

**3.5" SBC with 22nm Intel® Celeron® J1900 on-board SoC,
Dual PCIe GbE, USB, PCIe Mini, SATA 3Gb/s, mSATA,
VGA, LVDS, iDP, COM, Audio and RoHS**

WAFER-BT

Quick Installation Guide

Version 2.1

June 15, 2021

Package List

WAFER-BT package includes the following items:

- 1 x WAFER-BT single board computer
- 1 x Power cable
- 2 x RS-232 cable
- 2 x SATA with power cable kit
- 1 x Audio cable
- 1 x QIG (Quick Installation Guide)



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Specifications

- SoC:
Intel® Celeron® J1900 on-board SoC (2GHz, quad-core, 2MB cache, TDP=10W)
- BIOS: AMI UEFI BIOS
- Memory:
One 204-pin 1066/1333 MHz single-channel DDR3L SO-DIMM slot supports up to 8 GB
- Graphics Engine:
4th Gen 7 Graphics Engines with 4 execution unit, DX11, OGL 4.0, ES 2.0, OpenCL 1.2 support
- Display Output:
Dual independent display
1 x VGA (resolution: 2560x1600@60Hz)
1 x 24-bit dual-channel LVDS connector (1920x1200@60Hz)
1 x iDP
- Ethernet:
1 x PCIe GbE by Intel I210 controller (LAN1)
1 x PCIe GbE by Intel I211 controller (LAN2)
- Super IO: Fintek F81866
- Embedded Controller: ENE KB9068
- I/O Interface:
1 x PS/2 KB/MS
2 x SATA 3Gb/s with 5V SATA power connector (no RAID)
1 x USB 3.2 Gen 1 (5Gb/s, on rear I/O)
5 x USB 2.0 (1 on rear I/O, 4 by pin header)
1 x RS-422/485 (by pin header)
3 x RS-232 (1 on rear I/O, 2 by pin header)
- SMBus: 1 x 4-pin (1x4) wafer
- Audio:
Realtek ALC888S HD codec
1 x Analog audio by 10-pin (2x5) header

- Front Panel:
 - 1 x 6-pin (1x6) wafer for power LED & HDD LED
 - 1 x 2-pin (1x2) wafer for power button
 - 1 x 2-pin (1x2) wafer for power reset
- LAN LED: 2 x 2-pin (1x2) header
- Expansion:
 - 1 x Full-size PCIe Mini card slot with mSATA support (SATA2 and mSATA share SATA signal)
 - 1 x Half-size PCIe Mini card slot (support PCIe signal)
- Digital I/O: 8-bit digital I/O (4-bit input, 4-bit output)
- Fan:
 - 1 x 4-pin CPU fan connector
 - 1 x 4-pin system fan connector
- Power Supply:
 - 12V DC input only (AT/ATX support)
- Watchdog Timer:
 - Software programmable support 1~255 sec. system reset
- Power Consumption:
 - 12V@1.45A (Intel® Celeron® J1900 with 8GB 1333MHz DDR3 memory)
- Operating Temperature: -20°C ~ 60°C
- Storage Temperature: -20°C ~ 85°C
- Operation Humidity: 5% ~ 95%, non-condensing
- Dimensions: 146mm x 102mm
- Weight: GW:600g/NW:250g

Ordering Information

- **WAFER-BT-J19001-R21:**
3.5" SBC supports Intel® 22nm Quad-Core Celeron™ J1900 2.0GHz (10W) on-board SoC with VGA/LVDS/iDP, Dual PCIe GbE, USB 2.0, PCIe Mini, SATA 3Gb/s, mSATA, COM, Audio and RoHS
- **WAFER-BT-J19001-ECO-R21:**
3.5" SBC supports Intel® 22nm Quad-Core Celeron™ J1900 2.0GHz (10W) on-board SoC with VGA/LVDS/iDP, Dual PCIe GbE, USB 2.0, PCIe Mini, SATA 3Gb/s, mSATA, COM, Audio, ECO packing and RoHS
- **19800-000300-100-RS:** RS-232 cable, 300mm, P=2.0
- **32000-023800-RS:** PS/2 KB/MS cable, 135mm/110mm, P=2.0
- **32001-008600-200-RS:** Dual-port USB cable, 210mm, P=2.0
- **32205-003800-300-RS:** RS-422/485 cable, 200mm, P=2.0

Note: Models with other CPUs not listed in the table are requested by MOQ - 100 pcs/lot.

Jumpers Setting and Connectors

LABEL	FUNCTION
PWR_BTN1	Power on/off button pin header
RST_BTN1	System reset button pin header
J_ATX_AT1	AT/ATX mode select switch
J_CMOS1	Clear CMOS button
COM1, COM2, COM3	Serial port, RS-232
COM4	Serial port, RS-422/485
CN4	Front panel pin header
VGA1	VGA connector
USB1, USB4	USB 2.0 port pin header
USB2	External USB 2.0 connector
USB3	External USB 3.2 Gen 1 (5Gb/s) connector
DIO1	Digital I/O pin header
JSPI1	BIOS SPI ROM connector
JSPI2	EC SPI ROM connector
CPU_FAN1	CPU smart fan connector
SYS_FAN1	System smart fan connector
JP2, JP3	LAN link LED connector
KB_MS1	Keyboard & mouse pin header
CN5	+12V DC power input connector
CN2	SMBus connector
DP1	Internal DP port pin header
SATA_PWR1, SATA_PWR2	SATA power connectors (5 V)
SATA1, SATA2	SATA 3Gb/s drive connectors
AUDIO1	Audio pin header
INV1	LCD panel backlight power connector
LVDS_PWR1	LCD voltage selection
LVDS1	LVDS panel connector
SW1	LVDS panel resolution selection
J_FLASH1	Flash descriptor security override / TXE

PWR_BTN1: Power on/off button pin header	
PIN NO.	DESCRIPTION
Open	Normal Operation (Default)
Short	Power on/off

RST_BTN1: System reset button pin header	
PIN NO.	DESCRIPTION
Open	Normal Operation (Default)
Short	Reset

J_ATX_AT1: AT/ATX mode select switch	
PIN NO.	DESCRIPTION
Short A - B	ATX Mode (Default)
Short B - C	AT Mode

J_CMOS1: Clear CMOS button	
PIN NO.	DESCRIPTION
Open	Normal Operation (Default)
Push	Clear CMOS Setup

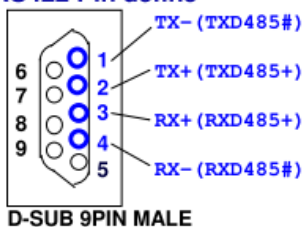
COM1: External RS-232 serial port			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	NDCD1#	6	NDSR1#
2	NRXD1	7	NRTS1#
3	NTXD1	8	NCTS1#
4	NDTR1#	9	NRI1#
5	GND		

COM2: Internal RS-232 serial port			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	NDCD2	6	NDSR2
2	NRXD2	7	NRTS2
3	NTXD2	8	NCTS2
4	NDTR2	9	NRI2
5	GND	10	GND

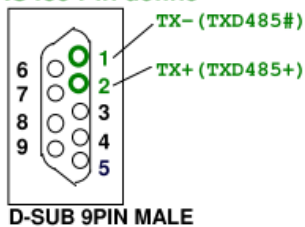
COM3: Internal RS-232 serial port			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	NDCD3	6	NDSR3
2	NRXD3	7	NRTS3
3	NTXD3	8	NCTS3
4	NDTR3	9	NRI3
5	GND	10	GND

COM4: Internal RS-422/485 serial port			
PIN	DESCRIPTION	PIN	DESCRIPTION
1	RXD422-	2	RXD422+
3	TXD422+/TXD485+	4	TXD422-/TXD485-

RS422 Pin define



RS485 Pin define



CN4: Front panel pin header			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	+5V	2	GND
3	PWR_LED+	4	PWR_LED-
5	HDD_LED+	6	HDD_LED-

VGA1: VGA connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	Red	2	Green
3	Blue	4	NC
5	GND	6	GND
7	GND	8	GND
9	VGAVCC	10	HOTPLUG
11	NC	12	DDCDAT
13	HSYNC	14	VSYNC
15	DDCCLK		

USB1: USB 2.0 port pin header			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	+5V	2	GND
3	-DATA_USB1	4	-DATA_USB2
5	+DATA_USB1	6	+DATA_USB2
7	GND	8	+5V

USB4: USB 2.0 port pin header			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	+5V	2	GND
3	-DATA_USB3	4	+DATA_USB4
5	+DATA_USB3	6	-DATA_USB4
7	GND	8	+5V

USB2: External USB 2.0 connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	+5V	2	DATA1_N
3	DATA1_P	4	GND

USB3: External USB 3.2 Gen 1 connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	+5V	2	USB2P0-
3	USB2P0+	4	GND
5	USB3P0_RXDN1	6	USB3P0_RXDP1
7	GND	8	USB3P0_TXDN1
9	USB3P0_TXDP1		

DIO1: Digital I/O pin header			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	2	5V
3	DOUT3	4	DOUT2
5	DOUT1	6	DOUT0
7	DIN3	8	DIN2
9	DIN1	10	DIN0

JSPI1: BIOS SPI ROM connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	+1.8V	2	SPI_CS#0_SW
3	SPI_SO_SW	4	SPI_CLK_SW
5	SPI_SI_SW	6	GND

JSPI2: EC SPI ROM connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	+3.3V	2	SPI_CS0#
3	SPI_SO	4	SPI_CLK
5	SPI_SI	6	GND
7	EC_DET_FLASH	8	NC

CPU_FAN1: CPU smart fan connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	2	+12V
3	FANIO1	4	FANOUT1

SYS_FAN1: System smart fan connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	2	+12V
3	FANIO2	4	FANOUT2

JP2: LAN1 link LED connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	+3.3VLAN	2	LAN1_LED_LINK#

JP3: LAN2 link LED connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	+3.3VLAN	2	LAN2_LED_LINK#

KB_MS1: Keyboard & mouse pin header			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	VCC5_KBMS	2	MDAT
3	MCLK	4	KDAT
5	KCLK	6	KBGND

CN5: +12V DC power input connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	2	GND
3	+12V	4	+12V

CN2: SMBus connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	2	SMBDATA
3	SMBCLK	4	+5V

DP1: Internal DP port pin header			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	DP_HPD#	2	DPD_AUX_CTRL_P2
3	GND	4	DPD_AUX_CTRL_N2
5	AUX_CTRL_DET_D	6	GND
7	GND	8	C_DPD_LANE2_P
9	C_DPD_LANE3_P	10	C_DPD_LANE2_N
11	C_DPD_LANE3_N	12	GND
13	GND	14	C_DPD_LANE0_P
15	C_DPD_LANE1_P	16	C_DPD_LANE0_N
17	C_DPD_LANE1_N	18	3.3V
19	5V	20	NC

SATA_PWR1, SATA_PWR2: SATA power connectors			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	+5V	2	GND

SATA1, SATA2: SATA 3Gb/s drive connectors			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	2	SATA_TX+
3	SATA_TX-	4	GND
5	SATA_RX+	6	SATA_RX-
7	GND		

AUDIO1 : Audio pin header			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	LINE_OUTR	2	LINEIN_R
3	Analog_GND	4	Analog_GND
5	LINE_OUTL	6	LINEIN_L
7	Analog_GND	8	Analog_GND
9	LMIC1-R	10	LMIC1-L

INV1: LCD panel backlight power connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	PWM	2	GND
3	12V	4	GND
5	ENABKL		

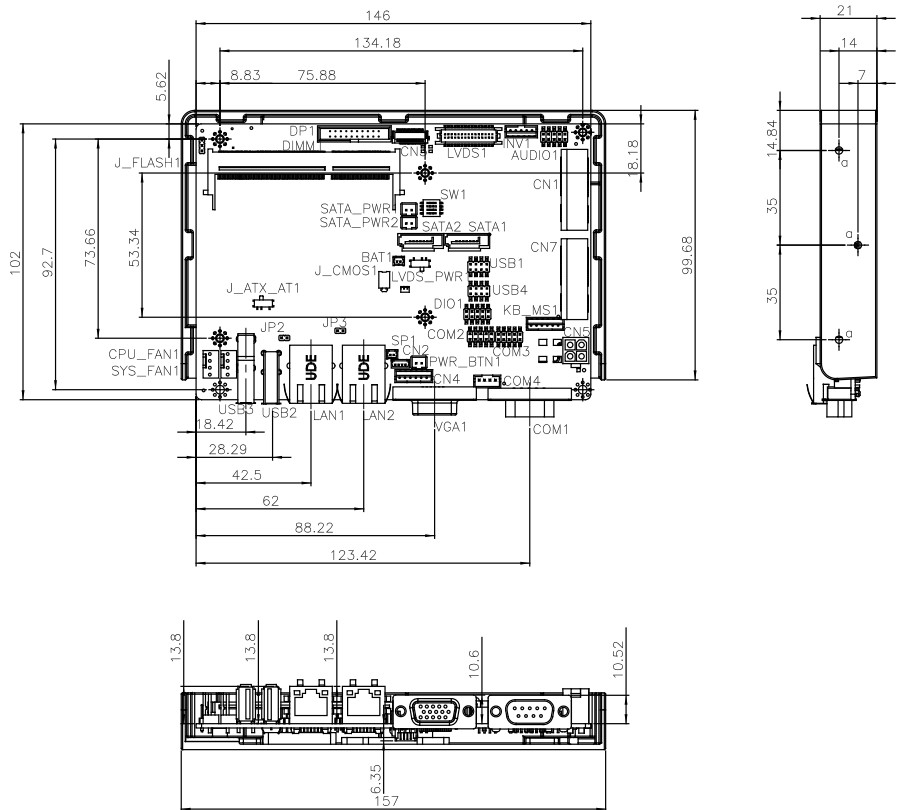
LVDS_PWR1: LCD voltage selection	
PIN NO.	DESCRIPTION
Short A- B	+3.3 V (Default)
Short B- C	+5 V

LVDS1: LVDS panel connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	16	LVDSB_DATA0#
2	GND	17	LVDSB_DATA1
3	LVDSA_DATA0	18	LVDSB_DATA1#
4	LVDSA_DATA0#	19	LVDSB_DATA2
5	LVDSA_DATA1	20	LVDSB_DATA2#
6	LVDSA_DATA1#	21	LVDSB_CLK
7	LVDSA_DATA2	22	LVDSB_CLK#
8	LVDSA_DATA2#	23	LVDSB_DATA3
9	LVDSA_CLK	24	LVDSB_DATA3#
10	LVDSA_CLK#	25	GND
11	LVDSA_DATA3	26	GND
12	LVDSA_DATA3#	27	+3.3V
13	GND	28	+3.3V
14	GND	29	+3.3V
15	LVDSB_DATA0	30	+3.3V

SW1: LVDS panel resolution selection	
* ON=0, OFF=1	
4-3-2-1	DESCRIPTION
0000	800x600 18-bit Single (Default)
0001	1024x768 18-bit Single
0010	1024x768 24-bit Single
0011	1280x768 18-bit Single
0100	1280x800 18-bit Single
0101	1280x960 18-bit Single
0110	1280x1024 24-bit Dual
0111	1366x768 18-bit Single
1000	1366x768 24-bit Single
1001	1440x960 24-bit Dual
1010	1400x1050 24-bit Dual
1011	1600x900 24-bit Dual
1100	1680x1050 24-bit Dual
1101	1600x1200 24-bit Dual
1110	1920x1080 24-bit Dual
1111	1920x1200 24-bit Dual

J_FLASH1: Flash descriptor security override / TXE	
PIN NO.	DESCRIPTION
Short 1-2	No override mode (Default)
Short 2-3	Override mode

Board Layout: Jumper and Connector Locations



(Unit: mm)