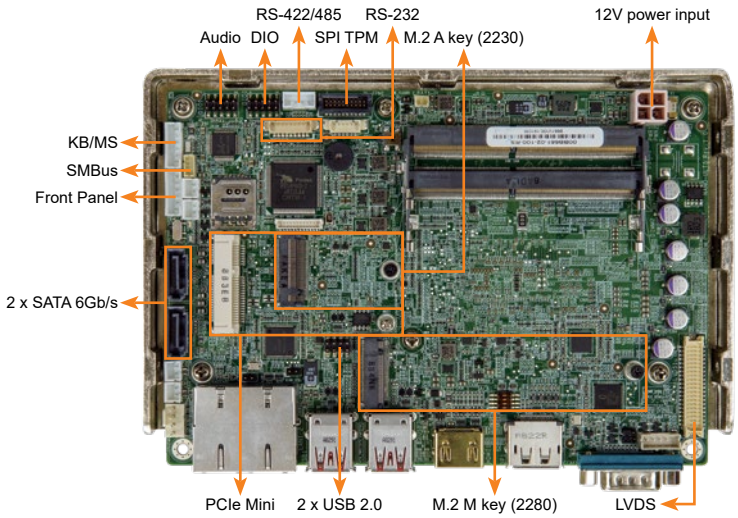
EPIC NANO Selection Guide

New

Model Name	NANO-ULT5	NANO-AL	NANO-ULT3	NANO-BT-i1/BTW2	NANO-QM871-i1	NANO-LX-R12
CPU Socket	On Board	On board	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	Intel® Core™ i7/i5/ i3, Celeron® Mobile processor	AMD Geode™ LX800
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	Intel® QM87	AMD Geode™ LX800 + AMD CS5536
Memory	2 x 260-pin 2400/2133 MHz Dual-channel DDR3L/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)	1 x 204-pin 1600/1333 MHz dual-channel DDR3/ DDR3L SO-DIMM (system max. 8 GB)	1 x 200-pin 400/333 MHz DDR SO-DIMM (system max. 1GB)
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	Dual display supported 1 x VGA 2 x HDMI 1 x 18/24-bit dual-channel LVDS	Dual display supported 1 x VGA 1 x 18-bit single-channel LVDS 1 x 24-bit TTL (LVDS to TTL)
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	LAN1: Intel® I217-LM PHY with Intel® AMT 9.0 supported LAN2: Intel® I211-AT PCIe GbE controller	10/100Mbps Realtek RTL8100C
iRIS Remote Management Module	N/A			1 x iRIS-1010 slot	1 x iRIS-1010 slot	N/A
I/O Interface	1 x TPM (2x10 pin SPI interface) 1 x RS-422/485 (Support Auto Flow Control over RS-485) 2 x RS-232 2 x SATA 6G/s with 5V SATA power connector 2 x USB 2.0 4 x USB 3.2 Gen 2	1 x PS/2 KB/MS 2 x RS-232/422/485 2 x USB 2.0 4 x RS-232 4 x USB 3.2 Gen 1	1 x PS/2 KB/MS 1 x RS-232/422/485 2 x RS-232 2 x USB 2.0 4 x USB 3.2 Gen 1	1 x PS/2 KB/MS 1 x RS-422/485 1 x USB 3.2 Gen 1 3 x RS-232 3 x USB 2.0	1 x PS/2 KB/MS 1 x RS-422/485 2 x RS-232 2 x USB 3.2 Gen 1 4 x USB 2.0	1 x Infrared interface 1 x LPT 1 x PS/2 for KB/MS 1 x RS-422/485 4 x USB 2.0 6 x RS-232
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	2 x SATA 6Gb/s with 5V SATA power connector (RAID 0, 1)	2 x SATA 1.5Gb/s (RAID 0,1) 1 x IDE 1 x CF Type II
Audio	Realtek ALC888S HD Audio codec 1 x Analog audio	Realtek ALC888S HD Audio codec				Realtek ALC203 with AC'97 codec
Digital I/O	8-bit programmable digital I/O					
Power Consumption	TBD	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)	12V@3.78A (Intel® 4th Gen. 2.0GHz CPU with one 1333HMz DDR3 4 GB memory)	12V@0.92A (AMD LX800, 256 MB 400 MHz DDR)
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	Temperature Range: -10°C ~ 60°C (14°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
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	1 x Full-size PCIe Mini card slot	1 x PC/104-Plus
CPU Cooler	Heat Spreader	Heatsink	Heat Spreader	Heatsink	XCF-479B-RS / CF-989B-RS-R11	Heatsink

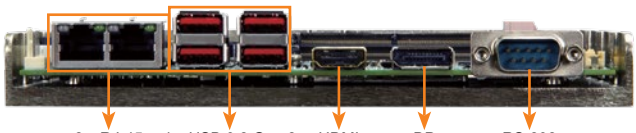
NANO-ULT5

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

New



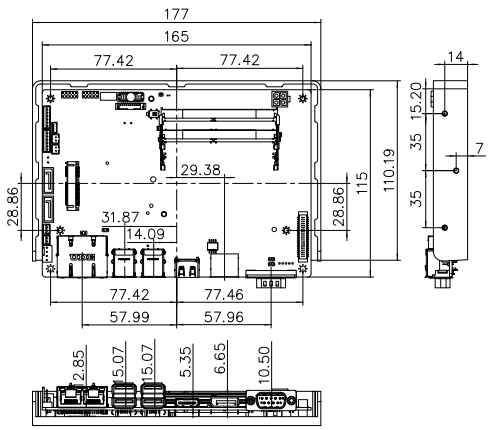
Specifications

- 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: TBD
- 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

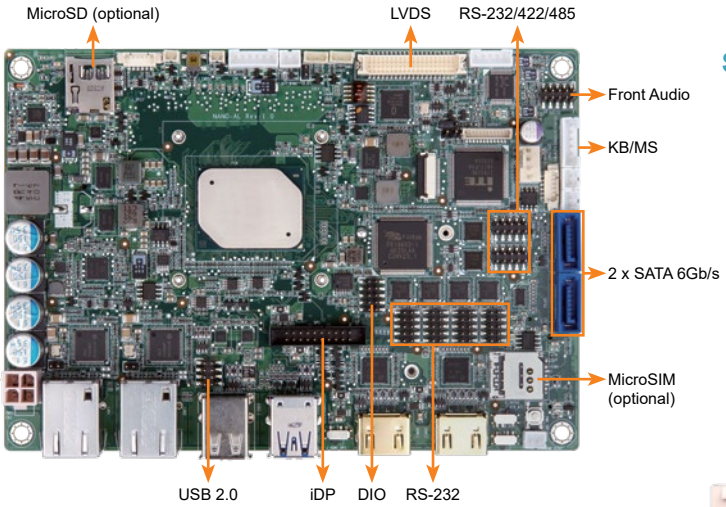
Ordering Information

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

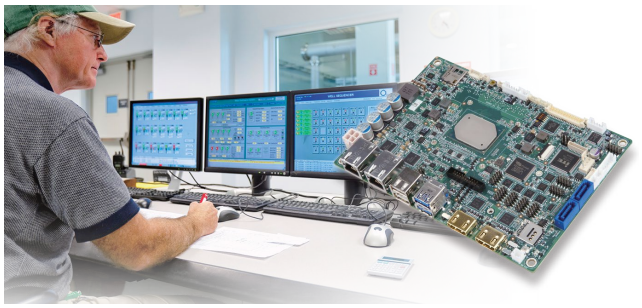
** Without full functions support, please refer to user manual

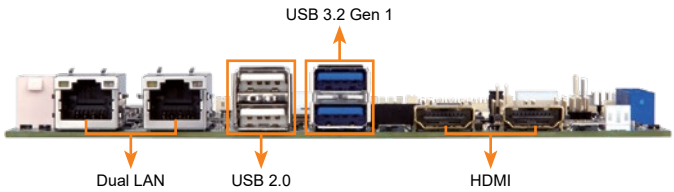
NANO-AL

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





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 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

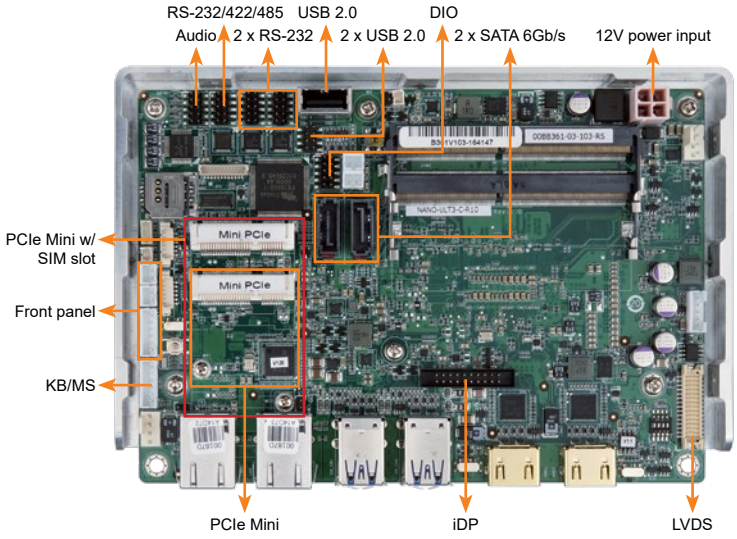
Ordering Information

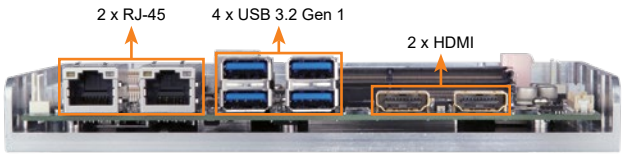
Part No.	Description
NANO-AL-N2-R10**	EPIC SBC supports Intel® 14nm quad-core Pentium® N4200 2.5GHz on-board SoC with Dual HDMI/LVDS/iDP, Dual PCIe GbE, USB 3.2 Gen 1 (5Gb/s), PCIe Mini, M.2, SATA 6Gb/s, COM, Audio and RoHS
NANO-AL-N1-R10	EPIC SBC supports Intel® 14nm dual-core Celeron® N3350 2.4GHz 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
32000-070301-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 Generarion 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





Features

- EPIC SBC with 6th generation Intel® ULT proccessor 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

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)
1 x USB 2.0 (180° Type-A)
2 x USB 2.0 (2x4 pin, P=2.0)
2 x RS-232 (2x5 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 (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

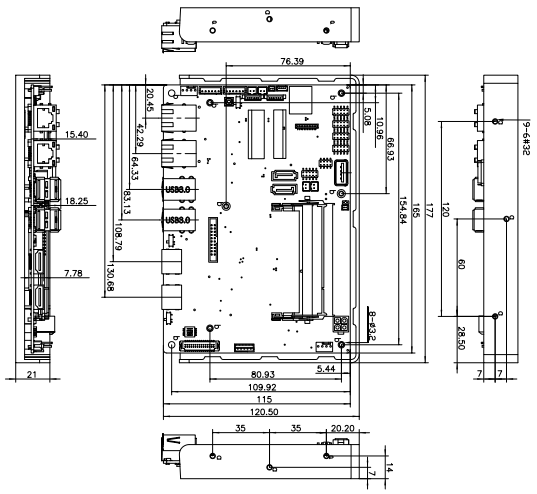
◆ Operating Humidity: 5% ~ 95%, non-condensing

◆ Dimensions: 115mm x 165mm

◆ Weight: GW: 850g / NW: 350g

◆ CE/FCC compliant

Dimensions *(Unit: mm)*



Packing List

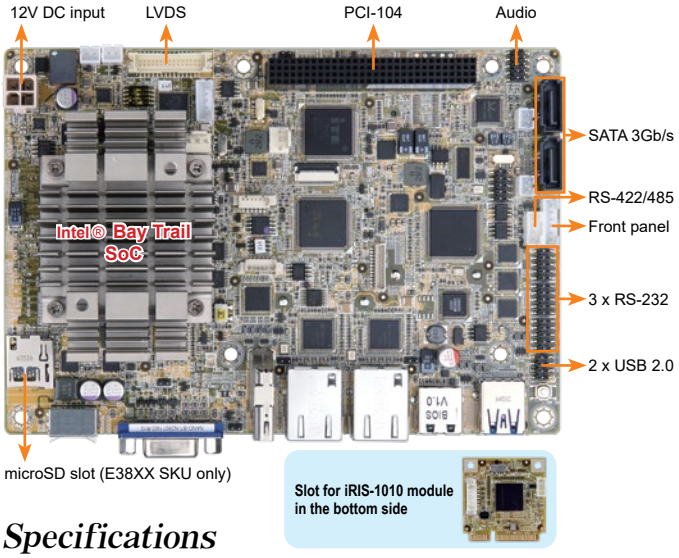
1 x NANO-ULT3 single board computer with heatspreader	1 x Audio cable
1 x RS-232 cable	1 x Power cable
1 x SATA with power cable kit	1 x QIG

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

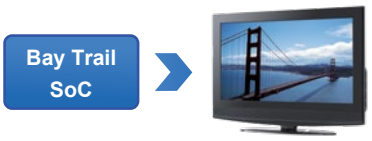
NANO-BTW2 / BT-i1

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

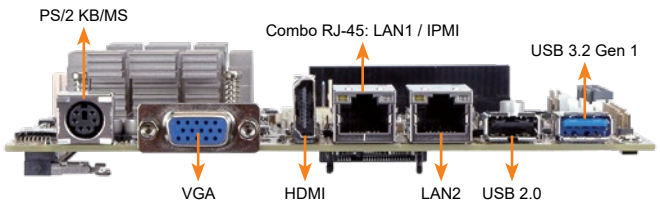


Highly efficient and power optimized multi-format codec engine

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



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



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 OpenCL1.2
- ◆ 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
- Support IPMI 2.0 with iRIS-1010 module

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

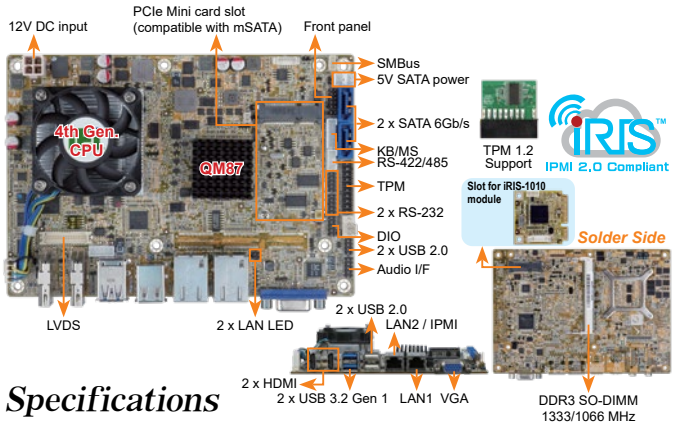
Ordering Information

Part No.	Description
NANO-BT-E38XX1W2-R11**	EPIC SBC supports Intel® 22nm single-Core Atom™ E381XX on-board SoC with VGA/HDMI/LVDS, Dual PCIe GbE, Dual PCIe Mini, USB 3.2 Gen 1 (5Gb/s), SATA 3Gb/s, mSATA , COM, audio and RoHS, -40~85°C
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-i1-E38XX1-R11**	EPIC SBC supports Intel® Atom™ E38XX on-board SoC with VGA/HDMI/LVDS, Dual PCIe GbE, USB 3.2 Gen 1 (5Gb/s), PCIe Mini, SATA 3Gb/s, mSATA, COM, iRIS-1010, Audio and RoHS
NANO-BT-J19001-ECO-R10	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, mSATA , COM, Audio, ECO packing and RoHS (10 pcs/pack)
iRIS-1010-R10	IPMI 2.0 adapter card with AST1010 BMC chip (w/o KVM over IP function) for PCIe Mini socket interface
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

**By order production, MOQ: 100

NANO-QM871-i1

EPIC SBC supports 4th Generation Intel® Mobile Processor with VGA/Dual HDMI/LVDS, Dual PCIe GbE, USB 3.2 Gen 1 (5Gb/s), PCIe Mini, iRIS-1010



Specifications

- CPU
  Intel® mobile Core™ i7-4700EQ on-board processor with Intel® AMT 9.0 support (2.4GHz, quad-core, 6MB cache, TDP=47W)
  Intel® mobile Core™ i5-4400E on-board processor with Intel® AMT 9.0 support (2.7GHz, dual-core, 3MB cache, TDP=37W)
  Intel® mobile Core™ i3-4100E on-board processor (2.4GHz, dual-core, 3MB cache, TDP=37W)
  Intel® mobile Celeron® 2000E on-board processor (2.2GHz, dual-core, 2MB cache, TDP=37W)
  Intel® mobile Core™ i5-4402E on-board processor with Intel® AMT 9.0 support (1.6GHz, dual-core, 3MB cache, TDP=25W)
  Intel® mobile Core™ i3-4102E on-board processor
  (1.6GHz, dual-core, 3MB cache, TDP=25W)
  Intel® mobile Celeron® 2002E on-board processor
  (1.5GHz, dual-core, 2MB cache, TDP=25W)
- Chipset: Intel® QM87
- BIOS: UEFI BIOS
- Memory: One 204-pin 1600/1333 MHz dual-channel DDR3 & DDR3L SDRAM unbuffered DIMM supports up to 8 GB
- Graphics Engine
  Intel® HD Graphics Gen 7.5 supports DX11.1 and OpenCL 1.2, OpenGL 3.2
  Full MPEG2, VC1, AVC Decode
- Display Output
  1 x VGA (up to 1920x1200@60Hz)
  1 x 18/24-bit dual-channel LVDS (up to 1920x1200@60Hz)
  2 x HDMI (up to 2500x1600@60Hz)
- TPM: 1 x TPM connector (2x10 pin)
- SMBus: 1 x SMBus (1x4 pin)
- Ethernet
  LAN1: Intel® I217-LM PHY with Intel® AMT 9.0 support
  LAN2: Intel® I210-AT PCIe controller
- External I/O Interface
  2 x USB 2.0 2 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 6Gb/s with 5V SATA power connector (RAID 0,1 supported)
  2 x USB 2.0 (2x4 pin, P=2.0)
- iRIS Remote Management Module: 1 x iRIS-1010 slot
- Audio
  Realtek ALC888S HD Audio codec
  1 x Front audio (2x5 pin)
- Front Panel: 1 x Front Panel (2x5 pin)
- LAN LED: 2 x LAN LED (1x2 pin)
- Expansion
  1 x Full-size PCIe Mini card slot (supports mSATA)
  1 x PCIe/104 Type 2 slot (optional)
- Watchdog Timer: Software programmable, support 1~255 sec. system reset
- 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
- Power Consumption
  12V@4.78A (Intel® Core™ i7-4770EQ 2.4GHz CPU with 4 GB 1333 MHz DDR3 memory)
- Operating Temperature: -10°C ~ 60°C
- Storage Temperature: -20°C ~ 60°C
- Operating Humidity: 5% ~ 95%, non-condensing
- Dimensions: 115 mm x 165 mm
- Weight: GW: 850g / NW: 350g
- CE/FCC compliant

Packing List

1 x NANO-QM871-i1 single board computer	
1 x Audio cable	2 x RS-232 cable
1 x CPU cooler	2 x SATA with power cable kit
1 x Power cable	1 x QIG

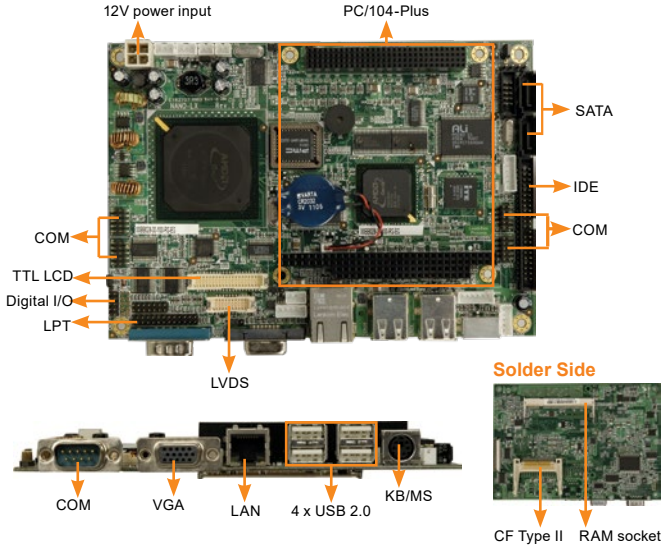
Ordering Information

Part No.	Description
NANO-QM871-i1-i7-R11	EPIC SBC supports Intel® 22nm Mobile Core™ i7-4700EQ on-board Processor with VGA/Dual HDMI/LVDS, Dual PCIe GbE, AMT 9.0, PCIe Mini, USB 3.2 Gen 1 (5Gb/s), SATA 6Gb/s, iRIS-1010, Audio and RoHS
NANO-QM871-i1-i5-R11	EPIC SBC supports Intel® 22nm Mobile Core™ i5-4400E on-board Processor with VGA/Dual HDMI/LVDS, Dual PCIe GbE, AMT 9.0, PCIe Mini, USB 3.2 Gen 1 (5Gb/s), SATA 6Gb/s, iRIS-1010, Audio and RoHS
NANO-QM871-i1-i3-R11	EPIC SBC supports Intel® 22nm Mobile Core™ i3-4100E on-board Processor with VGA/Dual HDMI/LVDS, Dual PCIe GbE, PCIe Mini, USB 3.2 Gen 1 (5Gb/s), SATA 6Gb/s, iRIS-1010, Audio and RoHS
NANO-QM871-i1-C-R11	EPIC SBC supports Intel® 22nm Celeron 2000E on-board Processor (37W) with VGA/Dual HDMI/LVDS, Dual PCIe GbE, PCIe Mini, USB 3.2 Gen 1 (5Gb/s), SATA 6Gb/s, iRIS-1010, Audio and RoHS
iRIS-1010-R10	IPMI 2.0 adapter card with AST1010 BMC chip (W/O KVM over IP function) for PCIe Mini socket interface
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
32205-003800-300-RS	RS-422/485 cable, 200mm, P=2.0
TPM-IN01-R20	20-pin Infineon TPM module, software management tool, firmware v3.17

Note: Models with other CPUs not listed in the table are requested by MOQ - 100 pcs/lot.

NANO-LX

EPIC SBC with AMD LX800 CPU, Audio, VGA/LVDS, SATA and RAID 0, 1, JBOD Function Support



Features

- EPIC form factor AMD LX800 processor embedded board with RoHS compliant
- DDR 400 MHz SO-DIMM SDRAM up to 1 GB
- VGA, 24-bit TTL, and 18-bit single-channel LVDS
- SATA RAID 0, 1, JBOD function support
- Complete I/O support with two SATA, IDE, PC/104-Plus and four USB 2.0

Specifications

- CPU
  AMD Geode™ LX800 (500 MHz) processor
- Chipset: AMD Geode LX800 + AMD CS5536
- BIOS: AWARD
- System Memory
  One 200-pin 400/333 MHz DDR SDRAM SO-DIMM supports up to 1GB
- Ethernet
  LAN: 10/100Mbps Realtek RTL8100C
- External I/O Interface
  1 x PS/2 KB/MS
  1 x RS-232
  4 x USB 2.0
- Internal I/O Interface
  1 x CF Type II 1 x IDE
  1 x LPT 1 x RS-232/422/485
  4 x USB 2.0 5 x RS-232
  2 x SATA (VIA VT6421A RAID 0, 1 function support)
- Expansion
  1 x PC/104 slot (ISA)
  1 x PCI-104 slot (PCI)
- Audio: Realtek ALC203 with AC'97 codec
- Digital I/O: 8-bit digital I/O (2x5 pin)
- Infrared Interface: 1 x Infared interface (1x5 pin)
- Display Output
  1 x VGA (up to 1920x1440@60Hz)
  1 x 24-bit single-channel TTL (up to 1600x1200@60Hz)
  1 x 18-bit single-channel LVDS (up to 1280x1024@60Hz)
- 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@0.92A (AMD LX800 with 400 MHz 256MB DDR RAM)
- Operating Temperature : 0°C ~ 60°C
- Storage Temperature: -10°C ~ 70°C
- Operating Humidity: 5% ~ 95%, non-condensing
- Dimensions: 115 mm x 165 mm
- Weight: GW: 950g / NW: 350g
- CE/FCC compliant

Packing List

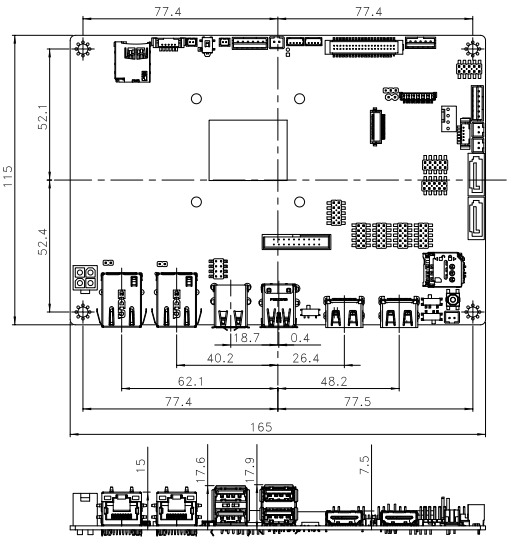
1 x NANO-LX single board computer	1 x SATA power cable
1 x Audio cable	2 x RS-232 port cable
1 x IDE flat cable 44p/44p	2 x SATA cable
1 x KB/MS Y cable	1 x Mini iumper pack
1 x Power cable	1 x QIG

Ordering Information

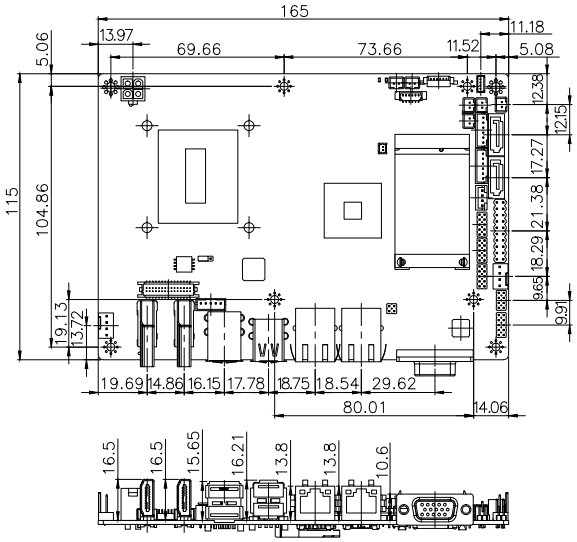
Part No.	Description
NANO-LX-800-R12	EPIC SBC, AMD LX800 500 MHz processor, VGA/LVDS/TTL, LAN, SATA and Audio
32102-022100-100-RS	ATX power cable, 300mm
32200-015100-RS	LPT cable, 280mm, P=2.0
19800-004300-100-RS	RS-232 & RS-422/485 cable with bracket, 14-pin to two DB-9, 250mm, P=2.0

EPIC NANO Dimensions (Unit: mm)

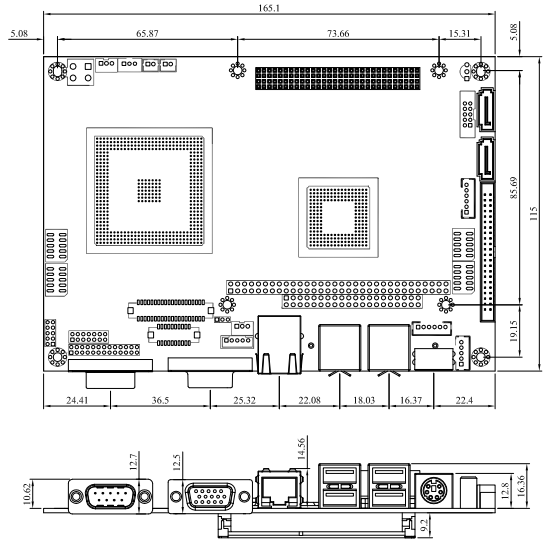
NANO-AL



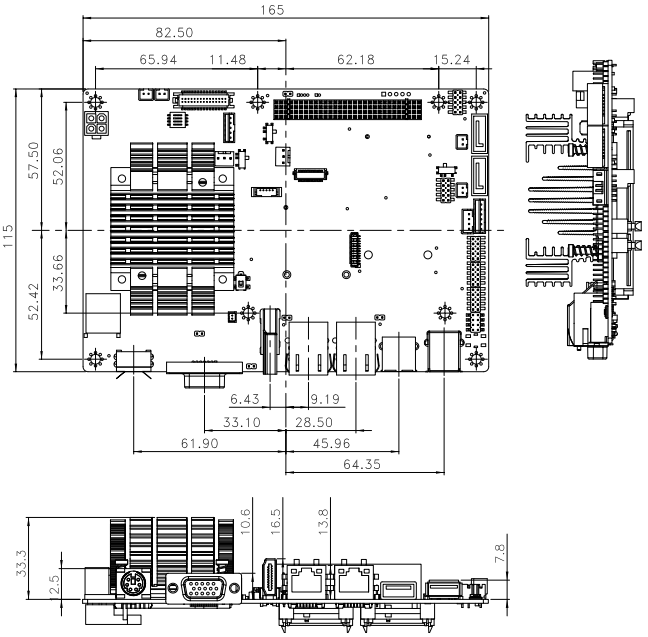
NANO-QM871-i1

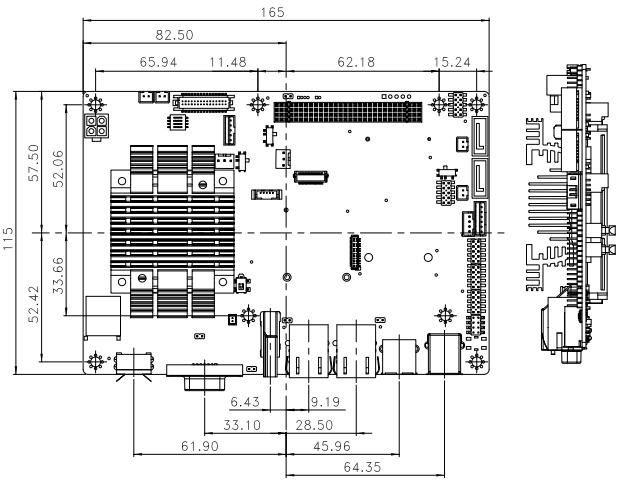


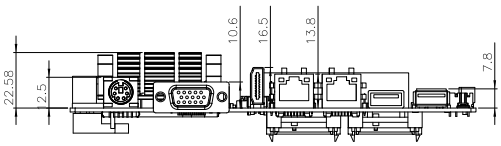
NANO-LX



NANO-BTW2/NANO-BT-i1



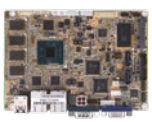


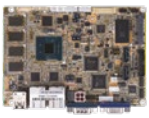


3.5″ WAFER Selection Guide

Model Name	WAFER-JL	WAFER-ULT6	WAFER-ULT5	WAFER-AL	WAFER-ULT4/ULT3	WAFER-BW
CPU Socket	On Board	On Board	On Board	On board	On board	On board
CPU Type	Intel® Atom®, Intel® Pentium® and Celeron® N Series processors (Code name: Jasper Lake)	Intel® Mobile ULT processors (Code name: Tiger Lake)	Intel® Mobile ULT processor	Intel® Celeron®/ Pentium® on-board SoC	Intel® Mobile ULT processor	Intel® Pentium®/ Celeron® SoC
Chipset	Intel® Atom®, Intel® Pentium® and Celeron® N Series processors (Code name: Jasper Lake)	Intel® Mobile ULT processors (Code name: Tiger Lake)	Intel® Mobile ULT processor	Intel® Celeron®/ Pentium® on-board SoC	Intel® Mobile ULT processor	Intel® Pentium®/ Celeron® SoC
Memory	One 204-pin 2933 MHz Dual-channel DDR4 SO-DIMMs support up to 16 GB	One 204-pin 3200 MHz Dual-channel DDR4 SO-DIMMs support up to 64 GB	1 x 260-pin 2400MHz DDR4 SDRAM SO-DIMM (channel 1)	1 x 204-pin 1866/1600 MHz single-channel DDR3L SO-DIMM (system max. 8 GB)	1 x 260-pin 2133MHz DDR4 SDRAM SO-DIMM (channel 1) On-board DDR4 memory (optional 4/8GB support)	1 x 204-pin 1600/1333 MHz single-channel DDR3L SDRAM unbuffered SO-DIMM slot (system max. 8 GB)
Display Interface	Triple independent display 2 x HDMI 1 x DP up to 3840x2160 @ 60Hz	Four independent displays 2 x HDMI 1 x LVDS 1 x DP++	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	Triple independent displays 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
Ethernet	3 x PCIe 2.5 GbE with Intal i225-V/LM	3 x PCIe 2.5 GbE with Intal i225-V/LM	LAN1: Intel® I211AT LAN2: Intel® I211AT LAN3: Intel® I219LM	LAN1: Realtek RTL8111 Controller LAN2: Realtek RTL8111 Controller	1 x Intel® I219LM 1 x Intel® I211AT	LAN1: Realtek RTL8111GN controller LAN2: Realtek RTL8111GN controller
iRIS Remote Management Module	N/A					
I/O Interface	1 x RS-232/422/485 1 x USB 3.2 Gen 1 2 x RS-232 3 x USB 3.2 Gen 2	1 x RS-232/422/485 2 x USB 3.2 Gen 2 2 x USB 2.0	1 x RS-232 1 x RS-232/422/485 (Support Auto Flow Control over RS-485) 4 x USB 3.2 Gen 2 2 x USB 2.0	2 x RS-232 2 x RS-232/422/485 2 x USB 3.2 Gen 1 4 x USB 2.0	2 x RS-232/422/485 4 x USB 3.2 Gen 1 2 x USB 2.0	1 x PS/2 KB/MS 2 x RS-232/422/485 2 x USB 3.2 Gen 1 4 x RS-232 4 x USB 2.0
Storage Interface	1 x SATA	2 x SATA	1 x SATA 6G/s with 5V SATA power connector	2 x SATA 6Gb/s with 5V SATA power connector	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)
Audio	Realtek ALC888S HD Audio codec		N/A	Realtek ALC888S HD Audio codec	N/A	Realtek ALC888S HD Audio codec
Digital I/O	1 x 8-bit digital I/O (2x5 pin)		8-bit programmable digital I/O			
Power Consumption	TBD	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)	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)
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 ~ 70°C (-4°F~158°F) 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 M.2 (A Key) 1 x M.2 (B Key)	1 x M.2 (A Key) 1 x M.2 (B Key) 1 x M.2(B key)	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, another one with SIM holder)	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)
Recommended CPU Cooler	Heat Spreader	Heat Spreader	Heat Spreader	Heatsink	Heat Spreader	Heat Spreader

3.5″ WAFER Selection Guide



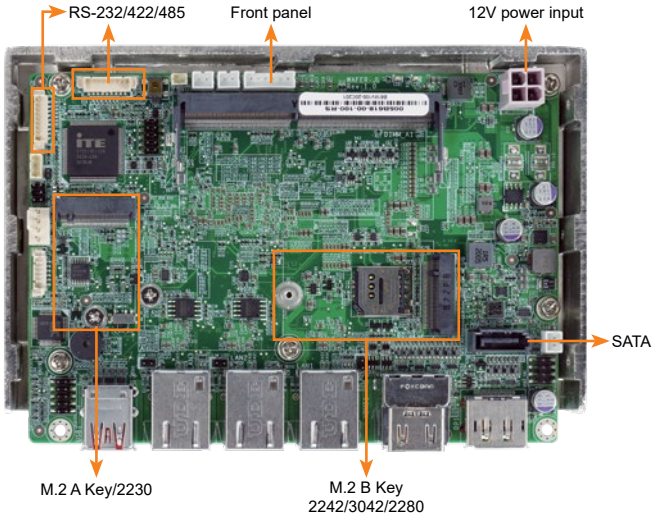


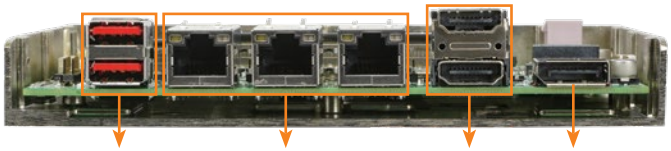
Model Name	WAFER-BTW2	WAFER-ULT2/ULT-i1	WAFER-BT-E38001W2	WAFER-BT	WAFER-KBN-i1	WAFER-LX-R12	WAFER-LX2-R12
CPU Socket	On board	On board	On Board	On board	On board	On board	On board
CPU Type	Intel® Atom™/ Celeron® SoC	Intel® Mobile ULT processor	Intel® Atom™ SoC	Intel® Atom™/ Celeron® SoC	AMD® Embedded G-Series SoC	AMD Geode™ LX800	AMD Geode™ LX800
Chipset	Intel® Atom™/ Celeron® SoC	Intel® Lynx Point SoC	Intel® Atom™ SoC	Intel® Atom™/ Celeron® on-board SoC	AMD® Embedded G-Series SoC	AMD Geode™ LX800 + AMD CS5536	AMD Geode™ LX800 + AMD CS5536
Memory	4 GB solder-down 1066/1333 MHz DDR3L memory (for E3845) 2 GB solder-down 1066/1333 MHz DDR3L memory (for E3825)	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)	1 x 204-pin 1600/1333 MHz dual-channel DDR3 & DDR3L SO-DIMM (system max. 8 GB)	1 x 200-pin 333/400 MHz. 1 GB (max.) DDR SO-DIMM	1 x 200-pin 400 MHz. 1 GB (max.) DDR SO-DIMM
Display Interface	Dual independent dispaly 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	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-bit single-channel LVDS 1 x 24-bit TTL	Dual display supported 1 x VGA 1 x 18-bit single-channel LVDS 1 x 24-bit TTL
Ethernet	LAN1: Intel® I210-IT PCIe controller LAN2: Intel® I210-IT PCIe 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	LAN1: Intel® I210-AT PCIe controller with NCSI support LAN2: Intel® I211-AT PCIe controller	Dual LAN: 10/100Mbps RTL8100C Ethernet Controller	LAN1: 10/100Mbps RTL8100C Ethernet Controller
iRIS Remote Management Module	N/A	1 x iRIS-1010 slot	N/A	N/A	1 x iRIS-1010 slot	N/A	N/A
I/O Interface	1 x PS/2 KB/MS 1 x RS-422/485 1 x USB 3.2 Gen 1 3 x RS-232 5 x USB 2.0	1 x PS/2 KB/MS 1 x RS-422/485 2 x USB 2.0 2 x USB 3.2 Gen 1 3 x RS-232	1 x PS/2 KB/MS 1 x RS-422/485 1 x RS-232 4 x USB 2.0	1 x PS/2 KB/MS 1 x RS-422/485 1 x USB 3.2 Gen 1 3 x RS-232 5 x USB 2.0	1 x PS/2 KB/MS 1 x RS-422/485 2 x USB 3.2 Gen 1 3 x RS-232 4 x USB 2.0	1 x LPT 1 x PS/2 for KB/MS 1 x RS-422/485 2 x RS-232 4 x USB 2.0	1 x RS-232/422/485 4 x USB 2.0 7 x RS-232
Storage Interface	2 x SATA 3Gb/s with 5V SATA power connector (no RAID) 1 x 4 GB on-borad SSD (optional) 1 x microSD 1 x mSATA	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)	2 x SATA 6Gb/s with 5V SATA power connector	2 x SATA 1.5Gb/s RAID 1 x IDE 1 x CF Type II	1 x IDE 1 x CF Type II
Audio	Realtek ALC888S HD Audio codec					Realtek ALC203 with AC'97 codec	
Digital I/O	8-bit programmable digital I/O						
Power Consumption	12V@1.32A (Intel® Atom™ processor E3845 with on-board 2 GB 1333 MHz 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)	12V@2.12A (AMD GX-415GA 1.5GHz CPU with 1333 MHz 4 GB DDR3 memory)	5V@1.53A (AMD Geode™ LX 800 1 GB 400 MHz DDR)	5V@1.33A (AMD Geode™ LX800 512MB 333 MHz DDR)
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: -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	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	
Expansion Slot	2 x Full-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 Full-size PCIe Mini card slot (supports mSATA)	1 x PC/104	1 x PC/104
Recommended CPU Cooler	Heatsink	Heat Spreader	Heatsink	N/A	GX-415GA (with hearsink) GX-210HA (with cooler)	Heatsink	Heatsink

WAFER-JL

3.5 SBC supports Intel® 10nm Gen 11 Pentium® Silver™ or Celeron® on-board SoC with Dual HDMI, DP, triple 2.5 GbE LAN port, USB 3.2 Gen 2, M.2, SATA 6Gb/s, COM, Audio and RoHS, -20°C ~ 60°C

Preliminary





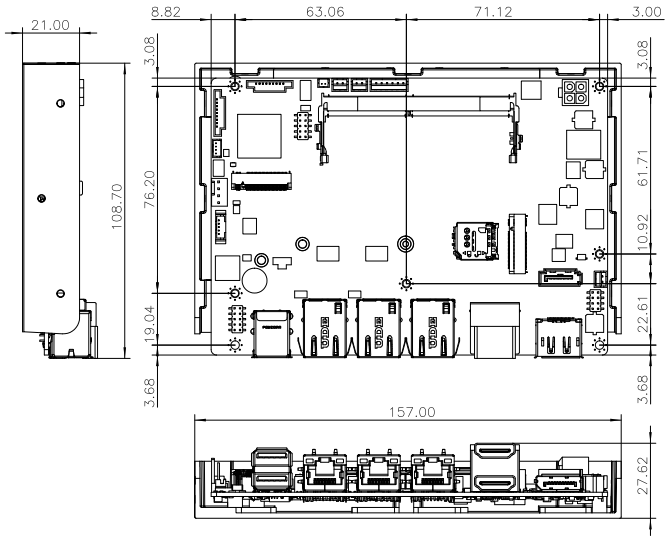
Specifications

- SoC
  Intel® Pentium® Silver N6005 on-board SoC (up to 3.30GHz, Quad-core, 4M Cache, TDP=10W)
  Intel® Celeron® N5105 on-board SoC (up to 2.90GHz, Quad-core, 4M Cache, TDP=10W)
  Intel® Celeron® N4505 on-board SoC (up to 2.90GHz, Dual-core, 2M Cache, TDP=10W)
  Intel® Pentium® Silver N6000 on-board SoC (up to 3.30GHz, Quad-core, 4M Cache, TDP=6W)
  Intel® Celeron® N5100 on-board SoC (up to 2.80GHz, Quad-core, 4M Cache, TDP=6W)
  Intel® Celeron® N4500 on-board SoC (up to 2.80GHz, Dual-core, 2M Cache, TDP=6W)
- BIOS
  AMI UEFI BIOS
- Memory
  One 204-pin 2933 MHz Dual-channel DDR4 SO-DIMMs support up to 16 GB
- Graphics Engine
  Intel® Gen11 UHD Graphics
- Display Output
  Dual Independent Displays
  2 x HDMI (up to 3840x2160 @ 30Hz)
  1 x DP up to 3840x2160 @ 60Hz
- Ethernet
  3 x PCIe 2.5 GbE with Intel® i225V/LM
- External I/O Interface
  2 x USB 3.2 Gen 2 (10Gb/s)
- Internal I/O Interface
  1 x SATA 6G/s with 5V SATA power connector (No RAID)
  2 x USB 2.0 (2x4 pin, P=2.0)
  2 x RS-232/422/485 (1x9 pin, P=1.25) from IT5571
- SMBus/ I²C
  1 x SMBus (1x4 pin, P=2.0)
- TPM
  On Board SPI TPM 2.0 (optional)
- Audio
  Realtek ALC888s
  1 x Analog HD 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
  3 x LAN LED (1x2 pin)
- Expansion
  1 x M.2 A Key for WIFI & BT
  1 x M.2 B Key for 5G
- 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 support 1~255 sec. system reset
- Power Consumption: TBD
- Operating Temperature: -20°C ~ 60°C
- Storage Temperature: -20°C ~ 70°C
- Operating Humidity: 5% ~ 95%, non-condensing
- Dimensions: 115mm x 165mm
- Weight: GW:850g / NW:350g
- CE/FCC compliant

Features

- 3.5" SBC with Intel® Jasper Lake platform on-board SoC
- SO-DIMM DDR4 3200 MHz support up to system maximum 32GB
- Triple displays with 2 x HDMI 1.4 1 x DP
- High speed I/O interface for USB 3.2 Gen 2, SATA 6Gb/s
- 3 x 2.5GbE with i225V/LM
- M.2 A Key 2230
- M.2 B key 2242/3042/2280

Dimensions *(Unit: mm)*



Packing List

1 x WAFER-JL single board computer with Heatspreader	
1 x SATA with power cable kit	1 x QIG (Quick Installation Guide)

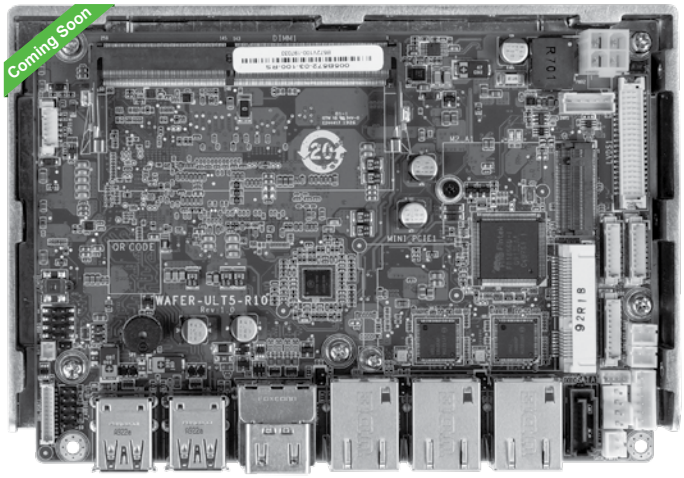
Ordering Information

Part No.	Description
WAFER-JL-N1-R10	3.5 SBC supports Intel® 10nm Gen 11 Quad-core Pentium® Silver N6000 3.30GHz TPD 6W on-board SoC with Dual HDMI, DP, triple 2.5 GbE Lan port, USB 3.2 Gen 2, M.2, SATA 6Gb/s, COM, Audio and RoHS, -20°C ~ 60°C
WAFER-JL-N2-R10	3.5 SBC supports Intel® 10nm Gen 11 Quad-core Celeron® N5100 2.80GHz TDP 6W on-board SoC with Dual HDMI, DP, triple 2.5 GbE Lan port, USB 3.2 Gen 2, M.2, SATA 6Gb/s, COM, Audio and RoHS, -20°C ~ 60°C
32000-070301-RS	Dual-port USB 2.0 cable, 210mm, P=2.0
32007-005200-200-RS	Audio cable, 300mm, P=2.0

WAFER-ULT6

3.5 SBC supports Intel® 10nm 11 Generation Core i® ULT on-board SoC with four HDMI, triple 2.5 GbE Lan port , USB 3.1 gen 2, M.2, SATA 6Gb/s, COM, Audio and RoHS, -20°C ~60°C

Preliminary



Specifications

- SoC
  Intel® Tirger Lake platform
- BIOS
  AMI UEFI BIOS
- Memory
  One 204-pin 3200 MHz Dual-channel DDR4 SO-DIMMs support up to 64 GB
- Graphics Engine
  Intel® Gen11 UHD Graphics
- Display Output
  Four Independent Displays
  4 x HDMI 1.4 or 3 x HDMI, 1 x LVDS
- Ethernet
  3 x PCIe 2.5 GbE with Intal i225-V
- External I/O Interface
  3 x USB 3.2 Gen 2
- Internal I/O Interface
  1 x SATA 6G/s with 5V SATA power connector (No RAID)
  4 x USB 2.0 front IO
  2 x RS-232/422/485 (1x9 pin, P=1.25) from Super IO
  2 x RS-232 (1x9 pin, P=1.25) from Super IO
- I²C
  1 x I²C (1x4 pin, P=2.0)
- TPM
  1 x On board TPM (2x10 pin) (optinal)
- Audio
  Realtek ALC888S HD Audio codec
- 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 M.2 A Key for WIFI & BT
  1 x M.2 B Key for 5G
  1 x M.2 M Key for Storage
- 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 support 1~255 sec. system reset
- Power Consumption
  TBD
- Operating Temperature
  -20°C ~ 60°C
- Storage Temperature
  -20°C ~ 70°C
- Operating Humidity
  5% ~ 95%, non-condensing
- Dimensions
  115mm x 165mm
- Weight
  GW:850g / NW:350g
- CE/FCC compliant

DDR4 2400 | Fanless | Jumper-less | PCIe GbE | USB 3.0 | SATA 6Gb/s

Features

- 1.3.5" SBC with Intel® Tirger Lake platform on-board SoC
- SO-DIMM DDR4 3200 MHz support up to system maximum 64GB
- Four displays with 4 x HDMI 1.4 or 3 x HDMI 1.4, 1 x LVDS
- High speed I/O interface for USB 3.2 Gen 2, SATA 6Gb/s
- 3 x 2.5GbE with i225-V
- M.2 A Key, B key, M key

Dimensions *(Unit: mm)*

Packing List

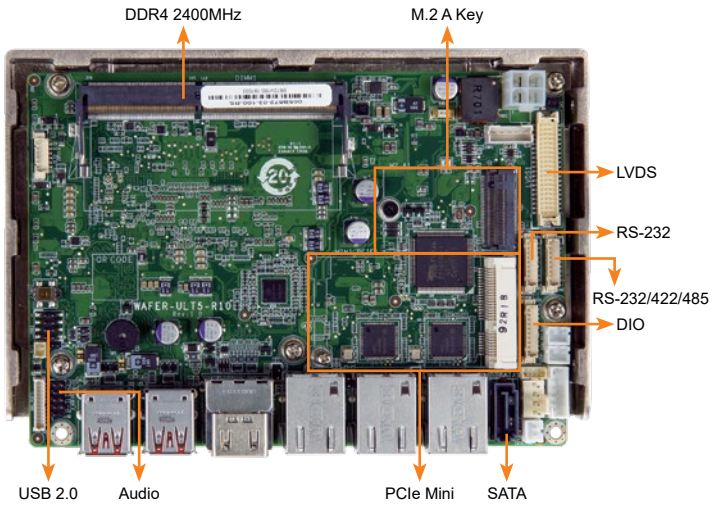
1 x WAFER-ULT6 single board computer	1 x Power cable
1 x SATA with power cable kit	1 x QIG

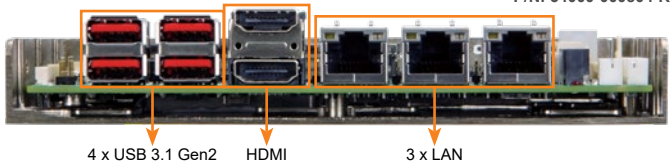
Ordering Information

Part No.	Description
WAFER-ULT6-xx-R10	3.5 SBC supports Intel® 10nm 11 Generation Core i® ULT on-board SoC with four HDMI, triple 2.5 GbE Lan port, USB 3.1 Gen 2, M.2, SATA 6Gb/s, COM, Audio and RoHS, -20°C ~ 60°C
32007-005200-200-RS	Audio cable, 300mm, P=2.0
32000-070301-RS	Dual-port USB 2.0 cable, 210mm, P=2.0

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, USB 3.1 Gen2, M.2 A key, mPCIe with mSATA support, SATA 6Gb/s, COM and RoHS





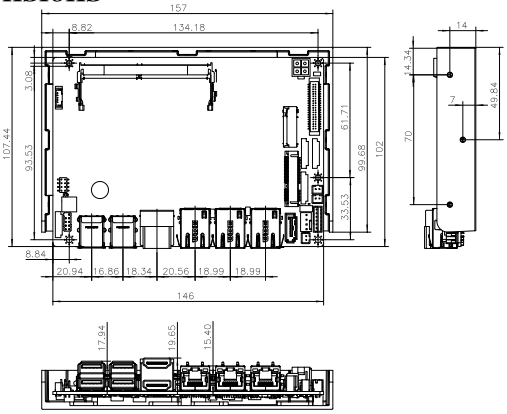
Specifications

- 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 3.1 Gen2
- 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 6G/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 spport
- COM, USB 3.1 Gen2, 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)

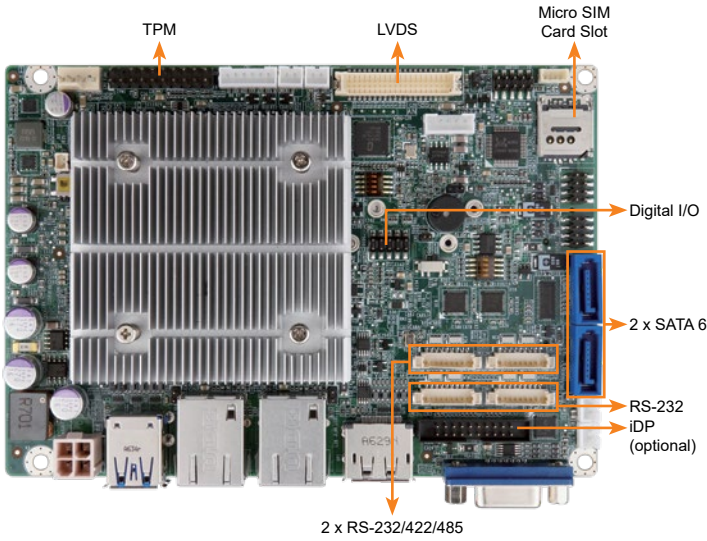
Ordering Information

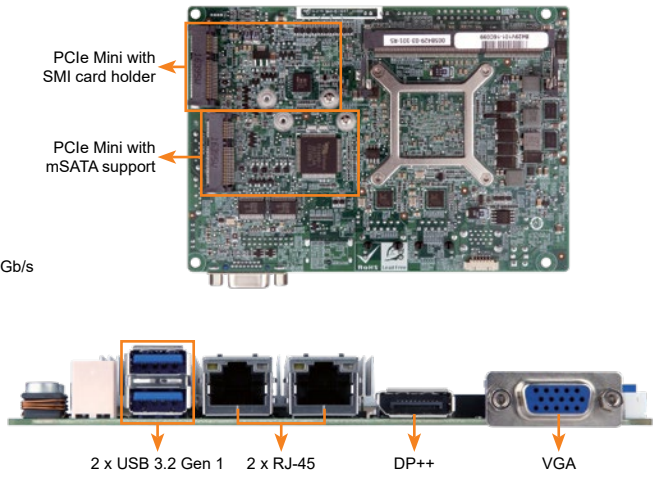
Part No.	Description
WAFER-ULT5-i7-R10	3.5" SBC supports Intel® 8th Generation Core™ i7-8665UE with DDR4 SO-DIMM, triple display with dual HDMI 1.4, LVDS, Triple GbE, USB 3.1, M.2 A key, mPCIe with mSATA support, SATA 6Gb/s, COM and RoHS
WAFER-ULT5-i5-R10	3.5" SBC supports Intel® 8th Generation Core™ i5-8365UE with DDR4 SO-DIMM, triple display with dual HDMI 1.4, LVDS, Triple GbE, USB 3.1, 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 3.1, 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 3.1, 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 3.1, 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°+LOCK, 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

TPM 2.0 Support

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

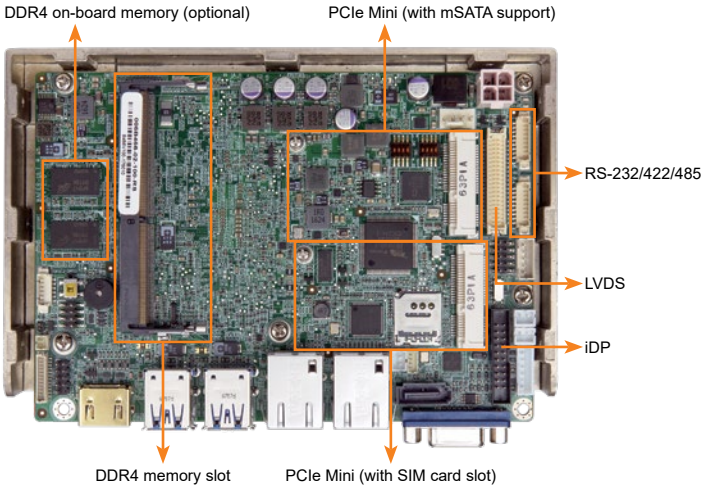
Ordering Information

Part No.	Description
WAFER-AL-N2-R10	3.5" SBC supports Intel® 14nm quad-core Pentium® N4200 2.5GHz on-board SoC with tripple display, Dual PCIe GbE, PCIe Mini with mSATA support, USB 3.2 Gen 1 (5Gb/s), SATA 6Gb/s, COM, Audio and RoHS
WAFER-AL-N1-R10	3.5" SBC supports Intel® 14nm dual-core Celeron® N3350 2.4GHz on-board SoC with tripple display, Dual PCIe GbE, PCIe Mini with mSATA support, USB 3.2 Gen 1 (5Gb/s), 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 tripple 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

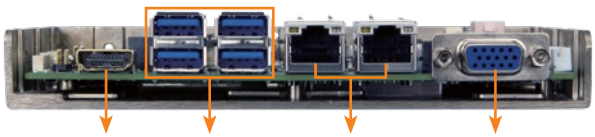
WAFER-ULT3/ULT4

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

34000-000673-RS
Fanless heatsink module (optional)



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)
- 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

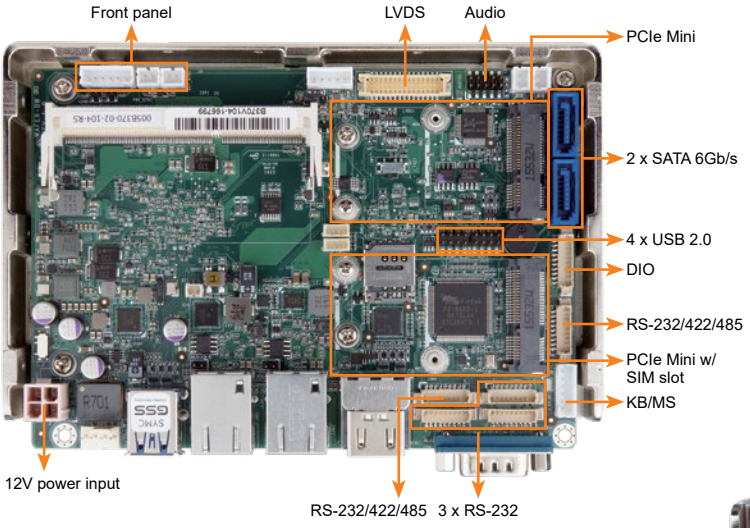
Ordering Information

Part No.	Description
WAFER-ULT3-i7-R10	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-R10	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-R10	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-R10	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
WAFER-ULT4-i7-R10**	3.5" SBC supports Intel® 7th Generation ULT Core™ i7-7600U 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-ULT4-i5-R10	3.5" SBC supports Intel® 7th Generation ULT Core™ i5-7300U 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-ULT4-i3-R10**	3.5" SBC supports Intel® 7th Generation ULT Core™ i3-7100U 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

**By order production, MOQ:100

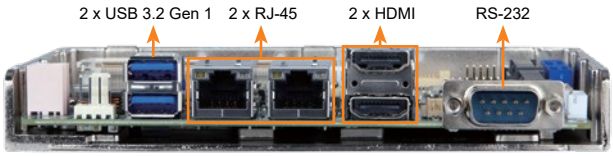
WAFER-BW

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)



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	1 x QIG

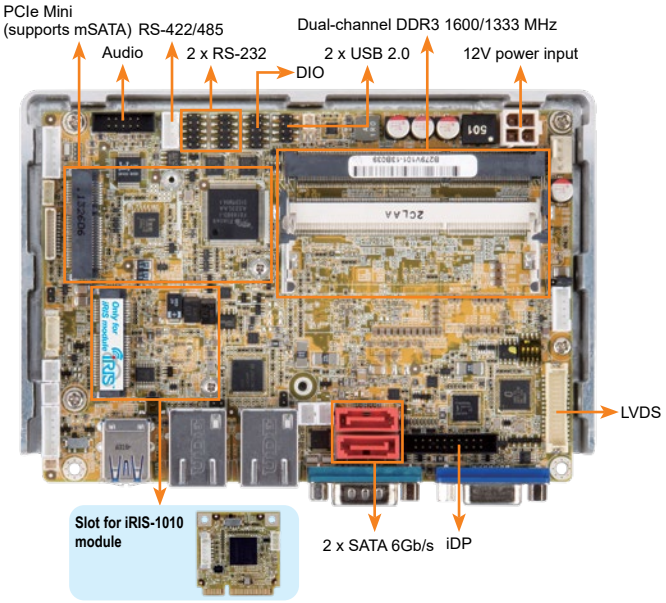
Ordering Information

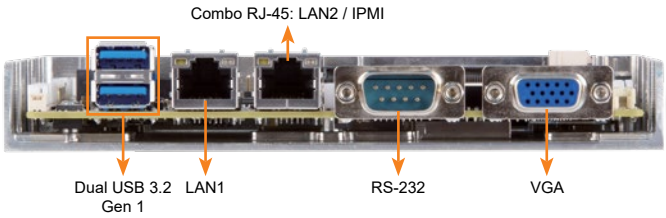
Part No.	Description
WAFER-BW-N4-R21	3.5" SBC supports Intel® Pentium® quad-core processor N3710 up to 2.56GHz (6W) with dual HDMI and LVDS, Dual PCIe GbE, PCIe Mini, USB 3.2 Gen 1 (5Gb/s), SATA 6Gb/s, mSATA, COM, Audio and RoHS
WAFER-BW-N3-R21	3.5" SBC supports Intel® Celeron® quad-core processor N3160 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

**By order production, MOQ: 100

WAFER-ULT2-i1 / WAFER-ULT-i1

3.5" SBC supports Intel® 22nm 4th/14nm 5th Generation Mobile Core™ i7/ i5/i3 and Celeron® on-board Processor (ULT), VGA/LVDS/iDP, Dual GbE, PCIe Mini, USB 3.2 Gen 1 (5Gb/s), SATA 6Gb/s Audio, iRIS-1010 and RoHS





IPMI 2.0 Compliant

1.35V DDR3L | Heat Spreader | USB 2.0 | SATA 6Gb/s | PCIe GbE | mSATA

Specifications

- CPU
  - » 5th generation Intel® mobile ULT on-board SoC
    - Intel® Core™ i7-5650U (2.2GHz, dual-core, 4MB cache, TDP=15W)
    - Intel® Core™ i5-5350U (1.8GHz, dual-core, 3MB cache, TDP=15W)
    - Intel® Core™ i3-5010U (2.1GHz, dual-core, 3MB cache, TDP=15W)
    - Intel® Celeron® processor 3765U (1.9GHz, dual-core, 2MB cache, TDP=15W)
  - » 4th generation Intel® mobile ULT on-board SoC
    - Intel® Core™ i5-4300U (1.9GHz, dual-core, 3MB cache, TDP=15W)
    - Intel® Core™ i3-4010U (1.7GHz, dual-core, 3MB cache, TDP=15W)
- BIOS: UEFI BIOS
- Memory
  - Two 204-pin 1600/1333 MHz dual-channel DDR3L SDRAM SO-DIMM slots support up to 16 GB
- Graphics Engine
  - Intel® HD Graphics Gen 7.5 supports DX11.1, OpenGL 4.2 and OpenCL1.2 Full MPEG2, VC1, AVC decode (4th generation SoC)
  - Intel® HD Graphics Gen 8 supports DX11.1, OpenGL 4.2 and OpenCL1.2 Full MPEG2, VC1, AVC decode (5th generation SoC)
- Display Output
  - Triple independent display
  - 1 x VGA (up to 2560x1600@60 Hz)
  - 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@60 Hz)
- Ethernet
  - LAN1: Intel® I218LM PHY with Intel® AMT 9.0 support
  - LAN2: Intel® I210-AT PCIe controller with NCSI support
- External I/O Interfaces
  - 2 x USB 3.2 Gen 1 (5Gb/s)
  - 1 x RS-232
- Internal I/O Interfaces
  - 1 x KB/MS (1x6 pin)
  - 1 x RS-422/485 (1x4 pin, P=2.0)
  - 2 x SATA 6Gb/s with 5V power connector
  - 2 x USB 2.0 (2x4 pin, P=2.0)
  - 2 x RS-232 (2x5 pin, P=2.0)
- iRIS Remote Management Module
  - 1 x iRIS-1010 slot
- Expansion: 1 x Full-size PCIe Mini card slot (mSATA support)
- Audio
  - Realtek ALC888S HD Audio codec
  - 1 x 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)
- Digital I/O: 8-bit digital I/O (2x5 pin)
- Fan Connector: 1 x System smart fan (1x4 pin)
- Watchdog Timer: Software programmable, support 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@2.72A (Intel® Core™ i5-4300U CPU with two 8 GB 1600 MHz DDR3 memory)
- Operating Temperature: -10°C ~ 60°C
- Storage Temperature: -20°C ~ 70°C
- Operating Humidity: 5% ~ 95%, non-condensing
- Dimensions: 146mm x 102mm
- Weight: GW: 600g/ NW: 250g
- CE/FCC compliant

Features

- 3.5" form fator with 4th/5th generation Intel® ULT SoC supports dual-channel DDR3L SO-DIMMs
- 12V only single voltage design with AT/ATX mode support
- 18/24-bit dual-channel LVDS support
- Support triple independent display via LVDS, VGA and iDP
- Support PCIe Mini card slot for mSATA, 3G card, wireless card and DOM

Packing List

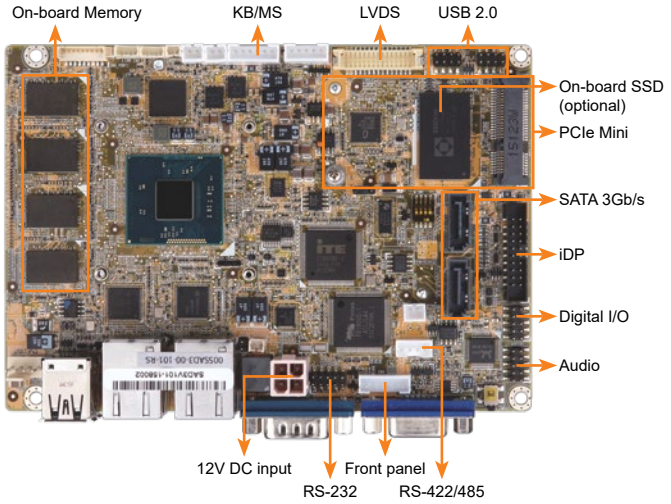
1 x WAFER-ULT/ULT2 single board computer with heatsink enclosure	
1 x Audio cable	
1 x Dual-port USB 2.0 cable	2 x SATA with 5V output cable kit
1 x Power cable	1 x QIG

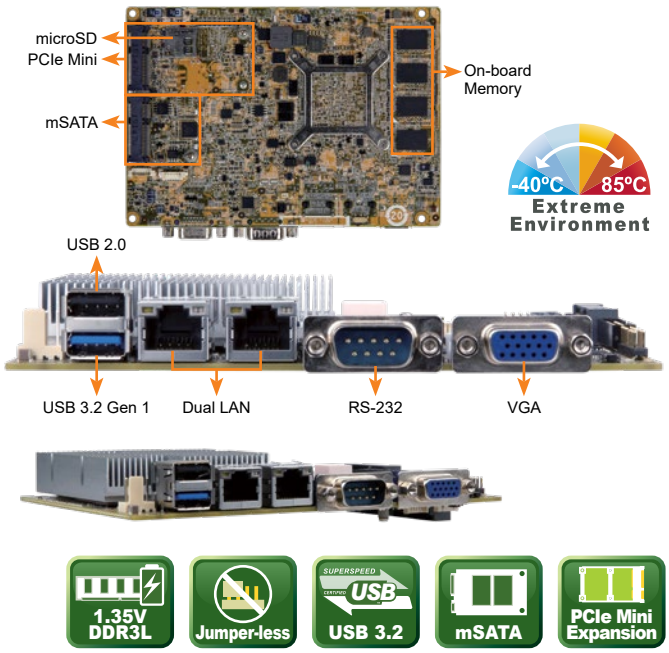
Ordering Information

Part No.	Description
WAFER-ULT2-i1-i7-R12	3.5" SBC with Intel® 14nm 5th Generation ULT Mobile Core™ i7-5650U processor (ULT), VGA/LVDS/iDP, Dual GbE, PCIe Mini, USB 3.2 Gen 1 (5Gb/s), SATA 6Gb/s and iRIS
WAFER-ULT2-i1-i5-R12	3.5" SBC with Intel® 14nm 5th Generation ULT Mobile Core™ i5-5350U processor (ULT), VGA/LVDS/iDP, Dual GbE, PCIe Mini, USB 3.2 Gen 1 (5Gb/s), SATA 6Gb/s and iRIS
WAFER-ULT2-i1-i3-R12	3.5" SBC with Intel® 14nm 5th Generation ULT Mobile Core™ i3-5010U processor (ULT), VGA/LVDS/iDP, Dual GbE, PCIe Mini, USB 3.2 Gen 1 (5Gb/s), SATA 6Gb/s and iRIS
WAFER-ULT2-i1-C-R12	3.5" SBC with Intel® 14nm 5th Generation ULT Mobile Celeron® 3765U processor (ULT), VGA/LVDS/iDP, Dual GbE, PCIe Mini, USB 3.2 Gen 1 (5Gb/s), SATA 6Gb/s and iRIS
WAFER-ULT-i1-i5-R12	3.5" SBC supports Intel® 22nm 4th Generation Mobile Core™ i5-4300U processor (ULT), VGA/LVDS/iDP, Dual GbE, USB 3.2 Gen 1 (5Gb/s), PCIe Mini, SATA 6Gb/s Audio, iRIS-1010 and RoHS
WAFER-ULT-i1-i3-R12	3.5" SBC supports Intel® 22nm 4th Generation Mobile Core™ i3-4010U processor (ULT), VGA/LVDS/iDP, Dual GbE, PCIe Mini, USB 3.2 Gen 1 (5Gb/s), SATA 6Gb/s Audio, iRIS-1010 and RoHS
iRIS-1010-R10	IPMI 2.0 adapter card with AST1010 BMC chip (w/o KVM over IP function) for PCIe Mini socket interface
19800-000300-200-RS	RS-232 cable, 300mm, 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
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-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)
  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)
- BIOS
  UEFI BIOS
- Memory
  4 GB solder-down 1066/1333 MHz DDR3L memory (for E3845)
- Graphics
  Intel® HD Graphics Gen 7 Engine with 4 execution units, supporting DX11.1, OpenGL 4.2 and OpenCL1.2
- Display Output
  Dual independent dispaly
  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)
  4 x USB 2.0 (2x4 pin, P=2.0)
  2 x SATA 3Gb/s with 5V SATA power connector (no RAID)
  1 x RS-232 (2x5 pin, P=2.0)
  1 x RS-422/485 (1x4 pin, P=2.0)
- 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

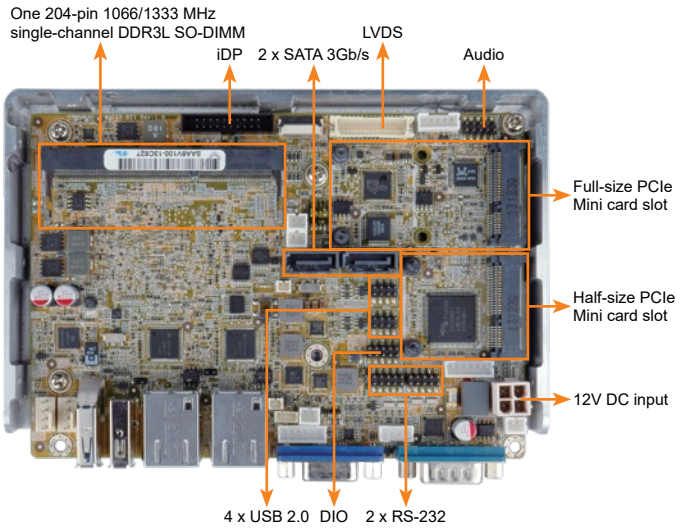
Ordering Information

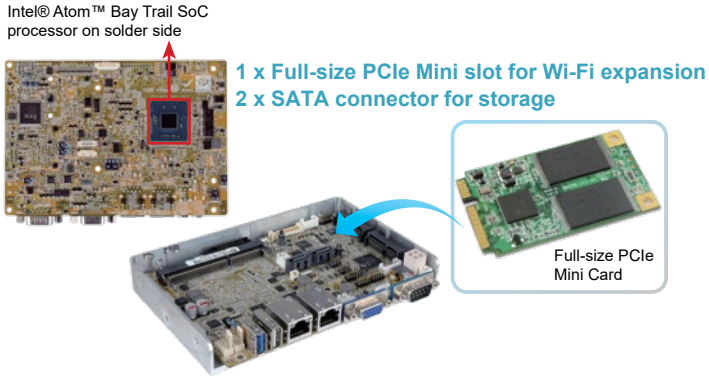
Part No.	Description
WAFER-BT-E38451W2-R12	3.5" SBC with Intel® 22nm Atom™ quad-core E3845 1.91GHz (10W) on-board SoC supports -40°C ~ 85°C, 4 GB DDR3 memory on board, VGA/LVDS/iDP, Dual PCIe GbE, USB 3.2 Gen 1 (5Gb/s), PCIe Mini, SATA 3Gb/s, mSATA, COM, Audio and RoHS
WAFER-BT-E38271W2-R12**	3.5" SBC with Intel® 22nm Atom™ dual-core E3827 1.75GHz (8W) on-board SoC supports -40°C ~ 85°C, 2 GB DDR3 memory on board, VGA/LVDS/iDP, Dual PCIe GbE, PCIe Mini, USB 3.2 Gen 1 (5Gb/s), SATA 3Gb/s, mSATA, COM, Audio and RoHS
WAFER-BT-E38261W2-R12**	3.5" SBC with Intel® 22nm Atom™ dual-core E3826 1.46GHz (7W) on-board SoC supports -40°C ~ 85°C, 2 GB DDR3 memory on board, VGA/LVDS/iDP, Dual PCIe GbE, PCIe Mini, USB 3.2 Gen 1 (5Gb/s), SATA 3Gb/s, mSATA, COM, Audio and RoHS
WAFER-BT-E38151W2-R12**	3.5" SBC with Intel® 22nm Atom™ single-core E3815 1.46GHz (5W) on-board SoC supports -40°C ~ 85°C, 2 GB DDR3 memory on board, VGA/LVDS/iDP, Dual PCIe GbE, PCIe Mini, USB 3.2 Gen 1 (5Gb/s), 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)

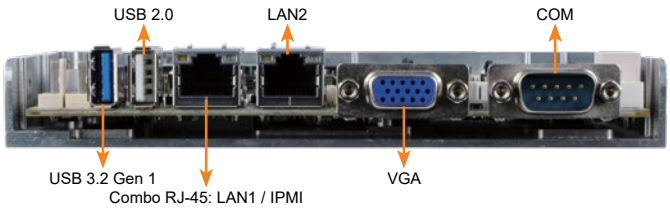
**By order production, MOQ: 100

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







Specifications

- SoC
  Intel® Atom™ E3845 on-board SoC (1.91GHz, quad-core, 2MB cache, TDP=10W)
  Intel® Atom™ E3825 on-board SoC (1.33GHz, dual-core, 1MB cache, TDP=6W)
  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® 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, E3845, E3827, E3826, E3825, E3815) or 4 GB (N2807)
- Graphics Engine
  Intel® HD Graphics Gen 7 Engine with 4 execution units, supports DX11.1, OpenGL 4.2 and OpenCL1.2
- 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-siza 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

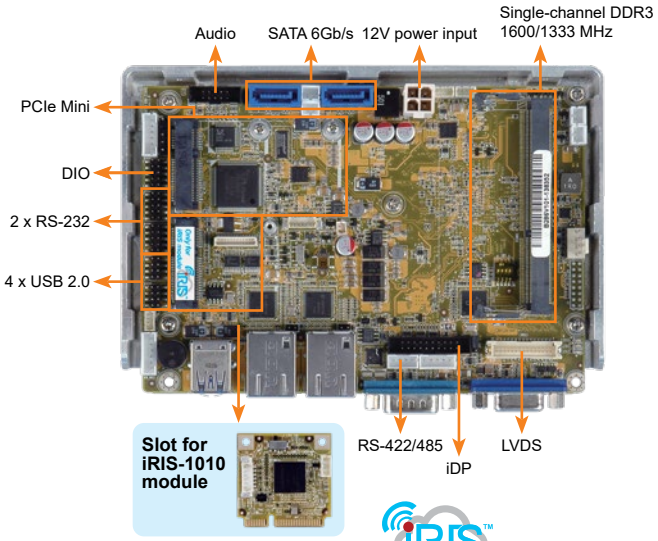
Ordering Information

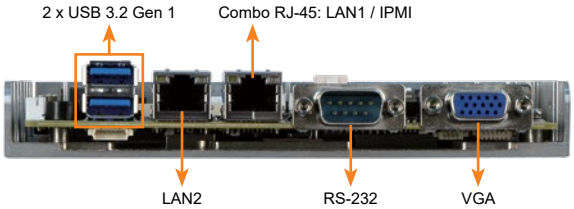
Part No.	Description
WAFER-BT-J19001-R20	3.5" SBC supports Intel® 22nm Quad-Core Celeron™ J1900 2.0GHz (10W) on-board SoC with VGA/LVDS/iDP, Dual PCIe GbE, USB 3.2 Gen 1 (5Gb/s), PCIe Mini, SATA, mSATA, COM, Audio and RoHS
WAFER-BT-N28071-R20	3.5" SBC supports Intel® 22nm Dual-Core Celeron™ N2807 1.58GHz (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-R20	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-E38XX1-R20**	3.5" SBC supports Intel® 22nm Quad-Core Atom™ E38XX 1.91GHz (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-J19001-ECO-R20	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, ECO packing and RoHS (10 pcs/pack)
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

**By order production, MOQ: 100

WAFER-KBN-i1

3.5" SBC supports AMD® Embedded G-Series SoC with VGA/LVDS/ iDP, Dual GbE, PCIe Mini, USB 3.2 Gen 1 (5Gb/s), SATA 6Gb/s, iRIS-1010, HD Audio and RoHS





Features

- 3.5" form fator with AMD® Embedded G-Series SoC
- 12V only single voltage design with AT/ATX mode
- 18/24-bit dual-channel LVDS for high resolution panel
- Support IPMI 2.0 with iRIS-1010 module
- Support full-size PCIe Mini card slot for mSATA, wireless card and DOM

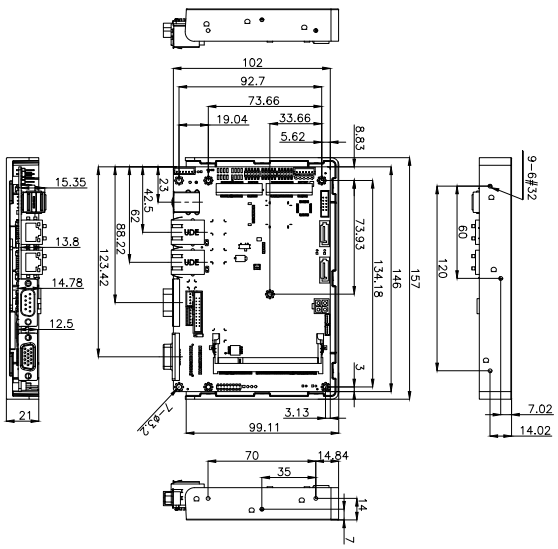
Packing List

1 x WAFER-KBN single board computer with Enclosure Heatsink	
1 x Audio cable	
1 x Power cable	2 x SATA with 5V output cable kit
1 x RS-232 cable	1 x QIG

Specifications

- SoC
  AMD® Embedded G-Series SoC
  GX-415GA on-board SoC (1.5GHz, quad-core, 2MB cache, TDP=15W)
  GX-210HA on-board SoC (1.0GHz, dual-core, 1MB cache, TDP=9W)
  GX-420CA on-board SoC (2.0GHz, quad-core, 2MB cache, TDP=25W)
  GX-217GA on-board SoC (1.65GHz, dual-core, 1MB cache, TDP=15W)
- BIOS
  AMI UEFI BIOS
- Memory
  One 204-pin 1600/1333 MHz dual-channel DDR3 & DDR3L SDRAM SO-DIMM slot supports up to 8 GB
- Graphics Engine
  GPU frequency 500 MHz (Radeon™ HD 8330E) for GX-415GA
  GPU frequency 300 MHz (Radeon™ HD 8210E) for GX-210HA
  GPU frequency 600 MHz (Radeon™ HD 8400E) for GX-420CA
  GPU frequency 450 MHz (Radeon™ HD 8280E) for GX-217GA
  Support DX11.1, OpenGL 4.1 and OpenCL1.2
  UVD4.2 decode for H.264, MPEG2/4, VC1, MVC
  VCE 2.0 encode for H.264, VCE
- Display Output
  1 x VGA (up to 2048x1536@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@60 Hz)
- Ethernet
  LAN1: Intel® I210-AT PCIe controller with NCSI support
  LAN2: Intel® I211-AT PCIe controller
- External I/O Interface
  1 x RS-232 — 2 x USB 3.2 Gen 1 (5Gb/s)
- Internal I/O Interface
  1 x KB/MS (1x6 pin) — 2 x SATA 3Gb/s with 5V SATA power connector
  1 x RS-422/485 (1x4 pin, P=2.0) — 4 x USB 2.0 (2x4 pin, P=2.0)
  2 x RS-232 (2x5 pin, P=2.0)
- iRIS Remote Management Module: 1 x iRIS-1010 slot
- SMBus: 1 x SMBus (1x4 pin)
- I²C: 1 x I²C (1x4 pin)
- Audio
  Realtek ALC888S HD Audio codec
  1 x Front audio (2x5 pin)
  1 x S/PDIF (1x4 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 co-lay SATA port 2)
- Digital I/O: 8-bit digital I/O (2x5 pin)
- Fan Connector: 1 x 4-pin system fan connector
- Watchdog Timer: Software programmable, support 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@2.12A (AMD GX-415GA 1.5GHz CPU with one 4 GB 1333 MHz DDR3 memory)
- Operating Temperature: 0°C ~ 60°C
- Storage Temperature: -10°C ~ 70°C
- Operating Humidity: 5% ~ 95%, non-condensing
- Dimensions: 146mm x 102mm
- Weight: GW: 600g/ NW: 250g
- CE/FCC compliant

Dimensions *(Unit: mm)*



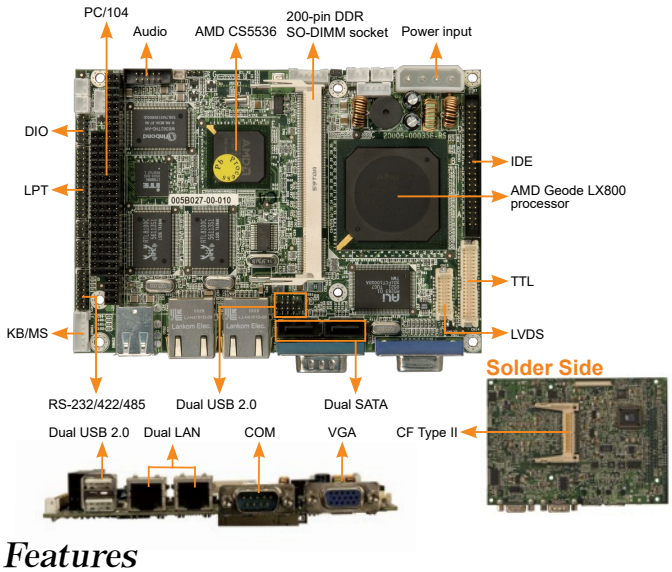
Ordering Information

Part No.	Description
WAFER-KBN-i1-4151-R10	3.5" SBC supports AMD 28nm quad-core GX-415GA 1.5GHz (15W) on-board SoC with VGA/LVDS, Dual GbE, PCIe Mini, USB 3.2 Gen 1 (5Gb/s), SATA 6Gb/s, iRIS-1010, HD Audio and RoHS
WAFER-KBN-i1-2101-R10	3.5" SBC supports AMD 28nm dual-core GX-210HA 1.0GHz (9W) on-board SoC with VGA/LVDS, Dual GbE, PCIe Mini, USB 3.2 Gen 1 (5Gb/s), SATA 6Gb/s, iRIS-1010, HD Audio and RoHS
iRIS-1010-R10	IPMI 2.0 adapter card with AST1010 BMC chip (W/O KVM over IP function) for PCIe Mini socket interface
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
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)

Note: Models with other CPU not listed in the table are requested by MOQ: 100 pcs/lot.

WAFER-LX

3.5" SBC with on-board AMD Geode™ LX 800 Processor VGA/LVDS/TTL, Dual LAN and SATA



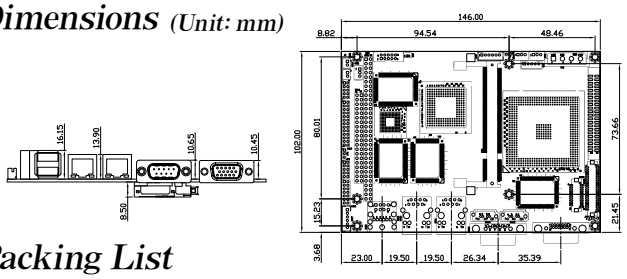
Features

- 3.5" form factor embedded board with AMD Geode™ LX 800 processor and RoHS compliant
- 333/400 MHz DDR SDRAM SO-DIMM supports up to 1 GB
- Complete I/O support with two SATA, IDE, CF Type II, PC/104, dual LAN and four USB 2.0
- 24-bit TTL/18-bit single-channel LVDS
- Value embedded applications with low power and fanless design. Support Windows® XP/CE/XPe
- The best choice for thin client Windows® CE 5.0, XPe OS image with ICA, RDP and IE APs ready

Specifications

- CPU
  AMD Geode™ LX800 (500 MHz) processor
- Chipset: AMD CS5536
- BIOS: Award BIOS
- System Memory
  One 200-pin 400/333 MHz DDR SDRAM SO-DIMM slot supports up to 1 GB
- Ethernet
  Dual LAN: 10/100Mbps RTL8100C Ethernet Controller
- External I/O Interface
  1 x RS-232 2 x USB 2.0
- Internal I/O Interface
  1 x CF Type II 1 x IDE (2x22 pin, P=2.0)
  1 x KB/MS (1x6 pin) 1 x LPT (2x13 pin, P=2.0)
  1 x RS-232 (2x5 pin, P=2.0)
  1 x RS-422/485 (2x2 pin, P=2.0)
  2 x SATA 1.5Gb/s (RAID 0, 1 support)
  2 x USB 2.0 (2x4 pin, P=2.0)
- Expansion: 1 x PC/104
- Digital I/O: 8-bit digital I/O (2x5 pin)
- Audio: Realtek ALC203 with AC'97 codec
- Display Output
  1 x VGA (up to 1920x1440@60Hz)
  1 x 18-bit single-channel LVDS (up to 1280x1024@60Hz)
- Infrared Interface: 1 x Infrared interface (1x5 pin)
- Watchdog Timer
  Software programmable supports 1~255 sec. system reset
- Power Supply
  5V only DC input
  1 x Internal power connector (1x4 pin)
  Support AT/ATX mode
- Power Consumption
  5V@1.53A (AMD LX800 with one 1 GB 400 MHz DDR memory)
- Operating Temperature: 0°C ~ 60°C
- Storage Temperature: -10°C ~ 70°C
- Operating Humidity: 5% ~ 95%, non-condensing
- Dimensions: 146 mm x 102 mm
- Weight: GW: 670g / NW: 230g
- CE/FCC compliant

Dimensions *(Unit: mm)*



Packing List

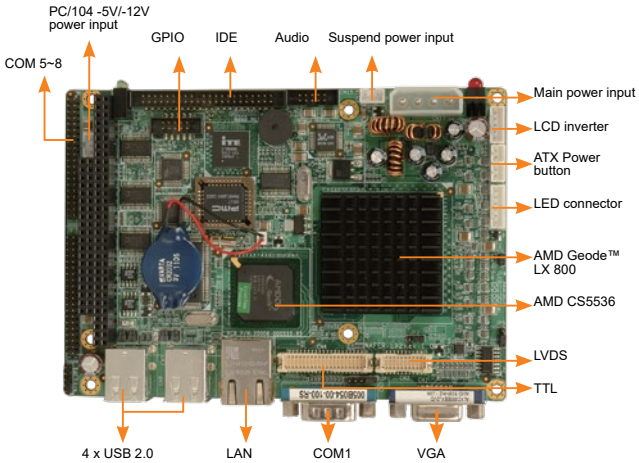
1 x WAFER-LX single board computer	1 x SATA power cable
1 x Audio cable	1 x USB cable
1 x IDE flat cable 44p/44p	2 x SATA cable
1 x KB/MS Y cable	1 x Mini jumper pack
1 x RS-232/422/485 cable	1 x QIG

Ordering Information

Part No.	Description
WAFER-LX-800-R12	3.5" SBC with AMD Geode™ LX 800 processor, audio, VGA/ LVDS/TTL, dual LAN and SATA connectors
WAFER-LX-800-NS-R12	3.5" SBC with AMD Geode™ LX 800 processor, audio, VGA/ LVDS/TTL, dual LAN and w/o SATA connectors
32200-015100-RS	LPT cable, 280mm, P=2.0

WAFER-LX2

3.5" SBC with AMD Geode™ LX 800 Processor, Eight COM, DDR 400 MHz, VGA/ LVDS/TTL Display Interfaces, PC/104, Four USB 2.0, Embedded OS Support



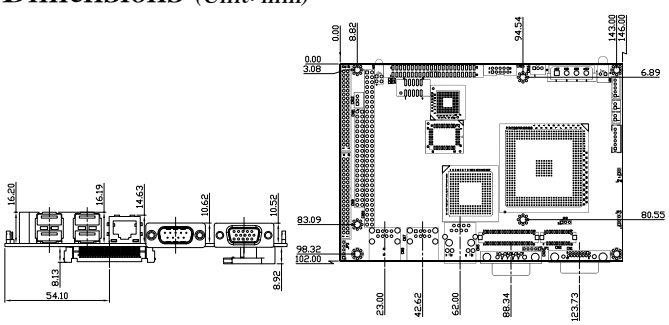
Features

- 3.5" form factor with AMD Geode™ LX 800 CPU
- One 333/400 MHz DDR SO-DIMM socket supports up to 1 GB memory
- VGA, 24-bit TTL, 18-bit LVDS display interfaces
- Seven RS-232 and one RS-232/422/485

Specifications

- CPU
  AMD Geode™ LX 800 (500 MHz)
- Chipset
  CS5536
- BIOS
  Award BIOS
- System Memory
  One 200-pin 400/333 MHz DDR SDRAM SO-DIMM slot supports up to 1 GB
- Ethernet
  LAN: 10/100Mbps RTL8100C Ethernet Controller
- External I/O Interface
  1 x RS-232 4 x USB 2.0
- Internal I/O Interface
  1 x CF Type II
  1 x IDE (2x22 pin, P=2.0)
  1 x RS-232/422/485 (2x7 pin, P=2.0)
  6 x RS-232 (2x5 pin, P=2.0)
- Expansion
  1 x PC/104 (ISA Bus)
- Digital I/O
  8-bit digital I/O (2x5 pin)
- Display Output
  1 x VGA (up to 1920x1440@60Hz)
  1 x 24-bit single-channel TTL (up to 1600x1200@60Hz)
  1 x 18-bit single-channel LVDS (up to 1280x1024@60Hz)
- Audio: Realtek ALC203 with AC`97 codec
- Watchdog Timer
  Software programmable supports 1 ~255 sec. system reset
- Power Supply
  5V only DC input
  1 x Internal power connector (1x4 pin)
  Support AT/ATX mode
- Power Consumption
  5V@1.33A (AMD Geode™ LX 800 with one 1 GB 400 MHz DDR memory)
- Operating Temperature
  0°C ~ 60°C (32°F ~ 140°F)
- Storage Temperature: -10°C ~ 70°C
- Operating Humidity
  5% ~ 95%, non-condensing
- Dimensions: 146 mm x 102 mm
- Weight: GW: 670g / NW: 230g
- CE/FCC compliant

Dimensions *(Unit: mm)*



Packing List

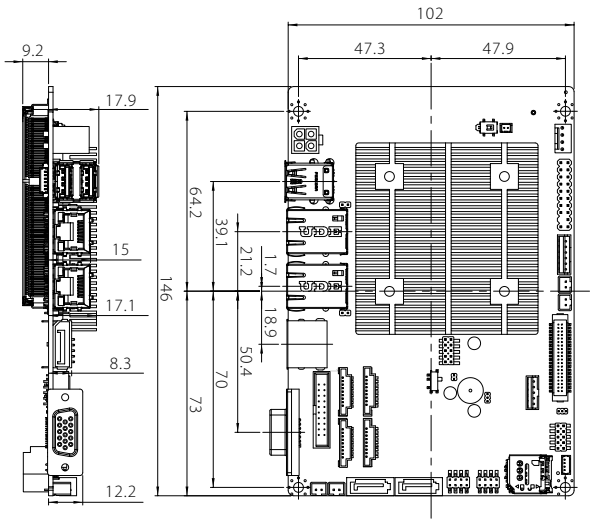
1 x WAFER-LX2 single board computer	2 x Quad RS-232 adapter cable
1 x Audio cable	1 x Mini jumper pack
1 x IDE flat cable 44p/44p	1 x QIG

Ordering Information

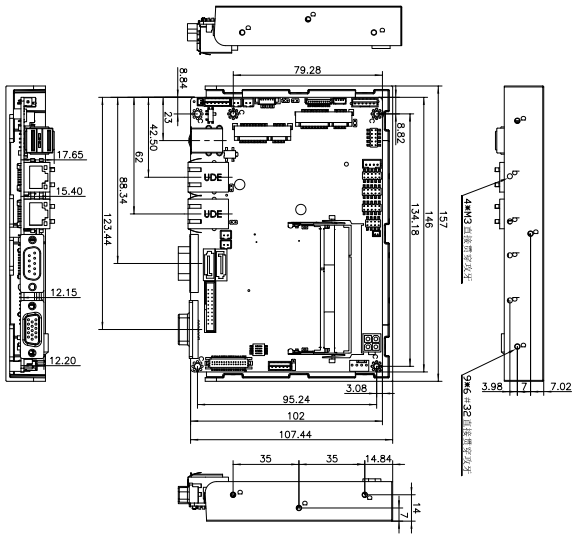
Part No.	Description
WAFER-LX2-800-R12	3.5" SBC with AMD Geode™ LX 800 processor, Audio, VGA/LVDS, TTL/LVDS, four USB 2.0, seven RS-232 and one RS-232/422/485

WAFER Dimensions (Unit: mm)

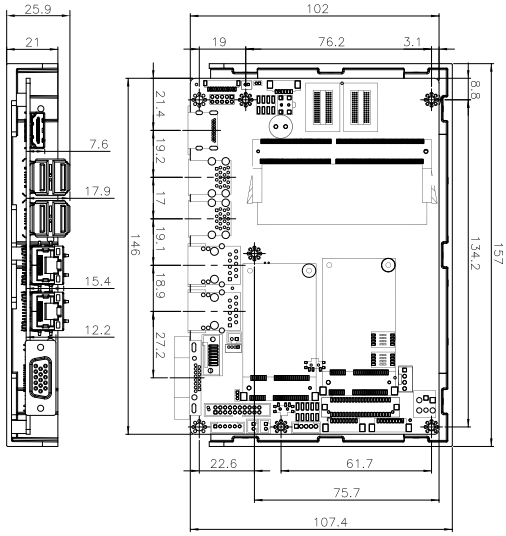
WAFER-AL



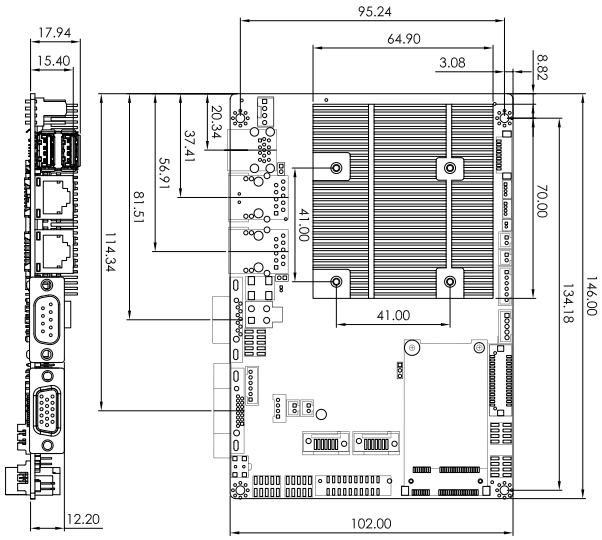
WAFER-ULT2-i1/WAFER-ULT-i1



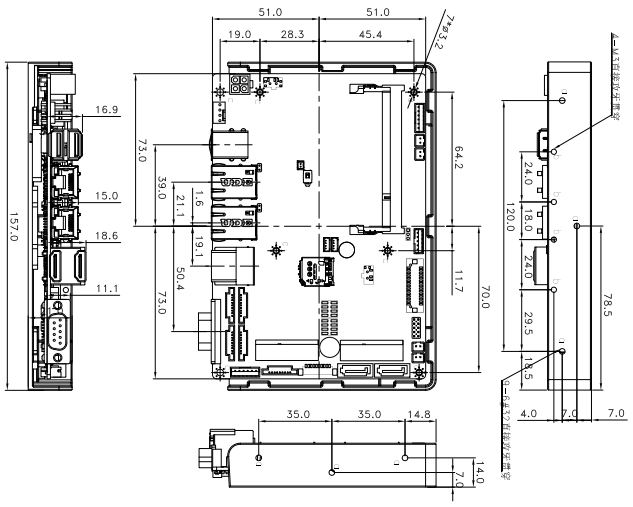
WAFER-ULT4/ULT3



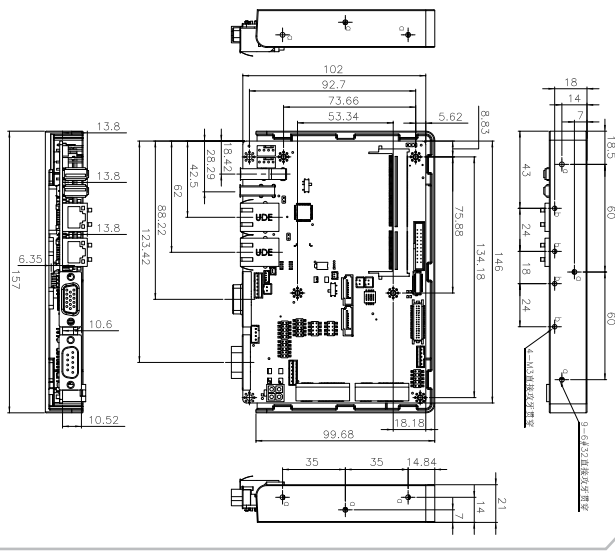
WAFER-BT-E38001W2



WAFER-BW



WAFER-BT-i1

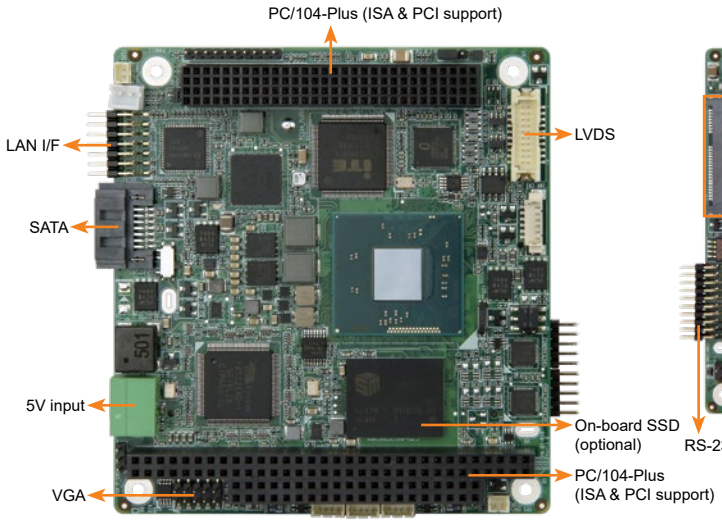


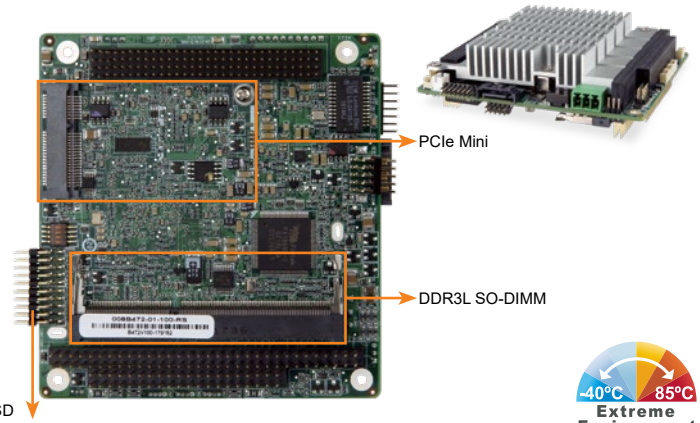
PC/104 Selection Guide

Model Name	PM-BT	PM-LX	PM-LX2
CPU Socket	On board	On board	On board
CPU Type	Intel® Atom™/Celeron® SoC	AMD Geode™ LX 800 500 MHz	AMD Geode™ LX 800 500 MHz
Chipset	Intel® Atom™/Celeron® SoC	Geode™ LX800 + CS5536	Geode™ LX800 + CS5536
Memory	1 x 204-pin 1066/1333 MHz DDR3L SO-DIMM (system max. 8 GB)	1 x 200-pin 400 MHz 1 GB (max.) DDR SDRAM SO-DIMM	1 x 200-pin 400 MHz 1 GB (max.) DDR SDRAM SO-DIMM
Display Interface	Dual display supported 1 x VGA 1 x 18/24-bit single-channel LVDS	Dual display supported 1 x VGA 1 x 24-bit TTL	Dual display supported 1 x VGA 1 x 24-bit TTL
Ethernet	GbE by Intel® I210 Ethernet PHY	10/100Mbps LAN by Realtek RTL8100C	10/100Mbps LAN by Realtek RTL8100C
iRIS Remote Management Module	N/A		
I/O Interface	2 x RS-232/422/485 (2x5, P=2.0) 3 x USB 2.0 (1x4 pin, P=1.25)	1 x KB/MS by pin header 1 x LPT 1 x RS-422/485 2 x RS-232 2 x USB 2.0	1 x KB/MS by pin header 1 x LPT 1 x RS-422/485 2 x RS-232 2 x USB 2.0
Storage Interface	1 x SATA 3Gb/s with 5V SATA power connector On-board SSD (optional)	1 x IDE 1 x CF Type II	1 x Slim FDD 1 x IDE 1 x CF Type II
Audio	N/A		
Digital I/O	1 x 8-bit DIO	N/A	
Power Consumption	5V@1.70A (Intel® Celeron® J1900 CPU with 8GB memory)	5V@1.13A (AMD Geode™ LX 800 with 1 GB DDR 400 MHz)	5V@1.09A (AMD Geode™ LX 800 with 512MB DDR 400 MHz)
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: 0°C ~ 60°C Relative Humidity: 5% ~ 95%, non-condensing	Temperature Range: -40°C ~ 70°C (W) 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 PCI-104	1 x PC-104
CPU Cooler	Heatsink	Heatsink	Heatsink

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





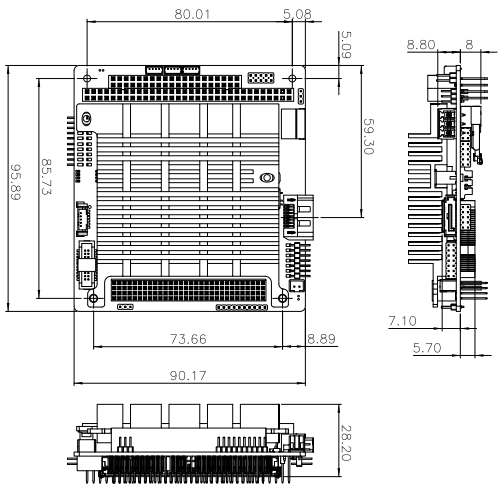
Specifications

- SoC
  Intel® Atom™ E3845 on-board SoC (1.91GHz, quad-core, 2MB cache, TDP=10W)
  Intel® Atom™ E3825 on-board SoC (1.33GHz, dual-core, 1MB cache, TDP=6W)
  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 DDR3L SO-DIMM supports up to 8 GB (J1900, N2930, E3845, E3827, E3826, E3825, E3815) or 4 GB (N2807)
- Graphics Engine
  Intel® HD Graphics Gen 7 Engine with four execution units, supporting DX11.1, OpenGL 4.2 and OpenCL1.2
- 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 (for J1900/N2930/N2807)
  -40°C ~ 85°C (for E38xx)
- 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
- Wide range temperature support froom -40°C ~ 85°C (for E38xx series CPU)

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

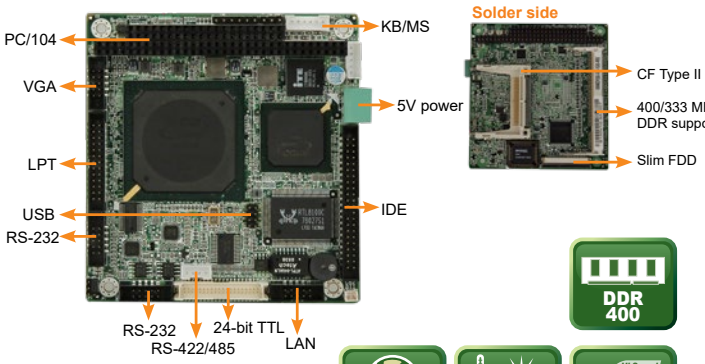
Ordering Information

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
PM-BT-N28071-R10	PC/104-Plus single board computer with Intel® Celeron® N2807 SoC with DDR3L, VGA, LVDS, USB 2.0, SATA 3Gb/s, GbE, RS-232/422/485 and 5V DC input, RoHS
PM-BT-E38xx1W2-R10**	PC/104-Plus single board computer with Intel® Atom™ E38xx SoC with DDR3L, VGA, LVDS, USB 2.0, SATA 3Gb/s, GbE, RS-232/422/485 and 5V DC input, RoHS,-40°C ~ 85°C
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

** Note: Models with other CPUs not listed in the table are requested by MOQ - 100 pcs/lot.
* ISA limitation, Please refer to the user manual for more information.

PM-LX2

AMD Geode™ LX 800 CPU on-board PC/104 Module

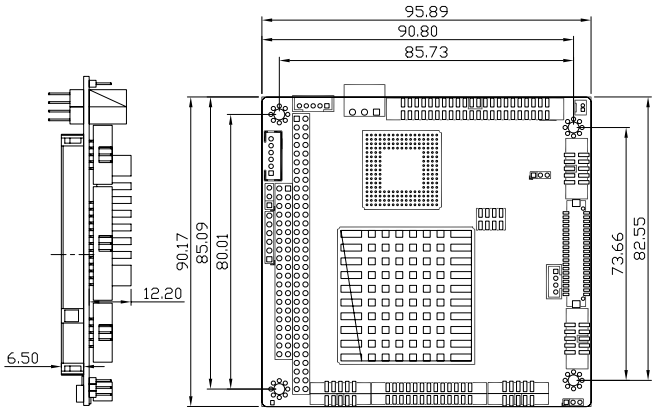


DDR 400 | Fanless | Wide Temperature | USB 2.0

Specifications

- CPU
  AMD Geode™ LX 800 (500 MHz)
- Chipset
  AMD CS5536
- BIOS
  AMI BIOS
- System Memory
  One 200-pin 400 MHz DDR SDRAM SO-DIMM supports up to 1 GB
- Ethernet
  One Realtek RTL8100C 10/100Mbps Ethernet chipset
- Internal I/O Interface
  1 x CF Type II
  1 x IDE (2x22 pin, P=2.0)
  1 x LPT (2x13 pin, P=2.0)
  1 x KB/MS (1x6 pin)
  2 x RS-232 (2x5 pin, P=2.0)
  1 x RS-422/485 (1x4 pin, P=2.0)
  1 x Slim FDD
  2 x USB 2.0 (2x4 pin, P=2.0)
- Expansion
  1 x PC/104
- Display Output
  1 x VGA (up to 1920x1440@60Hz)
  1 x 24-bit single-channel TTL (up to 1600x1200@60Hz)
- Watchdog Timer
  Softwafe programmable supports 1~255 sec. system reset.
- Power Supply
  5V only DC input
  1 x Internal power connector (1x2 pin)
  Support AT mode
- Power Consumption
  5V@1.09A (AMD Geode™ LX 800 with one 512MB 400 MHz DDR)
- Operating Temperature
  PM-LX2-800-R10: 0°C ~ 60°C
- Operating Humidity
  5% ~ 95%, non-condensing
- Dimensions
  96mm (L) x 90mm (W)
- Weight
  GW: 500g / NW 110g
- CE/FCC compliant

Dimensions (mm)



Packing List

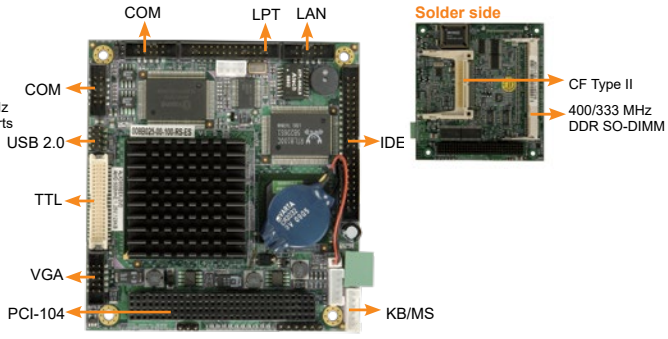
1 x PM-LX2 single board computer	1 x PS/2 KB/MS cable
1 x ATA33 flat cable	1 x VGA cable
1 x Dual USB cable	2 x RS-232 cable
1 x LAN cable	1 x Mini jumper pack
1 x Power cable	1 x QIG

Ordering Information

Part No.	Description
PM-LX2-800-R10	PC/104 SBC with AMD Geode™ LX 800 500 MHz, VGA/TTL, LAN, USB 2.0 and CF Type II
32200-015100-RS	LPT cable, 280mm, P=2.0
32205-003800-300-RS	RS-422/485 cable, 200mm, P=2.0

PM-LX

PCI-104 Module with on-board AMD Geode™ LX 800 CPU

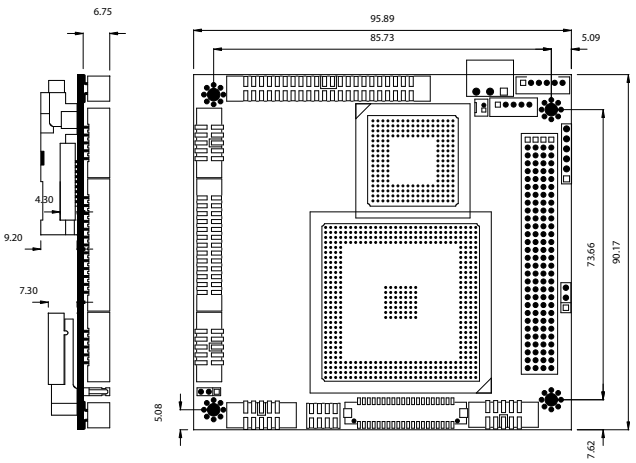


DDR 400 | Fanless | USB 2.0

Specifications

- CPU
  AMD Geode™ LX 800 (500 MHz) processor
- Chipset
  AMD CS5536
- BIOS
  Award BIOS
- System Memory
  One 200-pin 400 MHz DDR SDRAM SO-DIMM supports up to 1 GB
- Ethernet
  10/100Mbps realtek RTL8100C Ethernet chipset
- Internal I/O Interface
  1 x CF Type II
  1 x IDE (2x22 pin, P=2.0)
  1 x LPT (2x13 pin, P=2.0)
  1 x KB/MS (1x6 pin)
  2 x RS-232 (2x5 pin, P=2.0)
  1 x RS-422/485 (1x4 pin, P=2.0)
  2 x USB 2.0 (2x4 pin, P=2.0)
- Expansion
  1 x PCI-104
- Display Output
  1 x VGA (up to 1920x1440@60Hz)
  1 x 24-bit single-channel TTL (up to 1600x1200@60Hz)
- Watchdog Timer
  Software programmable supports 1~255 sec. system reset
- Power Supply
  5V only DC input
  1 x Internal power connector (1x2 pin)
  Support AT mode
- Power Consumption
  5V@1.13A (AMD Geode™ LX 800 with one 1 GB 400 MHz DDR memory)
- Operating Temperature
  0°C ~ 60°C
- Storage Temperature
  -10°C ~ 70°C
- Operating Humidity
  5% ~ 95%
- Dimensions: 95 mm x 95 mm
- Weight: GW: 500g / NW: 110g
- CE/FCC compliant

Dimensions (mm)



Packing List

1 x PM-LX single board computer	1 x USB cable
1 x ATA33 flat cable	1 x VGA cable
1 x KB/MS Y cable	2 x RS-232 cable
1 x LAN cable	1 x Mini jumper pack
1 x Power cable	1 x QIG

Ordering Information

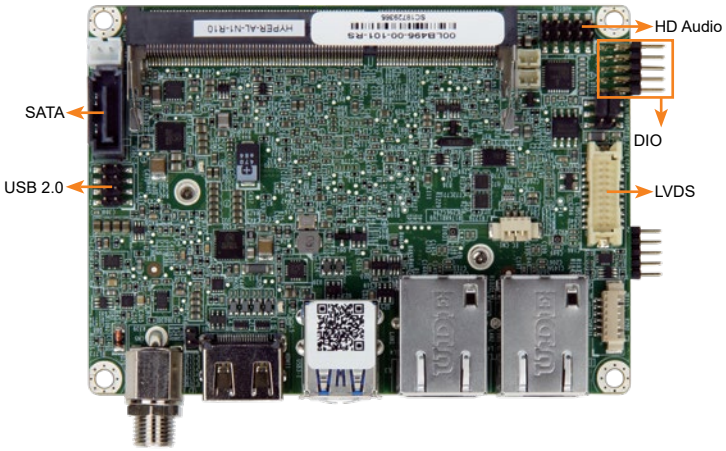
Part No.	Description
PM-LX-800-R11	PCI-104 SBC with AMD Geode™ LX 800 processor , VGA/TTL, LAN, USB 2.0, CF Type II
32200-015100-RS	LPT cable, 280mm, P=2.0
32205-003800-300-RS	RS-422/485 cable, 200mm, P=2.0

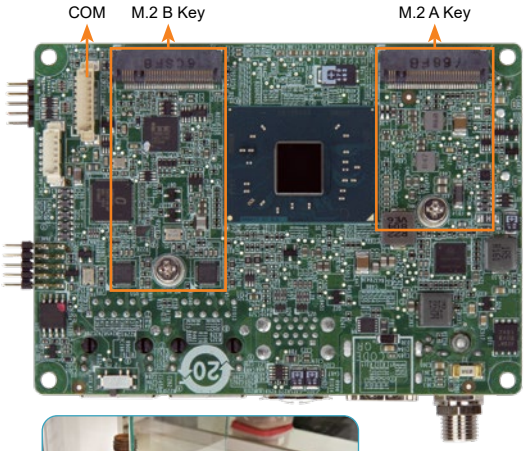
Pico-ITX Selection Guide

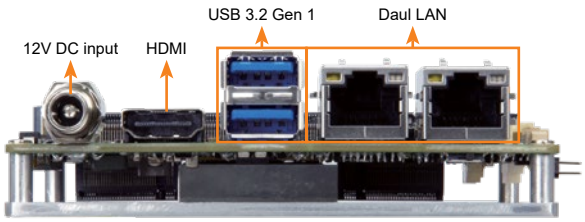
Model Name	HYPER-AL	HYPER-BW	HYPER-BT
CPU Socket	On board	On board	On board
CPU Type	Intel® Celeron® SoC	Intel® Pentium®/Celeron® SoC	Intel® Atom™/Celeron® SoC
Chipset	Intel® Celeron® SoC	Intel® Pentium®/Celeron® SoC	Intel® Atom™/Celeron® SoC
Memory	1 x 204-pin 1866/1600MHz single-channel DDR3L SDRAM 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 independent dispaly 1 x HDMI 1 x LVDS	Dual independent dispaly 2 x Mini HDMI	Dual independent dispaly 1 x VGA 1 x iDP interface
Ethernet	LAN1: Realtek RTL8111H controller LAN2: Realtek RTL8111H controller	LAN: Realtek RTL8111GN controller	LAN: Intel® I211-AT PCIe GbE controller
iRIS Remote Management Module	N/A		
I/O Interface	1 x RS-232 2 x USB 2.0 2 x USB 3.2 Gen 1	1 x RS-232 1 x USB 3.2 Gen 1 3 x USB 2.0	1 x RS-232 1 x USB 3.2 Gen 1 3 x USB 2.0
Storage Interface	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)
Audio	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	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 (-4°F ~ 140°F) Relative Humidity: 5% ~ 95%, non-condensing		
Expansion Slot	1 x M.2 A key 2230 1 x M.2 B key 2242	1 x M.2 (B key)	N/A
CPU Cooler	Heat Spreader	Heatsink	Heat Spreader

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







DDR3L 1600 | M.2 | Dual GbE | USB 3.2 | SATA 6Gb/s

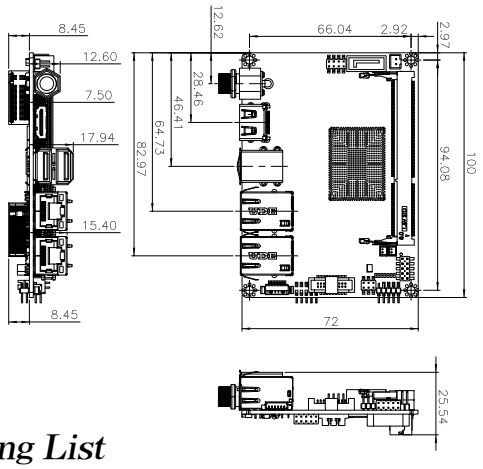
Specifications

- 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 buttom, reset buttom)
- 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

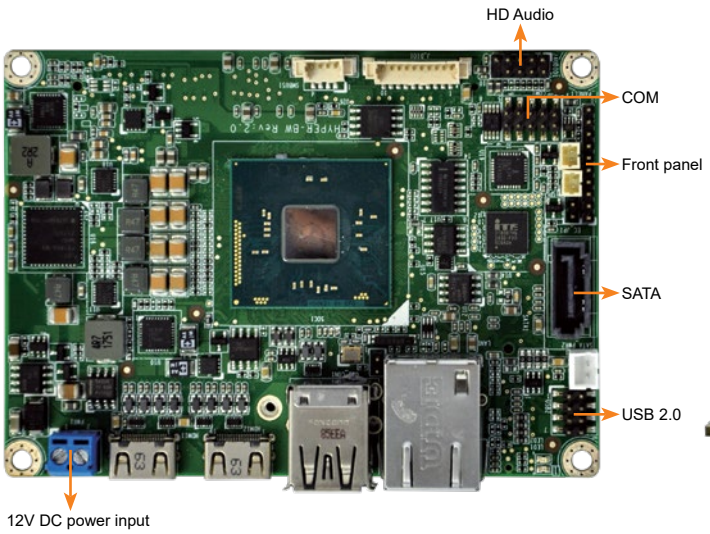
1 x HYPER-AL single board computer (heat spreader by default)	
1 x COM port cable	1 x QIG (Quick Installation Guide)
1 x SATA cable kit	

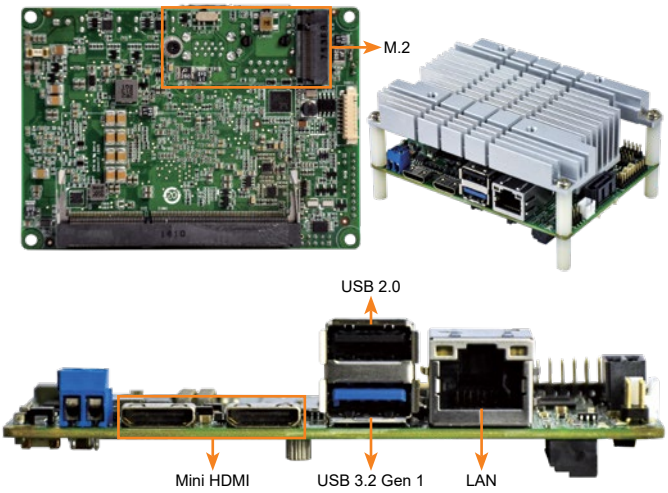
Ordering Information

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
AC-KIT-892HD-R10	Realtek ALC892 (Colay ALC888) 7.1 Channel HD Audio peripheral board, RoHS

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 OpenCL1.2
- 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 buttom, reset buttom)
- 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

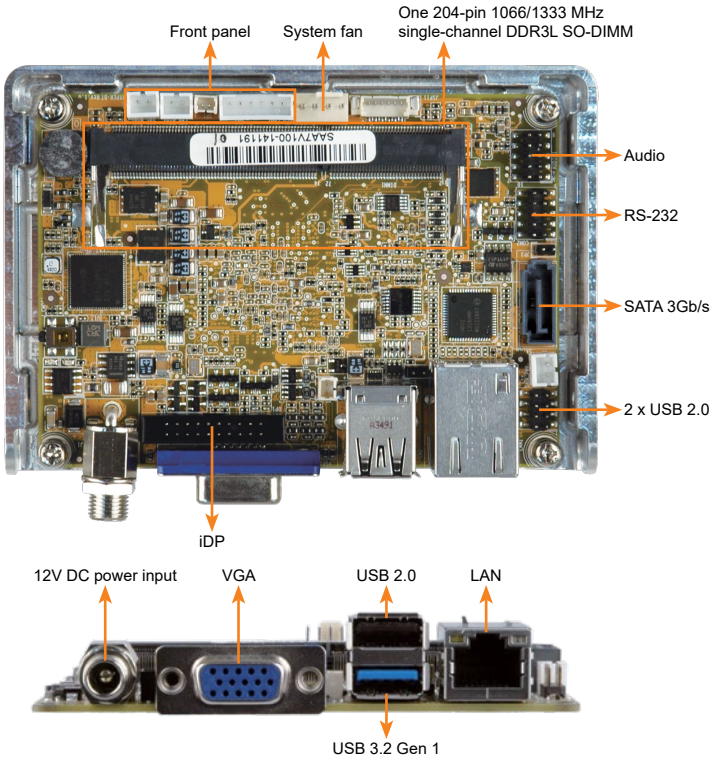
Ordering Information

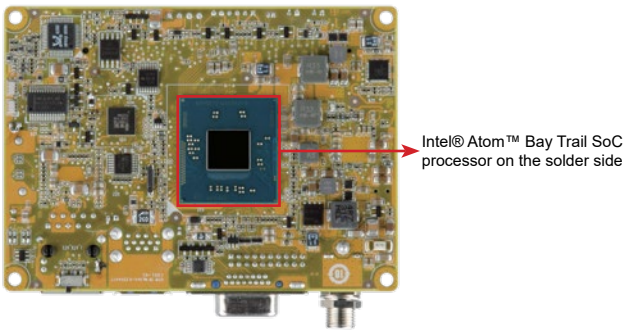
Part No.	Description
HYPER-BW-N4-R20	Pico-ITX SBC with Intel® Pentium® 14nm quad-core N3710 up to 2.56GHz (6W) on-board SoC with dual Mini HDMI, PCIe GbE, M.2, USB 3.2 Gen 1 (5Gb/s), SATA 6Gb/s, COM, Audio and RoHS
HYPER-BW-N3-R20	Pico-ITX SBC with Intel® Celeron® 14nm quad-core N3160 up to 2.24GHz (6W) 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
63040-010036-111-RS	12V 36W AC/DC adapter
AC-KIT-892HD-R10	Realtek ALC892 (Colay ALC888) 7.1 Channel HD Audio peripheral board, RoHS

**By order production, MOQ: 100

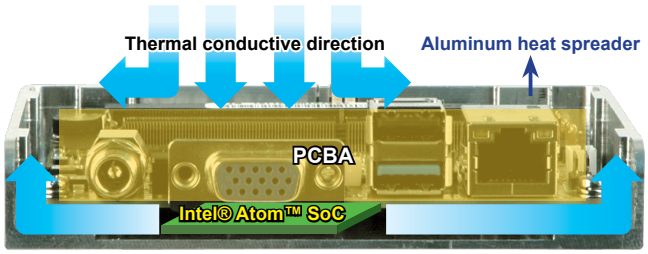
HYPER-BT

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 OpenGL 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

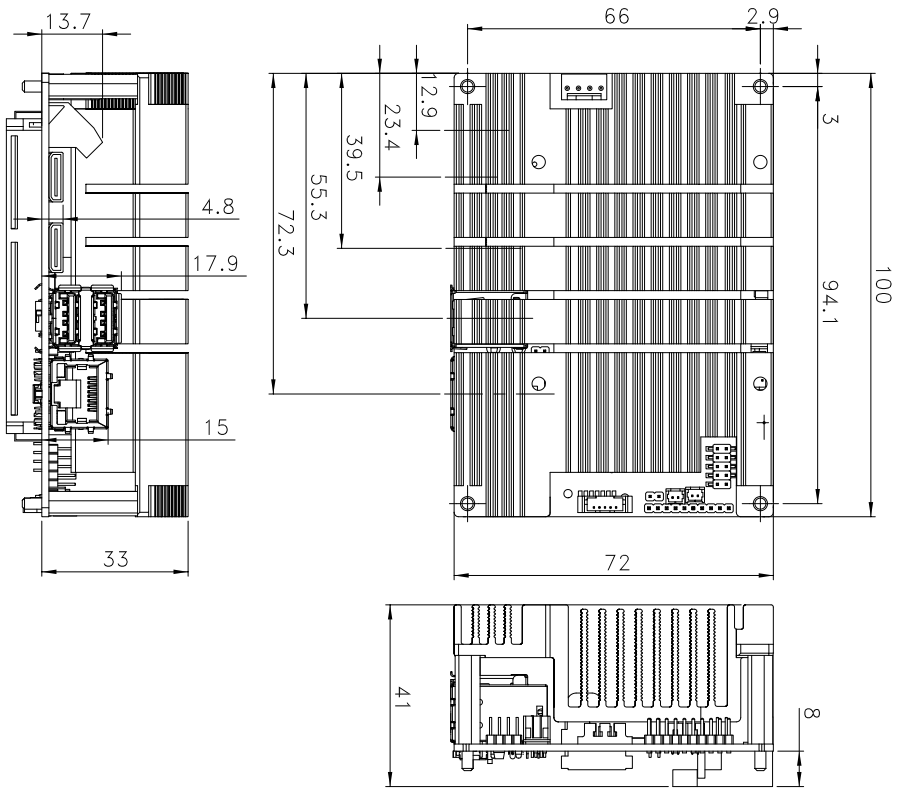
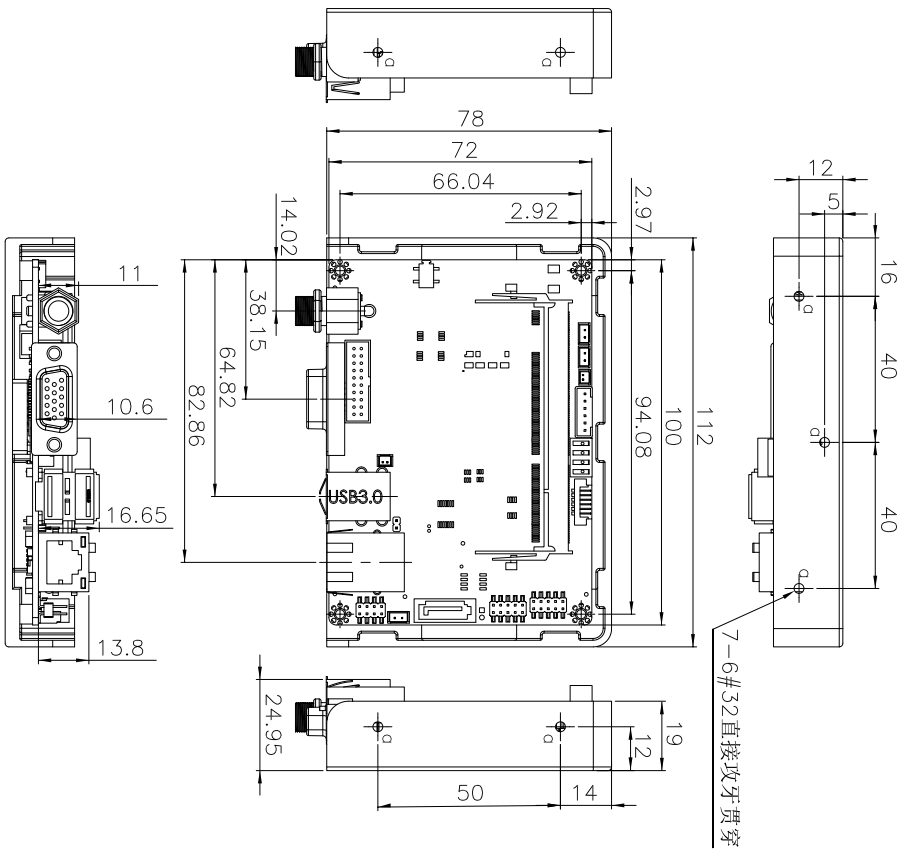
Ordering Information

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
32200-000049-RS	RS-232 cable, 240mm, 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 borad (for IEI iDP connector)
DP-VGA-R10	DisplayPort to VGA converter board (for IEI iDP connector)

**By order production, MOQ: 100

HYPER Dimensions (Unit: mm)

HYPER-BW



HYPER-BT