USER'S MANUAL

BC-0230

COM Express Type 6
ATX Carrier Board

Features VGA/LAN/3DP/4COM

BC-0230 M1

BC-0230

COM Express Type 6 ATX Carrier Board

With VGA/LAN/3DP/4COM

DISCLAIMER

This operation manual is meant to assist both Embedded Computer manufacturers and end users in installing and setting up the system. The information contained in this document is subject to change without any notice.

CE NOTICE

This is a class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

FCC NOTICE

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.

You are cautioned that any change or modifications to the equipment not expressly approve by the party responsible for compliance could void your authority to operate such equipment.

CAUTION! Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.

TABLE OF CONTENTS

CHAPTER 1 INTRODUCTION

CHAPTER 2 HARDWARE CONFIGURATION

INTRODUCTION

CHAPTER

1

This chapter gives you the information for BC-0230. It also outlines the system specifications.

Sections included:

- About This Manual
- System Specifications
- Safety Precautions

Experienced users can jump to chapter 2 on page 2-1 for a quick start.

1-1. ABOUT THIS MANUAL

Thank you for purchasing our BC-0230 COM Express Type 6 ATX Carrier Board enhanced with VGA, LAN, 3DP & 4COM, which is fully PC/AT compatible. The BC-0230 provides faster processing speed, greater expandability and can handle more tasks than before. This manual is designed to assist you how to install and set up the system. It contains four chapters. The user can apply this manual for configuration according to the following chapters:

Chapter 1 Introduction

This chapter introduces you to the background of this manual, and the specifications for this system. The final page of this chapter will indicate how to avoid damaging this board.

Chapter 2 Hardware Configuration

This chapter outlines the component locations and their functions. In the end of this chapter, you will learn how to set jumper and how to configure this card to meet your own needs.

Chapter 3 Software Utilities

This chapter contains helpful information for proper installations of the VGA utility, LAN utility, Sound utility, and Flash BIOS Update. It also describes the Watchdog-timer configuration.

Chapter 4 BIOS Setup

This chapter indicates you how to set up the BIOS configurations.

Appendix A Expansion Bus

This appendix introduces you the expansion bus for PCIe connectors.

Appendix B Technical Summary

This appendix gives you the information about the Technical maps.

1-2. SYSTEM SPECIFICATIONS

System

CPU Support	From CPU module
Chipset	From CPU module
Memory	From CPU module
BIOS	AMI
Watchdog	1~255 seconds
Power Supply	ATX
Power Request	12V, 5V
Dimension	305 x 244 mm (12" x 9.6")
Certificate	CE/FCC

I/O Ports (Signal from CPU module)

Serial Port	4 ports ▪ **COM1 & COM2:** support 5V & 12V ▪ **COM3 & COM4:** only TX/RX
USB Port	▪ 4 x USB 3.0 ▪ 2 x USB 2.0 (for express Card & Mini-PCIe)
SATA Interface	▪ 2 x SATA III ▪ 2 x SATA II
TPM	TPM 1.2 (via Protech external TPM module BR-4010)
GPIO	▪ 4 x GPO ▪ 4 x GPI
VGA	1 x VGA
LAN	1 x RJ45, Intel® I217-LM 10/100/1000 GB, signal from CPU module
Keyboard & Mouse	1 x PS/2 port
Audio	Realtek ALC888S High Definition audio codec on carrier board
Expansion Bus	▪ 1 x PCIe (x16) ▪ 5 x PCIe (1x) ▪ 1 x Mini-PCIe slot ▪ 1 x LPC bus ▪ 1 x Smbus ▪ 1 x I^2C

Display

Graphics	Built-in processor to share the system memory (Signal is from CPU Module). ▪ 1 x VGA ▪ 1 x LVDS (2CH, 24 bit) ▪ 3 x Display ports

Environment

Temperature	▪ Operation: 0 ~ 60°C (32 ~ 140°F) ▪ Storage: -40 ~ 80°C (-40 ~ 176°F)
Humidity	▪ Operation: 20~90% ▪ Storage: 20~95%

1-3. SAFETY PRECAUTIONS

Follow the messages below to avoid your systems from damage:

1. Keep your system away from static electricity on all occasions.

2. Prevent electric shock. Don‘t touch any components of this card when the card is power-on. Always disconnect power when the system is not in use.

3. Disconnect power when you change any hardware devices.
   For instance, when you connect a jumper or install any cards, a surge of power may damage the electronic components or the whole system.

CHAPTER

2

HARDWARE CONFIGURATION

*** QUICK START ***

Helpful information describes the jumper & connector settings, and component locations.

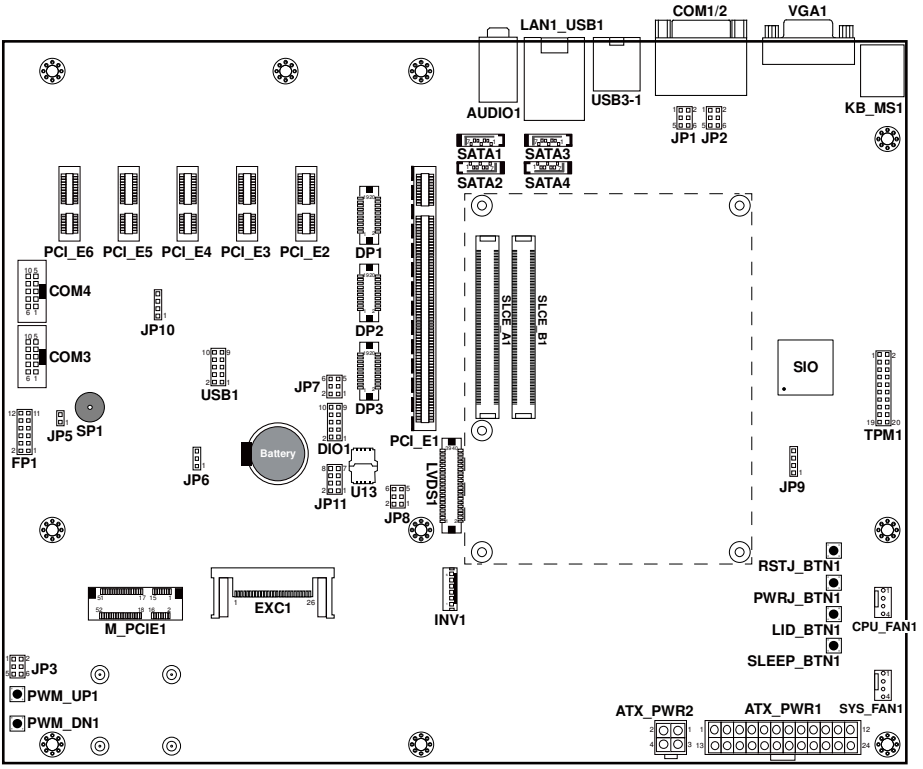
Sections included:

- Jumper & Connector Quick Reference Table
- Component Locations
- Configuration and Jumper settings
- Connector's Pin Assignments

2-1. JUMPER & CONNECTOR QUICK REFERENCE TABLE

JUMPER/CONNECTOR	Reference
COM Port	COM1, COM2, COM3, COM4
COM Port RI & Voltage Selection	JP1, JP2
LAN & USB3.0 Port	LAN1_USB1
USB Port	USB3_1, USB1
VGA Port	VGA1
Keyboard & Mouse Port	KB_MS1
Audio Jack	AUDIO1
ATX Power Connector	ATX_PWR1, ATX_PWR2
SATA Port	SATA1, SATA2, SATA3, SATA4
GPIO Port	DIO1
Hardware Power Fail Selection	JP5
Fan Connector	CPU_FAN1, SYS_FAN1
Clear CMOS Data Selection	JP6
I^2C Connector	JP9
BIOS Disable Selection	JP7
TPM Connector	TPM1
SMBus Connector	JP10
Display Port Connector	DP1, DP2, DP3
LVDS Inverter Connector	INV1
LVDS Connector	LVDS1
LVDS Voltage Selection	JP8
Front Panel Connector & Selection	FP1
Test Button	RSTJ_BTN1, PWRJ_BTN1, LID_BTN1, SLEEP_BTN1, PWMUP1, PWM_DN1

2-2. COMPONENT LOCATIONS



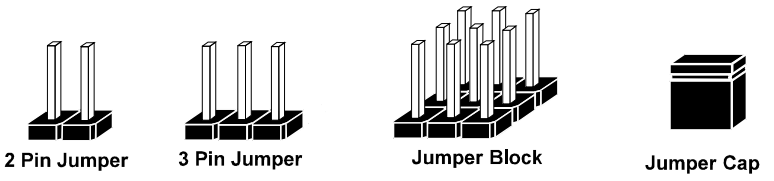
BC-0230 Front Connector, Jumper and Component locations

2-3. HOW TO SET JUMPERS

You can configure your board by setting jumpers. Jumper is consists of two or three metal pins with a plastic base mounted on the card, and by using a small plastic "cap", Also known as the jumper cap (with a metal contact inside), you are able to connect the pins. So you can set-up your hardware configuration by "open" or "close" pins.

The jumper can be combined into sets that called jumper blocks. When the jumpers are all in the block, you have to put them together to set up the hardware configuration. The figure below shows how this looks like.

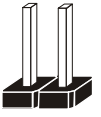
JUMPERS AND CAPS



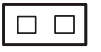
If a jumper has three pins (for examples, labelled PIN1, PIN2, and PIN3), You can connect PIN1 & PIN2 to create one setting by shorting. You can either connect PIN2 & PIN3 to create another setting. The same jumper diagrams are applied all through this manual. The figure below shows what the manual diagrams look and what they represent.

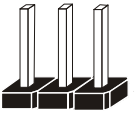
JUMPER DIAGRAMS

Jumper Cap looks like this



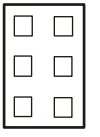
2 pin Jumper looks like this





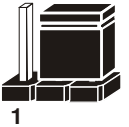
3 pin Jumper looks like this

Jumper Block looks like this

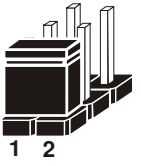


JUMPER SETTINGS

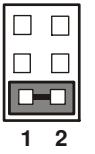
2 pin Jumper close(enabled) Looks like this



3 pin Jumper 2-3 pin close(enabled) Looks like this



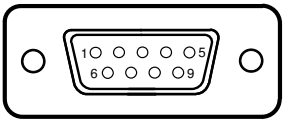
Jumper Block 1-2 pin close(enabled) Looks like this



2-4. COM PORT

COM1, COM2: Stacked COM Ports
The pin assignments are as follows:

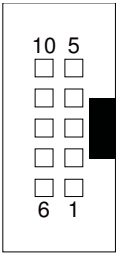
PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	DCD#	6	DSR#
2	RX	7	RTS#
3	TX	8	CTS#
4	DTR#	9	RI#
5	GND		



COM1/ COM2

COM3, COM4: Two COM Connectors
The pin assignments are as follows:

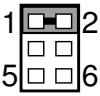
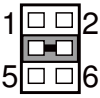
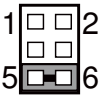
PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	NC	6	NC
2	RX	7	NC
3	TX	8	NC
4	NC	9	NC
5	NC	10	NC



COM3/ COM4

2-5. COM PORT RI & VOLTAGE SELECTION

JP1 & JP2: COM1 & COM2 Port RI & Voltage Selection
The pin assignments are as follows:

SELECTION	JUMPTER SETTING	JUMPER ILLUSTRATION
RI	1-2	 **JP1/ JP2**
12V	3-4	 **JP1/ JP2**
5V	5-6	 **JP1/ JP2**

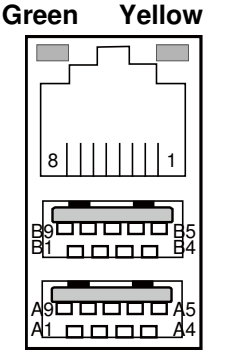
Note: Manufacturing default is RI.

2-6. LAN & USB3.0 PORT

LAN1_USB1: LAN & Two USB3.0 Ports

LAN1 signal:

PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	MDI_P0	5	MDI_P2
2	MDI_N0	6	MDI_N2
3	MDI_P1	7	MDI_P3
4	MDI_N1	8	MDI_N3



LAN1_USB1

LAN LED Indicator:

Left Side LED

Green Color On	10/100 LAN Speed Indicator
Orange Color On	Giga LAN Speed Indicator
OFF	No LAN Switch/Hub Connected

Right Side LED

Yellow Color Blinking	LAN Message Active
OFF	No LAN Message Active

USB signal:

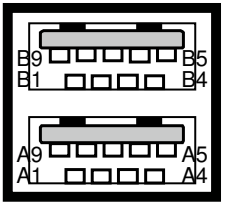
PIN	ASSIGNMENT	PIN	ASSIGNMENT
A1	USB_VCC5	B1	USB_VCC5
A2	USB_N	B2	USB_N
A3	USB_P	B3	USB_P
A4	GND	B4	GND
A5	USB3_RXN	B5	USB3_RXN
A6	USB3_RXP	B6	USB3_RXP
A7	GND	B7	GND
A8	USB3_TXN	B8	USB3_TXN
A9	USB3_TXP	B9	USB3_TXP

2-7. USB PORT

USB3-1: USB3.0 Port

The pin assignments are as follows:

PIN	ASSIGNMENT	PIN	ASSIGNMENT
A1	USB_VCC5	B1	USB_VCC5
A2	USB_N	B2	USB_N
A3	USB_P	B3	USB_P
A4	GND	B4	GND
A5	USB3_RXN	B5	USB3_RXN
A6	USB3_RXP	B6	USB3_RXP
A7	GND	B7	GND
A8	USB3_TXN	B8	USB3_TXN
A9	USB3_TXP	B9	USB3_TXP

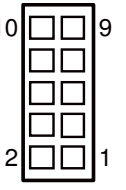


USB3-1

USB1: USB2.0 Connector

The pin assignments are as follows:

PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	USB_VCC5	6	USB_P
2	USB_VCC5	7	GND
3	USB_N	8	GND
4	USB_N	9	NC
5	USB_P	10	GND

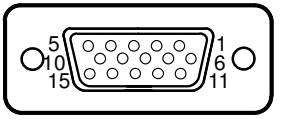


USB1

2-8. VGA PORT

VGA1: VGA Port
The pin assignments are as follows:

PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	CRT_RED	9	CRT_VCC
2	CRT_GREEN	10	GND
3	CRT_BLUE	11	NC
4	NC	12	CRT_DATA
5	GND	13	CRT_HSYNC
6	NC	14	CRT_VSYNC
7	GND	15	CRT_CLK
8	GND		



VGA1

2-9. KEYBOARD & MOUSE PORT

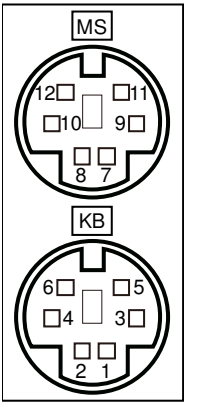
KB_MS1: PS/2 Keyboard & Mouse Port

Keyboard:

PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	KB_DATA	4	5VSB
2	NC	5	KB_CLK
3	GND	6	NC

Mouse:

PIN	ASSIGNMENT	PIN	ASSIGNMENT
7	MS_DATA	10	5VSB
8	NC	11	MS_CLK
9	GND	12	NC



KB_MS1

2-10. AUDIO JACK

AUDIO1: Line-In, Line-Out & Microphone
The connector can also support only Microphone.

Line-In:

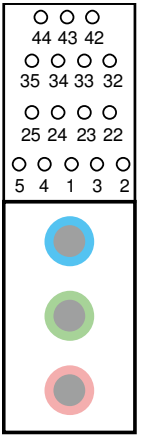
PIN	ASSIGNMENT
32	HD_LINE-IN-L
33	GND
34	GND
35	HD_LINE-IN-R

Line-Out:

PIN	ASSIGNMENT
22	LINE-OUT-L
23	GND
24	GND
25	LINE-OUT-R

Mic-In:

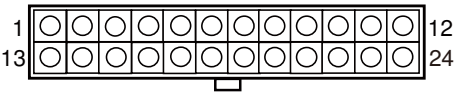
PIN	ASSIGNMENT
1	GND
2	HD_MIC1-L_L
3	GND
4	GND
5	HD_MIC1-R_L



AUDIO1

2-11. ATX POWER CONNECTOR

ATX_PWR1: ATX Power Connector
The pin assignments are as follows:

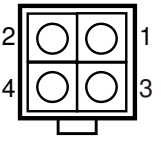


ATX_PWR1

PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	+3.3V	13	+3.3V
2	+3.3V	14	-12V
3	GND	15	GND
4	+5V	16	PSON
5	GND	17	GND
6	+5V	18	GND
7	GND	19	GND
8	POK	20	-5V
9	5VSB	21	+5V
10	+12V	22	+5V
11	+12V	23	+5V
12	+3.3V	24	GND

ATX_PWR2: ATX Power Connector
The pin assignments are as follows:

PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	GND	3	12V
2	GND	4	12V



ATX_PWR2

2-12. SATA PORT

SATA1~SATA4: Four Serial ATA Ports
The pin assignments are as follows:

SATA1, SATA3:

PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	GND	5	SATA_RXN
2	SATA_TXP	6	SATA_RXP
3	SATA_TXN	7	GND
4	GND		

SATA1/ SATA3

SATA2, SATA4:

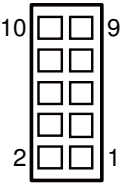
PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	GND	5	SATA_RXN
2	SATA_TXP	6	SATA_RXP
3	SATA_TXN	7	GND
4	GND		

SATA2/ SATA4

2-13. GPIO Port

DIO1: General Purpose I/O Connector
The pin assignments are as follows:

PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	VCC5	6	GPO2
2	GND	7	GPI3
3	GPI1	8	GPO3
4	GPO1	9	GPI4
5	GPI2	10	GPO4



DIO1

2-14. HARDWARE POWER FAIL SELECTION

JP5: Hardware Power Fail Selection

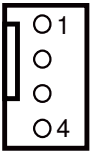
SELECTION	JUMPER SETTING	JUMPER ILLUSTRATION
Disable	Open	 **JP5**
Enable	Close	 **JP5**

Note: Manufacturing default is Disable.

2-15. FAN CONNECTOR

CPU_FAN1, SYS_FAN1: Fan Connector
The pin assignments are as follows:

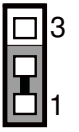
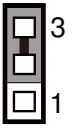
PIN	ASSIGNMENT
1	GND
2	VCC12
3	FAN_TAC
4	FAN_CTL



CPU_FAN1/ SYS_FAN1

2-16. CLEAR CMOS DATA SELECTION

JP6: Clear CMOS Data Selection
The selections are as follows:

SELECTION	JUMPER SETTINGS	JUMPER ILLUSTRATION
Clear CMOS*	1-2	 JP6
Normal	2-3	 JP6

Note: Manufacturing Default is Normal.

*To clear CMOS data, user must power-off the computer and set the jumper to "Clear CMOS" as illustrated above. After five to six seconds, set the jumper back to "Normal" and power-on the computer.

2-17. I²C CONNECTOR

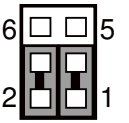
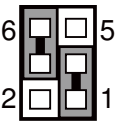
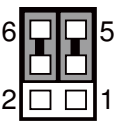
JP9: I²C Connector
The pin assignments are as follows:

PIN	ASSIGNMENT
1	VCC3
2	I2C CLK
3	I2C DATA
4	GND

JP9

2-18. BIOS DISABLE SELECTION

JP7: BIOS Disable Selection
The pin assignments are as follows:

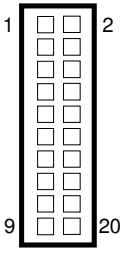
SELECTION	JUMPTER SETTING	JUMPER ILLUSTRATION
SPI1: Module SPI2: Carrier	1-3, 2-4	 **JP7**
SPI1: Carrier SPI2: Module	1-3, 4-6	 **JP7**
SPI1: Module SPI2: Module	3-5, 4-6	 **JP7**

Note: Manufacturing default is "SPI1: Module, SPI2: Module."

2-19. TPM CONNECTOR

TPM1: TPM Connector
The pin assignments are as follows:

PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	CLK	11	LAD0
2	GND	12	GND
3	FRAME	13	SMBCLK
4	NC	14	SMBDATA
5	RST	15	3VSB
6	VCC5	16	SERIRQ
7	LAD3	17	GND
8	LAD2	18	NC
9	VCC3	19	SUS_TAT
10	LAD1	20	GND

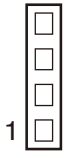


TPM1

2-20. SMBUS CONNECTOR

JP10: SMBUS Connector
The pin assignments are as follows:

PIN	ASSIGNMENT
1	VCC3
2	SMB CLK
3	SMB DATA
4	GND



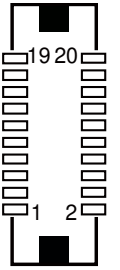
JP10

2-21. DISPLAY PORT CONNECTOR

DP1, DP2 & DP3: Display Port Connectors
The pin assignments are as follows:

JDP1:

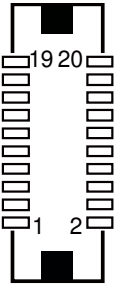
PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	DATA0+	11	GND
2	GND	12	DATA3-
3	DATA0-	13	AUX_EN#
4	DATA1+	14	GND
5	GND	15	AUX+
6	DATA1-	16	HPD
7	DATA2+	17	AUX-
8	GND	18	VCC3
9	DATA2-	19	VCC5
10	DATA3+	20	VCC3



DP1

JDP2:

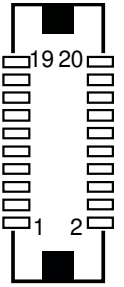
PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	DP_C_DATA0+	11	GND
2	GND	12	DP_C_DATA3-
3	DP_C_DATA0-	13	DP_C_AUX_ENJ
4	DP_C_DATA1+	14	GND
5	GND	15	DP_C_AUX+
6	DP_C_DATA1-	16	DP_C_HPD
7	DP_C_DATA2+	17	DP_C_AUX-
8	GND	18	DP_VCC3_3
9	DP_C_DATA2-	19	DP_VCC5
10	DP_C_DATA3+	20	DP_VCC3_3



DP2

JDP3:

PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	DP_D_DATA0+	11	GND
2	GND	12	DP_D_DATA3-
3	DP_D_DATA0-	13	DP_D_AUX_ENJ
4	DP_D_DATA1+	14	GND
5	GND	15	DP_D_AUX+
6	DP_D_DATA1-	16	DP_D_HPD
7	DP_D_DATA2+	17	DP_D_AUX-
8	GND	18	DP_VCC3_3
9	DP_D_DATA2-	19	DP_VCC5
10	DP_D_DATA3+	20	DP_VCC3_3

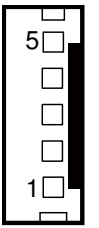


DP3

2-22. LVDS INVERTER CONNECTOR

INV1: LVDS Inverter Connector
The pin assignments are as follows:

PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	VCC12	4	VCC5
2	VCC12	5	GND
3	GND	6	ENABKL

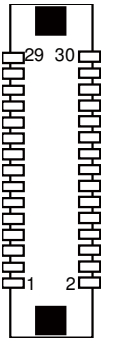


INV1

2-23. LVDS CONNECTOR

LVDS1: LVDS Connector
The pin assignments are as follows:

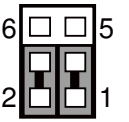
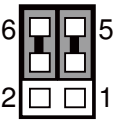
PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	LVDS_VCC	16	LVDS0_CLK+ (Odd)
2	GND	17	LVDS0_CLK- (Odd)
3	LVDS1_CLK- (Even)	18	GND
4	LVDS1_CLK+ (Even)	19	LVDS0_D2+ (Odd)
5	GND	20	LVDS0_D2- (Odd)
6	LVDS1_D2- (Even)	21	GND
7	LVDS1_D2+ (Even)	22	LVDS0_D1+ (Odd)
8	GND	23	LVDS0_D1- (Odd)
9	LVDS1_D1- (Even)	24	GND
10	LVDS1_D1+ (Even)	25	LVDS0_D0+ (Odd)
11	LVDS1_D3+ (Even)	26	LVDS0_D0- (Odd)
12	LVDS1_D3- (Even)	27	LVDS0_D3+ (Odd)
13	LVDS1_D0+ (Even)	28	LVDS0_D3- (Odd)
14	LVDS1_D0- (Even)	29	LVDS_VCC
15	GND	30	LVDS_VCC



LVDS1

2-24. LVDS VOLTAGE SELECTION

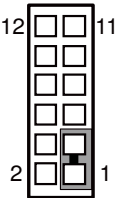
JP8: LVDS Voltage Selection
The selections are as follows:

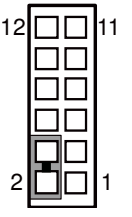
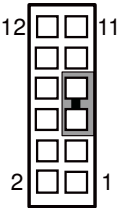
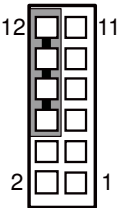
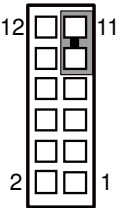
SELECTION	JUMPER SETTING	JUMPER ILLUSTRATION
3.3V	1-3, 2-4	 **JP8**
5V	3-5, 4-6	 **JP8**

Note: Manufacturing default is 3.3V.

2-25. FRONT PANEL CONNECTOR & SELECTION

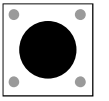
FP1: Front Panel Connector

SELECTION	PIN & ASSIGNMENT	JUMPER SETTINGS	JUMPER ILLUSTRATION
HDD LED	1. HDD_LED+	1-3	 **FP1**
	3. HDD_LED-		

SELECTION	PIN & ASSIGNMENT	JUMPER SETTINGS	JUMPER ILLUSTRATION
Power LED	2. PWR_LED+	2-4	
	4. PWR_LED-		
Reset Button	5. GND	5-7	
	7. RST_BTN		
External Speaker	6. Speaker VCC	6-8-10-12	
	8. Speaker signal		
	10. Speaker signal		
	12. Speaker signal		
ATX Power Button	9. PWR_BTN	9-11	
	11. GND		

2-26. TEST BUTTON

- **RSTJ_BTN1:** Reset Button
- **PWRJ_BTN1:** Power-on Button
- **LID_BTN1:** LID Function Button
- **SLEEP_BTN1:** Sleep Button
- **PWMUP1:** LVDS Brightness-up Button
- **PWM_DN1:** LVDS Brightness-down Button



Test Buttons

SOFTWARE UTILITIES

CHAPTER

3

This chapter comprises the detailed information of VGA driver, LAN driver, and Sound driver.

Sections included:

- Introduction.
- Sound Driver Utility

3-1. INTRODUCTION

Enclosed with our BC-0230 package are the driver utilities, which come in a format of CD ROM. Refer to the following table for driver locations:

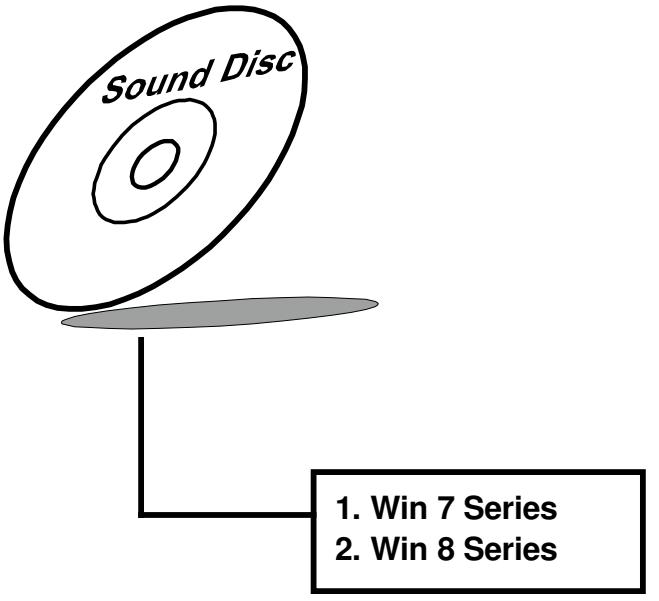
FILENAME (Assume that CD ROM drive is D:)	PURPOSE
▪ D:\Driver\Plaform\Win7(32-bit)\Sound ▪ D:\Driver\Platform\Win7(64-bit)\ Sound ▪ D:\Driver\Platform\Win8.1(32-bit)\Sound	Realtek ALC888S for sound driver installation
D:\Driver\FLASH	AMI BIOS update utility

Note: Be sure to install the Utility right after the OS fully installed.

3-2. SOUND DRIVER UTILITY

3-2-1. Introduction

The Realtek sound function enhanced in this system is fully compatible with Windows 8.1 & 7. Below, you will find the content of the Sound driver:



3-2-2. Installation of Sound Driver

1. Insert the driver disk into a CD ROM device.
2. Under Windows system, go to the directory where the Sound driver is located.
3. Run the application with administrative privileges..
4. Follow the instructions on the screen to complete the installation.
5. Once the installation is completed, shut down the system and restart in order for the changes to take effect.

EXPANSION BUS

APPENDIX

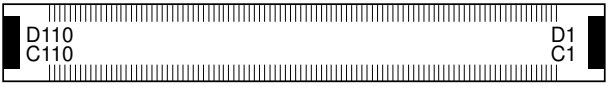
A

This appendix indicates the pin assignments for reference.

Sections included:

- COM Express Connector
- Mini-PCIe Bus
- PCIe Bus

COM EXPRESS CONNECTOR



SLCE_B1

SLCE_A1, SLCE_B1: COM Express connectors

	A	B	C	D
PIN	**ASSIGNMENT**	**ASSIGNMENT**	**ASSIGNMENT**	**ASSIGNMENT**
1	GND (FIXED)	GND (FIXED)	GND (FIXED)	GND (FIXED)
2	GBE0_MDI3-	GBE0_ACT#	GND	GND
3	GBE0_MDI3+	LPC_FRAME#	USB_SSRX0-	USB_SSTX0-
4	GBE0_LINK100#	LPC_AD0	USB_SSRX0+	USB_SSTX0+
5	GBE0_LINK1000#	LPC_AD1	GND	GND
6	GBE0_MDI2-	LPC_AD2	USB_SSRX1-	USB_SSTX1-
7	GBE0_MDI2+	LPC_AD3	USB_SSRX1+	USB_SSTX1+
8	GBE0_LINK#	LPC_DRQ0#	GND	GND
9	GBE0_MDI1-	LPC_DRQ1#	USB_SSRX2-	USB_SSTX2-
10	GBE0_MDI1+	LPC_CLK	USB_SSRX2+	USB_SSTX2+
11	GND (FIXED)	GND (FIXED)	GND (FIXED)	GND (FIXED)
12	GBE0_MDI0-	PRWBTN#	USB_SSRX3-	USB_SSTX3-
13	GBE0_MDI0+	SMB_CK	USB_SSRX3+	USB_SSTX3+
14	GBE0_CTREF	SMB_DAT	GND	GND
15	SUS_S3#	SMB_ALERT#	DDI1_PAIR6+	DDI1_CTRLCLK_AUX+
16	SATA0_TX+	SATA1_TX+	DDI1_PAIR6-	DDI1_CTRLCLK_AUX-
17	SATA0_TX-	SATA1_TX-	RSVD	RSVD
18	SUS_S4#	SUS_STAT#	RSVD	RSVD
19	SATA0_RX+	SATA1_RX+	PCIE_RX6+	PCIE_TX6+
20	SATA0_RX-	SATA1_RX-	PCIE_RX6-	PCIE_RX6-
21	GND (FIXED)	GND (FIXED)	GND (FIXED)	GND (FIXED)
22	SATA2_TX+	SATA3_TX+	PCIE_RX7+	PCIE_TX7+

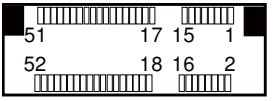
	A	B	C	D
PIN	**ASSIGNMENT**	**ASSIGNMENT**	**ASSIGNMENT**	**ASSIGNMENT**
23	SATA2_TX-	SATA3_TX-	PCIE_RX7-	PCIE_TX7-
24	SUS_S5#	PWR_OK	DDI1_HPD	RSVD
25	SATA2_RX+	SATA3_RX+	DDI1_PAIR4+	RSVD
26	SATA2_RX-	SATA3_RX-	DDI1_PAIR4-	DDI1_PAIR0+
27	BATLOW#	WDT	RSVD	DDI1_PAIR0-
28	(S)ATA ACT#	AC/HDA_SDIN2	RSVD	RSVD
29	AC/HDA SYNC	AC/HDA_SDIN1	DDI1_PAIR5+	DDI1_PAIR1+
30	AC/HDA RST#	AC/HDA_SDIN0	DDI1_PAIR5-	DDI1_PAIR1-
31	GND (FIXED)	GND (FIXED)	GND (FIXED)	GND (FIXED)
32	AC/HDA BITCLK	SPKR	DDI2_CTRLCLK _AUX+	DDI1_PAIR2+
33	AC/HDA SDOUT	I2C_CK	DDI2_CTRLCLK _AUX-	DDI1_PAIR2-
34	BIOS DIS0#	I2C_DAT	DDI2_DDC_AUX _SEL	DDI1_DDC_AUX _SEL
35	THRMTRIP#	THRM#	RSVD	RSVD
36	USB6-	USB7-	DDI3_CTRLCLK _AUX+	DDI1_PAIR3+
37	USB6+	USB7+	DDI3_CTRLCLK _AUX-	DDI1_PAIR3-
38	USB6_7_OC#	USB_4_5_OC#	DDI3_DDC_AUX _SEL	RSVD
39	USB4-	USB5-	DDI3_PAIR0+	DDI2_PAIR0+
40	USB4+	USB5+	DDI3_PAIR0-	DDI2_PAIR0-
41	GND (FIXED)	GND (FIXED)	GND (FIXED)	GND (FIXED)
42	USB2-	USB3-	DDI3_PAIR1+	DDI2_PAIR1+
43	USB2+	USB3+	DDI3_PAIR1-	DDI2_PAIR1-
44	USB_2_3_OC#	USB_0_1_OC#	DDI3_HPD	DDI2_HPD
45	USB0-	USB1-	RSVD	RSVD
46	USB0+	USB1+	DDI3_PAIR2+	DDI2_PAIR2+
47	VCC_RTC	EXCD1_PERST#	DDI3_PAIR2-	DDI2_PAIR2-
48	EXCD0_PERST#	EXCD1_CPPE#	RSVD	RSVD
49	EXCD0_CPPE#	SYS_RESET#	DDI3_PAIR3+	DDI2_PAIR3+
50	LPC_SERIRQ	CB_RESET#	DDI3_PAIR3-	DDI2_PAIR3-
51	GND (FIXED)	GND (FIXED)	GND (FIXED)	GND (FIXED)
52	PCIE_TX5+	PCIE_RX5+	PEG_RX0+	PEG_TX0+
53	PCIE_TX5-	PCIE_RX5-	PEG_RX0-	PEG_TX0-
54	GPI0	GPO1	TYPE0#	PEG_LANE_RV#
55	PCIE_TX4+	PCIE_RX4+	PEG_RX1+	PEG_TX1+
56	PCIE_TX4-	PCIE_RX4-	PEG_RX1-	PEG_TX1-

	A	B	C	D
PIN	**ASSIGNMENT**	**ASSIGNMENT**	**ASSIGNMENT**	**ASSIGNMENT**
57	GND	GPO2	TYPE1#	TYPE2#
58	PCIE_TX3+	PCIE_RX3+	PEG_RX2+	PEG_TX2+
59	PCIE_TX3-	PCIE_RX3-	PEG_RX2-	PEG_TX2-
60	GND (FIXED)	GND (FIXED)	GND (FIXED)	GND (FIXED)
61	PCIE_TX2+	PCIE_RX2+	PEG_RX3+	PEG_TX3+
62	PCIE_TX2-	PCIE_RX2-	PEG_RX3-	PEG_TX3-
63	GPI1	GPO3	RSVD	RSVD
64	PCIE_TX1+	PCIE_RX1+	RSVD	RSVD
65	PCIE_TX1-	PCIE_RX1-	PEG_RX4+	PEG_TX4+
66	GND	WAKE0#	PEG_RX4-	PEG_TX4-
67	GPI2	WAKE1#	RSVD	RSVD
68	PCIE_TX0+	PCIE_RX0+	PEG_RX5+	PEG_TX5+
69	PCIE_TX0-	PCIE_RX0-	PEG_RX5-	PEG_TX5-
70	GND (FIXED)	GND (FIXED)	GND (FIXED)	GND (FIXED)
71	LVDS_A0+	LVDS_B0+	PEG_RX6+	PEG_TX6+
72	LVDS_A0-	LVDS_B0-	PEG_RX6-	PEG_TX6-
73	LVDS_A1+	LVDS_B1+	GND	GND
74	LVDS_A1-	LVDS_B1-	PEG_RX7+	PEG_TX7+
75	LVDS_A2+	LVDS_B2+	PEG_RX7-	PEG_TX7-
76	LVDS_A2-	LVDS_B2-	GND	GND
77	LVDS_VDD_EN	LVDS_B3+	RSVD	RSVD
78	LVDS_A3+	LVDS_B3-	PEG_RX8+	PEG_TX8+
79	LVDS_A3-	LVDS_BKLT_EN	PEG_RX8-	PEG_TX8-
80	GND (FIXED)	GND (FIXED)	GND (FIXED)	GND (FIXED)
81	LVDS_A_CLK+	LVDS_B_CK+	PEG_RX9+	PEG_TX9+
82	LVDS_A_CLK-	LVDS_B_CK-	PEG_RX9-	PEG_TX9-
83	LVDS_I2C_CK	LVDS_BKLT_CTRL	RSVD	RSVD
84	LVDS_I2C_DAT	VCC_5V_SBY	GND	GND
85	GPI3	VCC_5V_SBY	PEG_RX10+	PEG_TX10+
86	RSVD	VCC_5V_SBY	PEG_RX10-	PEG_TX10-
87	eDP_HPD	VCC_5V_SBY	GND	GND
88	PCIE_CLK_REF+	BIOS_DIS1#	PEG_RX11+	PEG_TX11+
89	PCIE_CLK_REF-	VGA_RED	PEG_RX11-	PEG_TX11-
90	GND (FIXED)	GND (FIXED)	GND (FIXED)	GND (FIXED)
91	SPI_POWER	VGA_GRN	PEG_RX12+	PEG_TX12+
92	SPI_MISO	VGA_BLU	PEG_RX12-	PEG_TX12-
93	GPO0	VGA_HSYNC	GND	GND
94	SPI_CLK	VGA_VSYNC	PEG_RX13+	PEG_TX13+
95	SPI_MOSI	VGA_I2C_CK	PEG_RX13-	PEG_TX13-

	A	B	C	D
PIN	**ASSIGNMENT**	**ASSIGNMENT**	**ASSIGNMENT**	**ASSIGNMENT**
96	TMP_PP	VGA_I2C_DAT	GND	GND
97	TYPE_10#	SPI_CS#	RSVD	RSVD
98	SER0_TX	RSVD	PEG_RX14+	PEG_TX14+
99	SER0_RX	RSVD	PEG_RX14-	PEG_TX14-
100	GND (FIXED)	GND (FIXED)	GND (FIXED)	GND (FIXED)
101	SER1_TX	FAN_PWNOUT	PEG_RX15+	PEG_TX15+
102	SER1_RX	FAN_TACHIN	PEG_RX15-	PEG_TX15-
103	LID#	SLEEP#	GND	GND
104	VCC12	VCC12	VCC12	VCC12
105	VCC12	VCC12	VCC12	VCC12
106	VCC12	VCC12	VCC12	VCC12
107	VCC12	VCC12	VCC12	VCC12
108	VCC12	VCC12	VCC12	VCC12
109	VCC12	VCC12	VCC12	VCC12
110	GND (FIXED)	GND (FIXED)	GND (FIXED)	GND (FIXED)

MINI-PCIE BUS

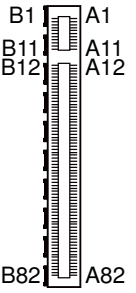
PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	WAKE#	27	GND
2	+3.3V	28	+1.5V
3	Reserved	29	GND
4	GND	30	SMB_CLK
5	Reserved	31	PE_TX_P7
6	+1.5V	32	SMB_DATA
7	CLKREQ#	33	PE_TX_N7
8	Reserved	34	GND
9	GND	35	GND
10	Reserved	36	USB_N6
11	REFCLK-	37	GND
12	Reserved	38	USB_P6
13	CLK_P	39	+3.3V
14	REFCLK+	40	GND
15	GND	41	+3.3V
16	Reserved	42	Reserved
17	Reserved	43	GND
18	GND	44	Reserved
19	Reserved	45	Reserved
20	Reserved	46	Reserved
21	GND	47	Reserved
22	PERST#	48	+1.5V
23	PE_RX_N7	49	Reserved
24	+3.3Vaux	50	GND
25	PE_RX_P7	51	Reserved
26	GND	52	+3.3V



M_PCIE1

PCIE BUS

PCI_E1 with 164 pins:

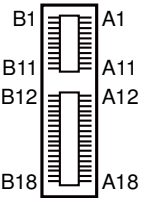


PCI_E1

A				B			
PIN	**ASSIGNMENT**	**PIN**	**ASSIGNMENT**	**PIN**	**ASSIGNMENT**	**PIN**	**ASSIGNMENT**
A1	NC	A42	GND	B1	+12V	B42	PEG_TX_N6
A2	+12V	A43	PEG_RX_P	B2	+12V	B43	GND
A3	+12V	A44	PEG_RX_N	B3	NC	B44	GND
A4	GND	A45	GND	B4	GND	B45	PEG_TX_P7
A5	NC	A46	GND	B5	SMB_CLK	B46	PEG_TX_N7
A6	NC	A47	PEG_RX_P	B6	SMB_DATA	B47	GND
A7	NC	A48	PEG_RX_N	B7	GND	B48	NC
A8	NC	A49	GND	B8	+3.3V	B49	GND
A9	+3.3V	A50	NC	B9	NC	B50	PEG_TX_P8
A10	+3.3V	A51	GND	B10	_3.3Vaux	B51	PEG_TX_N8
A11	PWRGD	A52	PEG_RX_P	B11	PE_WAKE#	B52	GND
A12	GND	A53	PEG_RX_N	B12	NC	B53	GND
A13	PEG_CLK_P	A54	GND	B13	GND	B54	PEG_TX_P9
A14	PEG_CLK_N	A55	GND	B14	PEG_TX_P0	B55	PEG_TX_N9
A15	GND	A56	PEG_RX_P	B15	PEG_TX_N0	B56	GND
A16	PEG_RX_P	A57	PEG_RX_N	B16	GND	B57	GND
A17	PEG_RX_N	A58	GND	B17	NC	B58	PEG_TX_P10
A18	GND	A59	GND	B18	GND	B59	PEG_TX_N10
A19	NC	A60	PEG_RX_P	B19	PEG_TX_P1	B60	GND
A20	GND	A61	PEG_RX_N	B20	PEG_TX_N1	B61	GND
A21	PEG_RX_P	A62	GND	B21	GND	B62	PEG_TX_P11
A22	PEG_RX_N	A63	GND	B22	GND	B63	PEG_TX_N11
A23	GND	A64	PEG_RX_P	B23	PEG_TX_P2	B64	GND
A24	GND	A65	PEG_RX_N	B24	PEG_TX_N2	B65	GND

A				B			
PIN	**ASSIGNMENT**	**PIN**	**ASSIGNMENT**	**PIN**	**ASSIGNMENT**	**PIN**	**ASSIGNMENT**
A25	PEG_RX_P	A66	GND	B25	GND	B66	PEG_TX_P12
A26	PEG_RX_N	A67	GND	B26	GND	B67	PEG_TX_N12
A27	GND	A68	PEG_RX_P	B27	PEG_TX_P3	B68	GND
A28	GND	A69	PEG_RX_N	B28	PEG_TX_N3	B69	GND
A29	PEG_RX_P	A70	GND	B29	GND	B70	PEG_TX_P13
A30	PEG_RX_N	A71	GND	B30	NC	B71	PEG_TX_N13
A31	GND	A72	PEG_RX_P	B31	NC	B72	GND
A32	NC	A73	PEG_RX_N	B32	GND	B73	GND
A33	NC	A74	GND	B33	PEG_TX_P4	B74	PEG_TX_P14
A34	GND	A75	GND	B34	PEG_TX_N4	B75	PEG_TX_N14
A35	PEG_RX_P	A76	PEG_RX_P	B35	GND	B76	GND
A36	PEG_RX_N	A77	PEG_RX_N	B36	GND	B77	GND
A37	GND	A78	GND	B37	PEG_TX_P5	B78	PEG_TX_P15
A38	GND	A79	GND	B38	PEG_TX_N5	B79	PEG_TX_N15
A39	PEG_RX_P	A80	PEG_RX_P	B39	GND	B80	GND
A40	PEG_RX_N	A81	PEG_RX_N	B40	GND	B81	NC
A41	GND	A82	GND	B41	PEG_TX_P6	B82	NC

PCI_E2~PCIE6 with 36 pins:



PCI_E2/
PCI_E3/
PCI_E4/
PCI_E5/
PCI_E6

A				B			
PIN	**ASSIGNMENT**	**PIN**	**ASSIGNMENT**	**PIN**	**ASSIGNMENT**	**PIN**	**ASSIGNMENT**
A1	Reserved	A10	+3.3V	B1	+12V	B10	+3.3SB
A2	+12V	A11	PWRDG	B2	+12V	B11	WAKE#
A3	+12V	A12	GND	B3	Reserved	B12	Reserved
A4	GND	A13	CLK_P1	B4	GND	B13	GND
A5	Reserved	A14	CLK_N1	B5	SMB_CLK	B14	PE_TX_P1
A6	Reserved	A15	GND	B6	SMB_DATA	B15	PE_TX_N1
A7	Reserved	A16	PE_RX_P1	B7	GND	B16	GND
A8	Reserved	A17	PE_RX_N1	B8	+3.3V	B17	Reserved
A9	+3.3V	A18	GND	B9	Reserved	B18	GND

TECHNICAL SUMMARY

APPENDIX

B

This section introduce you the maps concisely.

Sections included:

- Block Diagram

BLOCK DIAGRAM