integration with integrity

3308210 User's Manual

3.5" Embedded Controller

Version 1.0

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Chapter 1

Introduction

1.1 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.

1.2 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.

1.3 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.

1.4 Technical Support

If you have any technical difficulties, please call Global American at (603) 886-3900. Toll Free (US Only) (800) 833-8999.

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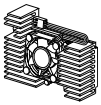
1.5 Packing List

	1x 3308210 3.5” Embedded Board
	1x Driver CD
	1x Quick Installation Guide
	1 x CPU Cooler
	1 x ATX Power cable ATX main power connector (2x10 pins) to 3308210 power connector (2x5 pins)

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

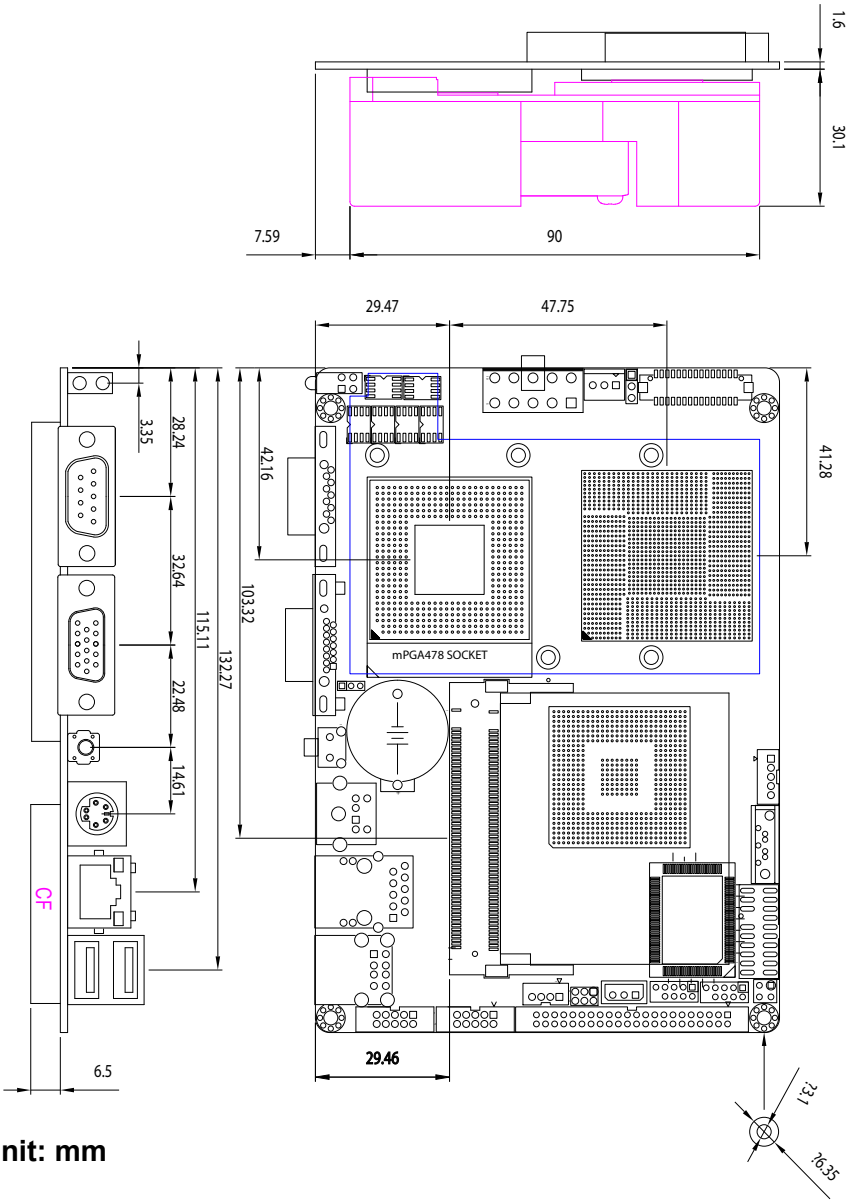
1.6 Ordering Information

3308210	3.5” Intel 65nm µFC-PGA Core™ Duo/Core™ 2 Duo/Celeron M (667MHz) Embedded Board with CRT/LCD, Audio and Gb LAN
1208710	Cable Kit 1 x Audio Cable 1 x COM Port Cable 1 x LPT to FDD Cable 1 x IDE Cable 1 x LPT Cable 1 x Keyboard & mouse Cable 1 x SATA Cable 2 x USB Cable

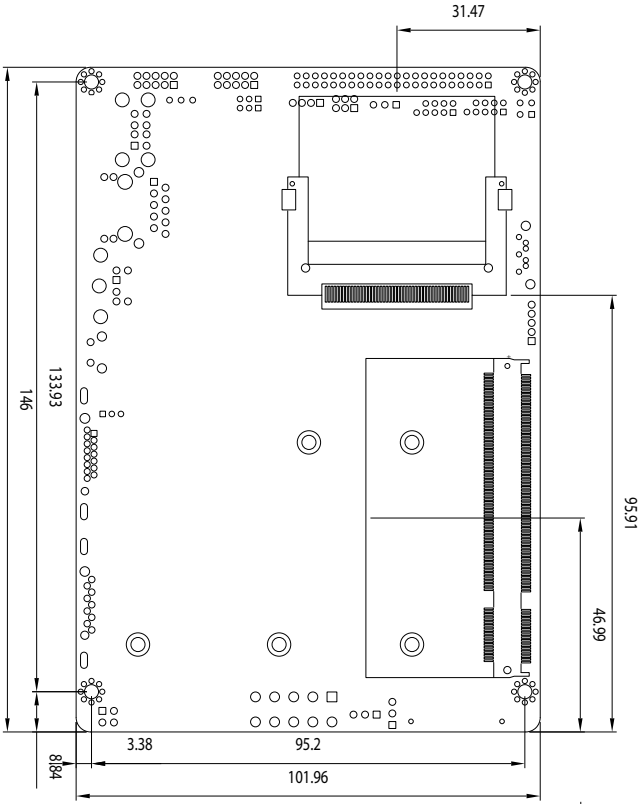
1.7 Specifications

Form Factor	3.5” Embedded Board
CPU	Supports socket mPGA 478 for Intel® Core™ 2 Duo/ Core™ Duo/ Celeron M (667MHz)
Chipset	Intel® 945GME + Intel® ICH7M
System Memory	1 x 200-pin SO-DIMM socket up to 2GB DDRII 400/533/667 SDRAM
VGA/ LCD Controller	Intel® Graphics Media Accelerator (GMA) 950 graphics core w/ CRT/ Dual Channel LVDS (Dual independent display)
Ethernet	1 x RTL8111B PCIe 10/100/1000 Base-T Ethernet
I/O Chips	WINBOND W83627
BIOS	Phoenix-Award PnP Flash BIOS
Audio	ALC655 AC’97 Codec, Line-in/out, Mic-in
IDE Interface	1 x IDE (Ultra ATA 33), support 2 IDE devices
SATA	1 x SATAII (300MB/s)
Serial Port	2 x COM port (1 x RS232, 1x RS232/422/485 selectable)
Parallel Port/ Floppy	1 x SPP/EPP/ECP mode 1 x Floppy connector, shared with Parallel Port
KBMS	Standard PS/2 Keyboard and Mouse
Universal Serial Bus	6 x USB 2.0 compliant
LCD	Dual Channel LVDS
Expansion Interface	1 x CF II socket 1 x MiniPCI socket
Hardware Monitor Chip	Integrated in W83627
Operation Temp.	0°C ~ 60°C (32°F ~ 140°F)
Watchdog Timer	255-level Reset
Dimension (L x W)	146 x 102 mm (5.7” x 4”)

1.8 Board Dimensions



Unit: mm

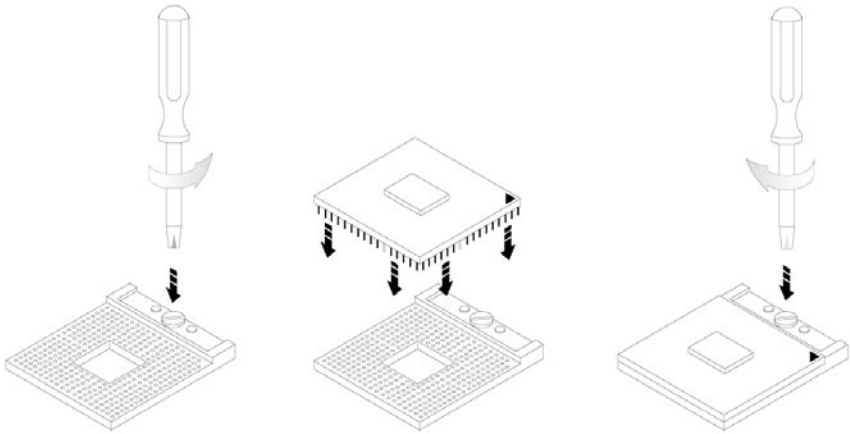


Unit: mm

1.9 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.

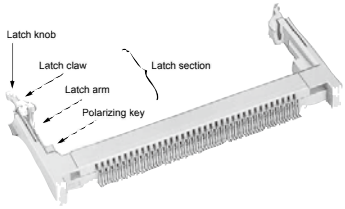
Place the CPU into the socket by making sure the notch on the corner of the CPU corresponding with the notch on the inside of the socket. Once the CPU has slide into the socket, lock the screw.

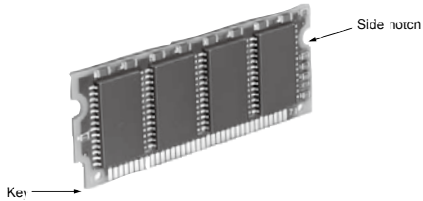


Make sure that heat sink of the CPU top surface is in complete contact to avoid the CPU overheating problem.

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

1.10 Installing the Memory

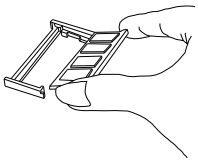




To install the Memory module, locate the Memory SO-DIMM slot on the board and perform as below:

1. Adjust the socket polarizing key and the board key to the same direction.
2. Insert the board obliquely. Moreover, lay the board in parallel to the opening at angle of 20° to 30°, and softly insert the board so as to hit the socket bottom. Stopping insertion halfway will result in improper insertion.
3. Applying the board side notch in parallel to the socket bottom so that the board position cannot be displaced, press the board side notch up, and fix it to the latch portion at both socket edges. Press the board side notch, and release the notch with a snap “click” tone, if the printed board exceeds the latch claw head.

①



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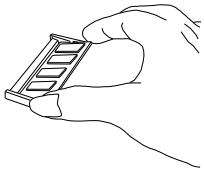

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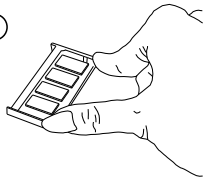
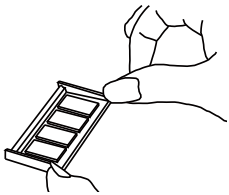


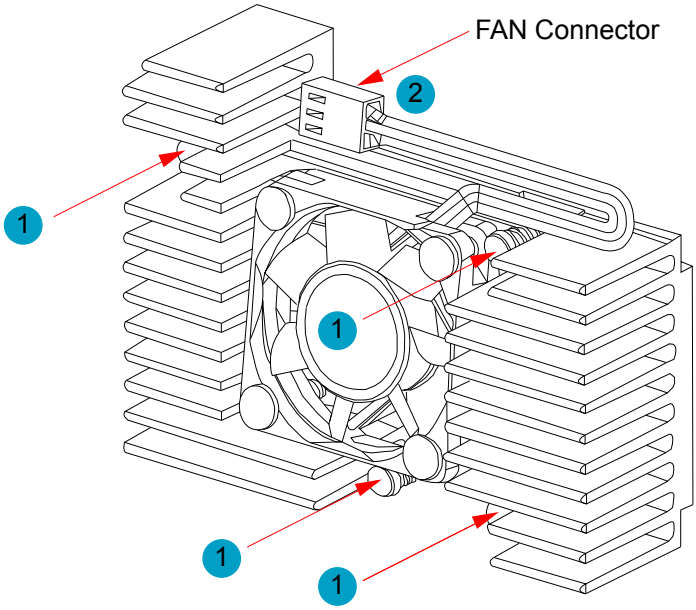
Procedures for board extraction

Apply the thumb nail to the latch knob at both socket edges. Forcibly widen the latch knobs to right and left ways, and release the latch. Then draw the board out along an angle where the board is raised.

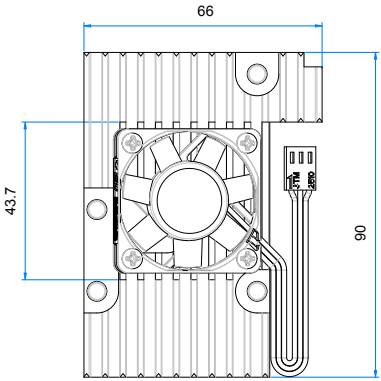


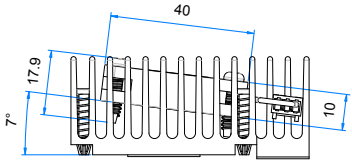
1.11 Heatsink Installation

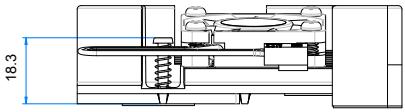
1. Put the heatsink on 3308210, and screw it on in the direction of the board. Insert four screws (No. 1) downward into the holes and turn them tightly.
2. Verify the direction is correct (No. 2) and plug the FAN connector into CPUF1 connector.

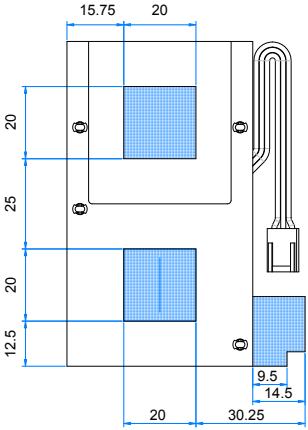


1.12 Heatsink Dimensions





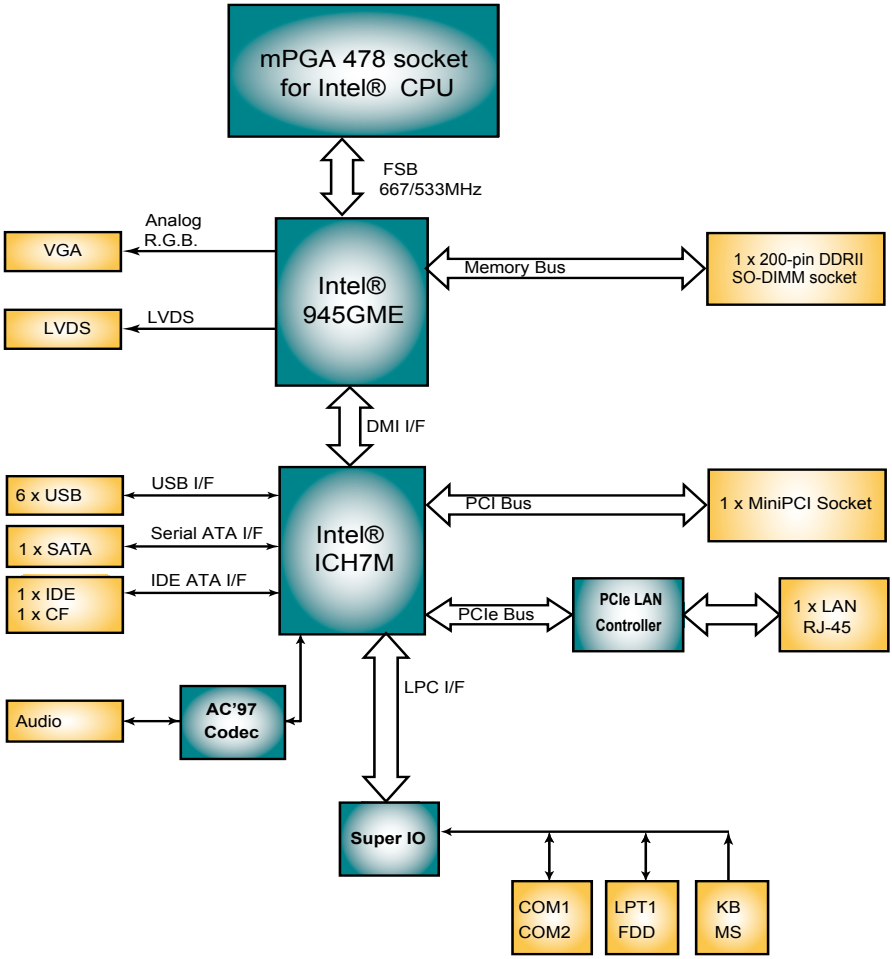




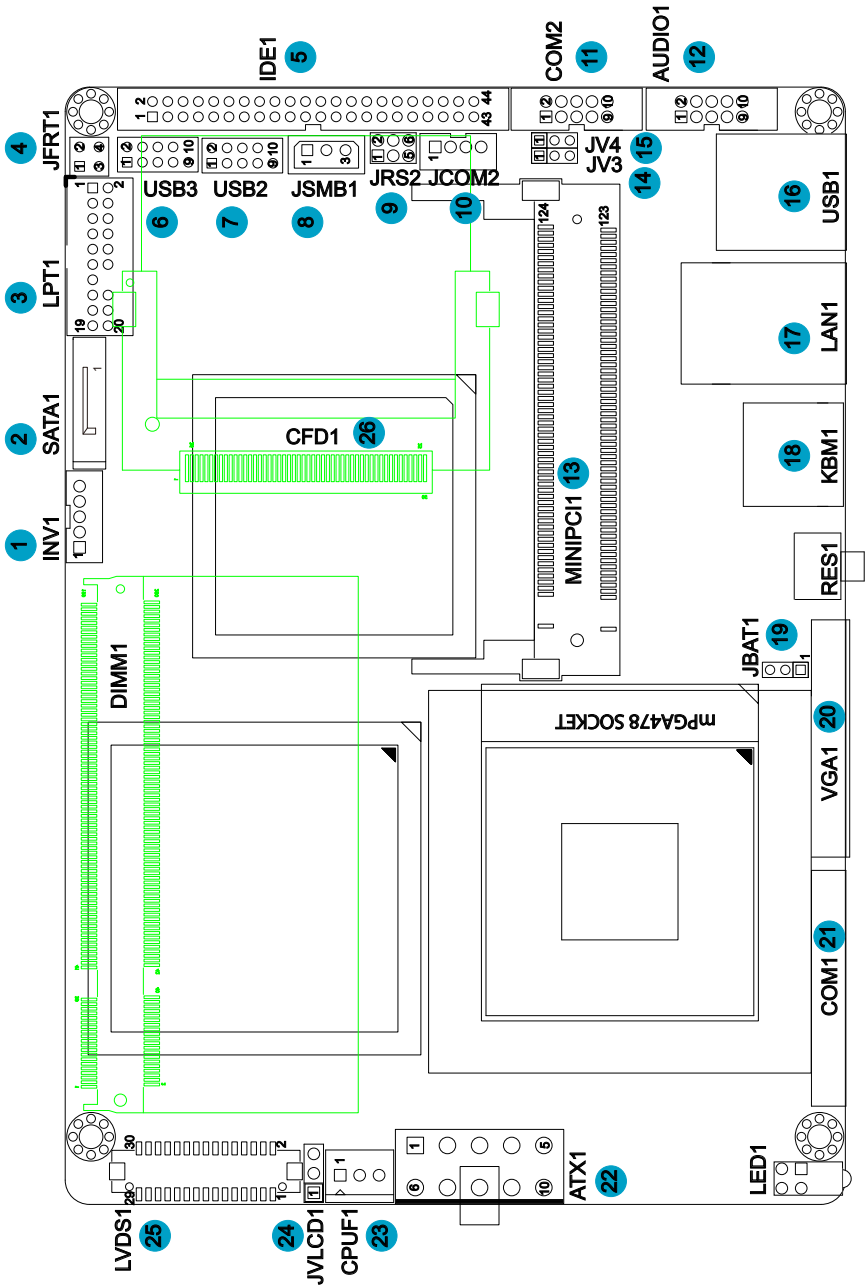
Chapter 2

Installation

2.1 Block Diagrams



2.2 Jumpers and Connectors



Jumpers

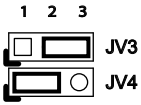
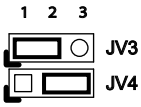
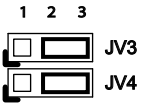
JRS2: COM2 RS-232/422/485 Mode Select (9)

The onboard COM2 port can be configured to operate in RS-422 or RS-485 modes. RS-422 modes differ in the way RX/TX is being handled. Jumper JRS1 switches between RS-232 or RS-422/485 mode. When JRS1 is set to RS-422 or RS-485 mode, there will be only +12V output let while JRS1 is set. All RS-232/422/482 modes are available on COM2.
It can be configured COM2 to operate in RS-232, RS-422 or RS-485 mode
Connector type: 2.00mm pitch 2x3 pin header.

Mode	RS-232 (Default)	RS-422	RS-485
1-2	ON	OFF	OFF
3-4	OFF	ON	OFF
5-6	OFF	OFF	ON

LV3, LV4: COM2 Power source Special Support (14), (15)

The voltage of COM2 could be selected by LV3 and LV4 to +5V or +12V.
Connector type: 2.54mm pitch 1x3 pin header.

Setup	JV3/JV4
POS: +5V on pin 1	
POS: +12V on pin 9	
POS: +5V on pin 1 and +12V on pin 9	

JBAT1: Clear CMOS Setup (19)

If the board refuses to boot due to inappropriate CMOS settings here is how to proceed to clear (reset) the CMOS to its default values.
Connector type: 2.00 mm pitch 1x3 pin header

Pin	Mode	
1-2	Keep CMOS (Default)	
2-3	Clear CMOS	

You may need to clear the CMOS if your system cannot boot up because you forgot your password, the CPU clock setup is incorrect, or the CMOS settings need to be reset to default values after the system BIOS has been updated.
Refer to the following solutions to reset your CMOS setting:

Solution A:

1. Power off the system and disconnect the power cable.
2. Place a shunt to short pin 1 and pin 2 of JBAT1 for five seconds.
3. Place the shunt back to pin 2 and pin 3 of JBAT1.
4. Power on the system.

Solution B:

If the CPU Clock setup is incorrect, you may not be able to boot up. In this case, follow these instructions:

1. Turn the system off, then on again. The CPU will automatically boot up using standard parameters.
2. As the system boots, enter BIOS and set up the CPU clock.

Note:

If you are unable to enter BIOS setup, turn the system on and off a few times.

JVLCD1: LCD Panel Voltage Select (25)

The voltage of LCD panel could be selected by JVLCD1 in +5V or +3.3V.
Connector type: 2.54 mm pitch 1x3 pin header

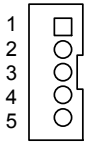
Pin	Voltage	
1-2	+5V	
2-3	+3.3V (Default)	

Connectors

INV1: LCD Inverter Connector (1)

Connector type: 2.00mm pitch 1x5-pin box wafer connector.

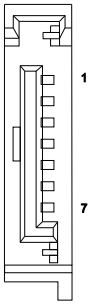
Pin	Description
1	+12V
2	GND
3	Backlight on/off
4	Brightness control
5	GND



SATA1: Serial ATA Connector (2)

The 3308210 CPU board on board supports four SATA II connectors, second generation SATA drives transfer data at speeds as high as 300MB/s, twice the transfer speed of first generation SATA drives. The SATA drives can be configured in a RAID 0, RAID 1 or RAID 10 configuration.

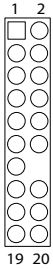
Pin	Description
1	GND
2	TX+
3	TX-
4	GND
5	RX-
6	RX+
7	GND



LPT1: Parallel Port or FDD Connector (3)

LPT1 is shared with FDD1. Connector type: 2.00mm pitch 2x10 pin header.

Pin	Description	Pin	Description
1	STROBE	2	AFD
3	PTD0	4	ERROR
5	PTD1	6	INIT
7	PTD2	8	SLIN
9	PTD3	10	GND
11	PTD4	12	GND
13	PTD5	14	N/C (Key)
15	PTD6	16	BUSY
17	PTD7	18	PE
19	ACK	20	SELECT



LPT1 can be configured as a connector floppy disk drive interface through BIOS setup.

Pin	Description	Pin	Description
1	N/C	2	RWC-
3	RINDEX-	4	HEAD-
5	TRAK0-	6	DIR-
7	WP-	8	STEP-
9	RDATA-	10	GND
11	DSKCHG-	12	GND
13	N/C	14	N/C
15	N/C	16	MOB-
17	N/C	18	WD-
19	DSB-	20	WE-

BIOS Setup

The default is to set LPT1 as FDD connector. To change the value, get into BIOS setup --> Integrated Peripheral --> Super IO Device.

BIOS Option	Setting	Description
External FDD Controller	Enabled	Set as FDD connector
Onboard Parallel Port	Disabled	
External FDD Controller	Disabled	
Onboard Parallel Port	378/IRQ7	Set as Parallel Port

JFRT1: Switches (4)

It provides connectors for system switches to change the computer status.
Connector type: 2.54 mm pitch 2x2 pin header

Pin	Description	Pin	Description
1	PWRBTN+	2	PWRBTN-
3	RST+	4	RST-

PWRBTN: ATX soft power switch, pin 1-2.

This 2-pin connector connects to the case-mounted Power button.

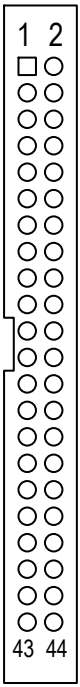
RES: Reset Button, pin 3-4.

This 2-pin connector connects to the case-mounted reset switch and is used to reboot the system.

IDE1: Primary IDE Connector (5)

An IDE drive ribbon cable has two connectors to support two IDE devices. If a ribbon cable connects to two IDE drives at the same time, one of them has to be configured as Master and the other has to be configured as Slave by setting the drive select jumpers on the drive.
Consult the documentation that came with your IDE drive for details on jumper locations and settings. You must orient the cable connector so that the pin 1 (color) edge of the cable corresponds to pin 1 of the IDE connector.
Connector type: 2.0mm pitch 2x22 box header

Pin	Description	Pin	Description
1	IDE RESET	2	GND
3	DATA7	4	DATA8
5	DATA6	6	DATA9
7	DATA5	8	DATA10
9	DATA4	10	DATA11
11	DATA3	12	DATA12
13	DATA2	14	DATA13
15	DATA1	16	DATA14
17	DATA0	18	DATA15
19	GND	20	N/C (Key)
21	REQ	22	GND
23	IO WRITE	24	GND
25	IO READ	26	GND
27	IO READY	28	IDESEL
29	DACK	30	GND
31	IRQ14	32	N/C
33	ADDR1	34	ATA66 DETECT
35	ADDR0	36	ADDR2
37	CS#2	38	CS#3
39	IDEACTP	40	GND
41	VCC (+5V)	42	VCC (+5V)
43	GND	44	N/C

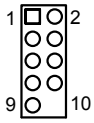


USB2/ USB3: USB Connectors (6), (7)

The 3308210 Embedded Board on board supports two headers USB2, USB3 that can connect up to four high-speed (Data transfers at 480MB/s), full-speed (Data transfers at 12MB/s) or low-speed (Data transfers at 1.5MB/s) USB devices.

Connector type: 2.00mm 2x5 pin header

Pin	Description	Pin	Description
1	+5V	2	+5V
3	USBD1-	4	USBD2-
5	USBD1+	6	USBD2+
7	GND	8	GND
9	GND	10	N/C (Key)



JSMB1: External SMBUS Connector (8)

Connector type: 2.00mm pitch 1x3 box wafer connector.

Pin	Description
1	Data
2	Clock
3	GND

JCOM2: RS-422/ 485 Output Connector (10)

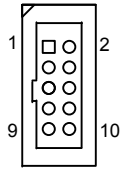
Connector type: 2.00mm pitch 1x4 box wafer connector

Pin	RS-422	RS-485
1	TX+	Data+
2	TX-	Data-
3	RX+	N/C
4	RX-	N/C

COM2: RS-232 Connector (11)

Connector type: 2.00 mm pitch 2x5 box header.

Pin	Description	Pin	Description
1	DCD#	2	RXD
3	TXD	4	DTR#
5	GND	6	DSR#
7	RTS#	8	CTS#
9	RI#	10	N/C



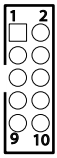
AUDIO1: Front Panel AUDIO Connector (12)

Connect a tape player or another audio source to the light blue Line-in connector to record audio on your computer or to play audio through your computer's sound chip and speakers.

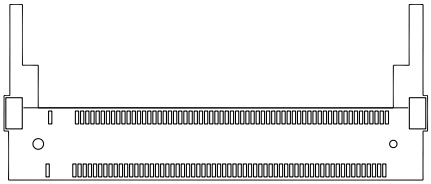
Connect a micro-phone to the pink microphone connector to record audio to your computer.

Connector type: 2.00mm pitch 2x5 pin header.

Pin	Description	Pin	Description
1	Line-in Left	2	Line-in Right
3	GND	4	GND
5	MIC1	6	MIC2
7	GND	8	GND
9	Line-out Left	10	Line-out Right

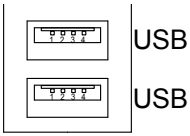


MINIPCI1: MiniPCI slot (13)



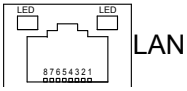
USB1: USB Connector (16)

USB1 supports two USB 2.0 connectors w/ 480MB/s.
Connector type: double stack USB type A.



LAN1: RJ-45 Connector (17)

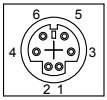
LAN1 supports one 10/100/1000 base-T Ethernet.
Connector type: RJ-45.



KBM1: Keyboard & Mouse (18)

Mini-Din Keyboard & Mouse connector

Pin	Description
1	KB Data
2	MS Data
3	GND
4	+5V
5	KB Clock
6	MS Clock

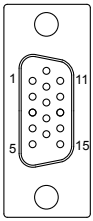


Note: KBM1 supports PS/2 keyboard directly, and PS/2 mouse supported with the additional PS/2 1-to-2 cable in standard packing.

VGA1: CRT Connector (20)

Connector type: D-Sub 15-pin female.

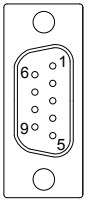
Pin	Description	Pin	Description
1	RED	9	+5V (VCC)
2	GREEN	10	GND
3	BLUE	11	N/C
4	N/C	12	D-DATA
5	GND	13	HSYNC
6	GND	14	VSYNC
7	GND	15	D-DCLK
8	GND		



COM1: RS232 Connector (21)

Connector type: D-Sub 9-pin male.

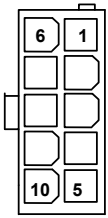
Pin	Description	Pin	Description
1	DCD#	6	DSR#
2	RXD	7	RTS#
3	TXD	8	CTS#
4	DTR#	9	RI#
5	GND		



ATX1: ATX Power Supply Connector (23)

The ATX power supply has a single lead connector with a clip on one side of the plastic housing. There is only one way to plug the lead into the ATX power connector. Press the lead connector down until the clip snaps into place and secures the lead onto the connector.

Pin	Description	Pin	Description
6	5VSB	1	PS-ON
7	+5V	2	GND
8	+5V	3	GND
9	N/C	4	+12V
10	GND	5	+3.3V



Warning

Incorrect installation of the power supply could result in serious damage to the mainboard and connected peripherals. Make sure the power supply is unplugged from the AC outlet before connecting the leads from the power supply.

CPUF1: CPU Fan Power Connector (24)

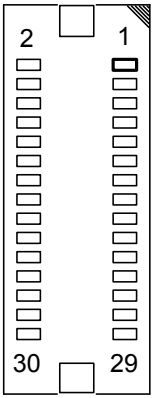
CPUF1 is 3-pin header for the system fan. The fan must be a +12V fan.

Pin	Description
1	GND
2	+12V
3	FAN_Detect

LVDS1: LVDS LCD Connector (26)

The LVDS connector supports dual channel LVDS.
VDD could be selected by JVLCD1 in +5V or +3.3V.
Connector type: DF-13-30DP-1.25V

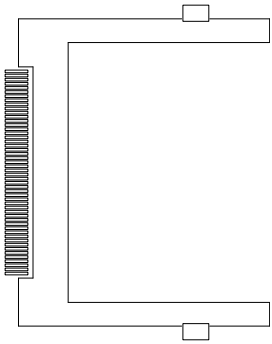
Pin	Description	Pin	Description
2	VDD	1	VDD
4	TX2CLK+	3	TX1CLK+
6	TX2CLK-	5	TX1CLK-
8	GND	7	GND
10	TX2D0+	9	TX1D0+
12	TX2D0-	11	TX1D0-
14	GND	13	GND
16	TX2D1+	15	TX1D1+
18	TX2D1-	17	TX1D1-
20	GND	19	GND
22	TX2D2+	21	TX1D2+
24	TX2D2-	23	TX1D2-
26	GND	25	GND
28	TX2D3+	27	TX1D3+
30	TX2D3-	29	TX1D3-



CFD1: Compact Flash II Socket (27)

Connector type: 50-pin compact flash connector

Pin	Description	Pin	Description
1	GND	26	N/C
2	PDD3	27	PDD11
3	PDD4	28	PDD12
4	PDD5	29	PDD13
5	PDD6	30	PDD14
6	PDD7	31	PDD15
7	PDCS1#	32	PDCS3#
8	GND	33	N/C
9	GND	34	PDIOR#
10	GND	35	PDIOW#
11	GND	36	+5V
12	GND	37	PIDEIRQ
13	+5V	38	+5V
14	GND	39	CSEL#
15	GND	40	N/C
16	GND	41	IDERST#
17	GND	42	PIORDY
18	PDA2	43	PDDREQ
19	PDA1	44	PDDACK#
20	PDA0	45	HD_LED1#
21	PDD0	46	PDIAG#
22	PD1	47	PDD8
23	PD2	48	PDD9
24	N/C	49	PDD10
25	N/C	50	GND



The interface of Compact Flash socket is designated to use IDE1.

Installation instructions

Compact Flash (CF) card is “not hot-swap”. If the CF card is swapped in the condition of system power-on, it will damage the CF card.

1. Make sure the Single Board Computer is powered OFF.
2. Plug the Compact Flash Type II device into its socket. Verify the direction is correct.
3. Power up the system.

Chapter 3

Appendix

4.1 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 - 00000CF7	PCI bus
00000000 - FFFFFFFF	ISAPNP Read Data Port
00000060 - 00000060	Standard 101/102-Key or Microsoft Natural PS/2 Keyboard
00000064 - 00000064	Standard 101/102-Key or Microsoft Natural PS/2 Keyboard
00000070 - 00000073	System CMOS/real time clock
00000170 - 00000177	Secondary IDE Channel
000001F0 - 000001F7	Primary IDE Channel
00000274 - 00000277	ISAPNP Read Data Port
00000279 - 00000279	ISAPNP Read Data Port
000002F8 - 000002FF	Communications Port
00000378 - 0000037F	Printer Port
000003B0 - 000003BB	Intel(R) 82945G Express Chipset Family
000003C0 - 000003DF	Intel(R) 82945G Express Chipset Family
000003F0 - 000003F5	Standard floppy disk controller
000003F6 - 000003F6	Primary IDE Channel
000003F7 - 000003F7	Standard floppy disk controller
000003F8 - 000003FF	Communications Port
00000778 - 0000077B	Printer Port
00000A79 - 00000A79	ISAPNP Read Data Port
00000D00 - 0000FFFF	PCI bus
0000B000 - 0000BFFF	Intel(R) 82801G (ICH7 Family) PCI Express Root Port - 27D6
0000BE00 - 0000BEFF	Realtek RTL8168/8111 PCI-E Gigabit Ethernet NIC

0000C000 - 0000CFFF	Intel(R) 82801G (ICH7 Family) PCI Express Root Port - 27D0
0000F000 - 0000F0FF	Realtek AC'97 Audio
0000F800 - 0000F80F	Intel(R) 82801G (ICH7 Family) Ultra ATA Storage Controllers - 27DF
0000FA00 - 0000FA3F	Realtek AC'97 Audio
0000FB00 - 0000FB1F	Intel(R) 82801G (ICH7 Family) USB Universal Host Controller - 27CB
0000FC00 - 0000FC1F	Intel(R) 82801G (ICH7 Family) USB Universal Host Controller - 27CA
0000FC00 - 0000FC1F	Intel(R) 82801G (ICH7 Family) USB Universal Host Controller - 27C9
0000FE00 - 0000FE1F	Intel(R) 82801G (ICH7 Family) USB Universal Host Controller - 27C8
0000FF00 - 0000FF07	Mobile Intel(R) 945GM Express Chipset Family

4.2 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 1	Standard 101/102-Key or Microsoft Natural PS/2 Keyboard
IRQ 3	Communications Port
IRQ 4	Communications Port
IRQ 6	Standard floppy disk controller
IRQ 8	System CMOS/real time clock
IRQ 9	Microsoft ACPI-Compliant System
IRQ 12	PS/2 Compatible Mouse
IRQ 14	Primary IDE Channel
IRQ 15	Secondary IDE Channel
IRQ 16	Intel(R) 82801G (ICH7 Family) USB Universal Host Controller - 27CB
IRQ 16	Intel(R) 82801G (ICH7 Family) PCI Express Root Port - 27D0
IRQ 16	Intel(R) 82945G Express Chipset Family
IRQ 18	Intel(R) 82801G (ICH7 Family) USB Universal Host Controller - 27CA
IRQ 19	Intel(R) 82801G (ICH7 Family) PCI Express Root Port - 27D6
IRQ 19	Intel(R) 82801G (ICH7 Family) USB Universal Host Controller - 27C9
IRQ 19	Realtek RTL8168/8111 PCI-E Gigabit Ethernet NIC
IRQ 23	Intel(R) 82801G (ICH7 Family) USB Universal Host Controller - 27C8
IRQ 23	Intel(R) 82801G (ICH7 Family) USB Universal Host Controller - 27CC

4.3 Memory Resources

Address	Device Description
D0000000 - FFFFFFF	Mobile Intel(R) 945GM Express Chipset Family
FD900000 - D9FFFFF	Intel(R) 82801G (ICH7 Family) PCI Express Root Port - 27D6
FDA00000 - DAFFFFF	Intel(R) 82801G (ICH7 Family) PCI Express Root Port - 27D6
FDAFF000 - DAFFFFF	Realtek RTL8168/8111 PCI-E Gigabit Ethernet NIC
FDAFF000 - DAFFFFF	Realtek RTL8168/8111 PCI-E Gigabit Ethernet NIC
FDB00000 - FDBFFFFF	Intel(R) 82801G (ICH7 Family) PCI Express Root Port - 27D0
FDE00000 - FDEFFFFF	Intel(R) 82801G (ICH7 Family) PCI Express Root Port - 27D0
FDF00000 - FDF7FFFF	Mobile Intel(R) 945GM Express Chipset Family
FDF80000 - FDFBFFFF	Mobile Intel(R) 945GM Express Chipset Family
FDFFD000 - FDFFD0FF	Realtek AC'97 Audio
FDFFE000 - FDFFE1FF	Realtek AC'97 Audio
FDFFF000 - FDFFF3FF	Intel(R) 82801G (ICH7 Family) USB2 Enhanced Host Controller - 27CC
000A0000 - 000BFFFF	PCI bus
000A0000 - 000BFFFF	Mobile Intel(R) 945GM Express Chipset Family
000C0000 - 000DFFFF	PCI bus
1F700000 - FEBFFFFF	PCI bus

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