



MODEL:
HYPER-RK39

**Pico-ITX SBC with Rockchip RK3399 Processor,
2 GB LPDDR3, 16 GB eMMC Flash, HDMI, eDP, GbE LAN,
PCIe Mini, USB 3.1, USB 2.0, COM and RoHS**

User Manual

Revision

Date	Version	Changes
November 23, 2018	1.01	Modified Section 2.4: Optional Items Added the connector type information of the eDP connector
September 14, 2018	1.00	Initial release

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Manual Conventions



WARNING

Warnings appear where overlooked details may cause damage to the equipment or result in personal injury. Warnings should be taken seriously.



CAUTION

Cautionary messages should be heeded to help reduce the chance of losing data or damaging the product.



NOTE

These messages inform the reader of essential but non-critical information. These messages should be read carefully as any directions or instructions contained therein can help avoid making mistakes.

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Chapter

1

Introduction

1.1 Introduction



Figure 1-1: HYPER-RK39

The HYPER-RK39 series is a single board computer in Pico-ITX form factor with an on-board Rockchip RK3399 SoC and 1866 MHz 2 GB LPDDR3 memory. It is a platform that supports Android 7.1 and Ubuntu 16.04 OS.

The HYPER-RK39 series includes one HDMI connector and one eDP connector for display. One RJ-45 GbE connector provides the system with smooth connections to an external LAN.

Expansion and I/O include one full-size PCIe Mini slot, one USB 3.1 Type-C port, one USB 3.1 port, one USB 2.0 port and digital I/O pin headers. Serial device connectivity is provided by the external RS-232/422/485 connector.

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1.2 Features

Some of the HYPER-RK39 motherboard features are listed below:

- Pico-ITX motherboard supports Rockchip RK3399 on-board SoC
- HDMI and eDP support dual display
- On-board 1866 MHz 2 GB LPDDR3 memory
- 16 GB eMMC NAND flash and one microSD slot
- 802.11a/b/g/n/ac Wi-Fi and Bluetooth v4.1
- GbE LAN supported by Realtek RTL8211E controller
- Optional WWAN by the full-size PCIe Mini slot
- Equipped MIPI CSI interface for camera
- One external RS-232/422/485 connector
- Two USB 3.1 ports (Type-A + Type-C) and one USB 2.0 port
- Support Android 7.1 and Ubuntu 16.04 OS

1.3 Connectors

The connectors on the HYPER-RK39 are shown in the figure below.

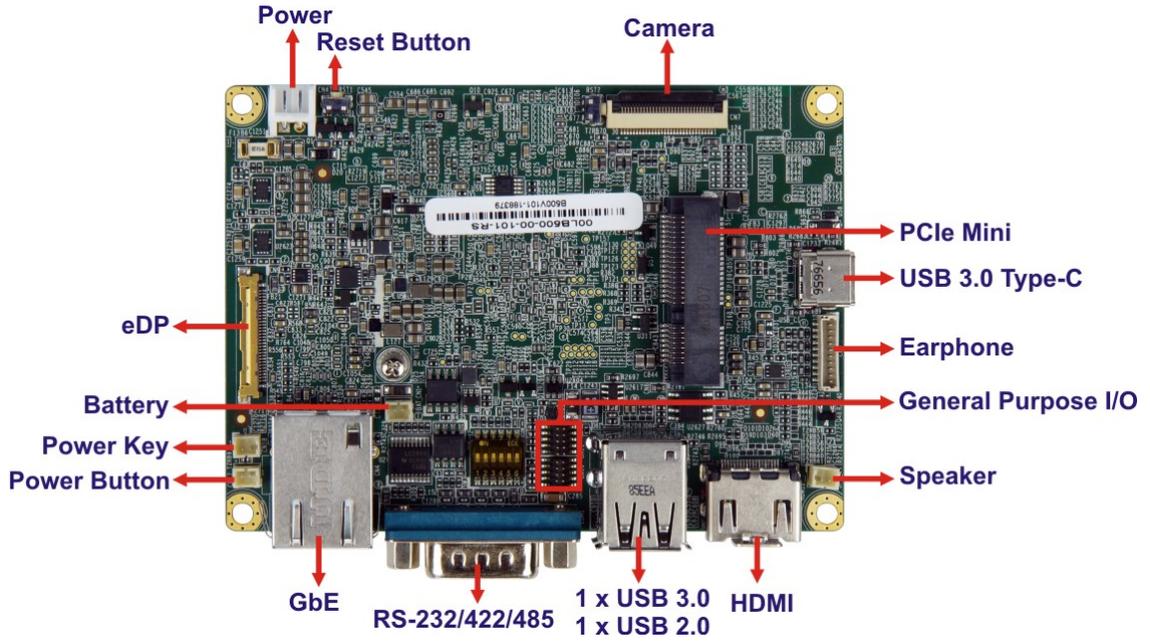


Figure 1-2: Connectors (Front Side)

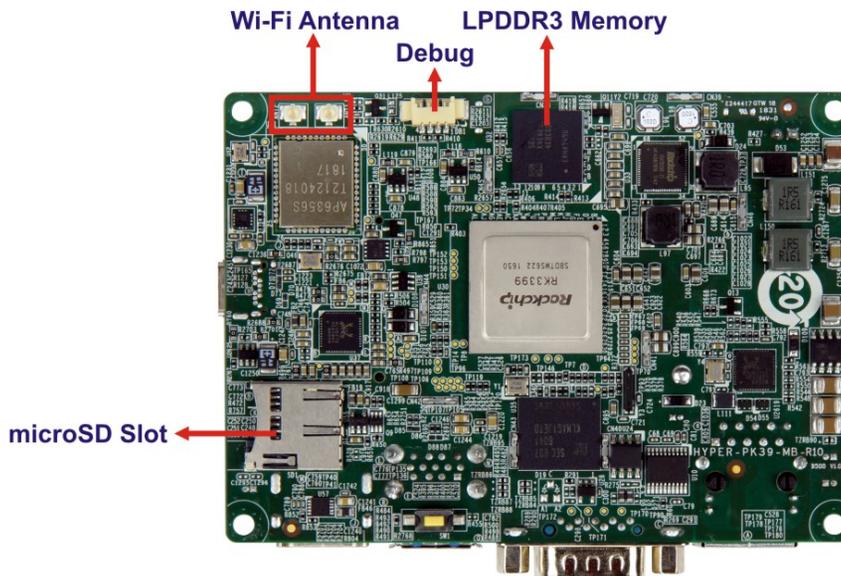


Figure 1-3: Connectors (Solder Side)

HYPER-RK39 SBC

1.4 Dimensions

The dimensions of the HYPER-RK39 series are listed in **Figure 1-4**.

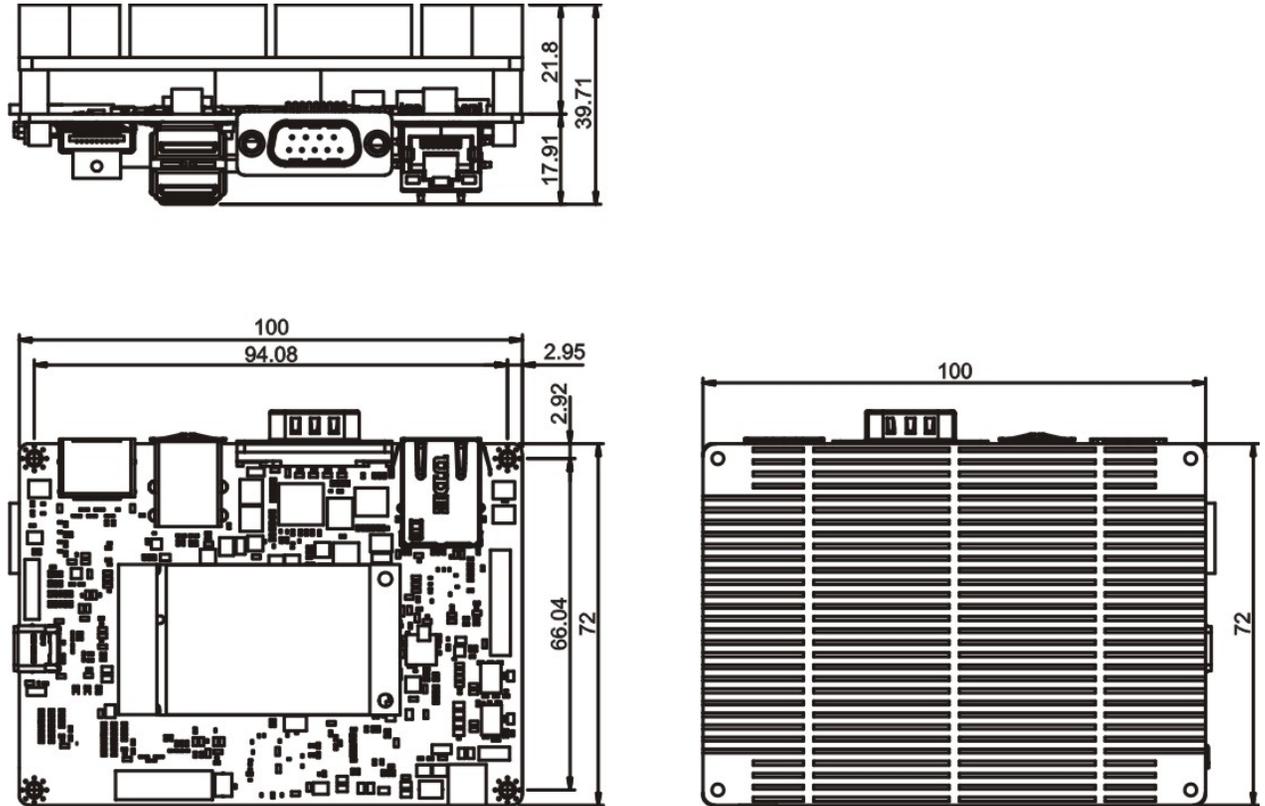


Figure 1-4: Dimensions (mm)

1.5 Data Flow

Figure 1-5 shows the data flow between the system chipset, the CPU and other components installed on the motherboard.

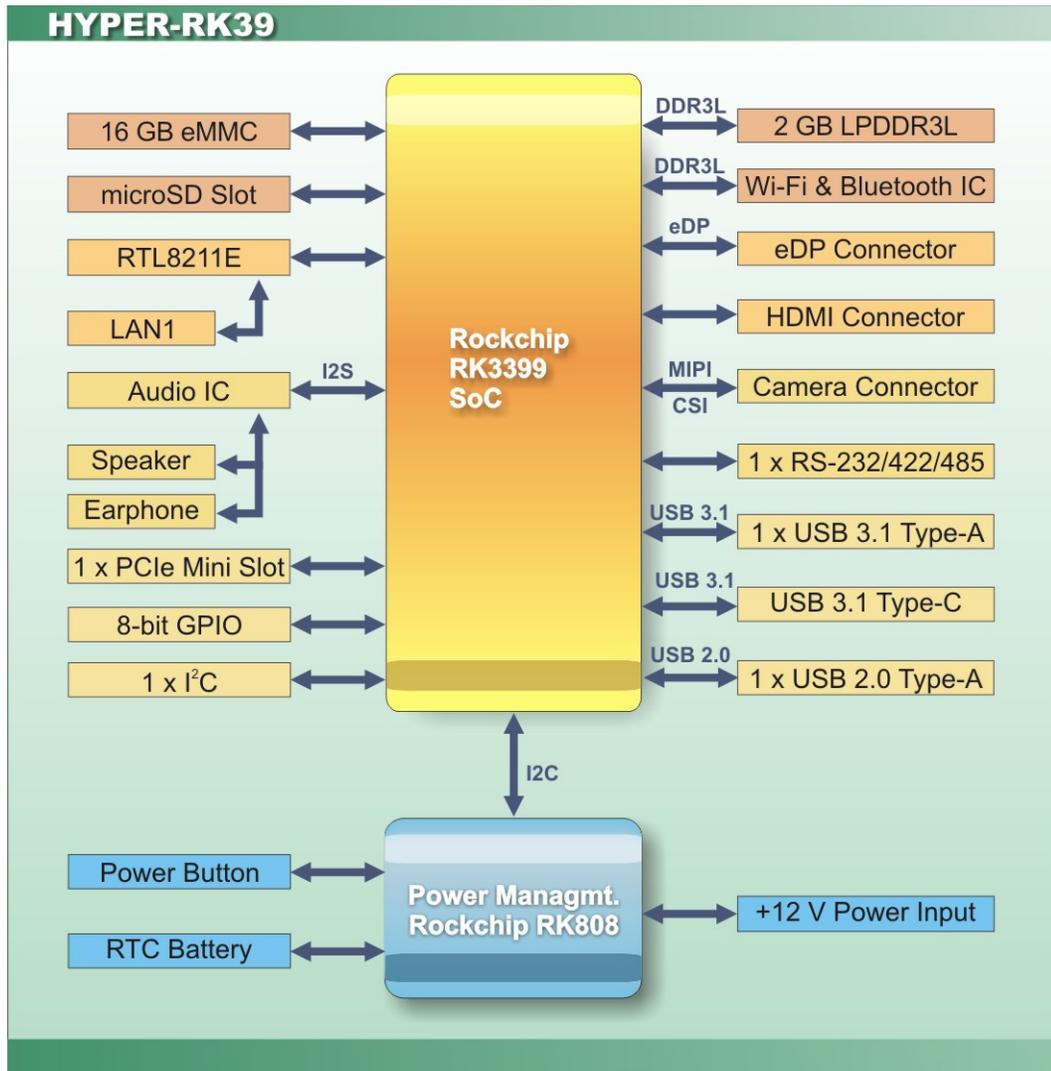


Figure 1-5: Data Flow Diagram

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1.6 Technical Specifications

HYPER-RK39 technical specifications are listed below.

Specification	HYPER-RK39
Form Factor	Pico-ITX
SoC	Rockchip RK3399 on-board SoC (dual-core Cortex-A72 + quad-core Cortex-A53, 64-bit)
Memory	2 GB 1866 MHz LPDDR3L on-board memory
Storage	1 x microSD card slot 16 GB eMMC NAND flash
Wireless LAN	802.11a/b/g/n/ac
Bluetooth	Bluetooth v4.1
Ethernet	Realtek RTL8211E GbE transceiver
WWAN	Optional by PCIe Mini LTE module
Display Output	1 x HDMI output port 1 x eDP port
Digital I/O	8-bit digital I/O (4 in and 4 out)
Supported OS	Android 7.1 or Linux Ubuntu 16.04
Watchdog Timer	Yes
I/O Interface	
Serial Port	1 x RS-232/422/485 by DB-9
Ethernet	1 x RJ-45 GbE port
USB Ports	1 x USB 3.1 Type-A 1 x USB 3.1 Type-C (for OS update) 1 x USB 2.0 Type-A
Audio Connector	1 x Speaker connector by 2-pin header 1 x Earphone (Line-in/line-out) connector by 10-pin wafer
Camera	1 x Camera connector (MIPI CSI)
I²C	1 x I ² C

Specification	HYPER-RK39
Environmental and Power Specifications	
Power Supply	12 V DC input power (2-pin wafer)
Power Consumption	+12 V @ 1.2 A (Rockchip RK3399 SoC with 2 GB 1866 MHz LPDDR3 memory)
Operating Temperature	-10°C ~ 50°C with air flow
Storage Temperature	-20°C ~ 60°C
Humidity	10% ~ 95%, non-condensing
Safety	CE, FCC
Physical Specifications	
Dimensions	100 mm x 72 mm
Weight GW/NW	600 g / 250 g

Table 1-1: Technical Specifications

Chapter

2

Unpacking

2.1 Anti-static Precautions



WARNING!

Static electricity can destroy certain electronics. Make sure to follow the ESD precautions to prevent damage to the product, and injury to the user.

Make sure to adhere to the following guidelines:

- ***Wear an anti-static wristband:*** Wearing an anti-static wristband can prevent electrostatic discharge.
- ***Self-grounding:*** Touch a grounded conductor every few minutes to discharge any excess static buildup.
- ***Use an anti-static pad:*** When configuring any circuit board, place it on an anti-static mat.
- ***Only handle the edges of the PCB:*** Don't touch the surface of the motherboard. Hold the motherboard by the edges when handling.

2.2 Unpacking Precautions

When the HYPER-RK39 is unpacked, please do the following:

- Follow the antistatic guidelines above.
- Make sure the packing box is facing upwards when opening.
- Make sure all the packing list items are present.

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2.3 Packing List



NOTE:

If any of the components listed in the checklist below are missing, do not proceed with the installation. Contact the IEI reseller or vendor the HYPER-RK39 was purchased from or contact an IEI sales representative directly by sending an email to sales@ieiworld.com.

The HYPER-RK39 is shipped with the following components:

Quantity	Item and Part Number	Image
1	HYPER-RK39 single board computer	
1	Power cable	
1	Heat sink with four M3*10 screws	
1	QIG	

2.4 Optional Items

The following are optional components which may be separately purchased:

Item and Part Number	Image
GPIO cable, 250mm, p=2.54 mm (P/N: 32133-030000-100-RS)	
Audio cable, 200mm, Jack:Ø3.5 (P/N: 32107-005200-100-RS)	
eDP cable, 300 mm, p=0.5 mm (P/N: 32602-030700-100-RS)	
Power switch cable, 200 mm, p=1.25 mm (P/N: 19S00-015600-100-RS)	
1.5 W speaker with cable (300 mm) (P/N: 19800-025000-100-RS)	
IPEX to SMA RF cable, 213 mm (P/N: 32501-000705-100-RS)	
Wi-Fi antenna, 108 mm (P/N: 32505-004800-100-RS)	
Camera module, 2592x1944 sensor type (P/N: 71001-COC794A5SFE-RS)	

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<p>60 W power adapter (P/N: 63040-010060-120-RS)</p>	
<p>LTE Antenna (P/N: 32505-004200-100-RS)</p>	
<p>LTE module* (PCIe Mini, WCDMA/HSPA+/LTE, SIM7500SA) (P/N: 27552-000004-RS)</p>	

*A SIM card slot board shown below has to be installed with the LTE module:



Chapter

3

Connectors

HYPER-RK39 SBC

3.1 Peripheral Interface Connectors

This chapter details all the internal and external connectors.

3.1.1 HYPER-RK39 Layout

The figures below show all the connectors and jumpers.

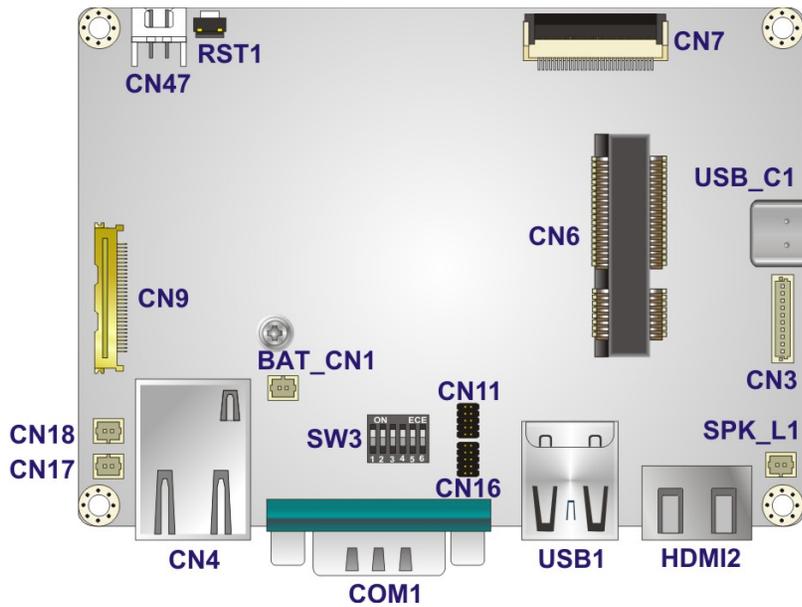


Figure 3-1: Connector and Jumper Locations (Front Side)

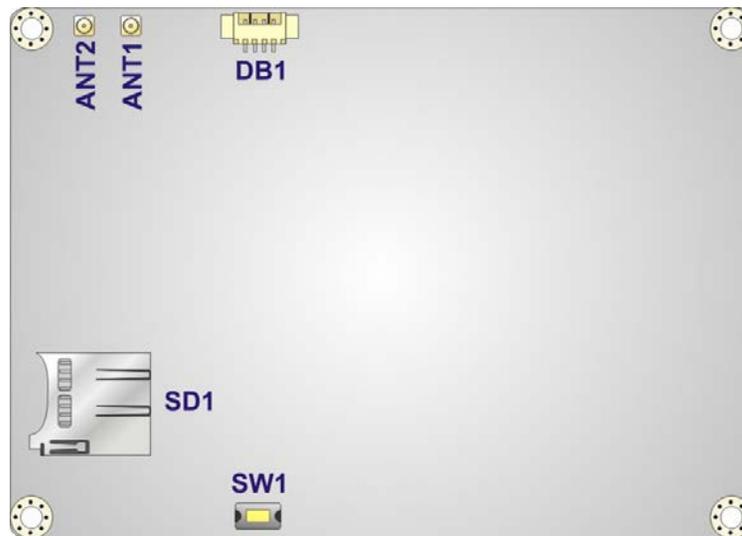


Figure 3-2: Connector and Jumper Locations (Solder Side)

3.1.2 Peripheral Interface Connectors

The table below lists all the connectors on the board.

Connector	Type	Label
Antenna connector	RF coaxial	ANT1, ANT2
Battery connector	2-pin wafer	BAT_CN1
Camera connector	30-pin FPC	CN7
Debug port	4-pin wafer	DB1
Earphone connector	10-pin wafer	CN3
eDP connector	30-pin wire-to-board	CN9
General purpose I/O connectors	10-pin header	CN11, CN16
microSD slot	microSD slot	SD1
PCIe Mini slot	Full-size PCIe Mini slot	CN6
Power connector	2-pin wafer, 180°	CN47
Power button connector	2-pin wafer	CN17
Power key connector	2-pin wafer	CN18
Reset button	Push button	RST1
Speaker connector	2-pin wafer	SPK_L1
Programming switch (for internal engineering use only)	Push button/DIP switch	SW1, SW3

Table 3-1: Peripheral Interface Connectors

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3.1.3 External Interface Panel Connectors

The table below lists the connectors on the external I/O panel.

Connector	Type	Label
HDMI connector	HDMI	HDMI2
LAN connector	RJ-45	CN4
RS-232/422/485 connector	DB-9	COM1
USB 2.0 & USB 3.1 combo connector	USB 2.0 & USB 3.1	USB1
USB 3.1 Type-C connector	USB 3.1 Type-C	USB_C1

Table 3-2: Rear Panel Connectors

3.2 Internal Peripheral Connectors

The section describes all of the connectors on the HYPER-RK39.

3.2.1 Antenna Connectors

- CN Label:** ANT1, ANT2
- CN Type:** RF coaxial connector
- CN Location:** See **Figure 3-3**

The antenna connectors are connected to Wi-Fi RF cables.

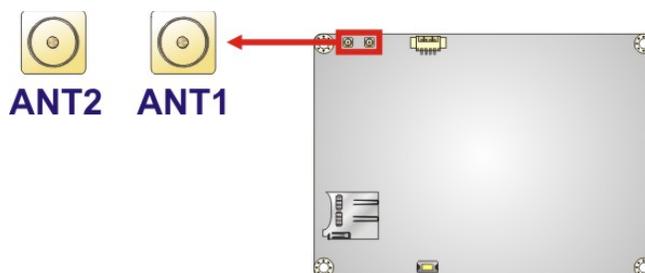


Figure 3-3: Antenna Connector Location

3.2.2 Battery Connector



CAUTION:

Risk of explosion if battery is replaced by an incorrect type. Only certified engineers should replace the on-board battery.

Dispose of used batteries according to instructions and local regulations.



NOTE:

It is recommended to attach the RTC battery onto the system chassis in which the HYPER-RK39 is installed.

CN Label:	BAT_CN1
CN Type:	2-pin wafer, p=1.25 mm
CN Location:	See Figure 3-4
CN Pinouts:	See Table 3-3

The battery connector is connected to the system battery. The battery provides power to the system clock to retain the time when power is turned off.

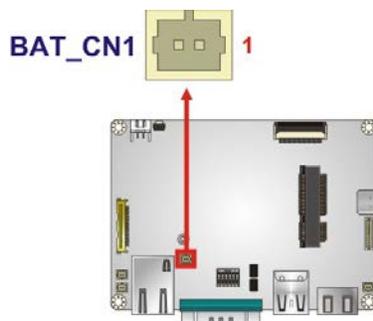


Figure 3-4: Battery Connector Location

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Pin	Description
1	VBAT+
2	GND

Table 3-3: Battery Connector Pinouts

3.2.1 Camera Connector

- CN Label:** CN7
- CN Type:** 30-pin FPC, p=0.5 mm
- CN Location:** See **Figure 3-5**
- CN Pinouts:** See **Table 3-4**

The camera connector is connected to a camera module.

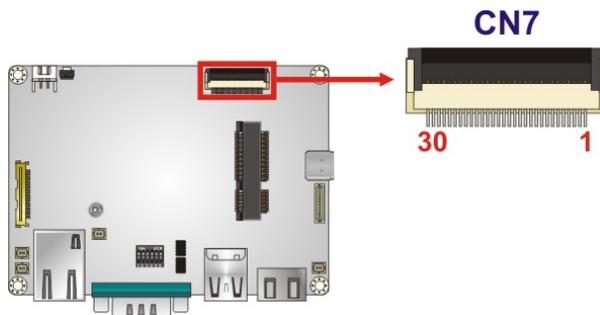


Figure 3-5: Camera Connector Location

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	CAM LED-	16	NC
2	CAM LED+	17	NC
3	2.8V	18	RESET
4	GND	19	NC
5	GND	20	NC
6	GND	21	NC
7	MIPI_D1_P	22	I2C SDA
8	MIPI_D1_N	23	I2C SCL
9	GND	24	Power down
10	MIPI_CLK_P	25	MCLK

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
11	MIPI_CLK_N	26	1.5V
12	GND	27	1.8V
13	MIPI_D0_P	28	GND
14	MIPI_D0_N	29	2.8V
15	GND	30	GND

Table 3-4: Camera Connector Pinouts

3.2.1 Debug Port

- CN Label:** DB1
- CN Type:** 4-pin wafer, p=1.25 mm
- CN Location:** See **Figure 3-6**
- CN Pinouts:** See **Table 3-5**

The debug port is for board debugging.

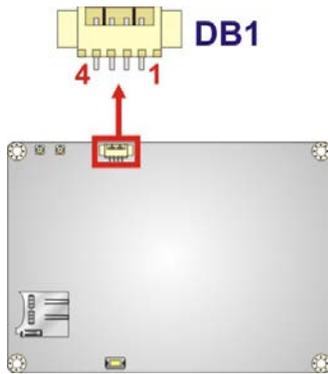


Figure 3-6: Debug Port Location

Pin	Description
1	GND
2	RX
3	TX
4	GND

Table 3-5: Debug Port Pinouts

HYPER-RK39 SBC

3.2.1 Earphone Connector

- CN Label:** CN3
- CN Type:** 10-pin wafer, p=1.00 mm
- CN Location:** See **Figure 3-7**
- CN Pinouts:** See **Table 3-6**

The earphone connector connects to an earphone jack module.

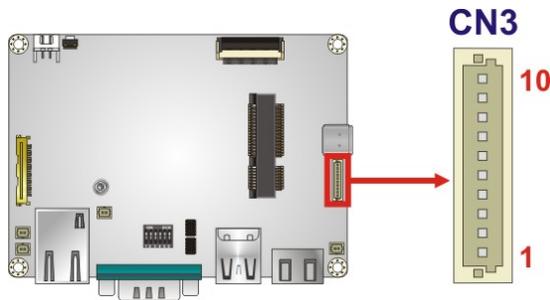


Figure 3-7: Earphone Connector Location

Pin	Description
1	NC
2	CPVREF
3	DET
4	MIC
5	Pull-down
6	HP R
7	GND
8	GND
9	HP L
10	NC

Table 3-6: Earphone Connector Pinouts

3.2.1 eDP Connector

- CN Label:** CN9
- CN Type:** 30-pin wire-to-board, p=0.5 mm, ACES 50473-0300M-P01
- CN Location:** See **Figure 3-8**
- CN Pinouts:** See **Table 3-7**

The eDP connector connects to an LCD panel.

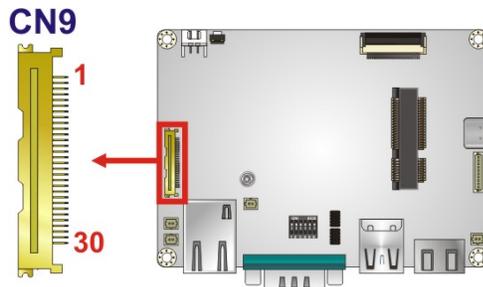


Figure 3-8: eDP Connector Location

Pin	Description	Pin	Description
1	NC	16	GND
2	GND	17	HPD
3	TX1N	18	GND
4	TX1P	19	GND
5	GND	20	GND
6	TX0N	21	GND
7	TX0P	22	LCD EN
8	GND	23	PWM
9	AUXP	24	I2C SDA
10	AUXN	25	I2C SCL
11	GND	26	12V
12	3V3	27	12V
13	3V3	28	12V
14	GND	29	12V
15	GND	30	GND

Table 3-7: eDP Connector Pinouts

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3.2.2 General Purpose I/O Connector

- CN Label:** CN11, CN16
- CN Type:** 10-pin header, p=1.00 mm
- CN Location:** See **Figure 3-9**
- CN Pinouts:** See **Table 3-8** and **Table 3-9**

The general purpose I/O connector can control external devices.

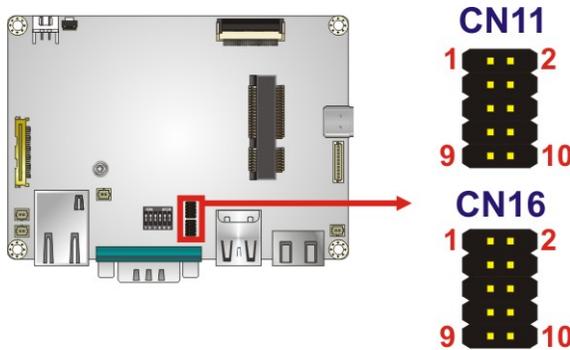


Figure 3-9: General Purpose Connector Locations

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GPIO	2	NC
3	GPIO	4	NC
5	GPIO	6	NC
7	+5V	8	NC
9	GND	10	NC

Table 3-8: General Purpose Connector (CN11) Pinouts

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	+3.3V	2	GPIO
3	GND	4	GPIO
5	I2C SDA	6	GPIO
7	I2C SCL	8	GPIO
9	NC	10	GPIO

Table 3-9: General Purpose Connector (CN16) Pinouts

3.2.1 microSD Slot

- CN Label:** SD1
- CN Type:** microSD slot
- CN Location:** See **Figure 3-10**

The microSD slot accepts microSD cards.

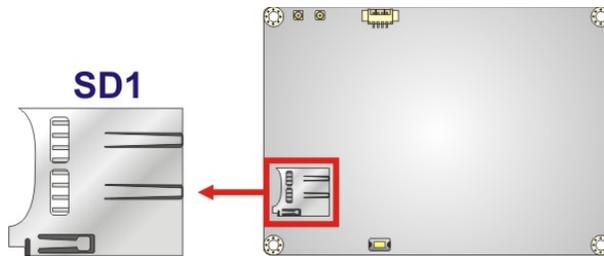


Figure 3-10: microSD Slot Location

3.2.1 PCIe Mini Card Slot

- CN Label:** CN6
- CN Type:** Full-size PCIe Mini card slot
- CN Location:** See **Figure 3-11**
- CN Pinouts:** See **Table 3-10**

The PCIe Mini card slot is for installing PCIe Mini expansion cards.

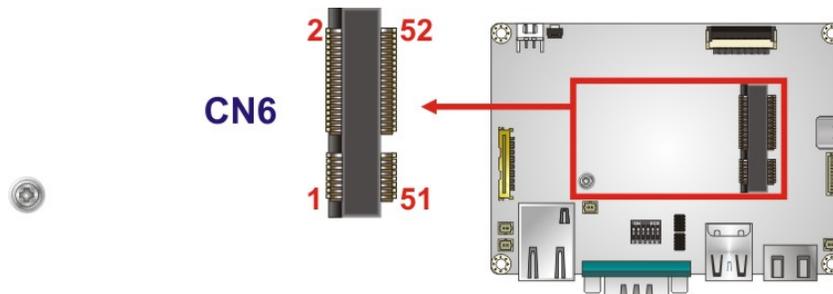


Figure 3-11: PCIe Mini Card Slot Location

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Pin	Description	Pin	Description
1	NC	2	3.8V
3	NC	4	GND
5	NC	6	NC
7	NC	8	NC
9	GND	10	NC
11	NC	12	NC
13	NC	14	NC
15	GND	16	NC
17	NC	18	GND
19	NC	20	NC
21	GND	22	RESET
23	NC	24	NC
25	NC	26	GND
27	GND	28	NC
29	GND	30	NC
31	NC	32	NC
33	NC	34	GND
35	GND	36	USB D-
37	GND	38	USB D+
39	3.8V	40	GND
41	3.8V	42	NC
43	GND	44	NC
45	NC	46	NC
47	NC	48	NC
49	NC	50	GND
51	NC	52	3.8V

Table 3-10: PCIe Mini Card Slot Pinouts

3.2.2 Power Connector

- CN Label:** CN47
- CN Type:** 2-pin wafer, p=2.5 mm
- CN Location:** See **Figure 3-12**
- CN Pinouts:** See **Table 3-11**

The power connector provides +12 V power to the board.

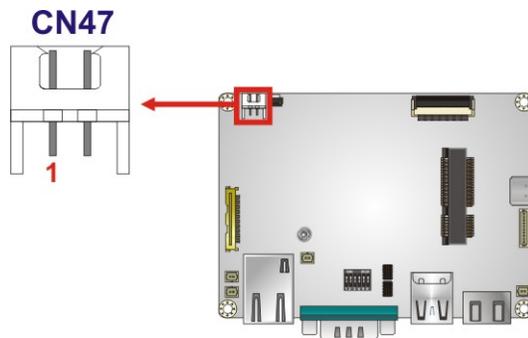


Figure 3-12: Power Connector Location

Pin	Description
1	DC +12 V
2	GND

Table 3-11: Power Connector Pinouts

HYPER-RK39 SBC

3.2.1 Power Button Connector

- CN Label:** CN17
- CN Type:** 2-pin wafer, p=1.25 mm
- CN Location:** See **Figure 3-13**
- CN Pinouts:** See **Table 3-12**

The power button connector is connected to a power switch on the system chassis.

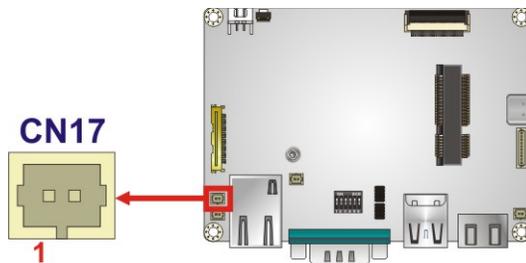


Figure 3-13: Power Button Connector Location

Pin	Description
1	GND
2	Power ON

Table 3-12: Power Button Connector Pinouts

3.2.2 Power Key Connector

- CN Label:** CN18
- CN Type:** 2-pin wafer, p=1.25 mm
- CN Location:** See **Figure 3-14**
- CN Pinouts:** See **Table 3-13**

The power key connector is connected to a power key.

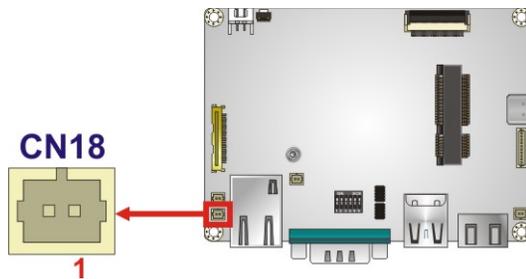


Figure 3-14: Power Key Connector Location

Pin	Description
1	GND
2	EN

Table 3-13: Power Key Connector Pinouts

3.2.1 Reset Button

- CN Label:** RST1
- CN Type:** Push button
- CN Location:** See **Figure 3-15**

Push the reset button to restart the system.

HYPER-RK39 SBC

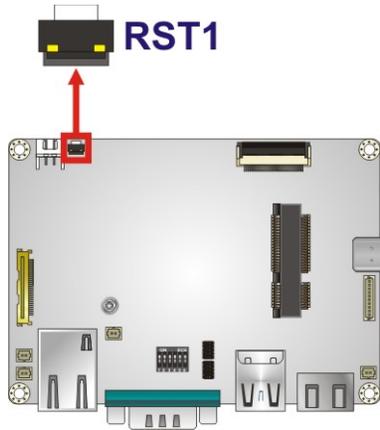


Figure 3-15: Reset Button Location

3.2.1 Speaker Connector

- CN Label:** SPK_L1
- CN Type:** 2-pin wafer, p=1.25 mm
- CN Location:** See **Figure 3-16**
- CN Pinouts:** See **Table 3-14**

This connector is connected to a speaker.

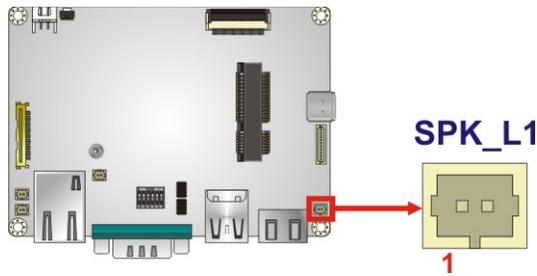


Figure 3-16: Speaker Connector Pinouts

Pin	Description
1	Speaker+
2	Speaker-

Table 3-14: Speaker Connector Pinouts

3.3 External Peripheral Interface Connector Panel

Figure 3-17 shows the HYPER-RK39 external peripheral interface connector (EPIC) panel. The EPIC panel consists of the following:

- 1 x HDMI connector
- 1 x GbE LAN connector
- 1 x RS-232/422/485 connector
- 1 x USB 2.0 connector
- 1 x USB 3.1 connector

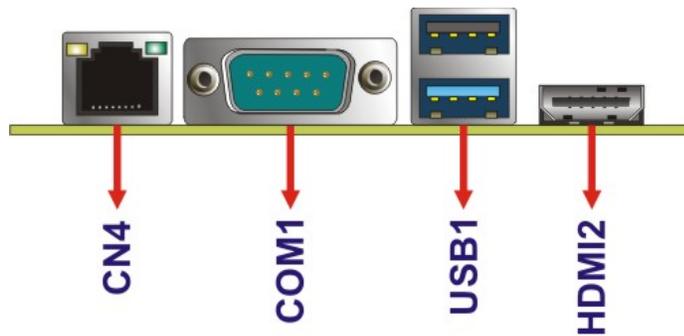


Figure 3-17: External Peripheral Interface Connector

3.3.1 HDMI Connector

- CN Label:** HDMI2
CN Type: HDMI
CN Location: See Figure 3-17
CN Pinouts: See Table 3-15

The HDMI connector can connect to an HDMI device.

Pin	Description	Pin	Description
1	HDMI_DATA2	2	GND
3	HDMI_DATA2#	4	HDMI_DATA1
5	GND	6	HDMI_DATA1#
7	HDMI_DATA0	8	GND
9	HDMI_DATA0#	10	HDMI_CLK

HYPER-RK39 SBC

Pin	Description	Pin	Description
11	GND	12	HDMI_CLK#
13	N/C	14	N/C
15	HDMI_SCL	16	HDMI_SDA
17	GND	18	+5V
19	HDMI_HPD		

Table 3-15: HDMI Connector Pinouts

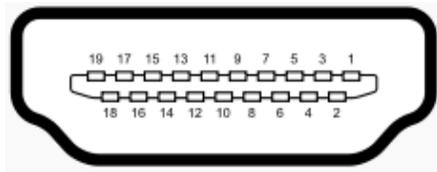


Figure 3-18: HDMI Connector

3.3.2 LAN Connector

- CN Label:** CN4
- CN Type:** RJ-45
- CN Location:** See **Figure 3-17**
- CN Pinouts:** See **Figure 3-19** and **Table 3-16**

The LAN connector connects to a local network.

Pin	Description	Pin	Description
1	LAN_MD10+	7	LAN_MD12+
2	LAN_MD10-	8	LAN_MD12-
3	LAN_MD11+	9	LAN_MD13+
4	LAN_MD11-	10	LAN_MD13-

Table 3-16: LAN Pinouts

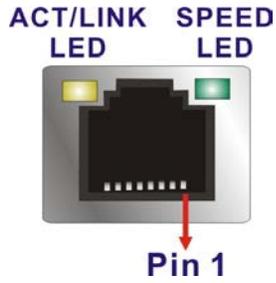


Figure 3-19: LAN Connector

3.3.1 RS-232/422/485 Serial Port Connector (COM1)

- CN Label:** COM1
- CN Type:** DB-9 connector
- CN Location:** See **Figure 3-17**
- CN Pinouts:** See **Table 3-17** and Figure 3-20

The pinouts for RS-232, RS-422 and RS-485 communication are shown below.

Pin	RS-232	RS-422	RS-485
1	--	TX-	D-
2	RX	TX+	D+
3	TX	RX+	--
4	--	RX-	--
5	GND	--	--
6	--	--	--
7	--	--	--
8	--	--	--
9	--	--	--

Table 3-17: COM1 Pinouts

HYPER-RK39 SBC

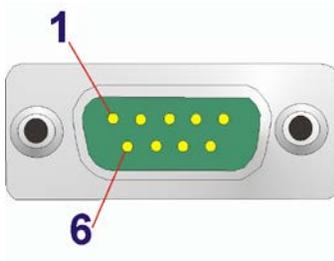


Figure 3-20: Serial Port Pinouts

3.3.2 USB Connectors

CN Label:	USB1
CN Type:	USB 3.1 Gen1 Type-A and USB 2.0 Type-A
CN Location:	See Figure 3-17

The HYPER-RK39 has one external USB 3.1 Gen 1 port and one USB 2.0 port. The USB connector can be connected to a USB 2.0 or USB 3.1 device.

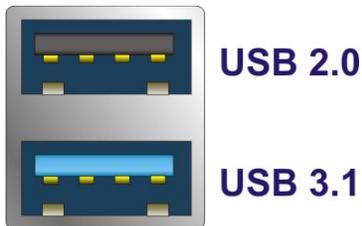


Figure 3-21: External USB Type-A Ports

CN Label:	USB_C1
CN Type:	USB 3.1 Gen1 Type-C
CN Location:	See Figure 3-22

The HYPER-RK39 also has one external USB 3.1 Type-C port that supports USB Type-C devices.

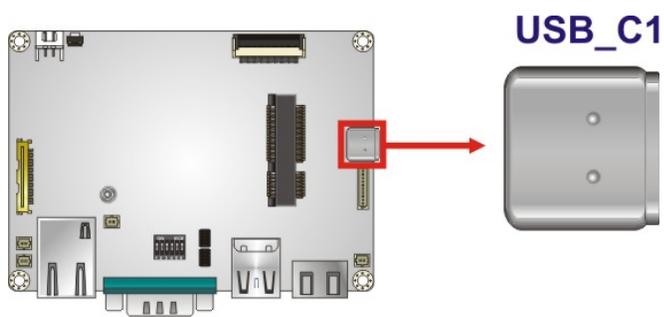


Figure 3-22: External USB 3.1 Type-C Port

Chapter

4

Installation

4.1 Anti-static Precautions



WARNING:

Failure to take ESD precautions during the installation of the HYPER-RK39 may result in permanent damage to the HYPER-RK39 and severe injury to the user.

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the HYPER-RK39. Dry climates are especially susceptible to ESD. It is therefore critical that whenever the HYPER-RK39 or any other electrical component is handled, the following anti-static precautions are strictly adhered to.

- **Wear an anti-static wristband:** Wearing a simple anti-static wristband can help to prevent ESD from damaging the board.
- **Self-grounding** Before handling the board, touch any grounded conducting material. During the time the board is handled, frequently touch any conducting materials that are connected to the ground.
- **Use an anti-static pad:** When configuring the HYPER-RK39, place it on an anti-static pad. This reduces the possibility of ESD damaging the HYPER-RK39.
- **Only handle the edges of the PCB:** When handling the PCB, hold the PCB by the edges.

4.2 Installation Considerations



NOTE:

The following installation notices and installation considerations should be read and understood before installation. All installation notices must be strictly adhered to. Failing to adhere to these precautions may lead to severe damage and injury to the person performing the installation.

HYPER-RK39 SBC



WARNING:

The installation instructions described in this manual should be carefully followed in order to prevent damage to the HYPER-RK39, components and injury to the user.

Before and during the installation please **DO** the following:

- Read the user manual:
 - The user manual provides a complete description of the HYPER-RK39 installation instructions and configuration options.
- Wear an electrostatic discharge cuff (ESD):
 - Electronic components are easily damaged by ESD. Wearing an ESD cuff removes ESD from the body and helps prevent ESD damage.
- Place the HYPER-RK39 on an antistatic pad:
 - When installing or configuring the motherboard, place it on an antistatic pad. This helps to prevent potential ESD damage.
- Turn all power to the HYPER-RK39 off:
 - When working with the HYPER-RK39, make sure that it is disconnected from all power supplies and that no electricity is being fed into the system.

Before and during the installation of the HYPER-RK39:

- **DO NOT** remove any of the stickers on the PCB board. These stickers are required for warranty validation.
- **DO NOT** use the product before verifying all the cables and power connectors are properly connected.
- **DO NOT** allow screws to come in contact with the PCB circuit, connector pins, or its components.

4.3 Full-size PCIe Mini Card Installation

The PCIe Mini card slot allows installation of either a full-size PCIe Mini card. To install a full-size PCIe Mini card, please follow the steps below.

Step 1: Locate the PCIe Mini card slot. See Chapter 3.

Step 2: Remove the retention screw. Remove the retention screw as shown in Figure 4-1.

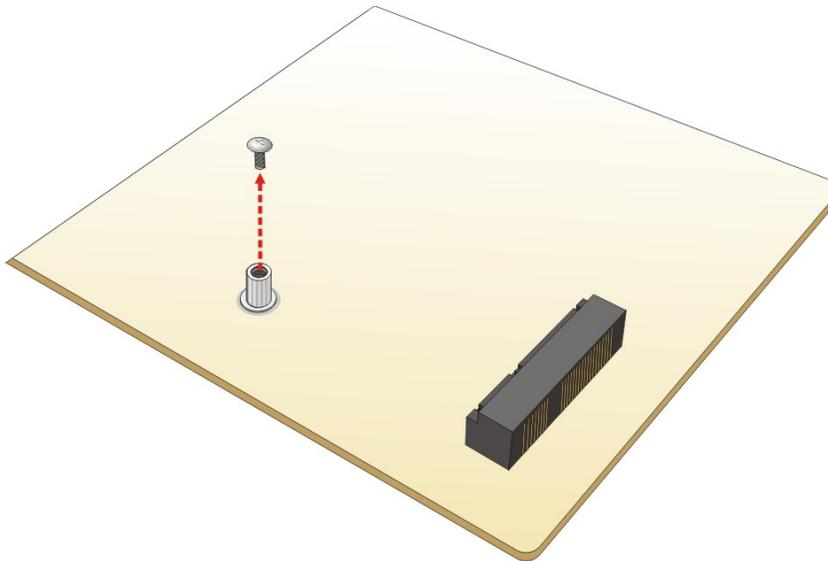


Figure 4-1: Removing the Retention Screw

Step 3: Insert into the socket at an angle. Line up the notch on the card with the notch on the slot. Slide the PCIe Mini card into the socket at an angle of about 20° (Figure 4-2).

HYPER-RK39 SBC

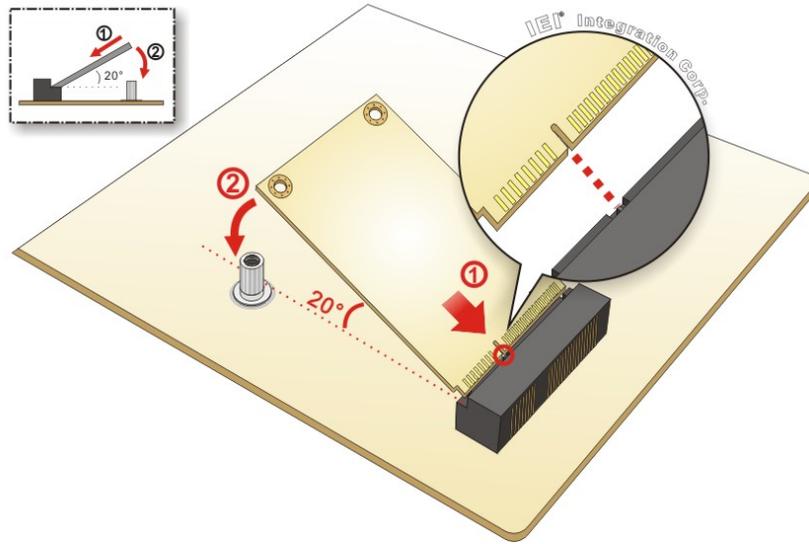


Figure 4-2: Inserting the Full-size PCIe Mini Card into the Slot at an Angle

Step 4: Secure the full-size PCIe Mini card. Secure the full-size PCIe Mini card with the retention screw previously removed (Figure 4-3).

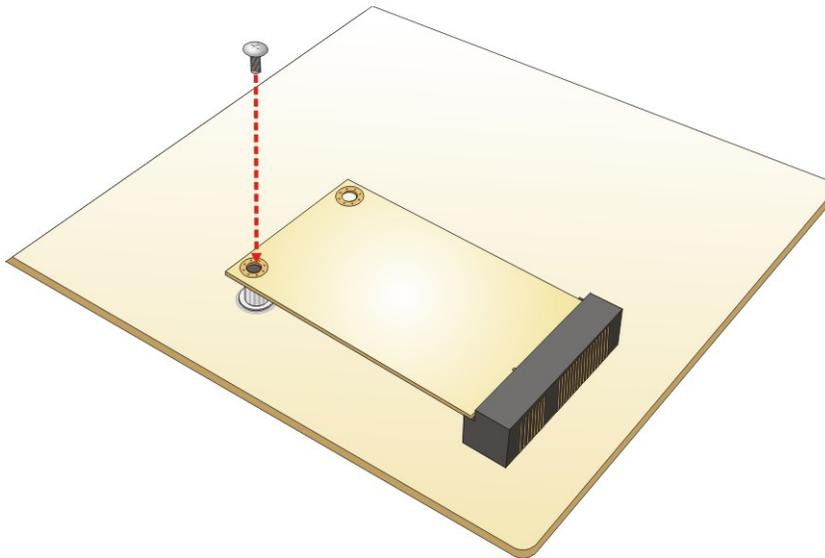


Figure 4-3: Securing the Full-size PCIe Mini Card

4.4 Chassis Installation

4.4.1 Airflow

**WARNING:**

Airflow is critical for keeping components within recommended operating temperatures. The chassis should have fans and vents as necessary to keep things cool.

The HYPER-RK39 must be installed in a chassis with ventilation holes on the sides allowing airflow to travel through the heat sink surface. In a system with an individual power supply unit, the cooling fan of a power supply can also help generate airflow through the board surface.

4.4.2 Heat Sink Installation

**WARNING:**

1. Never run the HYPER-RK39 without the heat sink secured to the board. The heat sink ensures the system remains cool.
 - 2 The plastic sheet attached on the thermal pad of the heat sink must be removed before installation.
-

A heat sink is shipped with the HYPER-RK39. The heat sink must be installed on to the HYPER-RK39 before operation. The following figure shows how to install the heat sink.

HYPER-RK39 SBC

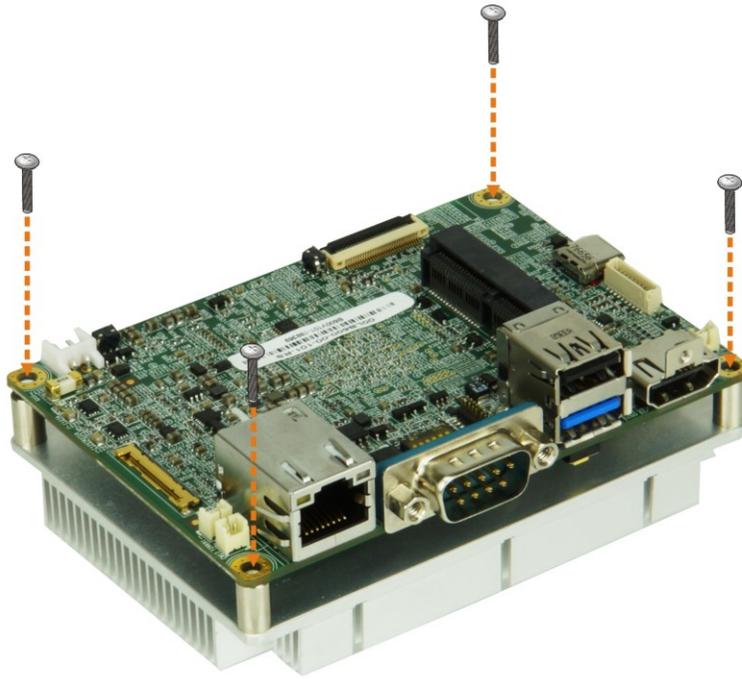


Figure 4-4: Heat Sink Installation

4.4.3 Motherboard Installation

To install the HYPER-RK39 motherboard into the chassis please refer to the reference material that came with the chassis.

4.5 Available Drivers

All the drivers for the HYPER-RK39 are available on IEI Resource Download Center (<https://download.ieiworld.com>). Type HYPER-RK39 and press Enter to find all the relevant software, utilities, and documentation.



Figure 4-5: IEI Resource Download Center

4.5.1 Driver Download

To download drivers from IEI Resource Download Center, follow the steps below.

Step 1: Go to <https://download.ieiworld.com>. Type HYPER-RK39 and press Enter.



Step 2: All product-related software, utilities, and documentation will be listed. You can choose **Driver** to filter the result.

HYPER-RK39 SBC

All Type BIOS Datasheet **Driver** QIG SDK User Manual Utility

Keyword: "WAFER-BW", Searching Result : 8 Records.

WAFER-BW [Product Info>](#)

Embedded Computer > Single Board Computer > Embedded Board

3.5" SBC with Intel® 14nm Pentium®/Celeron® on-board SoC

Driver

File Name	Published	Version	File Checksum
7B000-001168-RS_V1.4.iso (2.99 GB)	2017/12/19	1.40	7FB3D8A55C9F2EB072E30AF64257FA51

Step 3: Click the driver file name on the page and you will be prompted with the following window. You can download the entire ISO file (❶), or click the small arrow to find an individual driver and click the file name to download (❷).

7B000-001168-RS_V1.4.iso

❶ [Click here to download entire ISO file. \(2.99 GB\)](#)

* Download individual file *

- Docs
 - 1. Chipset
 - 10.1.1.12.zip (2.7 MB)
 - 2. VGA
 - 3. Audio
 - 4. Lan
 - 5. USB 3.0
 - 6. Serial IO
 - 7. TXE
 - 8. Manual

❷



NOTE:

To install software from the downloaded ISO image file in Windows 8, 8.1 or 10, double-click the ISO file to mount it as a virtual drive to view its content. On Windows 7 system, an additional tool (such as Virtual CD-ROM Control Panel from Microsoft) is needed to mount the file.

Chapter

5

Android OS

HYPER-RK39 SBC

The HYPER-RK39 may come with Android OS pre-installed. This chapter introduces the user interface and basic functions of Android OS installed in the HYPER-RK39.

5.1 Home Screen

Android OS supports multiple home screens allowing users to customize the screen with widgets, apps and shortcuts. The following sections describe the basic technique to manage the home screen.

5.1.1 Adding a Home Screen

To add a home screen, touch and hold an app/widget icon. The following screen appears, indicating that a new home screen is available. Drag and release the icon to the new home screen.

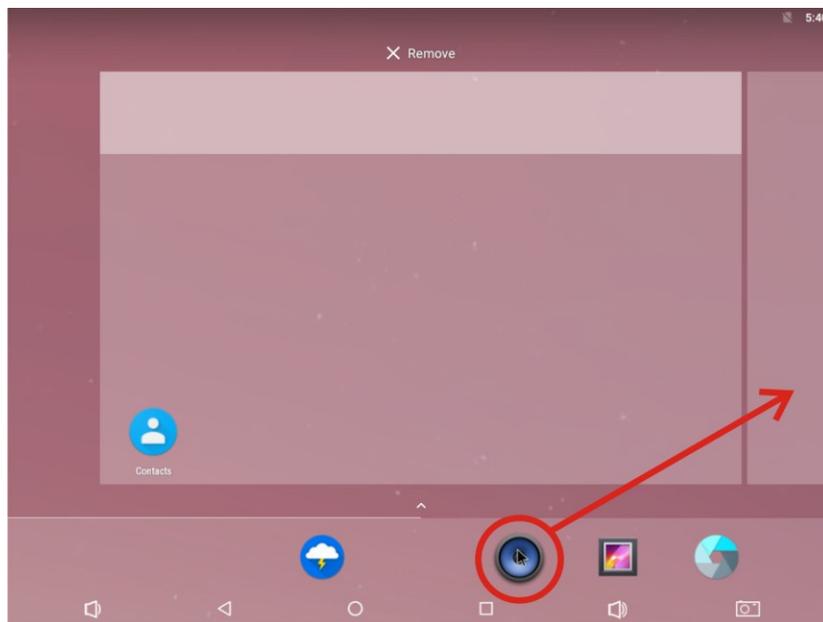


Figure 4-1: Adding a Home Screen

5.1.2 Switching between Home Screens

Swipe right or left to switch between home screens.

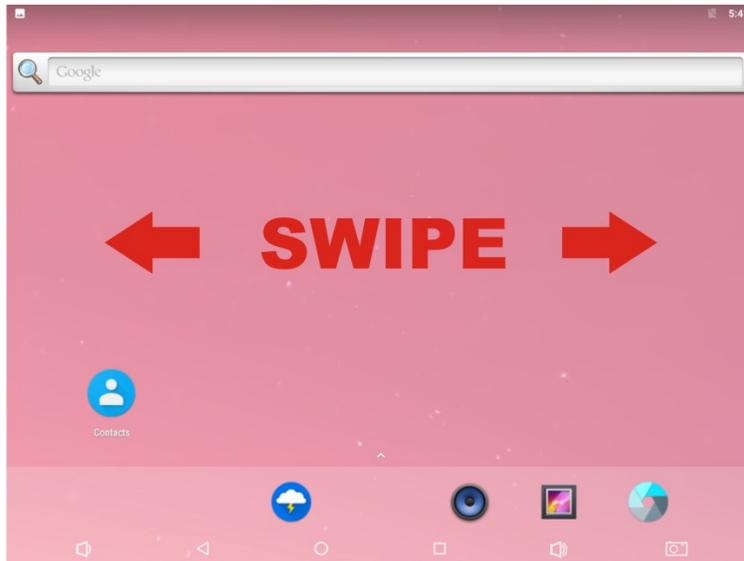


Figure 4-2: Multiple Home Screens

5.1.3 Favorites Tray

The Favorites tray at the bottom of each home screen allows users to keep the most important or frequently used shortcuts.

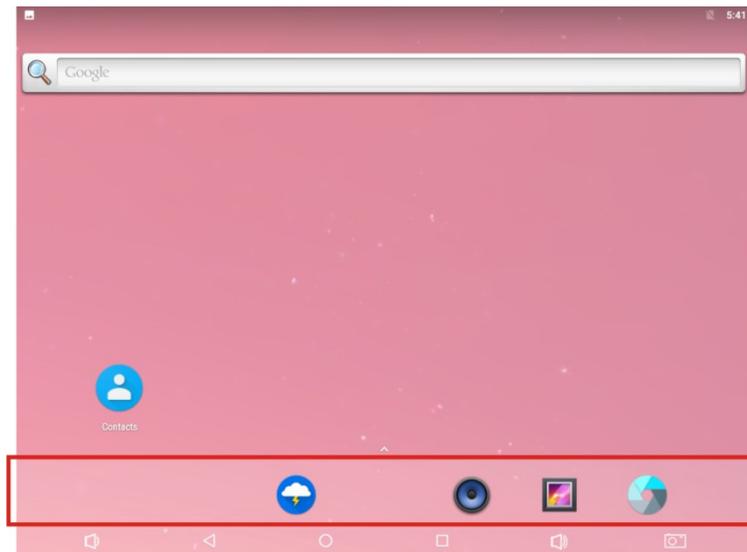


Figure 4-3: Favorites Tray

HYPER-RK39 SBC

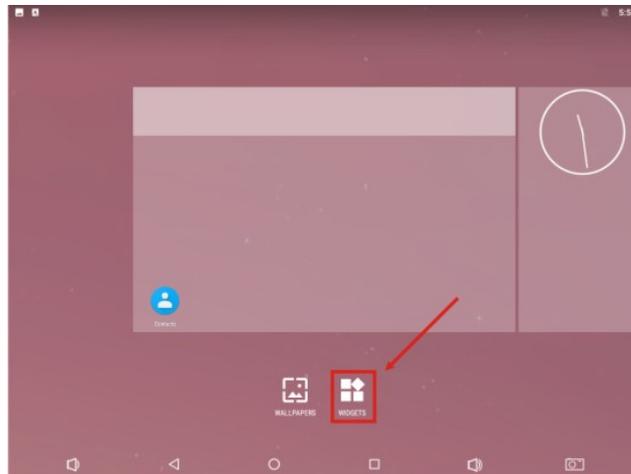
5.1.4 Adding Shortcuts

To add app or widget shortcuts on the home screen, follow the steps below.

Step 1: To add an app shortcut, tap the up arrow  on the home screen to access the All Apps page.



To add a widget shortcut, touch and hold the background of a home screen, then tap **WIDGETS**.



Step 2: Touch and hold an app icon or a widget, and drag it to the home screen.

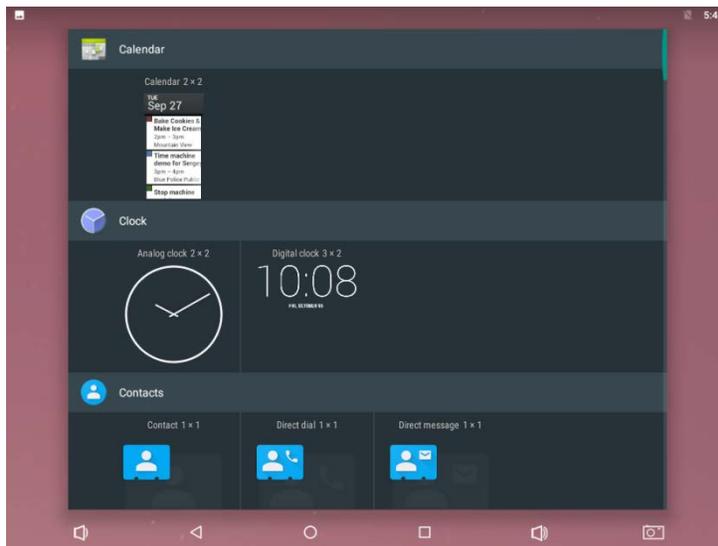
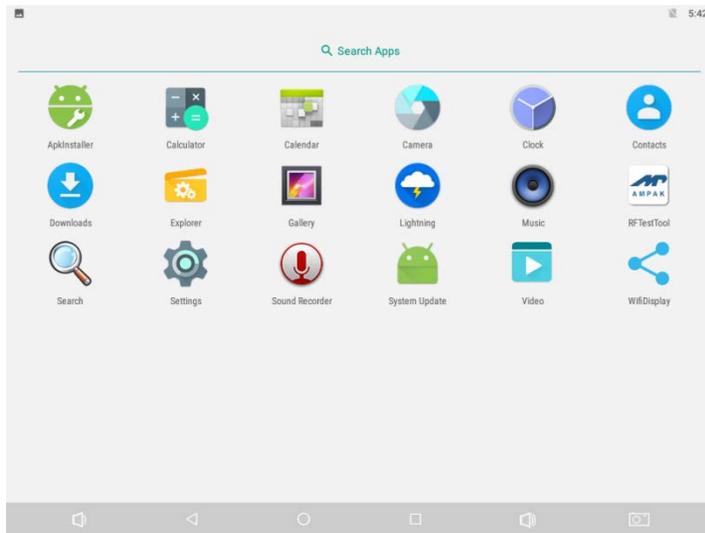


Figure 4-4: All Apps/WIDGETS Page

HYPER-RK39 SBC

5.1.5 Arranging the Home Screen

The items on the home screen can be moved and deleted. Touch and hold an item on the home screen and drag it where you want. To trash the item on the screen, drag it to the Remove icon. Release the icon when it turns gray.

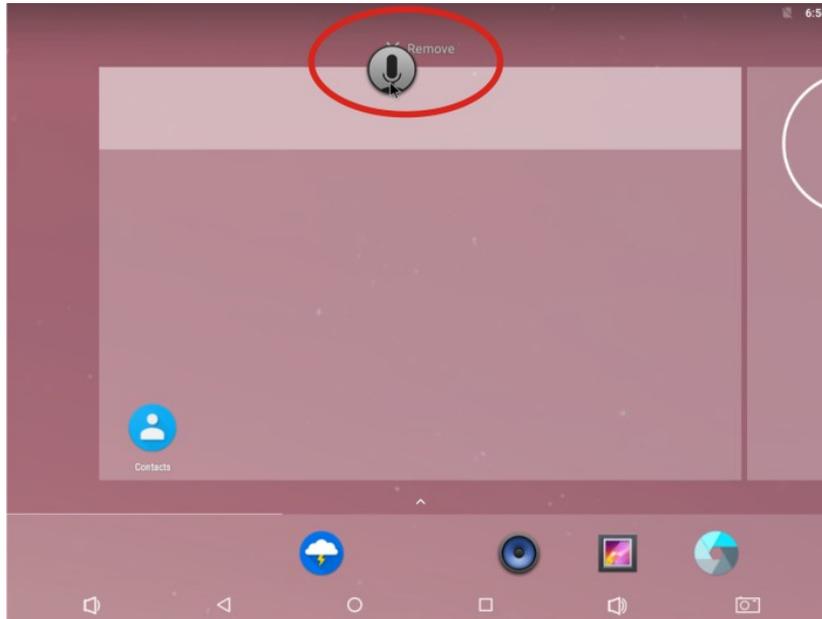


Figure 4-5: Trash an Item on Home Screen

5.2 Navigation Buttons

The navigation buttons shown in **Figure 4-8** can always be found at the bottom of every screen.

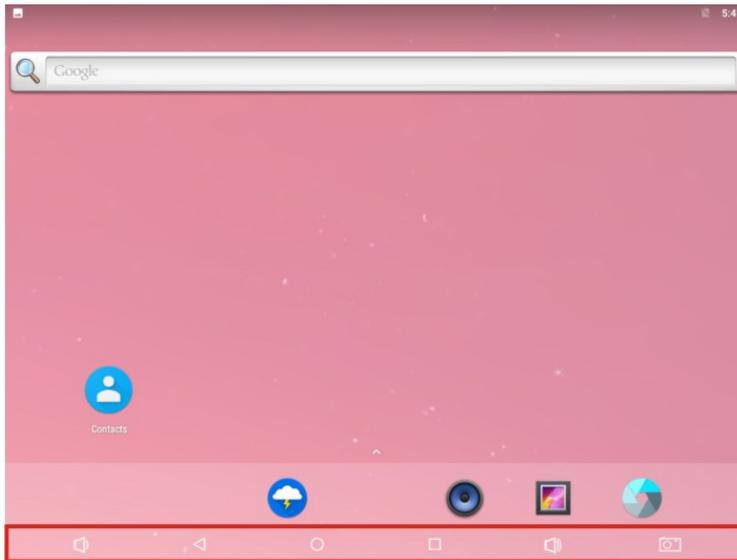


Figure 4-6: Navigation Buttons

Buttons	Description
	Tap to turn the volume down.
	Tap to return to the previous screen.
	Tap to return to the home screen.
	Tap to display all the recently used applications.
	Tap to turn the volume up.
	Tap to take a screenshot.

Table 4-1: Navigation Buttons

HYPER-RK39 SBC

5.3 Status Bar

The status bar on the top of the screen (**Figure 4-9**) displays system status, such as battery level or signal strength.

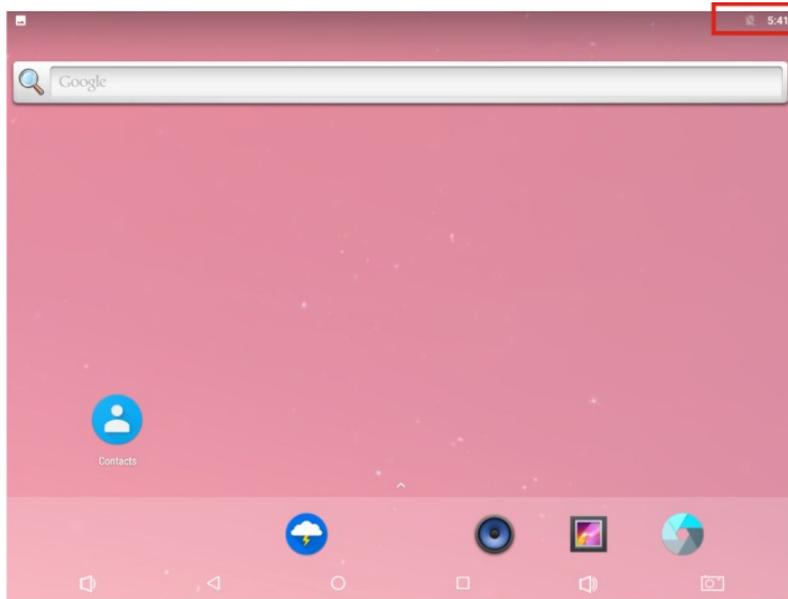
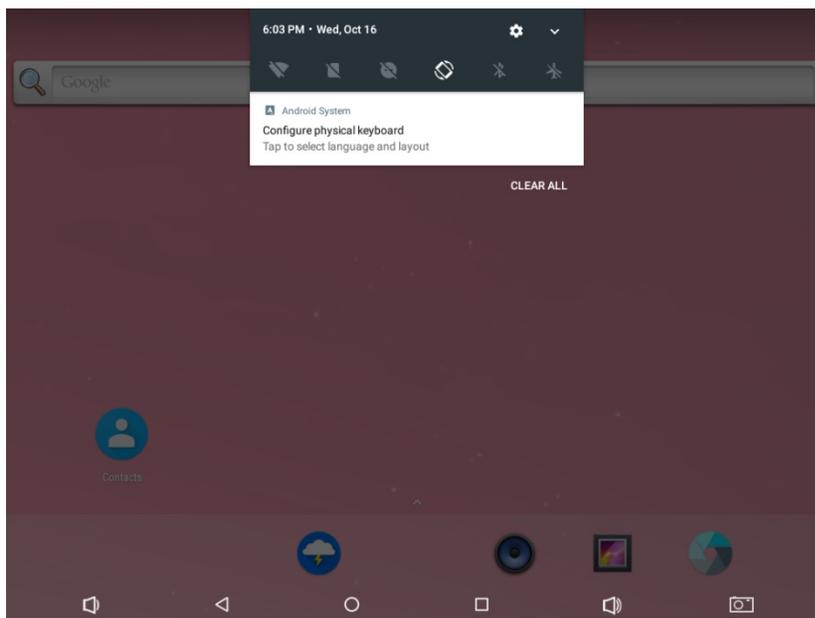


Figure 4-7: Status Bar

Swipe down from the status bar to view notification and status details (**Figure 4-10**).



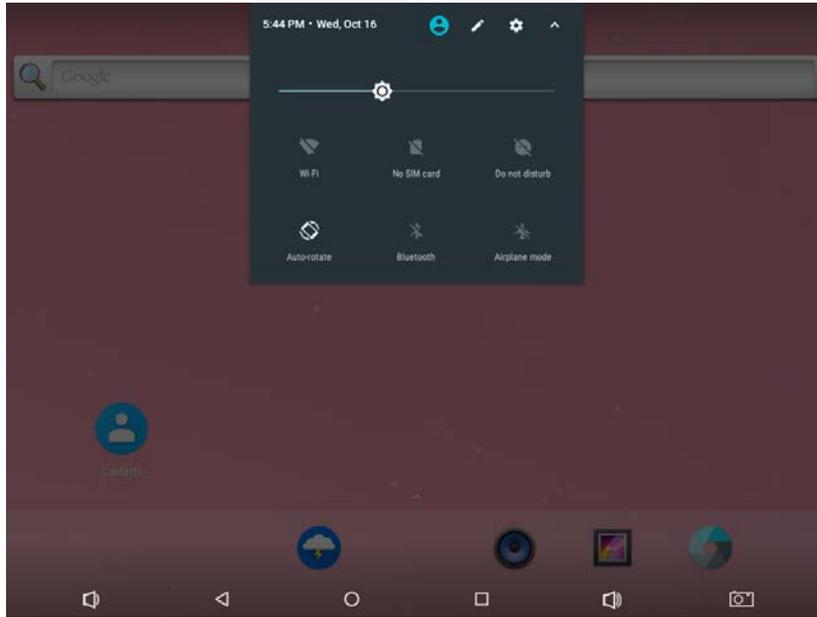


Figure 4-8: Notification List and System Status

Chapter

6

Ubuntu OS

The HYPER-RK39 may come with Ubuntu 16.04 OS pre-installed. This chapter introduces the user interface and basic functions of Ubuntu OS installed in the HYPER-RK39.

6.1 Desktop

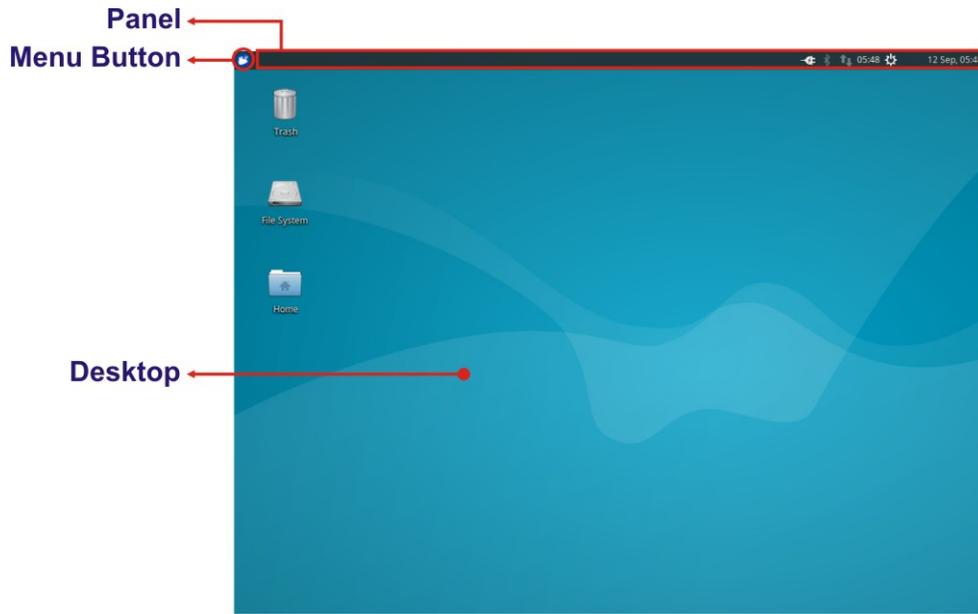


Figure 4-1: Ubuntu Desktop

<p>Panel</p>	<p>It is used for starting and switching applications and for receiving information about the system. It includes:</p> <ul style="list-style-type: none"> - Clock: displays the date and time. - Notification Area: contains indicators which provide system information, including network connectivity, power management and system settings. <p>The position of the panel, the items it contains and the Menu are all customizable by right-clicking on the Panel and select Panel → Panel Preferences.</p>
<p>Menu Button</p>	<p>Clicking on the menu button will open the Menu, offering many choices of applications. (See the following section for details.)</p>
<p>Desktop</p>	<p>The default desktop has just three icons on it: Home (where all personal data are stored), File System (which is the root of the filesystem) and Trash. The desktop can be customized by right-clicking in a blank area and choosing Desktop Settings.</p>

HYPER-RK39 SBC

6.2 Menu

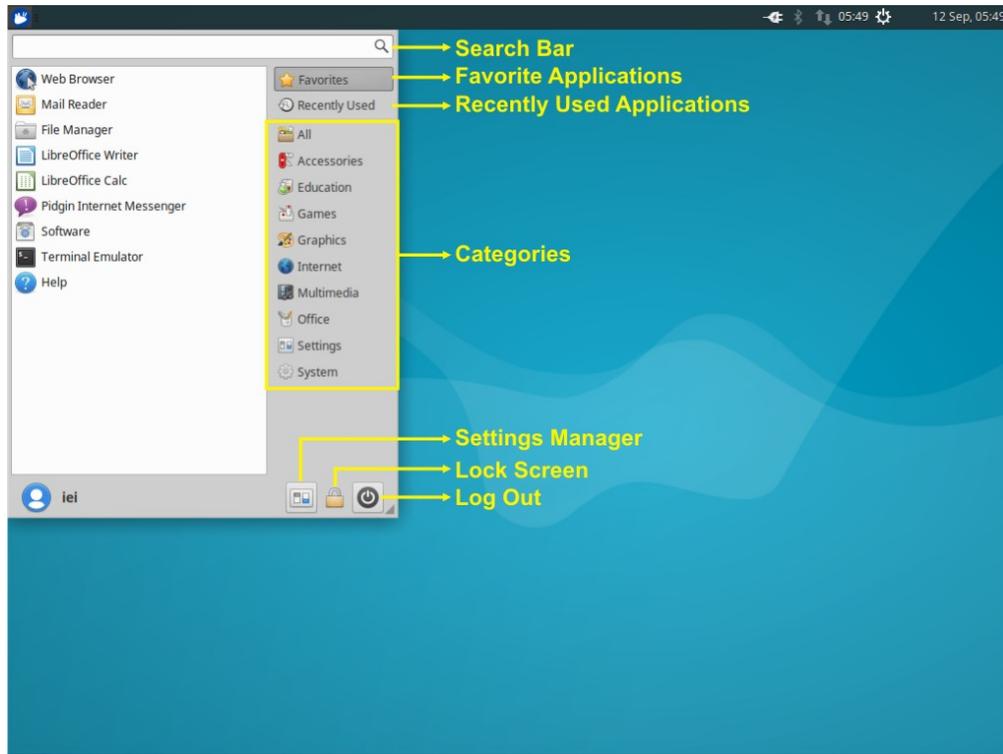


Figure 4-2: Ubuntu Menu

The Menu is an application launcher. After clicking on the Menu Button , a list of favorite applications is displayed. The user can browse through all of installed applications by clicking on the category buttons on the side. Additionally, the Menu keeps a list of the last ten applications that the user has launched from it.

Along the bottom of the Menu window are icons for Settings Manager, Lock Screen and Log Out.

6.3 Network Connection

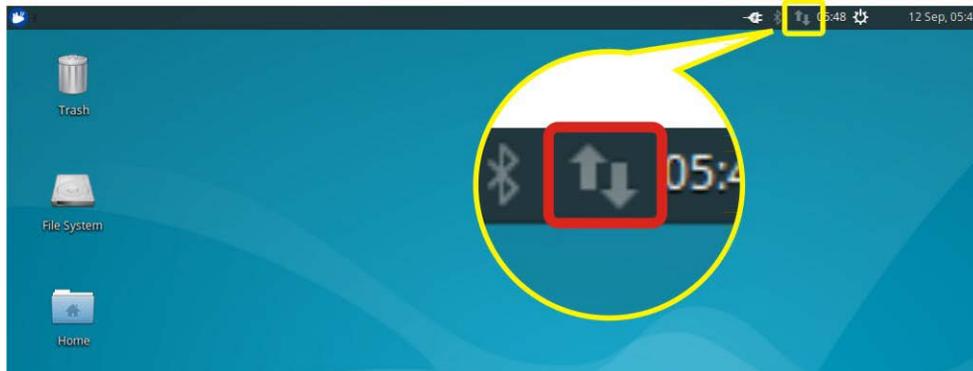


Figure 4-3: Ubuntu NetworkManager

Ubuntu uses *NetworkManager* to manage wired and wireless connections. *NetworkManager* will automatically use a wired network, if one is available.

To see all available connections, click the *NetworkManager* icon. To connect to a network, click the network name. To disconnect from a network, click the *NetworkManager* icon, and select **Disconnect**. To disable (and re-enable) wired and/or wireless connections all together, click the *NetworkManager* icon, then select **Enable Networking** and **Enable Wi-Fi**.

To configure the connections, click the *NetworkManager* icon and select **Edit**. In the dialog, select the appropriate network and press **Edit** or press **Add** to set up new networks.

HYPER-RK39 SBC

6.4 Managing Applications

**NOTE:**

1. To be able to install new software from the repositories, the system must be connected to the Internet.
2. Administrative access is required to add and remove software.

The Ubuntu software repositories contain software for users to download. To access the repositories, launch **Software** from the Menu .

Installing new software

- Search for an application or select a category to find an application to install
- From the application page, click **Install**
- The user will be asked to enter the system password; once entered, installation will begin
- A shortcut to the application will be added to the Applications menu



Figure 4-4: Ubuntu Software

Removing software

- Click **Installed** on the top panel
- Find the application that you want to remove by using the search box or looking through the installed applications
- Select the application and click **Remove**
- The user may be asked to enter the system password; once entered, the application will be removed

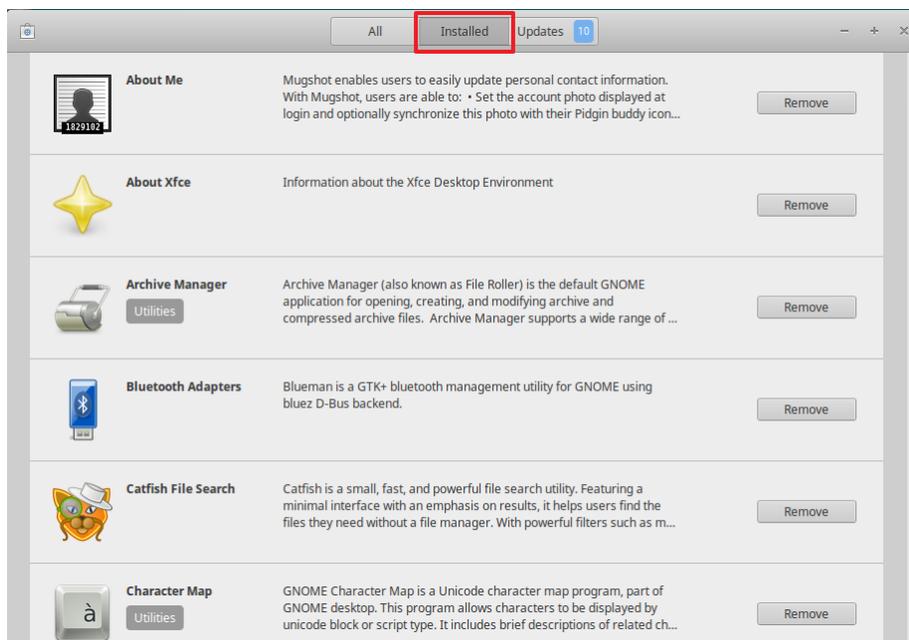


Figure 4-5: Removing Software

Appendix

A

Regulatory Compliance

DECLARATION OF CONFORMITY

This equipment has been tested and found to comply with specifications for CE marking. If the user modifies and/or installs other devices in the equipment, the CE conformity declaration may no longer apply.

FCC WARNING

This equipment complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- This device may not cause harmful interference, and
- This device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Appendix

B

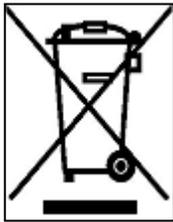
Product Disposal

**CAUTION:**

Risk of explosion if battery is replaced by an incorrect type. Only certified engineers should replace the on-board battery.

Dispose of used batteries according to instructions and local regulations.

- Outside the European Union–If you wish to dispose of used electrical and electronic products outside the European Union, please contact your local authority so as to comply with the correct disposal method.
- Within the European Union–The device that produces less waste and is easier to recycle is classified as electronic device in terms of the European Directive 2012/19/EU (WEEE), and must not be disposed of as domestic garbage.



EU-wide legislation, as implemented in each Member State, requires that waste electrical and electronic products carrying the mark (left) must be disposed of separately from normal household waste. This includes monitors and electrical accessories, such as signal cables or power cords. When you need to dispose of your device, please follow the guidance of your local authority, or ask the shop where you purchased the product. The mark on electrical and electronic products only applies to the current European Union Member States.

Please follow the national guidelines for electrical and electronic product disposal.

Appendix

C

Hazardous Materials Disclosure

The details provided in this appendix are to ensure that the product is compliant with the Peoples Republic of China (China) RoHS standards. The table below acknowledges the presences of small quantities of certain materials in the product, and is applicable to China RoHS only.

A label will be placed on each product to indicate the estimated “Environmentally Friendly Use Period” (EFUP). This is an estimate of the number of years that these substances would “not leak out or undergo abrupt change.” This product may contain replaceable sub-assemblies/components which have a shorter EFUP such as batteries and lamps. These components will be separately marked.

Please refer to the following table.

Part Name	Toxic or Hazardous Substances and Elements					
	Lead (Pb)	Mercury (Hg)	Cadmium (Cd)	Hexavalent Chromium (CR(VI))	Polybrominated Biphenyls (PBB)	Polybrominated Diphenyl Ethers (PBDE)
Housing	O	O	O	O	O	O
Display	O	O	O	O	O	O
Printed Circuit Board	O	O	O	O	O	O
Metal Fasteners	O	O	O	O	O	O
Cable Assembly	O	O	O	O	O	O
Fan Assembly	O	O	O	O	O	O
Power Supply Assemblies	O	O	O	O	O	O
Battery	O	O	O	O	O	O

O: This toxic or hazardous substance is contained in all of the homogeneous materials for the part is below the limit requirement in SJ/T11363-2006 (now replaced by GB/T 26572-2011).

X: This toxic or hazardous substance is contained in at least one of the homogeneous materials for this part is above the limit requirement in SJ/T11363-2006 (now replaced by GB/T 26572-2011).

HYPER-RK39 SBC

此附件旨在确保本产品符合中国 RoHS 标准。以下表格标示此产品中某有毒物质的含量符合中国 RoHS 标准规定的限量要求。

本产品上会附有“环境友好使用期限”的标签，此期限是估算这些物质“不会有泄漏或突变”的年限。本产品可能包含有较短的环境友好使用期限的可替换元件，像是电池或灯管，这些元件将会单独标示出来。

部件名称	有毒有害物质或元素					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (CR(VI))	多溴联苯 (PBB)	多溴二苯 醚 (PBDE)
壳体	○	○	○	○	○	○
显示	○	○	○	○	○	○
印刷电路板	○	○	○	○	○	○
金属螺帽	○	○	○	○	○	○
电缆组装	○	○	○	○	○	○
风扇组装	○	○	○	○	○	○
电力供应组装	○	○	○	○	○	○
电池	○	○	○	○	○	○

○: 表示该有毒有害物质在该部件所有物质材料中的含量均在 SJ/T 11363-2006 (现由 GB/T 26572-2011 取代) 标准规定的限量要求以下。

X: 表示该有毒有害物质至少在该部件的某一均质材料中的含量超出 SJ/T 11363-2006 (现由 GB/T 26572-2011 取代) 标准规定的限量要求。