

3.5" SBC supports Intel® 22nm 4th Generation Mobile Core™ i7/i5/i3 and Celeron® on-board Processor (ULT), VGA/LVDS/iDP, Dual GbE, PCIe Mini, USB 3.0, SATA 6Gb/s Audio, iRIS-1010 and RoHS

WAFER-ULT-i1

Quick Installation Guide

Version 1.0

Jul 28, 2014.

Package List

WAFER-ULT-i1 package includes the following items:

- 1 x WAFER-ULT-i1 single board computer with enclosure heatsink
- 2 x SATA with 5V output cable kit (P/N:32801-000201-100-RS)
- 1 x Audio cable (P/N: 32007-002600-100-RS)
- 1 x Dual-port USB 2.0 cable (P/N: 32000-070301-RS)
- 1 x Power cable (P/N: 32100-087100-RS)
- 1 x One Key Recovery CD
- 1 x QIG
- 1 x Utility CD



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Specifications

- CPU:
 - Intel® 4th generation mobile ULT on-board SoC
 - Intel® Core™ i7-4650U (1.7GHz, dual-core, 4MB cache, TDP=15W)
 - Intel® Core™ i5-4300U (1.9GHz, dual-core, 3MB cache, TDP=15W)
 - Intel® Core™ i3-4010U (1.7GHz, dual-core, 3MB cache, TDP=15W)
 - Intel® Celeron® processor 2980U (1.6GHz, dual-core, 2MB cache, TDP=15W)
- Memory:
 - Two 204-pin 1600/1333 MHz dual-channel DDR3L SDRAM unbuffered DIMMs support up to 16GB
- BIOS: UEFI BIOS
- Graphics:
 - Intel® HD Graphics Gen 7.5 supports DX11.1, OpenGL 4.2 and OpenCL1.2
 - Full MPEG2, VC1, AVC decode
- Display Output:
 - VGA (up to 1920x1200@60Hz)
 - 18/24-bit dual-channel LVDS by CH7511B DP to LVDS converter (up to 1920x1200@60Hz)
 - iDP interface for HDMI, LVDS, VGA, DVI, DP (up to 3840x 2160 @60 Hz)
- Ethernet:
 - GbE1: Intel® I218LM PHY with Intel® AMT 9.0 support
 - GbE2: Intel® I210-AT PCIe controller with NCSI support
- Super IO: Fintek F81866
- I/O Interface:
 - 3 x RS-232
 - 1 x RS-422/485
 - 1 x 6-pin wafer for PS/2 KB/MS

- 2 x SATA 6Gb/s with 5V power connector
- 2 x USB 3.0 (on rear I/O)
- 2 x USB 2.0 (by pin header)
- iRIS Remote Management Module: 1 x iRIS-1010 slot
- Expansion:
 - 1 x Full-size PCIe Mini card slot (mSATA support)
- Audio:
 - Realtek ALC662 HD Audio codec
- 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 button
- LAN LED:
 - 2 x 2-pin header for LAN1 Link LED, LAN2 Link LED
- Digital I/O: 8-bit digital I/O (4-bit input / 4-bit output)
- FAN:
 - 1 x 4-pin system fan connector
- Watchdog Timer:
 - Software programmable support 1~255 sec. system reset
- Power supply:
 - 12V only DC input
 - 1 x internal 4-pin (2x2) power connector
 - Support AT/ATX mode
- Operation Temperature: -10°C ~ 60°C
- Storage Temperature: -20°C ~ 85°C
- Operation Humidity: 5% ~ 95%, non-condensing
- Dimensions: 146mm x 102mm
- Weight GW/NW: 600g / 250g

Ordering Information

- **WAFER-ULT-i1-i7-R10:**
3.5" SBC supports Intel® 22nm 4th Generation Mobile Core™ i7-4650U processor (ULT), VGA/LVDS/iDP, Dual GbE, PCIe Mini, USB 3.0, SATA 6GB/s Audio, iRIS-1010 and RoHS
- **WAFER-ULT-i1-i5-R10:**
3.5" SBC supports Intel® 22nm 4th Generation Mobile Core™ i5-4300U processor (ULT), VGA/LVDS/iDP, Dual GbE, PCIe Mini, USB 3.0, SATA 6GB/s Audio, iRIS-1010 and RoHS
- **WAFER-ULT-i1-i3-R10:**
3.5" SBC supports Intel® 22nm 4th Generation Mobile Core™ i3-4010U processor (ULT), VGA/LVDS/iDP, Dual GbE, PCIe Mini, USB 3.0, SATA 6GB/s Audio, iRIS-1010 and RoHS
- **WAFER-ULT-i1-C-R10:**
3.5" SBC supports Intel® 22nm 4th Generation Mobile Celeron™ 2980U processor (ULT), VGA/LVDS/iDP, Dual GbE, PCIe Mini, USB 3.0, SATA 6GB/s Audio, iRIS-1010 and RoHS
- **iRIS-1010-R10:**
IPMI 2.0 adapter card with AST1010 BMC chip (W/O KVM over IP function) for PCIe Mini socket interface
- **32006-001100-100-RS:** PS/2 KB/MS cable
- **19800-000300-200-RS:** RS-232 cable
- **32200-074800-RS:** RS-422/485 cable, 200mm
- **DP-LVDS-R10:**
DisplayPort to 24-bit dual-channel LVDS converter board
(for IEI iDP connector)
- **DP-HDMI-R10:**
DisplayPort to HDMI converter board (for IEI iDP connector)

- **DP-DVI-R10:**
DisplayPort to DVI-D converter board (for IEL iDP connector)
- **DP-VGA-R10:**
DisplayPort to VGA converter board (for IEL iDP connector)
- **DP-DP-R10:**
DisplayPort converter board (for IEL iDP connector)

Jumpers setting and connectors

LABEL	FUNCTION
J_ATX_AT1	AT/ATX mode select switch
J_CMOS1	Clear CMOS button
JP1	LVDS1 voltage selection
SW1	LVDS panel resolution selection
FAN1	CPU fan connector
DIO1	Digital I/O connector
DP1	Display port connector
AUDIO1	HD audio connector
IPMI1	IPMI iRIS-1010 module slot
KB_MS1	Keyboard and mouse connector
LVDS1	LVDS1 panel connector
INV1	LVDS1 panel backlight +12V power source
M_PCIE1	Mini PCI-E Card Connector with mSATA
CN5	Power & HDD LED connector
RESET1	Reset button connector
PWR_BTN1	Power button connector
CN1	DC power input connector
COM2, COM3	RS-232 serial port connectors
COM4	RS-422/485 serial port connector
SATA1, SATA2	SATA 6Gb/s drive connectors
SATA_PWR1, SATA_PWR2	SATA power connectors
CN3	SMBUS connector
LED_LAN1, LED_LAN2	LAN Link LED connector
CN5	EC debug port connector
CHASSIS1	Chassis status connector
ID_LED1	ID LED Connector
USB1	Internal USB 2.0 connectors
LAN1, LAN2	RJ-45 LAN connectors
USB_CON1	External USB 3.0 ports
COM1	External RS-232 serial port connector
VGA1	VGA connector

J_ATX_AT1: AT/ATX mode select switch	
PIN NO.	DESCRIPTION
Short 1 - 2	ATX Mode (default)
Short 2 - 3	AT Mode

J_CMOS1: Clear CMOS button	
PIN NO.	DESCRIPTION
Push	Clear CMOS Setup

JP1: LVDS1 voltage selection	
PIN NO.	DESCRIPTION
Short 1 - 2	+3.3 V (Default)
Short 2 - 3	+5 V

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

FAN1: CPU fan connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	2	+12V
3	FANIO	4	PWM

DIO1: Digital I/O connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	2	VCC
3	Output 3	4	Output 2
5	Output 1	6	Output 0
7	Input 3	8	Input 2
9	Input 1	10	Input 0

DP1: Display port connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	+5V	11	AUXP
2	LANE1N	12	AUXN
3	LANE1P	13	GND
4	GND	14	LANE2P
5	LANE3N	15	LANE2N
6	LANE3P	16	GND
7	GND	17	LANE0P
8	AUX_CTRL_DET_D	18	LANE0N
9	GND	19	+3.3V
10	HPD		

AUDIO1: HD audio connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	LINEOUT1R	2	LINE1_R
3	AUD_GND	4	AUD_GND
5	LINEOUT1L	6	LINE1_L
7	AUD_GND	8	AUD_GND
9	FMIC1_R	10	FMIC1_L

KB_MS1: Keyboard and mouse connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	VCC	2	MSDATA
3	MSCLK	4	KBDATA
5	KBCLK	6	GND

LVDS1: LVDS connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	2	GND
3	LVDS_DATA0	4	LVDS_DATA0#
5	LVDS_DATA1	6	LVDS_DATA1#
7	LVDS_DATA2	8	LVDS_DATA2#
9	LVDS_CLK1	10	LVDS_CLK1#
11	LVDS_DATA3	12	LVDS_DATA3#
13	GND	14	GND
15	LVDS_DATA4	16	LVDS_DATA4#
17	LVDS_DATA5	18	LVDS_DATA5#
19	LVDS_DATA6	20	LVDS_DATA6#
21	LVDS_CLK2	22	LVDS_CLK2#
23	LVDS_DATA7	24	LVDS_DATA7#
25	GND	26	GND
27	VCC_LCD	28	VCC_LCD
29	VCC_LCD	30	VCC_LCD

INV1: LVDS backlight connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	LCD_BKLTCTL	2	GND
3	+12V	4	GND
5	BACKLIGHT ENABLE		

M_PCIE1: Mini PCI-E / M-SATA Card Connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	PCIE_WAKE#	2	VCC3
3	N/C	4	GND
5	N/C	6	1.5V
7	N/C	8	N/C
9	GND	10	N/C
11	PCIE_CLK#	12	N/C
13	PCIE_CLK	14	N/C
15	GND	16	N/C
17	N/C	18	GND
19	N/C	20	N/C
21	GND	22	PCIRST#
23	PCIE_RXN	24	VCC3
25	PCIE_RXP	26	GND
27	GND	28	1.5V
29	GND	30	SMBCLK
31	PCIE_TXN	32	SMBDATA
33	PCIE_TXP	34	GND
35	GND	36	USBD-
37	GND	38	USBD+
39	VCC3	40	GND
41	VCC3	42	N/C
43	GND	44	N/C
45	N/C	46	N/C
47	N/C	48	1.5V
49	N/C	50	GND
51	M-SATA Detect	52	VCC3

CN5: Power & HDD LED connector				
	PIN	DESCRIPTION	PIN	DESCRIPTION
+5V	1	VCC	2	GND
Power LED	3	PWRLED	4	GND
HDD LED	5	VCC	6	HDDLED

RESET1: Reset button connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	SYSRST	2	GND

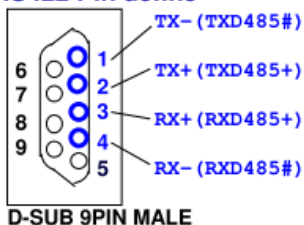
PWR_BTN1: Power button connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	PWRBTW#	2	GND

CN1: Power source connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	2	GND
3	+12V	4	+12V

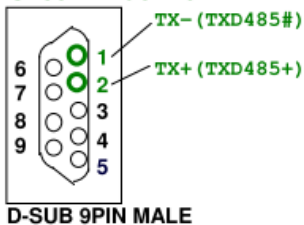
COM2, COM3: RS-232 serial port connectors			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	DCD	2	DSR
3	RXD	4	RTS
5	TXD	6	CTS
7	DTR	8	RI
9	GND	10	GND

COM4: RS-422/485 serial port connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	RXD485#	2	RXD485+
3	TXD485+	4	TXD485#

RS422 Pin define



RS485 Pin define



SATA1, SATA2: Serial ATA 3.0 connectors			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	2	TX+
3	TX-	4	GND
5	RX-	6	RX+
7	GND		

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

CN3: SMBUS connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	2	SMBUS DATA
3	SMBUS CLK	4	+5V

LED_LAN1: LAN Link LED connector			
PIN	DESCRIPTION	PIN	DESCRIPTION
1	+3.3V	2	LAN1_LED_LNK#_ACT

LED_LAN2: LAN Link LED connector			
PIN	DESCRIPTION	PIN	DESCRIPTION
1	+3.3V	2	LAN2_LED_LNK#_ACT

CN5: EC debug port connector			
PIN	DESCRIPTION	PIN	DESCRIPTION
1	EC_SMBCLK	2	EC_SMBDAT

CHASSIS1: Chassis status connector			
PIN	DESCRIPTION	PIN	DESCRIPTION
1	+3.3VSB	2	CHASSIS OPEN

ID_LED1: ID LED Connector			
PIN	DESCRIPTION	PIN	DESCRIPTION
1	+5VSB	2	LED Control

USB2, USB3: Internal USB 2.0 connectors			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	USB_VCC	2	GND
3	DATA-	4	DATA+
5	DATA+	6	DATA-
7	GND	8	USB_VCC

USB_CON1: External USB 3.0 ports			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	VCC	10	VCC
2	D-	11	D-
3	D+	12	D+
4	GND	13	GND
5	RX-	14	RX-
6	RX+	15	RX+
7	GND	16	GND
8	TX-	17	TX-
9	TX+	18	TX+

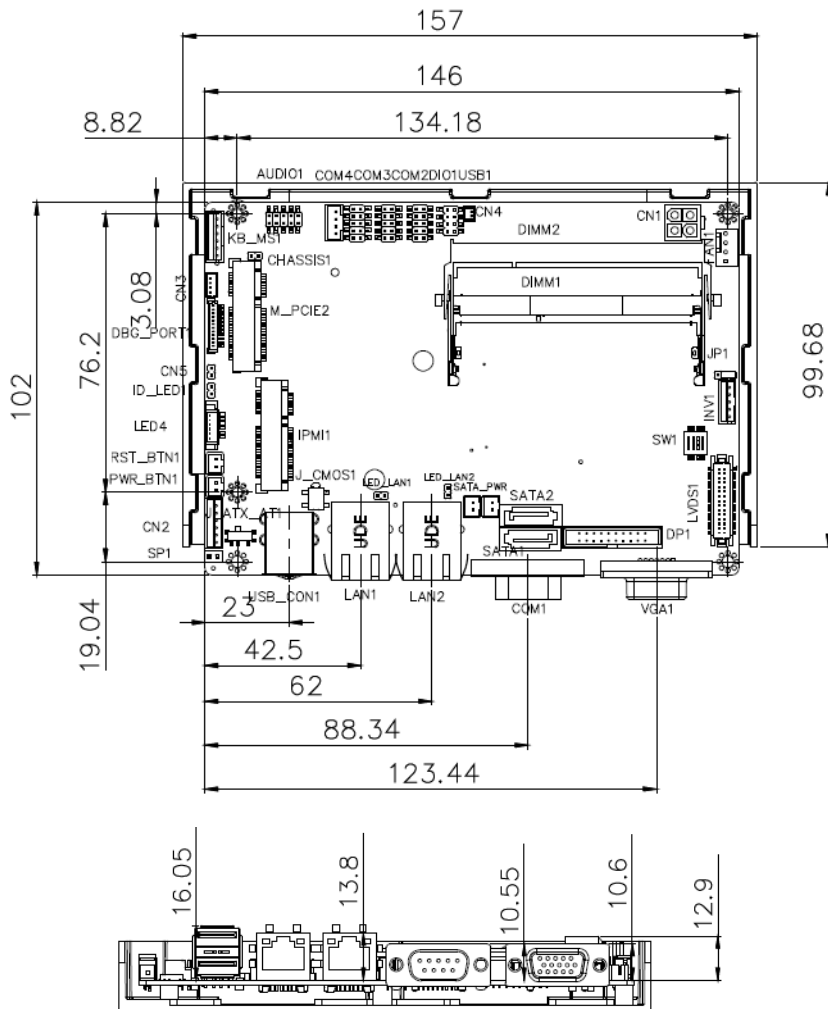
LAN1: RJ-45 LAN connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	LAN1_MDI0+	7	LAN1_MDI2+
2	LAN1_MDI0-	8	LAN1_MDI2-
3	LAN1_MDI1+	9	LAN1_MDI3+
4	LAN1_MDI1-	10	LAN1_MDI3-

LAN2: RJ-45 LAN connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	LAN2_MDI0+	7	LAN2_MDI2+
2	LAN2_MDI0-	8	LAN2_MDI2-
3	LAN2_MDI1+	9	LAN2_MDI3+
4	LAN2_MDI1-	10	LAN2_MDI3-

COM1: RS-232 serial port connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	DCD	2	RXD
3	TXD	4	DTR
5	GND	6	DSR
7	RTS	8	CTS
9	RI		

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	VCC	10	GND
11	NC	12	DDCDAT
13	HSYNC	14	VSYNC
15	DDCCLK		

Board Layout: Jumper and Connector Locations



(Unit: mm)