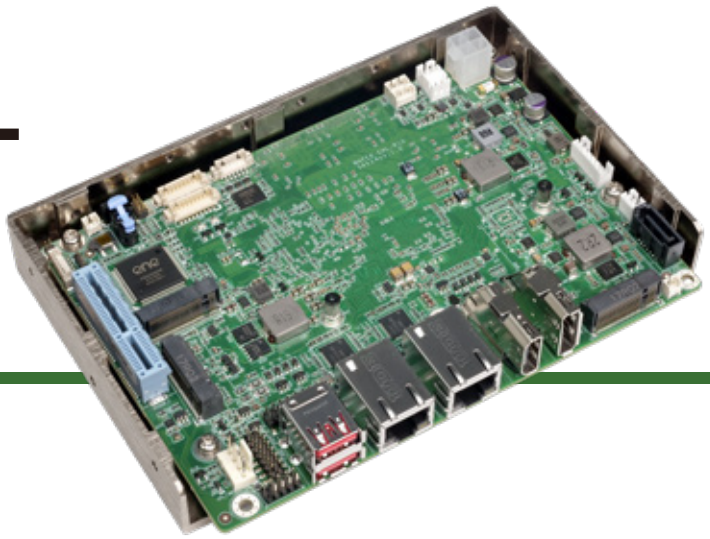
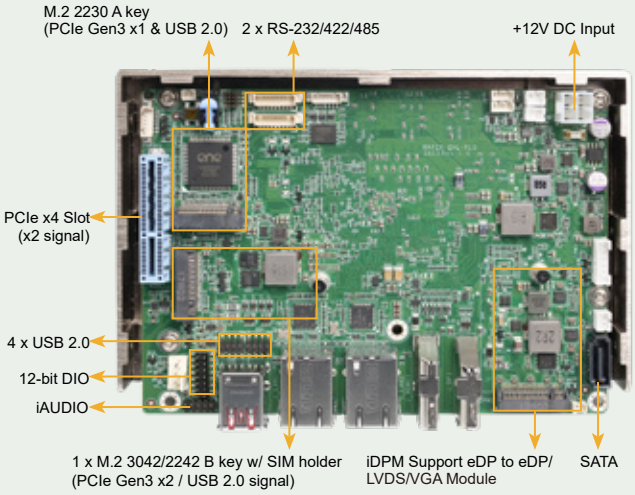
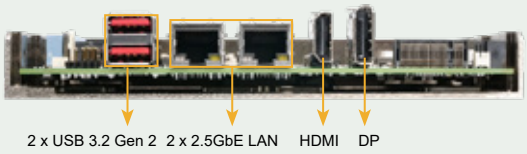
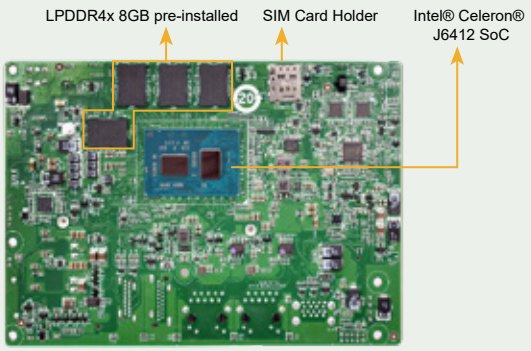
WAFER-EHL

3.5” SBC supports Intel® Elkhart Lake Atom® / Pentium® / Celeron® processor on-board SoC with 8GB LPDDR4x memory on board default, triple display with DP, HDMI and iDPM slot，dual 2.5 GbE, USB 3.2 Gen 2, M.2, SATA 6Gb/s, COM, iAUDIO, 0°C ~60°C and RoHS









10W Low-power Intel® Elkhart Lake J6412 CPU

10nm Intel® Celeron® J6412 on-board SoC, 4 cores and 4 threads, base frequency 2.00GHz, turbo frequency up to 2.60GHz, 1.5MB cache

Supporting Intel® I226-V 2.5GbE LAN

Two RJ45 network interfaces are supported via Intel® I226-V 2.5GbE controllers, achieving up to 2.5GbE network transmission rate.

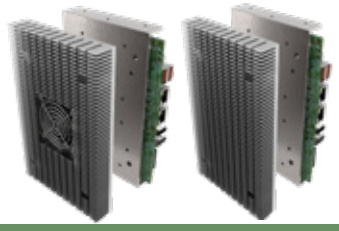
PCIe x4 Slot Available for Riser Card

One PCIe x4 slot (PCIe Gen3 x2 signal) is reserved on the edge of the motherboard, which can be used to connect a PCIe expansion card or a riser card designed by IEI. The riser card provides two PCIe x1 slots for multiple PCIe expansion cards.

IEI-specific iDPM Interface

IEI uniquely designs a iDPM interface that can connect to display modules, enabling users to add LVDS/eDP/VGA display interface upon requirements.

Structure Solution



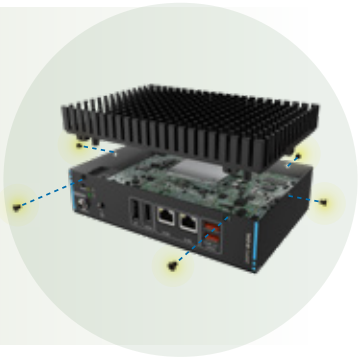
IEI Heat Conduction Casing (IHCC)

IEI has developed a highly efficient thermal solution for the 3.5" motherboard - IEI Heat Conduction Casing (IHCC). With its well-design structure, the IHCC can effectively improve heat transfer performance and cut time-to-market.

Completely joint with CPU for better heat transfer in 0ºC~60ºC operating temperature with the active cooling (PN:CM-WAFER-WF-R10), and in 0°C~45°C operating temperature with the passive cooling (PN:CM-WAFER-WOF-R10).

DRPC-W-EHL-JC-R10

The DRPC-W-EHL-JC-R10 is a compact embedded system and designed for 3.5" single board computers. With the two-dimensional heat conduction and low wind resistance design on the surfaced which means you don't need extra thermal solution to form the heat dissipation part. You can get higher hardness, and benefit from the reduced production cost resulting from shortening manufacturing time .Furthermore, the height of aluminum extrusion can therefore be downsized to make the product light weight.



IEI-developed riser card

The WAFER-EHL features a PCIe x4 (x2 signal) slot, which is a new design of the WAFER motherboard to expand functionality. By installing an IEI-developed riser card into the PCIe slot, the x2 signal is divided into two x1 slots, offering great configuration flexibility and expandability.

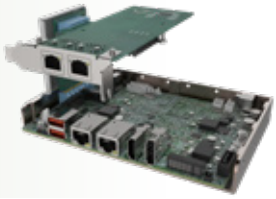
Two types of riser cards with different orientation are available, one with slots facing outwards and the other with slots facing inwards.

NWR-L2S-R10

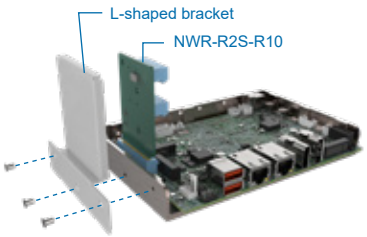
The outwards-facing riser card (P/N: NWR-L2S-R10), although lower in height, is able to provide better spacing to ensure expansion cards run at a low temperature. It is ideal for the chassis that is wide enough for the expansion card to be placed.

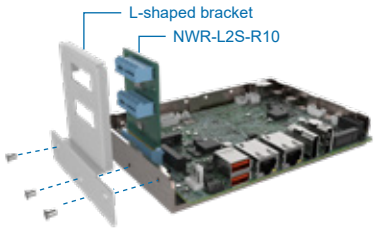
NWR-R2S-R10

The inwards-facing riser card (P/N: NWR-R2S-R10) is designed with higher height to keep a decent space between the expansion cards and the motherboard. This can help improve the airflow and heat transfer within the system. It is suitable for installation where space is limited. Moreover.

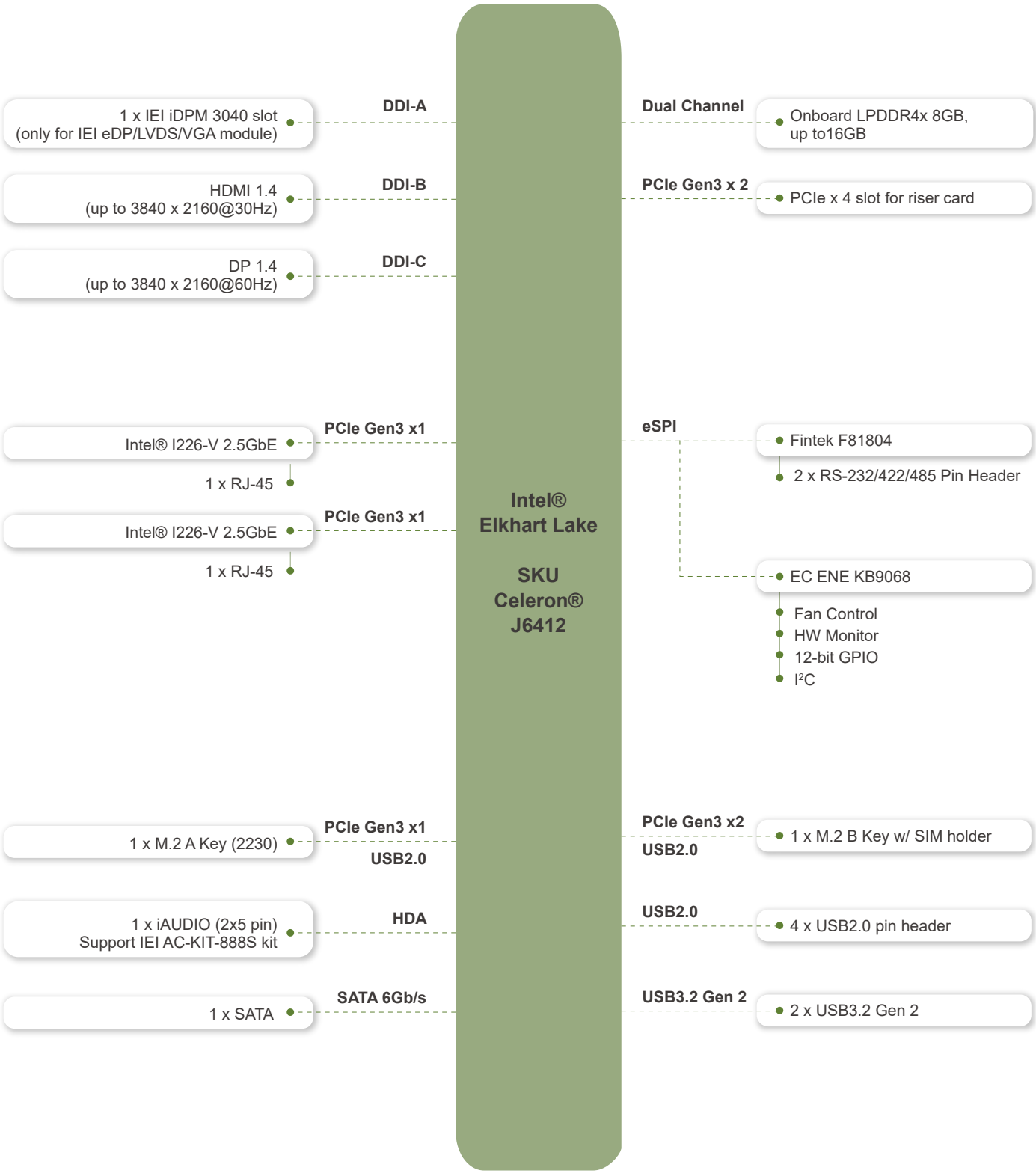


both of the riser cards can be firmly secured to enhance stability by using the L-shaped bracket, in which screw holes are perfectly matched with those on the side of the heat spreader to make it simple and easy to install.

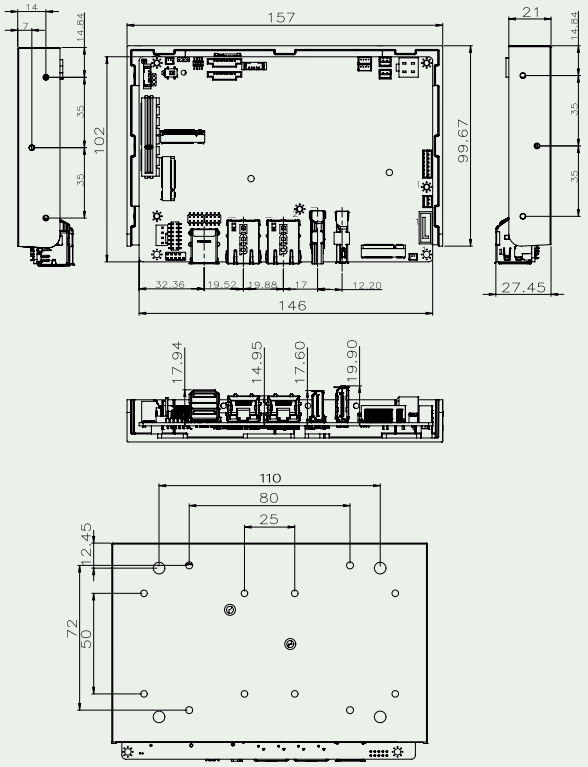




WAFER-EHL Block Diagram



Dimensions



Optional accessories

AC-KIT-888S-R10

CB-USB02A-RS

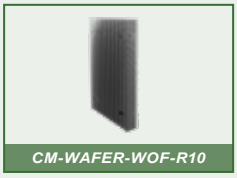
32102-000100-200-RS

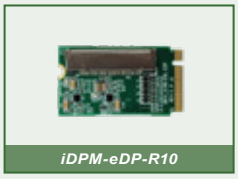
32005-003500-200-RS

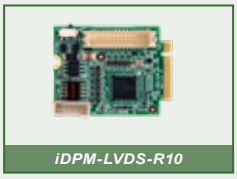
NWR-L2S-R10

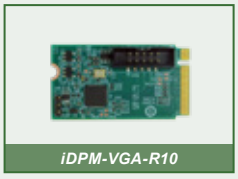
NWR-R2S-R10

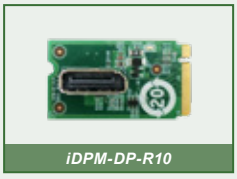
CM-WAFER-WF-R10


CM-WAFER-WOF-R10


iDPM-eDP-R10


iDPM-LVDS-R10


iDPM-VGA-R10


iDPM-DP-R10

Specifications

Model	WAFER-EHL
SoC	Onboard Intel® Atom® x6000 series / Pentium® / Celeron® processor (Elkhart Lake platform) Intel® Celeron® J6412 on-board SoC (up to 2.6GHz, quad-core, 1.5M Cache, TDP=10W)
BIOS	AMI UEFI BIOS
Memory	On-board LPDDR4x 8GB, up to 16 GB*
Graphics Engine	Intel® UHD Graphics
Display Output	Triple independent display 1 x HDMI 1.4 (up to 4096 x 2160@30Hz) 1 x DP 1.4 (up to 4096 x 2160 @ 60Hz) 1 x IEI iDPM 3040 slot (only for IEI eDP/LVDS/VGA module)
Ethernet	LAN1: Intel® I226-V 2.5GbE LAN LAN2: Intel® I226-V 2.5GbE LAN
External I/O Interface	2 x USB 3.2 Gen 2
Internal I/O Interface	1 x SATA 6Gb/s with 5V SATA power connector 4 x USB 2.0 (2x4 pin, p=2.0) 2 x RS-232/422/485 (1x9 pin, P=1.25)
I^2C	1 x I^2C (1x4 pin, P=2.0)
Audio	1 x iAUDIO (2x5 pin) Support IEI AC-KIT-888S kit
Front Panel	1 x Power LED & HDD LED (1x6 pin) 1 x Power button (1x2 pin) 1 x Reset button (1x2 pin)
LAN LED	2 x LAN LED (1x2 pin)
Expansion	1 x M.2 A key 2230 (PCIe Gen3 x1 & USB 2.0) 1 x M.2 B key 2242/3042 (PCIe Gen3 x2 & USB 2.0) 1 x On-board SIM card socket (hinge type) for M.2 B key 1 x PCIe x4 slot (PCIe Gen3 x2 signal) (x2 or x1+x1)
Digital I/O	1 x 12-bit digital I/O (2x7 pin)
TPM	Intel® PTT (TPM 2.0)
Fan Connector	1 x System fan connector (1x4 pin)
Power Supply	+12V DC input power (AT/ATX mode)
Watchdog Timer	Software programmable, support 1~255 sec. system reset
Power Consumption	12V@3.14A (Intel® Celeron® J6412 2.0GHz with on-board 8GB LPDDR4 memory and EUP enabled)
Operating Temperature	-10°C ~ 60°C
Storage Temperature	-30°C ~ 70°C
Operating Humidity	5% ~95%, non-condensing
Diemensions	146mm x 102mm
Weight	GW:850g / NW:350g
Certification	CE/FCC Compliant

*Please contact the sales for different memory configurations

Packing List

1 x WAFER-EHL single board computer	1 x SATA with power cable kit
1 x Power cable for P4	1 x QIG

Ordering Information

WAFER-EHL-J6412C-R11	3.5" SBC supports Intel® Celeron® J6412 on-board SoC with 8GB LPDDR4x memory on board default, triple display with DP, HDMI and iDPM slot, dual 2.5 GbE, USB 3.2 Gen 2, M.2, SATA 6Gb/s, COM, iAUDIO, 0°C ~60°C and RoHS

Optional Accessories

AC-KIT-888S-R10	Realtek ALC888S 7.1 Channel HD Audio peripheral board, RoHS
CB-USB02A-RS	Dual port USB cable with bracket, 300mm, P=2.00
32102-000100-200-RS	SATA power cable, MOLEX 5264-4P to SATA15P
32005-003500-200-RS	Round cable, RS-232/422/485, 300mm, P=1.25
NWR-L2S-R10	PCIe x2 to two PCIe x1 riser card for WAFER on the left side
NWR-R2S-R10	PCIe x2 to two PCIe x1 riser card for WAFER on the right side
CM-WAFER-WF-R10	Cooler Module (W/FAN); Mechanical; for 3.5" WAFER series; RoHS
CM-WAFER-WOF-R10	Cooler Module (W/O FAN); Mechanical; for 3.5" WAFER series; RoHS
iDPM-eDP-R10	eDP to eDP DisplayPort converter board (for IEI iDPM connector)
iDPM-LVDS-R10	eDP to LVDS DisplayPort converter board (for IEI iDPM connector)
iDPM-VGA-R10	eDP to VGA Connetor converter board
iDPM-DP-R10	eDP to DP DisplayPort converter board (for IEI iDPM connector)