data	Bidir
3	DP	117		
4	-	-	-	-
5	GND	-	Ground	Ground

CON13 CAN 2.0

CON13 is a CAN 2.0 connector, WAFER-SH1.0-4PWB. Pinout shown below.

Pin	Signal	Module Pin	Description	Signal Type
1	CANH	-	CAN Bus Data	Bidir
2	CANL	-		
3	GND	-	Ground	Ground
4	VDD_3V3	-	+3.3V	Power

CON12 UART1

CON12 is a UART1 connector, WAFER-SH1.0-4PWB. Pinout shown below.

Pin	Signal	Module Pin	Description	Signal Type
1	GND	-	Ground	Ground
2	UART1_RX	-	UART1 RX LVTTL	Input
3	UART1_TX	-	UART1 TX LVTTL	Output
4	-	-	-	-

CON8 UART2

CON8 is a UART2 connector, WAFER-SH1.0-4PWB. Pinout shown below.

Pin	Signal	Module Pin	Description	Signal Type
1	GND	-	Ground	Ground
2	UART2_RX	-	UART2 RX LVTTL	Input
3	UART2_TX	-	UART2 TX LVTTL	Output
4	-	-	-	-

CON7 Fan Connector

CON7 is a fan connector, WAFER-SH1.0-2PWB. Pinout shown below.

Pin	Signal	Module Pin	Description	Signal Type
1	PWR_5V	-	+5V	+5V
2	GND	-	Ground	Ground

J13 FAN

J13 is a fan connector, 50275-00471-003. Pinout shown below.

Pin	Signal	Module Pin	Description	Signal Type
1	GND	-	Ground	Ground
2	PWR_5V	-	+5V	+5V
2	TACH	208	Fan Tachometer signal (GPIO08)	Input, 5V
3	PWM	230	Fan Pulse Width Modulation signal (GPIO14)	Output, 5V

CON14

CON14 is a GbE connector, WAFER-SH1.0-8PWB. Pinout shown below.

Pin	Signal	Module Pin	Description	Signal Type
1	TD1+			
2	TD1-			
3	TD2+			
4	TD2-			
5	TD3+			
6	TD3-			
7	TD4+			
8	TD4-			

J32 Power Connector

J32 is a power connector, XT30APW-M. Pinout shown below.

Pin	Signal	Module Pin	Description	Signal Type
1	PWR_IN	-	+9~20V	Power
2	GND	-	Ground	Ground

J10 Wi-Fi + BT

J10 is an M.2 Key E connector with PCIe x1, USB 2.0, UART, I2S, and I2C; intended for Wi-Fi/BT.

Pin	Signal	Module Pin	Description	Type	Pin	Signal	Module Pin	Description	Type
1	–		Ground	Ground		**–**	**–**	**No Pin**	**–**
3	USB2_D_P	123	USB 2.0 Data	Bidir	**2**	–	–	Main 3.3V Supply	Power
5	USB2_D_N	121			**4**				
7	–		Ground	Ground	**6**	–	–	Unused	Unused
9	–	–	Unused	Unused	**8**	I2S1_CLK	226	I2S #1 Clock	Bidir, 1.8V
11					**10**	I2S1_FS	224	I2S #1 Left/Right Clock	Bidir, 1.8V

13					12	I2S1_DIN	222	I2S #1 Data In	Input, 1.8V
15					14	I2S1_DOUT	220	I2S #1 Data Out	Bidir, 1.8V
17					16	–	–	Unused	Unused
19					18	–	–	Ground	Ground
21					20	GPIO02	124	Bluetooth #2 Wake AP	Input, 3.3V
23					22	UART0_RXD	101	UART #0 Receive	Input, 1.8V
25	–	–	Key	Unused	24	–	–	Key	Unused
27					26				
29					28				
31					30				
33	–	–	Ground	Ground	32	UART0_TXD	99	UART #0 Transmit	Output, 1.8V
35	PEX1_TX0_P	174	PCIe #1 Transmit Lane 0	Output	34	UART0_CTS*	105	UART #0 Clear to Send	Input, 1.8V
37	PEX1_TX0_N	172			36	UART0_RTS*	103	UART #0 Request to Send	Output, 1.8V
39	–	–	Ground	Ground	38	–	–	Unused	Unused
41	PEX1_RX0_P	169	PCIe #1 Receive Lane 0	Input	40				
43	PEX1_RX0_N	167			42				
45	–	–	Ground	Ground	44				
47	PEX1_CLK_P	175	PCIe #1 Reference clock	Output	46				
49	PEX1_CLK_N	173			48				
51	–	–	Ground	Ground	50	CLK_32K_OUT	210	Suspend Clock (32 KHz)	Output, 3.3V
53	PEX1_CLKREQ	182	PCIe #1 Clock Request	Bidir, 3.3V	52	PEX0_RST*	183	PCIe #0 Reset	Output, 3.3V
55	PEX_WAKE*	179	PCIe Wake	Input, 3.3V	54	GPIO3	126	BT Enable	Output, 3.3V
57	–	–	Ground	Ground	56	GPIO5	128	Wi-Fi Disable	Output, 3.3V
59	–	–	Unused	Unused	58	I2C2_SDA	234	General I2C #2 (optional)	Bidir/OD, 1.8V
61					60	I2C2_SCL	232		
63	–	–	Ground	Ground	62	GPIO10	212	M.2, Key E Connector Alert	Input, 1.8V
65	–	–	Unused	Unused	64	–	–	Unused	Unused
67					66				
69	–	–	Ground	Ground	68				
71	–	–	Unused	Unused	70				
73					72	–	–	Main 3.3V Supply	Power
75	–	–	Ground	Ground	74				

J11 NVME

J11 is an M.2 Key M connector supporting PCIe x4 for NVMe storage.

Pin	Signal	Module Pin	Description	Type	Pin	Signal	Module Pin	Description	Type
1	–	–	Ground	Ground	2	–	–	Main 3.3V Supply	Power
3					4				
5	PCIE0_RX3_N	155	PCIe IF #0 Lane 3 Receive	Input	6	–	–	Unused	Unused
7	PCIE0_RX3_P	157			8				
9	–	–	Ground	Ground	10				
11	PCIE0_TX3_N	154	PCIe IF #0 Lane 3		12	–	–	Main 3.3V Supply	Power

13	PCIE0_TX3_P	156	Transmit	Output	14				
15	–	–	Ground	Ground	16				
17	PCIE0_RX2_N	149	PCIe IF #0 Lane 2 Receive	Input	18				
19	PCIE0_RX2_P	151			20	–	–	Unused	Unused

U505 GbE Ethernet

U505 Standard Gigabit Ethernet Port

Pin	Signal	Module Pin	Description	Signal Type
1	GPE_MDI0_P	186	Gigabit Ethernet MDI 0+	Bidir
2	GPE_MDI0_N	184	Gigabit Ethernet MDI 0–	Bidir
3	GPE_MDI1_P	192	Gigabit Ethernet MDI 1+	Bidir
4	–	–	MCT	–
5	–	–	MCT	–
6	GPE_MDI1_N	190	Gigabit Ethernet MDI 1–	Bidir
7	GPE_MDI2_P	198	Gigabit Ethernet MDI 2+	Bidir
8	GPE_MDI2_N	196	Gigabit Ethernet MDI 2–	Bidir
9	GPE_MDI3_P	204	Gigabit Ethernet MDI 3+	Bidir

J31 GPIO

J31 is a GPIO connector carrying GPIO, SPI, and I2C signals; connector: Molex 54548-1472.

Pin	Signal	Module Pin	Description	Signal Type
1	GND	-	Ground	GND
2	I2C1_SDA	191	Gigabit Ethernet MDI 0–	Bidir
3	I2C1_SCL	189	Gigabit Ethernet MDI 1+	Bidir
4	GPIO12	218	GPIO	Bidir
5	GPIO	95	GPIO	Bidir
6	GPIO	89	GPIO	Bidir
7	GPIO	93	GPIO	Bidir
8	GPIO	91	GPIO	Bidir
9	PWR_5V	-	+5V	+5V
10	GPIO07	206	GPIO	Bidir
11	GPIO1	118	GPIO	Bidir
12	GPIO11	216	GPIO	Bidir
13	GPIO13	228	GPIO	Bidir
14	GND	-	Ground	GND

U63 Micro HDMI

U63 Micro HDMI Port

J29 USB 3.0

J29 is a USB 3.0 Type-C port for system flashing.

J28,J27 USB 3.0

J27 and J28 are USB 3.0 Type-C connectors.

Button Functions

SW1: Power button.

SW2: Recovery button.

SW3: Reset button.

Accessories

- Power Adapter
- USB Cable, Type-C to USB Type-A
- User Guide

Ordering Information

Model	Product Description
CDS-516	Orin NX 16GB, 1 x Micro HDMI, 3 x USB 3.2, 1 x USB2.0, 2 x 100/1000Mbps, 1 x CAN2.0, SSD, DC 9-19V, -20℃-80℃
CDS-508	Orin NX 8GB, 1 x Micro HDMI, 3 x USB 3.2, 1 x USB2.0, 2 x 100/1000Mbps, 1 x CAN2.0, SSD, DC 9-19V, -20℃-80℃
CDS-506	Orin Nano 8GB, 1 x Micro HDMI, 3 x USB 3.2, 1 x USB2.0, 2 x 100/1000Mbps, 1 x CAN2.0, SSD, DC 9-19V, -20℃-80℃
CDS-504	Orin Nano 4GB, 1 x Micro HDMI, 3 x USB 3.2, 1 x USB2.0, 2 x 100/1000Mbps, 1 x CAN2.0, SSD, DC 9-19V, -20℃-80℃

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