

VT-CORE-3588S

Computer-on-Module



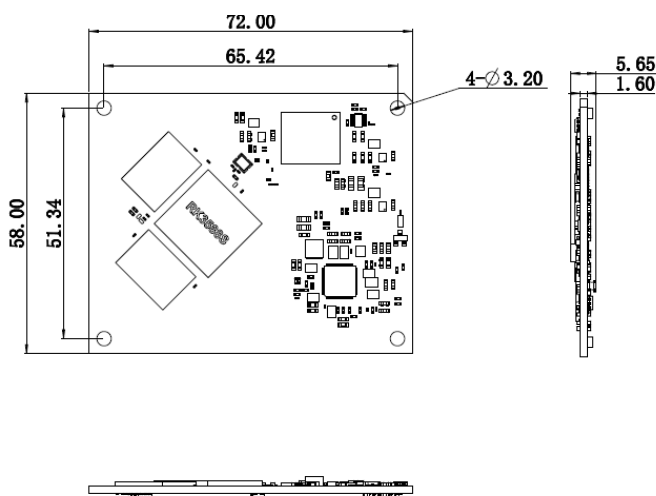
Product Brief

VT-CORE-3588S computer-on-module is powered by Rockchip RK3588S, which is a low-power solution tailored for cost-sensitive devices while maintaining the powerful capabilities of its predecessor, RK3588. It boasts an octa-core CPU architecture, blending 4x Cortex-A76 high-performance cores with 4x Cortex-A55 high-efficiency cores, delivering the horsepower needed for demanding applications. The powerful ARM Mali-G610 MP4 GPU is capable of rendering stunning visuals and supporting advanced 3D graphics. The 6 TOPS built-in NPU brings AI and machine learning capabilities to the forefront, empowering developers to create intelligent, responsive systems that adapt to user needs.

VT-CORE-3588S supports 8K video decoding and encoding, and multiple display outputs, making it perfect for digital signage, smart displays, and home entertainment systems. In addition, it offers rich I/O options, including MIPI DSI, MIPI CSI, HDMI, USB, and UART, all routed to four expansion headers for flexible integration and scalability.

From smart home devices to medical imaging and digital signage, VT-CORE-3588S offers robust capabilities, making itself an excellent choice for businesses looking to innovate and stay ahead in today's competitive landscape.

Product Outlines and Features



VT-CORE-3588S

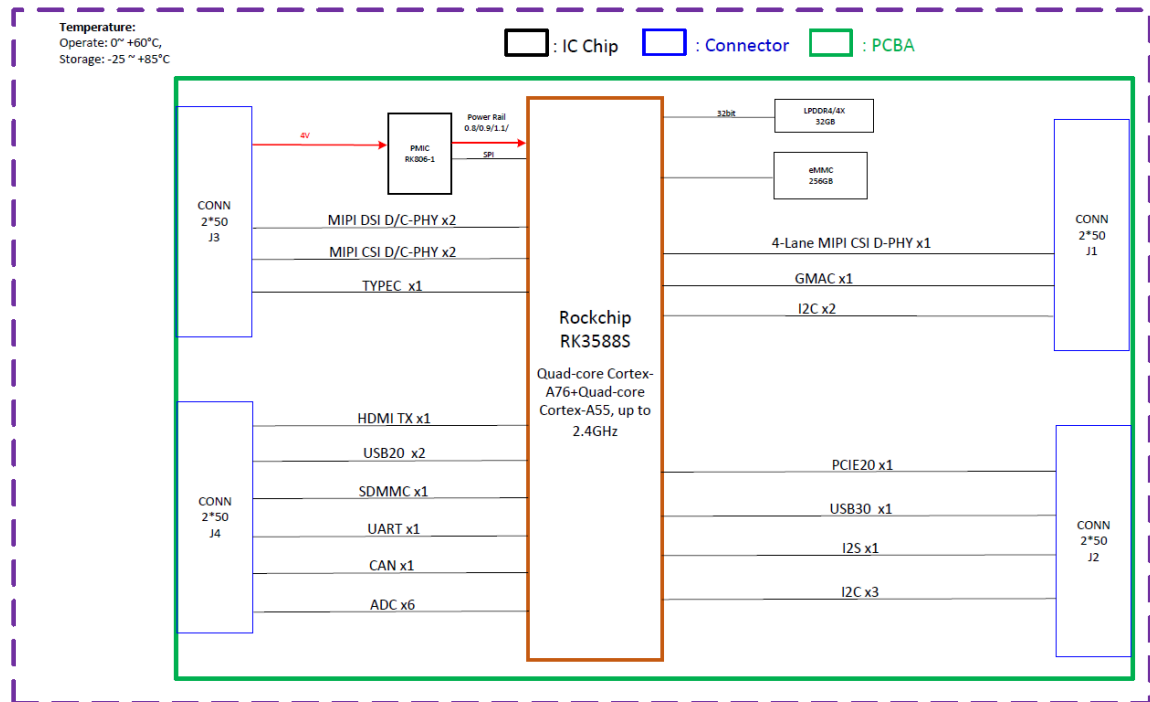
-  Rockchip RK3588S octa-core powerful processor
-  8K video decoding and encoding
-  HDMI/eDP/MIPI DSI for high-quality display
-  Rich interfaces for flexible expansion
-  Gigabit Ethernet
-  AI acceleration and edge computing
-  Optimized for energy efficiency
-  Compact and scalable

VT-CORE-3588S Computer-on-Module Datasheet

Specifications			
System	CPU	Rockchip RK3588S Quad-core Cortex-A76 + Quad-core Cortex-A55 processor, Max. 2.4GHz	
	GPU	ARM Mali-G610 MC4, Max. 1GHz OpenGL ES1.1/2.0/3.2, OpenCL 2.2, Vulkan 1.2 supported	
	NPU	6 TOPS, int4/int8/int16/FP16/BF16/TF32 supported	
	Memory	32GB LPDDR4x	
	Storage	256GB eMMC V5.1	
Media	Video processing	8K@30fps H.265/H.264 video encoder	8K@60fps H.265/8K@30fps H.264 video decoder
	Camera ISP	Up to 48MP: 8064 × 6048@15fps dual ISP (HDR, 3DNR, 2DNR)	
Power	Input	4V DC	
	Consumption	Typical: 1.8W (power-on without applications running)	
Software	Operating system	Android12, Debian 11, Ubuntu 20.04	
	Device management	BlueSphere MDM (Android version optional)	
Mechanical	Dimensions	72mm x 58mm x 5.65mm	
Environment Condition	Temperature	Operating: 0°C ~+60°C	Storage: -25°C ~ +85°C
	Humidity	Operating: 10%~90% RH	Storage: 5%~95% RH
I/O*			
Display	2 x 4-lane MIPI DSI (D-PHY) / 2 x 3-lane MIPI DSI (C-PHY), up to 4K@60Hz		
	1 x HDMI TX 2.0/2.1 / eDP, 7680 × 4320@60Hz for HDMI TX; 4K@60Hz for eDP		
	1 x DP TX 1.4a / USB 3.1 OTG, up to 7680 × 4320@30Hz		
Camera (3 or 4 cameras configurable)	2 x 4-lane MIPI CSI (D-PHY) / 2 x 3-lane MIPI CSI (C-PHY)		
	1 x 4-lane MIPI CSI (D-PHY) / 2 x 2-lane MIPI CSI (D-PHY)		
Ethernet	1 x RGMII/RMII (10/100/1000Mbps)		
USB	1 x USB 3.1 Type-C OTG/DP TX 1.4a		
	1 x USB 3.0 Host		
	2 x USB 2.0 Host		
UART	1 x UART (baud rate up to 4Mbps)		
CAN	1 x CAN (support CAN 2.0B)		
GPIO	92 x GPIO (Max.)		
I ² S	1 x I ² S		
I ² C	5 x I ² C		
PCIe	1 x PCIe 2.0 (5Gbps)		
SATA	1 x SATA 3.0		
ADC	6 x 12-bit SAR-ADC, up to 1MS/s sampling rate		
SDMMC	1 x SDMMC		
PWM	1 x PWM		

* The count of each I/O is based on the default function assigned to the pins, as outlined in **Pinout**.

Block Diagram



Product Exterior



Pinout

Header	Pin	Function 1*	Function 2*	GPIO	Level	Description
J1	100	GPIO	SDMMC_DET	GPIO0_A4	1.8V	GPIO
	99	GPIO	ETH1_REFCLKO_25M/MIPI_CAMERA1_CLK_M1/I2C4_SCL_M0	GPIO3_A6	1.8V	GPIO
	98	GPIO	GMAC1_PPSClk/UART7_RX_M1/SPI1_CLK_M1	GPIO3_C1	1.8V	GPIO
	97	GPIO	CLK32K_IN/CLK32K_OUT0	GPIO0_B2	1.8V	GPIO
	96	GPIO	SPI2_CS1_M2/I2C1_SCL_M1/UART0_RX_M1	GPIO0_B0	1.8V	GPIO
	95	NC	-	-	-	No connection
	94	GPIO	GMAC1_TXER/I2S2_SDI_M1/UART2_RX_M2/PWM3_IR_M1	GPIO3_B2	1.8V	GPIO
	93	I2C4_SCL_M3	UART6_CTSN_M1/PWM1_M2/SPI4_CS0_M2	GPIO1_A3	1.8V	I ² C4 clock
	92	I2C4_SDA_M3	VOP_POST_EMPTY/UART6_RTSN_M1/PWM0_M2/SPI4_CLK_M2	GPIO1_A2	1.8V	I ² C4 data
	91	NC	-	-	-	No connection
	90	GPIO	MAC1_MCLKINOUT/I2S2_LRCK_TX_M1/CAN1_TX_M0/UART3_RX_M1/PWM13_M0	GPIO3_B6	1.8V	GPIO
	89	NC	-	-	-	No connection
	88	GND	-	-	-	Ground
	87	NC	-	-	-	No connection
	86	NC	-	-	-	No connection
	85	NC	-	-	-	No connection
	84	NC	-	-	-	No connection
	83	NC	-	-	-	No connection
	82	NC	-	-	-	No connection
	81	GND	-	-	-	Ground
	80	NC	-	-	-	No connection
	79	NC	-	-	-	No connection
	78	NC	-	-	-	No connection
	77	NC	-	-	-	No connection
	76	NC	-	-	-	No connection
	75	NC	-	-	-	No connection
	74	GND	-	-	-	Ground
	73	NC	-	-	-	No connection
	72	NC	-	-	-	No connection
	71	NC	-	-	-	No connection
	70	NC	-	-	-	No connection

* Function 1 is set as the default. For specific pins, there are multiple functions available.

Header	Pin	Function 1	Function 2	GPIO	Level	Description
J1	69	GND	-	-	-	Ground
	68	NC	-	-	-	No connection
	67	NC	-	-	-	No connection
	66	GND	-	-	-	Ground
	65	NC	-	-	-	No connection
	64	NC	-	-	-	No connection
	63	GND	-	-	-	Ground
	62	NC	-	-	-	No connection
	61	NC	-	-	-	No connection
	60	GND	-	-	-	Ground
	59	NC	-	-	-	No connection
	58	NC	-	-	-	No connection
	57	GND	-	-	-	Ground
	56	NC	-	-	-	No connection
	55	NC	-	-	-	No connection
	54	GND	-	-	-	Ground
	53	NC	-	-	-	No connection
	52	NC	-	-	-	No connection
	51	GND	-	-	-	Ground
	1	UART0_RX_M0	I2S1_LRCK_RX_M1/PDM0_CLK1_M1/PWM2_M0/ I2C4_SDA_M2/DP0_HPDIN_M1	GPIO0_C4	3.3V	UART 0 receiving data
	2	UART0_TX_M0	I2S1_SDI0_M1/GPU_AVS/ /I2C4_SCL_M2/PWM4_M0	GPIO0_C5	3.3V	UART 0 transmitting data
	3	I2C6_SDA_M0	I2S1_SDI2_M1/PDM0_SDI0_M1/UART1_RTSN_M2/PWM6_M0/SPI0_MISO_M0	GPIO0_C7	3.3V	I ² C6 data
	4	I2C6_SCL_M0	I2S1_SDI3_M1/PDM0_SDI1_M1/ UART1_CTSN_M2/PWM7_IR_M0/SPI3_MISO_M2	GPIO0_D0	3.3V	I ² C6 clock
	5	NC	-	-	-	No connection
	6	GPIO	PMIC_SLEEP4	GPIO0_C2	3.3V	GPIO
	7	GPIO	I2S1_SDI1_M1/NPU_AVS/UART0_RTSN/PWM5_M1/SPI0_CLK_M0/ SATA_CP_POD	GPIO0_C6	3.3V	GPIO
	8	GPIO	ITCPU_AVS/SPI3_CLK_M2	GPIO0_D3	3.3V	GPIO
	9	GPIO	I2S1_SDO2_M1/PDM0_SDI2_M1/PWM3_IR_M0/I2C1_SCL_M2/CAN2_RX_M1/HDMI_TX0_SDA_M1/SPI3_CS0_M2/SATA_CPDET	GPIO0_D4	3.3V	GPIO

Header	Pin	Function 1	Function 2	GPIO	Level	Description
J1	10	GPIO	2S1_SDO3_M1/CPU_BIG1_AVS/ I2C1_SDA_M2/CAN2_TX_M1/ HDMI_TX0_ SCL_M1/SPI3_CS1_M2/SATA_MP_SWITCH	GPIO0_D5	3.3V	GPIO
	11	NC	-	-	-	No connection
	12	GPIO	GMAC1_PTP_REF_CLK/I2C3_ SCL_M1/SPI1_MOSI_M1	GPIO3_B7	1.8V	GPIO
	13	GND	-	-	-	Ground
	14	GMAC1_TXD3	SDIO_D1_M1/I2S3_SCLK/AUDDSM _LN/FSPI_D2_M2/I2C6_SCL_M4/ PWM11_IR_M0/SPI4_MOSI_M1	GPIO3_A1	1.8V	RGMII/RMII 1 transmitting data 3
	15	GMAC1_TXD2	SDIO_D0_M1/I2S3_MCLK/FSPI_D0_M2/ I2C6_SDA_M4/PWM10_M0/SPI4_MISO_M1	GPIO3_A0	1.8V	RGMII/RMII 1 transmitting data 2
	16	GMAC1_TXD1	I2S2_MCLK_M1/UART2_CTSN	GPIO3_B4	1.8V	RGMII/RMII 1 transmitting data 1
	17	GMAC1_TXD0	I2S2_SDO_M1/UART2_RTSN	GPIO3_B3	1.8V	RGMII/RMII 1 transmitting data 0
	18	GMAC1_TXEN	I2S2_SCLK_TX_M1/CAN1_RX_M0/ UART3_TX_M1/PWM12_M0	GPIO3_B5	1.8V	RGMII/RMII 1 transmitting control
	19	GMAC1_TXCLK	SDIO_CMD_M1/I2S3_SDI/AUDDSM_RP/ UART8_RTSN_M1/SPI4_CS1_M1	GPIO3_A4	1.8V	RGMII/RMII 1 transmitting clock
	20	GND	-	-	-	Ground
	21	GMAC1_RXD3	SDIO_D3_M1/I2S3_SDO/AUDDSM_RN/ FSPI_D3_M2/UART8_RX_M1/SPI4_CS0_M1	GPIO3_A3	1.8V	RGMII/RMII 1 receiving data 3
	22	GMAC1_RXD2	SDIO_D2_M1/I2S3_LRCK/AUDDSM_LP/ FSPI_D2_M2/UART8_TX_M1/SPI4_CLK_M1	GPIO3_A2	1.8V	RGMII/RMII 1 receiving data 2
	23	GMAC1_RXD1	I2S2_SCLK_RX_M1/MIPI_CAMERA3_ CLK_M1/PWM9_M0	GPIO3_B0	1.8V	RGMII/RMII 1 receiving data 1
	24	GMAC1_RXD0	MIPI_CAMERA2_CLK_M1/PWM8_M0	GPIO3_A7	1.8V	RGMII/RMII 1 receiving data 0
	25	GMAC1_RXDV_CRS	I2S2_LRCK_RX_M1/MIPI_CAMERA4 _CLK_M1/UART2_TX_M2/PWM2_M1	GPIO3_B1	1.8V	RGMII/RMII 1 receiving control
	26	GMAC1_RXCLK	SDIO_CLK_M1/MIPI_CAMERA0_CLK_M1/ FSPI_CLK_M2/I2C4_SDA_M0/UART8_CTSN_M1	GPIO3_A5	1.8V	RGMII/RMII 1 receiving clock
	27	GND	-	-	-	Ground
	28	GMAC1_MDIO	MIPI_TE1/I2C8_SDA_M4/UART7_CTSN_M1/ PWM15_IR_M0/SPI1_CS1_M1	GPIO3_C3	1.8V	ENET management data input/output
	29	GMAC1_MDC	MIPI_TE0/I2C8_SCL_M4/UART7_RTSN_M1/ PWM14_M0/SPI1_CS0_M1	GPIO3_C2	1.8V	ENET management data clock
	30	GMAC1_RSTn_L	CIF_D8/FSPI_CS0N_M2/CAN2_RX_M0/ UART5_TX_M1/SPI3_CS0_M3	GPIO3_C4	1.8V	ENET reset

Header	Pin	Function 1	Function 2	GPIO	Level	Description
J1	31	PHONE_CTL	GMAC1_PPSTRIG/I2C3_SDA_M1/ UART7_TX_M1/SPI1_MISO_M1	GPIO3_C0	1.8V	Earphone control
	32	GND	-	-	-	Ground
	33	MIPI_CSIO_RX_D0_N	-	-	-	MIPI CSI 0 receiving data 0 -
	34	MIPI_CSIO_RX_D0_P	-	-	-	MIPI CSI 0 receiving data 0 +
	35	GND	-	-	-	Ground
	36	MIPI_CSIO_RX_D1_N	-	-	-	MIPI CSI 0 receiving data 1 -
	37	MIPI_CSIO_RX_D1_P	-	-	-	MIPI CSI 0 receiving data 1 +
	38	GND	-	-	-	Ground
	39	MIPI_CSIO_RX_CLK0_N	-	-	-	MIPI CSI 0 receiving clock 0 -
	40	MIPI_CSIO_RX_CLK0_P	-	-	-	MIPI CSI 0 receiving clock 0 +
	41	GND	-	-	-	Ground
	42	MIPI_CSIO_RX_D2_N	-	-	-	MIPI CSI 0 receiving data 2 -
	43	MIPI_CSIO_RX_D2_P	-	-	-	MIPI CSI 0 receiving data 2 +
	44	GND	-	-	-	Ground
	45	MIPI_CSIO_RX_D3_N	-	-	-	MIPI CSI 0 receiving data 3 -
	46	MIPI_CSIO_RX_D3_P	-	-	-	MIPI CSI 0 receiving data 3 +
	47	GND	-	-	-	Ground
	48	MIPI_CSIO_RX_CLK1_N	-	-	-	MIPI CSI 0 receiving clock 1 -
	49	MIPI_CSIO_RX_CLK1_P	-	-	-	MIPI CSI 0 receiving clock 1 +
	50	GND	-	-	-	Ground
Header	Pin	Function 1	Function 2	GPIO	Level	Description
J2	100	I2C2_SDA_M4	PCIE20X1_1_CLKREQN_M2/DPO_ HPDIN_M2/ UART6_RX_M1/ SPI4_MISO_M2	GPIO1_A0	1.8V	I ² C2 data
	99	I2C2_SCL_M4	CIE20X1_1_WAKEN_M2/ UART6_TX_M1/SPI4_MOSI_M2/	GPIO1_A1	1.8V	I ² C2 clock
	98	GPIO	PDM1_SDI0_M1/PCIE20X1_1_PERST N_M2/PWM3_IR_M3/SPI2_CS0_M0	GPIO1_A7	1.8V	GPIO
	97	GPIO	DM1_SDI2_M1/SPI0_MISO_M2	GPIO1_B1	1.8V	GPIO
	96	GPIO	DM1_SDI1_M1/SPI2_CS1_M0	GPIO1_B0	1.8V	GPIO
	95	GPIO	PDM1_SDI3_M1/UART4_RX_M2/ SPI0_MOSI_M2	GPIO1_B2	1.8V	GPIO
	94	MIPI_CAM3_CLKOUT	2C8_SCL_M2/UART1_RTSN_M1/ PWM14_M2	GPIO1_D6	1.8V	MIPI CSI 3 clock output
	93	MIPI_CAM4_CLKOUT	2C8_SDA_M2/UART1_CTSN_M1/ PWM15_IR_M3	GPIO1_D7	1.8V	MIPI CSI 4 clock output

Header	Pin	Function 1	Function 2	GPIO	Level	Description
J2	92	I2C3_SDA_M0	UART3_RX_M0/SPI4_MISO_M0	GPIO1_C0	1.8V	I ² C 3 data
	91	I2C3_SCL_M0	UART3_TX_M0/SPI4_MOSI_M0	GPIO1_C1	1.8V	I ² C 3 clock
	90	LCD_BL2_PWM15	I2S0_LRCK_RX/PDM0_CLK0_M0/ I2C4_SDA_M4	GPIO1_C6	1.8V	MIPI DSI 2 backlight control
	89	GPIO	PDM0_SDI0_M0/SPI1_CS1_M2	GPIO1_D5	1.8V	GPIO
	88	GPIO	PDM1_CLK1_M1/SATA0_ACT_LED_ M1/UART4_TX_M2/SPI0_CLK_M2	GPIO1_B3	1.8V	GPIO
	87	GPIO	UART7_TX_M2/SPI0_CS1_M2	GPIO1_B5	1.8V	GPIO
	86	GPIO	SPI2_CLK_M0	GPIO1_A6	1.8V	GPIO
	85	GPIO	HDMI_TX0_HPD_M0/SPI2_MOSI_M0	GPIO1_A5	1.8V	GPIO
	84	NC	-	-	-	No connection
	83	NC	-	-	-	No connection
	82	NC	-	-	-	No connection
	81	GND	-	-	-	Ground
	80	NC	-	-	-	No connection
	79	NC	-	-	-	No connection
	78	GND	-	-	-	Ground
	77	NC	-	-	-	No connection
	76	NC	-	-	-	No connection
	75	GND	-	-	-	Ground
	74	NC	-	-	-	No connection
	73	NC	-	-	-	No connection
	72	GND	-	-	-	Ground
	71	NC	-	-	-	No connection
	70	NC	-	-	-	No connection
	69	GND	-	-	-	Ground
	68	NC	-	-	-	No connection
	67	NC	-	-	-	No connection
	66	GND	-	-	-	Ground
	65	NC	-	-	-	No connection
	64	NC	-	-	-	No connection
	63	GND	-	-	-	Ground
	62	NC	-	-	-	No connection
	61	NC	-	-	-	No connection
	60	GND	-	-	-	Ground
	59	NC	-	-	-	No connection
	58	NC	-	-	-	No connection
	57	GND	-	-	-	Ground

Header	Pin	Function 1	Function 2	GPIO	Level	Description
J2	56	SATA30_0_TX_P	-	-	-	SATA 3.0_0 transmitter +
	55	SATA30_0_TX_N	-	-	-	SATA 3.0_0 transmitter -
	54	GND	-	-	-	Ground
	53	SATA30_0_RX_P	-	-	-	SATA 3.0_0 receiver +
	52	SATA30_0_RX_N	-	-	-	SATA 3.0_0 receiver -
	51	GND	-	-	-	Ground
	1	GPIO	PDM1_CLK0_M1/UART7_RX_M2/ SPI0_CS0_M2	GPIO1_B4	1.8V	GPIO
	2	MIPI_CAM1_CLKOUT	MIPI_CAMERA1_CLK_M0/SPDIF0_TX_M0/I2C5_SCL_M3/UART1_TX_M1	GPIO1_B6	1.8V	MIPI CSI 1 clock output
	3	GPIO	I2S0_SDO3/I2S0_SDI2/PDM0_SDI2_M0/I2C1_SCL_M4/UART4_TX_M0/ PWM0_M1/SPI1_CLK_M2	GPIO1_D2	1.8V	GPIO
	4	GPIO	SPI2_MISO_M0	GPIO1_A4	1.8V	GPIO
	5	MIPI_CAM2_CLKOUT	SPDIF1_TX_M0/SATA2_ACT_LED_M1/I2C5_SDA_M3/UART1_RX_M1/PWM13_M2	GPIO1_B7	1.8V	MIPI CSI 2 clock output
	6	GPIO	I2S0_SDI1/PDM0_SDI3_M0/ I2C1_SDA_M4/UART4_RX_M0/ PWM1_M1/SPI1_CS0_M2	GPIO1_D3	1.8V	GPIO
	7	NC	-	-	-	No connection
	8	NC	-	-	-	No connection
	9	UART2_RX_M0	I2S1_SCLK_TX_M1/JTAG_TMS_M2/ I2C1_SDA_M0/UART2_RX_M0/ PCIE20X1_1_WAKEN_M0	GPIO0_B6	3.3V	UART 2 receiving data
	10	UART2_TX_M0	2S1_MCLK_M1/JTAG_TCK_M2/ I2C1_SCL_M0/UART2_TX_M0/ PCIE20X1_1_CLKREQN_M0	GPIO0_B5	3.3V	UART 2 transmitting data
	11	NC	-	-	-	No connection
	12	I2S0_SDI0	-	GPIO1_D4	1.8V	I ² S 0 data input
	13	I2S0_LRCK_TX	I2C2_SCL_M3/UART4_RTSN	GPIO1_C5	1.8V	I ² S 0 left-right channel clock
	14	I2S0_SDO0	I2C4_SCL_M4/UART4_CTSN	GPIO1_C7	1.8V	I ² S 0 data output
	15	I2S0_SCLK_TX	I2C6_SCL_M1/UART3_CTSN/ PWM7_IR_M2/SPI4_CS0_M0	GPIO1_C3	1.8V	I ² S 0 clock
	16	I2S0_MCLK	I2C6_SDA_M1/UART3_RTSN/ PWM3_IR_M2/SPI4_CLK_M0	GPIO1_C2	1.8V	I ² S 0 master clock

Header	Pin	Function 1	Function 2	GPIO	Level	Description
J2	17	I2C7_SCL_M0/CODEC	I2S0_SDO1/UART6_TX_M2/ SPI1_MISO_M2	GPIO1_D0	1.8V	I ² C7 clock
	18	I2C7_SDA_M0/CODEC	I2S0_SDO2/I2S0_SDI3/PDM0_SDI1_ M0/UART6_RX_M2/SPI1_MOSI_M2	GPIO1_D1	1.8V	I ² C7 data
	19	HP_DET_L	I2S0_SCLK_RX/PDM0_CLK1_M0/ I2C2_SDA_M3/PWM11_IR_M2/ SPI4_CS1_M0	GPIO1_C4	1.8V	Headphone plug detection
	20	PCIEx1_0_PERSTn_M1_L	CIF_D13/UART4_TX_M1/ PWM9_M2/SPI0_MISO_M3	GPIO3_D1	1.8V	PCIe 3.0 x1 reset
	21	PCIEx1_0_CLKREQn_M1_L	CIF_D11/HDMI_TX0_SCL_M2/ I2C5_SCL_M0/SPI3_MOSI_M3	GPIO3_C7	1.8V	PCIe 3.0 x1 clock request
	22	PCIEx1_0_WAKEn_M1_L	CIF_D12/HDMI_TX0_SDA_M2/ I2C5_SDA_M0/UART4_RX_M1/ PWM8_M2/SPI3_CLK_M3	GPIO3_D0	1.8V	PCIe 3.0 x1 wakeup
	23	GND	-	-	-	Ground
	24	NC	-	-	-	No connection
	25	NC	-	-	-	No connection
	26	GND	-	-	-	Ground
	27	NC	-	-	-	No connection
	28	NC	-	-	-	No connection
	29	GND	-	-	-	Ground
	30	NC	-	-	-	No connection
	31	NC	-	-	-	No connection
	32	GND	-	-	-	Ground
	33	NC	-	-	-	No connection
	34	NC	-	-	-	No connection
	35	GND	-	-	-	Ground
	36	NC	-	-	-	No connection
	37	NC	-	-	-	No connection
	38	GND	-	-	-	Ground
	39	PCIE20_2_REFCLK_N	-	-	-	PCIe 2.0_2 reference clock -
	40	PCIE20_2_REFCLK_P	-	-	-	PCIe 2.0_2 reference clock +
	41	GND	-	-	-	Ground
	42	PCIE20_1_REFCLK_N	-	-	-	PCIe 2.0_1 reference clock -
	43	PCIE20_1_REFCLK_P	-	-	-	PCIe 2.0_1 reference clock +
	44	GND	-	-	-	Ground
	45	PCIE20_1_TX_P	SATA30_1_TX_P	-	-	PCIe 2.0_1 transmitter +
	46	PCIE20_1_TX_N	SATA30_1_TX_N	-	-	PCIe 2.0_1 transmitter -

Header	Pin	Function 1	Function 2	GPIO	Level	Description
J2	47	GND	-	-	-	Ground
	48	PCIE20_1_RX_P	SATA30_1_RX_P	-	-	PCIe 2.0_1 receiver +
	49	PCIE20_1_RX_N	SATA30_1_RX_N	-	-	PCIe 2.0_1 receiver -
	50	GND	-	-	-	Ground
Header	Pin	Function 1	Function 2	GPIO	Level	Description
J3	100	GND	-	-	-	Ground
	99	TYPECO_SSRX1_N	DP0_TX0N	-	-	Type-C 0 receiver 1 -
	98	TYPECO_SSRX1_P	DP0_TX0P	-	-	Type-C 0 receiver 1 +
	97	GND	-	-	-	Ground
	96	TYPECO_SSTX1_N	DP0_TX1N	-	-	Type-C 0 transmitter 1 -
	95	TYPECO_SSTX1_P	DP0_TX1P	-	-	Type-C 0 transmitter 1 +
	94	GND	-	-	-	Ground
	93	TYPECO_SSRX2_N	DP0_TX2N	-	-	Type-C 0 receiver 2 -
	92	TYPECO_SSRX2_P	DP0_TX2P	-	-	Type-C 0 receiver 2 +
	91	GND	-	-	-	Ground
	90	TYPECO_SSTX2_N	DP0_TX3N	-	-	Type-C 0 transmitter 1 -
	89	TYPECO_SSTX2_P	DP0_TX3P	-	-	Type-C 0 transmitter 1 +
	88	GND	-	-	-	Ground
	87	MIPI_DPHY1_TX_D0_N	MIPI_CPHY1_TX_TRIO0_A	-	-	MIPI DPHY 1 transmitting data 0 -
	86	MIPI_DPHY1_TX_D0_P	MIPI_CPHY1_TX_TRIO0_B	-	-	MIPI DPHY 1 transmitting data 0 +
	85	GND	-	-	-	Ground
	84	MIPI_DPHY1_TX_D1_N	MIPI_CPHY1_TX_TRIO0_C	-	-	MIPI DPHY 1 transmitting data 1 -
	83	MIPI_DPHY1_TX_D1_P	MIPI_CPHY1_TX_TRIO1_A	-	-	MIPI DPHY 1 transmitting data 1 +
	82	GND	-	-	-	Ground
	81	MIPI_DPHY1_TX_CLK_N	MIPI_CPHY1_TX_TRIO1_B	-	-	MIPI DPHY 1 transmitting clock -
	80	MIPI_DPHY1_TX_CLK_P	MIPI_CPHY1_TX_TRIO1_C	-	-	MIPI DPHY 1 transmitting clock +
	79	GND	-	-	-	Ground
	78	MIPI_DPHY1_TX_D2_N	MIPI_CPHY1_TX_TRIO2_A	-	-	MIPI DPHY 1 transmitting data 2 -
	77	MIPI_DPHY1_TX_D2_P	MIPI_CPHY1_TX_TRIO2_B	-	-	MIPI DPHY 1 transmitting data 2 +
	76	GND	-	-	-	Ground
	75	MIPI_DPHY1_TX_D3_N	MIPI_CPHY1_TX_TRIO2_C	-	-	MIPI DPHY 1 transmitting data 3 -
	74	MIPI_DPHY1_TX_D3_P	-	-	-	MIPI DPHY 1 transmitting data 3 +
	73	GND	-	-	-	Ground
	72	MIPI_DPHY0_TX_D0_N	MIPI_CPHY0_TX_TRIO0_A	-	-	MIPI DPHY 0 transmitting data 0 -
	71	MIPI_DPHY0_TX_D0_P	MIPI_CPHY0_TX_TRIO0_B	-	-	MIPI DPHY 0 transmitting data 0 +
	70	GND	-	-	-	Ground

Header	Pin	Function 1	Function 2	GPIO	Level	Description
J3	69	MIPI_DPHY0_TX_D1_N	MIPI_CPHY0_TX_TRIO0_C	-	-	MIPI DPHY 0 transmitting data 1 -
	68	MIPI_DPHY0_TX_D1_P	MIPI_CPHY0_TX_TRIO1_A	-	-	MIPI DPHY 0 transmitting data 1 +
	67	GND	-	-	-	Ground
	66	MIPI_DPHY0_TX_CLK_N	MIPI_CPHY0_TX_TRIO1_B	-	-	MIPI DPHY 0 transmitting clock -
	65	MIPI_DPHY0_TX_CLK_P	MIPI_CPHY0_TX_TRIO1_C	-	-	MIPI DPHY 0 transmitting clock +
	64	GND	-	-	-	Ground
	63	MIPI_DPHY0_TX_D2_N	MIPI_CPHY0_TX_TRIO2_A	-	-	MIPI DSI 0 transmitting data 2 -
	62	MIPI_DPHY0_TX_D2_P	MIPI_CPHY0_TX_TRIO2_B	-	-	MIPI DSI 0 transmitting data 2 +
	61	GND	-	-	-	Ground
	60	MIPI_DPHY0_TX_D3_N	MIPI_CPHY0_TX_TRIO2_C	-	-	MIPI DPHY 0 transmitting data 3 -
	59	MIPI_DPHY0_TX_D3_P	-	-	-	MIPI DPHY 0 transmitting data 3 +
	58	GND	-	-	-	Ground
	57	MIPI_DSI0_RESET	CIF_D3/BT1120_D3/I2S1_SCLK_RX_M0/UART0_TX_M2	GPIO4_A3	3.3V	MIPI DSI 0 reset
	56	MIPI_DSI1_RESET	CIF_D4/BT1120_D4/I2S1_LRCK_RX_M0/I2C3_SCL_M2/UART0_RX_M2/SPI2_MISO_M1	GPIO4_A4	3.3V	MIPI DSI 1 reset
	55	RESET_L	-	-	-	Module reset
	54	VCC4.0	-	-	-	4V power input
	53		-	-	-	4V power input
	52		-	-	-	4V power input
	51		-	-	-	4V power input
	1	GND	-	-	-	Ground
	2	NC	-	-	-	No connection
	3	NC	-	-	-	No connection
	4	GND	-	-	-	Ground
	5	NC	-	-	-	No connection
	6	NC	-	-	-	No connection
	7	TYPECO_USB20_VBUSDET	-	-	-	Type-C 0 plug detection
	8	TYPECO_SBU1	DPO_AUXP	-	-	Type-C 0 SBU1
	9	TYPECO_SBU2	DPO_AUXN	-	-	Type-C 0 SBU2
	10	GND	-	-	-	Ground
	11	TYPECO_OTG_D_N	-	-	-	Type-C 0 OTG data -
	12	TYPECO_OTG_D_P	-	-	-	Type-C 0 OTG data +
	13	GND	-	-	-	Ground
	14	MIPI_DPHY1_RX_D0_P	MIPI_CPHY1_RX_TRIO0_B	-	-	MIPI DPHY 1 receiving data 0 +
	15	MIPI_DPHY1_RX_D0_N	MIPI_CPHY1_RX_TRIO0_A	-	-	MIPI DPHY 1 receiving data 0 -
	16	GND	-	-	-	Ground

Header	Pin	Function 1	Function 2	GPIO	Level	Description
J3	17	MIPI_DPHY1_RX_D1_P	MIPI_CPHY1_RX_TRIO1_A	-	-	MIPI DPHY 1 receiving data 1 +
	18	MIPI_DPHY1_RX_D1_N	MIPI_CPHY1_RX_TRIO0_C	-	-	MIPI DPHY 1 receiving data 1 -
	19	GND	-	-	-	Ground
	20	MIPI_DPHY1_RX_CLK_P	MIPI_CPHY1_RX_TRIO1_C	-	-	MIPI DPHY 1 receiving clock +
	21	MIPI_DPHY1_RX_CLK_N	MIPI_CPHY1_RX_TRIO1_B	-	-	MIPI DPHY 1 receiving clock -
	22	GND	-	-	-	Ground
	23	MIPI_DPHY1_RX_D2_P	MIPI_CPHY1_RX_TRIO2_B	-	-	MIPI DPHY 1 receiving data 2 +
	24	MIPI_DPHY1_RX_D2_N	MIPI_CPHY1_RX_TRIO2_A	-	-	MIPI DPHY 1 receiving data 2 -
	25	GND	-	-	-	Ground
	26	MIPI_DPHY1_RX_D3_P	-	-	-	MIPI DPHY 1 receiving data 3 +
	27	MIPI_DPHY1_RX_D3_N	MIPI_CPHY1_RX_TRIO2_C	-	-	MIPI DPHY 1 receiving data 3 -
	28	GND	-	-	-	Ground
	29	MIPI_DPHY0_RX_D0_P	MIPI_CPHY0_RX_TRIO0_B	-	-	MIPI DPHY 1 receiving data 0 +
	30	MIPI_DPHY0_RX_D0_N	MIPI_CPHY0_RX_TRIO0_A	-	-	MIPI DPHY 1 receiving data 0 -
	31	GND	-	-	-	Ground
	32	MIPI_DPHY0_RX_D1_P	MIPI_CPHY0_RX_TRIO1_A	-	-	MIPI DPHY 0 receiving data 1 +
	33	MIPI_DPHY0_RX_D1_N	MIPI_CPHY0_RX_TRIO0_C	-	-	MIPI DPHY 0 receiving data 1 -
	34	GND	-	-	-	Ground
	35	MIPI_DPHY0_RX_CLK_P	MIPI_CPHY0_RX_TRIO1_C	-	-	MIPI DPHY 0 receiving clock +
	36	MIPI_DPHY0_RX_CLK_N	MIPI_CPHY0_RX_TRIO1_B	-	-	MIPI DPHY 0 receiving clock -
	37	GND	-	-	-	Ground
	38	MIPI_DPHY0_RX_D2_P	MIPI_CPHY0_RX_TRIO2_B	-	-	MIPI DPHY 0 receiving data 2 +
	39	MIPI_DPHY0_RX_D2_N	MIPI_CPHY0_RX_TRIO2_A	-	-	MIPI DPHY 0 receiving data 2 -
	40	GND	-	-	-	Ground
	41	MIPI_DPHY0_RX_D3_P	-	-	-	MIPI DPHY 0 receiving data 3 +
	42	MIPI_DPHY0_RX_D3_N	MIPI_CPHY0_RX_TRIO2_C	-	-	MIPI DPHY 0 receiving data 3 -
	43	GND	-	-	-	Ground
	44	PWRON_L	-	-	-	Power on
	45	PMIC_EXT_EN_OUT	-	-	-	External power control
	46	VCC4V0_SYS	-	-	-	4V power input
	47		-	-	-	4V power input
	48		-	-	-	4V power input
	49		-	-	-	4V power input
	50		-	-	-	4V power input

Header	Pin	Function 1	Function 2	GPIO	Level	Description
J4	100	GND	-	-	-	Ground
	99	SDMMC0_D0	PDM1_SDI3_M0/JTAG_TCK_M1/ I2C3_SCL_M4/UART2_TX_M1/ PWM8_M1	GPIO4_D0	3.3V	SDMMC 0 data 0
	98	SDMMC0_D1	PDM1_SDI2_M0/JTAG_TMS_M1/ I2C3_SDA_M4/UART2_RX_M1/ PWM9_M1	GPIO4_D1	3.3V	SDMMC 0 data 1
	97	SDMMC0_D2	PDM1_SDI1_M0/JTAG_TCK_M0/ I2C8_SCL_M0/UART5_CTSN_M0	GPIO4_D2	3.3V	SDMMC 0 data 2
	96	SDMMC0_D3	PDM1_SDI0_M0/JTAG_TMS_M0/ I2C8_SDA_M0/UART5_RTSN_M0/ PWM10_M1	GPIO4_D3	3.3V	SDMMC 0 data 3
	95	SDMMC0_CMD	PDM1_CLK1_M0/MCU_JTAG_TCK_M0/ CAN0_TX_M1/UART5_RX_M0 /PWM7_IR_M1	GPIO4_D4	3.3V	SDMMC 0 command
	94	SD_CLK	PDM1_CLK0_M0/TEST_CLKOUT_M0/ MCU_JTAG_TMS_M0/CAN0_RX_M1/ UART5_TX_M0	GPIO4_D5	3.3V	SDMMC clock
	93	GND	-	-	-	Ground
	92	HDMI0_TX_SBD_N	eDP0_TX_AUX_N	-	-	HDMI 0 transmitter sideband -
	91	HDMI0_TX_SBD_P	eDP0_TX_AUX_P	-	-	HDMI 0 transmitter sideband +
	90	GND	-	-	-	Ground
	89	HDMI0_TX3_N	eDP0_TX_D3_N	-	-	HDMI 0 transmitter 3 -
	88	HDMI0_TX3_P	eDP0_TX_D3_P	-	-	HDMI 0 transmitter 3 +
	87	GND	-	-	-	Ground
	86	HDMI0_TX0_N	eDP0_TX_D0_N	-	-	HDMI 0 transmitter 0 -
	85	HDMI0_TX0_P	eDP0_TX_D0_P	-	-	HDMI 0 transmitter 0 +
	84	GND	-	-	-	Ground
	83	HDMI0_TX1_N	eDP0_TX_D1_N	-	-	HDMI 0 transmitter 1 -
	82	HDMI0_TX1_P	eDP0_TX_D1_P	-	-	HDMI 0 transmitter 1 +
	81	GND	-	-	-	Ground
	80	HDMI0_TX2_N	eDP0_TX_D2_N	-	-	HDMI 0 transmitter 2 -
	79	HDMI0_TX2_P	eDP0_TX_D2_P	-	-	HDMI 0 transmitter 2 +
	78	GND	-	-	-	Ground
	77	NC	-	-	-	No connection
	76	NC	-	-	-	No connection
	75	GND	-	-	-	Ground

Header	Pin	Function 1	Function 2	GPIO	Level	Description
J4	74	NC	-	-	-	No connection
	73	NC	-	-	-	No connection
	72	GND	-	-	-	Ground
	71	NC	-	-	-	No connection
	70	NC	-	-	-	No connection
	69	GND	-	-	-	Ground
	68	NC	-	-	-	No connection
	67	NC	-	-	-	No connection
	66	GND	-	-	-	Ground
	65	NC	-	-	-	No connection
	64	NC	-	-	-	No connection
	63	GND	-	-	-	Ground
	62	NC	-	-	-	No connection
	61	NC	-	-	-	No connection
	60	GND	-	-	-	Ground
	59	NC	-	-	-	No connection
	58	NC	-	-	-	No connection
	57	GND	-	-	-	Ground
	56	NC	-	-	-	No connection
	55	NC	-	-	-	No connection
	54	GND	-	-	-	Ground
	53	NC	-	-	-	No connection
	52	NC	-	-	-	No connection
	51	GND	-	-	-	Ground
	1	GND	-	-	-	Ground
	2	BOOT_SARADC_IN0	-	-	-	Flashing mode determination based on the button status
	3	SARADC_VIN1	-	-	-	SARADC_VIN1_KEY/RECOVERY
	4	SARADC_VIN2	-	-	-	SARADC_VIN2
	5	SARADC_VIN3	-	-	-	SARADC_VIN3_HP_HOOK
	6	SARADC_VIN4	-	-	-	SARADC_VIN4
	7	SARADC_VIN5	-	-	-	SARADC_VIN5_HW_ID
	8	NC	-	-	-	No connection
	9	NC	-	-	-	No connection
	10	NC	-	-	-	No connection

Header	Pin	Function 1	Function 2	GPIO	Level	Description
J4	11	NC	-	-	-	No connection
	12	UART9_RX_M1	BT1120_D11/PWM12_M1/ SPI3_MISO_M1	GPIO4_B5	3.3V	UART 9 receiving data
	13	UART9_TX_M1	CIF_CLKOUT/BT1120_D10/I2S1_SDO3_M0/DP0_HPDIN_M0/SPDIF0_TX_M1/UART9_TX_M1/PWM11_IR_M1	GPIO4_B4	3.3V	UART 9 transmitting data
	14	NC	-	-	-	No connection
	15	HDMITX0_SDA_M0	BT1120_D14/PCIE20X1_2_WAKEN_M1/I2C8_SCL_M3/SPI3_CS0_M1	GPIO4_C0	3.3V	HDMI 0 transmitter I ² C data
	16	HDMITX0_SCL_M0	BT1120_D13/PCIE20X1_2_CLKREQN_M1/I2C5_SDA_M1/SPI3_CLK_M1	GPIO4_B7	3.3V	HDMI 0 transmitter I ² C clock
	17	GPIO	BT1120_D12/SATA0_ACT_LED_M0/I2C5_SCL_M1/PWM13_M1/SPI3_MOSI_M1	GPIO4_B6	3.3V	GPIO
	18	HDMITX0_CEC_M0	BT1120_D15/SPDIF1_TX_M2/PCIE20X1_2_PERSTN_M1/I2C8_SDA_M3/PWM6_M1/SPI3_CS1_M1	GPIO4_C1	3.3V	HDMI 0 transmitter CEC
	19	HDMI0_TX_ON_H	MIPI_CAMERA0_CLK_M0/SPDIF1_TX_M1/I2S1_SDO0_M0/SATA2_ACT_LED_M0/I2C6_SCL_M3/UART8_RX_M0/SPIO_CS1_M1	GPIO4_B1	3.3V	HDMI 0 transmitter output enable
	20	TYPECO_USB20_OTG_ID	-	-	-	TYPECO_USB20_OTG_ID
	21	NC	-	-	-	No connection
	22	CAN1_TX_M1	CIF_VSYNC/BT1120_D9/I2S1_SDO2_M0/PCIE20X1_2_BUTTON_RSTN/I2C7_SDA_M3/UART8_CTSN_M0/PWM15_IR_M1	GPIO4_B3	3.3V	CAN 1 transmitter
	23	CAN1_RX_M1	CIF_HREF/BT1120_D8/I2S1_SDO1_M0/PCIE20X1_1_BUTTON_RSTN/I2C7_SCL_M3/UART8_RTSN_M0/PWM14_M1/SPIO_CS0_M1	GPIO4_B2	3.3V	CAN 1 receiver
	24	GPIO	CIF_CLKIN/BT1120_CLKOUT/I2S1_SDI3_M0/I2C6_SDA_M3/UART8_TX_M0/SPI2_CS1_M1	GPIO4_B0	3.3V	GPIO
	25	GPIO	CIF_D1/BT1120_D1/I2S1_SCLK_TX_M0/PCIE20X1_1_WAKEN_M1/UART9_CTSN_M1/SPIO_MOSI_M1	GPIO4_A1	3.3V	GPIO
	26	GPIO	CIF_D0/BT1120_D0/I2S1_MCLK_M0/PCIE20X1_1_CLKREQN_M1/UART9_RTSN_M1/SPIO_MISO_M1	GPIO4_A0	3.3V	GPIO

Header	Pin	Function 1	Function 2	GPIO	Level	Description
J4	27	UART3_TX_M2	CIF_D5/BT1120_D5/I2S1_SDI0_M0/ I2C3_SDA_M2/SPI2_MOSI_M1	GPIO4_A5	3.3V	UART 3 transmitting data
	28	UART3_RX_M2	CIF_D6/BT1120_D6/I2S1_SDI1_M0/ I2C5_SCL_M2/ SPI2_CLK_M1	GPIO4_A6	3.3V	UART 3 receiving data
	29	GPIO	CIF_D7/BT1120_D7/I2S1_SDI2_M0/ I2C5_SDA_M2/SPI2_CS0_M1	GPIO4_A7	3.3V	GPIO
	30	GPIO	CIF_D2/BT1120_D2/I2S1_LRCK_TX_M0/ PCIE20X1_1_PERSTN_M1/SPI0_CLK_M1	GPIO4_A2	3.3V	GPIO
	31	NC	-	-	-	No connection
	32	GND	-	-	-	Ground
	33	NC	-	-	-	No connection
	34	NC	-	-	-	No connection
	35	GND	-	-	-	Ground
	36	NC	-	-	-	No connection
	37	NC	-	-	-	No connection
	38	GND	-	-	-	Ground
	39	NC	-	-	-	No connection
	40	NC	-	-	-	No connection
	41	GND	-	-	-	Ground
	42	NC	-	-	-	No connection
	43	NC	-	-	-	No connection
	44	GND	-	-	-	Ground
	45	USB20_HOST0_D_P	-	-	-	USB 2.0 Host 0 data +
	46	USB20_HOST0_D_N	-	-	-	USB 2.0 Host 0 data -
	47	GND	-	-	-	Ground
	48	USB20_HOST1_D_P	-	-	-	USB 2.0 Host 1 data +
	49	USB20_HOST1_D_N	-	-	-	USB 2.0 Host 1 data -
	50	GND	-	-	-	Ground

Since its establishment in 2002 by two Silicon Valley entrepreneurs, Vantron Technology has been at the forefront of the connected IoT devices and IoT platform solutions. Today, Vantron boasts a global customer base that includes many Fortune Global 500 companies. Its product lines cover edge intelligent hardware, IoT communication devices, industrial displays and BlueSphere cloud platforms.

With over 20 years of experience in R&D of intelligent edge hardware, Vantron has provided users with diverse embedded solutions featuring ARM and X86 architectures. Its offerings range from Linux, Android to Windows, from embedded to desktop level, and from gateways to servers. In addition, it provides users with system trimming, driver transplantation and more to cater to the unique needs of its users.