Chipsee

Industrial PC

# PPC-A35-070


PN: CS10600-STMP25-070P

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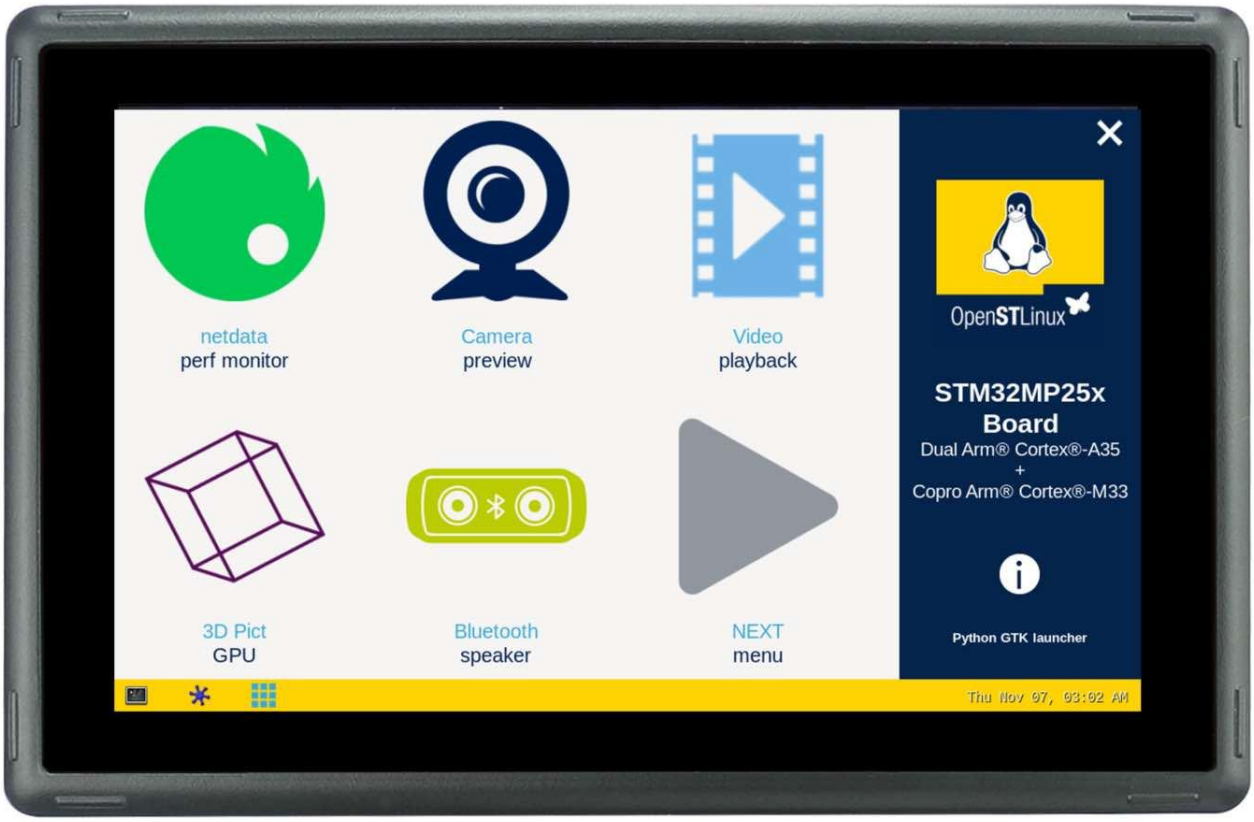
# Contents

# PPC-A35-070

## Front View



# Rear View


Chipsee
PN:CS10600-STMP25-070P
Rev:C111
OS: Yocto Linux
SN:2024110614000001
https://chipsee.com
Origin:Made in China

# Side View 1


CAN1-H
CAN1-L
CAN0-H
CAN0-L
RS485_5-
RS485_5+
RS485_4-
RS485_4+
RS485_3-
RS485_3+
RS232_0_RXD
RS232_0_TXD
RS232_2_RXD
RS232_2_TXD
GND
+5V
G
-
+
DC:6~36V

# Side View 2

# Product Overview

The Cortex®-A35 series PPC-A35-070 (PN: CS10600-STMP25-070P) is a high-quality industrial panel PC. This single board computer features a 7” 5-point capacitive touch screen with a resolution of 1024 x 600 pixels and a brightness of 500 cd/$m^2$.

Key Applications

- Human Machine Interface  HMI
- Mobile Applications
- Video Processing
- Machine Learning
- Video Gaming
- Process Control
- Process Monitoring
- ATM...

It is available as a device hosed in an aluminum casing with bezels.

The PPC-A35-070 Industrial Panel PC is based around the STM32MP257F System on Chip (SoC), powered by the STMicroelectronics low-power processor which integrates a dual(2)-core Cortex®-A35 1.5GHz processor.

The STM32MP257F supports multi-format video decoders and has a high-performance DDR4 4GB RAM capable of sustaining demanding memory bandwidths. It also provides a complete set of peripheral interfaces.

It also features a 1.35 Tops NPU for AI features.

# Ordering Options

Chipsee products can be customized during the ordering process. The product will be shipped with the pre-installed factory defaults if no extra requirements are specified. The table in the Hardware Features section provides information about the default options bundled with the product.

> **Note**
>
> You can order the PPC-A35-070 from the official Chipsee Store or from your nearest distributor.

## Operating System

This product comes with a pre-installed OS of your choice. Please see the list below for the supported OSes, which can also be obtained from the Software Documentation section, along with the detailed installation instructions.

- Yocto Linux

> **Warning**
>
> The Software Documentation section provides a detailed instruction on how to install different OSes on your own. However, bear in mind that Chipsee can't take the responsibility of inadequate installation procedure. If you "brick" your device, please contact Chipsee Technical Support at **support@chipsee.com** for further assistance.

## Optional Features

The PPC-A35-070 Industrial Panel PC: Does not include the 4G/LTE module by default. The module is optional and can be selected at the Chipsee store during the ordering process.

**Warning**

Installation, repair, and maintenance tasks should be performed by trained personnel only. Chipsee does not bear any responsibility for damage caused by inadequate handling of the product.

# Hardware Features

The PPC-A35-070 Industrial Panel PC offers a broad range of performance and connectivity options for scalable integration, providing expandability according to future needs. Some of the key features are listed in the table below.

| PPC-A35-070 | |
|---|---|
| **CPU** | STM32MP257F, Dual(2)-core Cortex-A35 (1.5GHz) |
| **GPU** | VeriSilicon GC8000UL - Open GL ES 3.2.8 - Vulkan 1.2, 900 MHz, up to 150 Mtriangle/s or 900 Mpixel/s |
| **NPU** | VeriSilicon GC8000UL - TensorFlowLite - ONNX - Linux NN, 900 MHz, 1.35 TOPS |
| **RAM** | DDR4 4GB |
| **eMMC** | 16GB |
| **SSD** | Not supported |
| **Storage** | TF Card, Supports up to 128GB SDHC |
| **Display** | 7" LCD, 1024 x 600, High Brightness: 500 $cd/m^2$ |
| **Touch** | 5-point capacitive touch screen |
| **USB** | 2 x USB 2.0 HOST, 1 x USB Type-C |
| **LAN** | 2 x RJ45, GbE, including **1 x optional** Power over Ethernet (PoE) port |
| **Audio** | 3.5mm Audio In/Out Connector, 1W Internal Speaker |
| **Buzzer** | Yes |
| **RTC** | High accuracy RTC with farad capacitor, can work 1 week after power off **(default)**. High accuracy RTC with lithium coin battery, can work 3 years after power off *(optional)*. |
| **RS232** | default 2 x RS232 (Optional 6 x RS232 at most, include 1 debug port)1 |
| **RS485** | default 3 x RS485 at most1 |
| **CAN** | default 2 x CAN FD (1 x CAN FD can be configured to RS232 optionally) |
| **GPIO** | 8 Channels Isolated IO, 4 x Input and 4 x Output |
| **WiFi/BT** | Integrated WiFi/BT Module |
| **4G/LTE** | Supported, Optional |
| **Power Input** | From 9V to 30V |
| **Current** | 500mA Max at 12V |
| **Power Consumption** | 6W Max |
| **Working Temperature** | From -10°C to +60°C |

| PPC-A35-070 | |
|---|---|
| **OS** | Yocto Linux |
| **Dimensions** | PPC-A35-070 (PN: CS10600-STMP25-070P): 188.05 x 123.11 x 33.20mm |
| **Weight** | PPC-A35-070 (PN: CS10600-STMP25-070P): 700g |
| **Mounting** | PPC-A35-070 (PN: CS10600-STMP25-070P): Panel, VESA |

## Key Features

**1(1,2)**This product has 6 x CPU UART, the default configuration is 2 x RS232 and 3 x RS485, include 1 x RS232 debug port. There is 1 x CAN FD that can be configured to RS232. UART can be swapped between RS232 and RS485 modes easily, if you need a different RS232/RS485/CAN configuration, please get in touch with the Chipsee Technical Support at **support@chipsee.com** when placing an order.

# Power Input

The PPC-A35-070 Industrial Panel PC can be powered by a wide range of input voltages: From 9V to 30V DC. The power input connector is a **3-pin, 3.81mm terminal**. The polarity and the pinout is shown in the figure below.


*Power Input*

Note that the "**+**" sign represents the positive power input, it is printed at the casing and as a silk-screen on a PCB of the embedded version. The "**-**" terminal is shorted to the ground.

| Power Input Definition | | |
|---|---|---|
| **Pin Number** | **Definition** | **Description** |
| Pin 1 | Positive Input | DC Power **Positive Terminal** |
| Pin 2 | Negative Input | DC Power **Negative Terminal** |
| Pin 3 | Ground | **Power System Ground** |

Power Connector

**Note**

> The system ground "**G**" is connected to power negative "**-**" on board.

There is another power input port, it is a 2.1mm x 5.5mm x 9.5mm DC jack. For a proper DC power connector, refer to the figure below.


*DC Jack*

# Touch Screen

The PPC-A35-070 Industrial Panel PC uses a 5-point capacitive touch screen. The touch layer is connected through I2C.

**Attention**

A capacitive touch screen is susceptible to power noise and Electromagnetic Radiation (EMR). It may cause LCD ripples or even capacitive touch malfunction. If using a capacitive multi-touch test application, you might notice the touch points float erratically across the display. There are several solutions to this problem:

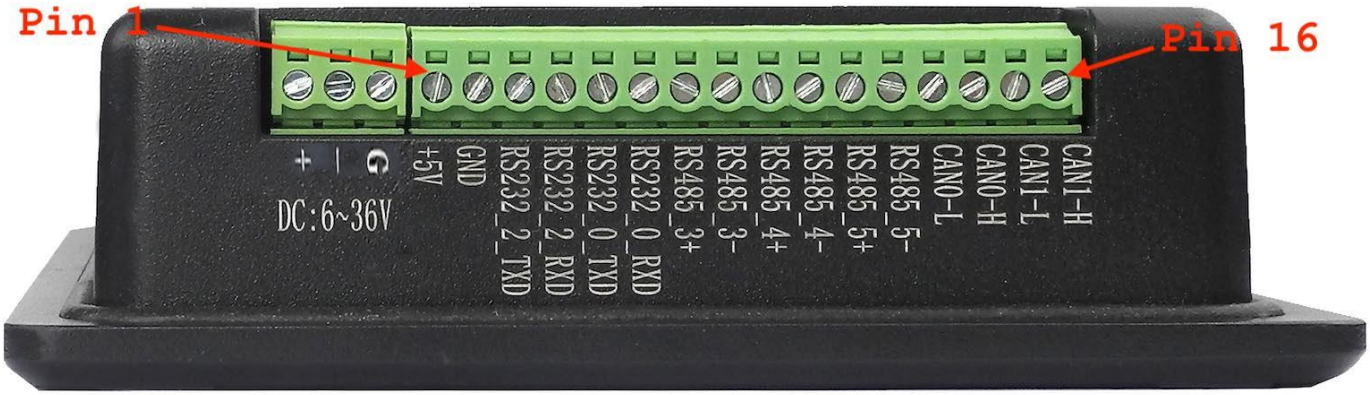
1. Use a high-quality Power Adapter Unit (PSU) with low EMR. You can also provide power from a battery.
2. Make sure that the PPC-A35-070 Power Input connector (pin 3) is properly connected to the Power System Ground to provide sufficient EMI shielding and eliminate the problem entirely.
3. Bad GND problems can also be confirmed by touching pin 3 of the Power Input connector with one hand while operating the capacitive touch screen with the other hand. In this case, the operator's body acts as the Power System Ground.

# Connectivity

There are many connectivity options available on the PPC-A35-070 industrial PC. It has 2 x USB 2.0 HOST, 1 x USB Type-C; 2 x RJ45, GbE, including **1 x optional** Power over Ethernet (PoE) port; up to 6 x UART terminals (RS232/RS485), up to 2 x CAN FD.

## RS232/RS485/CAN

The serial communication interfaces (RS485, RS232, and CAN) are routed to a **16-pin 3.81mm terminal**, as illustrated on the figure below.




*RS232, RS485 and CAN*

This product has 6 x CPU UART, the default configuration is 2 x RS232 and 3 x RS485, include 1 x RS232 debug port. There is 1 x CAN FD that can be configured to RS232.

The table below offers more detailed description of every pin and its definition:

| Pin Number | Definition | Description | OS Node |
|---|---|---|---|
| Pin 16 | CAN1_H | CPU CAN1 H signal | |
| Pin 15 | CAN1_L | CPU CAN1 L signal | CAN1 |
| Pin 14 | CAN0_H | CPU CAN0 H signal | |
| Pin 13 | CAN0_L | CPU CAN0 L signal | CAN0 |
| Pin 12 | RS485_7- | CPU UART7 RS485 –(B) signal | |
| Pin 11 | RS485_7+ | CPU UART7 RS485 +(A) signal | /dev/ttySTM4 |
| Pin 10 | RS485_6- | CPU UART6 RS485 –(B) signal | |
| Pin 9 | RS485_6+ | CPU UART6 RS485 +(A) signal | /dev/ttySTM3 |
| Pin 8 | RS485_4- | CPU UART4 RS485 –(B) signal | |
| Pin 7 | RS485_4+ | CPU UART4 RS485 +(A) signal | /dev/ttySTM2 |
| Pin 6 | RS232_5_RXD | CPU UART5 RS232 RXD signal | |

| Pin Number | Definition | Description | OS Node |
|---|---|---|---|
| Pin 5 | RS232_5_TXD | CPU UART5 RS232 TXD signal | /dev/ttySTM1 |
| Pin 4 | RS232_2_RXD | CPU UART2 RS232 RXD signal, Debug Port | |
| Pin 3 | RS232_2_TXD | CPU UART2 RS232 TXD signal, Debug Port | /dev/ttySTM0 |
| Pin 2 | GND | System Ground | |
| Pin 1 | +5V | System +5V Power Output, No more than 1A Current output | |

Connectivity Section

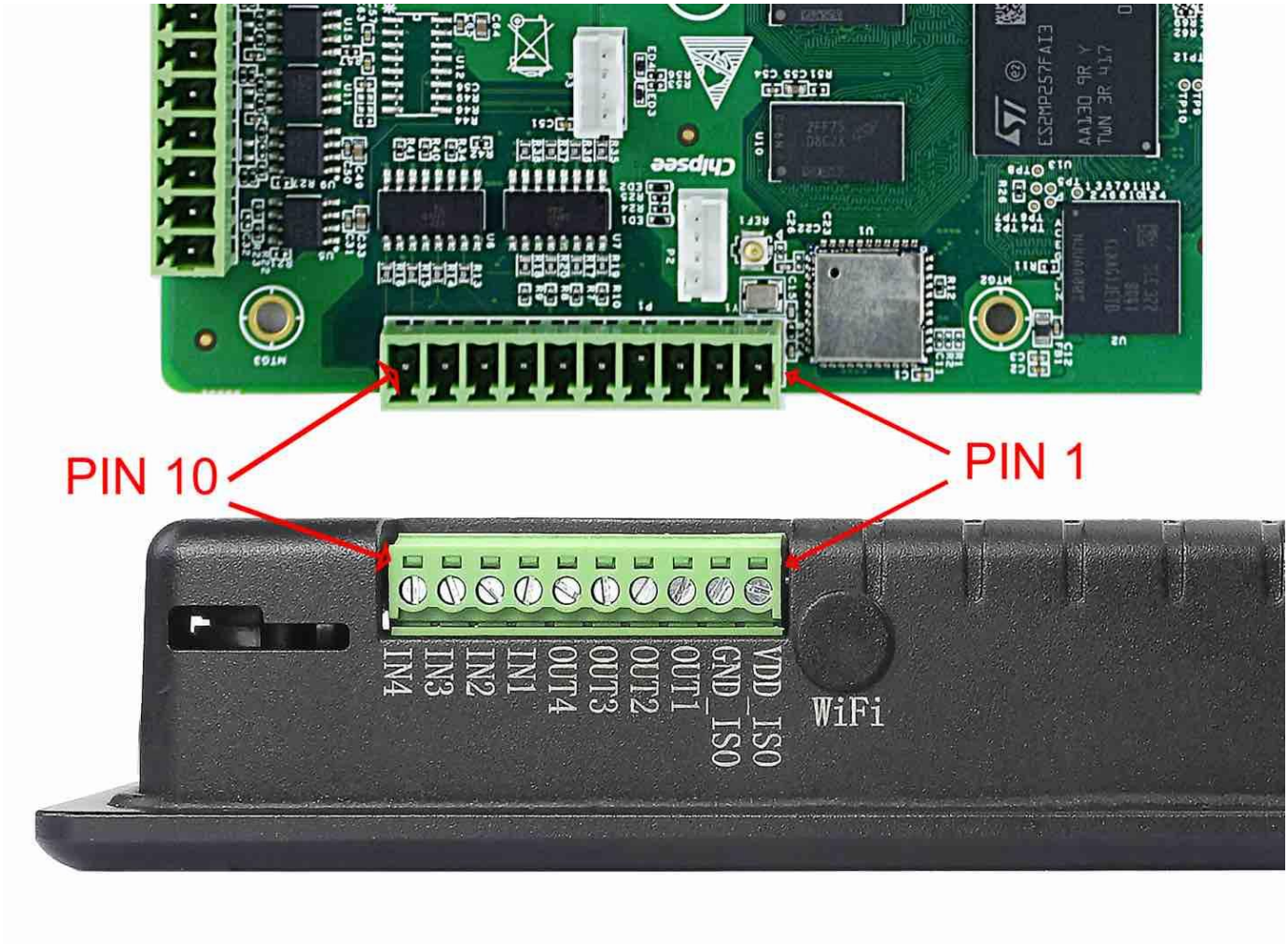
**Attention**

1. RS485 can control the input and output direction automatically. There's no need to control it from within the software.
2. The 120Ω match resistor for the **RS485** is **NOT mounted** by default.
3. The 120Ω match resistor for the **CAN** bus is **NOT mounted** by default.

## GPIO Port

The PPC-A35-070 Industrial Panel PC features a **10-pin 3.81 mm terminal** that provides 8 x opto-isolated GPIO pins, of which 4 x are output, and 4 x are input pins. The 10-pin terminal also includes an isolated PSU input in the range of 5 to 24 VDC. The exact pinout is given in follow table.

The GPIO **HIGH** output level corresponds to the voltage connected at the isolated Power Input, while the GPIO **LOW** output level corresponds to the isolated Ground Input. Each GPIO output can drive loads up to 500mA, enough to drive various applications directly, such as relays or solenoid valves.



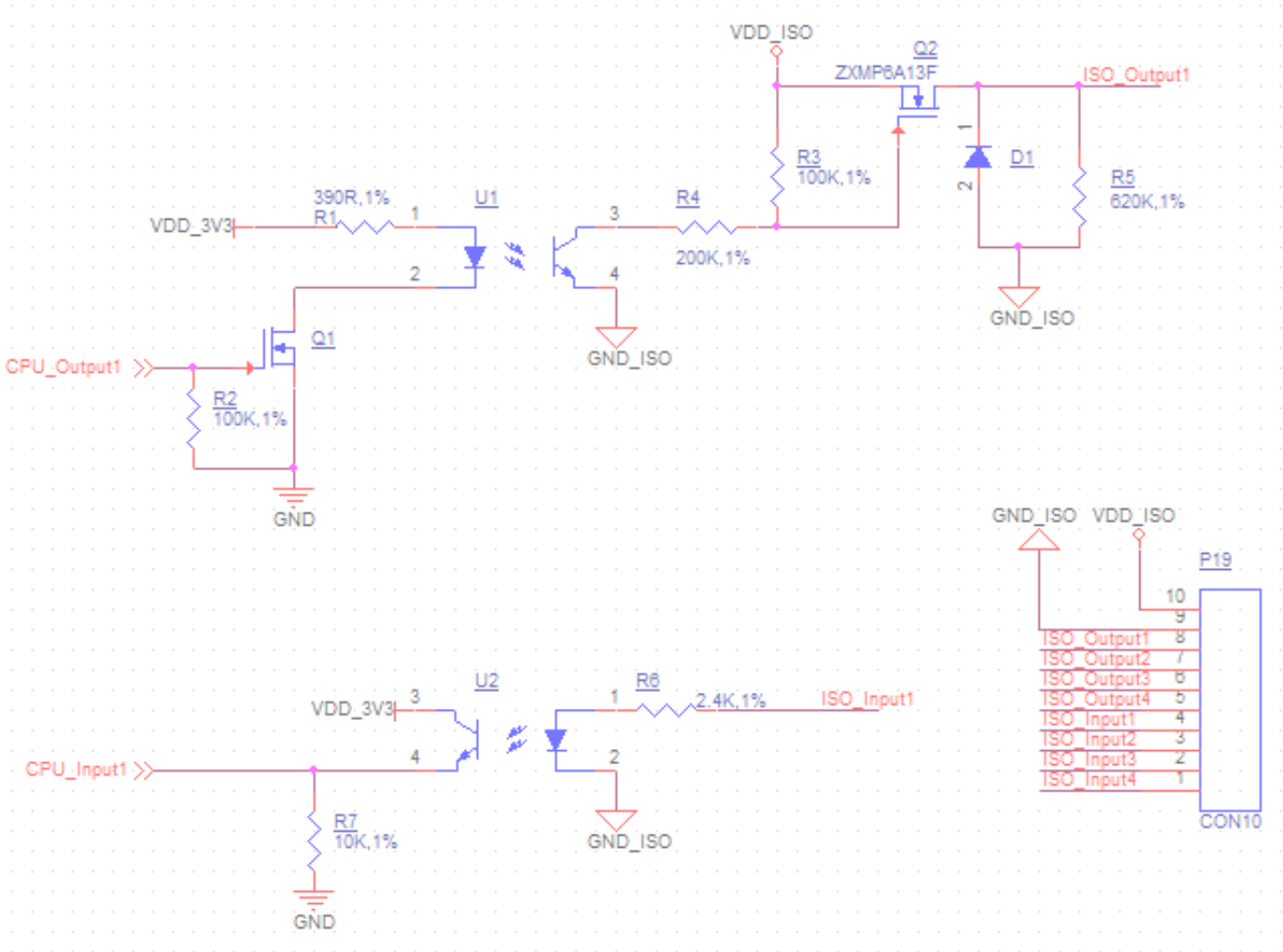

*GPIO*

| Pin Number | Definition | GPIO | GPIOD Chip | GPIOD Line |
|---|---|---|---|---|
| Pin 1 | Isolated Power Input2 | | | |
| Pin 2 | Isolated Ground Input | | | |
| Pin 3 | OUT1 | PZ6 | 11 | 406 |
| Pin 4 | OUT2 | PZ7 | 11 | 407 |

| Pin Number | Definition | GPIO | GPIOD Chip | GPIOD Line |
|---|---|---|---|---|
| Pin 5 | OUT3 | PZ8 | 11 | 408 |
| Pin 6 | OUT4 | PZ9 | 11 | 409 |
| Pin 7 | IN1 | PZ5 | 11 | 405 |
| Pin 8 | IN2 | PZ4 | 11 | 404 |
| Pin 9 | IN3 | PZ3 | 11 | 403 |
| Pin 10 | IN4 | PZ2 | 11 | 402 |

GPIO Connector Pin-out

2 If the isolation is not a requirement, it is possible to use a non-isolated PSU instead.



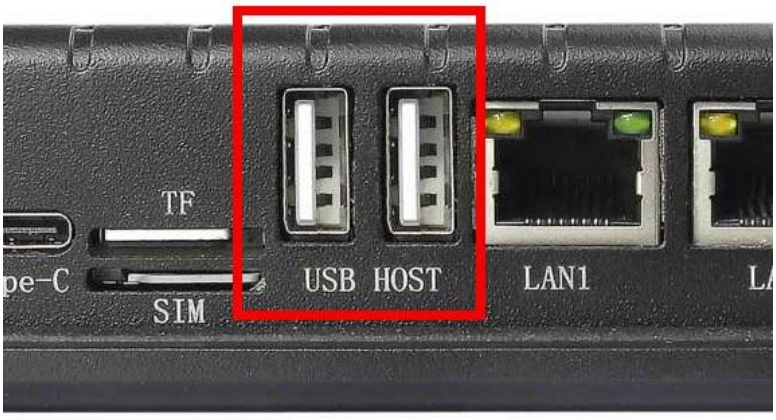

*Isolated GPIO reduced schematic*

**Attention**

- The GPIO has been Opt-Isolated and it uses the 24V Logic by default.
- The 4 output channels can drive at most 500mA current on each channel.

## USB Connectors

There are 2 x **USB HOST** and 1 x **USB DEVICE** (for flashing OS) ports onboard: 2 x USB 2.0 HOST, 1 x USB Type-C, as shown in the figures below.




*USB 2.0 HOST Port*


*USB Type-C Port*

**Warning**

Be careful not to touch surrounding electronic components accidentally while plugging USB devices into the embedded IPC version.

## LAN Connectors

**LAN (RJ45) connector** provides Ethernet connectivity over standardized Ethernet cables as shown in the figure below. The integrated 2 x RJ45, GbE, including **1 x optional** Power over Ethernet (PoE) port interface supports up to 1 Gbps data throughput.

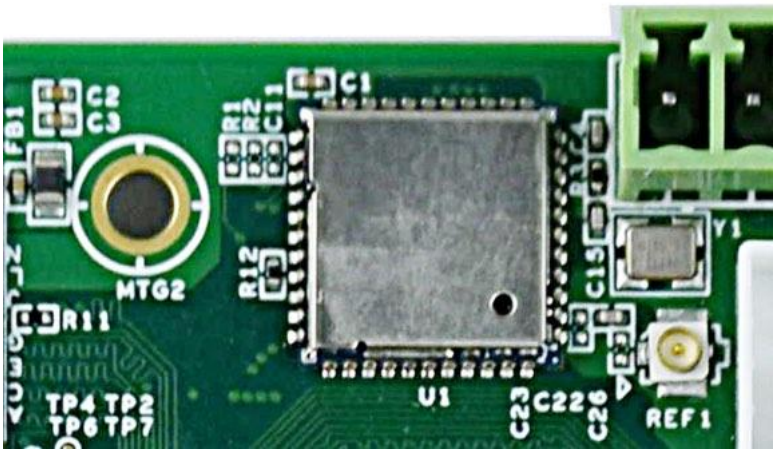
The LAN0 port supports **optional** Power over Ethernet (PoE) feature.


*RJ45 LAN Connector*

> **Note**
>
> Use CAT5 or better cables to achieve full data throughput over maximum distance defined by the 1000BASE-T standard (100m).

## WiFi & BT Module

The PPC-A35-070 Industrial Panel PC is equipped with the popular **Realtek RTL8821CS WiFi/BT module** which supports BT/BLE 2.1/3.0/4.2, as well as 802.11ac/abgn 433Mbps 2.4/5.8 GHz Wireless LAN (WLAN).



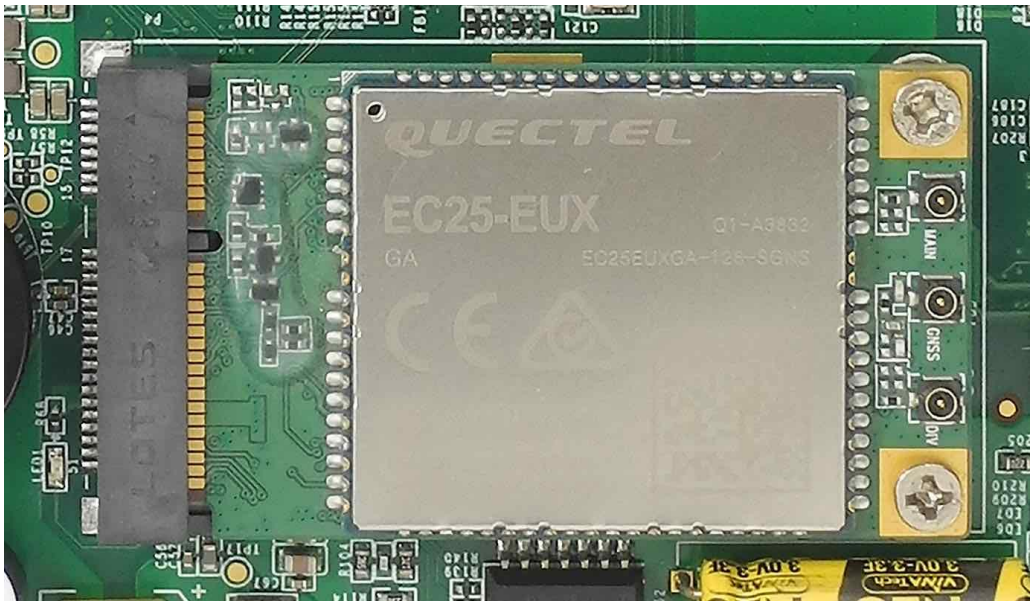

*RTL8821CS WiFi/BT Module*

The PPC-A35-070 includes an SMA connector for an external WiFi/BT antenna, as illustrated in the figure below.


*WiFi+BT Antenna SMA*

## 4G/LTE Module

The PPC-A35-070 Industrial Panel PC is equipped with a **mini-PCIe connector** that can connect a 4G/LTE module. The customer will also need a SIM Card Holder and a 4G/LTE Antenna Connector to ensure 4G/LTE works on the PPC-A35-070. SIM card does **NOT** support hot plug. **Power off** before inserting or removing SIM card.




*mini-PCIe Connector & 4G/LTE Module*


*SIM Card Direction (Micro SIM Card)*

**Attention**

The product does not come shipped with the 4G/LTE module by default. The customer can choose the 4G/LTE module option when placing an order, we will install all the necessary components.

# TF Card Slot

The PPC-A35-070 Industrial Panel PC features 1 x **TF Card (micro SD) slot**. TF Card can address up to 128GB of storage.


*TF (micro SD) Card Slot*

**Note**

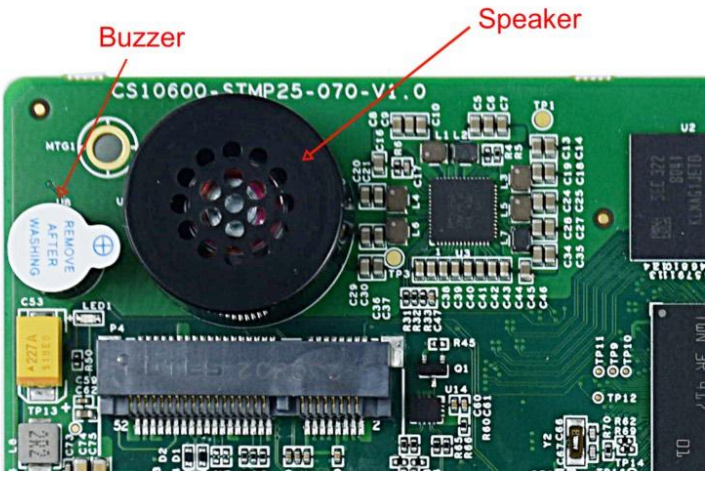
The product does not come shipped with the TF Card by default.

# Audio Connectors

The PPC-A35-070 Industrial Panel PC features some audio peripherals. It has a **3.5mm audio input/output jack**, an **internal speaker**, as well as a small **buzzer**.


*Audio Connector*

The miniature 2W embedded speaker is handy for audio reproduction, the small buzzer can play alarm/notification sounds.




*2W Micro Speaker and Buzzer*

**Attention**

By plugging in the headphone cable, the internal speaker will be disabled automatically.

# PROG Button

The PPC-A35-070 Industrial Panel PC has one button on the board marked as PROG, as shown in the figure below. It controls how the device will be booted.

To boot from SD card, press and hold the PROG button, then connect the power supply, after a few seconds, you can see the system boot from SD card, then you may release the button.

When the button is not pressed while powering up, the PPC-A35-070 will boot normally from eMMC.


*PROG Button*

# Mounting Procedure

You can mount PPC-A35-070 with VESA mounting (guide): **75 x 75** mm, 4 x **M4** (6mm) screws, enabling simplified installation onto any standard mounting fixture.

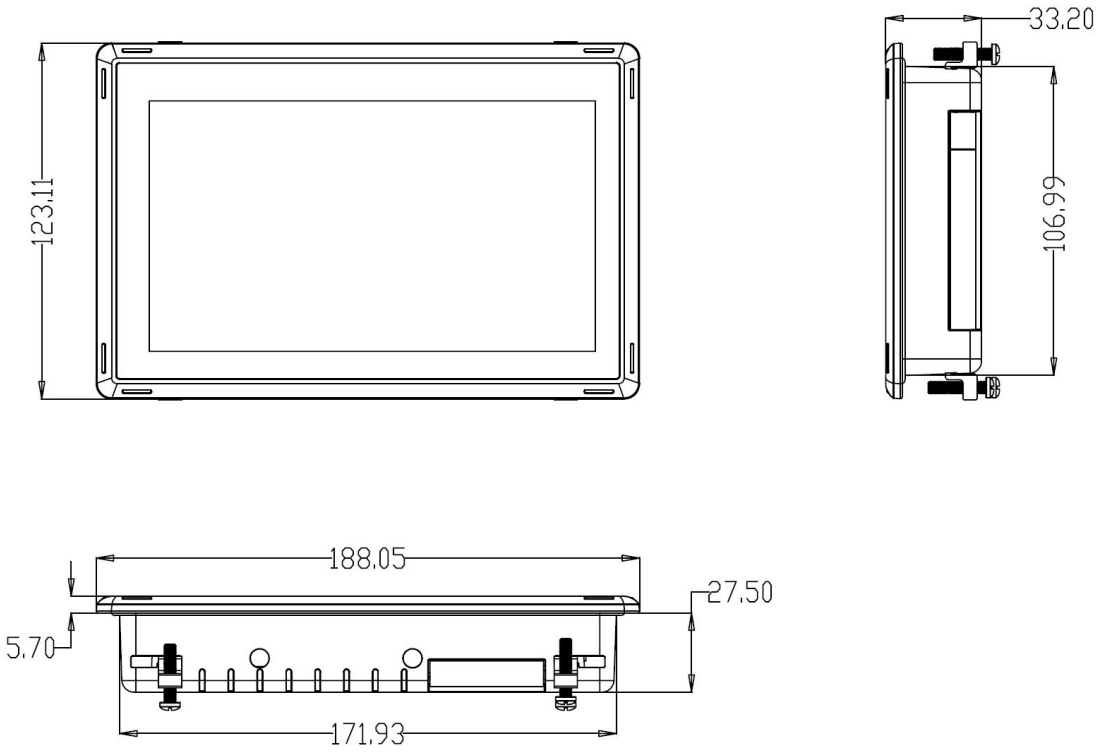
You can also mount PPC-A35-070 with panel mounting method (guide).

**Attention**

Please make sure the display is not exposed to high pressure when mounting into an enclosure.

# Mechanical Specifications

For PPC-A35-070, the outer mechanical dimensions are 188.05 x 123.11 x 33.20mm (W x L x H).




*Dimensions* (PPC-A35-070)

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