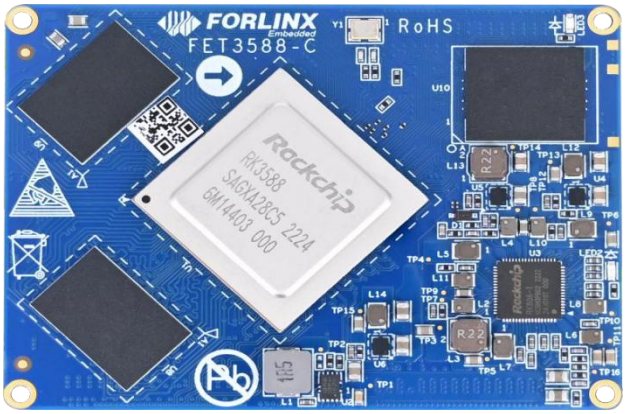
FET3588-C/FET3588J-C SoM

The FET3588-C/FET3588J-C SoMs are built on Rockchip's flagship processors RK3588/RK3588J, utilizing advanced 8nm technology with an architecture of 4 Cortex-A76 cores (up to 2.4 GHz) and 4 Cortex-A55 cores (up to 1.8 GHz). They support 8K ultra-clear display and enable four different screens simultaneously, along with various high-speed data communication interfaces to accommodate diverse needs. It has passed rigorous environmental temperature and pressure tests, ensuring optimal performance and stable operation for high-end applications.



Product Features:

- Simultaneous encoding and decoding of 8K videos, supporting multiple decoders;
- 48 - megapixel ISP3.0, meeting the requirements of image post - processing;
- Supports for multiple multi - channel video outputs with a resolution of up to 8K@60Hz;
- Supports for 4 lanes of PCIe3.0 and 3 lanes of PCIe2.1, with a transmission rate of up to 8Gbps per channel;
- Supports for multiple USB 3.1 Type - C interfaces and SATA 3.1;
- 4x100 pin ultra-thin connectors lead out all processor functions. The combined height of the connectors is 1.5 mm, which reduces the thickness of the SoM.

4×A76+4×A55 Architecture	Up to 2.4GHz Clock	6TOPS NPU
Mali-G610 MP4 GPU	8nm Manufacturing Process Technology	64bit Processor

SoM Parameters:

Processor	**Rockchip RK3588/RK3588J** **RK3588 CPU:** 4×Cortex-A76@2.4GHz+4×Cortex-A55@1.8GHz **RK3588J CPU**：4×Cortex-A76@1.6GHz+4×Cortex-A55@1.3GHz **NPU**：6 TOPS，supporting INT4/INT8/INT16/FP16 combined operations **GPU**：Mali-G610 MP4, OpenGLES 1.1, 2.0, 3.2, OpenCL 2.2, Vulkan1.2 **VPU**： Hardware Decoding： ·H.265, VP9：up to 8K@60fps ·H.264：up to 8K@30fps ·AV1：up to 4K@60fps Hardware Coding： H.265/HEVC, H.264/AVC：up to 8K@30fps

RAM	4GB/8GB/16GB LPDDR4
ROM	32GB/64GB/128GB eMMC
Operating Voltage	DC 12V
Operating Temperature	0℃ ~ +80℃/-40℃ ~ +85℃
Connection	Board-to-board connector (4 × 100pin, pin pitch 0.4mm, combined height 1.5mm)

■ SoM Function Parameters:

Function	Quantity	Parameter	
MIPI DC PHY(DPHY/CPHY)	2	· Support DPHY or CPHY; ·4 lanes MIPI DPHY V2.0, each lane up to 4.5Gbps; ·3 lanes MIPI CPHY V1.1, each lane up to 2.5Gbps.	MIPI camera combination: 2 MIPI DCPHY + 4×2 lanes MIPI CSI DPHY 2 MIPI DCPHY + 1×4 lanes MIPI CSI DPHY 2 MIPI DCPHY + 2×4 lanes MIPI CSI DPHY
MIPI CSI DPHY	4	·2 lanes MIPI DPHY V1.2, each lane up to 2.5Gbps; ·2 x 2 lanes DPHY can be combined into 1 x 4 lanes DPHY.	
DVP	1	·Supports 8/10/12/16-bit standard DVP interface, up to 150MHz; ·Supports BT.601/BT.656 and BT.1120 VI.	
HDMI RX	1	·3.4Gbps~6Gbps HDMI 2.0; ·250Mbps~3.4Gbps HDMI 1.4b; ·HDCP2.3 and HDCP1.4.	
HDMI/eDP TX	≤2	·Supports 2 x multiplexed HDMI/eDP TX (HDMI and eDP cannot work simultaneously); ·HDMI supports a resolution of 7680×4320@60Hz, bandwidths of 3, 6, 8, 10, and 12Gbps, and HDCP2.3; ·eDP supports a resolution of 4K@60Hz. Each interface supports x1, x2, x4 configurations, bandwidths of 1.62Gbps, 2.7Gbps, and 5.4Gbps, and HDCP1.3.	
DP TX	2	·Supports 2 x DP TX 1.4a, which are multiplexed with USB3.1 Gen1, and supports 1, 2, 4 lanes; ·Maximum resolution: 7680x4320@30Hz; ·Supports HDCP2.3 and HDCP 1.3.	
MIPI DSI	2	·Supports 2 x MIPI DPHY 2.0 or CPHY 1.1, and the resolution can reach 4K@60Hz; ·Supports dual - MIPI display on the left and right, and supports RGB/YUV formats (up to 10 bits).	
BT.1120 Output	1	·Supports RGB format (up to 8 bits), and the data rate can reach 150MHz; ·The resolution can reach 1920×1080@60Hz.	

I2S	≤4	·8 - lane I2S0/I2S1: Supports TX and RX, with audio resolution of 16 - 32 bits and a sampling rate of up to 192KHz; ·2 - lane I2S2/I2S3: Supports TX and RX, with audio resolution of 16 - 32 bits and a sampling rate of up to 192KHz.
SPDIF	2	·Supports 2×16bit audio data storage; ·Supports dual - phase stereo output.
PDM	2	·Up to 8 channels, with audio resolution of 16 - 24 bits and a sampling rate of up to 192KHz; ·Supports the PDM master receiving mode.
Ethernet	2	·2 x GMAC, providing RGMII / RMII interfaces; ·Supports data transfer rates of 10/100/1000Mbps.
USB3.1 Gen1	3	·USB3.1 Gen1, data rate up to 5Gbps; ·2 x USB3.1 OTG, multiplexed with DP TX (USB3OTG_0 and USB3OTG_1). USB3OTG_0 and USB3OTG_1 support USB Type - C and DP Alt; ·1 x USB3.1 Host, multiplexed with PIPE PHY2 (USB3OTG_2).
USB 2.0 Host	2	·Supports 2 x USB2.0 Host.
PCIe 2.0	≤3	·Each PCIe2.1 interface supports 1 lane, data rate up to 5Gbps.
PCIe 3.0	≤4	·Supports RC and EP; ·Each channel supports a maximum data rate of 8Gbps; ·Supports 4 combination modes: 1 lane x4, 2 lanes x2, 4 lanes x1, 1 lane x2 + 2 lanes x1
PDM	2	·Up to 8 channels, with audio resolution of 16 - 24 bits and a sampling rate of up to 192KHz ·Supports the PDM master receiving mode
Ethernet	2	·2 x GMAC, providing RGMII / RMII interfaces ·Supports data transfer rates of 10/100/1000Mbps
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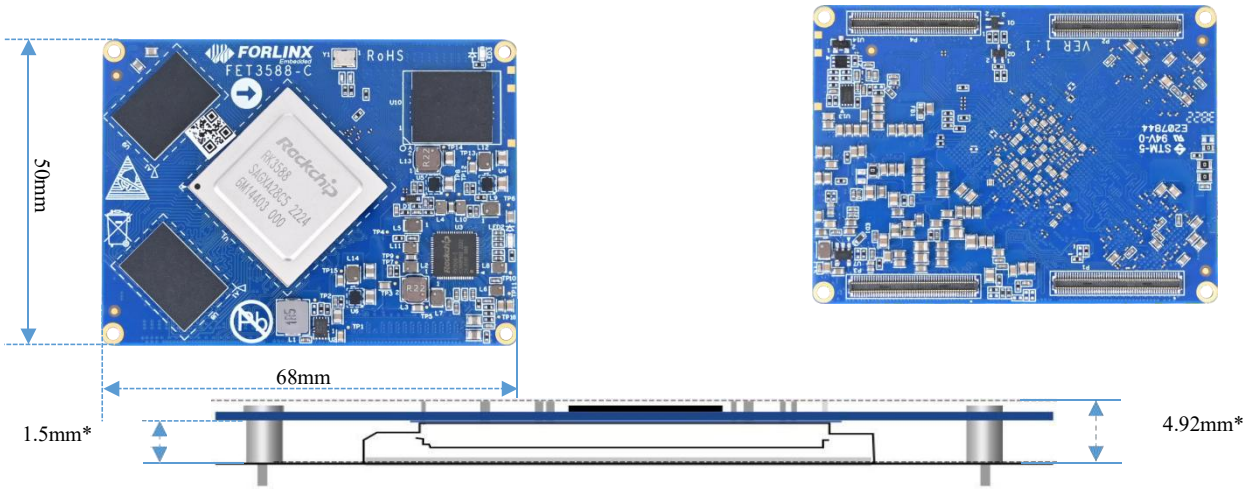
SDIO	1	·Supports SDIO 3.0.
SPI	≤5	·Each controller supports 2 chip - select outputs; ·Supports serial master and serial slave modes, which can be configured by software.
I2C	≤9	·Supports 7 - bit and 10 - bit address modes;

		·The data transfer rate in standard mode can reach 100k bits/s, and up to 400k bits/s in fast mode.
UART	**≤10**	·Built - in 2 64 - bit FIFO, which can be used for TX and RX respectively ; ·Supports serial data sending and receiving of 5 - bit, 6 - bit, 7 - bit, 8 - bit, with a baud rate of up to 4Mbps; ·10 x UART all support Auto Flow Control.
SATA	**≤3**	·3 x SATA3.0 controllers, which are multiplexed with PCIe2.0 and USB_HOST2 controllers for PIPE PHY0/1/2; ·Supports eSATA, with a maximum data rate of 6Gbps.
PWM	**≤16**	·Supports up to 16 on - chip PWM and the capture mode.
ADC	**≤8**	·Supports 8 x 12bit single - ended input SAR - ADC, with a sampling rate of up to 1MS/s.

***Note: The interface number listed in the table is the hardware design or theoretical maximum quantity, and most of the function pins are multiplexed. Please refer to the PinMux table for easy configuration.**

SoM Dimension:



Height after installation

*** Note: The dimensional tolerance is ±0.2mm.**

Software Support:

OS	Linux 5.10.209, Android 12.0/14.0, Forlinx Desktop 20.04/22.04 (Ubuntu file system), and others.
Flashing	•TF card •USB OTG

Note: * indicates that it is under planning and not yet launched.

Peripheral Support List:

Android12.0 Drive Support List	**Interface**	**Function**	**Plan**
	I2S	Audio	NAU88C22YG
	I2C	Capacitive touch	FT5x06
	I2C	Capacitive touch	GT9xx
	I2C	RTC	PCF8563
	RS485	TTL to 485	FIT-485 V1.1
	PCIe	2.4G/5G dual-band Wi-Fi	AW-CM276MA and AW-XM458
	UART	BT	AW-CM276MA and AW-XM458
	USB	4G module	Quectel EM05 (driver compatible with EC20-CEHDLG)
	USB	5G module	Quectel RM500U，RM500Q
	USB	USB camera	Logitech C270 (UVC protocol)
	MIPI-CSI	OV13850 camera	RF13850-JD01 V2.0 MIPI, 13-megapixel resolutions
	MIPI-DSI	7-inch LCD screen	FIT-LCD7.0C V2.1,1024*600 resolution
	eDP	12.5-inch LCD	BOE NV125FHM-N82,12.5-inch,1920*1080
	DP	DP Display	4K
	HDMI	HDMI Display	8K
	RGMII	Gigabit Ethernet	RTL8211FSI-CG
	PWM	LCD Backlight	/
	UART	General	General
	SPI	General	General
	GPIO	General	General

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	I2S	Audio	NAU88C22YG
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	I2C	RTC	PCF8563
	RS485	TTL to 485	FIT-485 V1.1
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	UART	BT	AW-CM276MA and AW-XM458
	USB	4G module	Quectel EM05 (driver compatible with EC20-CEHDLG)
	USB	5G module	Quectel RM500U，RM500Q
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	eDP	12.5-inch LCD	BOE NV125FHM-N82,12.5-inch,1920*1080
	DP	DP Display	4K
	HDMI	HDMI Display	8K
	RGMII	Gigabit Ethernet	RTL8211FSI-CG
	PWM	LCD Backlight	/
	UART	General	General
	SPI	General	General
	GPIO	General	General
Forlinx Desktop20.04 Drive Support List	**Interface**	**Function**	**Plan**
	I2S	Audio chip	NAU88C22YG
	I2C	RTC chip	PCF8563
	RS485	TTL to 485	FIT-485 V1.1
	PCIe	Onboard WIFI module	AW-CM276MA and AW-XM458
	PCIe	PCIe3.0x4	TL-NT521 10 Gigabit Ethernet Network Interface Card
	PCIe	M.2 NVMe SSD	Samsung 970 EVO Plus 250GB (Test Model)
	UART	BT	AW-CM276MA and AW-XM458
	USB	USB camera	Logitech C270 (UVC protocol)
	USB	4G module	Quectel EM05 (driver compatible with EC20-CEHDLG)
	USB	5G module	Quectel RM500U，RM500Q
	MIPI-CSI	Camera	OV13850
	MIPI-DSI	7-inch capacitive touch screen	FIT-LCD7.0C MIPI V2.0 V3.0
	eDP	12.5-inch LCD	BOE NV125FHM-N82,12.5-inch,1920*1080 resolution
	DP	DP Display	4K
	HDMI	HDMI Display	8K
	RGMII	Gigabit Ethernet	RTL8211FSI-CG
	PWM	LCD Backlight	/
	UART	General	General

	SPI	General	General
	GPIO	General	General
Linux5.10.66	**Interface**	**Function**	**Plan**
Drive Support List	I2S	Audio chip	NAU88C22YG
	I2C	RTC chip	PCF8563
	RS485	TTL to 485	FIT-485 V1.1
	PCIe	Onboard WIFI module	AW-CM276MA, AW-XM458
	PCIe	PCIe3.0x4	TL-NT521 10 Gigabit Ethernet Network Interface Card
	PCIe	M.2 NVMe SSD	Samsung 970 EVO Plus 250GB (Test Model)
	UART	BT	AW-CM276MA, AW-XM458
	USB	USB camera	Logitech C270 (UVC protocol)
	USB	4G module	Quectel EM05 (driver compatible with EC20-CEHDLG)
	USB	5G module	Quectel RM500U，RM500Q
	MIPI-CSI	Camera	OV13850
	MIPI-DSI	7-inch capacitive touch screen	FIT-LCD7.0C MIPI V2.0 V3.0
	eDP	12.5-inch LCD	BOE NV125FHM-N82,12.5-inch,1920*1080 resolution
	DP	DP Display	4K
	HDMI	HDMI Display	8K
	RGMII	Gigabit Ethernet	RTL8211FSI-CG
	PWM	LCD Backlight	/
	UART	General	General
	SPI	General	General
	GPIO	General	General
Forlinx Desktop22.04 Drive Support List	**Interface**	**Function**	**Plan**
	I2S	Audio chip	NAU88C22YG
	I2C	RTC chip	PCF8563
	RS485	TTL to 485	FIT-485 V1.1
	PCIe	Onboard WIFI module	AW-CM276MA and AW-XM458
	PCIe	PCIe3.0x4	TL-NT521 10 Gigabit Ethernet Network Interface Card
	PCIe	M.2 NVMe SSD	Samsung 970 EVO Plus 250GB (Test Model)
	UART	BT	AW-CM276MA and AW-XM458
	USB	USB camera	Logitech C270 (UVC protocol)
	USB	4G module	Quectel EM05 (driver compatible with EC20-CEHDLG)
	USB	5G module	Quectel RM500U，RM500Q
	MIPI-CSI	Camera	OV13850
	MIPI-DSI	7-inch capacitive touch screen	FIT-LCD7.0C MIPI V2.0 V3.0
	eDP	12.5-inch LCD	BOE NV125FHM-N82,12.5-inch,1920*1080 resolution
	DP	DP Display	4K
	HDMI	HDMI Display	8K
	RGMII	Gigabit Ethernet	RTL8211FSI-CG

	PWM	LCD Backlight	/
	UART	General	General
	SPI	General	General
	GPIO	General	General

Materials List:

Linux5.10.66+Qt5.12.8 Materials List:	User Manual, Compilation Guide Manual, Linux Kernel Source Code, File System, Factory Image, Development Environment VM Ubuntu Image, TF Card Flashing Tool, USB OTG Flashing Tool, QT Test Routine Source Code*, Application Notes*, User FAQ Manual*, Development Environment Docker Deployment Package*.
Android12.0 Materials List:	User Manual, Compilation Guide Manual, Linux Kernel Source Code, File System, Factory Image, Development Environment VM Ubuntu Image, TF Card Flashing Tool, USB OTG Flashing Tool, QT Test Routine Source Code*, Application Notes*, User FAQ Manual*, Development Environment Docker Deployment Package*.
Forlinx Desktop20.04 Materials List:	User Manual, Compilation Guide Manual, Linux Kernel Source Code, File System, Factory Image, Development Environment VM Ubuntu Image, TF Card Flashing Tool, USB OTG Flashing Tool, QT Test Routine Source Code*, Application Notes*, User FAQ Manual*, Development Environment Docker Deployment Package*.
Forlinx Desktop22.04 Materials List:	User Manual, Compilation Guide Manual, Linux Kernel Source Code, File System, Factory Image, Development Environment VM Ubuntu Image, TF Card Flashing Tool, USB OTG Flashing Tool, QT Test Routine Source Code*, Application Notes*, User FAQ Manual*, Development Environment Docker Deployment Package*.
Hardware Materials:	Hardware Manual, Carrier Board Schematic Diagram (AD Format) Source File, Carrier Board PCB (AD Format) Source File, Carrier Board Schematic Diagram PDF, Chip Data Sheet, SoM 2D CAD Drawing, Carrier Board 2D CAD Drawing, Pin Function Multiplexing Table, Design Guide*

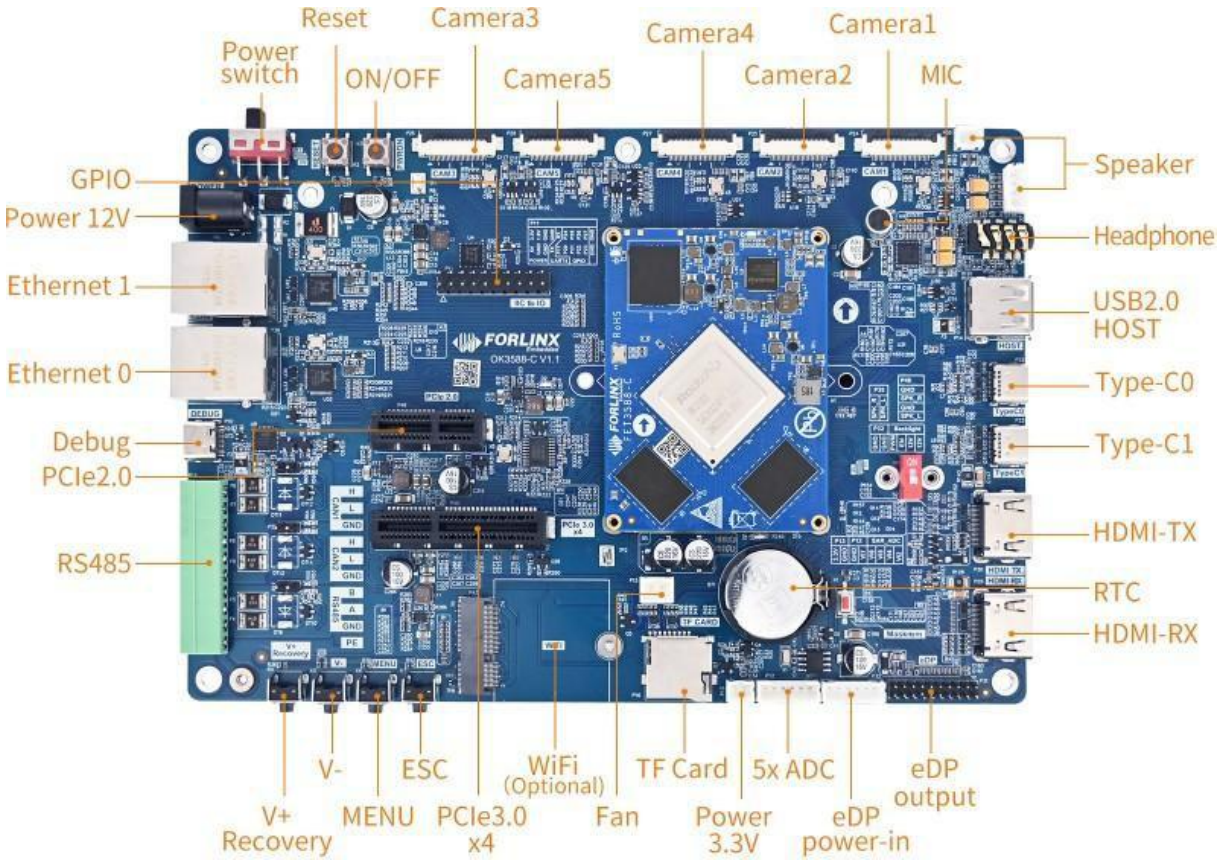
***: The documentation will be gradually provided and enriched after the product is released.**

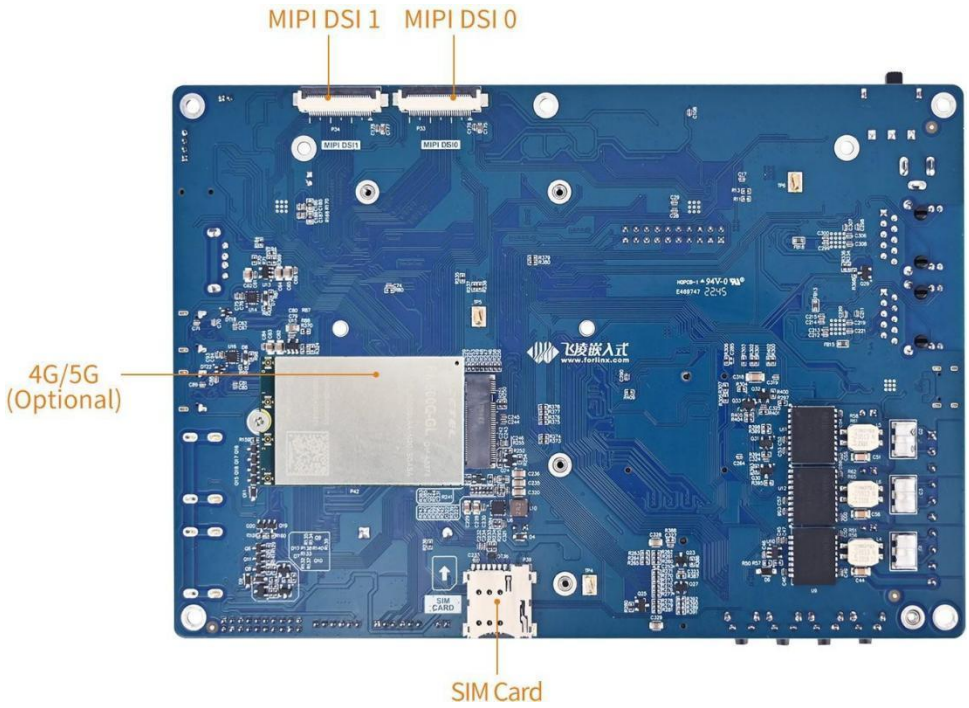
Order Model List:

Specification Model	Core	CPU Main Frequency	RAM	ROM	Operating Temperature	Supply
FET3588-C+244GSE32GC	4×A76+4×A55	A76@2.4GHz A55@1.8GHz	4GB	32 GB	0~+80℃	Mass Production
FET3588-C+248GSE64GC			8GB	64 GB	0~+80℃	Mass Production
FET3588-C+2416GSE128GC			16GB	128 GB	0~+80℃	Mass Production
FET3588J-C+224GSE32GI	4×A76+4×A55	A76@1.6GHz A55@1.3GHz	4GB	32 GB	-40~+85℃	Mass Production
FET3588J-C+228GSE64GI			8GB	64 GB	-40~+85℃	Mass Production
FET3588J-C+228GSE64GI			8GB	64 GB	-40~+85℃	Mass Production
FET3588J-C+2216GSE128GI			16GB	128 GB	-40~+85℃	Mass Production

Note: Product specifications, model numbers, configurations, clock speeds, etc., during the planning phase may be subject to change upon final release.

Development Board Interface:





Development Board Function Parameters:

Function	Quantity	Parameter
MIPI CSI	5	·2× MIPI DPHY V2.0 with 4 lanes, supporting up to 4.5Gbps per lane; routed through two 26pins FPC connectors, with OV13850 camera mounted by default; · 2× MIPI DPHY V1.2 with 2 lanes, supporting up to 2.5Gbps per lane; routed through three 26pins FPC connectors, with OV5645 camera mounted by default; · 1× MIPI DPHY V1.2 with 4 lanes, supporting up to 2.5Gbps per lane.
MIPI DSI	2	· Each MIPI interface supports 4 lanes output with a maximum resolution of 4K@60fps; · Compatible with Forlinx's 7-inch MIPI screen, featuring a resolution of 1024×600@30fps.
HDMI RX	1	·Routed through a standard HDMI socket; ·Supports up to 4K@60Hz.
HDMI	1	·Routed through a standard HDMI socket; ·Supports up to 7680×4320@60Hz.
eDP TX	1	·Compatible with displays at 1080p@60Hz; ·Supports up to 4K@60Hz.
DP TX	2	·2 x DP are combined with USB3.1 Gen1 and routed through a Type-C connector; ·Supports up to 7680×4320@30Hz.
USB3.1 Gen1	2	· Routed through a Type-C connector; · Combined with DP TX for data rates up to 5Gbps.
USB2.0 Host	1	·Routed through a Type-A USB connector; ·Supports three modes: High-speed (480Mbps), full-speed (12Mbps), and low-speed (1.5Mbps).
PCIe3.0	1	·Routes 1×4 lanes PCIe signals through a PCIe x4 slot; ·2.5Gbps(PCIe1.1), 5Gbps （PCIe2.1), 8Gbps (PCIe3.0).
PCIe2.0	1	·Routed through a PCIe x1 slot; ·Supports a data rate of 5Gbps.
Ethernet	2	·Routed through 2 x RJ45; ·Supports data transmission rates of 10/100/1000 Mbps.
TF card	1	·TF card is available, rate up to 150Mhz, supports SDR104 mode.
Audio	1	·Onboard Codec chip supporting functions such as headphone output, MIC input, and speaker output.
RS485	1	· 1 x RS485 CAN bus routed out through RS485 transceiver;
UART	1	·Routed through a 2.54mm pitch connector; ·Supports baud rates up to 4Mbps.
4G/5G	1	·Supports M.2 packaged 4G/5G modules.
WIFI&BT	1	·Supports M.2 packaged WIFI&BT modules (non-standard configuration); ·Supports WI-FI 6 SU and MU-MIMO + Bluetooth 5.3.
ADC	5	·Routed through PH2.0 sockets; ·12-bit resolution and sampling rates up to 1MS/s.
RTC	1	·Onboard RTC chip and battery socket.
FAN	1	·Onboard fan connector.
GPIO	9	·Routes 9 x GPIO (3.3V level) along with 5V, 3.3V, and 1.8V power supplies through a 2.54mm pitch pin header.

Power Consumption:

No.	Test Item	Power Voltage （V）	SoM Power (W)	Development board power (including SoM) (W)
1	Standby Power	12±5%	3.25	9.01

