



ВЫЛЕТ	DEPARTURE	ПУС	РЕГИСТРАЦИЯ	ВЫСОТ	Идет регистрация
19:10	Анадырь	731	124-126	30A	Идет регистрация
19:15	Чита	963	104,105	26A	Идет регистрация
19:20	Якутск	4963	104,105	27A	Идет регистрация
19:30	Врангелевск	474	124-126	26A	Идет регистрация
19:40	Белгород	387	051-070	29A	Идет регистрация
19:40	Магнитогорск	191	051-070	25A	Идет регистрация
19:40	Челяновск	351	051-070	26A	Идет регистрация
19:40	Ульяновск	981	105,106	26A	Идет регистрация
19:40	Киров	125	051-070	29	Идет регистрация
19:50	Иркутск	465	051-070	30A	Идет регистрация
19:50	С-Петербург	105	082,083	30A	Идет регистрация
19:55	С-Петербург	4105	082,083	30A	Идет регистрация
20:05	Москва	757	124-126	27A	Идет регистрация
20:10	Пермь	1565	051-070	26	Идет регистрация
20:10	Сургут	242	051-070	28	Идет регистрация
20:15	Тюмень	453	051-070	28	Идет регистрация
20:15	Ханты-Мансийск	351	051-070	30	Идет регистрация



Computer-On-Module

- COM Express Modules
- Mini Compact Basic
- Carrier Boards
- Qseven Modules
- Carrier Boards

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DFI

Revision Control • Long Product Life Cycle



▶ Mini

84 mm x 55 mm

▶ Compact

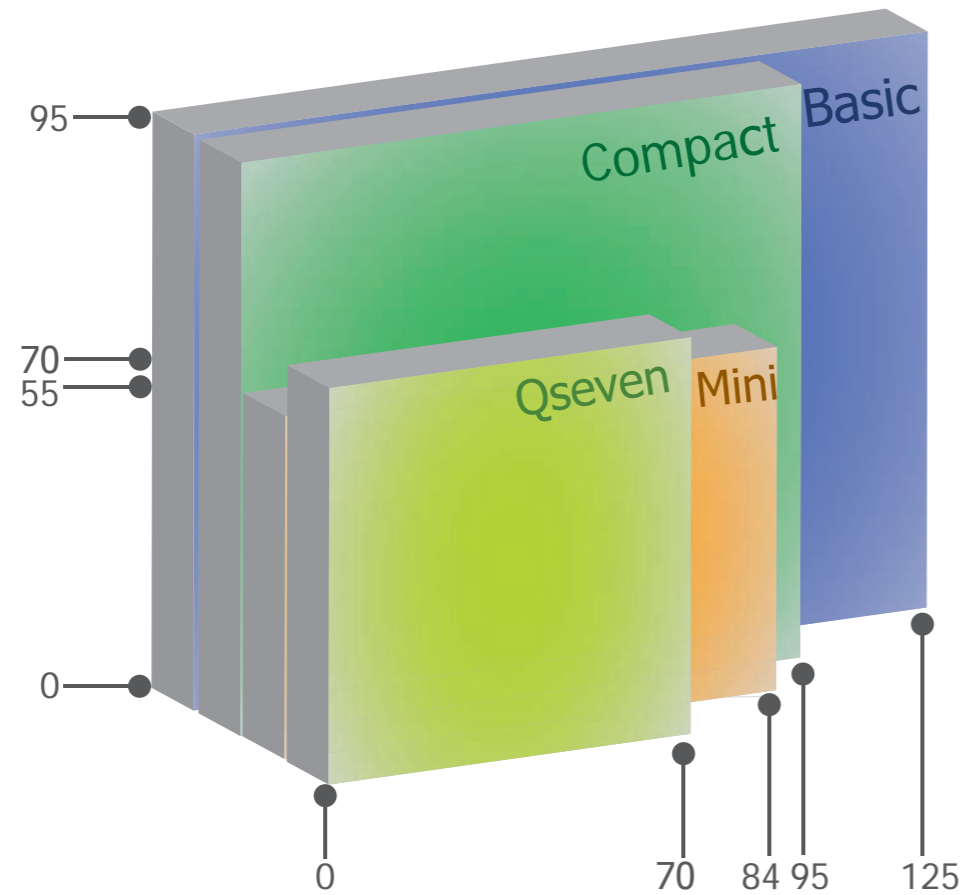
95 mm x 95 mm

▶ Basic

125 mm x 95 mm

▶ Qseven

70 mm x 70 mm



▶ COM Express Mini

Type	R2.1, Type 10
Model	BT9A3 CD9A3

▶ COM Express Compact

Type	R2.1, Type 6	R2.0, Type 2	R1.0, Type 2
Model	HU968	CD905-B	LR905-B18D/S/M
	CR908-B	OT905-B	CP908-B
	HR908-B		
	BT968		
	KB968		

▶ COM Express Basic

Type	R2.1, Type 6	R2.1, Type 2	R1.0, Type 2
Model	HM961-QM87	HM920-QM87	HR900-B
	HM960-QM87	HM920-HM86	CP900-B
	HM961-HM86	CR902-B	
	HM960-HM86	CR900-B	
	CR960-QM77	CR902-BL	
	CR901-B	HR902-B	
	CR960-HM76	HR902-BL	
	CM960-B		
	CM901-B		

▶ Qseven

Type	R2.0	R1.2	R1.1
Model	BT700	FS700 Series	QB700-B
		QB702-B	
		QB701-B	

► Cooling option

- Heat spreader
- Heat sink
- Heat sink + fan
- Heat spreader + heat sink + fan

► Thermal Test

Uses **thermal probe** to measure each component in order to determine the actual temperature of each component

► Support and Services

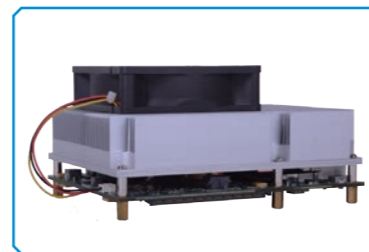
- Provides **3D** illustrations of custom thermal solution design
- Provides **MTBF and MTTF** based on thermal test results
- Thermal simulation** of customized heat sink



Heat sink



Heat sink with fan



Heat spreader with heat sink and fan

► Qseven

Model name	Heat spreader	Heat sink	Heat sink with fan	Heat spreader with heat sink and fan
BT700		●		
QB702-B	●	●		
QB701-B		●		
QB700-B		●		

► COM Express Mini

Model name	Heat spreader	Heat sink	Heat sink with fan	Heat spreader with heat sink and fan
BT9A3 Series		●	●	
CD9A3 Series		●	●	

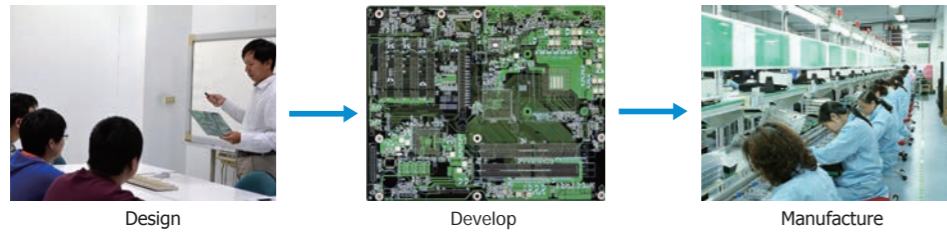
► COM Express Compact

Model name	Heat spreader	Heat sink	Heat sink with fan	Heat spreader with heat sink and fan
HU968				●
CR908-B	●		●	●
HR908-B	●		●	●
CP908-B	●		●	●
BT968	Will be available soon			
CD905-B Series	●	●	●	●
LR905-B18D/M/S		●	●	
KB968				●
OT905-B Series	●		●	●

► COM Express Basic

Model name	Heat spreader	Heat sink	Heat sink with fan	Heat spreader with heat sink and fan
HM961-QM87				●
HM961-HM86				●
HM960-QM87				●
HM960-HM86				●
HM920-QM87				●
HM920-HM86				●
CR960-QM77				●
CR960-HM76				●
CR902-B				●
CR902-BL				●
CR901-B	●		●	●
CR900-B	●		●	●
HR902-B				●
HR902-BL				●
HR900-B	●		●	●
CP900-B			●	
CM960-B				●
CM901-B	●		●	●

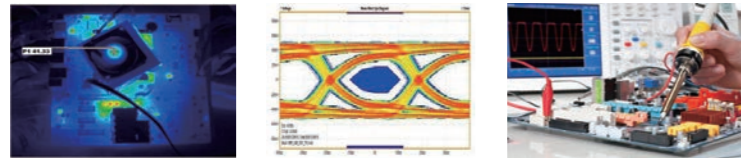
▶ 1. Customized evaluation of carrier board design



▶ 2. Customized BIOS and software services



▶ 3. Customized validation and testing

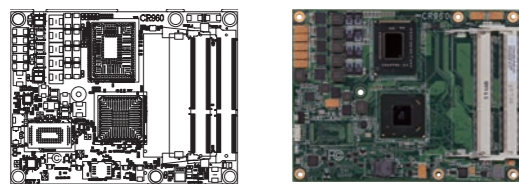


▶ 4. Customized product life cycle management

- Revision control
- Continuous supply of components and stock inventory management
- Support and services

▶ 5. Carrier board design guide

- We provide schematics/placement and layout to aid you in designing your own carrier board



▶ 6. EAPI Programming Guide

- Backlight function
- I²C Bus function
- GPIO function
- Storage function
- Watchdog function

▶ 7. Customized embedded OS



▶ 8. Customized API library for functions like Watchdog, GPIO, Backlight, etc.



Atom



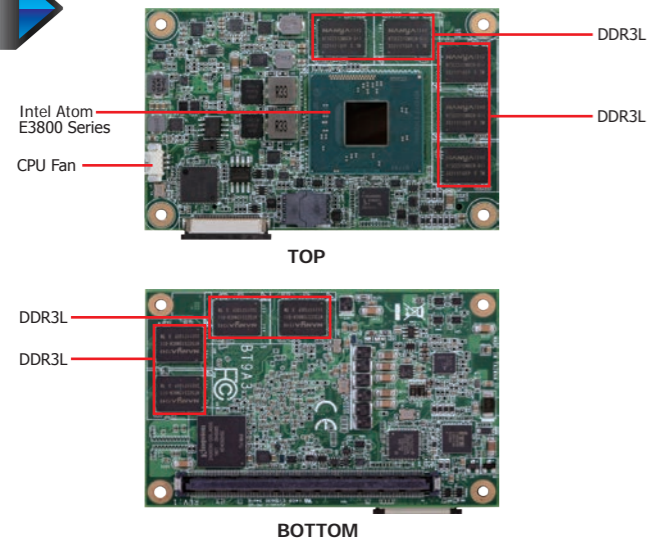
Atom



Model		BT9A3 Series	CD9A3 Series
Processor		Intel® Atom™ E3800 series	Intel® Atom™ D2550/N2800/N2600
Chipset		N/A	Intel® NM10
Memory		2GB/4GB DDR3L ECC onboard	2GB DDR3 onboard
Display		LVDS, DDI	LVDS, DDI
Ethernet		1 Intel	1 Intel
USB	USB 3.0	1	N/A
	USB 2.0	8	8
Serial	RS232/422/485	N/A	N/A
	RS232	N/A	N/A
Storage	SATA 3.0	N/A	N/A
	SATA 2.0	2	2
	SSD	N/A	Yes (optional)
	IDE, FDD	N/A	N/A
	CF	N/A	N/A
Expansion	PCIe x16	N/A	N/A
	PCIe x4	N/A	N/A
	PCIe x1	3	3
	Mini PCIe	N/A	N/A
	PCI	N/A	N/A
Digital I/O		8-bit	8-bit
Audio	Controller	HDA	HDA
LPC		N/A	N/A
CAN-bus		N/A	N/A
TPM (optional)		N/A	N/A
Watchdog		Yes	Yes
Power Input		4.75V~20V	4.75V~20V
Compliance		R2.1, Type 10	R2.1, Type 10
Dimensions		84mm x 55mm	84mm x 55mm

BT9A3 Series

Atom

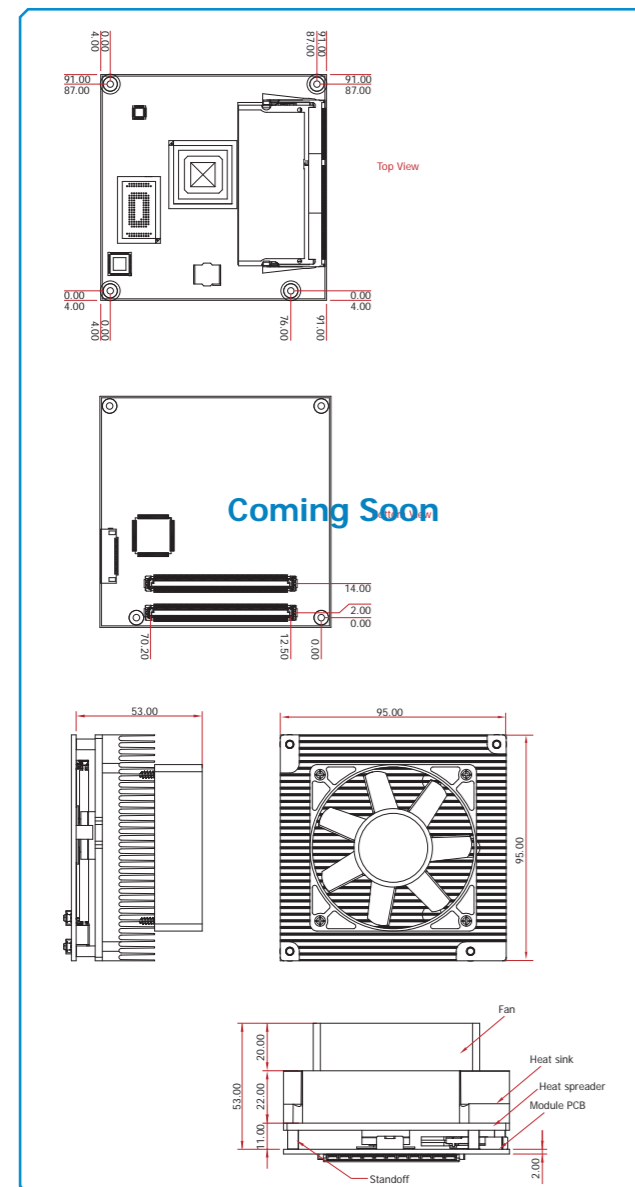


Features

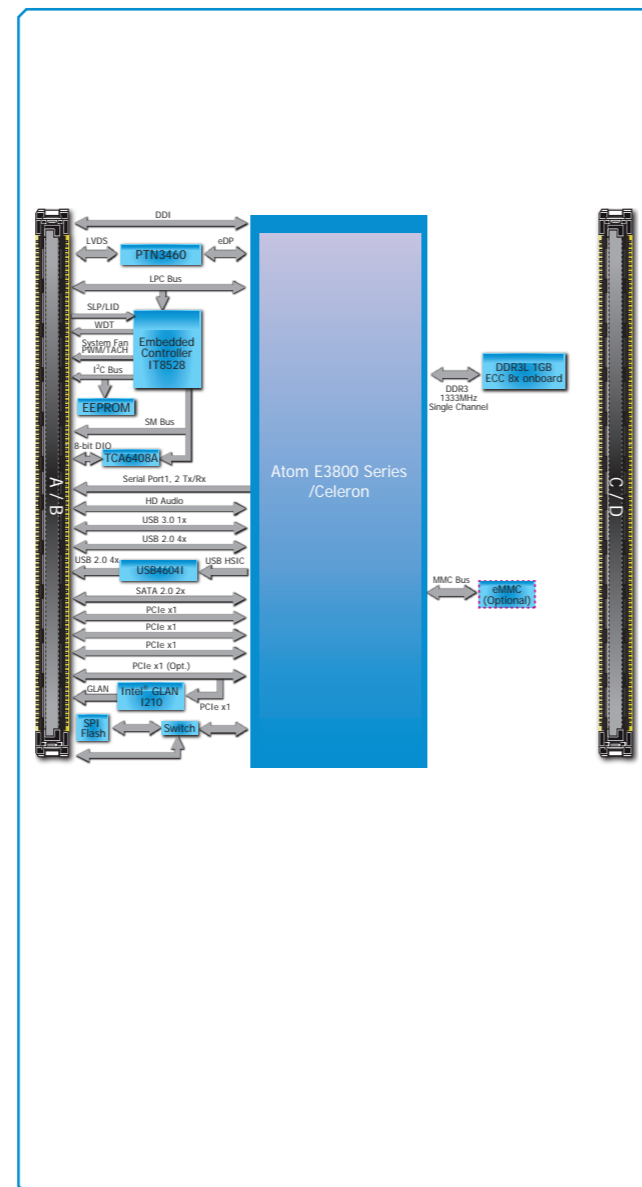
MEMORY	2GB/4GB DDR3L ECC onboard
STORAGE	4GB/8GB/16GB eMMC onboard (optional)
EXPANSION	3 PCIe x1 1 LPC, 1 SMBus, 1 I ² C, 2 serial 1 LVDS, 1 DDI (HDMI/DVI/DP) 1 HDA 9 USB: 1 USB 3.0, 8 USB 2.0 2 SATA 2.0 8-bit DIO
LAN	1 LAN
DIMENSIONS	COM Express® R2.1 Mini, Type 10 84mm x 55mm (3.30" x 2.16")



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

STORAGE

- Supports 4GB, 8GB and 16GB eMMC onboard (optional)

ONBOARD GRAPHICS FEATURES

- Intel® HD Graphics
- Supports LVDS and DDI interfaces
- LVDS: NXP PTN3460, 24-bit, dual channel, resolution up to 1920x1200 @ 60Hz
- Digital Display Interface: HDMI, DVI and DP
- HDMI, DVI: resolution up to 2560x1600 @ 24Hz
- DP: resolution up to 2560x1600 @ 60Hz
- Supports hardware acceleration for DirectX 11, OCL 1.2, OGL 3.2, H.264, MPEG2, MVC, VC-1, WMV9 and VP8

ONBOARD AUDIO FEATURES

- Supports High Definition Audio interface

ONBOARD LAN FEATURES

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

SERIAL ATA (SATA) INTERFACE

- Supports 2 Serial ATA interfaces
- SATA 2.0 with data transfer rate up to 3Gb/s
- Integrated Advanced Host Controller Interface (AHCI) controller

Ordering Information

Model Name	Temperature	Memory	eMMC	Processors
BT9A3	- B	2	0	E45
	B: 0°C to 60°C E: -20°C to 70°C T: -40°C to 85°C	2: 2GB 4: 4GB	0: None 4: 4GB 8: 8GB 1: 16GB	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 BT9A3 board
- 1 QR (Quick Reference)
- 1 DVD

BT9A3 Series

COM Express Mini
Computer-On-Module

EXPANSION INTERFACES

- Supports 1 USB 3.0 port
- Supports 8 USB 2.0 ports
 - 4 integrated USB 2.0 ports
 - 1 USB HSIC for 4 USB 2.0 ports
- Supports 3 PCIe x1 (default); or 1 PCIe x4 (PCIe port 3 share with on board LAN by default)
- Supports LPC interface
- Supports I²C interface
- Supports SMBus interface
- Supports 2 serial interfaces (TX/RX)
- Supports 8-bit Digital I/O

WATCHDOG TIMER

- Watchdog timeout programmable via software from 1 to 255 seconds

DAMAGE FREE INTELLIGENCE

- Monitors CPU/system temperature and overheat alarm
- Monitors Vcore/Vgfx/VDDR/3V3 voltages and failure alarm
- Monitors CPU/system fan speed and failure alarm
- Watchdog timer function

BIOS

- 16Mbit SPI BIOS

POWER CONSUMPTION

- TBD

OS SUPPORT

- TBD

TEMPERATURE

- Operating
 - Atom: 0°C to 60°C, -20°C to 70°C, -40°C to 85°C
 - Celeron: 0°C to 60°C
- Storage: -40°C to 85°C

HUMIDITY

- 5% to 90%

POWER INPUT

- 4.75V~20V, 5VSB, VCC_RTC (ATX mode)
- 4.75V~20V, VCC_RTC (AT mode)

PCB

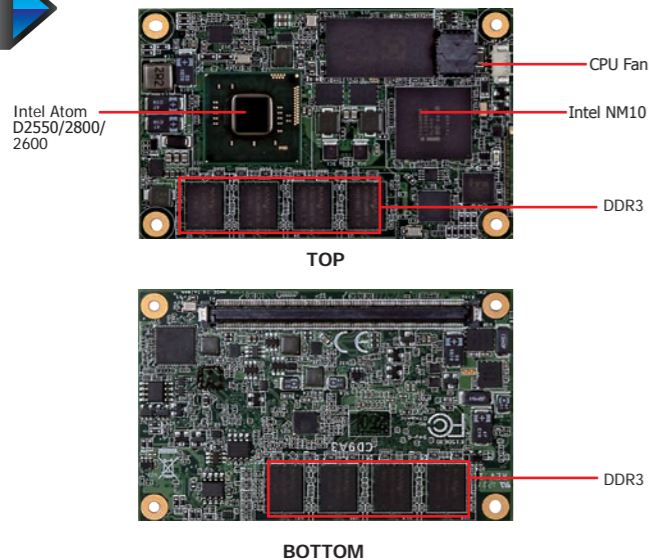
- Dimensions
 - COM Express® Mini
 - 84mm (3.30") x 55mm (2.16")
- Compliance
 - PICMG COM Express® R2.1, Type 10

Optional Items

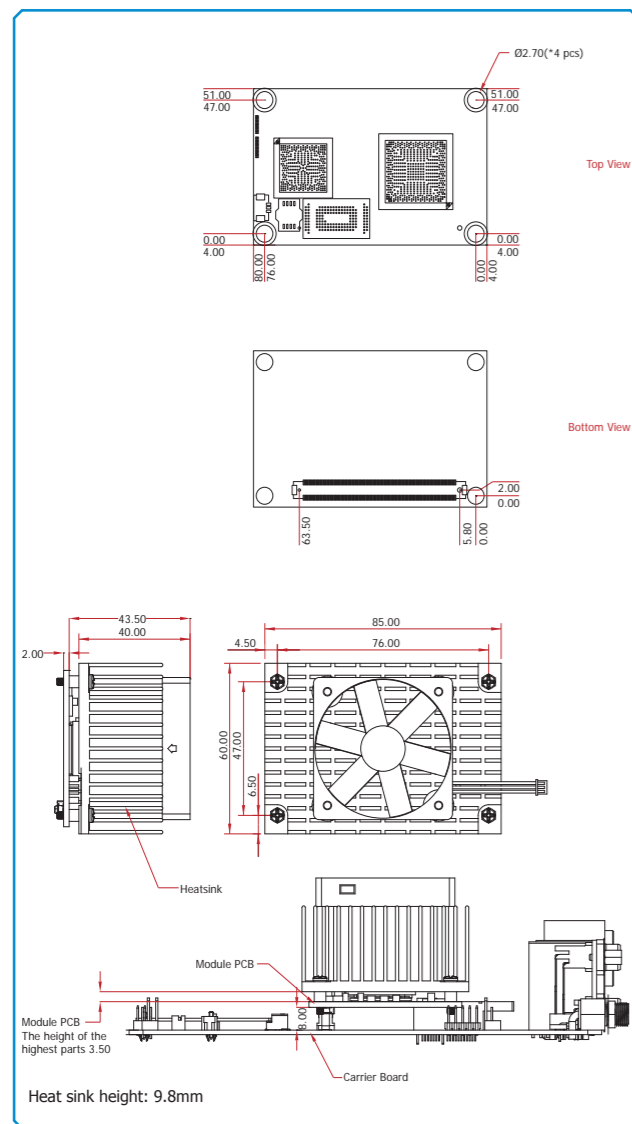
- COM100-B carrier board kit
- Heat sink: TBD
- Heat sink with fan: TBD

CD9A3 Series

Atom



Mechanical Drawing

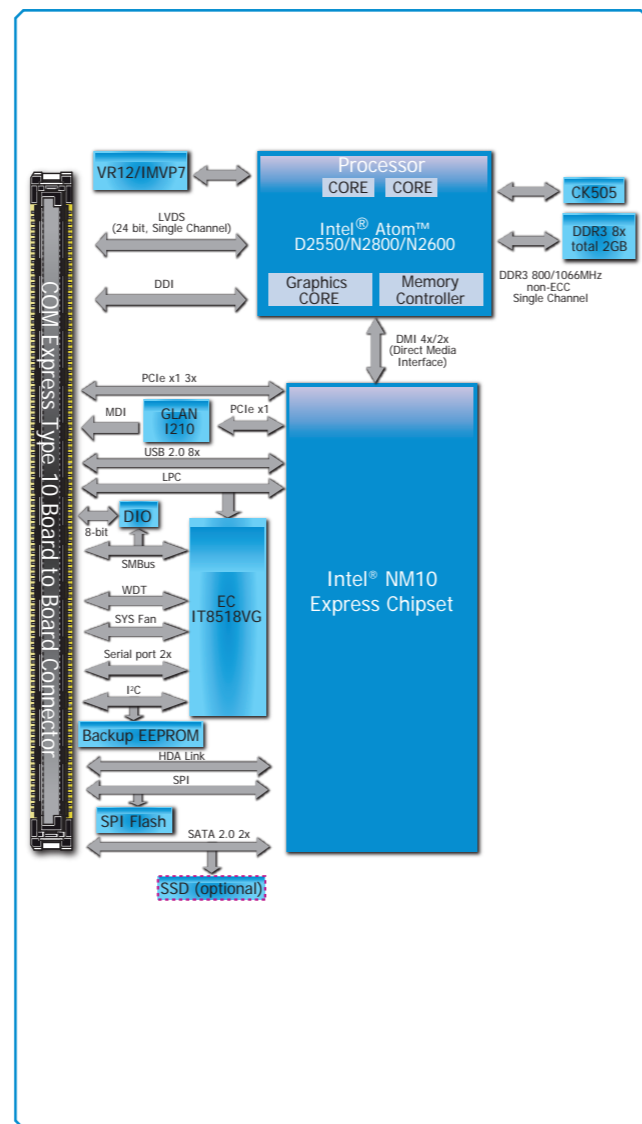


Features

MEMORY	2GB DDR3 onboard
EXPANSION	3 PCIe x1 1 LPC, 1 SMBus, 1 I ² C, 2 serial 1 LVDS, 1 DDI (HDMI/DVI/DP) 8 USB 2.0 2 SATA 2.0 8-bit DIO
LAN	1 LAN
DIMENSIONS	COM Express® R2.1 Mini, Type 10 84mm x 55mm (3.30" x 2.16")



Block Diagram



CD9A3 Series

COM Express Mini
Computer-On-Module

Specifications

PROCESSOR

- CD9A3-25B20:
 - Intel® Atom™ D2550, 1.86GHz, 2x 512K L2, 10W TDP, dual-core
 - Cooling option: heatsink with cooling fan
- CD9A3-28B20:
 - Intel® Atom™ N2800, 1.86GHz, 2x 512K L2, 6.5W TDP, dual-core
 - Cooling option: heatsink (fanless solution)
- CD9A3-26B20:
 - Intel® Atom™ N2600, 1.6GHz, 2x 512K L2, 3.5W TDP, dual-core
 - Cooling option: heatsink (fanless solution)

CHIPSET

- Intel® NM10 Express chipset

SYSTEM MEMORY

- 2GB DDR3 onboard

ONBOARD GRAPHICS FEATURES

- Intel® GMA 3650 (Intel® Atom™ D2550/N2800)
- Intel® GMA 3600 (Intel® Atom™ N2600)
- Supports LVDS and DDI interfaces
- LVDS: resolution up to 1440x900 @ 60Hz, 18/24bit (Intel® Atom™ D2550); resolution up to 1366x768 @ 60Hz, 18bit (Intel® Atom™ N2800/N2600)
- Digital Display Interface: HDMI, DVI and DP
- HDMI, DVI: resolution up to 1920x1200 @ 60Hz
- DP: resolution up to 1600x1200 @ 60Hz
- Supports Hardware H.264/AVC, MPEG-2 video decoder, VC-1, DirectX 9, 1080p decoder

ONBOARD AUDIO FEATURES

- Supports High Definition Audio interface

ONBOARD LAN FEATURES

- Intel® I210AT Gigabit Ethernet Controller
- Integrated 10/100/1000 transceiver
- Fully compliant with IEEE 802.3, IEEE 802.3u, IEEE 802.3ab
- Supports wire management

SERIAL ATA (SATA) INTERFACE

- Supports 2 Serial ATA interfaces
- SATA 2.0 with data transfer rate up to 3Gb/s
- Integrated Advanced Host Controller Interface (AHCI) controller

SSD (optional)

- 4GB/8GB/16GB/32GB
- Write: 30MB/sec (max), Read: 70MB/sec (max)
- SATA to SSD onboard

WATCHDOG TIMER

- Watchdog timeout programmable via software from 1 to 256 seconds

EXPANSION INTERFACES

- Supports 8 USB 2.0 ports
- Supports 3 PCIe x1 interfaces
- Supports LPC interface
- Supports SMBus interface
- Supports I²C interface
- Supports 2 serial interfaces (TX/RX)
- Supports 8-bit Digital I/O

DAMAGE FREE INTELLIGENCE

- Monitors CPU temperature
- Monitors CPU fan speed
- Monitors Vcore/VCC_RTC/DDR3 voltages
- Watchdog timer function

BIOS

- 16Mbit SPI BIOS

OS SUPPORT

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

TEMPERATURE

- Operating: 0°C to 60°C
- Storage: -40°C to 85°C

HUMIDITY

- 10% to 90%

POWER INPUT

- 4.75V~20V, 5VSB, VCC_RTC (ATX mode)
- 4.75V~20V, VCC_RTC (AT mode)

PCB

- Dimensions
 - COM Express® Mini
 - 84mm (3.30") x 55mm (2.16")
- Compliance
 - PICMG COM Express® R2.1, Type 10

CERTIFICATION

- RoHS

Ordering Information

Model Name	Part Number	Description
CD9A3-25B20	777-CD9A31-0F0G	Intel® Atom™ D2550, onboard DDR3 2GB
CD9A3-28B20	777-CD9A31-1F0G	Intel® Atom™ N2800, onboard DDR3 2GB
CD9A3-26B20	777-CD9A31-2F0G	Intel® Atom™ N2600, onboard DDR3 2GB

Packing List

- 1 CD9A3 board
- 1 QR (Quick Reference)
- 1 DVD

Optional Items

- COM100-B carrier board kit
- Heat sink: A71-011020-000G
- Heat sink with fan: 761-CD9030-000G

COM Express® Compact Computer-On-Module

★ **ULT**



★ **QM77**



Model		HU968	CR908-B
Processor		4th Generation Intel® Core™	3rd/2nd Generation Intel® Core™
Chipset		N/A	Intel® QM77
Memory		2GB/4GB/8GB DDR3L onboard	1 DDR3/DDR3L SODIMM up to 8GB
Display		VGA, LVDS, DDI	3 Independent Displays VGA, LVDS, DDI
Ethernet		1 Intel	1 Intel
USB	USB 3.0	2	4
	USB 2.0	8	4
Storage	SATA 3.0	3	2
	SATA 2.0	N/A	2
	SSD	Yes	N/A
	IDE, FDD	N/A	N/A
Expansion	PCIe x16	N/A	1
	PCIe x4	1	1
	PCIe x1	1	3
	PCI	N/A	N/A
Digital I/O		4-bit input and 4-bit output	4-bit input and 4-bit output
Audio Controller		HDA	HDA
LPC		Yes	Yes
SMBus		Yes	Yes
CAN-bus		N/A	N/A
TPM (optional)		Yes	N/A
Watchdog		Yes	Yes
Power Input		12V	12V
Compliance		R2.1, Type 6	R2.0, Type 6
Dimensions		95mm x 95mm	95mm x 95mm

COM Express® Compact Computer-On-Module

★ **QM67**



★ **HM55**

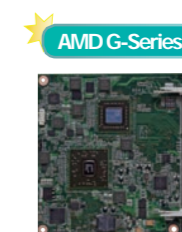
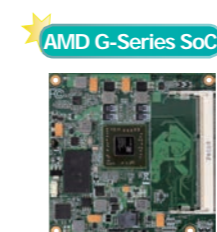


Model		HR908-B	CP908-B
Processor		3rd/2nd Generation Intel® Core™	Intel® Core™ i7/i5/i3/Celeron®
Chipset		Intel® QM67	Intel® HM55
Memory		1 DDR3/DDR3L SODIMM up to 8GB	1 DDR3 SODIMM up to 4GB
Display		VGA, LVDS, DDI	VGA, LVDS
Ethernet		1 Intel	1 Intel
USB	USB 3.0	4	N/A
	USB 2.0	4	8
Storage	SATA 3.0	N/A	N/A
	SATA 2.0	8	4
	SSD	N/A	N/A
	IDE, FDD	N/A	1 IDE
Expansion	PCIe x16	1	1
	PCIe x4	1	N/A
	PCIe x1	3	4
	PCI	N/A	4
Digital I/O		4-bit input and 4-bit output	8-bit
Audio Controller		HDA	HDA
LPC		Yes	Yes
SMBus		Yes	Yes
CAN-bus		N/A	N/A
TPM (optional)		N/A	N/A
Watchdog		Yes	Yes
Power Input		12V	12V
Compliance		R2.0, Type 6	R1.0, Type 2
Dimensions		95mm x 95mm	95mm x 95mm

COM Express® Compact Computer-On-Module



COM Express® Compact Computer-On-Module



Model		BT968 Series	CD905-B Series	LR905-B Series
Processor		Intel® Atom™ E3800 series	Intel® Atom™ D2550/N2800/N2600	Intel® Atom™ D525/D425/N455
Chipset		N/A	Intel® NM10	Intel® ICH8M
Memory		2 DDR3L SODIMM up to 8GB (-E45/-E27/-E26/-J00/-N30) 1 DDR3L SODIMM up to 4GB (-E25/-E15)	1 DDR3 SODIMM up to 4GB (-B2550/-B2800) 1 DDR3 SODIMM up to 2GB (-B2600)	1 DDR3 SODIMM up to 4GB (-B18D/-B18S) 1 DDR3 SODIMM up to 2GB (-B18M)
Display		VGA, LVDS, DDI	VGA, LVDS	VGA, LVDS
Ethernet		1 Intel	1 Intel	1 Intel
USB	USB 3.0	1	N/A	N/A
	USB 2.0	8	8	8
Storage	SATA 3.0	N/A	N/A	N/A
	SATA 2.0	2	2	3
	SSD	N/A	N/A	N/A
	IDE, FDD	N/A	1 IDE	1 IDE
Expansion	PCIe x16	N/A	N/A	N/A
	PCIe x4	N/A	N/A	Supports either 5 PCIe x1 or 1 PCIe x4
	PCIe x1	3	4	N/A
	PCI	N/A	4	4
Digital I/O		8-bit	8-bit	8-bit
Audio Controller		HDA	HDA	HDA
LPC		Yes	N/A	Yes
SMBus		Yes	N/A	Yes
CAN-bus		N/A	N/A	N/A
TPM (optional)		Yes	N/A	N/A
Watchdog		Yes	Yes	Yes
Power Input		12V	12V	12V
Compliance		R2.1, Type 6	R2.0, Type 2	R1.0, Type 2
Dimensions		95mm x 95mm	95mm x 95mm	95mm x 95mm

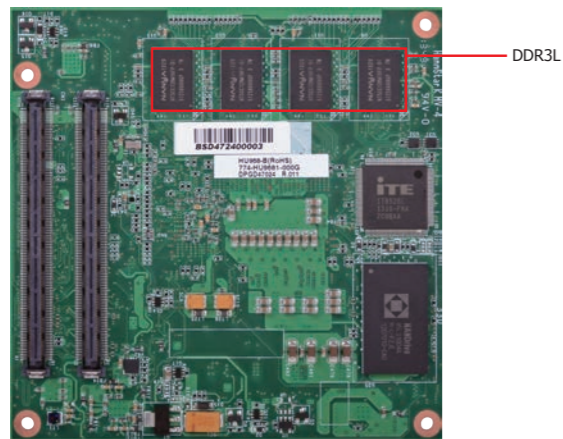
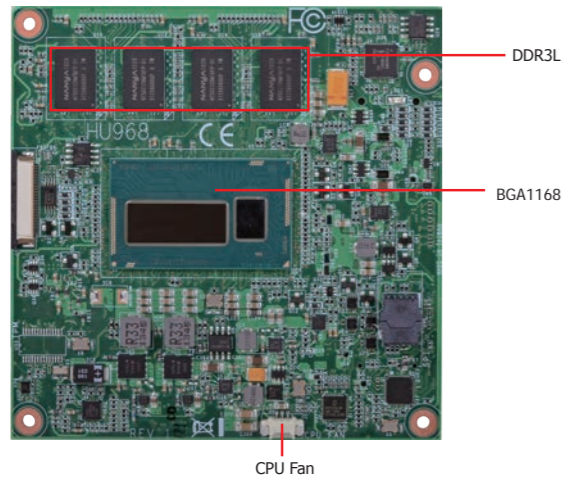
Model		KB968	OT905-BT56N	OT905-BT40N
Processor		AMD® Embedded G-Series SoC	AMD® G-Series	
Chipset		N/A	AMD® A55E	
Memory		1 DDR3 SODIMM up to 8GB	1 DDR3 SODIMM up to 8GB	
Display		VGA, DP/LVDS, DP	VGA, LVDS	
Ethernet		1 Intel	1 Intel	
USB	USB 3.0	2	N/A	
	USB 2.0	6	8	
Storage	SATA 3.0	2	4	
	SATA 2.0	N/A	N/A	
	RAID	N/A	0/1/5/10	
	SSD	Yes (option)	N/A	
	IDE, FDD	N/A	1 IDE	
Expansion	PCIe x16	N/A	N/A	
	PCIe x4	1	N/A	
	PCIe x1	1	6	
	Mini PCIe	N/A	N/A	
	PCI	N/A	4	
Digital I/O		8-bit	8-bit	
Audio Controller		HDA	HDA	
LPC		Yes	Yes	
SMBus		Yes	Yes	
CAN-bus		N/A	N/A	
TPM (optional)		Yes	Yes	
Watchdog		Yes	Yes	
Power Input		12V	12V	
Compliance		R2.1, Type 6	R2.0, Type 2	
Dimensions		95mm x 95mm	95mm x 95mm	

COM Express Compact
Computer-On-Module

HU968

HU968

ULT

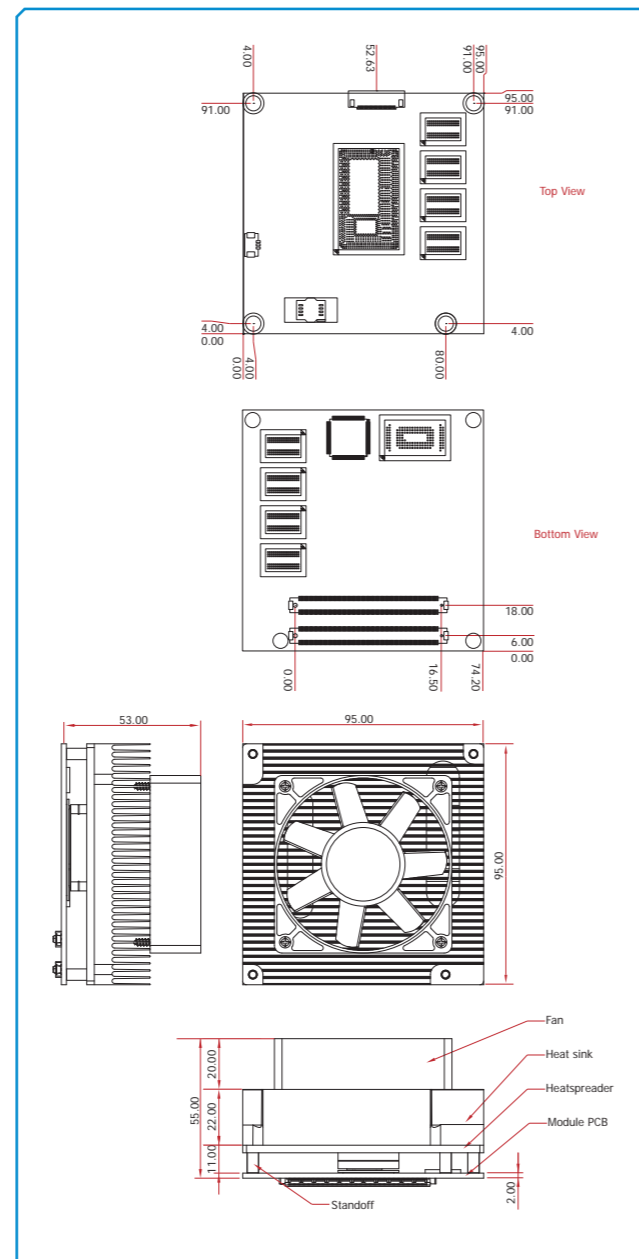


Features

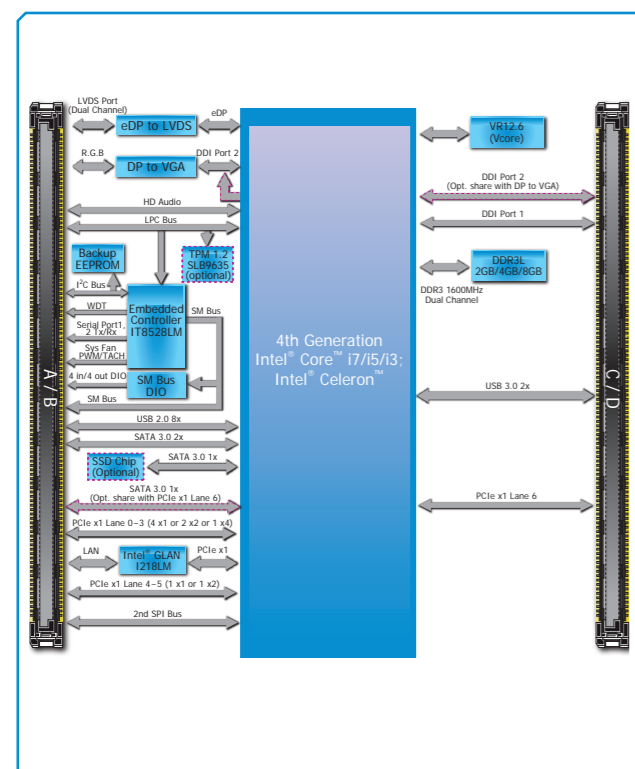
MEMORY	2GB/4GB/8GB DDR3L onboard
EXPANSION	1 PCIe x4, 1 PCIe x2, 1 PCIe x1 1 LPC, 1 SMBus, 1 I ² C, 2 serial 1 VGA, 1 LVDS, 1 DDI (HDMI/DVI/DP) 10 USB: 2 USB 3.0, 8 USB 2.0 3 SATA 3.0 SSD (optional) 4-bit input and 4-bit output GPIO
LAN	1 LAN
DIMENSIONS	COM Express® R2.1 Compact, Type 6 95mm x 95mm (3.74" x 3.74")



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

- 2GB/4GB/8GB DDR3L onboard
- Supports DDR3L 1600MHz
- Supports dual channel memory interface

ONBOARD GRAPHICS FEATURES

- Intel® HD Graphics GT Series
- Supports VGA, LVDS and DDI interfaces
- VGA: Chronitel CH7517, resolution up to 1920x1200 @ 60Hz
- LVDS: NXP PTN3460, 24-bit, dual channel, resolution up to 1920x1200 @ 60Hz
- Digital Display Interface: HDMI, DVI and DP
- HDMI, DVI: resolution up to 4096x2304 @ 24Hz
- DP: resolution up to 3200x2000 @ 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

- Supports High Definition Audio interface

ONBOARD LAN FEATURES

- Intel® I218LM 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 (SATA) INTERFACE

- Supports 3 SATA 3.0 with data transfer rate up to 6Gb/s
- One shares with PCIe Lane 6
- Integrated Advanced Host Controller Interface (AHCI) controller
- Supports RAID 0/1/5
- Supports Intel® Smart Response Technology

SSD (optional)

- 2GB/4GB/8GB/16GB/32GB/64GB
- Write: 30MB/sec (max), Read: 70MB/sec (max)
- SATA to SSD onboard

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) - optional

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

EXPANSION INTERFACES

- Supports 2 USB 3.0 interfaces
- Supports 8 USB 2.0 interfaces
- Supports 1 PCIe x4; or 2 PCIe x2; or 4 PCIe x1 interfaces
- Supports 1 PCIe x2; or 1 PCIe x1 interface
- Supports 1 PCIe x1 interface (PCIe Lane 6 shares with 1 SATA 3.0 port)
- Supports LPC interface
- Supports SMBus interface
- Supports I²C interface
- Supports 2 serial interfaces (TX/RX)
- Supports 4-bit input and 4-bit output GPIO

DAMAGE FREE INTELLIGENCE

- Monitors CPU temperature and overheat alarm
- Monitors CPU fan speed and failure alarm
- Monitors Vcore/1.05V/DDR voltages and failure alarm
- Watchdog timer function

BIOS

- AMI BIOS
- 64Mbit SPI BIOS

WATCHDOG TIMER

- Software programmable from 1 to 255 seconds

POWER

- Input: 12V, VCC_RTC, 5VSB (option)

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)
- Windows 8.1 Enterprise x86 (32-bit)
- Windows 8.1 Enterprise x64 (64-bit)

TEMPERATURE

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

HUMIDITY

- 5% to 90%

PCB

- Dimensions
 - COM Express® Compact
 - 95mm (3.74") x 95mm (3.74")
- Compliance
 - PICMG COM Express® R2.1, Type 6

Ordering Information

Model Name	Temperature	Memory	SSD	Processors
HU968	- B B: 0°C to 60°C	2 4: 4GB 8: 8GB	0 2: 2GB 4: 4GB 8: 8GB 1: 16GB 3: 32GB 6: 64GB	- 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 HU968 board
- 1 QR (Quick Reference)
- 1 DVD

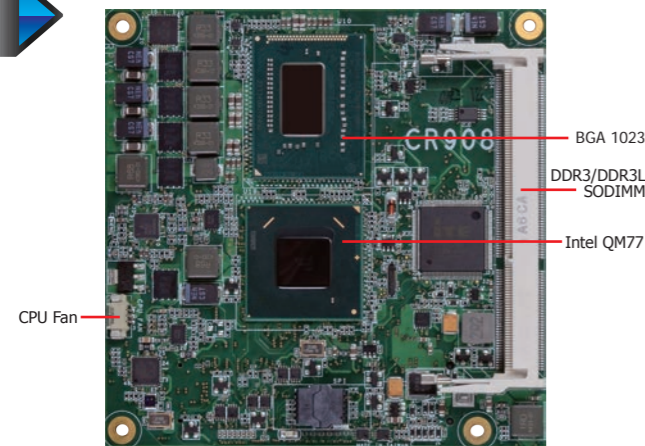
Optional Items

- COM331-B carrier board kit
- COM101-BAT carrier board kit
- Heat spreader with heat sink and fan: 761-HU9681-000G

CR908-B

CR908-B

QM77

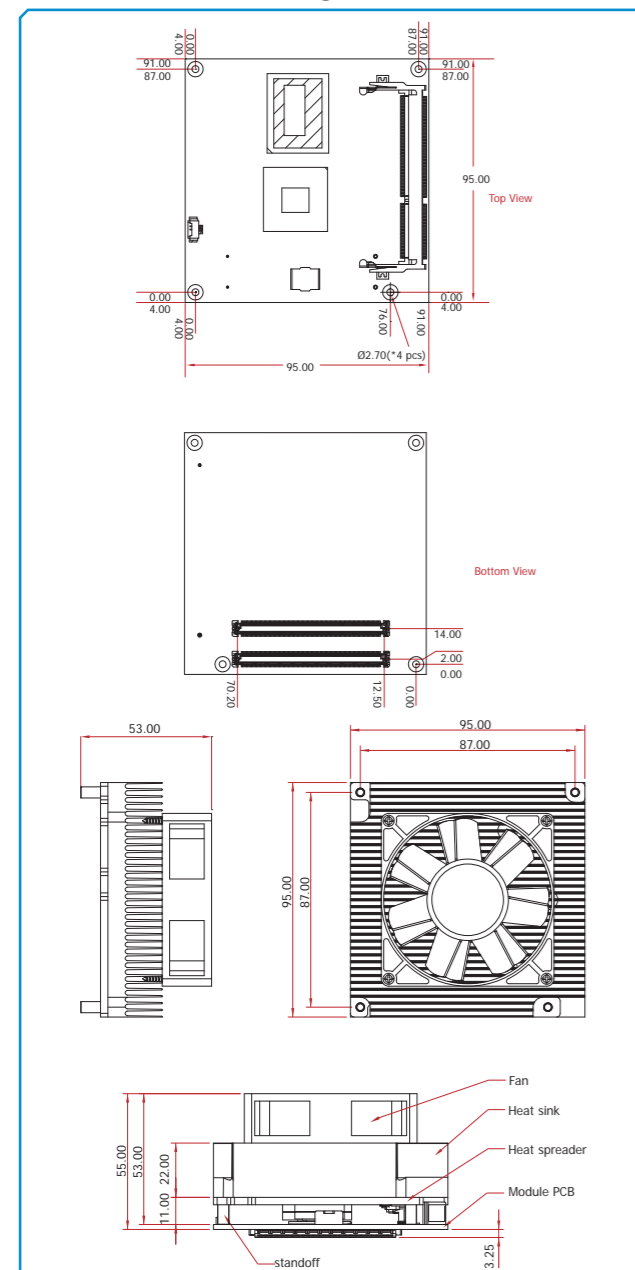


Features

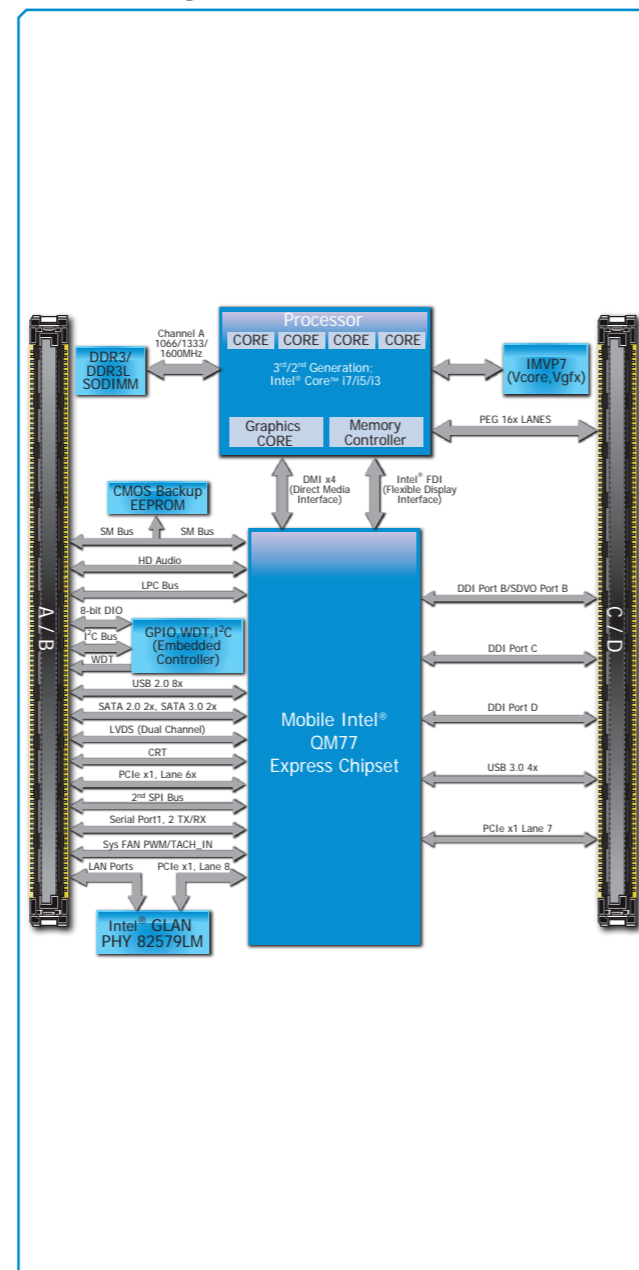
MEMORY	1 DDR3/DDR3L SODIMM up to 8GB
EXPANSION	1 PCIe x16, 7 PCIe x1 1 LPC, 1 SMBus, 1 I ² C, 2 serial 1 VGA, 1 LVDS, 3 DDI (HDMI/DVI/DP/SDVO) 8 USB: 4 USB 3.0/2.0, 4 USB 2.0 4 SATA: 2 SATA 3.0, 2 SATA 2.0 4-bit input and 4-bit output GPIO
LAN	1 LAN
DIMENSIONS	COM Express® R2.1 Compact, Type 6 95mm x 95mm (3.74" x 3.74")



Mechanical Drawing



Block Diagram



Specifications

- PROCESSOR**
- BGA 1023 packaging technology
 - 3rd generation Intel® Core™ processors (22nm process technology)
 - 2nd generation Intel® Core™ processors (32nm process technology)
 - Please refer to the Ordering Information below
- CHIPSET**
- Intel® QM77 Express chipset
- SYSTEM MEMORY**
- One 204-pin SODIMM socket
 - Supports DDR3 SODIMM
- | 3rd Generation Processors | 2nd Generation Processors |
|---------------------------|-----------------------------------|
| DDR3 1066/1333/1600MHz | DDR3 1066/1333MHz (i5/i3/Celeron) |
| | DDR3 1600MHz (i7) |
- Supports DDR3L SODIMM
 - 1066/1333MHz when operating at 1.35V
 - 1066/1333/1600MHz when operating at 1.5V
 - 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

ONBOARD GRAPHICS FEATURES

- Intel® HD Graphics 4000 (3rd generation processors)
- Intel® HD Graphics 3000 (2nd generation processors)
- Intel® HD Graphics (Intel® Celeron™ processors)
- Supports VGA, LVDS and DDI interfaces
- VGA: resolution up to 1920x1200 @ 60Hz
- LVDS: Single Channel - 18/24-bit; Dual Channel - 36/48-bit, resolution up to 1920x1200 @ 60Hz
- Digital Display Interfaces: HDMI, DVI, DP and SDVO
- HDMI, DVI, DP: resolution up to 1920x1200 @ 60Hz
- Intel® Clear Video Technology
- DirectX Video Acceleration (DXVA) for accelerating video processing
- Full AVC/VC1/MPEG2 HW Decode
- Supports DirectX 11/10.1/10/9 and OpenGL 3.0 (3rd generation processors)
- Supports DirectX 10.1/10/9 and OpenGL 3.0 (2nd generation processors)

ONBOARD AUDIO FEATURES

- Supports High Definition Audio interface

ONBOARD LAN FEATURES

- Intel® 82579LM Gigabit Ethernet PHY
- Integrated 10/100/1000 transceiver
- Fully compliant with IEEE 802.3, IEEE 802.3u, IEEE 802.3ab

SERIAL ATA (SATA) INTERFACE

- Supports 4 Serial ATA interfaces
- 2 SATA 3.0 with data transfer rate up to 6Gb/s
- 2 SATA 2.0 with data transfer rate up to 3Gb/s
- Integrated Advanced Host Controller Interface (AHCI) controller
- Supports RAID 0/1/5/10

USB INTERFACE

- XHCI Host Controller supports up to 4 super speed USB 3.0 ports

Ordering Information

	Model Name	Part Number	Description
3rd Gen Processors	CR908-B3120ME	777-CR9081-400G	Intel® Core™ i3-3120ME, 3M Cache, 2.40 GHz, 35W
	CR908-B810E	777-CR9081-E00G	Intel® Celeron™ B810E, 2M Cache, 1.6GHz, 35W
2nd Gen Processors	CR908-B847E	777-CR9081-F00G	Intel® Celeron™ 847E, 2M Cache, 1.1GHz, 17W
	CR908-B827E	777-CR9081-700G	Intel® Celeron™ 827E, 1.5M Cache, 1.4GHz, 17W

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

	Model Name	Part Number	Description
3rd Gen Processors	CR908-B3615QE	777-CR9081-600G	Intel® Core™ i7-3615QE, 6M Cache, up to 3.30 GHz, 45W
	CR908-B3612QE	777-CR9081-000G	Intel® Core™ i7-3612QE, 6M Cache, up to 3.10 GHz, 35W
	CR908-B3555LE	777-CR9081-100G	Intel® Core™ i7-3555LE, 4M Cache, up to 3.20 GHz, 25W
	CR908-B3517UE	777-CR9081-200G	Intel® Core™ i7-3517UE, 4M Cache, up to 2.80 GHz, 17W
	CR908-B3610ME	777-CR9081-300G	Intel® Core™ i5-3610ME, 3M Cache, up to 3.30 GHz, 35W
	CR908-B3217UE	777-CR9081-500G	Intel® Core™ i3-3217UE, 3M Cache, 1.60 GHz, 17W
	CR908-B1020E	777-CR9081-100G	Intel® Celeron™ 1020E, 2M Cache, 2.20 GHz, 35W
2nd Gen Processors	CR908-B1047UE	777-CR9081-J00G	Intel® Celeron™ 1047UE, 2M Cache, 1.40 GHz, 17W
	CR908-B927UE	777-CR9081-K00G	Intel® Celeron™ 927UE, 1M Cache, 1.50 GHz, 17W
	CR908-B2715QE	777-CR9081-800G	Intel® Core™ i7-2715QE, 6M Cache, up to 3.00 GHz, 45W
	CR908-B2655LE	777-CR9081-900G	Intel® Core™ i7-2655LE, 4M Cache, up to 2.90 GHz, 25W
	CR908-B2610UE	777-CR9081-A00G	Intel® Core™ i7-2610UE, 4M Cache, up to 2.40 GHz, 17W
	CR908-B2515E	777-CR9081-B00G	Intel® Core™ i5-2515E, 3M Cache, up to 3.10 GHz, 35W
	CR908-B2310E	777-CR9081-C00G	Intel® Core™ i3-2310E, 3M Cache, 2.10 GHz, 35W
	CR908-B2340UE	777-CR9081-D00G	Intel® Core™ i3-2340UE, 3M Cache, 1.30 GHz, 17W
	CR908-B807UE	777-CR9081-G00G	Intel® Celeron™ 807UE, 1M Cache, 1.00 GHz, 10W

Packing List

- 1 CR908 board
- 1 QR (Quick Reference)
- 1 DVD

WATCHDOG TIMER

- Watchdog timeout programmable via software from 1 to 255 seconds

EXPANSION INTERFACES

- Supports 8 USB 2.0 interfaces (4 supports USB 3.0)
- Supports 1 PCIe x16 interface
- Supports Gen 3.0
- Configurations (supported only via a riser card):
 - One x8 (GFX) and two x4 (I/O)
 - Two x8 (GFX, I/O)
 - One x16 (GFX, I/O)
- Supports 1 PCIe x4 and 3 PCIe x1 (default); or 7 PCIe x1 interfaces
- Supports LPC interface
- Supports SMBus interface
- Supports I²C interface
- Supports 2 serial interfaces (TX/RX)
- Supports 4-bit input and 4-bit output GPIO

BIOS

- 64Mbit UEFI SPI BIOS

DAMAGE FREE INTELLIGENCE

- Monitors CPU temperature
- Monitors CPU fan speed
- Monitors Vcore/VGFX/DDR voltages
- Watchdog timer function

POWER CONSUMPTION

- 35.42 W with i7-3612QE at 2.1GHz and 1x 2GB 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)
- 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%

POWER

- Input: 12V, 5VSB, VCC_RTC

PCB

- Dimensions
- COM Express® Compact
- 95mm (3.74") x 95mm (3.74")
- Compliance
- PICMG COM Express® R2.1 Compact form factor, Type 6

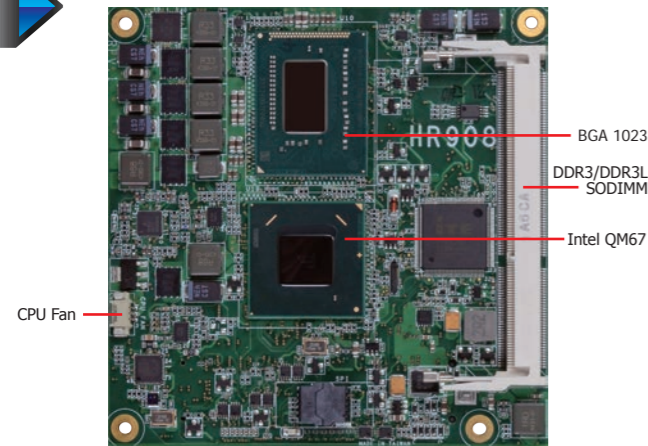
CERTIFICATION

- CE, FCC Class B, UL, RoHS

COM Express Compact
Computer-On-Module

HR908-B

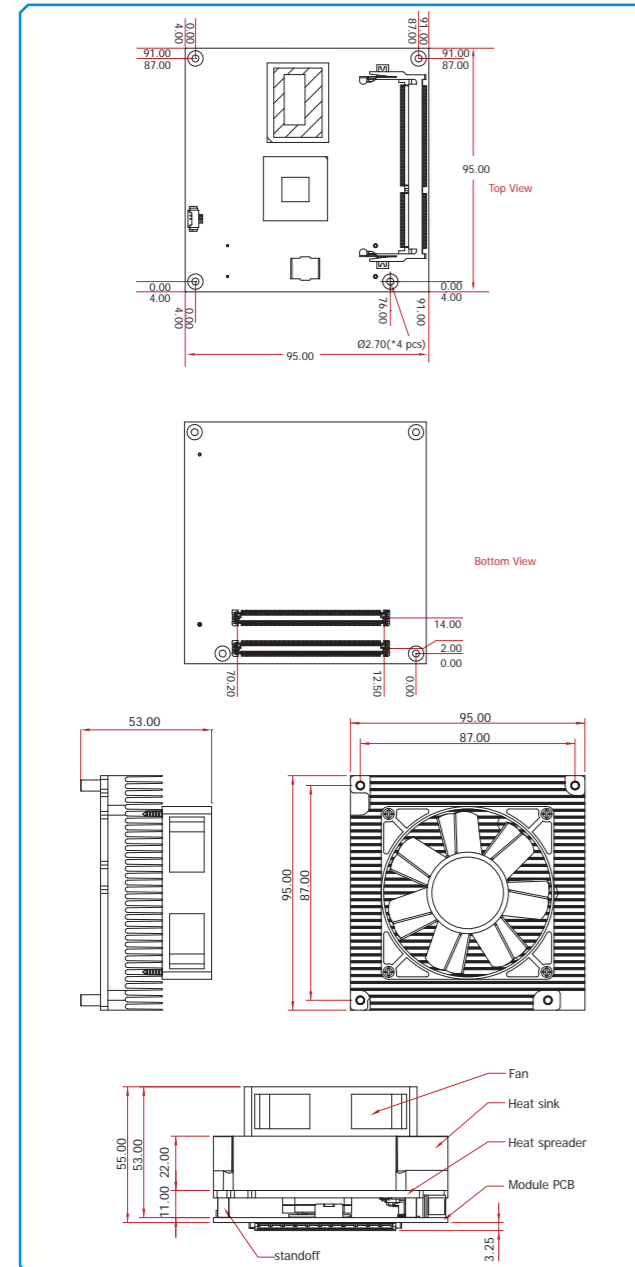
QM67



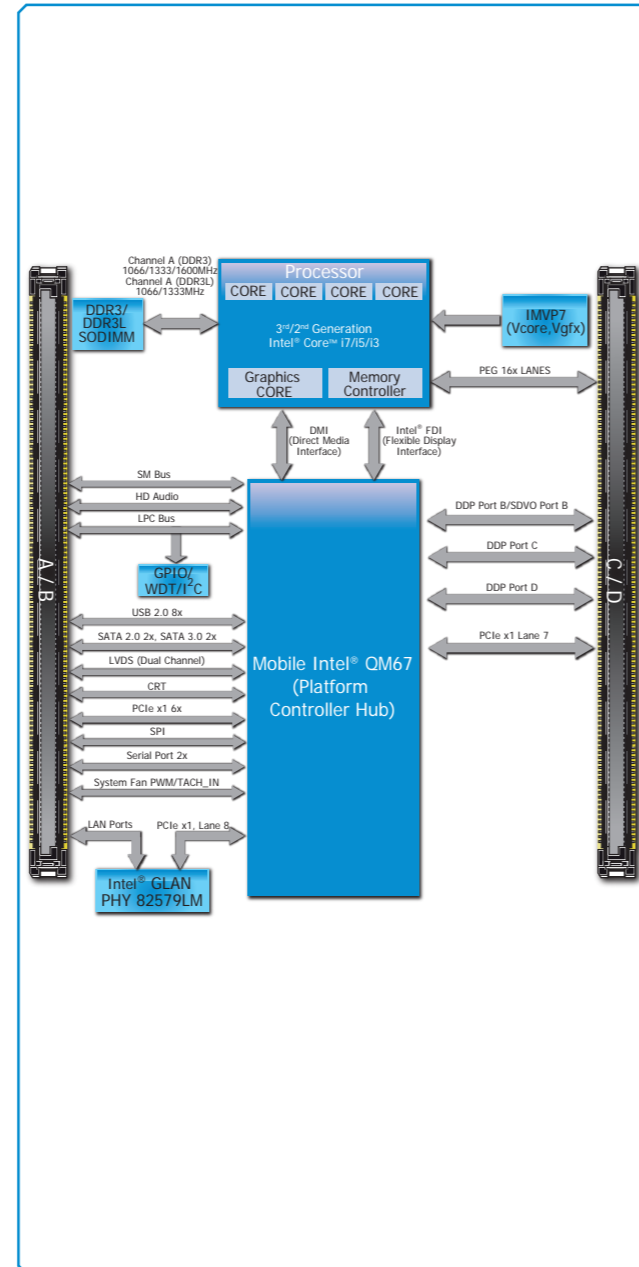
Features

MEMORY	1 DDR3/DDR3L SODIMM up to 8GB
EXPANSION	1 PCIe x16, 1 PCIe x4, 3 PCIe x1 1 LPC, 1 SMBus, 1 I ² C, 2 serial 1 VGA, 1 LVDS, 3 DDI (HDMI/DVI/DP/SDVO) 8 USB 2.0 4 SATA: 2 SATA 3.0, 2 SATA 2.0 4-bit input and 4-bit output GPIO
LAN	1 LAN
DIMENSIONS	COM Express® R2.1 Compact, Type 6 95mm x 95mm (3.74" x 3.74")

Mechanical Drawing



Block Diagram



HR908-B

Specifications

PROCESSOR

- BGA 1023 packaging technology
 - 3rd generation Intel® Core™ processors (22nm process technology)
 - 2nd generation Intel® Core™ processors (32nm process technology)
- Please refer to the Ordering Information below

CHIPSET

- Intel® QM67 Express chipset

SYSTEM MEMORY

- One 204-pin SODIMM socket
- Supports DDR3 SODIMM

3rd Generation Processors	2nd Generation Processors
DDR3 1066/1333/1600MHz	DDR3 1066/1333MHz (i5/i3/Celeron)
	DDR3 1600MHz (i7)

- Supports DDR3L SODIMM
- 1066/1333MHz when operating at 1.35V
- 1066/1333/1600MHz when operating at 1.5V
- 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

ONBOARD GRAPHICS FEATURES

- Intel® HD Graphics 4000 (3rd generation processors)
- Intel® HD Graphics 3000 (2nd generation processors)
- Intel® HD Graphics (Intel® Celeron™ processors)
- Supports VGA, LVDS and DDI interfaces
- VGA: resolution up to 1920x1200 @ 60Hz
- LVDS: Single Channel - 18/24-bit; Dual Channel - 36/48-bit, resolution up to 1920x1200 @ 60Hz
- Digital Display Interfaces: HDMI, DVI, DP and SDVO
- HDMI, DVI, DP: resolution up to 1920x1200 @ 60Hz
- Intel® Clear Video Technology
- DirectX Video Acceleration (DXVA) for accelerating video processing
- Full AVC/VC1/MPEG2 HW Decode
- Supports DirectX 11/10.1/10/9 and OpenGL 3.0 (3rd generation processors)
- Supports DirectX 10.1/10/9 and OpenGL 3.0 (2nd generation processors)

ONBOARD AUDIO FEATURES

- Supports High Definition Audio interface

ONBOARD LAN FEATURES

- Intel® 82579LM Gigabit Ethernet PHY
- Integrated 10/100/1000 transceiver
- Fully compliant with IEEE 802.3, IEEE 802.3u, IEEE 802.3ab

SERIAL ATA (SATA) INTERFACE

- Supports 4 Serial ATA interfaces
- 2 SATA 3.0 with data transfer rate up to 6Gb/s
- 2 SATA 2.0 with data transfer rate up to 3Gb/s
- Integrated Advanced Host Controller Interface (AHCI) controller
- Supports RAID 0/1/5/10

WATCHDOG TIMER

- Watchdog timeout programmable via software from 1 to 255 seconds

EXPANSION INTERFACES

- Supports 8 USB 2.0 interfaces
- Supports 1 PCIe x16 interface
- Supports Gen 3.0 (3rd generation processors)
- Configurations (supported only via a riser card):
 - One x8 (GFX) and two x4 (I/O)
 - Two x8 (GFX, I/O)
 - One x16 (GFX, I/O)
- Supports 1 PCIe x4 and 3 PCIe x1 (default); or 7 PCIe x1 interfaces
- Supports LPC interface
- Supports SMBus interface
- Supports I²C interface
- Supports 2 serial interfaces (TX/RX)
- Supports 4-bit input and 4-bit output GPIO

BIOS

- 64Mbit UEFI SPI BIOS

DAMAGE FREE INTELLIGENCE

- Monitors CPU temperature
- Monitors CPU fan speed
- Monitors Vcore/VGFX/DDR voltages
- 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)
- 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%

POWER

- Input: 12V, 5VSB, VCC_RTC

PCB

- Dimensions
 - COM Express® Compact
 - 95mm (3.74") x 95mm (3.74")
- Compliance
 - PICMG COM Express® R2.1 Compact form factor, Type 6

Ordering Information

	Model Name	Part Number	Description
3rd Gen Processors	HR908-B3120ME	777-HR9081-400G	Intel® Core™ i3-3120ME, 3M Cache, 2.40 GHz, 35W
	HR908-B810E	777-HR9081-E00G	Intel® Celeron™ B810E, 2M Cache, 1.6GHz, 35W
2nd Gen Processors	HR908-B847E	777-HR9081-F00G	Intel® Celeron™ 847E, 2M Cache, 1.1GHz, 17W
	HR908-B827E	777-HR9081-700G	Intel® Celeron™ 827E, 1.5M Cache, 1.4GHz, 17W

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

	Model Name	Part Number	Description
3rd Gen Processors	HR908-B3615QE	777-HR9081-600G	Intel® Core™ i7-3615QE, 6M Cache, up to 3.30 GHz, 45W
	HR908-B3612QE	777-HR9081-000G	Intel® Core™ i7-3612QE, 6M Cache, up to 3.10 GHz, 35W
	HR908-B3555LE	777-HR9081-100G	Intel® Core™ i7-3555LE, 4M Cache, up to 3.20 GHz, 25W
	HR908-B3517UE	777-HR9081-200G	Intel® Core™ i7-3517UE, 4M Cache, up to 2.80 GHz, 17W
	HR908-B3610ME	777-HR9081-300G	Intel® Core™ i5-3610ME, 3M Cache, up to 3.30 GHz, 35W
	HR908-B3217UE	777-HR9081-500G	Intel® Core™ i3-3217UE, 3M Cache, 1.60 GHz, 17W
	HR908-B1020E	777-HR9081-H00G	Intel® Celeron™ 1020E, 2M Cache, 2.20 GHz, 35W
	HR908-B1047UE	777-HR9081-I00G	Intel® Celeron™ 1047UE, 2M Cache, 1.40 GHz, 17W
2nd Gen Processors	HR908-B927UE	777-HR9081-J00G	Intel® Celeron™ 927UE, 1M Cache, 1.50 GHz, 17W
	HR908-B2715QE	777-HR9081-800G	Intel® Core™ i7-2715QE, 6M Cache, up to 3.00 GHz, 45W
	HR908-B2655LE	777-HR9081-900G	Intel® Core™ i7-2655LE, 4M Cache, up to 2.90 GHz, 25W
	HR908-B2610UE	777-HR9081-A00G	Intel® Core™ i7-2610UE, 4M Cache, up to 2.40 GHz, 17W
	HR908-B2515E	777-HR9081-B00G	Intel® Core™ i5-2515E, 3M Cache, up to 3.10 GHz, 35W
	HR908-B2310E	777-HR9081-C00G	Intel® Core™ i3-2310E, 3M Cache, 2.10 GHz, 35W
	HR908-B2340UE	777-HR9081-D00G	Intel® Core™ i3-2340UE, 3M Cache, 1.30 GHz, 17W
HR908-B807UE	777-HR9081-G00G	Intel® Celeron™ 807UE, 1M Cache, 1.00 GHz, 10W	

Packing List

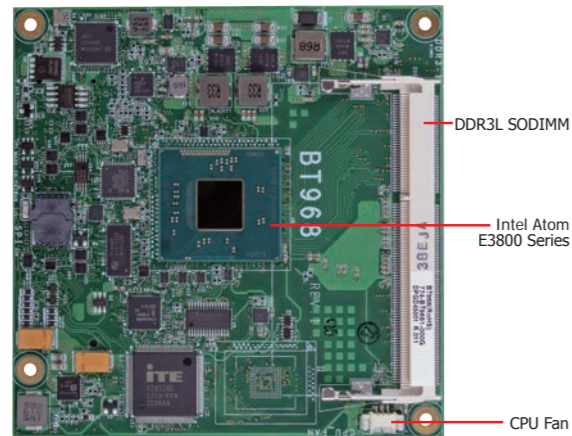
- 1 HR908 board
- 1 QR (Quick Reference)
- 1 DVD

Optional Items

- COM331-B carrier board kit
- COM101-BAT carrier board kit
- Heat spreader: TBD
- Heat spreader with heat sink and fan: TBD
- Heat sink with fan: A71-111008-000G

BT968 Series

Atom

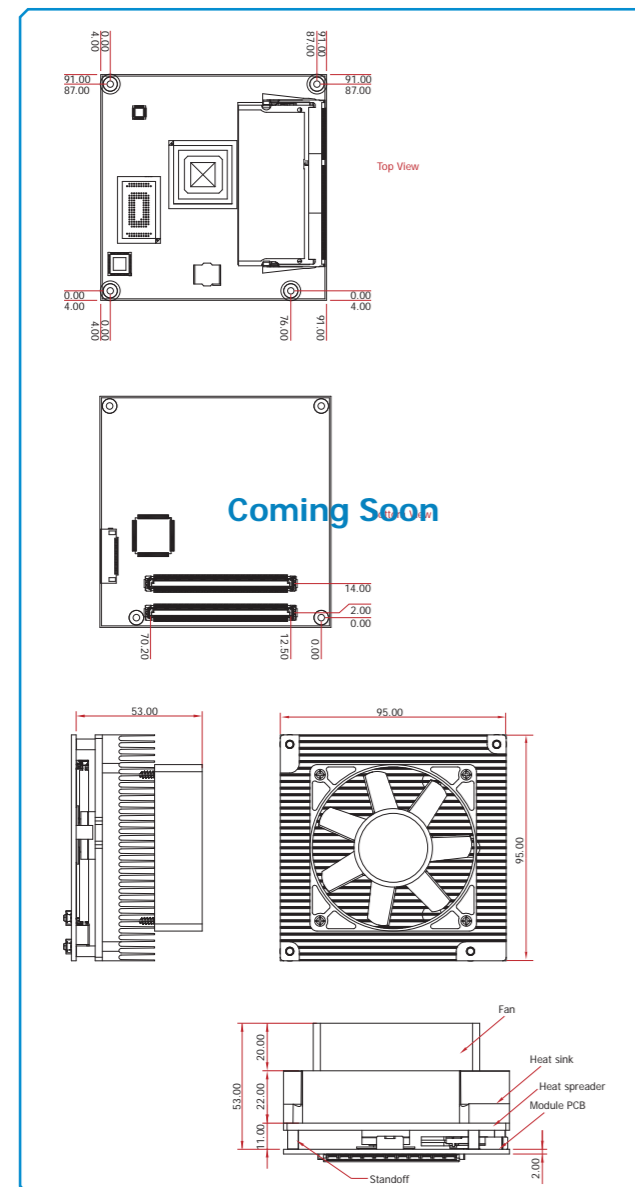


Features

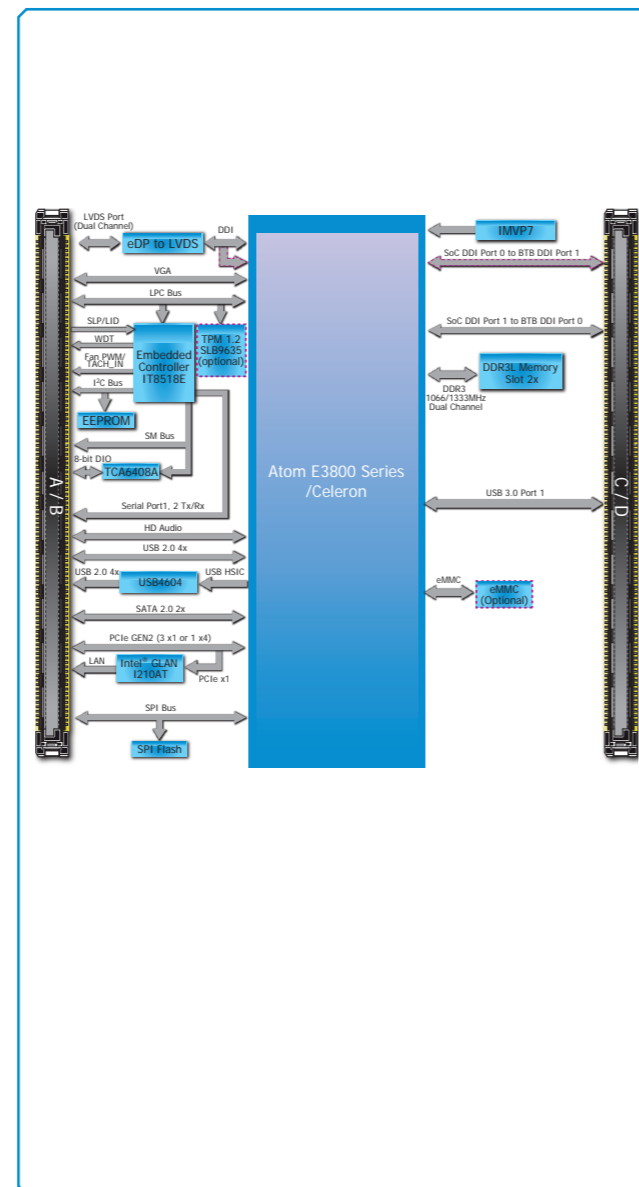
MEMORY	2 DDR3L SODIMM up to 8GB (-E45/-E27/-E26/-J00/-N30) 1 DDR3L SODIMM up to 4GB (-E25/-E15/-N07)
STORAGE	4GB/8GB/16GB eMMC onboard (optional)
EXPANSION	3 PCIe x1 1 LPC, 1 SMBus, 1 I ² C, 2 serial 1 VGA, 1 LVDS, 1 DDI (HDMI/DVI/DP) 1 HDA 9 USB: 1 USB 3.0, 8 USB 2.0 2 SATA 2.0 8-bit DIO
LAN	1 LAN
DIMENSIONS	COM Express® R2.1 Compact, Type 6 95mm x 95mm (3.74" x 3.74")



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

- Two 204-pin DDR3L SODIMM sockets (-E45/-E27/-E26/-J00/-N30)
 - up to 8GB system memory
 - dual channel memory interface
- One 204-pin DDR3L SODIMM socket (-E25/-E15/-N07)
 - up to 4GB system memory
 - single channel memory interface
- Supports DDR3L 1333MHz (-E45/-E27/-J00/-N30/-N07)
- Supports DDR3L 1066MHz (-E26/-E25/-E15)
- DRAM device technologies: 1Gb, 2Gb and 4Gb DDR3L DRAM technologies are supported for x8 and x16 devices, unbuffered, non-ECC

STORAGE

- Supports 4GB, 8GB and 16GB eMMC onboard (optional)

ONBOARD GRAPHICS FEATURES

- Intel® HD Graphics
- Supports VGA, LVDS (default)/DDI and DDI interfaces
- Supports 2 display interfaces at the same time
- VGA: 24-bit, resolution up to 2560x1600 @ 60Hz
- LVDS: NXP PTN3460, 24-bit, dual channel, resolution up to 1920x1200 @ 60Hz
- Digital Display Interface: HDMI, DVI and DP
- HDMI, DVI: resolution up to 2560x1600 @ 24Hz
- DP: resolution up to 2560x1600 @ 60Hz
- Supports hardware acceleration for DirectX 11, OCL 1.2, OGL 3.2, H.264, MPEG2, MVC, VC-1, WMV9 and VP8

ONBOARD AUDIO FEATURES

- Supports High Definition Audio interface

ONBOARD LAN FEATURES

- Intel® I210AT Gigabit Ethernet Controller
- Integrated 10/100/1000 transceiver
- Fully compliant with IEEE 802.3, IEEE 802.3u, IEEE 802.3ab

SERIAL ATA (SATA) INTERFACE

- Supports 2 Serial ATA interfaces
- SATA 2.0 with data transfer rate up to 3Gb/s
- Integrated Advanced Host Controller Interface (AHCI) controller

TRUSTED PLATFORM MODULE (TPM) - optional

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

Ordering Information

Model Name	Temperature	Memory	eMMC	Processors
BT968	- B B: 0°C to 60°C E: -20°C to 70°C T: -40°C to 85°C	S S: Socket	0 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 BT968 board
- 1 QR (Quick Reference)
- 1 DVD

BT968 Series

WATCHDOG TIMER

- Watchdog timeout programmable via software from 1 to 255 seconds

EXPANSION INTERFACES

- Supports 1 USB 3.0 port
- Supports 8 USB 2.0 ports
 - 4 integrated USB 2.0 ports
 - 1 USB HSIC for 4 USB 2.0 Ports
- Supports 3 PCIe x1 (default); or 1 PCIe x4 (PCIe port 3 share with on board LAN by default)
- Supports LPC interface
- Supports I²C interface
- Supports SMBus interface
- Supports 2 serial interfaces (TX/RX)
- Supports 8-bit Digital I/O

DAMAGE FREE INTELLIGENCE

- Monitors CPU temperature
- Monitors Vcore/Vgfx/VDDR/1V0/VBAT voltages
- Monitors CPU/system fan speed
- Watchdog timer function

BIOS

- TBD

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)
- Windows 8.1 Enterprise x86 (32-bit)
- Windows 8.1 Enterprise x64 (64-bit)

TEMPERATURE

- Operating
 - Atom: 0°C to 60°C, -20°C to 70°C, -40°C to 85°C
 - Celeron: 0°C to 60°C
- Storage: -40°C to 85°C

HUMIDITY

- 5% to 90%

POWER INPUT

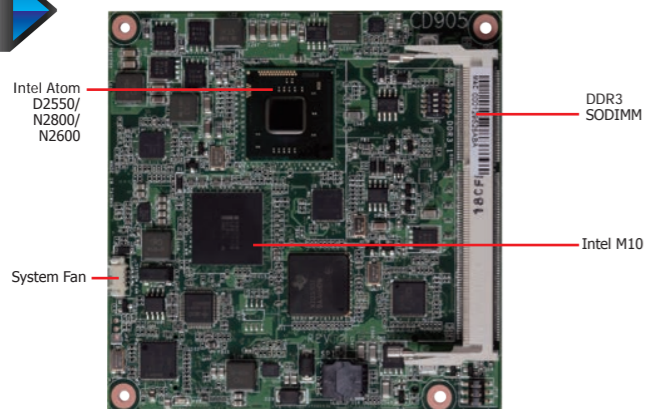
- 12V, 5VSB, VCC_RTC (ATX mode)
- 12V, VCC_RTC (AT mode)

PCB

- Dimensions
 - COM Express® Compact
 - 95mm (3.74") x 95mm (3.74")
- Compliance
 - PICMG COM Express® R2.1, Type 6

CD905-B Series

Atom

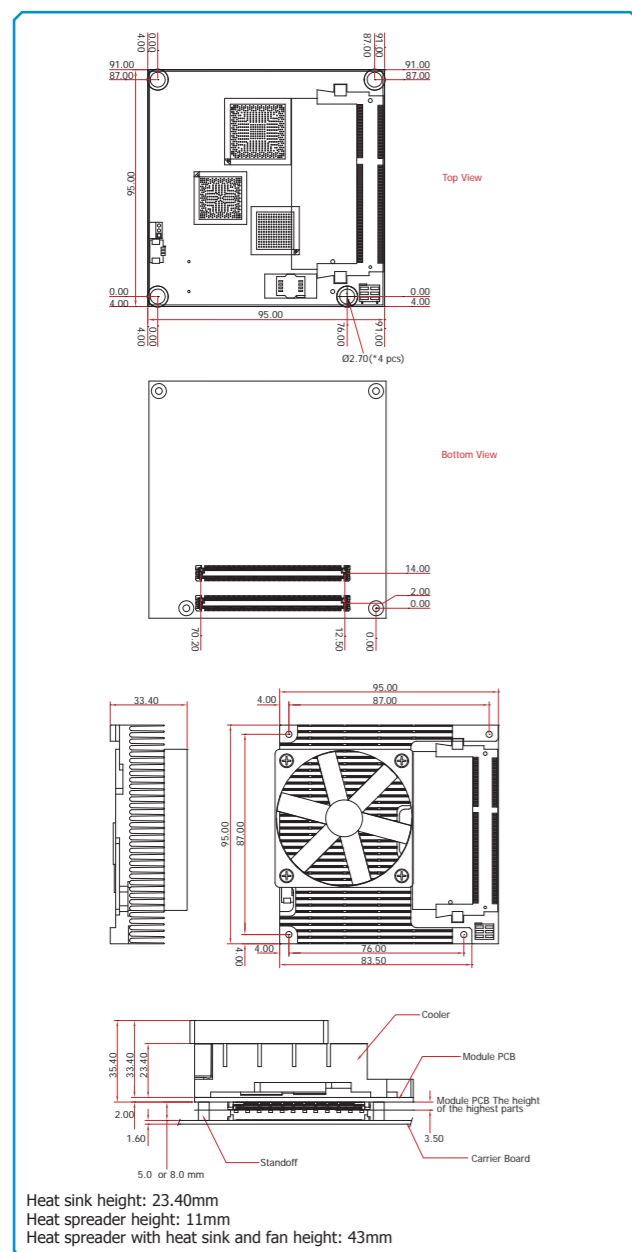


Features

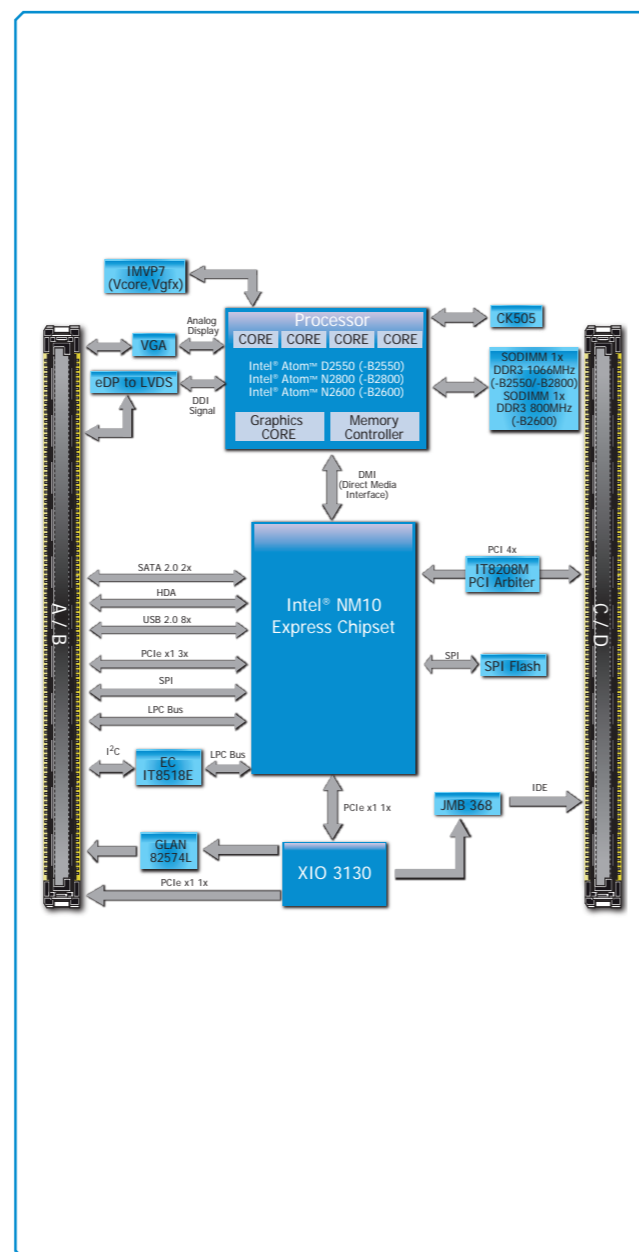
MEMORY	1 DDR3 SODIMM up to 4GB (-B2550/-B2800) 1 DDR3 SODIMM up to 2GB (-B2600)
EXPANSION	4 PCIe x1, 4 PCI 1 LPC, 1 I ² C, 1 IDE 1 VGA, 1 LVDS 8 USB 2.0 2 SATA 2.0 8-bit DIO
LAN	1 LAN
DIMENSIONS	COM Express® R2.0 Compact, Type 2 95mm x 95mm (3.74" x 3.74")



Mechanical Drawing



Block Diagram



CD905-B Series

Specifications

PROCESSOR

- CD905-B2550:
 - Intel® Atom™ D2550, 1.86GHz, 2x 512K L2, 10W TDP, dual-core
 - Cooling option: heatsink with cooling fan
- CD905-B2800:
 - Intel® Atom™ N2800, 1.86GHz, 2x 512K L2, 6.5W TDP, dual-core
 - Cooling option: heatsink (fanless solution)
- CD905-B2600:
 - Intel® Atom™ N2600, 1.6GHz, 2x 512K L2, 3.5W TDP, dual-core
 - Cooling option: 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

ONBOARD GRAPHICS FEATURES

- Intel® GMA 3650 (Intel® Atom™ D2550/N2800)
- Intel® GMA 3600 (Intel® Atom™ N2600)
- Supports LVDS and VGA interfaces
- LVDS: Chrontel 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

- Supports High Definition Audio interface

ONBOARD LAN FEATURES

- Intel® 82574 Gigabit Ethernet Controller
- Integrated 10/100/1000 transceiver
- Fully compliant with IEEE 802.3, IEEE 802.3u, IEEE 802.3ab
- Supports wire management

SERIAL ATA (SATA) INTERFACE

- Supports 2 Serial ATA interfaces
- SATA 2.0 with data transfer rate up to 3Gb/s
- Integrated Advanced Host Controller Interface (AHCI) controller

WATCHDOG TIMER (optional)

- Watchdog timeout programmable via software from 1 to 256 seconds

EXPANSION INTERFACES

- Supports 8 USB 2.0 ports
- Supports 4 PCIe x1 interfaces
- Supports 4 PCI interfaces
- Supports LPC interface
- Supports I²C interface
- Supports 1 IDE interface
- Supports 8-bit Digital I/O

DAMAGE FREE INTELLIGENCE

- Monitors CPU temperature and overheat alarm
- Monitors CPU fan speed and failure alarm
- Monitors V_{core}/V_{GFx}/1.5V voltages and failure alarm
- Watchdog timer function

BIOS

- 16Mbit SPI BIOS

POWER CONSUMPTION

- 24.51 W with D2550 at 1.86GHz and 1x 1GB 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%

POWER INPUT

- 12V, 5VSB, VCC_RTC (ATX mode)
- 12V, VCC_RTC (AT mode)

PCB

- Dimensions
 - COM Express® Compact
 - 95mm (3.74") x 95mm (3.74")
- Compliance
 - PICMG COM Express® R2.0, Type 2

CERTIFICATION

- CE
- FCC Class B
- RoHS
- UL

Ordering Information

Model Name	Part Number	Description
CD905-B2550	777-CD9051-000G	Intel® Atom™ D2550, 1.86GHz, 10W TDP
CD905-B2800	777-CD9051-800G	Intel® Atom™ N2800, 1.86GHz, 6.5W TDP
CD905-B2600	777-CD9051-600G	Intel® Atom™ N2600, 1.6GHz, 3.5W TDP

Packing List

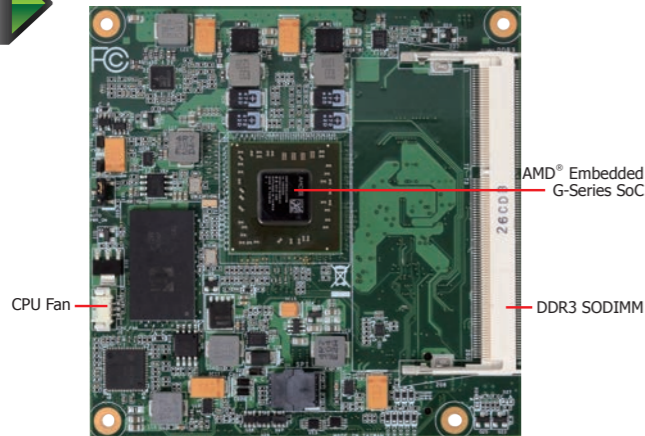
- 1 CD905-B board
- 1 QR (Quick Reference)
- 1 DVD

Optional Items

- COM330-B carrier board kit
- COM630-B carrier board kit
- Heat spreader: TBD
- Heat sink: A71-011003-000G
- Heat sink with fan: A71-111006-000G
- Heat spreader with heat sink and fan: TBD

KB968

G-Series SoC

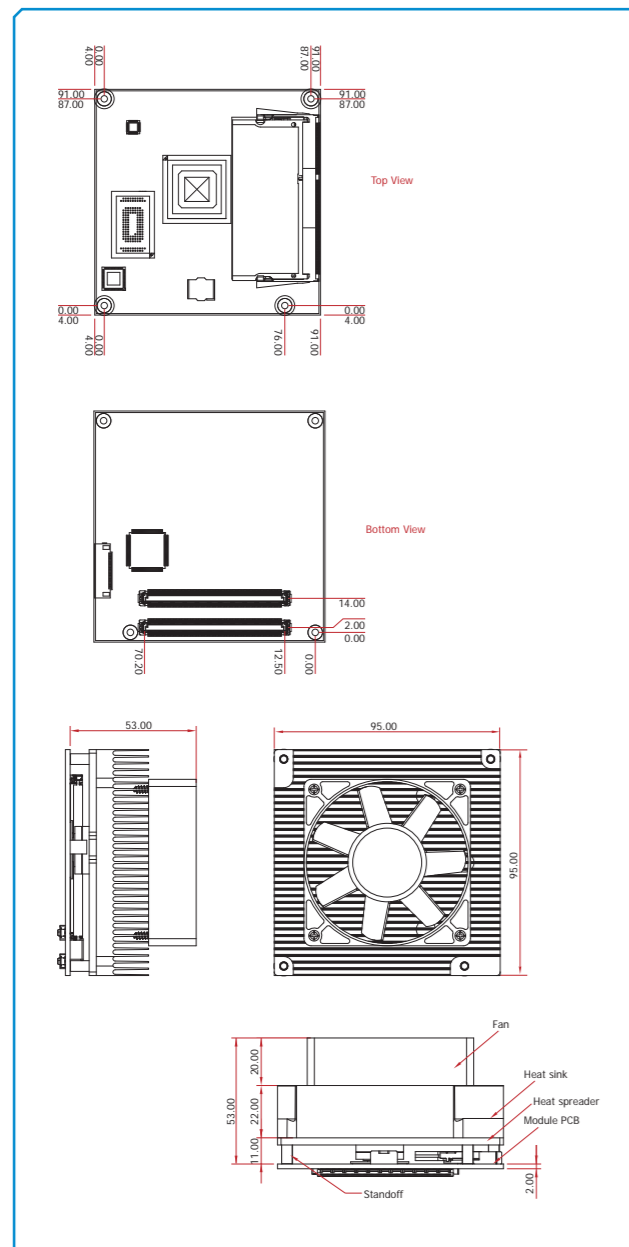


Features

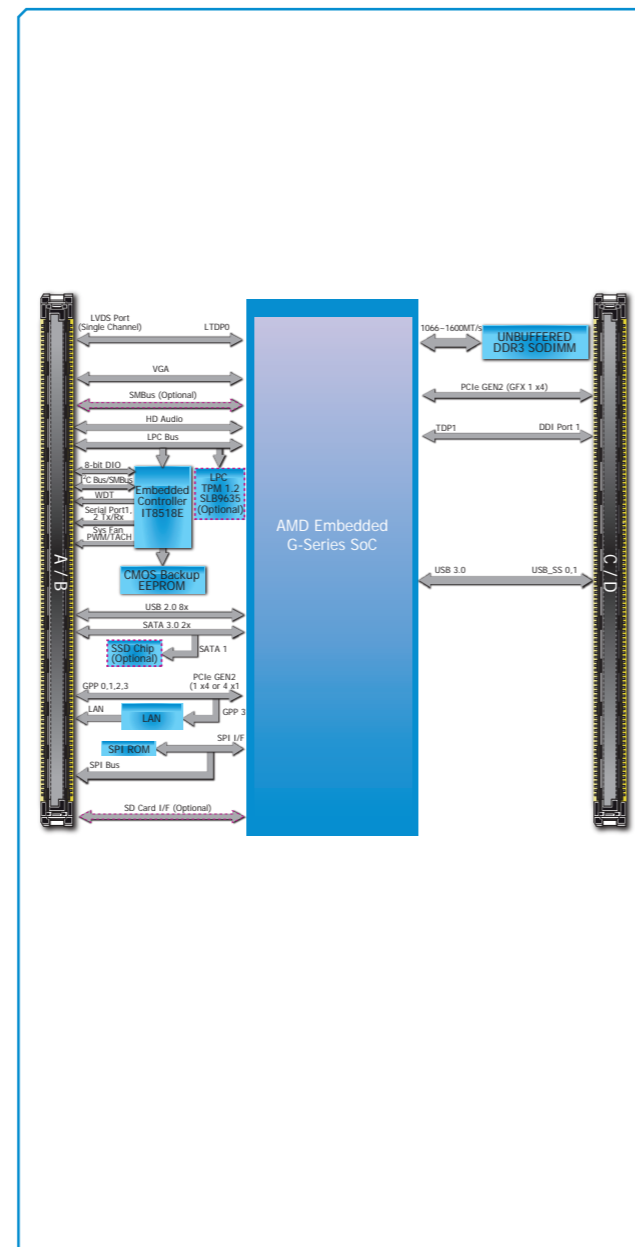
MEMORY	1 DDR3 SODIMM up to 8GB
EXPANSION	1 PCIe x4, 4 PCIe x1 1 LPC, 1 I ² C, 1 SMBus, 2 serial 1 VGA, 1 DP/LVDS, 1 DP 8 USB: 2 USB 3.0/2.0, 6 USB 2.0 2 SATA 3.0 8-bit DIO
LAN	1 LAN
DIMENSIONS	COM Express® R2.1 Compact, Type 6 95mm x 95mm (3.74" x 3.74")



Mechanical Drawing



Block Diagram



KB968

Specifications

APU (Accelerated Processing Unit)

- AMD® Embedded G-Series SoC FT3 BGA
 - 28nm process technology
- Please refer to the Ordering Information below

SYSTEM MEMORY

- One 204-pin DDR3 SODIMM socket
- Supports DDR3 1066/1333/1600MHz (-420C/-415G/-217G) Supports DDR3 1066/1333MHz (-210H)
- Supports single channel memory interface
- Supports up to 8GB system memory
- DRAM device technologies: 1Gb, 2Gb, 4Gb and 8Gb DDR3 DRAM technologies are supported for x8 and x16 devices, unbuffered, non-ECC

ONBOARD GRAPHICS FEATURES

- Advanced discrete-level GPU integrated in the processor
- Supports VGA, DP/LVDS and DP interfaces
- VGA: resolution up to 2048x1536 @ 60Hz
- LVDS: 18-bit, single channel, resolution up to 1600x900 @ 60Hz
- DP: resolution up to 4096x2160 @ 30Hz
- Supports hardware acceleration for DirectX 11.1, H.264, MPEG-2, MPEG-4 AVC, VC-1 and WMV

ONBOARD AUDIO FEATURES

- Supports High Definition Audio interface

ONBOARD LAN FEATURES

- Intel® WGI210AT Gigabit Ethernet Controller
- Integrated 10/100/1000 transceiver
- Fully compliant with IEEE 802.3, IEEE 802.3u, IEEE 802.3ab

SERIAL ATA (SATA) INTERFACE

- Supports 2 Serial ATA interfaces
- SATA 3.0 with data transfer rate up to 6Gb/s
- Integrated Advanced Host Controller Interface (AHCI) controller

SSD (optional)

- 2GB/4GB/8GB/16GB/32GB/64GB
- Write: 30MB/sec (max), Read: 70MB/sec (max)
- SATA to SSD onboard

TRUSTED PLATFORM MODULE (TPM) - optional

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

WATCHDOG TIMER

- Watchdog timeout programmable via software from 1 to 255 seconds

EXPANSION INTERFACES

- Supports 8 USB 2.0 ports (first 2 USB ports support up to USB 3.0)
- Supports 1 PCIe x4 (GFX)
- Supports 4 PCIe x1 (GPP, GPP3 is connected to onboard LAN by default)
- Supports LPC interface
- Supports I²C interface
- Supports SMBus interface
- Supports 2 serial interfaces (TX/RX)
- Supports 8-bit Digital I/O

DAMAGE FREE INTELLIGENCE

- Monitors APU temperature
- Monitors APU fan speed
- Monitors APU_VDD/APU_VDDNB/APU_VDDIO_SUS/1V8/0V95 voltages
- Watchdog timer function

BIOS

- 32Mbit SPI BIOS

POWER CONSUMPTION

- 28.58 W with GX420CA at 2.0GHz and 1x 4GB DDR3 SODIMM

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

- 5% to 90%

POWER INPUT

- 12V, 5VSB, VCC_RTC (ATX mode)
- 12V, VCC_RTC (AT mode)

PCB

- Dimensions
 - COM Express® Compact
 - 95mm (3.74") x 95mm (3.74")
- Compliance
 - PICMG COM Express® R2.1, Type 6

Ordering Information

Model Name	Temperature	Memory	SSD	Processors
KB968	- B: 0°C to 60°C	S: Socket	0: None 2: 2GB 4: 4GB 8: 8GB 1: 16GB 3: 32GB 6: 64GB	- 420C 420C: AMD® GX-420CA, Quad Core, 2M Cache, 2.0GHz, 25W 415G: AMD® GX-415GA, Quad Core, 2M Cache, 1.5GHz, 15W 217G: AMD® GX-217GA, Dual Core, 1M Cache, 1.65GHz, 15W 210H: AMD® GX-210HA, Dual Core, 1M Cache, 1.0GHz, 9W

Packing List

- 1 KB968 board
- 1 QR (Quick Reference)
- 1 DVD

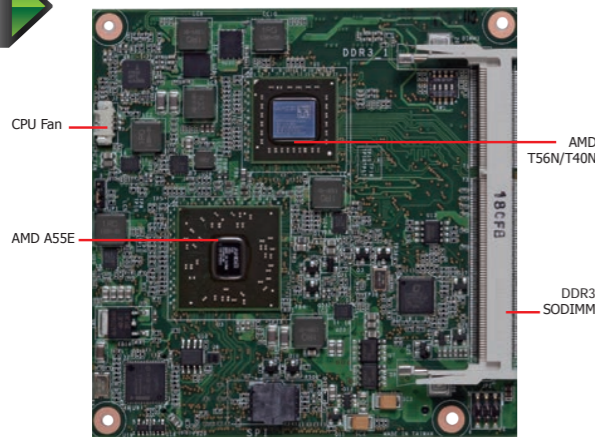
Optional Items

- COM331-B carrier board kit
- COM101-BAT carrier board kit
- Heat spreader with heat sink and fan: 761-KB9680-000G

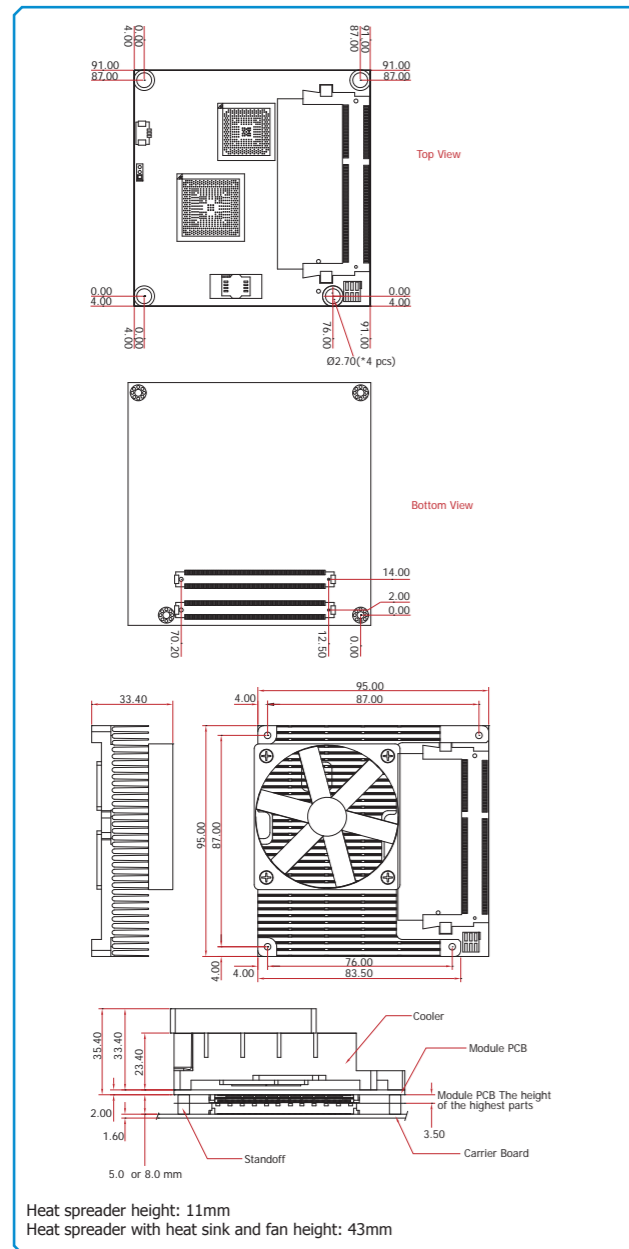
COM Express Compact
Computer-On-Module

OT905-B Series

G-Series



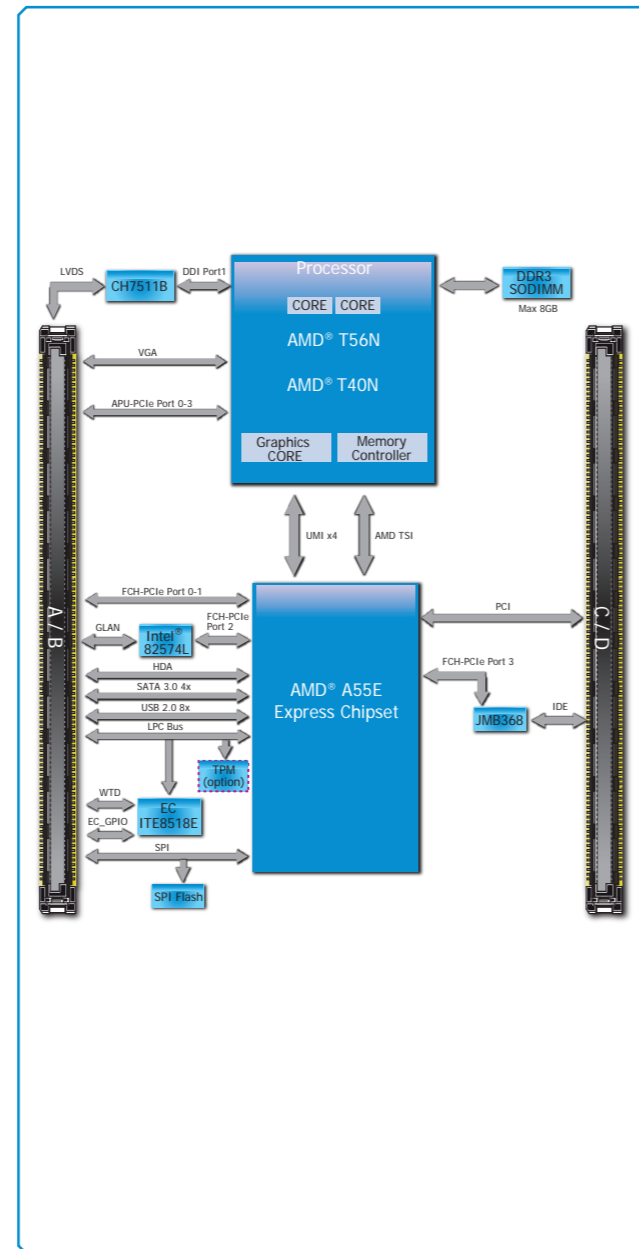
Mechanical Drawing



Features

MEMORY	1 DDR3 SODIMM up to 8GB
EXPANSION	6 PCIe x1, 4 PCI 1 LPC, 1 SMBus, 1 IDE 1 VGA, 1 LVDS 8 USB 2.0 4 SATA 3.0 8-bit DIO
LAN	1 LAN
DIMENSIONS	COM Express® R2.0 Compact, Type 2 95mm x 95mm (3.74" x 3.74")

Block Diagram



Specifications

- APU (Accelerated Processing Unit)**
- OT905-BT56N:
 - AMD® T56N, 1.65GHz, 2x 512KB L2, 18W TDP, dual-core
 - Cooling option: heat sink with cooling fan
 - OT905-BT40N:
 - AMD® T40N, 1.0GHz, 2x 512KB L2, 9W TDP, dual-core
 - Cooling option: heat sink with cooling fan

- CHIPSET**
- AMD® A55E Controller Hub

- SYSTEM MEMORY**
- One 204-pin DDR3 SODIMM socket
 - Supports DDR3 1066/1333MHz (OT905-BT56N)
 - Supports DDR3 1066MHz (OT905-BT40N)
 - 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

- ONBOARD GRAPHICS FEATURES**
- Advanced discrete-level GPU integrated in the processor
 - AMD Radeon™ HD 6320 (OT905-BT56N)
 - AMD Radeon™ HD 6290 (OT905-BT40N)
 - Supports LVDS and VGA interfaces
 - LVDS: Chronitel CH7511B, 24-bit, dual channel, resolution up to 1920x1200 @ 60Hz
 - VGA: resolution up to 2048x1536 @ 60Hz (OT905-BT56N); resolution up to 1920x1200 @ 60Hz (OT905-BT40N)
 - 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**
- Supports High Definition Audio interface

- ONBOARD LAN FEATURES**
- Intel® 82574L Gigabit Ethernet Controller
 - Integrated 10/100/1000 transceiver
 - Fully compliant with IEEE 802.3, IEEE 802.3u, IEEE 802.3ab

- SERIAL ATA (SATA) INTERFACE**
- Supports 4 Serial ATA interfaces
 - SATA 3.0 with data transfer rate up to 6Gb/s
 - Integrated Advanced Host Controller Interface (AHCI) controller
 - Supports RAID 0/1/5/10

- IDE INTERFACE**
- JMicron JMB368 PCI Express to PATA host controller
 - DMA mode: Ultra ATA up to 100MB/s
 - PIO mode: up to 16MB/s

Ordering Information

Model Name	Part Number	Description
OT905-BT56N	777-OT9051-000G	AMD® T56N, 1.65GHz, 18W TPD
OT905-BT40N	777-OT9051-500G	AMD® T40N, 1.00GHz, 9W TPD

Packing List

- 1 OT905-BT56N or OT905-BT40N board
- 1 QR (Quick Reference)
- 1 DVD

OT905-B Series

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

- WATCHDOG TIMER**
- Watchdog timeout programmable via software from 1 to 256 seconds

- EXPANSION INTERFACES**
- Supports 8 USB 2.0 ports
 - Supports 6 PCIe x1 interfaces
 - Supports 4 PCI interfaces
 - Supports 8-bit Digital I/O
 - Supports 1 IDE interface
 - Supports LPC interface
 - Supports SMBus interface

- DAMAGE FREE INTELLIGENCE**
- Monitors CPU temperature and overheat alarm
 - Monitors CPU fan speed and failure alarm
 - Monitors Vcore/Vnb/1.5V voltages and failure alarm
 - Watchdog timer function

- BIOS**
- 32Mbit SPI BIOS

- POWER CONSUMPTION**
- 17.21 W with T40N at 1.0GHz and 1x 2GB 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%

- POWER INPUT**
- 12V, 5VSB, VCC_RTC (ATX mode)
 - 12V, VCC_RTC (AT mode)

- PCB**
- Dimensions
 - COM Express® Compact
 - 95mm (3.74") x 95mm (3.74")
 - Compliance
 - PICMG COM Express® R2.0, Type 2

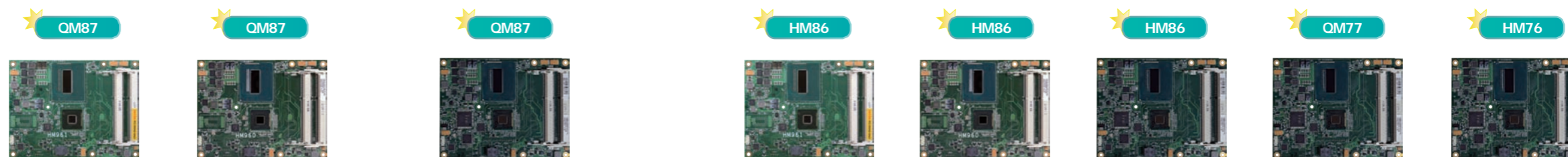
CERTIFICATION

- CE
- FCC Class B
- RoHS
- UL

Optional Items

- COM330-B carrier board kit
- Heat sink with fan: 761-011004-000G
- Heat spreader: TBD
- Heat spreader with heat sink and fan: TBD

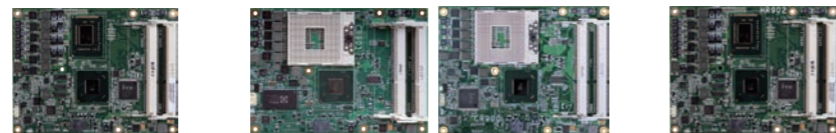
COM Express Compact
Computer-On-Module



Model		HM961-QM87	HM960-QM87	HM920-QM87		HM961-HM86	HM960-HM86	HM920-HM86	CR960-QM77	CR960-HM76	
Processor		4th Generation Intel® Core™ i7/i5/i3				4th Generation Intel® Core™ i7/i5/i3			4th Generation Intel® Core™ i7/i5/i3	3rd/2nd Generation Intel® Core™ i7/i5/i3	3rd/2nd Generation Intel® Core™ i7/i5/i3
Memory		2 DDR3L ECC SODIMM up to 16GB	2 DDR3L SODIMM up to 16GB	2 DDR3L SODIMM up to 16GB		2 DDR3L ECC SODIMM up to 16GB	2 DDR3L SODIMM up to 16GB	2 DDR3L SODIMM up to 16GB	2 DDR3/DDR3L SODIMM up to 16GB	2 DDR3/DDR3L SODIMM up to 16GB	
Display		VGA, LVDS, DDI				VGA, LVDS, DDI			VGA, LVDS	VGA, LVDS and DDI	VGA, LVDS and DDI
Ethernet		1 Intel				1 Intel			1 Intel	1 Intel	1 Intel
USB	USB 3.0	4				2			N/A	4	4
	USB 2.0	8				8			8	8	8
Serial	RS232/422/485	N/A				N/A			N/A	N/A	N/A
	RS232	N/A				N/A			N/A	N/A	N/A
Storage	SATA 3.0	4				2			2	2	2
	SATA 2.0	N/A				2			1	2	2
	SSD	Yes (option)				Yes (option)			Yes (option)	Yes (option)	Yes (option)
	IDE	N/A				N/A			1	N/A	N/A
	CF	N/A				N/A			N/A	N/A	N/A
Expansion	PCIe x16	1				1			1	1	1
	PCIe x4	N/A				N/A			N/A	N/A	N/A
	PCIe x1	7				7			6	7	7
	Mini PCIe	N/A				N/A			N/A	N/A	N/A
	PCI	N/A				N/A			4	N/A	N/A
Digital I/O		4-bit input and 4-bit output				4-bit input and 4-bit output			4-bit input and 4-bit output	4-bit input and 4-bit output	4-bit input and 4-bit output
Audio	Controller	HDA				HDA			HDA	HDA	HDA
LPC		Yes				Yes			Yes	Yes	Yes
SMBus		Yes				Yes			Yes	Yes	Yes
CAN-bus		N/A				N/A			N/A	N/A	N/A
TPM (optional)		Yes				Yes			Yes	Yes	Yes
Watchdog		Yes				Yes			Yes	Yes	Yes
Power Input		12V, VCC_RTC, 5VSB (option)				12V, VCC_RTC, 5VSB (option)			12V, VCC_RTC, 5VSB (option)	5VSB (option), 12V, VCC_RTC	5VSB (option), 12V, VCC_RTC
Compliance		R2.1, Type 6				R2.1, Type 6			R2.1, Type 2	R2.1, Type 6	R2.1, Type 6
Dimensions		95mm x 125mm				95mm x 125mm			95mm x 125mm	95mm x 125mm	95mm x 125mm

COM Express Basic
Computer-On-Module

QM77
HM76
QM77
QM77
QM67
HM65



QM67
HM55
AMD R-Series
AMD R-Series



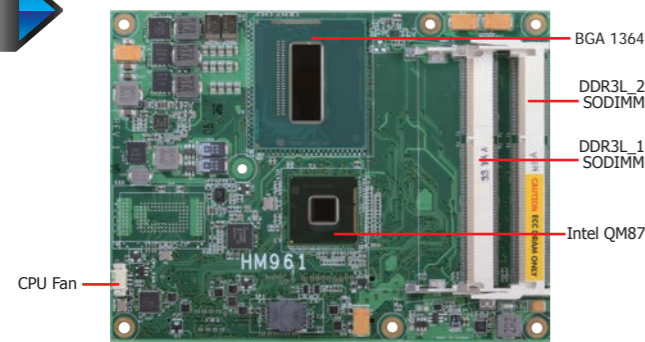
Model		CR902-B	CR902-BL	CR901-B	CR900-B	HR902-B	HR902-BL		HR900-B	CP900-B	CM960-B	CM901-B	
Processor		3rd/2nd Generation Intel® Core™ i7/i5/i3		3rd/2nd Generation Intel® Core™ i7/i5/i3		3rd/2nd Generation Intel® Core™ i7/i5/i3			3rd/2nd Generation Intel® Core™ i7/i5/i3	Intel® Core™ i7/i5 Intel® Celeron®	AMD® A70M	AMD® A70M	
Memory		2 DDR3/DDR3L SODIMM up to 16GB		2 DDR3/DDR3L SODIMM up to 16GB		2 DDR3 SODIMM up to 16GB			2 DDR3 SODIMM up to 16GB	2 DDR3 SODIMM up to 8GB	2 DDR3 SODIMM up to 16GB	2 DDR3 SODIMM up to 16GB	
Display		VGA, LVDS, DDI		3 Independent Displays VGA, LVDS, DDI	VGA, LVDS	VGA, LVDS, DDI			VGA, LVDS	VGA, LVDS	3 Independent Displays DP, DP/LVDS, DP/VGA	3 Independent Displays DP, DP/LVDS, DP/VGA	
Ethernet		1 Intel		1 Intel		1 Intel			1 Intel	1 Intel	1 Intel	1 Intel	
USB	USB 3.0	N/A		4	N/A	N/A			N/A	N/A	4	4	
	USB 2.0	8		8		8			8	8	4	4	
Serial	RS232/422/485	N/A		N/A		N/A			N/A	N/A	N/A	N/A	
	RS232	N/A		N/A		N/A			N/A	N/A	N/A	N/A	
Storage	SATA 3.0	2		2		2			2	N/A	4	4	
	SATA 2.0	2		2		2			2	4	N/A	N/A	
	SSD	N/A		Yes (option)		N/A			N/A	N/A	Yes (option)	Yes (option)	
	IDE, FDD	1 IDE		N/A	1 IDE		1 IDE			1 IDE	1 IDE	N/A	N/A
	CF	N/A		N/A		N/A			N/A	N/A	N/A	N/A	N/A
Expansion	PCIe x16	1		1		1			1	1	N/A	1	
	PCIe x8	N/A		N/A		N/A			N/A	N/A	1	N/A	
	PCIe x1	5		7	5	5			5	4	7	7	
	Mini PCIe	N/A		N/A		N/A			N/A	N/A	N/A	N/A	
	PCI	4		N/A	4		4			4	4	N/A	N/A
Digital I/O		8-bit		4-bit input and 4-bit output		8-bit			8-bit	8-bit	8-bit	8-bit	
Audio	Controller	HDA		HDA		HDA			HDA	HDA	HDA	HDA	
LPC		Yes		Yes		Yes			Yes	Yes	Yes	Yes	
SMBus		Yes		N/A		Yes			Yes	Yes	N/A	N/A	
CAN-bus		N/A		N/A		N/A			N/A	N/A	N/A	N/A	
TPM (optional)		N/A		N/A	Yes	N/A			N/A	N/A	N/A	N/A	
Watchdog		Yes		Yes		Yes			Yes	Yes	Yes	Yes	
Power Input		12V		12V		12V			12V	12V	12V/5VSB	12V/5VSB	
Compliance		R2.1, Type 2		R2.1, Type 6	R2.1, Type 2	R2.1, Type 2			R1.0, Type 2	R1.0, Type 2	R2.1, Type 6	R2.1, Type 6	
Dimensions		95mm x 125mm		95mm x 125mm		95mm x 125mm			95mm x 125mm	95mm x 125mm	95mm x 125mm	95mm x 125mm	

COM Express Basic
Computer-On-Module

HM961-QM87

HM961-QM87

QM87

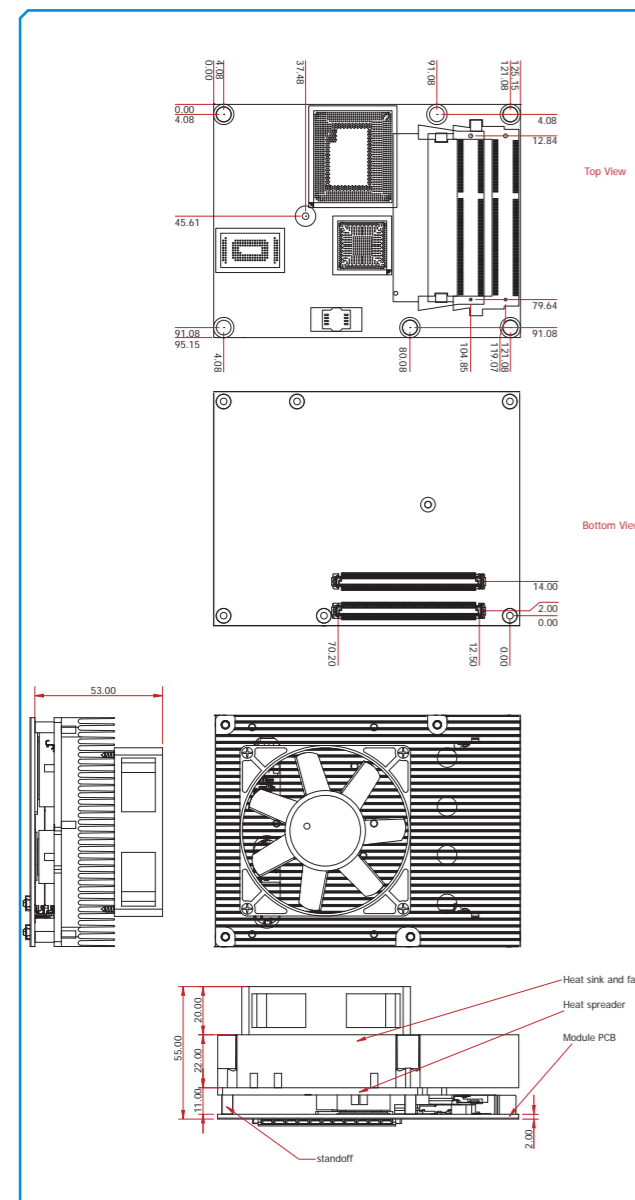


Features

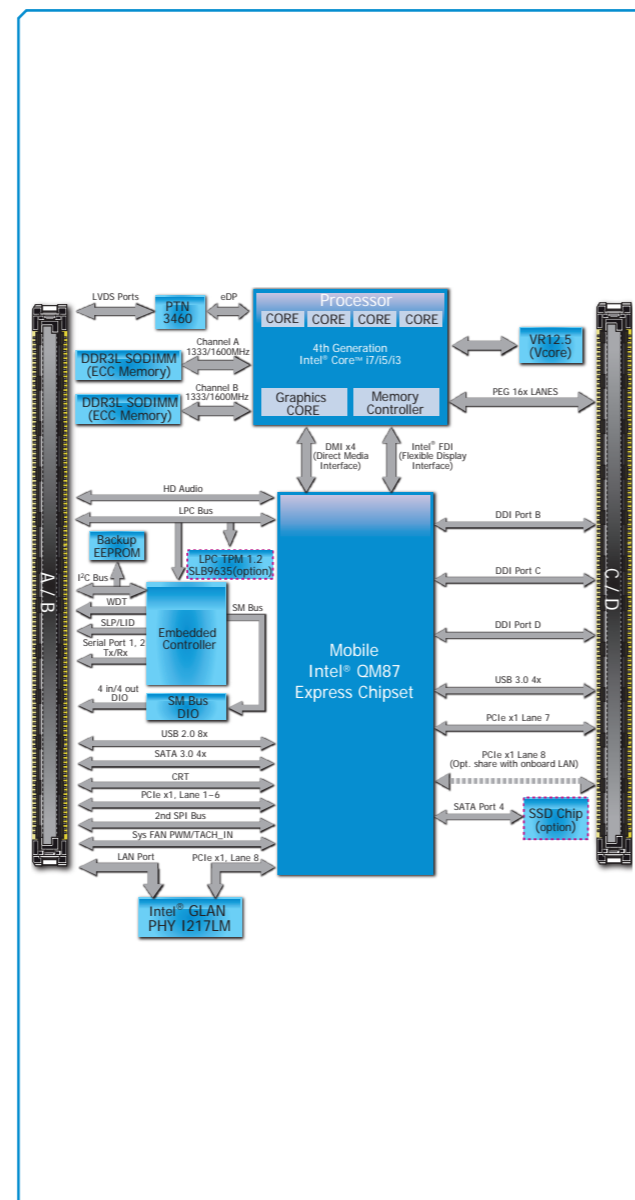
MEMORY	2 DDR3L ECC SODIMM up to 16GB
EXPANSION	1 PCIe x16, 7 PCIe x1 1 LPC, 1 I ² C, 1 SMBus, 2 serial 1 VGA, 1 LVDS, 3 DDI (HDMI/DVI/DP) 12 USB: 4 USB 3.0, 8 USB 2.0 4 SATA 3.0 SSD (optional) 4-bit input and 4-bit output GPIO
LAN	1 LAN
DIMENSIONS	COM Express® R2.1 Basic, Type 6 95mm x 125mm (3.74" x 4.9")



Mechanical Drawing



Block Diagram



Specifications

PROCESSOR

- 4th generation Intel® Core™ processors
 - BGA 1364 packaging technology
 - 22nm process technology
- Please refer to the Ordering Information below

CHIPSET

- Intel® QM87 Express Chipset

SYSTEM MEMORY

- Two 204-pin DDR3L SODIMM sockets
- Supports DDR3L 1333/1600MHz ECC SODIMM
- Supports up to 16GB system memory
- DRAM device technologies: 1Gb, 2Gb and 4Gb DDR3L DRAM technologies are supported for x8 and x16 devices, ECC DRAM only

ONBOARD GRAPHICS FEATURES

- Intel® HD Graphics 4600
- Supports 1 VGA, 1 LVDS and 3 DDI
- VGA: resolution up to 2048x1536 @ 75Hz
- LVDS: NXP PTN3460, 24-bit, dual channel, resolution up to 1920x1200 @ 60Hz
- Digital Display Interface: HDMI, DVI and DP
- HDMI: resolution up to 4096x2304 @ 24Hz or 2560x1600 @ 60Hz
- DVI: resolution up to 1920x1200 @ 60Hz
- DP: resolution up to 3840x2160 @ 60Hz
- Intel® Clear Video Technology
- Intel® Advanced Vector Extensions (Intel® AVX) Instructions
- Supports DirectX 11.1, OpenGL 3.2, OpenCL 1.2

ONBOARD AUDIO FEATURES

- Supports High Definition Audio interface

ONBOARD LAN FEATURES

- Intel® I217LM with iAMT9.0 Gigabit Ethernet Phy
- Integrated 10/100/1000 transceiver
- Fully compliant with IEEE 802.3, IEEE 802.3u, IEEE 802.3ab

SERIAL ATA (SATA) INTERFACE

- Supports 4 SATA 3.0 with data transfer rate up to 6Gb/s
- Integrated Advanced Host Controller Interface (AHCI) controller
- Supports RAID 0/1/5/10
- Supports Intel® Smart Response Technology

USB INTERFACE

- XHCI Host Controller supports up to 4 super speed USB 3.0 ports

SSD (optional)

- 2GB/4GB/8GB/16GB/32GB/64GB
- Write: 30MB/sec (max), Read: 70MB/sec (max)
- SATA to SSD onboard

INTEL ACTIVE MANAGEMENT TECHNOLOGY (AMT)

- Supports iAMT9.0
- Out-of-band system access
- Remote troubleshooting and recovery
- Hardware-based agent presence checking
- Proactive alerting
- Remote hardware and software asset tracking

Ordering Information

Model Name	Chipset	Temperature	Memory	SSD	Processors
HM961	- QM87	B	S	0	- 4700EQ
		B: 0°C to 60°C	S: Socket	0: None 2: 2GB 4: 4GB 8: 8GB 1: 16GB 3: 32GB 6: 64GB	4700EQ: Intel® Core™ i7-4700EQ, 6M Cache, up to 3.4 GHz, 47W 4400E: Intel® Core™ i5-4400E, 3M Cache, up to 3.3 GHz, 37W 4402E: Intel® Core™ i5-4402E, 3M Cache, up to 2.7 GHz, 25W 4100E: Intel® Core™ i3-4100E, 3M Cache, 2.4 GHz, 37W 4102E: Intel® Core™ i3-4102E, 3M Cache, 1.6 GHz, 25W 2000E: Intel® Celeron® 2000E, 2M Cache, 2.2 GHz, 37W 2002E: Intel® Celeron® 2002E, 2M Cache, 1.5 GHz, 25W

Packing List

- 1 HM961 board
- 1 QR (Quick Reference)
- 1 DVD

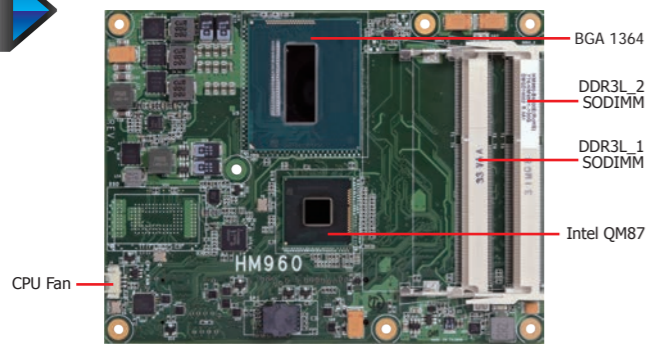
Optional Items

- COM331-B carrier board kit
- COM101-BAT carrier board kit
- Heat spreader with heat sink and fan: TBD

HM960-QM87

HM960-QM87

QM87



Features

MEMORY	2 DDR3L SODIMM up to 16GB
EXPANSION	1 PCIe x16, 7 PCIe x1 1 LPC, 1 I ² C, 1 SMBus, 2 serial 1 VGA, 1 LVDS, 3 DDI (HDMI/DVI/DP) 12 USB: 4 USB 3.0, 8 USB 2.0 4 SATA 3.0 SSD (optional) 4-bit input and 4-bit output GPIO
LAN	1 LAN
DIMENSIONS	COM Express® R2.1 Basic, Type 6 95mm x 125mm (3.74" x 4.9")



Specifications

PROCESSOR

- 4th generation Intel® Core™ processors
 - BGA 1364 packaging technology
 - 22nm process technology
- Please refer to the Ordering Information below

CHIPSET

- Intel® QM87 Express Chipset

SYSTEM MEMORY

- Two 204-pin DDR3L SODIMM sockets
- Supports DDR3L 1333/1600MHz SODIMM
- Supports up to 16GB system memory
- DRAM device technologies: 1Gb, 2Gb and 4Gb DDR3L DRAM technologies are supported for x8 and x16 devices, unbuffered, non-ECC

ONBOARD GRAPHICS FEATURES

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- Supports 1 VGA, 1 LVDS and 3 DDI
- VGA: resolution up to 2048x1536 @ 75Hz
- LVDS: NXP PTN3460, 24-bit, dual channel, resolution up to 1920x1200 @ 60Hz
- Digital Display Interface: HDMI, DVI and DP
- HDMI: resolution up to 4096x2304 @ 24Hz or 2560x1600 @ 60Hz
- DVI: resolution up to 1920x1200 @ 60Hz
- DP: resolution up to 3840x2160 @ 60Hz
- Intel® Clear Video Technology
- Intel® Advanced Vector Extensions (Intel® AVX) Instructions
- Supports DirectX 11.1, OpenGL 3.2, OpenCL 1.2

ONBOARD AUDIO FEATURES

- Supports High Definition Audio interface

ONBOARD LAN FEATURES

- Intel® I217LM with iAMT9.0 Gigabit Ethernet Phy
- Integrated 10/100/1000 transceiver
- Fully compliant with IEEE 802.3, IEEE 802.3u, IEEE 802.3ab

SERIAL ATA (SATA) INTERFACE

- Supports 4 SATA 3.0 with data transfer rate up to 6Gb/s
- Integrated Advanced Host Controller Interface (AHCI) controller
- Supports RAID 0/1/5/10
- Supports Intel® Smart Response Technology

USB INTERFACE

- XHCI Host Controller supports up to 4 super speed USB 3.0 ports

SSD (optional)

- 2GB/4GB/8GB/16GB/32GB/64GB
- Write: 30MB/sec (max), Read: 70MB/sec (max)
- SATA to SSD onboard

INTEL ACTIVE MANAGEMENT TECHNOLOGY (AMT)

- Supports iAMT9.0
- Out-of-band system access
- Remote troubleshooting and recovery
- Hardware-based agent presence checking
- Proactive alerting
- Remote hardware and software asset tracking

Ordering Information

Model Name	Chipset	Temperature	Memory	SSD	Processors
HM960	- QM87	B	S	0	- 4700EQ
		B: 0°C to 60°C	S: Socket	0: None 2: 2GB 4: 4GB 8: 8GB 1: 16GB 3: 32GB 6: 64GB	4700EQ: Intel® Core™ i7-4700EQ, 6M Cache, up to 3.4 GHz, 47W 4400E: Intel® Core™ i5-4400E, 3M Cache, up to 3.3 GHz, 37W 4402E: Intel® Core™ i5-4402E, 3M Cache, up to 2.7 GHz, 25W 4100E: Intel® Core™ i3-4100E, 3M Cache, 2.4 GHz, 37W 4102E: Intel® Core™ i3-4102E, 3M Cache, 1.6 GHz, 25W 2000E: Intel® Celeron® 2000E, 2M Cache, 2.2 GHz, 37W 2002E: Intel® Celeron® 2002E, 2M Cache, 1.5 GHz, 25W

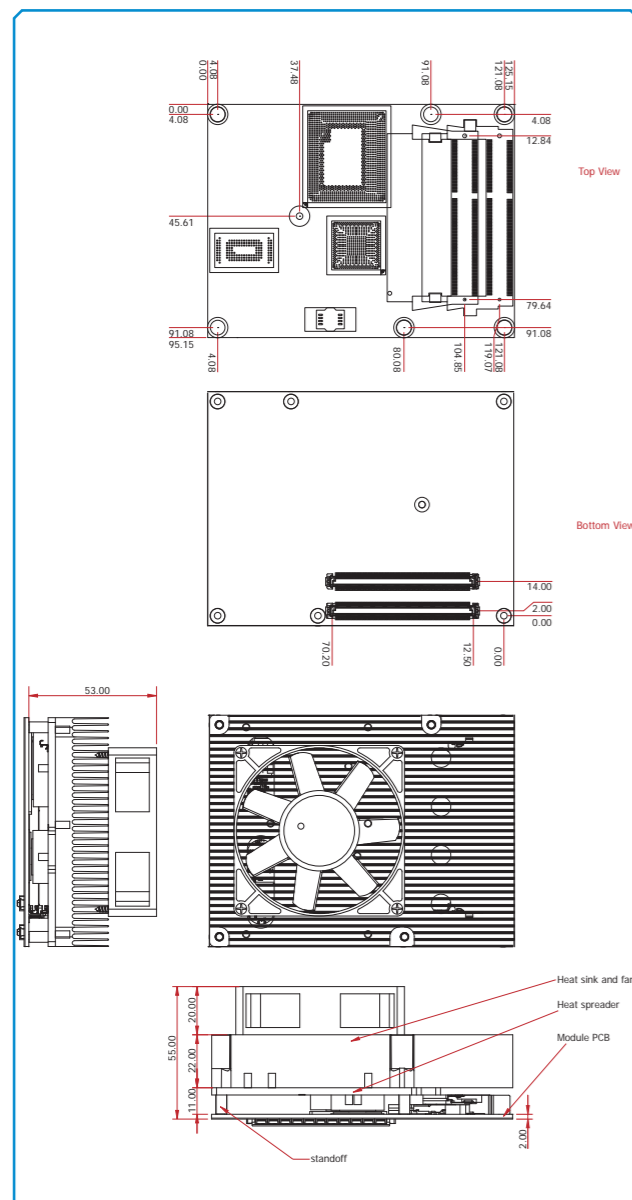
Packing List

- 1 HM960 board
- 1 QR (Quick Reference)
- 1 DVD

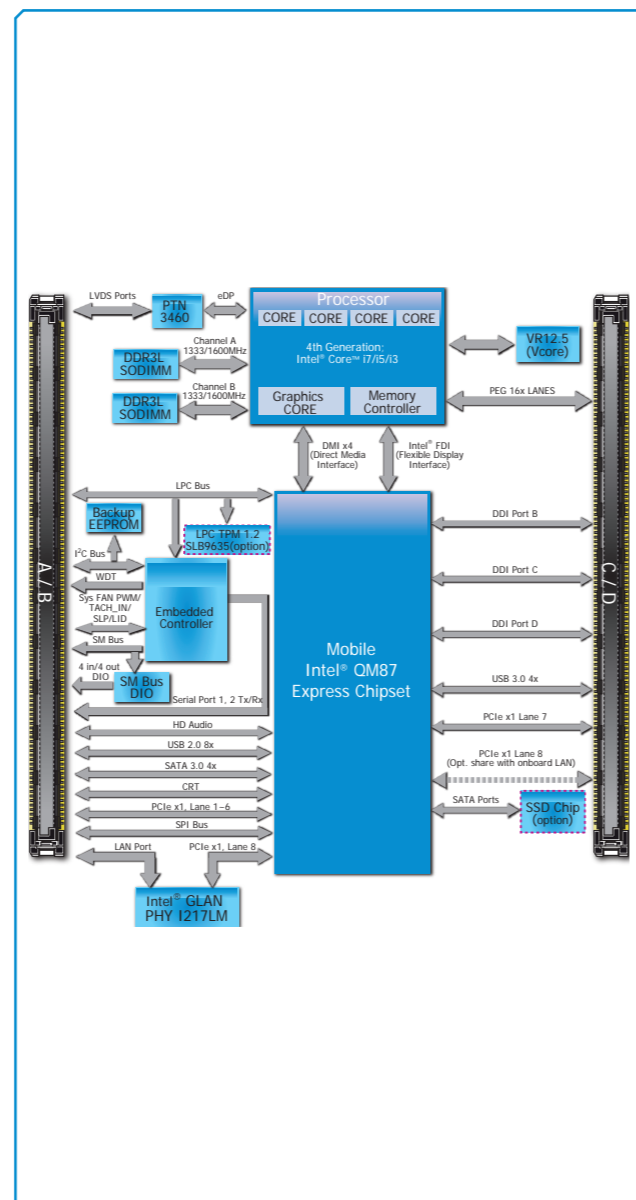
Optional Items

- COM331-B carrier board kit
- COM101-BAT carrier board kit
- Heat spreader with heat sink and fan: 761-HSWMBL-000G

Mechanical Drawing



Block Diagram

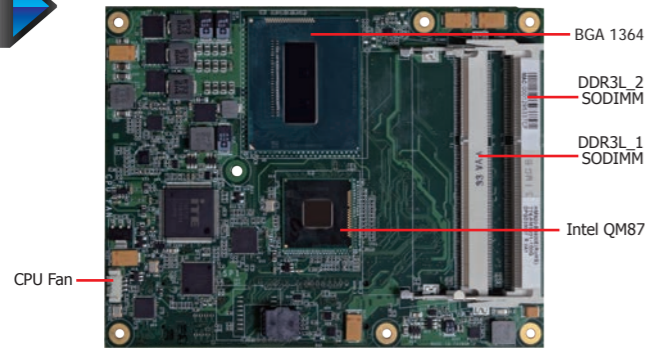


COM Express Basic
Computer-On-Module

HM920-QM87

HM920-QM87

QM87

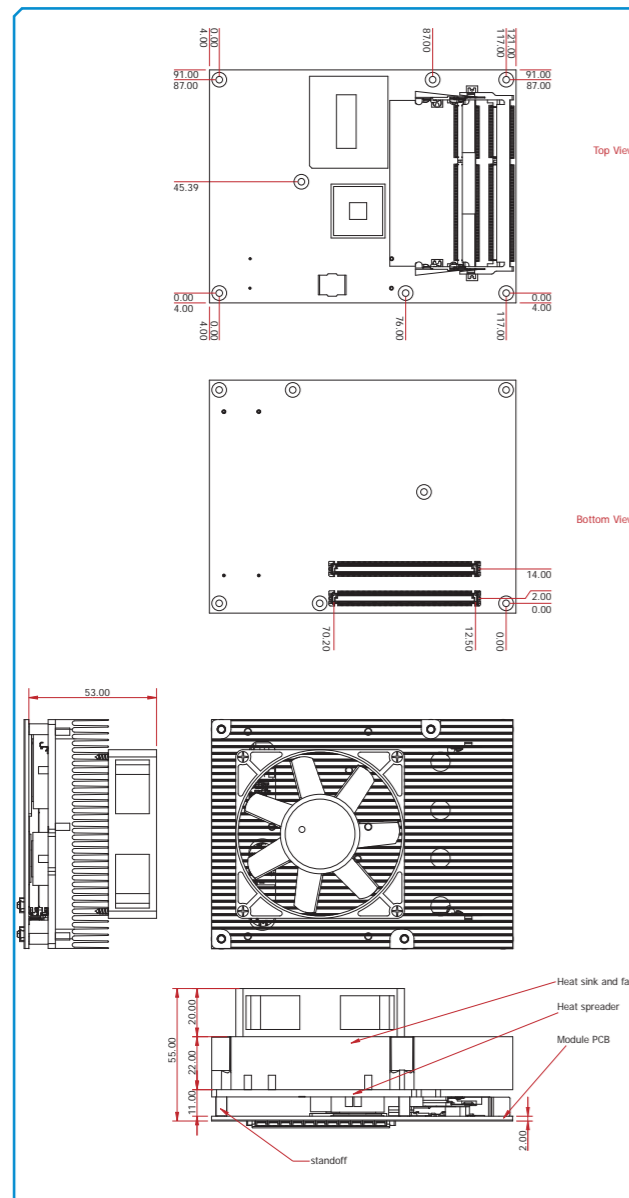


Features

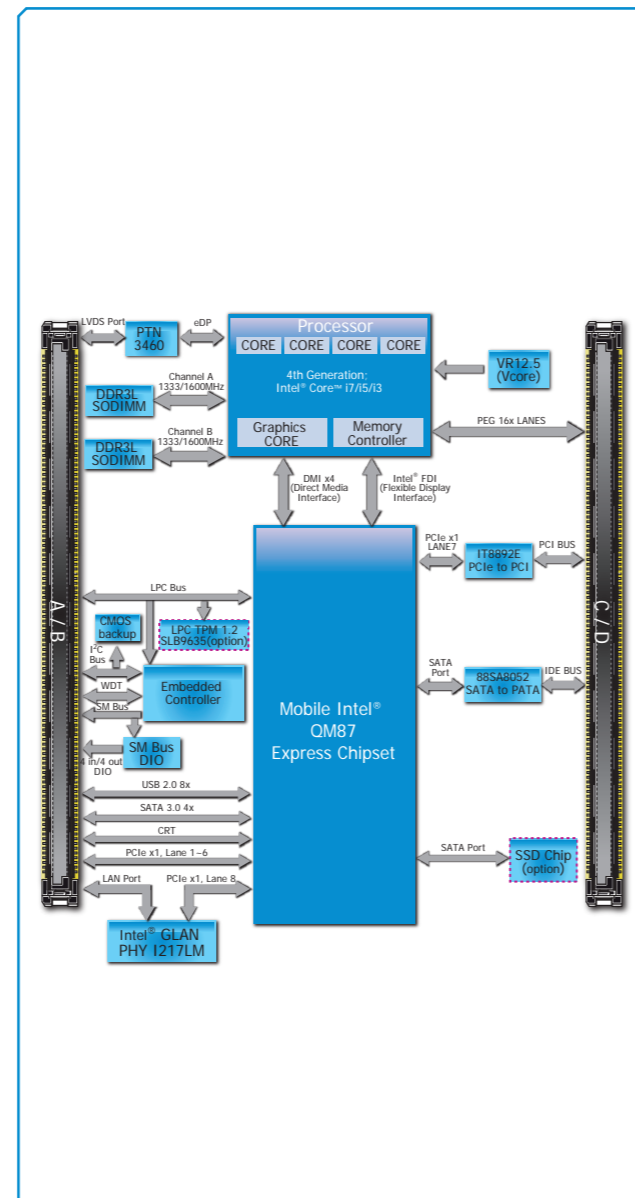
MEMORY	2 DDR3L SODIMM up to 16GB
EXPANSION	1 PCIe x16, 6 PCIe x1, 4 PCI 1 LPC, 1 SMBus, 1 I ² C, 1 IDE 1 VGA, 1 LVDS 8 USB 2.0 4 SATA 3.0 SSD (optional) 4-bit input and 4-bit output GPIO
LAN	1 LAN
DIMENSIONS	COM Express® R2.1 Basic, Type 2 95mm x 125mm (3.74" x 4.9")



Mechanical Drawing



Block Diagram



Specifications

PROCESSOR

- 4th generation Intel® Core™ processors
 - BGA 1364 packaging technology
 - 22nm process technology
- Please refer to the Ordering Information below

CHIPSET

- Intel® QM87 Express Chipset

SYSTEM MEMORY

- Two 204-pin DDR3L SODIMM sockets
- Supports DDR3L 1333/1600MHz SODIMM
- Supports up to 16GB system memory
- DRAM device technologies: 1Gb, 2Gb and 4Gb DDR3L DRAM technologies are supported for x8 and x16 devices, unbuffered, non-ECC

ONBOARD GRAPHICS FEATURES

- Intel® HD Graphics 4600
- Supports 1 VGA and 1 LVDS
- VGA: resolution up to 2048x1536 @ 60Hz
- LVDS: NXP PTN3460, 24-bit, dual channel, resolution up to 1920x1200 @ 60Hz
- Intel® Clear Video Technology
- Intel® Advanced Vector Extensions (Intel® AVX) Instructions
- Supports DirectX 11.1, OpenGL 3.2, OpenCL 1.2

ONBOARD AUDIO FEATURES

- Supports High Definition Audio interface

ONBOARD LAN FEATURES

- Intel® I217LM with iAMT9.0 Gigabit Ethernet Phy
- Integrated 10/100/1000 transceiver
- Fully compliant with IEEE 802.3, IEEE 802.3u, IEEE 802.3ab

SERIAL ATA (SATA) INTERFACE

- Supports 4 SATA 3.0 with data transfer rate up to 6Gb/s
- Integrated Advanced Host Controller Interface (AHCI) controller
- Supports RAID 0/1/5/10
- Supports Intel® Smart Response Technology

SSD-optional

- 2GB/4GB/8GB/16GB/32GB/64GB
- Write: 30MB/sec (max), Read: 70MB/sec (max)
- SATA to SSD onboard

INTEL ACTIVE MANAGEMENT TECHNOLOGY (AMT)

- Supports iAMT9.0
- Out-of-band system access
- Remote troubleshooting and recovery
- Hardware-based agent presence checking
- Proactive alerting
- Remote hardware and software asset tracking

IDE INTERFACE

- Supports up to two IDE devices
- DMA mode: Ultra ATA up to 100MB/s

TRUSTED PLATFORM MODULE (TPM) - optional

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

EXPANSION INTERFACES

- Supports 8 USB 2.0 interfaces
- Supports 1 PCIe x16 Gen 3 interface
- Supports 6 PCIe x1 interfaces
- Supports 4 PCI interfaces (PCI 2.3)
- Supports LPC interface
- Supports SMBus interface
- Supports I²C interface
- Supports IDE interface
- Supports 4-bit input and 4-bit output GPIO

DAMAGE FREE INTELLIGENCE

- Monitors CPU temperature and overheat alarm
- Monitors CPU fan speed and failure alarm
- Monitors Vcore/1.05V/DDR voltages and failure alarm

BIOS

- AMI BIOS
- 64Mbit SPI BIOS

WATCHDOG TIMER

- Software programmable from 1 to 255 seconds

POWER

- Input: 12V, VCC_RTC, 5VSB (optional)

POWER CONSUMPTION

- TBD

OS SUPPORT

- Windows XP Professional x86 & SP3 (32-bit)
 - 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)
- (based on Intel's Windows XP support list)

TEMPERATURE

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

HUMIDITY

- 5% to 90%

PCB

- Dimensions
 - COM Express® Basic
 - 95mm (3.74") x 125mm (4.9")
- Compliance
 - PICMG COM Express® R2.1, Type 2

Ordering Information

Model Name	Chipset	Temperature	Memory	SSD	Processors
HM920	- QM87	B B: 0°C to 60°C	S S: Socket	0 0: None 2: 2GB 4: 4GB 8: 8GB 1: 16GB 3: 32GB 6: 64GB	- 4700EQ 4700EQ: Intel® Core™ i7-4700EQ, 6M Cache, up to 3.4 GHz, 47W 4400E: Intel® Core™ i5-4400E, 3M Cache, up to 3.3 GHz, 37W 4402E: Intel® Core™ i5-4402E, 3M Cache, up to 2.7 GHz, 25W 4100E: Intel® Core™ i3-4100E, 3M Cache, 2.4 GHz, 37W 4102E: Intel® Core™ i3-4102E, 3M Cache, 1.6 GHz, 25W 2000E: Intel® Celeron® 2000E, 2M Cache, 2.2 GHz, 37W 2002E: Intel® Celeron® 2002E, 2M Cache, 1.5 GHz, 25W

Packing List

- 1 HM920 board
- 1 QR (Quick Reference)
- 1 DVD

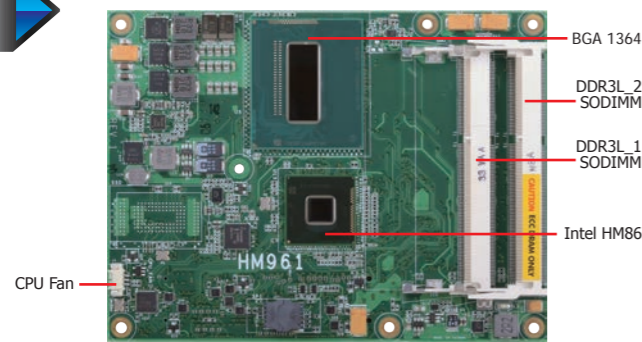
Optional Items

- COM330-B carrier board kit
- Heat spreader with heat sink and fan: 761-HSWMBL-000G

HM961-HM86

HM961-HM86

HM86

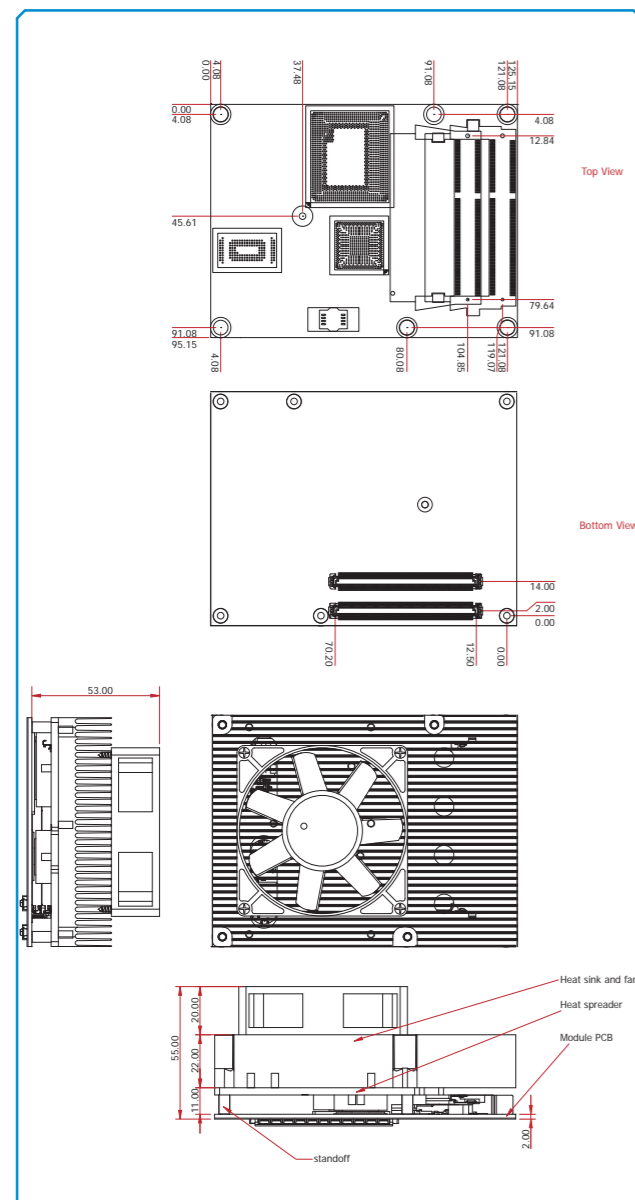


Features

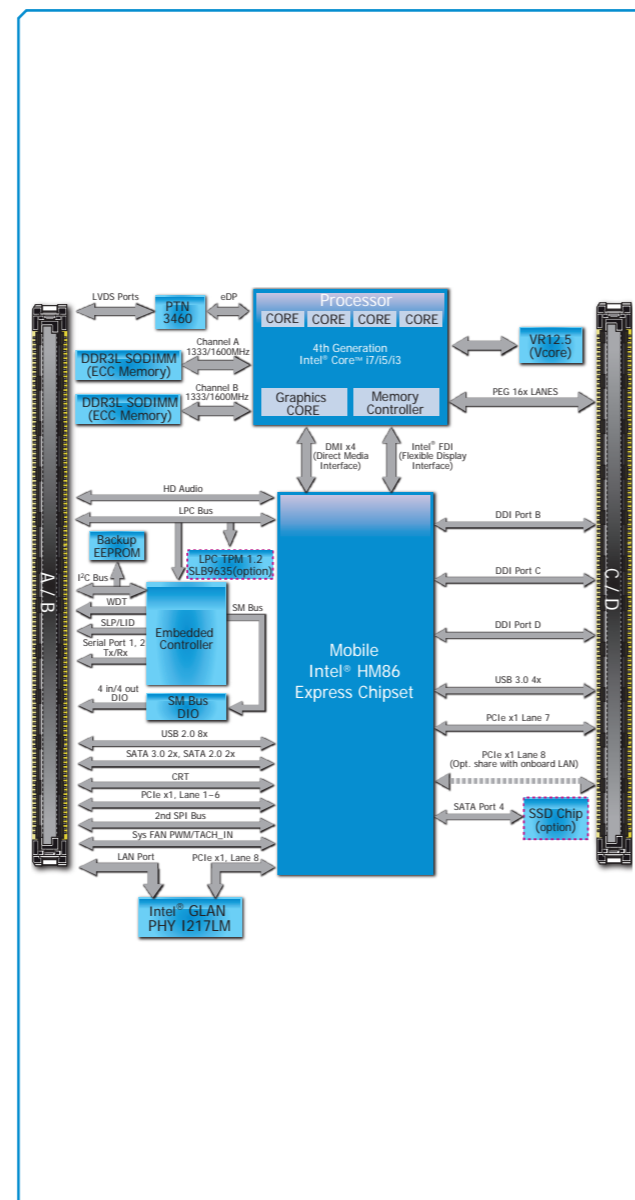
MEMORY	2 DDR3L ECC SODIMM up to 16GB
EXPANSION	1 PCIe x16, 7 PCIe x1 1 LPC, 1 SMBus, 1 I ² C, 2 serial 1 VGA, 1 LVDS, 3 DDI (HDMI/DVI/DP) 2 USB 3.0, 8 USB 2.0 4 SATA: 2 SATA 3.0, 2 SATA 2.0 SSD (optional) 4-bit input and 4-bit output GPIO
LAN	1 LAN
DIMENSIONS	COM Express® R2.1 Basic, Type 6 95mm x 125mm (3.74" x 4.9")



Mechanical Drawing



Block Diagram



Specifications

PROCESSOR

- 4th generation Intel® Core™ processors
 - BGA 1364 packaging technology
 - 22nm process technology
- Please refer to the Ordering Information below*

CHIPSET

- Intel® HM86 Express Chipset

SYSTEM MEMORY

- Two 204-pin DDR3L SODIMM sockets
- Supports DDR3L 1333/1600MHz ECC SODIMM
- Supports up to 16GB system memory
- DRAM device technologies: 1Gb, 2Gb and 4Gb DDR3L DRAM technologies are supported for x8 and x16 devices, ECC DRAM only

ONBOARD GRAPHICS FEATURES

- Intel® HD Graphics 4600
- Supports 1 VGA, 1 LVDS and 3 DDI
- VGA: resolution up to 2048x1536 @ 75Hz
- LVDS: NXP PTN3460, 24-bit, dual channel, resolution up to 1920x1200 @ 60Hz
- Digital Display Interface: HDMI, DVI and DP
- HDMI: resolution up to 4096x2304 @ 24Hz or 2560x1600 @ 60Hz
- DVI: resolution up to 1920x1200 @ 60Hz
- DP: resolution up to 3840x2160 @ 60Hz
- Intel® Clear Video Technology
- Intel® Advanced Vector Extensions (Intel® AVX) Instructions
- Supports DirectX 11.1, OpenGL 3.2, OpenCL 1.2

ONBOARD AUDIO FEATURES

- Supports High Definition Audio interface

ONBOARD LAN FEATURES

- Intel® I217LM Gigabit Ethernet Phy
- Integrated 10/100/1000 transceiver
- Fully compliant with IEEE 802.3, IEEE 802.3u, IEEE 802.3ab

SERIAL ATA (SATA) INTERFACE

- Supports 2 SATA 3.0, and 2 SATA 2.0
- Supports 2 SATA 3.0, 1 SATA 2.0, and 1 SSD (optional)
- Integrated Advanced Host Controller Interface (AHCI) controller

USB INTERFACE

- XHCI Host Controller supports up to 2 super speed USB 3.0 ports

SSD - optional

- 2GB/4GB/8GB/16GB/32GB/64GB
- Write: 30MB/sec (max), Read: 70MB/sec (max)
- SATA to SSD onboard

TRUSTED PLATFORM MODULE (TPM) - optional

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

EXPANSION INTERFACES

- Supports 2 USB 3.0 interfaces
- Supports 8 USB 2.0 interfaces
- Supports 1 PCIe x16 Gen 3 interface
- Supports 7 PCIe x1 interfaces
- Supports LPC interface
- Supports SMBus interface
- Supports I²C interface
- Supports 2 serial interfaces (TX/RX)
- Supports 4-bit input and 4-bit output GPIO

DAMAGE FREE INTELLIGENCE

- Monitors CPU temperature and overheat alarm
- Monitors CPU fan speed and failure alarm
- Monitors Vcore/1.05V/DDR voltages and failure alarm

BIOS

- AMI BIOS
- 64Mbit SPI BIOS

WATCHDOG TIMER

- Software programmable from 1 to 255 seconds

POWER

- Input: 12V, VCC_RTC, 5VSB (option)

POWER CONSUMPTION

- TBD

OS SUPPORT

- Windows XP Professional x86 & SP3 (32-bit)
 - 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)
- (based on Intel's Windows XP support list)*

TEMPERATURE

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

HUMIDITY

- 5% to 90%

PCB

- Dimensions
 - COM Express® Basic
 - 95mm (3.74") x 125mm (4.9")
- Compliance
 - PICMG COM Express® R2.1, Type 6

Ordering Information

Model Name	Chipset	Temperature	Memory	SSD	Processors
HM961	- HM86	B	S	0	- 4700EQ
		B: 0°C to 60°C	S: Socket	0: None 2: 2GB 4: 4GB 8: 8GB 1: 16GB 3: 32GB 6: 64GB	4700EQ: Intel® Core™ i7-4700EQ, 6M Cache, up to 3.4 GHz, 47W 4400E: Intel® Core™ i5-4400E, 3M Cache, up to 3.3 GHz, 37W 4402E: Intel® Core™ i5-4402E, 3M Cache, up to 2.7 GHz, 25W 4100E: Intel® Core™ i3-4100E, 3M Cache, 2.4 GHz, 37W 4102E: Intel® Core™ i3-4102E, 3M Cache, 1.6 GHz, 25W 2000E: Intel® Celeron® 2000E, 2M Cache, 2.2 GHz, 37W 2002E: Intel® Celeron® 2002E, 2M Cache, 1.5 GHz, 25W

Packing List

- 1 HM961 board
- 1 QR (Quick Reference)
- 1 DVD

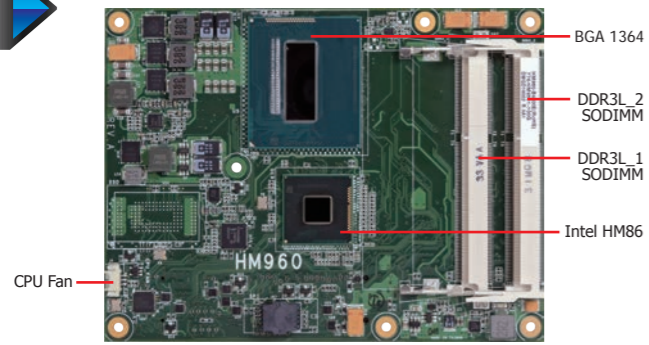
Optional Items

- COM331-B carrier board kit
- COM101-BAT carrier board kit
- Heat spreader with heat sink and fan: TBD

HM960-HM86

HM960-HM86

HM86

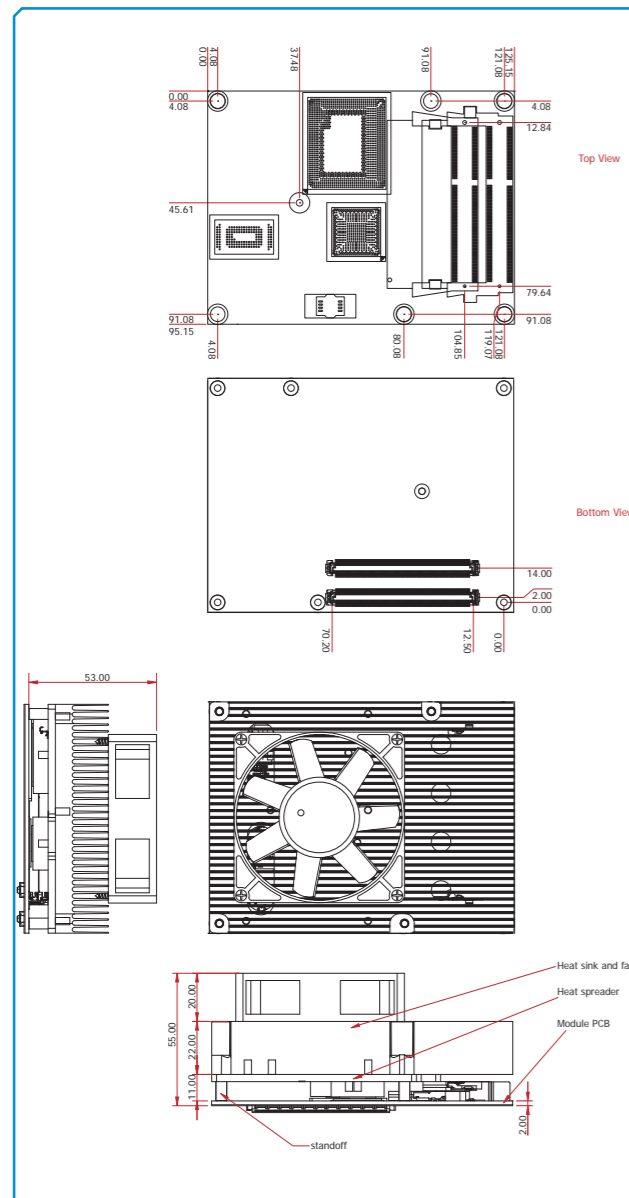


Features

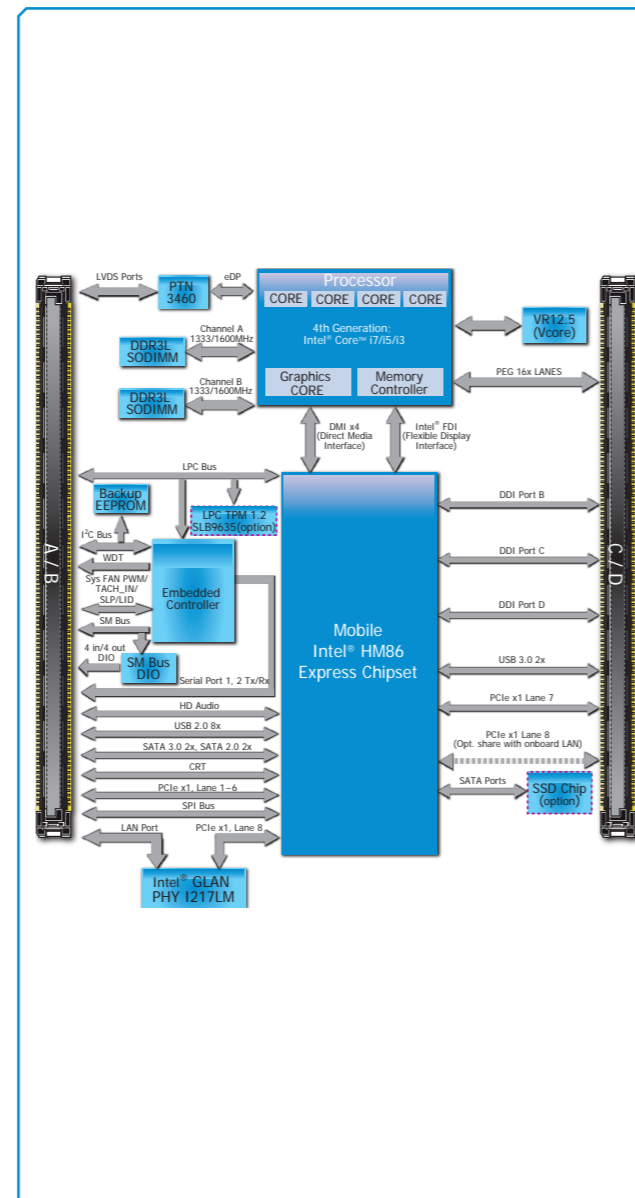
MEMORY	2 DDR3L SODIMM up to 16GB
EXPANSION	1 PCIe x16, 7 PCIe x1 1 LPC, 1 SMBus, 1 I ² C, 2 serial 1 VGA, 1 LVDS, 3 DDI (HDMI/DVI/DP) 2 USB 3.0, 8 USB 2.0 4 SATA: 2 SATA 3.0, 2 SATA 2.0 SSD (optional) 4-bit input and 4-bit output GPIO
LAN	1 LAN
DIMENSIONS	COM Express® R2.1 Basic, Type 6 95mm x 125mm (3.74" x 4.9")



Mechanical Drawing



Block Diagram



Specifications

PROCESSOR

- 4th generation Intel® Core™ processors
 - BGA 1364 packaging technology
 - 22nm process technology
- Please refer to the Ordering Information below*

CHIPSET

- Intel® HM86 Express Chipset

SYSTEM MEMORY

- Two 204-pin DDR3L SODIMM sockets
- Supports DDR3L 1333/1600MHz SODIMM
- Supports up to 16GB system memory
- DRAM device technologies: 1Gb, 2Gb and 4Gb DDR3L DRAM technologies are supported for x8 and x16 devices, unbuffered, non-ECC

ONBOARD GRAPHICS FEATURES

- Intel® HD Graphics 4600
- Supports 1 VGA, 1 LVDS and 3 DDI
- VGA: resolution up to 2048x1536 @ 75Hz
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- HDMI: resolution up to 4096x2304 @ 24Hz or 2560x1600 @ 60Hz
- DVI: resolution up to 1920x1200 @ 60Hz
- DP: resolution up to 3840x2160 @ 60Hz
- Intel® Clear Video Technology
- Intel® Advanced Vector Extensions (Intel® AVX) Instructions
- Supports DirectX 11.1, OpenGL 3.2, OpenCL 1.2

ONBOARD AUDIO FEATURES

- Supports High Definition Audio interface

ONBOARD LAN FEATURES

- Intel® I217LM Gigabit Ethernet Phy
- Integrated 10/100/1000 transceiver
- Fully compliant with IEEE 802.3, IEEE 802.3u, IEEE 802.3ab

SERIAL ATA (SATA) INTERFACE

- Supports 2 SATA 3.0, and 2 SATA 2.0
- Supports 2 SATA 3.0, 1 SATA 2.0, and 1 SSD (optional)
- Integrated Advanced Host Controller Interface (AHCI) controller

USB INTERFACE

- XHCI Host Controller supports up to 2 super speed USB 3.0 ports

SSD - optional

- 2GB/4GB/8GB/16GB/32GB/64GB
- Write: 30MB/sec (max), Read: 70MB/sec (max)
- SATA to SSD onboard

TRUSTED PLATFORM MODULE (TPM) - optional

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

Ordering Information

Model Name	Chipset	Temperature	Memory	SSD	Processors
HM960	- HM86	B B: 0°C to 60°C	S S: Socket	0 0: None 2: 2GB 4: 4GB 8: 8GB 1: 16GB 3: 32GB 6: 64GB	- 4700EQ 4700EQ: Intel® Core™ i7-4700EQ, 6M Cache, up to 3.4 GHz, 47W 4400E: Intel® Core™ i5-4400E, 3M Cache, up to 3.3 GHz, 37W 4402E: Intel® Core™ i5-4402E, 3M Cache, up to 2.7 GHz, 25W 4100E: Intel® Core™ i3-4100E, 3M Cache, 2.4 GHz, 37W 4102E: Intel® Core™ i3-4102E, 3M Cache, 1.6 GHz, 25W 2000E: Intel® Celeron® 2000E, 2M Cache, 2.2 GHz, 37W 2002E: Intel® Celeron® 2002E, 2M Cache, 1.5 GHz, 25W

Packing List

- 1 HM960 board
- 1 QR (Quick Reference)
- 1 DVD

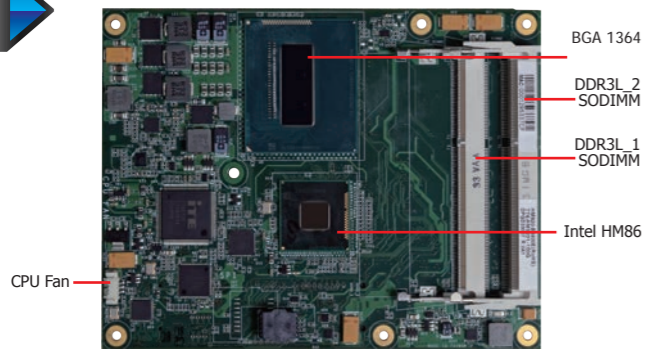
Optional Items

- COM331-B carrier board kit
- COM101-BAT carrier board kit
- Heat spreader with heat sink and fan: 761-HSWMBL-000G

HM920-HM86

HM920-HM86

HM86

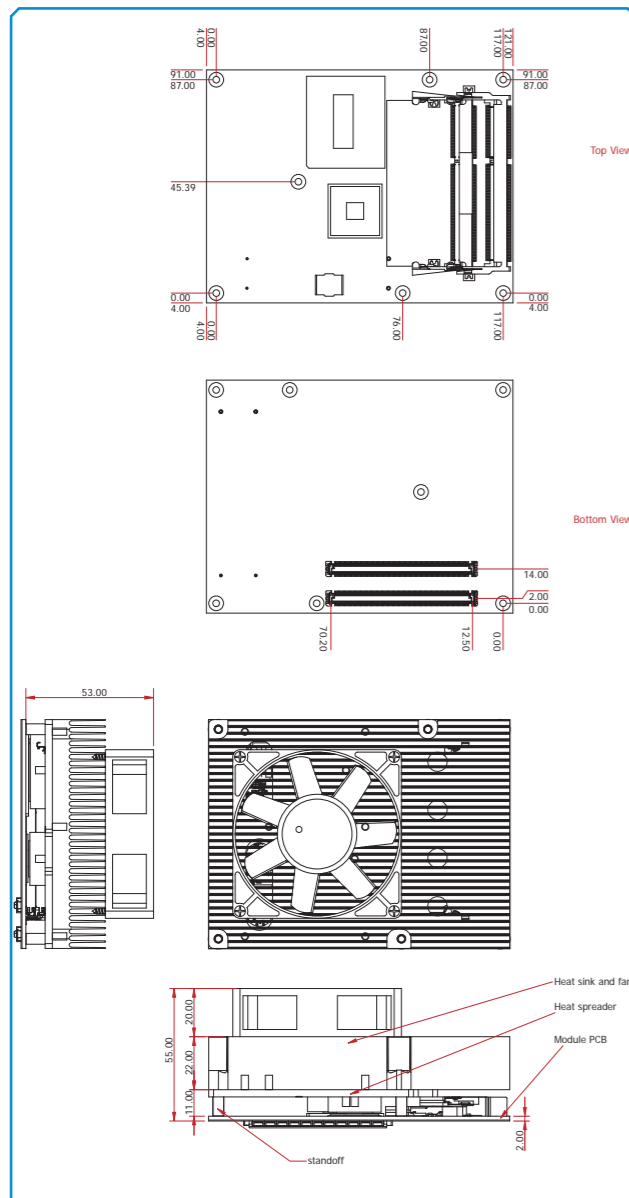


Features

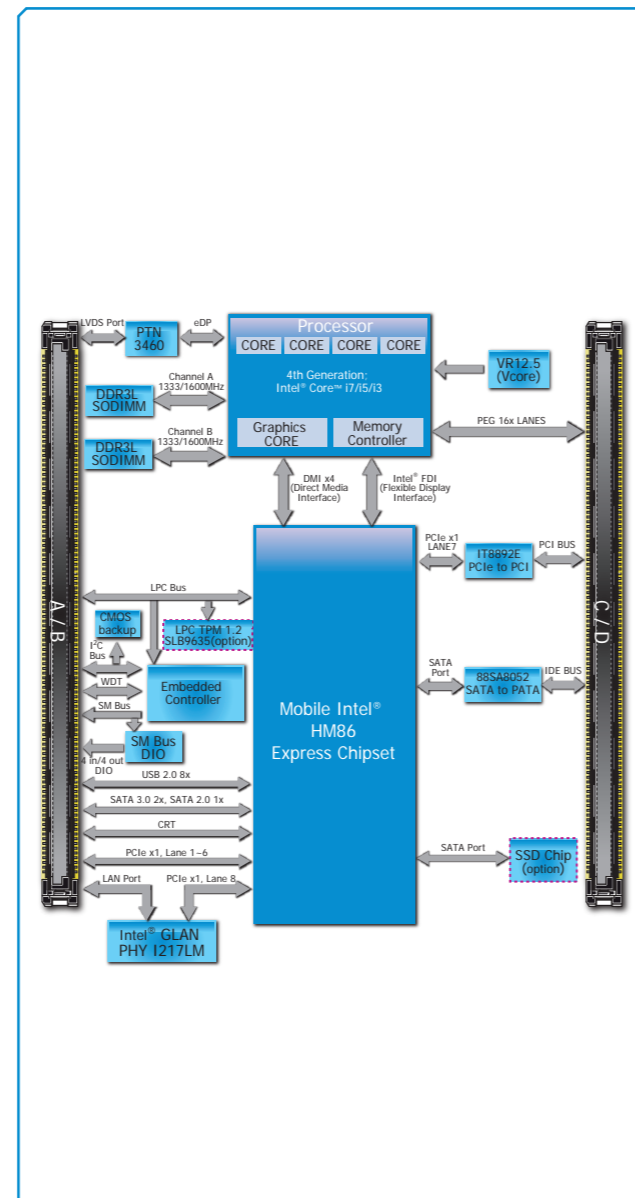
MEMORY	2 DDR3L SODIMM up to 16GB
EXPANSION	1 PCIe x16, 6 PCIe x1, 4 PCI 1 LPC, 1 SMBus, 1 I ² C, 1 IDE 1 VGA, 1 LVDS 8 USB 2.0 3 SATA: 2 SATA 3.0, 1 SATA 2.0 SSD (optional) 4-bit input and 4-bit output GPIO
LAN	1 LAN
DIMENSIONS	COM Express® R2.1 Basic, Type 2 95mm x 125mm (3.74" x 4.9")



Mechanical Drawing



Block Diagram



Specifications

PROCESSOR

- 4th generation Intel® Core™ processors
- BGA 1364 packaging technology
- 22nm process technology
- Please refer to the Ordering Information below*

CHIPSET

- Intel® HM86 Express Chipset

SYSTEM MEMORY

- Two 204-pin DDR3L SODIMM sockets
- Supports DDR3L 1333/1600MHz SODIMM
- Supports up to 16GB system memory
- DRAM device technologies: 1Gb, 2Gb and 4Gb DDR3L DRAM technologies are supported for x8 and x16 devices, unbuffered, non-ECC

ONBOARD GRAPHICS FEATURES

- Intel® HD Graphics 4600
- Supports 1 VGA and 1 LVDS
- VGA: resolution up to 2048x1536 @ 60Hz
- LVDS: NXP PTN3460, 24-bit, dual channel, resolution up to 1920x1200 @ 60Hz
- Intel® Clear Video Technology
- Intel® Advanced Vector Extensions (Intel® AVX) Instructions
- Supports DirectX 11.1, OpenGL 3.2, OpenCL 1.2

ONBOARD AUDIO FEATURES

- Supports High Definition Audio interface

ONBOARD LAN FEATURES

- Intel® I217LM Gigabit Ethernet Phy
- Integrated 10/100/1000 transceiver
- Fully compliant with IEEE 802.3, IEEE 802.3u, IEEE 802.3ab

SERIAL ATA (SATA) INTERFACE

- Supports 2 SATA 3.0, 1 SATA 2.0, and 1 IDE
- Supports 2 SATA 3.0, 1 IDE, and 1 SSD (optional)
- Integrated Advanced Host Controller Interface (AHCI) controller

SSD - optional

- 2GB/4GB/8GB/16GB/32GB/64GB
- Write: 30MB/sec (max), Read: 70MB/sec (max)
- SATA to SSD onboard

TRUSTED PLATFORM MODULE (TPM) - optional

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

Ordering Information

Model Name	Chipset	Temperature	Memory	SSD	Processors
HM920	- HM86	B	S	0	- 4700EQ
		B: 0°C to 60°C	S: Socket	0: None 2: 2GB 4: 4GB 8: 8GB 1: 16GB 3: 32GB 6: 64GB	4700EQ: Intel® Core™ i7-4700EQ, 6M Cache, up to 3.4 GHz, 47W 4400E: Intel® Core™ i5-4400E, 3M Cache, up to 3.3 GHz, 37W 4402E: Intel® Core™ i5-4402E, 3M Cache, up to 2.7 GHz, 25W 4100E: Intel® Core™ i3-4100E, 3M Cache, 2.4 GHz, 37W 4102E: Intel® Core™ i3-4102E, 3M Cache, 1.6 GHz, 25W 2000E: Intel® Celeron® 2000E, 2M Cache, 2.2 GHz, 37W 2002E: Intel® Celeron® 2002E, 2M Cache, 1.5 GHz, 25W

Packing List

- 1 HM920 board
- 1 QR (Quick Reference)
- 1 DVD

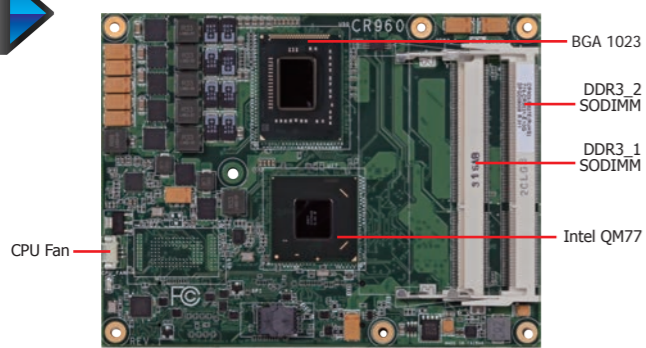
Optional Items

- COM330-B carrier board kit
- Heat spreader with heat sink and fan: 761-HSWMBL-000G

CR960-QM77

CR960-QM77

QM77

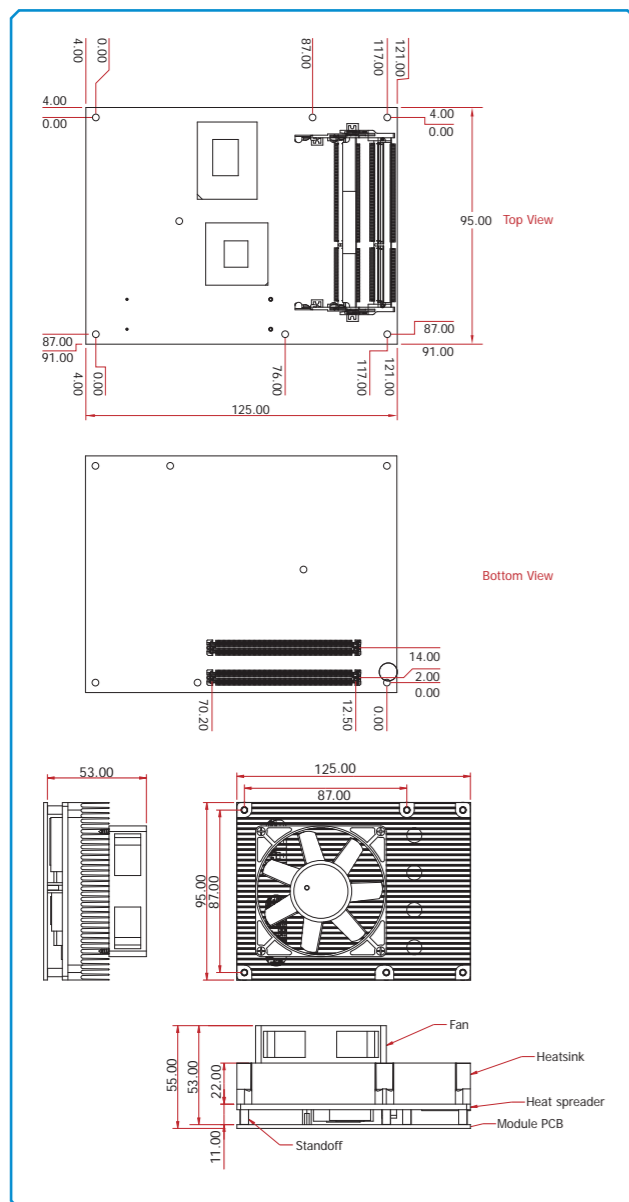


Features

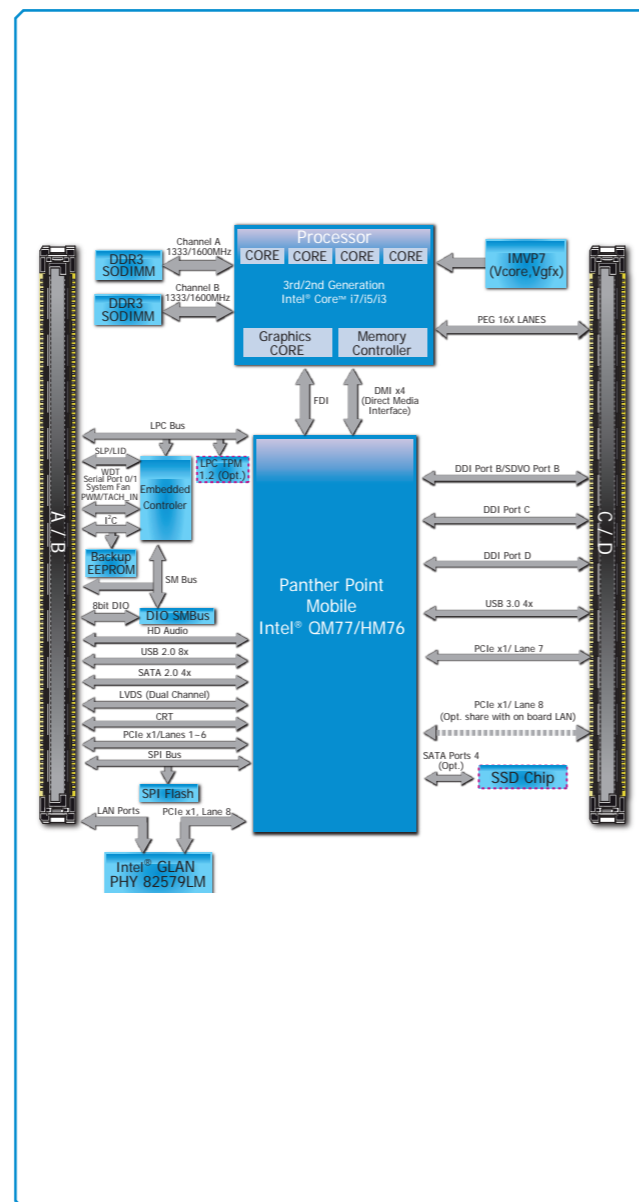
MEMORY	2 DDR3/DDR3L SODIMM up to 16GB
EXPANSION	1 PCIe x16, 7 PCIe x1 1 LPC, 1 SMBus, 1 I ² C, 2 serial 1 VGA, 1 LVDS, 3 DDI (HDMI/DVI/DP/SDVO) 12 USB: 4 USB 3.0, 8 USB 2.0 4 SATA: 2 SATA 3.0, 2 SATA 2.0 SSD (optional) 4-bit input and 4-bit output GPIO
LAN	1 LAN
DIMENSIONS	COM Express® R2.1 Basic, Type 6 95mm x 125mm (3.74" x 4.9")



Mechanical Drawing



Block Diagram



Specifications

- PROCESSOR**
- BGA 1023 packaging technology
 - 3rd generation Intel® Core™ processors (22nm process technology)
 - 2nd generation Intel® Core™ processors (32nm process technology)
 - Please refer to the Ordering Information below
- CHIPSET**
- Intel® QM77 Express Chipset
- SYSTEM MEMORY**
- Two 204-pin DDR3/DDR3L SODIMM sockets
 - 3rd generation processors
 - Supports DDR3/DDR3L 1333/1600 MHz (i7/i5/i3)
 - Supports DDR3/DDR3L 1066/1333/1600 MHz (i7 Quad Core)
 - 2nd generation processors
 - Supports DDR3 1066/1333 MHz (i7/i5/i3/Celeron)
 - Supports DDR3 1066/1333/1600 MHz (i7 Quad Core)
 - 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
- ONBOARD GRAPHICS FEATURES**
- Intel® HD Graphics 4000 (3rd generation processors)
 - Intel® HD Graphics 3000 (2nd generation processors)
 - Intel® HD Graphics (Intel® Celeron™ processors)
 - Supports VGA, LVDS and DDI interfaces
 - VGA: resolution up to 2048x1536 @ 75Hz
 - LVDS: Single Channel - 18/24-bit; Dual Channel - 36/48-bit, resolution up to 1920x1200 @ 60Hz
 - Digital Display Interfaces: HDMI, DVI, DP or SDVO (for Port B), resolution up to 1920x1200 @ 60Hz
 - Intel® Clear Video Technology
 - DirectX Video Acceleration (DXVA) for accelerating video processing
 - Full AVC/VC1/MPEG2 HW Decode
 - Supports DirectX 11/10.1/10/9 and OpenGL 3.0 (3rd generation processors)
 - Supports DirectX 10.1/10/9 and OpenGL 3.0 (2nd generation processors)

- ONBOARD AUDIO FEATURES**
- Supports High Definition Audio interface
- ONBOARD LAN FEATURES**
- Intel® 82579LM Gigabit Ethernet PHY
 - Integrated 10/100/1000 transceiver
 - Fully compliant with IEEE 802.3, IEEE 802.3u, IEEE 802.3ab

- SERIAL ATA (SATA) INTERFACE**
- Supports 4 Serial ATA interfaces
 - 2 SATA 3.0 with data transfer rate up to 6Gb/s
 - 2 SATA 2.0 with data transfer rate up to 3Gb/s
 - Integrated Advanced Host Controller Interface (AHCI) controller
 - Supports RAID 0/1/5/10

Ordering Information

Model Name	Chipset	Temperature	Memory	SSD	Processors
CR960	-	QM77	B	S	0
					0: None 2: 2GB 4: 4GB 8: 8GB 1: 16GB 3: 32GB 6: 64GB
					0: None 2: 2GB 4: 4GB 8: 8GB 1: 16GB 3: 32GB 6: 64GB

Packing List

- 1 CR960 board
- 1 QR (Quick Reference)
- 1 DVD

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

- SSD (optional)**
- 2GB/4GB/8GB/16GB/32GB/64GB
 - Write: 30MB/sec (max), Read: 70MB/sec (max)
 - SATA to SSD onboard

- WATCHDOG TIMER**
- Watchdog timeout programmable via software from 1 to 255 seconds

- EXPANSION INTERFACES**
- Supports 4 USB 3.0 ports
 - Supports 8 USB 2.0 ports
 - Supports 1 PCIe x16 interface
 - Supports 7 PCIe x1 interfaces
 - Supports LPC interface
 - Supports I²C interface
 - Supports SMBus interface
 - Supports 2 serial interfaces (TX/RX)
 - Supports 4-bit input and 4-bit output GPIO

- BIOS**
- 64Mbit SPI BIOS

- 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)
 - Windows 8 Enterprise x86 (32-bit)
 - Windows 8 Enterprise x64 (64-bit)

- TEMPERATURE**
- 0°C to 60°C

- HUMIDITY**
- 5% to 90%

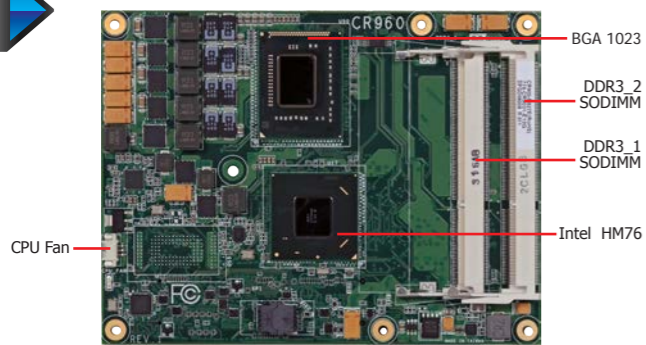
- POWER**
- Input: 5VSB (option), 12V, VCC_RTC

- PCB**
- Dimensions: 95mm (3.74") x 125mm (4.9")
 - Compliance: PICMG COM Express® R2.1 basic form factor, Type 6

COM Express Basic
Computer-On-Module

CR960-HM76

HM76

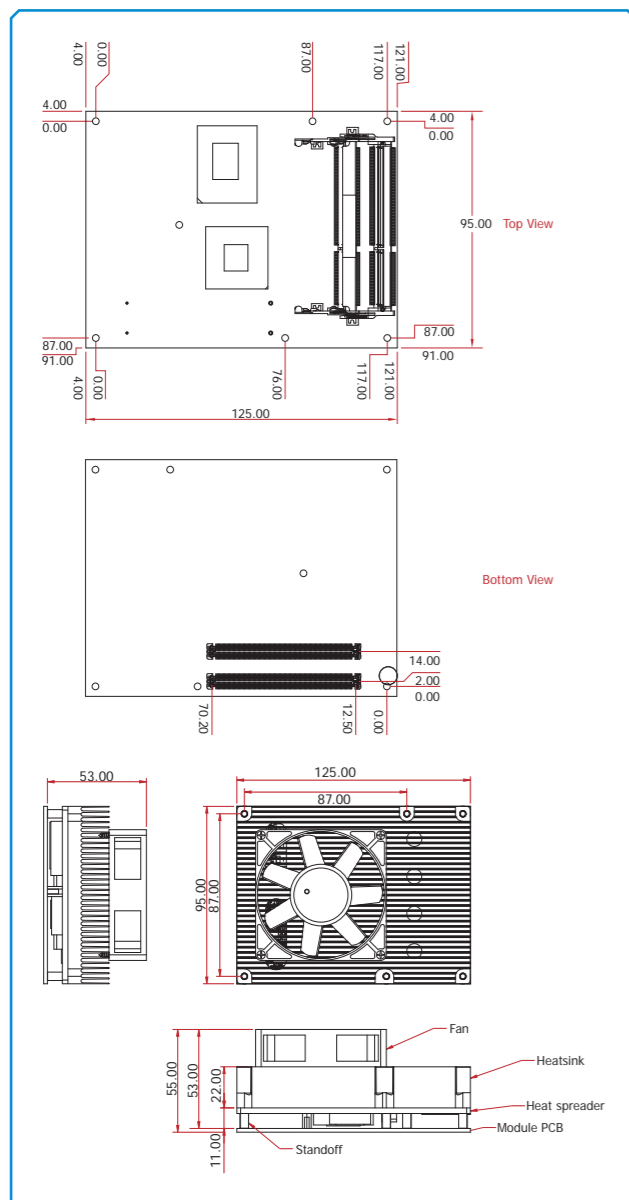


Features

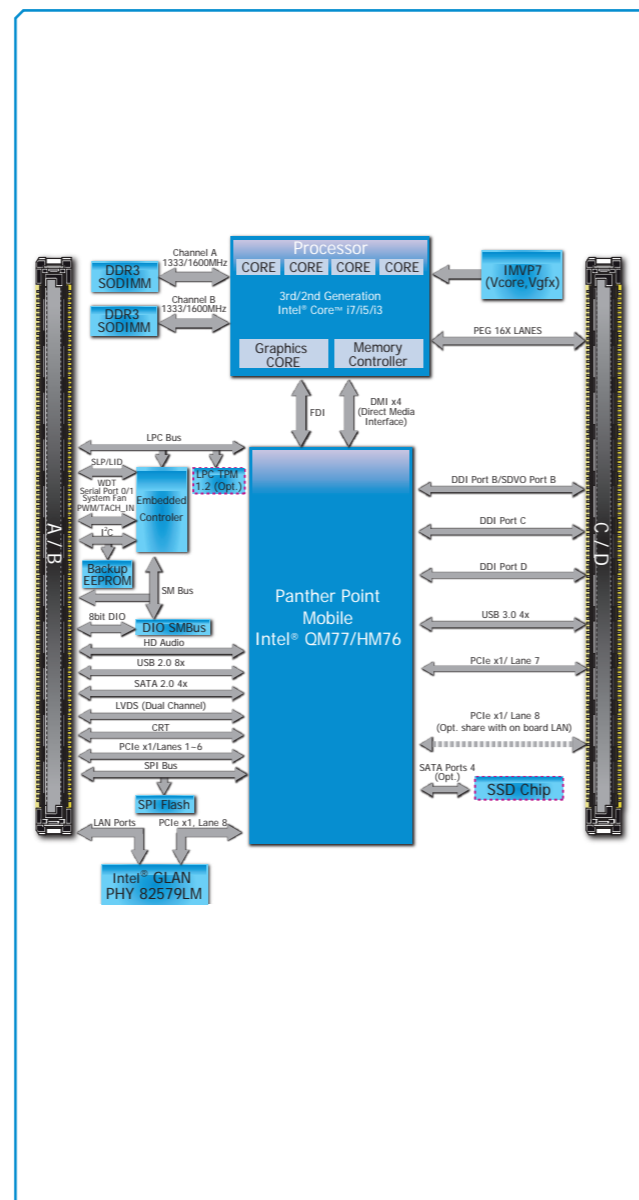
MEMORY	2 DDR3/DDR3L SODIMM up to 16GB
EXPANSION	1 PCIe x16, 7 PCIe x1 1 LPC, 1 SMBus, 1 I ² C, 2 serial 1 VGA, 1 LVDS, 3 DDI (HDMI/DVI/DP/SDVO) 12 USB: 4 USB 3.0, 8 USB 2.0 4 SATA: 2 SATA 3.0, 2 SATA 2.0 SSD (optional) 4-bit input and 4-bit output GPIO
LAN	1 LAN
DIMENSIONS	COM Express® R2.1 Basic, Type 6 95mm x 125mm (3.74" x 4.9")



Mechanical Drawing



Block Diagram



Specifications

PROCESSOR

- BGA 1023 packaging technology
 - 3rd generation Intel® Core™ processors (22nm process technology)
 - 2nd generation Intel® Core™ processors (32nm process technology)
- Please refer to the Ordering Information below

CHIPSET

- Intel® HM76 Express Chipset

SYSTEM MEMORY

- Two 204-pin DDR3/DDR3L SODIMM sockets
- 3rd generation processors
 - Supports DDR3/DDR3L 1333/1600 MHz (i7/i5/i3)
 - Supports DDR3/DDR3L 1066/1333/1600 MHz (i7 Quad Core)
- 2nd generation processors
 - Supports DDR3 1066/1333 MHz (i7/i5/i3/Celeron)
 - Supports DDR3 1066/1333/1600 MHz (i7 Quad Core)
- 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

ONBOARD GRAPHICS FEATURES

- Intel® HD Graphics 4000 (3rd generation processors)
- Intel® HD Graphics 3000 (2nd generation processors)
- Intel® HD Graphics (Intel® Celeron™ processors)
- Supports VGA, LVDS and DDI interfaces
- VGA: resolution up to 2048x1536 @ 75Hz
- LVDS: Single Channel - 18/24-bit; Dual Channel - 36/48-bit, resolution up to 1920x1200 @ 60Hz
- Digital Display Interfaces: HDMI, DVI, DP or SDVO (for Port B)
- HDMI, DVI, DP: resolution up to 1920x1200 @ 60Hz
- Intel® Clear Video Technology
- DirectX Video Acceleration (DXVA) for accelerating video processing
 - Full AVC/VC1/MPEG2 HW Decode
- Supports DirectX 11/10.1/10/9 and OpenGL 3.0 (3rd generation processors)
- Supports DirectX 10.1/10/9 and OpenGL 3.0 (2nd generation processors)

ONBOARD AUDIO FEATURES

- Supports High Definition Audio interface

ONBOARD LAN FEATURES

- Intel® 82579LM Gigabit Ethernet PHY
- Integrated 10/100/1000 transceiver
- Fully compliant with IEEE 802.3, IEEE 802.3u, IEEE 802.3ab

SERIAL ATA (SATA) INTERFACE

- Supports 4 Serial ATA interfaces
- 2 SATA 3.0 with data transfer rate up to 6Gb/s
- 2 SATA 2.0 with data transfer rate up to 3Gb/s
- Integrated Advanced Host Controller Interface (AHCI) controller

Ordering Information

Model Name	Chipset	Temperature	Memory	SSD	Processors
CR960	- HM76	B	S	0	- 3615QE
		B: 0°C to 60°C	S: Socket	0: None 2: 2GB 4: 4GB 8: 8GB 1: 16GB 3: 32GB 6: 64GB	3rd Generation 3615QE: Intel® Core™ i7-3615QE, 6M Cache, up to 3.30 GHz, 45W 3612QE: Intel® Core™ i7-3612QE, 6M Cache, up to 3.10 GHz, 35W 3555LE: Intel® Core™ i7-3555LE, 4M Cache, up to 3.20 GHz, 25W 3517UE: Intel® Core™ i7-3517UE, 4M Cache, up to 2.80 GHz, 17W 3610ME: Intel® Core™ i5-3610ME, 3M Cache, up to 3.30 GHz, 35W 3120ME: Intel® Core™ i3-3120ME, 3M Cache, 2.40 GHz, 35W 3217UE: Intel® Core™ i3-3217UE, 3M Cache, 1.60 GHz, 17W 1020E: Intel® Celeron™ 1020E, 2M Cache, 2.20 GHz, 35W 1047UE: Intel® Celeron™ 1047UE, 2M Cache, 1.40 GHz, 17W 927UE: Intel® Celeron™ 927UE, 1M Cache, 1.50 GHz, 17W 2nd Generation 2715QE: Intel® Core™ i7-2715QE, 6M Cache, up to 3.00 GHz, 45W 2655LE: Intel® Core™ i7-2655LE, 4M Cache, up to 2.90 GHz, 25W 2610UE: Intel® Core™ i7-2610UE, 4M Cache, up to 2.40 GHz, 17W 2515E: Intel® Core™ i5-2515E, 3M Cache, up to 3.10 GHz, 35W 2310E: Intel® Core™ i3-2310E, 3M Cache, 2.10 GHz, 35W 2340UE: Intel® Core™ i3-2340UE, 3M Cache, 1.30 GHz, 17W 810E: Intel® Celeron™ B810E, 2M Cache, 1.6GHz, 35W 847E: Intel® Celeron™ 847E, 2M Cache, 1.1GHz, 17W 827E: Intel® Celeron™ 827E, 1.5M Cache, 1.4GHz, 17W 807UE: Intel® Celeron™ 807UE, 1M Cache, 1.00 GHz, 10W

Packing List

- 1 CR960 board
- 1 QR (Quick Reference)
- 1 DVD

CR960-HM76

TRUSTED PLATFORM MODULE (TPM) - optional

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

SSD (optional)

- 2GB/4GB/8GB/16GB/32GB/64GB
- Write: 30MB/sec (max), Read: 70MB/sec (max)
- SATA to SSD onboard

WATCHDOG TIMER

- Watchdog timeout programmable via software from 1 to 255 seconds

EXPANSION INTERFACES

- Supports 4 USB 3.0 ports
- Supports 8 USB 2.0 ports
- Supports 1 PCIe x16 interface
- Supports 7 PCIe x1 interfaces
- Supports LPC interface
- Supports I²C interface
- Supports SMBus interface
- Supports 2 serial interfaces (TX/RX)
- Supports 4-bit input and 4-bit output GPIO

BIOS

- 64Mbit SPI BIOS

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)
- Windows 8 Enterprise x86 (32-bit)
- Windows 8 Enterprise x64 (64-bit)

TEMPERATURE

- 0°C to 60°C

HUMIDITY

- 5% to 90%

POWER

- Input: 5VSB (option), 12V, VCC_RTC

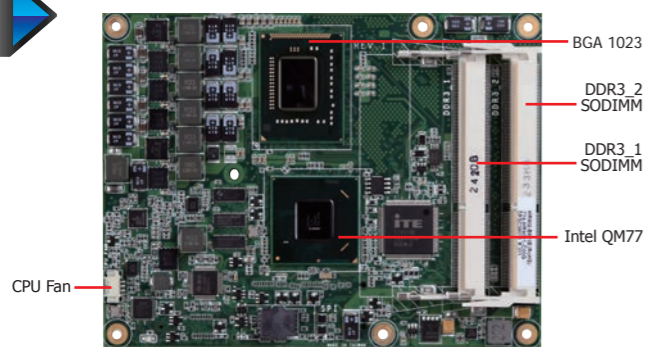
PCB

- Dimensions: 95mm (3.74") x 125mm (4.9")
- Compliance: PICMG COM Express® R2.1 basic form factor, Type 6

CR902-B

CR902-B

QM77

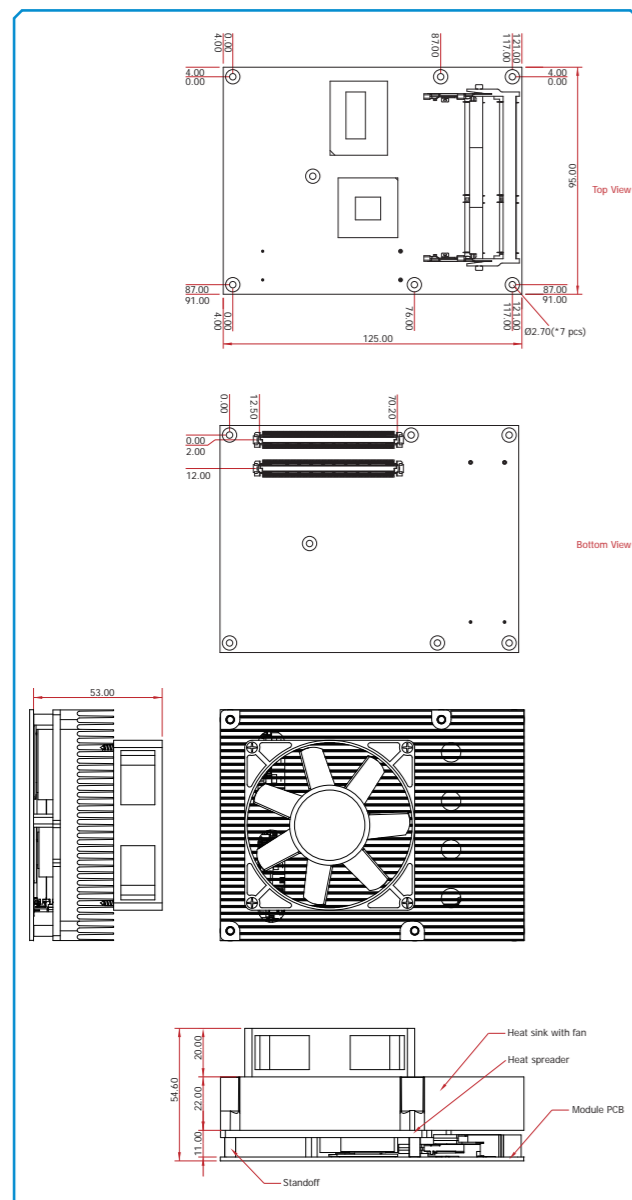


Features

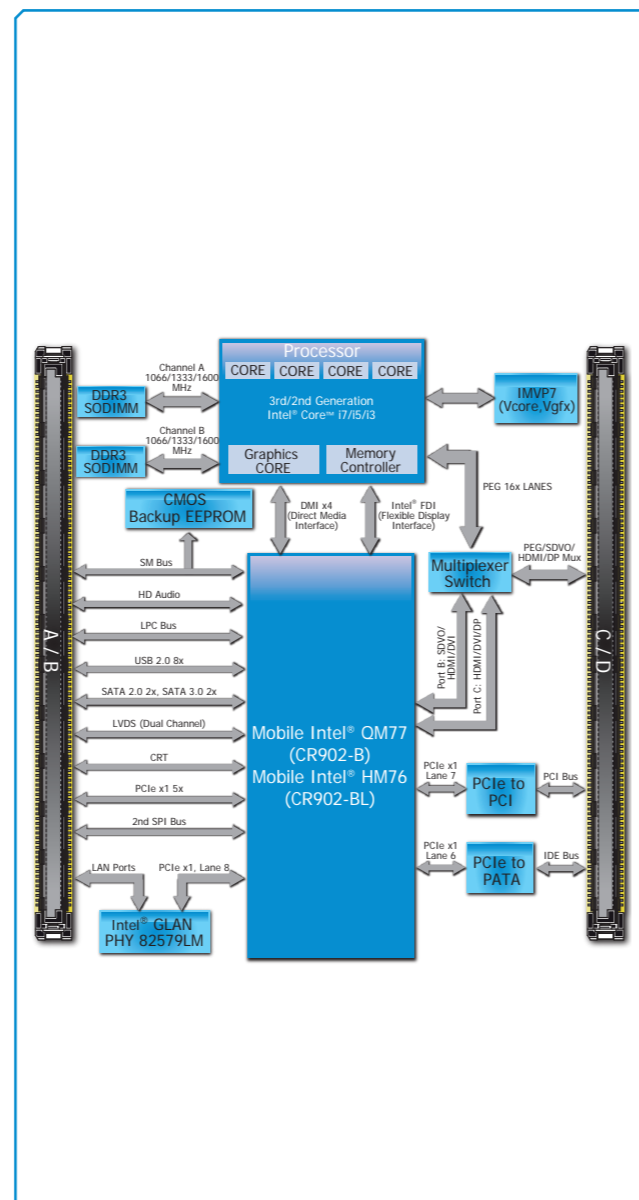
MEMORY	2 DDR3/DDR3L SODIMM up to 16GB
EXPANSION	1 PCIe x16, 1 PCIe x4 and 1 PCIe x1, 4 PCI 1 LPC, 1 SMBus, 1 IDE 1 VGA, 1 LVDS, 2 DDI (HDMI/DVI/DP/SDVO) 8 USB 2.0 4 SATA: 2 SATA 3.0, 2 SATA 2.0 8-bit DIO
LAN	1 LAN
DIMENSIONS	COM Express® R2.1 Basic, Type 2 95mm x 125mm (3.74" x 4.9")



Mechanical Drawing



Block Diagram



Specifications

PROCESSOR

- BGA 1023 packaging technology
- 3rd generation Intel® Core™ processors (22nm process technology)
- 2nd generation Intel® Core™ processors (32nm process technology)
- Please refer to the Ordering Information below

CHIPSET

- Intel® QM77 Express Chipset

SYSTEM MEMORY

- Two 204-pin DDR3/DDR3L SODIMM sockets
- 3rd generation processors
 - Supports DDR3/DDR3L 1333/1600 MHz (i7/i5/i3)
 - Supports DDR3/DDR3L 1067/1333/1600 MHz (i7 Quad Core)
- 2nd generation processors
 - Supports DDR3 1066/1333 MHz (i7/i5/i3/Celeron)
 - Supports DDR3 1066/1333/1600 MHz (i7 Quad Core)
- 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

ONBOARD GRAPHICS FEATURES

- Intel® HD Graphics 4000 (3rd generation processors)
- Intel® HD Graphics 3000 (2nd generation processors)
- Intel® HD Graphics (Intel® Celeron™ processors)
- Supports LVDS, VGA and DDI interfaces
- VGA: resolution up to 2048x1536 @ 75Hz
- LVDS: Single Channel - 18/24-bit; Dual Channel - 36/48-bit, resolution up to 1920x1200 @ 60Hz
- Digital Display Interfaces: HDMI, DVI, DP or SDVO
- HDMI, DVI, DP, SDVO: resolution up to 1920x1200 @ 60Hz
- Intel® Clear Video Technology
- DirectX Video Acceleration (DXVA) for accelerating video processing
 - Full AVC/VC1/MPEG2 HW Decode
- Supports DirectX 11/10.1/10/9 and OpenGL 3.0 (3rd generation processors)
- Supports DirectX 10.1/10/9 and OpenGL 3.0 (2nd generation processors)

ONBOARD AUDIO FEATURES

- Supports High Definition Audio interface

ONBOARD LAN FEATURES

- Intel® 82579LM Gigabit Ethernet PHY
- Integrated 10/100/1000 transceiver
- Fully compliant with IEEE 802.3, IEEE 802.3u, IEEE 802.3ab

SERIAL ATA (SATA) INTERFACE

- Supports 4 Serial ATA interfaces
- 2 SATA 3.0 with data transfer rate up to 6Gb/s
- 2 SATA 2.0 with data transfer rate up to 3Gb/s
- Integrated Advanced Host Controller Interface (AHCI) controller
- Supports RAID 0/1/5/10

EXPANSION INTERFACES

- Supports 8 USB 2.0 ports
- Supports 1 PCIe x16 interface (multiplex digital display interface)
- Supports 2 DDI (multiplex with PCIe x16)
 - Port B for SDVO/HDMI/DVI
 - Port C for HDMI/DVI/DisplayPort
- Supports 1 PCIe x4 and 1 PCIe x1 (default); or 5 PCIe x1 interfaces
- Supports 4 PCI interfaces (PCI 2.3 interface)
- Supports LPC interface
- Supports SMBus interface
- Supports IDE interface
- Supports 8-bit Digital I/O

IDE INTERFACE

- Supports up to two IDE devices
- DMA mode: Ultra ATA up to 100MB/s
- PIO mode: up to 16MB/s

DAMAGE FREE INTELLIGENCE

- Monitors CPU temperature and overheat alarm
- Monitors CPU fan speed and failure alarm
- Monitors Vcore/VCCRTC/DDR/+1.05V/VCCSA voltages and failure alarm
- Watchdog timer function

BIOS

- 64Mbit SPI BIOS

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)
- Windows 8 Enterprise x86 (32-bit)
- Windows 8 Enterprise x64 (64-bit)

TEMPERATURE

- 0°C to 60°C

HUMIDITY

- 10% to 90%

POWER

- Input: 5VSB (option), 12V, VCC_RTC

PCB

- Dimensions: 95mm (3.74") x 125mm (4.9")
- Compliance: PICMG COM Express® R2.1 basic form factor, Type 2

CERTIFICATION

- CE, FCC Class B, RoHS

Ordering Information

	Model Name	Part Number	Description
3rd Gen Processors	CR902-B3120ME	777-CR9021-510G	Intel® Core™ i3-3120ME, 3M Cache, 2.40 GHz, 35W
	CR902-B810E	777-CR9021-C10G	Intel® Celeron™ B810E, 2M Cache, 1.6GHz, 35W
2nd Gen Processors	CR902-B847E	777-CR9021-D10G	Intel® Celeron™ 847E, 2M Cache, 1.1GHz, 17W
	CR902-B827E	777-CR9021-E10G	Intel® Celeron™ 827E, 1.5M Cache, 1.4GHz, 17W

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

	Model Name	Part Number	Description
3rd Gen Processors	CR902-B3615QE	777-CR9021-010G	Intel® Core™ i7-3615QE, 6M Cache, up to 3.30 GHz, 45W
	CR902-B3612QE	777-CR9021-110G	Intel® Core™ i7-3612QE, 6M Cache, up to 3.10 GHz, 35W
	CR902-B3555LE	777-CR9021-210G	Intel® Core™ i7-3555LE, 4M Cache, up to 3.20 GHz, 25W
	CR902-B3517UE	777-CR9021-310G	Intel® Core™ i7-3517UE, 4M Cache, up to 2.80 GHz, 17W
	CR902-B3610ME	777-CR9021-410G	Intel® Core™ i5-3610ME, 3M Cache, up to 3.30 GHz, 35W
	CR902-B3217UE	777-CR9021-G10G	Intel® Core™ i3-3217UE, 3M Cache, 1.60 GHz, 17W
	CR902-B1020E	777-CR9021-H10G	Intel® Celeron™ 1020E, 2M Cache, 2.20 GHz, 35W
2nd Gen Processors	CR902-B1047UE	777-CR9021-I10G	Intel® Celeron™ 1047UE, 2M Cache, 1.40 GHz, 17W
	CR902-B927UE	777-CR9021-J10G	Intel® Celeron™ 927UE, 1M Cache, 1.50 GHz, 17W
	CR902-B2715QE	777-CR9021-610G	Intel® Core™ i7-2715QE, 6M Cache, up to 3.00 GHz, 45W
	CR902-B2655LE	777-CR9021-710G	Intel® Core™ i7-2655LE, 4M Cache, up to 2.90 GHz, 25W
	CR902-B2610UE	777-CR9021-810G	Intel® Core™ i7-2610UE, 4M Cache, up to 2.40 GHz, 17W
	CR902-B2515E	777-CR9021-910G	Intel® Core™ i5-2515E, 3M Cache, up to 3.10 GHz, 35W
	CR902-B2310E	777-CR9021-A10G	Intel® Core™ i3-2310E, 3M Cache, 2.10 GHz, 35W
	CR902-B2340UE	777-CR9021-B10G	Intel® Core™ i3-2340UE, 3M Cache, 1.30 GHz, 17W
	CR902-B807UE	777-CR9021-F10G	Intel® Celeron™ 807UE, 1M Cache, 1.00 GHz, 10W

Packing List

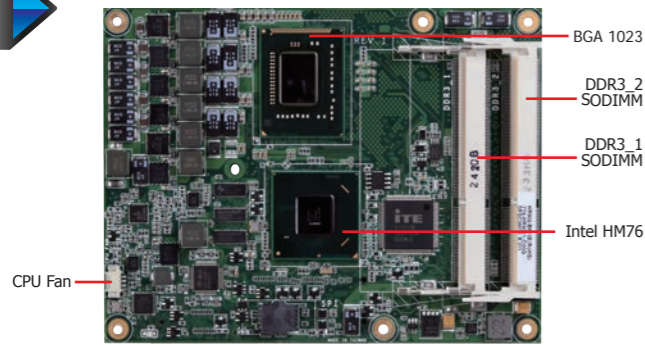
- 1 CR902 board
- 1 QR (Quick Reference)
- 1 DVD

Optional Items

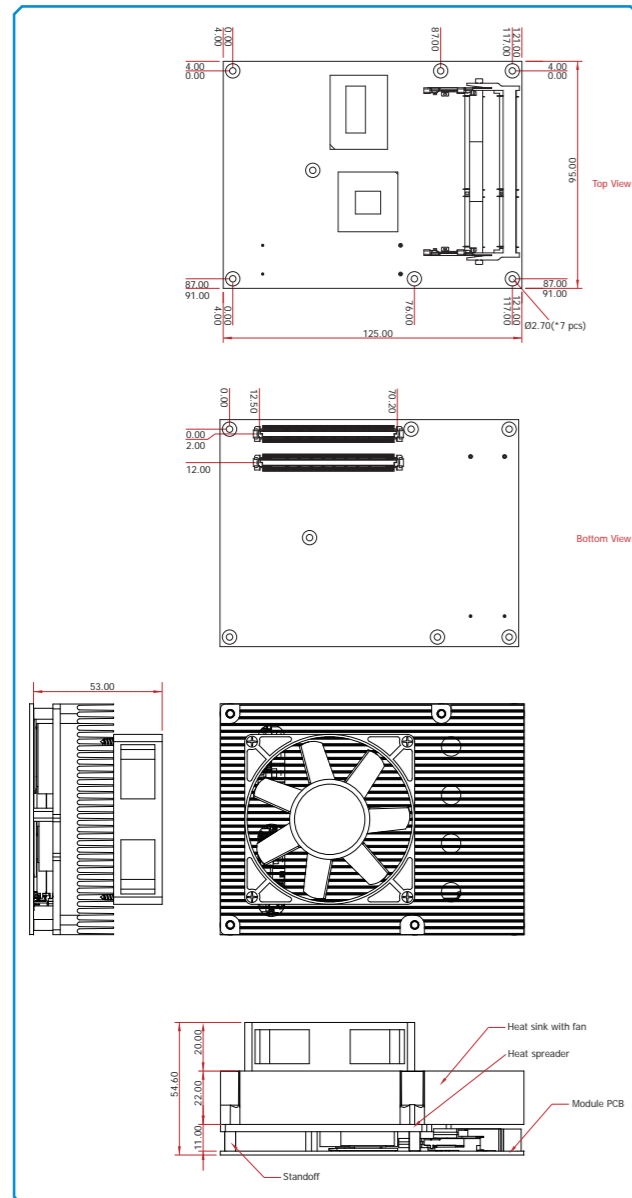
- COM330-B carrier board kit
- Heat spreader with heat sink and fan: 761-HR9020-300G (CR902-B3120ME, CR902-B810E, CR902-B847E, CR902-B827E)

CR902-BL

HM76



Mechanical Drawing

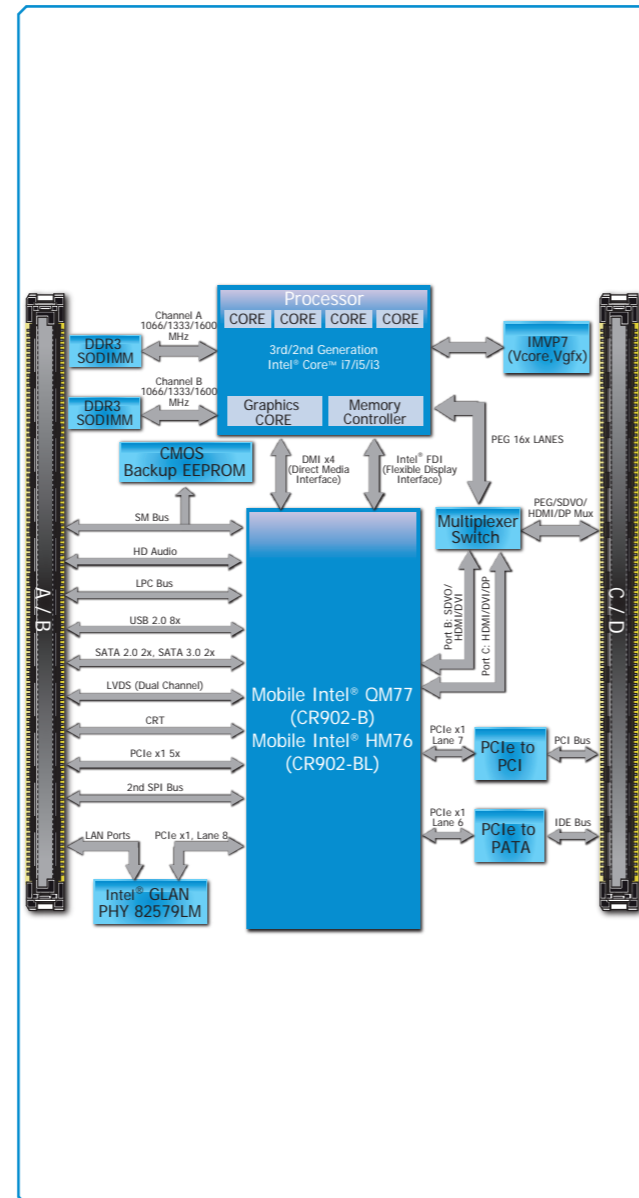


Features

MEMORY	2 DDR3/DDR3L SODIMM up to 16GB
EXPANSION	1 PCIe x16, 1 PCIe x4 and 1 PCIe x1, 4 PCI 1 LPC, 1 SMBus, 1 IDE 1 VGA, 1 LVDS, 2 DDI (HDMI/DVI/DP/SDVO) 8 USB 2.0 4 SATA: 2 SATA 3.0, 2 SATA 2.0 8-bit DIO
LAN	1 LAN
DIMENSIONS	COM Express® R2.1 Basic, Type 2 95mm x 125mm (3.74" x 4.9")



Block Diagram



Specifications

PROCESSOR

- BGA 1023 packaging technology
 - 3rd generation Intel® Core™ processors (22nm process technology)
 - 2nd generation Intel® Core™ processors (32nm process technology)
- Please refer to the Ordering Information below

CHIPSET

- Intel® HM76 Express Chipset

SYSTEM MEMORY

- Two 204-pin DDR3/DDR3L SODIMM sockets
- 3rd generation processors
 - Supports DDR3/DDR3L 1333/1600 MHz (i7/i5/i3)
 - Supports DDR3/DDR3L 1067/1333/1600 MHz (i7 Quad Core)
- 2nd generation processors
 - Supports DDR3 1066/1333 MHz (i7/i5/i3/Celeron)
 - Supports DDR3 1066/1333/1600 MHz (i7 Quad Core)
- 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

ONBOARD GRAPHICS FEATURES

- Intel® HD Graphics 4000 (3rd generation processors)
- Intel® HD Graphics 3000 (2nd generation processors)
- Intel® HD Graphics (Intel® Celeron™ processors)
- Supports LVDS, VGA and DDI interfaces
- VGA: resolution up to 2048x1536 @ 75Hz
- LVDS: Single Channel - 18/24-bit; Dual Channel - 36/48-bit, resolution up to 1920x1200 @ 60Hz
- Digital Display Interfaces: HDMI, DVI, DP or SDVO
- HDMI, DVI, DP, SDVO: resolution up to 1920x1200 @ 60Hz
- Intel® Clear Video Technology
- DirectX Video Acceleration (DXVA) for accelerating video processing
 - Full AVC/VC1/MPEG2 HW Decode
- Supports DirectX 11/10.1/10/9 and OpenGL 3.0 (3rd generation processors)
- Supports DirectX 10.1/10/9 and OpenGL 3.0 (2nd generation processors)

ONBOARD AUDIO FEATURES

- Supports High Definition Audio interface

ONBOARD LAN FEATURES

- Intel® 82579LM Gigabit Ethernet PHY
- Integrated 10/100/1000 transceiver
- Fully compliant with IEEE 802.3, IEEE 802.3u, IEEE 802.3ab

SERIAL ATA (SATA) INTERFACE

- Supports 4 Serial ATA interfaces
- 2 SATA 3.0 with data transfer rate up to 6Gb/s
- 2 SATA 2.0 with data transfer rate up to 3Gb/s
- Integrated Advanced Host Controller Interface (AHCI) controller

Ordering Information

	Model Name	Part Number	Description
3rd Gen Processors	CR902-BL3120ME	777-CR9021-500G	Intel® Core™ i3-3120ME, 3M Cache, 2.40 GHz, 35W
	CR902-BL810E	777-CR9021-C00G	Intel® Celeron™ B810E, 2M Cache, 1.6GHz, 35W
2nd Gen Processors	CR902-BL847E	777-CR9021-D00G	Intel® Celeron™ 847E, 2M Cache, 1.1GHz, 17W
	CR902-BL827E	777-CR9021-E00G	Intel® Celeron™ 827E, 1.5M Cache, 1.4GHz, 17W

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

	Model Name	Part Number	Description
3rd Gen Processors	CR902-BL3615QE	777-CR9021-000G	Intel® Core™ i7-3615QE, 6M Cache, up to 3.30 GHz, 45W
	CR902-BL3612QE	777-CR9021-100G	Intel® Core™ i7-3612QE, 6M Cache, up to 3.10 GHz, 35W
	CR902-BL3555LE	777-CR9021-200G	Intel® Core™ i7-3555LE, 4M Cache, up to 3.20 GHz, 25W
	CR902-BL3517UE	777-CR9021-300G	Intel® Core™ i7-3517UE, 4M Cache, up to 2.80 GHz, 17W
	CR902-BL3610ME	777-CR9021-400G	Intel® Core™ i5-3610ME, 3M Cache, up to 3.30 GHz, 35W
	CR902-BL3217UE	777-CR9021-G00G	Intel® Core™ i3-3217UE, 3M Cache, 1.60 GHz, 17W
	CR902-BL1020E	777-CR9021-H00G	Intel® Celeron™ 1020E, 2M Cache, 2.20 GHz, 35W
2nd Gen Processors	CR902-BL1047UE	777-CR9021-I00G	Intel® Celeron™ 1047UE, 2M Cache, 1.40 GHz, 17W
	CR902-BL927UE	777-CR9021-J00G	Intel® Celeron™ 927UE, 1M Cache, 1.50 GHz, 17W
	CR902-BL2715QE	777-CR9021-600G	Intel® Core™ i7-2715QE, 6M Cache, up to 3.00 GHz, 45W
	CR902-BL2655LE	777-CR9021-700G	Intel® Core™ i7-2655LE, 4M Cache, up to 2.90 GHz, 25W
	CR902-BL2610UE	777-CR9021-800G	Intel® Core™ i7-2610UE, 4M Cache, up to 2.40 GHz, 17W
	CR902-BL2515E	777-CR9021-900G	Intel® Core™ i5-2515E, 3M Cache, up to 3.10 GHz, 35W
	CR902-BL2310E	777-CR9021-A00G	Intel® Core™ i3-2310E, 3M Cache, 2.10 GHz, 35W
	CR902-BL2340UE	777-CR9021-B00G	Intel® Core™ i3-2340UE, 3M Cache, 1.30 GHz, 17W
	CR902-BL807UE	777-CR9021-F00G	Intel® Celeron™ 807UE, 1M Cache, 1.00 GHz, 10W

Packing List

- 1 CR902 board
- 1 QR (Quick Reference)
- 1 DVD

CR902-BL

EXPANSION INTERFACES

- Supports 8 USB 2.0 ports
- Supports 1 PCIe x16 interface (multiplex digital display interface)
- Supports 2 DDI (multiplex with PCIe x16)
 - Port B for SDVO/HDMI/DVI
 - Port C for HDMI/DVI/DisplayPort
- Supports 1 PCIe x4 and 1 PCIe x1 (default); or 5 PCIe x1 interfaces
- Supports 4 PCI interfaces (PCI 2.3 interface)
- Supports LPC interface
- Supports SMBus interface
- Supports IDE interface
- Supports 8-bit Digital I/O

IDE INTERFACE

- Supports up to two IDE devices
- DMA mode: Ultra ATA up to 100MB/s
- PIO mode: up to 16MB/s

DAMAGE FREE INTELLIGENCE

- Monitors CPU temperature and overheat alarm
- Monitors CPU fan speed and failure alarm
- Monitors Vcore/VCCRTC/DDR/+1.05V/VCCSA voltages and failure alarm
- Watchdog timer function

BIOS

- 64Mbit SPI BIOS

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)
- Windows 8 Enterprise x86 (32-bit)
- Windows 8 Enterprise x64 (64-bit)

TEMPERATURE

- 0°C to 60°C

HUMIDITY

- 10% to 90%

POWER

- Input: 5VSB (option), 12V, VCC_RTC

PCB

- Dimensions: 95mm (3.74") x 125mm (4.9")
- Compliance: PICMG COM Express® R2.1 basic form factor, Type 2

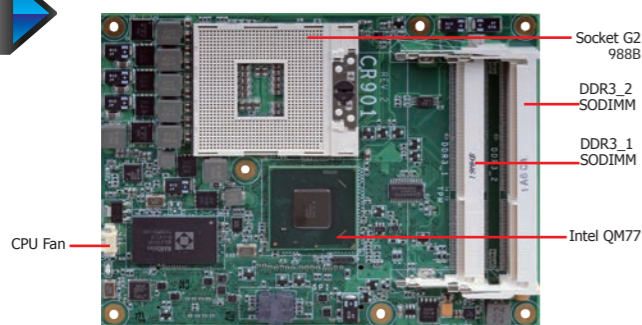
CERTIFICATION

- CE, FCC Class B, RoHS

CR901-B

CR901-B

QM77



Features

MEMORY	2 DDR3/DDR3L SODIMM up to 16GB
EXPANSION	1 PCIe x16, 7 PCIe x1 1 LPC, 1 SMBus, 1 I ² C, 2 serial 1 VGA, 1 LVDS, 3 DDI (HDMI/DVI/DP/SDVO) 12 USB: 4 USB 3.0, 8 USB 2.0 4 SATA: 2 SATA 3.0, 2 SATA 2.0 4-bit input and 4-bit output GPIO
LAN	1 LAN
DIMENSIONS	COM Express® R2.1 Basic, Type 6 95mm x 125mm (3.74" x 4.9")

Specifications

PROCESSOR

- Socket G2 988B for:
 - 3rd Generation Intel® Core™ processors (22nm process technology)
 - Intel® Core™ i7-3610QE (6M Cache, up to 3.3 GHz); 45W
 - Intel® Core™ i5-3610ME (3M Cache, up to 3.3 GHz); 35W
 - Intel® Core™ i3-3120ME (3M Cache, 2.4 GHz); 35W
 - 2nd Generation Intel® Core™ processors (32nm process technology)
 - Intel® Core™ i7-2710QE (6M Cache, up to 3.0 GHz); 45W
 - Intel® Core™ i5-2510E (3M Cache, up to 3.1 GHz); 35W
 - Intel® Core™ i3-2330E (3M Cache, 2.2 GHz); 35W
 - Intel® Celeron® B810 (2M Cache, 1.6 GHz); 35W

CHIPSET

- Intel® QM77 Express chipset

SYSTEM MEMORY

- Two 204-pin SODIMM sockets
- Supports DDR3 SODIMM

3rd Generation Processors	2nd Generation Processors
DDR3 1066/1333/1600MHz	DDR3 1066/1333MHz (i5/i3/Celeron)
	DDR3 1600MHz (i7)

- Supports DDR3L SODIMM
 - 1066/1333MHz when operating at 1.35V
 - 1066/1333/1600MHz when operating at 1.5V
- 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

ONBOARD GRAPHICS FEATURES

- Intel® HD Graphics 4000
- Supports VGA, LVDS and DDI interfaces
- VGA: resolution up to 2048x1536 @ 75Hz
- LVDS: Single Channel - 18/24-bit; Dual Channel - 36/48-bit, resolution up to 1920x1200 @ 60Hz
- Digital Display Interfaces: HDMI, DVI, DP and SDVO (for Port B)
- HDMI, DVI, DP: resolution up to 1920x1200 @ 60Hz
- Intel® Clear Video Technology
- DirectX Video Acceleration (DXVA) for accelerating video processing
 - Full AVC/VC1/MPEG2 HW Decode
- Supports DirectX 11/10.1/10/9 and OpenGL 3.0

ONBOARD AUDIO FEATURES

- Supports High Definition Audio interface

ONBOARD LAN FEATURES

- Intel® 82579LM Gigabit Ethernet PHY
- Integrated 10/100/1000 transceiver
- Fully compliant with IEEE 802.3, IEEE 802.3u, IEEE 802.3ab

SERIAL ATA (SATA) INTERFACE

- Supports 4 Serial ATA interfaces
- 2 SATA 3.0 with data transfer rate up to 6Gb/s
- 2 SATA 2.0 with data transfer rate up to 3Gb/s
- Integrated Advanced Host Controller Interface (AHCI) controller
- Supports RAID 0/1/5/10

USB INTERFACE

- XHCI Host Controller supports up to 4 super speed USB 3.0 ports

WATCHDOG TIMER

- Watchdog timeout programmable via software from 1 to 255 seconds

Ordering Information

Model Name	Part Number	Description
CR901-B	777-CR9011-000G	3rd/2nd generation Intel® Core™ processors

Packing List

- 1 CR901-B board
- 1 Heat sink kit
- 1 QR (Quick Reference)
- 1 DVD

SSD (optional)

- 4GB/8GB/16GB/32GB
- Write: 30MB/sec (max), Read: 70MB/sec (max)
- SATA to SSD onboard

TRUSTED PLATFORM MODULE (TPM) - optional

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

EXPANSION INTERFACES

- Supports 12 USB interfaces
 - 4 USB 3.0
 - 8 USB 2.0
- Supports 1 PCIe x16 interface
 - Supports Gen 3.0 (3rd generation processors)
 - Supports Gen 2.0 (2nd generation processors)
 - Configurations (supported only via a riser card):
 - One x8 (GFX) and two x4 (I/O)
 - Two x8 (GFX, I/O)
 - One x16 (GFX, I/O)
- Supports 1 PCIe x4 and 3 PCIe x1 (default); or 7 PCIe x1 interfaces
- Supports LPC interface
- Supports SMBus interface
- Supports I²C interface
- Supports 2 serial interfaces (TX/RX)
- Supports 4-bit input and 4-bit output GPIO

DAMAGE FREE INTELLIGENCE

- Detects CPU temperature
- Detects CPU fan speed
- Detects Vcore/VGFX/DDR voltages
- Watchdog timer function

BIOS

- 64Mbit SPI BIOS

POWER CONSUMPTION

- 63.06 W with i7-3610QE at 2.30GHz and 2x 2GB 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)
- 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%

POWER

- Input: 5VSB (option), 12V, VCC_RTC

PCB

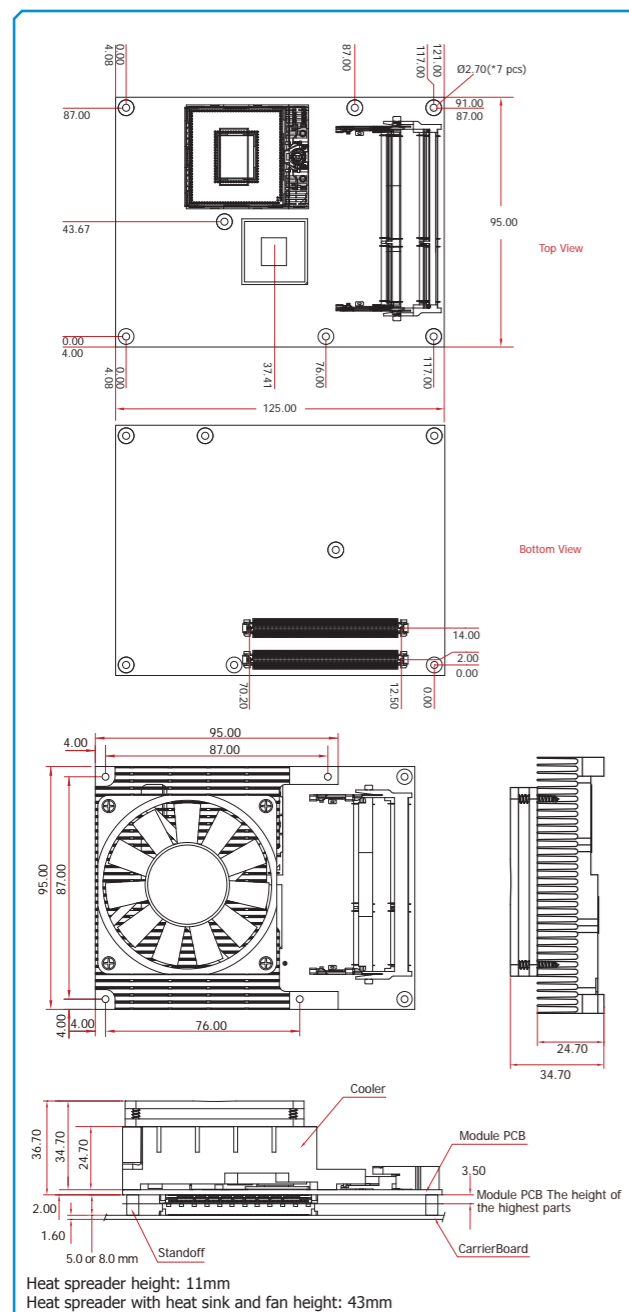
- Dimensions
 - COM Express® Basic
 - 95mm (3.74") x 125mm (4.9")
- Compliance
 - PICMG COM Express® R2.1, Type 6

CERTIFICATION

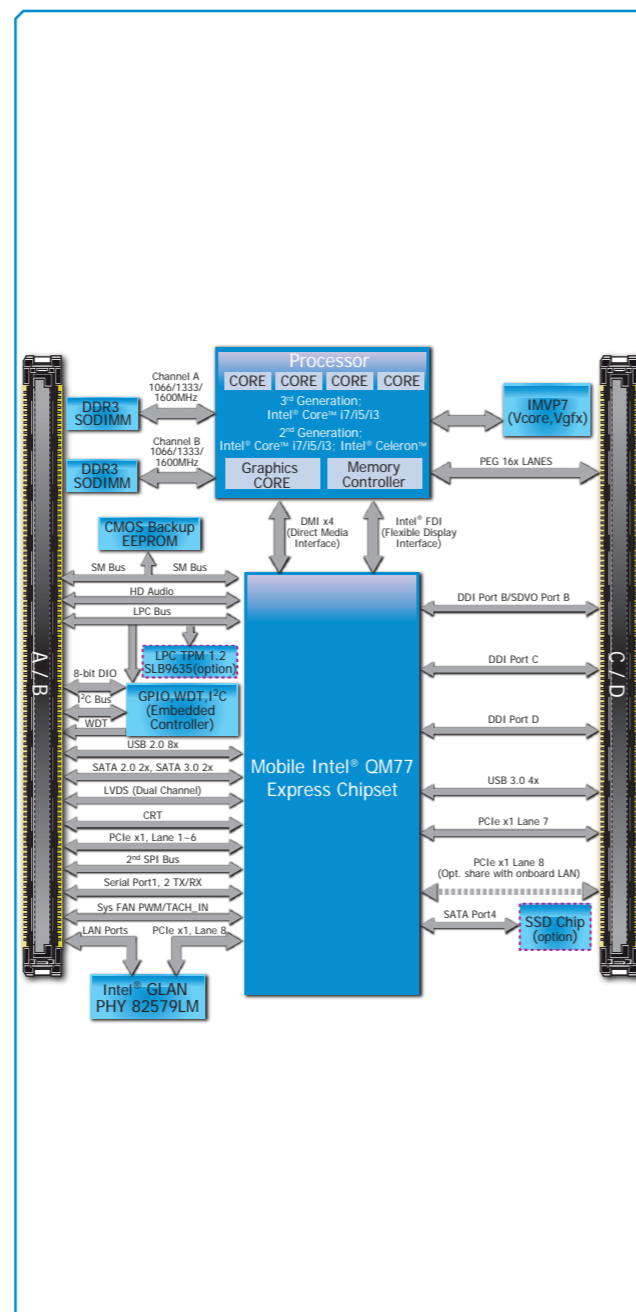
- CE, FCC Class B, UL, RoHS



Mechanical Drawing



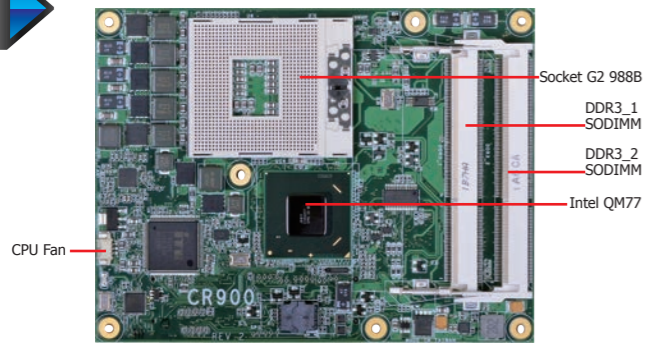
Block Diagram



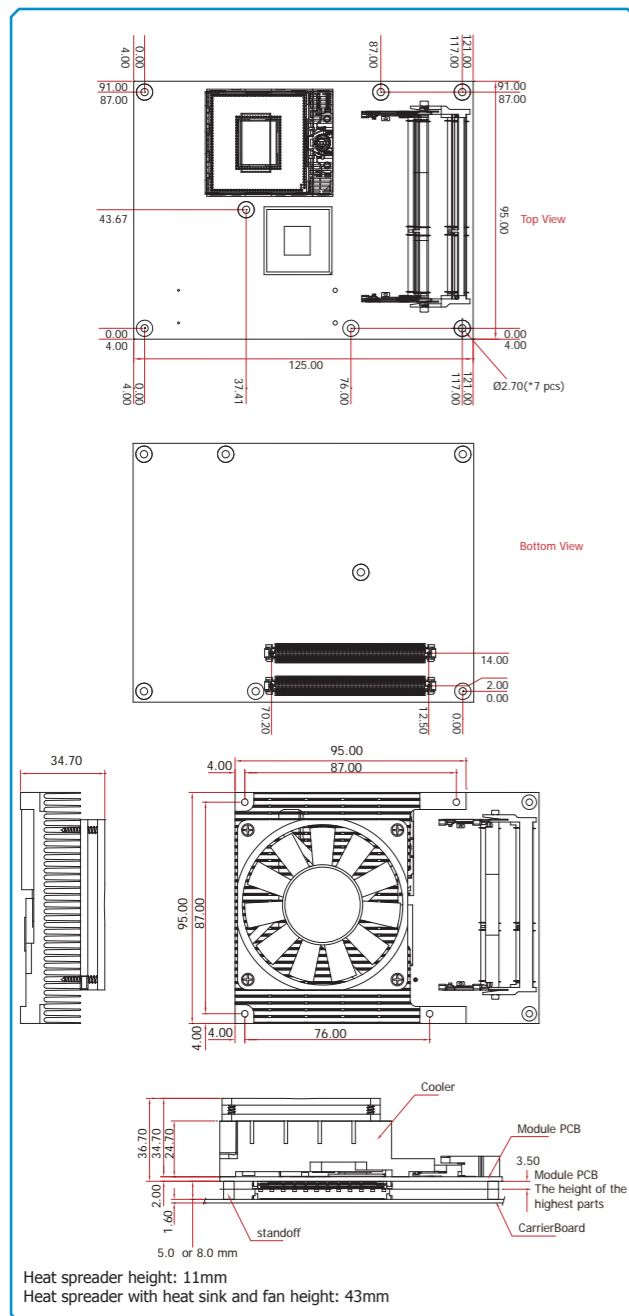
COM Express Basic
Computer-On-Module

CR900-B

QM77



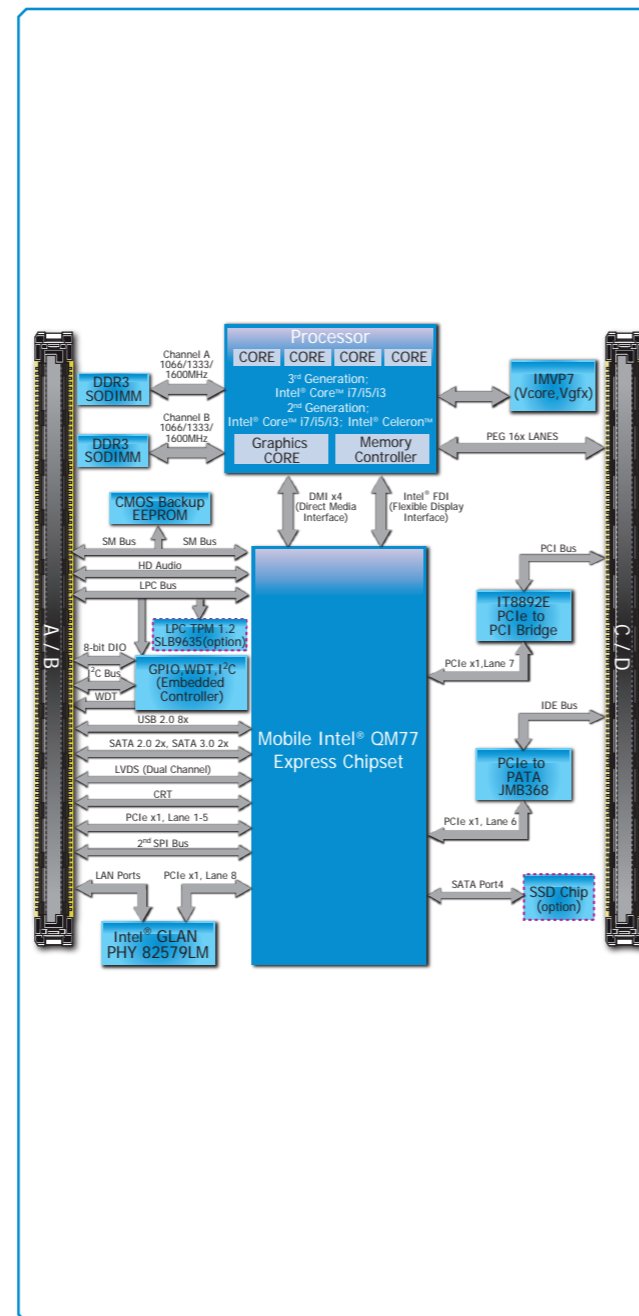
Mechanical Drawing



Features

MEMORY	2 DDR3/DDR3L SODIMM up to 16GB
EXPANSION	1 PCIe x16, 5 PCIe x1, 4 PCI 1 LPC, 1 SMBus, 1 I ² C, 1 IDE 1 VGA, 1 LVDS 8 USB 2.0 4 SATA: 2 SATA 3.0, 2 SATA 2.0 4-bit input and 4-bit output GPIO
LAN	1 LAN
DIMENSIONS	COM Express® R2.1 Basic, Type 2 95mm x 125mm (3.74" x 4.9")

Block Diagram



Specifications

PROCESSOR

- Socket G2 988B for:
 - 3rd Generation Intel® Core™ processors (22nm process technology)
 - Intel® Core™ i7-3610QE (6M Cache, up to 3.3 GHz); 45W
 - Intel® Core™ i5-3610ME (3M Cache, up to 3.3 GHz); 35W
 - Intel® Core™ i3-3120ME (3M Cache, 2.4 GHz); 35W
 - 2nd Generation Intel® Core™ processors (32nm process technology)
 - Intel® Core™ i7-2710QE (6M Cache, up to 3.0 GHz); 45W
 - Intel® Core™ i5-2510E (3M Cache, up to 3.1 GHz); 35W
 - Intel® Core™ i3-2330E (3M Cache, 2.2 GHz); 35W
 - Intel® Celeron® B810 (2M Cache, 1.6 GHz); 35W

CHIPSET

- Intel® QM77 Express Chipset

SYSTEM MEMORY

- Two 204-pin SODIMM sockets
- Supports DDR3 SODIMM

3rd Generation Processors	2nd Generation Processors
DDR3 1066/1333/1600MHz	DDR3 1066/1333MHz (i5/i3/Celeron)
	DDR3 1600MHz (i7)

- Supports DDR3L SODIMM
 - 1066/1333MHz when operating at 1.35V
 - 1066/1333/1600MHz when operating at 1.5V
- 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

ONBOARD GRAPHICS FEATURES

- Intel® HD Graphics 4000
- Supports LVDS and VGA interfaces
- VGA: resolution up to 2048x1536 @ 75Hz
- LVDS: Single Channel - 18/24-bit; Dual Channel: 36/48-bit, resolution up to 1920x1200 @ 60Hz
- Intel® Clear Video Technology
- DirectX Video Acceleration (DXVA) for accelerating video processing
 - Full AVC/VC1/MPEG2 HW Decode
- Supports DirectX 11/10.1/10/9 and OpenGL 3.0

ONBOARD AUDIO FEATURES

- Supports High Definition Audio interface

ONBOARD LAN FEATURES

- Intel® 82579LM Gigabit Ethernet PHY
- Integrated 10/100/1000 transceiver
- Fully compliant with IEEE 802.3, IEEE 802.3u, IEEE 802.3ab

SERIAL ATA (SATA) INTERFACE

- Supports 4 Serial ATA interfaces
- 2 SATA 3.0 with data transfer rate up to 6Gb/s
- 2 SATA 2.0 with data transfer rate up to 3Gb/s
- Integrated Advanced Host Controller Interface (AHCI) controller
- Supports RAID 0/1/5/10

IDE INTERFACE

- Supports up to two IDE devices
- DMA mode: Ultra ATA up to 100MB/s
- PIO mode: up to 16MB/s

WATCHDOG TIMER

- Watchdog timeout programmable via software from 1 to 255 seconds

Ordering Information

Model Name	Part Number	Description
CR900-B	777-CR9001-000G	3rd/2nd generation Intel® Core™ processors

Packing List

• 1 CR900-B board
• 1 QR (Quick Reference)
• 1 DVD

CR900-B

SSD (optional)

- 4GB/8GB/16GB/32GB
- Write: 30MB/sec (max), Read: 70MB/sec (max)
- SATA to SSD onboard

TRUSTED PLATFORM MODULE (TPM) - optional

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

EXPANSION INTERFACES

- Supports 8 USB 2.0/1.1 interfaces
- Supports 4 PCI slots (PCI 2.3 interface)
- Supports 1 PCIe x16 interface
 - Supports Gen 3.0 (3rd generation processors)
 - Supports Gen 2.0 (2nd generation processors)
 - Configurations (supported only via a riser card):
 - One x8 (GFX) and two x4 (I/O)
 - Two x8 (GFX, I/O)
 - One x16 (GFX, I/O)
- Supports 1 PCIe x1 and 1 PCIe x4 (default); or 5 PCIe x1 interfaces
- Supports LPC interface
- Supports SMBus interface
- Supports I²C interface
- Supports IDE interface
- Supports 4-bit input and 4-bit output GPIO

DAMAGE FREE INTELLIGENCE

- Monitors CPU temperature
- Monitors CPU fan speed
- Monitors Vcore/VGFX/DDR/1.05V/VCCSA voltages
- Watchdog timer function

BIOS

- 64Mbit SPI BIOS

POWER CONSUMPTION

- 59.78 W with i7-3610QE at 2.30GHz and 2x 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)
- 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%

POWER

- Input: 5VSB (option), 12V, VCC_RTC

PCB

- Dimensions
 - COM Express® Basic
 - 95mm (3.74") x 125mm (4.9")
- Compliance
 - PICMG COM Express® R2.1, Type 2

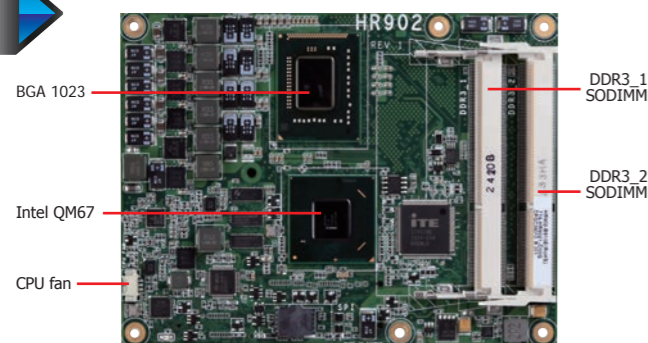
CERTIFICATION

- CE
- FCC Class B
- RoHS
- UL

HR902-B

HR902-B

QM67

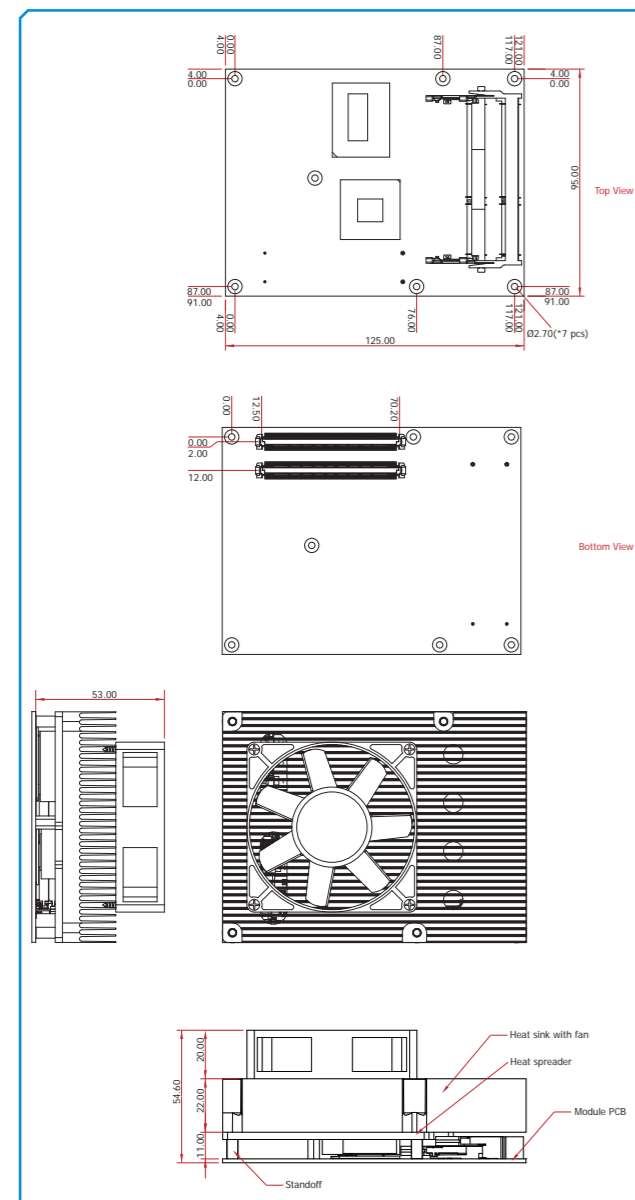


Features

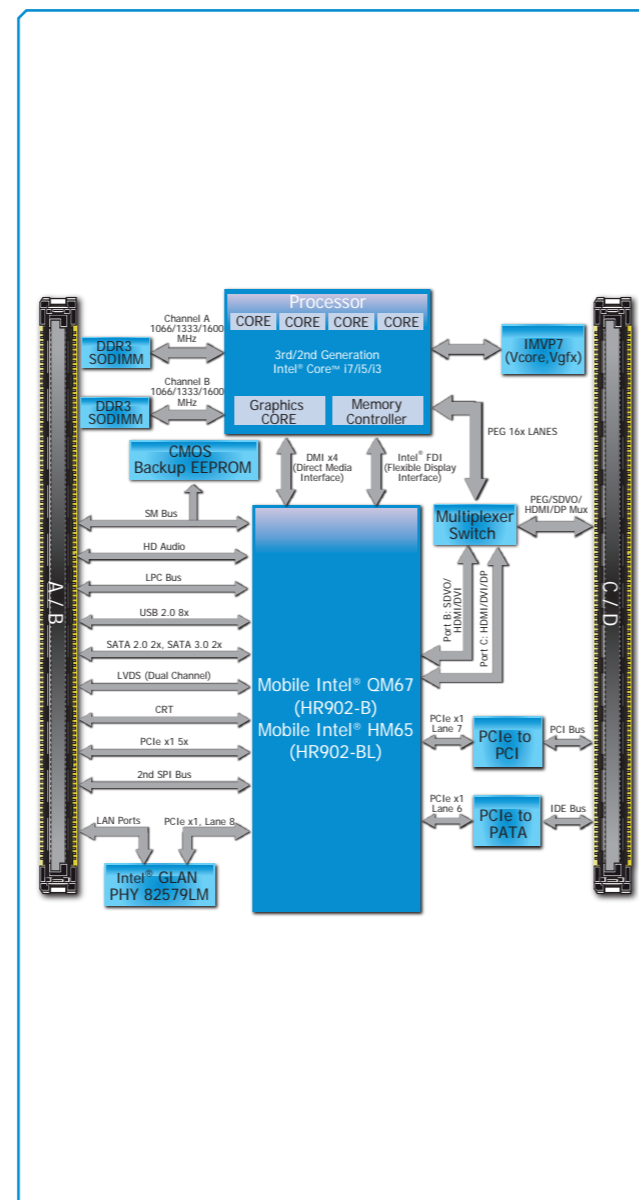
MEMORY	2 DDR3 SODIMM up to 16GB
EXPANSION	1 PCIe x16, 1 PCIe x4 and 1 PCIe x1, 4 PCI 1 LPC, 1 SMBus, 1 IDE 1 VGA, 1 LVDS, 2 DDI (HDMI/DVI/DP/SDVO) 8 USB 2.0 4 SATA: 2 SATA 3.0, 2 SATA 2.0 8-bit DIO
LAN	1 LAN
DIMENSIONS	COM Express® R2.1 Basic, Type 2 95mm x 125mm (3.74" x 4.9")



Mechanical Drawing



Block Diagram



Specifications

PROCESSOR

- BGA 1023 packaging technology
 - 3rd generation Intel® Core™ processors (22nm process technology)
 - 2nd generation Intel® Core™ processors (32nm process technology)
- Please refer to the Ordering Information below

CHIPSET

- Intel® QM67 Express Chipset

SYSTEM MEMORY

- Two 204-pin DDR3 SODIMM sockets
- 3rd generation processors
 - Supports DDR3/DDR3L 1333/1600 MHz (i7/i5/i3)
 - Supports DDR3/DDR3L 1067/1333/1600 MHz (i7 Quad Core)
- 2nd generation processors
 - Supports DDR3 1066/1333 MHz (i7/i5/i3/Celeron)
 - Supports DDR3 1066/1333/1600 MHz (i7 Quad Core)
- 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

ONBOARD GRAPHICS FEATURES

- Intel® HD Graphics 4000 (3rd generation processors)
- Intel® HD Graphics 3000 (2nd generation processors)
- Intel® HD Graphics (Intel® Celeron™ processors)
- Supports LVDS, VGA and DDI interfaces
- VGA: resolution up to 2048x1536 @ 75Hz
- LVDS: Single Channel - 18/24-bit; Dual Channel - 36/48-bit, resolution up to 1920x1200 @ 60Hz
- Digital Display Interfaces: HDMI, DVI, DP or SDVO
- HDMI, DVI, DP, SDVO: resolution up to 1920x1200 @ 60Hz
- Intel® Clear Video Technology
- DirectX Video Acceleration (DXVA) support for accelerating video processing
- Supports DirectX 11/10.1/10/9 and OpenGL 3.0 (3rd generation processors)
- Supports DirectX 10.1/10/9 and OpenGL 3.0 (2nd generation processors)

ONBOARD AUDIO FEATURES

- Supports High Definition Audio interface

ONBOARD LAN FEATURES

- Intel® 82579LM Gigabit Ethernet PHY
- Integrated 10/100/1000 transceiver
- Fully compliant with IEEE 802.3, IEEE 802.3u, IEEE 802.3ab

SERIAL ATA (SATA) INTERFACE

- Supports 4 Serial ATA interfaces
- 2 SATA 3.0 with data transfer rate up to 6Gb/s
- 2 SATA 2.0 with data transfer rate up to 3Gb/s
- Integrated Advanced Host Controller Interface (AHCI) controller
- Supports RAID 0/1/5/10

Ordering Information

	Model Name	Part Number	Description
3rd Gen Processors	HR902-B3120ME	777-HR9021-510G	Intel® Core™ i3-3120ME, 3M Cache, 2.40 GHz, 35W
	HR902-B810E	777-HR9021-C10G	Intel® Celeron™ B810E, 2M Cache, 1.6GHz, 35W
2nd Gen Processors	HR902-B847E	777-HR9021-D10G	Intel® Celeron™ 847E, 2M Cache, 1.1GHz, 17W
	HR902-B827E	777-HR9021-E10G	Intel® Celeron™ 827E, 1.5M Cache, 1.4GHz, 17W

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

	Model Name	Part Number	Description
3rd Gen Processors	HR902-B3615QE	777-HR9021-010G	Intel® Core™ i7-3615QE, 6M Cache, up to 3.30 GHz, 45W
	HR902-B3612QE	777-HR9021-110G	Intel® Core™ i7-3612QE, 6M Cache, up to 3.10 GHz, 35W
	HR902-B3555LE	777-HR9021-210G	Intel® Core™ i7-3555LE, 4M Cache, up to 3.20 GHz, 25W
	HR902-B3517UE	777-HR9021-310G	Intel® Core™ i7-3517UE, 4M Cache, up to 2.80 GHz, 17W
	HR902-B3610ME	777-HR9021-410G	Intel® Core™ i5-3610ME, 3M Cache, up to 3.30 GHz, 35W
	HR902-B3217UE	777-HR9021-G10G	Intel® Core™ i3-3217UE, 3M Cache, 1.60 GHz, 17W
	HR902-B1020E	777-HR9021-H10G	Intel® Celeron™ 1020E, 2M Cache, 2.20 GHz, 35W
2nd Gen Processors	HR902-B1047UE	777-HR9021-I10G	Intel® Celeron™ 1047UE, 2M Cache, 1.40 GHz, 17W
	HR902-B927UE	777-HR9021-J10G	Intel® Celeron™ 927UE, 1M Cache, 1.50 GHz, 17W
	HR902-B2715QE	777-HR9021-610G	Intel® Core™ i7-2715QE, 6M Cache, up to 3.00 GHz, 45W
	HR902-B2655LE	777-HR9021-710G	Intel® Core™ i7-2655LE, 4M Cache, up to 2.90 GHz, 25W
	HR902-B2610UE	777-HR9021-810G	Intel® Core™ i7-2610UE, 4M Cache, up to 2.40 GHz, 17W
	HR902-B2515E	777-HR9021-910G	Intel® Core™ i5-2515E, 3M Cache, up to 3.10 GHz, 35W
	HR902-B2310E	777-HR9021-A10G	Intel® Core™ i3-2310E, 3M Cache, 2.10 GHz, 35W
	HR902-B2340UE	777-HR9021-B10G	Intel® Core™ i3-2340UE, 3M Cache, 1.30 GHz, 17W
	HR902-B807UE	777-HR9021-F10G	Intel® Celeron™ 807UE, 1M Cache, 1.00 GHz, 10W

Packing List

- 1 HR902 board
- 1 QR (Quick Reference)
- 1 Drivers/utilities disk

Optional Items

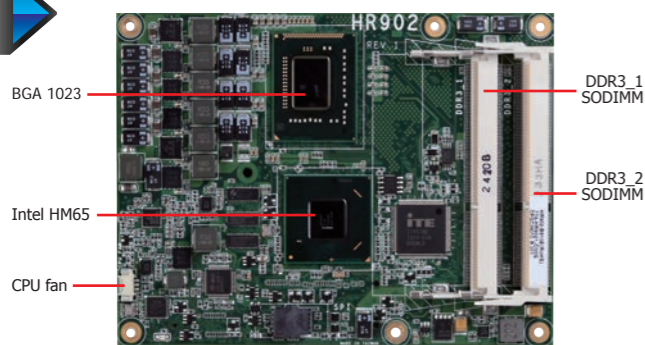
- COM330-B carrier board kit
- Heat spreader with heat sink and fan: 761-HR9020-300G (HR902-B3120ME, HR902-B810E, HR902-B847E, HR902-B827E)

COM Express Basic
Computer-On-Module

HR902-BL

HR902-BL

HM65



Features

MEMORY	2 DDR3 SODIMM up to 16GB
EXPANSION	1 PCIe x16, 1 PCIe x4 and 1 PCIe x1, 4 PCI 1 LPC, 1 SMBus, 1 IDE 1 VGA, 1 LVDS, 2 DDI (HDMI/DVI/DP/SDVO) 8 USB 2.0 4 SATA: 2 SATA 3.0, 2 SATA 2.0 8-bit DIO
LAN	1 LAN
DIMENSIONS	COM Express® R2.1 Basic, Type 2 95mm x 125mm (3.74" x 4.9")



Specifications

PROCESSOR

- BGA 1023 packaging technology
 - 3rd generation Intel® Core™ processors (22nm process technology)
 - 2nd generation Intel® Core™ processors (32nm process technology)
- Please refer to the Ordering Information below

CHIPSET

- Intel® HM65 Express Chipset

SYSTEM MEMORY

- Two 204-pin DDR3 SODIMM sockets
- 3rd generation processors
 - Supports DDR3/DDR3L 1333/1600 MHz (i7/i5/i3)
 - Supports DDR3/DDR3L 1066/1333/1600 MHz (i7 Quad Core)
- 2nd generation processors
 - Supports DDR3 1066/1333 MHz (i7/i5/i3/Celeron)
 - Supports DDR3 1066/1333/1600 MHz (i7 Quad Core)
- 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

ONBOARD GRAPHICS FEATURES

- Intel® HD Graphics 4000 (3rd generation processors)
- Intel® HD Graphics 3000 (2nd generation processors)
- Intel® HD Graphics (Intel® Celeron™ processors)
- Supports LVDS, VGA and DDI interfaces
- VGA: resolution up to 2048x1536 @ 75Hz
- LVDS: Single Channel - 18/24-bit; Dual Channel - 36/48-bit, resolution up to 1920x1200 @ 60Hz
- Digital Display Interfaces: HDMI, DVI, DP or SDVO
- HDMI, DVI, DP, SDVO: resolution up to 1920x1200 @ 60Hz
- Intel® Clear Video Technology
- DirectX Video Acceleration (DXVA) support for accelerating video processing
- Supports DirectX 11/10.1/10/9 and OpenGL 3.0 (3rd generation processors)
- Supports DirectX 10.1/10/9 and OpenGL 3.0 (2nd generation processors)

ONBOARD AUDIO FEATURES

- Supports High Definition Audio interface

ONBOARD LAN FEATURES

- Intel® 82579LM Gigabit Ethernet PHY
- Integrated 10/100/1000 transceiver
- Fully compliant with IEEE 802.3, IEEE 802.3u, IEEE 802.3ab

SERIAL ATA (SATA) INTERFACE

- Supports 4 Serial ATA interfaces
- 2 SATA 3.0 with data transfer rate up to 6Gb/s
- 2 SATA 2.0 with data transfer rate up to 3Gb/s
- Integrated Advanced Host Controller Interface (AHCI) controller

Ordering Information

	Model Name	Part Number	Description
3rd Gen Processors	HR902-BL3120ME	777-HR9021-500G	Intel® Core™ i3-3120ME, 3M Cache, 2.40 GHz, 35W
	HR902-BL810E	777-HR9021-C00G	Intel® Celeron™ B810E, 2M Cache, 1.6GHz, 35W
2nd Gen Processors	HR902-BL847E	777-HR9021-D00G	Intel® Celeron™ 847E, 2M Cache, 1.1GHz, 17W
	HR902-BL827E	777-HR9021-E00G	Intel® Celeron™ 827E, 1.5M Cache, 1.4GHz, 17W

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

	Model Name	Part Number	Description
3rd Gen Processors	HR902-BL3615QE	777-HR9021-000G	Intel® Core™ i7-3615QE, 6M Cache, up to 3.30 GHz, 45W
	HR902-BL3612QE	777-HR9021-100G	Intel® Core™ i7-3612QE, 6M Cache, up to 3.10 GHz, 35W
	HR902-BL3555LE	777-HR9021-200G	Intel® Core™ i7-3555LE, 4M Cache, up to 3.20 GHz, 25W
	HR902-BL3517UE	777-HR9021-300G	Intel® Core™ i7-3517UE, 4M Cache, up to 2.80 GHz, 17W
	HR902-BL3610ME	777-HR9021-400G	Intel® Core™ i5-3610ME, 3M Cache, up to 3.30 GHz, 35W
	HR902-BL3217UE	777-HR9021-G00G	Intel® Core™ i3-3217UE, 3M Cache, 1.60 GHz, 17W
	HR902-BL1020E	777-HR9021-H00G	Intel® Celeron™ 1020E, 2M Cache, 2.20 GHz, 35W
2nd Gen Processors	HR902-BL1047UE	777-HR9021-I00G	Intel® Celeron™ 1047UE, 2M Cache, 1.40 GHz, 17W
	HR902-BL927UE	777-HR9021-J00G	Intel® Celeron™ 927UE, 1M Cache, 1.50 GHz, 17W
	HR902-BL2715QE	777-HR9021-600G	Intel® Core™ i7-2715QE, 6M Cache, up to 3.00 GHz, 45W
	HR902-BL2655LE	777-HR9021-700G	Intel® Core™ i7-2655LE, 4M Cache, up to 2.90 GHz, 25W
	HR902-BL2610UE	777-HR9021-800G	Intel® Core™ i7-2610UE, 4M Cache, up to 2.40 GHz, 17W
	HR902-BL2515E	777-HR9021-900G	Intel® Core™ i5-2515E, 3M Cache, up to 3.10 GHz, 35W
	HR902-BL2310E	777-HR9021-A00G	Intel® Core™ i3-2310E, 3M Cache, 2.10 GHz, 35W
	HR902-BL2340UE	777-HR9021-B00G	Intel® Core™ i3-2340UE, 3M Cache, 1.30 GHz, 17W
	HR902-BL807UE	777-HR9021-F00G	Intel® Celeron™ 807UE, 1M Cache, 1.00 GHz, 10W

Packing List

- 1 HR902 board
- 1 QR (Quick Reference)
- 1 Drivers/utilities disk

IDE INTERFACE

- Supports up to two IDE devices
- DMA mode: Ultra ATA up to 100MB/s
- PIO mode: up to 16MB/s

EXPANSION INTERFACES

- Supports 8 USB 2.0 ports
- Supports 1 PCIe x16 interface (multiplex digital display interface)
- Supports 2 DDI (multiplex with PCIe x16)
 - Port B for HDMI/DVI/SDVO
 - Port C for HDMI/DVI/DisplayPort
- Supports 1 PCIe x4 and 1 PCIe x1 (default); or 5 PCIe x1 interfaces
- Supports 4 PCI interfaces (PCI 2.3 interface)
- Supports LPC interface
- Supports SMBus interface
- Supports IDE interface
- Supports 8-bit Digital I/O

DAMAGE FREE INTELLIGENCE

- Monitors CPU temperature and overheat alarm
- Monitors CPU fan speed and failure alarm
- Monitors Vcore/VCCRTC/DDR/+1.05V/VCCSA
- Watchdog timer function

BIOS

- 64Mbit SPI BIOS

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)
- Windows 8 Enterprise x86 (32-bit)
- Windows 8 Enterprise x64 (64-bit)

TEMPERATURE

- 0°C to 60°C

HUMIDITY

- 10% to 90%

POWER

- Input: 5VSB (option), 12V, VCC_RTC

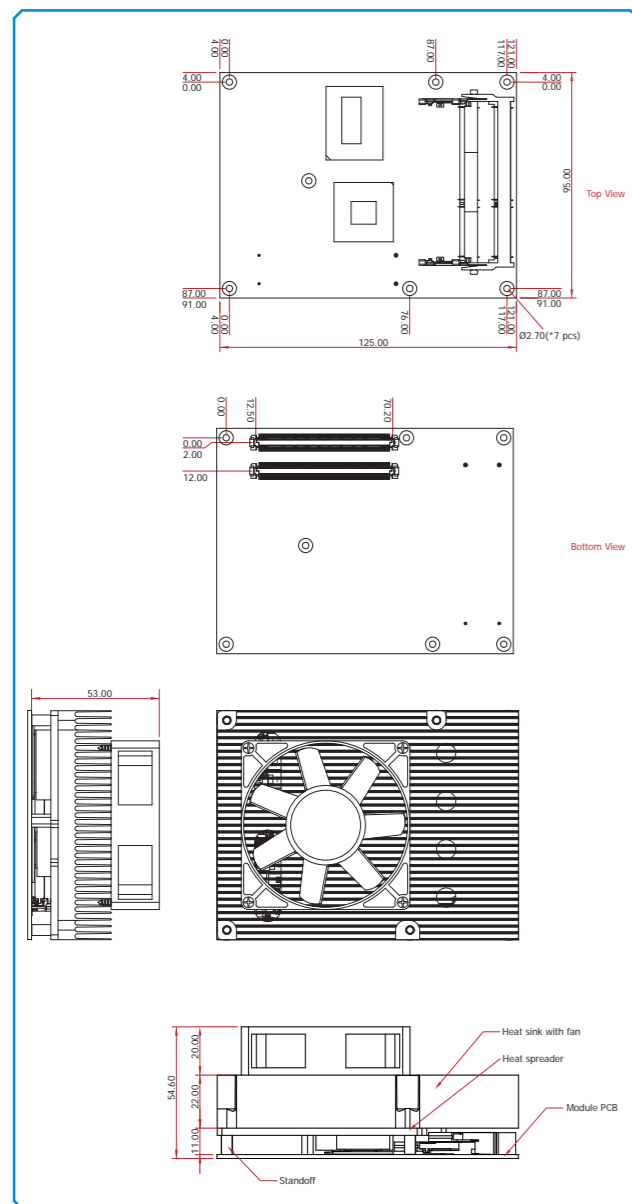
PCB

- Dimensions
 - COM Express® Basic
 - 95mm (3.74") x 125mm (4.9")
- Compliance
 - PICMG COM Express® R2.1 basic form factor, Type 2

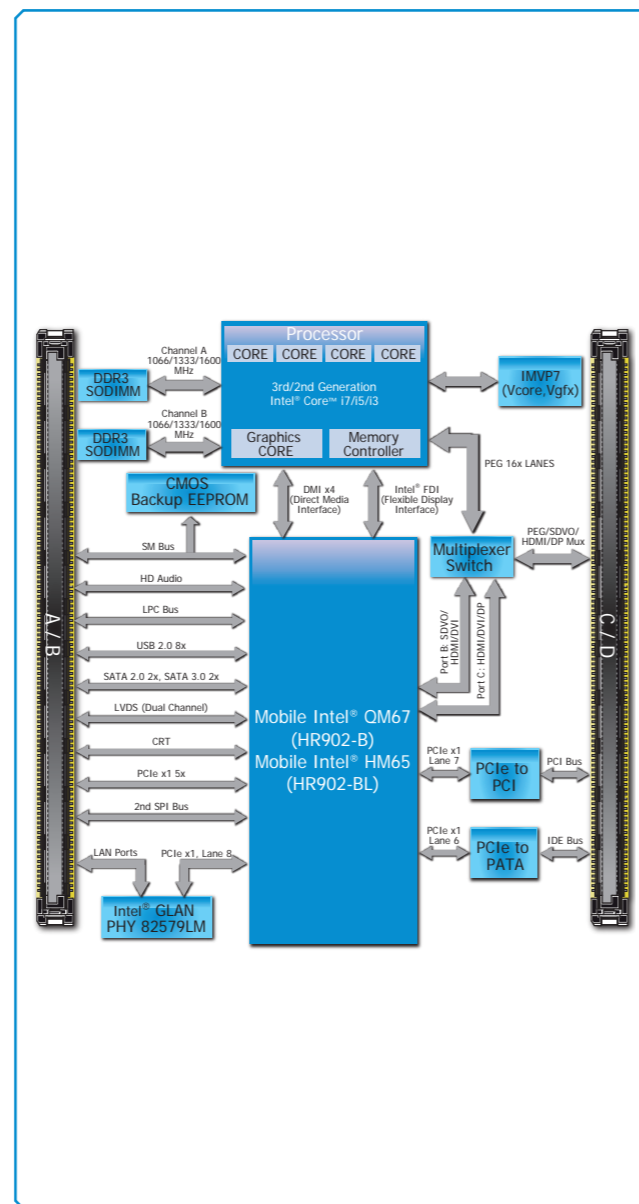
CERTIFICATION

- CE, FCC Class B, RoHS

Mechanical Drawing



Block Diagram

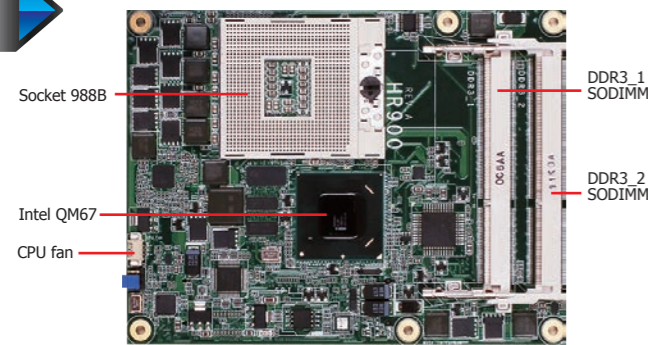


COM Express Basic
Computer-On-Module

HR900-B

HR900-B

QM67



Features

MEMORY	2 DDR3 SODIMM up to 16GB
EXPANSION	5 PCIe x1, 1 PCIe x16, 4 PCI 1 LPC, 1 SMBus, 1 IDE 1 VGA, 1 LVDS, 2 DDI (HDMI/DP/SDVO) Multiplex digital display with PCIe x16 8 USB 2.0 4 SATA: 2 SATA 3.0, 2 SATA 2.0 8-bit DIO
LAN	1 LAN
DIMENSIONS	COM Express® R1.0 Basic, Type 2 95mm x 125mm (3.74" x 4.9")

Specifications

PROCESSOR

- Socket G2 988B for:
 - 3rd Generation Intel® Core™ processors (22nm process technology)
 - Intel® Core™ i7-3610QE (6M Cache, up to 3.3 GHz); 45W
 - Intel® Core™ i5-3610ME (3M Cache, up to 3.3 GHz); 35W
 - Intel® Core™ i3-3120ME (3M Cache, 2.4 GHz); 35W
 - 2nd Generation Intel® Core™ processors (32nm process technology)
 - Intel® Core™ i7-2710QE (6M Cache, up to 3.0 GHz); 45W
 - Intel® Core™ i5-2510E (3M Cache, up to 3.1 GHz); 35W
 - Intel® Core™ i3-2330E (3M Cache, 2.2 GHz); 35W
 - Intel® Celeron® B810 (2M Cache, 1.6 GHz); 35W
- Intel® Advanced Vector Extensions (Intel® AVX) Instructions
- Intel® Turbo Boost Technology

CHIPSET

- Intel® QM67 Express Chipset

SYSTEM MEMORY

- Two 204-pin DDR3 SODIMM sockets

3rd Generation Processors	2nd Generation Processors
DDR3 1066/1333/1600MHz	DDR3 1066/1333MHz (i5/i3/Celeron)
	DDR3 1600MHz (i7)

- 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

ONBOARD GRAPHICS FEATURES

- Intel® HD Graphics 4000 (3rd generation processors)
- Intel® HD Graphics 3000 (2nd generation processors)
- Intel® HD Graphics (Intel® Celeron® processors)
- Supports VGA, LVDS and DDI interfaces
- VGA: resolution up to 2048x1536 @ 75Hz
- LVDS: Single Channel - 18/24-bit; Dual Channel - 36/48-bit, resolution up to 1920x1200 @ 60Hz
- Digital Display Interfaces: HDMI, DP and SDVO (for Port B)
- HDMI, DP: resolution up to 1920x1200 @ 60Hz
- Supports 6 or 16 Graphics Execution Units (EUs) (3rd generation processors)
- Supports 6 or 12 Graphics Execution Units (EUs) (2nd generation processors)
- Intel® Clear Video Technology
- DirectX Video Acceleration (DXVA) support for accelerating video processing
- Supports DirectX 11/10.1/10/9 and OpenGL 3.0 (3rd generation processors)
- Supports DirectX 10.1/10/9 and OpenGL 3.0 (2nd generation processors)

ONBOARD AUDIO FEATURES

- Supports High Definition Audio interface

ONBOARD LAN FEATURES

- Intel® 82579LM Gigabit Ethernet PHY
- Integrated 10/100/1000 transceiver
- Fully compliant with IEEE 802.3, IEEE 802.3u, IEEE 802.3ab

SERIAL ATA (SATA) INTERFACE

- Supports 4 Serial ATA interfaces
- 2 SATA 2.0 with data transfer rate up to 3Gb/s
- 2 SATA 3.0 with data transfer rate up to 6Gb/s
- Integrated Advanced Host Controller Interface (AHCI) controller

IDE INTERFACE

- Supports up to two IDE devices
- DMA mode: Ultra ATA up to 100MB/s
- PIO mode: up to 16MB/s

EXPANSION INTERFACES

- Supports 8 USB ports (USB 1.1/2.0 host controllers)
- Supports 4 PCI slots (PCI 2.3 interface)
- Supports PCIe x16 / SDVO / HDMI / Display Port switchable interface
 - Uses QM67's DDI (Digital Display Interface) Port B for SDVO/ HDMI and DDI Port C for Display Port / HDMI
 - VBIOS default setting at Port C only; VBIOS settings modified upon request
- Supports 1 PCIe x16 interface
 - Supports Gen 3.0 (3rd generation processors)
 - Supports Gen 2.0 (2nd generation processors)
- Supports 5 PCIe x1 interfaces
- Supports LPC interface
- Supports SMBus interface
- Supports IDE interface
- Supports 8-bit Digital I/O

DAMAGE FREE INTELLIGENCE

- Monitors CPU temperature and overheat alarm
- Monitors CPU fan speed and failure alarm
- Monitors Vcore/V_{core}/1.5V voltages and failure alarm
- Watchdog timer function

BIOS

- 64Mbit UEFI SPI BIOS

POWER CONSUMPTION

- 54.70 W with i7-2710QE at 2.10GHz and 2x 4GB 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)
- Windows 8 Enterprise x86 (32-bit)
- Windows 8 Enterprise x64 (64-bit)

TEMPERATURE

- 0°C to 60°C

HUMIDITY

- 10% to 90%

POWER

- Input: 12V, 5VSB (optional), VCC_RTC

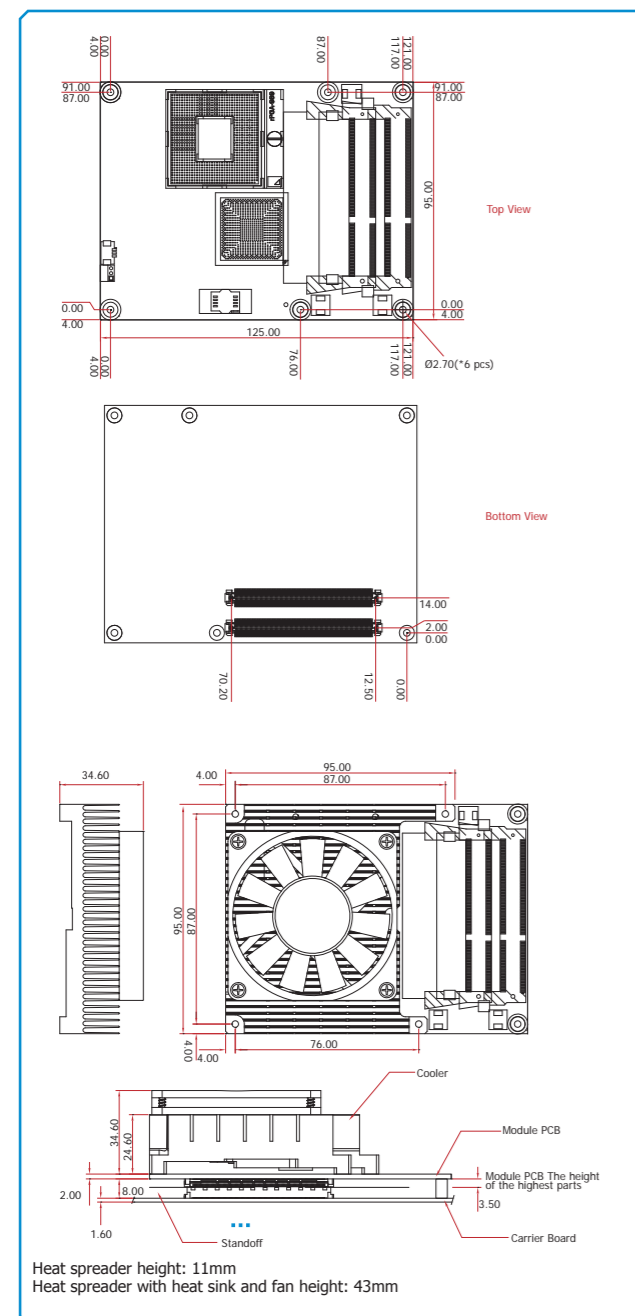
PCB

- Dimensions
 - COM Express® Basic
 - 95mm (3.74") x 125mm (4.9")
- Compliance
 - PICMG COM Express® R1.0, Type 2

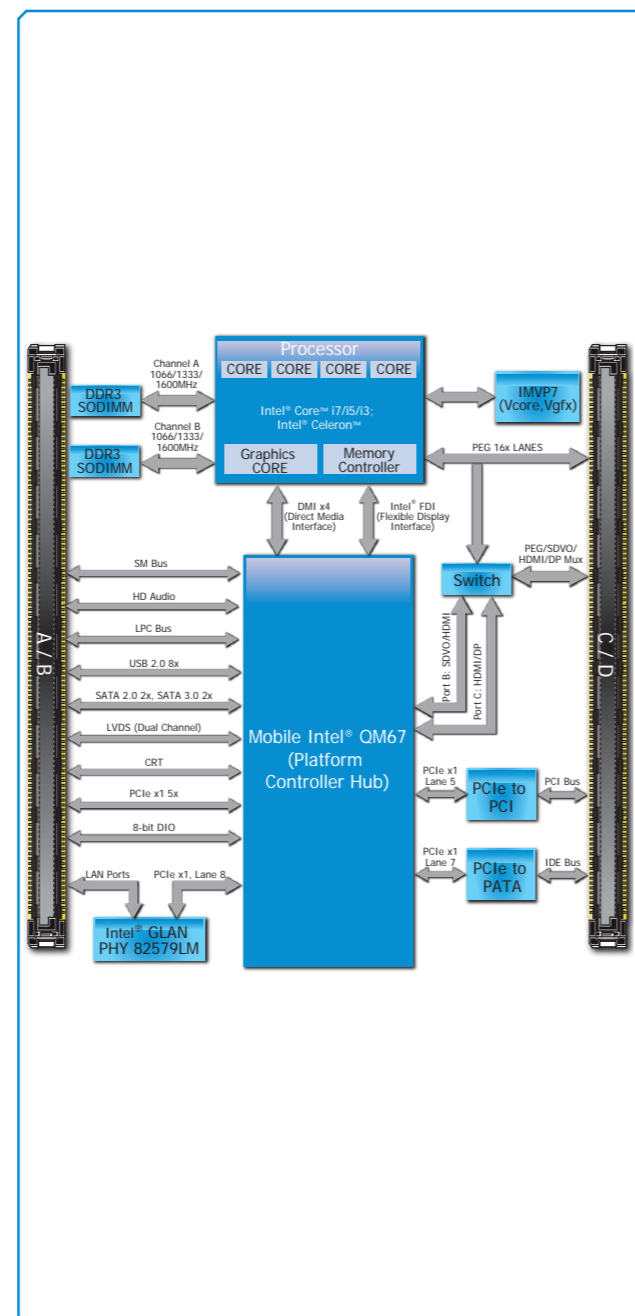
CERTIFICATION

- CE, FCC Class B, UL, RoHS

Mechanical Drawing



Block Diagram



Ordering Information

Model Name	Part Number	Description
HR900-B	777-HR9002-000G	3rd/2nd generation Intel® Core™ processors

Packing List

- 1 HR900-B board
- 1 QR (Quick Reference)
- 1 Drivers/utilities disk

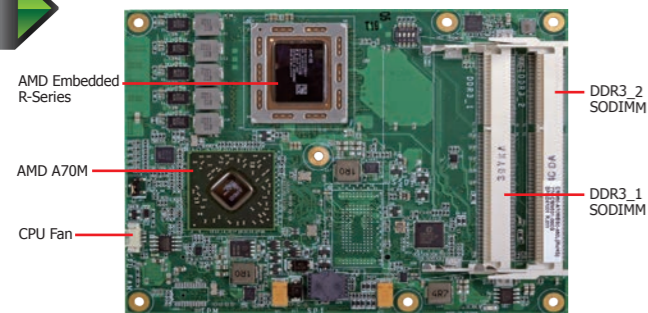
Optional Items

- COM630-B carrier board kit
- Heat spreader: TBD
- Heat sink with fan: A71-111009-001G
- Heat spreader with heat sink and fan: TBD

COM Express Basic
Computer-On-Module

CM960-B

R-Series

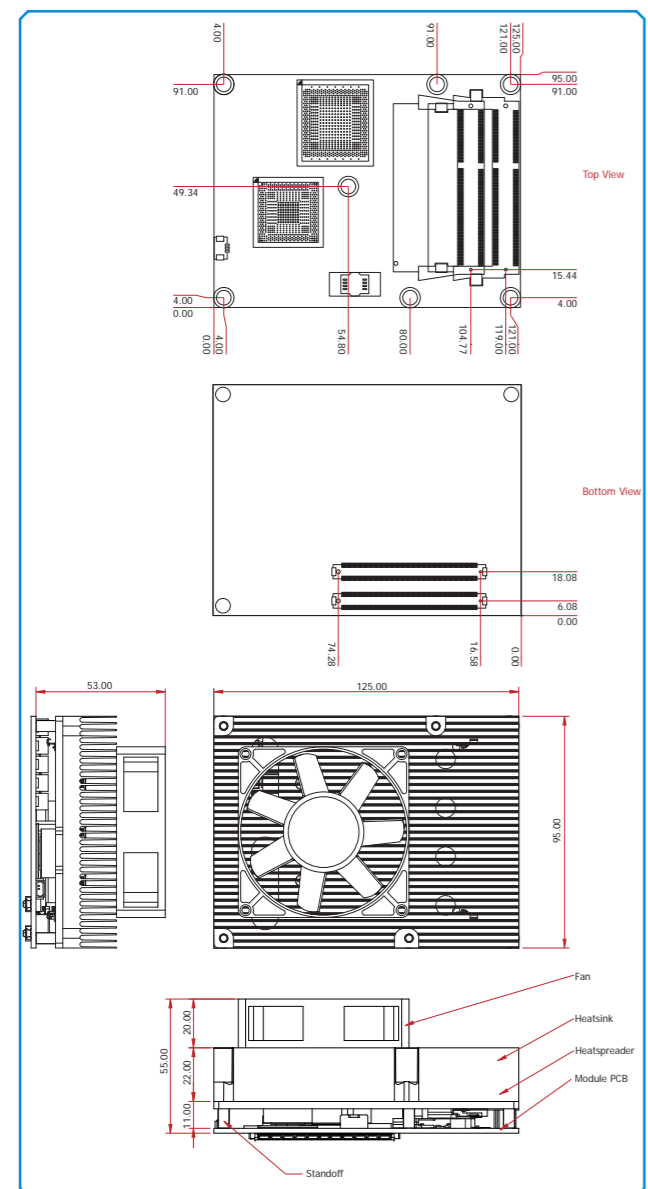


Features

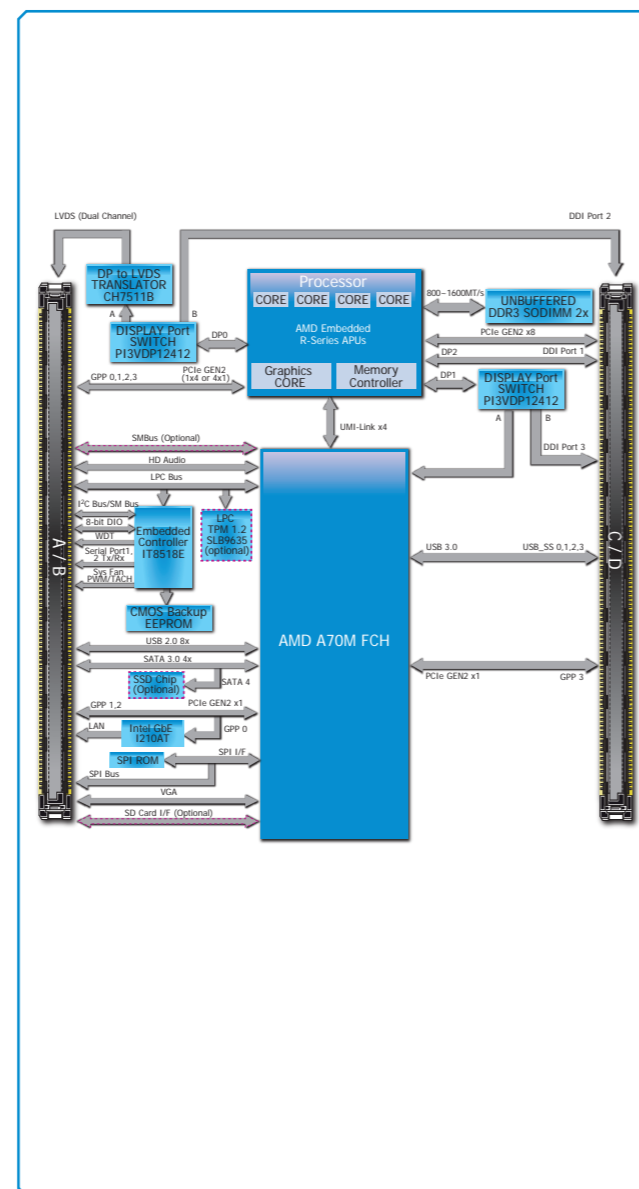
MEMORY	2 DDR3 SODIMM up to 16GB
EXPANSION	1 PCIe x8, 7 PCIe x1 1 LPC, 1 SMBus, 1 I ² C, 2 serial 3 Independent Displays 1 DP, 1 DP/LVDS, 1 DP/VGA 8 USB: 4 USB 3.0, 4 USB 2.0 4 SATA 3.0 SSD (optional) 8-bit DIO
LAN	1 LAN
DIMENSIONS	COM Express® R2.1 Basic, Type 6 95mm x 125mm (3.74" x 4.9")



Mechanical Drawing



Block Diagram



Specifications

- APU**
- AMD® Embedded R-Series APUs
 - FP2 BGA packaging technology
 - 32nm process technology
 - Please refer to the Ordering Information below*
- CHIPSET**
- AMD® A70M Fusion Controller Hub
- SYSTEM MEMORY**
- Two 204-pin DDR3 SODIMM sockets
 - Supports DDR3 (1.5V), LVDDR3(1.35V), ULVDDR3 (1.25V) up to 1600MHz
 - Supports dual channel memory interface
 - Supports up to 16GB system memory
 - DRAM device technologies: 1Gb, 2Gb, 4Gb and 8Gb DDR3 DRAM technologies are supported for x8 and x16 devices, unbuffered, non-ECC

- ONBOARD GRAPHICS FEATURES**
- Supports DP, DP/LVDS and DP/VGA interfaces
 - VGA: resolution up to 1920x1600 @ 60Hz
 - LVDS: Single Channel - 18/24-bit; Dual Channel: 36/48-bit, resolution up to 1920x1200 @ 60 Hz
 - DP: resolution up to 4096x2160 @ 30Hz
- ONBOARD AUDIO FEATURES**
- Supports High Definition Audio interface
- ONBOARD LAN FEATURES**
- Intel® I210AT Gigabit Ethernet controller
 - Integrated 10/100/1000 transceiver
 - Fully compliant with IEEE 802.3, IEEE 802.3u, IEEE 802.3ab

- SERIAL ATA (SATA) INTERFACE**
- Supports 4 Serial ATA interfaces
 - 4 SATA 3.0 with data transfer rate up to 6Gb/s
 - Integrated Advanced Host Controller Interface (AHCI) controller
 - Supports RAID 0/1
- SSD (optional)**
- 2GB/4GB/8GB/16GB/32GB/64GB
 - Write: 30MB/sec (max), Read: 70MB/sec (max)
 - SATA to SSD onboard

- WATCHDOG TIMER**
- Watchdog timeout programmable via software from 1 to 255 seconds
- TRUSTED PLATFORM MODULE (TPM) - optional**
- Provides a Trusted PC for secure transactions
 - Provides software license protection, enforcement and password protection

- TEMPERATURE**
- Operating: 0°C to 60°C
 - Storage: -20°C to 85°C
- HUMIDITY**
- 5% to 90%
- POWER**
- Input: 12V, 5VSB (optional), VCC_RTC
- PCB**
- Dimensions
 - COM Express® Basic
 - 95mm (3.74") x 125mm (4.9")
 - Compliance
 - PICMG COM Express® R2.1, Type 6

Ordering Information

Model Name	Chipset	Temperature	Memory	SSD	Processors
CM960	A70M	B B: 0°C to 60°C	S S: Socket	0 0: None 2: 2GB 4: 4GB 8: 8GB 1: 16GB 3: 32GB 6: 64GB	- 464L 464L: AMD® R-464L, Quad Core, 2x 2M Cache, up to 3.2GHz, 35W 460H: AMD® R-460H, Quad Core, 2x 2M Cache, up to 2.8GHz, 35W 460L: AMD® R-460L, Quad Core, 2x 2M Cache, up to 2.8GHz, 25W 452L: AMD® R-452L, Quad Core, 2x 2M Cache, up to 2.4GHz, 19W 260H: AMD® R-260H, Dual Core, 2M Cache, up to 2.6GHz, 17W 252F: AMD® R-252F, Dual Core, 1M Cache, up to 2.4GHz, 17W

Packing List

- 1 CM960-B board
- 1 QR (Quick Reference)
- 1 DVD

- USB INTERFACE**
- XHCI Host Controller supports up to 4 super speed USB 3.0 ports
- EXPANSION INTERFACES**
- Supports 8 USB 2.0 ports (first 4 USB ports support up to USB 3.0)
 - Supports 1 PCIe x8 interface
 - Supports 7 PCIe x1 interfaces (the first 4 PCIe x1 can be configured to support PCIe x4)
 - Supports LPC interface
 - Supports SMBus interface
 - Supports I²C interface
 - Supports 2 serial interfaces (TX/RX)
 - Supports 8-bit Digital I/O (4 In, 4 Out)

- DAMAGE FREE INTELLIGENCE**
- Monitors APU temperature
 - Monitors APU fan speed
 - Monitors APU_VDD/APU_VDDNB/APU_VDDIO_SUS/1V2/1V1 voltages
 - Watchdog timer function

- BIOS**
- 32Mbit SPI BIOS
- POWER CONSUMPTION**
- 38.3553W with R-460L at 2.00GHz and 2x 1GB DDR3 SODIMM

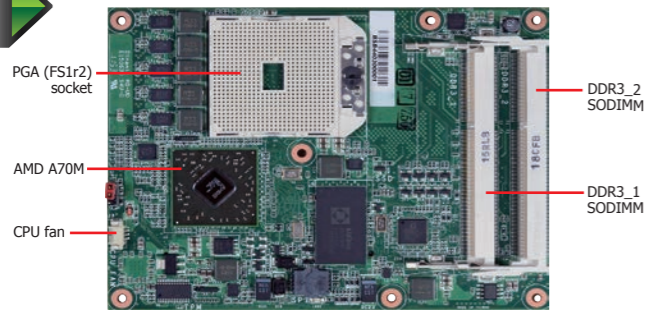
- OS SUPPORT**
- Windows XP Professional x86 & SP3 (32-bit)
 - Windows 7 Ultimate x86 & SP1 (32-bit)
 - Windows 7 Ultimate x64 & SP1 (64-bit)
 - Windows 8 Enterprise x86 (32-bit)
 - Windows 8 Enterprise x64 (64-bit)

CM960-B

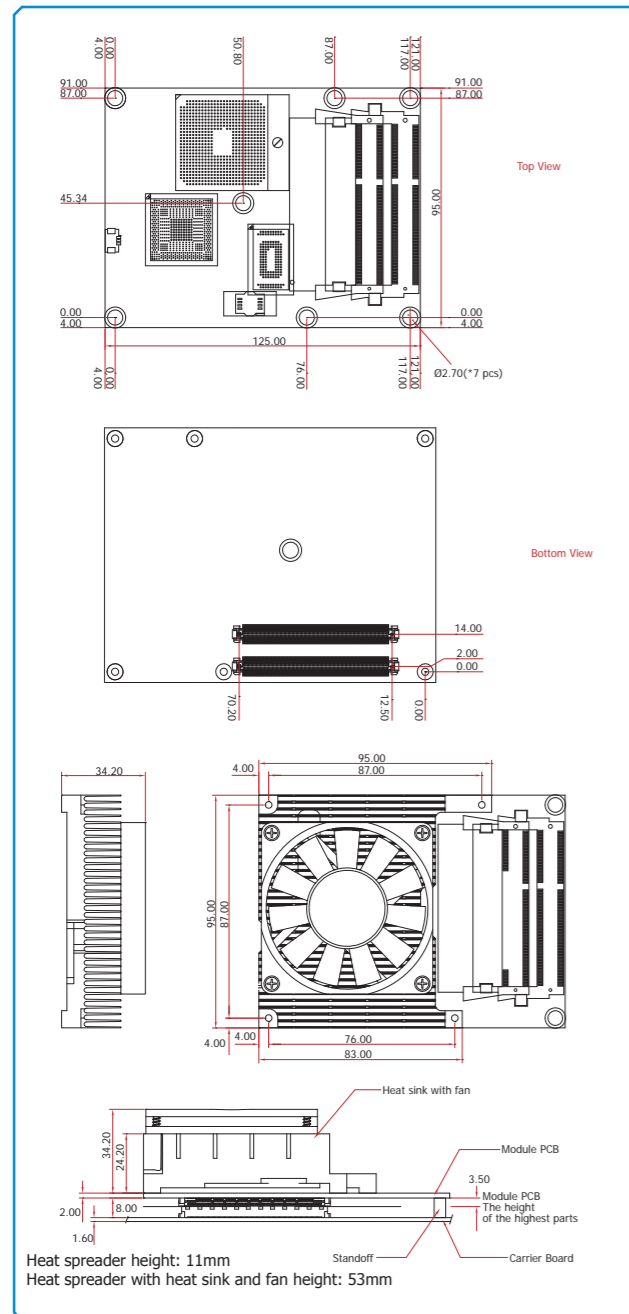
COM Express Basic
Computer-On-Module

CM901-B

R-Series



Mechanical Drawing

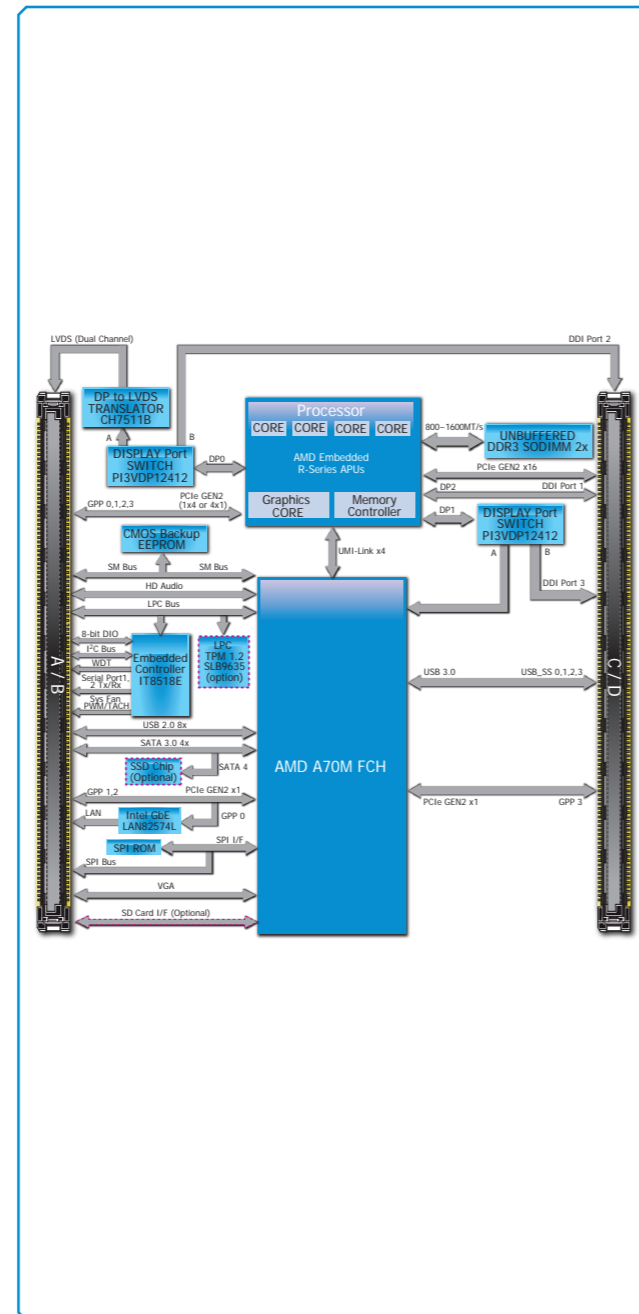


Features

MEMORY	2 DDR3 SODIMM up to 16GB
EXPANSION	1 PCIe x16, 7 PCIe x1 1 LPC, 1 SMBus, 1 I ² C, 2 serial 3 Independent Displays DP, DP/LVDS, DP/VGA 8 USB: 4 USB 3.0/2.0, 4 USB 2.0 4 SATA 3.0 8-bit DIO
LAN	1 LAN
DIMENSIONS	COM Express® R2.1 Basic, Type 6 95mm x 125mm (3.74" x 4.9")



Block Diagram



Specifications

APU

- AMD® Embedded R-Series APUs
 - : R-464L Quad-core 2.3GHz, 35W
 - : R-460H Quad-core 1.9GHz, 35W
 - : R-272F Dual-core 2.7GHz, 35W
 - : R-268D Dual-core 2.5GHz, 35W
- PGA (FS1r2) socket
- 32nm process technology

CHIPSET

- AMD® A70M Fusion Controller Hub

SYSTEM MEMORY

- Two 204-pin DDR3 SODIMM sockets
- Supports DDR3 (1.5V), LVDDR3(1.35V), ULVDDR3 (1.25V) up to 1600MHz
- Supports dual channel memory interface
- Supports up to 16GB system memory
- DRAM device technologies: 1Gb, 2Gb, 4Gb and 8Gb DDR3 DRAM technologies are supported for x8 and x16 devices, unbuffered, non-ECC

ONBOARD GRAPHICS FEATURES

- Supports DP, DP/LVDS and DP/VGA interfaces
- VGA: resolution up to 1920x1600 @ 60Hz
- LVDS: Single Channel - 18/24-bit; Dual Channel: 36/48-bit, resolution up to 1920x1200 @ 60 Hz
- DP: resolution up to 4096x2160 @ 30Hz

ONBOARD AUDIO FEATURES

- Supports High Definition Audio interface

ONBOARD LAN FEATURES

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

SERIAL ATA (SATA) INTERFACE

- Supports 4 Serial ATA interfaces
- 4 SATA 3.0 with data transfer rate up to 6Gb/s
- Integrated Advanced Host Controller Interface (AHCI) controller
- Supports RAID 0/1

SSD (optional)

- 4GB/8GB/16GB/32GB
- Write: 30MB/sec (max), Read: 70MB/sec (max)
- SATA to SSD onboard

USB INTERFACE

- XHCI Host Controller supports up to 4 super speed USB 3.0 ports

WATCHDOG TIMER

- Watchdog timeout programmable via software from 1 to 255 seconds

Ordering Information

Model Name	Part Number	Description
CM901-B	777-CM9011-000G	AMD® Embedded R-Series APUs

Packing List

- 1 CM901-B board
- 1 QR (Quick Reference)
- 1 DVD

CM901-B

TRUSTED PLATFORM MODULE (TPM) - optional

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

EXPANSION INTERFACES

- Supports 8 USB 2.0 ports (first 4 USB ports support up to USB 3.0)
- Supports 1 PCIe x16 interface
- Supports 7 PCIe x1 interfaces (the first 4 PCIe x1 can be configured to support PCIe x4)
- Supports LPC interface
- Supports SMBus interface
- Supports I²C interface
- Supports 2 serial interfaces (TX/RX)
- Supports 8-bit Digital I/O (4 In, 4 Out)

DAMAGE FREE INTELLIGENCE

- Monitors APU temperature
- Monitors APU fan speed
- Monitors APU_VDD/APU_VDDNB/APU_VDDIO_SUS/1V2/1V1 voltages
- Watchdog timer function

BIOS

- 32Mbit SPI BIOS

POWER CONSUMPTION

- 31.12 W with R-464L at 2.3GHz and 2x 1GB DDR3 SODIMM

OS SUPPORT

- Windows XP Professional x86 & SP3 (32-bit)
- 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: -40°C to 85°C

HUMIDITY

- 10% to 90%

POWER

- Input: 12V, 5VSB (optional), VCC_RTC

PCB

- Dimensions
 - COM Express® Basic
 - 95mm (3.74") x 125mm (4.9")
- Compliance
 - PICMG COM Express® R2.1, Type 6

CERTIFICATION

- CE
- FCC Class B
- RoHS

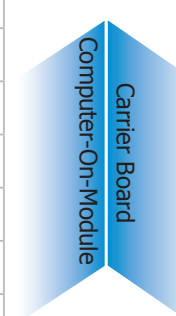
COM Express Basic
Computer-On-Module



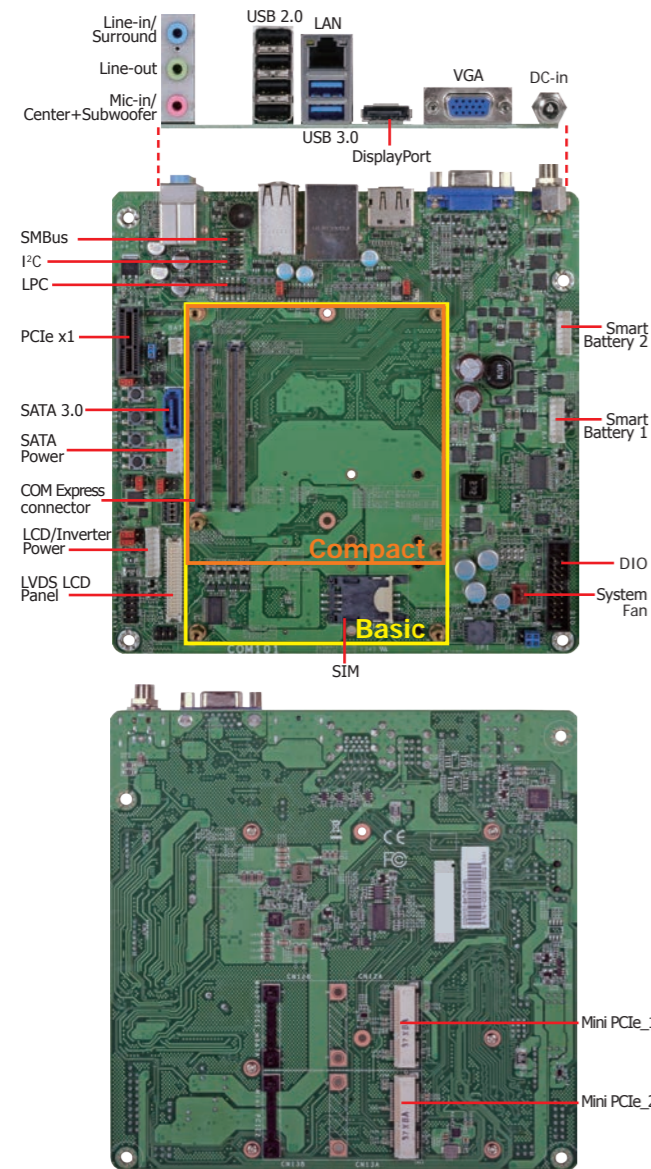
Model		COM101-BAT	COM100-B	COM331-B	COM330-B	COM630-B
Display		VGA, DisplayPort, LVDS	DisplayPort, LVDS	VGA, DisplayPort, LVDS	VGA, LVDS	VGA, LVDS
Ethernet		1	1	1	1	1
USB	USB 3.0	2 Rear	2 Rear	4 Rear	N/A	N/A
	USB 2.0	4 Rear	4 Rear	4 Rear	4 Rear, 4 by pin header	4 Rear, 4 by pin header
Serial	RS232/422/485	N/A	N/A	N/A	N/A	N/A
	RS232	N/A	2 Rear	1 Rear, 1 by pin header	3 Rear, 1 by pin header	3 Rear, 1 by pin header
Parallel		N/A	N/A	N/A	N/A	1
Storage	SATA 3.0	1	1	2	2	N/A
	SATA 2.0	N/A	N/A	2	2	4
	SSD	N/A	N/A	N/A	N/A	N/A
	IDE, FDD	N/A	N/A	N/A	N/A	1 IDE, 1 FDD
	CF	N/A	N/A	N/A	1	1
Expansion	PCIe x16	N/A	N/A	1	1	1
	PCIe x4	N/A	N/A	1	1	N/A
	PCIe x1	1	1	2	N/A	2
	Mini PCIe	2	3	1	1	N/A
	PCI	N/A	N/A	N/A	2	4
Digital I/O		8-bit	8-bit	8-bit	8-bit	8-bit
Audio	Controller	HDA	HDA	HDA	HDA	HDA
LPC		Yes	Yes	Yes	Yes	Yes
SMBus		Yes	Yes	Yes	Yes	N/A
CAN-bus		N/A	N/A	N/A	N/A	N/A
ExpressCard		N/A	Yes	Yes	Yes	N/A
Watchdog		N/A	Yes	N/A	N/A	Yes
Power Input		DC-in	DC-in	24-pin ATX	24-pin ATX	24-pin ATX
Compliance		R2.1, Type 6	R2.1, Type 10	R2.0, Type 6	R2.0, Type 2	R1.0, Type 2
Dimensions		170mm x 170mm	170mm x 170mm	244mm x 244mm	244mm x 244mm	305mm x 244mm

Module and Carrier Board Matrix

			Carrier Board				
			COM101-BAT	COM100-B	COM331-B	COM330-B	COM630-B
	Model	Type	Mini-ITX	Mini-ITX	microATX	microATX	ATX
			R2.1, Type 6	R2.1, Type 10	R2.0, Type 6	R2.1, Type 2	R1.0, Type 2
Mini	BT9A3	R2.1, Type 10		●			
	CD9A3	R2.1, Type 10		●			
Compact	HU968	R2.1, Type 6	●		●		
	CR908-B	R2.1, Type 6	●		●		
	HR908-B	R2.1, Type 6	●		●		
	CP908-B	R1.0, Type 2					●
	BT968	R2.1, Type 6	●		●		
	CD905-B	R2.0, Type 2				●	●
	LR905-B18	R1.0, Type 2					●
	KB968	R2.1, Type 6	●		●		
Basic	OT905-B	R2.0, Type 2				●	
	HM961-QM87	R2.1, Type 6	●		●		
	HM960-QM87	R2.1, Type 6	●		●		
	HM920-QM87	R2.1, Type 2				●	
	HM961-HM86	R2.1, Type 6	●		●		
	HM960-HM86	R2.1, Type 6	●		●		
	HM920-HM86	R2.1, Type 2				●	
	CR960-QM77	R2.1, Type 6	●		●		
	CR960-HM76	R2.1, Type 6	●		●		
	CR902-B	R2.1, Type 2				●	
	CR902-BL	R2.1, Type 2				●	
	CR901-B	R2.1, Type 6	●		●		
	CR900-B	R2.1, Type 2				●	
	HR902-B	R2.1, Type 2				●	
	HR902-BL	R2.1, Type 2				●	
	HR900-B	R1.0, Type 2					●
CP900-B	R1.0, Type 2					●	
CM960-B	R2.1, Type 6	●		●			
CM901-B	R2.1, Type 6	●		●			



COM101-BAT

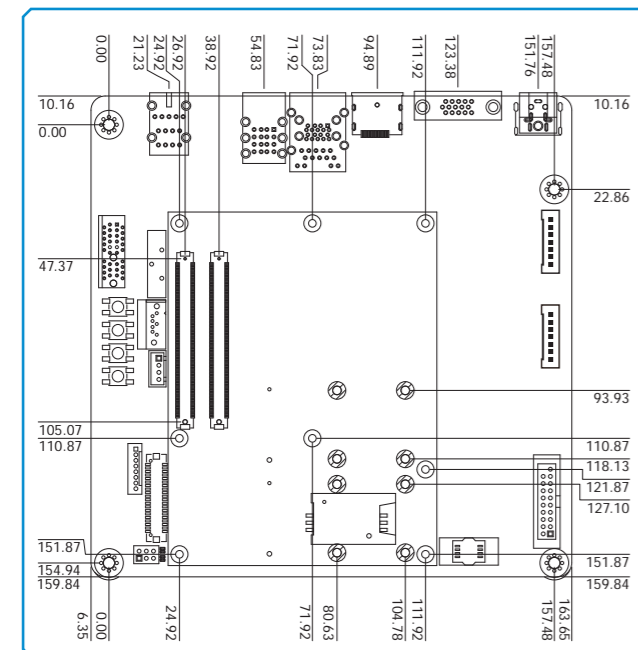


Features

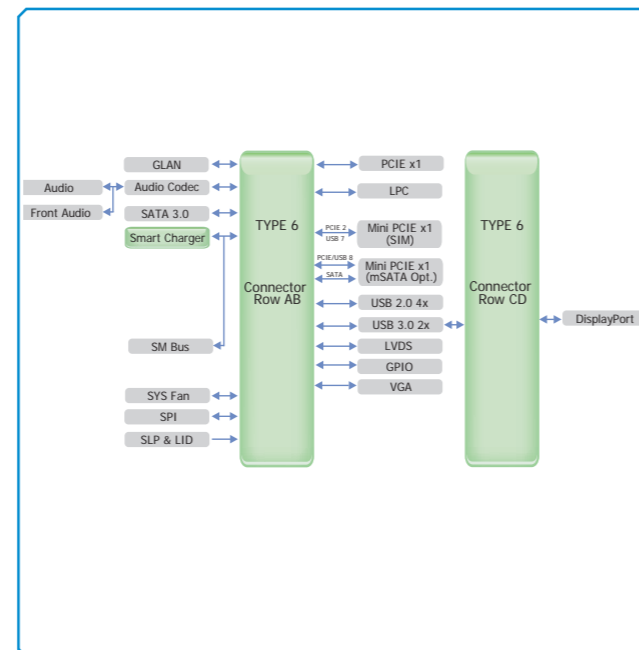
EXPANSION	1 PCIe x1 2 Mini PCIe 1 SIM
DISPLAY OUTPUTS	1 DisplayPort 1 VGA 1 LVDS
LAN	1 LAN
USB	6 USB: 2 USB 3.0, 4 USB 2.0
STORAGE	1 SATA 3.0
DIO	8-bit DIO
DIMENSIONS	170mm x 170mm (6.7" x 6.7")

Supports Compact and Basic modules

Mechanical Drawing



Block Diagram



Specifications

ONBOARD GRAPHICS FEATURES

- Display ports
 - 1 DisplayPort
 - 1 VGA
 - 1 24-bit dual channel LVDS

ONBOARD AUDIO FEATURES

- Realtek ALC886 7.1-channel High Definition Audio
- Audio outputs: Mic-in/Center+Subwoofer, line-in/surround and line out
- S/PDIF audio interface

ONBOARD USB FEATURES

- 2 USB 3.0 ports
- 4 USB 2.0 ports

STORAGE

- 1 SATA 3.0 port with data transfer rate up to 6Gb/s

DIGITAL I/O

- 8-bit Digital I/O connector
 - 4-bit GPI (General Purpose Input)
 - 4-bit GPO (General Purpose Output)

REAR PANEL I/O PORTS

- 19V DC-in jack
- 1 DisplayPort
- 1 RJ45 LAN port
- 2 USB 3.0 ports
- 4 USB 2.0 ports
- 1 VGA port
- Line-in/Surround, Line out, Mic-in/Center+Subwoofer jacks

I/O CONNECTORS

- 2 3-pin connector for general purpose serial interface (Type 6)
- 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 S/PDIF connector
- 1 SATA 3.0 port
- 1 SATA power connector
- 2 Smart battery charger connectors
- 1 LPC connector
- 1 I²C connector
- 1 SMBus connector
- 1 front panel connector
- 1 fan connector

Packing List

• 1 COM101-BAT board
• 1 SATA data with power cable
• 1 QR (Quick Reference)
• 1 DVD

COM101-BAT

EXPANSION SLOTS

- 1 PCIe x1 slot (PCIe 2.0)
- 2 Mini PCIe slots (PCIe 2.0)
 - 1 slot supports PCIe and USB signals for 3G module
 - 1 slot supports PCIe, USB or mSATA signal
 - Supports half/full size Mini PCIe card
- 1 SIM card socket

ROM INTERFACE

- 1 SPI interface
 - Supports up to 64Mbit

TEMPERATURE

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

HUMIDITY

- 10% to 90%

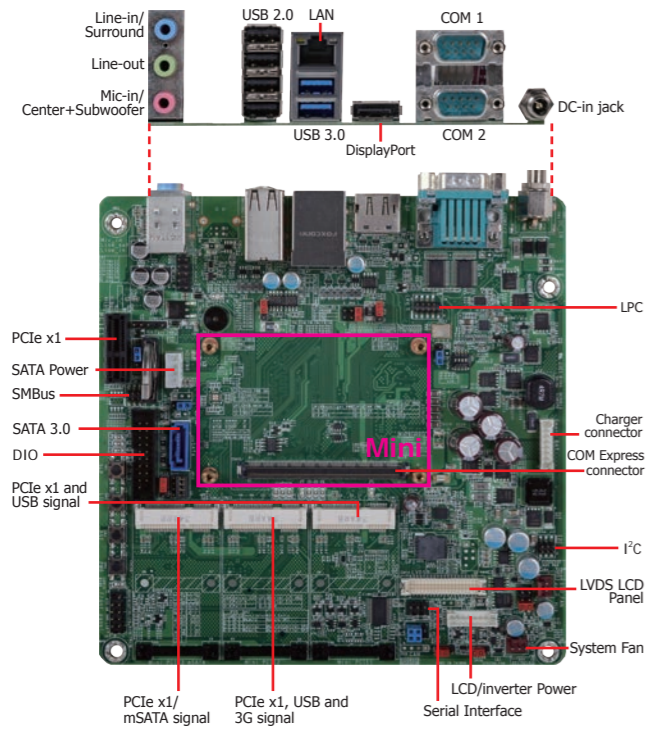
POWER OUTPUT

- 12V, 5VSB, VCC_RTC (ATX mode)
- 12V, 5V, VCC_RTC (AT mode)
- 12V, VCC_RTC (AT mode)

PCB

- Dimensions
 - Mini-ITX form factor
 - 170mm (6.7") x 170mm (6.7")
- Compliance
 - PICMG COM Express® R2.1, Type 6

COM100-B



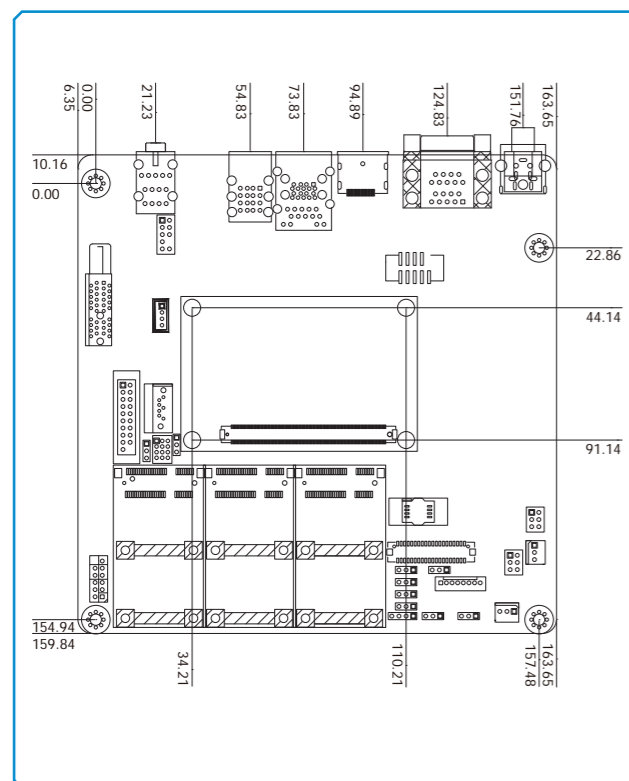
Features

EXPANSION	1 PCIe x1 3 Mini PCIe 1 SIM
DISPLAY OUTPUTS	1 DisplayPort 1 LVDS
LAN	1 LAN
COM	2 COM
USB	6 USB: 2 USB 3.0, 4 USB 2.0
STORAGE	1 SATA 3.0
DIO	8-bit DIO
DIMENSIONS	170mm x 170mm (6.7" x 6.7")

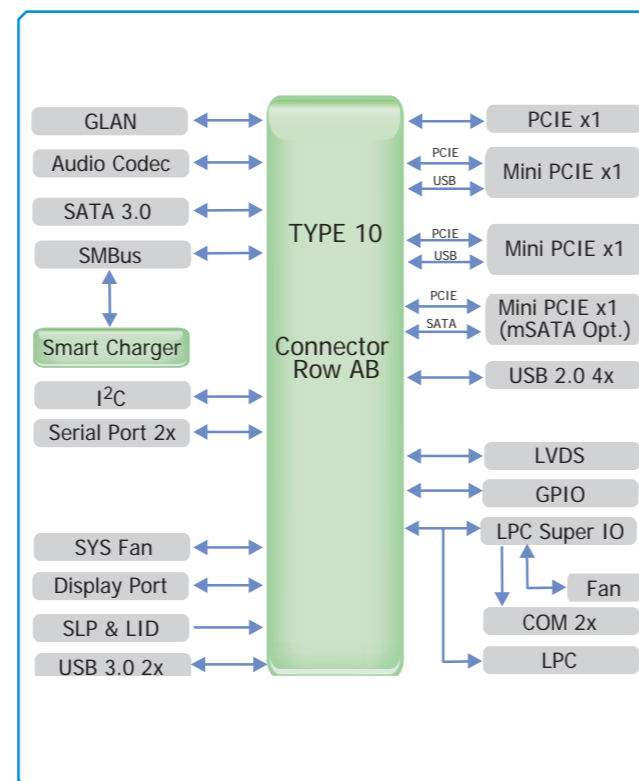


Supports Mini modules

Mechanical Drawing



Block Diagram



Specifications

ONBOARD GRAPHICS FEATURES

- Display ports
 - 1 DisplayPort
 - 1 24-bit single channel LVDS

ONBOARD AUDIO FEATURES

- Realtek ALC886 7.1-channel High Definition Audio
- Audio outputs: Mic-in/Center+Subwoofer, line-in/surround and line out
- S/PDIF audio interface

ONBOARD USB FEATURES

- 2 USB 3.0 ports
- 4 USB 2.0 ports

STORAGE

- 1 SATA 3.0 port with data transfer rate up to 6Gb/s

DIGITAL I/O

- 8-bit Digital I/O connector
 - 4-bit GPI (General Purpose Input)
 - 4-bit GPO (General Purpose Output)

REAR PANEL I/O PORTS

- 5V~19V DC-in jack
- 2 DB-9 RS232 serial ports
- 1 DisplayPort
- 1 RJ45 LAN port
- 2 USB 3.0 ports
- 4 USB 2.0 ports
- Line-in/Surround, Line out, Mic-in/Center+Subwoofer jacks

I/O CONNECTORS

- 1 serial interface for 2 serial ports (TX/RX)
- 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 S/PDIF connector
- 1 SATA 3.0 port
- 1 SATA power connector
- 1 Smart battery charger connector
- 1 LPC connector
- 1 I²C connector
- 1 SMBus connector
- 1 front panel connector
- 2 fan connectors

Packing List

- 1 COM100-B board
- 1 SATA data cable
- 1 SATA power cable
- 1 I/O shield
- 1 QR (Quick Reference)
- 1 DVD

COM100-B

EXPANSION SLOTS

- 1 PCIe x1 slot (PCIe 2.0)
- 3 Mini PCIe slots (PCIe 2.0)
 - 1 slot supports PCIe and USB signals for 3G module
 - 1 slot supports PCIe and USB signals
 - 1 slot supports PCIe or mSATA signal
- Supports half/full size Mini PCIe card
- 1 SIM card socket

SUPPORTED COM EXPRESS MODULE

- Mini form factor

DAMAGE FREE INTELLIGENCE

- Legacy Super I/O support (option)
 - Monitors 5V/1.5V/12V/3.3V
 - Monitors SIO_Fan

ROM INTERFACE

- 1 SPI interface
 - Supports up to 64Mbit

TEMPERATURE

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

HUMIDITY

- 10% to 90%

POWER OUTPUT

- 12V, 5VSB, VCC_RTC (ATX mode)
- 12V, 5V, VCC_RTC (AT mode)
- 12V, VCC_RTC (AT mode)

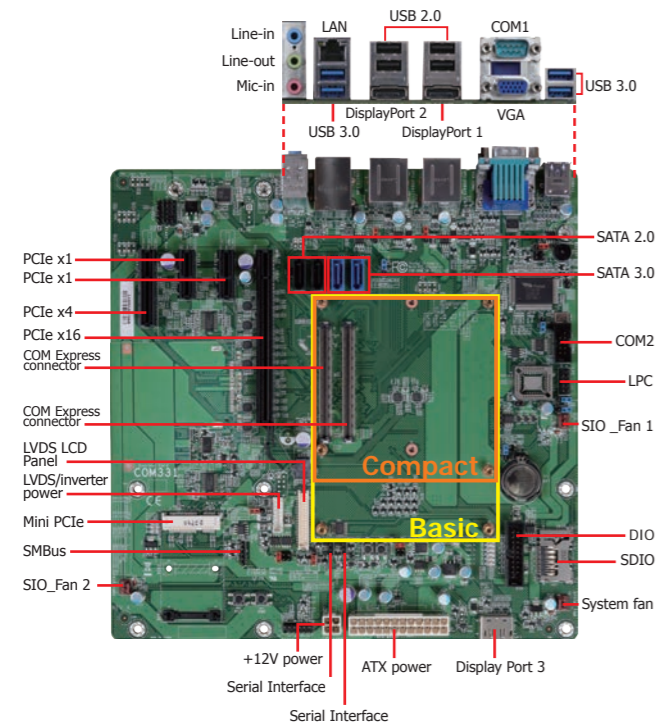
PCB

- Dimensions
 - Mini-ITX form factor
 - 170mm (6.7") x 170mm (6.7")
- Compliance
 - PICMG COM Express® R2.1, Type 10

Optional Items

- SATA data cable
- Serial ATA power cable
- I/O shield
- Power adapter (120W, 19V) : 671-112004-100G

COM331-B



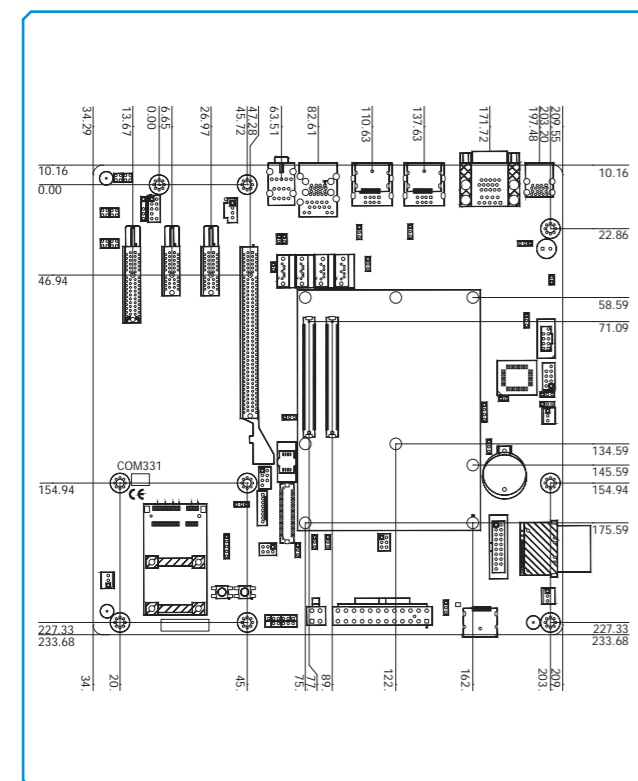
Features

EXPANSION	1 PCIe x16, 1 PCIe x4, 2 PCIe x1 1 Mini PCIe (PCIe signal only)
DISPLAY OUTPUTS	1 VGA, 3 DisplayPorts, 1 LVDS
LAN	1 LAN
COM	2 COM
USB	8 USB: 4 USB 3.0, 4 USB 2.0
STORAGE	4 SATA: 2 SATA 3.0, 2 SATA 2.0 1 SDIO
DIO	8-bit DIO
DIMENSIONS	244mm x 244mm (9.6" x 9.6")

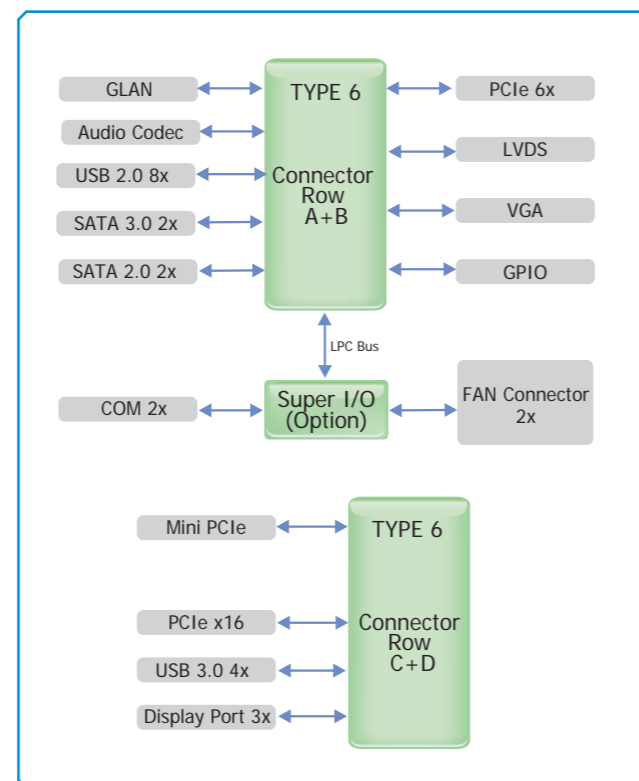
Supports Compact and Basic modules



Mechanical Drawing



Block Diagram



Specifications

ONBOARD AUDIO FEATURES

- Realtek ALC886 5.1-channel High Definition Audio
- Audio outputs: Mic-in/Center+Subwoofer, line-in/surround and line out
- S/PDIF audio interface

STORAGE

- 4 Serial ATA ports
- 2 SATA 3.0 ports with data transfer rate up to 6Gb/s
- 2 SATA 2.0 ports with data transfer rate up to 3Gb/s

DIGITAL I/O

- 8-bit Digital I/O connector
- 4-bit GPI (General Purpose Input)
- 4-bit GPO (General Purpose Output)

REAR PANEL I/O PORTS

- 1 DB-9 RS232 serial port
- 1 DB-15 VGA port
- 2 DisplayPorts
- 1 RJ45 LAN port
- 4 USB 3.0 ports
- 4 USB 2.0 ports
- Line-in/Surround, Line out, Mic-in/Center+Subwoofer jacks

I/O CONNECTORS

- 1 connector for 1 external RS232 serial port
- 2 serial interface connectors (TX/RX)
- 1 SDIO slot
- 1 DisplayPort
- 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 S/PDIF connector
- 4 Serial ATA ports
- 1 LPC connector
- 1 I²C connector
- 1 SMBus connector
- 1 24-pin ATX power connector
- 1 4-pin 12V power connector
- 1 chassis intrusion connector
- 1 front panel connector
- 3 fan connectors

EXPANSION SLOTS

- 1 PCIe x16 Gen 3 slot
- 1 PCIe x4 Gen 2 slot
- 2 PCIe x1 slots (PCIe 2.0)
- 1 Mini PCIe slot (PCIe 2.0) (PCIe signal only)
- USB signal: optional
- Supports half/full size Mini PCIe card

Packing List

- 1 COM331-B board
- 2 Serial ATA data cables
- 1 COM port cable (with bracket)
- 1 I/O shield
- 1 QR (Quick Reference)
- 1 DVD

COM331-B

SUPPORTED COM EXPRESS MODULES

- Basic
- Compact

DAMAGE FREE INTELLIGENCE

- Legacy Super I/O support (option)
- Monitors 5V/1.5V/12V/3.3V
- Monitors SIO_Fan 1/SIO_Fan 2/System fan

ROM INTERFACE

- 1 SPI interface
- Supports up to 64Mbit
- 1 LPC/FWH interface

TEMPERATURE

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

HUMIDITY

- 10% to 90%

POWER OUTPUT

- 12V, 5VSB, VCC_RTC (ATX mode)
- 12V, 5V, VCC_RTC (AT mode)
- 12V, VCC_RTC (AT mode)

PCB

- Dimensions
- microATX form factor
- 244mm (9.6") x 244mm (9.6")
- Compliance
- PICMG COM Express® R2.0, Type 6

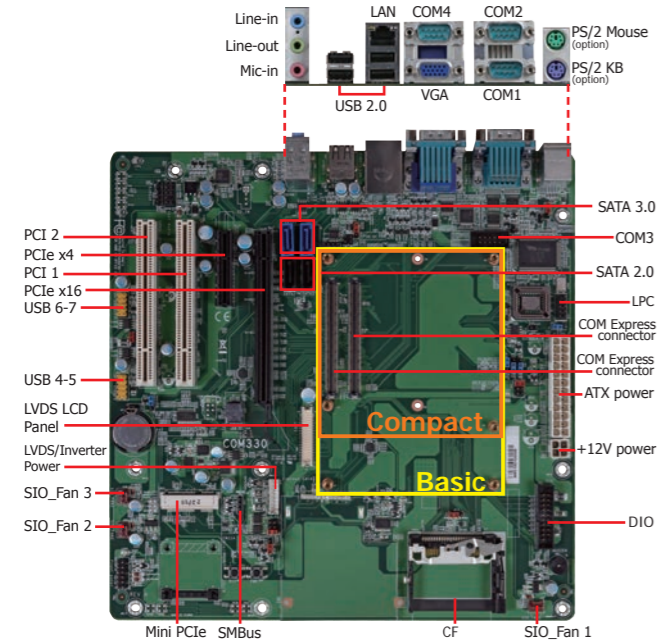
CERTIFICATION

- CE
- FCC Class B
- RoHS

Optional Items

- Serial ATA data cable
- COM port cable
- I/O shield
- Serial ATA power cable

COM330-B



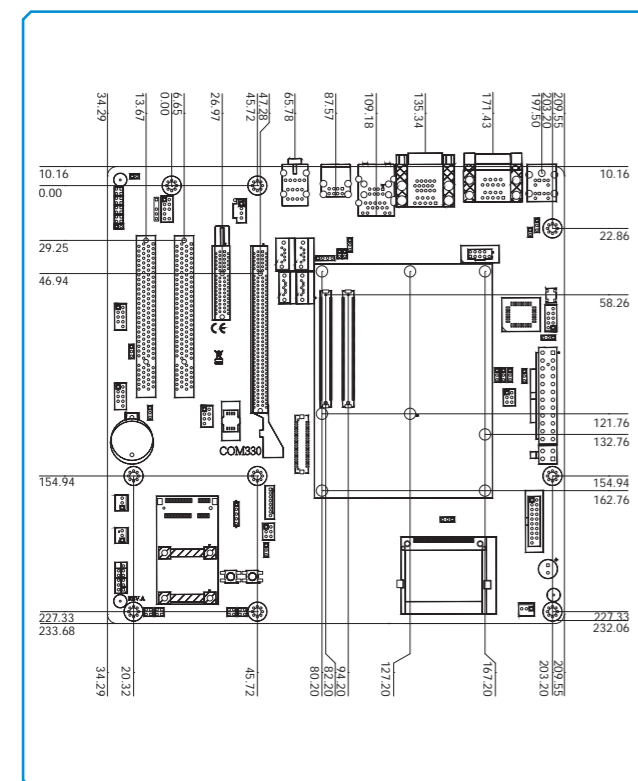
Features

EXPANSION	1 PCIe x16, 1 PCIe x4, 2 PCI 1 Mini PCIe (PCIe signal only)
DISPLAY OUTPUTS	1 VGA, 1 LVDS
LAN	1 LAN
COM	4 COM
USB	8 USB 2.0
STORAGE	4 SATA: 2 SATA 3.0, 2 SATA 2.0 1 CF
DIO	8-bit DIO
DIMENSIONS	244mm x 244mm (9.6" x 9.6")

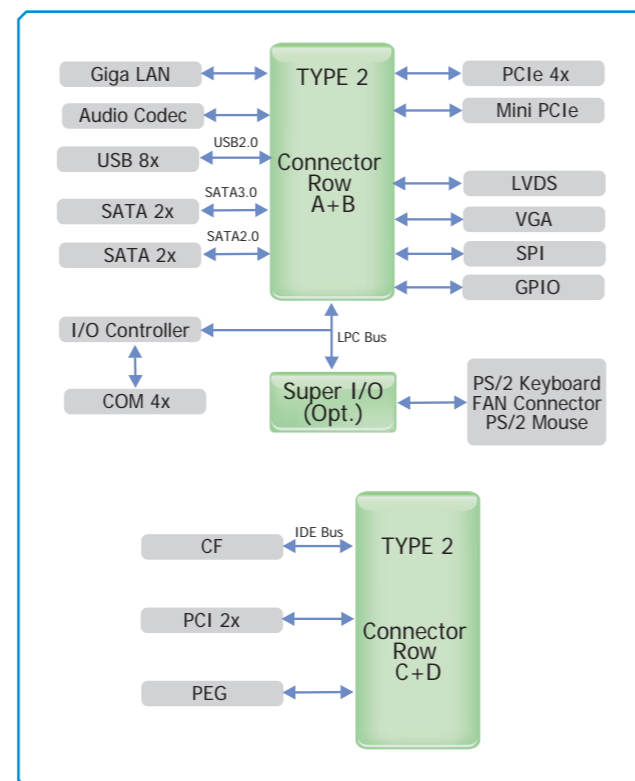
Supports Compact and Basic modules



Mechanical Drawing



Block Diagram



COM330-B

Specifications

ONBOARD AUDIO FEATURES

- Realtek ALC886 5.1-channel High Definition Audio
- Audio outputs: Mic-in/Center+Subwoofer, line-in/surround and line out
- S/PDIF audio interface

STORAGE

- 4 Serial ATA ports
 - 2 SATA 3.0 ports with data transfer rate up to 6Gb/s
 - 2 SATA 2.0 ports with data transfer rate up to 3Gb/s
- 1 CompactFlash socket

DIGITAL I/O

- 8-bit Digital I/O connector
 - 4-bit GPI (General Purpose Input)
 - 4-bit GPO (General Purpose Output)

REAR PANEL I/O PORTS

- 3 DB-9 RS232 serial ports
- 1 DB-15 VGA port
- 1 RJ45 LAN port
- 4 USB 2.0/1.1 ports
- Line-in/Surround, Line out, Mic-in/Center+Subwoofer jacks
- 1 mini-DIN-6 PS/2 mouse port (option)
- 1 mini-DIN-6 PS/2 keyboard port (option)

I/O CONNECTORS

- 2 connectors for 4 external USB 2.0/1.1 ports
- 1 connector for 1 external RS232 serial port
- 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 S/PDIF connector
- 4 Serial ATA ports
- 1 LPC connector
- 1 I²C connector
- 1 SMBus connector
- 1 24-pin ATX power connector
- 1 4-pin 12V power connector
- 1 chassis intrusion connector
- 1 front panel connector
- 3 fan connectors

Packing List

• 1 COM330-B board
• 2 Serial ATA data cables
• 1 USB port cable (with bracket)
• 1 COM port cable (with bracket)
• 1 I/O shield
• 1 QR (Quick Reference)
• 1 DVD

EXPANSION SLOTS

- 1 PCIe x16 Gen 3 slot
- 1 PCIe x4 Gen 2 slot
- 1 Mini PCIe slot (PCIe 2.0) (PCIe signal only)
 - USB signal: optional
 - Supports half/full size Mini PCIe card
- 2 PCI slots (PCI 2.3)

SUPPORTED COM EXPRESS MODULES

- Basic
- Compact

DAMAGE FREE INTELLIGENCE

- Legacy Super I/O support (option)
 - Monitors 5V/1.5V/12V/3.3V
 - Monitors SIO_Fan 1/SIO_Fan 2/SIO_Fan 3

ROM INTERFACE

- 1 SPI interface
 - Supports up to 64Mbit
- 1 LPC/FWH interface

TEMPERATURE

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

HUMIDITY

- 10% to 90%

POWER OUTPUT

- 12V, 5VSB, VCC_RTC (ATX mode)
- 12V, 5V, VCC_RTC (AT mode)
- 12V, VCC_RTC (AT mode)

PCB

- Dimensions
 - microATX form factor
 - 244mm (9.6") x 244mm (9.6")
- Compliance
 - PICMG COM Express® R2.0, Type 2

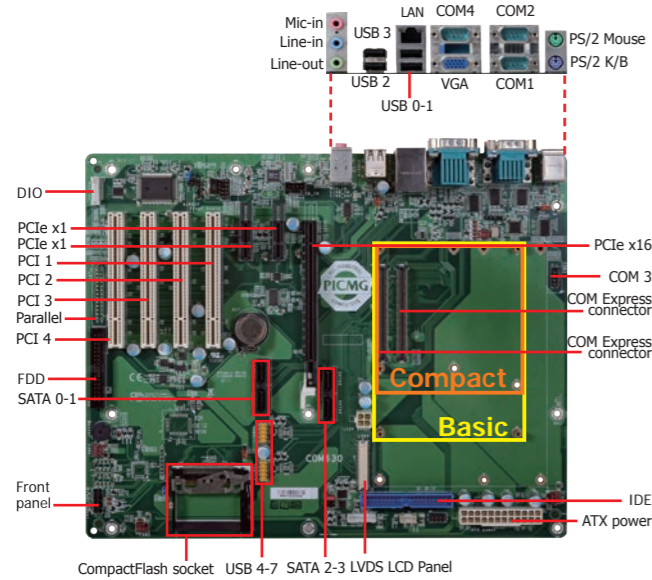
CERTIFICATION

- CE
- FCC Class B
- RoHS

Optional Items

• Serial ATA data cable
• COM port cable
• USB port cable
• I/O shield
• Serial ATA power cable

COM630-B



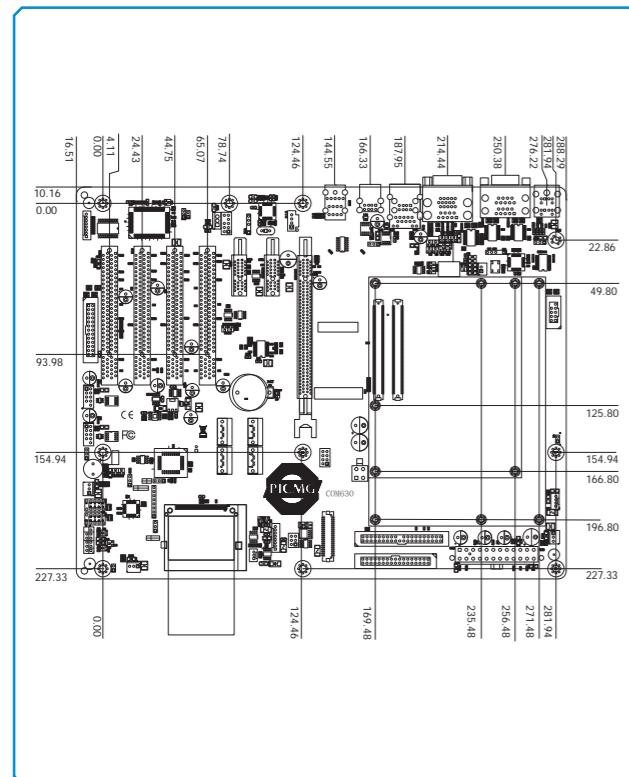
Features

EXPANSION	1 PCIe x16, 2 PCIe x1, 4 PCI
DISPLAY OUTPUTS	1 VGA, 1 LVDS
LAN	1 LAN
COM	4 COM
USB	8 USB 2.0
PARALLEL	1 Parallel
STORAGE	4 SATA 2.0 1 CF 1 IDE 1 FDD
DIO	8-bit DIO
DIMENSIONS	305mm x 244mm (12" x 9.6")

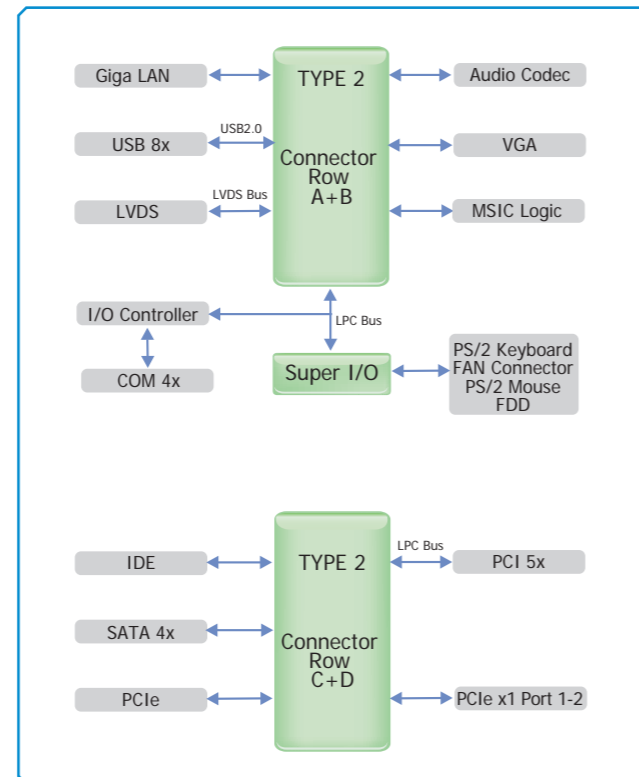
Supports Compact and Basic modules



Mechanical Drawing



Block Diagram



COM630-B

Specifications

AUDIO FEATURES

- Realtek ALC262 audio codec (ALC655 optional)
- 6-channel audio output

SERIAL ATA FEATURES

- SATA speed up to 3Gb/s
- Four SATA ports

IDE FEATURES

- Supports up to Ultra ATA 100
- One IDE channel supports up to 2 IDE devices

BIOS FEATURES (optional)

- FWH/LPC interface
- Supports up to 4Mbit flash ROM
- PLCC32 socket
- Supports WP# jumper
- Carrier board ROM enable/disable function supported

I/O CHIP 1 FEATURES

- Winbond 83627HG-AW controller
- LPC interface
- Supports Smart fan
- Supports WP# jumper
- Default I/O port address "2eh"

I/O CHIP 2 FEATURES

- Fintek F81216D controller
- LPC interface
- Supports 4 COM ports
- Supports IrDA
- Watchdog timer function
- Default I/O port address "4eh"

EXPANSION SLOTS

- 1 CompactFlash socket
- 1 PCI Express x16 (Graphics or Dual SDVO)
- 2 PCI Express x1
- 4 PCI slots (PCI 2.3, 32-bit, 33MHz)

REAR PANEL I/O PORTS

- 1 mini-DIN-6 PS/2 mouse port
- 1 mini-DIN-6 PS/2 keyboard port
- 3 DB-9 serial ports
- 1 DB-15 VGA port
- 1 RJ45 LAN port
- 4 USB 2.0/1.1 ports
- Mic-in, line-in and line-out

Packing List

• 1 COM630-B board
• 1 USB port cable
• 1 Serial ATA data cable
• 1 Serial ATA power cable
• 1 IDE cable
• 1 FDD cable
• 1 I/O shield
• 1 QR (Quick Reference)

I/O CONNECTORS

- 2 connectors for 4 additional external USB 2.0/1.1 ports
- 1 connector for an external serial port
- 1 LVDS LCD panel connector
- 1 LCD/inverter power connector
- 1 Digital I/O connector
- 1 Digital I/O power connector
- 1 front audio connector for line-out and mic-in jacks
- 1 CD-in internal audio connector
- 1 S/PDIF-in/out connector
- 1 GPIO connector
- 1 connector for IrDA interface
- 4 Serial ATA connectors
- 1 40-pin IDE connector
- 1 FDD connector
- 1 parallel connector (optional)
- 1 24-pin ATX power connector
- 1 4-pin 12V power connector
- 1 Wake-On-Ring connector
- 1 chassis open connector
- 1 front panel connector
- 3 fan connectors
- 1 diagnostic LED (optional)

DAMAGE FREE INTELLIGENCE

- Monitors system temperature and overheat alarm
- Monitors system fan speed and failure alarm

TEMPERATURE

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

HUMIDITY

- Operating: 10% to 90%

COM EXPRESS CONNECTORS

- Two 220-pin COM Express standard connectors
- Module connector pin: Tyco 3-631849-6

Dimensions

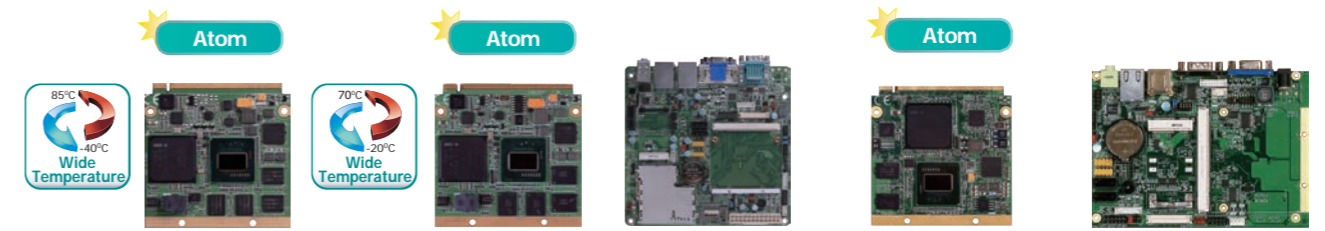
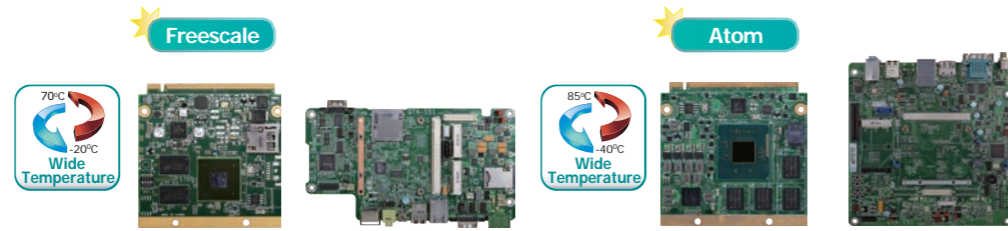
- Dimensions
 - ATX form factor
 - 305mm (12") x 244mm (9.6")
- Compliance
 - PICMG COM Express® R1.0, Type 2

CERTIFICATION

- CE
- FCC Class B
- UL
- RoHS

Optional Items

• Serial ATA data cable
• IDE cable
• USB port cable
• I/O shield
• Serial ATA power cable

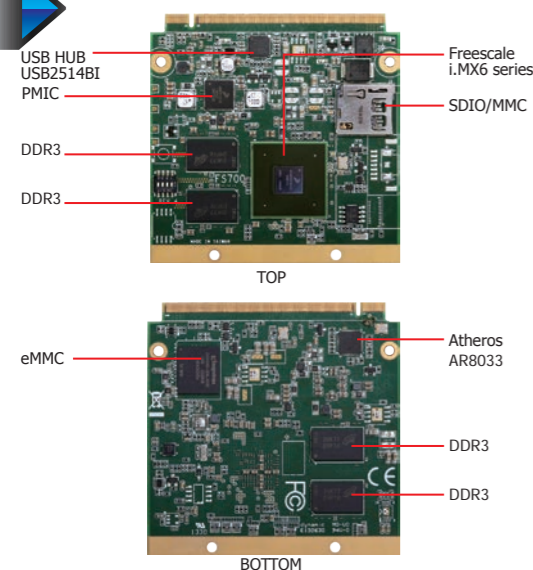


		Module	Carrier Board	Module	Carrier Board		Module	Module	Carrier Board	Module	Carrier Board
Model		FS700 Series	Q7A-551	BT700	Q7X-151		QB702-B	QB701-B	Q7-100	QB700-B	Q7-951
Processor		Freescale i.MX 6 series		Intel® Atom™ E3800 series			Intel® Atom™ E6x0T	Intel® Atom™ E6xxT/E6xx		Intel® Atom™ E6xx	
Memory		1GB DDR3 onboard	N/A	2GB/4GB DDR3L onboard	N/A		1GB DDR2 onboard	1GB DDR2 onboard	N/A	512MB/ 1GB DDR2 onboard	N/A
Display		HDMI, LVDS	HDMI, LVDS	LVDS, DDI	LVDS, DP		LVDS, SDVO	LVDS, SDVO	DVI, VGA, LVDS	LVDS, SDVO	VGA, LVDS
Ethernet		1	1	1	1		1 Micrel	1 Micrel	2	1 Micrel	1
USB	USB 3.0	N/A	N/A	1	2		N/A	N/A	N/A	N/A	N/A
	USB 2.0	4 USB 2.0, 1 USB OTG	2 Rear, 1 USB OTG	6	4		8 USB 2.0	7 USB host and 1 USB host/client	4 Rear, 4 by pin header (1 USB client)	6 USB ports 1 USB client	2 Rear, 4 by pin header
Serial	RS232/422/485	N/A	1	N/A	N/A		N/A	N/A	N/A	N/A	1 by pin header
	RS232	N/A	2 Rear	N/A	2 Rear		N/A	N/A	2 Rear	N/A	1 Rear
Storage	SATA 3.0	N/A	N/A	N/A	1		N/A	N/A	2	N/A	N/A
	SATA 2.0	1	1	2	N/A		2	1	N/A	2	2
	SSD	N/A	N/A	N/A	N/A		N/A	2GB (-B620T012) 4GB (-B640T122)	N/A	N/A	N/A
	SDIO	Yes	N/A	Yes	Yes		Yes	Yes	Yes	Yes	Yes
Expansion	Mini PCIe	N/A	2	N/A	N/A		N/A	N/A	1	N/A	1
	PCIe x16	N/A	N/A	N/A	N/A		N/A	N/A	N/A	N/A	N/A
	PCIe x4	N/A	N/A	N/A	1		N/A	N/A	N/A	N/A	N/A
	PCIe x1	1	N/A	3	N/A		3	3	1	3	N/A
	ExpressCard	N/A	N/A	N/A	N/A		1	N/A	Yes	N/A	N/A
I ² C		Yes	N/A	Yes	Yes		Yes	Yes	Yes	Yes	Yes
Digital I/O		N/A	8-bit	N/A	8-bit (option)		8-bit	N/A	8-bit	N/A	8-bit
Audio	Controller	I ² S	I ² S	HDA	HDA		HDA	HDA	HDA	HDA	HDA
LPC		N/A	N/A	Yes	Yes		Yes	Yes	Yes	Yes	Yes
SMBus		N/A	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes
CAN-bus		Yes	N/A	N/A	Yes		Yes	Yes	Yes	Yes	Yes
TPM (optional)		N/A	N/A	Yes	N/A		Yes	Yes	N/A	N/A	Yes
Watchdog		Yes	N/A	Yes	Yes		Yes	Yes	N/A	Yes	N/A
Power Input		5V	2-pin DC-in	5V	12V DC-in		5V	5V	24-pin ATX	5V	12V
Compliance		Qseven R1.2	N/A	Qseven R2.0	N/A		Qseven R1.2	Qseven R1.2	N/A	Qseven R1.1	N/A
Dimensions		70mm x 70mm	190mm x 102mm	70mm x 70mm	170mm x 170mm		70mm x 70mm	70mm x 70mm	170mm x 170mm	70mm x 70mm	102mm x 147mm

FS700 Series

FS700 Series

Freescale

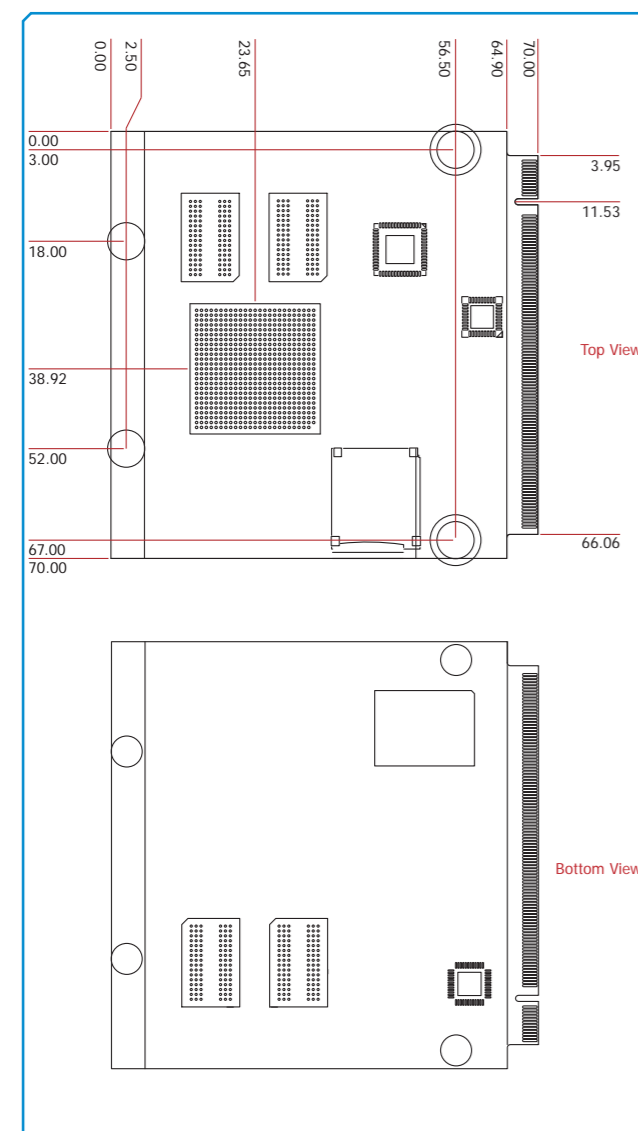


Features

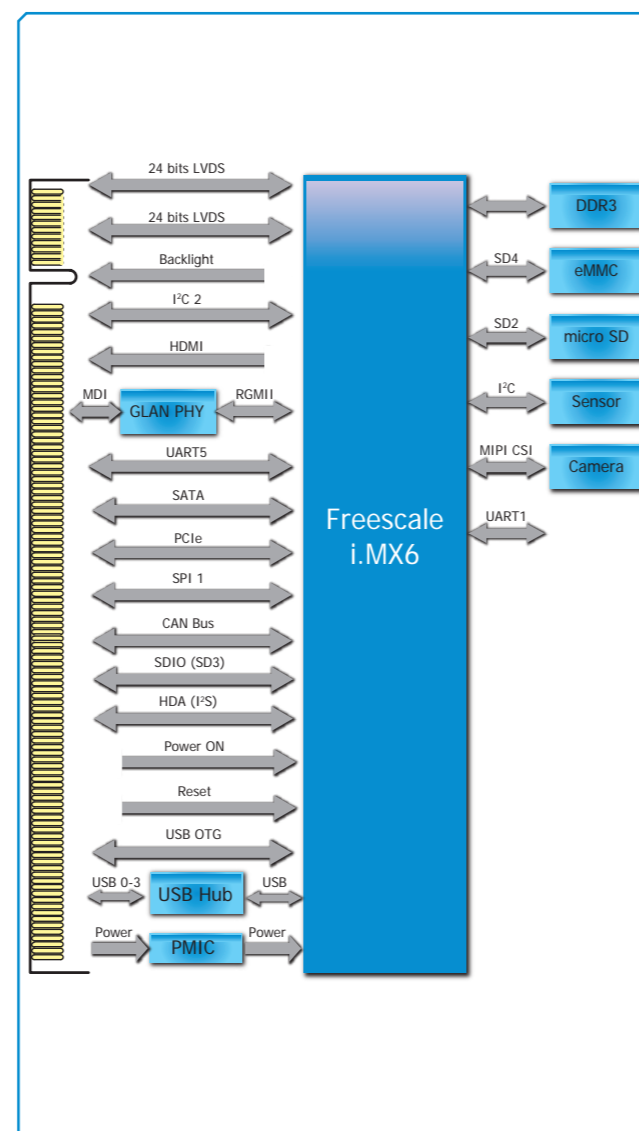
MEMORY	1GB/2GB DDR3 onboard
STORAGE	4GB/8GB/16GB eMMC onboard
DISPLAY OUTPUTS	1 HDMI, 2 LVDS
EXPANSION	1 PCIe x1 2 I ² C, 1 CAN-bus 4 USB 2.0, 1 USB OTG 1 SATA 2.0 1 SDIO/MMC 1 RS232
LAN	1 10/100Mbps LAN (FS700E) 1 Gigabit LAN (FS700)
DIMENSIONS	Qseven R1.2 70mm x 70mm (2.76" x 2.76")



Mechanical Drawing



Block Diagram



Specifications

PROCESSOR

- Freescale i.MX 6 series processors
 - i.MX6Q: i.MX 6Quad at 1.0GHz, Four Cortex-A9 cores
 - i.MX6D: i.MX 6Dual at 1.0GHz, Two Cortex-A9 cores
 - i.MX6L: i.MX 6DualLite at 1.0GHz, Two Cortex-A9 cores
 - i.MX6S: i.MX 6Solo at 1.0GHz, One Cortex-A9 core

SYSTEM MEMORY

- DDR3 onboard
- Onboard memory: 1GB/2GB

STORAGE

- Supports 4GB, 8GB and 16GB eMMC onboard

ONBOARD GRAPHICS FEATURES

- Supports HDMI and LVDS interfaces
- HDMI: resolution up to 1920x1200 @ 60Hz
- LVDS: 18/24-bit, single channel, resolution up to 2560x1600 @ 60Hz
- Supports 3D and 2D graphics
- Multi-stream-capable HD video engine delivering 1080p60 decode, 1080p30 encode and 3D video playback

ONBOARD AUDIO FEATURES

- Supports I²S interface

ONBOARD LAN FEATURES

- One Atheros AR8033 Ethernet PHY
- Supports 10Mbps, 100Mbps data transmission (FS700E)
- Supports 10Mbps, 100Mbps and 1Gbps data transmission (FS700)

SERIAL ATA (SATA) INTERFACE

- Supports 1 SATA 2.0 interface (Quad and Dual processors only)
- SATA speed up to 3Gb/s (SATA 2.0)

SDIO/MMC

- Supports 1 SDIO/MMC
- Supports SDA Standard Ver 1.0, SD memory card specification Ver 2.0, SDIO card specification Ver 1.0, MMC System specification Ver 4.1
- Conforms to Secure Digital Host Controller (SDHC) speed class 6

EXPANSION INTERFACES

- Supports 4 USB 2.0 interfaces
- Supports 1 USB OTG (Type B) interface
- Supports 1 PCIe x1 interface
- Supports 1 RS232 serial interface
- Supports 2 I²C interfaces
- Supports CAN-bus (Controller-Area Network) interface

WATCHDOG TIMER

- Software programmable from 1 to 255 seconds

POWER

- Input: 5V standby, 5V

POWER CONSUMPTION

- TBD

OS SUPPORT

- LTIBLinux 3.0.35
- Android
 - Quad, Dual and DualLite processors only
 - 8GB eMMC required

TEMPERATURE

- Operating
 - Quad: -20°C to 70°C (TBD)
 - Dual, DualLite, Solo: 0°C to 60°C
- Storage: -30°C to 80°C

HUMIDITY

- 5% to 90%

PCB

- Dimensions
 - Qseven form factor
 - 70mm (2.76") x 70mm (2.76")
- Compliance
 - Qseven specification revision 1.2

Ordering Information

Model Name	Part Number	Description
FS700E-M60-6Q1041	777-FS70E1-EF0G	i.MX 6Quad, onboard DDR3 1GB, eMMC 4GB, RoHS, -20°C to 70°C (TBD)
FS700E-M60-6D1041	777-FS70E1-DF0G	i.MX 6Dual, onboard DDR3 1GB, eMMC 4GB, RoHS, 0°C~60°C
FS700E-M60-6L1041	777-FS70E1-CF0G	i.MX 6DualLite, onboard DDR3 1GB, eMMC 4GB, RoHS, 0°C~60°C
FS700E-M60-6S1041	777-FS70E1-500G	i.MX 6Solo, onboard DDR3 1GB, eMMC 4GB, 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
FS700-M60-6Q1041	777-FS7001-EF0G	i.MX 6Quad, onboard DDR3 1GB, eMMC 4GB, RoHS, -20°C to 70°C (TBD)
FS700-M60-6D1041	777-FS7001-DF0G	i.MX 6Dual, onboard DDR3 1GB, eMMC 4GB, RoHS, 0°C~60°C
FS700-M60-6L1041	777-FS7001-CF0G	i.MX 6DualLite, onboard DDR3 1GB, eMMC 4GB, RoHS, 0°C~60°C
FS700-M60-6S1041	777-FS7001-500G	i.MX 6Solo, onboard DDR3 1GB, eMMC 4GB, RoHS, 0°C~60°C

Packing List

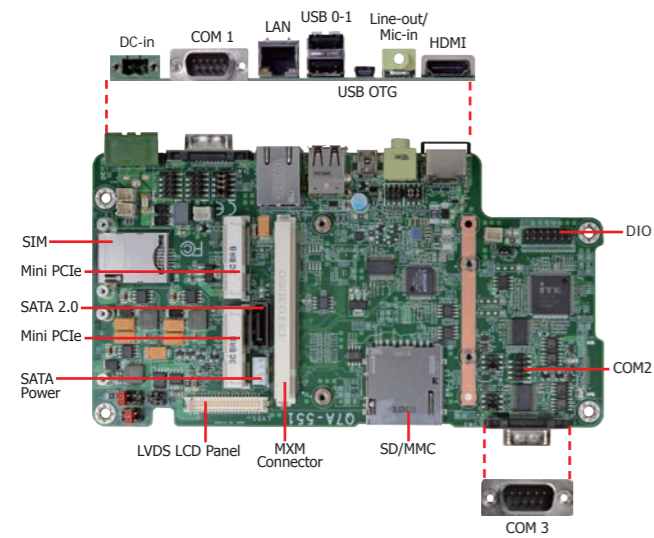
- 1 FS700E/FS700-M60 board
- 1 QR (Quick Reference)
- 1 DVD

Optional Items

- Q7A-551 carrier board kit
- 1 Bracket

Qseven
Computer-On-Module

Q7A-551

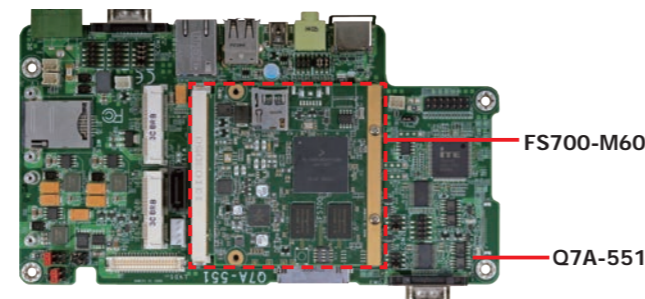


Features

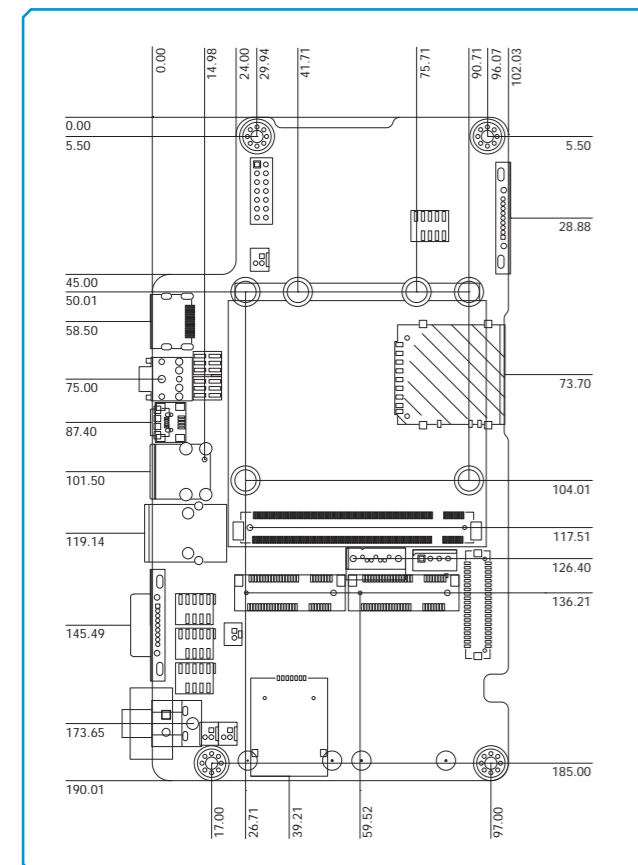
EXPANSION	2 Mini PCIe 1 SIM
DISPLAY OUTPUTS	1 HDMI, 1 LVDS
LAN	1 LAN
COM	3 COM
USB	2 USB 2.0, 1 USB OTG
STORAGE	1 SATA 2.0 1 SD/MMC
DIO	12-bit DIO
DIMENSIONS	190mm x 102mm (7.48" x 4.02")



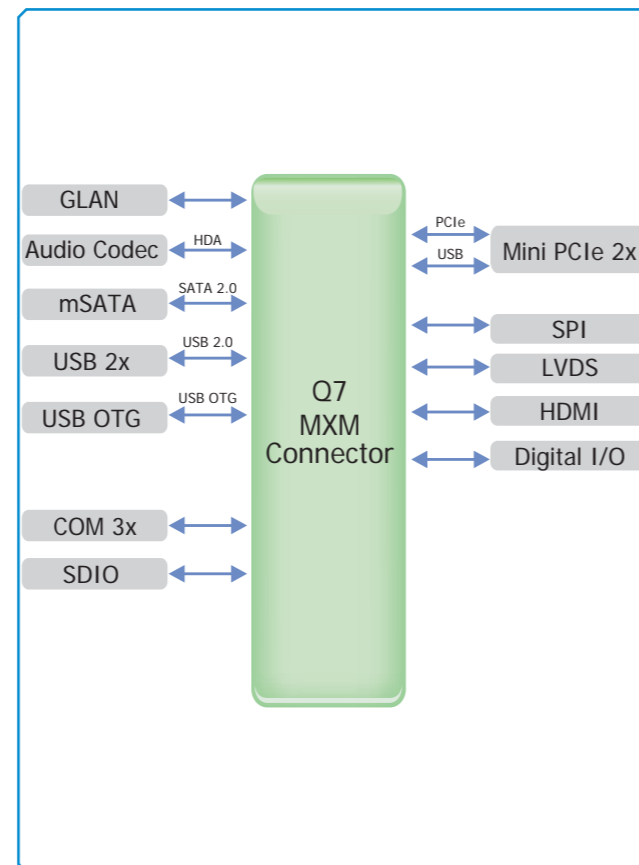
For FS700 Series



Mechanical Drawing



Block Diagram



Specifications

ONBOARD GRAPHICS FEATURES

- Display ports
 - 1 HDMI
 - 2 24-bit single channel LVDS

ONBOARD AUDIO FEATURES

- Supports I²S audio interface
- 2 1W audio amplifier connectors (left and right sides)

ONBOARD USB FEATURES

- 2 USB 2.0 ports
- 1 USB OTG port

STORAGE

- 1 SATA 2.0 port with data transfer rate up to 3Gb/s
- 1 SD/MMC socket

PANEL I/O PORTS

- 2 USB 2.0 ports
- 1 USB OTG port
- 2 DB-9 serial ports
 - 1 RS232/422/485
 - 1 RS232 (debug or UART)
- 1 RJ45 LAN port
- 1 HDMI port
- 1 Line-out/Mic-in jack
- 1 9~36V DC-in jack

I/O CONNECTORS

- 1 connector for an external RS232/422/485 serial port (2.0mm pitch)
- 1 LVDS LCD panel connector
- 1 SATA 2.0 port
- 1 SATA power port
- 2 1W audio amplifier connectors (left and right sides)
- 1 12-bit Digital I/O connector

Packing List

• 1 Q7A-551 board
• 1 SATA data cable
• 1 I/O shield
• 1 QR (Quick Reference)
• 1 DVD

Q7A-551

EXPANSION SLOTS

- 2 Mini PCIe slots
 - 1 slot supports PCIe and USB signals
 - 1 slot supports PCIe, USB and mSATA signals
 - Supports full size Mini PCIe card
- 1 SIM card socket

TEMPERATURE

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

HUMIDITY

- 10% to 90%

BOARD TO BOARD CONNECTORS

- One MXM connector

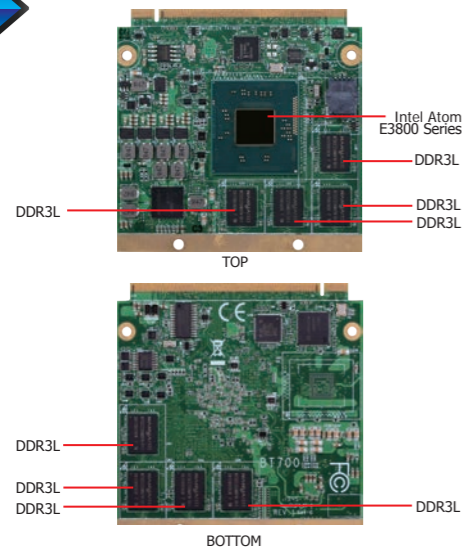
DIMENSIONS

- 190mm (7.48") x 102mm (4.02")

BT700

BT700

Atom

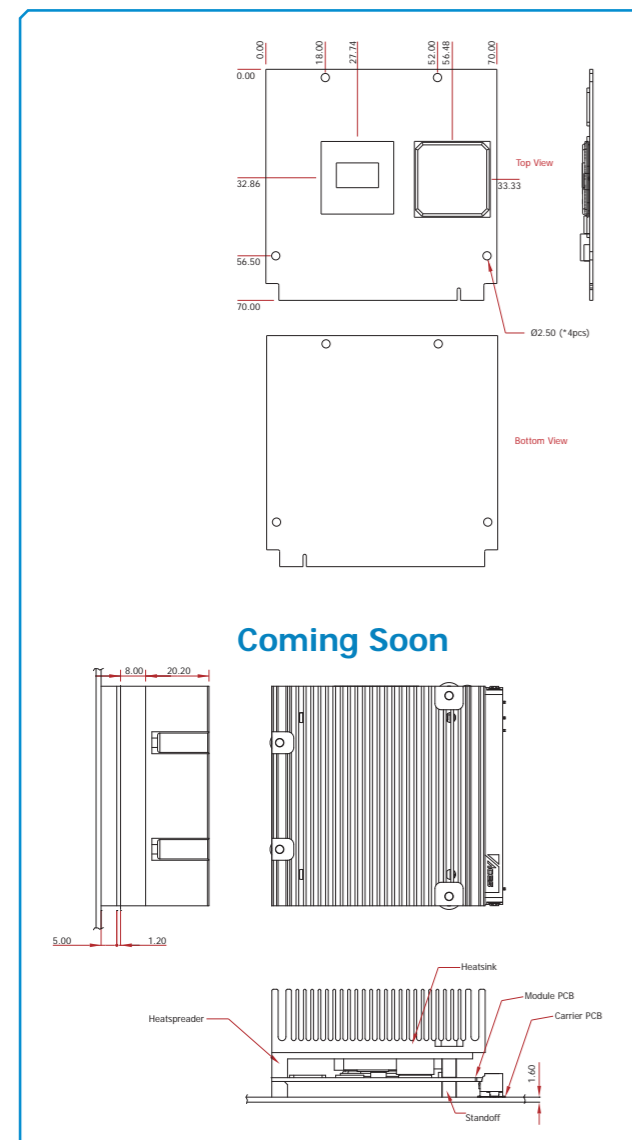


Features

MEMORY	2GB/4GB DDR3L onboard
STORAGE	4GB/8GB/16GB eMMC onboard (optional)
EXPANSION	3 PCIe x1 1 LPC, 1 SMBus, 1 I ² C, 1 UART 1 LVDS, 1 DDI (HDMI/DVI/DP) 1 HDA 7 USB: 1 USB 3.0, 6 USB 2.0 2 SATA 2.0 1 SDIO
LAN	1 LAN
DIMENSIONS	Qseven R2.0 70mm x 70mm (2.76" x 2.76")

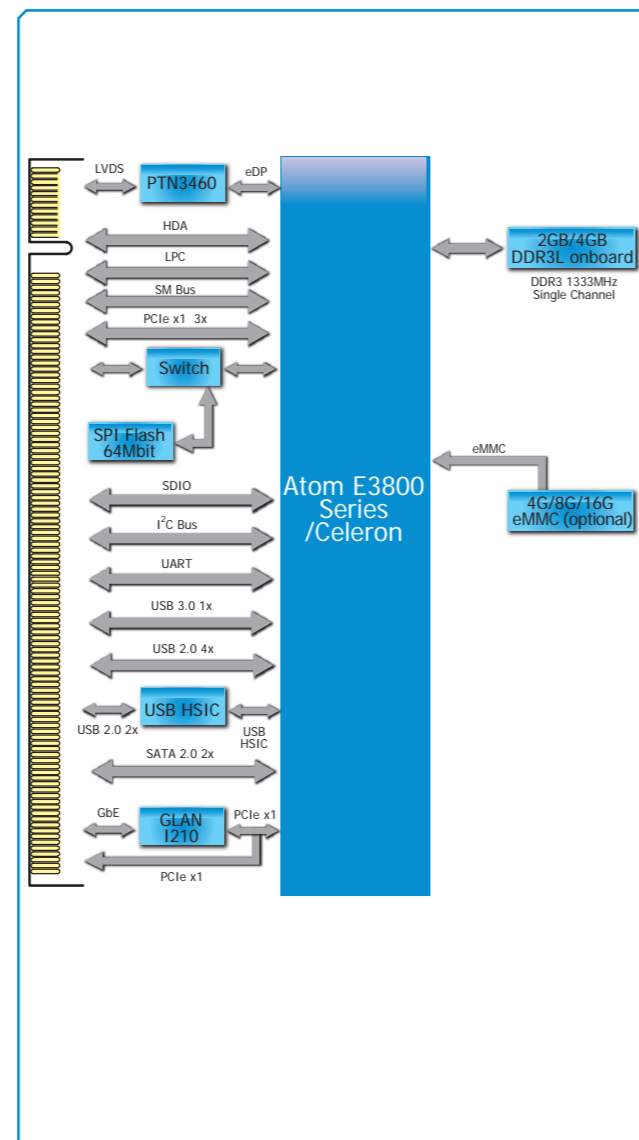


Mechanical Drawing



Coming Soon

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

STORAGE

- Supports 4GB, 8GB and 16GB eMMC onboard (optional)

ONBOARD GRAPHICS FEATURES

- Intel® HD Graphics
- Supports LVDS and DDI interfaces
- LVDS: NXP PTN3460, 24-bit, dual channel, resolution up to 1920x1200 @ 60Hz
- Digital Display Interface: HDMI, DVI and DP
- HDMI, DVI: resolution up to 2560x1600 @ 24Hz
- DP: resolution up to 2560x1600 @ 60Hz
- Supports hardware acceleration for DirectX 11, OCL 1.2, OGL 3.2, H.264, MPEG2, MVC, VC-1, WMV9 and VP8

ONBOARD AUDIO FEATURES

- Supports High Definition Audio interface

ONBOARD LAN FEATURES

- Intel® WG1210 Gigabit Ethernet Controller
- Integrated 10/100/1000 transceiver
- Fully compliant with IEEE 802.3, IEEE 802.3u, IEEE 802.3ab

SERIAL ATA (SATA) INTERFACE

- Supports 2 Serial ATA interfaces
- SATA 2.0 with data transfer rate up to 3Gb/s
- Integrated Advanced Host Controller Interface (AHCI) controller

SDIO INTERFACE

- Supports 1 SDIO
- Supports SDA Standard Ver 1.0, SD memory card specification Ver 2.0, SDIO card specification Ver 1.0
- Conforms to Secure Digital Host Controller (SDHC) speed class 6

TRUSTED PLATFORM MODULE (TPM) - optional

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

Ordering Information

Model Name	Temperature	Memory	eMMC	Processors
BT700	- B	2	0	- E45
	B: 0°C to 60°C E: -20°C to 70°C T: -40°C to 85°C	2: 2GB 4: 4GB	0: None 4: 4GB 8: 8GB 1: 16GB	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 BT700 board
- 1 QR (Quick Reference)
- 1 DVD

WATCHDOG TIMER

- Watchdog timeout programmable via software from 1 to 255 seconds

EXPANSION INTERFACES

- Supports 1 USB 3.0 port
- Supports 4 USB 2.0 ports
- Supports 1 USB HSIC for 2 USB 2.0 (default); or 4 USB 2.0 ports
- Supports 3 PCIe x1 (GPP, GPP3 is connected to onboard LAN by default)
- Supports LPC interface
- Supports I²C interface
- Supports SMBus interface
- Supports 1 UART interface (TX/RX/CTS/RTS)

DAMAGE FREE INTELLIGENCE

- Monitors CPU temperature
- Monitors CPU fan speed
- Monitors Vcore/VGFX/VSM voltages
- Watchdog timer function

BIOS

- 64Mbit SPI Flash BIOS

POWER

- Input: VCC_RTC, 5V standby, 5V

POWER CONSUMPTION

- TBD

OS SUPPORT

- Windows 8 Enterprise x64 (64-bit)

TEMPERATURE

- Operating
 - Atom: 0°C to 60°C, -20°C to 70°C, -40°C to 85°C
 - Celeron: 0°C to 60°C
- Storage: -40°C to 85°C

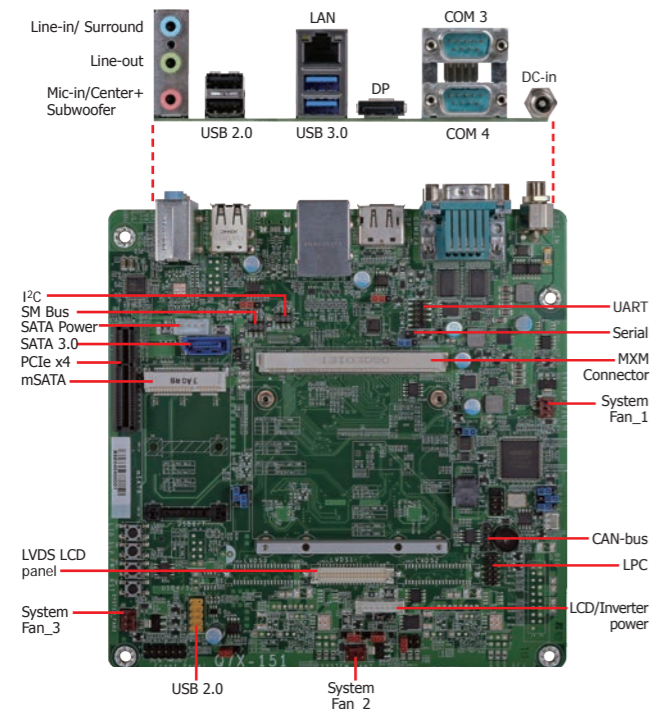
HUMIDITY

- 5% to 95%

PCB

- Dimensions
 - Qseven form factor
 - 70mm (2.76") x 70mm (2.76")
- Compliance
 - Qseven specification revision 2.0

Q7X-151

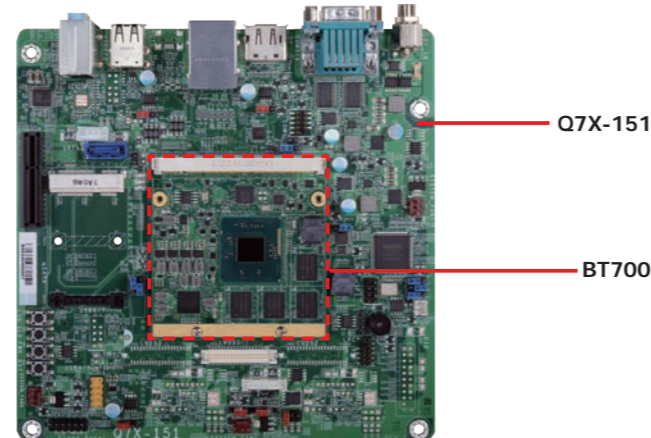


Features

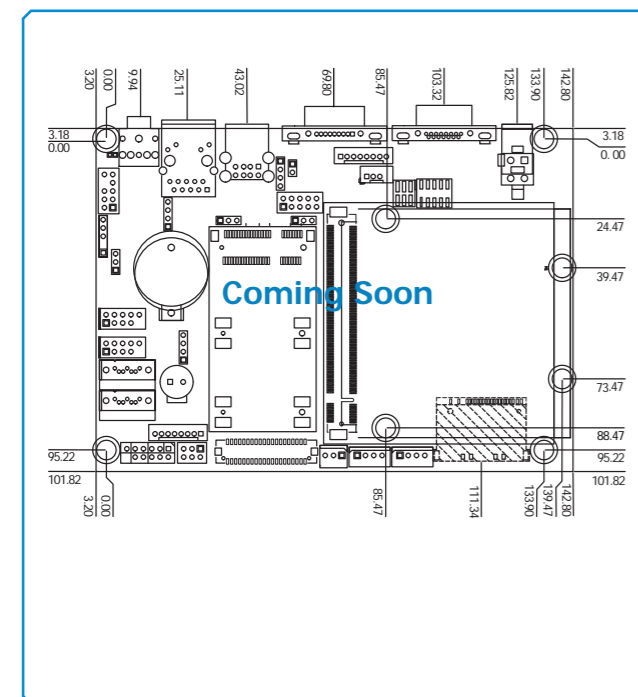
EXPANSION	1 PCIe x4 1 SDIO
DISPLAY OUTPUTS	1 LVDS, 1 DP
LAN	1 LAN
COM	2 COM
USB	6 USB: 2 USB 3.0, 4 USB 2.0
STORAGE	1 SATA 3.0 1 mSATA
DIMENSIONS	170mm x 170mm (6.7" x 6.7")



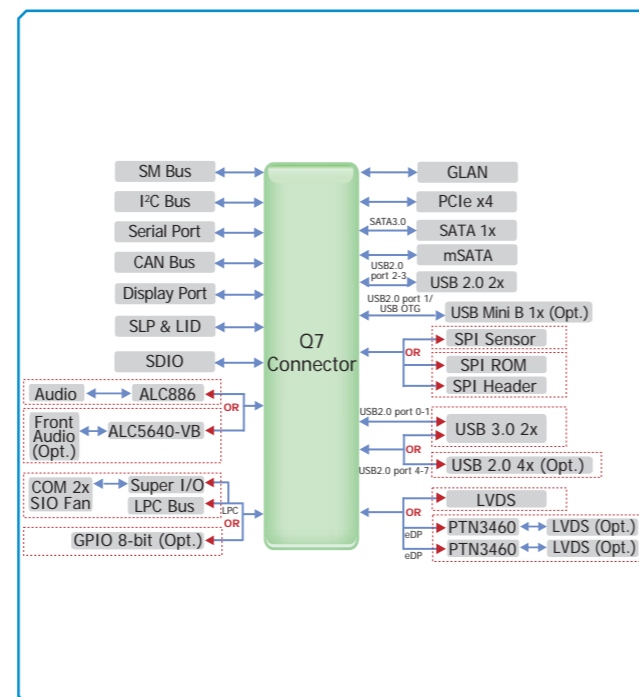
For BT700



Mechanical Drawing



Block Diagram



Specifications

ONBOARD GRAPHICS FEATURES

- Display ports
 - 1 dual channel LVDS (standard); or
 - 2 embedded DisplayPort to dual channel PTN3460 LVDS (optional)
 - 1 DP port

ONBOARD AUDIO FEATURES

- Realtek ALC886 5.1-channel High Definition Audio (standard); or Realtek ALC5640-VB 2-channel I²S Audio interface (optional)
- Audio outputs: Mic-in/Center+Subwoofer, line-in/surround and line out

ONBOARD USB FEATURES

- 2 USB 3.0 and 4 USB 2.0 ports (standard); or 8 USB 2.0 ports (optional)
- With BT700: 1 USB 3.0 and 6 USB 2.0 ports (standard); or 8 USB 2.0 ports (optional)
- USB 2.0 port 1 supports USB OTG (optional)

STORAGE

- 1 SATA 3.0 port with data transfer rate up to 6Gb/s
 - SATA port provides adequate space for SATA DOM
- 1 mSATA port

DIGITAL I/O

- 8-bit Digital I/O connector (optional)

REAR PANEL I/O PORTS

- 1 12V DC-in jack
- 2 DB-9 RS232 serial ports
- 1 DP port
- 1 RJ45 LAN port
- 2 USB 3.0 ports
- 2 USB 2.0 type A ports
- 1 USB OTG type Mini B port (optional)
- Mic-in/Center+Subwoofer, line-in/surround and line out jacks

I/O CONNECTORS

- 1 connector for 2 external USB 2.0/1.1 ports; or 2 connectors for 4 external USB 2.0/1.1 ports (optional)
- 1 UART port
- 1 serial interface for 1 serial port (TX/RX)
- 1 LVDS LCD panel connector
- 1 LCD/inverter power connector
- 1 8-bit Digital I/O connector (optional)
- 1 front audio connector for line-out and mic-in jacks
- 1 Serial ATA connector
- 1 Serial ATA power connector
- 1 mSATA port
- 1 LPC connector
- 1 I²C connector
- 1 SMBus connector
- 1 CAN-bus connector
- 1 front panel connector
- 3 fan connectors

Packing List

- 1 Q7X-151 board
- 1 Serial ATA data with power cable
- 1 I/O shield
- 1 QR (Quick Reference)
- 1 DVD

Q7X-151

EXPANSION SLOTS

- 1 PCIe x4 slot
- 1 SDIO socket

WATCHDOG TIMER

- Watchdog timeout programmable via software from 1 to 255 seconds

DAMAGE FREE INTELLIGENCE

- Monitors system temperature and overheat alarm
- Monitors system fan speed and failure alarm

ROM INTERFACE

- 1 SPI interface
 - Supports up to 64Mbit

TEMPERATURE

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

HUMIDITY

- 5% to 90%

BOARD TO BOARD CONNECTORS

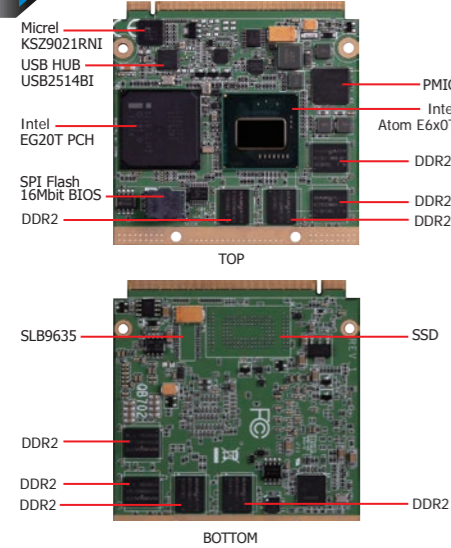
- One MXM connector

DIMENSIONS

- Mini-ITX form factor
- 170mm (6.7") x 170mm (6.7")

QB702-B

Atom

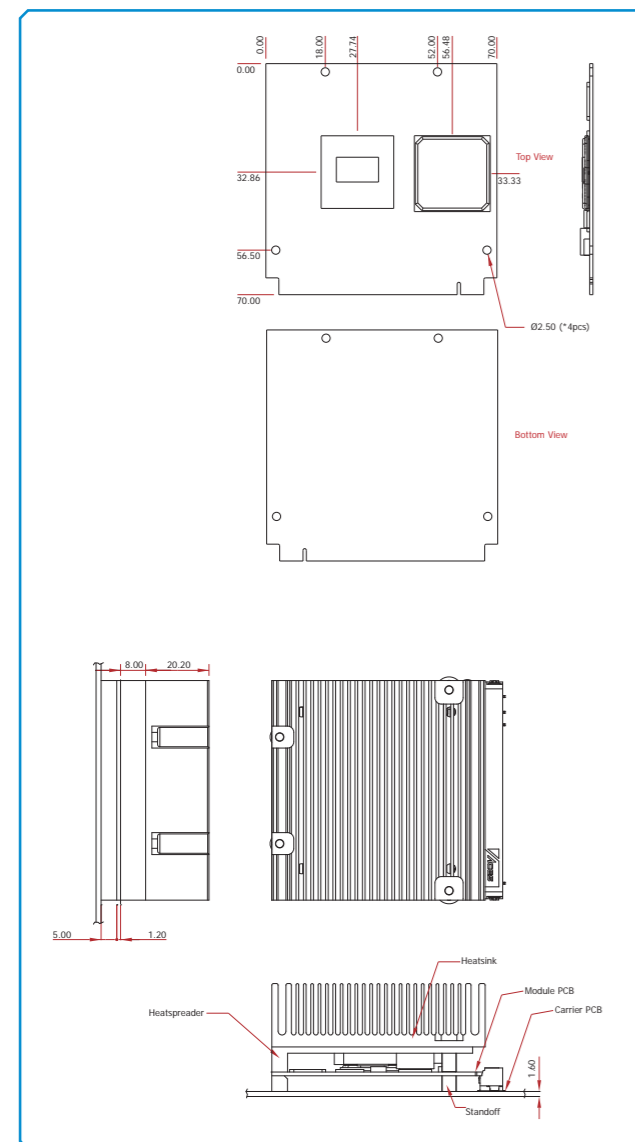


Features

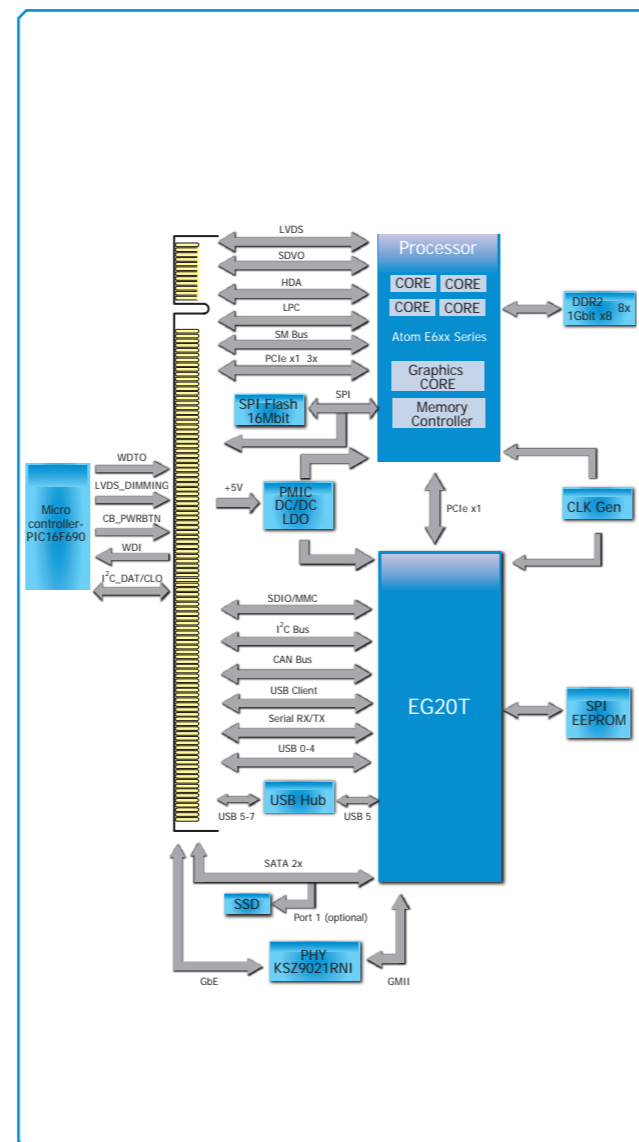
MEMORY	1GB DDR2 onboard
EXPANSION	3 PCIe x1 1 LPC, 1 SMBus, 1 I ² C, 1 CAN-bus, 1 serial 1 LVDS, 1 SDVO 8 USB 2.0 2 SATA 2.0 1 SDIO/MMC 1 ExpressCard
LAN	1 LAN
DIMENSIONS	Qseven R1.2 70mm x 70mm (2.76" x 2.76")



Mechanical Drawing



Block Diagram



Specifications

PROCESSOR

- QB702-B620T102
 - Intel® Atom™ E620T (512KB L2 cache, 600 MHz, 3.3W)
- QB702-B640T102
 - Intel® Atom™ E640T (512KB L2 cache, 1.0 GHz, 3.6W)
- QB702-B660T102
 - Intel® Atom™ E660T (512KB L2 cache, 1.3 GHz, 3.6W)
- QB702-B680T102
 - Intel® Atom™ E680T (512KB L2 cache, 1.6 GHz, 4.5W)

CHIPSET

- Intel® EG20T PCH

SYSTEM MEMORY

- 1GB DDR2 onboard
- Supports memory down (single 32-bit channel)

ONBOARD GRAPHICS FEATURES

- Intel® GMA 600
- Supports up to 400MHz graphics frequency
- Ultra low power integrated 3D graphics
- High definition hardware video decoder and encoder engine
- Supports LVDS and SDVO interfaces
 - LVDS: Supports pixel clock depths of 18/24-bit, single channel, max. pixel clock of 80MHz, equates to 1280x768 @ 60Hz
 - SDVO: Up to 160MHz pixel clock, equates to 1280x1024 @ 85Hz

ONBOARD AUDIO FEATURES

- Supports High Definition Audio interface

ONBOARD LAN FEATURES

- Integrated Intel® PCH GbE MAC
- One Micrel KSZ9021RNI Ethernet PHY
- Supports 10Mbps, 100Mbps and 1Gbps data transmission
- IEEE 802.3 (10/100Mbps) and IEEE 802.3ab (1Gbps) compliant

SERIAL ATA (SATA) INTERFACE

- Supports 2 SATA interfaces
 - One port shared with SSD
- SATA speed up to 3Gb/s (SATA 2.0)

SSD (optional)

- 2GB/4GB/8GB/16GB/32GB

SDIO/MMC INTERFACE

- Supports 1 SDIO/MMC
- Supports SDA Standard Ver 1.0, SD memory card specification Ver 2.0, SDIO card specification Ver 1.0, MMC System specification Ver 4.1
- Conforms to Secure Digital Host Controller (SDHC) speed class 6

Ordering Information

Model Name	Part Number	Description
QB702-B620T102	777-QB7021-4C0G	Intel® Atom™ E620T, 600 MHz, 3.3W, onboard DDR2 1GB, RoHS
QB702-B640T102	777-QB7021-5C0G	Intel® Atom™ E640T, 1.0 GHz, 3.6W, onboard DDR2 1GB, RoHS
QB702-B660T102	777-QB7021-6C0G	Intel® Atom™ E660T, 1.3 GHz, 3.6W, onboard DDR2 1GB, RoHS
QB702-B680T102	777-QB7021-7C0G	Intel® Atom™ E680T, 1.6 GHz, 4.5W, onboard DDR2 1GB, RoHS

Packing List

- 1 QB702-B board
- 1 QR (Quick Reference)
- 1 DVD

QB702-B

TRUSTED PLATFORM MODULE (TPM) - optional

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

EXPANSION INTERFACES

- Supports 8 USB 2.0 interfaces:
 - 7 Host and 1 Host/Client (selectable)
- Supports 3 PCIe x1 interfaces
- Supports 1 LPC interface
- Supports 1 SMBus interface
- Supports 1 I²C interface
- Supports CAN-bus (Controller-Area Network) interface
- Supports ExpressCard (PCIe signal only)
- Supports 1 serial interface (TX/RX)

ENERGY EFFICIENT DESIGN

- Supports ACPI 2.0/1.0 specification
- Enhanced Intel® SpeedStep Technology

BIOS

- AMI BIOS
 - 16Mbit SPI Flash BIOS (UEFI BIOS)

WATCHDOG TIMER

- Software programmable from 1 to 255 seconds

POWER

- Input: VCC_RTC, 5V standby, 5V
- Supports ATX/AT mode

POWER CONSUMPTION

- 7.6 W with E680 at 1.6GHz and 1GB DDR2 onboard

OS SUPPORT

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

TEMPERATURE

- Operating: -40°C to 85°C
- Storage: -40°C to 85°C

HUMIDITY

- 10% to 90%

PCB

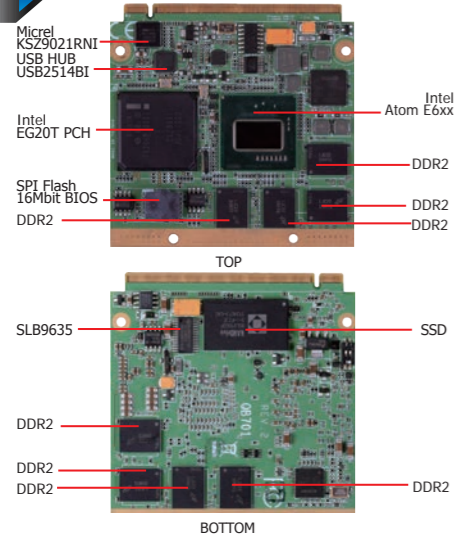
- Dimensions
 - Qseven form factor
 - 70mm (2.76") x 70mm (2.76")
- Compliance
 - Qseven specification revision 1.2

Optional Items

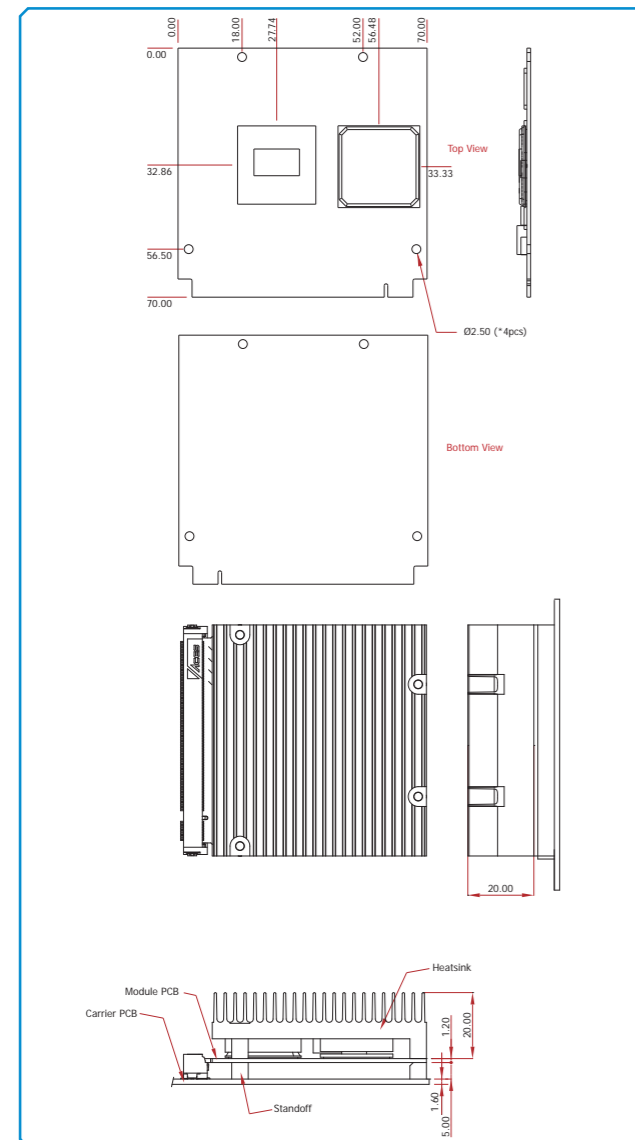
- Q7-100 carrier board kit
- Heat spreader with heat sink: 761-Q70000-000G
- Heat spreader: A71-012002-000G
- 1 Bracket

QB701-B

Atom



Mechanical Drawing

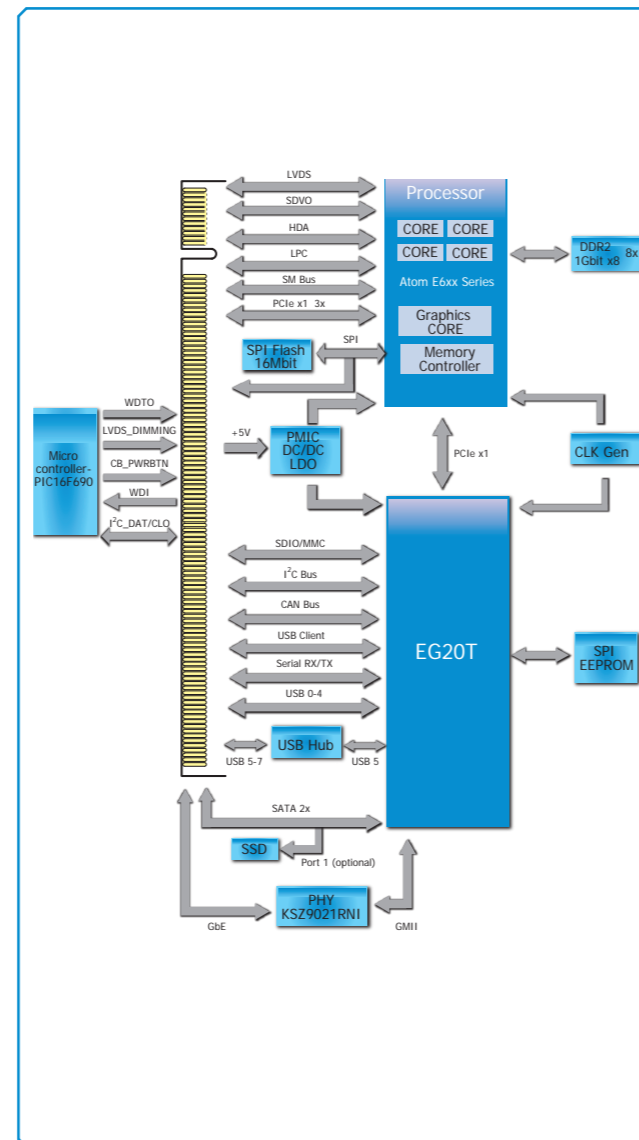


Features

MEMORY	512MB/1GB/2GB DDR2 SDRAM onboard
EXPANSION	3 PCIe x1 1 LPC, 1 SMBus, 1 I ² C, 1 CAN-bus, 1 serial 1 LVDS, 1 SDVO 7 USB Host and 1 USB Host/Client 2 SATA 2.0 1 SDIO/MMC
LAN	1 LAN
DIMENSIONS	Qseven R1.2 70mm x 70mm (2.76" x 2.76")



Block Diagram



Specifications

PROCESSOR

- Intel® Atom™ E600 Series processors
- Please refer to the Ordering Information below

CHIPSET

- Intel® EG20T PCH (Platform Controller Hub)

ONBOARD GRAPHICS FEATURES

- Intel® GMA 600
- Supports up to 400MHz graphics frequency
- Ultra low power integrated 3D graphics
- High definition hardware video decoder and encoder engine
- Supports LVDS and SDVO interfaces
 - LVDS: Supports pixel clock depths of 18/24-bit, single channel, max. pixel clock of 80MHz, equates to 1280x768 @ 60Hz
 - SDVO: Up to 160MHz pixel clock, equates to 1280x1024 @ 85Hz

ONBOARD AUDIO FEATURES

- Supports High Definition Audio interface

ONBOARD LAN FEATURES

- Integrated Intel® PCH GbE MAC
- One Micrel KSZ9021RNI Ethernet PHY
- Supports 10Mbps, 100Mbps and 1Gbps data transmission
- IEEE 802.3 (10/100Mbps) and IEEE 802.3ab (1Gbps) compliant

SERIAL ATA (SATA) INTERFACE

- Supports two Serial ATA interfaces
 - One port shared with SSD
- SATA speed up to 3Gb/s (SATA 2.0)

TRUSTED PLATFORM MODULE (TPM) - optional

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

SDIO/MMC INTERFACE

- Supports 1 SDIO/MMC
- Supports SDA Standard Ver 1.0, SD memory card specification Ver 2.0, SDIO card specification Ver 1.0, MMC System specification Ver 4.1
- Conforms to Secure Digital Host Controller (SDHC) speed class 6

EXPANSION INTERFACES

- Supports USB interface:
 - 7 Host and 1 Host/Client (selectable)
- Supports 3 PCIe x1 interfaces
- Supports LPC interface
- Supports SMBus interface
- Supports I²C interface
- Supports CAN-bus (Controller-Area Network) interface
- Supports 1 serial interface (TX/RX)

WATCHDOG TIMER

- Software programmable from 1 to 255 seconds

ENERGY EFFICIENT DESIGN

- Supports ACPI 2.0/1.0 specification
- Enhanced Intel® SpeedStep Technology

BIOS

- 16Mbit SPI Flash BIOS (UEFI BIOS)

POWER

- Input: VCC_RTC, 5V standby, 5V

POWER CONSUMPTION

- 12.42 W with E660T at 1.3GHz and 1GB DDR2 onboard

OS SUPPORT

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

HUMIDITY

- 10% to 90%

PCB

- Dimensions
 - Qseven form factor
 - 70mm (2.76") x 70mm (2.76")
- Compliance
 - Qseven specification revision 1.2

CERTIFICATION

- CE, FCC Class B, UL, RoHS

Ordering Information

Model Name	Part Number	Description
QB701-B620T201	777-QB7011-4F0G	Intel® Atom™ E620T, onboard DDR2 2GB, -20°C to 70°C
QB701-B620T101	777-QB7011-4C0G	Intel® Atom™ E620T, onboard DDR2 1GB, -20°C to 70°C
QB701-B620T011	777-QB7011-4A0G	Intel® Atom™ E620T, onboard DDR2 512MB, 2GB SSD onboard, -20°C to 70°C
QB701-B640T201	777-QB7011-5F0G	Intel® Atom™ E640T, onboard DDR2 2GB, -20°C to 70°C
QB701-B640T101	777-QB7011-5C0G	Intel® Atom™ E640T, onboard DDR2 1GB, -20°C to 70°C
QB701-B640T121	777-QB7011-5E0G	Intel® Atom™ E640T, onboard DDR2 1GB, 4GB SSD onboard, -20°C to 70°C
QB701-B660T101	777-QB7011-6C0G	Intel® Atom™ E660T, onboard DDR2 1GB, -20°C to 70°C
QB701-B680T101	777-QB7011-7C0G	Intel® Atom™ E680T, onboard DDR2 1GB, -20°C to 70°C
QB701-B680T201	777-QB7011-7F0G	Intel® Atom™ E680T, onboard DDR2 2GB, -20°C to 70°C
QB701-B620100	777-QB7011-0C0G	Intel® Atom™ E620, onboard DDR2 1GB, 0°C to 60°C
QB701-B640100	777-QB7011-1C0G	Intel® Atom™ E640, onboard DDR2 1GB, 0°C to 60°C
QB701-B660100	777-QB7011-2C0G	Intel® Atom™ E660, onboard DDR2 1GB, 0°C to 60°C
QB701-B680100	777-QB7011-3C0G	Intel® Atom™ E680, onboard DDR2 1GB, 0°C to 60°C

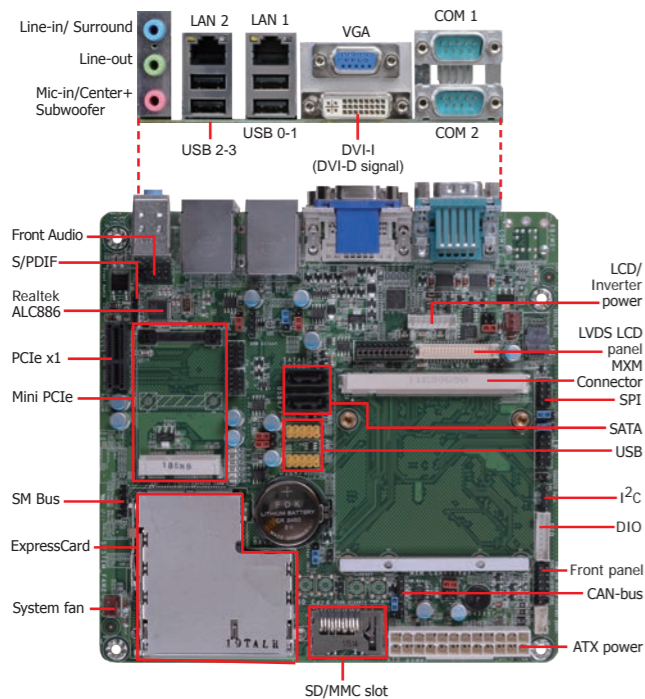
Packing List

- 1 QB701-B board
- 1 QR (Quick Reference)
- 1 Drivers/utilities disk

Optional Items

- Q7-100 carrier board kit
- Heat sink: A71-012001-000G
- 1 Bracket

Q7-100

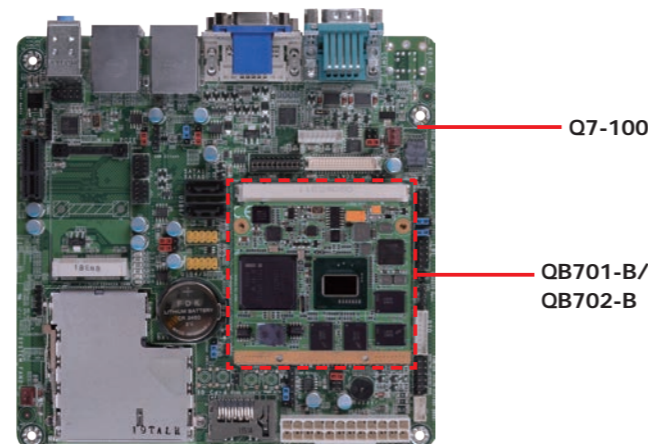


Features

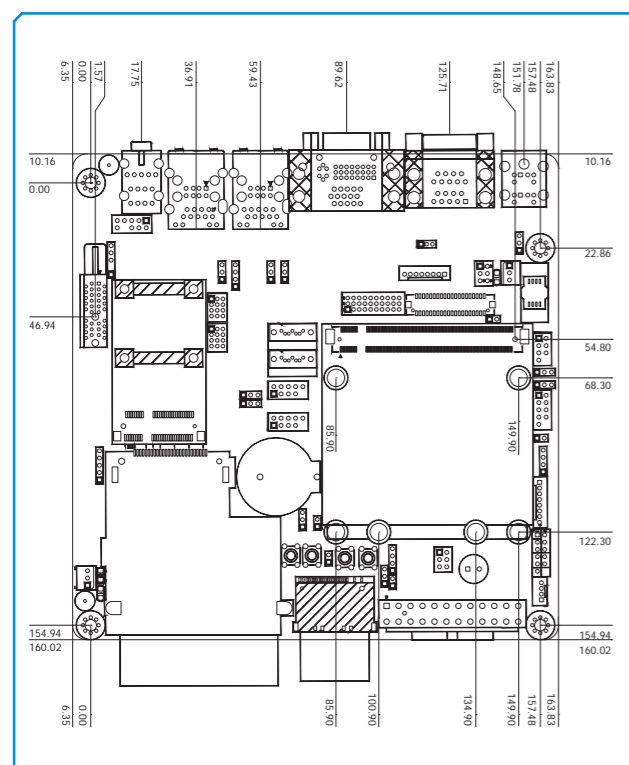
EXPANSION	1 PCIe x1, 1 Mini PCIe 1 ExpressCard
DISPLAY OUTPUTS	1 DVI-I, 1 VGA, 1 LVDS
LAN	2 LAN
COM	2 COM
USB	8 USB 2.0 - LAN1: Gigabit Ethernet supported by the Qseven module - LAN2: Realtek RTL8111DL PCIe Gigabit Ethernet controller
STORAGE	2 SATA 3.0 1 SD/MMC
DIO	8-bit DIO
DIMENSIONS	170mm x 170mm (6.7" x 6.7")



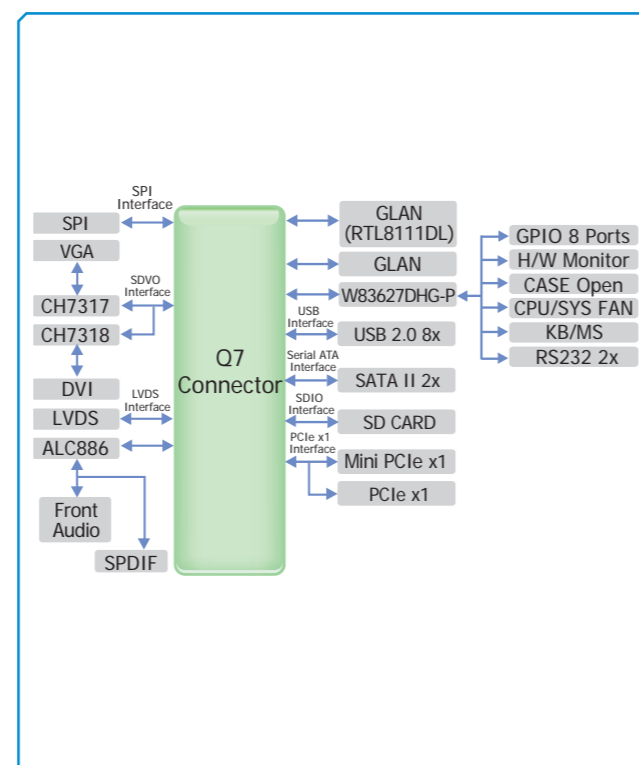
For QB702-B and QB701-B



Mechanical Drawing



Block Diagram



Specifications

GRAPHICS FEATURES

- Chrontek CH7317B (SDVO to RGB DAC)

LAN FEATURES

- 2 LAN ports
 - LAN1: Gigabit Ethernet supported by the Qseven module
 - LAN2: Realtek RTL8111DL PCIe Gigabit Ethernet controller

AUDIO FEATURES

- Realtek ALC886 5.1-channel High Definition Audio
- Audio outputs: Mic-in/Center+Subwoofer, line-in/surround and line out
- S/PDIF audio interface

STORAGE

- 2 SATA 3.0 ports with data transfer rate up to 6Gb/s
- 1 SD/MMC slot

I/O CHIP FEATURES

- Winbond 83627DHG-P controller
- LPC interface
- Supports system fan
- Default I/O port address "2Eh"

EXPANSION SLOTS

- 1 PCIe x1 slot
- 1 Mini PCIe slot
 - Supports half/full size Mini PCIe card
- 1 ExpressCard slot

REAR PANEL I/O PORTS

- 2 DB-9 RS232 serial ports
- 1 DB-15 VGA port
- 1 DVI-I port (DVI-D signal)
- 2 RJ45 LAN ports
- 4 USB 2.0/1.1 ports
- Mic-in/Center+Subwoofer, line-in/surround and line out

Packing List

• 1 Q7-100 board
• 1 Serial ATA data cable
• 1 I/O shield
• 1 QR (Quick Reference)
• 1 DVD

Q7-100

I/O CONNECTORS

- 2 connectors for 4 external USB 2.0/1.1 ports
- 1 LPC connector
- 1 I²C connector
- 1 CAN-bus connector
- 1 LVDS LCD panel connector
 - 18/24-bit single channel
- 1 LCD/inverter power connector
- 1 8-bit Digital I/O connector
- 1 front audio connector for line-out and mic-in jacks
- 1 S/PDIF connector
- 2 Serial ATA connectors
- 1 24-pin ATX power connector
- 1 chassis intrusion connector
- 1 front panel connector
- 2 fan connectors

DAMAGE FREE INTELLIGENCE

- Monitors system temperature and overheat alarm
- Monitors system fan speed and failure alarm

TEMPERATURE

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

HUMIDITY

- Operating: 10% to 90%

BOARD TO BOARD CONNECTORS

- One MXM connector

Dimensions

- Mini-ITX form factor
- 170mm (6.7") x 170mm (6.7")

CERTIFICATION

- CE
- FCC Class B
- RoHS

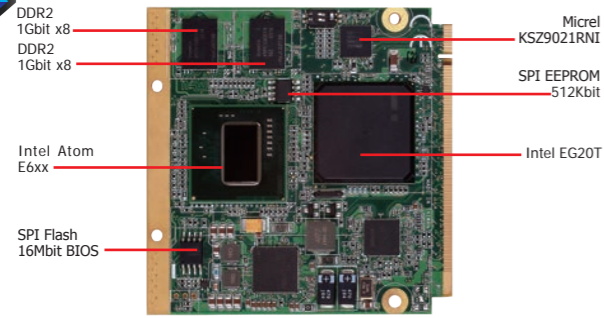
Optional Items

• SATA data cable
• Serial ATA power cable
• I/O shield
• USB port cable

QB700-B

QB700-B

Atom

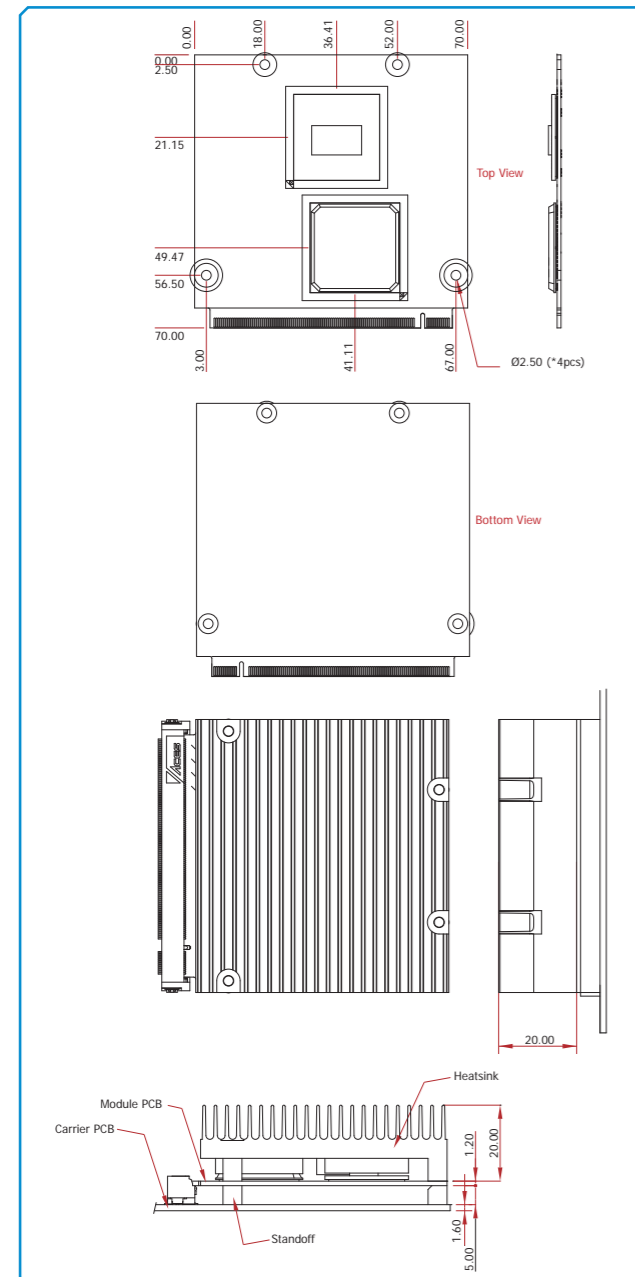


Features

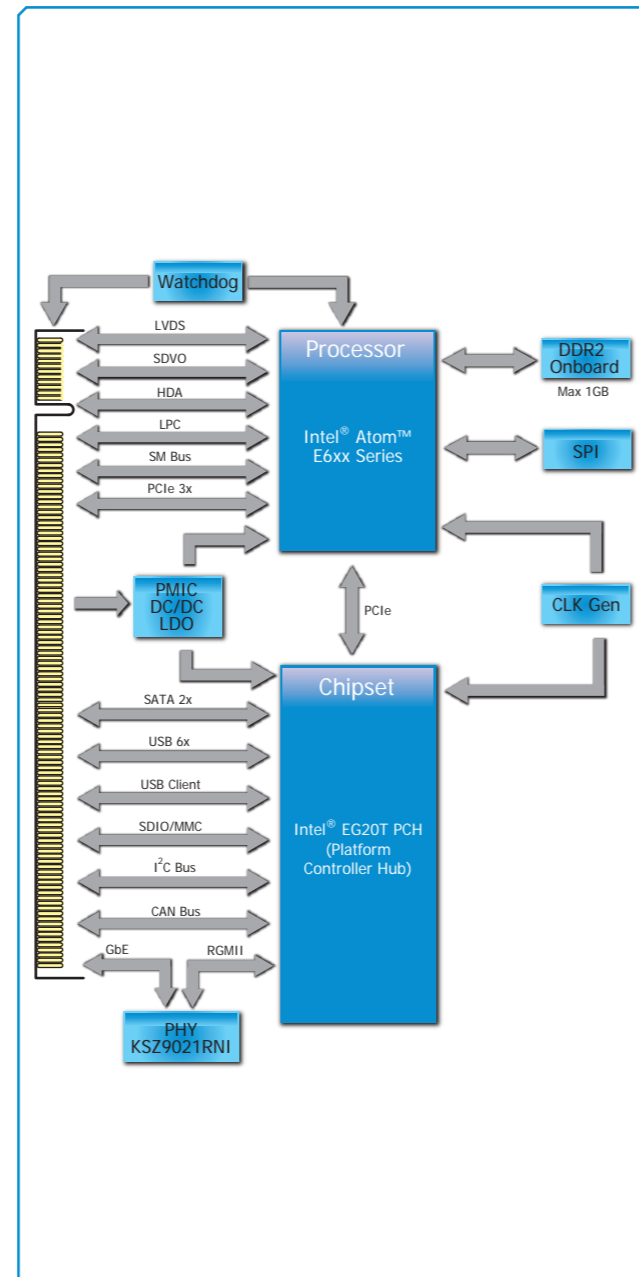
MEMORY	512MB DDR2 SDRAM onboard
EXPANSION	3 PCIe x1 1 LPC, 1 SMBus, 1 I ² C, 1 CAN-bus 1 LVDS, 1 SDVO 6 USB 2.0, 1 USB Client 2 SATA 2.0 1 SDIO/MMC
LAN	1 LAN
DIMENSIONS	Qseven R1.1 70mm x 70mm (2.76" x 2.76")



Mechanical Drawing



Block Diagram



Specifications

PROCESSOR

- Intel® Atom™ E680 : QB700-B680
- Intel® Atom™ E660 : QB700-B660
- Intel® Atom™ E640 : QB700-B640
- Intel® Atom™ E620 : QB700-B620

CHIPSET

- Intel® EG20T PCH (Platform Controller Hub)

SYSTEM MEMORY

- Supports memory down (single 32-bit channel)
- Supports DDR2 800MHz
- Supports up to 1GB system memory (default: 512MB)

ONBOARD GRAPHICS FEATURES

- Intel® GMA 600
- Supports up to 400MHz graphics frequency
- Ultra low power integrated 3D graphics
- High definition hardware video decoder and encoder engine
- Supports LVDS and SDVO interfaces
 - LVDS: Supports pixel clock depths of 18/24-bit, single channel, max. pixel clock of 80MHz, equates to 1280x768 @ 60Hz
 - SDVO: Up to 160MHz pixel clock, equates to 1280x1024 @ 85Hz

ONBOARD AUDIO FEATURES

- Supports High Definition Audio interface

ONBOARD LAN FEATURES

- Integrated Intel® PCH GbE MAC
- One Micrel KSZ9021RNI Ethernet PHY
- Supports 10Mbps, 100Mbps and 1Gbps data transmission
- IEEE 802.3 (10/100Mbps) and IEEE 802.3ab (1Gbps) compliant

SERIAL ATA (SATA) INTERFACE

- Supports two Serial ATA interfaces
- SATA speed up to 3Gb/s (SATA 2.0)

SDIO/MMC INTERFACE

- Supports 1 SD/SDIO/MMC
- Supports SDA Standard Ver 1.0, SD memory card specification Ver 2.0, SDIO card specification Ver 1.0, MMC System specification Ver 4.1
- Conforms to Secure Digital Host Controller (SDHC) speed class 6

EXPANSION INTERFACES

- Supports 6 USB ports (USB 1.1/2.0 host controllers)
- Supports 1 USB Client interface
- Supports LPC interface
- Supports SMB and I²C interfaces
- Supports 3 PCIe x1 interfaces
- Supports CAN-bus (Controller-Area Network) interface

BIOS

- 16Mbit SPI Flash BIOS (UEFI BIOS)

ENERGY EFFICIENT DESIGN

- Supports ACPI 2.0/1.0 specification
- Enhanced Intel® SpeedStep Technology

POWER

- Input: VCC_RTC, 5V standby, 5V

POWER CONSUMPTION

- 15.94 W with E680 at 1.6GHz and 512MB DDR2 onboard

OS SUPPORT

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

TEMPERATURE

- 0°C to 60°C

HUMIDITY

- 10% to 90%

PCB

- Dimensions
 - Qseven form factor
 - 70mm (2.76") x 70mm (2.76")
- Compliance
 - Qseven specification revision 1.1

CERTIFICATION

- CE
- FCC Class B
- RoHS

Ordering Information

Model Name	Part Number	Description
QB700-B680	777-QB7001-310G	Intel® Atom™ E680, onboard DDR2 1GB
	777-QB7001-300G	Intel® Atom™ E680, onboard DDR2 512MB
QB700-B660	777-QB7001-210G	Intel® Atom™ E660, onboard DDR2 1GB
	777-QB7001-200G	Intel® Atom™ E660, onboard DDR2 512MB
QB700-B640	777-QB7001-110G	Intel® Atom™ E640, onboard DDR2 1GB
	777-QB7001-100G	Intel® Atom™ E640, onboard DDR2 512MB
QB700-B620	777-QB7001-010G	Intel® Atom™ E620, onboard DDR2 1GB
	777-QB7001-000G	Intel® Atom™ E620, onboard DDR2 512MB

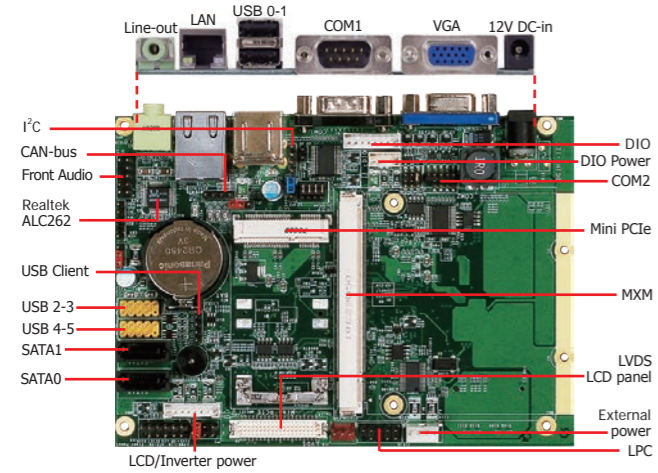
Packing List

- 1 QB700-B board
- 1 QR (Quick Reference)
- 1 DVD

Optional Items

- Q7-951 carrier board kit
- Heat sink: A71-012000-000G
- 1 Bracket

Q7-951

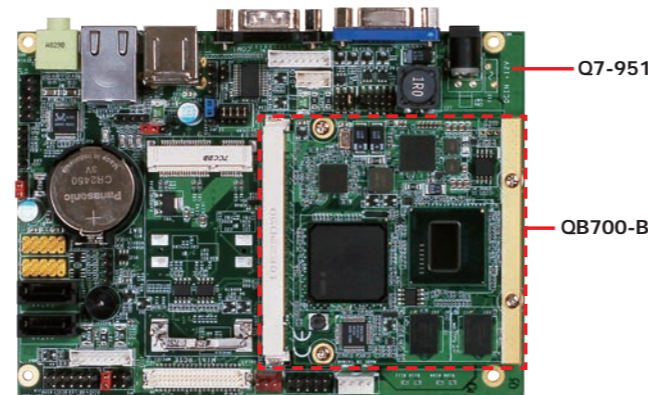


Features

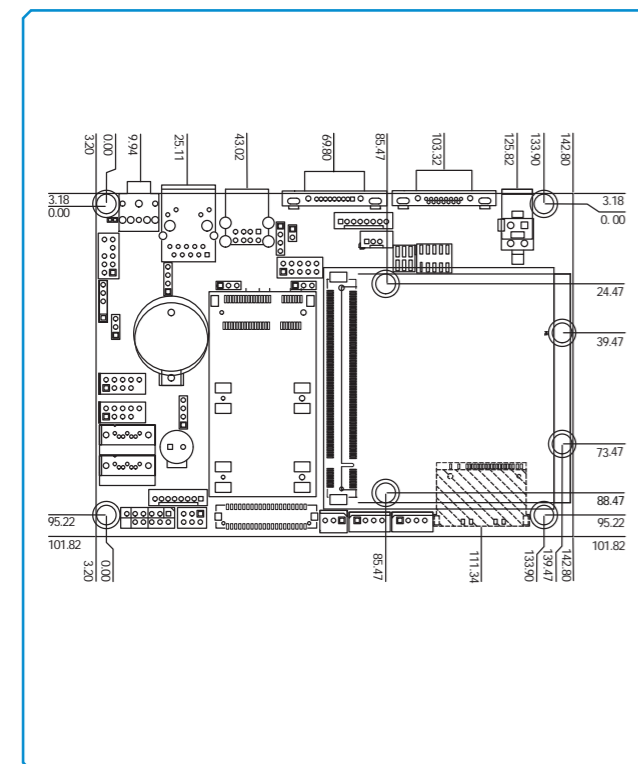
EXPANSION	1 Mini PCIe
DISPLAY OUTPUTS	1 VGA, 1 LVDS
LAN	1 LAN
COM	2 COM
USB	6 USB 2.0, 1 USB Client
STORAGE	2 SATA 2.0 1 SDIO/MMC
DIO	8-bit DIO
DIMENSIONS	102mm x 147mm (4.02" x 5.79")



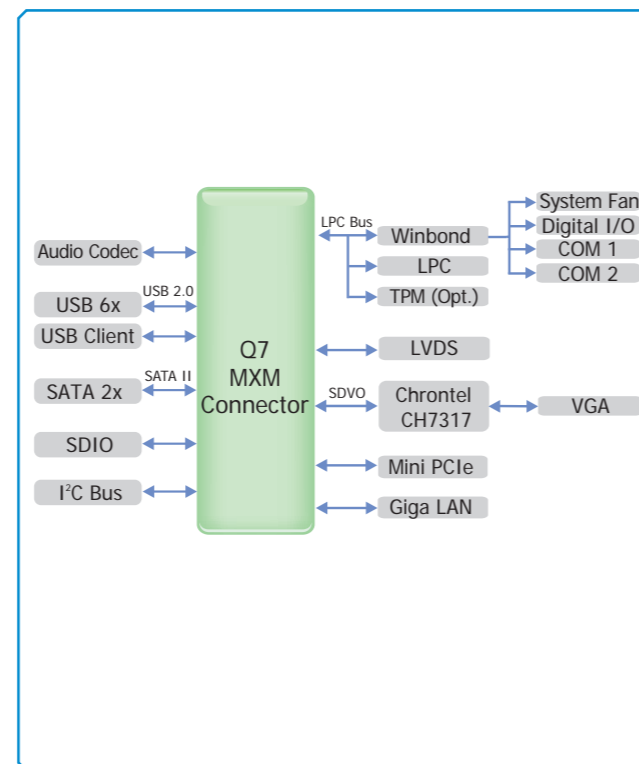
For QB700-B



Mechanical Drawing



Block Diagram



Specifications

GRAPHICS FEATURES

- Chrontel CH7317B (SDVO to RGB DAC)

AUDIO FEATURES

- Realtek ALC262 audio codec
- 2-channel audio output

SERIAL ATA (SATA) FEATURES

- Two Serial ATA ports
- SATA speed up to 3Gb/s (SATA 2.0)

TPM FEATURES (optional)

- Infineon SLB9635TT12

I/O CHIP FEATURES

- Winbond 83627DHG-P controller
- LPC interface
- Supports system fan
- Default I/O port address "2Eh"

DAMAGE FREE INTELLIGENCE

- Monitors system temperature and overheat alarm
- Monitors system fan speed and failure alarm

EXPANSION SLOTS

- 1 SDIO/MMC socket
- 1 Mini PCIe socket
- Supports half/full size Mini PCIe card

REAR PANEL I/O PORTS

- 1 12V DC-in jack
- 1 DB-15 VGA port
- 1 DB-9 RS232 serial port
- 2 USB 2.0/1.1 ports
- 1 RJ45 LAN port
- 1 line-out jack

Packing List

• 1 Q7-951 board
• 1 Serial ATA data cable
• 1 Power cable
• 1 COM cable
• 1 QR (Quick Reference)
• 1 DVD

Q7-951

I/O CONNECTORS

- 2 connectors for 4 external USB 2.0/1.1 ports
- 1 connector for an external RS232/422/485 serial port
- 1 LPC connector
- 1 SMBus connector
- 1 I²C connector
- 1 CAN-bus connector
- 1 USB client connector
- 1 LVDS LCD panel connector
- 18/24-bit single channel
- 1 LCD/inverter power connector
- 1 8-bit Digital I/O connector
- 1 Digital I/O power connector
- 1 audio connector for line-in, line-out and mic-in jacks
- 1 S/PDIF connector
- 2 Serial ATA connectors
- 1 4-pin 12V power connector
- 1 chassis intrusion connector
- 1 front panel connector
- 1 fan connector

BOARD TO BOARD CONNECTORS

- One MXM connector

TEMPERATURE

- 0°C to 60°C

HUMIDITY

- Operating: 10% to 90%

DIMENSIONS

- 3.5" form factor
- 102mm (4.02") x 147mm (5.79")

CERTIFICATION

- CE
- FCC Class B
- RoHS

Optional Items

• SATA data cable
• COM port cable
• I/O shield
• Power adapter (100W, 12V) : 671-110001-100G

Design

We Focus on Research and Development

Since 1981

- 1. Modular Design**
Consistency in design and quality
Shortens development process
- 2. Dedicated Design Review Team**
The review team checks and verifies the circuit, layout and components

Quality

Reliable quality

1. Less than 0.3% RMA Return Rate

2. **Certifications**
Conforms to International Standards

CE, FC Class B, cULUS, RoHS, ISO 9001, ISO14001, QC080000, ISO13485

Sony Green Partner

Service

Quick and Efficient Services

- 1. Express Customization Service: 30 days**
First engineering sample available within 30 working days
- 2. Custom BIOS, API, OS Image**
- 3. OEM/ODM/EMS**
We provide well-rounded support and services that fit your need

Manufacturing

100% in-house

- 1. From project kickoff to life cycle management: 100% in-house**
- 2. Two manufacturing sites produce the same quality products**
- 3. 32 years of experience in volume production (up to 250K/m)**

► B

BT700	Intel® Atom™ E3800 Series Qseven	94
BT968	Intel® Atom™ E3800 Series COM Express® Compact	30
BT9A3	Intel® Atom™ E3800 Series COM Express® Mini	16

► C

CD905-B	Intel® Atom™ D2550/N2800/N2600 and NM10 COM Express® Compact	32
CD9A3	Intel® Atom™ D2550/N2800/N2600 and NM10 COM Express® Mini	18
CM901-B	AMD® Embedded R-Series and A70M Express® Basic	74
CM960-B	AMD® Embedded R-Series and A70M Express® Basic	72
COM100-B	COM Express® Carrier Board	80
COM101-BAT	COM Express® Carrier Board	78
COM330-B	COM Express® Carrier Board	84
COM331-B	COM Express® Carrier Board	82
COM630-B	COM Express® Carrier Board	86
CR900-B	3rd/2nd Gen Intel® Core™ and QM77 COM Express® Basic	64
CR901-B	3rd/2nd Gen Intel® Core™ and QM77 COM Express® Basic	62
CR902-B	3rd/2nd Gen Intel® Core™ and QM77 COM Express® Basic	58
CR902-BL	3rd/2nd Gen Intel® Core™ and HM76 COM Express® Basic	60
CR908-B	3rd/2nd Gen Intel® Core™ and QM77 COM Express® Compact	26
CR960-HM76	3rd/2nd Gen Intel® Core™ and HM76 COM Express® Basic	56
CR960-QM77	3rd/2nd Gen Intel® Core™ and QM77 COM Express® Basic	54

► F

FS700 Series	Freescale i.MX 6 series Qseven	90
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► H

HM920-HM86	4th Gen Intel® Core™ and HM86 COM Express® Basic	52
HM920-QM87	4th Gen Intel® Core™ and QM87 COM Express® Basic	46
HM960-HM86	4th Gen Intel® Core™ and HM86 COM Express® Basic	50
HM960-QM87	4th Gen Intel® Core™ and QM87 COM Express® Basic	44
HM961-HM86	4th Gen Intel® Core™ and HM86 COM Express® Basic	48
HM961-QM87	4th Gen Intel® Core™ and QM87 COM Express® Basic	42
HR900-B	3rd/2nd Gen Intel® Core™ and QM67 COM Express® Basic	70
HR902-B	3rd/2nd Gen Intel® Core™ and QM67 COM Express® Basic	66
HR902-BL	3rd/2nd Gen Intel® Core™ and HM65 COM Express® Basic	68
HR908-B	3rd/2nd Gen Intel® Core™ and QM67 COM Express® Compact	28
HU968	4th Gen Intel® Core™ COM Express® Compact	24

► K

KB968	AMD® Embedded G-Series SoC COM Express® Compact	34
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► O

OT905-B	AMD® Embedded G-Series and A55E Express® Compact	36
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► Q

Q7-100	Qseven Carrier Board	102
Q7-951	Qseven Carrier Board	106
Q7A-551	Qseven Carrier Board	92
Q7X-151	Qseven Carrier Board	96
QB700-B	Intel® Atom™ E600 Series Qseven	104
QB701-B	Intel® Atom™ E600 Series Qseven	100
QB702-B	Intel® Atom™ E600 Series Qseven	98

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