

Industrial PC

# PPC-A55-050



PN: CS12720-RK3568-050P

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## PPC-A55-050

## Front View



## Rear View



## Side View 1



## Side View 2



PPC-A55-050 Product Overview

#### **Product Overview**

The Cortex<sup>®</sup>-A55 series PPC-A55-050 (PN: CS12720-RK3568-050P) is a high-quality IP65-compliant industrial panel PC. It features a 5" ten-point capacitive touch screen with a resolution of 1280 x 720 pixels and brightness of 400 cd/m<sup>2</sup>.

#### **Key Applications**

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

It is available both as an embedded solution and as a device hosed in an aluminum casing with bezels, thus facilitating different installation options:

- Installation on an industrial cabinet
- Integration with the existing equipment

The PPC-A55-050 Industrial Panel PC is based around the powerful RK3568 System on Chip (SoC), powered by the Rockchip RK3568 low-power processor which integrates a quad-core Cortex<sup>®</sup>-A55 processor.

The RK3568 supports multi-format video decoders and has a high-performance RAM (LPDDR4X) capable of sustaining demanding memory bandwidths. It also provides a complete set of peripheral interfaces.

PPC-A55-050 Ordering Options

## **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-A55-050 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.

- Debian 11
- Android 11
- Buildroot Linux Qt 5.15



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

PPC-A55-050 Operating System



#### 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.

PPC-A55-050 Hardware Features

### **Hardware Features**

The PPC-A55-050 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-A55-050					
CPU Rockchip RK3568, Quad-core Cortex-A55 (2.0GHz)					
RAM	2GB LPDDR4				
еММС	16GB				
SSD	N/A				
Storage	TF Card, Supports up to 128GB SDHC				
Display	5" LCD, 1280 x 720, High Brightness: 400 cd/m <sup>2</sup>				
номі	1 x HDMI-D 2.0 (Micro-HDMI) Out				
Touch	5-point capacitive touch screen				
USB 1 x USB 2.0 HOST, 1 x USB 3.0 HOST, 1 x USB Type-C					
LAN	1 x RJ45, GbE				
POE N/A					
Audio	3.5mm Audio In/Out Connector, 2W Internal Speaker				
Buzzer	Yes				
RTC	High accuracy RTC with farad capacitor, can work 1 week after power off <b>(default)</b> .  High accuracy RTC with lithium coin battery, can work 3 years after power off <i>(optional)</i> .				
RS232	default 2 x RS232 (Optional 4 x RS232 at most, include 1 debug port)1				
RS485	2 x RS485 at most1				
CAN	default 1 x CAN (Optional 2 x CAN at most)				
GPIO	N/A				
WiFi/BT	Integrated WiFi/BT Module				
4G/LTE	N/A				
Power Input	From 6V to 36V				
Current	450mA Max at 12V				
Power Consumption	5.4W Max				
Working Temperature	From -20°C to +60°C				

PPC-A55-050 Hardware Features

PPC-A55-050		
OS Android 11, Debian11, Buildroot Linux Qt 5.15		
Dimensions	PPC-A55-050 (PN: CS12720-RK3568-050P): 138.55 x 84.70 x 27.10mm	
Weight	PPC-A55-050 (PN: CS12720-RK3568-050P): 310g	
Mounting	PPC-A55-050 (PN: CS12720-RK3568-050P): Panel, VESA	

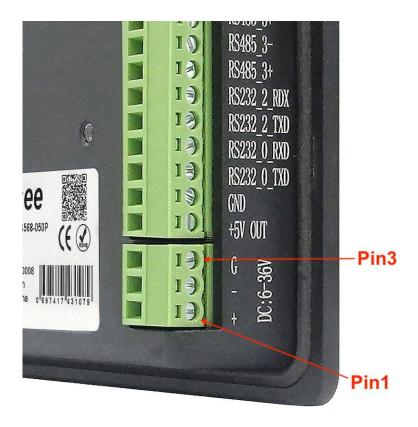
Table 185 Key Features

**1(1,2)**This product has 4 x UART channels in total. The default configuration is 2 x RS232 and 2 x RS485, including 1 debug port. UART can be swapped between RS232 and RS485 modes easily, if you need a different RS232/ RS485 configuration, please get in touch with the Chipsee Technical Support at **support@chipsee.com** 

PPC-A55-050 Power Input

### **Power Input**

The PPC-A55-050 Industrial Panel PC can be powered by a wide range of input voltages: From 6V to 36V DC. The power input connector is a **3-pin, 3.81mm terminal**. The polarity and the pinout is clearly marked on the housing of the product as 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 <b>Positive Terminal</b>		
Pin 2	Negative Input	DC Power <b>Negative Terminal</b>		
Pin 3	Ground	Power System Ground		

Table 186 Power Connector



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

PPC-A55-050 Touch Screen

#### **Touch Screen**

The PPC-A55-050 Industrial Panel PC uses a 5-point capacitive touch screen.



Figure 599: Capacitive Touch Screen Connector



#### **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-A55-050 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.

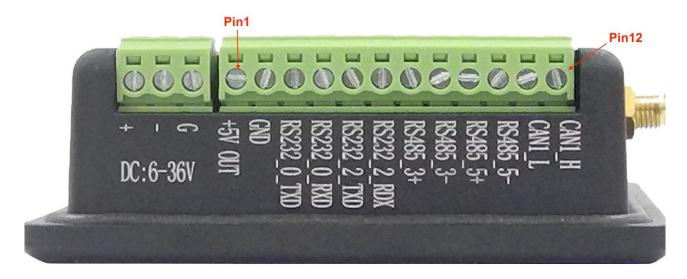
PPC-A55-050 Connectivity

## Connectivity

There are many connectivity options available on the PPC-A55-050 industrial PC. It has 1 x USB 2.0 HOST, 1 x USB 3.0 HOST, 1 x USB Type-C, 1 x RJ45, GbE (RJ45) Ethernet connector supporting up to 1 Gbps, and 4 x UART terminals (RS232/RS485/CAN).

#### RS232/RS485/CAN

The serial communication interfaces (RS485, RS232, and CAN) are routed to a **12-pin 3.81mm terminal**, as illustrated on the figure below.



RS232-RS485-CAN

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

RS232 / RS485 / CAN Pin Definition:				
Pin Number	Definition	Description		
Pin 12	CAN1_H	CAN H signal		
Pin 11	CAN1_L	CAN L signal		
Pin 10	RS485_5-	CPU UART4, RS485 –(B) signal		
Pin 9	RS485_5+	CPU UART4, RS485 +(A) signal		
Pin 8	RS485_3-	CPU UART3, RS485 –(B) signal		
Pin 7	RS485_3+	CPU UART3, RS485 +(A) signal		
Pin 6	RS232_2_RXD	CPU UARTO, RS232 RXD signal		
Pin 5	RS232_2_TXD	CPU UARTO, RS232 TXD signal		
Pin 4	RS232_0_RXD	CPU UART2, RS232 RXD signal, Debug Port		
Pin 3	RS232_0_TXD	CPU UART2, RS232 TXD signal, Debug Port		

PPC-A55-050 RS232/RS485/CAN

RS232 / RS485 / CAN Pin Definition:				
Pin 2	GND	System Ground		
Pin 1	+5V	System +5V Power Output, No more than 1A Current output		

Table 187 Connectivity Section



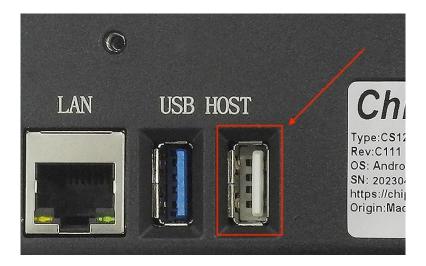
#### **Attention**

- 1. RS485\_3 and RS485\_4 can control the input and output direction automatically. There's no need to control it from within the software.
- 2. The  $120\Omega$  match resistor for the RS485 is mounted by default.
- 3. The  $120\Omega$  match resistor for the CAN bus is NOT mounted by default.

PPC-A55-050 USB Connectors

#### **USB Connectors**

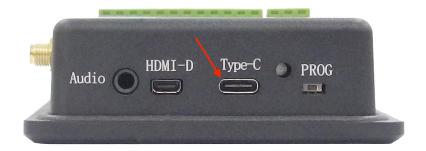
There are  $2 \times USB HOST$  and  $1 \times USB DEVICE$  (for flashing OS) ports onboard:  $1 \times USB 2.0$  HOST,  $1 \times USB 3.0$  HOST,  $1 \times USB Type-C$ , as shown in the figures below.



USB 2.0 HOST Port (embedded / enclosed PC version)



USB 3.0 HOST Port (embedded / enclosed PC version)



USB Type-C Port (embedded / enclosed PC version)



#### Warning

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

PPC-A55-050 LAN Connectors

#### **LAN Connectors**

**LAN (RJ45) connector** provides 1 x RJ45 Ethernet connectivity over standardized Ethernet cables as shown in the figure below. The integrated Ethernet interface supports up to 1 Gbps data throughput.



RJ45 LAN Connector



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

PPC-A55-050 WiFi & BT Module

#### WiFi & BT Module

The PPC-A55-050 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).



Figure 600: RTL8821CS WiFi/BT Module

The PPC-A55-050 includes an SMA connector for an external WiFi/BT antenna, as illustrated in the figure below.



WiFi+BT Antenna SMA

PPC-A55-050 TF Card Slot

## **TF Card Slot**

The PPC-A55-050 Industrial Panel PC features 1 x **TF Card (micro SD) slot**: SD, TF slots can address up to 128GB of memory.



TF (micro SD) Card Slot

PPC-A55-050 Audio Connectors

### **Audio Connectors**

The PPC-A55-050 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 (enclosed PC version)* 

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

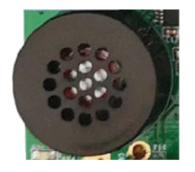




Figure 601: 2W Micro Speaker and Buzzer



**Attention** 

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

PPC-A55-050 HDMI Connector

### **HDMI Connector**

The PPC-A55-050 Industrial Panel PC is equipped with 1 x HDMI-D 2.0 (Micro-HDMI) Out port. The HDMI connector allows connecting an additional (external) monitor. HDMI output resolution can be configured by the software.



HDMI Connector

PPC-A55-050 PROG Button

#### **PROG Button**

The PPC-A55-050 Industrial Panel PC has one button on the board marked as PROG, as shown in the figure below.

When the button is pressed before powering up, the PPC-A55-050 will enter MASKROM mode. In this mode you can use a USB Type-C cable to upgrade its operating system. You can use this feature to flash another OS to the internal eMMC.

When the button is not pressed before and during power up, the PPC-A55-050 will boot normally.

There is no need to press the button during regular operation. However, if you need to flash the OS in MASKROM mode, the button will be used. Please refer to the software documents for more information.



PROG Button

PPC-A55-050 Mounting Procedure

## **Mounting Procedure**

The PPC-A55-050 Industrial Panel PC can be mounted with 2 x M4 screws, enabling simplified installation onto any standard mounting fixture.

#### PPC-A55-050

You can mount PPC-A55-050 with the Vesa (75  $\times$  75mm) and Panel mounting methods, as shown on the figure below.

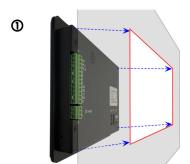






Figure 602: Panel mounting



#### **Attention**

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

You can find detailed information about mounting in the Mount IPC Guide.

PPC-A55-050 Mechanical Specifications

## **Mechanical Specifications**

#### PPC-A55-050

The outer mechanical dimensions of PPC-A55-050 are  $138.55 \times 84.70 \times 27.10$ mm (W x L x H). Please refer to the technical drawing in the figure below for details related to the specific product measurements.

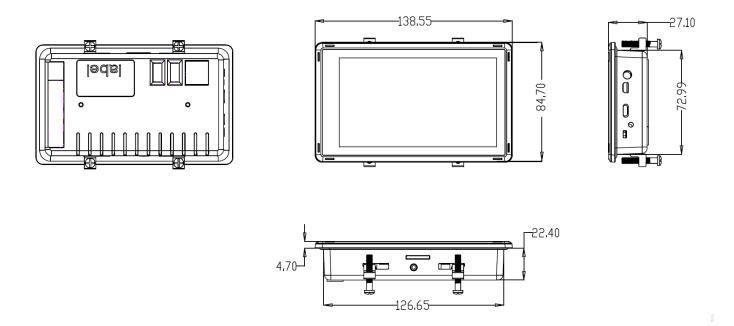


Figure 603: PPC-A55-050 Technical Drawing

PPC-A55-050 3D Model

### **3D Model**

PPC-A55-050 3D model can be viewed in the online doc in a web browser, **if you are reading from the PDF** version, please visit the online doc PPC-A55-050, select hardware documentation, drag the navigation bar to the 3D Model section.

PPC-A55-050 Disclaimer

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