

## Embedded SBCs

4" • 3.5"  
Full Size PICMG 1.3

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**DFI**<sup>®</sup>

Revision Control • Long Product Life Cycle



# 4" • 3.5" Embedded SBCs

# 4" • 3.5" Embedded SBCs

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AMD G-Series



AMD G-Series



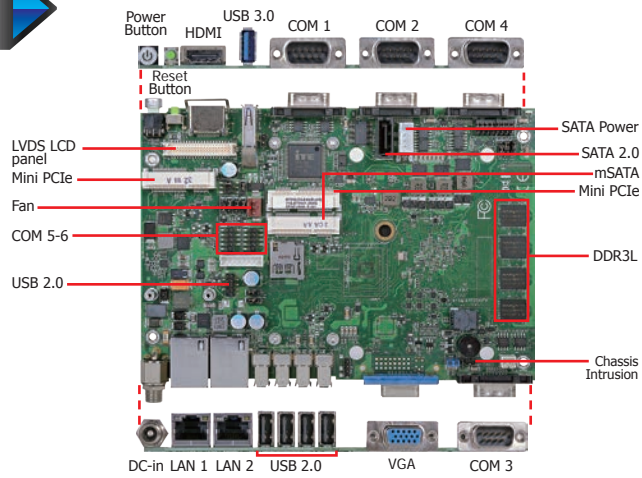
Processor		Intel® Atom™ E3800 Series	4th Generation Intel® Core™ i7/i5/i3			Intel® Atom™ D2550/N2800/N2600	Intel® Atom™ D2550/N2800/N2600	AMD® G-Series	
Model		BT253	HU551 Series	HU553 Series		CD952 Series	CD951-C Series	OT951-DT56N	OT951-DT40N
Chipset		N/A	N/A			Intel® NM10	Intel® NM10	AMD® A50M	
Memory		2GB/4GB DDR3L ECC onboard	1 DDR3L SODIMM up to 8GB			2GB DDR3 onboard	2 DDR3 SODIMM up to 4GB (-C2550/-C2800) 1 DDR3 SODIMM up to 2GB (-C2600)	1 DDR3 SODIMM up to 8GB	
Display		VGA, LVDS, HDMI	LVDS, DP or HDMI			DVI-I or VGA and micro HDMI	VGA, LVDS	HDMI, VGA, LVDS	
Ethernet		2 Intel	2 Intel			2 Intel	2 Intel	2 Realtek	
USB	USB 3.0	N/A	4			N/A	N/A	N/A	
	USB 2.0	5	2			4 Front	2 Rear, 4 by pin header	2 Rear, 2 by pin header	
Serial	RS232/422/485	4	1 (RS485)			2 Front	1 by pin header	2 by pin header	
	RS232	2	2			N/A	1 Rear, 4 by pin header	N/A	
Storage	SATA 3.0	N/A	2			N/A	N/A	1	
	SATA 2.0	1	N/A			N/A	1	N/A	
	RAID	N/A	N/A			N/A	N/A	N/A	
	IDE, FDD	N/A	N/A			N/A	N/A	N/A	
	CFast	N/A	N/A			1	N/A	N/A	
	CF	N/A	N/A			N/A	1	1	
Expansion	PCIe x16	N/A	N/A			N/A	N/A	N/A	
	PCIe x4	N/A	N/A			N/A	N/A	N/A	
	PCIe x1	N/A	N/A			N/A	N/A	M/A	
	Mini PCIe	3	2			3	1	1	
	Mini PCI	N/A	N/A			N/A	N/A	N/A	
Digital I/O		N/A	8-bit			8-bit or isolated 4-bit	8-bit	8-bit	
Audio	Controller	HDA	HDA			HDA	HDA	HDA	
	Interfaces	Mic-in	Front Audio			Line-out and Mic-in	Front Audio	Front Audio	
AMT		N/A	Yes			N/A	N/A	N/A	
TPM (optional)		Yes	Yes			N/A	N/A	Yes	
Watchdog		Yes	Yes			Yes	Yes	Yes	
Power Input		9~36V DC-in	12V DC-in/4-pin power	19~24V DC-in/ 4-pin power		9~24V DC-in	12V DC-in/4-pin power	12V DC-in/4-pin power	
Dimensions		165mm x 136.5mm	146mm x 102mm			146mm x 102mm	146mm x 102mm	146mm x 102mm	

3.5" Embedded SBC

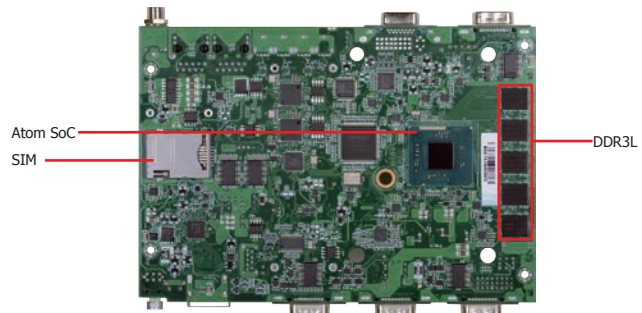


# BT253

Atom



Top View



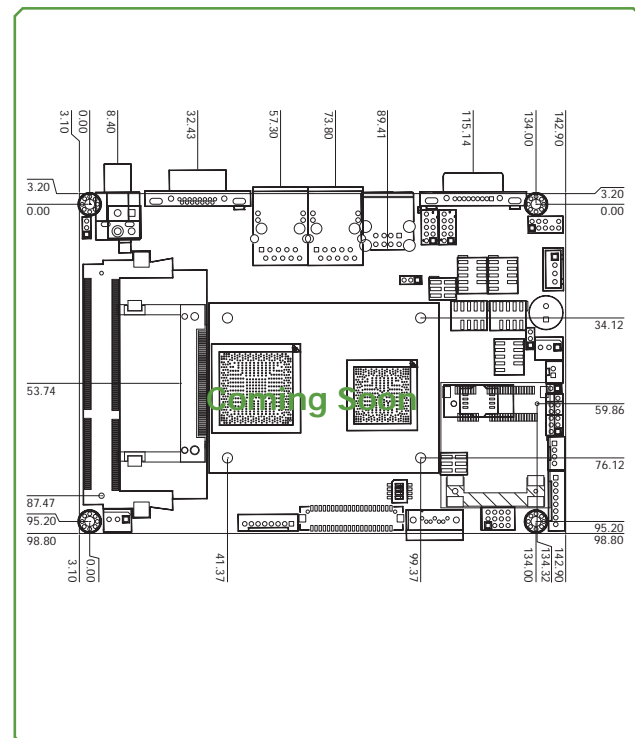
Bottom View

## Features

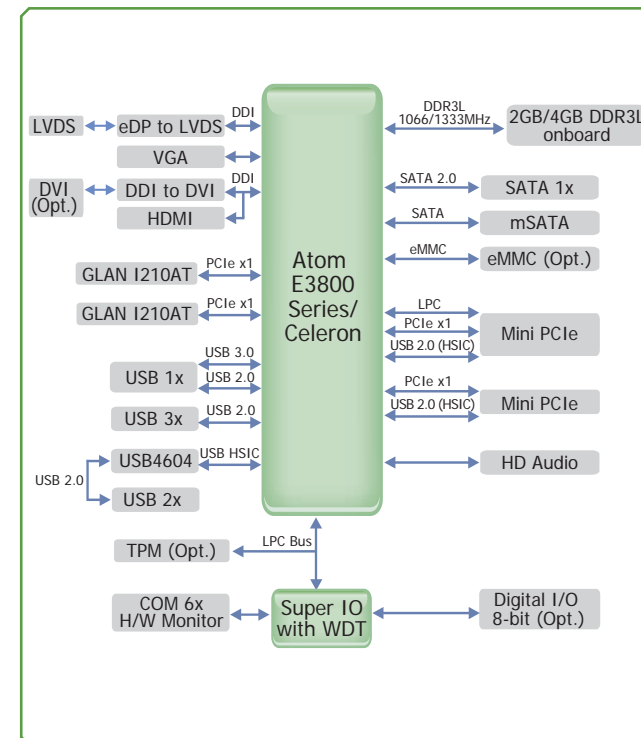
MEMORY	2GB/4GB DDR3L ECC onboard
EXPANSION	3 Mini PCIe 1 SIM
DISPLAY OUTPUTS	1 VGA, 1 LVDS, 1 HDMI
LAN	2 LAN
COM	6 COM
USB	6 USB: 1 USB 3.0, 5 USB 2.0
STORAGE	1 SATA 2.0 4GB/8GB/16GB eMMC onboard (optional)
DIMENSIONS	165mm x 136.5mm (6.49" x 5.37")



## Mechanical Drawing



## Block Diagram



## Specifications

### PROCESSOR

- Intel® Atom™/Intel® Celeron® processors
- BGA 1170 packaging technology
- 22nm process technology
- Please refer to the Ordering Information below

### SYSTEM MEMORY

- 2GB/4GB DDR3L ECC onboard
- Supports DDR3L 1333MHz (-E45/-E27/-J00/-N30/-N07)
- Supports DDR3L 1066MHz (-E26/-E25/-E15)
- Supports single channel memory interface

### EXPANSION SLOTS

- 3 Mini PCIe slots
  - 1 full size supports USB, PCIe and 3G signals
  - 1 full size supports mSATA
  - 1 half size supports USB, PCIe and LPC signals
- 1 SIM socket
- 1 microSD socket (optional)

### ONBOARD GRAPHICS FEATURES

- Intel® HD Graphics
- Display ports: 1 LVDS, 1 HDMI, 1 VGA (default); or 1 LVDS, 1 DVI-I
- VGA, DVI-I: 24-bit, resolution up to 2560x1600 @ 60Hz
- LVDS: NXP PTN3460, 24-bit, dual channel, resolution up to 1920x1200 @ 60Hz
- HDMI: resolution up to 2560x1600 @ 24Hz
- Supports hardware acceleration for DirectX 11, OCL 1.2, OGL 3.2, H.264, MPEG2, MVC, VC-1, WMV9 and VP8

### ONBOARD AUDIO FEATURES

- Realtek ALC888 5.1-channel High Definition Audio

### ONBOARD LAN FEATURES

- 2 Intel® I210 PCI Express Gigabit Ethernet controllers
- Integrated 10/100/1000 transceiver
- Fully compliant with IEEE 802.3, IEEE 802.3u, IEEE 802.3ab

### SERIAL ATA INTERFACE

- 1 SATA 2.0 port with data transfer rate up to 3Gb/s
  - SATA port 0 provides adequate space for SATA DOM
- Supports 4GB, 8GB and 16GB eMMC onboard (optional)
- Integrated Advanced Host Controller Interface (AHCI) controller

### TRUSTED PLATFORM MODULE (TPM)\*

- Provides a Trusted PC for secure transactions
- Provides software license protection, enforcement and password protection

### FRONT PANEL I/O PORTS

- 1 power button
- 1 reset button
- 3 DB-9 serial ports
  - supports RS232/422/485
  - One of the ports supports an optional 8-bit DIO
- 1 USB 3.0 port
- 1 HDMI port

## Ordering Information

Model Name	Memory	eMMC	Processors
BT253	- C	2	0
	2: 2GB 4: 4GB	0: None 4: 4GB 8: 8GB 1: 16GB	E45
			E45: Intel® Atom™ E3845, Quad Core, 2M Cache, 1.91GHz, 10W E27: Intel® Atom™ E3827, Dual Core, 1M Cache, 1.75GHz, 8W E26: Intel® Atom™ E3826, Dual Core, 1M Cache, 1.46GHz, 7W E25: Intel® Atom™ E3825, Dual Core, 1M Cache, 1.33GHz, 6W E15: Intel® Atom™ E3815, Single Core, 0.5M Cache, 1.46GHz, 5W J00: Intel® Celeron® J1900, Quad Core, 2M Cache, up to 2.42GHz, 10W N30: Intel® Celeron® N2930, Quad Core, 2M Cache, up to 2.16GHz, 7.5W N07: Intel® Celeron® N2807, Dual Core, 1M Cache, up to 2.16GHz, 4.3W

## Packing List

- 1 BT253 board
- 1 Serial ATA data with power cable
- 1 I/O shield
- 1 DVD
- 1 QR (Quick Reference)

# BT253

### REAR PANEL I/O PORTS

- 1 9~36V DC-in jack
- 1 DB-9 serial port
  - supports RS232/422/485
- 1 VGA port; or 1 DVI-I port\*
- 2 RJ45 LAN ports
- 4 USB 2.0 ports (default); or  
3 USB 2.0 ports and 1 line-out jack\*

### I/O CONNECTORS

- 1 connector for 1 external USB 2.0 port
- 2 connectors for 2 external RS232 serial ports (2.0mm pitch)
- 1 LVDS LCD panel with power connector
- 1 mic-in connector
- 1 Serial ATA connector
- 1 Serial ATA power connector
- 1 chassis intrusion connector
- 1 fan connector

### BIOS

- AMI BIOS
- 64Mbit SPI BIOS

### WATCHDOG TIMER

- Watchdog timeout programmable via software from 1 to 255 seconds

### ENERGY EFFICIENT DESIGN\*

- Supports ErP Lot6 power saving\*
- Supports ACPI
- System Power Management
- Wake-On-Events include:
  - Wake-On-USB KB/Mouse\*
  - Wake-On-LAN
  - RTC timer to power-on the system
- AC power failure recovery

### DAMAGE FREE INTELLIGENCE

- Monitors CPU/system temperature and overheat alarm
- Monitors VCORE/12V/5V/DDR voltages and failure alarm
- Monitors CPU/system fan speed and failure alarm
- Read back capability that displays temperature, voltage and fan speed

### POWER CONSUMPTION

- TBD

### OS SUPPORT

- Windows 7 Ultimate x64 & SP1 (64-bit)
- Windows 8 Enterprise x86 (32-bit)
- Windows 8 Enterprise x64 (64-bit)
- Windows 8.1 Enterprise x86 (32-bit)
- Windows 8.1 Enterprise x64 (64-bit)

### TEMPERATURE

- Operating: 0°C to 60°C, -20°C to 70°C (TBD), -40°C to 85°C (TBD)
- Storage: -20°C to 85°C

### HUMIDITY

- 10% to 90%

### DIMENSIONS

- 4" board
- 165mm (6.49") x 136.5mm (5.37")

\*Optional and is not supported in standard model. Please contact your sales representative for more information.

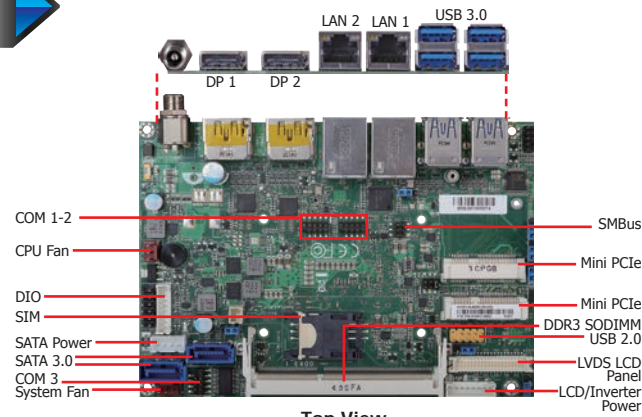
## Optional Items

- USB port cable
- Serial ATA data with power cable
- Power adapter (120W, 19V) : 671-112004-100G

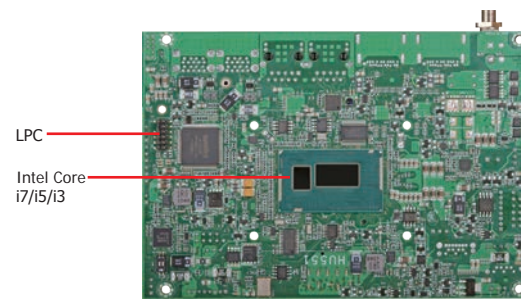
# HU551

# HU551

ULT



Top View



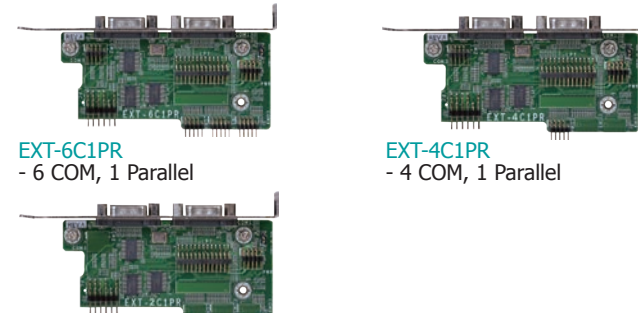
Bottom View

## Features

MEMORY	1 DDR3L SODIMM up to 8GB
EXPANSION	2 Mini PCIe 1 SIM
DISPLAY OUTPUTS	1 LVDS, 2 DP or 2 HDMI
LAN	2 LAN
COM	3 COM
USB	6 USB: 4 USB 3.0, 2 USB 2.0
STORAGE	2 SATA 3.0
DIO	8-bit DIO
DIMENSIONS	146mm x 102mm (5.75" x 4.02")



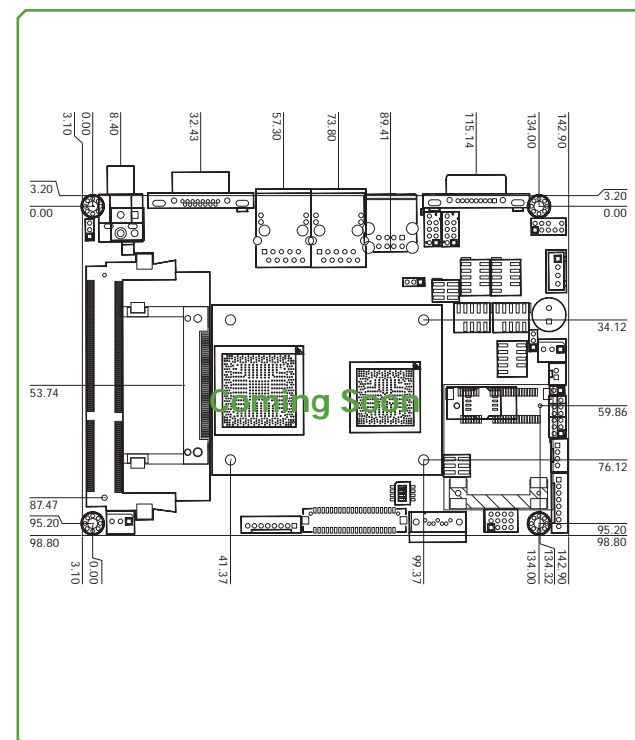
### 3 Modules for Additional COM/Parallel Ports (via the LPC connector)



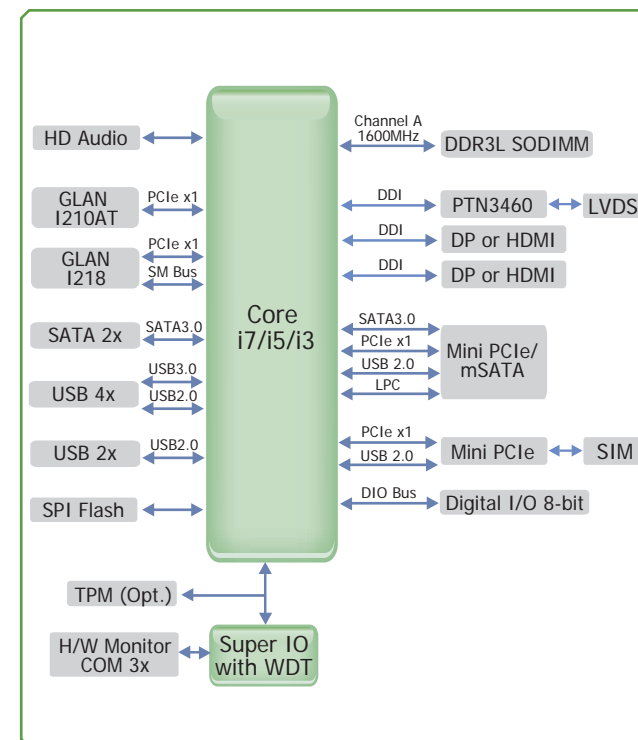
EXT-2C1PR  
- 2 COM, 1 Parallel

Note: To support the additional COM/Parallel ports, please contact your sales representative for the LPC module and its BIOS.

## Mechanical Drawing



## Block Diagram



## Specifications

### PROCESSOR

- 4th generation Intel® Core™ processors
- BGA 1168 packaging technology
- 22nm process technology
- Please refer to the Ordering Information below

### SYSTEM MEMORY

- One 204-pin SODIMM socket
- Supports DDR3L 1600MHz
- Supports up to 8GB system memory
- Supports single channel memory interface
- DRAM device technologies: 1Gb, 2Gb and 4Gb DDR3L DRAM technologies are supported for x8 and x16 devices, unbuffered, non-ECC

### EXPANSION SLOTS

- 2 Mini PCIe slots
  - 1 full size supports USB, PCIe, mSATA and LPC signals
  - 1 half size supports USB, PCIe and 3G signals
- 1 SIM card socket

### ONBOARD GRAPHICS FEATURES

- Intel® HD Graphics GT series
- Display ports: 1 LVDS, 2 DP (default) or 2 HDMI\*
- LVDS: NXP PTN3460, 48-bit, dual channel, resolution up to 1920x1200 @ 60Hz
- DP: resolution up to 3200 x 2000 @ 60Hz
- HDMI: resolution up to 4096x2304 @ 24Hz or 2560x1600 @ 60Hz
- Intel® Clear Video Technology
- Intel® Advanced Vector Extensions 2.0 (Intel® AVX 2.0) Instructions
- Supports DirectX 11.1, OpenGL 4.0, OpenCL 1.2

### ONBOARD AUDIO FEATURES

- Realtek ALC888 5.1-channel High Definition Audio

### ONBOARD LAN FEATURES

- Intel® I210 PCI Express Gigabit Ethernet controller
- Intel® I218 with iAMT9.5 Gigabit Ethernet Phy
- Integrated 10/100/1000 transceiver
- Fully compliant with IEEE 802.3, IEEE 802.3u, IEEE 802.3ab

### SERIAL ATA INTERFACE

- 2 SATA 3.0 ports with data transfer rate up to 6Gb/s
  - SATA port 0 provides adequate space for SATA DOM
- Integrated Advanced Host Controller Interface (AHCI) controller
- Supports RAID 0/1
- Supports Intel® Smart Response Technology

### INTEL ACTIVE MANAGEMENT TECHNOLOGY (AMT)

- Supports iAMT9.5
- Out-of-band system access
- Remote troubleshooting and recovery
- Hardware-based agent presence checking
- Proactive alerting
- Remote hardware and software asset tracking

### TRUSTED PLATFORM MODULE (TPM)\*

- Provides a Trusted PC for secure transactions
- Provides software license protection, enforcement and password protection

### REAR PANEL I/O PORTS

- 1 12V DC-in jack (default) or 4-pin power connector\*
- 2 DP (default) or 2 HDMI ports\*
- 2 RJ45 LAN ports
- 4 USB 3.0 ports

## Ordering Information

Model Name	Processors	
HU551	-	N
	4650U	
	4650U: Intel® Core™ i7-4650U, 4M Cache, up to 3.3 GHz, 15W	
	4300U: Intel® Core™ i5-4300U, 3M Cache, up to 2.9 GHz, 15W	
	4010U: Intel® Core™ i3-4010U, 3M Cache, 1.7 GHz, 15W	
	2980U: Intel® Celeron® 2980U, 2M Cache, 1.6 GHz, 15W	

## Packing List

- 1 HU551 board
- 1 Serial ATA data with power cable
- 1 Serial ATA power Y cable
- 1 DVD
- 1 QR (Quick Reference)

### I/O CONNECTORS

- 1 connector for 2 external USB 2.0 ports
- 3 connectors for 3 external serial ports (2.0mm pitch)
  - 1 RS485
  - 2 RS232
- 1 LVDS LCD panel connector
- 1 LCD/inverter power connector
- 1 8-bit Digital I/O and/or power connector
- 1 front audio connector for line-out and mic-in jacks
- 1 LPC connector
- 1 SMBus connector
- 2 Serial ATA connectors
- 1 Serial ATA power connector
- 1 front panel connector
- 1 chassis intrusion connector
- 2 fan connectors

### BIOS

- AMI BIOS
- 64Mbit SPI BIOS

### WATCHDOG TIMER

- Watchdog timeout programmable via software from 1 to 255 seconds

### ENERGY EFFICIENT DESIGN

- Supports ErP Lot6 power saving\*
- Supports ACPI
- System Power Management
- Wake-On-Events include:
  - Wake-On-USB KB/Mouse
  - Wake-On-LAN
  - RTC timer to power-on the system
- AC power failure recovery

### DAMAGE FREE INTELLIGENCE

- Monitors CPU/system temperature and overheat alarm
- Monitors VCore/12V/5V/DDR voltages and failure alarm
- Monitors CPU/system fan speed and failure alarm
- Read back capability that displays temperature, voltage and fan speed

### POWER CONSUMPTION

- TBD

### OS SUPPORT

- Windows 7 Ultimate x86 & SP1 (32-bit)
- Windows 7 Ultimate x64 & SP1 (64-bit)
- Windows 8 Enterprise x86 (32-bit)
- Windows 8 Enterprise x64 (64-bit)

### TEMPERATURE

- Operating: 0°C to 60°C
- Storage: -20°C to 85°C

### HUMIDITY

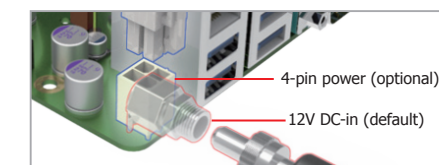
- 10% to 90%

### DIMENSIONS

- 3.5" board
- 146mm (5.75") x 102mm (4.02")

\*Optional and is not supported in standard model. Please contact your sales representative for more information.

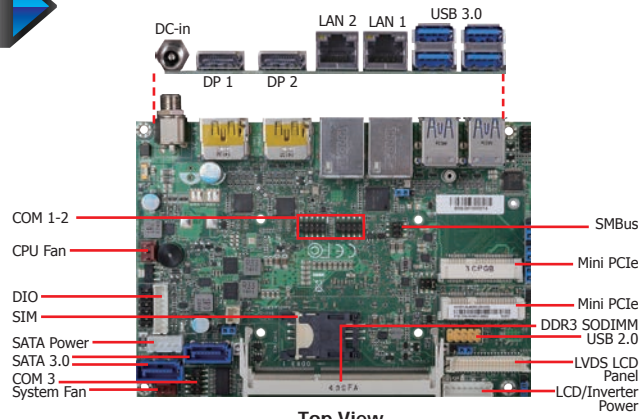
## Power Connector



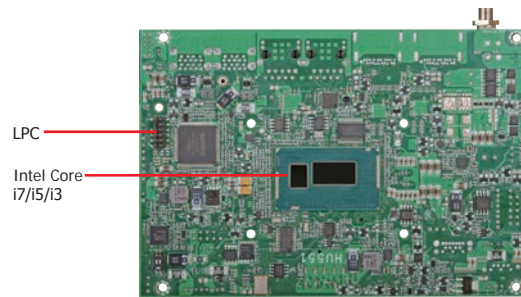
## Optional Items

- USB port cable
- Serial ATA data with power cable
- 1 LPC module kit (COM/Parallel extension module)
- Power adapter (100W, 12V) : 671-110001-100G





Top View



Bottom View

## Features

MEMORY	1 DDR3L SODIMM up to 8GB
EXPANSION	2 Mini PCIe 1 SIM
DISPLAY OUTPUTS	1 LVDS, 2 DP or 2 HDMI
LAN	2 LAN
COM	3 COM
USB	6 USB: 4 USB 3.0, 2 USB 2.0
STORAGE	2 SATA 3.0
DIO	8-bit DIO
DIMENSIONS	146mm x 102mm (5.75" x 4.02")



### 3 Modules for Additional COM/Parallel Ports (via the LPC connector)



EXT-6C1PR  
- 6 COM, 1 Parallel



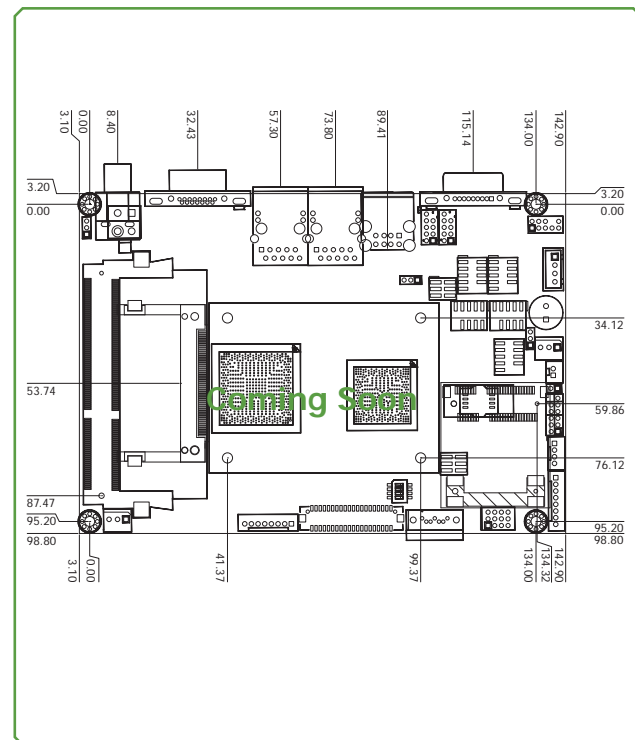
EXT-4C1PR  
- 4 COM, 1 Parallel



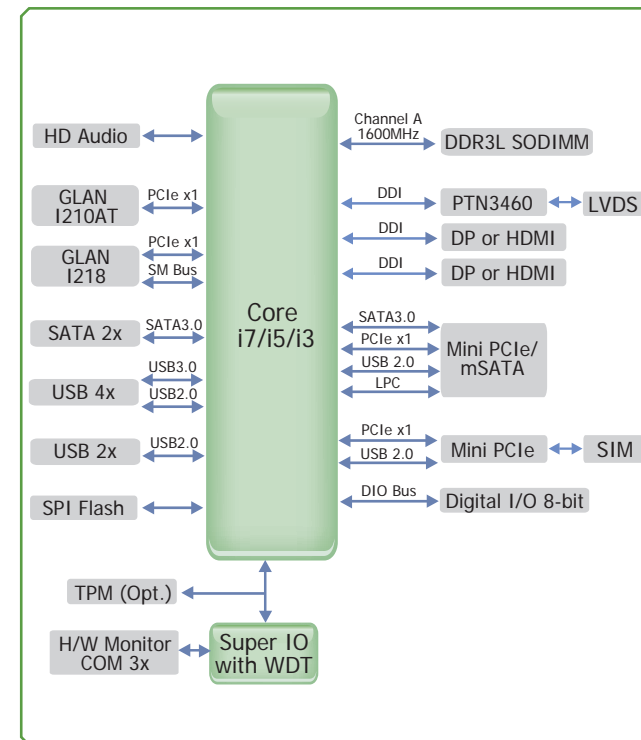
EXT-2C1PR  
- 2 COM, 1 Parallel

Note: To support the additional COM/Parallel ports, please contact your sales representative for the LPC module and its BIOS.

## Mechanical Drawing



## Block Diagram



## Specifications

### PROCESSOR

- 4th generation Intel® Core™ processors
- BGA 1168 packaging technology
- 22nm process technology
- Please refer to the Ordering Information below

### SYSTEM MEMORY

- One 204-pin SODIMM socket
- Supports DDR3L 1600MHz
- Supports up to 8GB system memory
- Supports single channel memory interface
- DRAM device technologies: 1Gb, 2Gb and 4Gb DDR3L DRAM technologies are supported for x8 and x16 devices, unbuffered, non-ECC

### EXPANSION SLOTS

- 2 Mini PCIe slots
  - 1 full size supports USB, PCIe, mSATA and LPC signals
  - 1 half size supports USB, PCIe and 3G signals
- 1 SIM card socket

### ONBOARD GRAPHICS FEATURES

- Intel® HD Graphics GT series
- Display ports: 1 LVDS, 2 DP (default) or 2 HDMI\*
- LVDS: NXP PTN3460, 48-bit, dual channel, resolution up to 1920x1200 @ 60Hz
- DP: resolution up to 3200 x 2000 @ 60Hz
- HDMI: resolution up to 4096x2304 @ 24Hz or 2560x1600 @ 60Hz
- Intel® Clear Video Technology
- Intel® Advanced Vector Extensions 2.0 (Intel® AVX 2.0) Instructions
- Supports DirectX 11.1, OpenGL 4.0, OpenCL 1.2

### ONBOARD AUDIO FEATURES

- Realtek ALC888 5.1-channel High Definition Audio

### ONBOARD LAN FEATURES

- Intel® I210 PCI Express Gigabit Ethernet controller
- Intel® I218 with iAMT9.5 Gigabit Ethernet Phy
- Integrated 10/100/1000 transceiver
- Fully compliant with IEEE 802.3, IEEE 802.3u, IEEE 802.3ab

### SERIAL ATA INTERFACE

- 2 SATA 3.0 ports with data transfer rate up to 6Gb/s
  - SATA port 0 provides adequate space for SATA DOM
- Integrated Advanced Host Controller Interface (AHCI) controller
- Supports RAID 0/1
- Supports Intel® Smart Response Technology

### INTEL ACTIVE MANAGEMENT TECHNOLOGY (AMT)

- Supports iAMT9.5
- Out-of-band system access
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- Hardware-based agent presence checking
- Proactive alerting
- Remote hardware and software asset tracking

### TRUSTED PLATFORM MODULE (TPM)\*

- Provides a Trusted PC for secure transactions
- Provides software license protection, enforcement and password protection

### REAR PANEL I/O PORTS

- 1 19~24V DC-in jack (default) or 4-pin power connector\*
- 2 DP (default) or 2 HDMI ports\*
- 2 RJ45 LAN ports
- 4 USB 3.0 ports

## Ordering Information

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	2980U: Intel® Celeron® 2980U, 2M Cache, 1.6 GHz, 15W	

## Packing List

- 1 HU553 board
- 1 Serial ATA data with power cable
- 1 Serial ATA power Y cable
- 1 DVD
- 1 QR (Quick Reference)

### I/O CONNECTORS

- 1 connector for 2 external USB 2.0 ports
- 3 connectors for 3 external serial ports (2.0mm pitch)
  - 1 RS485
  - 2 RS232
- 1 LVDS LCD panel connector
- 1 LCD/inverter power connector
- 1 8-bit Digital I/O and/or power connector
- 1 front audio connector for line-out and mic-in jacks
- 1 LPC connector
- 1 SMBus connector
- 2 Serial ATA connectors
- 1 Serial ATA power connector
- 1 front panel connector
- 1 chassis intrusion connector
- 2 fan connectors

### BIOS

- AMI BIOS
- 64Mbit SPI BIOS

### WATCHDOG TIMER

- Watchdog timeout programmable via software from 1 to 255 seconds

### ENERGY EFFICIENT DESIGN

- Supports ErP Lot6 power saving\*
- Supports ACPI
- System Power Management
- Wake-On-Events include:
  - Wake-On-USB KB/Mouse
  - Wake-On-LAN
  - RTC timer to power-on the system
- AC power failure recovery

### DAMAGE FREE INTELLIGENCE

- Monitors CPU/system temperature and overheat alarm
- Monitors VCore/12V/5V/DDR voltages and failure alarm
- Monitors CPU/system fan speed and failure alarm
- Read back capability that displays temperature, voltage and fan speed

### POWER CONSUMPTION

- TBD

### OS SUPPORT

- Windows 7 Ultimate x86 & SP1 (32-bit)
- Windows 7 Ultimate x64 & SP1 (64-bit)
- Windows 8 Enterprise x86 (32-bit)
- Windows 8 Enterprise x64 (64-bit)

### TEMPERATURE

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- Storage: -20°C to 85°C

### HUMIDITY

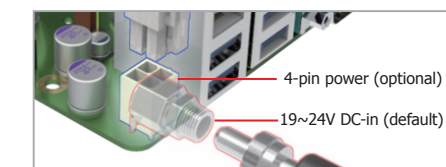
- 10% to 90%

### DIMENSIONS

- 3.5" board
- 146mm (5.75") x 102mm (4.02")

\*Optional and is not supported in standard model. Please contact your sales representative for more information.

## Power Connector



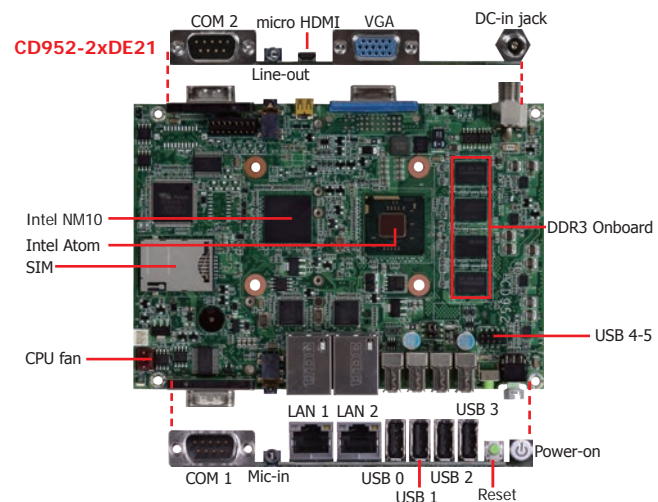
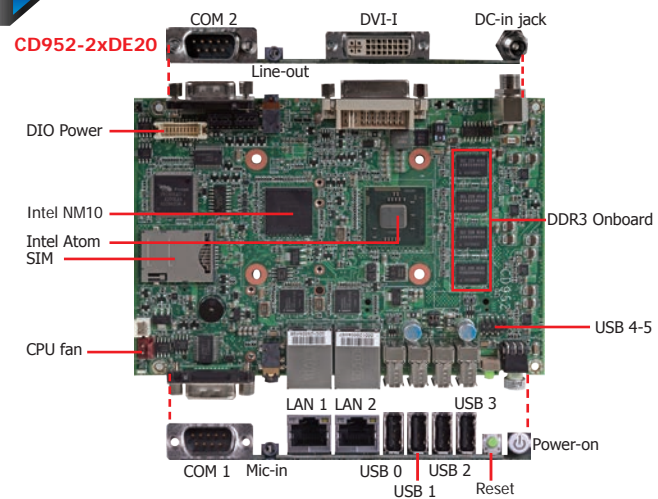
## Optional Items

- USB port cable
- Serial ATA data with power cable
- 1 LPC module kit (COM/Parallel extension module)
- Power adapter (120W, 19V) : 671-112004-100G



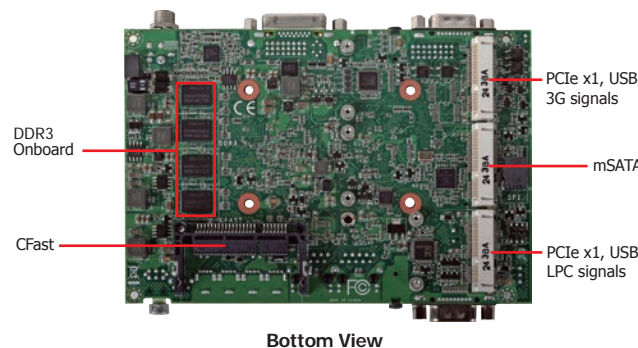
# CD952 Series

Atom



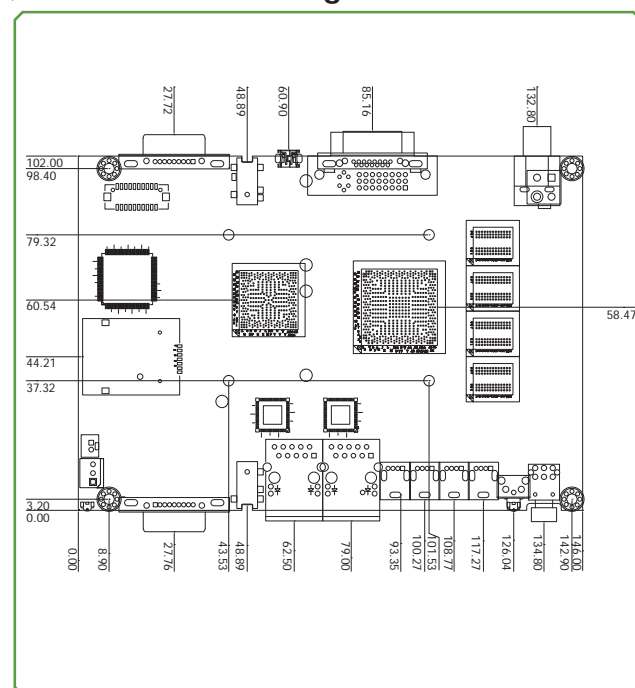
## Features

MEMORY	2GB DDR3 onboard
EXPANSION	3 Mini PCIe 1 SIM
DISPLAY OUTPUTS	1 DVI-I or 1 VGA + 1 micro HDMI
LAN	2 LAN
COM	2 COM
USB	4 USB 2.0
STORAGE	1 mSATA 1 CFast
DIO	8-bit or isolated 4-bit
DIMENSIONS	146mm x 102mm (5.75" x 4.02")

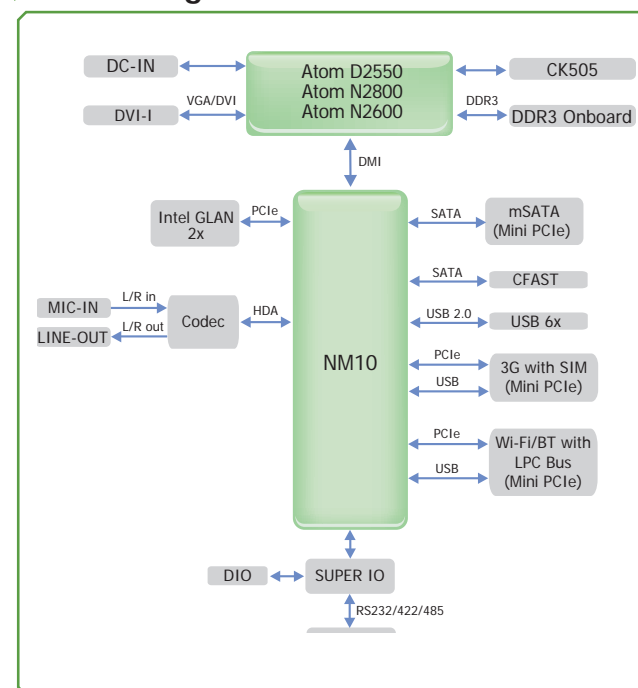


Bottom View

## Mechanical Drawing



## Block Diagram



# CD952 Series

## Specifications

### PROCESSOR

- Intel® Atom™ D2550, 1.86GHz, 2x 512K L2, 10W TDP, dual-core
- Intel® Atom™ N2800, 1.86GHz, 2x 512K L2, 6.5W TDP, dual-core
- Intel® Atom™ N2600, 1.6GHz, 2x 512K L2, 3.5W TDP, dual-core

### CHIPSET

- Intel® NM10 Express chipset

### SYSTEM MEMORY

- 2GB DDR3 onboard (standard)
- Intel® Atom™ D2550/N2800 supports up to 4GB (option)

### EXPANSION SLOTS

- 3 Mini PCIe slots
  - 2 slots for communication
    - : One slot supports PCIe x1, USB, and LPC signals for Wi-Fi/ LPC
    - : One slot supports PCIe x1, USB, and 3G signals for 3G/ GPRS
  - 1 slot for storage
    - : Supports mSATA module
- 1 SIM card socket
- 1 CFast socket

### ONBOARD GRAPHICS FEATURES

- Intel® GMA 3650 (Intel® Atom™ D2550/N2800)
- Intel® GMA 3600 (Intel® Atom™ N2600)
- VGA: resolution up to 1920x1600 @ 60Hz
- HDMI, DVI: resolution up to 1920x1200 @ 60Hz
- Smooth Video Playback
  - Supports hardware decoders (H.264, VC-1, MPEG-4) with Full HD 1080p video playback capability

### ONBOARD AUDIO FEATURES

- Realtek® ALC886 7.1-channel High Definition Audio
- 1 line-out and 1 mic-in

### ONBOARD LAN FEATURES

- 2 Intel® WG82574L Gigabit Ethernet Controllers
- Integrated 10/100/1000 transceiver
- Fully compliant with IEEE 802.3, IEEE 802.3u, IEEE 802.3ab

### COM

- 2 DB-9 ports
  - 1 DB-9 port supports RS232/422/485 COM port
  - 1 DB-9 port supports RS232/422/485 COM or isolated 2-bit In and 2-bit Out DIO
- Supports RS485 auto direction control

### STORAGE

- 1 mSATA module via a Mini PCIe slot
- 1 CFast socket

### DIO

- 1 isolated 2-bit In and 2-bit Out DIO via the DB-9 port (signal+power)
- 1 8-pin DIO (4-bit In and 4-bit Out) connector

### FRONT I/O PORTS

- 1 DB-9 RS232/422/485 COM
- 1 mic-in
- 2 LAN
- 4 USB 2.0 (Type A)
- 1 CFast socket
- 1 reset switch connector
- 1 power button with LED connector

## Ordering Information

Model Name	Part Number	Description
CD952-25DB20	770-CD9521-9B0G	With heat sink, Intel® Atom™ D2550, 1 DVI-I, 2 COM, onboard DDR3 2G, RoHS, 0°C~60°C
CD952-25DB21	770-CD9521-AB0G	With heat sink, Intel® Atom™ D2550, 1 VGA, 1 micro HDMI, 2 COM, onboard DDR3 2G, RoHS, 0°C~60°C
CD952-28DB20	770-CD9521-BB0G	With heat sink, Intel® Atom™ N2800, 1 DVI-I, 2 COM, onboard DDR3 2G, RoHS, 0°C~60°C
CD952-28DB21	770-CD9521-DB0G	With heat sink, Intel® Atom™ N2800, 1 VGA, 1 micro HDMI, 2 COM, onboard DDR3 2G, RoHS, 0°C~60°C
CD952-26DB20	770-CD9521-CB0G	With heat sink, Intel® Atom™ N2600, 1 DVI-I, 2 COM, onboard DDR3 2G, RoHS, 0°C~60°C
CD952-26DB21	770-CD9521-EB0G	With heat sink, Intel® Atom™ N2600, 1 VGA, 1 micro HDMI, 2 COM, onboard DDR3 2G, RoHS, 0°C~60°C

The following models will be available upon request. Please contact your sales representative for more information.

Model Name	Part Number	Description
CD952-25DE20	770-CD9521-0A0G	With heat sink, Intel® Atom™ D2550, 1 DVI-I, 2 COM, onboard DDR3 2G, RoHS, -20°C~70°C
CD952-25DE21	770-CD9521-1A0G	With heat sink, Intel® Atom™ D2550, 1 VGA, 1 micro HDMI, 2 COM, onboard DDR3 2G, RoHS, -20°C~70°C
CD952-28DE20	770-CD9521-8A0G	With heat sink, Intel® Atom™ N2800, 1 DVI-I, 2 COM, onboard DDR3 2G, RoHS, -20°C~70°C
CD952-28DE21	770-CD9521-3A0G	With heat sink, Intel® Atom™ N2800, 1 VGA, 1 micro HDMI, 2 COM, onboard DDR3 2G, RoHS, -20°C~70°C
CD952-26DE20	770-CD9521-6A0G	With heat sink, Intel® Atom™ N2600, 1 DVI-I, 2 COM, onboard DDR3 2G, RoHS, -20°C~70°C
CD952-26DE21	770-CD9521-2A0G	With heat sink, Intel® Atom™ N2600, 1 VGA, 1 micro HDMI, 2 COM, onboard DDR3 2G, RoHS, -20°C~70°C

## Packing List

- 1 CD952 board
- 1 DVD
- 1 QR (Quick Reference)

### I/O CONNECTORS

- 1 connector for 2 external USB 2.0/1.1 ports
- 1 chassis intrusion connector
- 1 fan connector

### BIOS

- AMI BIOS
- 16Mbit SPI BIOS

### WATCHDOG TIMER

- Software programmable from 1 to 255 seconds

### POWER

- 9~24V DC power input voltage

### ENERGY EFFICIENT DESIGN

- Supports ACPI
- System Power Management
- Wake-On-Events include:
  - Wake-On-USB KB/Mouse
  - Wake-On-LAN
  - RTC timer to power-on the system
- CPU stopped clock control
- AC power failure recovery

### DAMAGE FREE INTELLIGENCE

- Monitors CPU/system temperature and overheat alarm
- Monitors Vcore/5V/3.3V/V\_DIMM/12V/5VSB voltages and failure alarm
- Monitors system fan speed and failure alarm
- Read back capability that displays temperature, voltage and fan speed

### POWER CONSUMPTION

- 13.41W with N2800 at 1.86GHz and 1x 2GB DDR3 onboard

### OS SUPPORT

- Windows XP Professional x86 & SP3 (32-bit)
- Windows 7 Ultimate x86 & SPI (32-bit)

### TEMPERATURE

- Operating
  - Standard: 0°C to 60°C
  - Option: -20°C to 70°C
- Storage: -20°C to 85°C

### HUMIDITY

- 10% to 90%

### DIMENSIONS

- 146mm (5.75") x 102mm (4.02")

Rear I/O Ports	CD952-2xDx20	CD952-2xDx21
9~24V DC-in jack	1	1
Line-out	1	1
DVI-I	1	0
VGA: DB-15 D-sub	0	1
micro HDMI	0	1
COM: DB-9	2	1*
DIO: DB-9 (signal+power)	0	1*

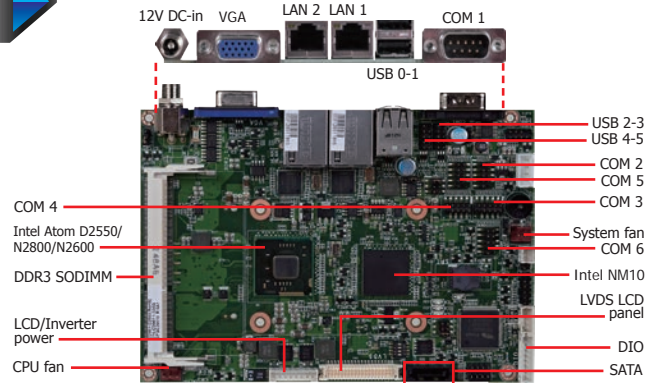
\* Jumper selectable

## Optional Items

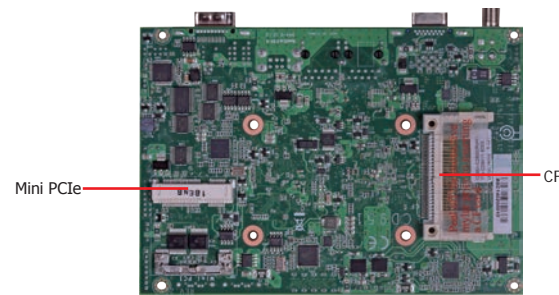
- USB port cable
- Power adapter (60W, 12V) : 671-106002-102G

# CD951-C Series

Atom



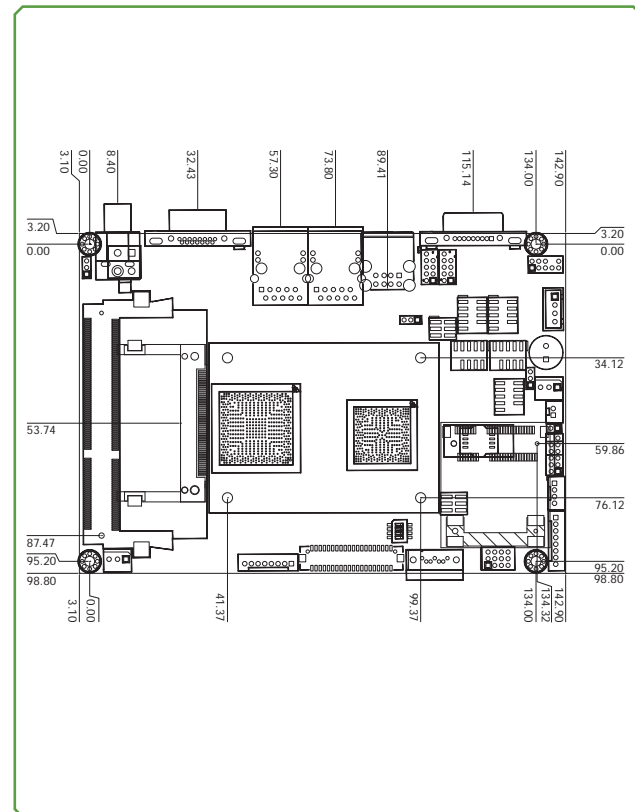
Top View



Bottom View



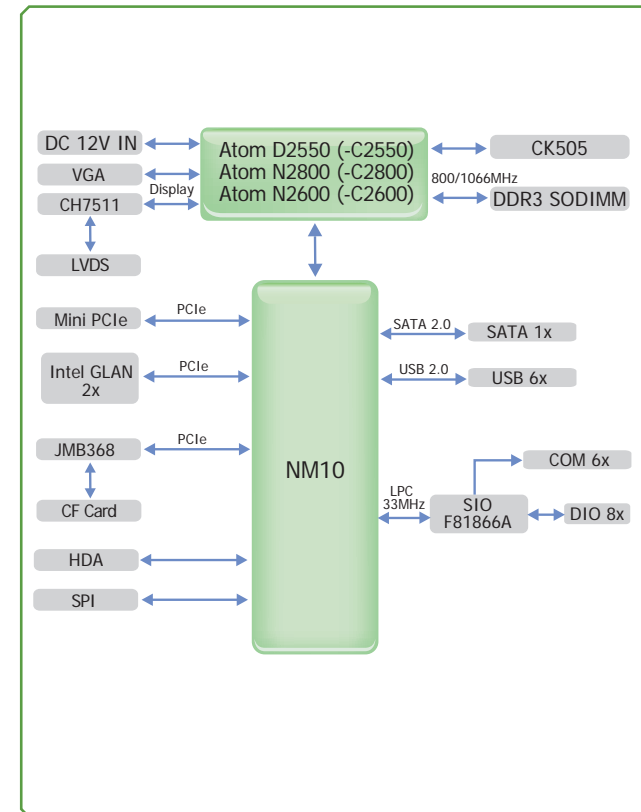
## Mechanical Drawing



## Features

MEMORY	1 DDR3 SODIMM up to 4GB (-C2550/-C2800) 1 DDR3 SODIMM up to 2GB (-C2600)
EXPANSION	1 Mini PCIe
DISPLAY OUTPUTS	1 VGA, 1 LVDS
LAN	2 LAN
COM	6 COM
USB	6 USB 2.0
STORAGE	1 SATA 2.0 1 CF
DIO	8-bit DIO
DIMENSIONS	146mm x 102mm (5.75" x 4.02")

## Block Diagram



## Specifications

### PROCESSOR

- CD951-C2550:
  - Intel® Atom™ D2550, 1.86GHz, 2x 512K L2, 10W TDP, dual-core
  - Cooling: heatsink with cooling fan
- CD951-C2800:
  - Intel® Atom™ N2800, 1.86GHz, 2x 512K L2, 6.5W TDP, dual-core
  - Cooling: heatsink (fanless solution)
- CD951-C2600:
  - Intel® Atom™ N2600, 1.6GHz, 2x 512K L2, 3.5W TDP, dual-core
  - Cooling: heatsink (fanless solution)

### CHIPSET

- Intel® NM10 Express chipset

### SYSTEM MEMORY

- One 204-pin DDR3 SODIMM socket
- Supports DDR3 1066MHz (Intel® Atom™ D2550/N2800)
- Supports DDR3 800MHz (Intel® Atom™ N2600)
- Supports single channel memory interface
- Supports up to 4GB system memory (Intel® Atom™ D2550/N2800)
- Supports up to 2GB system memory (Intel® Atom™ N2600)
- DRAM device technologies: 1Gb, 2Gb and 4Gb DDR3 DRAM technologies are supported for x8 and x16 devices, unbuffered, non-ECC

### EXPANSION SLOTS

- 1 Mini PCIe slot
  - Supports PCIe (PCIe and USB signals) or mSATA module
  - Supports half size card
- 1 CompactFlash socket

### ONBOARD GRAPHICS FEATURES

- Intel® GMA 3650 (Intel® Atom™ D2550/N2800)
- Intel® GMA 3600 (Intel® Atom™ N2600)
- Supports LVDS and VGA interfaces
- LVDS: Chronitel CH7511B, 24-bit, dual channel, resolution up to 1920x1200 @ 60Hz
- VGA: resolution up to 1920x1200 @ 60Hz
- Supports Hardware H.264/AVC, MPEG-2 video decoder, VC-1, DirectX 9, 1080p decoder

### ONBOARD AUDIO FEATURES

- Realtek ALC886 2-channel High Definition Audio

### ONBOARD LAN FEATURES

- 2 Intel® 82574 Gigabit Ethernet Controllers
- Integrated 10/100/1000 transceiver
- Fully compliant with IEEE 802.3, IEEE 802.3u, IEEE 802.3ab

### SERIAL ATA (SATA) INTERFACE

- Supports 1 Serial ATA interface
- SATA 2.0 with data transfer rate up to 3Gb/s
- Integrated Advanced Host Controller Interface (AHCI) controller

### IDE INTERFACE

- JMicron JMB368 PCI Express to PATA host controller
- Supports 1 CompactFlash interface

### REAR PANEL I/O PORTS

- 1 12V DC-in jack (default) or 4-pin power connector (optional)
- 1 DB-9 RS232 serial port
- 1 DB-15 VGA port
- 2 RJ45 LAN ports
- 2 USB 2.0/1.1 ports

## Packing List

- 1 CD951-C board
- 1 Serial ATA data cable
- 1 DVD
- 1 QR (Quick Reference)

# CD951-C Series

### I/O CONNECTORS

- 2 connectors for 4 external USB 2.0/1.1 ports
- 5 connectors for 5 external serial ports
  - 1 connector supports RS232/422/485
  - 4 connectors support RS232
- 1 LVDS LCD panel connector
- 1 LCD/inverter power connector
- 1 8-bit Digital I/O connector
- 1 front audio connector for line-out and mic-in jacks
- 1 Serial ATA port
- 1 chassis intrusion connector
- 1 front panel connector
- 2 fan connectors

### BIOS

- AMI BIOS
  - 16Mbit SPI BIOS

### ENERGY EFFICIENT DESIGN

- Supports ACPI
- System Power Management
- Wake-On-Events include:
  - Wake-On-PS/2 KB/Mouse
  - Wake-On-USB KB/Mouse
  - Wake-On-LAN
  - RTC timer to power-on the system
- CPU stopped clock control
- AC power failure recovery

### DAMAGE FREE INTELLIGENCE

- Monitors CPU/system temperature and overheat alarm
- Monitors V<sub>CORE</sub>/5V/3.3V/V<sub>DIMM</sub>/12V/5VSB voltages and failure alarm
- Monitors CPU/system fan speed and failure alarm
- Read back capability that displays temperature, voltage and fan speed
- Watchdog timer function

### POWER CONSUMPTION

- 17.5W with D2550 at 1.86GHz and 1x 2GB DDR3 SODIMM
- 17.5W with N2800 at 1.86GHz and 1x 2GB DDR3 SODIMM
- 13.8W with N2600 at 1.6GHz and 1x 2GB DDR3 SODIMM

### OS SUPPORT

- Windows XP Professional x86 & SP3 (32-bit)
- Windows 7 Ultimate x86 & SP1 (32-bit)

### TEMPERATURE

- Operating: 0°C to 60°C
- Storage: -20°C to 85°C

### HUMIDITY

- 10% to 90%

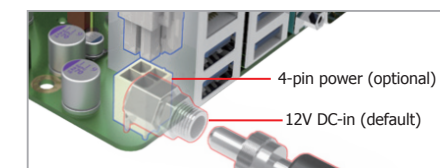
### DIMENSIONS

- 3.5" board
- 146mm (5.75") x 102mm (4.02")

### CERTIFICATION

- CE
- FCC Class B
- RoHS
- UL

## Power Connector



## Optional Items

- Serial ATA data cable
- USB port cable
- COM port cable
- Power adapter (100W, 12V) : 671-110001-100G
- Heat sink with fan: A71-110012-000G
- Heat sink: A71-010012-000G

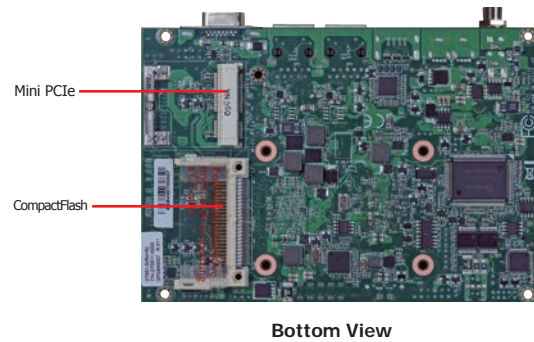
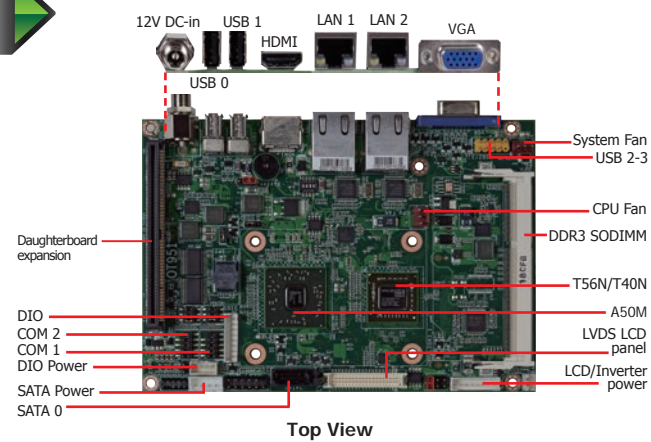
3.5"  
Embedded SBC



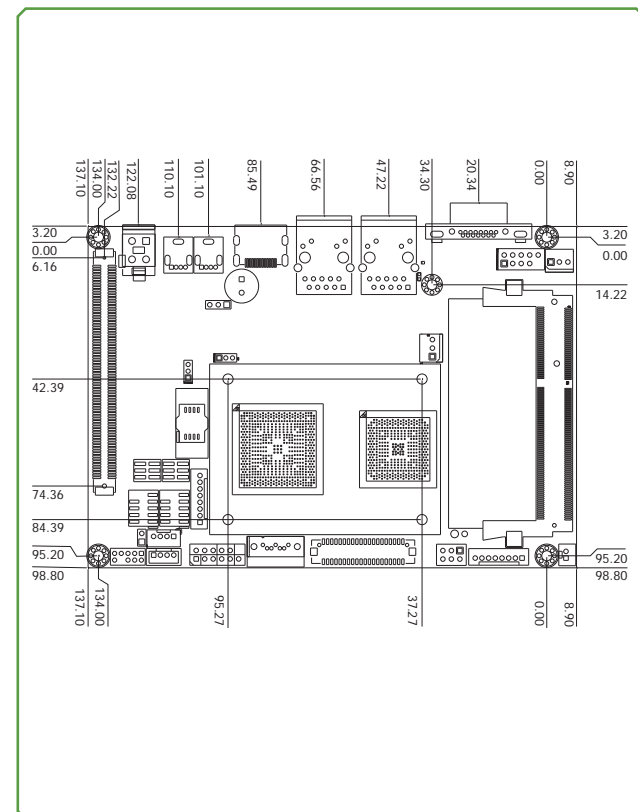
# OT951-D Series

# OT951-D Series

R-Series



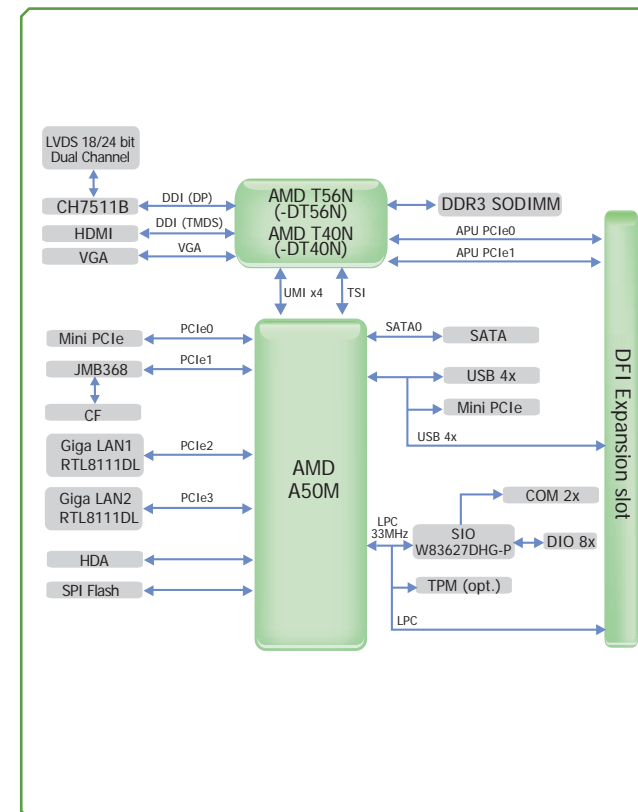
## Mechanical Drawing



## Features

MEMORY	1 DDR3 SODIMM up to 8GB
EXPANSION	1 Mini PCIe 1 Connector for daughterboard expansion
DISPLAY OUTPUTS	1 HDMI, 1 VGA, 1 LVDS
LAN	2 LAN
COM	2 COM
USB	4 USB 2.0
STORAGE	1 SATA 3.0 1 CF
DIO	8-bit DIO
DIMENSIONS	146mm x 102mm (5.75" x 4.02")

## Block Diagram



## Specifications

- APU (Accelerated Processing Unit)**
- OT951-DT56N:
    - AMD® T56N, 1.65GHz, 2x 512KB L2, 18W TDP, dual-core
    - Cooling: heatsink with cooling fan
  - OT951-DT40N:
    - AMD® T40N, 1.0GHz, 2x 512KB L2, 9W TDP, dual-core
    - Cooling: heatsink without cooling fan

- CHIPSET**
- AMD® A50M Controller Hub

- SYSTEM MEMORY**
- One 204-pin DDR3 SODIMM sockets
  - Supports DDR3 1066/1333MHz (OT951-DT56N)
  - Supports DDR3 1066MHz (OT951-DT40N)
  - Supports single channel memory interface
  - Supports up to 8GB system memory
  - DRAM device technologies: 1Gb, 2Gb and 4Gb DDR3 DRAM technologies are supported for x8 and x16 devices, unbuffered, non-ECC

- EXPANSION SLOTS**
- 1 Mini PCIe slot
    - Supports half size Mini PCIe card
  - 1 CompactFlash socket
  - 1 connector for daughterboard expansion
    - 2 PCIe x1
    - 4 USB 2.0
    - 1 LPC

- ONBOARD GRAPHICS FEATURES**
- Advanced discrete-level GPU integrated in the processor
    - AMD Radeon™ HD 6320 (OT951-DT56N)
    - AMD Radeon™ HD 6290 (OT951-DT40N)
  - Supports LVDS, VGA and HDMI interfaces
  - LVDS: Chronitel CH7511B, 24-bit, dual channel, resolution up to 1920x1200 @ 60Hz
  - VGA: resolution up to 2048x1536 @ 60Hz (OT951-DT56N); resolution up to 1920x1200 @ 60Hz (OT951-DT40N)
  - HDMI: resolution up to 1920x1080 @ 60Hz
  - Supports AMD Turbo Core 2.0 technology
  - Supports DirectX 11, OpenGL 3.2 and OpenCL 1.1
  - Supports Hardware H.264, MPEG4 Part 2, VC-1, and MPEG2 decode

- ONBOARD AUDIO FEATURES**
- Realtek ALC886 5.1-channel High Definition Audio

- ONBOARD LAN FEATURES**
- 2 Realtek RTL8111DL Gigabit Ethernet Controllers
  - Integrated 10/100/1000 transceiver
  - Fully compliant with IEEE 802.3, IEEE 802.3u, IEEE 802.3ab

- SERIAL ATA (SATA) INTERFACE**
- Supports 1 Serial ATA interface
  - SATA 3.0 with data transfer rate up to 6Gb/s
  - Integrated Advanced Host Controller Interface (AHCI) controller

- IDE INTERFACE**
- JMicron JMB368 PCI Express to PATA host controller
  - Supports 1 CompactFlash interface

- TRUSTED PLATFORM MODULE (TPM) - optional**
- Provides a Trusted PC for secure transactions
  - Provides software license protection, enforcement and password protection

## Packing List

• 1 OT951-D board
• 1 Serial ATA data cable
• 1 DVD
• 1 QR (Quick Reference)

- REAR PANEL I/O PORTS**
- 1 12V DC-in jack (default) or 4-pin power connector (optional)
  - 1 HDMI port
  - 1 DB-15 VGA port
  - 2 RJ45 LAN ports
  - 2 USB 2.0/1.1 ports

- I/O CONNECTORS**
- 1 connector for 2 external USB 2.0/1.1 ports
  - 2 connectors for 2 external RS232/422/485 serial ports
  - 1 LVDS LCD panel connector
  - 1 LCD/inverter power connector
  - 1 8-bit Digital I/O connector
  - 1 front audio connector for line-out and mic-in jacks
  - 1 Serial ATA port
  - 1 chassis intrusion connector
  - 1 front panel connector
  - 2 fan connectors

- BIOS**
- AMI BIOS
  - 64Mbit SPI BIOS

- ENERGY EFFICIENT DESIGN**
- Supports ACPI
  - System Power Management
  - Wake-On-Events include:
    - Wake-On-USB KB/Mouse
    - Wake-On-LAN
    - RTC timer to power-on the system
  - CPU stopped clock control
  - AC power failure recovery

- DAMAGE FREE INTELLIGENCE**
- Monitors CPU/system temperature and overheat alarm
  - Monitors Vcore/Vnb/V\_DIMM/5V/12V voltages and failure alarm
  - Monitors CPU/system fan speed and failure alarm
  - Read back capability that displays temperature, voltage and fan speed
  - Watchdog timer function

- POWER CONSUMPTION**
- 26.66 W with T56N at 1.65GHz and 1x 2GB DDR3 SODIMM
  - 19.23 W with T40N at 1.00GHz and 1x 1GB DDR3 SODIMM

- OS SUPPORT**
- Windows XP Professional x86 & SP3 (32-bit)
  - Windows XP Professional x64 & SP2 (64-bit)
  - Windows 7 Ultimate x86 & SP1 (32-bit)
  - Windows 7 Ultimate x64 & SP1 (64-bit)

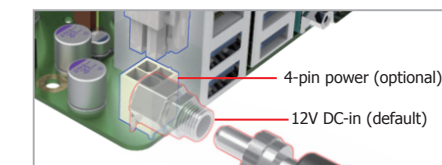
- TEMPERATURE**
- Operating: 0°C to 60°C
  - Storage: -20°C to 85°C

- HUMIDITY**
- 10% to 90%

- DIMENSIONS**
- 3.5" board
  - 146mm (5.75") x 102mm (4.02")

- CERTIFICATION**
- CE
  - FCC Class B
  - UL
  - RoHS

## Power Connector



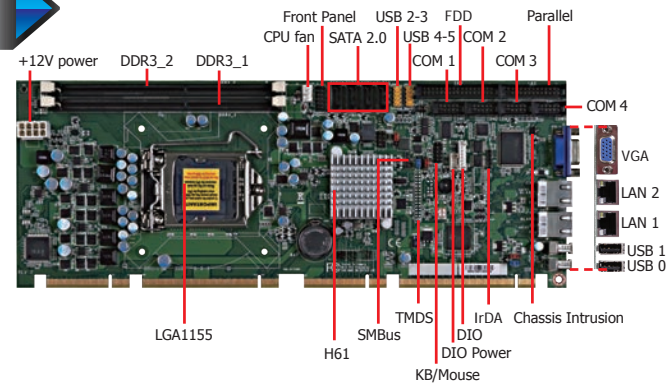
## Optional Items

• Serial ATA data cable
• USB port cable
• COM port cable
• Power adapter (100W, 12V) : 671-110001-100G



# PIC-H61

H61

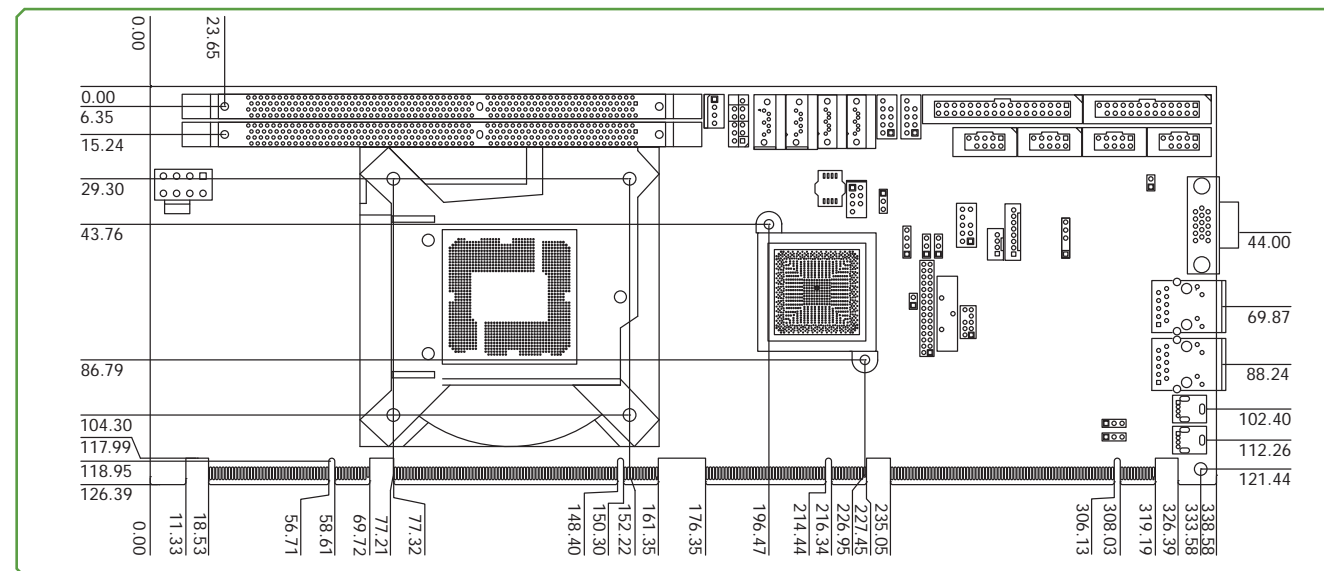


## Features

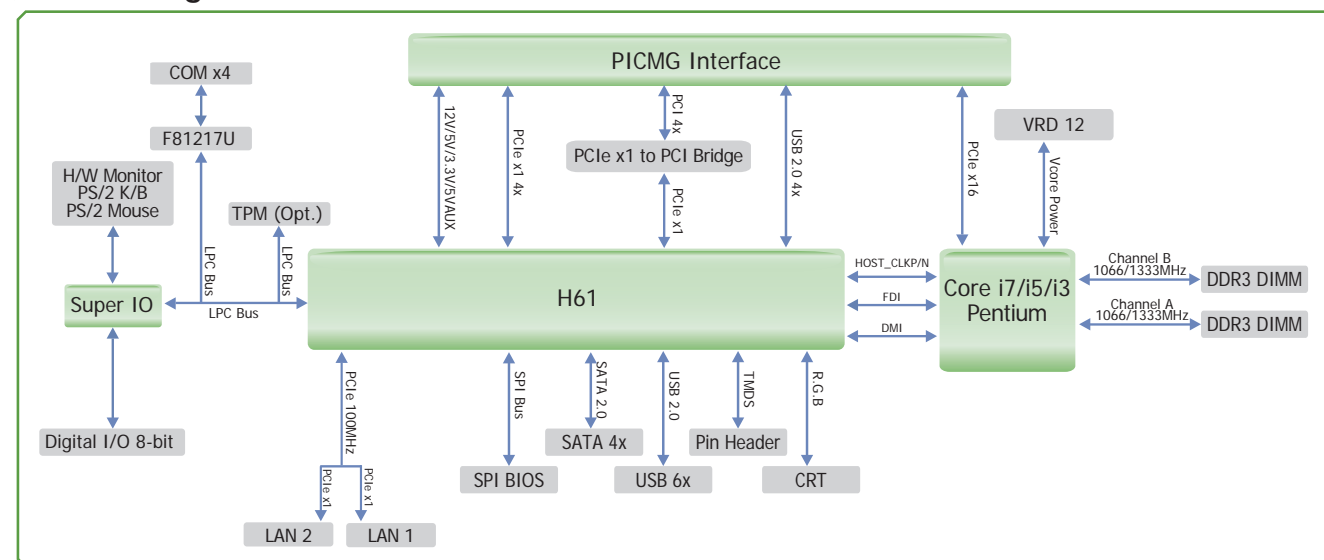
MEMORY	2 DDR3 DIMM up to 16GB
EXPANSION (via gold fingers)	1 PCIe x16 4 PCIe x1 4 PCI 4 USB
DISPLAY OUTPUTS	1 DVI-D (optional), 1 VGA
LAN	2 LAN
COM	4 COM
USB	6 USB 2.0
PARALLEL	1 Parallel
STORAGE	4 SATA 2.0 1 FDD
DIO	8-bit DIO
DIMENSIONS	338mm x 122mm (13.3" x 4.8")



## Mechanical Drawing



## Block Diagram



## Specifications

### PROCESSOR

- LGA 1155 socket for:
  - 3rd generation Intel® Core™ processors (22nm process technology)
    - Intel® Core™ i7-3770 (8M Cache, up to 3.9GHz); 77W
    - Intel® Core™ i5-3550S (6M Cache, up to 3.7GHz); 65W
    - Intel® Core™ i3-3220 (3M Cache, 3.3GHz); 55W
    - Intel® Pentium® G2120 (3M Cache, 3.1 GHz); 65W
  - 2nd generation Intel® Core™ processors (32nm process technology)
    - Intel® Core™ i7-2600 (8M Cache, up to 3.8 GHz); 95W
    - Intel® Core™ i5-2400 (6M Cache, up to 3.4 GHz); 95W
    - Intel® Core™ i3-2120 (3M Cache, 3.3 GHz); 65W
    - Intel® Pentium® G850 (3M Cache, 2.9 GHz); 65W
- Intel® Advanced Vector Extensions (Intel® AVX) Instructions
- Intel® Turbo Boost Technology

### CHIPSET

- Intel® H61 Express Chipset

### SYSTEM MEMORY

- Two 240-pin DDR3 DIMM sockets
- Supports DDR3 1333/1600MHz (3rd generation processors)
- Supports DDR3 1066/1333MHz (2nd generation processors)
- Supports dual channel memory interface
- Supports up to 16GB system memory
- DRAM device technologies: 1Gb, 2Gb and 4Gb DDR3 DRAM technologies are supported for x8 and x16 devices, unbuffered, non-ECC

### EXPANSION INTERFACES (via gold fingers)

- 1 PCIe x16 slot
  - Supports Gen 3.0 (3rd generation processors)
  - Supports Gen 2.0 (2nd generation processors)
- 4 PCIe x1
- 4 PCI
- 4 USB 2.0

### ONBOARD GRAPHICS FEATURES

- Intel® HD Graphics
- Display outputs:
  - 1 VGA port at rear I/O
  - 1 TMDs port pin header supports PIC-DVI module (optional)
- DVI-D supports up to 1920x1080 @ 60Hz resolution (optional)
- VGA supports up to 2048x1536 @ 75Hz resolution
- Supports 6 Graphics Execution Units (EUs)
- Intel® Clear Video Technology
- DirectX Video Acceleration (DXVA) support for accelerating video processing

### ONBOARD LAN FEATURES

- 2 Intel® W82574L PCI Express Gigabit Ethernet controllers
- Integrated 10/100/1000 transceiver
- Fully compliant with IEEE 802.3, IEEE 802.3u, IEEE 802.3ab

### ONBOARD USB FEATURES

- 6 USB 2.0
  - 2 USB at the rear I/O
  - 4 USB via 2 USB connectors

### TRUSTED PLATFORM MODULE (TPM) - optional

- Infineon SLB9635
- Provides a Trusted PC for secure transactions
- Provides software license protection, enforcement and password protection

### SERIAL ATA (SATA) INTERFACE

- 4 SATA 2.0 ports with data transfer rate up to 3Gb/s

## Packing List

- 1 PIC-H61 board
- 2 USB port cables (with bracket)
- 2 COM port cables (with bracket)
- 2 Serial ATA data cables
- 1 DVD
- 1 QR (Quick Reference)

# PIC-H61

### REAR I/O PORTS

- 1 DB-15 VGA port
- 2 RJ45 LAN ports
- 2 USB 2.0/1.1 ports

### I/O CONNECTORS

- 1 PS/2 KB/Mouse connector
- 4 serial connectors
  - 1 RS232/422/485
  - 3 RS232
- 4 SATA 2.0 ports
- 1 parallel connector
- 1 floppy connector
- 2 connectors for 4 USB 2.0/1.1 ports
- 1 8-bit Digital I/O connector
- 1 SMBus connector
- 1 IrDA connector
- 1 front panel connector
- 1 chassis intrusion connector
- 1 CPU fan connector (supports Smart fan)
- 1 8-pin 12V ATX power connector

### BIOS

- AMI BIOS
  - 64Mbit SPI BIOS

### ENERGY EFFICIENT DESIGN

- Supports ErP Lot6 power saving (optional)
- Supports ACPI
- System Power Management
- Wake-On-Events include:
  - Wake-On-PS/2 KB/Mouse
  - Wake-On-USB KB/Mouse
  - Wake-On-LAN
  - RTC timer to power-on the system
- CPU stopped clock control
- AC power failure recovery

### DAMAGE FREE INTELLIGENCE

- Monitors CPU/system temperature and overheat alarm
- Monitors Vcore/5V/3.3V/V\_DIMM/12V/5VSB voltages and failure alarm
- Monitors CPU/system fan speed and failure alarm
- Read back capability that displays temperature, voltage and fan speed
- Watchdog timer function

### OS SUPPORT

- Windows XP Professional x86 & SP3 (32-bit)
- Windows XP Professional x64 & SP2 (64-bit)
- Windows 7 Ultimate x86 & SP1 (32-bit)
- Windows 7 Ultimate x64 & SP1 (64-bit)

### TEMPERATURE

- Operating: 0°C to 60°C
- Storage: -20°C to 85°C

### HUMIDITY

- 10% to 90%

### DIMENSIONS

- 338mm (13.3") x 122mm (4.8")

### CERTIFICATION

- CE
- FCC Class B
- RoHS

## Optional Items

- USB port cable
- COM port cable
- Serial ATA data cable
- Serial ATA power cable

Embedded SBC  
3.5"

