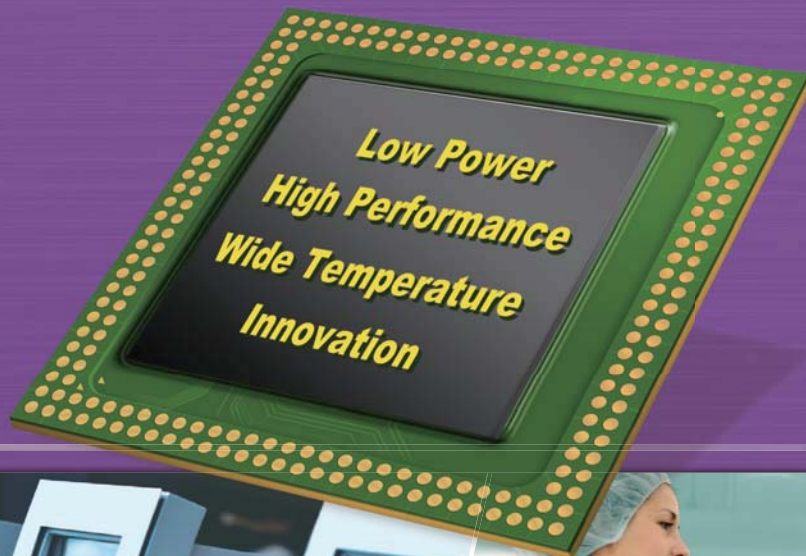


Intel® Atom™ Processor E3800

The Latest Low Power Platform



E3800 Family Platform for Intelligent Systems

While designed to be a true test of Intel's performance in the ultra mobile space, Silvermont is the first true architecture update to Intel's Atom processor since its introduction in 2008. Leveraging Intel's first 22nm process and a very low power-micro architecture, Silvermont aims squarely at the latest Krait cores from Qualcomm and ARM's Cortex A15. Based on Silvermont, Intel® introduces E3800 product family, a series of system on chip (SoC) designed for low-power, feature-rich and highly-capable applications.

E3800 product family takes up to four Silvermont cores, and for the first time in an ultra mobile Intel SoC, is paired with Intel's own graphics IP. In other words, rather than using a GPU block from Imagination Technologies, E3800 product family leverages the same GPU architecture as the 3rd generation Intel Core processors (codenamed Ivy Bridge).

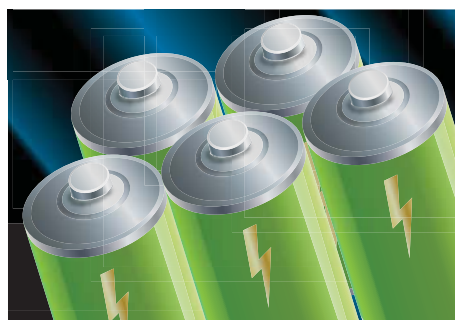
Silvermont Core Highlights

Better Performance



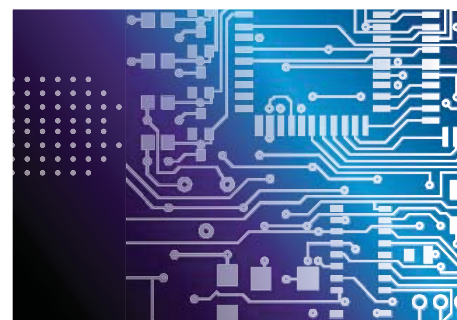
- Out-of-order execution engine
- New multi-core and system fabric architecture
- New IA instructions extensions (Intel Core Westmere Level)

Better Power Efficiency



- Wider dynamic operating range
- Enhanced active and idle power management

22nm Architecture



- 3D Tri-gate transistors tuned for SoC products
- Architecture and design co-optimized with the process

Bay Trail: Not just for Atoms anymore

E3800 product family combines a CPU based on Intel's new Silvermont architecture with a GPU that is architecturally similar to (but less powerful than) the HD 4000 graphics engine integrated in the 3rd generation Intel® Core processors launched in early 2012. These core components are combined with dedicated I/O blocks and media encoding and decoding to make one system-on-a-chip, which is then manufactured on the 22nm process (and the 3D tri-gate transistors) currently being used for both the 3rd and 4th generation Intel® Core processors.

Since Silvermont is the first major overhaul of the Atom CPU architecture since it was introduced in 2008, the main performance improvement will come from the CPU's new out-of-order (OoO) execution engine, which allows the CPU to process different instructions as soon as resources to execute them are available. On the graphics side, E3800 product family's GPU uses the same Intel® execution units (EUs) as the 3rd generation Intel Core processors' HD 4000, which gives them support for most of the same APIs and features: DirectX 11, OpenGL 4.0 (and OpenGL ES 3.0 on mobile, provided the drivers support it), and OpenCL 1.2 support are all present on the API side, and dual-display support for panels up to 2560×1440 (or 1080p over HDMI) as well as via Intel's Wireless Display feature will please multi-monitor fans.



Features and Performance

Extended beyond Atom Processors

E3800 product family contains the Silvermont CPU cores, and there can be up to four of them, sharing a total of 2 MB L2-cache. The CPU cores are supported by the Intel-developed HD Graphics GPU with 4 execution units. That's different with Atom, because Atom chips use the PowerVR GPUs from Imagination Technologies. An integrated power controller distributes the available power between the CPU and GPU cores. In addition to a GPU, E3800 product family also has an integrated image processor that will be used for things like processing images from tablet cameras.

The integrated memory controller supports dual-channel LP-DDR3-1066 or single-channel DDR3L-RS-1333. There can be a maximum of 2 GB per channel, which means the dual-channel versions can have a maximum of 4 GB RAM.

The SoC is equipped with USB 3.0 controllers for peripheral devices, along with energy-efficient SPI and I2C busses commonly used in mobile devices. Storage support comes in the form of eMMC flash and SD cards.

Power-Saving and Management

Aside from the shrink to 22nm, Intel® is employing a few of the same tricks in E3800 product family as it does in Intel® 4th Generation platform to increase battery life without unduly impacting performance. First up is Turbo Boost, which can increase the speed of both CPU and GPU cores as long as there is thermal (and power) headroom available. The idea behind this technology is that most common computing tasks are “bursty”—they require short bursts of activity followed by longer idle stretches. Turbo Boost is designed to get those short bursts out of the way more quickly so that the SoC can return to a low-power idle state more quickly. E3800 product family employs Turbo Boost in both its CPU and GPU cores,

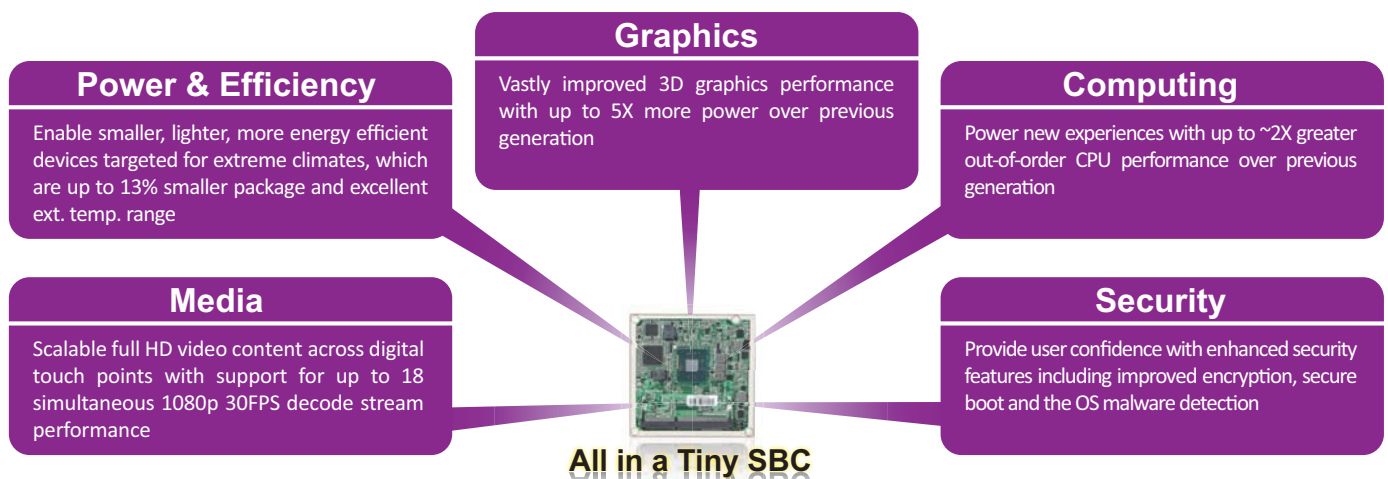
and the two different blocks will communicate to make sure they've achieved the best balance of CPU and GPU performance. That “active idle” feature from Clover Trail and Intel® 4th Generation Platform, which reduces the amount of time the computer needs to enter and exit these idle states, is also included in E3800 product family.

A useful power-saving feature is called Display Power Saving Technology (DPST) 6.0. The backlight of a screen saves the most power in laptops and tablets. DPST can save power by applying a clever combination of image processing and backlight adjusting, basically increasing the brightness of the incoming visuals and dimming the backlight.

The other feature highlighted is power gating, which shuts off unused parts of the SoC entirely and only keeps the parts of the chip awake that have to be. This is nothing new in CPUs, but the Intel-provided heat map of the E3800 product family SoC shows just how completely those parts of the chip can be turned off when they're not being used.

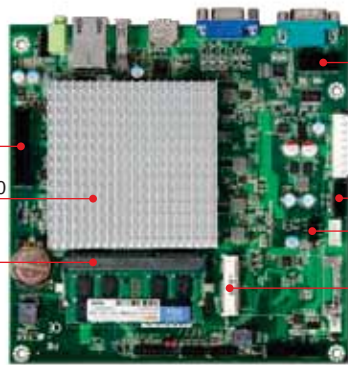
Extended Temperature

In the past, Intel® platform operates from 0°C to 90°C, or from 0°C to 100°C, as a standard range of temperature depending on the model of platform. E3800 product family is the first Intel CPU that supports extended range of temperature, operating from -40°C to +110°C, for harsh environment. It comes with 1, 2 or 4 CPU cores. Entry-level SKU has 1 CPU core, 1.46GHz clock rate, and TDP 5W. Mid-class SKU has 2 cores, 1.33 GHz - 1.75 GHz clock rate, and TDP 6W ~8W. High-end SKU has 4 cores, 1.91 GHz clock rate, and TDP 10W. Integrated memory controller on entry-level and mid-class SKUs will have only one channel, whereas high-end and premium SKUs will have two memory channels. They incorporate AES instructions and work with ECC memory.



WADE-8078

New Intel® Atom™ processor E3800 family based Mini-ITX board DDR3L SDRAM, VGA, eDP, HDMI, Gigabit Ethernet and 3Gbps SATA.



RS-232 port

PCIe x4 slot

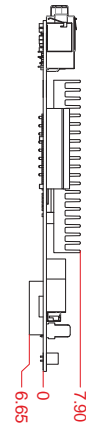
Intel® Atom™ processor E3800 family, 22nm process technology

SODIMM socket

SATA II port

Two USB port

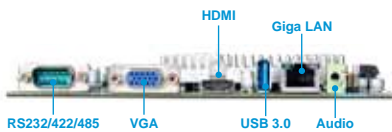
Mini-PCIe Slot



CFEX Slot

WADE-8078 is the first Portwell off-the-shelf Mini-ITX embedded board product based on the Intel® Atom™ processor E3800 product family with memory and PCI Express controller integrated to support one-channel DDR3L memory and PCI Express 2.0 lanes. Portwell has taken advantage of such technology to furnish a series of products that meets multiple industrial requirements for cost effectiveness, reliable performance and a high level of data integrity and uptime.

REAR I/O



FEATURES

- ④ Latest Intel® Atom embedded processor provides cost effective solutions with low power and quad core processor technology
- ④ Supports up to four PCI Express lanes, four x 1 lanes can be configured to one x 4 lane
- ④ Supports one DDR3L 1067MT/s SDRAM, UP to 8GB
- ④ Supports one USB 3.0 port

ORDERING GUIDE

AB1-3910	TBD
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PACKING LIST

One WADE-8078 Mini-ITX board
One Driver CD
One SATA cable



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44200 Christy Street,
Fremont, CA 94538, USA
Tel: +1-510-403-3399
Fax: +1-510-403-3184
E-mail: info@portwell.com
http://www.portwell.com

GENERAL

Processor	- Intel® Atom™ processor E3800 family, 22nm process technology - Cache up to 2MB (for Quad Core) - DPM (Defect Per Million devices) <50 - Support Intel® VT-x technology
BIOS	- Phoenix(EFI) BIOS
Memory	- Support up to 4GB DDR3L -ECC 1066/1333 SDRAM on one 204pin SO-DIMM
Storage Devices	- One SATA 2.0 - One CFEX(optional) - One Mini-PCIe(optional)
Watchdog Timer	- Programmable by embedded controller
Expansion Interface	- Supports PCIe x4 slot (with PCIe x2 Lanes)

I/O INTERFACE

Audio	- HDA controller integrated in SoC
Ethernet	- Onboard Intel I210AT
Serial Port	- Two series RX/TX supported from onboard EC (embedded controller)
USB	- 2 ports USB2.0 - 1 port USB3.0
Keyboard & Mouse	- KBC controller integrated in embedded controller
GPIO	- 8bit configurable controlled by embedded controller

DISPLAY

Graphic Controller	- Intel® HD Graphics 4600 supports DirectX*11, OCL 1.2, OGL 3.2 - Video decode hardware acceleration supports for H.264, MPEG2, MVC, VC-1, WMV9 and VP8 formats
Display Interface	- VGA: resolution up to 2560x1536@24bpp - HDMI: resolution up to 1920x1080@24bpp

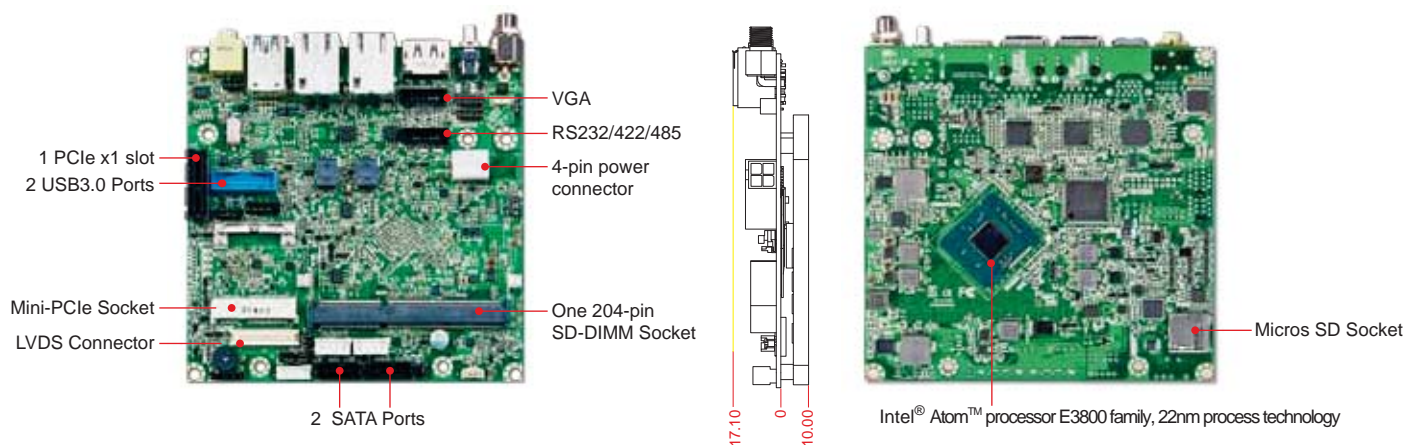
Mechanical & Environment

Dimension	- 170mm(L) x 170mm(W) x 1.6mm(H)
Power Supply	- ATX (support non-5V satdby)
Environment	- Operation temperature: 0~60°C - Storage temperature: -40~80°C - Relative humidity : 5~95%, non-condensing
MTBF	- Over 100000hrs at 55°C



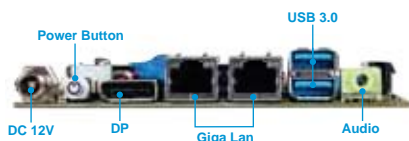
NANO-6060

Intel® Atom™ processor E3800 family based NANO-ITX board with dual display, Gigabit Ethernet, Audio, USB 3.0, micro SD and SATA



NANO-6060 build with Intel® Atom™ processor E3800 family that not only outputs under 10W for fan-less applications, but also supports a wide industrial temperature from -40°C to 85°C. With its superior up to Quad Core processing power and high capability. Portwell have taken advantage of such technology to furnish a series of products that can meet multiple industrial requirements such as fanless, cost-effective of CPU performance or compact systems..

REAR I/O



FEATURES

- ④ Intel® Atom™ processor E3800 family, 22nm process
- ④ One 204-pin SODIMM supports DDR3L up to 4GB
- ④ Multiple display by VGA, DP, dual channel 24 bit LVDS
- ④ Supports two SATA 2.0 ports, one micro SD socket, and four USB 3.0 ports
- ④ One Mini-PCIe socket and PCIe x1 slot for expansion
- ④ Supports DC 12V input

ORDERING GUIDE

AB1-3910

TBD

PACKING LIST

One NANO-6060 NANO-ITX Main Board

One passive Heatsink

One Installation CD



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Fremont, CA 94538, USA
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Fax: +1-510-403-3184
E-mail: info@portwell.com
http://www.portwell.com

GENERAL

Processor	- Intel® Atom™ processor E3800 family, 22nm process technology - Cache up to 2MB (for Quad Core) - DPM (Defect Per Million devices) <50 - Support Intel® VT-x technology
BIOS	- Phoenix EFI BIOS
Memory	- Support up to 4GB DDR3L 1066/1333 SDRAM on one 204pin SO-DIMM
Storage Devices	- Two SATA 2.0 - One Micro-SD socket
Watchdog Timer	- Programmable by embedded controller
Hardware Monitoring	- Temperature (CPU & System) - Voltage (CPU Vcore, 12V, 5V, 3.3V, 1.35V)
Expansion Interface	- 1x PCI Expressx1 slot - 1x Mini-PCIe slot

I/O INTERFACE

Audio	- HAD controller integrated in Intel® SoC - Realtek ALC892 HDA codec, 7.1+2 channels Audio Jack on rear I/O with Line-out and on board pin header with Line-in, Line-out and Mic-in
Ethernet	- Dual Intel® I210IT Gigabit Ethernet controller - 2x RJ45 connectors on rear I/O
Serial Port	- 1x RS232/422/485 on board connector (selected by bios)
USB	- 2x USB 3.0 ports on rear I/O - 2x USB 2.0 and 2x USB 3.0 ports on board with pitch 2.0 header
GPIO	- 8bit configurable controlled by embedded controller

DISPLAY

Graphic Controller	- Intel® HD Graphics 4600 supports DirectX*11, OCL 1.2, OGL 3.2 - Video decode hardware acceleration supports for H.264, MPEG2, MVC, VC-1, WMV9 and VP8 formats
Display Interface	- LVDS: Dual channel 24bit LVDS on board connector, resolution up to 1920x1200 @60Hz - CRT: One on-board DB-15 connector, resolution up to 1920x1200 (WUXGA) - DP: One DP port on rear I/O, resolution up to 2560x1600

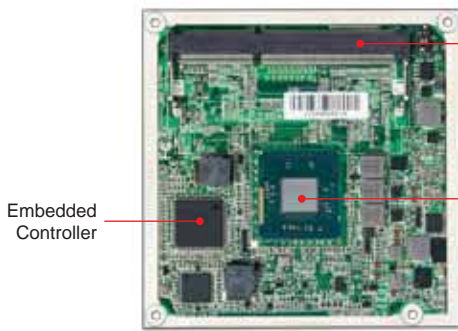
Mechanical & Environment

Dimension	- 120(L) x 120(W)mm; 4.72"(L) x 4.72"(W)
Power Supply	- DC 12V input (support AT mode)
Environment	- Operation temperature: -40~80°C - Storage temperature: -40~80°C - Relative humidity : 5~95%, non-condensing
MTBF	- Over 100,000hrs at 40°C



PCOM-B632VG

New Intel® Mobile platform based Type VI COM Express module with DDR3L SDRAM, VGA, eDP, HDMI, Gigabit Ethernet and 3Gbps SATA



DDR3L SDRAM Socket
1066/1333 MHz

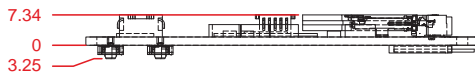
Embedded
Controller

Intel® Atom™ processor E3800
family, 22nm process technology



Board-to-Board
interconnecting

PCOM-B632VG is designed to offer good EMC protection by Intel® Atom™ processor E3800 family (codenamed Bay Trail), SoC (System-On-Chip) integrated embedded controller. Also, PCOM-B632VG provides higher performance for various display, eDP and HDMI. The fast PCI-Express interfaces and DDR3L memory capacity also support PCOM-B632VG to support enhance performance than before.



GENERAL

Processor	<ul style="list-style-type: none"> - Intel® Atom™ processor E3800 family, 22nm process technology - Cache up to 2MB (for Quad Core) - DPM (Defect Per Million devices) <50 - Support Intel® VT-x technology
BIOS	- Phoenix BIOS
Memory	- Support up to 8GB DDR3L 1066/1333 SDRAM on one 204pin SO-DIMM
Storage Devices	<ul style="list-style-type: none"> - Two SATA 2.0 - One Micro-SD slot
Watchdog Timer	- Programmable by embedded controller
Expansion Interface	- Supports up to four PCI Express lanes, four x 1 lanes can be configured to one x 4 lane (default 3x PCI-Express lanes)

FEATURES

- ④ Latest Intel® Atom embedded processor provides cost effective solutions with low power and quad core processor technology
- ④ Supports up to four PCI Express lanes, four x 1 lanes can be configured to one x 4 lane
- ④ Supports one DDR3L 1067MT/s SDRAM, UP to 8GB
- ④ Supports one USB3.0 port

I/O INTERFACE

Audio	- HDA controller integrated in SoC
Ethernet	- Onboard Intel I210IT
Serial Port	- Two series RX/TX supported from onboard EC (embedded controller)
USB	<ul style="list-style-type: none"> - 6 ports USB2.0 - 1 port USB3.0
Keyboard & Mouse	- KBC controller integrated in embedded controller
GPIO	- 8bit configurable controlled by embedded controller

ORDERING GUIDE

AB1-3A33	TBD
AB1-3A34	TBD
AB1-3A35	TBD
AB1-3A36	TBD

DISPLAY

Graphic Controller	- Graphic Controller
Display Interface	<ul style="list-style-type: none"> - VGA: resolution up to 2560x1536@24bpp - eDP: resolution up to 2560x1600@24bpp - Display Port: resolution up to 1080p

PACKING LIST

One PCOM-B632VG COM-Express module
One Driver CD



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44200 Christy Street,
Fremont, CA 94538, USA
Tel: +1-510-403-3399
Fax: +1-510-403-3184
E-mail: info@portwell.com
http://www.portwell.com

Mechanical & Environment

Dimension	- 95mm(L) x 95mm(W) x 2.0mm(H)
Power Supply	- DC 6V~16.8V
Environment	<ul style="list-style-type: none"> - Operation temperature: -40~80°C - Storage temperature: -40~80°C - Relative humidity : 5~95%, non-condensing
MTBF	- Over 180000hrs at 55°C





CAD-0225

Intel® Atom™ processor E3800 family and Intel® Celeron J1900 based
Desktop Network Security Appliance



FEATURE

- Intel® Atom™ processor E3800 family and Intel® Celeron® processor J1900
- Up to 8GB DDR3L SO-DIMM
- 4 x Intel I211 GbE ports
- 1 x SATA
- RJ-45 type console and two USB ports
- Rack mount option available

Low power desktop network security appliance, based on Intel® Atom™ processor E3800 family and Intel® Celeron® processor up to 8 GB DDR3L/DDR3L (ECC optional) memory, one HDD space. Ideal platform for Virtualization Application, Firewall and WAN.



SPECIFICATION

CPU Board	- Intel® Atom™ processor E3800 family - Intel® Celeron® processor J1900*
System Memory	- DDR3L 1333MHz SO-DIMM up to 8GB
Ethernet Port	- 4 x PCIe GbE RJ45
Storage Device	- One 2.5" HDD
Serial Port	- One front access RJ45 for system console
LEDS	- Power State, Storage Status, Ethernet Status, Ethernet Speed
USB	- Dual USB2.0, front access
Power	- 40W 12V power adapter
Dimension	- W:180mm x D:150mm x H: 42mm
Operating Environment	- Temperature: 0 to 40°C (32 to 104°F) - Humidity 20% to 90%RH @ 55°C
Storage Environment	- Temperature: -10 to 70°C (14 to 158°F) - Humidity 5% to 95%RH @ 55°C
Certification	- CE/FCC

ORDERING GUIDE

Model No.	CAD-0225
Ethernet	4 GbE RJ45 ports





* CAD-0225 with Intel® Celeron® processor J1900 will not be available until after 12/1/2013



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<http://www.portwell.com>

Reference Table

Model	Dimension	Form Factor	Key Feature	Target Application
 WADE-8078	170(L) x 170(W)mm	MINI-ITX	<ul style="list-style-type: none"> Latest Intel® Atom embedded processor provides cost effective solutions with low power and quad core processor technology Supports PCIe x4 slot (with PCIe x2 Lanes) Supports one DDR3L ECC 1066/1333MT/s SDRAM, UP to 4GB Supports one USB3.0 port 	- KIOSK - Digital Signage
 NANO-6060	120(L) x 120(W)mm	NANO-ITX	<ul style="list-style-type: none"> Intel® Valleyview-I SoC based platform One 204-pin SODIMM supports DDR3L up to 4GB Multiple display by VGA, DP, dual channel 24 bit LVDS Supports two SATA 2.0 ports, one micro SD socket, and four USB 3.0 ports One Mini-PCIe socket and PCIe x1 slot for expansion Supports DC 12V input 	- Automation
 PCOM-B632	170(L) x 170(W)mm	COM Express	<ul style="list-style-type: none"> Latest Intel® Atom embedded processor provides cost effective solutions with low power and quad core processor technology Supports up to four PCI Express lanes, four x 1 lanes can be configured to one x 4 lane Supports one DDR3L 1067MT/s SDRAM, UP to 8GB Supports one USB3.0 port 	- Military - Medical - Portable device
 CAD-0225	180(W) x 150(D) x 42(H)mm	desktop	<ul style="list-style-type: none"> Intel® Celeron® Processor (codename Bay Trail) 4 x PCI-Ex1 from CPU directly use Intel® I211-AT Support DDR3L-1333 low voltage memory 	- Communication

The Bay Trail Lineup

Bay Trail Family	CPU Core/CPU Freq	TDP	Junction Temp	Sku name	ISG RM
Bay Trail-D	QC 2.00 GHz	10W	0°C~ 100°C	Celeron J1900	Yes
Bay Trail-M	QC 1.60 GHz	7.5W	0°C~ 100°C	Celeron N2920	Yes
Bay Trail-I	QC 1.91 GHz	10W	-40°C ~ 110°C	Atom E3845	Yes
Bay Trail-I	DC 1.75 GHz	8W	-40°C ~ 110°C	Atom E3827	Yes
Bay Trail-I	DC 1.46 GHz	7W	-40°C ~ 110°C	Atom E3826	Yes
Bay Trail-I	DC 1.33 GHz	6W	-40°C ~ 110°C	Atom E3825	Yes
Bay Trail-I	SC 1.46 GHz	5W	-40°C ~ 110°C	Atom E3815	Yes

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