ECS-5600 USER Manual

2nd Gen Intel® Core™ Mobile i7/i5/i3, Sandy Bridge
Extreme Temp. Fanless Embedded Controller

Vecow

Record of Revision

Version	Date	Page	Description	Remark
V1.00	Jun 12, 2012	All	Preliminary Release	
V1.01	Sep 05, 2012	V, 7, 15, 68	ECS-5600-8R Added, 4.7 deleted	
V1.02	Oct 11, 2012	22, 54, 55	RS-422 mode and SIO Configuration	

Declaimer

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Declaration of Conformity

FCC This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

CE The product(s) described in this manual complies with all applicable European Union (CE) directives if it has a CE marking. For computer systems to remain CE compliant, only CE-compliant parts may be used. Maintaining CE compliance also requires proper cable and cabling techniques.

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Packing List

Item	Description	Qty
1	ECS-5600 Series fanless controller (According to the configuration you order, the ECS-5600 series may contain HDD and DDR3 SO-DIMM. Please verify these items if necessary.)	1
2	Accessory box, which contains	
	• Vecow Drivers & Utilities DVD	1
	• Wall-mounting bracket	2
	• M4 screws for wall-mounting bracket	4
	• Foot pad	4
	• 4-pin pluggable terminal block	1

Order Information

Part Number	Description
ECS-5600-3G	Extreme Fanless Embedded Controller with 3x GbE, 2x DDR3 SODIMM, 2x eSATA, 4x COM, 2x MiniPCI-e, 2x HDD
ECS-5600-5G	Extreme Fanless Embedded Controller with 5x GbE, 2x DDR3 SODIMM, 2x eSATA, 4x COM, 2x MiniPCI-e, 2x HDD
ECS-5600-5GD	Extreme Fanless Embedded Controller with 5x GbE, 2x DDR3 SODIMM, 2x eSATA, 4x COM, 2x MiniPCI-e, 2x HDD, Isolated DIO, AMT 7.0
ECS-5600-5GDE	Extreme Fanless Embedded Controller with 5x GbE, 2x DDR3 SODIMM, 2x eSATA, 4x COM, 2x MiniPCI-e, 2x HDD, Isolated DIO, SUMIT (A, B), AMT 7.0
ECS-5600-3V	Fanless Embedded Controller with 4CH Video capture, 3x GbE, 2x DDR3 SODIMM, 2x eSATA, 4x COM, 2x MiniPCI-e, 2x HDD
ECS-5600-8R	Extreme Fanless Embedded Controller with 8x GbE, 2x DDR3 SODIMM, 2x eSATA, 4x COM, 2x MiniPCI-e, 2x HDD, SUMIT (A, B), iAMT 7.0
ECS-5600-3R	Extreme Fanless Embedded Controller with 3x GbE, 2x DDR3 SODIMM, 2x eSATA, 4x COM, 2x MiniPCI-e, 2x Removable HDD with Key Lock
ECS-5600-5R	Extreme Fanless Embedded Controller with 5x GbE, 2x DDR3 SODIMM, 2x eSATA, 4x COM, 2x MiniPCI-e, 2x Removable HDD with Key Lock, AMT 7.0

Optional Accessories

Part Number	Description
LSM-100-3	SUMIT, 3 Gigabit Ethernet Card
VSM-200-4	4-CH, D1, Real-time, SUMIT(PCIe), 120 fps, Video Capture Card, include cables and SDK
VSM-200-8	8-CH, D1, Real-time, SUMIT(PCIe), 240 fps, Video Capture Card, include cables and SDK
VMX-200-4	4-CH, D1, Real-time, Mini-PCI Express, 120 fps, Video Capture Card, include cables and SDK
VMX-200-8	8-CH, D1, Real-time, Mini-PCI Express, 240 fps, Video Capture Card, include cables and SDK
NVTE3G	3G module, MiniPCI-e, W/HSPA+/UMTS 850/900/AWS/1900/2100 MHz, EGPRS 850/900/1800/1900 MHz
DN WiFI	802.11n a/b/g WiFi, 2Tx/2R, Mini-PCIe
PWA-90W	90W, 24V, 90V_{AC} to 264V_{AC} power adapter

Table of Contents

1

General Introduction

1.1 Overview

ECS-5600 series, High Performance Fanless Embedded Controller, which enables to integrated 2nd Gen Intel® Core™ i7, i5, i3, and Celeron® Sandy Bridge mobile series processors equips maximum 5 GbE LANs, DVI-D/HDMI and VGA dual display, CFast, SUMIT™ A, B, and two 2.5" SATA 6Gp/s HDD/SSDs, and 2 eSATA ports, plus with superior fanless thermal and housing structure enables systems operating under -25ºC to +70ºC.

Designed for harsh operation environment, wide vibration and shocks resistances, and high flexibility of card expansion. In order to satisfy diverse requirements of in-vehicle and industrial markets, ECS-5600 series are constructed with wide DC input range from 6 to 36 voltages to ensure system stability and safety.

Specifically designed for flexible data storage and security, ECS-5600-3R/5R series equipped with 2 front-panel access SATA III (6Gb/s) 2.5" removable HDD/SSD trays with key lock.

For industrial automation application, Vecow also provide ECS-5600-5GD/5GDE series with Isolated DIO and SUMIT A, B enable better power supply protection and various I/O adoptions to select. Integrated all outstanding features, the new ECS-5600 series are ideal solutions for various applications, for example, in-vehicle surveillance, factory/machine automation, medicine and healthcare, digital signage and environment monitoring.

1.2 Product Specification

1.2.1 Specification of Vecow ECS-5600-3G

System	
Processor	2nd Generation Intel® Core™ i7/i5/i3 and Celeron™ Mobile, Sandy Bridge Processors
Chipset	Intel® QM67
BIOS	Phoenix UEFI BIOS
SIO	Nuvoton NCT6106D
Memory	DDR3 1333 / 1066MHz Max. 16GB 2 204-pin SO-DIMM Sockets
I/O Ports	
Serial Port	3 COM RS-232, 1 COM RS-232/485/422
USB Interface	6 USB Ports, Compliant with USB 2.0
LED	Power/Suspend, HDD, and WDT LEDs
GPIO	8 DI, 8 DO
Expansion	
Mini PCIe	2 Mini PCIe, 1 SIM Socket on 1 Mini PCIe Interface
Graphics	
Chipset	Intel® GMA HD 3000
Display Memory	Shared Memory, Up to 1.7GB
Interface	VGA + DVI-D / HDMI Onboard VGA, Supports Max. Resolution 2048 x 1536 (@60Hz) Onboard DVI-D, Supports Max. Resolution 1920 x 1200
Storage	
SATA	2 SATA III (6Gbps) 2.5" HDD / SSD Drive Bays
Storage Expansion	CFast Slot, External Hot-Swap, Push In/Out Ejector
eSATA	2 eSATA Ports
Audio	
Audio Codec	Realtek ALC892, 5.1 channel HD Audio
Audio Interface	Line-in, Line-out, Mic-in, Front Audio Header
Ethernet	
LAN1	Intel® 82574L Gigabit LAN
LAN2	Intel® 82574L Gigabit LAN
LAN3	Intel® 82574L Gigabit LAN
Power	
Power Input	DC Jack, 2-pin Terminal Block
Power Input Voltage	DC-IN 6 ~ 36 V
Power Adapter	AC to DC +24V / 3.75A. 90W Max. (Optional)
Other	
Watchdog Timer	Reset: 1 to 255 sec./min. Per Step
HW Monitor	Temperature/Voltages Auto Throttling Control When CPU Overheats
Mechanical	
Chasis Construction	Aluminum Housing
Size (W x D x H)	260mm x 175mm x 78mm (10.2" x 6.9" x 3.1")
Weight	2.8 Kg (6 lb)
Mounting	Wall-mount by Mounting Bracket
Environmental	
Operating Temperature	-25°C to 70°C (-4°F to 157°F)
Storage Temperature	-40°C to 85°C (-40°F to 185°F)
Humidity	10% to 95% Humidity, Non-condensing
Vibration	Operating, 5 Grms, 5-500 Hz, 3 Axes (w/ SSD, According to IEC60068-2-64)
Shock	Operating, 50 Grms, Half-sine 11 ms Duration (w/ SSD, According to IEC60068-2-27)
EMC	CE, FCC, RoHS, EN50155 & EN50121-3-2

1.2.2 Specification of Vecow ECS-5600-5G

System	
Processor	2nd Generation Intel® Core™ i7/i5/i3 and Celeron™ Mobile, Sandy Bridge Processors
Chipset	Intel® QM67
BIOS	Phoenix UEFI BIOS
SIO	Nuvoton NCT6106D
Memory	DDR3 1333 / 1066MHz Max. 16GB 2 204-pin SO-DIMM Sockets
I/O Ports	
Serial Port	3 COM RS-232, 1 COM RS-232/485/422
USB Interface	6 USB Ports, Compliant with USB 2.0
LED	Power/Suspend, HDD, and WDT LEDs
GPIO	8 DI, 8 DO
Expansion	
Mini PCIe	2 Mini PCIe, 1 SIM Socket on 1 Mini PCIe Interface
Graphics	
Chipset	Intel® GMA HD 3000
Display Memory	Shared Memory, Up to 1.7GB
Interface	VGA + DVI-D / HDMI Onboard VGA, Supports Max. Resolution 2048 x 1536 (@60Hz) Onboard DVI-D, Supports Max. Resolution 1920 x 1200
Storage	
SATA	2 SATA III (6Gbps) 2.5" HDD / SSD Drive Bays
Storage Expansion	CFast Slot, External Hot-Swap, Push In/Out Ejector
eSATA	2 eSATA Ports
Audio	
Audio Codec	Realtek ALC892, 5.1 channel HD Audio
Audio Interface	Line-in, Line-out, Mic-in, Front Audio Header
Ethernet	
LAN1	Intel® 82574L Gigabit LAN
LAN2	Intel® 82574L Gigabit LAN
LAN3	Intel® 82574L Gigabit LAN
LAN4	Intel® 82574L Gigabit LAN
LAN5	Intel® 82579LM Gigabit LAN
Power	
Power Input	DC Jack, 2-pin Terminal Block
Power Input Voltage	DC-IN 6 ~ 36 V
Power Adapter	AC to DC +24V / 3.75A. 90W Max. (Optional)
Other	
Watchdog Timer	Reset: 1 to 255 sec./min. Per Step
HW Monitor	Temperature/Voltages Auto Throttling Control When CPU Overheats
Mechanical	
Chasis Construction	Aluminum Housing
Size (W x D x H)	260mm x 175mm x 78mm (10.2" x 6.9" x 3.1")
Weight	2.8 Kg (6 lb)
Mounting	Wall-mount by Mounting Bracket
Environmental	
Operating Temperature	-25°C to 70°C (-4°F to 157°F)
Storage Temperature	-40°C to 85°C (-40°F to 185°F)
Humidity	10% to 95% Humidity, Non-condensing
Vibration	Operating, 5 Grms, 5-500 Hz, 3 Axes (w/ SSD, According to IEC60068-2-64)
Shock	Operating, 50 Grms, Half-sine 11 ms Duration (w/ SSD, According to IEC60068-2-27)
EMC	CE, FCC, RoHS, EN50155 & EN50121-3-2

1.2.3 Specification of Vecow ECS-5600-5GD

System	
Processor	2nd Generation Intel® Core™ i7/i5/i3 and Celeron™ Mobile, Sandy Bridge Processors
Chipset	Intel® QM67
BIOS	Phoenix UEFI BIOS
SIO	Nuvoton NCT6106D
Memory	DDR3 1333 / 1066MHz Max. 16GB 2 204-pin SO-DIMM Sockets
I/O Ports	
Serial Port	3 COM RS-232, 1 COM RS-232/485/422
USB Interface	6 USB Ports, Compliant with USB 2.0
Isolated DIO	8 DI, 8 DO
LED	Power/Suspend, HDD, and WDT LEDs
GPIO	8 DI, 8 DO
Expansion	
Mini PCIe	2 Mini PCIe, 1 SIM Socket on 1 Mini PCIe Interface
Graphics	
Chipset	Intel® GMA HD 3000
Display Memory	Shared Memory, Up to 1.7GB
Interface	VGA + DVI-D / HDMI Onboard VGA, Supports Max. Resolution 2048 x 1536 (@60Hz) Onboard DVI-D, Supports Max. Resolution 1920 x 1200
Storage	
SATA	2 SATA III (6Gbps) 2.5" HDD / SSD Drive Bays
Storage Expansion	CFast Slot, External Hot-Swap, Push In/Out Ejector
eSATA	2 eSATA Ports
Audio	
Audio Codec	Realtek ALC892, 5.1 channel HD Audio
Audio Interface	Line-in, Line-out, Mic-in, Front Audio Header
Ethernet	
LAN1	Intel® 82574L Gigabit LAN
LAN2	Intel® 82574L Gigabit LAN
LAN3	Intel® 82574L Gigabit LAN
LAN4	Intel® 82574L Gigabit LAN
LAN5	Intel® 82579LM Gigabit LAN
Power	
Power Input	DC Jack, 2-pin Terminal Block
Power Input Voltage	DC-IN 6 ~ 36 V
Power Adapter	AC to DC +24V / 3.75A. 90W Max. (Optional)
Other	
Watchdog Timer	Reset: 1 to 255 sec./min. Per Step
HW Monitor	Temperature/Voltages Auto Throttling Control When CPU Overheats
Mechanical	
Chasis Construction	Aluminum Housing
Size (W x D x H)	260mm x 175mm x 78mm (10.2" x 6.9" x 3.1")
Weight	2.8 Kg (6 lb)
Mounting	Wall-mount by Mounting Bracket
Environmental	
Operating Temperature	-25°C to 70°C (-4°F to 157°F)
Storage Temperature	-40°C to 85°C (-40°F to 185°F)
Humidity	10% to 95% Humidity, Non-condensing
Vibration	Operating, 5 Grms, 5-500 Hz, 3 Axes (w/ SSD, According to IEC60068-2-64)
Shock	Operating, 50 Grms, Half-sine 11 ms Duration (w/ SSD, According to IEC60068-2-27)
EMC	CE, FCC, RoHS, EN50155 & EN50121-3-2

1.2.4 Specification of Vecow ECS-5600-5GDE

System	
Processor	2nd Generation Intel® Core™ i7/i5/i3 and Celeron™ Mobile, Sandy Bridge Processors
Chipset	Intel® QM67
BIOS	Phoenix UEFI BIOS
SIO	Nuvoton NCT6106D
Memory	DDR3 1333 / 1066MHz Max. 16GB 2 204-pin SO-DIMM Sockets
I/O Ports	
Serial Port	3 COM RS-232, 1 COM RS-232/485/422
USB Interface	6 USB Ports, Compliant with USB 2.0
Isolated DIO	8 DI, 8 DO
LED	Power/Suspend, HDD, and WDT LEDs
GPIO	8 DI, 8 DO
Expansion	
Mini PCIe	2 Mini PCIe, 1 SIM Socket on 1 Mini PCIe Interface
SUMIT A, B	2 SUMIT Slots
Graphics	
Chipset	Intel® GMA HD 3000
Display Memory	Shared Memory, Up to 1.7GB
Interface	VGA + DVI-D / HDMI Onboard VGA, Supports Max. Resolution 2048 x 1536 (@60Hz) Onboard DVI-D, Supports Max. Resolution 1920 x 1200
Storage	
SATA	2 SATA III (6Gbps) 2.5" HDD / SSD Drive Bays
Storage Expansion	CFast Slot, External Hot-Swap, Push In/Out Ejector
eSATA	2 eSATA Ports
Audio	
Audio Codec	Realtek ALC892, 5.1 channel HD Audio
Audio Interface	Line-in, Line-out, Mic-in, Front Audio Header
Ethernet	
LAN1	Intel® 82574L Gigabit LAN
LAN2	Intel® 82574L Gigabit LAN
LAN3	Intel® 82574L Gigabit LAN
LAN4	Intel® 82574L Gigabit LAN
LAN5	Intel® 82579LM Gigabit LAN
Power	
Power Input	DC Jack, 2-pin Terminal Block
Power Input Voltage	DC-IN 6 ~ 36 V
Power Adapter	AC to DC +24V / 3.75A. 90W Max. (Optional)
Other	
Watchdog Timer	Reset: 1 to 255 sec./min. Per Step
HW Monitor	Temperature/Voltages Auto Throttling Control When CPU Overheats
Mechanical	
Chasis Construction	Aluminum Housing
Size (W x D x H)	260mm x 175mm x 78mm (10.2" x 6.9" x 3.1")
Weight	2.8 Kg (6 lb)
Mounting	Wall-mount by Mounting Bracket
Environmental	
Operating Temperature	-25°C to 70°C (-4°F to 157°F)
Storage Temperature	-40°C to 85°C (-40°F to 185°F)
Humidity	10% to 95% Humidity, Non-condensing
Vibration	Operating, 5 Grms, 5-500 Hz, 3 Axes (w/ SSD, According to IEC60068-2-64)
Shock	Operating, 50 Grms, Half-sine 11 ms Duration (w/ SSD, According to IEC60068-2-27)
EMC	CE, FCC, RoHS, EN50155 & EN50121-3-2

1.2.5 Specification of Vecow ECS-5600-3V

System	
Processor	2nd Generation Intel® Core™ i7/i5/i3 and Celeron™ Mobile, Sandy Bridge Processors
Chipset	Intel® QM67
BIOS	Phoenix UEFI BIOS
SIO	Nuvoton NCT6106D
Memory	DDR3 1333 / 1066MHz Max. 16GB 2 204-pin SO-DIMM Sockets
I/O Ports	
Serial Port	3 COM RS-232, 1 COM RS-232/485/422
USB Interface	6 USB Ports, Compliant with USB 2.0
LED	Power/Suspend, HDD, and WDT LEDs
GPIO	8 DI, 8 DO
Expansion	
Mini PCIe	2 Mini PCIe, 1 SIM Socket on 1 Mini PCIe Interface
Graphics	
Chipset	Intel® GMA HD 3000
Display Memory	Shared Memory, Up to 1.7GB
Interface	VGA + DVI-D / HDMI Onboard VGA, Supports Max. Resolution 2048 x 1536 (@60Hz) Onboard DVI-D, Supports Max. Resolution 1920 x 1200
Storage	
SATA	2 SATA III (6Gbps) 2.5" HDD / SSD Drive Bays with Key Lock
Storage Expansion	CFast Slot, External Hot-Swap, Push In/Out Ejector
eSATA	2 eSATA Ports
Audio	
Audio Codec	Realtek ALC892, 5.1 channel HD Audio
Audio Interface	Line-in, Line-out, Mic-in, Front Audio Header
Maximum Channel No.	4 Mono or 2 Stereo
Input Connector	4 Input RCA on Board
Video	
Maximum Channel No.	4
Input Connector	4 Input BNC on Board
Resolution	D1 (NTSC: 720x480/PAL:720x576), CIF (NTSC:360x240/PAL:360x288) 4CIF (NTSC:704x480/PAL:704x576), DCIF (NTSC:528x320/PAL:528x384) QCIF (NTSC:180x120/PAL:180x144), 4CH with full D1 resolution
Recording Rate	120 fps on NTSC system, 100 fps on PAL system
Ethernet	
LAN1	Intel® 82574L Gigabit LAN
LAN2	Intel® 82574L Gigabit LAN
LAN3	Intel® 82574L Gigabit LAN
Power	
Power Input	DC Jack, 2-pin Terminal Block
Power Input Voltage	DC-IN 6 ~ 36 V
Power Adapter	AC to DC +24V / 3.75A. 90W Max. (Optional)
Other	
Watchdog Timer	Reset: 1 to 255 sec./min. Per Step
HW Monitor	Temperature/Voltages Auto Throttling Control When CPU Overheats
Mechanical	
Chasis Construction	Aluminum Housing
Size (W x D x H)	260mm x 175mm x 78mm (10.2" x 6.9" x 3.1")
Weight	2.8 Kg (6 lb)
Mounting	Wall-mount by Mounting Bracket
Environmental	
Operating Temperature	-25°C to 70°C (-4°F to 157°F)
Storage Temperature	-40°C to 85°C (-40°F to 185°F)
Humidity	10% to 95% Humidity, Non-condensing
Vibration	Operating, 5 Grms, 5-500 Hz, 3 Axes (w/ SSD, According to IEC60068-2-64)
Shock	Operating, 50 Grms, Half-sine 11 ms Duration (w/ SSD, According to IEC60068-2-27)
EMC	CE, FCC, RoHS, EN50155 & EN50121-3-2

1.2.6 Specification of Vecow ECS-5600-8R

System	
Processor	2nd Generation Intel® Core™ i7/i5/i3 and Celeron™ Mobile, Sandy Bridge Processors
Chipset	Intel® QM67
BIOS	Phoenix UEFI BIOS
SIO	Nuvoton NCT6106D
Memory	DDR3 1333 / 1066MHz Max. 16GB 2 204-pin SO-DIMM Sockets
I/O Ports	
Serial Port	3 COM RS-232, 1 COM RS-232/485/422
USB Interface	6 USB Ports, Compliant with USB 2.0
LED	Power/Suspend, HDD, and WDT LEDs
GPIO	8 DI, 8 DO
Expansion	
Mini PCIe	2 Mini PCIe, 1 SIM Socket on 1 Mini PCIe Interface
SUMIT A, B	2 SUMIT Slots
Graphics	
Chipset	Intel® GMA HD 3000
Display Memory	Shared Memory, Up to 1.7GB
Interface	VGA + DVI-D / HDMI Onboard VGA, Supports Max. Resolution 2048 x 1536 (@60Hz) Onboard DVI-D, Supports Max. Resolution 1920 x 1200
Storage	
SATA	2 SATA III (6Gbps) 2.5" HDD / SSD Drive Bays with Key Lock
Storage Expansion	CFast Slot, External Hot-Swap, Push In/Out Ejector
eSATA	2 eSATA Ports
Audio	
Audio Codec	Realtek ALC892, 5.1 channel HD Audio
Audio Interface	Line-in, Line-out, Mic-in, Front Audio Header
Ethernet	
LAN1~4	Intel® 82574L Gigabit LAN
LAN5	Intel® 82579LM Gigabit LAN
LAN6~8	Intel® 82574L Gigabit LAN
Power	
Power Input	DC Jack, 2-pin Terminal Block
Power Input Voltage	DC-IN 6 ~ 36 V
Power Adapter	AC to DC +24V / 3.75A. 90W Max. (Optional)
Other	
Watchdog Timer	Reset: 1 to 255 sec./min. Per Step
HW Monitor	Temperature/Voltages Auto Throttling Control When CPU Overheats
Mechanical	
Chasis Construction	Aluminum Housing
Size (W x D x H)	260mm x 175mm x 78mm (10.2" x 6.9" x 3.1")
Weight	2.8 Kg (6 lb)
Mounting	Wall-mount by Mounting Bracket
Environmental	
Operating Temperature	-25°C to 70°C (-4°F to 157°F)
Storage Temperature	-40°C to 85°C (-40°F to 185°F)
Humidity	10% to 95% Humidity, Non-condensing
Vibration	Operating, 5 Grms, 5-500 Hz, 3 Axes (w/ SSD, According to IEC60068-2-64)
Shock	Operating, 50 Grms, Half-sine 11 ms Duration (w/ SSD, According to IEC60068-2-27)
EMC	CE, FCC, RoHS, EN50155 & EN50121-3-2

1.2.7 Specification of Vecow ECS-5600-3R

System	
Processor	2nd Generation Intel® Core™ i7/i5/i3 and Celeron™ Mobile, Sandy Bridge Processors
Chipset	Intel® QM67
BIOS	Phoenix UEFI BIOS
SIO	Nuvoton NCT6106D
Memory	DDR3 1333 / 1066MHz Max. 16GB 2 204-pin SO-DIMM Sockets
I/O Ports	
Serial Port	3 COM RS-232, 1 COM RS-232/485/422
USB Interface	6 USB Ports, Compliant with USB 2.0
LED	Power/Suspend, HDD, and WDT LEDs
GPIO	8 DI, 8 DO
Expansion	
Mini PCIe	2 Mini PCIe, 1 SIM Socket on 1 Mini PCIe Interface
Graphics	
Chipset	Intel® GMA HD 3000
Display Memory	Shared Memory, Up to 1.7GB
Interface	VGA + DVI-D / HDMI Onboard VGA, Supports Max. Resolution 2048 x 1536 (@60Hz) Onboard DVI-D, Supports Max. Resolution 1920 x 1200
Storage	
SATA	2 SATA III (6Gbps) 2.5" HDD / SSD Drive Bays with Key Lock
Storage Expansion	CFast Slot, External Hot-Swap, Push In/Out Ejector
eSATA	2 eSATA Ports
Audio	
Audio Codec	Realtek ALC892, 5.1 channel HD Audio
Audio Interface	Line-in, Line-out, Mic-in, Front Audio Header
Ethernet	
LAN1	Intel® 82574L Gigabit LAN
LAN2	Intel® 82574L Gigabit LAN
LAN3	Intel® 82574L Gigabit LAN
Power	
Power Input	DC Jack, 2-pin Terminal Block
Power Input Voltage	DC-IN 6 ~ 36 V
Power Adapter	AC to DC +24V / 3.75A. 90W Max. (Optional)
Other	
Watchdog Timer	Reset: 1 to 255 sec./min. Per Step
HW Monitor	Temperature/Voltages Auto Throttling Control When CPU Overheats
Mechanical	
Chasis Construction	Aluminum Housing
Size (W x D x H)	260mm x 175mm x 78mm (10.2" x 6.9" x 3.1")
Weight	2.8 Kg (6 lb)
Mounting	Wall-mount by Mounting Bracket
Environmental	
Operating Temperature	-25°C to 70°C (-4°F to 157°F)
Storage Temperature	-40°C to 85°C (-40°F to 185°F)
Humidity	10% to 95% Humidity, Non-condensing
Vibration	Operating, 5 Grms, 5-500 Hz, 3 Axes (w/ SSD, According to IEC60068-2-64)
Shock	Operating, 50 Grms, Half-sine 11 ms Duration (w/ SSD, According to IEC60068-2-27)
EMC	CE, FCC, RoHS, EN50155 & EN50121-3-2

1.2.8 Specification of Vecow ECS-5600-5R

System	
Processor	2nd Generation Intel® Core™ i7/i5/i3 and Celeron™ Mobile, Sandy Bridge Processors
Chipset	Intel® QM67
BIOS	Phoenix UEFI BIOS
SIO	Nuvoton NCT6106D
Memory	DDR3 1333 / 1066MHz Max. 16GB 2 204-pin SO-DIMM Sockets
I/O Ports	
Serial Port	3 COM RS-232, 1 COM RS-232/485/422
USB Interface	6 USB Ports, Compliant with USB 2.0
LED	Power/Suspend, HDD, and WDT LEDs
GPIO	8 DI, 8 DO
Expansion	
Mini PCIe	2 Mini PCIe, 1 SIM Socket on 1 Mini PCIe Interface
Graphics	
Chipset	Intel® GMA HD 3000
Display Memory	Shared Memory, Up to 1.7GB
Interface	VGA + DVI-D / HDMI Onboard VGA, Supports Max. Resolution 2048 x 1536 (@60Hz) Onboard DVI-D, Supports Max. Resolution 1920 x 1200
Storage	
SATA	2 SATA III (6Gbps) 2.5" HDD / SSD Drive Bays with Key Lock
Storage Expansion	CFast Slot, External Hot-Swap, Push In/Out Ejector
eSATA	2 eSATA Ports
Audio	
Audio Codec	Realtek ALC892, 5.1 channel HD Audio
Audio Interface	Line-in, Line-out, Mic-in, Front Audio Header
Ethernet	
LAN1	Intel® 82574L Gigabit LAN
LAN2	Intel® 82574L Gigabit LAN
LAN3	Intel® 82574L Gigabit LAN
LAN4	Intel® 82574L Gigabit LAN
LAN5	Intel® 82579LM Gigabit LAN
Power	
Power Input	DC Jack, 2-pin Terminal Block
Power Input Voltage	DC-IN 6 ~ 36 V
Power Adapter	AC to DC +24V / 3.75A. 90W Max. (Optional)
Other	
Watchdog Timer	Reset: 1 to 255 sec./min. Per Step
HW Monitor	Temperature/Voltages Auto Throttling Control When CPU Overheats
Mechanical	
Chasis Construction	Aluminum Housing
Size (W x D x H)	260mm x 175mm x 78mm (10.2" x 6.9" x 3.1")
Weight	2.8 Kg (6 lb)
Mounting	Wall-mount by Mounting Bracket
Environmental	
Operating Temperature	-25°C to 70°C (-4°F to 157°F)
Storage Temperature	-40°C to 85°C (-40°F to 185°F)
Humidity	10% to 95% Humidity, Non-condensing
Vibration	Operating, 5 Grms, 5-500 Hz, 3 Axes (w/ SSD, According to IEC60068-2-64)
Shock	Operating, 50 Grms, Half-sine 11 ms Duration (w/ SSD, According to IEC60068-2-27)
EMC	CE, FCC, RoHS, EN50155 & EN50121-3-2

1.3 Supported CPU List

Vecow ECS-5600 accepts 2nd generation Intel® i7/i5/i3 processors via a rPGA988B CPU socket. The following processors have been tested by Vecow Co., Ltd. for the compatibility with Vecow ECS-5600. Instead of i7-2710QE, i5-2510E and i3-2330E, You may also select other processor according to your consideration of cost and performance.

Series		Socket	Max. TDP	Embedded
i7	2620M	rPGA988B	35W	
	2630QM		45W	
	2640M		35W	
	2670QM		45W	
	2710QE		**45W**	√
	2720QM		45W	
i5	2410M	rPGA988B	35W	
	2430M		35W	
	2520M		35W	
	2510E		**35W**	√
	2540M		35W	
i3	2310M*	rPGA988B	35W	
	2312M*		35W	
	2330E		**35W**	√
	2330M*		35W	
	2350M*		35W	
Celeron	B710	rPGA988B	35W	
	B800		35W	
	B810		**35W**	√
	B840		35W	

The processors with "√" are listed in Intel® Embedded Roadmap and with a 7-year life cycle support (from 2011 to 2017). The processors with "*" the maximum operation temperature is 55°C.

1.4 Mechanical Dimension

Figure 1.1 ECS-5600-3G

175 (6.9")

90 (3.5")

260 (10.2")

124 (4.9")

90 (3.5")

53 (2.1")

175 (6.9")

260 (10.2")

79 (3.1")

260 (10.2")

175 (6.9")

Figure 1.2 ECS-5600-5G

175 (6.9")

90 (3.5")

90 (3.5")

124 (4.9")

260 (10.2")

53 (2.1")

175 (6.9")

260 (10.2")

79 (3.1")

260 (10.2")

175 (6.9")
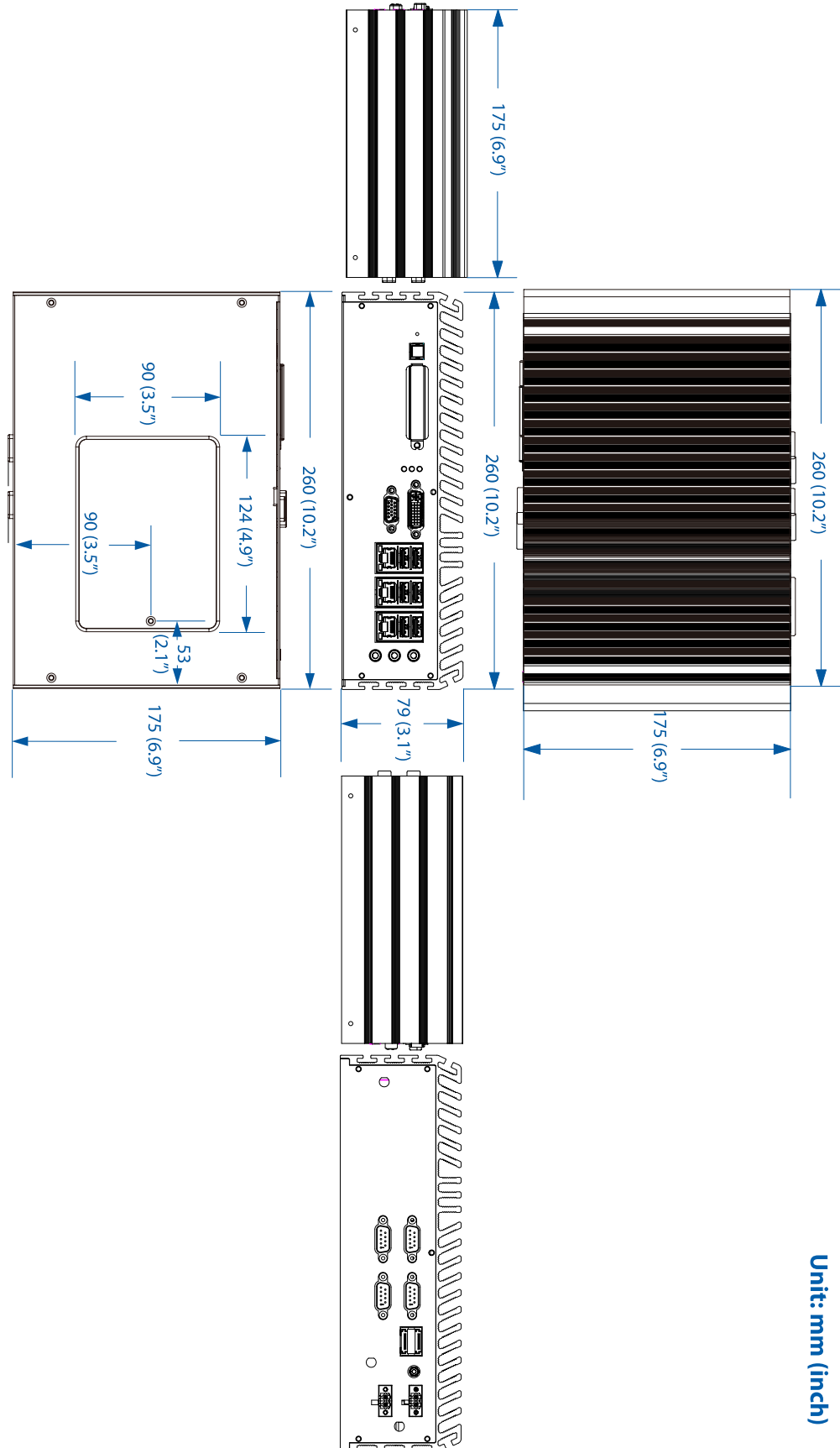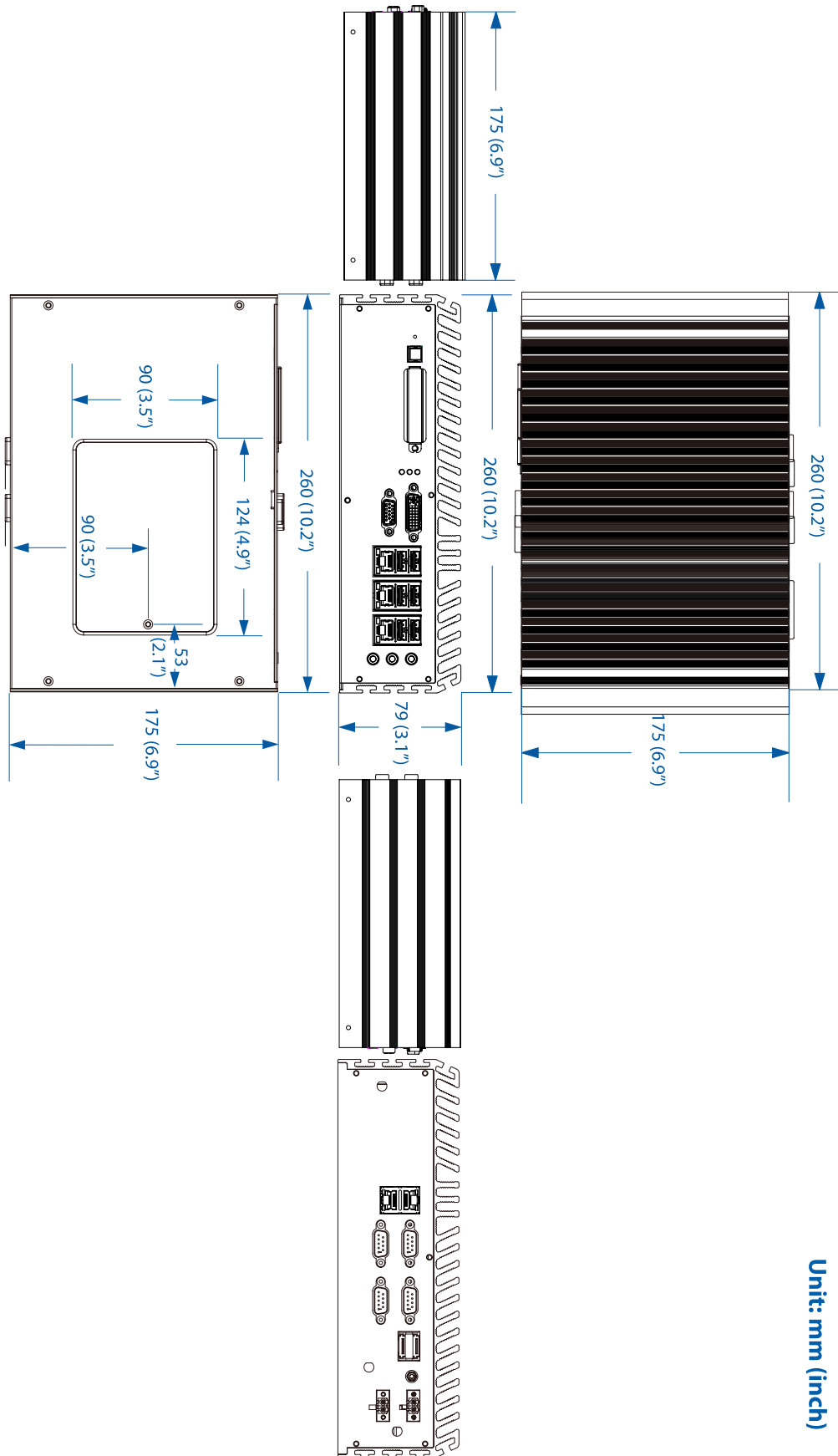
Unit: mm (inch)

Figure 1.3 ECS-5600-5GD / ECS-5600-5GDE

175 (6.9")

90 (3.5")

90 (3.5")

124 (4.9")

260 (10.2")

53 (2.1")

175 (6.9")

260 (10.2")

79 (3.1")

260 (10.2")

175 (6.9")

Unit: mm (inch)

Figure 1.4 ECS-5600-3V

Unit: mm (inch)

175 (6.9")

260 (10.2")

175 (6.9")

260 (10.2")

175 (6.9")

260 (10.2")

79 (3.1")

Figure 1.5 ECS-5600-8R

175 (6.9")

260 (10.2")

260 (10.2")

260 (10.2")

175 (6.9")

79 (3.1")

175 (6.9")
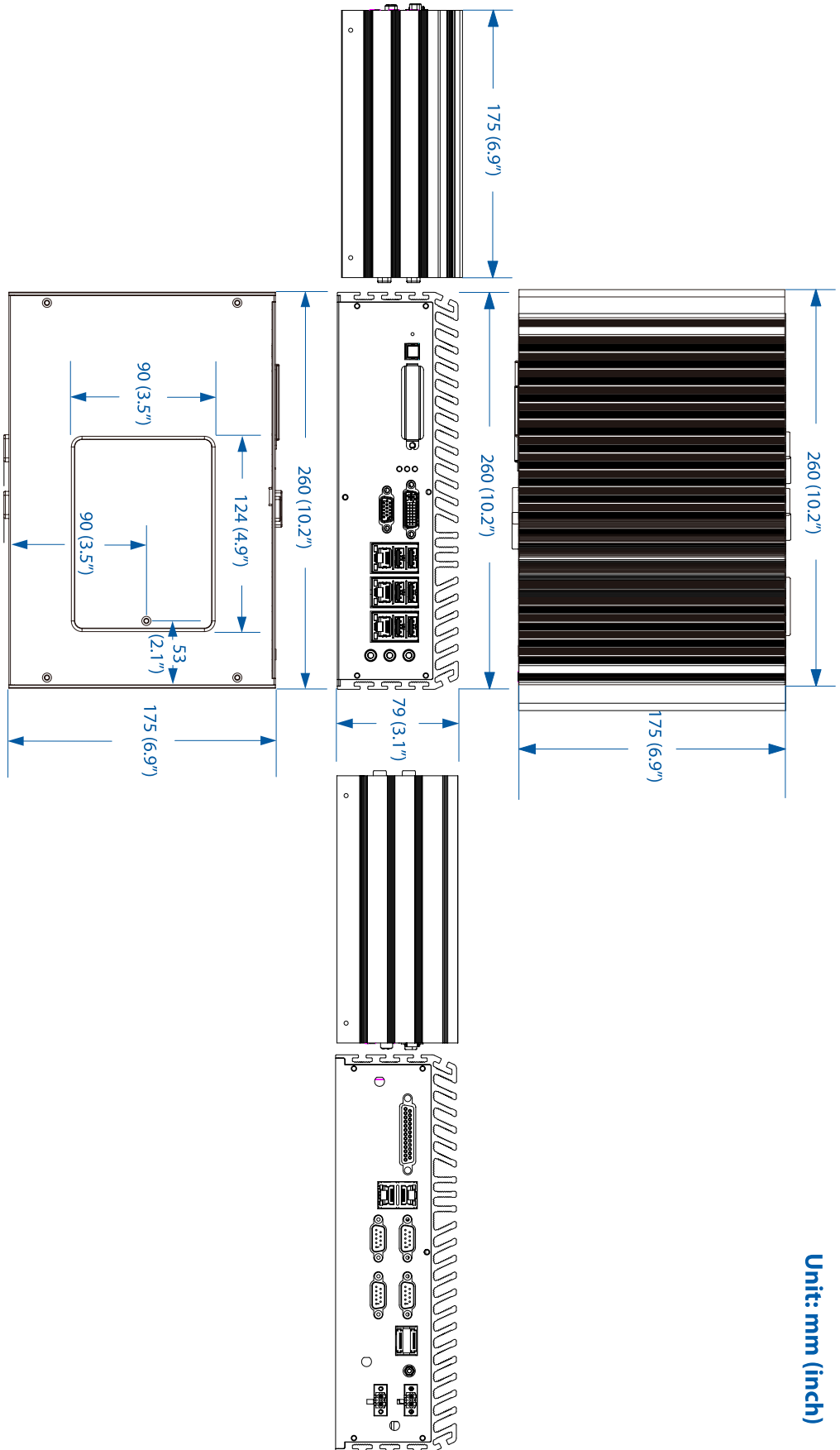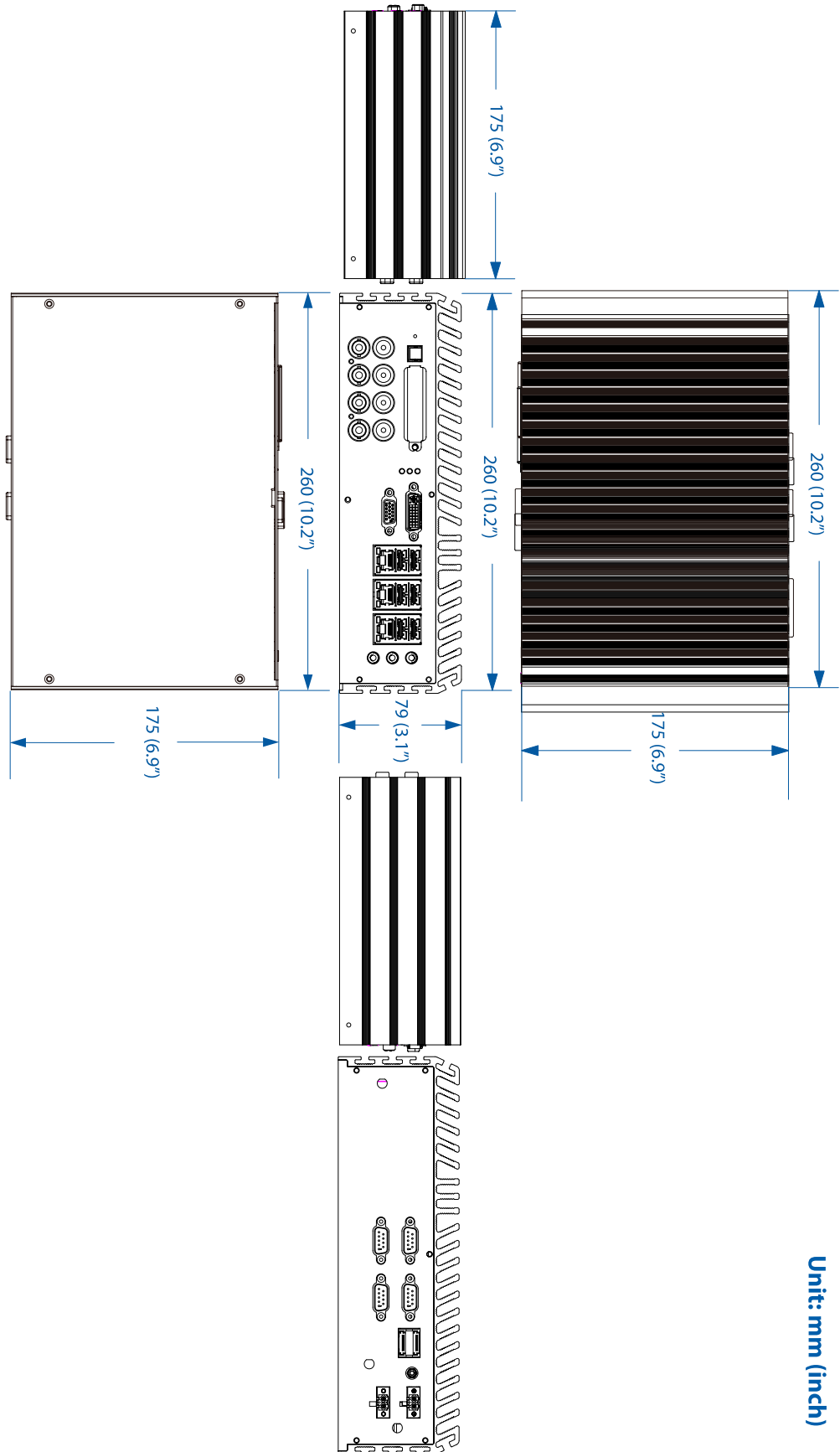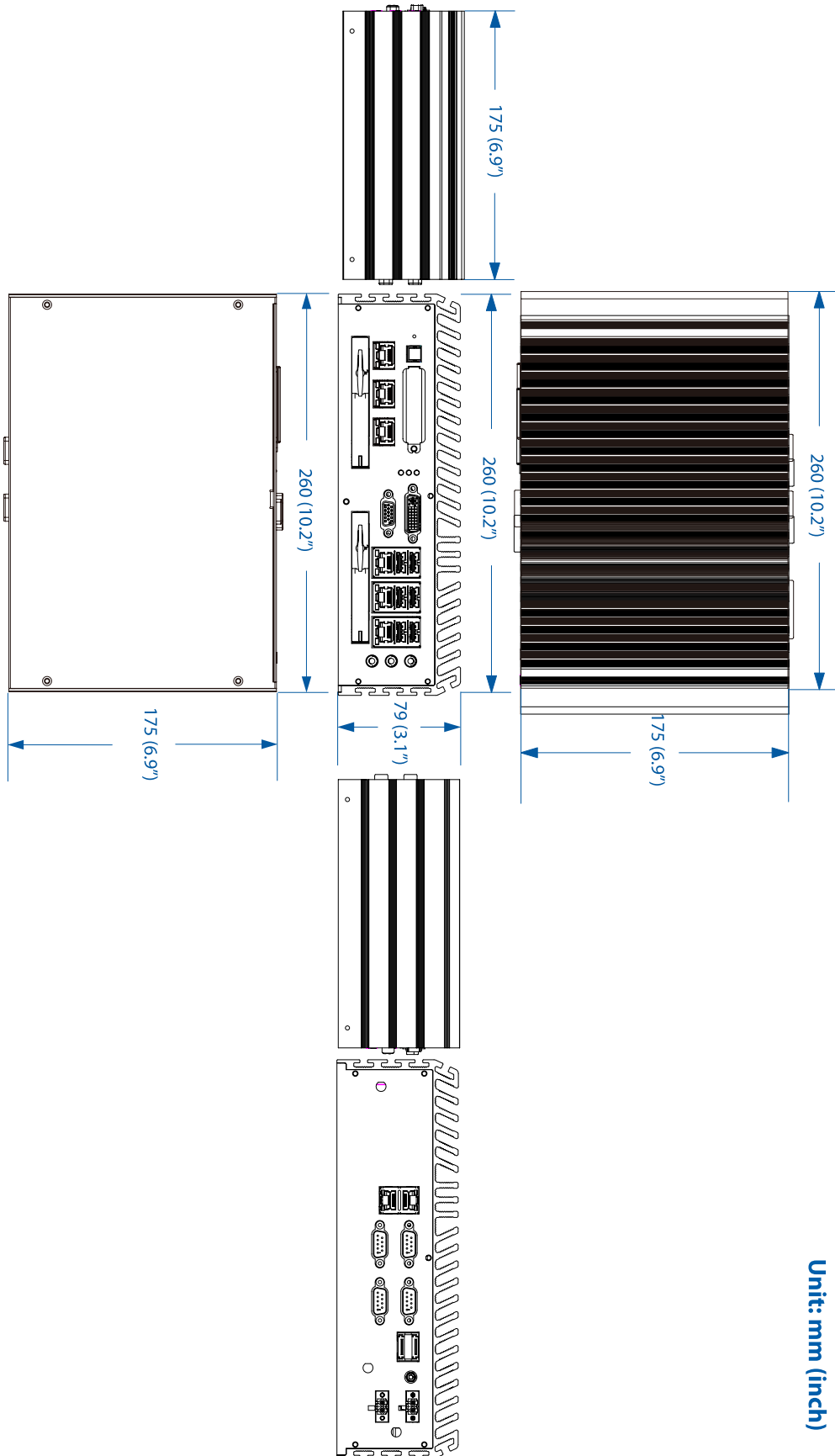
Unit: mm (inch)

Figure 1.6 ECS-5600-3R

175 (6.9")

260 (10.2")

260 (10.2")

260 (10.2")

175 (6.9")

79 (3.1")

175 (6.9")

Unit: mm (inch)

Figure 1.7 ECS-5600-5R

175 (6.9")

260 (10.2")

175 (6.9")

260 (10.2")

260 (10.2")

79 (3.1")

175 (6.9")

Unit: mm (inch)
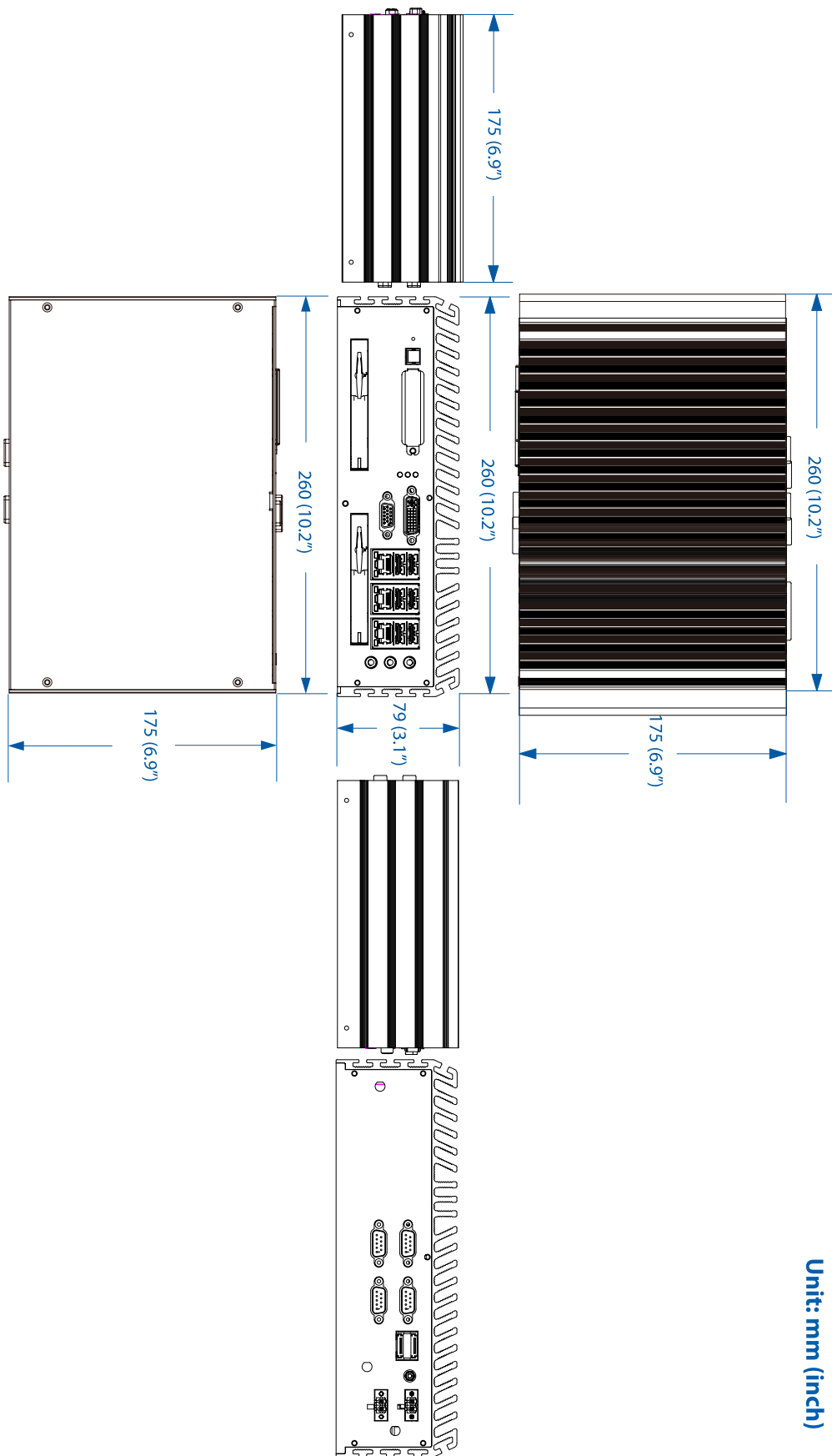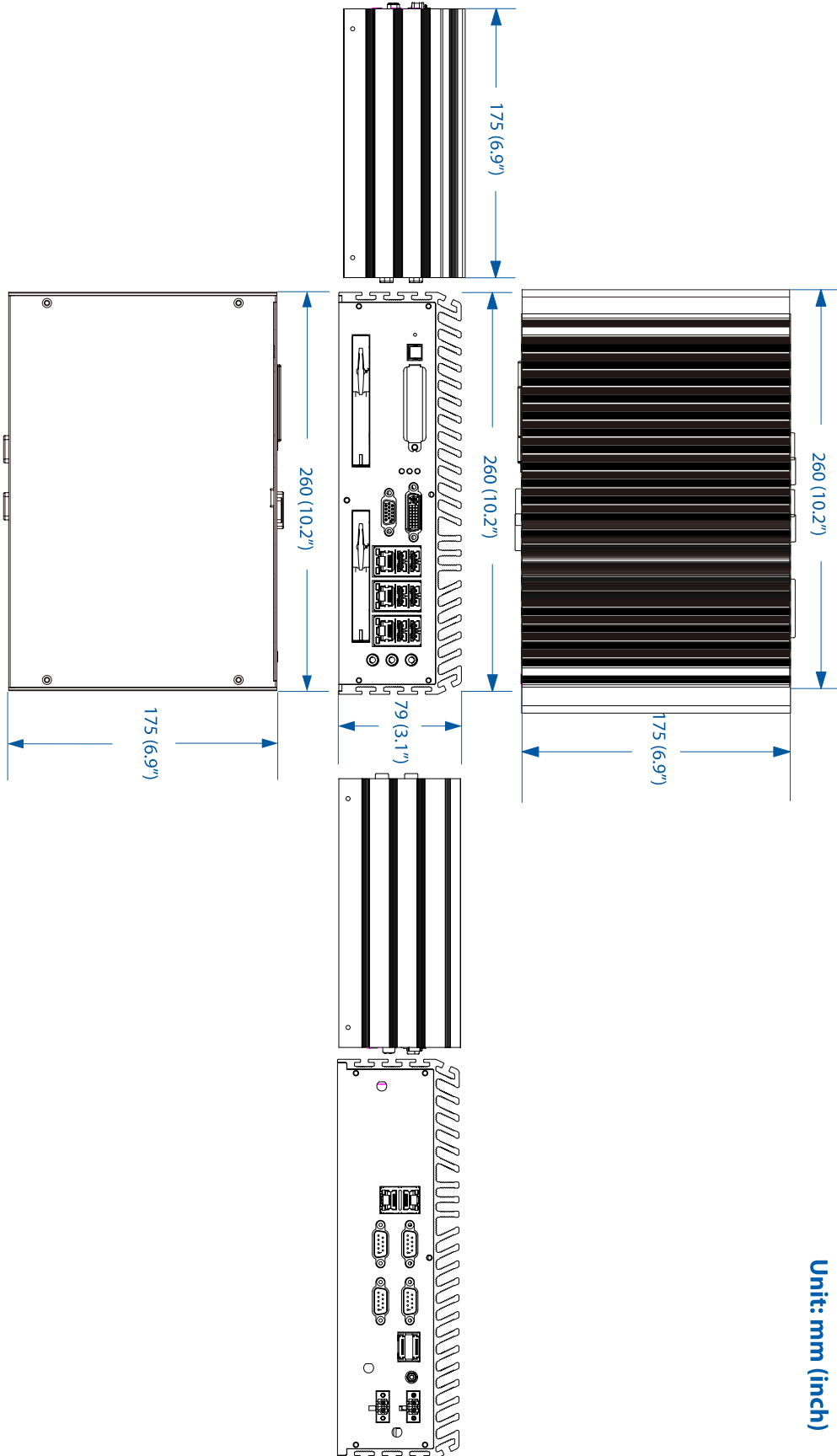
2

Hardware Installation

2.1 Front Side External I/O Connectors

On ECS-5600 series, all I/O connectors are located on front panel and rear panel. Most general computer connectors (i.e. audio, USB, DVI-D, VGA and etc.) are placed on the front panel.

2.1.1 Audio Jacks
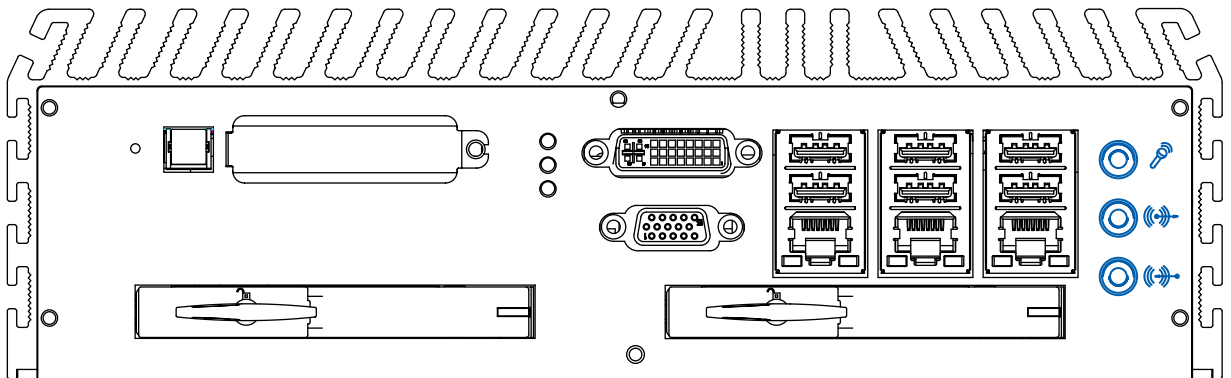
On ECS-5600 series, all I/O connectors are located on front panel and rear panel. Most general computer connectors (i.e. audio, USB, DVI-D, VGA and etc.) are placed on the front panel. To utilize the audio function in Windows, you need to install corresponding drivers for both Intel® QM67 PCH chipset and Realtek ALC892 codec. Please refer to section 4 for information of driver installation.

2.1.2 USB Connectors
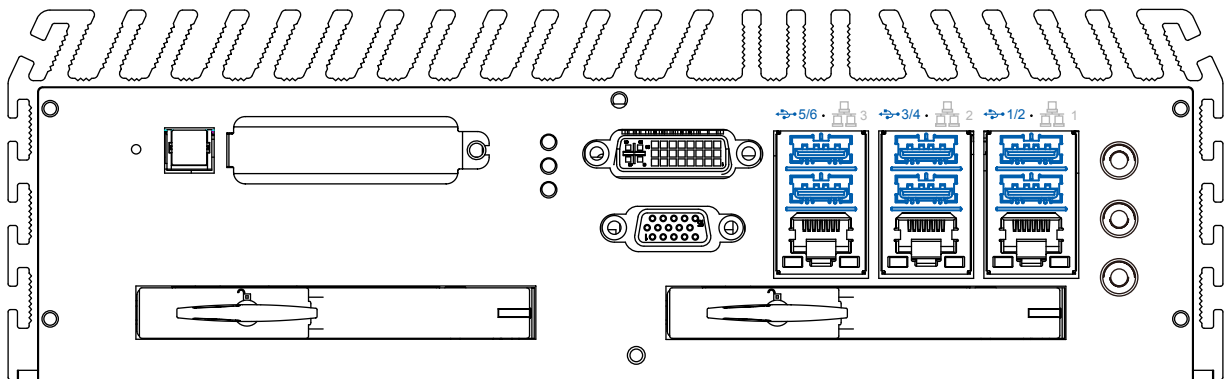
There are totally 6 USB ports on the front panel. By BIOS default, these USB ports are operated in EHCI (Enhanced Host Control Interface) mode and are compatible to USB 2.0, USB 1.1 and USB 1.0 devices. Legacy USB support is provided so you can use USB keyboard/mouse in DOS environment.

2.1.3 Gigabit Ethernet Port
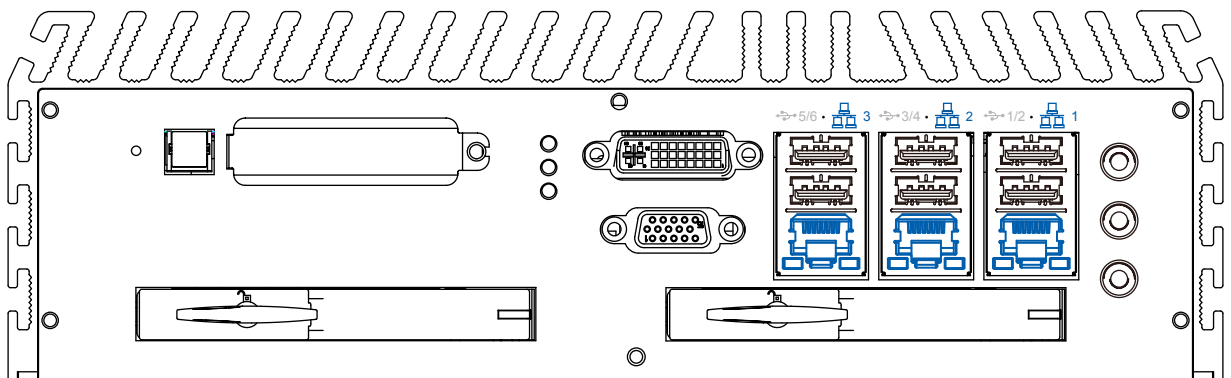
ECS-5600 series controller offers 5 GbE ports (ECS-5600-5G/5GD/5GDE/5R) or 3 GbE ports (ECS-5600-3G/3R), LAN1~LAN4 using Intel® 82583v and LAN5 using Intel® 82579LM Gigabit Ethernet controllers. Each port has one dedicated GbE controller and one dedicated PCI Express link to present maximal network performance. Three of these GbE ports is located on the front panel and two are located on the rear panel. When plugging in the Ethernet cable, you can tell the Ethernet status and speed from the LED indicators on the RJ45 connector as following:

Active/Link LED

LED Color	Status	Description
Yellow	Off	Ethernet port is disconnected
	On	Ethernet port is connected and no data transmission
	Flashing	Ethernet port is connected and data is transmitting/receiving

Speed LED

LED Color	Status	Description
Green / Orange	Off	10 Mbps
	Green	100 Mbps
	Orange	1000 Mbps

2.1.4 DVI-D/HDMI Connector
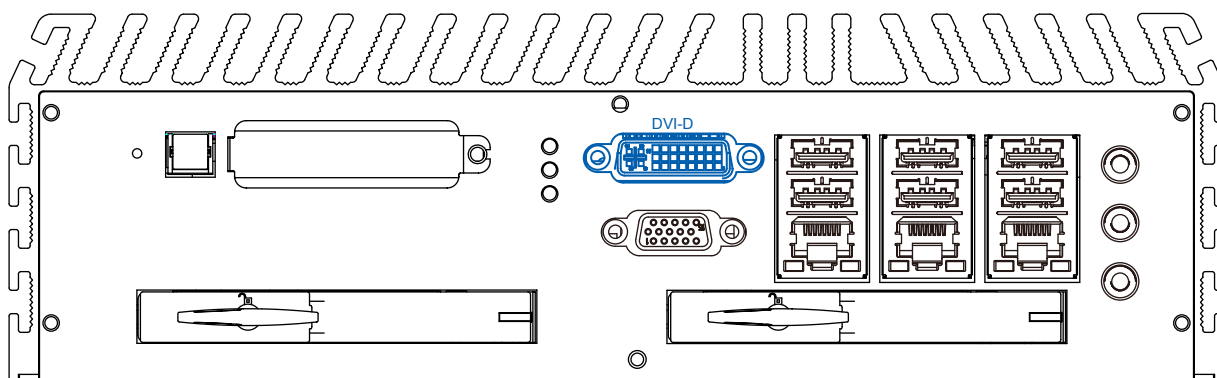
The DVI-D connector on the front panel supports both DVI and HDMI operation mode. This connector can either output DVI signals or HDMI signal. The DVI output mode supports up to 1920x1200 resolution and HDMI output mode supports up to 1920x1200 resolution. The DVI or HDMI mode is automatically selected according to the display device connected. **You shall need a DVI-D to HDMI cable when connecting to a HDMI display device.**

To utilize the VGA or DVI/HDMI output in Windows, you need to install corresponding graphics driver. Please refer to section 4 for information of driver installation.

2.1.5 VGA Connector
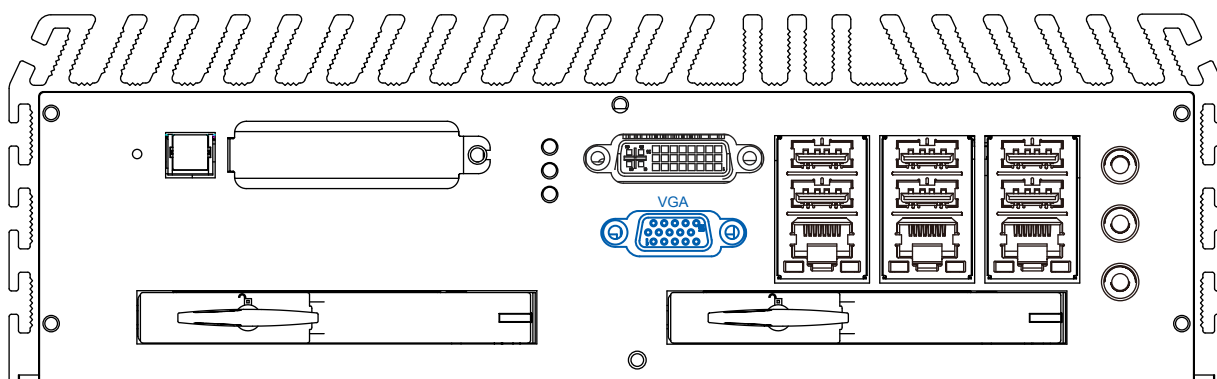
VGA connector is the most popular way to connect a display. The VGA output of ECS-5600 series supports up to 2048 x 1536 resolution. By BIOS default, **both VGA and DVI/HDMI output are enabled**. To utilize the VGA or DVI/HDMI output in Windows, you need to install corresponding graphics driver. Please refer to section 4 for information of driver installation.

2.1.6 CFast Socket
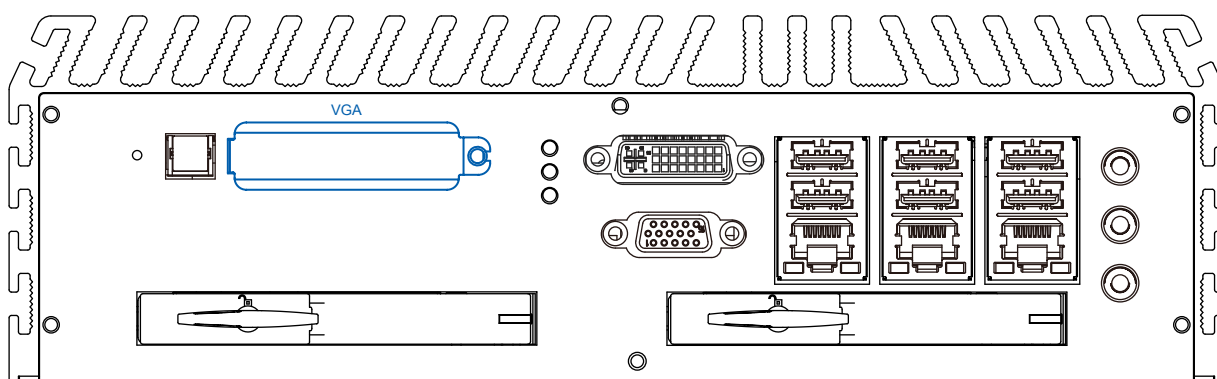
ECS-5600 series provides a CFast socket on the front panel for Type-I / Type-II CompactFlash card. It is implemented by a SATA II port from QM67 PCH.

2.1.7 Power Button
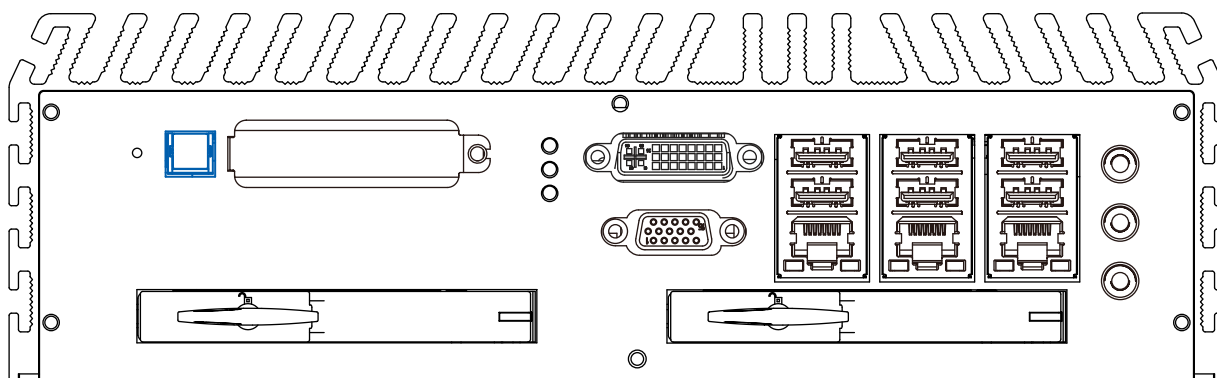
The power button is a non-latched switch with dual color LED for indicating S0, S3 and S5 status. Power button dual-color LED indicator:

Status	LED Display	System Situation
S0	Blue	System working
S3	Blinking Orange	Suspend to RAM
S5	Orange	System off with standby power

To turn on the ECS-5600, press the power button and the blue LED is lighted up.

- **To turn off** the ECS-5600 series, you can either issue a shutdown command in OS, or just simply press the power button.
- In case of **system halts**, you can press and hold the power button for 4 seconds to compulsorily shut down the system.
- Please note that a 4 seconds interval is kept by the system between two on/off operations (i.e. once turning off the system, you **shall wait for 4 seconds to initiate another power-on operation**).

2.1.8 LED Indicators
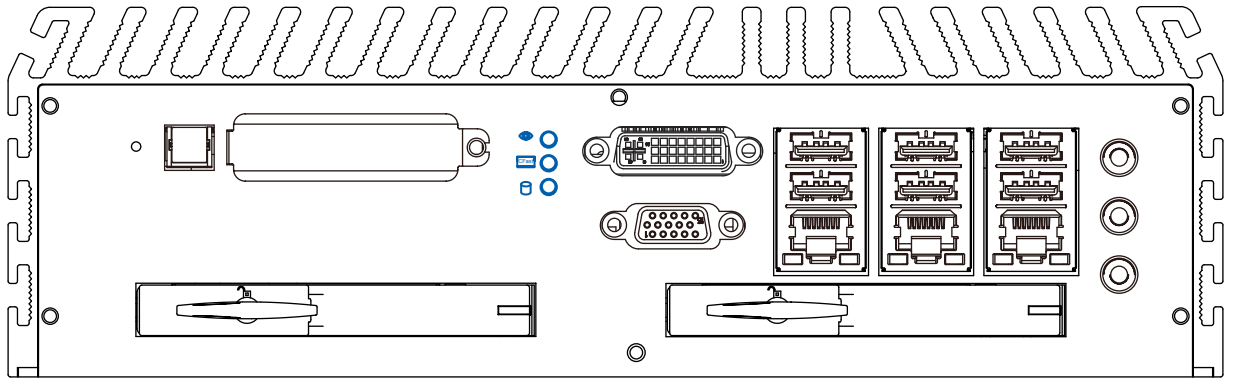
There are three LED indicators on the front panel: WDT, CFast and HDD. The descriptions of these three LED are listed in the following table.

Indicator	Color	Description
WDT	BlinkingYellow	Watchdog timer indicator, flashing when watchdog timer is started.
CFast	Red	CF indictor, flashing when CFast device is active.
HDD	Green	Hard drive indicator, flashing when SATA port is active.

2.2 Rear Side External I/O Connectors

Power input, GbE ports, COM ports and optional isolated DIO are located on the rear panel. In this section, we'll illustrate connectors on the rear panel.

2.2.1 DC Input Terminal Block
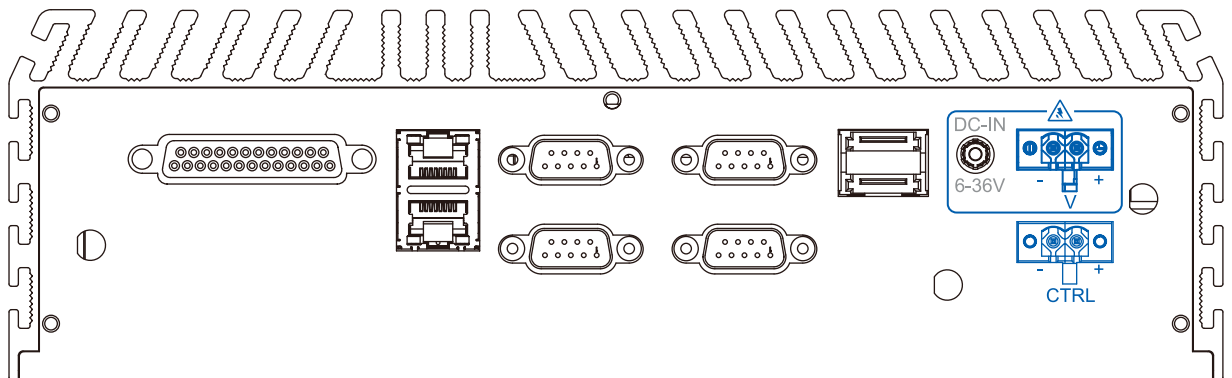
ECS-500 series allows a wide range of operational DC power input from 6 to 36V. It provides two ways for connecting DC power: a 4-pin pluggable terminal block or a DC jack. The 4-pin pluggable terminal block is fit for field usage where DC power is usually provided. And the screw clamping connection of terminal block gives a very reliable way of wiring the DC power. In addition to 2 pins for DC power input (V+, V-), the terminal block offers another 2 pins for remote on/off control (Ctrl+, Ctrl-). The following table describes the pin definition of the pluggable terminal block. For detail information of connecting DC power and remote on/off control, please refer to section 2.6.

| Pin	Description
V+	Positive polarity of DC power input.
V-	Negative polarity of DC power input (usually power ground).
Ctrl+	Control pin to connect Positive Voltage Level(+)/ACC or Push Button(+).
Ctrl-	Control pin to connect Negative Voltage Level(-)/GND or Push Button(-).
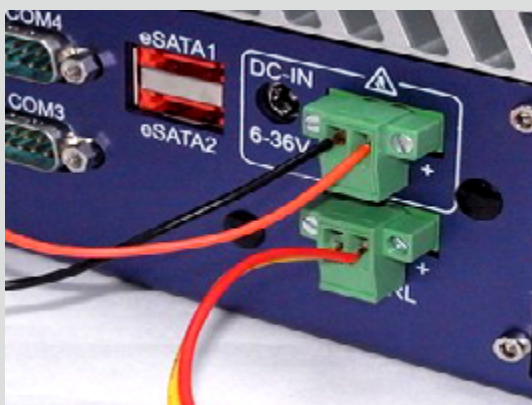
CAUTION!

1. Please make sure the voltage of DC power is correct before you connect it to ECS-5600 series. Supplying a voltage over 60V will damage the system.
2. You should use either 2-pin pluggable terminal block or DC jack for DC power input. **DO NOT** supply power to both connectors at the same time.

2.2.2 DC Jack
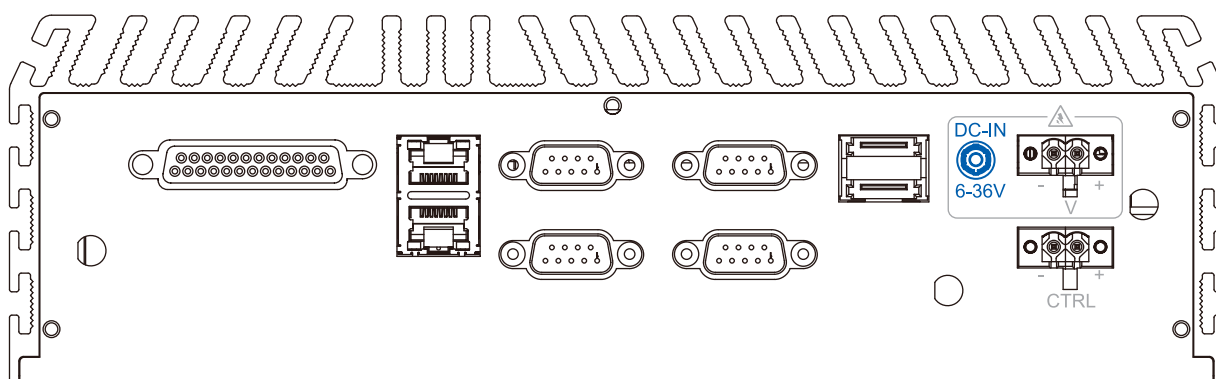
The DC jack on the rear panel provides another way for supplying DC power. It's convenient for indoor usage where AC power is usually available. The DC jack is designed to use with a 12/19/24V AC/DC adapter with a ø2.5/5.5 plug.
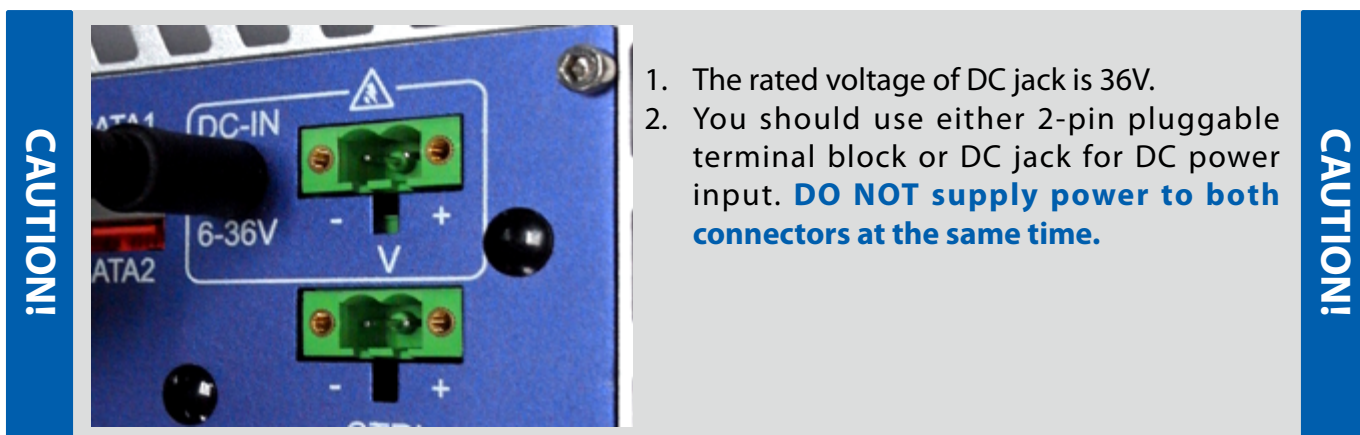
1. The rated voltage of DC jack is 36V.
2. You should use either 2-pin pluggable terminal block or DC jack for DC power input. **DO NOT supply power to both connectors at the same time.**

2.2.3 Gigabit Ethernet Ports
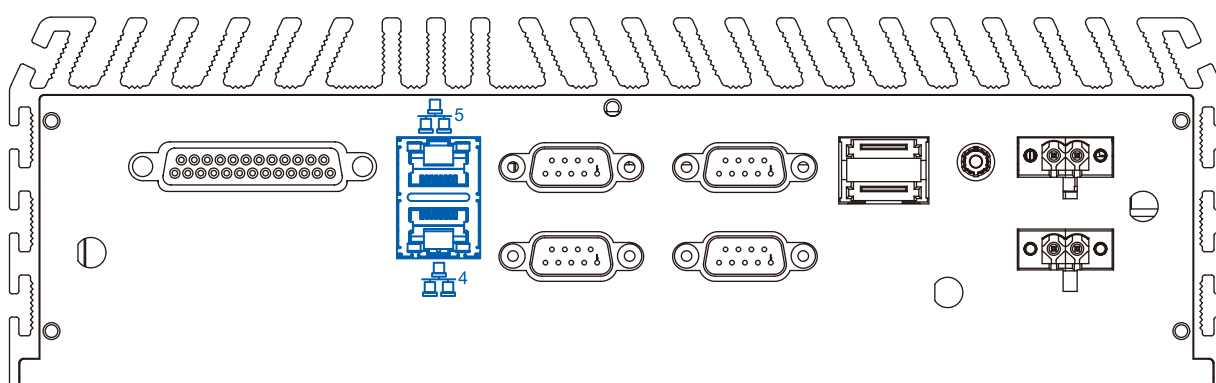
There are another 2 GbE ports (ECS-5600-5G/5GD/5GDE/5R) on the rear panel. The LAN5 GbE port is implemented using Intel® 82579LM Gigabit Ethernet controller, and the other one LAN 4 is implemented using Intel 82583v . Each port has one dedicated GbE controller and one dedicated PCI Express link to present maximal network performance. When plugging in the Ethernet cable, you can tell the Ethernet status and speed from the LED indicators on the RJ45 connector as following:

Active/Link LED

LED Color	Status	Description
Yellow	Off	Ethernet port is disconnected
	On	Ethernet port is connected and no data transmission
	Flashing	Ethernet port is connected and data is transmitting/receiving

Speed LED

LED Color	Status	Description
Green / Orange	Off	10 Mbps
	Green	100 Mbps
	Orange	1000 Mbps

To utilize the GbE port in Windows, you need to install corresponding driver for Intel® 82583v GbE controller. Please refer to section 5 for information of driver installation.

2.2.4 COM Ports
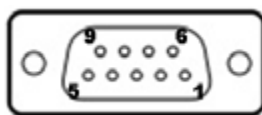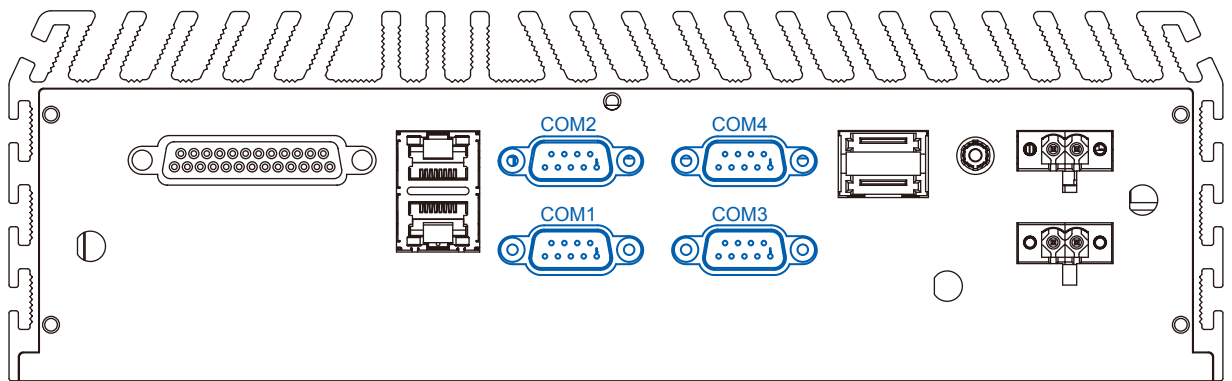
ECS-5600 series provides 4 COM ports via 9-pin D-Sub male connectors for communicating with external devices. These COM ports are implemented using industrial-grade NCT6106D Super IO chip (-40 to 85°C) and provide up to 115200 bps baud rate. COM2 is a software-selectable RS-232/422/485 port and COM1/COM3/COM4 is RS-232 only. The operation mode of COM2 can be set in BIOS setup utility (refer to section 3 for detail).
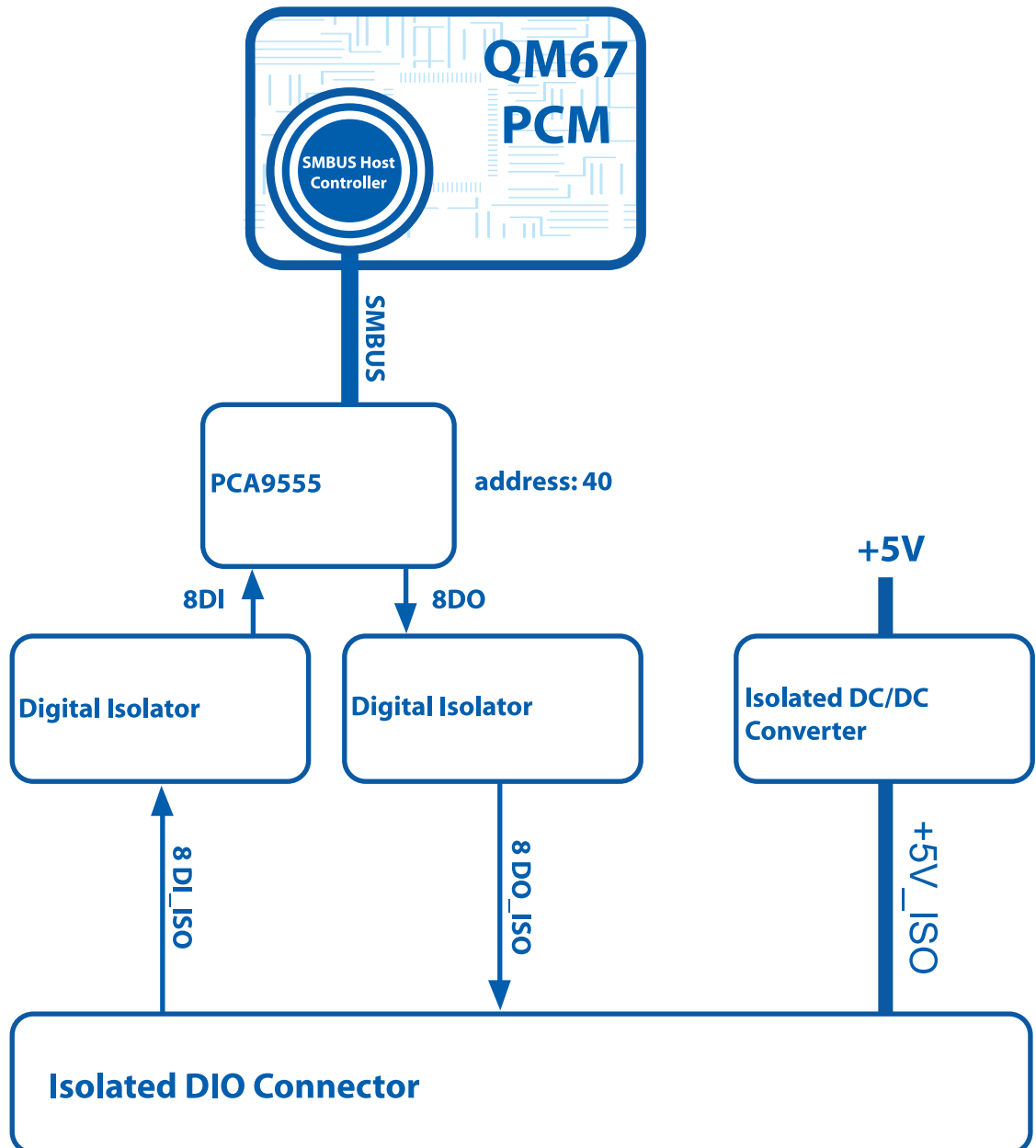
Pin#	COM2			COM1/COM3/COM4
	RS-232 Mode	RS-422 Mode	RS-485 Mode (Two-wire 485)	RS-232 Mode
1	DCD	422 TxD-	485 TXD+ / RXD +	DCD
2	RX	422 TxD+	485 TXD- / RXD -	RX
3	TX	422 RxD+	N/C	TX
4	DTR	422 RxD-	N/C	DTR
5	GND	GND	GND	GND
6	DSR	N/C	N/C	DSR
7	RTS	N/C	N/C	RTS
8	CTS	N/C	N/C	CTS
9	N/C	N/C	N/C	RI

2.2.5 Isolated DIO
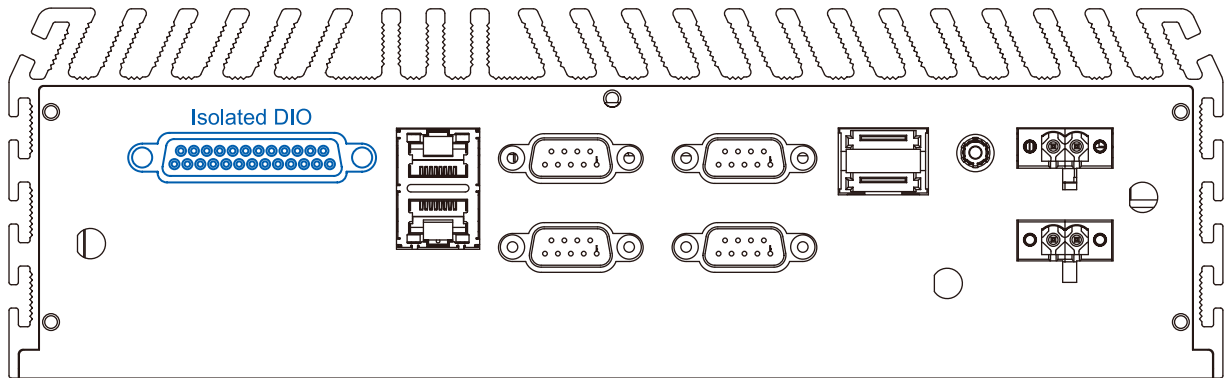
Specification
- SMBUS GPIO Controller PCA9555
- Insulation Rating (kVrms): 2.5kV rms

QM67 PCM

SMBUS Host Controller

SMBUS

PCA9555   address: 40

8DI   8DO

Digital Isolator   Digital Isolator   Isolated DC/DC Converter

+5V

8 DI_ISO   8 DO_ISO   +5V_ISO

Isolated DIO Connector

Connector Pin-Definition

Pin #	Pin Name	Description
1	+5V_ISO	Isolated +5V
2	DO-0	Digital Output bit-0
3	DO-3	Digital Output bit-3
4	GND-ISO	Isolated GND
5	DO-5	Digital Output bit-5
6	DO-7	Digital Output bit-7
7	GND-ISO	Isolated GND
8	DI-6	Digital Input bit-6
9	DI-1	Digital Input bit-1
10	GND-ISO	Isolated GND
11	DI-0	Digital Input bit-0
12	DI-2	Digital Input bit-2
13	DI-4	Digital Input bit-4
14	+5V_ISO	Isolated +5V
15	GND-ISO	Isolated GND
16	DO-1	Digital Output bit-1
17	DO-2	Digital Output bit-2
18	DO-4	Digital Output bit-4
19	DO-6	Digital Output bit-6
20	GND-ISO	Isolated GND
21	GND-ISO	Isolated GND
22	DI-5	Digital Input bit-5
23	DI-3	Digital Input bit-3
24	DI-7	Digital Input bit-7
25	GND-ISO	Isolated GND

2.2.6 eSATA Ports
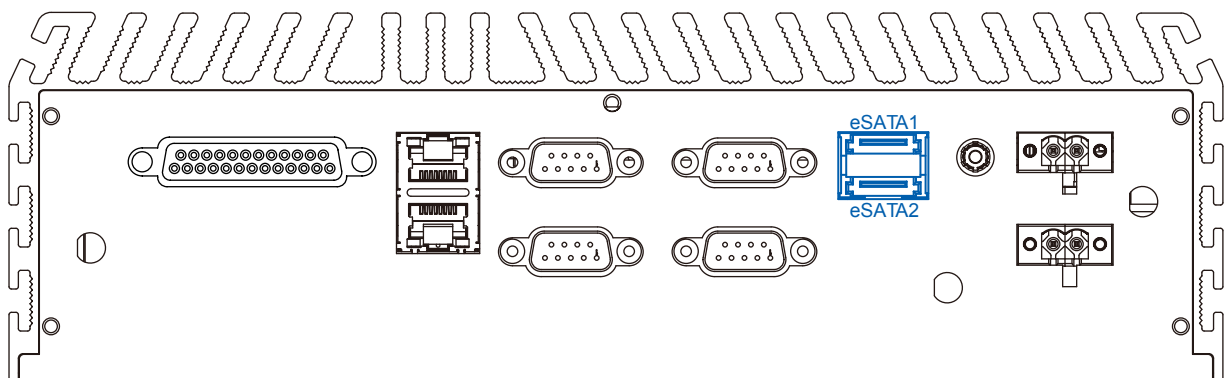
eSATA is a convenient way to extend storage devices. Devices with SATA interface, such as hard drive and CD/DVD drive, can be attached to the ECS-5600 series controller via eSATA ports. In addition, eSATA interface supports **hot-plug** if SATA controller is configured as AHCI (Advanced Host Controller Interface) mode. Please refer to section 3.2.6 for setting SATA controller mode in BIOS.

2.3 SUMIT A, B

SUMIT-A CN 18					
Pin#	Pin Name	Description	Pin#	Pin Name	Description
1	+5VSB		2	+12V	
3	+3.3V		4	SIO_SMB1_DAT	
5	+3.3V		6	SIO_SMB1_CLK	
7	PCIE-CLKREQ0#		8	NC	
9	NC		10	SPI_MISO	
11	USB_OC#67		12	SPI_MOSI	
13	NC		14	SPI_CLK	
15	+5V		16	SPI_CS0#	
17	USB9_DATA+		18	SPI_CS1#	
19	USB9_DATA-		20	NC	
21	+5V		22	LPC_DRQ#	
23	USB8_DATA+		24	LPC_AD0	
25	USB8_DATA-		26	LPC_AD1	
27	+5V		28	LPC_AD2	
29	USB7_DATA+		30	LPC_AD3	
31	USB7_DATA-		32	LPC_FRAME#	
33	+5V		34	SERIRQ#	
35	USB6_DATA+		36	SIO_PRST#	
37	USB6_DATA-		38	CLK33M	
39	GND		40	GND	
41	PCIe1_TX+		42	PCIe1_RX+	
43	PCIe1_TX-		44	PCIe1_RX-	
45	GND		46	GND	
47	PCIe_RESET#		48	PCIe1_CLK0+	
49	PCIe_WAKE#		50	PCIe1_CLK0-	
51	+5V		52	GND	
G1	GND	Central GND Plate	G1	GND	Central GND Plate

SUMIT-B CN 17					
Pin#	Pin Name	Description	Pin#	Pin Name	Description
1	GND		2	GND	
3	x1PCIe_TX+		4	x1PCIe_TX+	
5	x1PCIe_TX-		6	x1PCIe_TX-	
7	GND		8	GND	
9	x4PCIe-CLK_C0+	PCIe x4 CLK+	10	X1PCIe-CLK_B0+	PCIe x1 CLK+
11	X4PCIe-CLK_C0-	PCIe x4 CLK-	12	X1PCIe-CLK_B0-	PCIe x1 CLK-
13	GND		14	GND	
15	x4PCIe_TX0+	PCIe x4 TX0+	16	x4PCIe_RX0+	PCIe x4 RX0+
17	x4PCIe_TX0-	PCIe x4 TX0-	18	x4PCIe_RX0-	PCIe x4 RX0-
19	GND		20	GND	
21	x4PCIe_TX1+	PCIe x4 TX1+	22	x4PCIe_RX1+	PCIe x4 RX1+
23	x4PCIe_TX1-	PCIe x4 TX1-	24	x4PCIe_RX1-	PCIe x4 RX1-
25	GND		26	GND	
27	x4PCIe_TX2+	PCIe x4 TX2+	28	x4PCIe_RX2+	PCIe x4 RX2+
29	x4PCIe_TX2-	PCIe x4 TX2-	30	x4PCIe_RX2-	PCIe x4 RX2-
31	GND		32	GND	
33	x4PCIe_TX3+	PCIe x4 TX3+	34	x4PCIe_RX3+	PCIe x4 RX3+
35	x4PCIe_TX3-	PCIe x4 TX3-	36	x4PCIe_RX3-	PCIe x4 RX3-
37	GND		38	GND	
39	PCIe_RESET#		40	PCIE_WAKE#	
41	NC		42	NC	
43	+5V		44	NC	
45	+5V		46	+3.3V	
47	+5V		48	+3.3V	
49	+5V		50	+3.3V	
51	+5V		52	+5VSB	
G1	GND	Central GND Plate	G1	GND	Central GND Plate
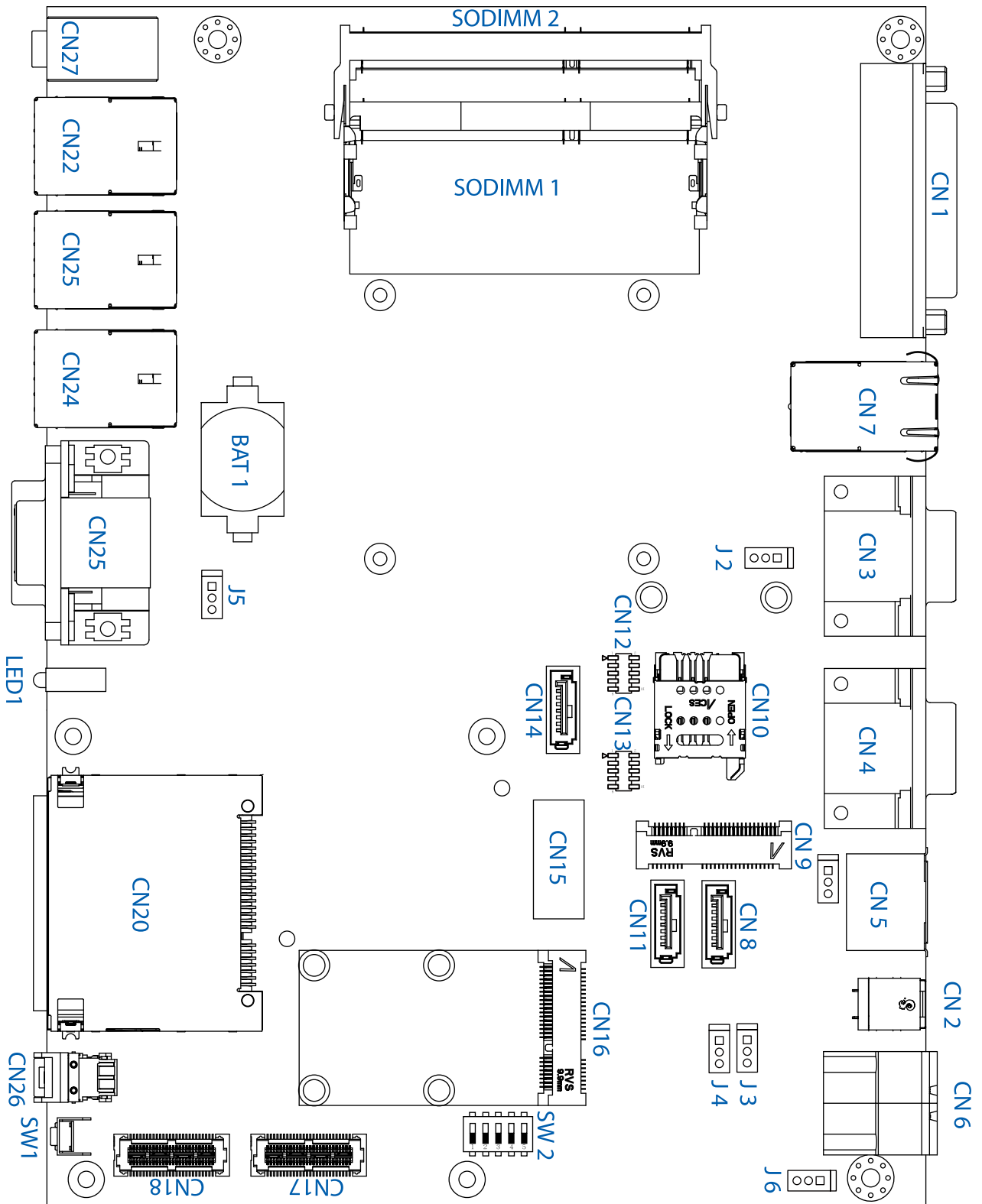
Figure 2.3.1 Internal Connectors and Jumpers

2.4 Install HDD and DDR3 SO-DIMM

When you put the ECS-5600 series upside down, you can see the "pet-door" on the bottom of the chassis. The "pet-door" design allows users to install or replace the memory module and hard drive quickly and easily.


2.4.1 To install a DDR3 SO-DIMM module

Step1.

Put the ECS-5600 series upside down on a flat surface. You can see the "Pet-Door" exposed. Use a Philips screwdriver to loose the M3 flat-head screw on the "Pet-Door".

Step2.

DDR3 SO-DIMM Socket

Remove the "Pet-Door" and you can see a SATA cable and DDR3 SODIMM socket exposed.

Step3.

Tile the SODIMM module and insert it to the SODIMM socket.

As it's firmly contacted with socket connectors, press it down until the clamps of the socket snap into the latching position of SODIMM module.

2.4.2 To install a HDD

Step1.

Put the ECS-5600 series upside down on a flat surface. You can see the "Pet-Door" exposed. Use a Philips screwdriver to loose the M3 flat-head screw on the "Pet-Door".

Step2.

Remove the "Pet-Door" and you can see a SATA cable and DDR3 SODIMM socket exposed.

Step3.
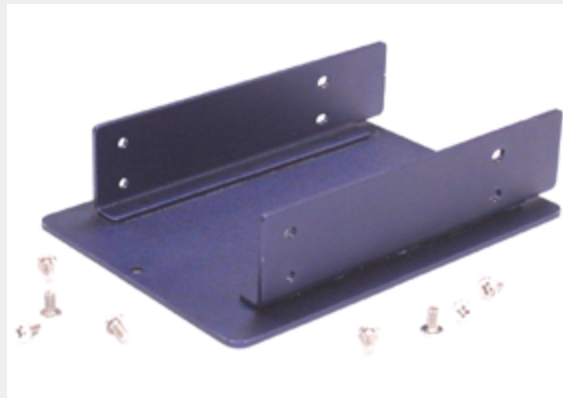
Find the HDD bracket come with "Pet-Door", M3 screws (4 pieces), and HDD thermal pad (1 piece) in the accessory box.

Step4.

Place the HDD into the bracket and gently push it down to make it contact with thermal pad. Use a Philips screwdriver to fix the HDD with M3 screws. Please note that the HDD must be placed in the right direction as below.

Step5.

SATA Connector of HDD

Pull out the SATA cable inside the chassis and connect it to HDD.

Step6.
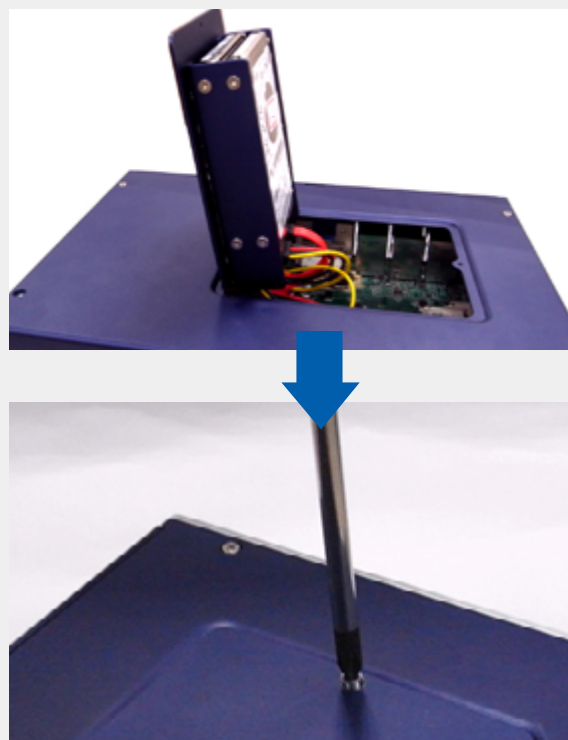
Tilt the HDD assembly and insert the wedge of HDD bracket to the bottom cover.

Once it's firmly wedged, push it down and fix it using a M3 flat-head screw.

2.5 Wall-Mount EC-5500 series

EC-5500 is shipped with wall-mount brackets. You can mount your EC-5500 series on the wall by following the steps listed below.

Step1.

Find your wall-mounts brackets (2 pieces) and M4 screws (4 pieces) in the accessory box.

Step2.

Put the EC-5500 series upside down on a flat surface. 4 screw holes for M4 screws exposed on the bottom cover.

Step3.

Fix two wall-mount brackets to the chassis with four M4 screws using a Philips screwdriver.

Installation Method 1
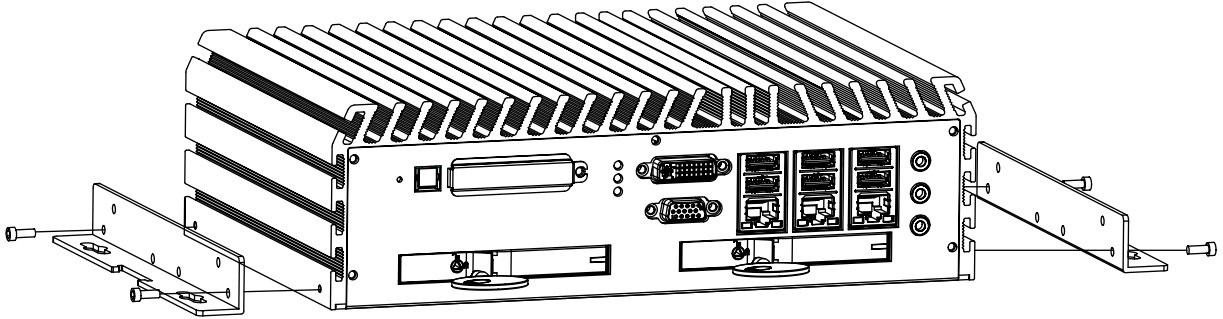
Installation Method 2
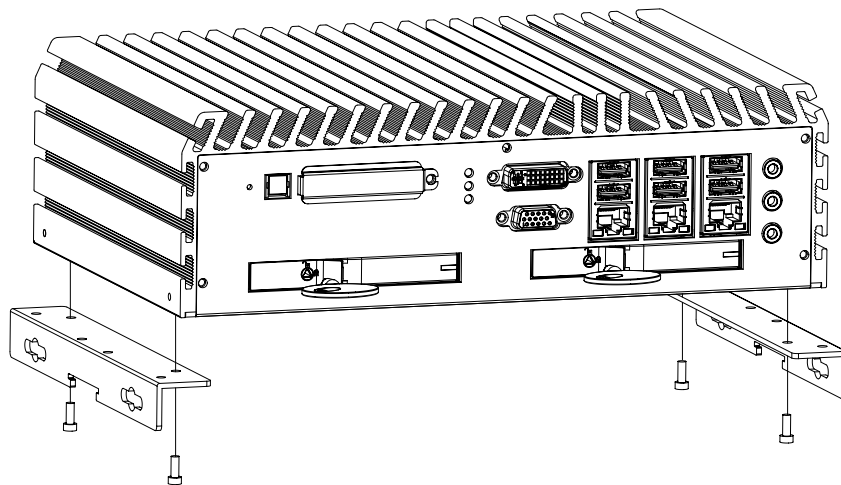
2.6 Power Supply

There are two connectors on the rear panel you can use for DC power input: a 2-pin pluggable terminal block and a DC jack. The 2-pin pluggable terminal block accepts 6~36V DC input and the DC jack also accepts 6~36V DC input.

CAUTION!

Please make sure the voltage of DC power is correct before you connect it to ECS-5600 series. Supplying a voltage over 37V will trigger off self-protection mechanism to refuse incorrect power supply feed into the system. This protection stage ranges from 37V to 60V. If the 37~60V overvoltage spike is in very short time period, it might be clamped to 36V and the system can keep running. If the overvoltage time interval is too long to act like a continuous DC voltage, then the protection mechanism will refuse the power to go into the system, then system will restart. Voltage spike ranges from 60V to 93V will be suppressed to 60V by an earlier protection stage. Please don't supply a continuous voltage over than 60V, and also don't use noisy power supply with voltage spike over than 93V. The recommended nominal supply voltages are 12V, 19V and 24V.

CAUTION!

2.6.1 To connect DC power via the 4-pin pluggable terminal block

Step1.
Make sure the external DC power supply is power off or disconnected before wiring.

Step2.
Locate the 4-pin pluggable terminal block in the accessory box. Note that the terminal block fits the wires with a gauge of 12~24 AWG.

Step3.
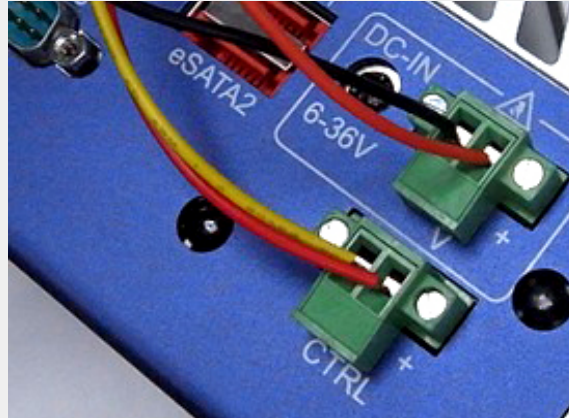
You should use either 2-pin pluggable terminal block or DC jack for DC power input. DO NOT supply power to both connectors at the same time.

Step4.

Insert the wires to correct contacts of pluggable terminal block and tighten clamping screws using a Philips screwdriver.

Step5.
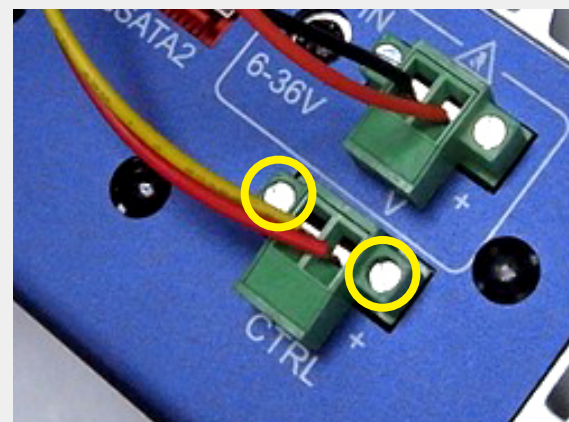
Firmly plug the terminal block into a receptacle on the rear panel, and tighten the captive screws using a Slotted screwdriver.
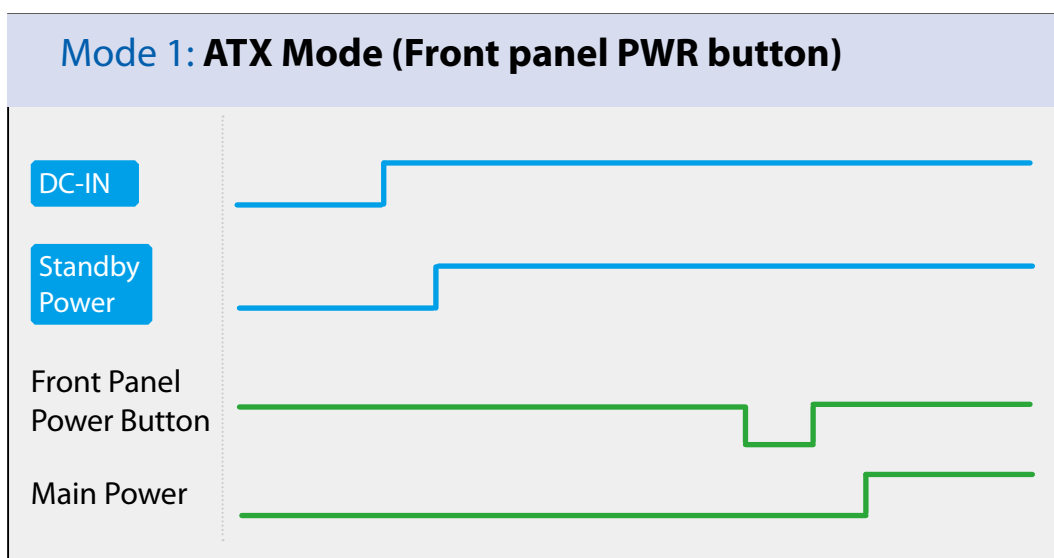
2.7 Power Management & Function Settings

For better operation flexibility, ECS-5600 series supports four alternatives power-on methods as charts shows as follow:

Power-On Mode	J1	J3	J4	J6	CTRL+/-	Function
1	1-2	2-3	2-3	2-3	x	ATX Mode, use front panel Power Button to turn on the system
2	1-2	2-3	2-3	2-3	External Power Button	ATX Mode, use external Power Button to turn on the system
3	1-2	1-2	1-2	1-2	Front panel power button or External power button	MAX Power Saving Mode (ECS-5600-5G, 5GD, 5GDE, 5R, 8R only)
4 Setting by BIOS setup menu	N/C	N/C	N/C	N/C	DC voltage	Power-on after power failiure goes to "Always Power-On" mode

Table 2.8 Power-On Modes

2.7.1 Power-On Modes Behavior

When short the "ctrl+" and "ctrl-" pins, system hardware will generate one pulse of power button. While Windows is runningin, you can active this signal to turn off the system as the graphic 1 shows. And short the "ctrl+" and "ctrl-" pins again to turn onsystem as the graphic 2 shows.

Mode 1: **ATX Mode (Front panel PWR button)**

Mode 2: ATX Mode (External PWR Button)

DC-IN

Standby Power

Ctrl+

Ctrl-

Main Power
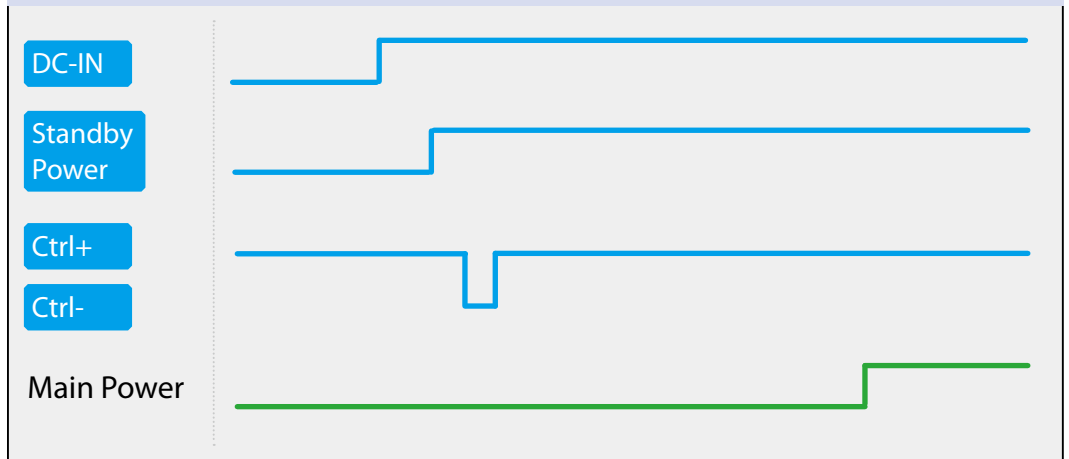
Mode 3: Max. Power Saving Use External Voltage

DC-IN

External Voltage

Standby PWR

Auto PWR on Pulse

5 sec. Delay

Main Power

Mode 4: AT Mode

DC-IN

Standby PWR

Main Power
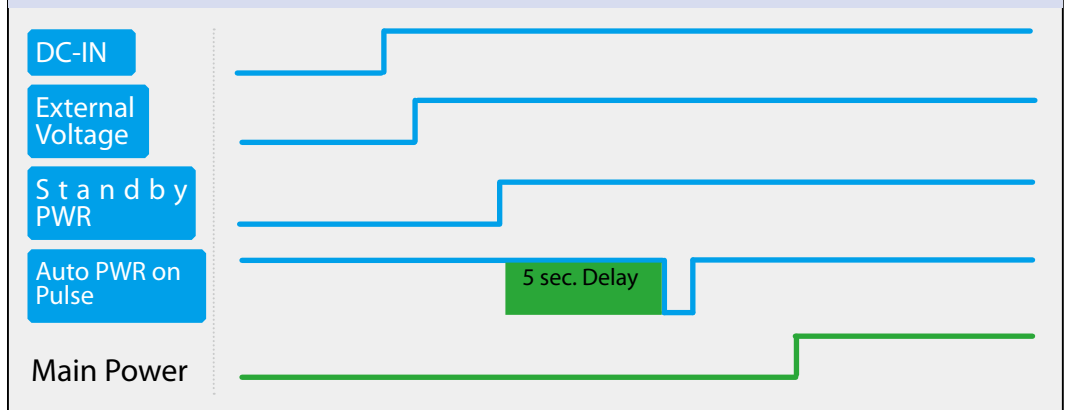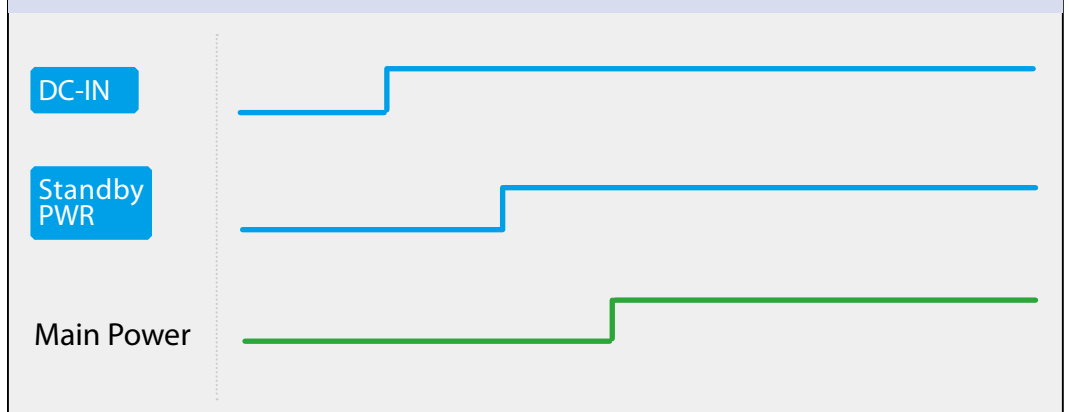
2.7.2 Using the power button on the front panel

This is the simplest way to start ECS-5600 series. The power button on the front panel is a non-latched switch and behaves an ATX-mode on/off control.

As DC power is connected, the system enter S5 state, the orange LED of power button is on, push the power button and then system is on as well as the blue LED of power button is on. The button is also can turn-off the system while the system is under operation.

If your operating system supports ATX power mode (i.e. Microsoft Windows or Linux), push the power button causes a pre-defined system behavior, such as shutdown or hibernation.

2.7.3 Using remote on/off control on the rear panel

In addition to accept DC power (V+, V-), the 4-pin pluggable terminal block provides two pins (Ctrl+, Ctrl-) for behaving AT-mode remote on/off control. Please follow the steps listed below to use the remote on/off control function.

Step1.

When ECS-5600 series boots up, press F2 to enter BIOS setup page.

Step2.

Configure the [Power On after Power Failure] BIOS option as [Always On].

This setting allows the system to turn on after external DC power is connected. Please refer to section 2.6 for the instruction of configuring this option.
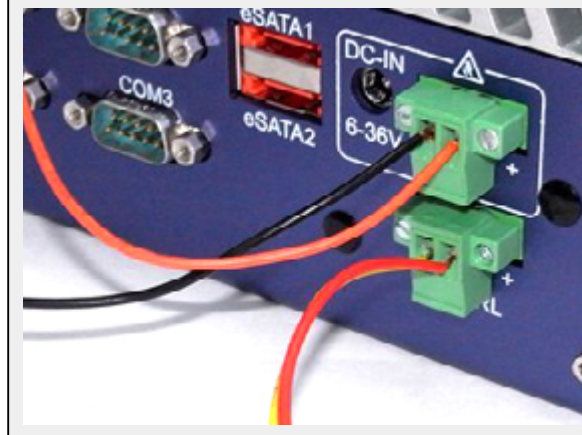
Connect a latched switch to Ctrl+ and Ctrl-. Polarity is negligible.*

*When the latched switch is closed, the DC power is break off and system is turn off. When the latched switch is open, the DC power is feed-in, and, with the correct setting of "Power On after Power Failure" BIOS option, the system is turn on.

2.7.4 Using Wake-on-LAN function

Wake-on-LAN (WOL) is a feature to wake up a computer system from a S3 (standby), S4 (Hibernate) or S5 (system off with standby power) state via issuing Subnet Directed Broadcasts (SDB) or a magic packet. ECS-5600 seires implements the Wake-on-LAN function on the GbE port on the front panel. The rest GbE ports on the rear panel do not support WOL function.

To enable WOL function and power on ECS-5600 series, please follow the steps listed below.
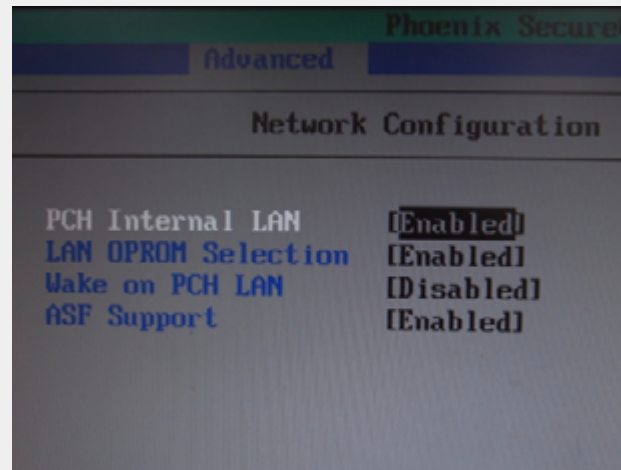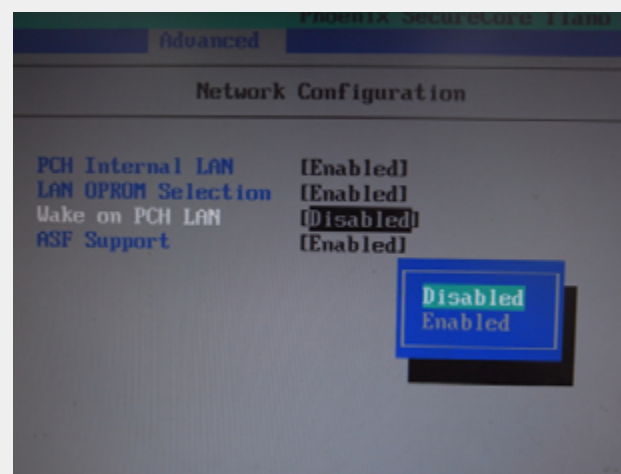
Step1.

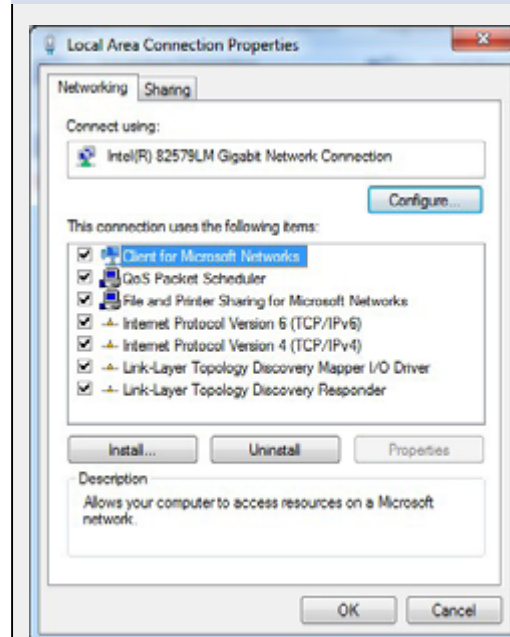When ECS-5600 series boots up, press F2 to enter BIOS setup page.

Step2.

Go to the [Power] BIOS setting menu.

Step3.

Configure the [Wake On LAN] BIOS option as [Enabled]. This setting enables the Wake-on-LAN function for ECS-5600 series. Please refer to section 3 for the instruction of this configuring option.
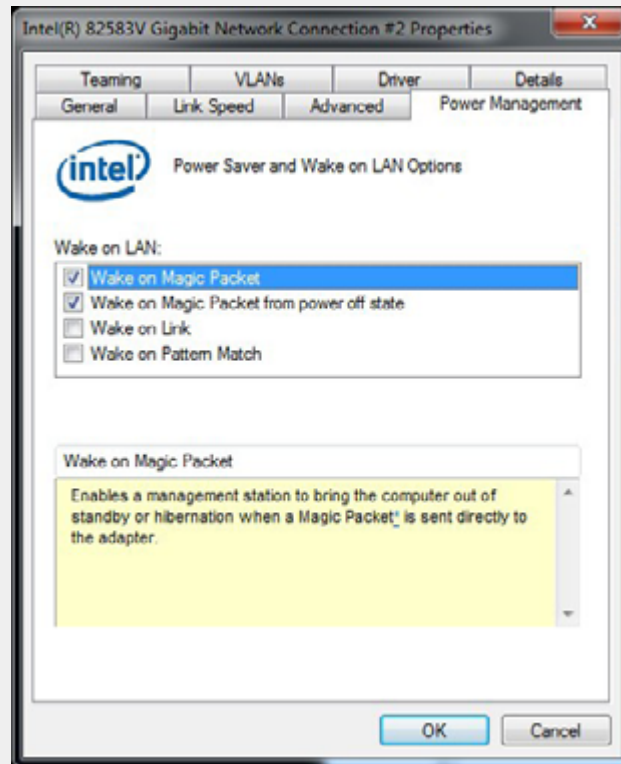
Step4.

In Windows system, identify the Intel® 82574L Gigabit Connection on PCI bus 1, device 0, function 0. This is the GbE port on the front panel.

Step5.

Click the Power Management tag, there are several options for Wake-on-LAN.

- **Wake on Direct Packet**

  ECS-5600 series can wake from S3 or S4 state when receiving a direct packet, such as a ping command from another computer. Please note that the "Wake on Direct Packet" option does not support waking from S5 state.

- **Wake on Magic Packet***

  The ECS-5600 series can wake from S3 or S4 state when receiving a magic packet. The magic packet is a broadcast frame containing anywhere within its payload 6 bytes of all 255 (FF FF FF FF FF FF in hexadecimal), followed by sixteen repetitions of the target computer's 48-bit MAC address. For example, NIC's 48-bit MAC Address is 78h D0h 04h 0Ah 0Bh 0Ch

  DESTINATION SOURCE MISC
  FF FF FF FF FF FF
  78 D0 04 0A 0B 0C 78 D0 04 0A 0B 0C
  78 D0 04 0A 0B 0C 78 D0 04 0A 0B 0C
  78 D0 04 0A 0B 0C 78 D0 04 0A 0B 0C
  78 D0 04 0A 0B 0C 78 D0 04 0A 0B 0C
  78 D0 04 0A 0B 0C 78 D0 04 0A 0B 0C
  78 D0 04 0A 0B 0C 78 D0 04 0A 0B 0C
  78 D0 04 0A 0B 0C 78 D0 04 0A 0B 0C
  78 D0 04 0A 0B 0C 78 D0 04 0A 0B 0C
  MISC   CRC

  *There are some free tools available on Internet that can be used to send a magic packet. Please refer to the following link to understand more about Magic Packet.
  http://en.wikipedia.org/wiki/Wake-on-LAN

- **Wake on Magic Packet from power off state**

  When checking this option, ECS-5600 series can wake from S5 (system off with standby power) state when receiving a magic packet.

3

BIOS Settings

ECS-5600 series is shipped with factory-default BIOS settings cautiously programmed for best performance and compatibility. In this section, we'll introduce some of BIOS settings you may need to modify. Please always make sure you understand the effect of change before you proceed with any modification.

3.1 Main Menu
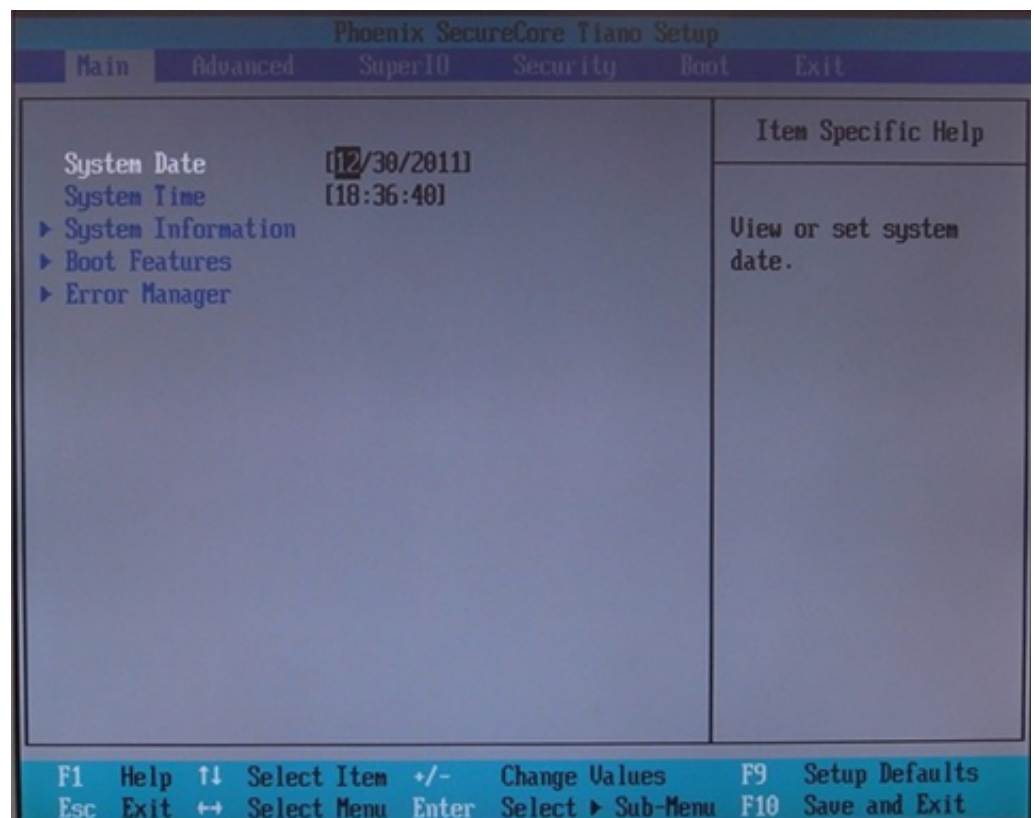
- Set system Time and Date
  Shows current time and date. You can change the value using [Up] key or [Down] key , then press [Enter] key to save and move to next field. Press [Tab] key or [Shift]+[Tab] keys that make next value and previous value.
  Date format --> MM/DD/YYYY
  Time format --> HH:MM:SS (24-hour format)

- BIOS information
  Showa the hardware information and BIOS code information.

3.2 Advanced BIOS Features
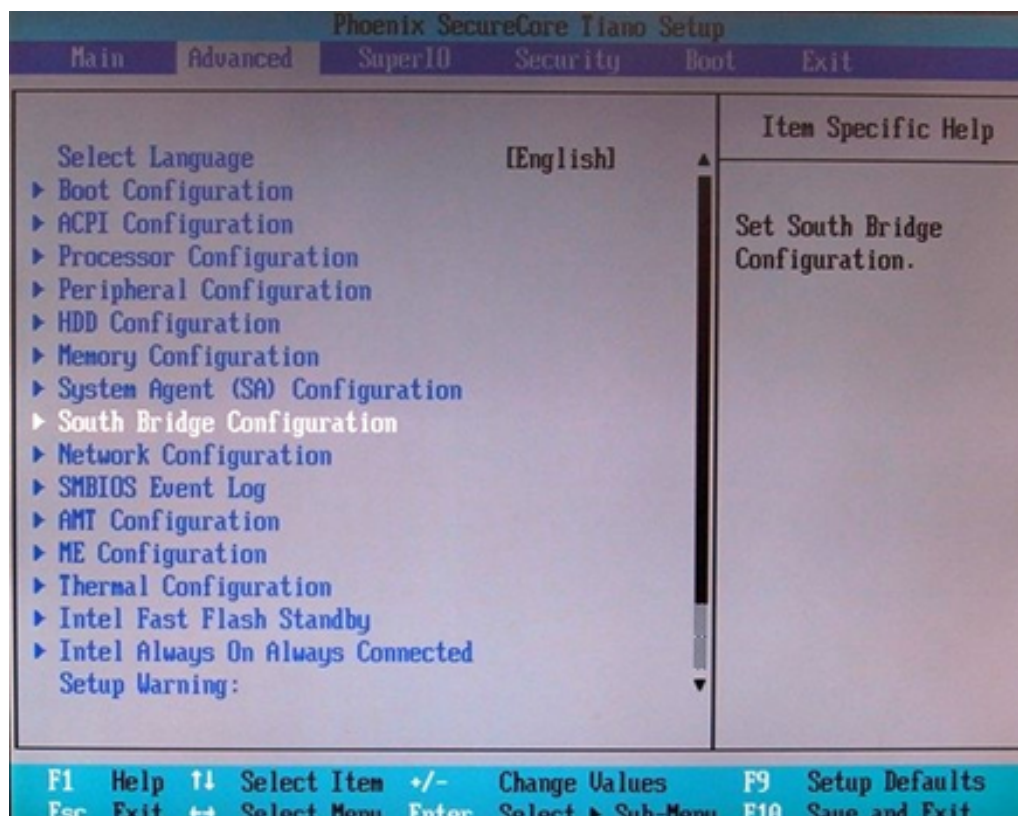
3.2.1 Select Languages
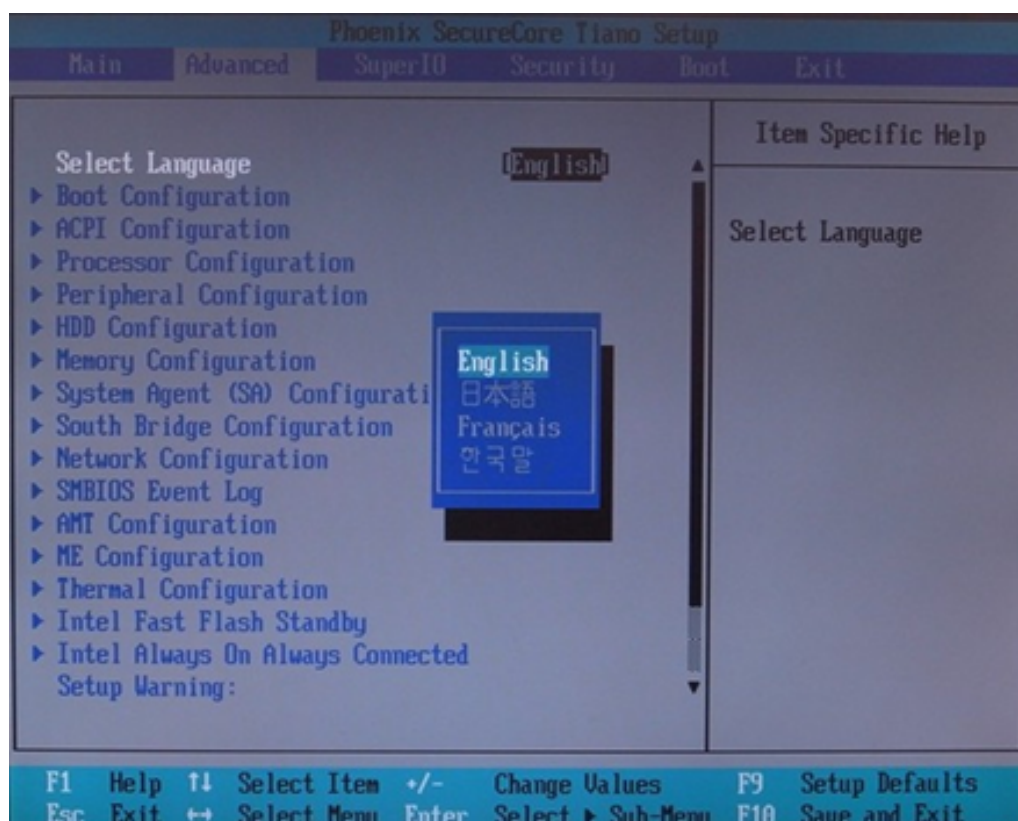
3.2.2 Boot Configurations

Phoenix SecureCore Tiano Setup

Advanced

| Boot Configuration		Item Specific Help
High Resolution Graphics	[Enabled]	Enable/Disable high
BIOS Level USB	[Enabled]	resolution graphics
USB Legacy	[Enabled]	mode.
Console Redirection	[Disabled]	
UEFI Boot	[Enabled]	
Legacy Boot	[Enabled]	
Boot in Legacy Video Mode	[Disabled]	

F1   Help ↑↓ Select Item +/-   Change Values   F9   Setup Defaults
Esc Exit ↔   Select Menu Enter Select ▶ Sub-Menu F10 Save and Exit

3.2.3 ACPI Configurations

Phoenix SecureCore Tiano Setup

Advanced

ACPI Configuration		Item Specific Help
FACP - RTC S4 Flag Value	[Enabled]	Valid Only for ACPI.
APIC - IO APIC Mode	[Enabled]	Controls the value
ALS Support	[Legacy]	for the RTC S4 flag
EMA Support	[Disabled]	in the FACP table.
MEF Support	[Disabled]	
Enabled PTID	[Disabled]	
FACP - PM Timer Flag Value	[Disabled]	

F1   Help ↑↓ Select Item +/-   Change Values   F9   Setup Defaults
Esc Exit ↔   Select Menu Enter Select ▶ Sub-Menu F10 Save and Exit

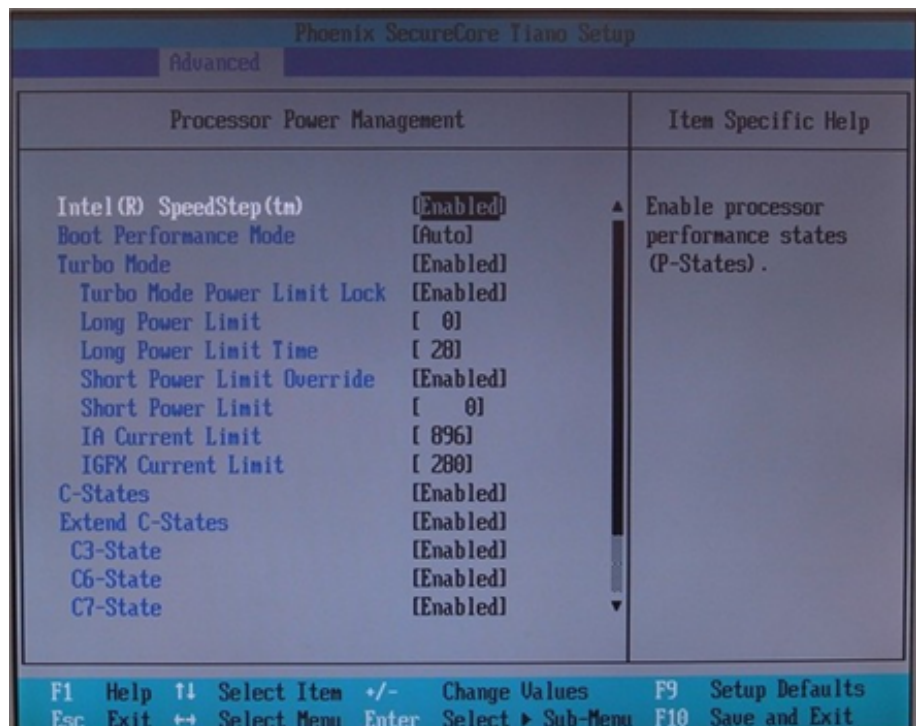## 3.2.4 Processor Configurations
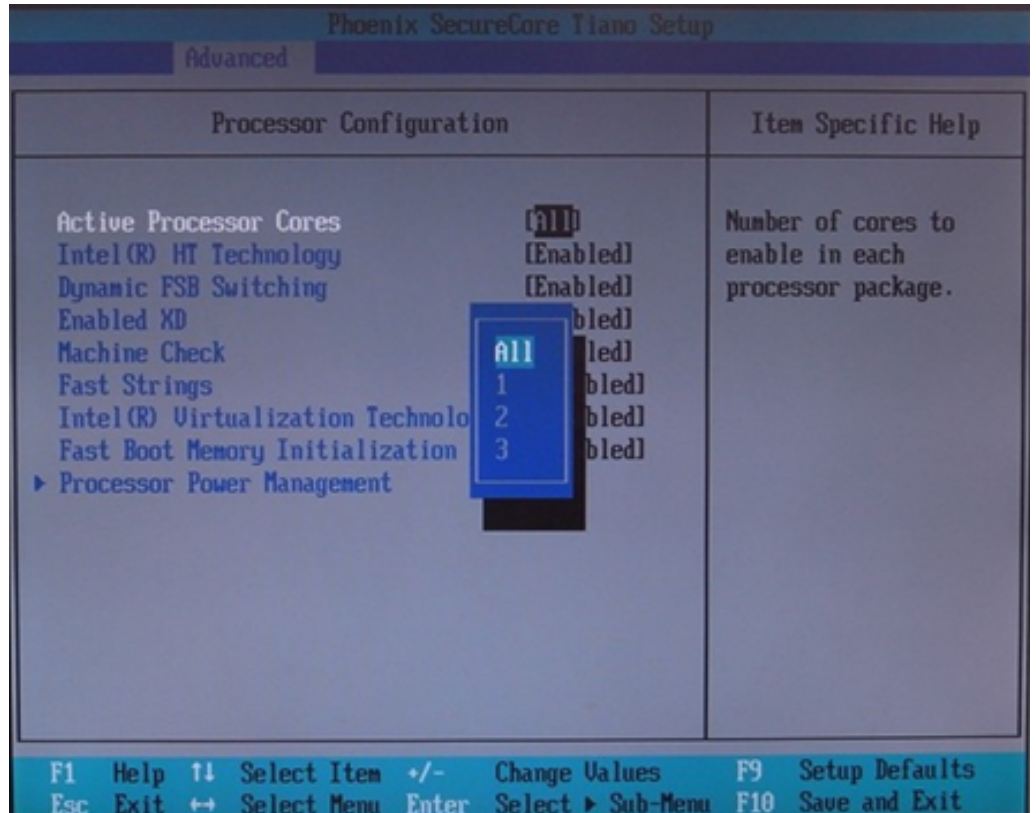
Active Processor Cores
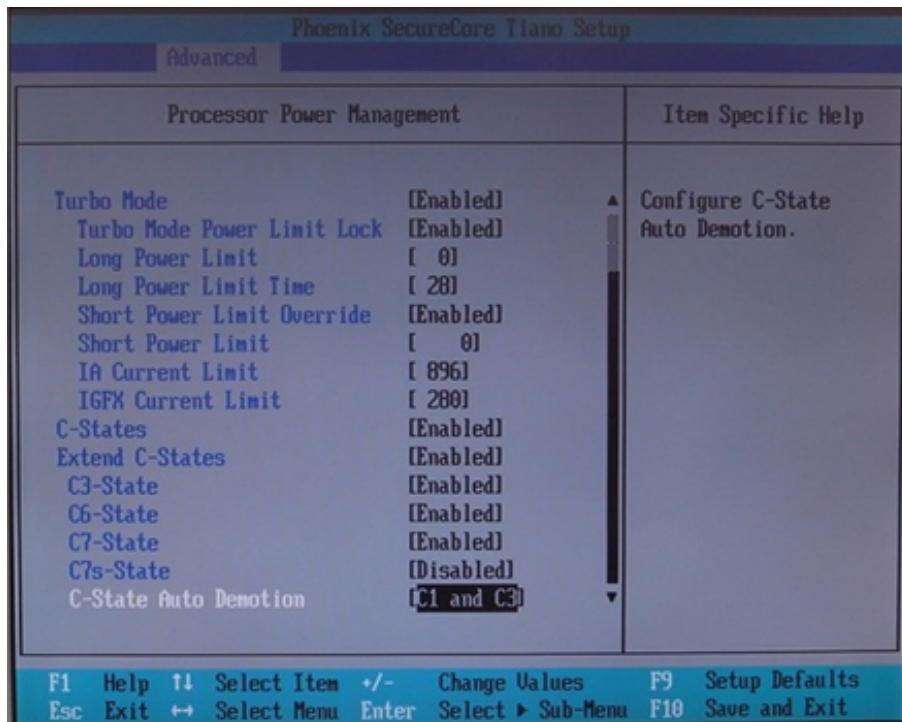Select how may CPU Core you would like to active.
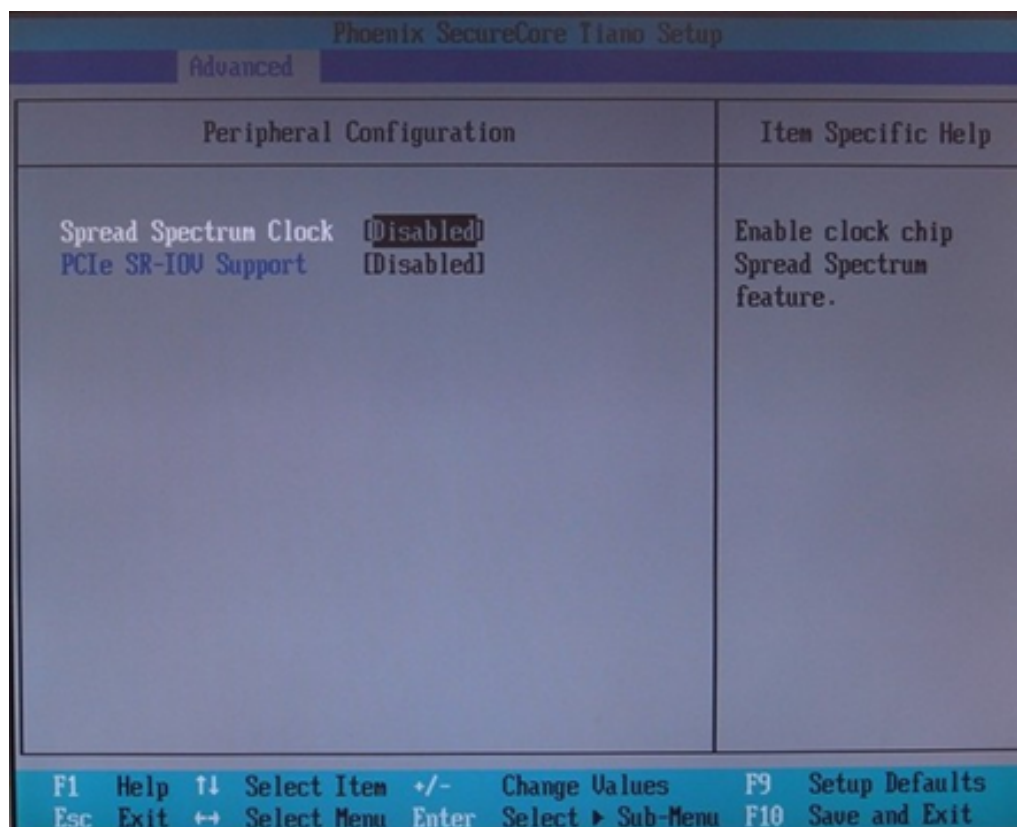When select 'ALL', BIOS will active max number of CPU cores for system.

- **Processor Power Management**

3.2.5 Peripheral Configurations

3.2.6 HDD Configurations
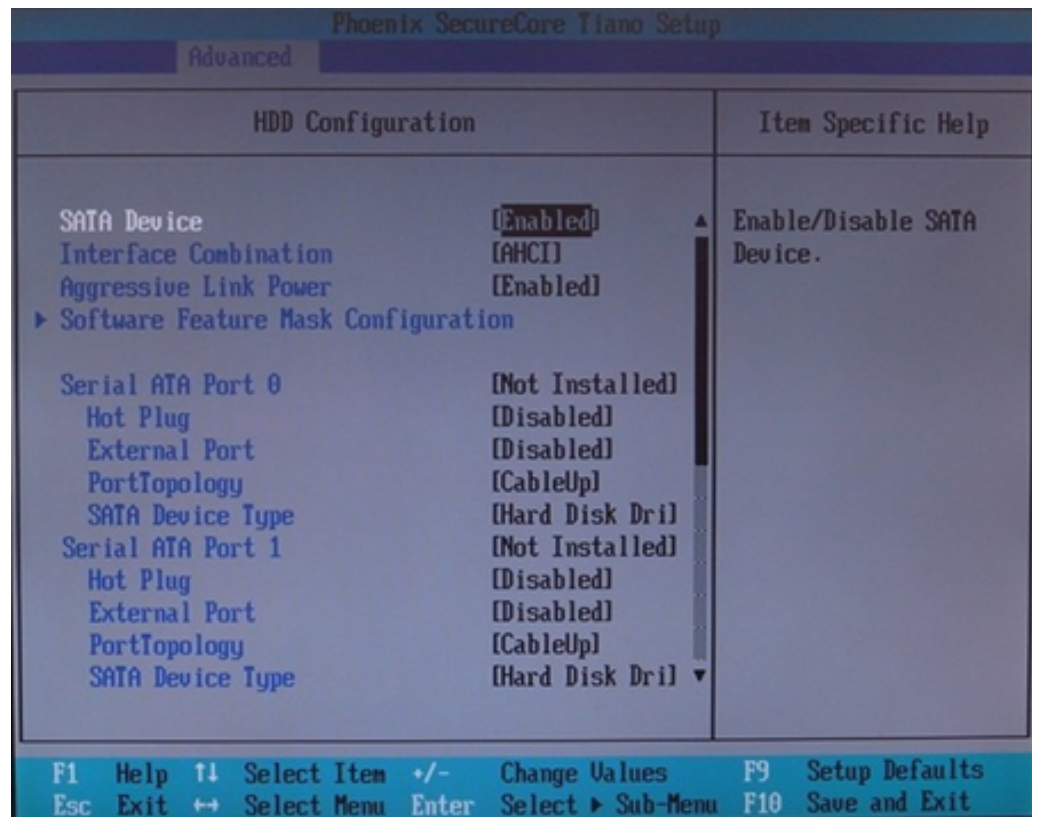
- **SATA Device**
  Enable or disable the SATA controller.

- **Interface Combination**
  IDE , AHCI , RAID

- **Aggressive Link Power (Remove, should be check)**
  Software Feature Mask Configuration (Remove, should be check)

- **Serial ATA Port 0/1/2 , Serial ATA 3/4 is ESATA port , CFast Port**
  Select how may CPU Core you would like to active.

- **Hot Plug**
  Enable this SATA port support Hot-Plug function.

- **Interlock Switch ON/OFF (Remove, should be check)**

- **External Port –ON/OFF (Remove, should be check)**

- **PortTopology –CableUp/DirectConnect (Remove, should be check)**

- **SATA Device Type – HardDisk/SSD (Remove, should be check)**

3.2.7 Memory Configurations
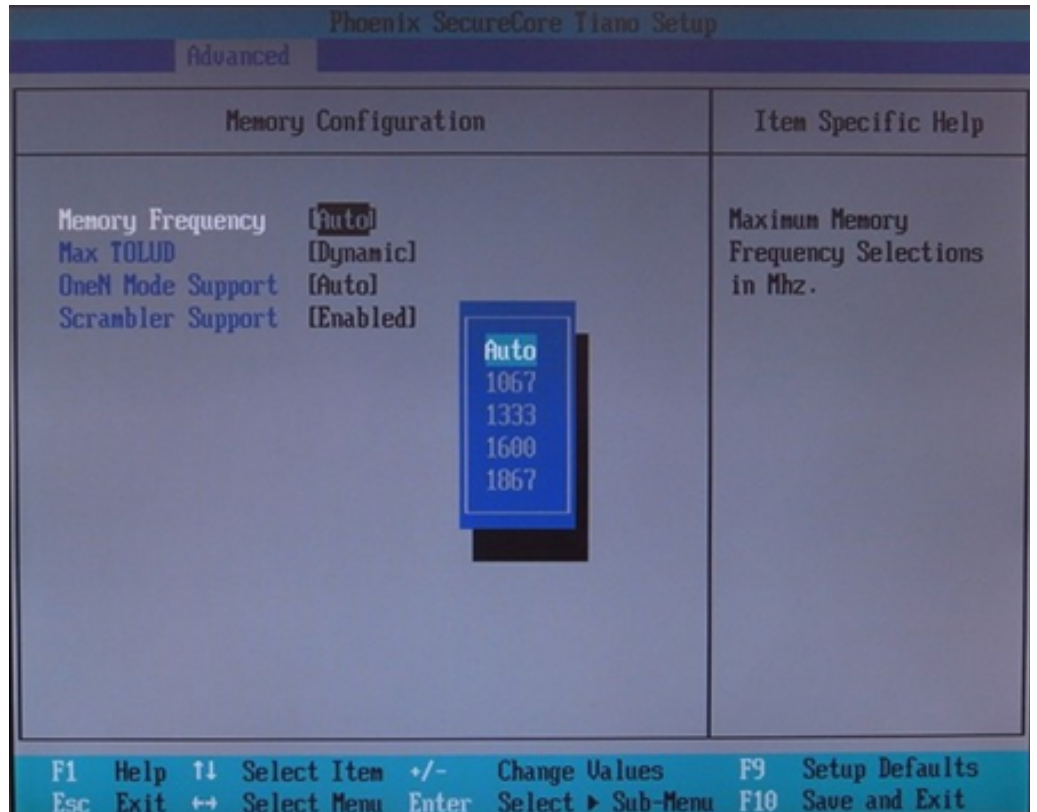
Memory Frequency

System will detect the DRAM type that you use on DIMM1/2 slot.You can select the DRAM to match it, Normally , we recommend set as 'AUTO'.

3.2.8 System Agent (SA) Configurations
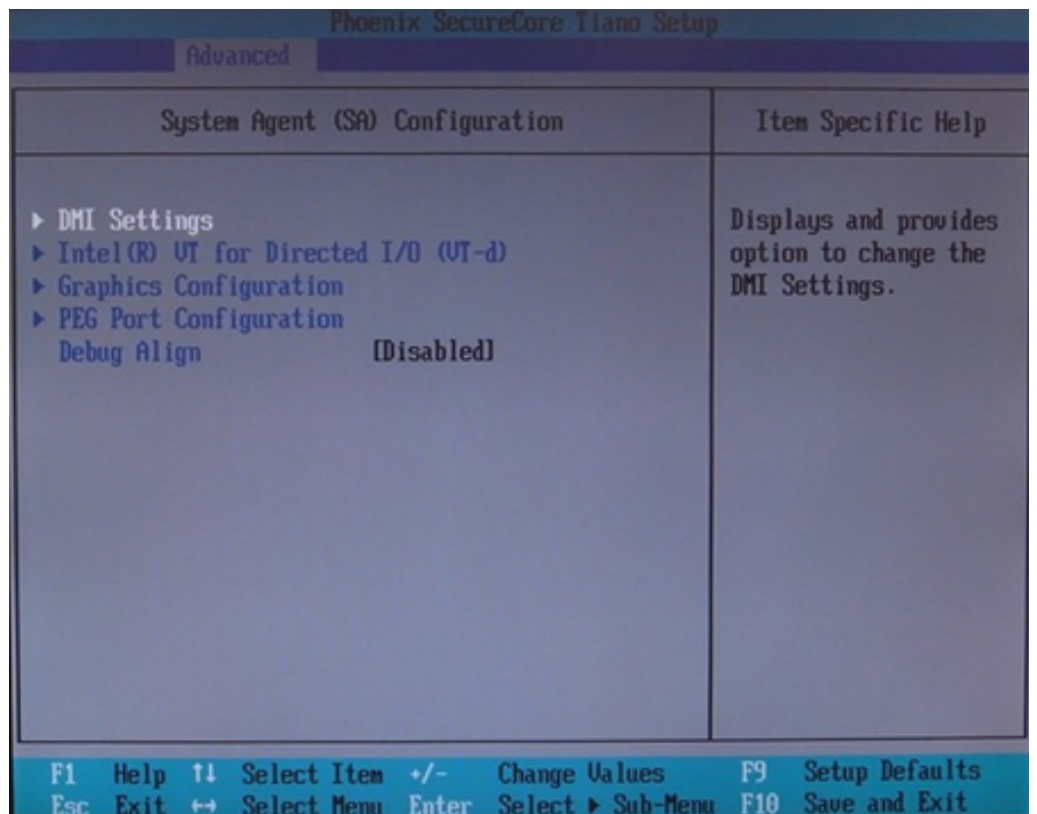
DMI Settings
Enable or disable the DMI control

Intel(R) VT for Directed I/O (VT-d)
Enable or disable Intel Virtualization Technology for Directed I/O(VT-d)

Graphics Configuration (Remove, should be check)
PEG Port Configuration (Remove, should be check)
Debug Aligs (Remove, should be check)

3.2.9 South Bridge Configurations
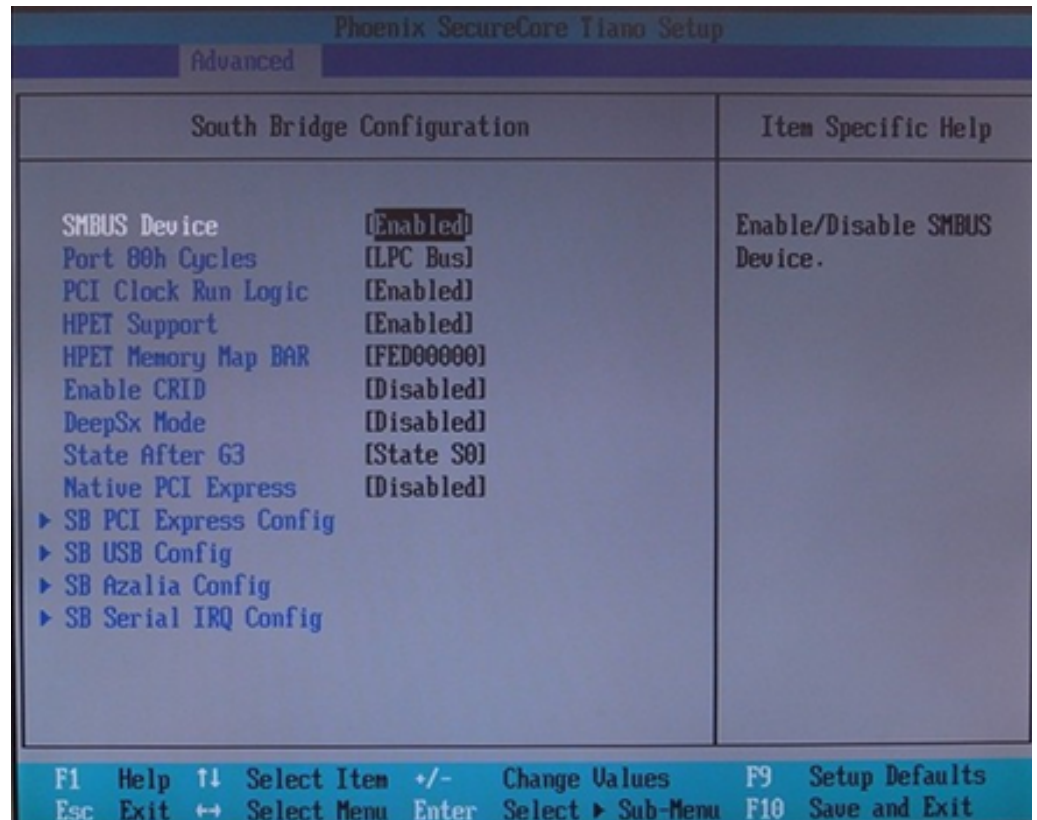
SMBUS Devuce
Enable or disable the DMI control

Port 80h Cycles
Enable or disable the DMI control

PCI Clock Run Logic
Enable or disable the DMI control

HPET Support
Enable or disable the DMI control

HPET Memory MAP Bar
Enable or disable the DMI control

Enable CRID
Enable or disable the DMI control

DeepSx Mode
Enable or disable the DMI control

State After G3
Enable or disable the DMI control

Native PCI Express
Enable or disable the DMI control

SB PCI Express Config

SB USB Config
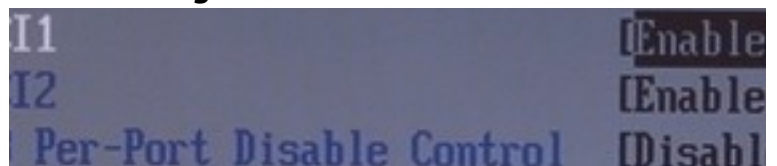
SB Azalia Config
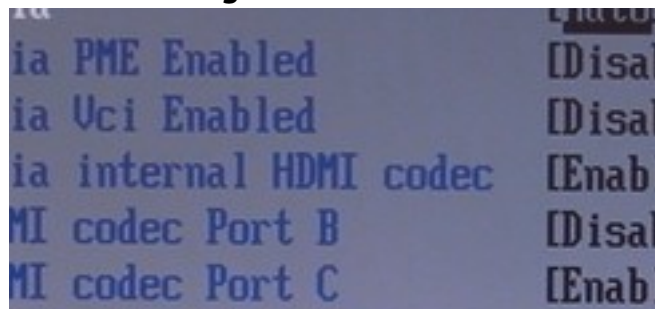
SB Serial IRQ Config
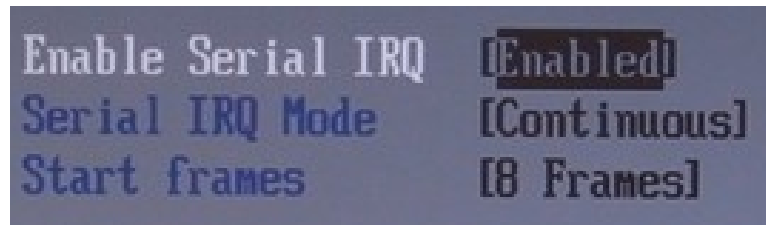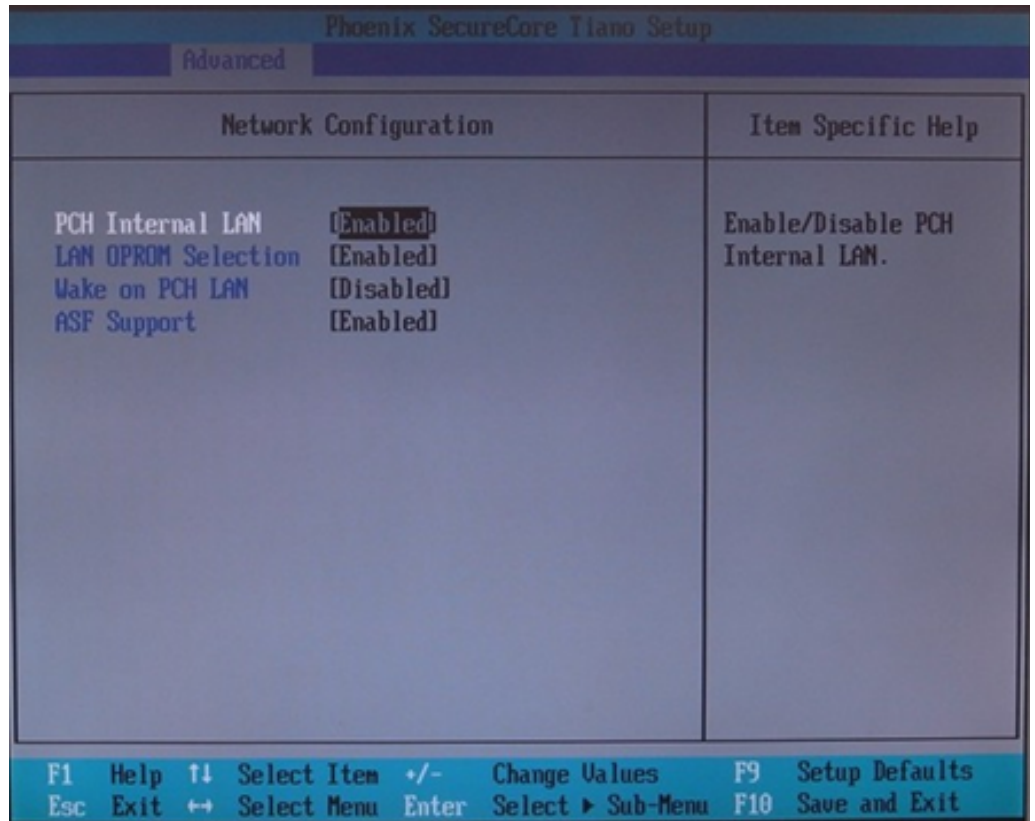
```
Enable Serial IRQ      [Enabled]
Serial IRQ Mode        [Continuous]
Start frames           [8 Frames]
```

3.2.10 Network Configurations

```
                  Phoenix SecureCore Tiano Setup
       Advanced

          Network Configuration              Item Specific Help

    PCH Internal LAN      [Enabled]         Enable/Disable PCH
    LAN OPROM Selection   [Enabled]         Internal LAN.
    Wake on PCH LAN       [Disabled]
    ASF Support           [Enabled]

 F1   Help  ↑↓ Select Item  +/-   Change Values    F9   Setup Defaults
 Esc  Exit  ↔  Select Menu  Enter Select ▶ Sub-Menu F10  Save and Exit
```
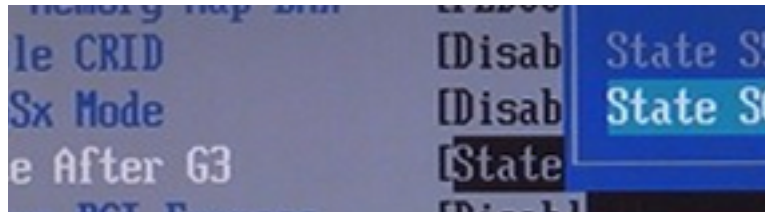
Serial ATA Port 0/1/2 , Serial ATA 3/4 is ESATA port , CFast Port
Select how may CPU Core you would like to active.

PXE Boot
Once you enable the LAN OPROM.. You should select the Boot Priority on BOOT Menu

```
Boot Priority Order
   1.  USB HDD:
   2.  USB CD:
   3.  USB FDD:
   4.  ATAPI CD:
   5.  ATA HDD0:
   6.  ATA HDD1:
   7.  ATA HDD2:
   8.  ATA HDD3:
   9.  ATA HDD4:
  10.  ATA HDD5: MRCAJ5B016GC1CAC00
  11.  Other HDD:
  12.  Internal Shell
  13.  PCI LAN: IBA GE Slot 00C8 v1360
```

3.2.11 SMBIOS Event Log

```
                  Phoenix SecureCore Tiano Setup
        Advanced

              SMBIOS Event Log                    Item Specific Help

   Event Log Validity        Valid              Enable/Disable Event
   Event Log Capacity        Space Available    Log.

   Event Log                 [Enabled]
   View SMBIOS event log     [Enter]

   Mark SMBIOS events as read [Enter]
   Clears SMBIOS events       [Enter]




   F1   Help   ↑↓  Select Item  +/-    Change Values    F9   Setup Defaults
   Esc  Exit   ↔   Select Menu   Enter  Select ▶ Sub-Menu  F10  Save and Exit
```

3.2.12 AMT Configurations

```
                  Phoenix SecureCore Tiano Setup
        Advanced

              AMT Configuration                  Item Specific Help

   Intel AMT                      [Enabled]  ▲   Enable/Disable Intel
   Intel AMT Hot Key              [Enabled]      (R) Active Management
   Intel AMT SPI Protected        [Disabled]     Technology BIOS
   Intel AMT Password Write       [Enabled]      Extension.
   AMT Wait Timer                 [  5]          Note : iAMT H/W is
   Activate Remote Assistance Process [Disabled] always enabled.
   Un-Configure ME                [Disabled]     This option just
   Hide Un-Configure ME Confirmation [Disabled]  controls the BIOS
   MEBx Debug Message output      [Disabled]     extension execution.
   MEBx Verbose Output            [Enabled]      If enabled this
   USB Provision                  [Disabled]     requires additional
   PET Progress                   [Enabled]      firmware in the SPI
   AMT CIRA Timeout               [  1]          device
   Watchdog                       [Disabled]
   OS Timer                       [  1]      ▼

   F1   Help   ↑↓  Select Item  +/-    Change Values    F9   Setup Defaults
   Esc  Exit   ↔   Select Menu   Enter  Select ▶ Sub-Menu  F10  Save and Exit
```

3.2.13 ME Configurations

```
                    Phoenix SecureCore Tiano Setup
          Advanced

              ME Configuration                    Item Specific Help

  ME FW Version  7.1.20.1119                    Configure Management
  ME Firmware    Intel(R)ME 5MB firmware        Engine Technology
  Intel ME       [Enabled]                      Parameters




  F1   Help  ↑↓  Select Item  +/-    Change Values    F9   Setup Defaults
  Esc  Exit  ↔   Select Menu  Enter  Select ▶ Sub-Menu F10  Save and Exit
```

3.2.14 Thermal Configurations

```
                    Phoenix SecureCore Tiano Setup
          Advanced

              Thermal Configuration             Item Specific Help

  ▶ CPU Thermal Configuration                   CPU Thermal
  ▶ Platform Thermal Configuration              Configuration Submenu.




  F1   Help  ↑↓  Select Item  +/-    Change Values    F9   Setup Defaults
  Esc  Exit  ↔   Select Menu  Enter  Select ▶ Sub-Menu F10  Save and Exit
```
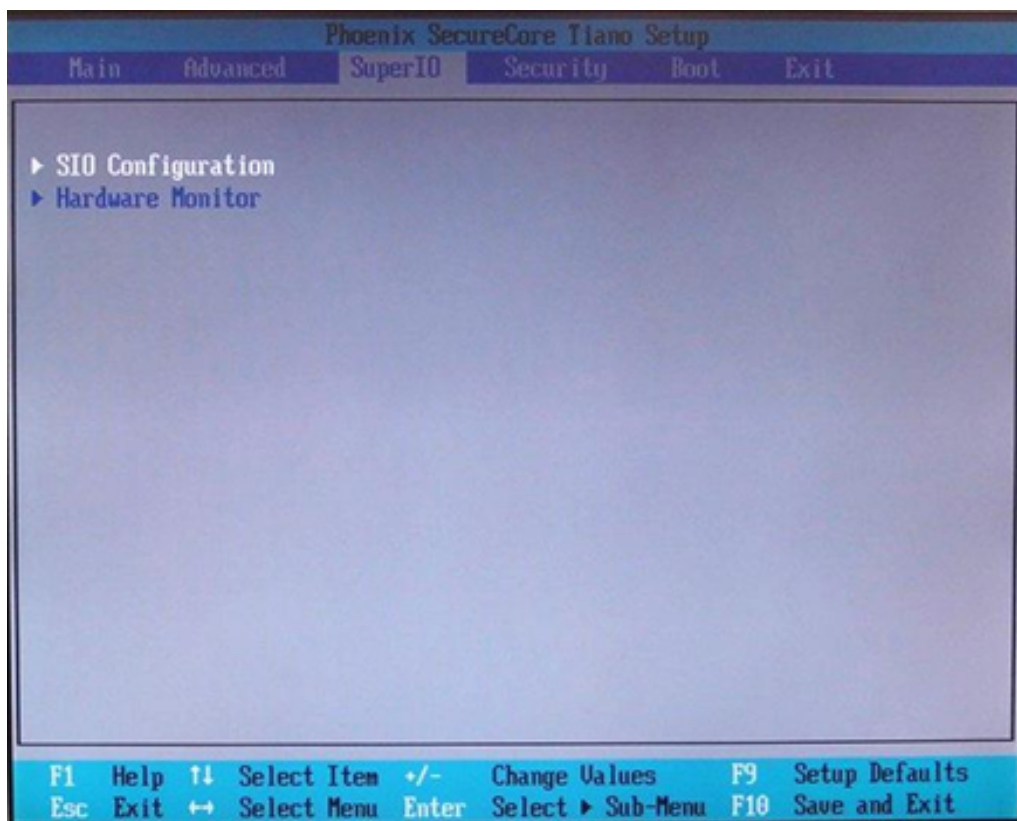
3.2.15 Intel Fast Flash Standby
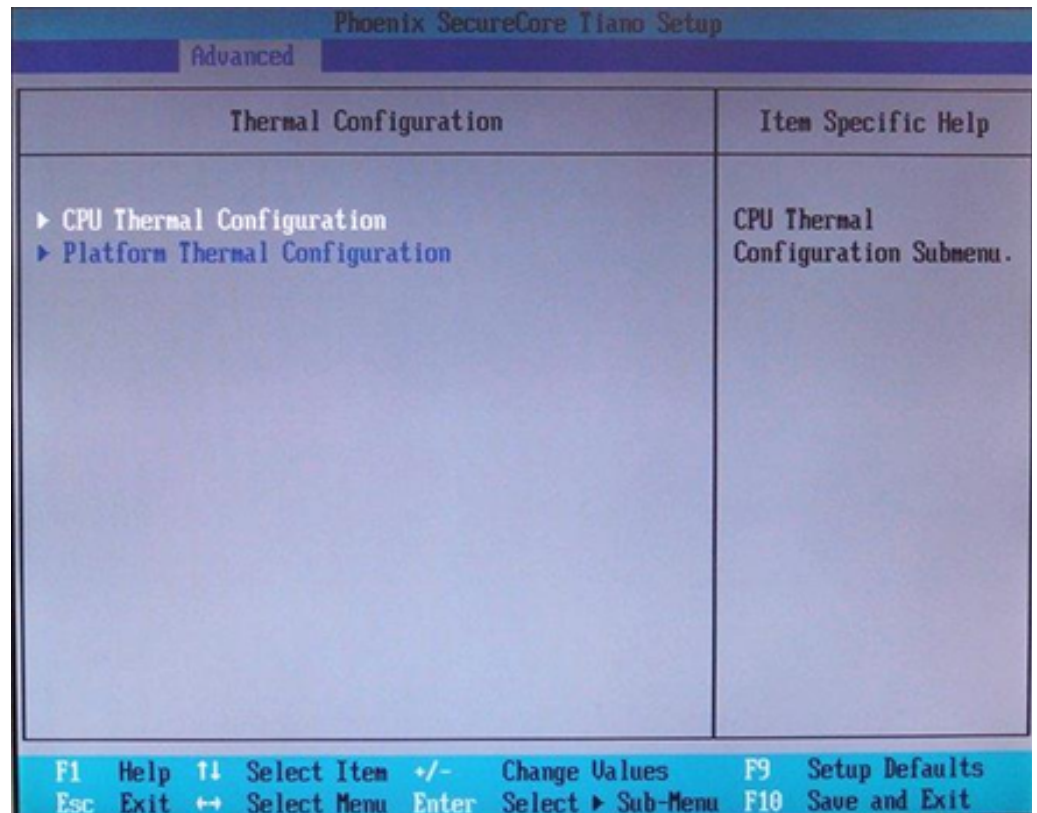
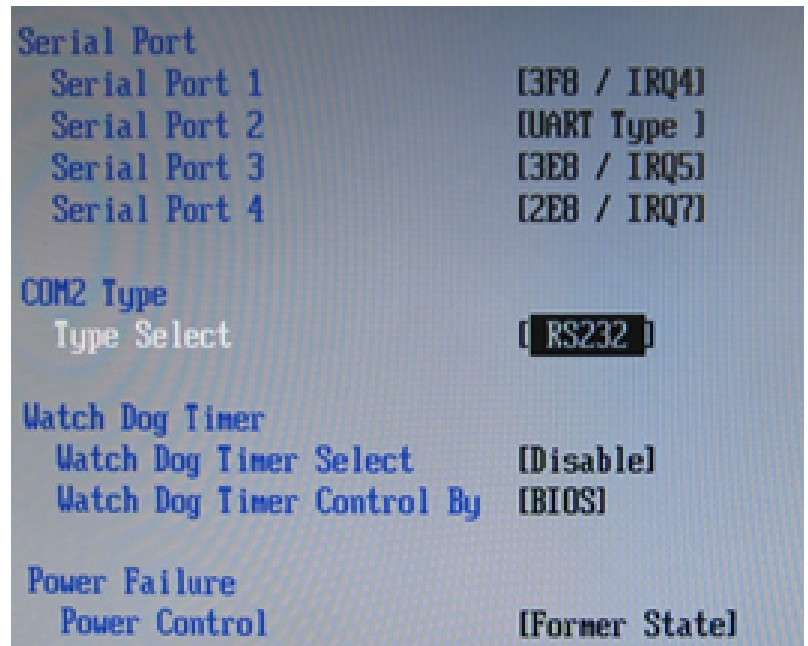### 3.2.16 Intel Always On Connected
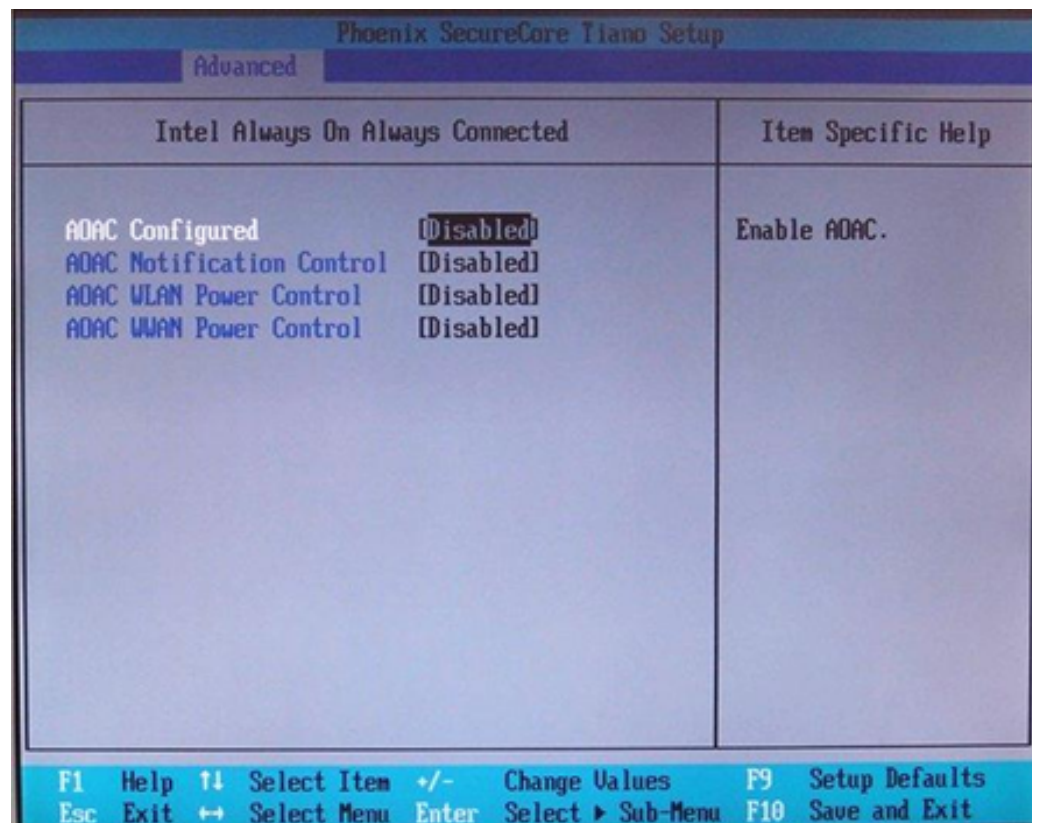
3.3 Super IO

## 3.3.1 SIO Configurations

Serial Port 1/2/3/4 ,

The IO base address and IRQ could be specified for each serial port. The Serial Port 2 (COM2) could be configured as RS-232/RS-422/RS-485 through BIOS settings as the figures below. Select UART Type for Serial Port 2.
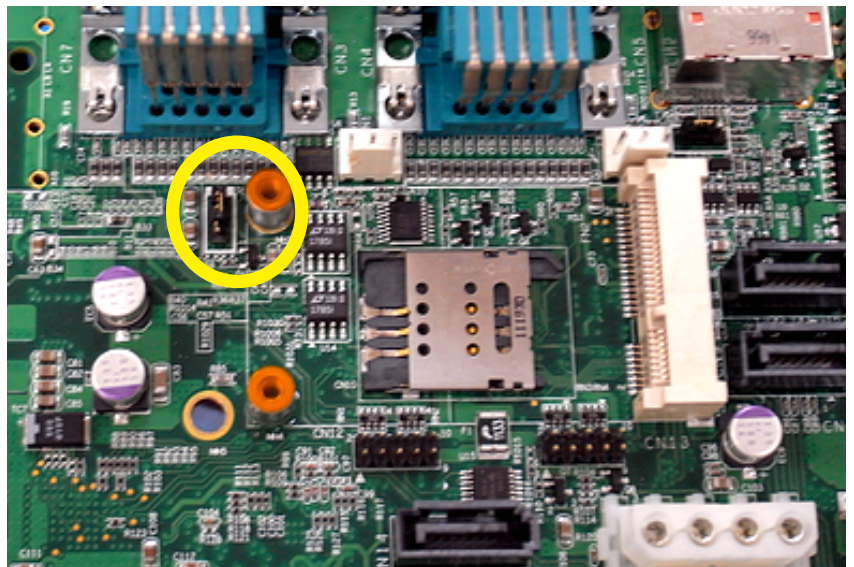
The configurable options for COM2 will be shown as the figure below.

Press enter for the selecting the UART type of the COM2.
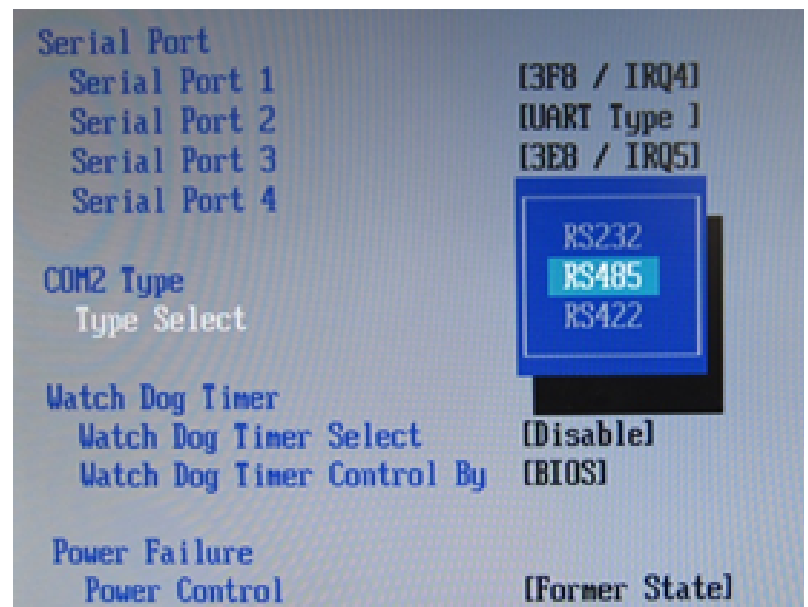
Watchdog Timer

Watchdog timer is a hardware mechanism to reset the system in case the operating system or an application halts. After starting watchdog timer, you need to periodically reset the watchdog timer in the application before the timer expires. Once watchdog timer expires, hardware would auto-generated a reset pulse to reset the system. When you application still running , you should clear or write the WDT timer value, the WDT hardware will re-start again.
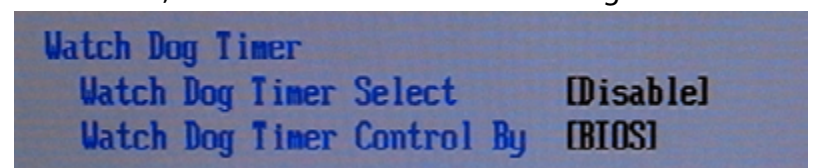
Watch Dog Timer Select : Select the time of tick for Watch dog timer.
[Disable] : Close watch dog timer function.
[20 secs] : When system no response within 20 sec., system will auto reset.
[40 secs] : When system no response within 40 sec., system will auto reset.
[1 mins] : When system no response within 1 mins , system will auto reset.
[2 mins] : When system no response within 2 mins , system will auto reset.
[3 mins] : When system no response within 3 mins , system will auto reset.

Watch Dog Timer Control By : Choice the WDT hardware control side
[BIOS] : WDT setting by Watch Dog Timer
[OS] : WDT setting by Watch Dog Timer. If into OS , the WDT function will automatically stop.

Power Failure : Once you remove the POWER source what is not in shutdown status, you can define the operation when you connect to the power again.
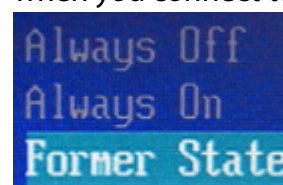
**Power Control:** Define the power operation when connect the power source.

[Always OFF] : System will into Standby mode when power source connect.
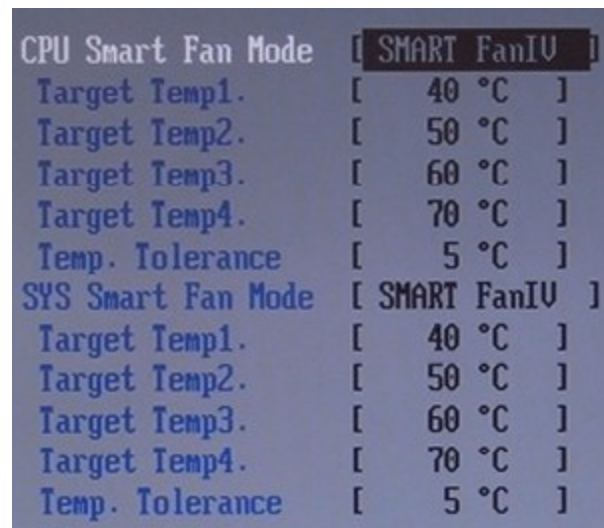[Always ON] : System will auto power-on when power source connect reset.
[Former State] :
- The Power operation depending on the last system power state.
- If power state is SB mode of last time loss the power , system will into SB mode.
- If power state is power-ON of last time loss the power , system will auto power-on.

3.3.2 Hardware Monitor
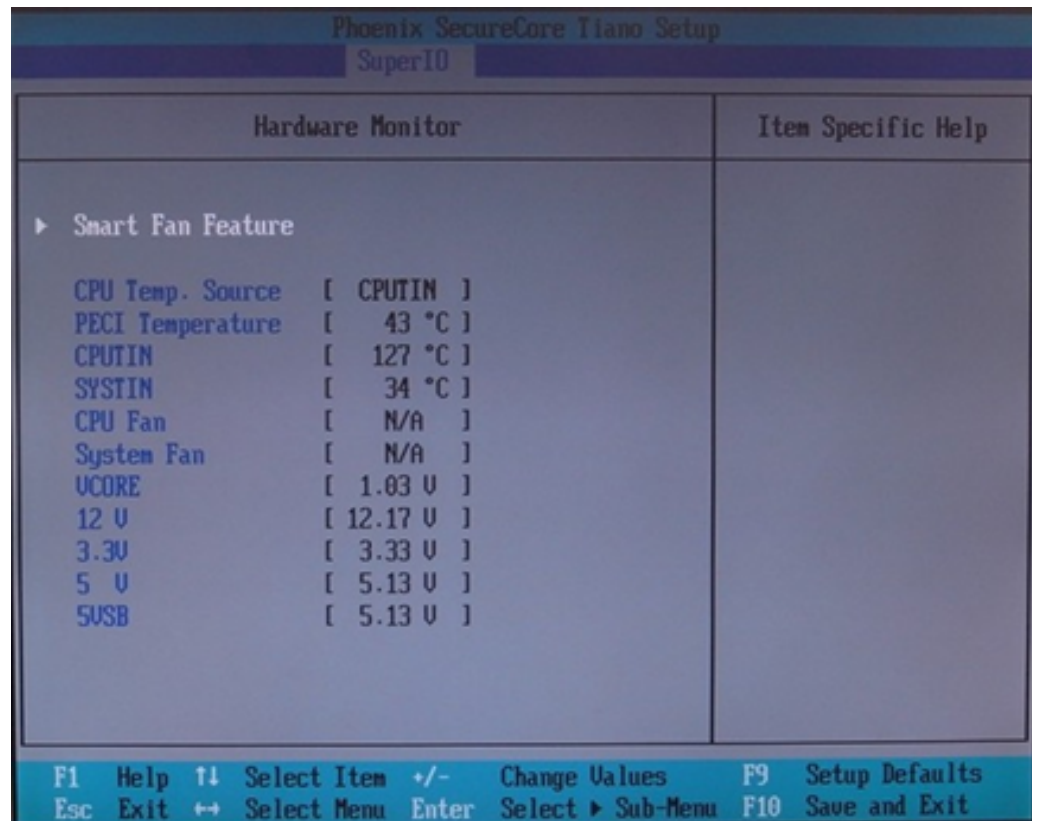
Smart Fan

CPU Temp. Source
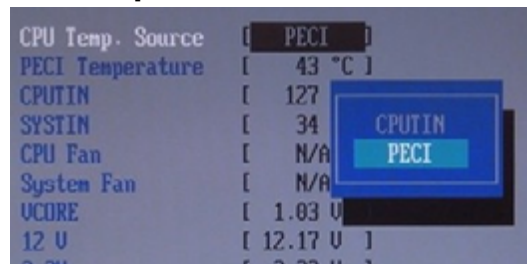
3.4 Security

3.4.1 Set Supervisor Password
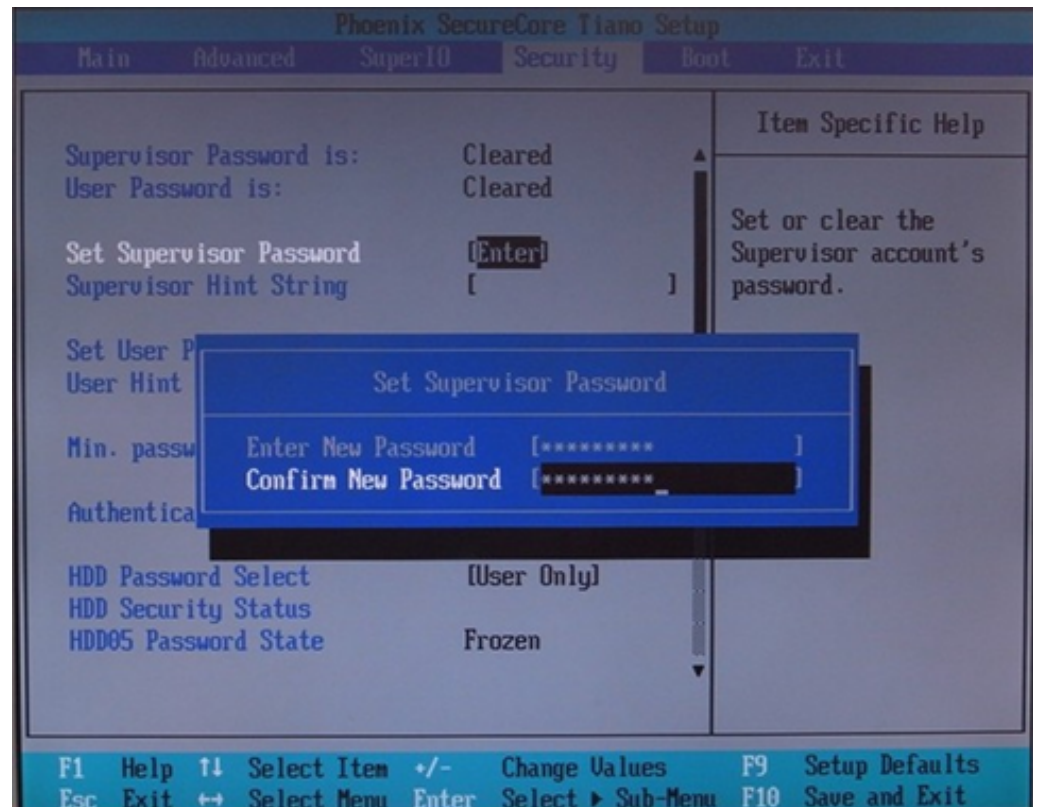
Setting the password for entering the BIOS menu. You must type in twice the same password when setting the password in the first time.

3.4.2 Clear Supervisor Password
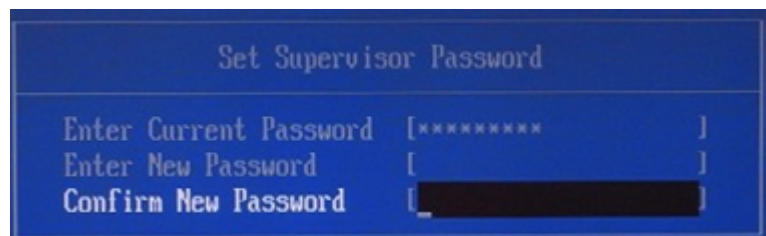
Please enter the supervisor password again for verify. Please keep the "Enter New Password" and "Confirm New Password" blank, and then save. There is no supervisor password anymore. After successfully clear the password, you should type the password when you enter BIOS next time.

3.5 Load BIOS Default

3.5.1 Load BIOS Default Setting
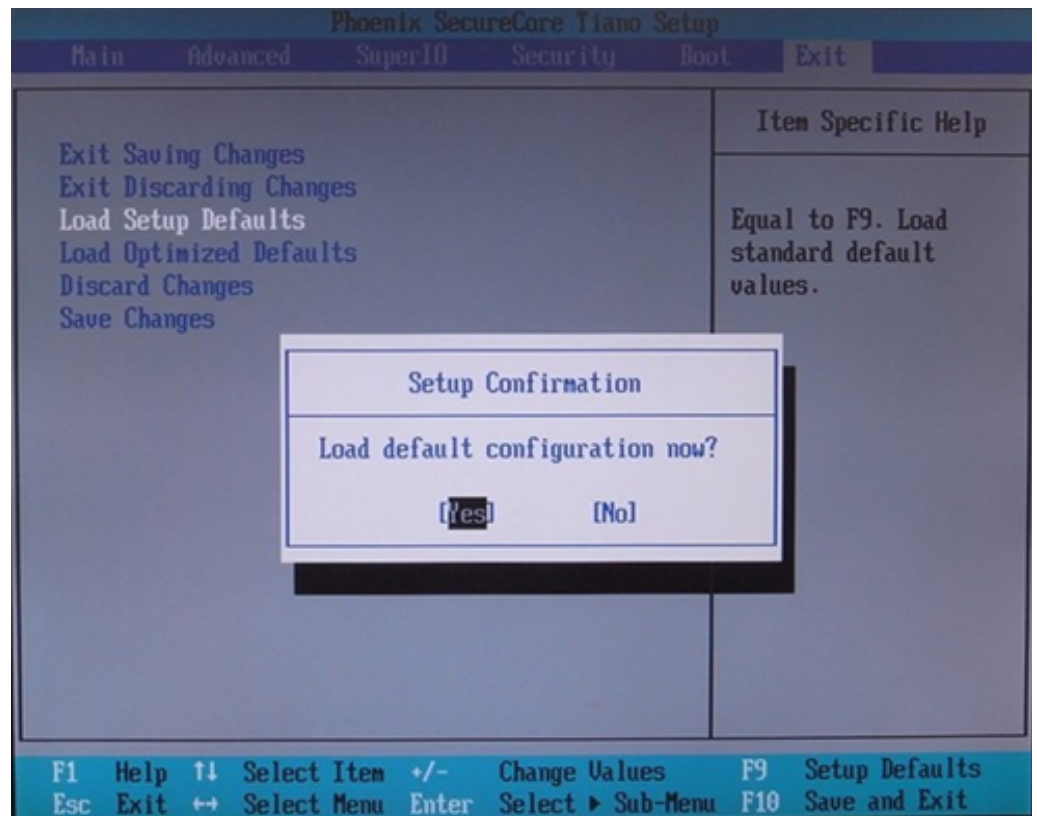
Exit Saving Changes
After you finish you BIOS setting operation, use this option to save all value and reboot the system automatically.

Exit Discarding Changes
Nothing changes and reboot system.

Load Setup Defaults
Use this option to set all BIOS value by default value.All seeting you are changes will be loss and clrared.When you 'Load Setup Defaults', you should use 'Exit Saveing Changes' again.

4

Software Installation

For The ECS-5600 series, we need to install drivers as listed as below for Windows system. Normally, most of devices can be detected and install by windows.

1. Intel Chipset
2. Intel HD Graphics
3. Network Device – Include 82583V(LAN1~LAN4) and 82579LM(LAN5)
4. Audio driver
5. Intel ME(Management Engine)
6. Addition driver :
   - AHCI install file (For WinXP only)
   - Intel Rapid

4.1 Chipset Driver Installation

This driver will install following features or functions properly:
- PCIe Support
- IDE/ATA33/ATA66/ATA100 Storage Support (IDE Mode)
- SATA Storage Support(AHCI Mode)
- USB 1.1/2.0 bus service
- SMBUS controller service
- Identification of Intel(R) Chipset Components in the Device Manager

Please follow the installation steps to setup drivers.

Step1.
Find the driver install files as follow: • Windows 7 64bit version : 　**The Chipset driver location is : [CD]:\Win7\64bit\INF** • Windows 7 32bit version : 　**The Chipset driver location is : [CD]:\Win7\32bit\INF** • WindowsXP 32bit version : 　**The Chipset driver location is : [CD]:\WinXP\INF**

Step2.
Execute and install the files which matches your operation system. Instruction windows will pop-up when you start to setup the driver, please follow it and complete the setup processes.

Step3.
Once you completed the chipset driver installation, please reboot your system to active functions.

4.2 Graphic Driver Installation

This driver will install following features or functions properly:
- Display serive
- High definition Audio support

Step1.

Find the driver install files as follow:
• Windows 7 64bit version :
  The Chipset driver location is : [CD]:\Win7\64bit\VGA
• Windows 7 32bit version :
  The Chipset driver location is : [CD]:\Win7\32bit\VGA
• WindowsXP 32bit version :
  The Chipset driver location is : [CD]:\WinXP\VGA
  (For WinXP use , must install .NET framework 3.5 , please find on [CD]:\WinXP\ )

Step2.
Execute and install the files which matches your operation system. Instruction windows will pop-up when you start to setup the driver, please follow it and complete the setup processes.

Step3.
Once you completed the graphic driver installation, please reboot your system to active functions.

4.3 Network Device Driver Installation

This driver will install following features or functions properly:
- LAN 1~4 82583V
- LAN 5 82579LM

Step1.

Find the driver install files as follow:
- Windows 7 64bit version :
  The Chipset driver location is : [CD]:\Win7\64bit\LAN
- Windows 7 32bit version :
  The Chipset driver location is : [CD]:\Win7\32bit\LAN
- WindowsXP 32bit version :
  The Chipset driver location is : [CD]:\WinXP\LAN

Step2.

Execute and install the files which matches your operation system. Instruction windows will pop-up when you start to setup the driver, please follow it and complete the setup processes.

Step3.

Once you completed the LAN driver installation, the LAN connection will loss for a while and then restart automatically.

4.4 Audio Device Driver Installation

This driver will install following features or functions properly:
- LAN 1~4 82583V
- LAN 5 82579LM

Step1.

Find the driver install files as follow:
- Windows 7 64bit version :
  The Chipset driver location is : [CD]:\Win7\64bit\LAN
- Windows 7 32bit version :
  The Chipset driver location is : [CD]:\Win7\32bit\LAN
- WindowsXP 32bit version :
  The Chipset driver location is : [CD]:\WinXP\LAN

Step2.

Execute and install the files which matches your operation system. Instruction windows will pop-up when you start to setup the driver, please follow it and complete the setup processes.

Step3.

Once you completed the LAN driver installation, the LAN connection will loss for a while and then restart automatically.

4.5 ME Driver Installation

This driver will install following features or functions properly:
- Intel ME (Management Engine) support
- Intel AMT software panel

Step1.

Find the driver install files as follow:
- Windows 7 64bit version :
  The Chipset driver location is : [CD]:\Win7\64bit\LAN\ME
- Windows 7 32bit version :
  The Chipset driver location is : [CD]:\Win7\32bit\LAN\ME
- WindowsXP 32bit version :
  The Chipset driver location is : [CD]:\WinXP\LAN\ME

Step2.

Execute and install the files which matches your operation system. Instruction windows will pop-up when you start to setup the driver, please follow it and complete the setup processes.

Step3.

Once you completed the LAN driver installation, the LAN connection will loss for a while and then restart automatically.

4.6 Intel Rapid Software Installation

This driver will install following features or functions properly:
- Software panel for SATA device

1. **This function only use on AHCI mode**

Step1.

Find the driver install files as follow:
- Windows 7 64bit version :
  The Chipset driver location is : [CD]:\Win7\64bit\LAN
- Windows 7 32bit version :
  The Chipset driver location is : [CD]:\Win7\32bit\LAN
- WindowsXP 32bit version :
  The Chipset driver location is : [CD]:\WinXP\LAN

Step2.

Execute and install the files which matches your operation system. Instruction windows will pop-up when you start to setup the driver, please follow it and complete the setup processes.

Step3.

Once you completed the LAN driver installation, the LAN connection will loss for a while and then restart automatically.

Appendix A : Isolating DIO Guide

Here are 8 GPI (General purpose Input) channels and 8 GPO (General purpose output) channels on ECS-5600 Isolating DIO port. Below are programming guide and operating step for access the Isolating DIO port. ECS-5600 implements the SMBus to DIO controller for software programming. The SMbus is alike I^2C bus protocol, please refer to SMBus spec. or I^2C spec. first.
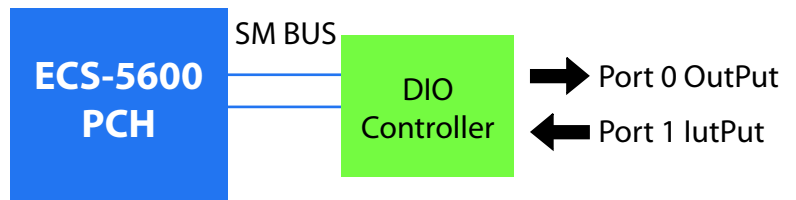
The ECS5600 SMBus base address: **0xEFA0**

- ECS-5600 PCH SMBus I/O Register Address Map

SMB_Base + Offset	Name	Default	Type
00h	SMBus_Host_Status	00h	RO
02h	SMBus_Host_Control	00h	R/W
03h	SMBus_Host_Command	00h	R/W
04h	SMBus_Trans_Addr	00h	R/W
05h	SMBus_Host_Data0	00h	R/W
06h	SMBus_Host_Data1	00h	R/W
07h	SMBus_Host_Block	00h	R/W

(Host Satus & Host Control have multiple mode , please refer to Intel spec.)

DIO controller Index command : **[I^2C Device address = 0x40]**

```
#define SDIO_Device_Addr      0x40
#define Input_Port0_Reg       0x00
#define Input_Port1_Reg       0x01
#define Output_Port0_Reg      0x02
#define Output_Port1_Reg      0x03
#define Polar_Invert0_Reg     0x04
#define Polar_Invert1_Reg     0x05
#define Configuration0_Reg    0x06
#define Configuration1_Reg    0x07
```

A. Build the base protocol for I²C/SMBus access

I²C/SMBus Write Command:

Write Slave address: DIO Device address with write bit
Write Command: DIO Reg Index.
Write data 0: Update Value
Write Control: Active write sequence.
(If you want to send more data in one command stream , you should use Block mode)

Example:

WriteAByte(SMBus_Trans_Addr, device_id);
WriteAByte(SMBus_Host_Command, reg_no);
WriteAByte(SMBus_Host_Data0, data);
WriteAByte(SMBus_Host_Control, 0x48);

I²C/SMBus Read Command :

Write Slave address: DIO Device address with Read bit
Write Host Command: DIO Reg Index
Write Host Control: 0x48.
Read data: Active read sequence from the Host Data 0

Example:

WriteAByte(SMBus_Trans_Addr, device_id+1);
WriteAByte(SMBus_Host_Command, reg_no);
WriteAByte(SMBus_Host_Control, 0x48);   //read data
Delay_T(20);
err_no = Check_SMBus_Ready();
if (err_no != 0) return err_no;
*dat = ReadAByte(SMBus_Host_Data0);

B. Access DIO Controller using I²C/SMBus access function

Write Data form DIO port :

I²C_Write_Byte (DIO Device address , Output_port0, Trans_Data)

Example:

Unsigned char data=0x21;
I²C_Write_Byte(SDIO_Device_Addr, Output_Port0_Reg, data);
//Set bit 5 & bit 0 of DIO output port as High level ,another bit is Low

Read Data form DIO port :

I²C_Read_Byte (DIO Device address , Output_port0, &Data_Array)

Example:

unsigned char input_data;
I²C_Read_Byte(SDIO_Device_Addr, Input_Port1_Reg, &input_data);
//Get DIO input port status on input_data variable.

C. Initialized the DIO controller

The DIO Controller port 0 is set for output ; port 1 is for input.
// Config the Port 0 as Output

I^{2}C_Read_Byte (SDIO_Device_Addr , Configuration0_Reg,0x00)
// Config the Port 1 as Input

I^{2}C_Write_Byte (SDIO_Device_Addr , Configuration1_Reg,0xFF)

Appendix B : GPIO & WDT Function

The GPIO& WDT are using internal Super IO function. However, you must entry super I/O configuration mode to set it.

The output port is set as GPIO 1 on CN13 , reg. index = **0xE5**.
The input port is set as GPIO 4 on CN12 , reg. index = **0xF1**.
Super I/O special address port = 0x2E
Super I/O special data port = 0x2F
GPIO Logical device is 0x07

A. Entry Super I/O configuration mode

//write twice 0x87 value.
outportb(special address port, 0x87);
outportb(special data port, 0x87);

B. Located on Logical Device 7

//write 0x07 on Reg [0x07] , this setup must follow Step A. that can be workable.
outportb(special address port, 0x07);
outportb(special data port, 0x07);

C. Access the Super I/O register

Base control for write Super I/O register.
outportb(special address port, Register Index.);
outportb(special data port, update_value);

Base control for read Super I/O register
outportb(special address port, Register Index.);
inportb(special data port);   //It will return a BYTE value.

D. Start to Access the ECS-5600 GPIO port

Please refer to source code for set_data() and get_data() function.
Write data to GPO(output) port
set_data(Register Index , update_value);

example :
unsigned char data = 0x82;
set_data(0xE5 , data);
//Set bit 7 & bit 1 of GPO output port as High level ,another bit is Low

Please refer to source code for set_data() and get_data() function.

Read data to GPI(input) port
get_data(Register Index) //It will return a BYTE value.
example :
unsigned char data
get_data(0xF1 , data);
//Get GPI(input) port status on input_data variable.

E. WDT ON/OFF and Timer-Counter setting

Refer to GPIO setting of Step A and B. , located Logical 0x08 for WDT function.

Reg [0x30] is WatchDog ON/OFF control.
       WatchDog On :   set_data(0x30 , 0x01);
       WatchDog Off :   set_data(0x30 , 0x00);

Reg [0xF0] is WatchDog timer - counterON/OFF control.

       WatchDog counter start : set_data(0xF0 , 0x02);
       WatchDog counter start : set_data(0xF0 , 0x00);

Reg [0xF1] is WatchDog time-out value, Reading this register returns the current value in the Watch Dog Counter, not the Watch Dog Timer Time-out value..

       WatchDog time-out value : set_data(0xF1 ,);