

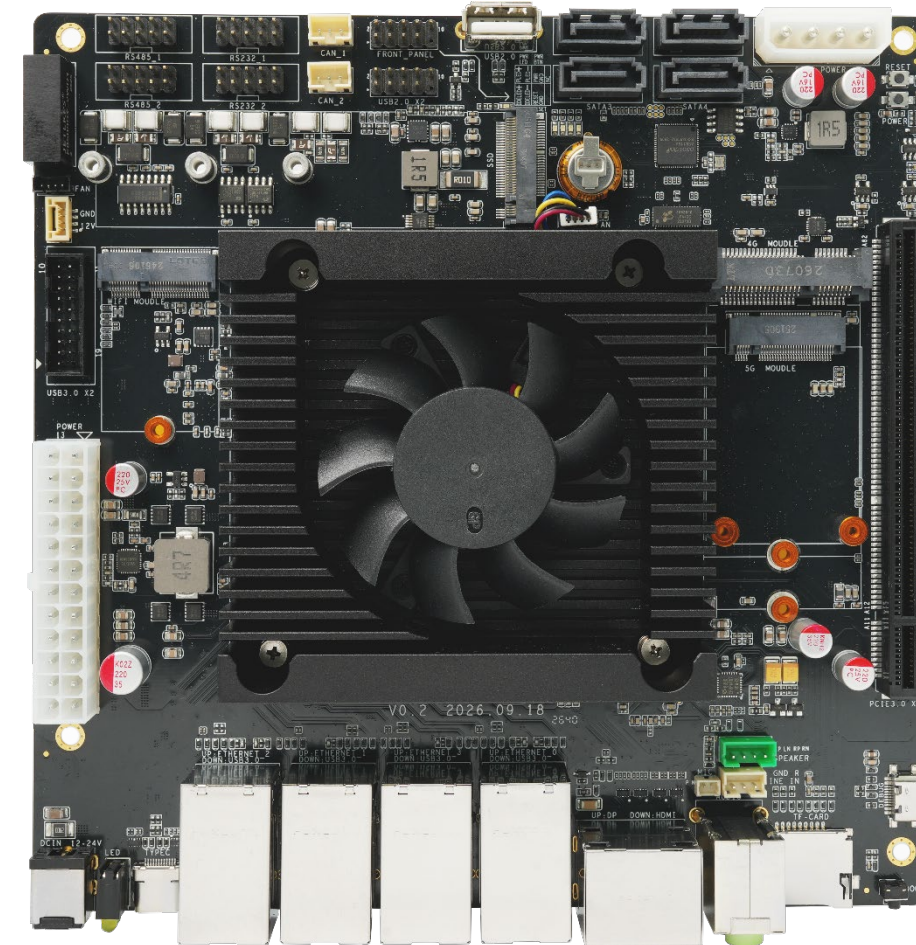


ITX-K3L

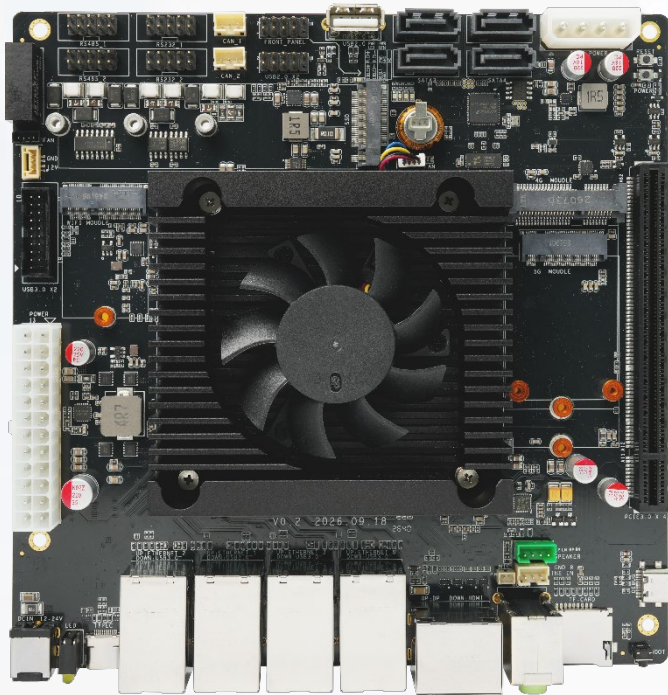
SpacemiT K3 Motherboard

V0.2 2026-10-19

FIREFLY TECHNOLOGY



Product features



High-performance RISC-V AI Processor K3

Equipped with an 8-core X100™ 64-bit RISC-V AI Processor SpacemiT Key Stone K3, it features a maximum main frequency of 2.4GHz and a computing power of 130KDMIPS. Supporting the complete RVA23 Profile, it delivers robust performance and can meet the requirements of high-performance computing and complex scenario applications.



Supports running 30B large models

Powered by an 8-core A100™ processor, it delivers 60 TOPS general AI computing power, fully supporting RVV vector instruction set, native FP8 inference and multi-modal algorithm acceleration. It supports 30B large models, with measured inference speed exceeding 10Tokens/S@30B.



4K HD Video Hardware Encoding and Decoding

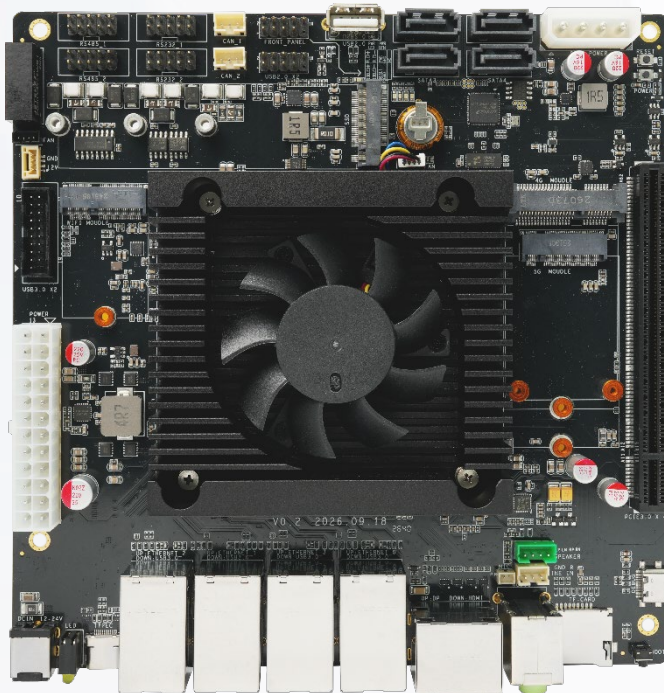
Supports 4K@120fps H.265/H.264/VP9 high-definition video decoding, enabling smooth parsing of high-bitrate UHD video streams with clear and stutter-free playback. It also supports 4K@60fps H.265/H.264 hardware video encoding for efficient video compression, recording and transmission, saving storage space and bandwidth while maintaining excellent image quality.



High-Bandwidth LPDDR5 & UFS2.2 High-Speed Storage

Supports up to 32GB large-capacity LPDDR5 high-bandwidth memory paired with UFS2.2 high-speed storage. Featuring larger capacity, higher bandwidth and lower power consumption, it enables faster data read and write speeds to meet the requirements of large model private deployment for memory capacity and real-time response speed.

Product features



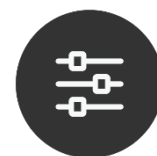
Higher-Level Security Defense Technology

Supports M/S/U three-level privileges, defends against Spectre, Meltdown and other vulnerability attacks at the hardware level, adopts RISC-V PMP/ePMP and dedicated IOPMP mechanisms to establish high-level security protection, supports secure boot, secure storage and signature verification, and integrates AES, SHA, RSA, SM2, SM3 and SM4 algorithms.



RISC-V Parallel Computing & Hardware Virtualization

Adopts brand-new RISC-V architecture, supports 1024-bit RVV1.0 vector computing and Vector Crypto encryption. With TCM cache & DMA acceleration, it greatly improves data throughput. Relying on RVH1.0, AIA and IOMMU extensions, it fully supports full hardware virtualization for CPU, memory and peripherals.



Rich Expansion Interfaces

Comes with 4×Gigabit Ethernet, PCIe3.0, USB3.0, USB2.0, MIPI-CSI, MIPI-DSI, HD2.0, DP1.2, RS485, RS232, CAN and other expansion interfaces to meet peripheral expansion requirements in diverse scenarios.



Wide Application Scenarios

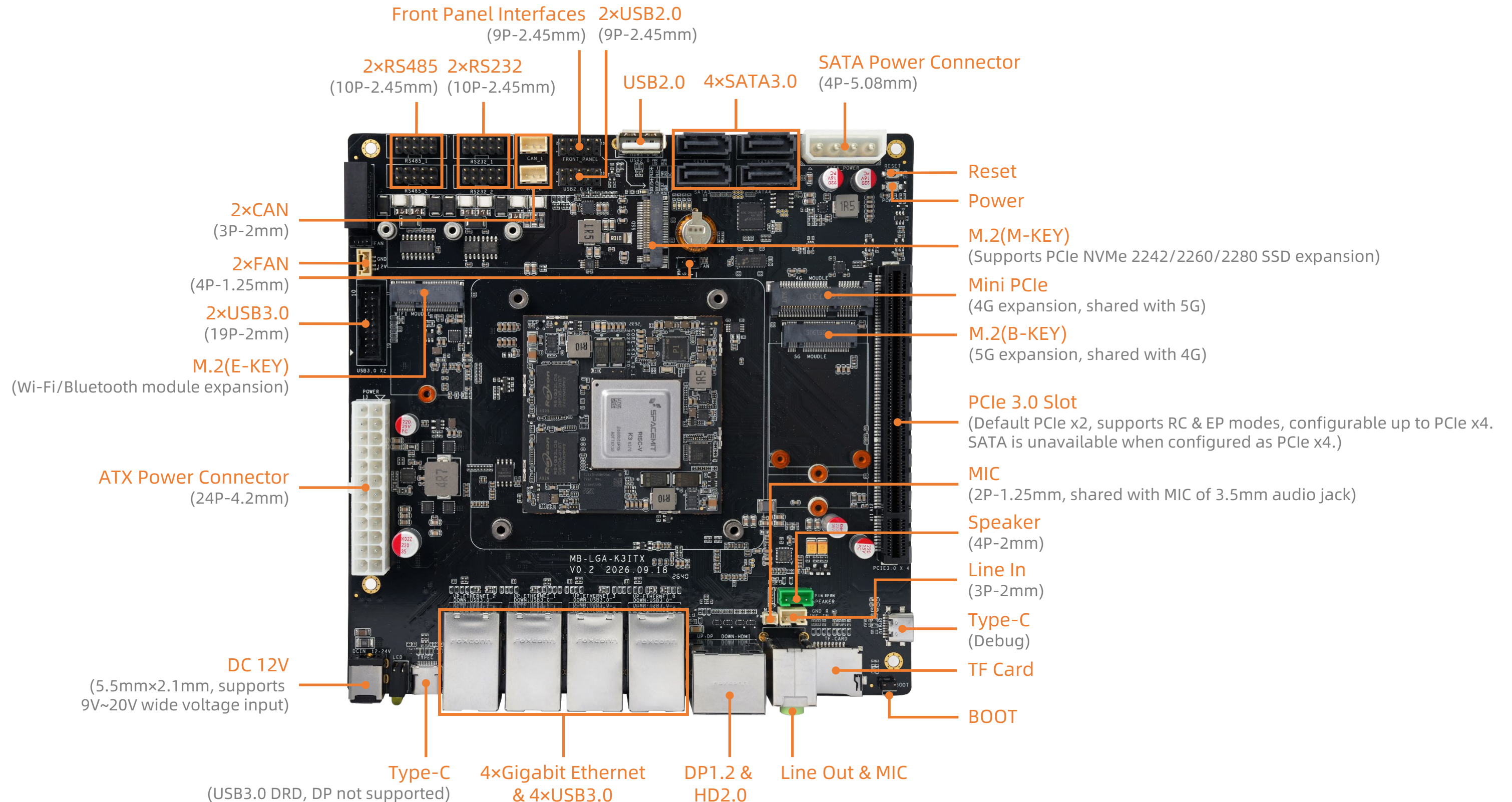
Widely applicable to edge computing, computing power services, data security, private large model deployment, AI computers, AI teaching, robotics, AI retail, intelligent computing servers, smart home and other fields.

Specifications

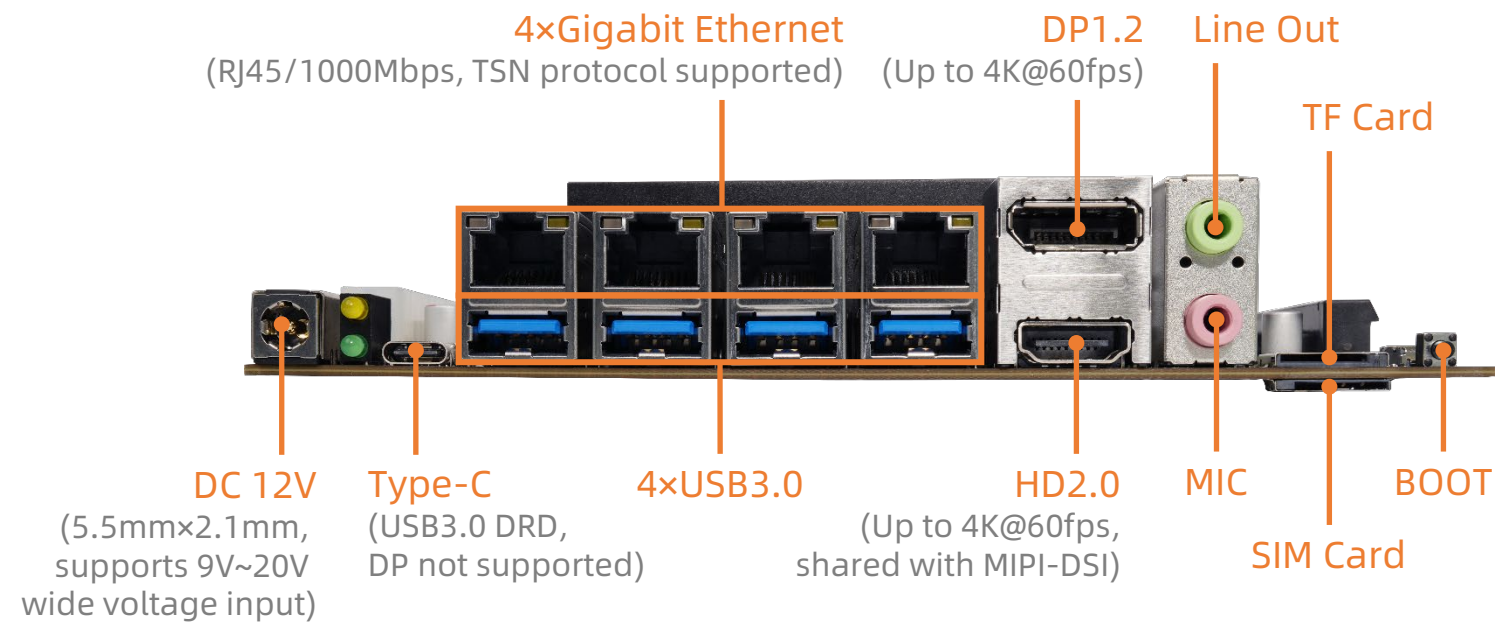


Specifications		
Basic Specifications	SOC	SpacemiT Key Stone K3
	CPU	Octa-core X100™ 64-bit RISC-V AI Processor, max main frequency 2.4GHz, 130KDMIPS general computing power, full RVA23 Profile support, single-core Specint2006>9.0/GHz, equivalent to ARM-A76
	AI performance	Octa-core A100™ delivers 60TOPS AI computing power (SquareINT4), supporting BF16, FP16, FP8, INT8, INT4 and other data formats. Equipped with RVV vector instruction set, native FP8 inference and multi-modal algorithm acceleration, it supports 30B local models, with inference performance exceeding 10Tokens/S@30B, and adapts to various AI algorithms and model deployment.
	GPU	Integrated 3D graphics engine, supporting Vulkan 1.3, OpenCL 3.0, OpenGL ES 1.1/3.2, EGL 1.5
	Codec	Video decoding: 4K@180fps H.265/H.264/VP9/VP8, 4K@120fps VC-1/MPEG4/MPEG2/H.263 Video encoding: 4K@90fps H.265/H.264/VP9/VP8
	RAM	8GB/16GB/32GB LPDDR5
	Storage	128GB/256GB/512GB UFS2.2
	Expansion storage	4 × SATA3.0 (supports 3.5" or 2.5" SSD/HDD expansion), 1 × M.2 M-KEY (PCIe3.0 x2 lane, supports 2242/2260/2280 PCIe NVMe SSD expansion), 1 × TF Card
	Power supply	Motherboard Power Supply Selection: DC 12V (5.5 × 2.1mm, supports 9V~20V wide voltage input) ATX 24Pin Connector Power Supply
	Power consumption	Normal: 13.2W(12V/1100mA), Max: 24W(12V/2000mA), Min(Sleep):1.86W(12V/155mA)
	OS	Ubuntu 26.04, Buildroot Linux with QT GUI, Fedora, Bianbu OS, Deepin, OpenKylin, OpenHarmony 6.1, OpenEuler
	Size	170.0mm × 172.37mm × 35.7mm
	Weight	≈ 527g (with heatsink)
	Environment	Operating Temperature: -20℃ ~ 60℃, Storage Temperature: -20℃ ~ 70℃, Operating Humidity: 10% ~ 90%RH (No condensation)
Interface Specifications	Internet	Ethernet: 4 × RJ45 (1000Mbps), supports TSN protocol Wi-Fi & Bluetooth: Expand Wi-Fi/Bluetooth module via M.2 E-KEY (2230) interface, supports 2.4GHz/5GHz dual-band WiFi6 (802.11a/b/g/n/ac/ax), Bluetooth 5.2 4G: Expand 4G LTE via Mini PCIe (shared with 5G) 5G: Expand 5G via M.2 B-KEY interface (shared with 4G)
	Video input	3 × MIPI-CSI (4Lanes, 1.5Gbps/Lane; CSI0, CSI1, CSI2 do not support lane splitting. CSI2 supports 1/2/4Lane modes (4Lane + 4Lane + 4Lane / 4Lane + 4Lane + 2Lane + 2Lane), 30Pin-0.5mm FPC) K3 has no built-in ISP hardware; external ISP cameras are required. It supports simultaneous input of 4 cameras (up to 12 camera inputs with aggregator or deserializer)
	Video output	1 × MIPI-DSI (8Lanes, 4.5Gbps/Lane, max resolution 3840×2160@60fps or 2560×1440@90fps, 45Pin-0.5mm FPC, shared with HD) 1 × HD2.0 (max resolution 4K@60fps, shared with MIPI-DSI) 1 × DP1.2 (max resolution 4K@60fps)
	Audio input	1 × MIC Input (select either 3.5mm audio jack or 2Pin-1.25mm wafer socket), 1 × Line In (3Pin-2mm Wafer)
	Audio output	1 × Audio Output (3.5mm audio jack), 1 × Speaker Interface (10W/CH into 8Ω, 4Pin-2mm Wafer)
	PCIe slot	1 × PCIe3.0 Slot (PCIe x2 by default, supports RC & EP modes, configurable up to PCIe x4. SATA is unavailable when set to PCIe x4)
	USB	4 × USB3.0 (USB-A), 2 × USB3.0 (19Pin-2mm dual-row header), 1 × USB3.0 DRD (Type-C, with USB2.0 OTG, DP not supported), 1 × USB2.0 (USB-A), 2 × USB2.0 (9Pin-2.54mm dual-row pin header)
	Button	1 × Reset, 1 × Power, 1 × BOOT
	Other interfaces	2 × RS485 (10Pin-2.54mm dual-row pin header), 2 × RS232 (10Pin-2.54mm dual-row pin header), 2 × CAN (supports CAN FD, 3Pin-2mm wafer), 1 × Front Panel Interface (9Pin-2mm dual-row pin header, breakout: HDD LED, reset button, activity LED, power button), 1 × Debug (Type-C), 2 × FAN (4Pin-1.25mm wafer), 1 × SIM Card, 1 × SATA Power (4Pin-5.08mm)

Interface description



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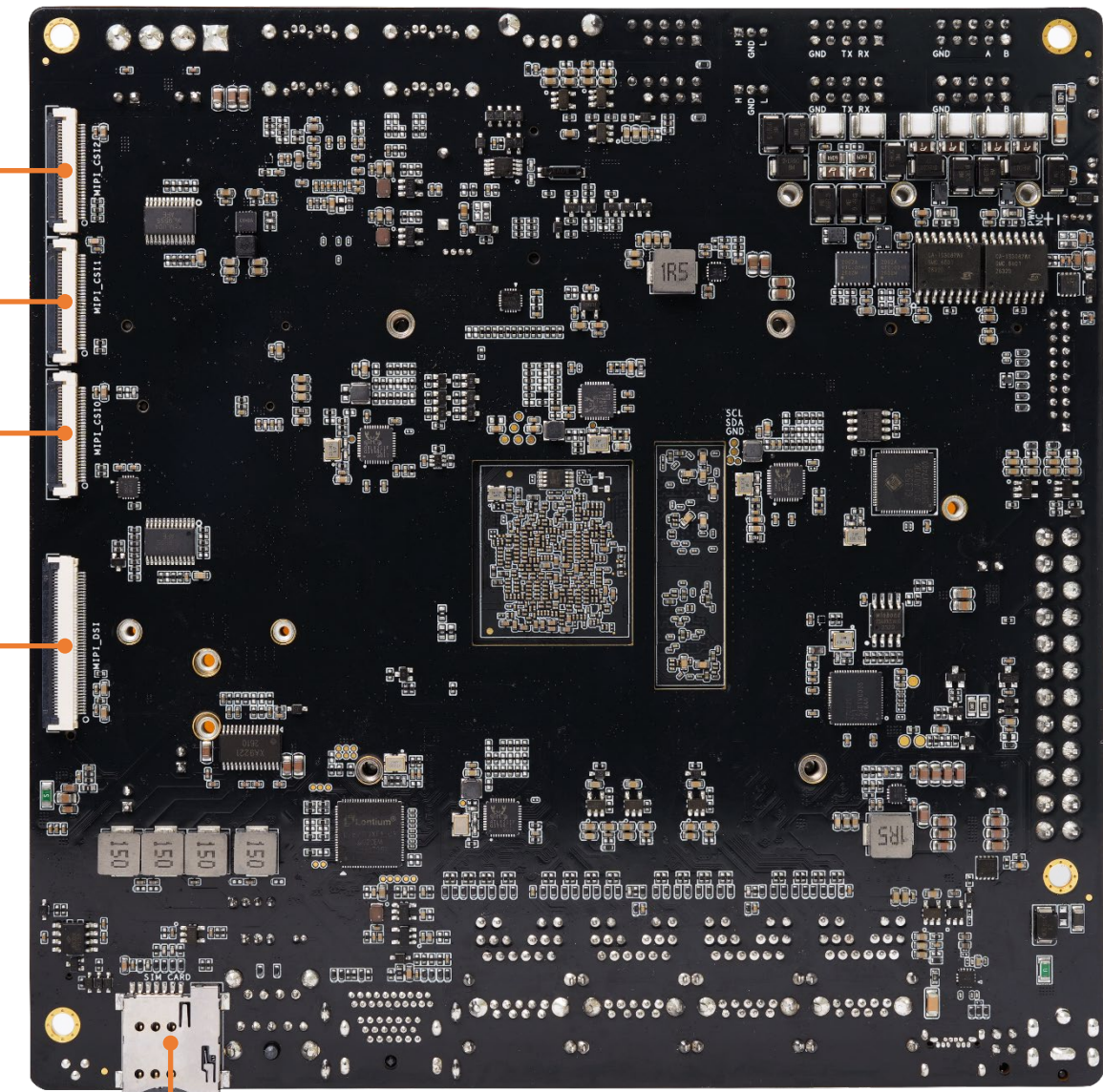


MIPI-CSI2
(Supports 1/2/4-lane modes, 30Pin-0.5mm)

MIPI-CSI1
(4Lane, 30Pin-0.5mm)

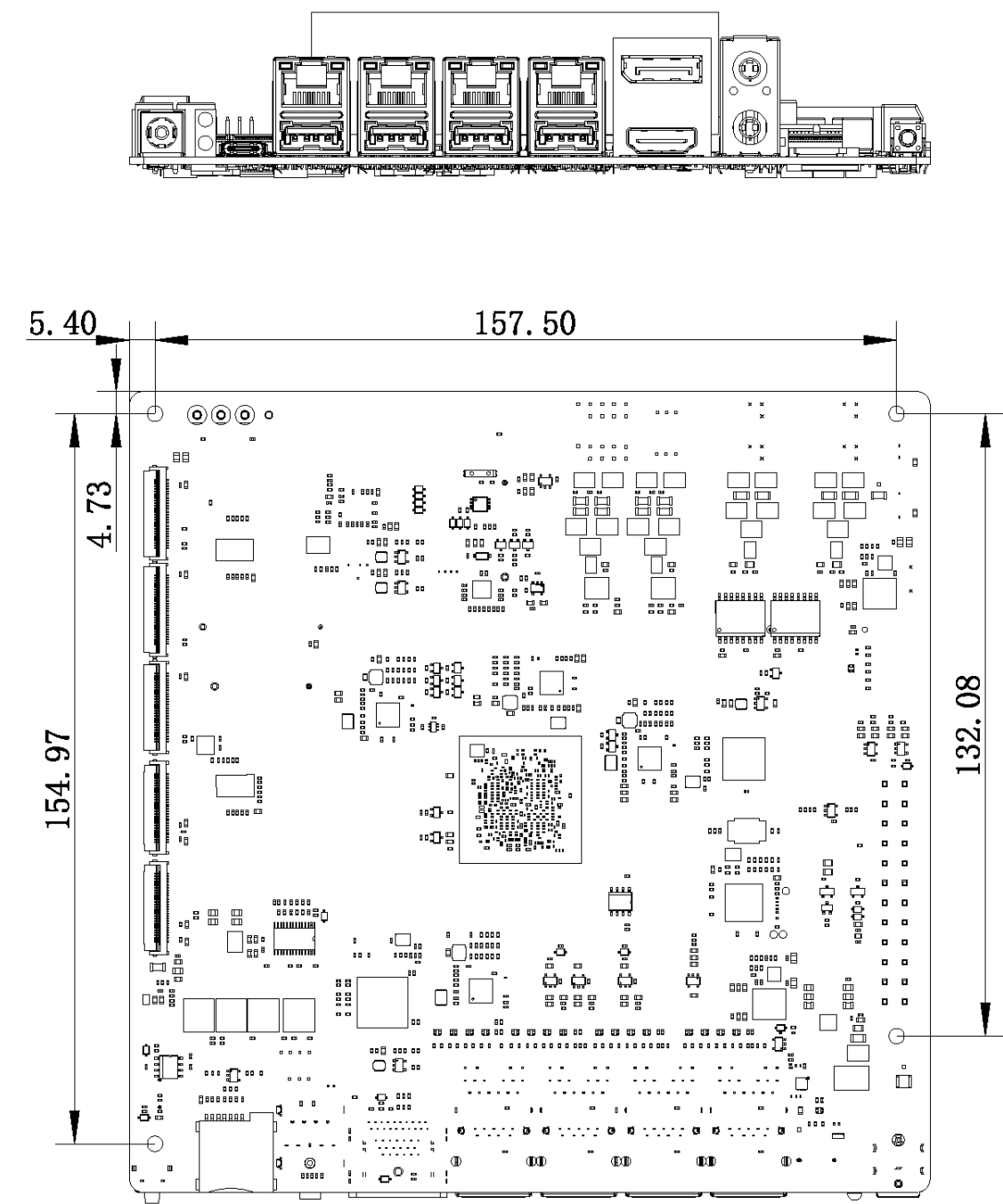
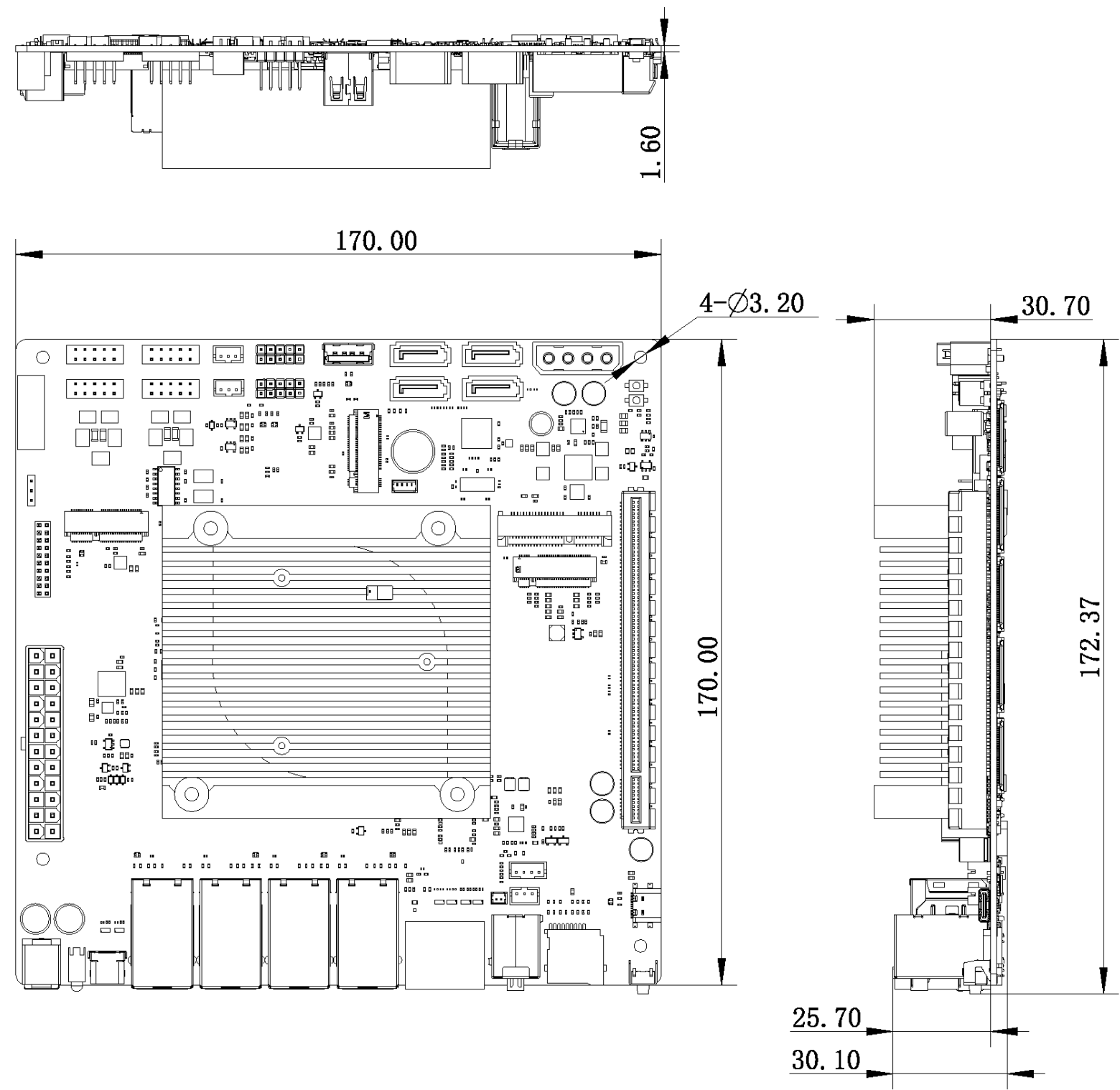
MIPI-CSI0
(4Lane, 30Pin-0.5mm)

MIPI-DSI1
(8Lane, shared with HD, 45Pin-0.5mm)



SIM Card

Dimension





FIREFLY TECHNOLOGY



Contact Us
(+86)18688117175



E-mail
global@t-firefly.com



Website
<https://en.t-firefly.com/>



Address
Room 2101, Hongyu Building, #57 Zhongshan 4Rd, East District,
Zhongshan, Guangdong, China.