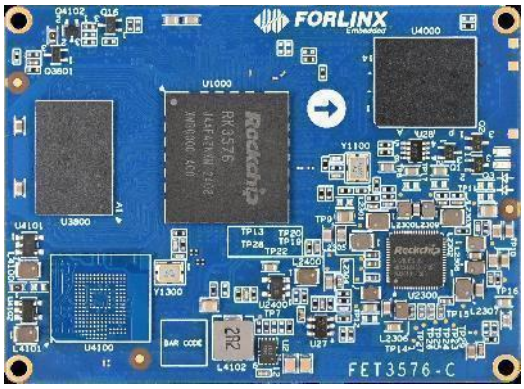
FET3576-C SoM

FET3576-C System on Module (SoM) is powered by Rockchip's RK3576 an advanced, low power and versatile SoC for AIoT and industrial automation related applications, it contains 4 Cortex-A72 cores and 4 Cortex-A53 cores, and is with a 6 TOPS NPU. It's designed with 4 ultra thin connectors which is convenient for plug operations and maintenance.

Rigorous comprehensive tests ensures stability for device running in tough industrial environment.



Features:

- 8NM processing technology;
- 4x 100-pin board-to-board connectors maximize processor performance;
- Compatible designing with FET3588-C;
- Firewall supports device access and priority management ;
- H.265 decoding up to 8K;
- Multiple display interface: HDMI/eDP, MIPI DSI, Parallel, EBC, DP, supports three displays work together with different content ;
- Various high-speed peripheral: PCIe2.1, USB3.2, CAN-FD, etc.

4x A72+ 4x A55	Big.Little	RK Firewall
CPU	Architecture	Isolation
Mali-G52 MC3	6TOPS	H.265@8Kp30
GPU	NPU	VPU

SoM Overview:

Processor	Rockchip RK3576 ARM: 4×Cortex-A72@2.3GHz + 4×Cortex-A53@2.2GHz NPU: 6TOPS INT8, supports INT4/INT8/INT16/FP16/BF16/TF32 GPU: ARM Mali-G52 MC3 **VPU:** Hard Decode: H.264、H.265，4K@60fps Hard Encode: H.264, H.265, VP9, AV1, AVS2, 8K@30fps or 4K@120fps
RAM	2GB/4GB LPDDR4
ROM	32GB eMMC
Power input	DC 12V
Operating temp	FET3576-C: 0℃~+80℃ FET3576J-C: -40℃~+85℃
Package	Board-to-board connector(4*100-pin, 0.4mm pitch, combined height 1.5mm)

SoM Features

Interface	QTY	Spec.	
HDMI/eDP TX (1)	1	• Supports 1x HDMI/eDP TX (multiplexed) **HDMI:** HDMIv2.1, up to 4K@ 120Hz; Supported form: RGB/YUV444/YUV422/YUV420 8/10-bits Supports CEC, ARC, HDCP v2.3 and HDCP v1.4 **eDP:** eDP v1.3 contains	3x VOP, can support up to 3 displays with different content
MIPI DSI (1)	1	Supports 1x MIPI DSI-2 TX D-PHY v2.0 or C-PHY v1.1: 4 data lanes on D-PHY 3 data trios on C-PHY Up to 2560×1600@60Hz Supported form: RGB(up to 10bit)	
Parallel (1)	1	Supports RGB/BT.656/BT1120 Up to 1920×1080@60Hz Supported form: RGB(up to 10bit)	
EBC (1)	1	Supports E-ink EPD (Electronic paper Display) Supports 2560×1920 hard decoding Supported data bus width: 16-bit Up to 32 level gray scale Supports Direct mode, LUT mode and 3-window mode Supports window display mode	
DP TX (1)	1	Supports one USB/ DP combination USB: USB 3.2 Gen1x1，Dual-Role Device(DRD); DisplayPort TX: DisplayPort v1.4，supports 1/2/4 lanes with lane speed including 1.62, 2.7, 5.4 and 8.1Gbps; Up to 4K@120Hz, supported form: RGB/YUV444/YUV422/YUV420 8/10-bit; Supports MST; Supports USB Type-C with DP Alt; Supports HDCP v2.3 and HDCP v1.3	
USB3.2	2	1x USB Type-C can support DP Alt mode; 1x Combo high speed interface	
MIPI-CSI	5	5x CSI-2 Four of them are 2x D-PHY v1.2 data-lane, 2.5Gbps/lane, and they can combine to two interfaces each with 4 data lanes; Another one supports 4 D-PHY data-lane or 3 C-PHY trios: D-PHY v2.0, 4.5Gbps/lane C-PHY v1.1, 2.5Gsps/trio	Can support up to 5 CSI work together
DVP	1	8/10/12/16-bit standard DVP, up to 150MHz data input; Supports BT.601/BT.656 and BT.1120 VI	
SAI (2)	≤5	SAI 0/1 support 4 TX lanes and 4 RX lanes; SAI 2/3/4 support 1TX lane and 1 RX lane; Supports I2S/TDM/PCM mode(2) Sampling rate up to 192KHz Audio resolution up to 16~32bits	

SPDIF TX	≤2	
SPDIF RX	≤2	
PDM	≤2	Supports PDM with main receiving mode; Up to 8 channels, audio resolution 16~ 24-bit, sampling rate up to 192KHz
Digital Audio Codec	1	Supports 2x DAC, each DAC can support 3 blending modes; Supports I2S/ PCM, master/ slave mode; 16-bit sampling rate; Supports volume controlling
SDIO	≤2	SDIO v3.0，4-bits
Ethernet	≤2	2x GMAC, pin out by RGMII/ RMII; 10/ 100/ 1000Mbps
USB2.0 OTG	2	
Combo high speed interface	2	**Combo 1:** 1-lane PCIe2.1/SATA3.1 **Combo 2:** 1-lane PCIe2.1/SATA3.1/USB3.2 Gen1x1 **PCIe interface** PCIe v2.1; Root Complex (Rc) only; Up to 5GT/s data rate **SATA interface** SATA v3.1 and AHCI revision v1.3.1; eSATA; Up to 6GT/s data rate **USB interface** UsB3.2 Gen1x1 with UsB v2.0 DRD (host and device) Up to 5Gbps data rate xHCI Host with up to 64 devices
UART	≤12	2 built-in 64 bits FIFO for TX and RX; Supports 5/6/7/8-bit serial trasceving, up to 4Mbps; All 12 UARTs can support flow control and RS485
CAN-FD	≤2	Compliant with CAN and CAN-FD; Supports CAN standard frame and extended frames transceiving; Supports 8192-bit FIFO
DSMC	≤1	Can support up to 4 chips selection Support 8-line and 16-line Supported configurable serial address width: 16-bit or 32-bit
FlexBus	≤1	Supports built-in DMA and ping-pong operations for two addresses allocation Supports sending and receiving modes Supports single mode and continuous mode
SPI	≤5	Supports master mode and slave mode, each can support two chips selection
I2C	≤9	7-bit and 10-bit address modes; Standard mode data rating 100k bits/ s, and HS mode rating 400k bits/ s
I3C	≤2	
PWM	≤16	Supports up to 16 on-chip PWMs with interrupt operation, supports capturing mode
ADC	≤8	8x 12-bit SAR-ADC, sampling rate up to 1MS/s
GPIO	/	All GPIO can be used to generate interrupt; Supports power trigger interrupt and edge trigger interrupt; Supports polarity triggered by power configuring; Supports interrupt triggered by rising edge, falling edge and double edges; Supports pull-up/ pull-down configuration(weak pull-up and weak pull-down); Supports drive capacity configuring

Note(1) Video Port

Video Port0: up to 4K@120Hz, 10 bits;

Video Port1: up to 2560x1600@60Hz, 10 bits;

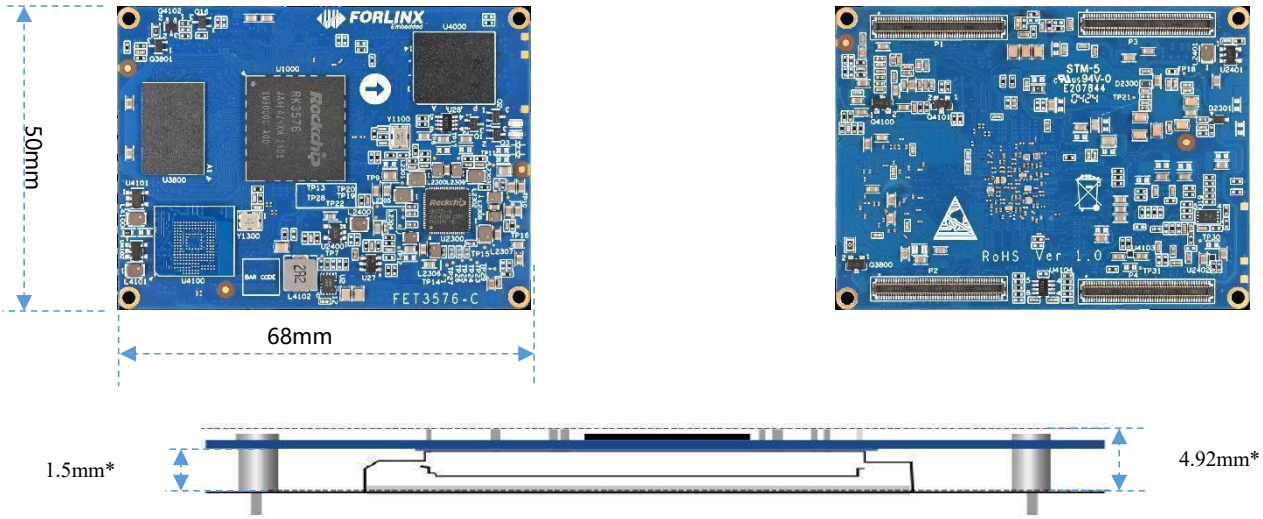
Video Port2: up to 1920x1080@60Hz, 8 bits

Each interface can be connected to HDMI/eDP/DSI-2

Port1 and Port2 can be connected to serial output interface

Note(2): single TDM clock up to 50MHz, when working with TDM mode, it can work together with audio sampling frame rate and resolution to compute supported audio channels

Exterior and dimensions:



Height diagram after installation

* tolerance ±0.2mm

OS:

OS	Linux 6.1.57, Android[TBD]
Firmware installation	USB OTG

Driver list:

Linux6.1.57 Driver List

Interface	Function	Spec.
SDIO	WiFi	AWCM358SM
UART	BT	
I2C	RTC	rx8010
I2C	IO expanding	PCAL6524
SAI	audio	NAU88C22YG
MIPI-DSI/ I2C	Capacitive TP	FIT-LCD7.0C, MIPI V2.0 V3.0
PCIe	PCIe to Ethernet	8111E
MIPI-CSI	camera	OV13855
USB	Camera	UVC, C270
USB	4G/ 5G	EM05, RM500U, M.2 slot, compatible with EC20
UART	TTL to RS485	FIT-485 V1.1
RGMII	Gigabit Ethernet	RTL8211FSI-CG
PWM	LCD backlight	Generic
CAN	Generic	Generic
PWM	Generic	Generic
ADC	Generic	Generic

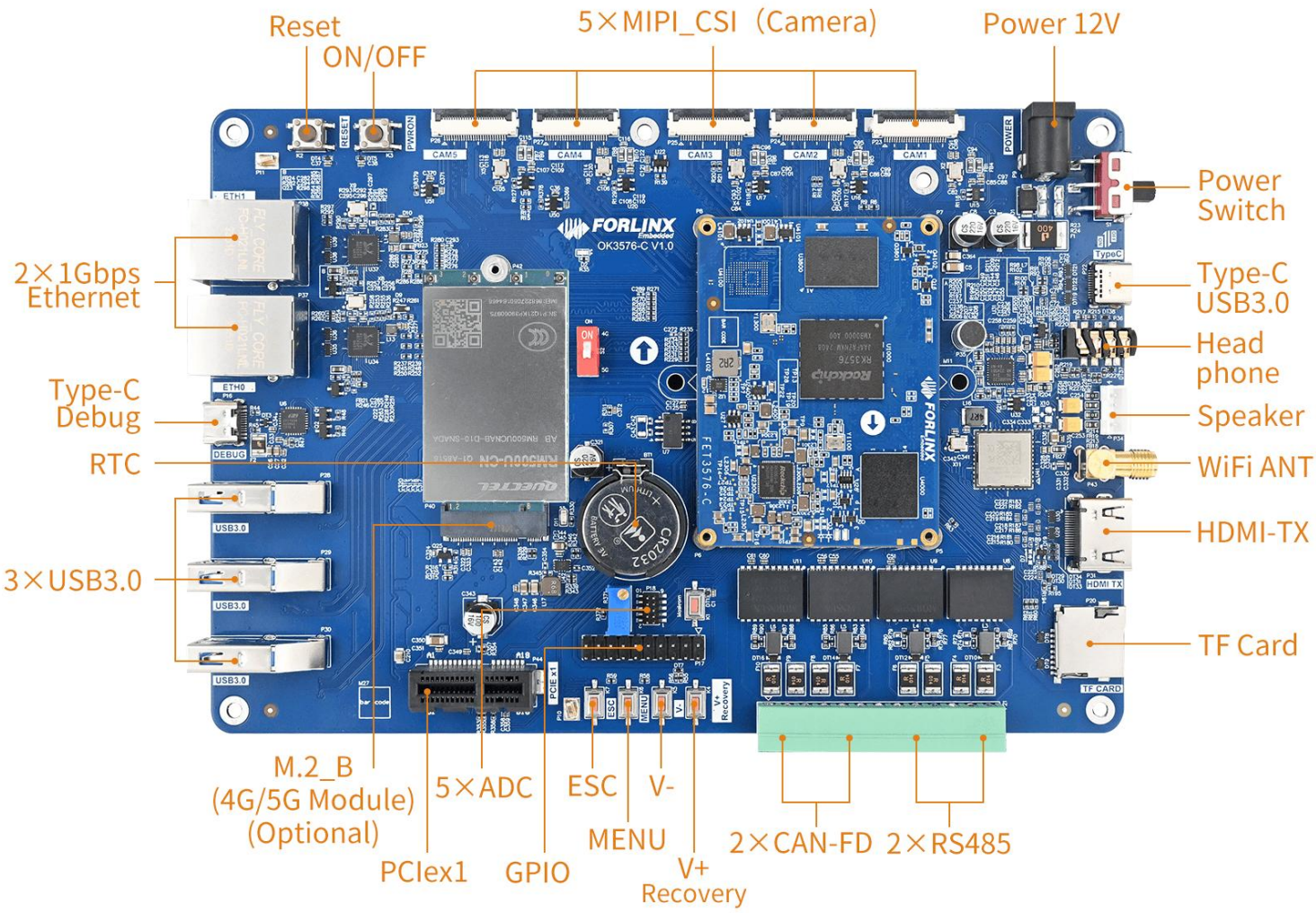
Provided technical files

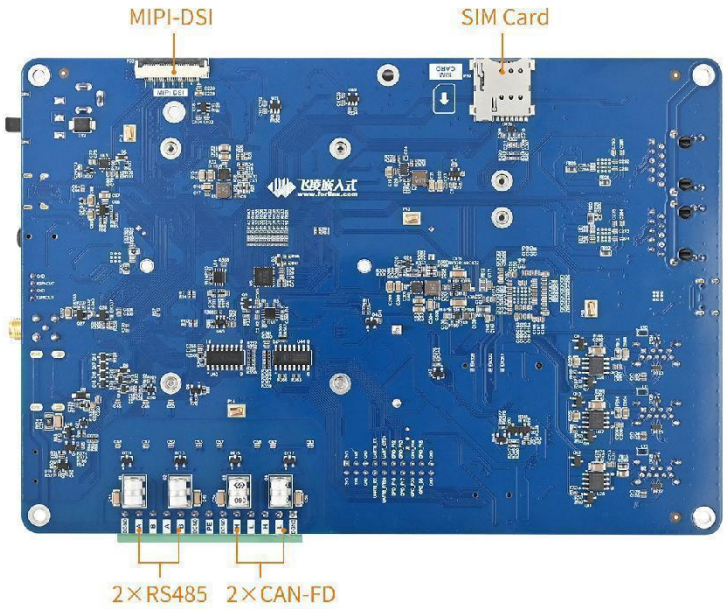
Linux6.1.57	User manual, compiling guideline, kernel source code, file system, OS image, VM ubuntu image, flashing tool
Hardware	User manual, carrier board schematic, carrier board PCB(AD) source files, datasheet, carrier board and SoM DXF files, pinmux sheet

Order options:

Model	Core number	CPU speed	RAM	Flash	Working temp	Status
FET3576-C+232GSE32GCAxx: xx	4 x A72+4 x A53	2.3GHz	2GB	32GB	0~+80℃	Sampling
FET3576-C+234GSE32GCBxx: xx	4 x A72+4 x A53	2.3GHz	4GB	32GB	0~+80℃	Sampling
FET3576J-C+xx2GSE16GIxxx: xx	4 x A72+4 x A53	TBD	2GB	16GB	-40℃~+85℃	Scheduled
FET3576J-C+xx4GSE32GIxxx: xx	4 x A72+4 x A53	TBD	4GB	32GB	-40℃~+85℃	Scheduled
FET3576J-C+xx8GSE64GIxxx: xx	4 x A72+4 x A53	TBD	8GB	64GB	-40℃~+85℃	Scheduled

Development board/ kit





Carrier board features:

Interface	QTY	Spec.
HDMI TX	1	Standard HDMI connector, HDMI v2.1, up to 4K@ 120Hz
MIPI DSI	1	• Supports 4 lanes output, up to 2560×1600@60Hz; • Forlinx default option: 7'' MIPI DSI module, 1024x 600@30FPS
DP TX	1	Multiplexed with USB3.1 Gen1, pin out by Type-C connector; DisplayPort v1.4, up to 4K@ 120Hz
HDMI	1	Standard HDMI connector, up to 7680x4320@60Hz
USB3.1 Gen1	1	By Type-C connector, work together with DP TX
MIPI-CSI	5	1×MIPI DPHY V2.0 4 lanes, each lane up to 4.5Gbps; By 1x 26pins FPC connector, default supported camera model: OV13850; 4×MIPI DPHY V1.2 2 lanes, each lane up to 2.5Gbps; By 4x 26pins FPC connectors, default supported camera model: OV5645
Audio	1	On-board codec chip, supports Phone, MIC and Speaker
TF Card	1	•up to 150Mhz, supports SDR104 mode
Ethernet	2	2x RJ45, 10/100/1000 Mbps
4G/ 5G	1	M.2 slot
WiFi& BT	1	AW-CM358SM-WIFI&BTm supports 2.4G/ 5G WiFi and BT5.0
USB2.0 Host	3	3x Type-A USB connector, supports HS mode(480Mbps), FS mode(12Mbps) and LS mode(1.5Mbps)
PCIe2.0	1	By PCIe x1 slot, up to 5Gbps
UART	1	Headers with pitch of 2.54mm, up to 4Mbps
CAN-FD	2	Compliant with CAN and CAN-FD, with built-in transceivers
RS485	2	
ADC	5	Headers with pitch of 1.27mm, 12 bits SAR-ADC, sampling rate up to 1MS/ s
RTC	1	On-board RTC chip and batter holder
GPIO	8	Headers with pitch of 2.54mm for 8 GPIOs and power of 5V/ 3.3V/ 1.8V