

3.5" SBC Supports 10nm 11th Gen Intel® Core™ i7/i5/i3 and Celeron® on-board SoC with HDMI, DP, iDPM, Triple 2.5GbE LAN, M.2, COM, SATA 6Gb/s, USB 3.2 Gen 2, iAUDIO, 0°C~60°C and RoHS

WAFER-TGL

Quick Installation Guide

Version 1.0

July 12, 2022

Package List

WAFER-TGL package includes the following items:

- 1 x WAFER-TGL single board computer
- 1 x Power cable
- 1 x SATA with power cable
- 1 x QIG



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Specifications

- CPU:
 - Intel® Core™ i7-1185G7E (up to 4.8GHz, quad-core, 12M cache, TDP=28W/15W/12W)
 - Intel® Core™ i5-1145G7E (up to 4.4GHz, quad-core, 8M cache, TDP=28W/15W/12W)
 - Intel® Core™ i3-1115G4E (up to 4.1GHz, quad-core, 6M cache, TDP=28W/15W/12W)
 - Intel® Celeron® 6305 (up to 1.8GHz, dual-core, 4M cache, TDP=15W)
- Memory:
 - One 260-pin 3200 MHz DDR4 SO-DIMM slot, supporting up to 32 GB
- BIOS:
 - AMI UEFI BIOS
- Graphics Engine:
 - Intel® Gen11 UHD Graphics for i3-1115G4E and Celeron 6305E
 - Intel® Iris® Xe Graphics for i5-1145G7E and i7-1185G7E
- Display Output:
 - Four independent displays
 - 2 x HDMI 1.4 (up to 4096 x 2160@30Hz)
 - 1 x DP 1.4 (up to 4096 x 2160 @60Hz)
 - 1 x IEI iDPM 3040 slot (only for IEI eDP/LVDS/VGA module)
- Ethernet:
 - 3 x PCIe 2.5GbE with Intel® I225-V
- External I/O Interface:
 - 4 x USB 3.2 Gen 2x1 (10Gb/s)
- Internal I/O Interface:
 - 1 x SATA 6Gb/s
 - 2 x USB 2.0 (2x4 pin, p=2.0)
 - 2 x RS-232/422/485 (2x5 pin, p=2.0)
 - 1 x RS-232 (2x5 pin, p=2.0)

- I²C:
 - 1 x I²C (1x4 pin)
- Audio:
 - 1 x iAUDIO (2x5 pin), supporting IEI AC-KIT-888S kit
- Front Panel:
 - 1 x Power LED & HDD LED (1x6 pin, p=2.0)
 - 1 x Power button (1x2 pin, p=2.0)
 - 1 x Reset button (1x2 pin, p=2.0)
- LAN LED:
 - 2 x LAN LED (1x2 pin, p=2.0)
- Expansions:
 - 1 x M.2 A-Key 2230 for Wi-Fi & Bluetooth (PCIe Gen3 x1 / USB 2.0 signal)
 - 1 x M.2 B-Key 3052/2242 for 5G with SIM slot (PCIe Gen3 x2 / USB 2.0 signal)
- Digital I/O:
 - 1 x 12-bit digital I/O (2x7 pin, p=2.0)
- TPM: Intel® PTT (TPM 2.0)
- Fan Connector:
 - 1 x System fan connector (1x4 pin, p=2.54)
- Power Supply:
 - +12V DC input power (AT/ATX mode)
- Power Consumption:
 - 12V@4.0A (11th Gen Intel® Core™ i5-1145G7E 2.6GHz with 8GB 3200MHz DDR4 memory and EUP enabled)
- Watchdog Timer:
 - Software programmable support 1–255 sec. system reset
- Operation Temperature: 0°C – 60°C
- Storage Temperature: -20°C – 70°C
- Operation Humidity: 5% – 95%, non-condensing
- Dimensions: 146 mm x 102 mm
- Weight: GW:850 g / NW:350 g
- Certification: CE/FCC compliant

Ordering Information

- **WAFER-TGL-U-C-R10:**
3.5" SBC with Intel® Celeron® 6305 processor (Tiger Lake-UP3), DDR4 SO-DIMM, 12V DC input, quad display, triple Intel® 2.5 GbE, SATA, USB 3.2, M.2, SoC, RoHS
- **WAFER-TGL-U-i3-R10:**
3.5" SBC with Intel® Core™ i3-1115G4E processor (Tiger Lake-UP3), DDR4 SO-DIMM, 12V DC input, quad display, triple M.2 A/B key, triple Intel® 2.5 GbE, SATA, USB 3.2, M.2, SoC, RoHS
- **WAFER-TGL-U-i5-R10:**
3.5" SBC with Intel® Core™ i5-1145G7E processor (Tiger Lake-UP3), DDR4 SO-DIMM, 12V DC input, quad display, triple M.2 A/B key, triple Intel® 2.5 GbE, SATA, USB 3.2, M.2, SoC, RoHS
- **WAFER-TGL-U-i7-R10:**
3.5" SBC with Intel® Core™ i7-1185G7E processor (Tiger Lake-UP3), DDR4 SO-DIMM, 12V DC input, quad display, triple M.2 A/B key, triple Intel® 2.5 GbE, SATA, USB 3.2, M.2, SoC, RoHS
- **CB-USB02A-RS:**
Dual-port USB cable with bracket, 300mm, p=2.0
- **AC-KIT-888S-R10:**
Realtek ALC888S 7.1 Channel HD Audio peripheral board, RoHS
- **32205-002700-200-RS:**
RS-232/422/485 cable, 200mm, p=2.0
- **19XM0B619-0002001-000-RS:**
Cooler module, 157 mm x 100 mm x 20 mm, with pad and fan
- **19XM0B619-0002002-000-RS:**
Heatsink module, 157 mm x 100 mm x 20 mm, with pad
- **iDPM-eDP-R10:**
eDP to eDP converter board (for IEI iDPM slot)
- **iDPM-LVDS-R10:**
eDP to LVDS converter board (for IEI iDPM slot)
- **iDPM-VGA-R10:**
eDP to VGA converter board (for IEI iDPM slot)

Jumpers Setting and Connectors

LABEL	FUNCTION
J_CMOS1	Clear CMOS button
J_ATX_AT1	AT/ATX power mode setting
ME_FLASH1	ME override setting jumper
IAUDIO	Audio connector for IEI AC-KIT-888S kit
PWR1	ATX 12V power connector
BAT1	Battery connector
SP1	Buzzer connector
DIO1	Digital I/O connector
CPU/FAN1	Fan connector
F_PANEL1	Power LED & HDD LED connector
JLAN_LED2	LAN2 link LED connector
JLAN_LED3	LAN3 link LED connector
PWR_BTN1	Power button connector
RST_BTN1	Reset button connector
COM1	RS-232 serial port connector
COM2, COM3	RS-232/422/485 serial port connectors
SATA1	SATA 6Gb/s connectors
SATA_PWR1	SATA power connector
I2C1	SMBus connector
JBIOS1	Flash SPI ROM connector
USB2_CN1	Internal USB 2.0 connector
M2_B1	M.2 B-key slot
M2_AE1	M.2 A-key slot
SIM1	SIM slot

IDPM	IEI IDPM slot
LAN1, LAN2, LAN3	External 2.5GbE RJ-45 connectors
USB_CON1, USB_CON2	External USB 3.2 Gen 2x1 Type-A connector
DP1	External DisplayPort connector
HDMI1	External dual HDMI connector

J_CMOS1: Clear CMOS Button	
PIN NO.	DESCRIPTION
NC (default)	Keep CMOS Setup (Normal Operation)
Press button	Clear CMOS Setup

J_ATX_AT1: AT/ATX Power Mode Setting	
PIN NO.	DESCRIPTION
Short A - B	ATX Power Mode (default)
Short B - C	AT Power Mode

ME_FLASH1: ME Override Setting Jumper	
PIN NO.	DESCRIPTION
Open	Disable (default)
Short	Enable

IAUDIO : Internal Audio Connector for IEI AC-KIT-888S Kit			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	HDA_SYNC	2	HDA_CLK
3	HDA_SDOUT	4	HDA_SPKR
5	HDA_SDIN	6	HDA_RST#
7	+5V	8	GND
9	+12V	10	GND

PWR1: ATX 12V Power Connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	3	+12V
2	GND	4	+12V

BAT1: RTC Battery Connector			
PIN	DESCRIPTION	PIN	DESCRIPTION
1	VBATT	2	GND

SP1: Buzzer Connector			
PIN	DESCRIPTION	PIN	DESCRIPTION
1	+5V	2	PC_BEEP

DIO1 : Digital Input/Output Connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	2	VCC
3	DOUT5	4	DOUT4
5	DOUT3	6	DOUT2
7	DOUT1	8	DOUT0
9	DIN5	10	DIN4
11	DIN3	12	DIN2
13	DIN1	14	DIN0

CPU/FAN1: Fan Connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	2	+12V
3	FANIO	4	PWM

F_PANEL1: Power LED & HDD LED Connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	+5V	2	GND
3	PWR_LED+	4	PWR_LED-
5	HDD_LED+	6	HDD_LED-

JLAN_LED2: LAN2 Link LED Connector			
PIN	DESCRIPTION	PIN	DESCRIPTION
1	+3.3V	2	LAN2_LED_LNK#_ACT

JLAN_LED3: LAN3 Link LED Connector			
PIN	DESCRIPTION	PIN	DESCRIPTION
1	+3.3V	2	LAN3_LED_LNK#_ACT

PWR_BTN1: Power Button Connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	PWR_BTN+	2	PWR_BTN-

RST_BTN1: Reset Button Connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	Reset+	2	Reset-

COM1: RS-232 Serial Port Connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	DCD	2	DSR
3	RXD	4	RST
5	TXD	6	CTS
7	DTR	8	RI
9	GND	10	GND

COM2, COM3: RS-232/422/485 Serial Port Connectors			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	DCD	2	DSR
3	RXD	4	RST
5	TXD	6	CTS
7	DTR	8	RI
9	GND	10	GND

SATA1: SATA 6Gb/s Connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	5	SATA_RX-
2	SATA_TX+	6	SATA_RX+
3	SATA_TX-	7	GND
4	GND	8	N/C

SATA_PWR1: SATA Power Connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	+5V	2	GND

I2C1: SMBus Connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	3	SMB_CLK
2	SMB_DATA	4	+5V

JBIOS1: Flash SPI ROM Connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	+3.3V	2	SPI_CS#
3	SPI_SO	4	SPI_CLK
5	SPI_SI	6	GND

USB2_CN1: Internal USB 2.0 Connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	VCC	2	GND
3	USB_DATA-	4	USB_DATA+
5	USB_DATA+	6	USB_DATA-
7	GND	8	VCC

M2_B1: M.2 B-key Slot			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	CONFIG_3	2	+3.3V
3	GND	4	+3.3V

5	GND	6	WWAN_FCP_OFF
7	USB_D+	8	WWAN_DISABLE
9	USB_D-	10	NC
11	GND	12	Module Key
13	Module Key	14	Module Key
15	Module Key	16	Module Key
17	Module Key	18	Module Key
19	Module Key	20	NC
21	CONFIG_0	22	NC
23	NC	24	NC
25	NC	26	NC
27	GND	28	NC
29	PCIE_RXN5	30	WWAN_UIM_RST
31	PCIE_RXP5	32	WWAN_UIM_CLK
33	GND	34	WWAN_UIM_DATA
35	PCIE_TXN5	36	UIM_PWR
37	PCIE_TXP5	38	DEVSLP
39	GND	40	NC
41	PCIE_RXN4	42	NC
43	PCIE_RXP4	44	NC
45	GND	46	NC
47	PCIE_TXN4	48	NC
49	PCIE_TXP4	50	BUF_PLT_RST#
51	GND	52	N/C
53	REFCLKN	54	PCIE_WAKE#
55	REFCLKP	56	NC
57	GND	58	NC
59	NC	60	NC
61	NC	62	NC
63	NC	64	NC
65	NC	66	NC
67	WWAN_RST	68	NC
69	GND	70	+3.3V
71	GND	72	+3.3V
73	GND	74	+3.3V

75	GND	
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M2_AE1: M.2 A-key Slot			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	2	+V3.3A
3	USB+	4	+V3.3A
5	USB-	6	NC
7	GND	8	Module Key
9	Module Key	10	Module Key
11	Module Key	12	Module Key
13	Module Key	14	Module Key
15	Module Key	16	NC
17	NC	18	GND
19	NC	20	NC
21	NC	22	NC
23	GND	24	GND
25	NC	26	NC
27	NC	28	NC
29	GND	30	GND
31	NC	32	NC
33	GND	34	NC
35	PCIE_TX9+	36	GND
37	PCIE_TX9-	38	CL_RST#
39	GND	40	CL_DATA
41	PCIE_RX9+	42	CL_CLK
43	PCIE_RX9-	44	NC
45	GND	46	NC
47	CLK_M2_A+	48	NC
49	CLK_M2_A-	50	NC
51	GND	52	BUF_PLT_RST#
53	NC	54	Pull Up +V3.3A
55	NC	56	Pull Up +V3.3A
57	GND	58	NC
59	NC	60	NC

61	NC	62	NC
63	GND	64	NC
65	NC	66	NC
67	NC	68	NC
69	GND	70	NC
71	NC	72	+V3.3A
73	NC	74	+V3.3A
75	GND		

SIM1: SIM Card Slot			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
C1	SIM_VCC	C5	GND
C2	SIM_RST	C6	NC
C3	SIM_CLOCK	C7	SIM_DATA

LAN1, LAN2, LAN3: External 2.5GbE RJ-45 Connectors			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	MDI0P	5	MDI2P
2	MDI0N	6	MDI2N
3	MDI1P	7	MDI3P
4	MDI1N	8	MDI3N

DP1: External DP Connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	DATA_0P	11	GND
2	GND	12	DATA_3N
3	DATA_0N	13	CONFIG1
4	DATA_1P	14	CONFIG2
5	GND	15	AUX_P
6	DATA_1N	16	GND
7	DATA_2P	17	AUX_N
8	GND	18	DP HPD
9	DATA_2N	19	GND
10	DATA_3P	20	DP PWR

HDMI1: External HDMI Connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	HDMI2_DATA2	2	GND
3	HDMI2_DATA2#	4	HDMI2_DATA1
5	GND	6	HDMI2_DATA1#
7	HDMI2_DATA0	8	GND
9	HDMI2_DATA0#	10	HDMI2_CLK
11	GND	12	HDMI2_CLK#
13	N/C	14	N/C
15	HDMI2_SCL	16	HDMI2I_SDA
17	GND	18	+5V
19	HDMI2_HPD		

USB_CON1, USB_CON2: External USB 3.2 Gen 1 Connectors			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	VCC	10	VCC
2	USB_DATA0-	11	USB_DATA1-
3	USB_DATA0+	12	USB_DATA1+
4	GND	13	GND
5	USB3_RX0-	14	USB3_RX1-
6	USB3_RX0+	15	USB3_RX1+
7	GND	16	GND
8	USB3_TX0-	17	USB3_TX1-
9	USB3_TX0+	18	USB3_TX1+

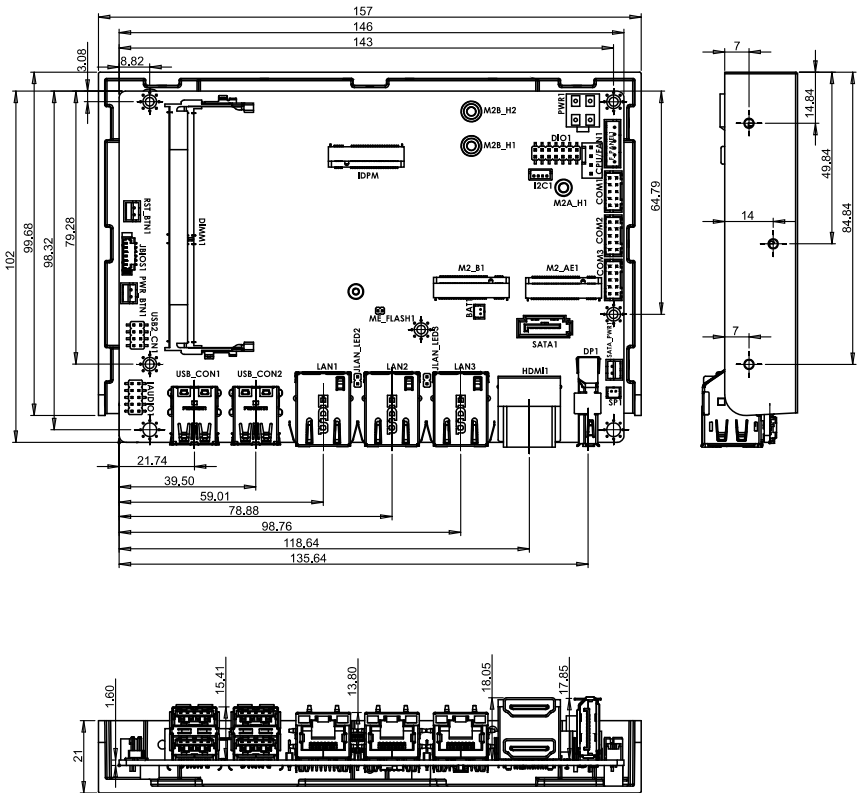
All the drivers and utility for the WAFER-TGL are available on IEI Resource Download Center. Type WAFER-TGL and press Enter to find all the relevant software, utilities, and documentation. To install software from the downloaded ISO file, mount the file as a virtual drive to view its content.

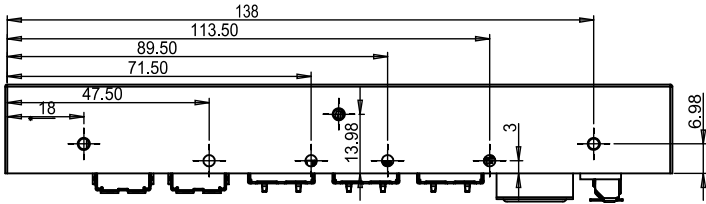
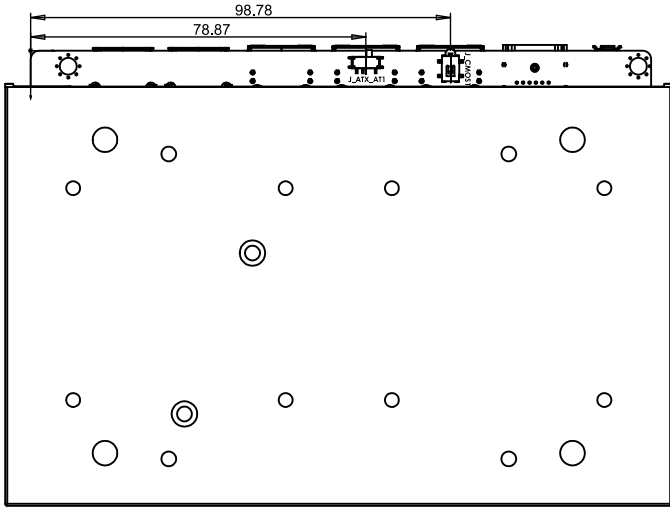
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Board Layout: Jumper and Connector Locations





(Unit: mm)