integration with integrity

3312550 User's Manual

ETX CPU Module

Version 1.0

Table of Content

Chapter 1

Introduction

1.1 Copyright Notice

1.2 About This User's Manual

This User's Manual is intended for experienced users and integrators with hardware knowledge of personal computers. If you are not sure about any description in this User's Manual, please consult your vendor before further handling.

1.3 Warning

Single Board Computers and their components contain very delicate Integrated Circuits (IC). To protect the Single Board Computer and its components against damage from static electricity, you should always follow the following precautions when handling it :

1. Disconnect your Single Board Computer from the power source when you want to work on the inside.
2. Hold the board by the edges and try not to touch the IC chips, leads or circuitry.
3. Use a grounded wrist strap when handling computer components.
4. Place components on a grounded antistatic pad or on the bag that came with the Single Board Computer, whenever components are separated from the system.

1.4 Replacing the lithium battery

Incorrect replacement of the lithium battery may lead to a risk of explosion. The lithium battery must be replaced with an identical battery or a battery type recommended by the manufacturer.
Do not throw lithium batteries into the trashcan. It must be disposed of in accordance with local regulations concerning special waste.

1.5 Technical Support

If you have any technical difficulties, please consult the user's manual first at:

http://www.globalamericaninc.com/manuals/3312550.pdf

Please do not hesitate to call or e-mail our customer service when you still can not find out the answer.

1.6 Warranty

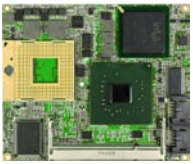
This product is warranted to be in good working order for a period of two years from the date of purchase. Should this product fail to be in good working order at any time during this period, we will, at our option, replace or repair it at no additional charge except as set forth in the following terms. This warranty does not apply to products damaged by misuse, modifications, accident or disaster.

Vendor assumes no liability for any damages, lost profits, lost savings or any other incidental or consequential damage resulting from the use, misuse of, or inability to use this product. Vendor will not be liable for any claim made by any other related party.

Vendors disclaim all other warranties, either expressed or implied, including but not limited to implied warranties of merchantibility and fitness for particular purpose, with respect to the hardware, the accompanying product's manual(s) and written materials, and any accompanying hardware. This limited warranty gives you specific legal rights.

Return authorization must be obtained from the vendor before returned merchandise will be accepted. Authorization can be obtained by calling or faxing the vendor and requesting a Return Merchandise Authorization (RMA) number. Returned goods should always be accompanied by a clear problem description.

1.7 Packing List

	1 x 3312550 ETX CPU Module
	1 x Driver CD
	1 x Quick Installation Guide

If any of the above items is damaged or missing, contact your vendor immediately.

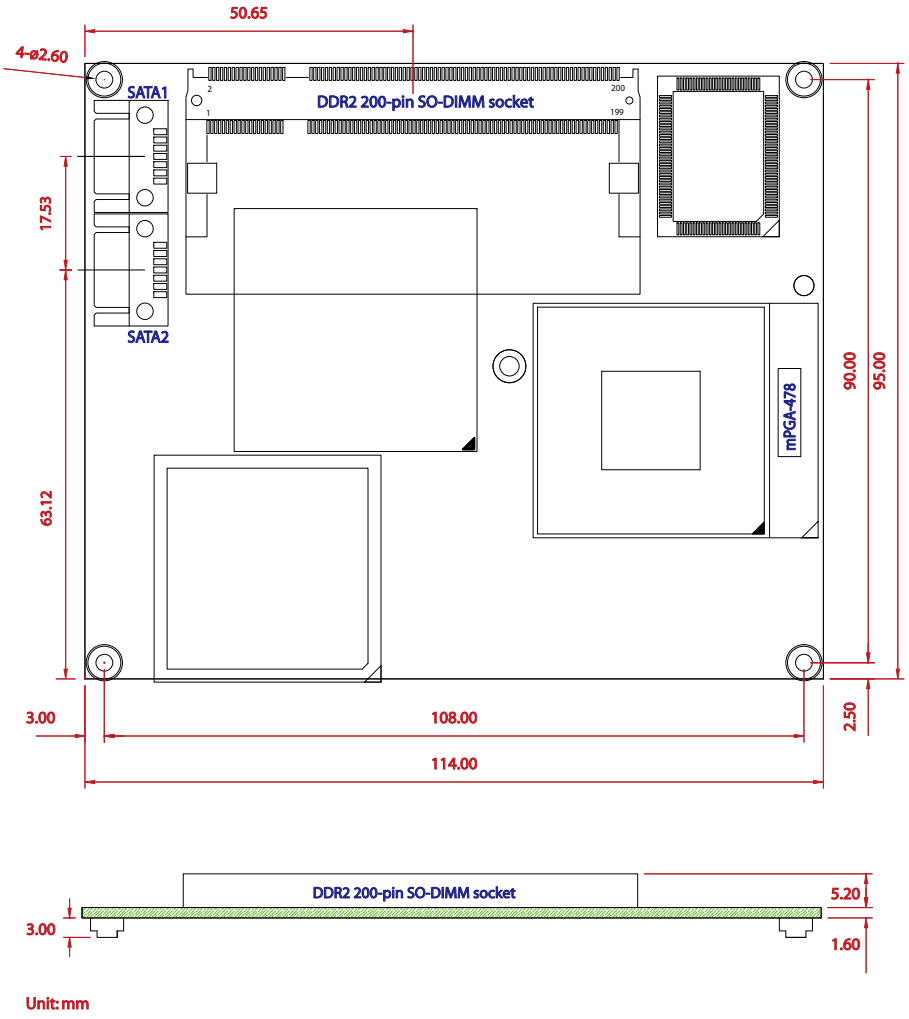
1.8 Ordering Information

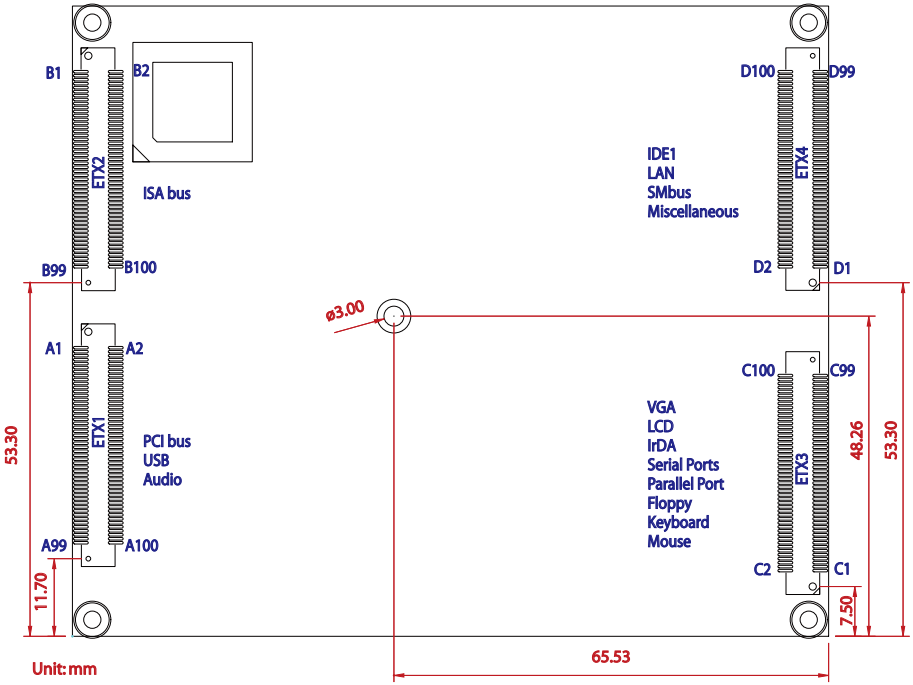
3312550	ETX CPU Module with mPGA 478 Socket for Intel® Core™ 2 Duo, Core™ Duo, Intel® Celeron M Processor
1001010	ETX evaluation board in ATX form factor
2107820	Heatsink Aluminium 114 (L) x 95 (W) x 32 (H) mm w/ FAN

1.9 Specification

Form Factor	ETX CPU Module
CPU	With mPGA 478 Socket for Intel® Core™ 2 Duo, Core™ Duo, Intel® Celeron M Processor
Chipset	Intel® 945GME + Intel® ICH7M
System Memory	1 x 200-pin SO-DIMM Up to 2GB DDRII SDRAM
VGA/ LCD Controller	Intel® Graphics Media Accelerator (GMA) 950 graphics core w/ CRT/ Dual Channel LVDS (Dual independent display)
Ethernet	1 x Intel® 82562 10/100 Base-T Ethernet
BIOS	Phoenix-Award BIOS
Serial ATA	2 x Serial ATA II
IDE Interface	1 x IDE (Ultra ATA 100/66/33), support 2 IDE devices
Serial Port	2 x COM ports
Parallel Port/ Floppy	1 x SPP/EPP/ECP mode 1 x Floppy connector, shared with Parallel Port #1
KBMS	Standard PS/2 Keyboard and Mouse
Universal Serial Bus	4 x USB 2.0
Expansion Interface	4 x PCI ISA Bus
RTC	Real Time Clock
Operation Temp.	0ºC ~ 60ºC (32ºF ~ 140ºF)
Watchdog Timer	255-level Reset
Dimension (L x W)	114 x 95 mm (4.5” x 3.7”)

1.10 Board Dimensions

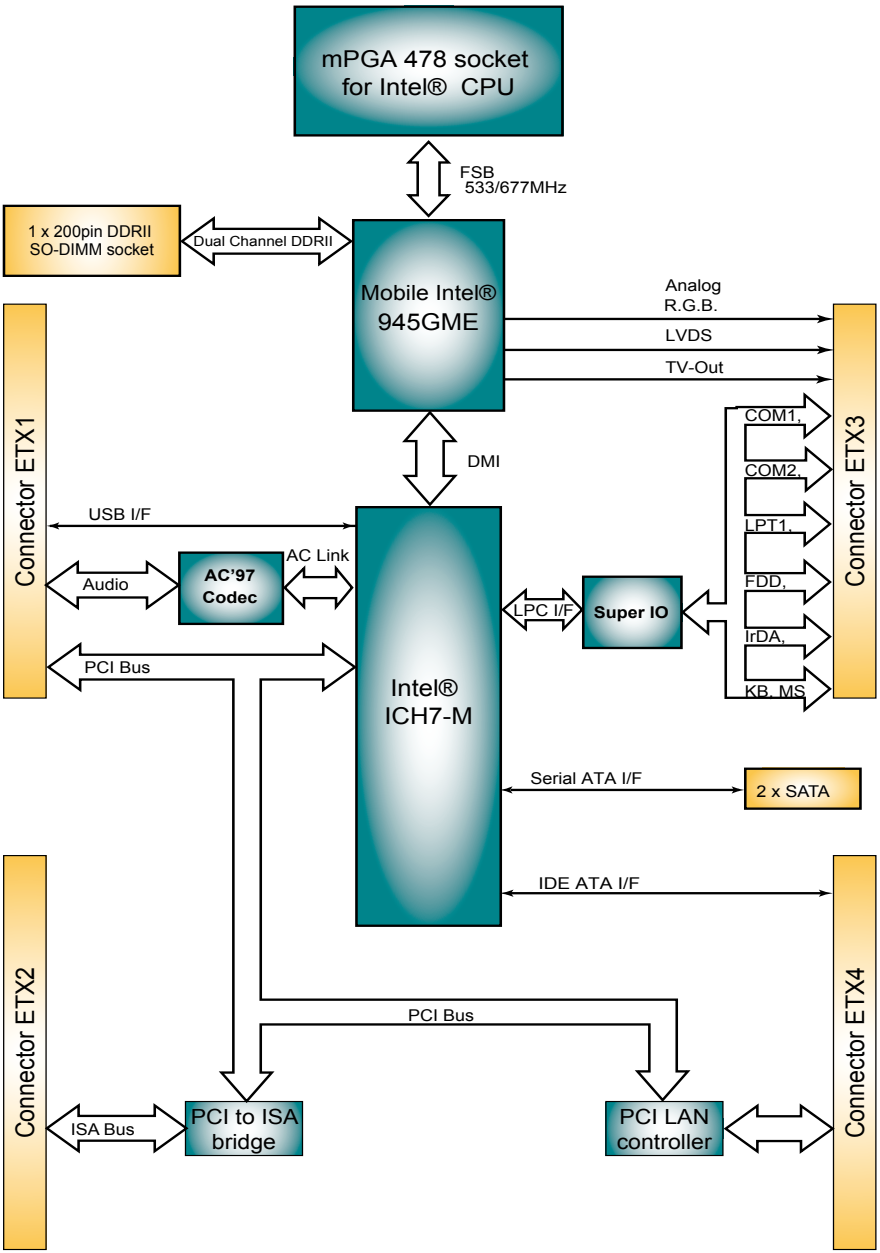



B1
B2
ETX2
ISA bus
B99
B100
A1
A2
ETX1
PCI bus
USB
Audio
A99
A100
53.30
11.70
ø3.00
D100
D99
IDE1
LAN
SMbus
Miscellaneous
ETX4
D2
D1
C100
C99
VGA
LCD
IrDA
Serial Ports
Parallel Port
Floppy
Keyboard
Mouse
ETX3
48.26
53.30
C2
C1
7.50
65.53
Unit: mm

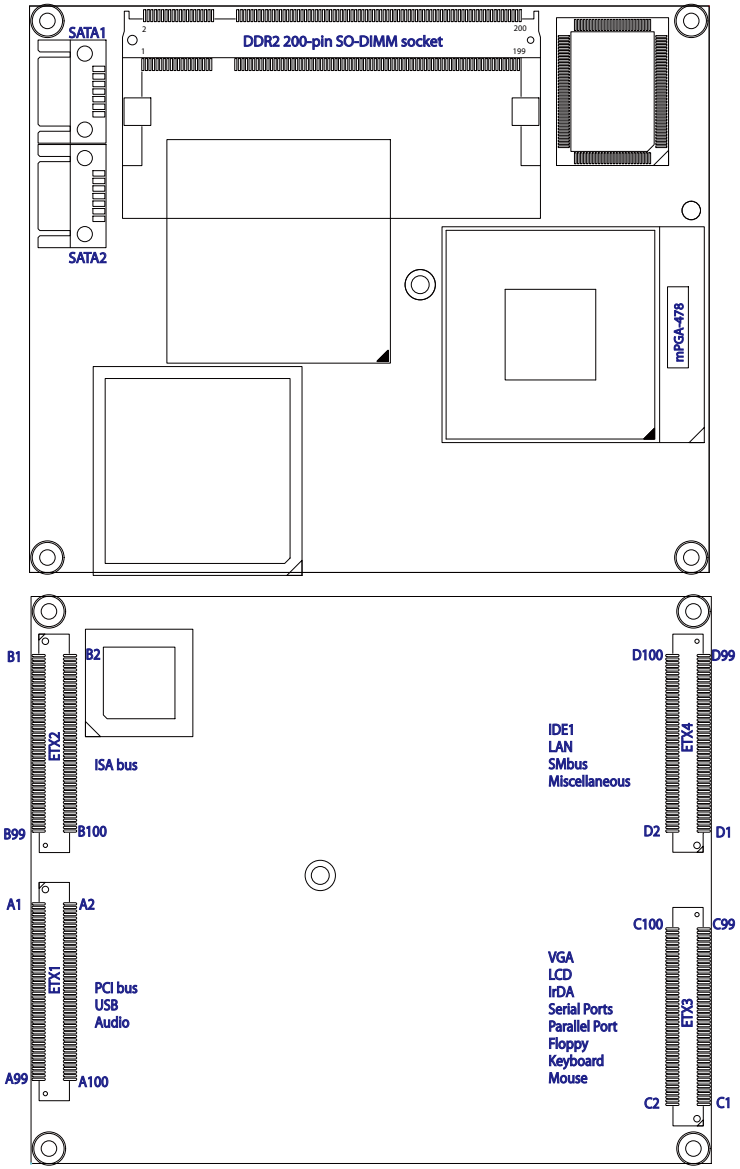
Chapter 2

Installation

2.1 Block Diagrams



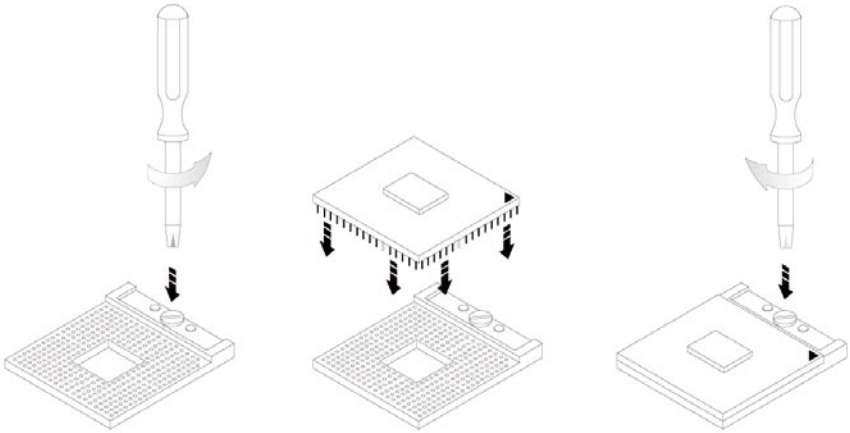
2.2 Connectors



2.3 Installing the CPU

The processor socket comes with a screw to secure the CPU. As showing in the picture as bellow, loose the screw first before inserting the CPU.

Place the CPU into the socket by making sure the notch on the corner of the CPU corresponding with the notch on the inside of the socket. Once the CPU has slide into the socket, lock the screw.



Make sure that heat sink of the CPU top surface is in complete contact to avoid the CPU overheating problem.

If not, it would cause your system or CPU to be hanged, unstable, damaged.

2.4 The Installation Paths of CD Driver

Drive	Path
AUDIO	\AUDIO\REALTEK_AC97\WINDOWS_A401
CHIPSET	\CHIPSET\INTEL\INF 8.1
LAN	\ETHERNET\INTEL\82562
VGA	\GRAPHICS\INTEL_2K_XP_32\1431

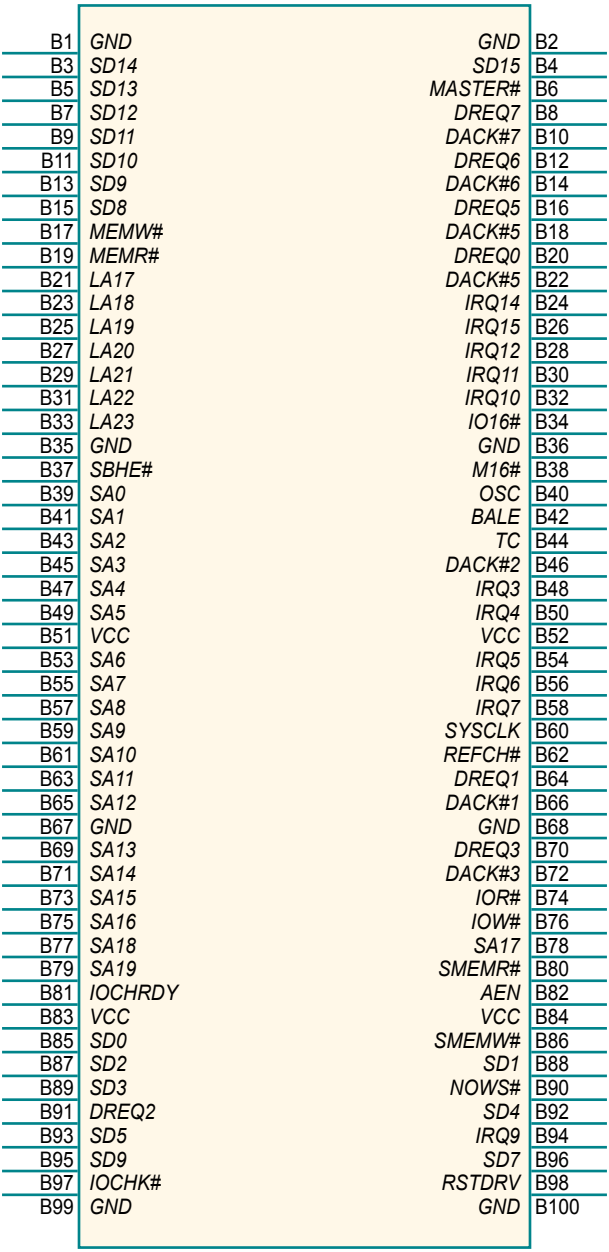
2.5 SATA1, SATA2 Connectors

Pin	Description
1	GND
2	TX+
3	TX-
4	GND
5	RX+
6	RX-
7	GND

2.6 ETX1 Connector

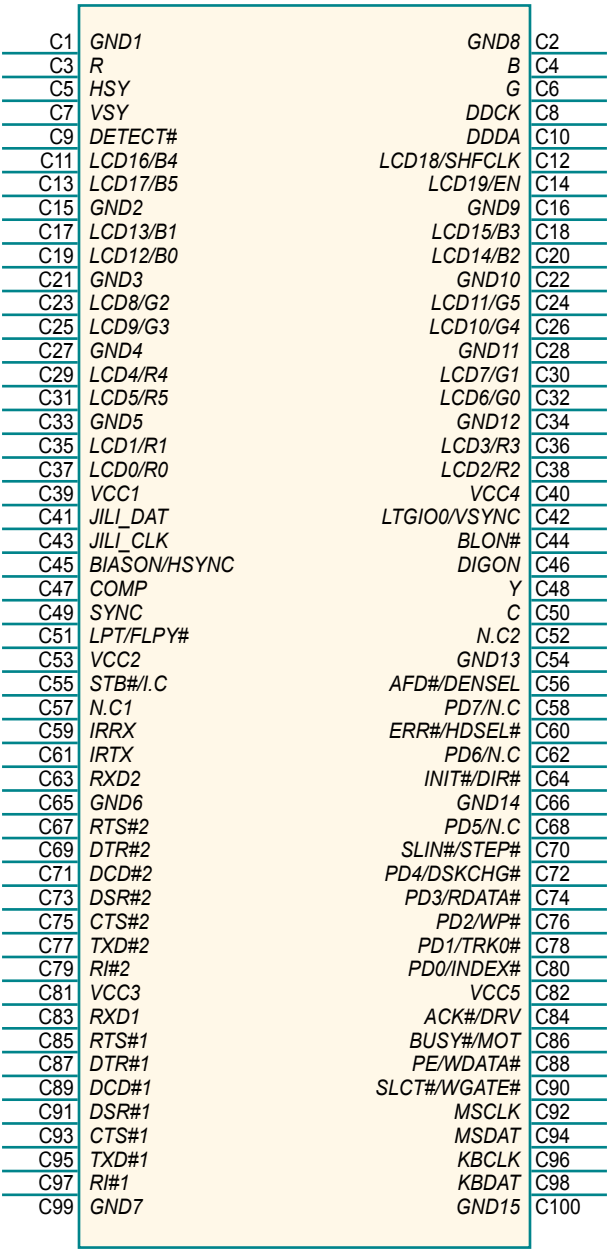
A1	GND5	GND10	A2
A3	PCICLK3	PCICLK4	A4
A5	GND6	GND11	A6
A7	PCICLK1	PCICLK2	A8
A9	REQ#3	GNT#3	A10
A11	GNT#2	VCC32	A12
A13	REQ#2	GNT#1	A14
A15	REQ#1	VCC33	A16
A17	GNT#0	N.C1	A18
A19	VCC1	VCC4	A20
A21	SERIRQ	REQ#0	A22
A23	AD0	VCC34	A24
A25	AD1	AD2	A26
A27	AD4	AD3	A28
A29	AD6	AD5	A30
A31	CBE#0	AD7	A32
A33	AD8	AD9	A34
A35	GND7	GND12	A36
A37	AD10	AUXAL	A38
A39	AD11	MIC	A40
A41	AD12	AUXAR	A42
A43	AD13	ASVCC	A44
A45	AD14	SNDL	A46
A47	AD15	ASGND	A48
A49	CBE#1	SNDR	A50
A51	VCC2	VCC5	A52
A53	PAR	SERR#	A54
A55	PERR#	N.C2	A56
A57	PME#	USB2-	A58
A59	LOCK#	DEVSEL#	A60
A61	TRDY#	USB3-	A62
A63	IRDY#	STOP#	A64
A65	FRAME#	USB2+	A66
A67	GND8	GND13	A68
A69	AD16	CBE#2	A70
A71	AD17	USB3+	A72
A73	AD19	AD18	A74
A75	AD20	USB0-	A76
A77	AD22	AD21	A78
A79	AD23	USB1-	A80
A81	AD24	CBE#3	A82
A83	VCC31	VCC6	A84
A85	AD25	AD26	A86
A87	AD28	USB0+	A88
A89	AD27	AD29	A90
A91	AD30	USB1+	A92
A93	PCIRST#	AD31	A94
A95	INTR#C	INTR#D	A96
A97	INTR#A	INTR#B	A98
A99	GND9	GND14	A100

2.7 ETX2 Connector



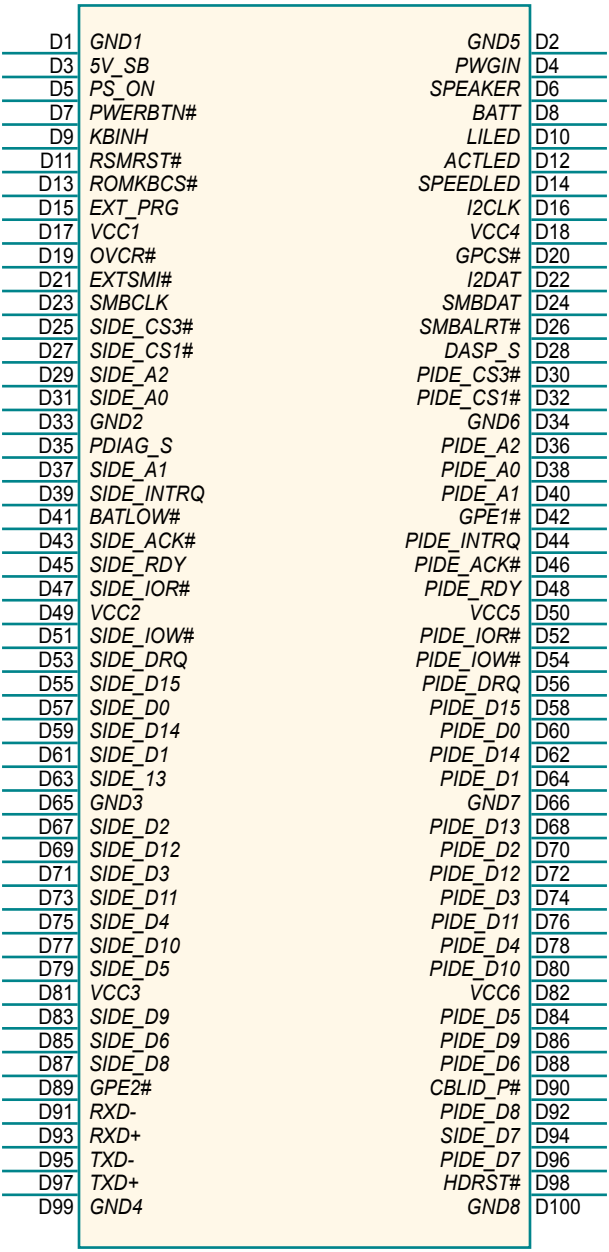
B1	GND	GND	B2
B3	SD14	SD15	B4
B5	SD13	MASTER#	B6
B7	SD12	DREQ7	B8
B9	SD11	DACK#7	B10
B11	SD10	DREQ6	B12
B13	SD9	DACK#6	B14
B15	SD8	DREQ5	B16
B17	MEMW#	DACK#5	B18
B19	MEMR#	DREQ0	B20
B21	LA17	DACK#5	B22
B23	LA18	IRQ14	B24
B25	LA19	IRQ15	B26
B27	LA20	IRQ12	B28
B29	LA21	IRQ11	B30
B31	LA22	IRQ10	B32
B33	LA23	IO16#	B34
B35	GND	GND	B36
B37	SBHE#	M16#	B38
B39	SA0	OSC	B40
B41	SA1	BALE	B42
B43	SA2	TC	B44
B45	SA3	DACK#2	B46
B47	SA4	IRQ3	B48
B49	SA5	IRQ4	B50
B51	VCC	VCC	B52
B53	SA6	IRQ5	B54
B55	SA7	IRQ6	B56
B57	SA8	IRQ7	B58
B59	SA9	SYSCLK	B60
B61	SA10	REFCH#	B62
B63	SA11	DREQ1	B64
B65	SA12	DACK#1	B66
B67	GND	GND	B68
B69	SA13	DREQ3	B70
B71	SA14	DACK#3	B72
B73	SA15	IOR#	B74
B75	SA16	IOW#	B76
B77	SA18	SA17	B78
B79	SA19	SMEMR#	B80
B81	IOCHRDY	AEN	B82
B83	VCC	VCC	B84
B85	SD0	SMEMW#	B86
B87	SD2	SD1	B88
B89	SD3	NOWS#	B90
B91	DREQ2	SD4	B92
B93	SD5	IRQ9	B94
B95	SD9	SD7	B96
B97	IOCHK#	RSTDRV	B98
B99	GND	GND	B100

2.8 ETX3 Connector



C1	GND1	GND8	C2
C3	R	B	C4
C5	HSY	G	C6
C7	VSY	DDCK	C8
C9	DETECT#	DDDA	C10
C11	LCD16/B4	LCD18/SHFCLK	C12
C13	LCD17/B5	LCD19/EN	C14
C15	GND2	GND9	C16
C17	LCD13/B1	LCD15/B3	C18
C19	LCD12/B0	LCD14/B2	C20
C21	GND3	GND10	C22
C23	LCD8/G2	LCD11/G5	C24
C25	LCD9/G3	LCD10/G4	C26
C27	GND4	GND11	C28
C29	LCD4/R4	LCD7/G1	C30
C31	LCD5/R5	LCD6/G0	C32
C33	GND5	GND12	C34
C35	LCD1/R1	LCD3/R3	C36
C37	LCD0/R0	LCD2/R2	C38
C39	VCC1	VCC4	C40
C41	JILI_DAT	LTGIO0/VSYNC	C42
C43	JILI_CLK	BLON#	C44
C45	BIASON/HSYNC	DIGON	C46
C47	COMP	Y	C48
C49	SYNC	C	C50
C51	LPT/FLPY#	N.C2	C52
C53	VCC2	GND13	C54
C55	STB#/I.C	AFD#/DENSEL	C56
C57	N.C1	PD7/N.C	C58
C59	IRRX	ERR#/HDSEL#	C60
C61	IRTX	PD6/N.C	C62
C63	RXD2	INIT#/DIR#	C64
C65	GND6	GND14	C66
C67	RTS#2	PD5/N.C	C68
C69	DTR#2	SLIN#/STEP#	C70
C71	DCD#2	PD4/DSKCHG#	C72
C73	DSR#2	PD3/RDATA#	C74
C75	CTS#2	PD2/WP#	C76
C77	TXD#2	PD1/TRK0#	C78
C79	RI#2	PD0/INDEX#	C80
C81	VCC3	VCC5	C82
C83	RXD1	ACK#/DRV	C84
C85	RTS#1	BUSY#/MOT	C86
C87	DTR#1	PE/WDATA#	C88
C89	DCD#1	SLCT#/WGATE#	C90
C91	DSR#1	MSCLK	C92
C93	CTS#1	MSDAT	C94
C95	TXD#1	KBCLK	C96
C97	RI#1	KBDAT	C98
C99	GND7	GND15	C100

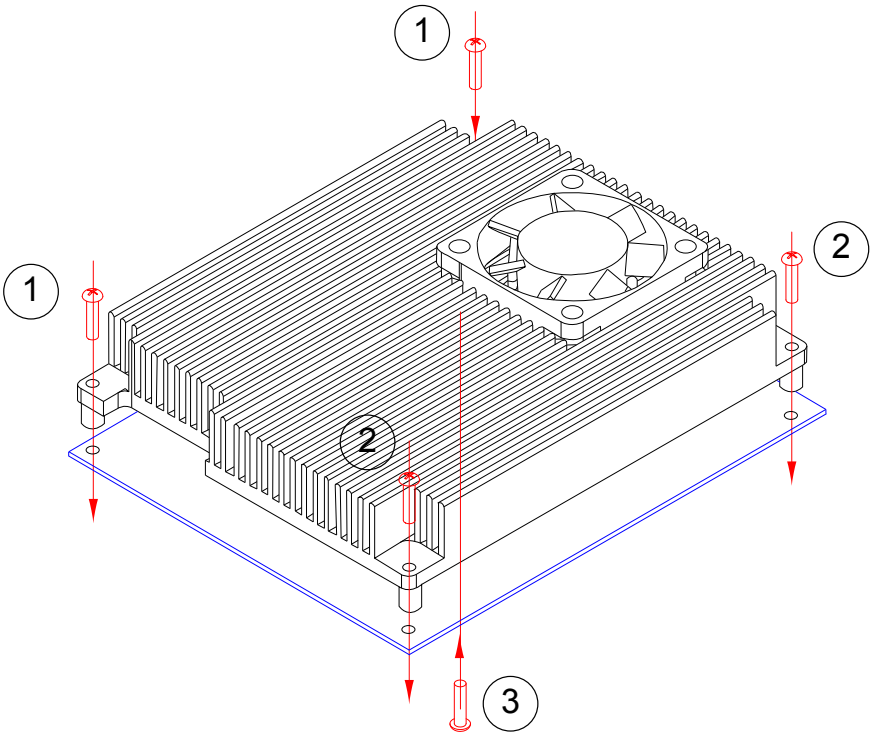
2.9 ETX4 Connector



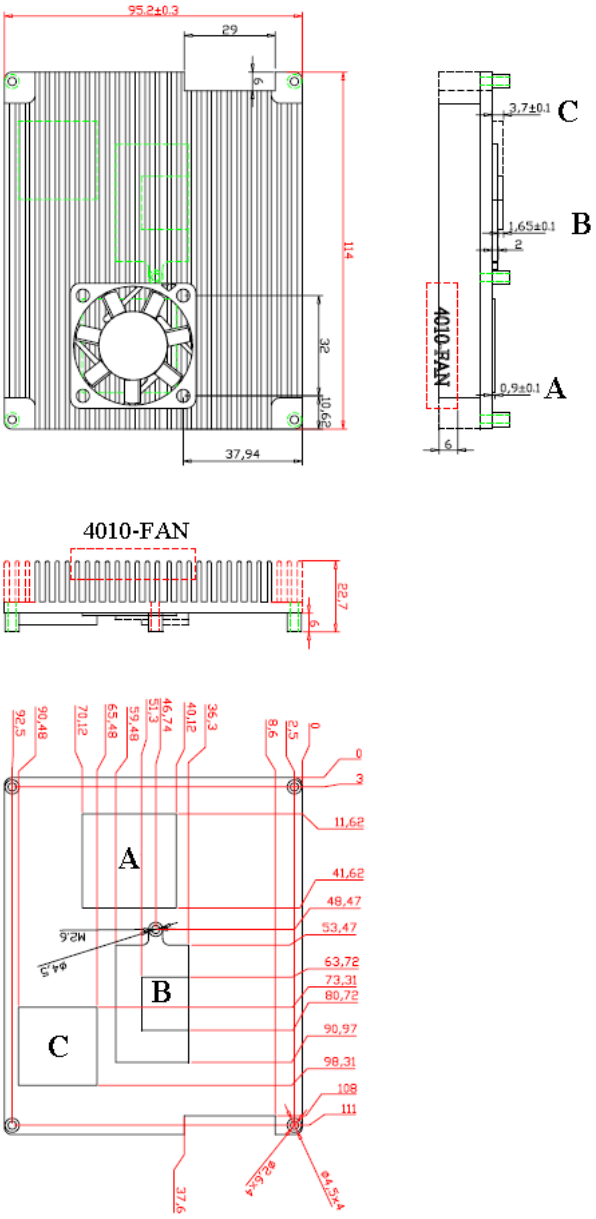
D1	GND1	GND5	D2
D3	5V_SB	PWGIN	D4
D5	PS_ON	SPEAKER	D6
D7	PWERBTN#	BATT	D8
D9	KBINH	LILED	D10
D11	RSMRST#	ACTLED	D12
D13	ROMKBCS#	SPEEDLED	D14
D15	EXT_PRG	I2CLK	D16
D17	VCC1	VCC4	D18
D19	OVCR#	GPCS#	D20
D21	EXTSMI#	I2DAT	D22
D23	SMBCLK	SMBDAT	D24
D25	SIDE_CS3#	SMBALRT#	D26
D27	SIDE_CS1#	DASP_S	D28
D29	SIDE_A2	PIDE_CS3#	D30
D31	SIDE_A0	PIDE_CS1#	D32
D33	GND2	GND6	D34
D35	PDIAG_S	PIDE_A2	D36
D37	SIDE_A1	PIDE_A0	D38
D39	SIDE_INTRQ	PIDE_A1	D40
D41	BATLOW#	GPE1#	D42
D43	SIDE_ACK#	PIDE_INTRQ	D44
D45	SIDE_RDY	PIDE_ACK#	D46
D47	SIDE_IOR#	PIDE_RDY	D48
D49	VCC2	VCC5	D50
D51	SIDE_IOW#	PIDE_IOR#	D52
D53	SIDE_DRQ	PIDE_IOW#	D54
D55	SIDE_D15	PIDE_DRQ	D56
D57	SIDE_D0	PIDE_D15	D58
D59	SIDE_D14	PIDE_D0	D60
D61	SIDE_D1	PIDE_D14	D62
D63	SIDE_13	PIDE_D1	D64
D65	GND3	GND7	D66
D67	SIDE_D2	PIDE_D13	D68
D69	SIDE_D12	PIDE_D2	D70
D71	SIDE_D3	PIDE_D12	D72
D73	SIDE_D11	PIDE_D3	D74
D75	SIDE_D4	PIDE_D11	D76
D77	SIDE_D10	PIDE_D4	D78
D79	SIDE_D5	PIDE_D10	D80
D81	VCC3	VCC6	D82
D83	SIDE_D9	PIDE_D5	D84
D85	SIDE_D6	PIDE_D9	D86
D87	SIDE_D8	PIDE_D6	D88
D89	GPE2#	CBLID_P#	D90
D91	RXD-	PIDE_D8	D92
D93	RXD+	SIDE_D7	D94
D95	TXD-	PIDE_D7	D96
D97	TXD+	HDRST#	D98
D99	GND4	GND8	D100

2.10 Heatsink Installation

1. 1. Put the heatsink (2107820) on 3312550, and screw it on in the direction shown in the figure below. Insert two screws (No. 1) downward into the holes and turn them tightly.
2. Insert screw (No. 2) upward into the hole and turn it tightly.
3. Insert two screws (No. 3) downward into the holes and turn them tightly.



2.11 Heatsink Dimensions



Chapter A

Appendix

A.1 I/O Port Address Map

Each peripheral device in the system is assigned a set of I/O port addresses which also becomes the identity of the device.
The following table lists the I/O port addresses used.

Address	Device Description
00000000 - 00000007	DMA Controller
00000000 - 00000CF7	PCI bus
00000010 - 0000001F	Motherboard Resource
00000020 - 00000021	Programmable Interrupt Controller
00000022 - 0000003F	Motherboard Resource
00000040 - 00000043	System Timer
00000044 - 0000005F	Motherboard Resource
00000060 - 00000060	Standard 101/102-Key or Microsoft Natural PS/2 Keyboard
00000061 - 00000061	System Speaker
00000062 - 00000063	Motherboard Resource
00000064 - 00000064	Standard 101/102-Key or Microsoft Natural PS/2 Keyboard
00000065 - 0000006F	Motherboard Resource
00000070 - 00000073	System CMOS/real time clock
00000074 - 0000007F	Motherboard Resource
00000080 - 00000090	DMA Controller
00000091 - 00000093	Motherboard Resource
00000094 - 0000009F	DMA Controller
000000A0 - 000000A1	Programmable Interrupt Controller
000000A2 - 000000BF	Motherboard Resource
000000C0 - 000000DF	DMA Controller
000000E0 - 000000EF	Motherboard Resource
000000F0 - 000000FF	Numeric Data Processor
000001F0 - 000001F7	Primary IDE Channel
00000274 - 00000277	ISAPNP Read Data Port

00000279 - 00000279	ISAPNP Read Data Port
00000294 - 00000297	Motherboard Resource
000002E8 - 000002EF	Communications Port (COM4)
000002F8 - 000002FF	Communications Port (COM2)
00000378 - 0000037F	Printer Port (LPT1)
000003B0 - 000003BB	Mobile Intel® 945 Express Chipset Family
000003C0 - 000003DF	Mobile Intel® 945 Express Chipset Family
000003E8 - 000003EF	Communications Port (COM3)
000003F6 - 000003F6	Primary IDE Channel
000003F8 - 000003FF	Communications Port (COM1)
00000400 - 000004BF	Motherboard Resource
000004D0 - 000004D1	Motherboard Resource
00000500 - 0000051F	Intel® 82801G (ICH7 Family) SMBus Controller - 27DA
00000680 - 000006FF	Motherboard Resource
00000778 - 0000077B	Printer Port (LPT1)
00000880 - 0000088F	Motherboard Resource
00000A78 - 00000A7B	Motherboard Resource
00000BBC - 00000BBF	Motherboard Resource
00000BBC - 00000BBF	Motherboard Resource
00000D00 - 0000FFFF	PCI bus
00000E78 - 00000E7B	Motherboard Resource
00000F78 - 00000F7B	Motherboard Resource
00000FBC - 00000FBF	Motherboard Resource
0000B000 - 0000BFFF	Intel® 82801G (ICH7 Family) PCI Express Root Port - 27D4
0000C000 - 0000CFFF	Intel® 82801G (ICH7 Family) PCI Express Root Port - 27D0
0000DF00 - 0000DF3F	Intel® PRO/100 VE Network Connection
0000F000 - 0000F0FF	Realtek AC'97 Audio
0000F300 - 0000F30F	Intel® 82801GBM/GHM (ICH7-M Family) Serial ATA Storage Controller - 27C4

0000F400 - 0000F40F	Intel® 82801GBM/GHM (ICH7-M Family) Serial ATA Storage Controller - 27C4
0000F500 - 0000F50F	Intel® 82801GBM/GHM (ICH7-M Family) Serial ATA Storage Controller - 27C4

A.2 Interrupt Request Lines (IRQ)

Peripheral devices use interrupt request lines to notify CPU for the service required. The following table shows the IRQ used by the devices on board.

Level	Function
IRQ 01	Standard 101/102-Key or Microsoft Natural PS/2 Keyboard
IRQ 03	Communications Port
IRQ 04	Communications Port
IRQ 08	System CMOS/real time clock
IRQ 09	Microsoft ACPI-Compliant System
IRQ 10	Communications Port
IRQ 11	Communications Port
IRQ 12	PS/2 Compatible Mouse
IRQ 13	Math Coprocessor
IRQ 14	Primary IDE Channel
IRQ 15	Intel® 82801G (ICH7 Family) SMBus Controller - 27DA
IRQ 16	Intel® 82801G (ICH7 Family PCI Express Root Port - 27D0
IRQ 16	Intel® 82801G (ICH7 Family) USB Universal Host Controller - 27CB
IRQ 16	Mobile Intel 945GM Express Chipset Family
IRQ 17	Realtek AC'97 Audio
IRQ 18	Intel® 82801G (ICH7 Family) PCI Express Root Port - 27D4
IRQ 18	Intel® 82801G (ICH7 Family) USB Universal Host Controller - 27CA
IRQ 19	Intel® 82801G (ICH7 Family) USB Universal Host Controller - 27C9
IRQ 19	Intel® 82801G (ICH7-M Family) Serial ATA Storage Controller - 27C4
IRQ 19	Intel® 82801G (ICH7 Family) USB Universal Host Controller - 27C9
IRQ 20	Intel® PRO/100 VE Network Connection
IRQ 23	Intel® 82801G (ICH7 Family) USB Universal Host Controller - 27C8

IRQ 23	Intel® 82801G (ICH7 Family) USB2 Enhanced Host Controller - 27CC

Any advice or comments about our products and service, or anything we can help you with please don't hesitate to contact with us. We will do our best to support your products, projects and business.

Address: Global American, Inc.
17 Hampshire Drive
Hudson, NH 03051

Telephone: Toll Free U.S. Only (800) 833-8999
(603) 886-3900

FAX: (603) 886-4545

Website: http://www.globalamericaninc.com

Support: Technical Support at Global American