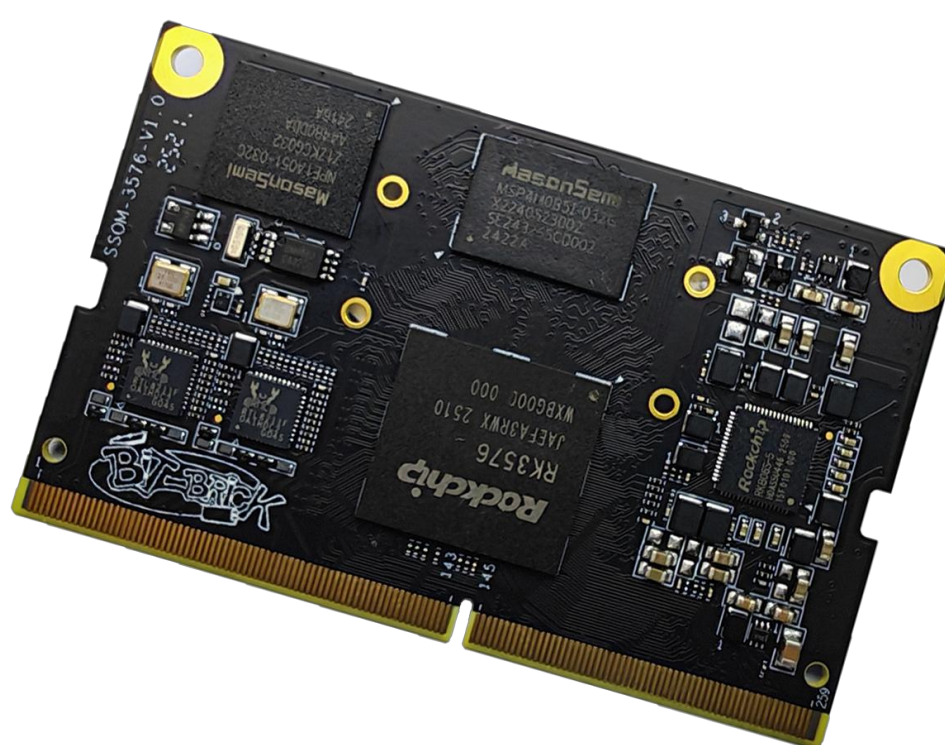


Bit-Brick SSOM-3576-XXXX datasheet



Provisional version

V 1.0

Bit Brick Technology Corporation

May 16, 2025

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1. Product Introduction

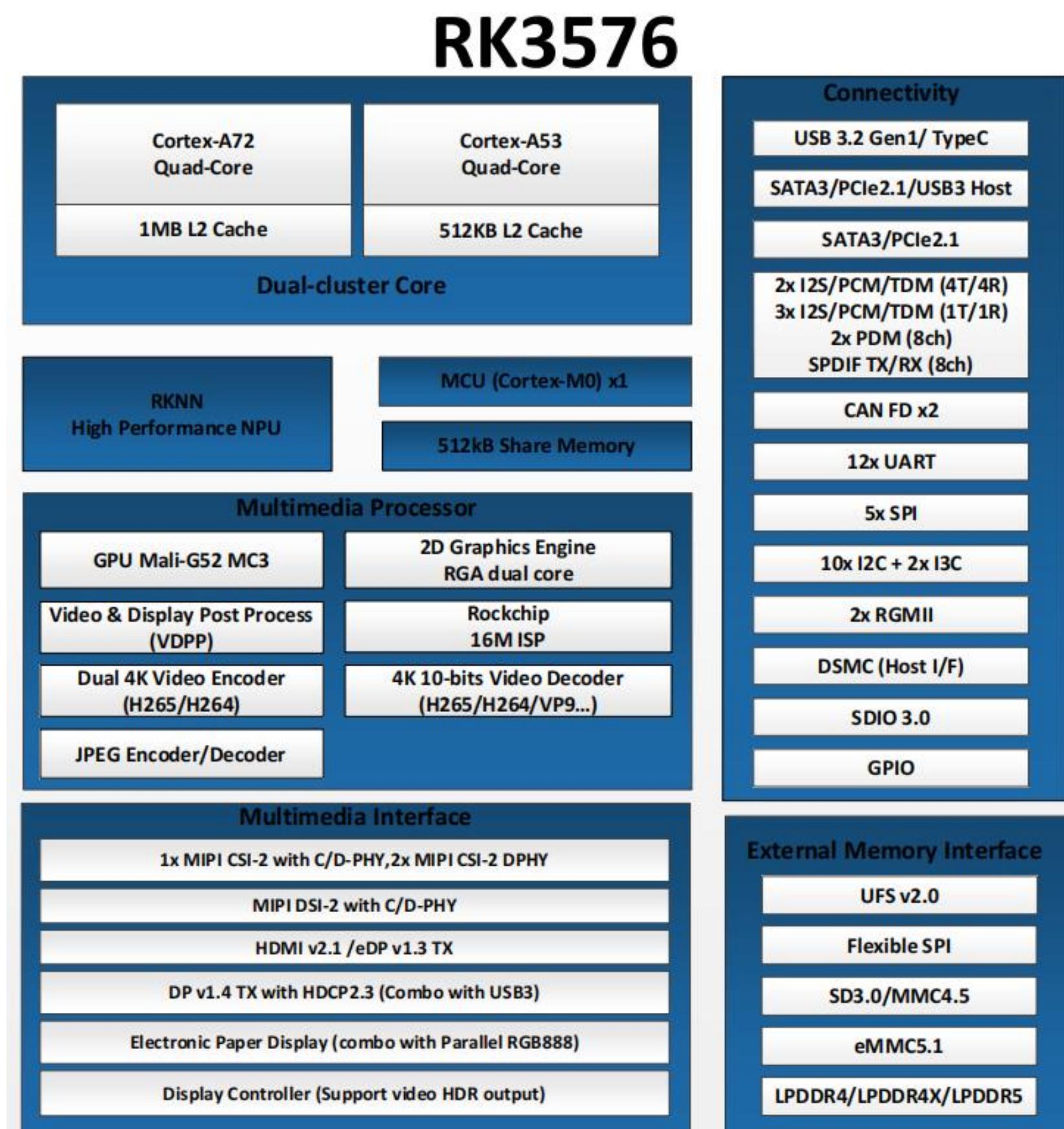
Bit-Brick SSOM-3576 is a high-performance System-on-Module (SoM) built around the Rockchip RK3576 processor, designed for intelligent terminals, industrial control systems, and edge computing applications, etc.

The module features a heterogeneous octa-core CPU architecture, integrates quad-core Cortex-A72 and quad-core Cortex-A53, with clock speeds up to 2.2GHz. It integrates an ARM Mali-G52 MP4 GPU, delivering robust capabilities for multitasking and advanced graphics processing. A built-in Neural Processing Unit (NPU) with 6 TOPS of AI computing power enables efficient on-device inference for AI workloads, supporting applications such as computer vision and intelligent interaction at the edge.

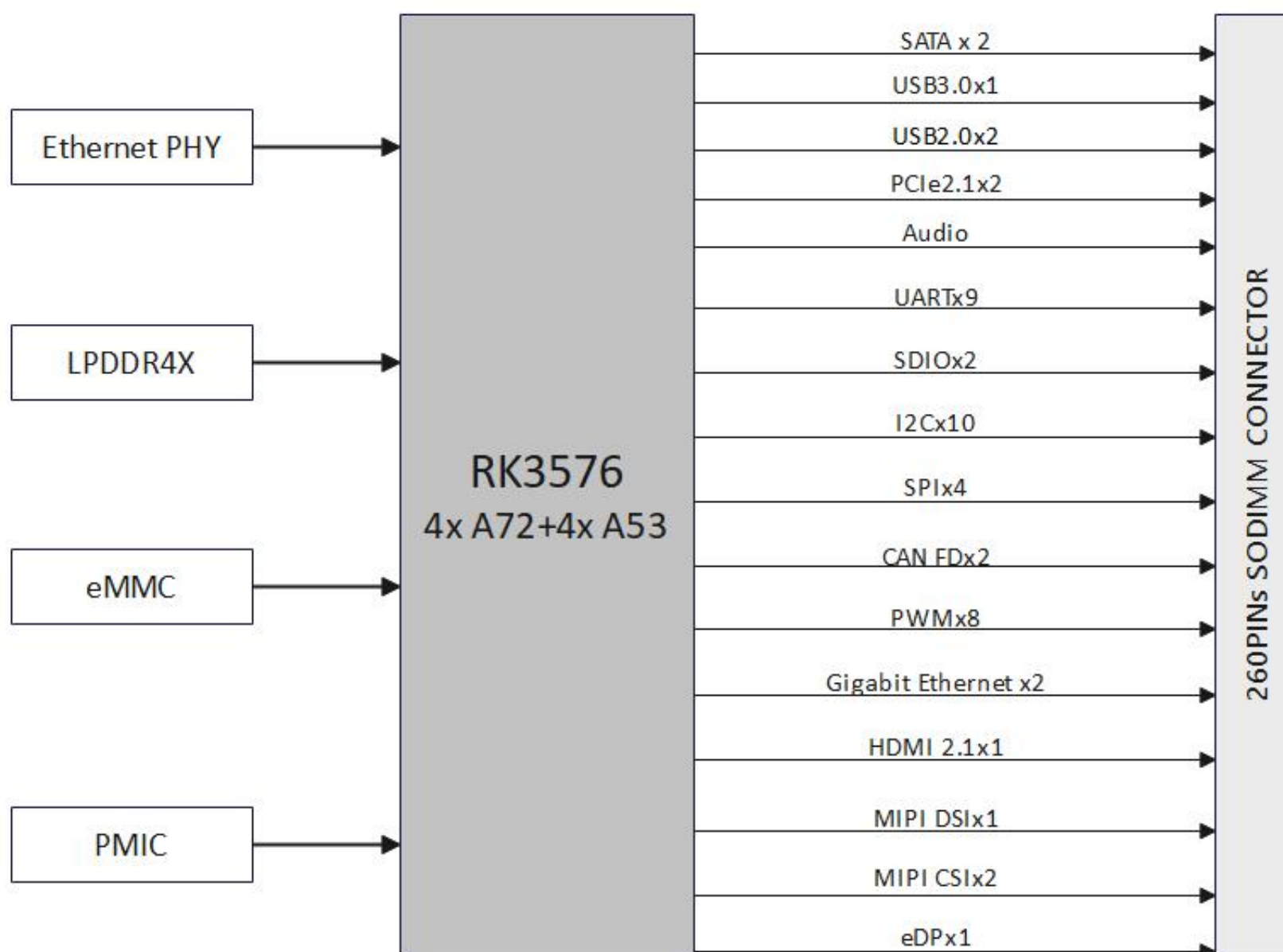
The module incorporates a rich set of high-speed interfaces, including Gigabit Ethernet, PCIe 2.1, USB 3.0, and MIPI DSI/CSI, facilitating flexible peripheral expansion and system integration. It supports ultra-high-definition video decoding up to 4K@120fps and multi-display configurations, including both mirrored and independent output modes, addressing a wide range of multimedia and display-centric use cases.

With its low power consumption, high stability, and excellent scalability, the SSOM-3576 is ideally suited for deployment in smart retail terminals, industrial panel PCs, AI-powered vision systems, and smart home control hubs, offering developers a reliable and efficient embedded hardware platform.

2. Processor Functional Block Diagram



3. Hardware Functional Block Diagram



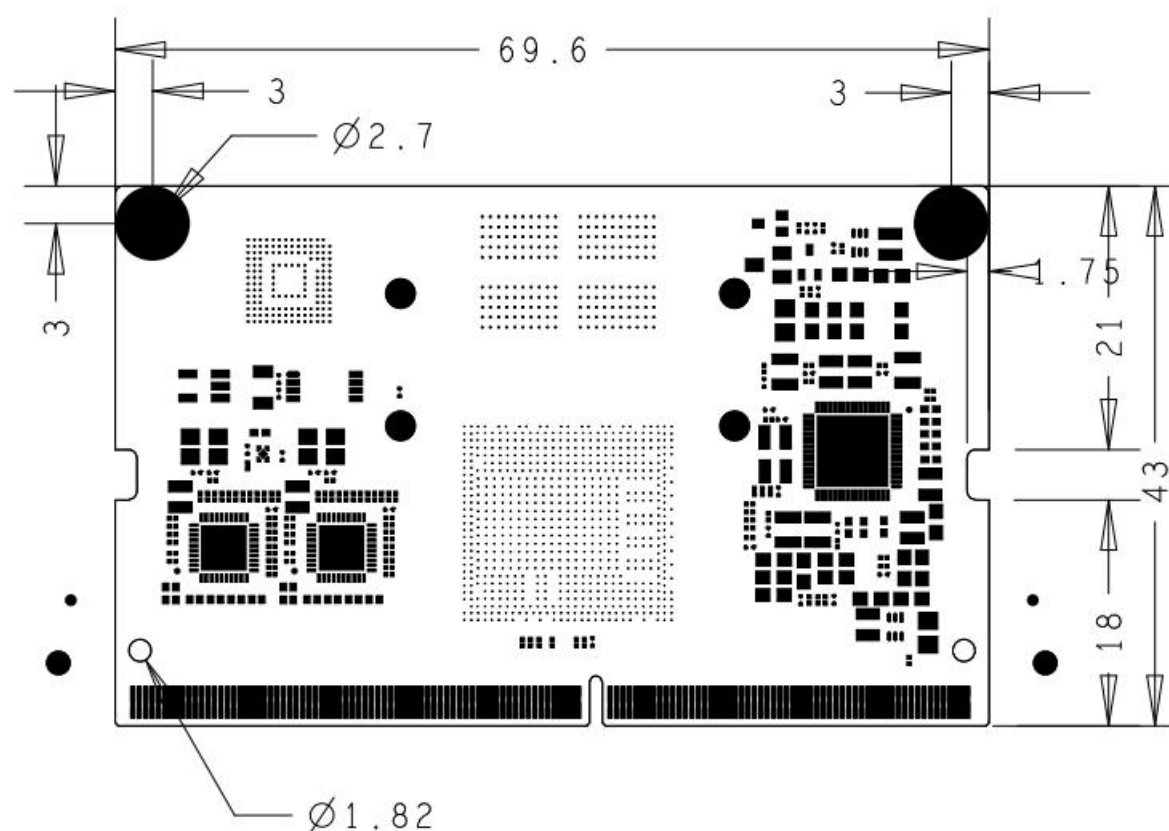
4. Specifications

Form factor	Specification	
Processor	CPU	RK3576, 8-core 64-bit (4xCortex-A72 + 4xCortex-A53) with 8nm advanced process, and the main frequency can reach up to 2.2GHz
	GPU	ARM Mali-G52 MC3 GPU, support OpenGL ES 1.1, 2.0 and 3.2/OpenCL 2.1/Vulkan 1.2
	NPU	6 TOPS@INT8,support INT4/INT8/INT16/FP16/BF16/TF32, support deep learning frameworks such as TensorFlow, PyTorch, Caffe,etc.
	VPU	Decoder: 8K@30fps or 4K@120fps(H.265 HEVC/VP9/AVS2/AV1); 4K@60fps (H.264 AVC); 1080P@60fps(H.264 MVC); Encoder: 4K@60fps(H.265/H.264)
Memory	RAM	4GB/8GB LPDDR4X SDRAM(optional)
	Flash	32GB/64GB eMMC(optional)
Multimedia	Video	Output: 1x HDMI2.1(4K@120fps)/eDP(4K@60fps) combo; 1x MIPI-DSI(2560x1600@60fps) Input: 1x 16MP ISP with HDR & 3DNR; 1x DVP, support HDCP2.3; 1x MIPI-CSI DC PHY; 2x MIPI DPHY
	Audio	5x SAI, support I2S/TDM/PCM mode; SPDIF TX/RX; 2x 8-channel PDM

IO	PCIe	2x PCIe2.1
	Ethernet	2x Gigabit Ethernet
	USB	1x USB3.0; 2x USB2.0
	UART	9x
	SDIO	2x
	I2C	10x
	SPI	4x
	CAN FD	2x
	PWM	8x
	MIPI DSI	1x
	MIPI CSI	2x
	SATA	2x
	eDP	1x
Power supply	Power Supply Voltage	DC 4V
Environment	Operating Temperature	-20 ~ 75 °C
	Operating Humidity	95% relative humidity, non-condensing
Mechanical	Dimensions (W x D)	69.6 x 43mm
Operation System		Linux/Android
Certifications		CE/FCC Class B

5. Dimension Specifications

Size: 69.6mm X 43.0mm



6. Pin definations

Top			Butttom		
Pin Number	Default Defination	Corresponding GPIO	Pin Number	Default Defination	Corresponding GPIO
1	GND		2	GND	
3	PHY1_LED1/CFG_LDO0		4	CSI1_DP0	
5	PHY1_LED2/CFG_LDO1		6	CSI1_DN0	
7	GND		8	GND	
9	PHY1_MDI0+		10	CSI1_CKP	
11	PHY1_MDI0-		12	CSI1_CKN	
13	GND		14	GND	
15	PHY1_MDI1+		16	CSI1_DP1	
17	PHY1_MDI1-		18	CSI1_DN1	



19	GND		20	GND	
21	PHY1_MDI2+		22	CSI1_DP2	
23	PHY1_MDI2-		24	CSI1_DN2	
25	GND		26	GND	
27	PHY1_MDI3+		28	CSI1_DP3	
29	PHY1_MDI3-		30	CSI1_DN3	
31	GND		32	GND	
33	PHY0_LED1/CFG_LDO0		34	CSI3_DP0	
35	PHY0_LED2/CFG_LDO1		36	CSI3_DN0	
37	GND		38	GND	
39	PHY0_MDI0+		40	CSI3_CKP	
41	PHY0_MDI0-		42	CSI3_CKN	
43	GND		44	GND	
45	PHY0_MDI1+		46	CSI3_DP1	
47	PHY0_MDI1-		48	CSI3_DN1	
49	GND		50	GND	
51	PHY0_MDI2+		52	CSI3_DP2	
53	PHY0_MDI2-		54	CSI3_DN2	
55	GND		56	GND	
57	PHY0_MDI3+		58	CSI3_DP3	
59	PHY0_MDI3-		60	CSI3_DN3	
61	GND		62	GND	
63	ETH_CLK0_25M_OUT_M0	GPIO3_A4_d	64	CSI2_CKP	
65	ETH_CLK1_25M_OUT_M0	GPIO2_D6_d	66	CSI2_CKN	
67	GND		68	GND	
69	USB3_OTG0_SSTX1P		70	CSI1_PWDN	GPIO4_A4_d
71	USB3_OTG0_SSTX1N		72	CSI1_RST	GPIO4_A6_d
73	GND		74	GND	
75	EDP_TX_AUXP		76	I2C4_SCL_M3_MIPI_CAM0/2	GPIO3_C0_d
77	EDP_TX_AUXN		78	I2C4_SDA_M3_MIPI_CAM0/2	GPIO3_B7_d
79	GND		80	GND	
81	USB2_OTG0_DP		82	CSI3_RST	GPIO3_D4_d
83	USB2_OTG0_DM		84	CSI3_PWDN	GPIO3_C7_d
85	GND		86	GND	
87	USB2_OTG1_DP		88	CSI_MCLK	GPIO3_D7_d
89	USB2_OTG1_DM		90	USB2_PWREN	GPIO2_B7_d
91	GND		92	GND	
93	USB3_OTG0_SSRX1P		94	USB3_PWREN	GPIO3_A1_d
95	USB3_OTG0_SSRX1N		96	LCD_BL_PWM1_CH1_M0	GPIO0_B5_d
97	GND		98	GND	
99	MIPI_DSI1_D3N		100	I2C3_SCL_M2	GPIO3_D5_d
101	MIPI_DSI1_D3P		102	I2C3_SDA_M2	GPIO3_D6_d
103	GND		104	GND	
105	MIPI_DSI1_D2N		106	USB1_PWREN	GPIO2_B6_d
107	MIPI_DSI1_D2P		108	GPIO3_B0	GPIO3_B0_d
109	GND		110	GPIO3_D0	GPIO3_D0_d
111	MIPI_DSI1_CLKN		112	GMAC1_MCLKINOUT_M0	GPIO2_D7_d
113	MIPI_DSI1_CLKP		114	GPIO3_A0_d	GPIO3_A0_d
115	GND		116	PCIE0_CLKREQn_M0	GPIO2_B2_d
117	MIPI_DSI1_D1N		118	PCIE1_PERSTn	GPIO2_A6_d
119	MIPI_DSI1_D1P		120	PCIE0_PERSTn	GPIO2_B1_d
121	GND		122	PCIE0_WAKEN_M0	GPIO0_D2_d
123	MIPI_DSI1_D0N		124	SDMMC0_PWREN_H	GPIO0_B6_d
125	MIPI_DSI1_D0P		126	CLK1_32K_OUT_WIFI	GPIO1_D5_d
127	GND		128	GND	
129	HDMI_TXCN		130	GPIO0_C3_d	GPIO0_C3_d
131	HDMI_TXCP		132	GPIO0_C4_d	GPIO0_C4_d
133	GND		134	GND	
135	HDMI_TX0N		136	HDMI_CEC	GPIO4_C0_d
137	HDMI_TX0P		138	HDMI_HPD	GPIO4_C1_d
139	GND		140	LCD_BL_EN	GPIO0_D1_d
141	HDMI_TX1N		142	LCD_PWREN_H	GPIO0_C6_d
143	HDMI_TX1P		144	LCD_RST_3V3	GPIO0_C7_d
145	GND		146	GND	



147	HDMI_TX2N		148	SDMMC0_D1	GPIO2_A1_d
149	HDMI_TX2P		150	SDMMC0_CLK	GPIO2_A5_d
151	GND		152	SDMMC0_D3	GPIO2_A3_d
153	USB3_OTG0_SSRX2N		154	SDMMC0_DET_L	GPIO0_A6_u
155	USB3_OTG0_SSRX2P		156	SDMMC0_D2	GPIO2_A2_d
157	GND		158	SDMMC0_CMD	GPIO2_A4_d
159	PCIE0_REFCLKN		160	SDMMC0_D0	GPIO2_A0_d
161	PCIE0_REFCLKP		162	HDMI_SCL	GPIO4_C2_d
163	GND		164	HDMI_SDA	GPIO4_C3_d
165	PCIE0_RXN		166	I2C5_SDA_M3/CAN0_RX_M3	GPIO3_C1_d
167	PCIE0_RXP		168	I2C5_SCL_M3/CAN0_TX_M3	GPIO3_C0_d
169	GND		170	I2C7_SCL_M2	GPIO4_A0_d
171	USB3_OTG0_SSTX2N		172	I2C7_SDA_M2	GPIO4_A1_d
173	USB3_OTG0_SSTX2P		174	I2C0_SCL_M1_TP	GPIO0_C1_d
175	GND		176	I2C0_SDA_M1_TP	GPIO0_C2_d
177	PCIE0_TXN		178	GND	
179	PCIE0_TXP		180	MIPI_LCD_ADC_1V8	GPIO4_A7_d
181	GND		182	GND	
183	DP_TX_AUXN		184	SARADC_VIN3_HP_HOOK	
185	DP_TX_AUXP		186	UART8_RX_M0	GPIO3_C5_d
187	GND		188	UART8_TX_M0	GPIO3_C6_d
189	PCIE1_RXN		190	GND	
191	PCIE1_RXP		192	UART2_RX_M1	GPIO4_B4_d
193	GND		194	UART2_TX_M1	GPIO4_B5_d
195	NC		196	SARADC_VIN0_BOOT	
197	NC		198	SARADC_VIN2_HW_ID	
199	GND		200	GND	
201	PCIE1_REFCLKN		202	TP_INT_L	GPIO0_C5_d
203	PCIE1_REFCLKP		204	TP_RST	GPIO0_D0_d
205	GND		206	GND	
207	PCIE1_TXN		208	UART0_RX_M0_DEBUG	GPIO0_D5_u
209	PCIE1_TXP		210	UART0_TX_M0_DEBUG	GPIO0_D4_u
211	GND		212	UART4_CTSN_M1	GPIO1_C3_u
213	PCIE1_WAKEN_M0	GPIO2_A7_d	214	UART4_RTSN_M1	GPIO1_C2_u
215	GND		216	UART4_RX_M1	GPIO1_C5_u
217	PCIE1_CLKREQn_M0	GPIO2_B3_d	218	UART4_TX_M1	GPIO1_C4_u
219	GPIO0_B4_d	GPIO0_B4_d	220	SAI2_SCLK_M0	GPIO1_D1_d
221	GND		222	SAI2_LRCK_M0	GPIO1_D2_d
223	SDMMC1_D0_M0	GPIO1_B4_d	224	SAI2_SDI_M0	GPIO1_D3_d
225	SDMMC1_D1_M0	GPIO1_B5_d	226	SAI2_SDO_M0	GPIO1_D0_d
227	SDMMC1_D2_M0	GPIO1_B6_d	228	SAI1_SDO2_M0	GPIO4_B1_d
229	SDMMC1_D3_M0	GPIO1_B7_d	230	SAI1_SCLK_M0	GPIO4_A3_d
231	SDMMC1_CMD_M0	GPIO1_C0_d	232	SAI1_LRCK_M0	GPIO4_A5_d
233	SDMMC1_CLK_M0	GPIO1_C1_d	234	SAI1_MCLK_M0	GPIO4_A2_d
235	GND		236	SAI1_SDI0_M0	GPIO4_B3_d
237	WL_DIS_N	GPIO4_B2_d	238	HP_DET_L	GPIO2_B5_d
239	WIFI_REG_ON_H	GPIO1_C6_d	240	PA_SHUTDOWN	GPIO4_B0_d
241	HOST_WAKE_BT_H	GPIO1_D4_d	242	SPI4_CLK_M0	GPIO4_C7_d
243	BT_REG_ON_H	GPIO1_C7_d	244	SPI4_MISO_M0	GPIO4_C6_d
245	WIFI_WAKE_HOST_H	GPIO0_B0_z	246	SPI4_MOSI_M0	GPIO4_C5_d
247	BT_WAKE_HOST_H	GPIO0_B1_z	248	SPI4_CSN0_M0	GPIO4_C4_d
249	PCIE0_PWREN_H	GPIO0_D3_d	250	PWRON_L	
251	SARADC_VIN1_KEY/RECOVERY		252	RESET_L	
253	VCC5V0_SYS_S5		254	VCC5V0_SYS_S5	
255	VCC5V0_SYS_S5		256	VCC5V0_SYS_S5	
257	VCC5V0_SYS_S5		258	VCC5V0_SYS_S5	
259	VCC5V0_SYS_S5		260	RTC_VBAT	

7. Ordering Information

Part No.	CPU	Memory	Flash	Operating Temperature
SSOM-3576-0432	RK3576	4GB	32GB	-20~75°C
SSOM-3576-0864	RK3576	8GB	64GB	-20~75°C



8. Update History

Version Revision	Update Date	Content
Provisional V 1.0	2025-5-16	Initial the first version