

Industrial PC

# PPC-A72-150-C



PN: CS10768R150

Content can change at anytime, check documentation website for latest information. www.chipsee.com

## **Contents**

Р	PC-A72-150-C	3
	1. Product Overview	7
	2. Ordering Options	8
	2.1. Operating System	8
	2.2. Optional Features	9
	3. Hardware Features	10
	4. Power Input	12
	5. Touch Screen	13
	6. Connectivity	14
	6.1. DB9 Connectors	14
	6.2. RS232+RS485 Connector	14
	6.3. USB Connectors	17
	6.4. LAN Connectors	18
	6.5. WiFi & BT Module	19
	6.6. 4G/LTE Module	20
	6.7. Expansion Connector	21
	7. TF Card Slot	23
	8. Audio Connectors	24
	9. HDMI Connector	25
	10. Power Button	26
	11. Measurements and Mounting Procedure	27
	12. 3D Model	35
	13. Disclaimer	36
	14. Technical Support	36

## PPC-A72-150-C

## Front View



## Rear View



## Side View 1



## Side View 2



PPC-A72-150-C Product Overview

#### **Product Overview**

The Cortex<sup>®</sup>-A72/53 series PPC-A72-150-C (PN: CS10768R150) is a high-quality industrial panel PC. It features a 15" ten-point capacitive touch screen with a resolution of  $1024 \times 768$  pixels and brightness of 350 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-A72-150-C Industrial Panel PC is based around the powerful CS-SOM-RK3399 System on Module (SoM), powered by the Rockchip RK3399 low-power processor which integrates a dual-core Cortex<sup>®</sup>-A72 and a quad-core Cortex<sup>®</sup>-A53 with a separate NEON coprocessor.

The RK3399 supports multi-format video decoders and has a high-performance dual-channel external memory interface (DDR3/DDR3L/LPDDR3/LPDDR4) capable of sustaining demanding memory bandwidths. It also provides a complete set of peripheral interfaces.

PPC-A72-150-C 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 PPC-A72-150-C 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 be also obtained from the Software Documentation section, along with the detailed installation instructions.

- Buildroot Linux Qt5.14\*
- Android 7.1
- Debian 10
- \* (Formerly Chipsee Linux) Based on buildroot that has been integrated with:
  - 1. Chipsee Hardware Test Application
  - 2. An initialization script for GPIO/Buzzer/Audio
  - 3. Multiple libraries, such as the libQt5Sql to develop Qt application with SQL
  - 4. Various packages, such as the <a href="ntfs-3g">ntfs-3g</a> to use NTFS file system



#### 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 <a href="mailto:support@chipsee.com">support@chipsee.com</a> for further assistance

PPC-A72-150-C **Optional Features** 

#### **Optional Features**

The PPC-A72-150-C Industrial Panel PC does not include 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. PPC-A72-150-C Hardware Features

### **Hardware Features**

The PPC-A72-150-C Industrial Panel PC offers a broad range of performance and connectivity options for scalable integration, providing expandability to meet future needs. Some of the key features are listed in the table below.

PPC-A72-150-C					
СРИ	Rokchip RK3399, Dual-core Cortex-A72 (1.8GHz), Quad-core Cortex-A53 (1.4GHz)				
RAM	4GB DDR3				
еММС	16GB				
Storage	TF Card, Supports up to 32GB SDHC				
Display	15" LCD, 1024 x 768, High Brightness: 350 cd/m <sup>2</sup>				
Touch	10-point capacitive touch screen				
USB	4 x USB 2.0 HOST, 1 x USB 3.0 HOST, 1 x USB Type-C				
LAN	1 x RJ45, GbE				
Audio	3.5mm Audio Out Connector, 2W Internal Speaker				
Buzzer	Yes				
RTC	Yes				
RS232	6 x RS2321				
RS485	1 x RS485 (4 at most, 1 debug port)1				
GPIO	8 Channels				
WiFi/BT	Integrated WiFi/BT Module				
НДМІ	1 x HDMI				
4G/LTE	Supported, Optional				
Power Input	From 12V to 36V				
Current at 15V	1000mA Max				
Power Consumption	15W Typical				
Working Temperature	From 0°C to +70°C				
OS	Android 7.1				
Dimensions	377 x 307 x 58mm				
Weight	4100g				
Mounting	VESA & Panel methods				

PPC-A72-150-C Hardware Features

#### Table 135 Key Features

**1(1,2)**This product has 7 x UART channels in total. The default configuration is 5 x RS232 and 2 x RS485. UART can be swapped between RS232 and RS485 modes easily, so if you need different RS232/RS485 configuration, please get in touch with the Chipsee Technical Support at **support@chipsee.com** 

PPC-A72-150-C Power Input

## **Power Input**

The PPC-A72-150-C Industrial Panel PC can be powered by a wide range of input voltages: From 12V 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 on the figure below.



Figure 534: Power Input

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

Power Input Definitio	n		
Pin Number	Definition	Description	
Pin 1	Positive Input	DC Power Positive Terminal  DC Power Negative Terminal  Power System Ground	
Pin 2	Negative Input		
Pin 3	Ground		

Table 136 Power Connector



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

PPC-A72-150-C Touch Screen

#### **Touch Screen**

The PPC-A72-150-C Industrial Panel PC uses a 10-point capacitive touch screen.



#### 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-A72-150-C 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 problem 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-A72-150-C Connectivity

## Connectivity

#### **DB9 Connectors**

The PPC-A72-150-C Industrial Panel PC has 1 x DB9 connector that is configured for debugging by default as shown on the figure below.



Figure 535: DB9 Connector

#### RS232+RS485 Connector

The serial communication interfaces (RS485 and RS232) are routed to a **16-pin 3.81mm terminal**, as illustrated in the figure below. Serial communication on both RS485 and RS232 interfaces can reach up to 115200 kbps.

PPC-A72-150-C RS232+RS485 Connector



Figure 536: Serial pins connector

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

RS232 / RS485 / CAN Pin Definition:				
Pin Number	Definition	Description		
Pin 1	RS232_4_RXD	USB RS232 4 RXD signal		
Pin 2	RS232_4_TXD	USB RS232 4 TXD signal		
Pin 3	RS232_3_RXD	USB RS232 3 RXD signal		

PPC-A72-150-C RS232+RS485 Connector

Pin 4	RS232_3_TXD	USB RS232 3 TXD signal	
Pin 5	RS232_2_RXD	USB RS232 2 RXD signal	
Pin 6	RS232_2_TXD	USB RS232 2 TXD signal	
Pin 7	RS232_1_RXD	USB RS232 1 RXD signal	
Pin 8	RS232_1_TXD	USB RS232 1 TXD signal	
Pin 9	CPU_RS232_4_RXD	CPU UART4, RS232 RXD signal	
Pin 10	CPU_RS232_4_TXD	CPU UART4, RS232 TXD signal	
Pin 11	CPU_RS232_0_RXD	CPU UARTO, RS232 RXD signal	
Pin 12	CPU_RS232_0_TXD	CPU UARTO, RS232 TXD signal	
Pin 13	CPU_RS232_2_RXD	CPU UART2, RS232 RXD signal	
Pin 14	CPU_RS232_2_TXD	CPU UART2, RS232 TXD signal	
Pin 15	GND	System Ground	
Pin 16	VCC5V	System +5V output, up to 1A	

Table 137 Connectivity Section



If you need different RS232/RS485 configuration, contact the Chipsee Technical Support at **support@chipsee.com**.

PPC-A72-150-C USB Connectors

#### **USB Connectors**

There are 4 x dual **USB 2.0 HOST connectors** onboard, as shown on the figure below.



Figure 537: USB 2.0 HOST Connectors

There is also 1 x **USB 3.0 HOST connector** and 1 x **USB Type-C connector**, as shown below.



Figure 538: USB 3.0 HOST Connector



Figure 539: USB Type-C Connector

PPC-A72-150-C LAN Connectors

#### **LAN Connectors**

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



Figure 540: RJ45 LAN Connector



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

PPC-A72-150-C WiFi & BT Module

#### WiFi & BT Module

The PPC-A72-150-C Industrial Panel PC is equipped with the popular **Realtek RTL8723 WiFi/BT module** that supports BT/BLE 4.0 (with backward compatibility), as well as 802.11bgn 2.4 GHz Wireless LAN (WLAN).

The product includes an SMA connector for an external WiFi/BT antenna, as illustrated in the figure below.

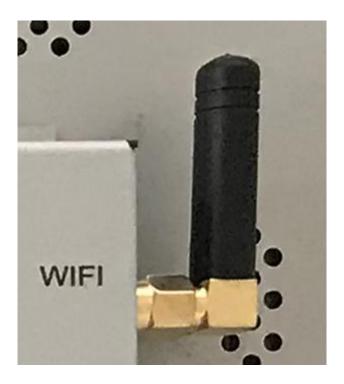


Figure 541: WiFi+BT Antenna

PPC-A72-150-C 4G/LTE Module

#### **4G/LTE Module**

The PPC-A72-150-C Industrial Panel PC is equipped with a **mini-PCle connector** that can connect to 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-A72-150-C.

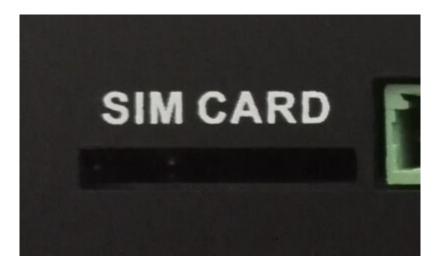


Figure 542: SIM Card Holder



#### Attention

The product does not come shipped with the 4G/LTE module by default.

PPC-A72-150-C Expansion Connector

#### **Expansion Connector**

The PPC-A72-150-C Industrial Panel PC has 1 x **Expansion Connector** (closed by default), as shown on the figure below. This connector has connected to isolated GPIO signals. The table below gives details about the definition of every Pin.



Figure 543: Expansion Connector



Isolated GPIO reduced schematic

Expansion Connector Pinout						
PIN	Function	PIN	Function			
1	VDD, lsolated Power Input (+5V – +24V)	2	GND_ISO			
3	OUT1	4	OUT2			
5	OUT3	6	OUT4			
7	IN1	8	IN2			
9	IN3	10	IN4			

PPC-A72-150-C **Expansion Connector** 

#### Table 138 Expansion Connector Pinout



#### Warning

Since the PCB traces of the port are connected to the processor directly, be careful not to cause electrostatic discharge or over voltage on the pins, as it may damage the processor. Take all the necessary precautions while working with electrostatic-sensitive equipment.

PPC-A72-150-C TF Card Slot

## **TF Card Slot**

The PPC-A72-150-C Industrial Panel PC features 1 x **TF Card (micro SD) slot**. It can address up to 32GB of memory.



Figure 544: TF (micro SD) Card Slot



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

PPC-A72-150-C Audio Connectors

## **Audio Connectors**

The PPC-A72-150-C Industrial Panel PC features some audio peripherals, as well. It has 1  $\times$  **3.5mm audio output jack**.



Figure 545: Audio Out Connector

PPC-A72-150-C HDMI Connector

## **HDMI Connector**

The PPC-A72-150-C Industrial Panel PC is equipped with 1 x **HDMI connector**. The HDMI connector allows connecting an additional (external) monitor. HDMI output resolution can be configured by the software.



Figure 546: HDMI Connector

PPC-A72-150-C Power Button

### **Power Button**

The PPC-A72-150-C Industrial Panel PC has a power button, as shown on the figure below. You can use the button to power ON or OFF the industrial PC.



Figure 547: Power button

## **Measurements and Mounting Procedure**

The outer mechanical dimensions of PPC-A72-150-C are  $377 \times 307 \times 58$ mm (W x L x H). Please refer to the technical drawing in the figure below for details related to the specific product measurements.

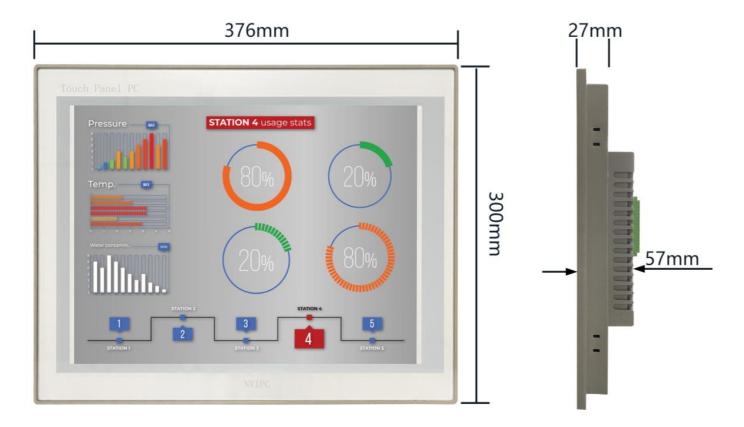


Figure 548: PPC-A72-150-C Technical Drawing

The PPC-A72-150-C Industrial Panel PC can be mounted with 8 x M4 screws or  $4 \times M4$  screws using the VESA (100x100cm or 75x75cm) and Panel mounting methods, enabling simplified installation onto any standard mounting fixture.

#### **Panel Mounting**

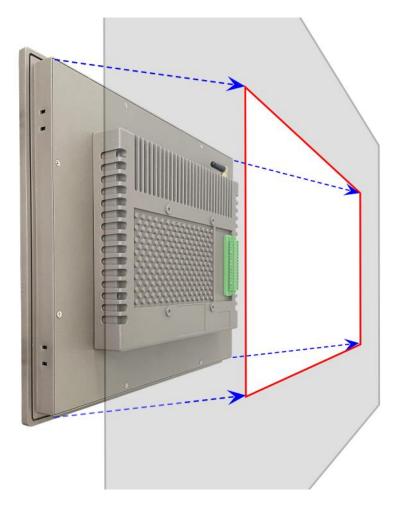


Figure 549: Panel Mounting-1

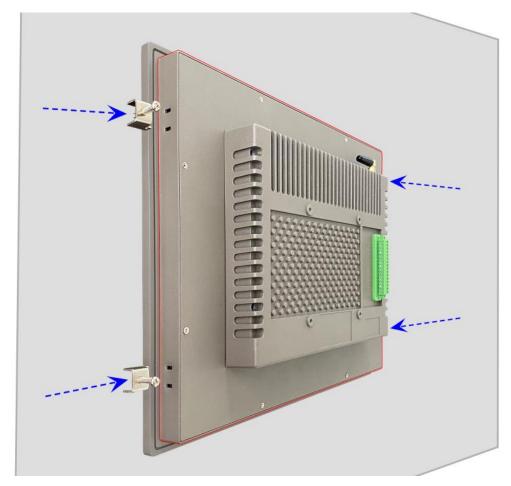


Figure 550: Panel Mounting-2

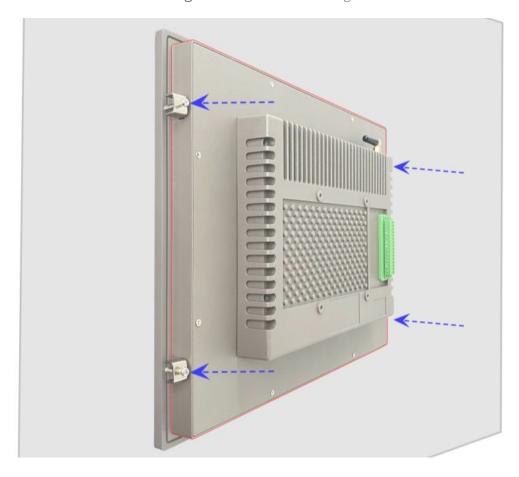


Figure 551: Panel Mounting-3



Figure 552: Panel Mounting-4



Figure 553: Panel Mounting-5



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

### **VESA Mounting**



Figure 554: VESA Mounting-1



Figure 555: VESA Mounting-2



Figure 556: VESA Mounting-3



Figure 557: VESA Mounting-4

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

PPC-A72-150-C 3D Model

## **3D Model**

PPC-A72-150-C 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-A72-150-C Disclaimer

### **Disclaimer**

This document is provided strictly for informational purposes. Its contents are subject to change without notice. Chipsee assumes no responsibility for any errors that may occur in this document. Furthermore, Chipsee reserves the right to alter the hardware, software, and/or specifications set forth herein at any time without prior notice and undertakes no obligation to update the information contained in this document.

While every effort has been made to ensure the accuracy of the information contained herein, this document is not guaranteed to be error-free. Further, it does not offer any warranties or conditions, whether expressed orally or implied in law, including implied warranties and conditions of merchantability or fitness for a particular purpose. We specifically disclaim any liability with respect to this document, and no contractual obligations are formed either directly or indirectly by this document.

Despite our best efforts to maintain the accuracy of the information in this document, we assume no responsibility for errors or omissions, nor for damages resulting from the use of the information herein. Please note that Chipsee products are not authorized for use as critical components in life support devices or systems.

### **Technical Support**

If you encounter any difficulties or have questions related to this document, we encourage you to refer to our other documentation for potential solutions. If you cannot find the solution you're looking for, feel free to contact us. Please email Chipsee Technical Support at **support@chipsee.com**, providing all relevant information. We value your queries and suggestions and are committed to providing you with the assistance you require.