3.5" SBC with Rockchip RK3568 Processor, 2GB/4GB LPDDR4, 32GB eMMC, HDMI 2.0, MIPI DSI & CSI, eDP, M.2 B-key, Dual 1GbE RJ45, USB 3.0, USB 2.0, RS-232/485, 12V DC-IN, SIM Slot, microSD Slot, Support Android/Linux, RoHS

WAFER-RK3568

Quick Installation Guide

Version 1.0

January 4, 2023

Package List

WAFER-RK3568 package includes the following items:

- 1 x WAFER-RK3568 single board computer
- 1 x QIG

Specifications

- CPU:

  Rockchip RK3568 (quad-code Cortex-A55 up to 2.0GHz)
- Memory:

  2GB/4GB LPDDR4/4x, up to 8GB (option: 2GB SKU only supports Linux)
- SD Card:

  1 x microSD slot
- Flash Memory:

  32GB eMMC NAND flash
- WLAN

  802.11a/b/g/n/ac/ax via board-to-board connector
- Bluetooth

  Bluetooth v5.0 via board-to-board connector
- Display Output:

  1 x HDMI 2.0 Type A, up to 4K

  1 x eDP 1.3 (30-pin, p=0.5)

  1 x MIPI DSI (4 lanes, 40-pin, p=0.5)
- Ethernet:

  2 x 1GbE RJ45 by YT8521
- I/O Interface:

  2 x USB 3.0 Type A (one OTG, one host)

  3 x USB 2.0 host (one by 1x4 pin with frame, p=1.25; two by 2x4 pin header, p=2.0)

  1 x RS232+RS485 COM port (DB-9)
- Console Port:

  1 x Console port
- I^2C Touch:

  1 x I^2C touch (8-pin, p=0.5)
- Audio:

  1 x Audio connector (line-out & mic-in, 2x3 pin, p=2.54)

  1 x Speaker connector (2-pin, p=1.25)

  1 x Microphone connector (2-pin, p=1.25)

- Camera:
  1 x MIPI CSI (4 lanes, 30-pin, p=0.5)
- GPIO:
  1 x 14-bit GPIO (7 in / 7 out, 2x8 pin, p=2.0)
- Expansions:
  1 x M.2 B key (Support 4G (3042) + 5G (3052) module)
  1 x NANO SIM card slot
- Buttons:
  1 x Reset button
  1 x Power button
- LED Indicators:
  1 x Power LED
  1 x Reserved LED (programmable)
- Power Supply:
  +12V DC input power
- Power Consumption:
  12V@1.608A (Rockchip RK3568 processor with 4GB 1866MHz LPDDR4x memory and 32GB eMMC)
- Watchdog Timer: Yes
- Operation Temperature: 0°C – 60°C with air flow
- Storage Temperature: -20°C – 70°C
- Operation Humidity: 10% – 95%, non-condensing
- Dimensions: 146 mm x 102 mm
- Safety/EMC: EMC Class A
- Supported OS: Android 11.0, Linux Debian 10 (kernel 4.19)

All the drivers and utility for the WAFER-RK3568 are available on IEI Resource Download Center. Type WAFER-RK3568 and press Enter to find all the relevant software, utilities, and documentation. To install software from the downloaded ISO file, mount the file as a virtual drive to view its content.

IEI Resource Download Center

https://download.ieiworld.com

Jumpers Setting and Connectors

LABEL	FUNCTION
LCD_PWR1	LCD (MIPI) power select jumper
IMAGE_SW	Maskrom recovery button
J_OTG_HOST	OTG/Host mode setting switch
PWRON	Power button
RESET_SW	Reset button
DEBUG_CN	Console port connector
AUDIO	Audio connector
BAT1	Battery connector
EDP	eDP connector
GPIO	GPIO connector
M2_B1	M.2 B key slot
MIC	Microphone connector
CAMERA	MIPI CSI connector
LCD1	MIPI DSI connector
SIM1	SIM card slot
SPK	Speaker connector
TP	Touch connector
USB2_1, USB2_2	USB 2.0 connectors
CN1	Wi-Fi/Bluetooth connector
PWR1	Power input connector (internal)
DC_IN	Power input jack
COM2/1	External serial port connector
LAN0, LAN1	External 1GbE RJ-45 connectors
USB3	External USB 3.0 connectors
SD1	microSD slot
HDMI	External HDMI connector

LCD_PWR1: LCD (MIPI) Power Select Jumper	
PIN NO.	**DESCRIPTION**
Short 1 - 2	1.8 V (default)
Short 2 - 3	GND

J_OTG_HOST: OTG/Host Mode Setting Switch	
PIN NO.	**DESCRIPTION**
Short A - B	Host Mode
Short B - C	OTG Mode (default)

IMAGE_SW: Maskrom Recovery Button			
PIN NO.	**DESCRIPTION**	**PIN NO.**	**DESCRIPTION**
1	eMMC_D0/FLASH_D0	2	GND

DEBUG_CN: Console Port Connector			
PIN NO.	**DESCRIPTION**	**PIN NO.**	**DESCRIPTION**
1	GND	3	UART2DBG_TX_C
2	UART2DBG_RX_C	4	GND

AUDIO: Audio Connector			
PIN NO.	**DESCRIPTION**	**PIN NO.**	**DESCRIPTION**
1	MIC1_INN	2	HPL_OUT
3	GND	4	HP_DET
5	HP_SNS	6	HPR_OUT

BAT1: RTC Battery Connector			
PIN	**DESCRIPTION**	**PIN**	**DESCRIPTION**
1	VBATT	2	GND

GPIO : GPIO Connector			
PIN NO.	**DESCRIPTION**	**PIN NO.**	**DESCRIPTION**
1	GND	2	VIO_3V3
3	GPIO_12	4	GPIO_16
5	GPIO_11	6	GPIO_15
7	GPIO_10	8	GPIO_14
9	GPIO_5	10	GPIO_13
11	GPIO_4	12	GPIO_8
13	GPIO_3	14	GPIO_7
15	GPIO_2	16	GPIO_6

LCD1: MIPI DSI Connector			
PIN NO.	**DESCRIPTION**	**PIN NO.**	**DESCRIPTION**
1	VLED+	21	TX_D3N
2	VLED+	22	GND
3	VGH	23	TX_D2P
4	NC	24	TX_D2N
5	NC	25	GND
6	VGL	26	TX_CLKP
7	NC	27	TX_CLKN
8	NC	28	GND
9	LED-	29	TX_D1P
10	LED-	30	TX_D1N
11	GND	31	GND
12	AVDD	32	TX_D0P
13	SELB	33	TX_D0N
14	DIMO	34	GND
15	NC	35	STBYB
16	GND	36	Reset
17	NC	37	NC
18	NC	38	VDD
19	GND	39	VDD
20	TX_D3P	40	VCOM

EDP: eDP Connector			
PIN NO.	**DESCRIPTION**	**PIN NO.**	**DESCRIPTION**
1	GND	16	GND
2	D0N	17	LCD_PWM_BL
3	D0P	18	LCD_TE
4	GND	19	VCC3V3_LCD
5	D1N	20	LCD_RST
6	D1P	21	LCD_ID
7	GND	22	LCD_PWREN
8	CLKN/AUXN	23	TP_I2C_SCL
9	CLKP/AUXP	24	TP_I2C_SDA
10	GND	25	TP_INT
11	D2N	26	TP_RST
12	D2P	27	GND
13	GND	28	5V0
14	D3N	29	5V0
15	D3P	30	5V0

CAMERA: MIPI CSI Connector			
PIN NO.	**DESCRIPTION**	**PIN NO.**	**DESCRIPTION**
1	GND	2	VCC2V8
3	VDD1V2	4	VDD1V8
5	NC	6	GND
7	AVDD2V8	8	GND
9	I2C_SDA	10	I2C_CLK
11	RST	12	PDN
13	GND	14	CLKOUT
15	GND	16	D3P
17	D3N	18	GND
19	D2P	20	D2N
21	GND	22	D1P
23	D1N	24	GND
25	CLKP	26	CLKN
27	GND	28	D0P
29	D0N	30	GND

MIC: Microphone Connector			
PIN	**DESCRIPTION**	**PIN**	**DESCRIPTION**
1	MIC1_INP	2	GND

SPK: Speaker Connector			
PIN NO.	**DESCRIPTION**	**PIN NO.**	**DESCRIPTION**
1	SPKP_OUT	2	SPKN_OUT

TP: Touch Connector			
PIN NO.	**DESCRIPTION**	**PIN NO.**	**DESCRIPTION**
1	GND	5	SCL
2	RST	6	VDD
3	INT	7	NC
4	SDA	8	GND

USB2_1: USB 2.0 Connector			
PIN NO.	**DESCRIPTION**	**PIN NO.**	**DESCRIPTION**
1	VCC	3	USB_DATA+
2	USB_DATA-	4	GND

USB2_2: USB 2.0 Connector			
PIN NO.	**DESCRIPTION**	**PIN NO.**	**DESCRIPTION**
1	VCC	2	GND
3	USB_DATA-	4	USB_DATA+
5	USB_DATA+	6	USB_DATA-
7	GND	8	VCC

SIM1: SIM Card Slot			
PIN NO.	**DESCRIPTION**	**PIN NO.**	**DESCRIPTION**
C1	SIM_VCC	C2	SIM_RST
C3	SIM_CLK	C5	GND
C6	SIM_VPP	C7	SIM_CIO
G1	GND	G2	GND
G3	GND	G4	GND

CN1: Wi-Fi/Bluetooth Connector			
PIN NO.	**DESCRIPTION**	**PIN NO.**	**DESCRIPTION**
1	GND	2	GND
3	UART_RTSn	4	SDMMC_D0
5	UART_TX	6	SDMMC_D1
7	UART_RX	8	SDMMC_D2
9	UART_CTSn	10	SDMMC_D3
11	GND	12	SDMMC_CMD
13	I2S_LRCK	14	WIFI2T2R_CLK
15	I2S_SDO	16	GND
17	I2S_SDI	18	WIFI_REG_ON
19	I2S_SCLK	20	WIFI_WAKE_HOST
21	GND	22	BT_WAKE_HOST
23	32KOUT_WIFI	24	HOST_WAKE_BT
25	GND	26	BT_REG_ON_
27	GND	28	WLAN_PEN
29	NC	30	GND
31	VCC	32	SDIO_INT
33	VCC	34	SDIO_RESET
35	VCC	36	GND
37	VCC	38	GND
39	NC	40	GND

PWR1: Power Input Connector (Internal)			
PIN NO.	**DESCRIPTION**	**PIN NO.**	**DESCRIPTION**
1	GND		PWR-IN
2	GND		PWR-IN

DC_IN: Power Input Jack			
PIN NO.	**DESCRIPTION**	**PIN NO.**	**DESCRIPTION**
1	DCIN_12V	2	GND

M2_B1: M.2 B-key Slot			
PIN NO.	**DESCRIPTION**	**PIN NO.**	**DESCRIPTION**
1	CONFIG_3	2	+3.3V
3	GND	4	+3.3V
5	GND	6	NC
7	USB_D+	8	MBK_D
9	USB_D-	10	NC
11	GND	12	Module Key
13	Module Key	14	Module Key
15	Module Key	16	Module Key
17	Module Key	18	Module Key
19	Module Key	20	NC
21	CONFIG_0	22	NC
23	NC	24	NC
25	NC	26	NC
27	GND	28	NC
29	NC	30	SIM_RST
31	NC	32	SIM_CLK
33	GND	34	SIM_IO
35	NC	36	SIM_VCC
37	NC	38	NC
39	GND	40	NC
41	PCIE_RXN0	42	NC
43	PCIE_RXP0	44	NC

45	GND	46	NC
47	PCIE_TXN0	48	NC
49	PCIE_TXP0	50	PCIE_PERSTn
51	GND	52	PCIE_CLKREQn
53	REFCLKN	54	PCIE_WAKEn
55	REFCLKP	56	NC
57	GND	58	NC
59	NC	60	NC
61	NC	62	NC
63	NC	64	NC
65	NC	66	SIM_DET
67	RESET_N	68	NC
69	NC	70	+3.3V
71	GND	72	+3.3V
73	GND	74	+3.3V
75	GND		

COM2/1: External Serial Port Connector			
PIN NO.	**DESCRIPTION**	**PIN NO.**	**DESCRIPTION**
1	RS232_RXD1	6	RS485_DATA1-
2	RS232_TXD1	7	RS485_DATA1+
3	RS232_RXD2	8	RS485_DATA2-
4	RS232_TXD2	9	RS485_DATA2+
5	GND		

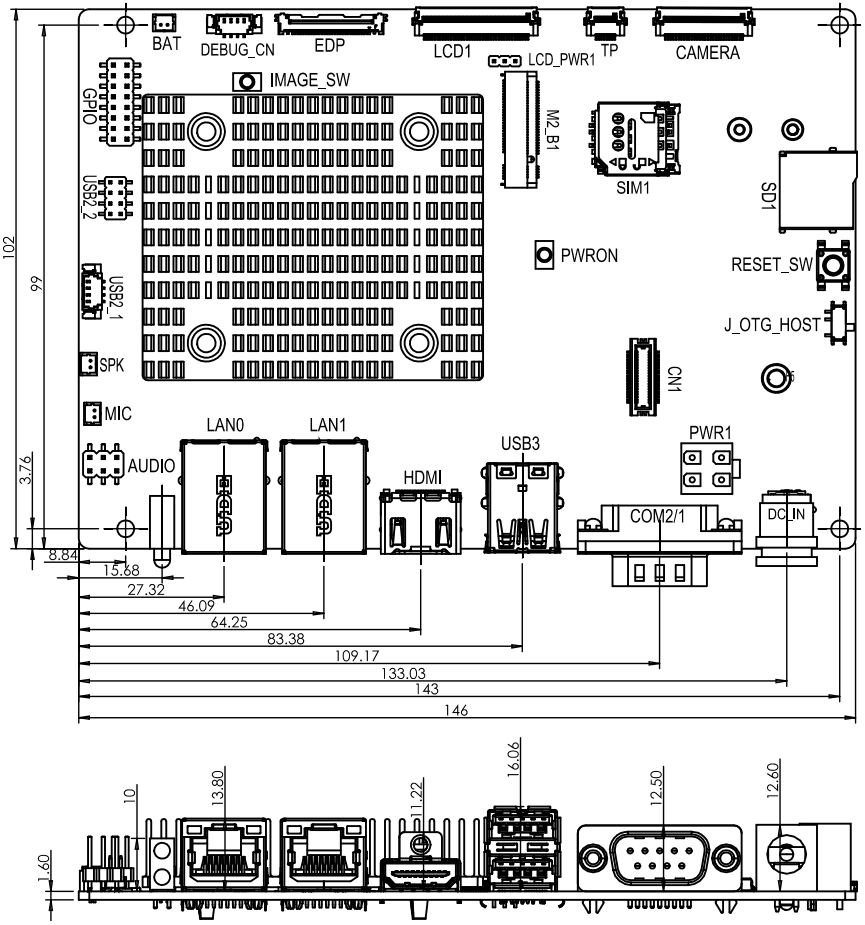
LAN0, LAN1: External 1GbE RJ-45 Connectors			
PIN NO.	**DESCRIPTION**	**PIN NO.**	**DESCRIPTION**
1	MDI0P	5	MDI2P
2	MDI0N	6	MDI2N
3	MDI1P	7	MDI3P
4	MDI1N	8	MDI3N

HDMI: External HDMI Connector			
PIN NO.	**DESCRIPTION**	**PIN NO.**	**DESCRIPTION**
1	HDMI2_DATA2	2	GND
3	HDMI2_DATA2#	4	HDMI2_DATA1
5	GND	6	HDMI2_DATA1#
7	HDMI2_DATA0	8	GND
9	HDMI2_DATA0#	10	HDMI2_CLK
11	GND	12	HDMI2_CLK#
13	N/C	14	N/C
15	HDMI2_SCL	16	HDM2I_SDA
17	GND	18	+5V
19	HDMI2_HPD		

USB3: External USB 3.0 Connectors			
PIN NO.	**DESCRIPTION**	**PIN NO.**	**DESCRIPTION**
1	VCC	10	VCC
2	USB_DATA-	11	USB_DATA-
3	USB_DATA+	12	USB_ DATA+
4	GND	13	GND
5	USB3_RX-	14	USB3_RX-
6	USB3_RX+	15	USB3_ RX+
7	GND	16	GND
8	USB3_TX-	17	USB3_TX-
9	USB3_TX+	18	USB3_TX+

SD1: microSD Slot			
PIN NO.	**DESCRIPTION**	**PIN NO.**	**DESCRIPTION**
1	DATA2	2	DATA3
3	CMD	4	VDD
5	CLK	6	GND
7	DATA0	8	DATA1
9	GND	10	DET

Board Layout: Jumper and Connector Locations



(Unit: mm)