IMB-1247

Mini-ITX Motherboard

KEY FEATURES

· Intel® Core™ Ultra Series 2 Processors (Arrow Lake-S) with Q870 chipset

· 2 x 262-pin CSO-DIMM DDR5 6400 MHz, SO-DIMM DDR5 5600 MHz, up to 128 GB (64 GB per DIMM)

· 1 x PCIe x16 (Gen5), 1 x USB4/Thunderbolt™4, 5 x USB 3.2 Gen2, 2 x USB 3.2 Gen1, 2 x USB 2.0, 1 x M.2 Key B, 1 x M.2 Key E, 2 x M.2 Key M, 4 x COM, 3 x SATA3

· 1 x Intel 2.5 Gigabit LAN, 1 x Intel 1 Gigabit LAN

· Supports Quad display, 2 x HDMI 2.1, 1 x DP 2.1 (from Type-C), 1 x DP 1.4a, 1 x LVDS or eDP

· TPM 2.0 onboard IC

· Supports Intel® vPro, VMD RAID 0/1/5/10

· ATX-PWR (24+4-pin) and +12V DC-In co-design

SPECIFICATIONS

Form Factor

Dimensions	Mini-ITX (6.7-in x 6.7-in x 1.5-in, 17.0 cm x 17.0 cm x 3.8 cm)

Processor System

CPU	Intel® Core™ Ultra Series 2 Processors (Arrow Lake-S), up to 65W
Chipset	Intel® Q870
Socket	LGA1851
BIOS	AMI SPI 256 Mbit

Memory

Technology	Dual Channel DDR5 5600/6400 MHz
Capacity	128 GB (64 GB per DIMM)
Socket	2 x 262-pin SO-DIMM

Graphics

Controller	Intel® Xᵉ LPG Graphics
HDMI	HDMI 2.1
	Max resolution up to 7680x4320@60Hz
DisplayPort	DisplayPort 2.1/ 1.4a, DP++
	Max resolution up to 4096x2160@60Hz
LVDS	Dual channel 24 bit up to 1920x1200@60Hz
	(Connector shared with eDP)
eDP	Max resolution up to 1920x1080@60Hz
	(Connector shared with LVDS)
MultiDisplay	Quad Display (Included 1 output from Type-C)

Expansion Slot

PCIe	1 x PCIe x16 (Gen5, supports riser card x8/x8, x8/x4/x4)
M.2	1 x M.2 (Key E, 2230) with PCIe Gen4 x1, USB 2.0 and CNVi for Wireless
	1 x M.2 (Key B, 3042/3052) with PCIe Gen4 x1, USB 3.2 Gen1, USB 2.0 and SIM for 4G/5G
SIM Socket	1 x Socket connected to M.2 Key B

Audio

Interface	Realtek ALC897, High Definition Audio. Line-out, Mic-in

Security

TPM	TPM 2.0 onboard IC

Ethernet

Controller/ Speed	LAN1: Intel® I219LM with 10/100/1000 Mbps, supports vPro
	LAN2: Intel® I226V with 10/100/1000/2500 Mbps
Connector	2 x RJ-45

Rear I/O

HDMI	2 x HDMI 2.1
DisplayPort	1 x DP 1.4a++
Ethernet	1 x 2.5 Gigabit LAN
	1 x 1 Gigabit LAN
USB	1 x USB4/Thunderbolt™ 4 (5V/3A, supports DP 2.1 display output)
	5 x USB 3.2 Gen2
	*For Thunderbolt support, please refer to support list.
Audio	2 (Mic-in, Line-out or Mic-in, Line-in (optional))
COM	COM1, COM3 (RS-232/422/485)

Internal Connector

USB	2 x USB 3.2 Gen1 (1 x USB 3.2 header)
	2 x USB 2.0 (1 x 2.54 pitch header)
COM	COM4, COM6 (RS-232)
GPIO	4 x GPI, 4 x GPO
LVDS	1 (Connector with LVDS/eDP signal, switch by BIOS)
SATA PWR Output	1
Speaker Header	1

Storage

M.2	1 x M.2 (Key M, 3042/2280) with PCIe Gen4 x4 and SATA3 for SSD
	1 x M.2 (Key M, 2242) with PCIe Gen4 x4 and SATA3 for SSD*
	*Recommend using M2X4-SATA-4P module to support extra 4 SATA ports (supported by special BIOS).
SATA	3 x SATA3 (6Gb/s)*
	*SATA3_7 shared with M.2 Key M1
RAID	Intel® VMD RAID 0/1/5/10*
	*supported by identical interface (PCIe or SATA)
	PCIe interface: M.2 Key B + M.2 Key M1/2 or 2*M.2 Key M
	SATA interface: SATA port

Watchdog Timer

Output	From Super I/O to drag RESETCON#
Interval	256 Segments, 0, 1, 2, ...255sec

Power Requirements

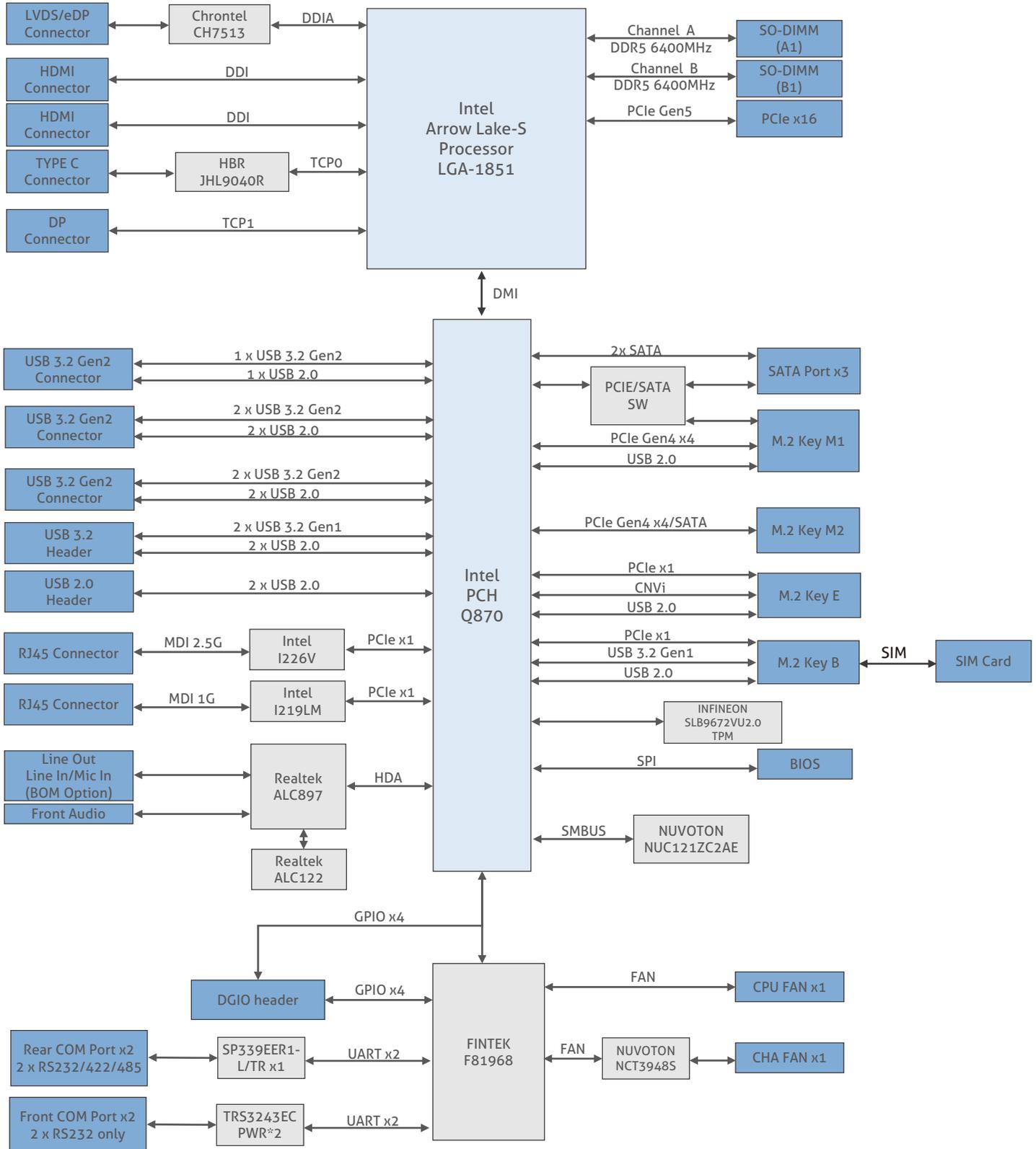|	
Input PWR	ATX PWR (24+4-pin) and +12V DC-In co-design
Power On	AT/ATX Supported
	- AT : Directly PWR on as power input ready
	- ATX : Press button to PWR on after power input ready

Environment

Operating Temp	-20 ºC ~ 70 ºC
Storage Temp	-40 °C ~ 85 °C
Operating Humidity	5% ~ 90% (non-condensing)
Storage Humidity	5% ~ 90% (non-condensing)

ASRock Industrial

BLOCK DIAGRAM

IMB-1247

- LVDS/eDP Connector — Chrontel CH7513 — DDIA — Intel Arrow Lake-S Processor LGA-1851
- HDMI Connector — DDI
- HDMI Connector — DDI
- TYPE C Connector — HBR JHL9040R — TCP0
- DP Connector — TCP1
- Channel A DDR5 6400MHz — SO-DIMM (A1)
- Channel B DDR5 6400MHz — SO-DIMM (B1)
- PCIe Gen5 — PCIe x16
- DMI
- USB 3.2 Gen2 Connector — 1 x USB 3.2 Gen2 / 1 x USB 2.0
- USB 3.2 Gen2 Connector — 2 x USB 3.2 Gen2 / 2 x USB 2.0
- USB 3.2 Gen2 Connector — 2 x USB 3.2 Gen2 / 2 x USB 2.0
- USB 3.2 Header — 2 x USB 3.2 Gen1 / 2 x USB 2.0
- USB 2.0 Header — 2 x USB 2.0
- Intel PCH Q870
- 2x SATA — SATA Port x3
- PCIE/SATA SW
- PCIe Gen4 x4 / USB 2.0 — M.2 Key M1
- PCIe Gen4 x4/SATA — M.2 Key M2
- PCIe x1 / CNVi / USB 2.0 — M.2 Key E
- PCIe x1 / USB 3.2 Gen1 / USB 2.0 — M.2 Key B — SIM — SIM Card
- RJ45 Connector — MDI 2.5G — Intel I226V — PCIe x1
- RJ45 Connector — MDI 1G — Intel I219LM — PCIe x1
- INFINEON SLB9672VU2.0 TPM
- SPI — BIOS
- Line Out / Line In/Mic In (BOM Option) / Front Audio — Realtek ALC897 — HDA
- Realtek ALC122
- SMBUS — NUVOTON NUC121ZC2AE
- GPIO x4 — DGIO header — GPIO x4
- FINTEK F81968
- FAN — CPU FAN x1
- Rear COM Port x2 2 x RS232/422/485 — SP339EER1-L/TR x1 — UART x2
- Front COM Port x2 2 x RS232 only — TRS3243EC PWR*2 — UART x2
- FAN — NUVOTON NCT3948S — CHA FAN x1

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Ordering Information

Model	IMB-1247
CPU/Chipset	Q870
HDMI	2
LVDS/eDP	1/ (1)
Gbe LAN	1
2.5 Gbe LAN	1
COM	4
USB4/Thunderbolt™4	1
USB 3.2	7
USB 2.0	2
SATA III	3
M.2 E-Key	1
M.2 B-Key	1
M.2 M-Key	2
TPM	1

Packing List (Gift)

Description	Quantity
COM Cable	1
SATA Data Cable	2
SATA Power Cable	1
I/O Shield	1
SCREW M3*2.5	4
3.35mm M3 NUT	1

Packing List (Bulk)

Description	Quantity
I/O Shield	1
SCREW M3*2.5	4
3.35mm M3 NUT	1

I/O View