

# WAFER-RK3588

3.5" SBC supports Rockchip RK3588 Processors with 8GB LPDDR4x memory & 32GB eMMC NAND FLASH on board default, single HDMI input and dual HDMI out, 2.5GbE LAN, GbE LAN, USB 3.2 GEN 1, USB 2.0, 0°C ~60°C and RoHS

Provide AI demo kit

## CPU

▶ 8-Core 4xA76 + 4xA55, Frequency 2.4GHz

Geekbench 4

Single core



3~5 times improved

Multi core



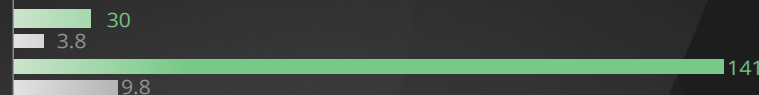
3~5 times improved

## GPU

▶ ARM Mali G610

GFXBench

Car chase 1080P

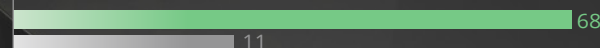


6~8 times improved

ALU2

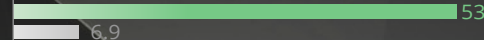


Manhattan3.0 1080P



6~8 times improved

Manhattan3.1 1080P



## NPU

▶ 6TOPS Supports int4 / int8 / int16 / BF16 / TF32

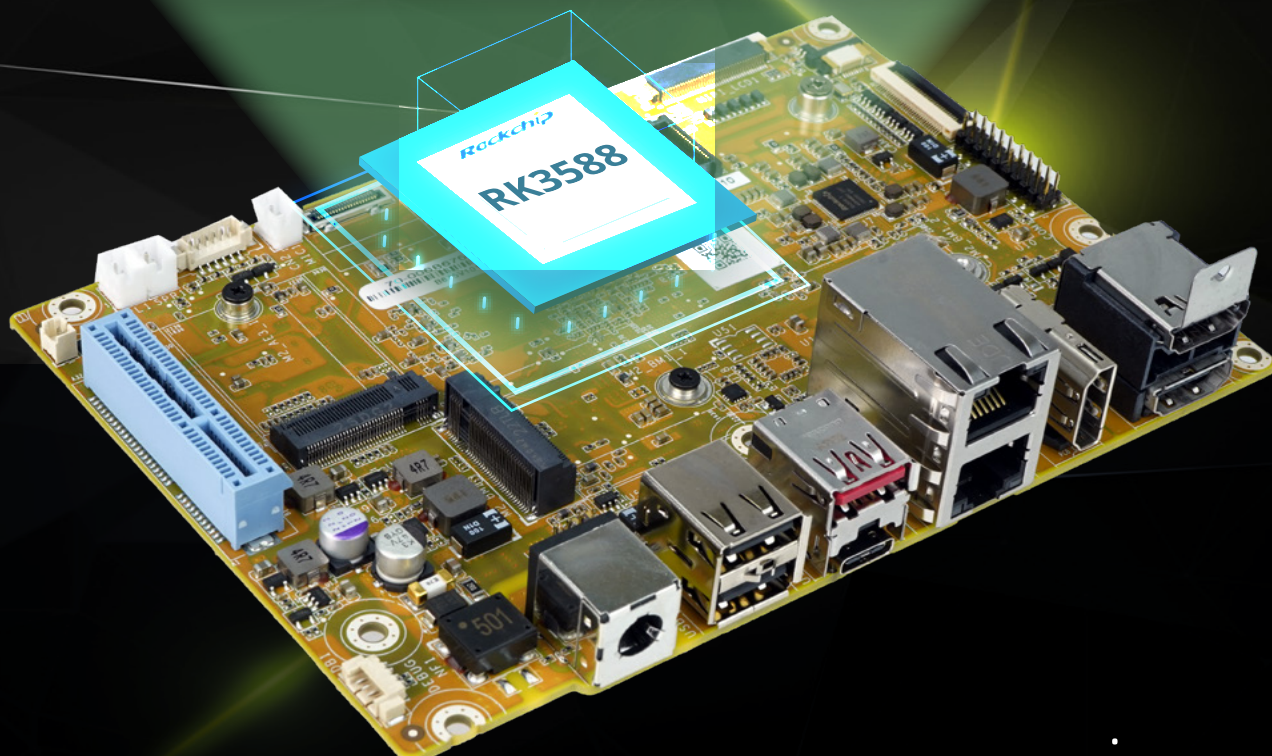
Support framework such as



ONNX

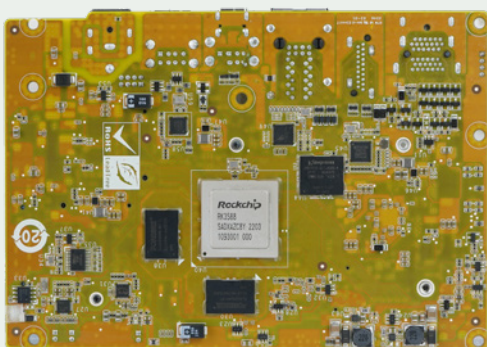
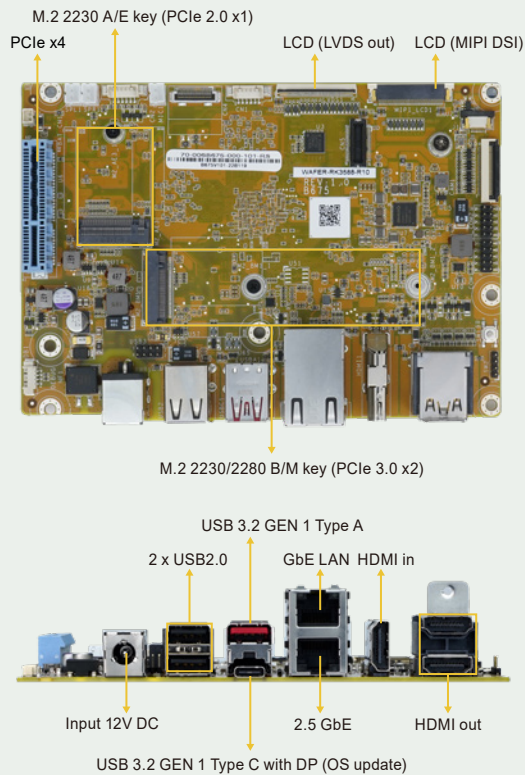
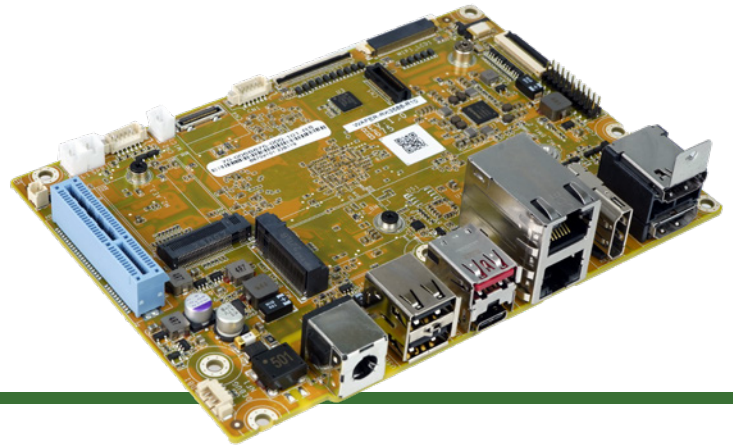


Caffe



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- Quad-core Cortex-A76 and quad-core Cortex-A55, up to 2.4GHz
- Built-in AI accelerator NPU with processing performance of up to 6.0 TOPS, supports int4/int8/int16/FP16/BF16/TF32
- Built-in 4 core GPU Mali G610 (4x256KB L2 Cache) supports OpenGL ES 3.2/OpenCL 2.2/Vulkan 1.1
- Multi-channel input output: 4K HDMI input, 8K HDMI output, MIPI, LVDS, MIPI\_DSI and Camera MIPI\_CSI input
- Rich I/O: 2.5GbE, GbE RJ45, USB 3.2 GEN 1, USB 2.0
- Expansion slot: PCIe 3.0 x2, M.2 B/M key, M.2 A/E key
- Optional Wi-Fi 5/Wi-Fi 6/BLE 5.0
- OS supports Android 13 / Debian 11 (Linux Kernel 5.10)

## Software Support

Android 13	
Framework	1. NEW KOTLIN based GPIO APP 2. Multiple APPs Presentation 3. UART APP 4. F-Droid APP Store
System	1. A/B partitions 2. System Update Engine (New A/B OTA) 3. Dual Ethernet: 1WAN, 1LAN 4. Multiple Display 5. Auto mounting NVME SSD
Wireless	1. WiFi STA/AP mode 2. WiFi Direct 3. Concurrent mode 4. Bluetooth classic 5. Bluetooth LE
Neural Network	RKNN Demo (NPU)
Video support format	MP4, AVI, MKV, WEBM, 3gp
Audio support format	WAV, MP3, AAC
Debian 11	
Kernel	5.10.66
System	Debian11 supports apt-get
Application Frameworks	QT 5.19 Python 3.9.2
Application demo	I/O function demo app
Neural Network	rknn-toolkit2 v1.2 (NPU)
Graphic	Support OpenGL v1.1 / v2.0 / v3.2 OpenCL v2.2
Network Security	OpenSSL 1.1.1k
Wireless	Wi-Fi STA/AP mode Bluetooth EDR/BLE
Video Support Format	Encode: H.264, HEVC Decode: H.264, MP4, AVI, VP9
Audio Support Format	MP3, AC3, WMA



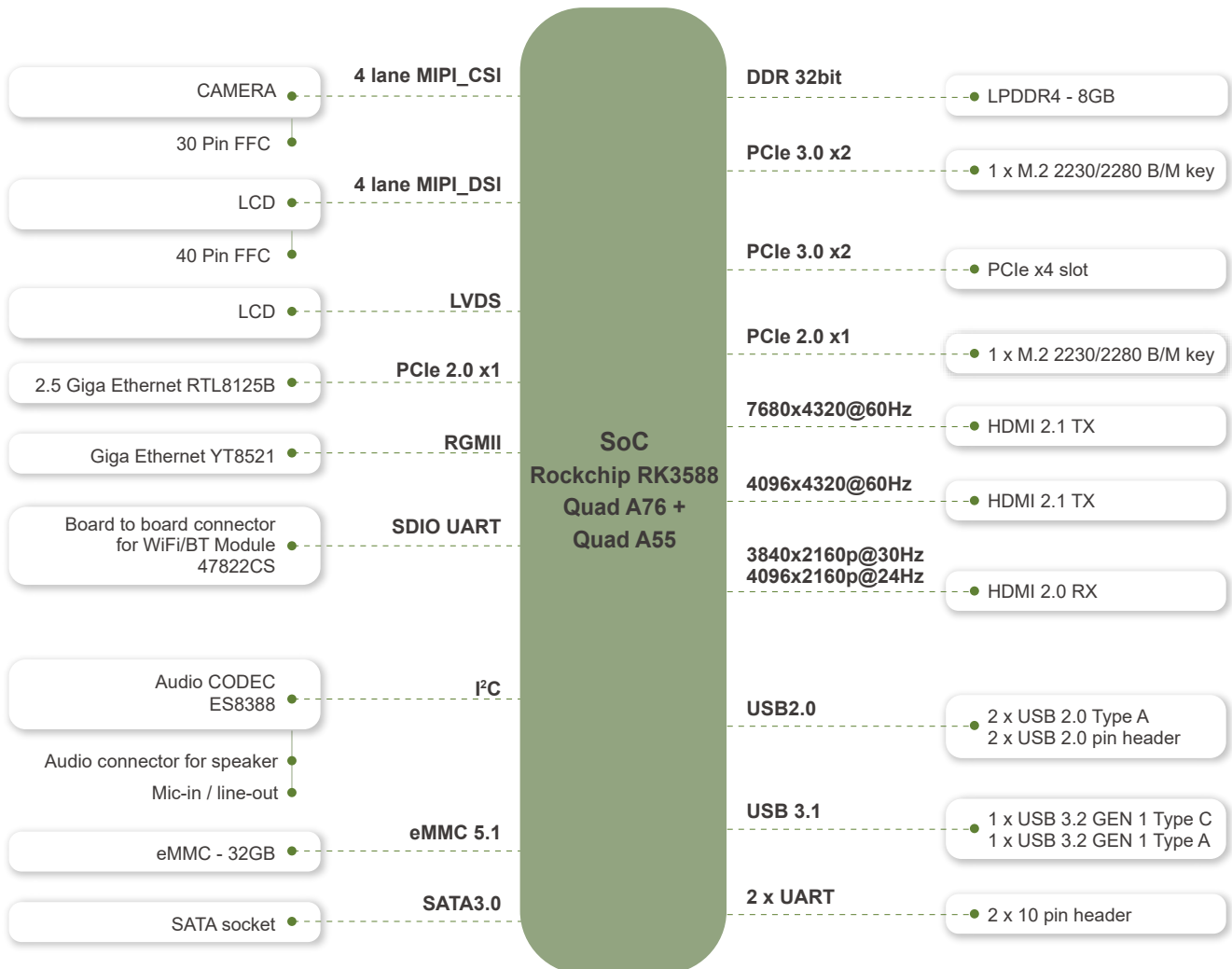


# PCIe X4 Expansion For Added Functionality And Fast Application Deployment

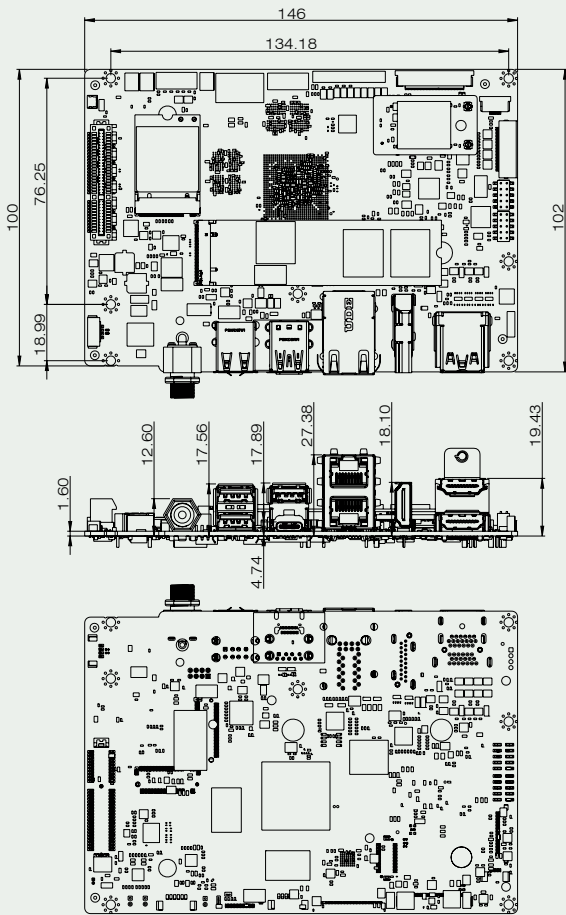
The WAFER-RK3588 features a PCIe x4 (x2 signal) slot, which is a new design of the WAFER motherboard to expand functionality providing easy integration of PoE, video capture or other I/O cards. \*\*PCIe expansion card needs SW customization. Please contact us for further information.



## WAFER-RK3588 Block Diagram



### Dimensions



### Specifications

Model	WAFER-RK3588
Processor	Rockchip RK3588 (Quad core Cortex A76 + Quad core Cortex A55)
GPU	ARM Mali-G610 MP4
NPU	6TOPS supports int4/int8/int16/FP16/BF16/TF32
RAM	On-board 8GB LPDDR4x
Flash	32GB of eMMC NAND Flash for OS and IEI's boot loader
Expansion	1 x PCIe 3.0 x2 1 x M.2 2230/2280 B/M key (PCIe 3.0 x2) 1 x M.2 2230 A/E key (PCIe 2.0 x1)
Audio	Pin header to Mic-in / line-out jack
Speaker	2 x 2pin header
Display	1 x MIPI DSI / 1 x LVDS out
Camera	1 x MIPI CSI
HDMI	1 x HDMI-input up to 4K@60FPS 1 x HDMI-output up to 8K@60Hz 1 x HDMI-output up to 4K@60Hz
Wi-Fi	Wi-Fi 5/6 (optional board to board IEI module)
Bluetooth	Support Bluetooth V5.0
I/O	1 x GHz LAN 1 x 2.5 GHz LAN 1 x USB 3.2 GEN 1 Type C with DP (OS update) 1 x USB 3.2 GEN 1 Type A 2 x USB2.0 Type A UART (2x9pin header) SATA (1 x SATA3.0 up to 6 Gb/s) 1 x DC jack
Dimensions (LxW) (mm)	146 x 102
Input	12V DC
Operating Temperature	0°C – 60°C
Storage Temperature	-20°C – 60°C
Humidity	5 ~ 95% relative humidity, non-condensing
EMC & Safety	EMC Class B
Supported OS	Android 13 / Debian 11 (Linux Kernel 5.10)

### Optional accessories



### Ordering Information

Android 13	WAFER-RK3588-A/CE	3.5" SBC supports Rockchip RK3588 Processors with 8GB LPDDR4 memory & 32GB eMMC NAND Flash, Android platform and provide update service
Linux Debian 11	WAFER-RK3588-D/CE	3.5" SBC supports Rockchip RK3588 Processors with 8GB LPDDR4 memory & 32GB eMMC NAND Flash, Debian platform and provide update service

### Optional Accessories

23T00-01010AW01-RS	LCD BONDING TOUCH; 10.1"; All Win; 800*1280; 340 cd/; LED; TQ101AJ02TP; MIPI 8BIT; TOUCH WINDOWS; Capacity Type[Projected Capacitive]; COF; WeidahiTech; WDT8913; RoHS
71001-COC794A5SFE-RS	Camera; Image Module; 2592*1944; TRULY; COC794-A5SF-E; 1/4"; 8.5 X 15.8 X 5.45mm; I2C; sensor type: OV5640; RoHS
30400-000188-RS	Speaker Box Assembly; FLYING; FC-K25RB101-3W-4-WE250L-P2-2P; 4Ω ±0.6Ω;3W; 28*28*13.6MM; 250MM; 24AWG; JST PHR-2 P=2.0; Conductive Fabric_245MM; RoHS
iWB-BCM43752-R10	Radio Frequency Card, WIFI+BlueTooth MODULE, AP6275S, 2T2R, 802.11 a/b/g/n/ac/lax Wi-Fi + BT 5.0; RoHS
iWB-RTL8822-R10	Radio Frequency Card, Support 2-stream 802.11ac solutions, A 2T2R capable WLAN baseband,Support Bluetooth 5.0 system,B TO B Connector, RoHS.