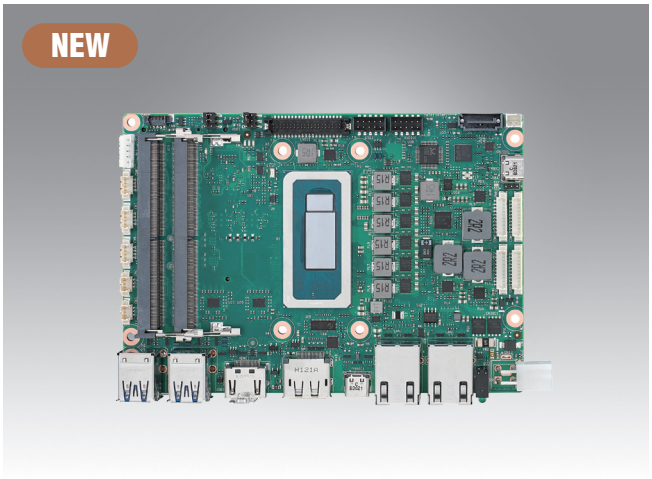
MIO-5377R

13th Gen. Intel® Core™ Processors (Code Name: Raptor Lake-P) 3.5" SBC with USB4 for MXM GPU



Features

- 13th Gen. Intel® Core™ Processor up to 14 Cores, TDP 28/15W
- Dual Channel DDR5-4800 up to 64GB, IBECC support by SKU
- 4 simultaneous displays: LVDS/HDMI/DP/USB-C Alt. DP
- 2x LAN, 8x USB (incl. 1x USB4), 4x UART, 2x CANBus, 3x I²C
- 3 Expansions: M.2 E-Key, B-Key, M-Key (support NVMe)
- Supports Windows 10 LTSC & Ubuntu 22.04 LTS, embedded software APIs, DeviceOn

Software APIs: GPIO, SMBus/I²C, Watch Dog Timer, Backlight On/Off, Brightness, CAN bus

Utilities: Hardware Monitor, System Throttling, Thermal Protection, Smart Fan, Data Security, System Info

Windows 10 Ubuntu DeviceOn iManager CE FC

Specifications

Platform	Processor	i7-1370PE	i7-1370PRE	i7-1365UE	i7-1365URE	i5-1345UE	i3-1315UE	U300E
	Max. Frequency (P-Core)	4.80 GHz	4.80 GHz	4.90 GHz	4.90 GHz	4.60 GHz	4.50 GHz	4.30 GHz
	Base Frequency (P-Core)	1.90 GHz	1.90 GHz	1.70 GHz	1.70 GHz	1.40 GHz	1.20 GHz	1.10 GHz
	Core/Thread	6P+8E / 20T	6P+8E / 20T	2P+8E / 12T	2P+8E / 12T	2P+8E / 12T	2P+4E / 8T	1P+4E / 6T
	Intel® Smart Cache (L3)	24MB	24MB	12MB	12MB	12MB	10MB	8MB
	CPU TDP	28W	28W	15W	15W	15W	15W	15W
	Chipset	On-package Intel 600 Series Chipset						
	BIOS	AMI UEFI 256Mbit						
Memory	Technology	DDR5-4800						
	Max. Capacity	Up to 64GB						
	IBECC	No	Yes	No	Yes	No	No	No
	Channel/Socket	Dual Channels / 2 sockets						
Graphics	Controller	Intel® Iris® Xe Graphics					Intel® UHD Graphics	
	Max. Frequency	1.40 GHz	1.40 GHz	1.30 GHz	1.30 GHz	1.25 GHz	1.20 GHz	1.10 GHz
	Execution Units	96	96	96	96	80	64	48
	3D/HW Acceleration	DX12.1, OGL4.6, OCL3.0, HW Encode: H.265/HEVC, H.264, MPEG2, HW Decode: H.265						
Display I/F	LCD	1 x LVDS: Dual Channel 18/24-bit, up to 1920 x 1200						
	HDMI/DP	1 x HDMI 2.0b, up to 4096 x 2160 x 24bpp@60Hz 1 x DP1.4, up to 4096 x 2304 x 36bpp@60Hz						
	Multiple Display	4 simultaneous displays via LVDS + HDMI + DP + USB Type-C Alt. Mode						
Ethernet	Controller	LAN1: Intel i219 ; LAN2: Intel i226						
	Speed	LAN1: GbE ; LAN2: 2.5GbE						
	TSN support	No	Yes (LAN2 only)	No	Yes (LAN2 only)	No	No	No
External I/O	Ethernet	2 x RJ-45						
	HDMI/DP	1 x HDMI, 1 x DP						
	USB Type-C	1 x USB3.2 Gen2x1 10Gbps, support DisplayPort1.4 Alt. Mode						
	USB Type-A	4 x USB3.2 Gen2x1 10Gbps						
	LED	Power status, SATA R/W						
	Power DC-Jack	Optional						
Internal I/O	SATA	1 x SATA GenIII 6.0Gbps						
	USB4	1 USB4 with USB Type-C, Bandwidth min. 20Gbps, max. 40Gbps, with USB3.2, Display & PCIe						
	USB2.0	2						
	COM Port	2 x RS-232/422/485, 2 x RS-232 (4-wire), max. 1Mbps						
	CAN Bus	2 x CAN2.0						
	Serial Bus	3 x I²C (CN6 is BOM option to 1 x SMBus by request; First priority is to use CN6; On Windows, CN7 & CN8 are supported by custom BIOS)						
	Audio	Realtek ALC888s, Line-in/Line-out/MIC						
	GPIO	8-bit general purpose input output I/O						
	Invertor	12V/5V/3.3V selectable						
	Fan	12V, 1A (4-wire)						
	Front Panel Control	Power-on, Reset, Buzzer, SATA LED, CaseOpen						
Board Feature	Watchdog Timer	65536 level, 0–65535 sec						
	TPM	Discrete TPM2.0 IC (*fTPM support by request)						
	iManager 3.0	SW API for Hardware Monitor, Smart Fan Control, Brightness Control, I²C, GPIO, WDT						
Expansion	M.2 E-Key	1 x E-Key 2230 (PCIex1, USB2.0) for WiFi/BT module						
	M.2 B-Key	1 x B-Key 3042 (PCIex1, SATA, USB2.0) for storage and 4G/LTE module w/ Nano SIM (Default with 3042. *Support 3052 for 5G module by request.)						
	M.2 M-Key	1 x M-Key 2280 (PCIe Gen.4 x4) for NVMe SSD						
Power	Supply Voltage	Vin: DC 12V–24V ± 10%; RTC Battery: Lithium 3V/220mAH (*200mAH for Extend Temp. SKU)						
	Connector	ATX 2x2 pin 90D, optional DC-Jack, or ATX 2x2 pin 180D						
	Power Management	AT, ATX						
	Max. Consumption (*Ref. data with Burn-In Test. Please contact FAE for adapter selection.)	12V: 46.7W 24V: 48.5W	12V: 46.7W 24V: 48.5W	12V: 29.5W 24V: 29.7W	12V: 29.5W 24V: 29.7W	12V: 25.6W 24V: 27.5W	12V: 24.5W 24V: 25.1W	12V: 24.0W 24V: 26.3W
	Idle Consumption	12V: 23.4W 24V: 24.3W	12V: 23.4W 24V: 24.3W	12V: 18.8W 24V: 19.8W	12V: 18.8W 24V: 19.8W	12V: 17.6W 24V: 19.3W	12V: 15.8W 24V: 17.0W	12V: 15.7W 24V: 19.7W
Environment	Temperature	Operating: Standard: 0 ~ 60 °C (32 ~ 140 °F); *Extend: -40 ~ 85 °C (-40 ~ 185 °F), support with selected SKU 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						
Mechanical	Dimensions	146 x 102 mm (5.7" x 4")						

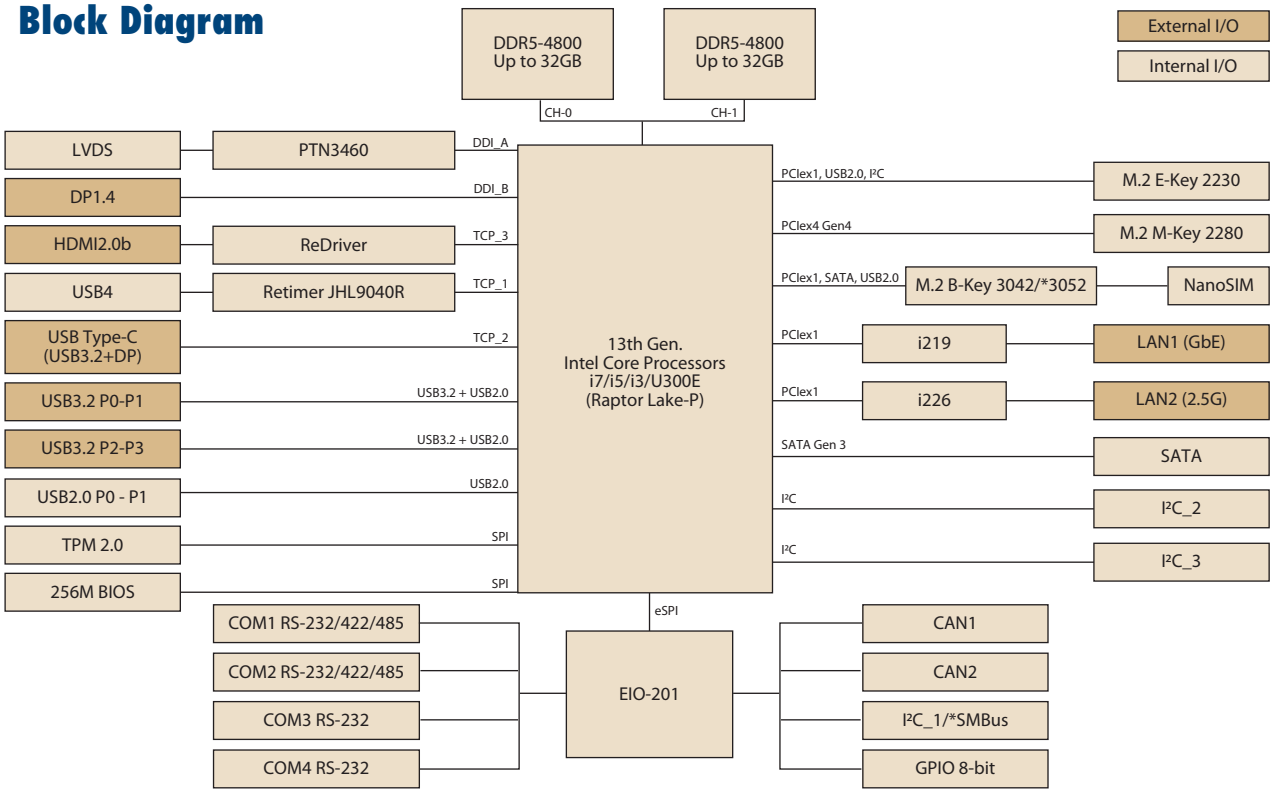
*Note: Support by request

All product specifications are subject to change without notice.

Last updated: 9-Dec-2025

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Block Diagram



*Note: Support by request

Ordering Information

Part No.	CPU	Core	Max. Frequency	TDP	Memory IBECC	GPU	GPU Max. Frequency	Execution Units	LAN2 with TSN support	Thermal Solution	Operating Temperature
MIO-5377RC7P-Q8A1	i7-1370PE	6P+8E	4.80 GHz	28W	No	Xe Graphics	1.40 GHz	96 EUs	No	Active Cooler	0 ~ 60 °C
MIO-5377RC7PX-Q8A1	i7-1370PRE	6P+8E	4.80 GHz	28W	Yes	Xe Graphics	1.40 GHz	96 EUs	Yes	Active Cooler	-40 ~ 85 °C
MIO-5377RC7-Q9A1	i7-1365UE	2P+8E	4.90 GHz	15W	No	Xe Graphics	1.30 GHz	96 EUs	No	Passive Heatsink	0 ~ 60 °C
MIO-5377RC7X-Q9A1	i7-1365URE	2P+8E	4.90 GHz	15W	Yes	Xe Graphics	1.30 GHz	96 EUs	Yes	Passive Heatsink	-40 ~ 85 °C
MIO-5377RC5-Q6A1	i5-1345UE	2P+8E	4.60 GHz	15W	No	Xe Graphics	1.25 GHz	80 EUs	No	Passive Heatsink	0 ~ 60 °C
MIO-5377RC3-Q5A1	i3-1315UE	2P+4E	4.50 GHz	15W	No	UHD Graphics	1.20 GHz	64 EUs	No	Passive Heatsink	0 ~ 60 °C
MIO-5377RU-Q3A1	U300E	1P+4E	4.30 GHz	15W	No	UHD Graphics	1.10 GHz	48 EUs	No	Passive Heatsink	0 ~ 60 °C

Packing List

Part No.	Description	Quantity
	MIO-5377 SBC	1
2046537701	Startup Manual	1
1700006291	SATA Cable, 30cm	1
1700031583-01	SATA Power Cable, 35cm	1
1700030406-01	USB 2.0 Cable, 20cm	1
1700030404-01	COM Port Cable: COM1/COM2, 20cm	2
1700031582-01	COM Port Cable: COM3/COM4, 20cm	2
1700019584-01	Audio Cable, 20cm	1
1970005548T001	MIO-5377 Heatsink (Passive for TDP 15W CPU)	1
1970005512T001	MIO-5377 QFCS (Active for TDP 28W CPU)	1

Optional Accessories

Part No.	Description
1970005615T001	MIO-5377 Heatspreader
MIOe-UMXM-FVA1	USB4 to MXM carrier card, ATX conn., 12V
MIOe-UMXM-WVA1	USB4 to MXM carrier card, Phoenix conn., 12~24V
1700034699-01	Thunderbolt3 cable (compatible to USB4), 20cm

Rear I/O View



Embedded OS/API

OS	Part No.	Description
Windows 11 LTSC	20706WLH1S0045	Win 11 IoT Ent LTSC 2024 High End: Core i7
	20706WLV1S0045	Win 11 IoT Ent LTSC 2024 Value: Core i5/i3
	20706WLE1S0045	Win 11 IoT Ent LTSC 2024 Entry: U300E
Ubuntu 22.04 LTS	20706U22DS0022	Ubuntu Desktop 22.04 LTS 64-bit
Advantech Robotic Suite	Download from ESS-WIKI	Advantech Robotic Suite v1.3.0
Software API	Website Download	SUSI v4.0
Yocto BSP	Support by Request	Yocto BSP and Test Image

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Compatible Expansion Boards

MIOe-UMXM



Specifications

Product	MXM carrier card	MIOe-UMXM-WVA1	MIOe-UMXM-FVA1
Expansion	Supported MXM Modules	Type A	Type A, B, B+
Power	Supply DC-in	12~24V	12V
	Connector	2-pin phoenix connector	ATX 2x2pin 180D, optional to 90D
	MXM Power Requirement	Supply up to 60W TGP MXM	Supply up to 115W TGP MXM
Internal I/O	USB4	2, support alternate mode: DP1.4, up to 40Gbps bandwidth; 1 port upstream to Host, 1 port downstream to Device	
	SMBus	1	
	Fan	12V, 4-wire smart fan	
External I/O	DP	4 x DP1.4a, up to 3840x2160 (4K UHD) resolution @120Hz, or 7680x4320 (8K) @60Hz. max. 4 simultaneous outputs	
Environment	Temperature	Operating: 0~55°C	Operating: 0~50°C
	Humidity	Operating: 40 @95% relative humidity, non-condensing	
	Vibration Resistance	3.5 Grms	
Certification	EMC	CE, FCC Class B	
Mechanical	Dimensions	140 x 100mm	
Compatible	USB4 Host	MIO-5377, MIO-5377R series	MIO-5377, MIO-5377R series
	MXM GPUs	SKY-MXM-A1000-4SDA	SKY-MXM-A1000-4SDA SKY-MXM-A4500-6SDA

Ordering Information

Part No.	MXM support Type	USB4 (Type-C)	DP	Power DC-in	Power Connector	Operating Temperature
MIOe-UMXM-WVA1	Type A	2	4	12~24V	Phoenix	0 ~ 55 °C
MIOe-UMXM-FVA1	Type A, B, B+	2	4	12V	ATX	0 ~ 50 °C

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