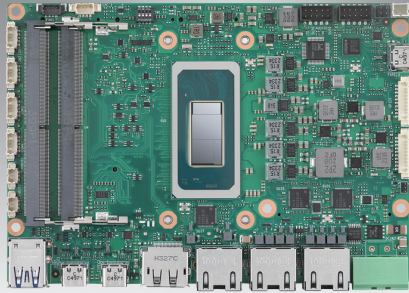


AFE-R360

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

Preliminary



Features

- Intel® Core™ Ultra 7/5 Processors, up to 16 Cores, TDP 28/15W
- Dual Channel DDR5-5600, up to 96GB
- Support MIPI-CSI through 120Pin B2B connector
- 3x LAN, 5x USB (incl. 1x USB4), 4x UART, 2x CAN-FD
- 4x Expansions: M.2 E-Key, B-Key, 2x M-Key (support NVMe)
- Supports Ubuntu22.04 LTS & Windows 10 LTSC, embedded software APIs, DeviceOn

Software APIs:



Utilities:

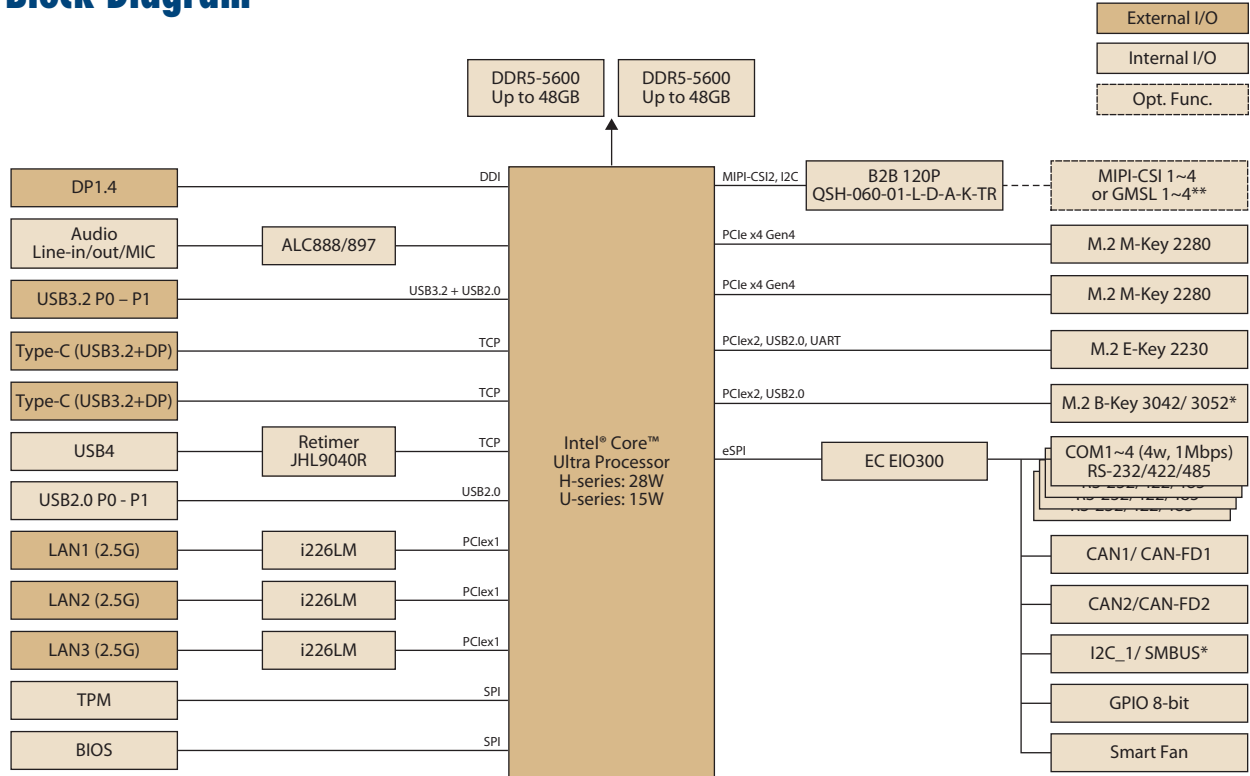


Specifications

	Processor	Core Ultra 7, 165H	Core Ultra 5, 135H	Core Ultra 7, 165U	Core Ultra 5, 135U
Platform	Max. Frequency	5.0GHz	4.6GHz	4.9GHz	4.4GHz
	Base Frequency (P-Core)	1.4GHz	1.7GHz	1.7GHz	1.6GHz
	Core/ Thread	6P+8E+2LPE/ 22	4P+8E+2LPE/ 18	2P+8E+2LPE/ 14	2P+8E+2LPE/ 14
	LLC	24MB	18MB	12MB	12MB
	CPU TDP	28W	28W	15W	15W
	Chipset	On-package Intel 600 Series Chipset			
	BIOS	AMI EFI 256Mbit			
Memory	Technology	DDR5 5600			
	Max. Capacity	Up to 96GB			
	Channel/ Socket	Dual Channels/ 2 Sockets			
Graphics	Controller	Intel® ARC® Graphics	Intel® Arc™ graphics	Intel® Graphics	Intel® Graphics
	Max. Frequency	2.3GHz	2.2GHz	2.0GHz	1.9GHz
	Execution Unit	128	128	64	64
	3D/ HW Acceleration	DX12.1, OGL4.6, OCL3.0, HW Encode/ Decode: H.265 (HEVC), H.264, AV1			
Display I/F	DisplayPort	1 x DP1.4a, up to 4096 x 2304 x 36bpp@60Hz			
Ethernet	Controller	LAN1-3: Intel i226LM			
	Speed	LAN1-3: 2.5GbE			
Expansion	M.2 E-Key	1 x E-Key 2230 (PCIex2, USB2.0, UART)			
	M.2 B-Key	1 x B-Key 3042/ 3052* (PCIe x2/ SATA, USB2.0) w' Nano SIM			
	M.2 M-Key	2 x M-Key 2280 (PCIex4 Gen.4 NVMe)			
	120Pin B2B	8 lanes MIPI-CSI, I2C, 3.3V, 1.8V...			
External I/O	Ethernet	3 x RJ-45			
	DP	1			
	USB Type-C	2 x USB3.2 Gen2x1 10Gbps, support DisplayPort1.4 Alt. Mode			
	USB Type-A	2 x USB3.2 Gen2x1 10Gbps			
	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			
	USB2.0	2			
	COM Port	4 x RS-232/422/485, max. 1Mbps			
	CANBus	2 x CAN-FD			
	Serial Bus	1 x I2C default, optional to SMBus			
Internal I/O	Audio	Realtek ALC888s, Line-in/Line-out/MIC			
	GPIO	8-bit general purpose input output I/O			
	Fan	12V, 1A (4-wire)			
	Front Panel Control	Power-on, Reset, Buzzer, CaseOpen			
	MIPI-CSI	Up to 4x Raspberry Pi 22pin MIPI-CSI ports, expanded through MIPI-CSI interfaced card, MIOe-MIPI.			
	GMSL	Up to 4x FAKRA, expanded through GMSL interfaced card, MIOe-GMSL.			
	Watchdog Timer	65536 level, 0-65535 sec			
	TPM	Discrete TPM2.0, fTPM* support by request			
	iManager 3.0	SW API for Hardware Monitor, Smart Fan Control, I2C, GPIO, WDT			
	Power	Supply Voltage	Vin: DC 12V-24V +/- 10%; RTC Battery: Lithium 3V/210mAH		
Connector		2P Phoenix, optional to ATX 2x2 pin 90D			
Power Management		AT, ATX			
Max. Consumption		TBU	TBU	TBU	TBU
Environment	Idle Consumption	TBU	TBU	TBU	TBU
	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			
	Vibration Resistance	3.5 Grms			
Certification	EMC	CE, FCC Class B			
	Dimensions	146 x 102 mm (5.7" x 4")			
Mechanical	Net Weight	TBU			

*Note: Support by request

Block Diagram



* support by request

**AFE-R360 need camera interfaced cards for MIPI-CSI port (through MIOe-MIPI) and GMSL ports (through MIOe-GMSL).

Ordering Information

PN	CPU sku	Core	Max. Frequency	TDP	Camera Interfaced Card	Thermal	Operating Temp.
AFE-R360C7P-R0A1	Core Ultra 7, 165H	16C, 6P+8E+2LPE	5.0GHz	28W	N	Active	0 ~ 60 °C
AFE-R360C5P-Q6A1	Core Ultra 5, 135H	14C, 4P+8E+2LPE	4.6GHz	28W	N	Active	0 ~ 60 °C
AFE-R360C7-Q9A1	Core Ultra 7, 165U	12C, 2P+8E+2LPE	4.9GHz	15W	N	Passive Heatsink	0 ~ 60 °C
AFE-R360C5-Q4A1	Core Ultra 5, 135U	12C, 2P+8E+2LPE	4.4GHz	15W	N	Passive Heatsink	0 ~ 60 °C
TBD	Core Ultra 7, 165U	12C, 2P+8E+2LPE	4.9GHz	15W	Y, with MIOe-MIPI	Passive Heatsink	0 ~ 60 °C

Packing List

Part No.	Description	Quantity
	AFE-R360 SBC	
	Startup Manual	
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
TBU	Passive heatsink for TDP 15W CPU	1

Optional Accessories

Part No.	Description
TBU	AFE-R360 Heatspreader
MIOe-UMXM-FVA1	USB4 to MXM carrier card, ATX conn., 12V
MIOe-UMXM-WVA1	USB4 to MXM carrier card, Phoenix conn., 12-24V
TBU	MIOe-MIPI

Embedded OS/API

OS	Part No.	Description
WIN10	TBU	64-bit (UEFI mode only)
Ubuntu 22.04 LTS	TBU	
Software API	Download by website	
ROS2	TBU	
Yocto BSP		

Rear IO View

