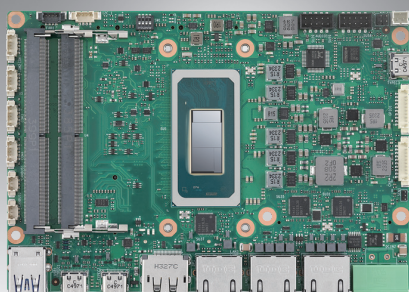


AFE-R360

Intel® Core™ Ultra 7/5 Processors, (Code Name: Meteor Lake-H/U) 3.5" SBC

Preliminary



Windows 10

WISE-DeviceOn iManager

yocto



ubuntu



Specifications

Platform	Processor	Core Ultra 7, 155H	Core Ultra 5, 125H	Core Ultra 7, 155U	Core Ultra 5, 125U
	Max. Frequency	4.8GHz	4.5GHz	4.8GHz	4.3GHz
Memory	Base Frequency (P-Core)	1.4GHz	1.2GHz	1.7GHz	1.3GHz
	Core/ Thread	16, 6P+8E+2LE/ 22	14, 4P+8E+2LPE/ 18	12, 2P+8E+2LE / 14	12, 2P+8E+2LE / 14
Graphics	LLC	24MB	18MB	12MB	12MB
	CPU TDP	28W	28W	15W	15W
Expansion	Chipset	On-package Intel 600 Series Chipset			
	BIOS	AMI EFI 256Mbit			
Display I/F	Technology	DDR5 5600			
	Max. Capacity	Up to 96GB			
Ethernet	Channel/ Socket	Dual Channels/ 2 Sockets			
	Controller	Intel® ARC® Graphics	Intel® Arc™ graphics	Intel® Graphics	Intel® Graphics
Expansion	Max. Frequency	2.25GHz	2.2GHz	1.95GHz	1.85GHz
	Execution Unit	128	112	128	112
External I/O	3D/ HW Acceleration	DX12.1, OGL4.6, OCL3.0, HW Encode/ Decode: H.265 (HEVC), H.264, AV1			
	DisplayPort	1 x DP1.4a, up to 4096 x 2160x 36bpp @60Hz			
Internal I/O	Controller	LAN1-3: Intel i226LM			
	Speed	LAN1-3: 2.5GbE			
Board Feature	M.2 E-Key	1 x E-Key 2230 (PCIex2, USB2.0)			
	M.2 B-Key	1 x B-Key 3042/ 3052* (PCIe x2/ SATA, USB2.0) w/ Nano SIM			
Power	M.2 M-Key	2 x M-Key 2280 (PCIex4 Gen.4 NVMe)			
	120Pin B2B	8 lanes MIPI-CSI, I2C, 3.3V, 1.8V...			
Environment	Ethernet	3 x RJ-45			
	DP	1			
Certification	USB Type-C	2 x USB3.2 Gen2x1 10Gbps, support DisplayPort1.4 Alt. Mode			
	USB Type-A	2 x USB3.2 Gen2x1 10Gbps			
Mechanical	Power Connector	2-pin phoenix connector, optional 4-pin ATX connector			
	USB4	1 USB4 with USB Type-C, Bandwidth min. 20Gbps, max. 40Gbps, with USB4/ Display/ PCIe			
Mechanical	USB2.0	2			
	COM Port	4 x RS-232/422/485, max. 1Mbps			
Mechanical	CANBus	2 x CAN-FD			
	Serial Bus	1x I2C/ SMBUS			
Mechanical	Audio	Realtek ALC888s, Line-in/Line-out/MIC			
	GPIO	8-bit general purpose input output I/O			
Mechanical	Fan	12V, 1A (4-wire)			
	Front Panel Control	Power-on, Reset, Buzzer, CaseOpen			
Mechanical	MIPI-CSI	Up to 4x 22pin FPC, or option to 2x 30pin I-PEX MIPI-CSI ports, expanded through MIPI-CSI interfaced card, MIOe-MIPI			
	GMSL	Up to 4x FAKRA, expanded through GMSL interfaced card, MIOe-GMSL.			
Mechanical	Watchdog Timer	65536 level, 0-65535 sec			
	TPM	Discrete TPM2.0, fTPM* support by request			
Mechanical	SUSI	SW API for Hardware Monitor, Smart Fan Control, I2C, GPIO, WDT			
	Supply Voltage	Vin: DC 12V-24V +/- 10%; RTC Battery: Lithium 3V/210mAH			
Mechanical	Connector	2P Phoenix, optional to ATX 2x2 pin 90D			
	Power Management	AT, ATX			
Mechanical	Max Consumption	116.04 (12V)/ 128.4 (24V)	129.96W (12V)/ 134.4W (24V)	81.10 (12V)/ 74.3W (24V)	115.26W (12V)/ 123.40W (24V)
	Idle Consumption	13.06 (12V)/ 15.19 (24V)	15.36W (12V)/ 17.69W (24V)	14.6W (12V)/ 15.84W (24V)	12.74W (12V)/ 15.12W (24V)
Mechanical	Temperature	Operating: 0 ~ 60 °C (32 ~ 140 °F) Storage: -40 ~ 85 °C (-40 ~ 185 °F)			
	Humidity	Operating: 40 °C @ 95% relative humidity, non-condensing Storage: 60 °C @ 95%relative humidity, non-condensing			
Mechanical	Vibration Resistance	3.5 Grms			
	EMC	CE, FCC Class B			
Mechanical	Dimensions	146 x 102 mm (5.7" x 4")			
	Net Weight	170g			

*Note: Support by request

ADVANTECH

MI/O Extension SBCs, Modules and Chassis

All product specifications are subject to change without notice.

Last updated: 30-Aug-2024

Features

- Intel® Core™ Ultra 7/5 Processors, up to 16 Cores, TDP 28/15W
- Dual Channel DDR5-5600, up to 96GB
- Support 4x MIPI-CSI/ GMSL through 120pin B2B connector
- 3x LAN, 7x USB (incl. 3x USB-C), 4x UART, 2x CAN
- 4x Expansions: M.2 E-Key, B-Key, 2x M-Key (support NVMe)
- Supports Ubuntu22.04/ 24.04 LTS, Windows 10/ 11 LTSC, embedded software API SUSI, ROS2, DeviceOn

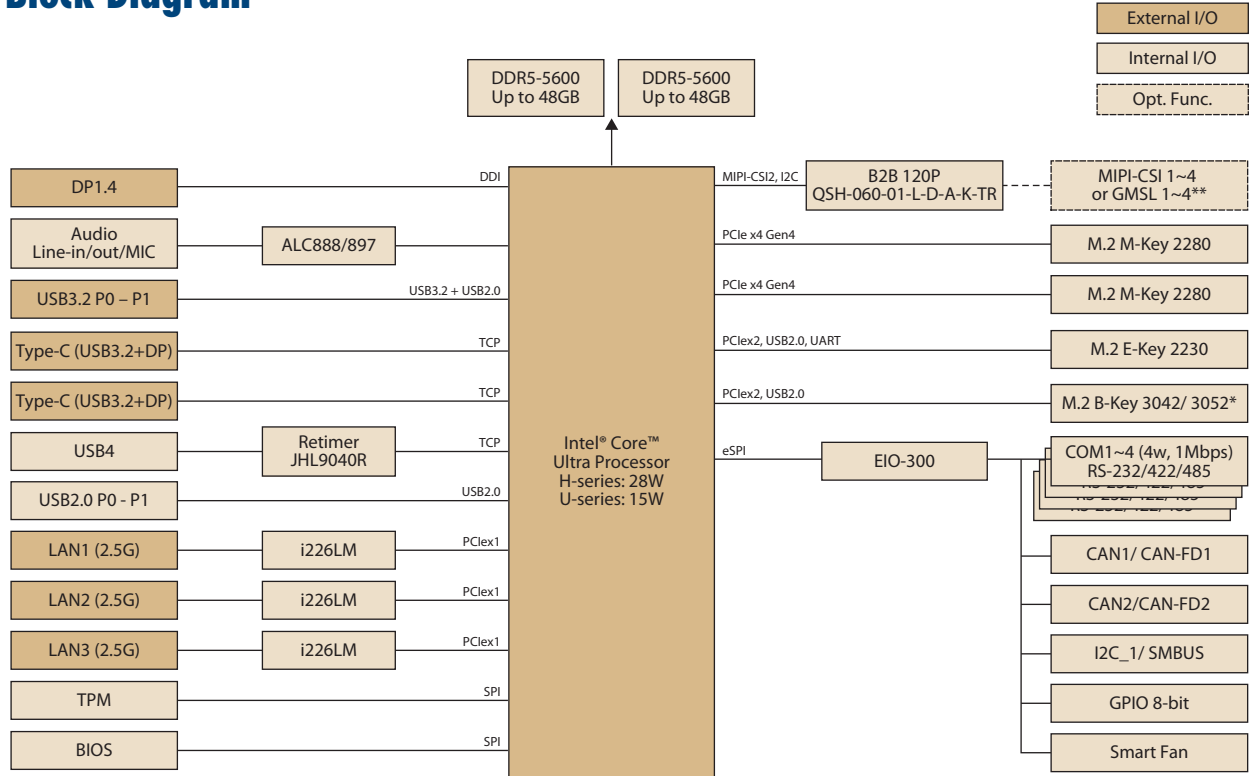
Software APIs:



Utilities:



Block Diagram



**With optional MIOe-MIPI/ MIOe-GMSL module, AFE-R360 can support up to 4xMIPI-CSI or 4x GMSL cameras.

Ordering Information

PN	CPU sku	Core	Max. Frequency	TDP	Camera Interfaced Card	Thermal	Operating Temp.
AFE-R360C7P-Q8A1	Core Ultra 7, 155H	16C, 6P+8E+2LPE	4.8GHz	28W	N	Active Cooler	0 ~ 60 °C
AFE-R360C5P-Q5A1	Core Ultra 5, 125H	14C, 4P+8E+2LPE	4.5GHz	28W	N	Active Cooler	0 ~ 60 °C
AFE-R360C7-Q8A1	Core Ultra 7, 155U	12C, 2P+8E+2LPE	4.8GHz	15W	N	Passive Heatsink	0 ~ 60 °C
AFE-R360C5-Q3A1	Core Ultra 5, 125U	12C, 2P+8E+2LPE	4.3GHz	15W	N	Passive Heatsink	0 ~ 60 °C
TBD	Core Ultra 7, 155H	16C, 6P+8E+2LPE	4.8GHz	28W	Y, with MIOe-MIPI	Active Cooler	0 ~ 60 °C

Packing List

Part No.	Description	Quantity
	AFE-R360 SBC	
1700030406-01	M Cable 2*5P-2.0/USB-A 4P(F)*2 20cm	1
1700031582-01	COM1~4 Cable, D-SUB 9P(M)/1*5P-1.25, 20cm	4
1700019584-01	A Cable 2*5P-2.0/Audio JACK*3 20cm	1
1970005512T001	Active cooler for TDP 28W CPU	1
1970005973T001	Passive heatsink for TDP 15W CPU	1

Optional Accessories

Part No.	Description
1970005998T001	AFE-R360 Heatspreader
1700009001	2P Phoenix to DC jack power cable
1700035016-01	4 wires COM RS-422/485 cables
MIOe-MIPI	MIOe-MIPI Module, 4x 22pin FPC or 2x 30pin IPEX
MIOe-GMSL	MIOe-GMSL Module, 4x GMSL
MIOe-UMXM	MIOe-UMXM USB4 to MXM carrier card

Rear IO View

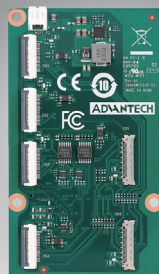


Embedded OS/API

OS	Part No.	Description
win11	TBU	64-bit (UEFI mode only)
Ubuntu 22.04 LTS	20706U22DS0050	
Software API	Download by website	
ROS2	TBU	

MIOe-MIPI

4x 2lane MIPI-CSI or 2x 4lane MIPI-CSI module card



CE FCC

MIOe-GMSL

4x GMSL module card



CE FCC

Specifications

General	Product	MIOE-MIPI-RPA1	MIOE-MIPI-IPA1
	Interface	Samtec 120pin B2B connector	
Power	DC input	From AFE-R360	From AFE-R360
	Connector	NA	NA
Camera	Interface	MIPI-CSI	MIPI-CSI
	Connector	4x 22pin FPC	2x 30pin IPEX
	MIPI lane	4x 2 lane	2x 4lane
	Data pin	I2C	I2C, GPIO
	Output Voltage	3.3V	3.3 & 1.8V
Environment	Operating Temperature	0 ~ 60 °C (32 ~ 140 °F)	
	Operating Humidity	40°C @ 95% relative humidity, non-condensing	
	Storage	60 °C @ 95%relative humidity, non-condensing	
	Vibration Resistance	3.5 Grms	
	Certification	CE, FCC Class B	
Mechanical	Dimensions	55 x 95 mm	
	Net weight	30g	
Compatibility	Board	AFE-R360	
	Camera	Innodisk: EV2M-OOM1, EV2M-GOM1	e-con: e-CAM25, e-CAM81

Specifications

General	Product	MIOE-GMSL-4PA1
	Interface	Samtec 120pin B2B connector
Power	DC input	12~24V
	Connector	2P Pwr Conn.
Camera	Interface	GMSL
	Connector	4x FAKRA
	MIPI lane	4 x 2lane
	Data pin	I2C, GPIO
	Output Voltage	12V (support POC)
Environment	Operating Temperature	0 ~ 60 °C (32 ~ 140 °F)
	Operating Humidity	40°C @ 95% relative humidity, non-condensing
	Storage	60 °C @ 95%relative humidity, non-condensing
	Vibration Resistance	3.5 Grms
	Certification	CE, FCC Class B
Mechanical	Dimensions	55 x 95 mm
	Net weight	60g
Compatibility	Board	AFE-R360
	Camera	Intel RealSense: D457