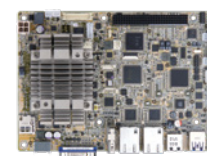
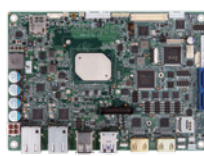


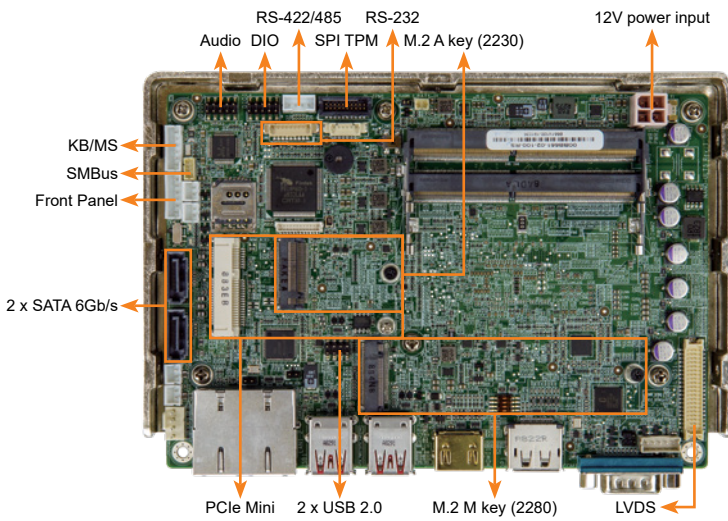
EPIC NANO Selection Guide



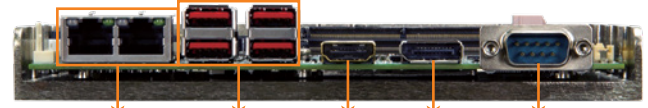
Model Name	NANO-ULT5	NANO-AL	NANO-ULT3	NANO-BT-i1/BTW2
CPU Socket	On board	On board	On board	On board
CPU Type	Intel® Core™ i7/i5/i3, Celeron® ULT processor	Intel® Atom®/Celeron®/Pentium® on-board SoC	Intel® Core™ i7/i5/i3, Celeron® ULT processor	Intel® Atom®, Celeron® SoC
Chipset	Intel® Core™ i7/i5/i3, Celeron® ULT processor	Intel® Atom®/Celeron®/Pentium® on-board SoC	Intel® Core™ i7/i5/i3, Celeron® ULT processor	Intel® Atom®/Celeron® on-board SoC
Memory	2 x 260-pin 2400/2133 MHz Dual-channel DDR4, SO-DIMM (system max. 32 GB)	1 x 204-pin 1866/1600 MHz single-channel DDR3L SO-DIMM (system max. 8 GB)	2 x 260-pin 2133/1867 MHz dual-channel DDR4 SO-DIMMs (system max. 32 GB)	1 x 204-pin 1333/1066 MHz single-channel DDR3L SO-DIMM (system max. 8 GB)
Display Interface	Triple independent displays 1 x HDMI 1 x DP 1 x Internal LVDS	Triple independent display 2 x HDMI 1 x 18/24-bit dual-channel LVDS 1 x iDP	Triple independent display 2 x HDMI 1 x 18/24-bit dual-channel LVDS 1 x iDP interface	Dual display supported 1 x VGA 1 x HDMI 1 x 18/24-bit dual-channel LVDS
Ethernet	1 x PCIe GbE LAN Intel® i211 controller 1 x PCIe GbE LAN Intel® i219 controller	Dual LAN: Intel® I210-IT/I211-AT PCIe controller	LAN1: Intel® I219-LM PHY with Intel® AMT 11.0 supported LAN2: Intel® I211-AT PCIe GbE controller	LAN1: Intel® I210-AT PCIe controller with NCSI support LAN2: Intel® I211-AT PCIe controller
I/O Interface	1 x TPM (2x10 pin SPI interface) 1 x RS-422/485 pin header (Support Auto Flow Control over RS-485) 1 x RS-232 1 x RS-232 pin header 4 x USB 3.2 Gen 2	1 x PS/2 KB/MS pin header 2 x RS-232/422/485 pin header 4 x RS-232 pin header 2 x USB 2.0 2 x USB 2.0 pin header 2 x USB 3.2 Gen 1	1 x PS/2 KB/MS pin header 1 x RS-232/422/485 pin header 2 x RS-232 pin header 2 x USB 2.0 pin header 4 x USB 3.2 Gen 1	1 x PS/2 KB/MS 1 x RS-422/485 pin header 1 x USB 3.2 Gen 1 3 x RS-232 pin header 1 x USB 2.0 2 x USB 2.0 pin header
Storage Interface	2 x SATA 6Gb/s with 5V SATA power connector 1 x M.2 (M Key with SATA/PCIe interface) (Celeron with M.2 M Key PCIe only)	2 x SATA 6Gb/s with 5V SATA power connector 1 x M.2 (B Key) (SATA only)	2 x SATA 6Gb/s with 5V SATA power connector 1 x 8 GB eMMC (optional)	2 x SATA 3Gb/s with 5V SATA power connector
Audio	Realtek ALC888S HD Audio codec 1 x Analog audio	Realtek ALC888S HD Audio codec		
Digital I/O	8-bit programmable digital I/O			
Power Consumption	12V@6.62A (4.6 GHz Intel® Core™ i7-8665UE CPU with two 16 GB 2666 MHz DDR4 memory modules)	12V@2.13 A (Intel® Pentium® N4200 CPU with one 8GB 1600MHz DDR3L memory)	12V@2.48A (Intel® Core™ i3-6100U CPU)	12V@1.52A (Intel® Atom® Processor J1900 CPU with one 8 GB 1333 MHz DDR3L memory)
Watchdog Timer	Software programmable and supports 1~255 sec. system reset			
Operating Environment	Temperature Range: -20°C ~ 60°C (-4°F ~ 140°F) Relative Humidity: 5% ~ 95%, non-condensing	Temperature Range: NANO-AL: -20°C ~ 70°C (-4°F~158°F) NANO-ALW2: -40°C ~ 85°C (-40°F~185°F) Relative Humidity: 5% ~ 95% non-condensing	Temperature Range: -20°C ~ 60°C (-4°F ~ 140°F) Relative Humidity: 5% ~ 95%, non-condensing	Temperature Range: NANO-BT-i1: -20°C ~ 60°C (-4°F ~ 140°F) NANO-BTW2: -40°C ~ 85°C (-40°F ~ 185°F) Relative Humidity: 5% ~ 95% non-condensing
Expansion Slots	1 x Full-size PCIe Mini slot 1 x M.2 slot with 2230 A key 1 x M.2 slot with 2280 M key 1 x SIM card	1 x Full/Half-size PCIe Mini slot (w/ Micro SIM holder)	1 x Full-size PCIe Mini card slot (with SIM holder & mSATA support) 1 x Half-size PCIe Mini card slot	1 x Full-size PCIe Mini card slot with mSATA support 1 x PCI-104 slot
CPU Cooler	Heat Spreader	Heatsink	Heat Spreader	Heatsink

NANO-ULT5

EPIC SBC supports Intel® 14nm 8th Generation Mobile Core™ i3/i5/i7 and Celeron® on-board processor (ULT) with HDMI, DP LVDS, mPCIe, M.2 A key M key, USB 3.2 Gen 2, SATA 6Gb/s, COM, Audio and RoHS, -20°C ~ 60°C



Multiple Expansion for Diverse Applications



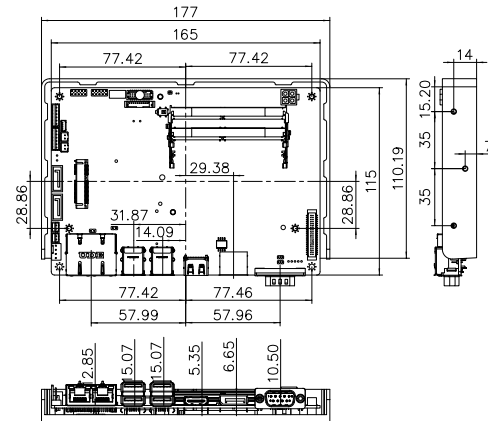
Specifications

- ◆ SoC
 - Intel® Celeron® processor 4305UE (2.0 GHz Dual Core, 2MB cache, TDP=15W)
 - Intel® Core™ i3-8145UE (2.2 GHz Dual Core, 4MB cache, TDP=15W)
 - Intel® Core™ i5-8365UE (1.6 GHz, Quad Core, 6MB cache, TDP=15W)
 - Intel® Core™ i7-8665UE (1.7 GHz Quad Core, 8MB cache, TDP=15W)
- ◆ BIOS:
 - AMI UEFI BIOS
- ◆ Memory
 - Dual 260-pin 2400MHz Dual-channel DDR4 SO-DIMMs support up to 32GB
- ◆ Graphics Engine
 - Intel® HD Graphics Gen9 Low Power; 16 Execution Units
 - 4K Codec Decode
- ◆ Display Output
 - Triple Independent Displays
 - 1 x HDMI up to 3840x2160@60Hz
 - 1 x DP up to 3840x2160@60Hz
 - 1 x Internal LVDS up to 1920x1200@60Hz
- ◆ Ethernet
 - 1 x PCIe GbE LAN Intel® i211 controller
 - 1 x PCIe GbE LAN Intel® i219 controller
- ◆ Embedded Controller
 - iWDD IT8587VG
- ◆ External I/O Interface
 - 4 x USB 3.2 Gen 2
 - 1 x RS-232
- ◆ Internal I/O Interface
 - 1 x 32 GB eMMC 5.1 (optional)
 - 2 x SATA 6G/s with 5V SATA power connector
 - 1 x TPM (2x10 pin, P=0.5)
 - 2 x USB 2.0 (2x4 pin, P=2.0)
 - 1 x RS-422/485 (1x4 pin, P=2.0) (Support Auto Flow Control over RS-485)
 - 1 x RS-232 (1x9 pin, P=1.25)
- ◆ SMBus/I²C
 - 1 x 4-pin connector (1x4)
- ◆ Audio
 - Realtek ALC888S HD Audio codec
 - 1 x Analog audio (2x5 pin)
- ◆ 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 slot with 2230 A key
 - 1 x Full-size PCIe Mini slot
 - 1 x M.2 slot with 2280 M key
 - 1 x SIM card
- ◆ Digital I/O
 - 1 x 8-bit digital I/O (2x5 pin)
- ◆ Fan Connector
 - 1 x Smart fan connector (1x4 pin)
- ◆ Power Supply
 - 12V DC input
 - 1 x Internal power connector (2x2 pin)
 - Support AT/ATX mode
- ◆ Watchdog Timer
 - Software programmable support 1~255 sec. system reset
- ◆ Power Consumption
 - 12V@6.62A (4.6 GHz Intel® Core™ i7-8665UE CPU with two 16 GB 2666 MHz DDR4 memory modules)
- ◆ Operating Temperature: -20°C ~ 60°C
- ◆ Storage Temperature: -30°C ~ 70°C
- ◆ Operating Humidity: 5% ~ 95%, non-condensing
- ◆ Dimensions: 115mm x 165mm
- ◆ Weight: GW:850g / NW:350g

Features

- EPIC SBC supports Intel® 8th Generation ULT processor or Celeron® on-board SoC supports dual-channel DDR4 SO-DIMMs
- Triple independent display support
- 12V DC input design
- M.2 slot with A key, M.2 M Key PCIe Mini slot with SIM holder
- COM, USB 3.2 Gen 2, SATA 6Gb/s, eMMC 5.1 and audio support
- Support temperature operation: -20°C ~ 60°C
- Support Auto Flow Control over RS-485

Dimensions (Unit: mm)



Packing List

1 x NANO-ULT5 single board computer with heatspreader	1 x Power cable
1 x Audio cable	2 x RS-232 cable
1 x SATA with power cable kit	1 x QIG

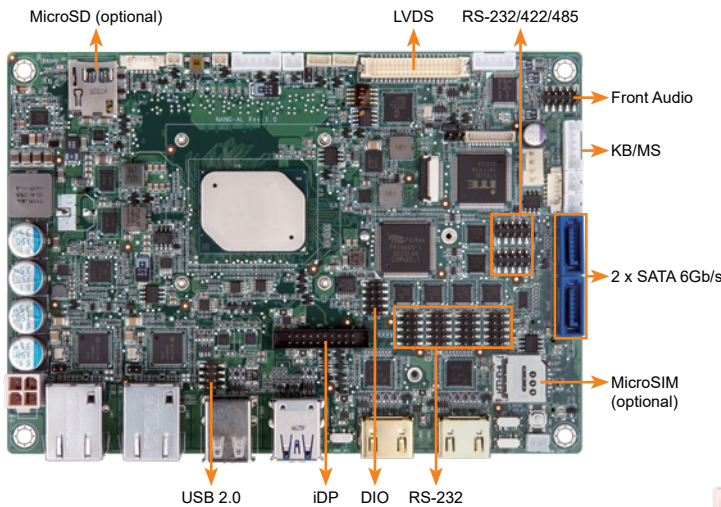
Ordering Information

Part No.	Description
NANO-ULT5-C-R10**	EPIC SBC supports Intel® 14nm 8th Generation Mobile Celeron™ 4305UE (15W) on-board Processor (ULT) with HDMI/LVDS/DP, Dual PCIe GbE, USB 3.2 Gen 2, PCIe Mini, M.2 A & M Key, SATA 6Gb/s, SPI TPM, COM, Audio and RoHS
NANO-ULT5-i3-R10	EPIC SBC supports Intel® 14nm 8th Generation Mobile Core™ i3-8145UE (15W) on-board Processor (ULT) with HDMI/LVDS/DP, Dual PCIe GbE, USB 3.2 Gen 2, PCIe Mini, M.2 A & M Key, SATA 6Gb/s, SPI TPM, COM, Audio and RoHS
NANO-ULT5-i5-R10	EPIC SBC supports Intel® 14nm 8th Generation Mobile Core™ i5-8365UE (15W) on-board Processor (ULT) with HDMI/LVDS/DP, Dual PCIe GbE, USB 3.2 Gen 2, PCIe Mini, M.2 A & M Key, SATA 6Gb/s, COM, SPI TPM, Audio and RoHS
NANO-ULT5-i7-R10	EPIC SBC supports Intel® 14nm 8th Generation Mobile Core™ i7-8665UE (15W) on-board Processor (ULT) with HDMI/LVDS/DP, Dual PCIe GbE, USB 3.2 Gen 2, PCIe Mini, M.2 A & M Key, SATA 6Gb/s, COM, SPI TPM, Audio and RoHS

** Without full functions support, please refer to user manual

NANO-AL

EPIC SBC supports 14nm Intel® Pentium®/Celeron®/Atom® on-board SoC with Dual HDMI/LVDS/iDP, Dual PCIe GbE, USB 3.2 Gen 1 (5Gb/s), PCIe Mini, M.2, SATA 6Gb/s, COM, Audio and RoHS, -40°C ~ 85°C



Support Triple Display Configuration



USB 3.2 Gen 1



Dual LAN

USB 2.0

HDMI



Specifications

- ◆ SoC
 - Intel® Pentium® N4200 on-board SoC (up to 2.5GHz, quad-core, 2M Cache, TDP=6W)
 - Intel® Celeron® N3350 on-board SoC (up to 2.4GHz, dual-core, 2M Cache, TDP=6W)
 - Intel® Atom® x7-E3950 on-board SoC (up to 2.0GHz, quad-core, 2M Cache, TDP=12W)
 - Intel® Atom® x5-E3940 on-board SoC (up to 1.8GHz, quad-core, 2M Cache, TDP=9W)
 - Intel® Atom® x5-E3930 on-board SoC (up to 1.8GHz, dual-core, 2M Cache, TDP=6W)
- ◆ BIOS
 - AMI UEFI BIOS
- ◆ Memory
 - One 204-pin 1866/1600MHz Single-channel DDR3L SO-DIMM supports up to 8GB
- ◆ Graphics Engine
 - Intel® HD Graphics Gen9 Low Power, 18 Execution Units
 - 4K Codec Decode & Encode for HEVC 4, H.264, VP8, SVC, MVC
- ◆ Display Output
 - Triple independent display
 - 1 x 18/24-bit dual-channel LVDS (up to 1920x1200@60Hz)
 - 2 x HDMI (up to 3840x2160 @ 30Hz)
 - 1 x iDP interface for HDMI. LVDS, VGA, DVI, DP (up to 4096x2304@60Hz) (colay with HDMI1)
- ◆ Ethernet
 - Intel® I211-AT PCIe controller
- ◆ External I/O Interface
 - 2 x USB 3.2 Gen 1 (5Gb/s)
 - 2 x USB 2.0
- ◆ Internal I/O Interface
 - 1 x KB/MS (1x6 pin) 2 x USB 2.0 (2x4 pin, P=2.0)
 - 2 x RS-232/422/485 (2x5 pin, P=2.0) 4 x RS-232 (2x5 pin, P=2.0)
 - 2 x SATA 6Gb/s with 5V SATA power connector (no RAID)
- ◆ SMBus
 - 1 x SMBus (1x4 pin)
- ◆ I²C
 - 1 x I²C (1x4 pin)
- ◆ Audio
 - Realtek ALC888S HD Audio codec
 - 1 x Front audio (2x5 pin)
- ◆ 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 Full/Half-size PCIe Mini slot with SIM holder (optional)
 - 1 x M.2 2242 (B key, SATA, USB 2.0, USB 3.2 Gen 1 (5Gb/s) signal only)
 - 1 x Micro SD (Optional)
- ◆ Digital I/O
 - 8-bit digital I/O (2x5 pin)
- ◆ Fan Connector
 - 1 x Smart fan connector (1x4 pin)
- ◆ Power Supply
 - 9V~30V DC input
 - 1 x Internal power connector (2x2 pin)
 - Support AT/ATX mode
- ◆ Watchdog Timer
 - Software programmable, supports 1~255 sec. system reset
- ◆ Power Consumption
 - 12V@2.13A (Intel® Pentium® N4200 CPU with one 8GB 1600MHz DDR3L memory)
 - 12V@2.81A (Intel® Atom® x7-E3950 CPU with one 8GB 1600MHz DDR3L memory)
- ◆ Operating Temperature: -20°C ~ 70°C / -40°C ~ 85°C (NANO-AL-ExW2)
- ◆ Storage Temperature: -40°C ~ 85°C
- ◆ Operating Humidity: 5% ~ 95%, non-condensing
- ◆ Dimensions: 115mm x 165mm
- ◆ Weight: GW: 850g / NW: 350g
- ◆ CE/FCC compliant

Features

- EPIC SBC supports Intel® 14nm Generation Atom®, Celeron® or Pentium® on-board SoC supports single-channel DDR3L SO-DIMMs
- Triple independent display support
- Wide range 9V~30V DC input design
- COM, USB 3.2 Gen 1 (5Gb/s), SATA 6Gb/s, M.2 and audio support
- Support temperature operation: -20°C ~ 70°C / -40°C ~ 85°C (NANO-AL-ExW2)

Packing List

1 x NANO-AL single board computer with Heatsink	1 x RS-232/422/485 cable
1 x SATA with power cable kit	1 x Power cable
1 x Screw set (for half-size PCIe Mini card)	1 x QIG

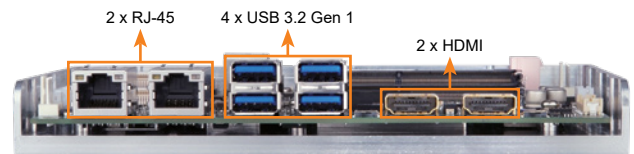
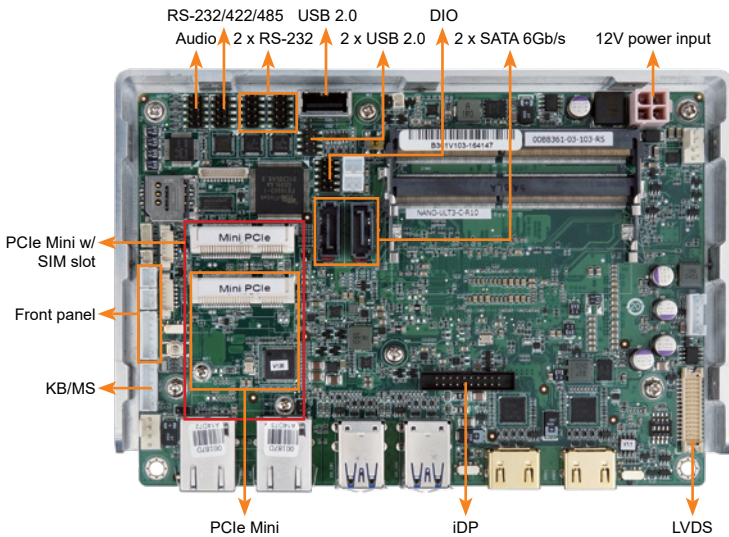
Ordering Information

Part No.	Description
NANO-AL-J2-R10	EPIC SBC supports Intel® 14nm dual-core Celeron® J3455 2.3GHz on-board SoC with Dual HDMI/LVDS/iDP, Dual PCIe GbE, USB 3.0, PCIe Mini, M.2, SATA 6Gb/s, COM, Audio and RoHS
NANO-AL-N2-R10**	EPIC SBC supports Intel® 14nm quad-core Pentium® N4200 2.5GHz on-board SoC with Dual HDMI/LVDS/iDP, Dual PCIe GbE, USB 3.2 Gen 1 (5Gb/s), PCIe Mini, M.2, SATA 6Gb/s, COM, Audio and RoHS
NANO-AL-N1-R10	EPIC SBC supports Intel® 14nm dual-core Celeron® N3350 2.4GHz on-board SoC with Dual HDMI/LVDS/iDP, Dual PCIe GbE, USB 3.2 Gen 1 (5Gb/s), PCIe Mini, M.2, SATA 6Gb/s, COM, Audio and RoHS
NANO-AL-E3W2-R10**	EPIC SBC supports Intel® 14nm quad-core Atom® x7-E3950 2.0GHz on-board SoC with Dual HDMI/LVDS/iDP, Dual PCIe GbE, USB 3.2 Gen 1 (5Gb/s), PCIe Mini, M.2, SATA 6Gb/s, COM, Audio and RoHS, -40°C ~ 85°C
NANO-AL-E2W2-R10**	EPIC SBC supports Intel® 14nm quad-core Atom® x5-E3940 1.8GHz on-board SoC with Dual HDMI/LVDS/iDP, Dual PCIe GbE, USB 3.2 Gen 1 (5Gb/s), PCIe Mini, M.2, SATA 6Gb/s, COM, Audio and RoHS, -40°C ~ 85°C
NANO-AL-E1W2-R10**	EPIC SBC supports Intel® 14nm dual-core Atom® x5-E3930 1.8GHz on-board SoC with Dual HDMI/LVDS/iDP, Dual PCIe GbE, USB 3.2 Gen 1 (5Gb/s), PCIe Mini, M.2, SATA 6Gb/s, COM, Audio and RoHS, -40°C ~ 85°C
32001-008600-200-RS	Dual-port USB cable, 210mm, P=2.0
32006-001100-201-RS	PS/2 KB/MS cable, 135mm, P=2.0
DP-DP-R10	DisplayPort to DisplayPort converter board (for IEI iDP connector)
DP-DVI-R10	DisplayPort to DVI-D converter board (for IEI iDP connector)
DP-HDMI-R10	DisplayPort to HDMI converter board (for IEI iDP connector)
DP-LVDS-R10	DisplayPort to 24-bit dual-channel LVDS converter board (for IEI iDP connector)
DP-VGA-R10	DisplayPort to VGA converter board (for IEI iDP connector)

**By order production, MOQ: 100

NANO-ULT3

EPIC SBC supports Intel® 14nm 6th Generation Mobile Core™ i7/i5/i3 and Celeron® on-board Processor (ULT) with HDMI/LVDS/iDP, Dual PCIe GbE, USB 3.2 Gen 1 (5Gb/s), PCIe Mini, SATA 6Gb/s, mSATA, COM, Audio and RoHS



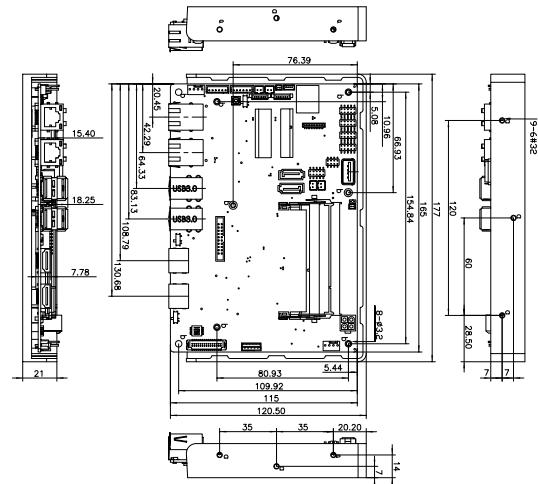
Specifications

- ◆ SoC
 - 6th generation Intel® mobile ULT on-board SoC
 - Intel® Core™ i7-6600U (up to 3.4GHz, dual-core, 4MB cache, TDP=15W)
 - Intel® Core™ i5-6300U (up to 3.0GHz, dual-core, 3MB cache, TDP=15W)
 - Intel® Core™ i3-6100U (up to 2.3GHz, dual-core, 3MB cache, TDP=15W)
 - Intel® Celeron® processor 3955U (up to 2.0GHz, dual-core, 2MB cache, TDP=15W)
- ◆ BIOS
 - AMI UEFI BIOS
- ◆ Memory
 - Two 260-pin 2133/1866 MHz dual-channel DDR4 non-ECC unbuffered SO-DIMMs support up to 32GB
- ◆ Graphics Engine
 - Intel® HD Graphics Gen 9 Engine with 16 low-power execution units, supporting DX11/12, OpenGL 4.3/4.4 and OpenCL2.x, ES 2.0
- ◆ Display Output
 - Triple independent display
 - 2 x HDMI (up to 4096x2160@24Hz)
 - 1 x 18/24-bit dual-channel LVDS (up to 1920x1200@60Hz)
 - 1 x iDP interface for HDMI, LVDS, VGA, DVI, DP (up to 3840x2160@60Hz) (colay with HDMI1)
- ◆ Ethernet
 - LAN1: Intel® I219-LM PHY with Intel® AMT 11.0 supported
 - LAN2: Intel® I211-AT PCIe GbE controller
- ◆ External I/O Interface
 - 4 x USB 3.2 Gen 1 (5Gb/s)
- ◆ Internal I/O Interface
 - 1 x 8 GB eMMC (optional)
 - 1 x KB/MS (1x6 pin)
 - 1 x RS-232/422/485 (2x5 pin, P=2.0)
 - 2 x SATA 6Gb/s with 5V SATA power connector (no RAID)
- ◆ SMBus
 - 1 x SMBus (1x4 pin)
- ◆ Audio
 - Realtek ALC888S HD Audio codec
 - 1 x Front audio (2x5 pin)
- ◆ 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 Full-size PCIe Mini card slot (with SIM holder & mSATA support)
 - 1 x Half-size PCIe Mini card slot
- ◆ Digital I/O
 - 8-bit digital I/O (2x5 pin)
- ◆ Fan Connector
 - 1 x CPU fan connector (1x4 pin)
 - 1 x System fan connector (1x4 pin)
- ◆ Power Supply
 - 12V only DC input
 - 1 x Internal power connector (2x2 pin)
 - Support AT/ATX mode
- ◆ Watchdog Timer
 - Software programmable supports 1~255 sec. system reset
- ◆ Power Consumption
 - 12V@2.48A (Intel® Core™ i3-6100U CPU with two 8 GB memory)
- ◆ Operating Temperature: -20°C ~ 60°C
- ◆ Storage Temperature: -30°C ~ 70°C
- ◆ Operating Humidity: 5% ~ 95%, non-condensing
- ◆ Dimensions: 115mm x 165mm
- ◆ Weight: GW: 850g / NW: 350g
- ◆ CE/FCC compliant

Features

- EPIC SBC with 6th generation Intel® ULT processor supports dual-channel DDR4 SO-DIMMs
- Triple independent display support
- Easy assembly heat spreader for thermal management
- Full-size PCIe Mini slot with SIM sockets for 3G/LTE expansion
- COM, USB 3.2 Gen 1 (5Gb/s), SATA 6Gb/s, mSATA, eMMC 5.0 and audio support

Dimensions (Unit: mm)



Packing List

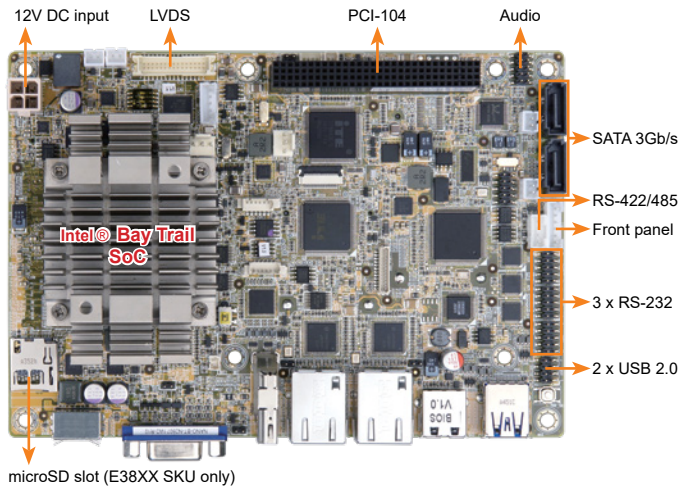
1 x NANO-ULT3 single board computer with heatspreader	1 x Audio cable
1 x RS-232 cable	1 x Power cable
1 x SATA with power cable kit	1 x QIG

Ordering Information

Part No.	Description
NANO-ULT3-i7-R10	EPIC SBC supports Intel® 14nm 6th Generation Mobile Core™ i7-6600U (15W) on-board Processor (ULT) with HDMI/LVDS/iDP, Dual PCIe GbE, USB 3.2 Gen 1 (5Gb/s), SATA 6Gb/s, Dual PCIe Mini, mSATA, COM, Audio and RoHS
NANO-ULT3-i5-R10	EPIC SBC supports Intel® 14nm 6th Generation Mobile Core™ i5-6300U (15W) on-board Processor (ULT) with HDMI/LVDS/iDP, Dual PCIe GbE, USB 3.2 Gen 1 (5Gb/s), SATA 6Gb/s, Dual PCIe Mini, mSATA, COM, Audio and RoHS
NANO-ULT3-i3-R10	EPIC SBC supports Intel® 14nm 6th Generation Mobile Core™ i3-6100U (15W) on-board Processor (ULT) with HDMI/LVDS/iDP, Dual PCIe GbE, USB 3.2 Gen 1 (5Gb/s), SATA 6Gb/s, Dual PCIe Mini, mSATA, COM, Audio and RoHS
NANO-ULT3-C-R10	EPIC SBC supports Intel® 14nm 6th Generation Mobile Celeron® 3955U (15W) on-board Processor (ULT) with HDMI/LVDS/iDP, Dual PCIe GbE, USB 3.2 Gen 1 (5Gb/s), SATA 6Gb/s, Dual PCIe Mini, mSATA, COM, Audio and RoHS
32001-008600-200-RS	Dual-port USB cable, 210mm, P=2.0
32006-001100-201-RS	PS/2 KB/MS cable, 135mm/110mm, P=2.0

NANO-BTW2 -BT-i1

EPIC SBC supports 22nm Intel® Atom®/Celeron® on-board SoC with VGA, HDMI, LVDS, Dual Intel® PCIe GbE, USB 3.2 Gen 1 (5Gb/s), Dual PCIe Mini, SATA 3Gb/s, mSATA, COM, Audio and RoHS



Highly efficient and power optimized multi-format codec engine

- Full HW Acceleration for Video Decoding
H.264, VC1 MPEG2, MVC, VP8, MPEG-4/H.263 MJPEG formats

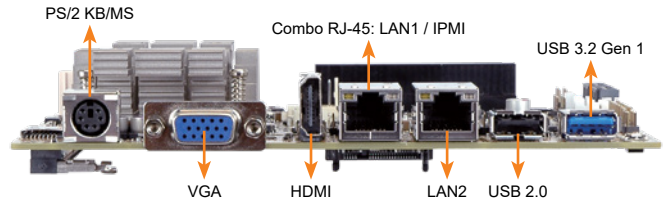
Bay Trail SoC



- Video Encoding
» Full HW acceleration for H.264
» Hybrid HW acceleration of MPEG2



Bay Trail SoC



Specifications

- ◆ SoC
Intel® Atom® E3827 on-board SoC (1.75GHz, dual-core, 1MB cache, TDP=8W)
Intel® Atom® E3826 on-board SoC (1.46GHz, dual-core, 1MB cache, TDP=7W)
Intel® Atom® E3815 on-board SoC (1.46GHz, single-core, 512KB cache, TDP=5W)
Intel® Celeron® J1900 on-board SoC (2GHz, quad-core, 2MB cache, TDP=10W)
Intel® Celeron® N2807 on-board SoC (1.58GHz, dual-core, 2MB cache, TDP=4.3W)
- ◆ BIOS
AMI UEFI BIOS
- ◆ Memory
One 204-pin 1333/1066 MHz single-channel unbuffered DDR3L SDRAM SO-DIMM supports up to 8 GB (J1900, N2930, E3827, E3826, E3815) or 4 GB (N2807)
- ◆ Graphics Engine
Intel® HD Graphics Gen 7 Engine with four execution units, supporting DX11.1, OpenGL 4.2 and OpenCL 1.2
- ◆ Display Output
Dual independent display
1 x VGA (up to 2560x1600@60 Hz)
1 x HDMI (up to 1920x1080@60 Hz)
1 x 18/24-bit dual-channel LVDS (up to 1920x1200@60Hz)
- ◆ Ethernet
» NANO-BT-i1
LAN1: Intel® I210-AT PCIe controller with NCSI support
LAN2: Intel® I211-AT PCIe controller
» NANO-BT-E38XX1W2
LAN1: Intel® I210-IT PCIe controller with NCSI support
LAN2: Intel® I210-IT PCIe controller
- ◆ External I/O Interface
1 x PS/2 KB/MS
1 x USB 2.0
1 x USB 3.2 Gen 1 (5Gb/s)
- ◆ Internal I/O Interface
1 x RS-422/485 (1x4 pin, P=2.0)
2 x SATA 3Gb/s with 5V SATA power connector (no RAID)
2 x USB 2.0 (2x4 pin, P=2.0)
3 x RS-232 (2x5 pin, P=2.0)
- ◆ iRIS Remote Management Module: 1 x iRIS-1010 slot
- ◆ SMBus: 1 x SMBus (1x4 pin)
- ◆ Audio
Realtek ALC888S HD Audio codec
1 x Front audio (2x5 pin)
- ◆ 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 Full-size PCIe Mini card slot (support mSATA co-lay SATA port 2)
1 x PCI-104 slot (PCI signal)
1 x microSD slot (E38XX SKU only)
- ◆ Digital I/O: 8-bit digital I/O (2x5 pin)
- ◆ Fan Connector
1 x CPU smart fan (1x3 pin)
1 x System smart fan (1x3 pin)
- ◆ Power Supply
12V only DC input
1 x Internal power connector (2x2 pin)
Support AT/ATX mode
- ◆ Power Consumption
12V@1.52A (Intel® Atom® processor J1900 with one 8 GB 1333 MHz DDR3 memory)
- ◆ Watchdog Timer: Software programmable, support 1~255 sec. system reset
- ◆ Operating Temperature: -20°C ~ 60°C, -40°C ~ 85°C (NANO-BT-E38XX1W2)
- ◆ Storage Temperature: -30°C ~ 70°C, -40°C ~ 85°C (NANO-BT-E38XX1W2)
- ◆ Operating Humidity: 5% ~ 95%, non-condensing
- ◆ Dimensions: 115mm x 165mm
- ◆ Weight: GW: 850g / NW: 350g
- ◆ CE/FCC compliant



Features

- EPIC SBC supports 22nm Intel® Atom® or Celeron® on-board SoC
- Supports dual independent display with LVDS, VGA and HDMI
- 1.35V DDR3L 1333/1066 MHz SDRAM support up to 8 GB

Packing List

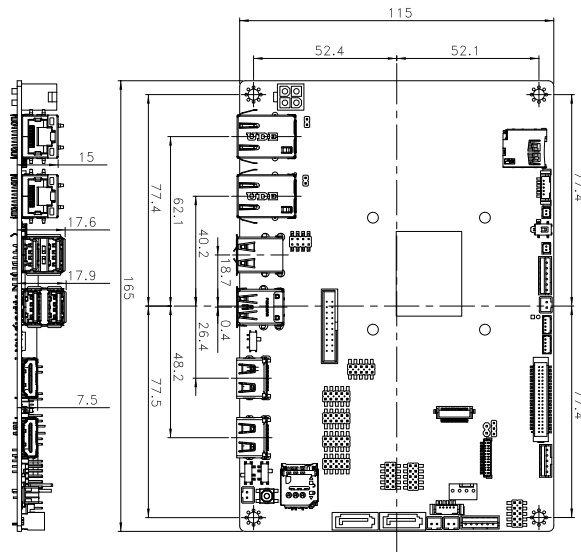
1 x NANO-BT single board computer with heatsink	
1 x Power cable	2 x SATA with power cable kit
2 x RS-232 cable	1 x QIG

Ordering Information

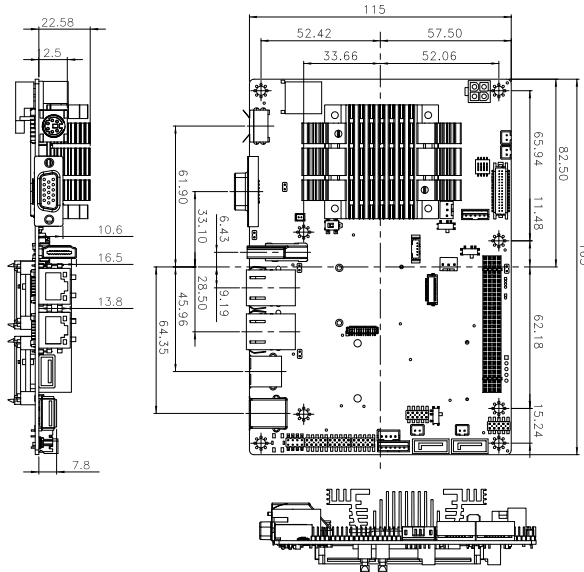
Part No.	Description
NANO-BT-i1-J19001-R11	EPIC SBC supports Intel® 22nm quad-core J1900 2.0GHz (10W) on-board SoC with VGA/HDMI/LVDS, Dual PCIe GbE, PCIe Mini, USB 3.2 Gen 1 (5Gb/s), SATA 3Gb/s, mSATA, COM, iRIS-1010, Audio and RoHS
NANO-BT-i1-N28071-R11	EPIC SBC supports Intel® 22nm dual-core N2807 1.58GHz (4.3W) on-board SoC with VGA/HDMI/LVDS, Dual PCIe GbE, PCIe Mini, USB 3.2 Gen 1 (5Gb/s), SATA 3Gb/s, mSATA, COM, iRIS-1010, Audio and RoHS
NANO-BT-J19001-ECO-R11	Intel 22nm Quad-Core Celeron J1900 2.0GHz (10W) on-board SoC with VGA/HDMI/LVDS, Dual PCIe GbE, USB 3.0, PCIe Mini, SATA, mSATA, COM, Audio, ECO packing and RoHS
32001-008600-200-RS	Dual-port USB 2.0 cable, 210mm, P=2.0
32006-000300-100-RS	PS/2 KB/MS Y-cable without bracket, 140mm/120mm
32205-003800-300-RS	RS-422/485 cable, 200mm, P=2.0

EPIC NANO Dimensions (Unit: mm)

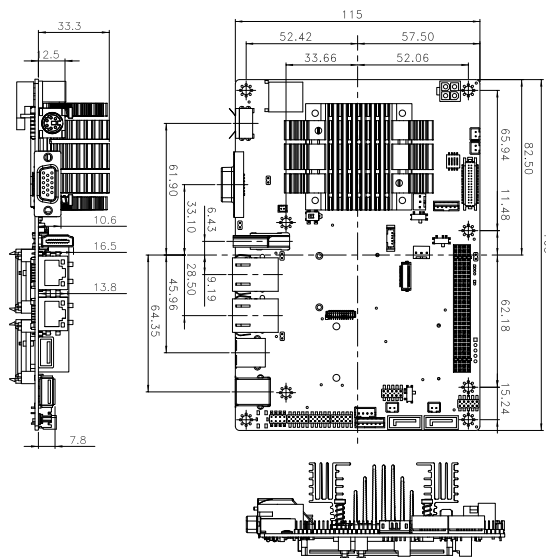
NANO-AL



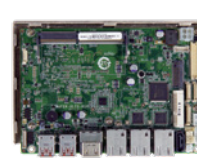
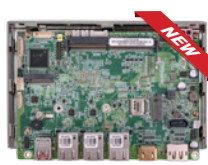
NANO-BTW2



NANO-BT-i1

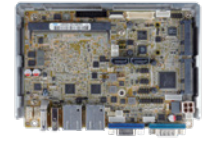
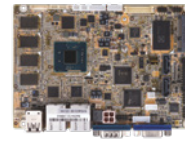
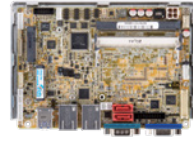
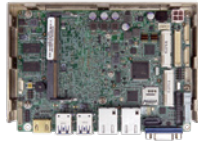


3.5" WAFER Selection Guide



Model Name	WAFER-EHL-J6412	WAFER-JL	WAFER-TGL	WAFER-ULT5	WAFER-AL
CPU Socket	On board	On board	On board	On board	On board
CPU Type	Intel® Elkhart Lake Processor Non-PSE SKU Intel® Celeron® J6412 on-board SoC (up to 2.6GHz, quad-core, 1.5M Cache, TDP=10W)	Intel® Celeron® N5105 on-board SoC (Code name: Jasper Lake)	Intel® Mobile ULT processors (Code name: Tiger Lake)	Intel® Mobile ULT processor (Code name: Whiskey Lake)	Intel® Celeron®/Pentium® on-board SoC (Code name: Apollo Lake)
Chipset	Intel® Elkhart Lake Processor Non-PSE SKU Intel® Celeron® J6412 on-board SoC (up to 2.6GHz, quad-core, 1.5M Cache, TDP=10W)	Intel® Celeron® N5105 on-board SoC	Intel® Mobile ULT processors	Intel® Mobile ULT processor	Intel® Celeron®/Pentium® on-board SoC
Memory	On-board LPDDR4x-3200 MHz 4GB (system max. 16GB)	1 x 260-pin 2933 MHz DDR4 SO-DIMM (system max. 16GB)	1 x 260-pin 3200 MHz DDR4 SO-DIMM (system max. 32GB)	1 x 260-pin 2400MHz DDR4 SDRAM SO-DIMM single channel	1 x 204-pin 1866/1600 MHz single-channel DDR3L SO-DIMM (system max. 8 GB)
Display Interface	Triple independent display 1 x HDMI 2.0 (up to 4096x2160 @ 60Hz) 1 x DP 1.4 (up to 4096x2160 @ 60Hz) 1 x IEI IDPM 3040 slot (only for IEI eDP/LVDS/VGA module)	Dual independent display 1 x DP 1.4 1 x HDMI 1.4	Quad independent display 2 x HDMI 1.4 1 x DP++ 1.4 1 x IEI IDPM 3040 slot (only for IEI eDP/LVDS/VGA module)	Triple independent display 2 x HDMI 1 x 18/24-bit dual-channel LVDS	Triple independent display 1 x VGA 1 x DP++ 1 x 18/24-bit dual-channel LVDS 1 x IDP
Ethernet	LAN1: Intel® I225V 2.5GbE controller LAN2: Intel® I225V 2.5GbE controller	LAN1: Intel® I225V 2.5GbE controller LAN2: Intel® I225V 2.5GbE controller LAN3: Intel® I225V 2.5GbE controller	3 x PCIe 2.5 GbE with Intel i225-V/LM	LAN1: Intel® I211AT LAN2: Intel® I211AT LAN3: Intel® I219LM	LAN1: Realtek RTL8111 controller LAN2: Realtek RTL8111 controller
I/O Interface	2 x USB 3.2 Gen 2 Type A 4 x USB 2.0 pin header 2 x RS-232/422/485 pin header	2 x RS-232 pin header 2 x USB 2.0 pin header 2 x USB 3.2 Gen 2	4 x USB 3.2 Gen 2 2 x USB 2.0 pin header 2 x RS-232/422/485 pin header 1 x RS-232 pin header	1 x RS-232 pin header 1 x RS-232/422/485 pin header (support Auto Flow Control over RS-485) 4 x USB 3.2 Gen 2 2 x USB 2.0 pin header	2 x RS-232 pin header 2 x RS-232/422/485 pin header 2 x USB 3.2 Gen 1 4 x USB 2.0 pin header
Storage Interface	1 x SATA 6Gb/s	1 x SATA 6Gb/s	2 x SATA 6Gb/s	1 x SATA 6Gb/s with 5V SATA power connector	2 x SATA 6Gb/s with 5V SATA power connector
Audio	1 x IAUDIO, support IEI AC-KIT-888S Audio Module (2x5 pin)			N/A	Realtek ALC888S HD Audio codec
Digital I/O	12-bit programmable I/O (12-bit GPIO is for programming I/O)	1 x 12-bit digital I/O (2x7 pin)	1 x 12-bit digital I/O (2x7 pin)	8-bit programmable digital I/O	
Power Consumption	TBD	12V@2.45A (Intel® Pentium® Silver N6000 3.30 GHz TDP 6W with one 16GB 2933MHz DDR4 SO-DIMM)	TBD	12V@3.38A (Intel® Core™ i7-8665UE up to 1.7GHz CPU with 16GB 2666MHz DDR4 memory)	12V@2.57A (Intel® Pentium® N4200 up to 2.5GHz with 8GB DDR3L memory)
Watchdog Timer	Software programmable and supports 1~255 sec. system reset				
Operating Environment	Temperature Range: 0°C ~ 60°C (32°F ~ 140°F) Relative Humidity: 5% ~ 95%, non-condensing	Temperature Range: 0°C ~ 60°C (32°F ~ 140°F) Relative Humidity: 5% ~ 95%, non-condensing	Temperature Range: 0°C ~ 60°C (32°F ~ 140°F) Relative Humidity: 5% ~ 95%, non-condensing	Temperature Range: -20°C ~ 60°C (-4°F ~ 140°F) Relative Humidity: 5% ~ 95%, non-condensing	Temperature Range: -20°C ~ 70°C (-4°F ~ 158°F) Relative Humidity: 5% ~ 95%, non-condensing
Expansion Slot	1 x M.2 A key 1 x M.2 B key 1 x PCIe x4 (PCIe Gen3 x2 signal (x2 or x1+x1))	1 x M.2 A key (PCIe Gen3 x1/USB 2.0 signal) 1 x M.2 B key w/ SIM holder (PCIe Gen3 x2/USB 2.0 signal)	1 x M.2 A key (PCIe Gen3 x1/USB 2.0 signal) 1 x M.2 B key w/ SIM holder (PCIe Gen3 x2/USB 2.0 signal)	1 x Full-size PCIe Mini slot (w/ SATA signal, support mSATA) 1 x M.2 slot with A key 2230	2 x Full/Half-size PCIe Mini card slot (one supports mSATA, the other one with SIM holder)
Recommended CPU Cooler	Heatsink	Heat Spreader	Heat Spreader	Heat Spreader	Heatsink

3.5" WAFER Selection Guide

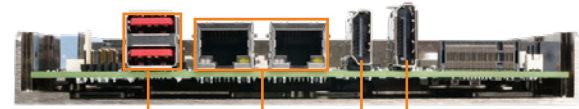
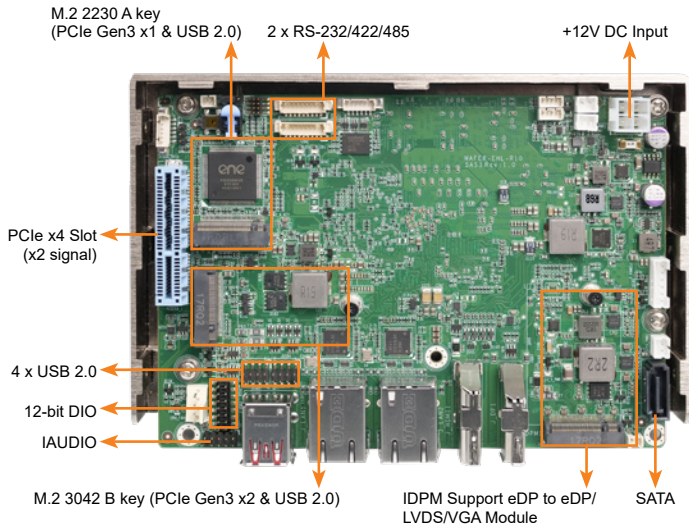


Model Name	WAFER-ULT3	WAFER-BW	WAFER-ULT2/ULT-1	WAFER-BT-E38001W2	WAFER-BT
CPU Socket	On board	On board	On board	On board	On board
CPU Type	Intel® Mobile ULT processor (Code name: Kaby Lake)	Intel® Pentium®/Celeron® SoC (Code name: Braswell)	Intel® Mobile ULT processor (Code name: Broadwell)	Intel® Atom® SoC (Code name: Bay Trail)	Intel® Atom®/Celeron® SoC (Code name: Bay Trail)
Chipset	Intel® Mobile ULT processor	Intel® Pentium®/Celeron® SoC	Intel® Lynx Point SoC	Intel® Atom® SoC	Intel® Atom®/Celeron® on-board SoC
Memory	1 x 260-pin 2133MHz single-channel DDR4 SDRAM SO-DIMM On-board DDR4 memory (optional 4GB/8GB support)	1 x 204-pin 1600/1333 MHz single-channel DDR3L SDRAM unbuffered SO-DIMM slot (system max. 8 GB)	2 x 204-pin 1600/1333 MHz dual-channel DDR3L SO-DIMMs (system max. 16 GB)	On-board DDR3L memory 2GB for E3825 4GB for E3845	1 x 204-pin 1066/1333 MHz dual-channel DDR3L SO-DIMMs (system max. 8 GB)
Display Interface	Triple independent display 1 x VGA 1 x HDMI 1 x 18/24-bit dual-channel LVDS 1 x iDP interface for HDMI, LVDS, VGA, DVI, DP	Triple independent display 2 x HDMI 1 x 18/24-bit dual-channel LVDS	Dual display supported 1 x VGA 1 x 18/24-bit dual-channel LVDS 1 x iDP interface	Dual display supported 1 x VGA 1 x 18/24-bit dual-channel LVDS 1 x iDP interface	Dual display supported 1 x VGA 1 x 18/24-bit dual-channel LVDS 1 x iDP interface
Ethernet	1 x Intel® I219LM 1 x Intel® I211AT	LAN1: Realtek RTL8111GN controller LAN2: Realtek RTL8111GN controller	LAN1: Intel® I218LM PHY with Intel® AMT 9.0 support LAN2: Intel® I210-AT PCIe GbE controller	LAN1: Intel® I210-IT PCIe controller LAN2: Intel® I211-IT PCIe controller	LAN1: Intel® I210-AT PCIe controller with NCSI support LAN2: Intel® I211-AT PCIe controller
iRIS Remote Management Module	N/A	N/A	1 x iRIS-1010 slot	N/A	N/A
I/O Interface	2 x RS-232/422/485 pin header 4 x USB 3.2 Gen 1 2 x USB 2.0 pin header	1 x PS/2 KB/MS pin header 2 x RS-232/422/485 pin header 1 x RS-232 3 x RS-232 pin header 2 x USB 3.2 Gen 1 4 x USB 2.0 pin header	1 x PS/2 KB/MS pin header 1 x RS-232 2 x RS-232 pin header 1 x RS-422/485 pin header 2 x USB 2.0 pin header 2 x USB 3.2 Gen 1	1 x PS/2 KB/MS pin header 1 x RS-422/485 pin header 1 x RS-232 1 x USB 2.0 1 x USB 3.2 Gen 1 4 x USB 2.0 pin header	1 x PS/2 KB/MS pin header 1 x RS-232 1 x RS-422/485 pin header 2 x RS-232 pin header 1 x USB 3.2 Gen 1 1 x USB 2.0 4 x USB 2.0 pin header
Storage Interface	1 x SATA 6Gb/s with 5V SATA power connector	2 x SATA 6Gb/s with 5V SATA power connector (no RAID) 1 x eMMC4.51 (optional)	2 x SATA 6Gb/s with 5V power connector	2 x SATA 3Gb/s with 5V SATA power connector (no RAID)	2 x SATA 3Gb/s with 5V SATA power connector (no RAID)
Audio	N/A	Realtek ALC888S HD Audio codec			
Digital I/O	8-bit programmable digital I/O				
Power Consumption	12V@4.27A (Intel® Core™ i7-6600U up to 3.4GHz CPU with 16GB (16GB x1) DDR4-2133 memory running in 3.0GHz)	12V@1.52A (Intel® Pentium® processor N3710 with 8 GB 1600MHz DDR3L memory)	12V@2.72A (Intel® Core™ i5-4300U CPU with two 8 GB 1600 MHz DDR3 memory)	12V@1.332A (Intel® Atom E3840 Processor 1.91GHz with one 2 GB 1333 MHz DDR3 memory)	12V@1.45A (Intel® Celeron® Processor J1900 CPU with one 8 GB 1333 MHz DDR3L memory)
Watchdog Timer	Software programmable and supports 1~255 sec. system reset				
Operating Environment	Temperature Range: -20°C ~ 60°C (-4°F~140°F) Relative Humidity: 5% ~ 95%, non-condensing	Temperature Range: -20°C ~ 60°C (-4°F~140°F) Relative Humidity: 5% ~ 95%, non-condensing	Temperature Range: -10°C ~ 60°C (14°F~140°F) Relative Humidity: 5% ~ 95% non-condensing	Temperature Range: -40°C ~ 85°C Relative Humidity: 5% ~ 95%, non-condensing	Temperature Range: -20°C ~ 60°C (-4°F~140°F) Relative Humidity: 5% ~ 95%, non-condensing
Expansion Slot	1 x Full-size PCIe Mini slot (w/ SATA signal, support mSATA) 1 x Full-size PCIe Mini slot (w/ SIM card slot support)	2 x Full/Half-size PCIe Mini card slot (one with SIM holder)	1 x Full-size PCIe Mini card slot (supports mSATA)	2 x Full-size PCIe Mini card slot (one supports mSATA)	1 x Full-size PCIe Mini card slot (supports mSATA) 1 x Half-size PCIe Mini card slot (except for ECO sku)
Recommended CPU Cooler	Heat Spreader	Heat Spreader	Heat Spreader	Heatsink	N/A

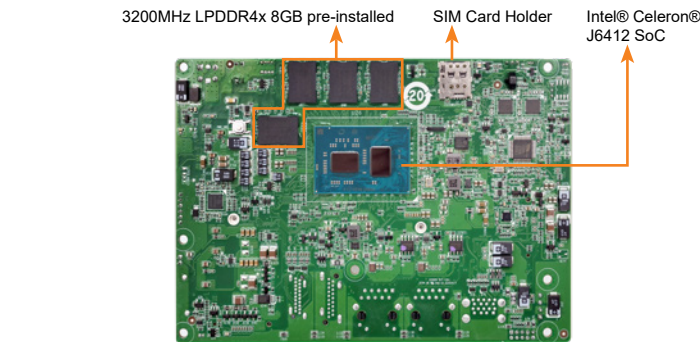
WAFER-EHL

Preliminary

3.5" SBC supports Intel® Celeron® J6412 on-board SoC, 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



2 x USB 3.2 Gen 2 2 x 2.5GbE LAN HDMI DP



Features



10W Low-power Intel® Elkhart Lake Celeron® 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® I225V 2.5GbE Controllers

Two RJ45 network interfaces are supported via Intel® I225V 2.5GbE controllers, achieving up to 2.5GbE network transmission rate.



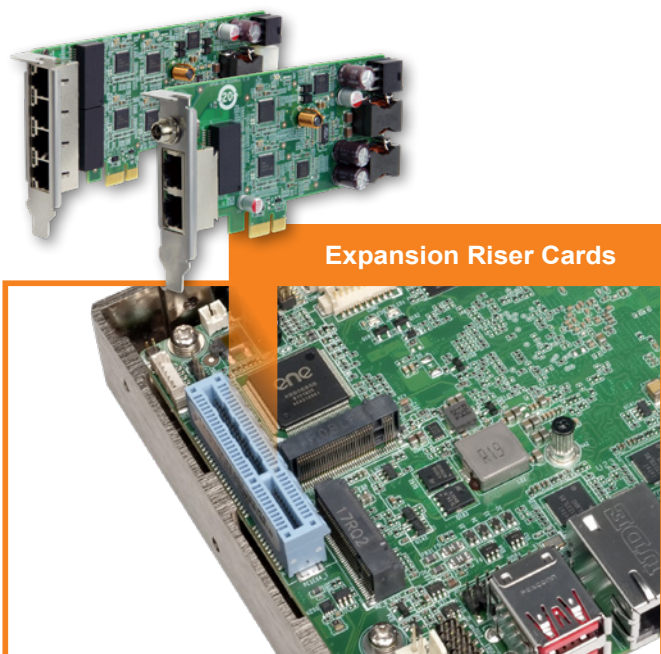
PCIe x4 Slot Available for Expansion

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

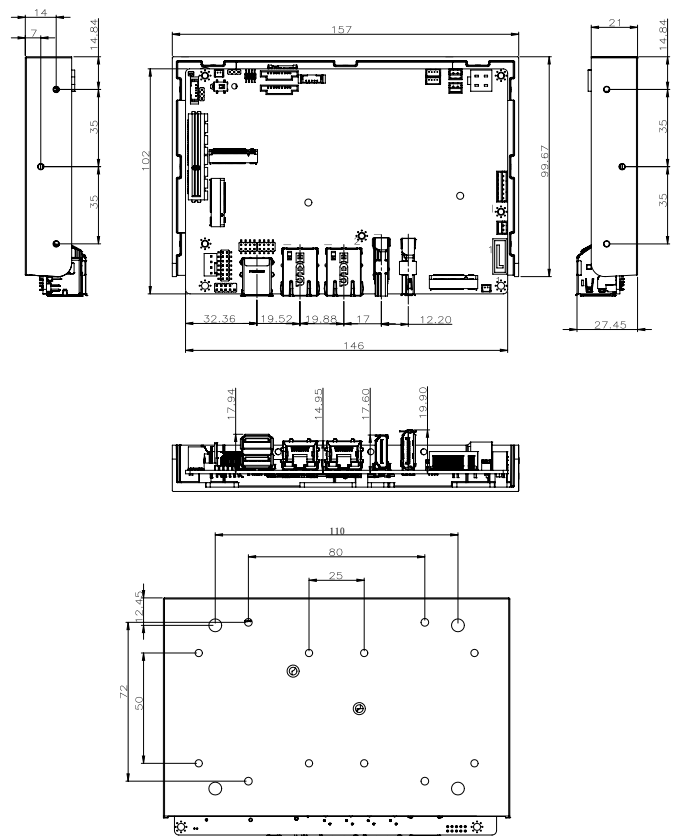
IEI uniquely designs an IDPM interface that can connect to display modules, enabling users to add LVDS/eDP/VGA display interface upon requirements.



Specifications

- ◆ 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 3200 MHz 8GB
- ◆ Graphics Engine
Intel® Gen11 UHD Graphics
- ◆ Display Output
Triple independent display
1 x HDMI 2.0 (up to 4096x2160 @ 60Hz)
1 x DP 1.4 (up to 4096x2160 @ 60Hz)
1 x IEI IDPM 3040 slot (only for IEI eDP/LVDS/VGA module)
- ◆ Ethernet
LAN1: Intel® I225V 2.5GbE
LAN2: Intel® I225V 2.5GbE
- ◆ 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 pin header
2 x RS-232/422/485 (1x9 pin, P=1.25)
- ◆ I²C
1 x I²C (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 2230 A key for Wi-Fi & BT (PCIe Gen3 x1 / USB 2.0 signal)
1 x M.2 3052/2042 B key w/ SIM holder (PCIe Gen3 x2 / USB 2.0 signal)
1 x PCIe Gen3 x4 (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
TBD
- ◆ Operating Temperature
0°C ~ 60°C
- ◆ Storage Temperature
-30°C ~ 70°C
- ◆ Operating Humidity
5% ~95%, non-condensing
- ◆ Dimensions
146mm x 102mm
- ◆ Weight
GW:850g / NW:350g
- ◆ Certification
CE/FCC Compliant

Dimensions (Unit: mm)



Packing List

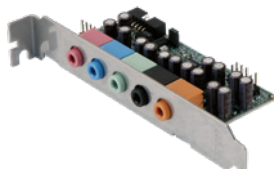
1 x WAFER-EHL single board computer	1 x SATA with power cable kit
1 x Power cable for P4	1 x QIG

Ordering Information

Part No.	Description
WAFER-EHL-J6412-R10	3.5" SBC supports Intel® Celeron® J6412 on-board SoC, 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

Part No.	Description
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



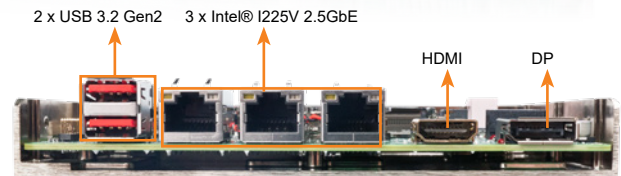
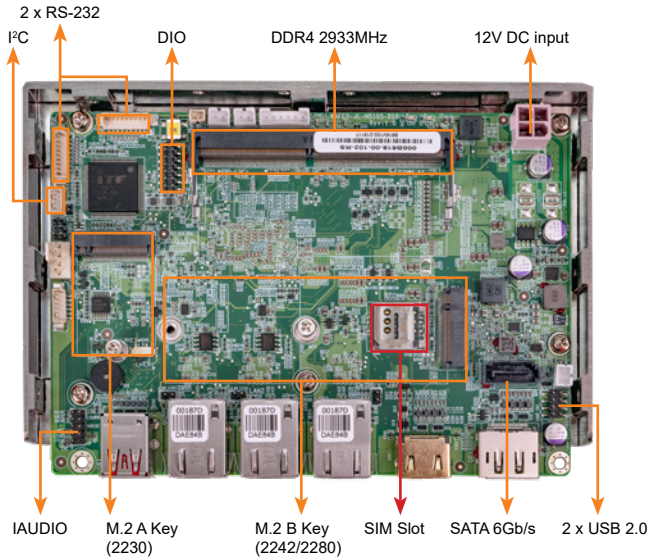
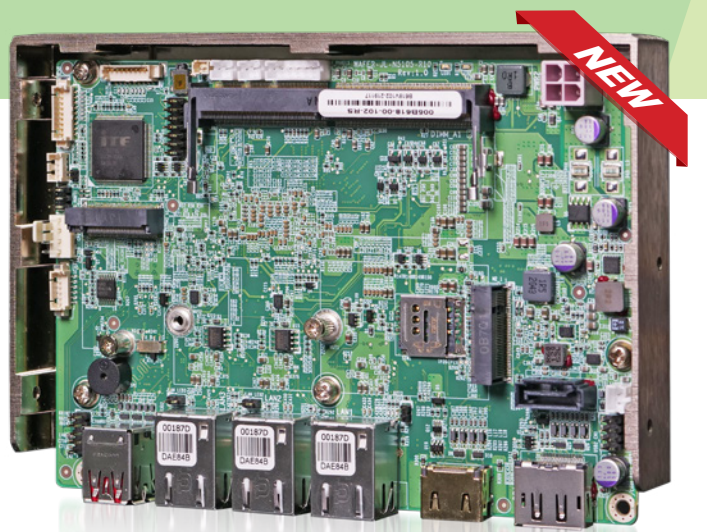
AC-KIT-888S-R10



CB-USB02A-RS

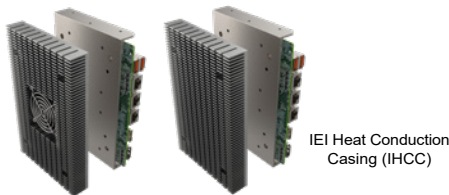
WAFER-JL

ATX motherboard supports 10th/11th Generation Intel® Core™ i9/i7/i5/i3, Celeron® and Pentium® processor, DDR4 memory, triple independent display, dual 2.5GbE LAN, M.2, USB 3.2, SATA 6Gb/s, HD Audio and RoHS

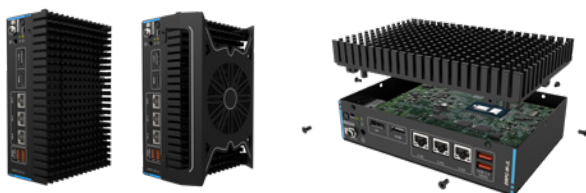


Structure Solution

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 0°C~60°C operating temperature with the active cooling (PN:19XM0B619-0002001-000-RS), and in 0°C~45°C operating temperature with the passive cooling (PN:19XM0B619-0002002-000-RS).



The DRPC-W-JL-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.



Features



Advanced Jasper Lake Platform

The new generation of Intel ultra-low power processor, the Jasper Lake series, is built with the new 10nm process and Tremont architecture, and integrated with 11th gen Intel® UHD Graphics.



10W Low-power Intel® Celeron® N5105 CPU

10nm Intel® Celeron® N5105 on-board SoC features 4 cores, 4 threads, 2.0GHz base frequency, up to 2.9GHz turbo frequency and 4MB cache.



Supporting Intel® I225V 2.5GbE Controllers

Three RJ45 network interfaces are supported via Intel® I225V 2.5GbE controllers, achieving up to 2.5GbE network transmission rate



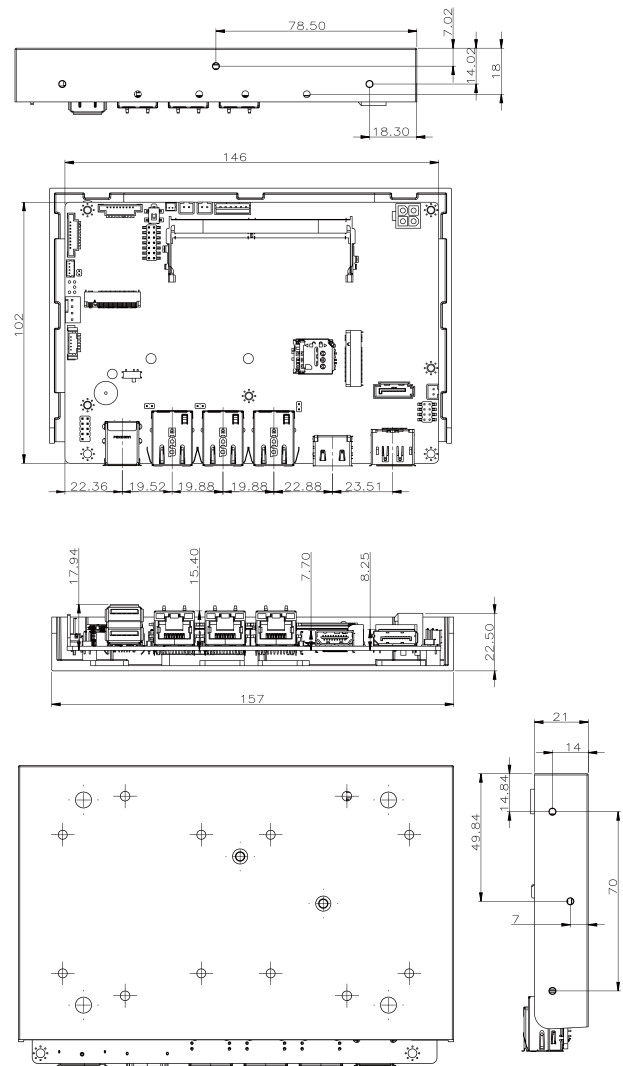
Rich I/O Interface

The WAFER-JL supports two external USB 3.2 Gen 2 (10Gb/s) ports, providing lightning-fast data transfer rate. The internal USB 2.0 ports, M.2 A key slot and M.2 B key slot can be used for function expansion.

Specifications

- ◆ CPU
Intel® Celeron® N5105 on-board SoC (up to 2.90GHz, Quad-core, 4M Cache, TDP=10W)
- ◆ BIOS
AMI UEFI BIOS
- ◆ Memory
1 x 260-pin 2933 MHz DDR4 SO-DIMM (system max. 16GB)
- ◆ Graphics Engine
Intel® Gen11 UHD Graphics
- ◆ Display Output
Dual independent display
1 x DP 1.4 (up to 4096 x 2160 @60Hz)
1 x HDMI 1.4 (up to 4096 x 2160@30Hz)
- ◆ Ethernet
3 x Intel® I225V 2.5GbE controller (colay with I225-LM)
- ◆ External I/O Interface
2 x USB 3.2 Gen 2
- ◆ Internal I/O Interface
1 x SATA 6Gb/s
2 x USB 2.0 (2x4 pin, P=2.0)
2 x RS-232/422/485 (1x9 pin, P=1.25)
- ◆ SMBus / I²C
1 x SMBus (1x4 pin)
- ◆ Audio
1 x iAudio supports IEI AC-KIT-888S Audio Kit (2x5 pin)
- ◆ Front Panel
1 x Front panel connector
Power LED & HDD LED (1x6 pin); power button (1x2 pin); reset button (1x2 pin)
- ◆ LAN LED
3 x LAN LED (1x2 pin)
- ◆ Expansions
1 x M.2 2230 A key (PCIe Gen3 x1, USB 2.0)
1 x M.2 3042/2280 B key w/ SIM holder (PCIe Gen3 x2, USB 2.0)
- ◆ 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 power input (AT/ATX mode)
- ◆ Watchdog Timer
Software programmable, support 1~255 sec. system reset
- ◆ Power Consumption
12V@2.45A (Intel® Pentium® Silver N6000 3.30 GHz TDP 6W with one 16GB 2933MHz DDR4 SO-DIMM)
- ◆ Operating Temperature
0°C ~ 60°C
- ◆ Storage Temperature
-30°C ~ 70°C
- ◆ Operating Humidity
5% ~ 95%, non-condensing
- ◆ Dimensions
146mm x 102mm
- ◆ Weight
GW:850g / NW:350g
- ◆ Certification
CE/FCC compliant

Dimensions (Unit: mm)



Optional Accessories

Part No.	Description
AC-KIT-888S-R10	Realtek ALC888S 7.1 Channel HD Audio peripheral board, RoHS
CB-USB02A-RS	Dual-port USB 2.0 cable, 210mm, P=2.0
32005-003500-200-RS	RS-232/422/485 cable, 2, 250mm, 26AWG, (A) D-SUB 9P MALE+HEXAGONAL screw, (B) MOLEX 51021-0900 P=1.25
19XM0B619-0002001-000-RS	Cooler module, 157 mm x 100 mm x 20 mm, with pad and fan
19XM0B619-0002002-000-RS	Heatsink module, 157 mm x 100 mm x 20 mm, with pad

Packing List

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

Ordering Information

Part No.	Description
WAFER-JL-N5105-R10	3.5" SBC supports 10nm 11th Gen. Intel® Celeron® N5105 on-board SoC, dual HDMI, DP, triple 2.5GbE LAN ports, USB 3.2 Gen 2x1, M.2, SATA 6Gb/s, COM, RoHS, 0°C ~ 60°C



AC-KIT-888S-R10

CB-USB02A-RS

32005-003500-200-RS

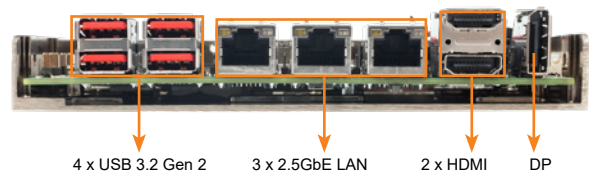
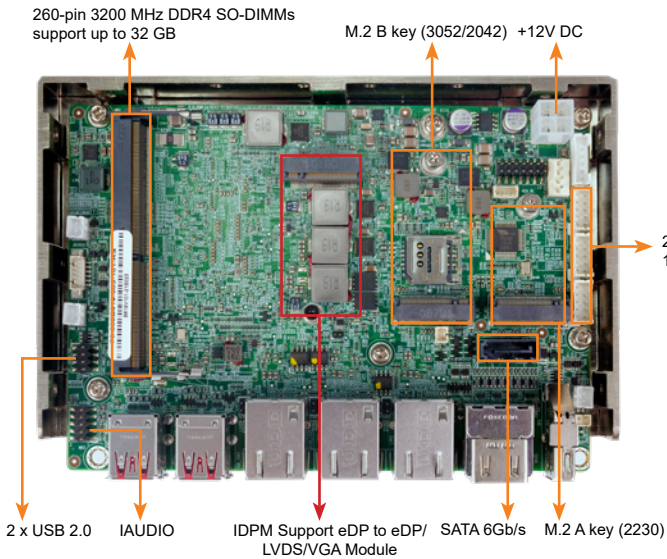
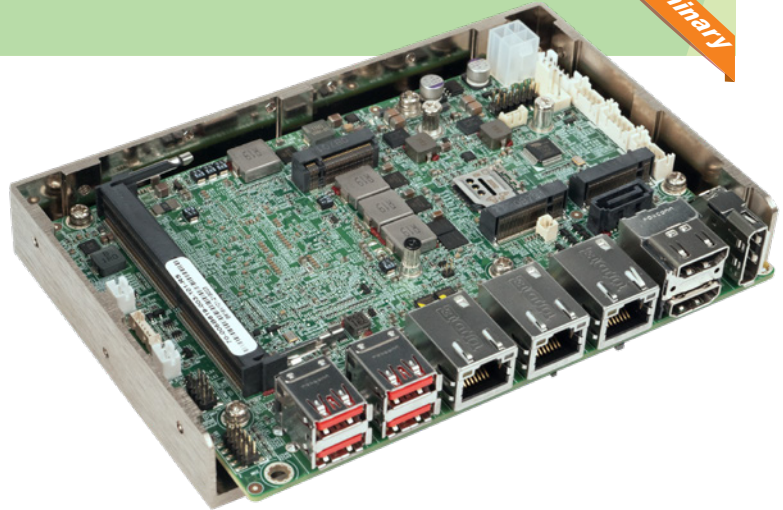
19XM0B619-0002001-000-RS

19XM0B619-0002002-000-RS

WAFER-TGL

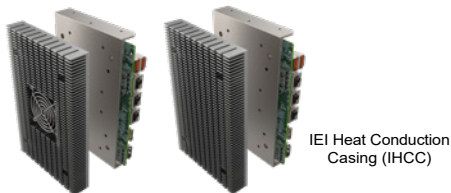
Preliminary

3.5" SBC with 10nm 11th Gen. Intel® Tiger Lake-UP3 Core™ i7/i5/i3 and Celeron® on-board SoC with HDMI, DP, IDPM, triple 2.5 GbE LAN, USB 3.2 Gen 2, M.2, SATA 6Gb/s, COM, IAUDIO, 0°C ~60°C and RoHS

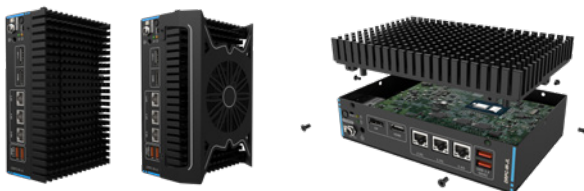


Structure Solution

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 0°C~60°C operating temperature with the active cooling (PN:19XM0B619-0002001-000-RS), and in 0°C~45°C operating temperature with the passive cooling (PN:19XM0B619-0002002-000-RS).



The DRPC-W-JL-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.



Features



Support Intel® Tiger Lake-UP3 Processors

Equipped with 11th Gen. Intel® Core™ i7/i5/i3, Celeron® UP3 processor, the KINO-TGL features high performance, and can handle multitasking efficiently.



Support Intel® I225V 2.5GbE Network Controller

Two Gigabit RJ45 network ports are provided via Intel® I225V 2.5GbE network controller to achieve up to 2.5GbE network transmission rate.



Support USB 3.2 Gen 1 / Gen 2 up to 10Gb/s

The design of the motherboard is based on USB 3.2 protocol. Four USB 3.2 Gen 2 (10Gb/s) are provided through external I/O for efficient data transfer rate. The WAFER-TGL also supports two internal USB 2.0 ports for additional wiring options.



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.

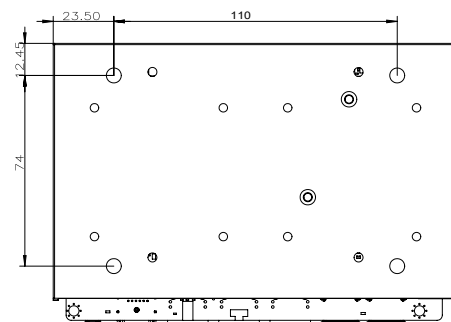
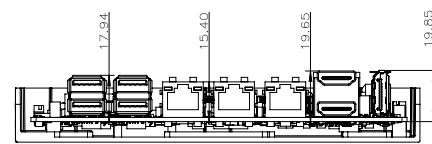
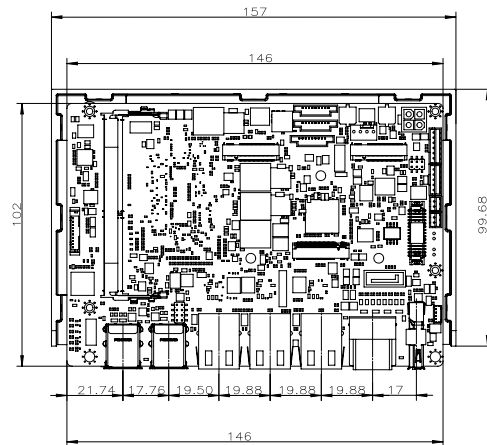
Specifications

- ◆ SOC
 - 11th Gen. Intel® mobile Tiger Lake-UP3 SoC
 - Intel® Core™ i7-1185G7E (up to 4.8GHz, quad-core, 12M Cache, TDP=28/15/12W)
 - Intel® Core™ i5-1145G7E (up to 4.4GHz, quad-core, 8M Cache, TDP=28/15/12W)
 - Intel® Core™ i3-1115G4E (up to 4.1GHz, quad-core, 6M Cache, TDP=28/15/12W)
 - Intel® Celeron® 6305 (up to 1.8GHz, dual-core, 4M Cache, TDP=15W)
- ◆ BIOS
 - AMI UEFI BIOS
- ◆ Memory
 - 1 x 260-pin 3200 MHz DDR4 SO-DIMMs support up to 32 GB
- ◆ Graphics Engine
 - Intel® Gen11 UHD Graphics
- ◆ Display Output
 - Four Independent Displays
 - 2 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® I225V 2.5GbE
 - LAN2: Intel® I225V 2.5GbE
 - LAN3: Intel® I225V 2.5GbE
- ◆ External I/O
 - 4 x USB 3.2 Gen 2 (10Gb/s)
- ◆ Internal I/O
 - 1 x SATA 6Gb/s
 - 2 x USB 2.0 pin header (P=2.0)
 - 2 x RS-232/422/485 (2x5 pin, P=2.0)
 - 1 x RS-232 (2x5 pin, P=2.0)
- ◆ I²C
 - 1 x I²C (1x4 pin)
- ◆ Audio
 - 1 x IAUDIO (2x5 pin) supporting IEI AC-KIT-888S kit
- ◆ Front Panel
 - 1 x Power LED & HDD LED (1x6 pin P=2.0)
 - 1 x Power button (1x2 pin P=2.0)
 - 1 x Reset button (1x2 pin P=2.0)
- ◆ LAN LED
 - 3 x LAN LED (1x2 pin)
- ◆ Expansion
 - 1 x M.2 A key for Wi-Fi & BT (2230) (PCIe Gen3 x1/USB 2.0 signal)
 - 1 x M.2 B key (3052/2042) w/ SIM holder (PCIe Gen3 x2/USB 2.0 signal)
- ◆ Digital I/O
 - 1 x 12-bit digital I/O (2x7pin)
- ◆ 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
 - TBD
- ◆ Operating Temperature
 - 0°C ~ 60°C
- ◆ Storage Temperature
 - 20°C ~ 70°C
- ◆ Operating Humidity
 - 5% ~95%, non-condensing
- ◆ Dimension
 - 146mm x 102mm
- ◆ Weight
 - GW: 850g / NW: 350g
- ◆ Certification
 - CE/FCC Compliant

Optional Accessories

Part No.	Description
CB-USB02A-RS	Dual port USB cable with bracket, 300mm, P=2.00
AC-KIT-888S-R10	Realtek ALC888S 7.1 Channel HD Audio peripheral board, RoHS
32205-002700-200-RS	RS-232/422/485, 200mm, P=2.0
19XM0B619-0002001-000-RS	Cooler module, 157 mm x 100 mm x 20 mm, with pad and fan
19XM0B619-0002002-000-RS	Heatsink module, 157 mm x 100 mm x 20 mm, with pad

Dimensions (Unit: mm)



Packing List

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

Ordering Information

Part No.	Description
WAFER-TGL-U-C-R10	3.5" SBC with Intel® Tiger Lake-UP3 Celeron® 6305 Processor, DDR4 SO-DIMM, 12V DC input, quad display, triple Intel® 2.5 GbE, SATA, USB 3.2, M.2, SoC, RoHS
WAFER-TGL-U-i3-R10	3.5" SBC with Intel® Tiger Lake-UP3 Core™ i3-1115G4E Processor, DDR4 SO-DIMM, 12V DC input, quad display, triple M.2 A/B key, triple Intel® 2.5 GbE, SATA, USB 3.2, SoC, RoHS
WAFER-TGL-U-i5-R10	3.5" SBC with Intel® Tiger Lake-UP3 Core™ i5-1145G7E Processor, DDR4 SO-DIMM, 12V DC input, quad display, triple M.2 A/B key, triple Intel® 2.5 GbE, SATA, USB 3.2, SoC, RoHS
WAFER-TGL-U-i7-R10	3.5" SBC with Intel® Tiger Lake-UP3 Core™ i7-1185G7E Processor, DDR4 SO-DIMM, 12V DC input, quad display, triple M.2 A/B key, triple Intel® 2.5 GbE, SATA, USB 3.2, SoC, RoHS



CB-USB02A-RS

AC-KIT-888S-R10

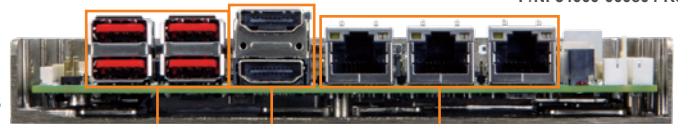
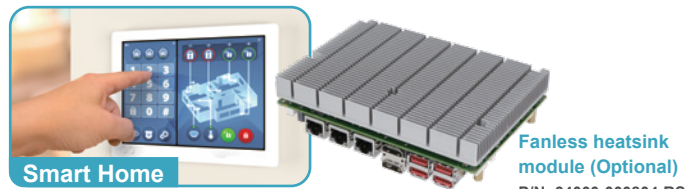
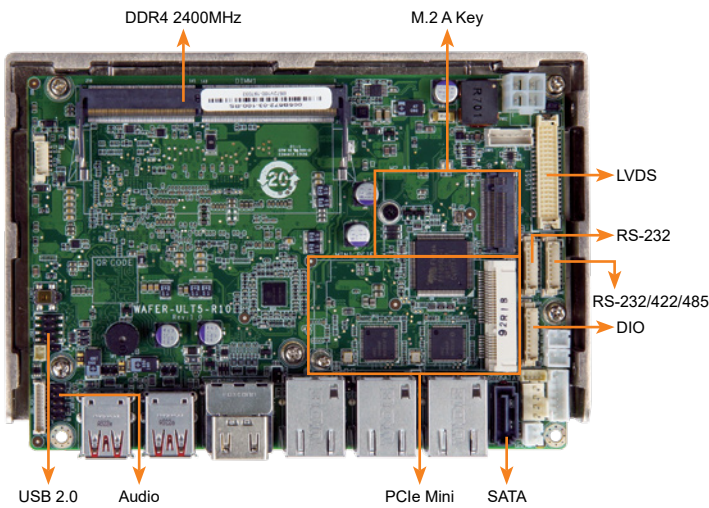
32205-002700-200-RS

19XM0B619-0002001-000-RS

19XM0B619-0002002-000-RS

WAFER-ULT5

3.5" SBC supports Intel® 8th Generation Whiskey Lake processor with DDR4 SO-DIMM, Triple display with dual HDMI 1.4, LVDS, Triple GbE, M.2 A Key, USB 3.2 Gen 2 x1, mPCIe with mSATA support, SATA 6Gb/s, COM and RoHS



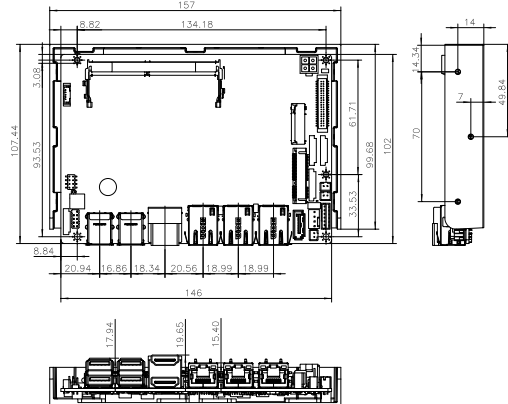
Specifications

- ◆ SoC
 - 8th generation Intel® mobile ULT Processor
 - Intel® Core™ i7-8665UE 1.7 GHz (up to 4.4GHz, Quad-core, 8MB cache, TDP=15W)
 - Intel® Core™ i5-8365UE 1.6 GHz (up to 4.1GHz, Quad-core, 6MB cache, TDP=15W)
 - Intel® Core™ i3-8145UE 2.2 GHz (up to 3.9GHz, Dual-core, 4MB cache, TDP=15W)
 - Intel® Celeron® processor 4305UE (up to 2.0GHz, Dual-core, 2MB cache, TDP=15W)
 - Intel® Celeron® processor 4205U (up to 1.8GHz, Dual-core, 2MB cache, TDP=15W)
- ◆ BIOS
 - AMI UEFI BIOS
- ◆ Memory
 - 1 x DDR4 2400MHz SO-DIMM support up to 32GB
- ◆ Graphics Engine
 - Intel® UHD Graphics 620
- ◆ Display Output
 - Triple Independent Displays
 - 2 x HDMI 1.4 (up to 4096x2160@30Hz)
 - 1 x LVDS: 18/24-bit dual-channel LVDS by CH7511B DP to LVDS converter (up to 1920x1200@60Hz)
- ◆ Ethernet
 - 2 x Intel® I211AT (colay with I210)
 - 1 x PCIe GbE LAN Intel i219 Controller
- ◆ Embedded Controller
 - ITE IT8587VG-FX
- ◆ External I/O Interface
 - 4 x USB 3.2 Gen 2 x1
- ◆ Internal I/O Interface
 - 1 x RS-232 (1x9 pin, P=1.25)
 - 1 x RS-232/422/485 (1x9 pin, P=1.25) (Support Auto Flow Control over RS-485)
 - 1 x SATA 6Gb/s with 5V SATA power connector
 - 2 x USB 2.0 (2x4 pin, P=2.0)
- ◆ I²C
 - 1 x I²C (1x4 pin)
- ◆ Audio
 - 1 x HD audio (2x5 pin, support 7.1 channel HD audio by IEI AC-KIT-888S-R10 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
 - 3 x LAN LED (1x2 pin)
- ◆ Expansion
 - 1 x Full-size PCIe Mini slot (w/ SATA signal, support mSATA)
 - 1 x M.2 slot with A Key 2230
- ◆ Digital I/O
 - 1 x 8-bit digital I/O (1x10 pin)
- ◆ Fan Connector
 - 1 x Smart fan connector (1x4 pin)
- ◆ Power Supply
 - 12V DC input
 - 1 x Internal power connector (2x2 pin)
 - Support AT/ATX mode
- ◆ Watchdog Timer
 - Software programmable support 1~255 sec. system reset
- ◆ Power Consumption
 - 12V@3.38A (Intel® Core™ i7-8665UE up to 1.7GHz CPU with 16GB 2666MHz DDR4 memory)
- ◆ Operating Temperature
 - 20°C ~ 60°C
- ◆ Storage Temperature
 - 30°C ~ 70°C
- ◆ Operating Humidity: 5% ~ 95%, non-condensing
- ◆ Dimensions: 146mm x 102mm
- ◆ Weight: GW: 700g / NW: 350g

Features

- 3.5" SBC supports Intel® 8th generation Whiskey Lake processor with DDR4 SO-DIMMs
- Triple display with dual HDMI, LVDS selection
- M.2 A Key, PCIe Mini slot with mSATA support
- COM, USB 3.2 Gen 2 x1, SATA 6Gb/s support
- Support temperature operation: -20°C ~ 60°C
- Support Auto Flow Control over RS-485

Dimensions (Unit: mm)



Packing List

1 x WAFER-ULT5 single board computer with Heatspreader	
1 x Power cable	1 x SATA with power cable kit
2 x RS-232/422/485 cable	1 x QIG (Quick Installation Guide)

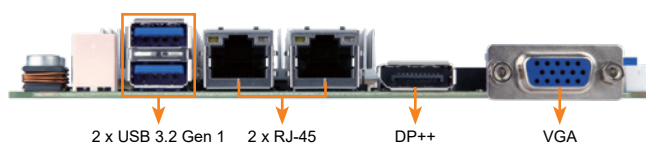
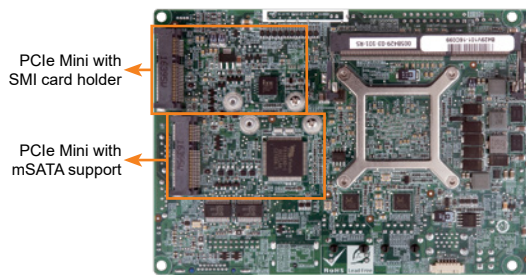
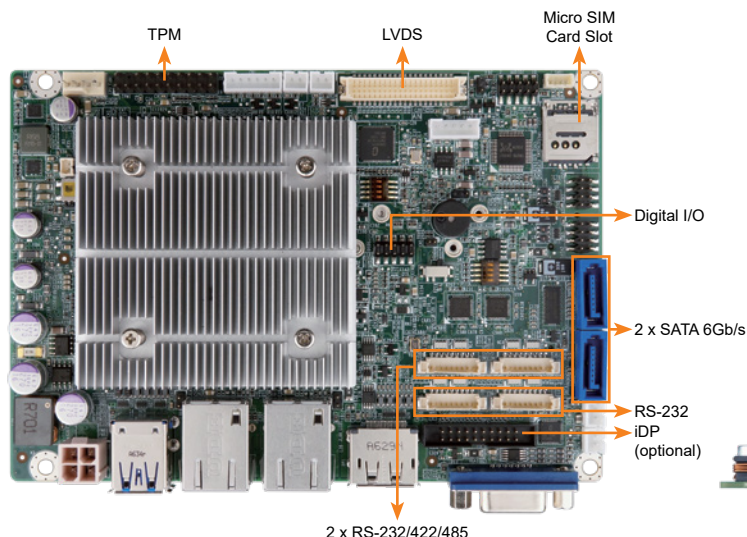
Ordering Information

Part No.	Description
WAFER-ULT5-i7-R10	3.5" SBC supports Intel® 8th Generation Core™ i7-8665UE with DDR4 SO-DIMM, triple display with dual HDMI 1.4, LVDS, Triple GbE, USB 3.2 Gen 2 x1, M.2 A key, mPCIe with mSATA support, SATA 6Gb/s, COM and RoHS
WAFER-ULT5-i5-R10	3.5" SBC supports Intel® 8th Generation Core™ i5-8365UE with DDR4 SO-DIMM, triple display with dual HDMI 1.4, LVDS, Triple GbE, USB 3.2 Gen 2 x1, M.2 A key, mPCIe with mSATA support, SATA 6Gb/s, COM and RoHS
WAFER-ULT5-i3-R10	3.5" SBC supports Intel® 8th Generation Core™ i3-8145UE with DDR4 SO-DIMM, triple display with dual HDMI 1.4, LVDS, Triple GbE, USB 3.2 Gen 2 x1, M.2 A key, mPCIe with mSATA support, SATA 6Gb/s, COM and RoHS
WAFER-ULT5-C-R10**	3.5" SBC supports Intel® 8th Generation Celeron® 4305UE with DDR4 SO-DIMM, triple display with dual HDMI 1.4, LVDS, Triple GbE, USB 3.2 Gen 2 x1, M.2 A key, mPCIe support, SATA 6Gb/s, COM and RoHS
WAFER-ULT5-CE-R10	3.5" SBC supports Intel® 8th Generation Celeron® 4205U with DDR4 SO-DIMM, triple display with dual HDMI 1.4, LVDS, Triple GbE, USB 3.2 Gen 2 x1, M.2 A key, mPCIe support, SATA 6Gb/s, COM and RoHS
32005-003500-200-RS	Round cable, RS-232/422/485, RS-232 cable, 2, 250mm, 26AWG, (A) D-SUB 9P MALE+HEXAGONAL screw, (B) MOLEX 51021-0900 P=1.25, Wins Precision, RoHS
32801-000201-300-RS	SATA cable, 3, 150mm, 26AWG, SATA 7+15P female 180°, SATA 7P female 180°+L.OCK, JST PHR-2 P=2.0, one pcs PKG w/ label, Wins Precision, RoHS

**By order production, MOQ: 100

WAFER-AL

3.5" SBC supports Intel® 14nm Generation Pentium® or Celeron® on-board SoC with DP++/VGA/LVDS/iDP support, Dual PCIe GbE, USB 3.2 Gen 1 (5Gb/s), PCIe Mini with mSATA support, SATA 6Gb/s, COM, Audio and RoHS



Specifications

- ◆ SoC
 - Intel® Pentium® N4200 on-board SoC (up to 2.5GHz, quad-core, 2M Cache, TDP=6W)
 - Intel® Celeron® N3350 on-board SoC (up to 2.4GHz, dual-core, 2M Cache, TDP=6W)
- ◆ BIOS
 - AMI UEFI BIOS
- ◆ Memory
 - One 204-pin 1866/1600MHz Single-channel DDR3L DIMMs support up to 8GB
- ◆ Graphics Engine
 - Intel® HD Graphics Gen9 Low Power; 18 Execution Units
 - 4K Codec Decode & Encode for HEVC 4, H.264, VP8, SVC, MVC
- ◆ Display Output
 - Triple independent display
 - 1 x DP++ (up to 4096x2160@60Hz)
 - 1 x VGA (up to 1920x1200@60Hz)
 - 1 x LVDS: 18/24-bit dual-channel LVDS (up to 1920x1200@60Hz)
 - 1 x iDP (colay with VGA, support by request)
- ◆ Ethernet
 - 2 x PCIe GbE LAN Realtek RTL8111 Controller
- ◆ External I/O Interface
 - 2 x USB 3.2 Gen 1 (5Gb/s)
- ◆ Internal I/O Interface
 - 2 x RS-232 (1x9 pin, P=1.25)
 - 2 x RS-232/422/485 (1x9 pin, P=1.25)
 - 2 x SATA 6Gb/s with 5V SATA power connector (no RAID)
 - 4 x USB 2.0 (2x4 pin, P=2.0)
- ◆ SMBus/I²C
 - 1 x SMBus (1x4 pin, P=2.0)
- ◆ TPM
 - 1 x TPM (2x10 pin)
- ◆ Audio
 - Realtek ALC888S HD Audio codec
 - 1 x Front audio (2x5 pin)
- ◆ 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 Full/Half-size PCIe Mini slot (supports mSATA, colay with SATA port 2)
 - 1 x Full/Half-size PCIe Mini slot (supports SIM card holder)
- ◆ Digital I/O
 - 1 x 8-bit digital I/O (2x5 pin)
- ◆ Fan Connector
 - 1 x System fan connector (1x4 pin)
- ◆ Power supply
 - +12V DC input power (AT/ATX mode)
- ◆ Watchdog Timer
 - Software programmable, supports 1~255 sec. system reset
- ◆ Power Consumption
 - 12V@2.57A (Intel® Pentium® N4200 up to 2.5GHz with 8GB DDR3L memory)
- ◆ Operating Temperature: -20°C ~ 70°C
- ◆ Storage Temperature: -20°C ~ 70°C
- ◆ Operating Humidity: 5% ~ 95%, non-condensing
- ◆ Dimensions: 146mm x 102mm
- ◆ Weight: 600g / NW: 250g
- ◆ CE/FCC compliant

New Intel® Apollo Lake platform solution for entry level system



Features

- 3.5" SBC with Intel® Apollo Lake platform on-board SoC
- One SO-DIMM DDR3L 1867/1600MHz support up to system maximum 8GB
- Triple displays with 1 x DP++, 1 x VGA / 1 x iDP, 1 x LVDS selection
- High speed I/O interface for USB 3.2 Gen 1 (5Gb/s), SATA 6Gb/s
- PCIe Mini with mSATA support

Packing List

1 x WAFER-AL single board computer	
1 x Power cable	1 x SATA with power cable kit
1 x RS-232/422/485 cable	1 x QIG

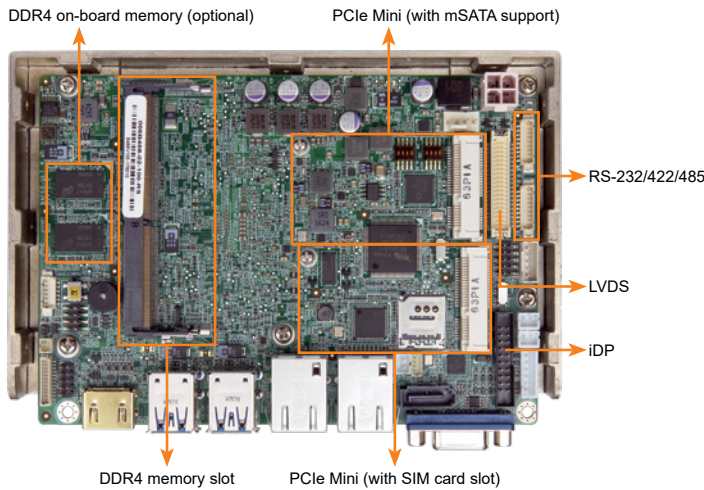
Ordering Information

Part No.	Description
WAFER-AL-N2-R11	3.5" SBC supports Intel® 14nm dual-core Celeron® N3350 2.4GHz on-board SoC with triple display, Dual PCIe GbE, USB 3.0, PCIe Mini with mSATA support, SATA 6Gb/s, COM, Audio and RoHS
WAFER-AL-N1-R11	3.5" SBC supports Intel® 14nm quad-core Pentium® N4200 2.5GHz on-board SoC with triple display, Dual PCIe GbE, USB 3.0, PCIe Mini with mSATA support, SATA 6Gb/s, COM, Audio and RoHS
WAFER-AL-Nx-iDP-R10**	3.5" SBC supports Intel® 14nm quad-core Pentium® N4200/ Celeron® N3350 on-board SoC with iDP, DP++, LVDS triple display, Dual PCIe GbE, USB 3.2 Gen 1 (5Gb/s), PCIe Mini with mSATA support, SATA 6Gb/s, COM, Audio and RoHS
32001-008600-200-RS	Dual-port USB 2.0 cable, 210mm, P=2.0
32005-003500-200-RS	RS-232/422/485 cable, 250mm, P=1.25
32007-005200-200-RS	Audio cable, 300mm, P=2.0
TPM-IN02-R20	20-pin Infineon TPM 2.0 module, software management tool, firmware v5.5

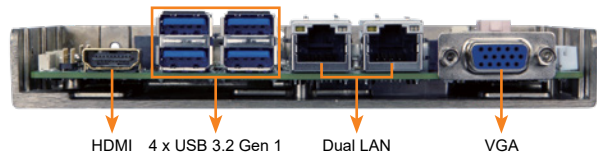
**By order production, MOQ: 100

WAFER-ULT3

3.5" SBC supports Intel® 6th/7th Generation ULT Processor with DDR4 SO-DIMM/On-board Memory Support, Triple Display, PCIe Mini with SIM Card Slot/mSATA Support, SATA 6Gb/s, COM, Audio, and RoHS



Passenger information system for transportation



Specifications

- ◆ CPU
 - 7th generation Intel® mobile ULT processor
 - Intel® Core™ i7-7600U (up to 3.9GHz, dual-core, 4MB cache, TDP=15W)
 - Intel® Core™ i5-7300U (up to 3.5GHz, dual-core, 3MB cache, TDP=15W)
 - Intel® Core™ i3-7100U (up to 2.4GHz, dual-core, 3MB cache, TDP=15W)
 - 6th generation Intel® mobile ULT processor
 - Intel® Core™ i7-6600U (up to 3.4GHz, dual-core, 4MB cache, TDP=15W)
 - Intel® Core™ i5-6300U (up to 3.0GHz, dual-core, 3MB cache, TDP=15W)
 - Intel® Core™ i3-6100U (up to 2.3GHz, dual-core, 3MB cache, TDP=15W)
 - Intel® Celeron® processor 3955U (up to 2.0GHz, dual-core, 2MB cache, TDP=15W)
- ◆ BIOS: AMI UEFI BIOS
- ◆ Memory
 - 1 x 260-pin 2133MHz DDR4 SDRAM SO-DIMM (channel 1, supports up to 16GB)
 - On-board 4GB DDR4 memory (channel 2, optional support by request)
- ◆ Graphics Engine
 - Intel® HD Graphics
- ◆ Display Output
 - Triple independent display
 - 1 x VGA (up to 1920x1200@60Hz)
 - 1 x HDMI (up to 4096x2160@30Hz)
 - 1 x 18/24-bit dual-channel LVDS (up to 1920x1200@60Hz)
 - 1 x iDP interface for HDMI, LVDS, VGA, DVI, DP (co-layout with VGA)
- ◆ Ethernet
 - 1 x Intel® I219LM
 - 1 x Intel® I211AT
- ◆ External I/O Interface
 - 4 x USB 3.2 Gen 1 (5Gb/s)
- ◆ Internal I/O Interface
 - 1 x SATA 6Gb/s with 5V SATA power connector
 - 2 x USB 2.0 (2x4 pin, P=2.0)
 - 2 x RS-232/422/485 (1x9 pin, P=1.25)
- ◆ SMBus
 - 1 x SMBus (1x4 pin, P=2.0)
- ◆ Audio
 - 1 x HD audio (2x5 pin, support 7.1 channel HD audio by IEI AC-KIT-888S-R10 kit)
- ◆ Front Panel
 - 1 x Power LED & HDD LED (1x6 pin)
 - 1 x Power button (1x2 pin)
 - 1 x Reset button (1x2 pin)
- ◆ Expansion
 - 1 x Full-size PCIe Mini slot (w/ SATA signal, supports mSATA)
 - 1 x Full-size PCIe Mini slot (w/ SIM card slot support)
 - * 3955U belongs to Skylake ULT Base series which supports PCIe Gen 2 signal only.
- ◆ Digital I/O
 - 1 x 8-bit digital I/O (2x5 pin)
- ◆ Fan Connector
 - 1 x System fan connector (1x4 pin)
- ◆ Watchdog Timer
 - Software programmable, supports 1~255 sec. system reset
- ◆ Power Supply
 - 12V only DC input
 - 1 x Internal power connector (2x2 pin, or optional terminal block)
- ◆ Power Consumption
 - 12V@4.27A (Intel® Core™ i7-6600U up to 3.4GHz CPU with 16GB 2133MHz DDR4 memory running in 3.0GHz)
- ◆ Operating Temperature: -20°C ~ 60°C
- ◆ Storage Temperature: -30°C ~ 70°C
- ◆ Operating Humidity: 5% ~ 95%, non-condensing
- ◆ Dimensions: 146mm x 102mm
- ◆ Weight: GW: 600g / NW: 250g
- ◆ CE/FCC compliant



Features

- 3.5" SBC with Intel® 6th/7th Generation ULT processor supports DDR4 SO-DIMM (on-board memory support by request)
- Triple display with VGA/iDP, HDMI and LVDS selection
- Two PCIe Mini with mSATA/SIM card slot support
- Intel® GbE LAN with Intel® AMT 11.0 supported

Packing List

1 x WAFER-ULT3/ULT4 single board computer (heat spreader by default)	
1 x Power cable	1 x SATA with power cable kit
1 x RS-232/422/485 cable	1 x QIG

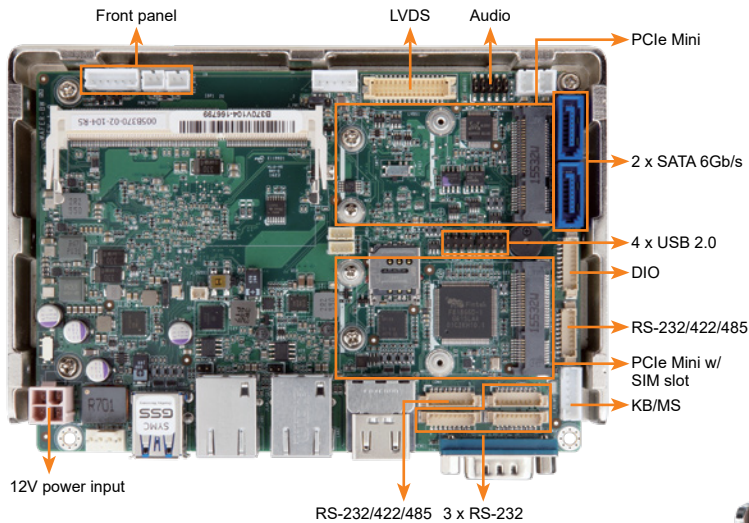
Ordering Information

Part No.	Description
WAFER-ULT3-i7-R11	3.5" SBC supports Intel® 6th Generation ULT Core™ i7-6600U processor with DDR4 SO-DIMM, triple display with VGA/iDP, HDMI, LVDS, Dual GbE, PCIe Mini with SIM card slot/mSATA support, SATA 6Gb/s, COM and RoHS
WAFER-ULT3-i5-R11*	3.5" SBC supports Intel® 6th Generation ULT Core™ i5-6300U processor with DDR4 SO-DIMM, triple display with VGA/iDP, HDMI, LVDS, Dual GbE, PCIe Mini with SIM card slot/mSATA support, SATA 6Gb/s, COM and RoHS
WAFER-ULT3-i3-R11*	3.5" SBC supports Intel® 6th Generation ULT Core™ i3-6100U processor with DDR4 SO-DIMM, triple display with VGA/iDP, HDMI, LVDS, Dual GbE, PCIe Mini with SIM card slot/mSATA support, SATA 6Gb/s, COM and RoHS
WAFER-ULT3-C-R11*	3.5" SBC supports Intel® 6th Generation ULT Celeron® 3955U processor with DDR4 SO-DIMM, triple display with VGA/iDP, HDMI, LVDS, Dual GbE, PCIe Mini with SIM card slot/mSATA support, SATA 6Gb/s, COM and RoHS
32001-008600-200-RS	Dual-port USB 2.0 cable, 210mm, P=2.0
32005-003500-200-RS	RS-232/422/485 cable, 250mm, P=1.25
34000-000673-RS	Optional fanless heatsink module, 146mm x 102mm x 16mm

*EoS

WAFER-BW

3.5" SBC with Intel® 14nm Pentium®/Celeron® on-board SoC with Dual HDMI and LVDS, Dual PCIe GbE, USB 3.2 Gen 1 (5Gb/s), PCIe Mini, SATA 6Gb/s, mSATA, COM, Audio and RoHS

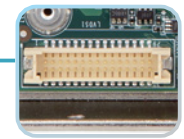


Triple independent display

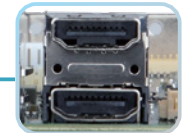
(Dual HDMI and one 18/24-bit dual-channel LVDS)



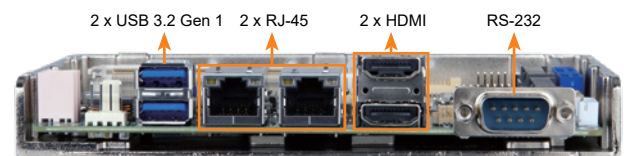
Digital Signage



LVDS



HDMI



Specifications

- ◆ SoC
 - Intel® Pentium® N3710 on-board SoC (up to 2.56GHz, quad-core, 2MB cache, TDP=6W)
 - Intel® Celeron® N3160 on-board SoC (up to 2.24GHz, quad-core, 2MB cache, TDP=6W)
 - Intel® Celeron® N3060 on-board SoC (up to 2.48GHz, dual-core, 2MB cache, TDP=6W)
 - Intel® Celeron® N3010 on-board SoC (up to 2.24GHz, dual-core, 2MB cache, TDP=4W)
- ◆ BIOS
 - AMI UEFI BIOS
- ◆ Memory
 - One 204-pin 1600/1333 MHz single-channel DDR3L SDRAM unbuffered SO-DIMM slot supports up to 8 GB
- ◆ Graphics Engine
 - Intel® HD Graphics Gen 8 Engine with 16 low-power execution units, supporting DX11.1, OpenGL 4.2 and OpenCL1.2
- ◆ Display Output
 - Triple independent display
 - 2 x HDMI (up to 3840x2160@30Hz)
 - 1 x 18/24-bit dual-channel LVDS (up to 1920x1200@60Hz)
- ◆ Ethernet
 - LAN1: Realtek RTL8111GN
 - LAN2: Realtek RTL8111GN
- ◆ External I/O Interface
 - 1 x RS-232
 - 2 x USB 3.2 Gen 1 (5Gb/s) (on rear I/O)
- ◆ Internal I/O Interface
 - 1 x eMMC4.51 (optional)
 - 1 x KB/MS (1x6 pin)
 - 1 x mSATA
 - 2 x RS-232/422/485 (2 by pin header) (1x9 pin, P=1.25)
 - 2 x SATA 6Gb/s with 5V SATA power connector (no RAID)
 - 3 x RS-232 (1x9 pin, P=1.25)
 - 4 x USB 2.0 (2x4 pin, P=2.0)
- ◆ SMBus
 - 1 x SMBus (1x4 pin)
- ◆ I²C
 - 1 x I²C (1x4 pin)
- ◆ Audio
 - Realtek ALC888S HD Audio codec
 - 1 x Front audio (2x5 pin)
- ◆ 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 Full/Half-size PCIe Mini slot (with SIM card holder)
 - 1 x Full/Half-size PCIe Mini slot (supports mSATA, colay with SATA port 2)
- ◆ Digital I/O: 8-bit digital I/O (1x10 pin, P=1.25)
- ◆ Fan Connector
 - 1 x Smart fan connector (1x4 pin)
- ◆ Power Supply
 - 12V only DC input
 - 1 x Internal power connector (2x2 pin)
 - Support AT/ATX mode
- ◆ Power Consumption
 - 12V@1.52A (Intel® Pentium® processor N3710 with 8 GB 1600 MHz DDR3L memory)
- ◆ Watchdog Timer: Software programmable supports 1~255 sec. system reset
- ◆ Operating Temperature: -20°C ~ 60°C
- ◆ Storage Temperature: -30°C ~ 70°C
- ◆ Operating Humidity: 5% ~ 95%, non-condensing
- ◆ Dimensions: 146mm x 102mm
- ◆ Weight: GW: 600g/ NW: 250g
- ◆ CE/FCC compliant



Features

- 3.5" SBC supports Intel® 14nm Pentium®/Celeron® on-board SoC
- Triple independent display support
- 1.35V DDR3L 1333/1600 MHz SDRAM up to 8 GB
- COM, USB 3.2 Gen 1 (5Gb/s), SATA 6Gb/s, PCIe Mini, mSATA and Audio support
- Two full-size PCIe Mini slots (one with SIM holder for WLAN/WWAN expansion)

Packing List

1 x WAFER-BW single board computer	
1 x Audio cable	
1 x Power cable	2 x SATA with power cable kit
1 x RS-232/422/485 cable	

Ordering Information

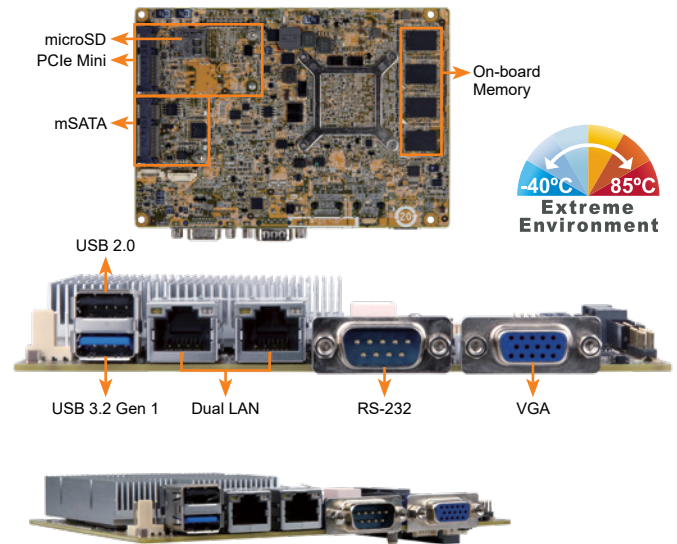
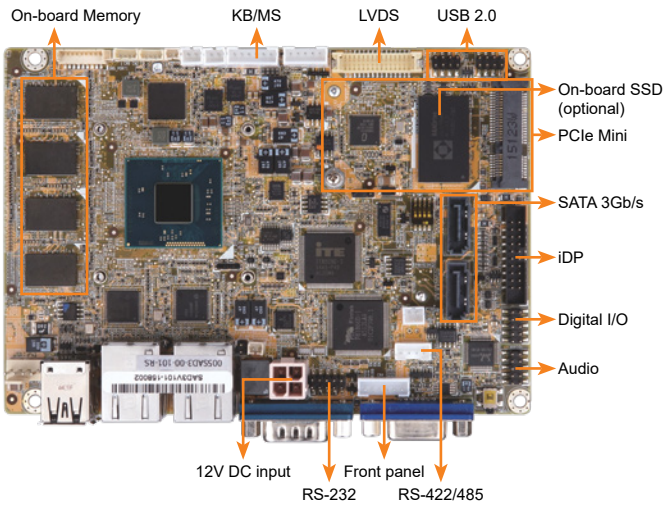
Part No.	Description
WAFER-BW-N4-R21*	3.5" SBC supports Intel® Pentium® quad-core processor N3710 up to 2.56GHz (6W) with dual HDMI and LVDS, Dual PCIe GbE, PCIe Mini, USB 3.2 Gen 1 (5Gb/s), SATA 6Gb/s, mSATA, COM, Audio and RoHS
WAFER-BW-N3-R21	3.5" SBC supports Intel® Celeron® quad-core processor N3160 up to 2.24GHz (6W) with dual HDMI and LVDS, Dual PCIe GbE, PCIe Mini, USB 3.2 Gen 1 (5Gb/s), SATA 6Gb/s, mSATA, COM, Audio and RoHS
WAFER-BW-N2-R21	3.5" SBC supports Intel® Celeron® dual-core processor N3060 up to 2.48GHz (6W) with dual HDMI and LVDS, Dual PCIe GbE, PCIe Mini, USB 3.2 Gen 1 (5Gb/s), SATA 6Gb/s, mSATA, COM, Audio and RoHS
WAFER-BW-N1-R21**	3.5" SBC supports Intel® Celeron® dual-core processor N3010 up to 2.24GHz (4W) with dual HDMI and LVDS, Dual PCIe GbE, PCIe Mini, USB 3.2 Gen 1 (5Gb/s), SATA 6Gb/s, mSATA, COM, Audio and RoHS
32001-008600-200-RS	Dual-port USB 2.0 cable, 210mm, P=2.0
32006-001100-201-RS	PS/2 KB/MS cable, 135mm/110mm, P=2.0
32005-003500-200-RS	RS-232/422/485 cable, 250mm, P=1.25

*EOS

**By order production, MOQ: 100

WAFER-BT-E38001W2

3.5" SBC with Intel® 22nm Atom® SoC, -40°C ~ 85°C, VGA/LVDS/iDP, Dual PCIe GbE, USB 3.2 Gen 1 (5Gb/s), PCIe Mini, SATA 3Gb/s, mSATA, COM, Audio and RoHS



Specifications

- ◆ SoC
Intel® Atom® E3845 on-board SoC (1.91GHz, quad-core, 2MB cache, TDP=10W)
- ◆ BIOS
UEFI BIOS
- ◆ Memory
4 GB solder-down 1066/1333 MHz DDR3L memory
- ◆ Graphics
Intel® HD Graphics Gen 7 Engine with 4 execution units, supporting DX11.1, OpenGL 4.2 and OpenCL1.2
- ◆ Display Output
Dual independent display
1 x VGA (up to 2560x1600@60Hz)
1 x 18/24-bit dual-channel LVDS (up to 1920x1200@60Hz)
1 x iDP interface for HDMI, LVDS, VGA, DVI, DP (up to 2560x1600@60Hz)
- ◆ Ethernet
LAN1: Intel® I210-IT PCIe controller
LAN2: Intel® I210-IT PCIe controller
- ◆ External I/O Interface
1 x RS-232
1 x USB 2.0
1 x USB 3.2 Gen 1 (5Gb/s)
- ◆ Internal I/O Interface
1 x PS/2 KB/MS (1x6 pin) 1 x RS-232 (2x5 pin, P=2.0)
4 x USB 2.0 (2x4 pin, P=2.0) 1 x RS-422/485 (1x4 pin, P=2.0)
2 x SATA 3Gb/s with 5V SATA power connector (no RAID)
- ◆ Expansion
2 x Full-size PCIe Mini slot
- ◆ Audio
Realtek ALC888S HD Audio codec
1 x Front audio (2x5 pin)
- ◆ Storage
On-board SSD 4 GB colay SATA port 1 (optional)
1 x mSATA colay SATA port 2
1 x microSD socket
- ◆ Front Panel
1 x Power LED & HDD LED (1x6 pin)
1 x Power button (1x2 pin)
1 x Reset button (1x2 pin)
- ◆ SMBus: 1 x SMBus (1x4 pin)
- ◆ I²C: 1 x I²C (1x4 pin)
- ◆ LAN LED: 2 x LAN LED (1x2 pin)
- ◆ Digital I/O: 8-bit digital I/O (2x5 pin)
- ◆ Fan Connector
1 x Smart fan connector (1x4 pin)
- ◆ Watchdog Timer: Software programmable supports 1~255 sec. system reset
- ◆ Power Supply
12V only DC input
1 x Internal power connector (2x2 pin)
Support AT/ATX mode
- ◆ Power Consumption
12V@1.32A (Intel® Atom® processor E3845 with on-board 2 GB 1333 MHz DDR3L memory)
- ◆ Operating Temperature: -40°C ~ 85°C
- ◆ Storage Temperature: -40°C ~ 85°C
- ◆ Operating Humidity: 5% ~ 95%, non-condensing
- ◆ Dimensions: 146mm x 102mm
- ◆ Weight: GW: 600g / NW: 250g
- ◆ CE/FCC compliant



Features

- 3.5" SBC supports Intel® 22nm Atom® on-board SoC
- Dual independent display support
- On-board 2 GB/4 GB 1066/1333 MHz DDR3L memory
- COM, USB 3.2 Gen 1 (5Gb/s), SATA 3Gb/s, PCIe Mini, mSATA and Audio support
- Supports -40°C ~ 85°C

Packing List

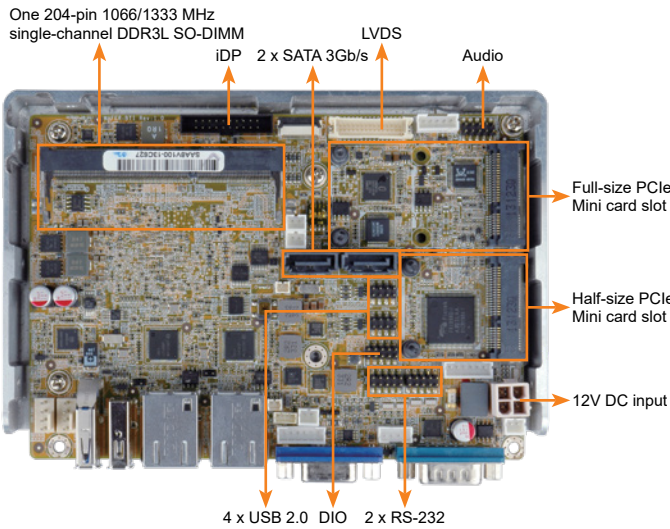
1 x WAFER-BT single board computer	1 x SATA with power cable kit
1 x Power cable	1 x QIG

Ordering Information

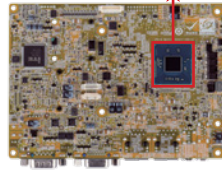
Part No.	Description
WAFER-BT-E38451W2-R12	3.5" SBC with Intel® 22nm Atom® quad-core E3845 1.91GHz (10W) on-board SoC supports -40°C ~ 85°C, 4 GB DDR3 memory on board, VGA/LVDS/iDP, Dual PCIe GbE, USB 3.2 Gen 1 (5Gb/s), PCIe Mini, SATA 3Gb/s, mSATA, COM, Audio and RoHS
19800-000300-100-RS	RS-232 cable with bracket, 300mm, P=2.0
32001-008600-200-RS	Dual-port USB cable, 210mm, P=2.0
32006-001100-201-RS	PS/2 KB/MS cable, 135mm/110mm, P=2.0
32007-005200-200-RS	Audio cable, 300mm, P=2.0
32205-003800-300-RS	RS-422/485 cable, 200mm, P=2.0
DP-DP-R10	DisplayPort to DisplayPort converter board (for IEI iDP connector)
DP-DVI-R10	DisplayPort to DVI-D converter board (for IEI iDP connector)
DP-HDMI-R10	DisplayPort to HDMI converter board (for IEI iDP connector)
DP-LVDS-R10	DisplayPort to LVDS converter board (for IEI iDP connector)
DP-VGA-R10	DisplayPort to VGA converter board (for IEI iDP connector)

WAFER-BT

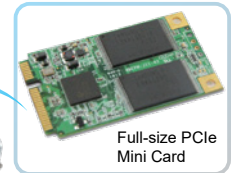
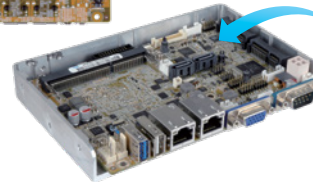
3.5" SBC with Intel® 22nm Atom®/Celeron® on-board SoC, VGA/LVDS/iDP, Dual PCIe GbE, USB 3.2 Gen 1 (5Gb/s), PCIe Mini, SATA 3Gb/s, mSATA, COM, Audio and RoHS



Intel® Atom® Bay Trail SoC processor on solder side



1 x Full-size PCIe Mini slot for Wi-Fi expansion
2 x SATA connector for storage

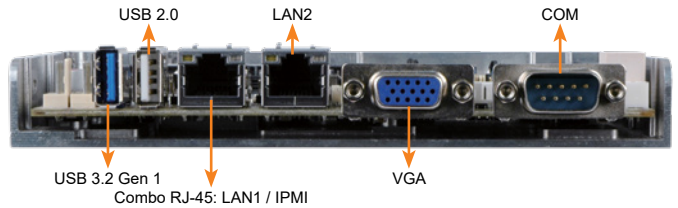


Dual independent display (max. support 1920x1200@60Hz)



Specifications

- ◆ SoC
 - Intel® Celeron® J1900 on-board SoC (2GHz, quad-core, 2MB cache, TDP=10W)
 - Intel® Celeron® N2930 on-board SoC (1.83GHz, quad-core, 2MB cache, TDP=7.5W)
 - Intel® Celeron® N2807 on-board SoC (1.58GHz, dual-core, 2MB cache, TDP=4.3W)
- ◆ BIOS
 - AMI UEFI BIOS
- ◆ Memory
 - One 204-pin 1066/1333 MHz single-channel DDR3L SO-DIMM slot supports up to 8 GB (J1900, N2930) or 4 GB (N2807)
- ◆ Graphics Engine
 - Intel® HD Graphics Gen 7 Engine with 4 execution units, supports DX11.1, OpenGL 4.2 and OpenCL 1.2
- ◆ Display Output
 - Dual independent display
 - 1 x VGA (up to 2560x1600@60Hz)
 - 1 x 24-bit dual-channel LVDS connector (up to 1920x1200@60Hz)
 - 1 x iDP interface for HDMI, LVDS, VGA, DVI, DP (up to 2560x1600@60Hz)
- ◆ Ethernet
 - LAN1: Intel® I210-AT PCIe controller with NCSI support
 - LAN2: Intel® I211-AT PCIe controller
- ◆ External I/O Interface
 - 1 x RS-232
 - 1 x USB 2.0
 - 1 x USB 3.2 Gen 1 (5Gb/s)
- ◆ Internal I/O Interface
 - 1 x KB/MS (1x6 pin)
 - 1 x RS-422/485 (1x4 pin, P=2.0)
 - 2 x RS-232 (2x5 pin, P=2.0)
 - 2 x SATA 3Gb/s with 5V SATA power connector
 - 4 x USB 2.0 (2x4 pin, P=2.0)
- ◆ SMBus
 - 1 x SMBus (1x4 pin)
- ◆ Audio
 - Realtek ALC888S HD Audio codec
 - 1 x Front audio (2x5 pin)
- ◆ 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 Full-size PCIe Mini card slot (supports mSATA, colay with SATA port 2)
 - 1 x Half-size PCIe Mini card slot (except for ECO sku)
- ◆ Digital I/O: 8-bit digital I/O (2x5 pin)
- ◆ Fan Connector
 - 1 x CPU smart fan (1x4 pin)
 - 1 x System smart fan (1x4 pin)
- ◆ Power Supply
 - 12V only DC input
 - 1 x Internal power connector (2x2 pin)
 - Support AT/ATX mode
- ◆ Watchdog Timer: Software programmable, supports 1~255 sec. system reset
- ◆ Power Consumption
 - 12V@1.45A (Intel® Celeron® J1900 with one 8 GB 1333 MHz DDR3 memory)
- ◆ Operating Temperature: -20°C ~ 60°C
- ◆ Storage Temperature: -30°C ~ 70°C
- ◆ Operating Humidity: 5% ~ 95%, non-condensing
- ◆ Dimensions: 146mm x 102mm
- ◆ Weight: GW: 600g / NW: 250g
- ◆ CE/FCC compliant



Features

- 3.5" SBC supports Intel® 22nm Atom® on-board SoC
- Dual independent display support
- 1333/1066 MHz 1.35V DDR3L SDRAM up to 8 GB
- COM, USB 3.2 Gen 1 (5Gb/s), SATA 3Gb/s, PCIe Mini, mSATA and Audio support

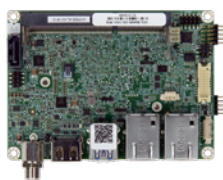
Packing List

1 x WAFER-BT-i1 single board computer	
1 x Audio cable	1 x SATA with power cable kit
1 x Power cable	1 x QIG

Ordering Information

Part No.	Description
WAFER-BT-J19001-R21	3.5" SBC supports Intel® 22nm Quad-Core Celeron™ J1900 2.0GHz (10W) on-board SoC with VGA/LVDS/iDP, Dual PCIe GbE, USB 3.2 Gen 1 (5Gb/s), PCIe Mini, SATA, mSATA, COM, Audio and RoHS
WAFER-BT-N28071-R21	3.5" SBC supports Intel® 22nm Dual-Core Celeron™ N2807 1.58GHz (4.5W) on-board SoC with VGA/LVDS/iDP, Dual PCIe GbE, USB 3.2 Gen 1 (5Gb/s), PCIe Mini, SATA, mSATA, COM, Audio and RoHS
WAFER-BT-N29301-R21	3.5" SBC supports Intel® 22nm Quad-Core Celeron™ N2920 1.86GHz (7.5W) on-board SoC with VGA/LVDS/iDP, Dual PCIe GbE, USB 3.2 Gen 1 (5Gb/s), PCIe Mini, SATA, mSATA, COM, Audio and RoHS
WAFER-BT-J19001-ECO-R21	3.5" SBC supports Intel® 22nm Quad-Core Celeron™ J1900 2.0GHz (10W) on-board SoC with VGA/LVDS/iDP, Dual PCIe GbE, USB 2.0, PCIe Mini, SATA 6Gb/s, mSATA, COM, Audio, ECO packing and RoHS
19800-000300-100-RS	RS-232 cable, 300mm, P=2.0
32001-008600-200-RS	Dual-port USB cable, 210mm, P=2.0
32006-001100-201-RS	PS/2 KB/MS cable, 135mm/110mm, P=2.0
32205-003800-300-RS	RS-422/485 cable, 200mm, P=2.0

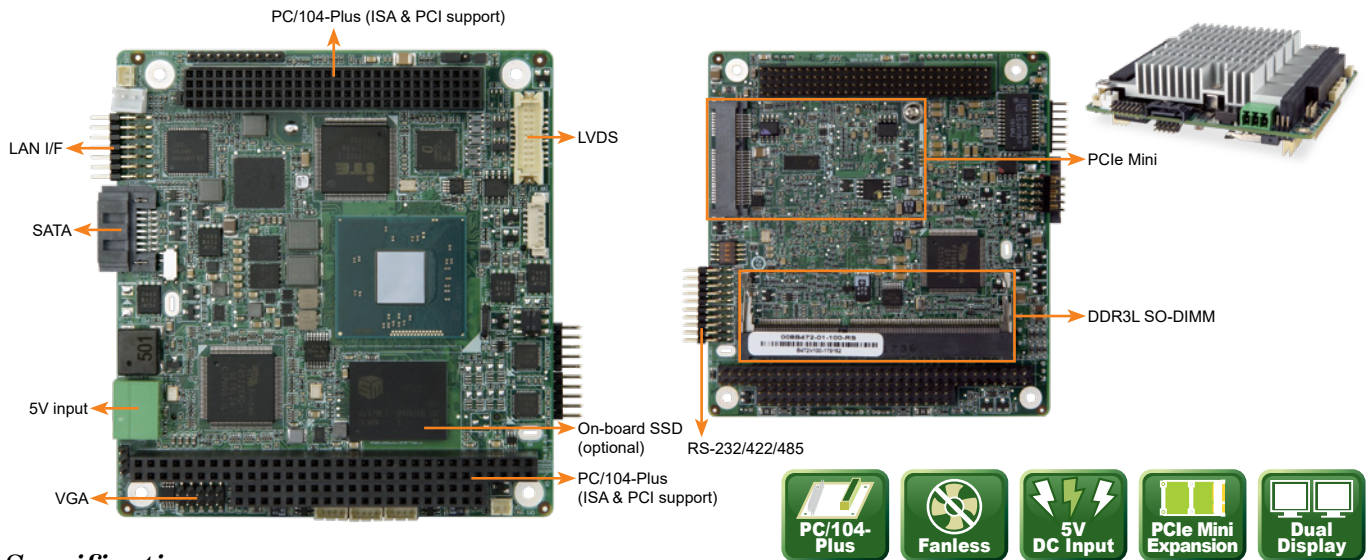
PC/104, Pico-ITX Selection Guide



Model Name	PM-BT	HYPER-AL	HYPER-BW	HYPER-BT
CPU Socket	On board	On board	On board	On board
CPU Type	Intel® Atom®/Celeron® SoC (Code name: Bay Trail)	Intel® Celeron® SoC Code name: Apollo Lake	Intel® Pentium®/Celeron® SoC (Code name: Braswell)	Intel® Atom®/Celeron® SoC Code name: Bay Trail
Chipset	Intel® Atom®/Celeron® SoC	Intel® Celeron® SoC	Intel® Pentium®/Celeron® SoC	Intel® Atom®/Celeron® SoC
Memory	1 x 204-pin 1066/1333 MHz DDR3L SO-DIMM (system max. 8 GB)	1 x 204-pin 1866/1600MHz single-channel DDR3L SDRAM unbuffered SO-DIMM slot (system max. 8GB)	1 x 204-pin 1600/1333 MHz single-channel DDR3L SDRAM unbuffered SO-DIMM slot (system max. 8 GB)	1 x 204-pin 1600/1333 MHz single-channel DDR3L SDRAM unbuffered SO-DIMM slot (system max. 8 GB)
Display Interface	Dual display supported 1 x VGA 1 x 18/24-bit single-channel LVDS	Dual independent display 1 x HDMI 1 x LVDS	Dual independent display 2 x Mini HDMI	Dual independent display 1 x VGA 1 x iDP interface
Ethernet	GbE by Intel® I210 Ethernet PHY	LAN1: Realtek RTL8111H controller LAN2: Realtek RTL8111H controller	LAN: Realtek RTL8111GN controller	LAN: Intel® I211-AT PCIe GbE controller
I/O Interface	2 x RS-232/422/485 (2x5, P=2.0) 3 x USB 2.0 (1x4 pin, P=1.25)	N/A		
Storage Interface	1 x SATA 3Gb/s with 5V SATA power connector On-board SSD (optional)	1 x RS-232 pin header 2 x USB 2.0 pin header 2 x USB 3.2 Gen 1	1 x RS-232 pin header 1 x USB 3.2 Gen 1 1 x USB 2.0 2 x USB 2.0 pin header	1 x RS-232 pin header 1 x USB 3.2 Gen 1 1 x USB 2.0 2 x USB 2.0 pin header
Audio	N/A	1 x SATA 6Gb/s with 5V SATA power connector (no RAID)	1 x SATA 6Gb/s with 5V SATA power connector (no RAID)	1 x SATA 3Gb/s with 5V SATA power connector (no RAID)
Digital I/O	1 x 8-bit DIO	10 pin header on board support 7.1 channel HD Audio by IEI AC-KIT-888S-R10 kit		Realtek ALC888S HD Audio codec
Power Consumption	5V@1.70A (Intel® Celeron® J1900 CPU with 8GB memory)	12V@2.36A (Intel® Celeron® processor N3350 with 8 GB 1600 MHz DDR3L memory)	12V@1.52A (Intel® Pentium® processor N3710 with 8 GB 1600 MHz DDR3L memory)	12V@1.35A (Intel® Celeron® processor J1900 with one 8 GB 1333 MHz DDR3L memory)
Watchdog Timer	Software programmable and supports 1~255 sec. system reset			
Operating Environment	Temperature Range: -20°C ~ 60°C (for J1900/N2930/N2807) Relative Humidity: -40°C ~ 85°C (for E38xx)	Temperature Range: -20°C ~ 60°C (-4°F ~ 140°F) Relative Humidity: 5% ~ 95%, non-condensing		
Expansion Slot	1 x Full-size PCIe Mini slot (support mSATA) 1 x PC/104-Plus (ISA+PCI)	1 x M.2 A key 2230 1 x M.2 B key 2242	1 x M.2 (B key)	N/A
CPU Cooler	Heatsink	Heat Spreader	Heatsink	Heat Spreader

PM-BT

PC/104-Plus SBC with Intel® Atom®/Celeron® on-board SoC with DDR3L, VGA, LVDS, GbE, USB 2.0, SATA 3Gb/s, RS-232/422/485 and 5V DC input, RoHS



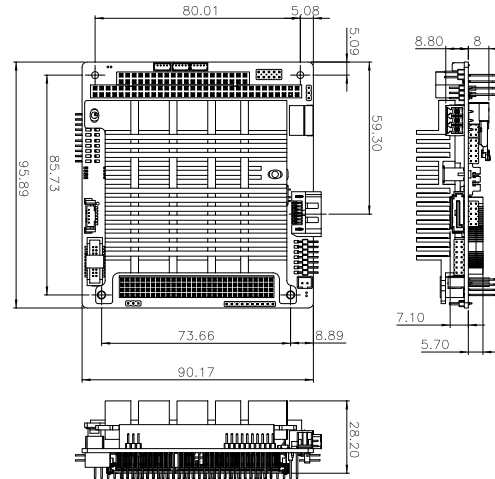
Specifications

- ◆ SoC
Intel® Celeron® J1900 on-board SoC (2GHz, quad-core, 2MB cache, TDP=10W)
- ◆ BIOS
AMI UEFI BIOS
- ◆ Memory
One 204-pin 1333/1066 MHz single-channel DDR3L SO-DIMM supports up to 8 GB
- ◆ Graphics Engine
Intel® HD Graphics Gen 7 Engine with four execution units, supporting DX11.1, OpenGL 4.2 and OpenCL 1.2
- ◆ Display Output
Dual independent display
1 x VGA (up to 2560x1600@60 Hz)
1 x 18/24-bit single-channel LVDS (2x10 pin)
- ◆ Ethernet
1 x Intel® I210
- ◆ Super I/O
Fintek F81866
- ◆ Internal I/O Interface
1 x SATA 3Gb/s with 5V SATA power connector
3 x USB 2.0 (1x4 pin, P=1.25)
2 x RS-232/422/485 (2x5, P=2.0)
- ◆ Storage
On-board SSD (optional, support by request)
- ◆ Front Panel
1 x 10-pin header, P=2.0 (power LED, HDD LED, power button and reset button)
- ◆ Expansion
1 x Full-size PCIe Mini slot (supports mSATA)
1 x PC/104-Plus (ISA+PCI)*
- ◆ Digital I/O
1 x 8-bit digital I/O (2x5 pin, P=2.0)
- ◆ Power Supply
5V DC input
12V for fan, LVDS and PCI-104 plus
» 5V for PCI-104 plus (1x3 pin, P=2.0)
» 12V for PCI-104 plus (1x3 pin, P=2.0)
3/5V jumper for PCI-104 plus
Support AT/ATX mode
ErP/EuP Compliant
- ◆ Power Consumption
5V@1.70A (Intel® Celeron® J1900 CPU with 8GB memory)
- ◆ Watchdog Timer
Software programmable, supports 1~255 sec. system reset
- ◆ Operating Temperature
-20°C ~ 60°C
- ◆ Storage Temperature
-40°C ~ 85°C
- ◆ Thermal
Heatsink
- ◆ Operating Humidity
5% ~ 95%, non-condensing
- ◆ Dimensions
96 mm x 90 mm
- ◆ Weight
GW: 500g / NW 120g
- ◆ CE/FCC compliant

Features

- PC/104 form factor SBC supports 22nm Intel® Atom® on-board SoC
- PC/104-Plus (ISA and PCI signal) function support
- 5V DC input solution
- Support 2 COM, PCIe Mini, USB and optional on-board SSD
- Dual display from VGA and LVDS

Dimensions (Unit: mm)



Packing List

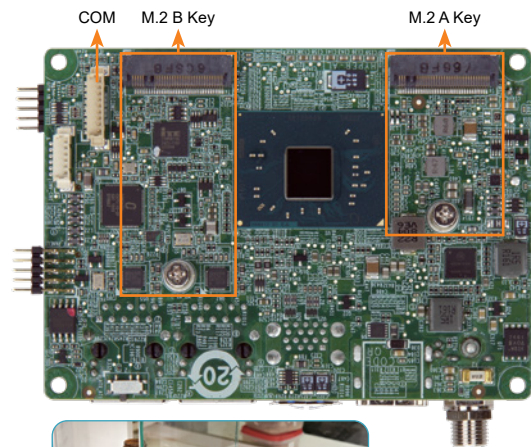
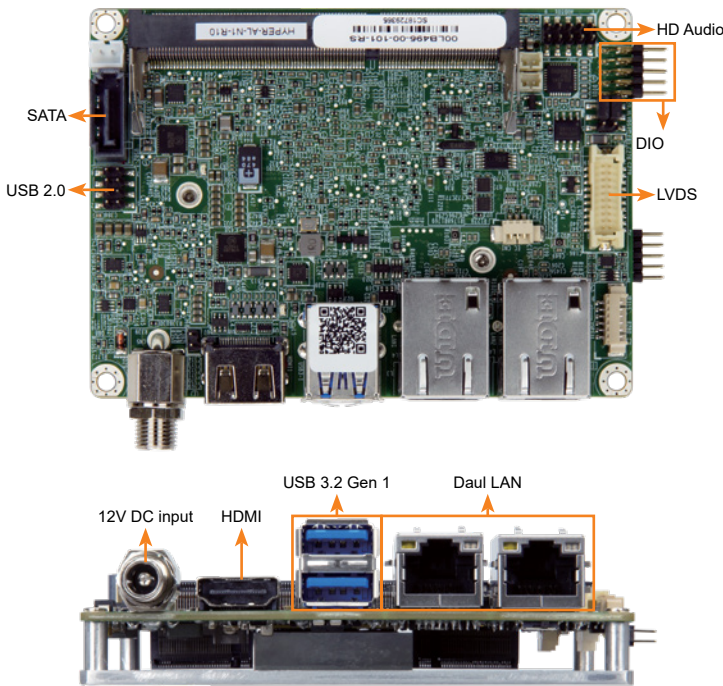
1 x PM-BT single board computer	
1 x COM port cable	1 x SATA cable kit
1 x Heatsink	1 x Single-port USB cable
1 x LAN cable	1 x VGA cable

Ordering Information

Part No.	Description
PM-BT-J19001-R10	PC/104-Plus single board computer with Intel® Celeron® J1900 SoC with DDR3L, VGA, LVDS, USB 2.0, SATA 3Gb/s, GbE, RS-232/422/485 and 5V DC input, RoHS
33403-000015-RS	PC104 plus spacer (for PCI) 120 pin socket connector
33403-000016-RS	PC104 plus spacer (for ISA) 64+40 pin socket connector

HYPER-AL

PICO-ITX SBC supports Intel® 14nm Apollo Lake on-board SoC with DDR3L, HDMI, LVDS, dual GbE, USB 3.2 Gen 1 (5Gb/s), SATA, M.2 and RoHS



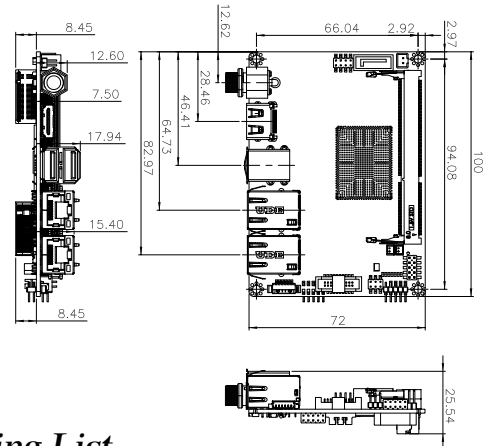
Specifications

- ◆ SoC
Intel® Celeron® N3350 on-board SoC (up to 2.4GHz, dual-core, 2M Cache, TDP=6W)
- ◆ BIOS
AMI UEFI BIOS
- ◆ Memory
One 204-pin 1866/1600MHz single-channel DDR3L SDRAM unbuffered SO-DIMM slot (system max. 8GB)
- ◆ Graphics Engine
Intel® HD Graphics Gen9 Low Power, 18 Execution Units
4K Codec Decode & Encode for HEVC 4, H.264, VP8, SVC, MVC
- ◆ Display Output
1 x HDMI
1 x LVDS (2x10 pin, single channel, 24bit)
- ◆ Ethernet
LAN1: Realtek RTL8111H controller
LAN2: Realtek RTL8111H controller
- ◆ External I/O interface
2 x USB 3.2 Gen 1 (5Gb/s) (on rear I/O)
- ◆ Internal I/O interface
1 x RS-232 (1x9 pin, P=1.25)
1 x SATA 6Gb/s (w/ 5V SATA PWR)
2 x USB 2.0 (2 by pin header) (2x4 pin, P=2.0)
- ◆ Audio
1 x HD audio (2x5 pin, support 7.1 channel HD audio by IEI AC-KIT-888S-R10 kit)
- ◆ Front Panel
1 x Front panel (1 x 8 pin, power LED, HDD LED, power button, reset button)
- ◆ Expansion
1 x M.2 A key 2230 (PCIe, USB)
1 x M.2 B key 2242 (USB, SATA)
- ◆ Digital I/O
1 x 8-bit DIO (2x5 pin, P=2.0)
- ◆ Watchdog Timer
Software programmable support 1~255 sec. system reset
- ◆ Power Supply
12V DC input only (DC jack)
Support AT/ATX mode
- ◆ Power Consumption
12V@2.36A (Intel® Celeron® N3350 with 8GB 1600MHz DDR3L memory)
- ◆ Operating Temperature
-20°C ~ 60°C
- ◆ Storage Temperature
-30°C ~ 70°C
- ◆ Operating Humidity
5% ~ 95%, non-condensing
- ◆ Dimensions
100mm x 72mm
- ◆ Weight
GW:600g/NW:250g
- ◆ CE/FCC compliant

Features

- PICO-ITX SBC supports Intel® 14nm Apollo Lake on-board SoC supports Intel® 14nm Apollo Lake on-board SoC
- Dual GbE LAN support
- Flexible expansion with M.2 A key 2230 and M.2 B key 2242 support
- HDMI and internal LVDS for independent display
- 12V only single voltage design for AT/ATX power by DC power jack

Dimensions (Unit: mm)



Packing List

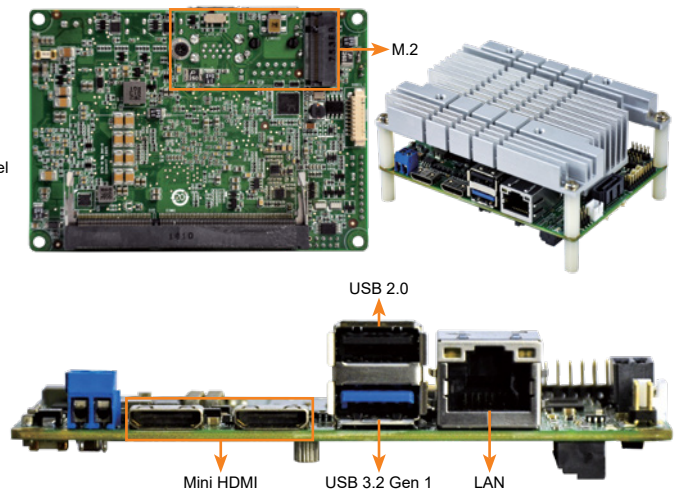
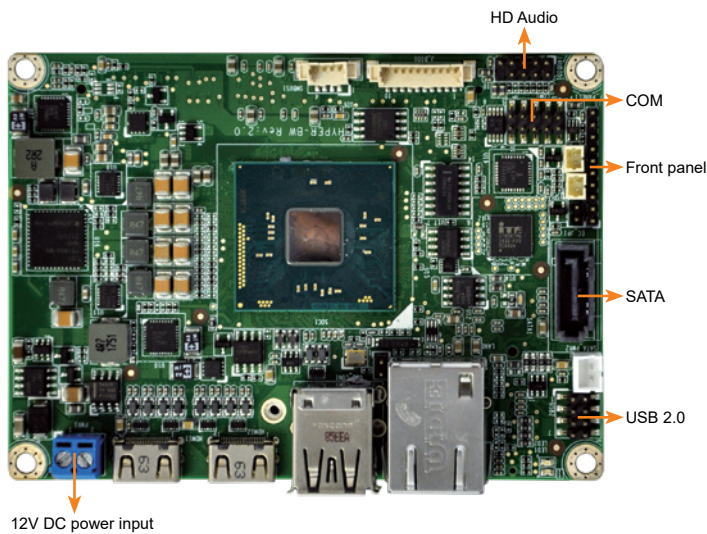
1 x HYPER-AL single board computer (heat spreader by default)	
1 x COM port cable	1 x QIG (Quick Installation Guide)
1 x SATA cable kit	

Ordering Information

Part No.	Description
HYPER-AL-N1-R10	PICO-ITX SBC supports Intel® 14nm dual-core Celeron® N3350 2.4GHz on-board SoC with HDMI, LVDS, dual LAN, M.2, COM, USB 3.2 Gen 1 (5Gb/s), SATA 6Gb/s and RoHS
34000-000706-RS	Optional fanless heatsink module, 100mm x 72mm x 20.5mm
32001-008600-200-RS	Dual port USB cable, 210mm, P=2.0

HYPER-BW

Pico-ITX SBC with Intel® 14nm Pentium®/Celeron® on-board SoC with dual Mini HDMI, M.2, GbE, USB 3.2 Gen 1 (5Gb/s), SATA 6Gb/s, COM, Audio and RoHS



Specifications

- ◆ SoC
 - Intel® Pentium® N3710 on-board SoC (up to 2.56GHz, quad-core, 2MB cache, TDP=6W)
 - Intel® Celeron® N3160 on-board SoC (up to 2.24GHz, quad-core, 2MB cache, TDP=6W)
 - Intel® Celeron® N3060 on-board SoC (up to 2.48GHz, dual-core, 2MB cache, TDP=6W)
 - Intel® Celeron® N3010 on-board SoC (up to 2.24GHz, dual-core, 2MB cache, TDP=4W)
 - Intel® Atom® x5-E8000 on-board SoC (up to 2.00 GHz, quad-core, 2M cache, TDP=5W)
- ◆ BIOS
 - AMI UEFI BIOS
- ◆ Memory
 - One 204-pin 1600/1333 MHz single-channel DDR3L SDRAM SO-DIMM slot supports up to 8 GB
- ◆ Graphics Engine
 - Intel® HD Graphics Gen 8 Engine with 16 low-power execution units, supporting DX11.1, OpenGL 4.2 and OpenCL 1.2
- ◆ Display Output
 - Dual independent display
 - 2 x Mini HDMI (up to 3840x2160@30Hz)
- ◆ Ethernet
 - LAN1: Realtek RTL8111 controller
- ◆ External I/O Interface
 - 1 x USB 2.0
 - 1 x USB 3.2 Gen 1 (5Gb/s)
- ◆ Internal I/O Interface
 - 1 x RS-232 (1x9 pin, P=1.25)
 - 1 x SATA 6Gb/s with 5V SATA power connector
 - 2 x USB 2.0 (2x4 pin, P=2.0)
- ◆ Audio
 - 1 x HD audio (2x5 pin, support 7.1 channel HD audio by IEI AC-KIT-888S-R10 kit)
- ◆ Front Panel
 - 1 x Front panel (1x10 pin, power LED, HDD LED, power button, reset button)
- ◆ LAN LED
 - 1 x LAN LED (1x2 pin)
- ◆ Expansion
 - 1 x M.2 2242 (B key)
- ◆ Digital I/O
 - 8-bit digital I/O (2x5 pin)
- ◆ Power Supply
 - 12V DC input only
 - 1 x Power terminal block (1x2 pin)
 - Support AT/ATX mode
- ◆ Power Consumption
 - 12V@1.52A (Intel® Pentium® processor N3710 with 8 GB 1600 MHz DDR3L memory)
- ◆ Watchdog Timer
 - Software programmable supports 1~255 sec. system reset
- ◆ Operating Temperature
 - 20°C ~ 60°C
- ◆ Storage Temperature
 - 30°C ~ 70°C
- ◆ Operating Humidity
 - 5% ~ 95%, non-condensing
- ◆ Dimensions
 - 100mm x 72mm
- ◆ Weight
 - GW:600g/ NW:250g
- ◆ CE/FCC compliant



Features

- Pico-ITX SBC supports Intel® 14nm Pentium®/Celeron® on-board SoC
- IEI jumper-less function
- Dual independent display support
- 1333/1600 MHz 1.35V DDR3L SDRAM up to 8 GB supported
- COM, USB 3.2 Gen 1 (5Gb/s), SATA 6Gb/s and Audio support
- 1 x M.2 B key slot for expansion possibility

Packing List

1 x HYPER-BW single board computer with heatsink	1 x RS-232 cable
1 x SATA with power cable kit	1 x QIG

Ordering Information

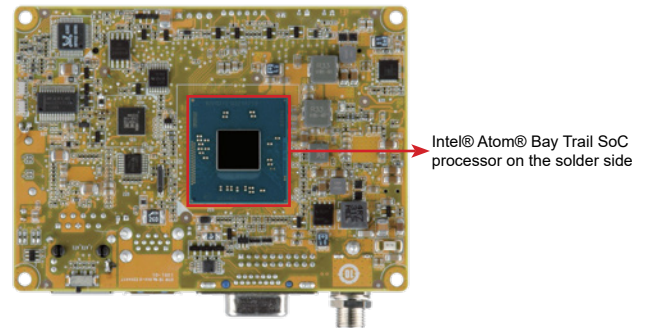
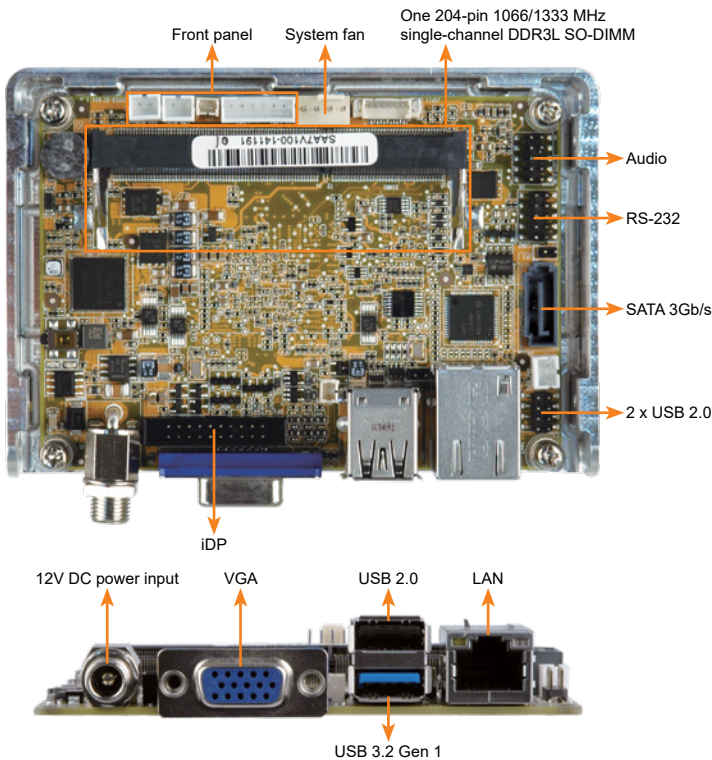
Part No.	Description
HYPER-BW-N4-R20	Pico-ITX SBC with Intel® Pentium® 14nm quad-core N3710 up to 2.56GHz (6W) on-board SoC with dual Mini HDMI, PCIe GbE, M.2, USB 3.2 Gen 1 (5Gb/s), SATA 6Gb/s, COM, Audio and RoHS
HYPER-BW-N3-R20	Pico-ITX SBC with Intel® Celeron® 14nm quad-core N3160 up to 2.24GHz (6W) on-board SoC with dual Mini HDMI, PCIe GbE, M.2, USB 3.2 Gen 1 (5Gb/s), SATA 6Gb/s, COM, Audio and RoHS
HYPER-BW-N2-R20*	Pico-ITX SBC with Intel® Celeron® 14nm dual-core N3060 up to 2.48GHz (6W) on-board SoC with dual Mini HDMI, PCIe GbE, M.2, USB 3.2 Gen 1 (5Gb/s), SATA 6Gb/s, COM, Audio and RoHS
HYPER-BW-N1-R20**	Pico-ITX SBC with Intel® Celeron® 14nm dual-core N3010 up to 2.24GHz (4W) on-board SoC with dual Mini HDMI, PCIe GbE, M.2, USB 3.2 Gen 1 (5Gb/s), SATA 6Gb/s, COM, Audio and RoHS
HYPER-BW-E8-R20	Pico-ITX SBC with Intel® Atom® 14nm quad-core x5-E8000 up to 2.00GHz (5W) on-board SoC with dual Mini HDMI, PCIe GbE, M.2, USB 3.2 Gen 1 (5Gb/s), SATA 6Gb/s, COM, Audio and RoHS
HYPER-BW-E8-ECO-R20	Pico-ITX SBC with Intel® Atom® 14nm quad-core x5-E8000 up to 2.00GHz (5W) on-board SoC with dual Mini HDMI, PCIe GbE, M.2, USB 3.2 Gen 1 (5Gb/s), SATA 6Gb/s, COM, Audio, ECO packing and RoHS (10 pcs/pack)
32001-008600-200-RS	Dual-port USB cable, 210mm, P=2.0
32102-045100-100-RS	DC JACK 5.5*2.5+NUT to open end power cable, 100mm
63040-010036-101-RS	12V 36W AC/DC adapter
AC-KIT-888S-R10	Realtek ALC888S 7.1 Channel HD Audio peripheral board, RoHS

*EOS

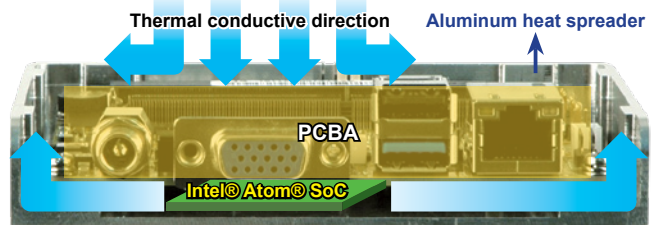
**By order production, MOQ: 100

HYPER-BT

Pico-ITX SBC supports Intel® 22nm Atom®/Celeron® on-board SoC, DDR3L, VGA/iDP, GbE, USB 3.2 Gen 1 (5Gb/s), SATA 3Gb/s, HD Audio and RoHS



You can attach aluminum heat spreader directly to your construction for better heat dissipation



Specifications

- ◆ SoC
 - Intel® Atom® E3845 on-board SoC (1.91GHz, quad-core, 2MB cache, TDP=10W)
 - Intel® Atom® E3827 on-board SoC (1.75GHz, dual-core, 1MB cache, TDP=8W)
 - Intel® Atom® E3826 on-board SoC (1.46GHz, dual-core, 1MB cache, TDP=7W)
 - Intel® Atom® E3825 on-board SoC (1.33GHz, dual-core, 1MB cache, TDP=6W)
 - Intel® Atom® E3815 on-board SoC (1.46GHz, dual-core, 1MB cache, TDP=5W)
 - Intel® Celeron® J1900 on-board SoC (2GHz, quad-core, 2MB cache, TDP=10W)
 - Intel® Celeron® N2930 on-board SoC (1.83GHz, quad-core, 2MB cache, TDP=7.5W)
 - Intel® Celeron® N2807 on-board SoC (1.58GHz, dual-core, 2MB cache, TDP=4.3W)
- ◆ BIOS
 - AMI UEFI BIOS
- ◆ Memory
 - One 204-pin 1066/1333 MHz single-channel DDR3L SO-DIMM supports up to 8 GB (J1900, N2930, E3845, E3827, E3826) or 4 GB (N2807, E3825, E3815)
- ◆ Graphics
 - Intel® HD Graphics Gen 7 Engine with 4 execution units, supporting DX11.1 OpenCL 4.2 and OpenCL 1.2
- ◆ Display Output
 - Dual independent display
 - 1 x VGA (up to 2560x1600@60Hz)
 - 1 x iDP interface for HDMI, LVDS, VGA, DVI, DP (up to 2560x1600@60Hz)
- ◆ Ethernet: LAN: Intel® I211-AT PCIe controller
- ◆ External I/O Interface
 - 1 x USB 2.0
 - 1 x USB 3.2 Gen 1 (5Gb/s)
- ◆ Internal I/O Interface
 - 1 x RS-232 (2x5 pin, P=2.0)
 - 1 x SATA 3Gb/s with 5V SATA power connector
 - 2 x USB 2.0 (2x4 pin, P=2.0)
- ◆ Audio: Realtek ALC888S HD Audio codec supports 7.1-channel
- ◆ Front Panel
 - 1 x Power LED & HDD LED (1x6 pin)
 - 1 x Power button (1x2 pin)
 - 1 x Reset button (1x2 pin)
- ◆ LAN LED: 1 x LAN LED (1x2 pin)
- ◆ Fan Connector: 1 x Smart fan connector (1x4 pin)
- ◆ Watchdog Timer: Software programmable, support 1~255 sec. system reset
- ◆ Power Supply
 - 12V only DC input
 - 1 x External DC power jack (ø5.5 mm)
 - Support AT/ATX mode
- ◆ Power Consumption
 - 12V@1.35A (Intel® Celeron® J1900 with one 4 GB 1333 MHz DDR3 memory)
- ◆ Operating Temperature: -20°C ~ 60°C
- ◆ Storage Temperature: -30°C ~ 70°C
- ◆ Operating Humidity: 5% ~ 95%, non-condensing
- ◆ Dimensions (LxW)
 - Single board: 100mm x 72mm / Heat spreader: 112mm x 78mm
- ◆ Weight: GW: 600g / NW: 250g
- ◆ CE/FCC compliant

Features

- Pico-ITX SBC supports Intel® 22nm Atom® or Celeron® on-board SoC
- 12V only single voltage design for AT/ATX power by DC power jack
- VGA and iDP support dual display

Packing List

1 x HYPER-BT single board computer	
1 x Audio cable	1 x SATA with 5V output cable kit
1 x RS-232 cable	1 x QIG

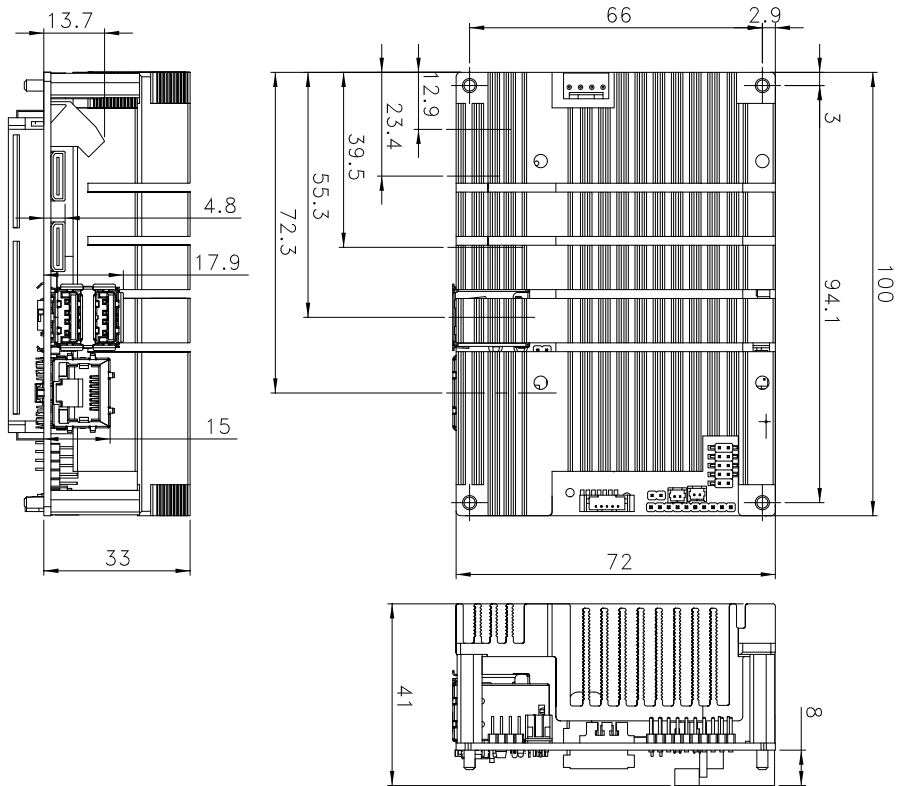
Ordering Information

Part No.	Description
HYPER-BT-J19001-R10	PICO-ITX SBC supports Intel® Celeron® quad-core J1900 (10W) on-board SoC with DDR3L, VGA/iDP, GbE, USB 3.2 Gen 1 (5Gb/s), SATA 3Gb/s, Audio and RoHS
HYPER-BT-N29301-R10*	PICO-ITX SBC supports Intel® Celeron® quad-core N2930 (7.5W) on-board SoC with DDR3L, VGA/iDP, GbE, USB 3.2 Gen 1 (5Gb/s), SATA 3Gb/s, Audio and RoHS
HYPER-BT-N28071-R10	PICO-ITX SBC supports Intel® Celeron® dual-core N2807 (4.3W) on-board SoC with DDR3L, VGA/iDP, GbE, USB 3.2 Gen 1 (5Gb/s), SATA 3Gb/s, Audio and RoHS
HYPER-BT-E38XX1-R10**	PICO-ITX SBC supports Intel® Atom® E38XX on-board SoC with DDR3L, VGA/iDP, GbE, USB 2.0, SATA 3Gb/s, Audio and RoHS
32001-008600-200-RS	Dual-port USB cable, 210mm, P=2.0
32006-000300-100-RS	PS/2 KB/MS Y-cable without bracket, 140mm/120mm
32205-002700-200-RS	RS-232 cable, 200mm, P=2.0
DP-DP-R10	DisplayPort to DisplayPort converter board (for IEI iDP connector)
DP-DVI-R10	DisplayPort to DVI-D converter board (for IEI iDP connector)
DP-HDMI-R10	DisplayPort to HDMI converter board (for IEI iDP connector)
DP-LVDS-R10	DisplayPort to LVDS converter board (for IEI iDP connector)
DP-VGA-R10	DisplayPort to VGA converter board (for IEI iDP connector)

*EOS
**By order production, MOQ: 100

HYPER Dimensions (Unit: mm)

HYPER-BW



HYPER-BT

