

User Manual

BW-35 Disk Size SBC Motherboard

A decorative graphic consisting of multiple overlapping, wavy lines in shades of gray, creating a sense of motion and depth across the lower half of the page.

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BW35 Motherboard

User Manual

(Version 1.0)

Version:		
NO.	Description	Issue Date:
V1.0	Initial version (EN)	2020/07/24
	Updated the USB ports to three USB3.0 and one USB2.0	2020/09/15
	Updated to support 12V/19V DC-in power supply	2021/10/28

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Chapter 1 Product Introduction

1.1 Brief Introduction

The BW35 motherboard is a 3.5" SBC (Single Board Computer) based on the Intel Haswell-U/Broadwell-U platform, small formed, low power consumption, and high performance.

1.2 Parameters

Haswell-U:

- Intel Core i5-4200U — Dual Core Four Threads, Base Frequency 1.60GHz, Turbo Frequency 2.60GHz, TDP 15W, Supports Enhanced Intel SpeedStep[®] Technology.

Broadwell-U:

- Intel Core i5-5200U — Dual Core Four Threads, Base Frequency 2.20GHz, Turbo Frequency 2.70GHz, TDP 15W Supports Enhanced Intel SpeedStep[®] Technology.
- Intel Core i3-5005U — Dual Core Four Threads, Base Frequency 2.00GHz, TDP 15W, Supports Enhanced Intel SpeedStep[®] Technology.

Memory: Single Channel SO-DIMM DDR3L, up to 8GB

GPU: Integrated Graphics based on CPU, Display via 1x HDMI, 1x DP, 1xLVDS (eDP optional)

Storage: 1x mSATA3.0 interface (3G/4G Module optional), 1x SATA3.0

USB: 3xUSB3.2 Gen1, 3xUSB2.0(2*headers)

Ethernet: 2xGigabyte Intel Network Controllers

Audio: High-definition audio chip, supports Speaker-out, Mic-in, and power amplifier functions

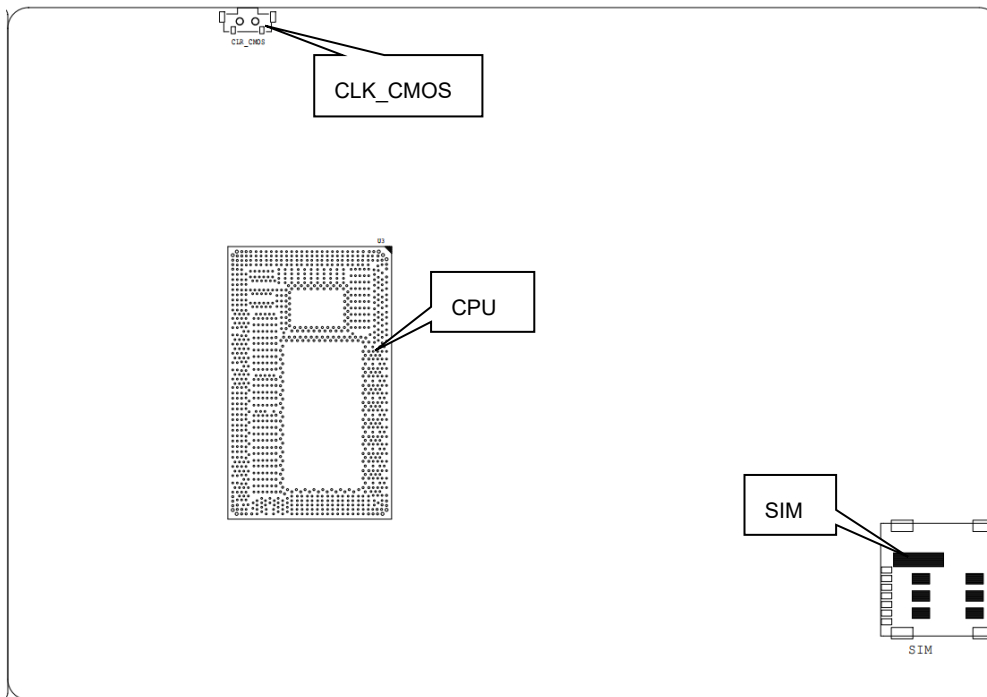
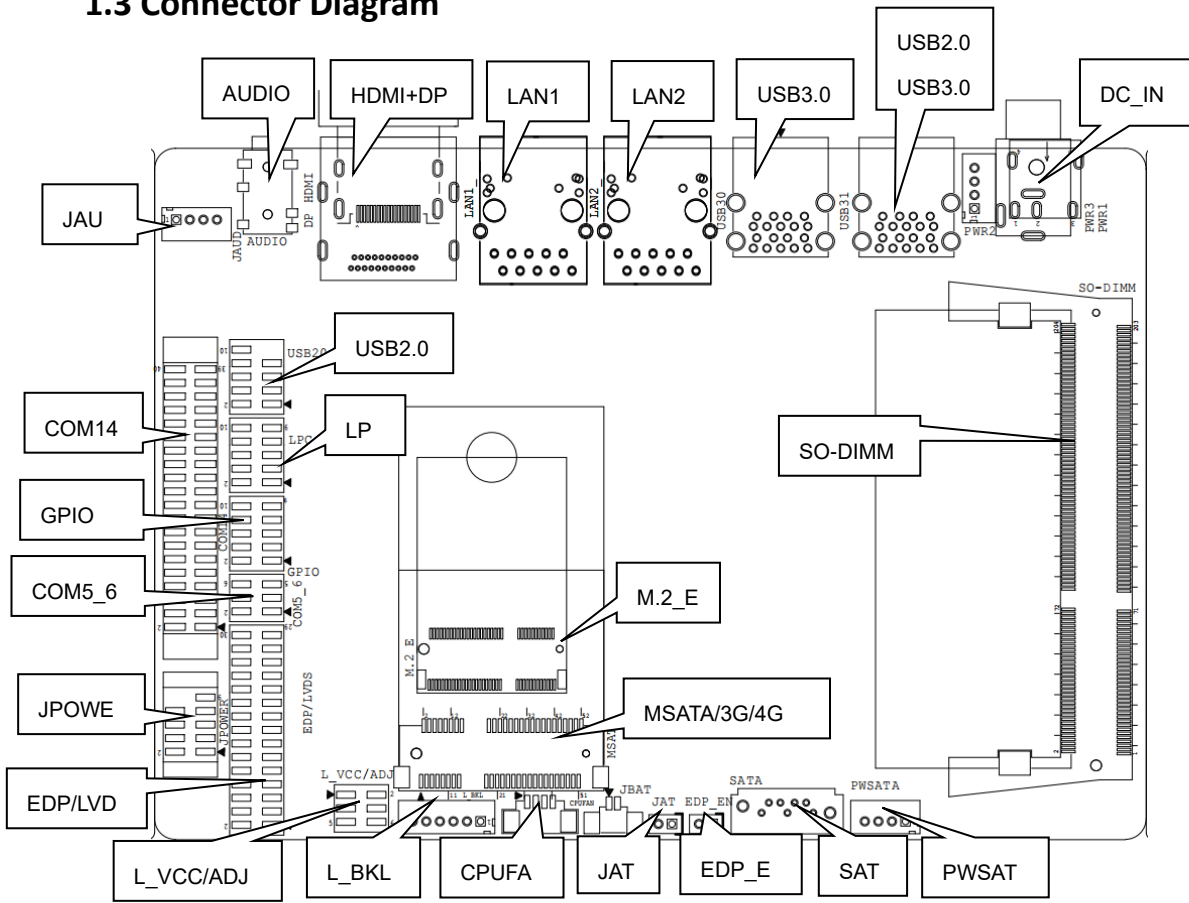
Other I/O: 1xM.2 Key E (Type 2230, for Wi-Fi card and Bluetooth), 1 set of LPC, 1 set of GPIO, 4xRS232, 2xRS485

Dimension: 146mm x 102mm (3.5")

Power: 12V/19V DC-in

Working Temperature: -20°C~60°C

1.3 Connector Diagram



Chapter 2 Hardware

2.1 Jumper Setting

Please configure the jumpers according to your requirements before installing the hardware.

How to identify the first header of jumpers and pins: Observe the mark beside the jumper or pins and find the header marked by “1” or bold line or triangular symbol. Or observe the rear panel and the header with a square solder pad is the first header.

2.2 Memory Slots

1 x SO-DIMM DDR3L-1600MHz slot, maximum capacity 8GB.

2.3 Display Interfaces

The board features Integrated graphics, supports 1xHDMI1.4, 1xDP, 1x 24bit Dual Channel LVDS, and dual independent display. The LVDS can be set as 2 lanes eDP, when it is configured as eDP the LVDS function will be disabled.

2.3.1 LVDS (Screen printing: EDP/LVDS, L_BKL, L_VCC/ADJ, EDP_EN)

When it is configured as an LVDS function, the "EDP/LVDS" transmits LVDS signals. The "EDP_EN " is LVDS' switch control jumper and the “L_VCC/ADJ” is for display working voltage and backlight adjustment. The LVDS' display working voltage can be adjusted between 5V and 3V.

LVDS Data Pin (Screen printing: EDP/LVDS)

Signal	Pin		Signal
VCC	1	2	VCC
VCC	3	4	GND
GND	5	6	GND
A_DATA0_DN	7	8	A_DATA0_DP
A_DATA1_DN	9	10	A_DATA1_DP
A_DATA2_DN	11	12	A_DATA2_DP
GND	13	14	GND
A_CLK_DN	15	16	A_CLK_DP
A_DATA3_DN	17	18	A_DATA3_DP
B_DATA0_DN	19	20	B_DATA0_DP
B_DATA1_DN	21	22	B_DATA1_DP
B_DATA2_DN	23	24	B_DATA2_DP
GND	25	26	GND
B_CLK_DN	27	28	B_CLK_DP
B_DATA3_DN	29	30	B_DATA3_DP

EDP_EN (Screen printing: EDP_EN)

Setting	EDP_EN
Open	Turn off LVDS function

Close	Turn on LVDS function
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LVDS Backlight Adjustment Pin (Screen printing: L_BKL)

Pin	Signal
1	GND
2	GND
3	LCD_BKL_ADJ
4	LCD_BKL_ON
5	12V
6	12V

LVDS working voltage and backlight control pin (Screen printing: L_VCC/ADJ)

Pin	Setting	Function
1-3	Close	VCC(+3.3V)
3-5	Close	VCC(+5V)
2-4	Close	Backlight Control Standard
4-6	Close	Backlight Control Reverse

Note: Please do not short-circuit pins two or more different voltages at the same time.

2.3.2 eDP (Optional)

When it is set as eDP functions, the “EDP/LVDS” pin transmits the eDP signal. The "EDP_EN " is EDP’s switch control jumper and the “L_VCC/ADJ” is for display working voltage and backlight adjustment. The display working voltage can be adjusted between 5V and 3V.

eDP Data Pin (Screen Printing: EDP/LVDS)

Signal	Pin		Signal
VCC	1	2	VCC
VCC	3	4	EDP_HPD
GND	5	6	GND
EDP_AUXN	7	8	EDP_AUXP
N/A	9	10	N/A
EDP_DATA0_P	11	12	EDP_DATA0_N
GND	13	14	GND
N/A	15	16	N/A
EDP_DATA1_P	17	18	EDP_DATA1_N
N/A	19	20	N/A
N/A	21	22	N/A
N/A	23	24	N/A
GND	25	26	GND
N/A	27	28	N/A
N/A	29	30	N/A

EDP_EN (Screen printing: EDP_EN)

Setting	EDP_EN
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Open	Turn off eDP function
Close	Turn on eDP function

eDP Backlight Adjustment Pin (Screen printing: L_BKL)

Pin	Signal
1	GND
2	GND
3	LCD_BKL_ADJ
4	LCD_BKL_ON
5	12V
6	12V

eDP working voltage and backlight control pin (Screen printing: L_VCC/ADJ)

Pin	Setting	Function
1-3	Close	VCC(+3.3V)
3-5	Close	VCC(+5V)
2-4	Close	Backlight Control Standard
4-6	Close	Backlight Control Reverse

2.4 Expansion (screen printing: M.2_E)

Screen printing M.2_E: M.2 slots Key E, Supports 2230 WIFI Card with Bluetooth functions.

2.5 Storage (screen printing: MSATA, SATA, PWSATA)

Support 1x mSATA interface with Micro SIM, support 3G/4G module as an optional choice. 1x Standard SATA3.0 interface. The “PWSATA” is the disk power supply interface of SATA (only applies to a 2.5-inch hard drive).

PWSATA (Screen Printing: PWSATA)

Pin	Signal
1	5V
2	GND
3	GND
4	5V

2.6 USB Interface

3x standard USB3.0 rear ports, 1x standard USB2.0 rear port. (Screen printing: USB31, the top USB is USB2.0 and bottom one is USB3.0). 2x USB2.0 header (2.0mm pitch pins).

USB2.0 Pin (screen printing: USB20)

Signal	Pin		Signal
VCC 5V	1	2	VCC 5V
USB DATA -	3	4	USB DATA-
USB DATA+	5	6	USB DATA+

GND	7	8	GND
(N/A)	9	10	NC

2.7 LAN

The board provides two RJ45 high-performance Intel i211 Gigabit Ethernet controllers, supports Magic packet wake-up. The LAN1 (i211) also supports PXE network boot.

LED Status Indicators:

LI_LED Status (Green)	Function	ACT_LED Status (Orange)	Function
Always on	Network Connected	Blink	Data transfer

2.8 COM

The board provides 4x RS232 and 2xRS485 on-board COM header (2.0mm spacing). The RS232 serial ports are electrified, their voltage is the same as the input voltage of the board.

RS232 (screen printing: COM14)

Signal	Pin		Signal
DCD#	1	2	RXD
TXD	3	4	DTR#
GND	5	6	DSR#
RTS#	7	8	CTS#
RI#	9	10	VCC(same as the input voltage of the board)
DCD#	11	12	RXD
TXD	13	14	DTR#
GND	15	16	DSR#
RTS#	17	18	CTS#
RI#	19	20	VCC (same as the input voltage of the board)
DCD#	21	22	RXD
TXD	23	24	DTR#
GND	25	26	DSR#
RTS#	27	28	CTS#
RI#	29	30	VCC (same as the input voltage of the board)
DCD#	31	32	RXD
TXD	33	34	DTR#
GND	35	36	DSR#
RTS#	37	38	CTS#
RI#	39	40	VCC (same as the input voltage of the board)

RS485 (screen printing: COM5_6)

Signal	Pin	Signal
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COM5_DATA-	1	2	COM6_DATA-
COM5_DATA+	3	4	COM6_DATA+
GND	5	6	GND

2.9 Audio Interface

Realtek ALC662 HD audio chip equipped, provides a 3.5mm Line-out/MIC 2 in 1 combo jack (CTIA American standard), and a built-in dual-channel power amplifier output socket for connecting passive speakers.

Two-in-one headphone jack:



JAUD (screen printing: JAUD)

Pin	Signal
1	L+
2	L-
3	R-
4	R+

2.10 Power Supply (screen printing: PWR1, PWR2)

The board supports 12V/19V DC-in power supply.

PWR1:



PWR2 (screen printing: PWR2)

Pin	Signal
1	VIN
2	VIN
3	GND
4	GND

2.11 GPIO (screen printing: GPIO)

The board is equipped with 2x5Pin GPIO (2.0mm spacing), supports 8 programmable I/O lanes in total.

GPIO (screen printing: GPIO)

Signal	Pin		Signal
SIO_GP70	1	2	3.3V
SIO_GP71	3	4	SIO_GP74

SIO_GP72	5	6	SIO_GP75
SIO_GP73	7	8	SIO_GP76
GND	9	10	SIO_GP77

2.12 LPC

The board provides a set of LPC pins (2.0mm spacing. Low Pin Count Interface) for connecting external LPC devices as an optional feature.

LPC (screen printing: LPC)

Signal	Pin		Signal
L_FRAME_N	1	2	LPC_AD3
LPC_AD2	3	4	LPC_AD1
LPC_AD0	5	6	GND
PLTRST	7	8	CLK_LPC
3.3V	9	10	SERIRQ

2.13 Switch Button/Indicator Pin (screen printing: JPOWER)

A set of 2.0mm spacing pins that can be connected to a switch button, a system reset button, a hard disk read/write indicator, a power-on indicator.

In addition, there was a hard disk read/write indicator (red) and a power-on indicator (blue) on board on the rear IO panel.

JPOWER (screen printing: JPOWER)

Signal	Pin		Signal
HDD_LED+	1	2	PWR_LED+
HDD_LED-	3	4	PWR_LED-
RSTBTN-	5	6	PWR_ON+
RSTBTN+	7	8	PWR_ON-
NC	9	10	(N/A)

2.14 CPU FAN Socket (screen printing: CPU_FAN)

The board provides a CPU cooling fan socket for better cooling and heat dissipation.

CPU_FAN:

Pin	Signal
1	+5V
2	GND

3	CPUFAN_TAC
4	CPUFAN_CTL

2.15 Hardware Auto Start (Screen Printing: JAT)

JAT (Screen Printing: JAT)

Setting	JAT
Close	Hardware Auto Start

Please note that this jumper’s function is similar to the BIOS’s “Restore AC Power Loss” function. When the latter is set to power on, the device will also start automatically after power is connected.

2.16 CMOS Clearance/Retention (screen printing: JCMOS)

CMOS is powered by onboard button batteries. Clearing CMOS will permanently remove the previous system settings and restore the board system to original settings (factory settings).


Step 1: Turn off the PC and disconnect the power adapter.

Step 2: Press JCMOS for 10 seconds and disconnect.

Step 3: Restart the device, press the button to enter the BIOS, load the optimal default value, save, and exit the settings.

CLR_CMOS (Screen Printing: CLR_CMOS)

Setting	JCMOS
Close	Clear CMOS

 Please do not clear COMS when the PC is connected to power in case board damages.