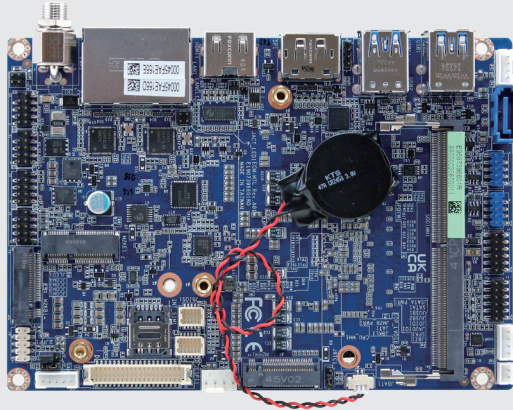




## Features

- Bottom Layer Soldered Processor
- One 262-pin DDR5 5600MHz S0-DIMM socket, supports up to 48GB Max
- Four Display, 1 x DP, 1 x HDMI, 1 x 2CH LVDS or eDP, 1 x USB Type C support DP
- Expansion Slot, M.2 Key-B, M.2 Key-E, M.2 Key-M
- Two Gigabit Ethernet, 2 x 2.5GbE
- DC in +12V ~ +24V



HDMI



DP++



DDR5  
S0-DIMM



USB 3.2



RS232/422/485

## Specifications

### System Information

|                    |                                                                            |
|--------------------|----------------------------------------------------------------------------|
| Processor          | Intel® Core™ Ultra 5 Processor 125U<br>Intel® Core™ Ultra 5 Processor 125H |
| System Memory      | 1 x 262-pin DDR5 5600MHz S0-DIMM socket, supports up to 48GB Max.          |
| I/O Chipset        | EC ITE IT5782VG                                                            |
| Watchdog Timer     | H/W Reset, 1sec. ~ 65535sec and 1sec. or 1min./step                        |
| BIOS               | AMI BIOS, 256Mbit SPI Flash ROM                                            |
| H/W Status Monitor | CPU & system temperature monitoring Voltages monitoring                    |
| TPM                | Onboard NuvoTon NPCT760AABYX supports TPM 2.0                              |
| Board              | 3.5"                                                                       |

### Expansion

|           |                                                                                                                                                                                                                                                                                                                                                                       |
|-----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Expansion | 1 x M.2 Key M 2280 (with 1 x PCIe Gen4 x4) NVME<br>1 x M.2 Key B 3042/3052/2242 (with 1 x PCIe x1 or SATA, USB 3.2 Gen1x1, USB 2.0 with 1 x SIM card slot support WWAN+GNSS) support 5G (3.3V & 3.8V)<br>* Only supports one SIM card (co-lay 1 x 10pin FPC connector for uSIM card adapter)<br>1 x M.2 Key E 2230 support WiFi module (1 x PCIe x1 & USB 2.0 Signal) |
|-----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

### Storage

|         |                                                                          |
|---------|--------------------------------------------------------------------------|
| Storage | 1 x M.2 (Key M, 2280)<br>1 x M.2 (Key B, 3042/3052/2242)<br>1 x SATA III |
|---------|--------------------------------------------------------------------------|

### Display

|                    |                                                                                                                                                                                                                                                                                                                    |
|--------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Graphic Chipset    | Intel® Xe LPG Graphics                                                                                                                                                                                                                                                                                             |
| Spec. & Resolution | 1 x DP 1.4a: Max: 7680 x 4320@30 Hz<br>1 x USB Type C support DP: 4096 x 2160@60Hz<br>1 x HDMI 2.0b: 3840 x 2160@60Hz<br>1 x LVDS: 1920 x 1080 Dual channel 18/24-bits LVDS (Chronitel CH7513A-BF eDP to LVDS) or 1 x eDP: 1920 x 1080@60Hz (2 Lanes), default LVDS<br>Note: EDP_LVDS1 Support 1 x LVDS or 1 x eDP |
| Multiple Display   | Four Display                                                                                                                                                                                                                                                                                                       |
| LVDS               | 1 x LVDS: 1920 x 1080 Dual channel 18/24-bits LVDS (Chronitel CH7513A-BF eDP to LVDS) or 1 x eDP: 1920 x 1080@60Hz (2 Lanes) Default LVDS.<br>Note: EDP_LVDS1 Support 1 x LVDS or 1 x eDP                                                                                                                          |

### Audio

|                 |                                              |
|-----------------|----------------------------------------------|
| Audio Codec     | Realtek ALC888S HD Audio Decoding Controller |
| Audio Interface | Line-in, Mic-in, Line-out                    |
| Audio Amplifier | 2 x 2W 4Ω Amplifier                          |

### Ethernet

|                    |                                                                                                       |
|--------------------|-------------------------------------------------------------------------------------------------------|
| LAN Chipset        | 1 x Intel® I226LM 2.5 Gigabit Ethernet Controller<br>1 x Intel® I226V 2.5 Gigabit Ethernet Controller |
| Ethernet Interface | 10/100/1000/2.5G Base-Tx GbE compatible                                                               |
| LAN Port           | 2 x RJ-45                                                                                             |

### Power Requirement

|            |                              |
|------------|------------------------------|
| Power Mode | AT/ATX (Default Setting: AT) |
|------------|------------------------------|

### Software Support

|    |                   |
|----|-------------------|
| OS | Windows 11, Linux |
|----|-------------------|

### Certification

|                           |                         |
|---------------------------|-------------------------|
| Certification Information | CE, FCC, RoHS Compliant |
|---------------------------|-------------------------|

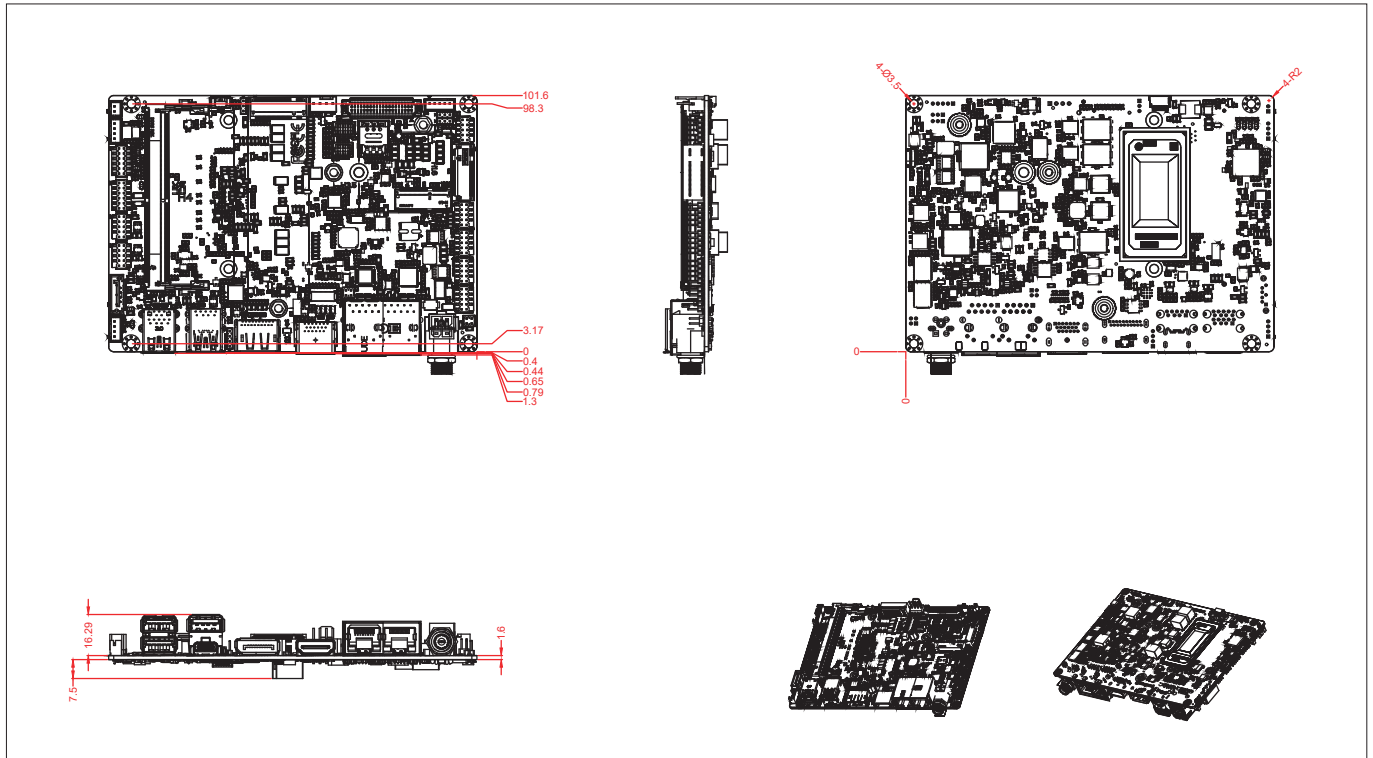
### I/O

|          |                                                                                                                                                                                       |
|----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| USB      | 4 x USB 2.0 by pin header<br>2 x USB 3.2 Gen 2 x1 at rear I/O<br>1 x USB 3.2 Gen 1x1 at rear I/O + 1 x USB Type-C 5V 3A at I/O (with USB 3.2 Gen 2x2 & DP 1.4a signal display output) |
| COM Port | 2 x RS-232, 2 x RS-232/422/485                                                                                                                                                        |
| SATA     | 1 x SATA III                                                                                                                                                                          |
| DIO      | 1 x 8-bit GPIO                                                                                                                                                                        |
| MIO      | 1 x eSPI<br>1 x BIOS SPI<br>1 x SIM Card Slot                                                                                                                                         |

### Mechanical & Environmental

|                    |                                              |
|--------------------|----------------------------------------------|
| Operating Temp.    | 0 ~ 60°C (32 ~ 140°F) with 0.5m/s air flow   |
| Storage Temp.      | -40°C ~ 75°C (-40°F ~ 167°F)                 |
| Operating Humidity | 40°C @ 95% Relative Humidity, Non-condensing |
| Weight             | 0.44lbs (0.2kg)                              |
| Power Requirement  | DC in +12V ~ +24V                            |
| Dimension (L x W)  | 5.7" x 4" (146mm x 101mm)                    |

## Mechanical Drawing



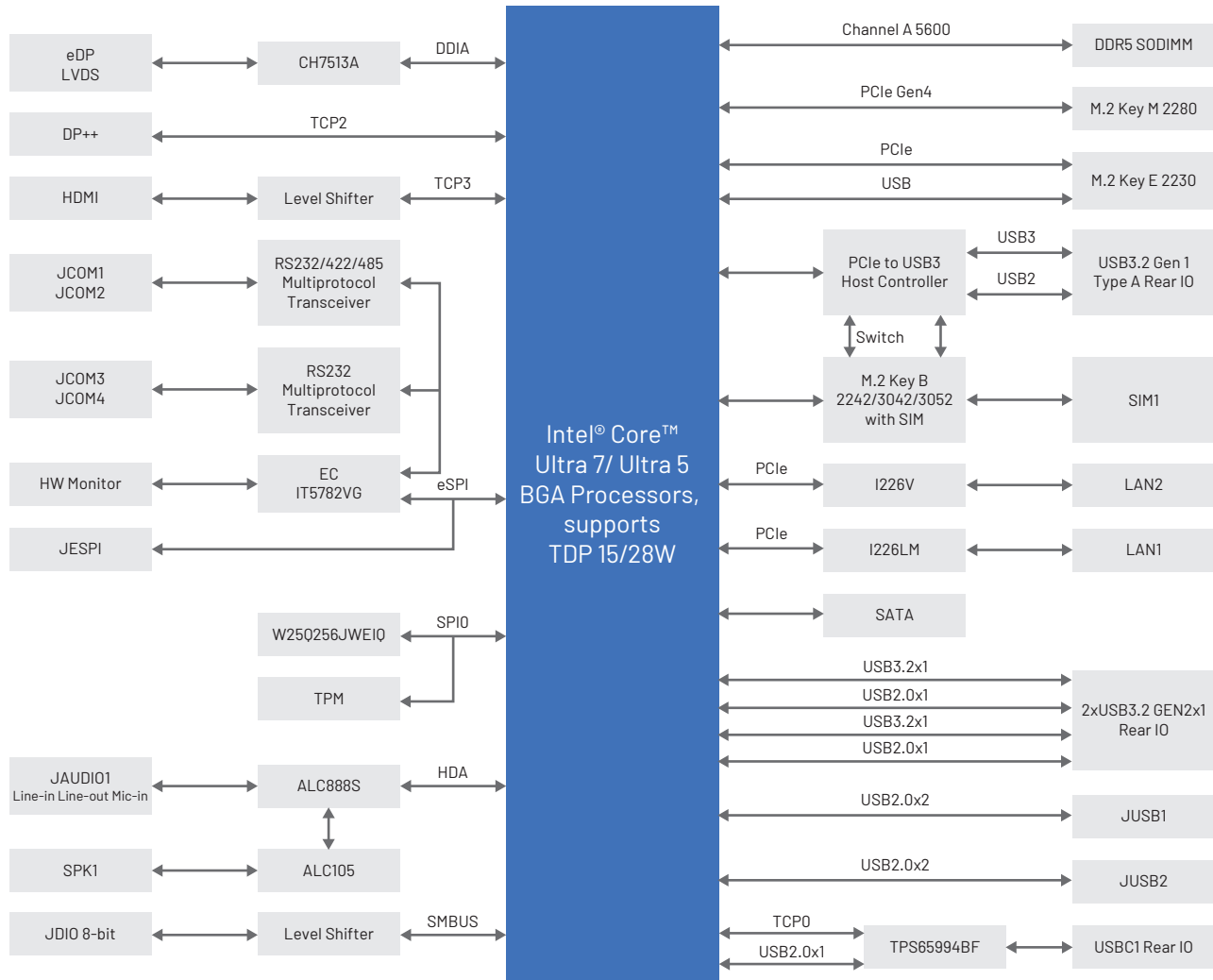
## Ordering Information

| P/N              | Processor                           | Chipset | LAN | USB | COM | PCIe Slot | Power Input | Temp.                     |
|------------------|-------------------------------------|---------|-----|-----|-----|-----------|-------------|---------------------------|
| ECM-MTL-125U-A1R | Intel® Core™ Ultra 5 Processor 125U | NA      | 2   | 8   | 4   | 0         | +12~24V DC  | 0°C ~ 60°C (32°F ~ 140°F) |
| ECM-MTL-125H-A1R | Intel® Core™ Ultra 5 Processor 125H | NA      | 2   | 8   | 4   | 0         | +12~24V DC  | 0°C ~ 60°C (32°F ~ 140°F) |

## Packing List

| Item                                     | P/N | Quantity |
|------------------------------------------|-----|----------|
| Serial ATA cable (7-pin, standard)       | -   | 1        |
| Wire SATA power cable (15-pin, 4P/2.0mm) | -   | 1        |
| Flat cable 9P (M) - PHD 10P/2.0mm)       | -   | 1        |
| CPU Heatsink/Cooler                      | -   | 1        |
| M.2 Screws                               | -   | 3        |
| Graphene sheet                           | -   | 1        |

## Block Diagram



## I/O Overview

