

3.5" SBC with Rockchip RK3588 Processors, 8GB LPDDR4x Memory, 32GB eMMC NAND Flash, Single HDMI Input and Dual HDMI Output, 2.5GbE LAN, GbE LAN, USB 3.2 Gen 1, USB 2.0, 0°C ~60°C and RoHS

WAFER-RK3588

Quick Installation Guide

Version 1.0

April 19, 2023

Package List

WAFER-RK3588 package includes the following items:

- 1 x WAFER-RK3588 single board computer
- 1 x QIG



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Specifications

- Processor:
Rockchip RK3588 (quad-core Cortex®-A76 + quad-core Cortex®A55)
- GPU: Arm Mali-G610
- NPU: 6 TOPS, supports int4, int8, int16, FP16, BF16 and TF32
- RAM: On-board 8GB LPDDR4x
- Flash:
32 GB eMMC NAND Flash for OS and IEI's boot loader
- Audio:
Pin header to mic-in & line-out jacks
- Speaker:
2 x Speaker output (2-pin header)
- Display:
1 x MIPI DSI
1 x LVDS out
- HDMI:
1 x HDMI-input up to 4K@60FPS
1 x HDMI-output up to 8K@60Hz
1 x HDMI-output up to 4K@60Hz
- Camera:
1 x MIPI CSI
- Wi-Fi: Wi-Fi 5/6 (optional board-to-board IEI module)
- Bluetooth: Support Bluetooth v5.0
- I/O Interface:
1 x GbE LAN
1 x 2.5GbE LAN
1 x USB 3.2 Gen 1 Type-C with DP (OS update)
1 x USB 3.2 Gen 1 Type-A
2 x USB 2.0 Type-A
2 x UART (2x9 pin header)
1 x SATA 6Gb/s
1 x DC jack
- Expansion:
1 x PCIe 3.0 x2
1 x M.2 2230/2280 B/M key (PCIe 3.0 x2)
1 x M.2 2230 A/E key (PCIe 2.0 x1)
- Dimensions (LxW): 146 mm x 102 mm
- Power Input: 12 V DC

- Operating Temperature: 0°C – 60°C (with air flow)
- Storage Temperature: -20°C – 60°C
- Humidity: 5% – 95%, non-condensing
- EMC & Safety: EMC Class B
- Supported OS: Debian 11 (Linux kernel 5.10)

Ordering Information

- **WAFER-RK3588-R10:**
3.5" SBC with Rockchip RK3588 Processors, 8GB LPDDR4x Memory, 32GB eMMC NAND Flash, Single HDMI Input and Dual HDMI Output, 2.5GbE LAN, GbE LAN, USB 3.2 Gen 1, USB 2.0, 0°C ~60°C and RoHS
- **23T00-01010AW01-RS:**
10.1" color TFT-LCD with projected capacitive touch (800x1280, 340 cd/m2, LED, RoHS)
- **71001-COC794A5SFE-RS:**
Camera module (2592x1944, 1/4", 8.5x15.8x5.45mm, sensor type: OV5640, RoHS)
- **30400-000188-RS:**
Speakers with cables (Speakers: 28x28x13.6mm, 4 Ω , 3W; cable: 250mm; RoHS)
- **iWB-BCM43752-R10:**
Wi-Fi & Bluetooth module (AP6275S, 2T2R, 802.11 a/b/g/n/ac/ax Wi-Fi + BT 5.0, RoHS)
- **iWB-RTL8822-R10:**
Wi-Fi & Bluetooth module (2-stream 802.11ac, 2T2R, Bluetooth 5.0, RoHS)

All the drivers and utility for the WAFER-RK3588 are available on IEI Resource Download Center. Type WAFER-RK3588 and press Enter to find all the relevant software, utilities, and documentation.

IEI Resource Download Center

<https://download.ieiworld.com>



Jumpers Setting and Connectors

LABEL	FUNCTION
CN2	Audio line-out connector
MIC1	Audio mic-in connector
BAT_CN1	RTC battery connector
LVDS1	LVDS connector
M2_AE3	M.2 A/E key slot
M2_BM1	M.2 B/M key slot
MIPI_LCD1	MIPI DSI output connector
CAM1	MIPI CSI connector
U6	PCIe x4 slot (x2 signal)
SW2	Front panel connector
CN4	SATA 6Gb/s connector
SPL1, SPR1	Speaker connectors
CN1	Touch panel connector (LVDS)
J1	Touch panel connector (MIPI DSI)
COM1, COM2	UART connectors
USB3	USB 2.0 connector
CN5	Wi-Fi/Bluetooth module slot
DB1	Debug port (IEI internal use only)
SW1	Maintenance button (IEI internal use only)

CN2: Audio Line-out Connector

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	4	MIC-IN
2	HP-OUT_R	5	HP_DET
3	HP-OUT_L	6	GND

MIC1: Audio Mic-in Connector

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	MIC_P	2	MIC_N

LVDS1: LVDS Connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	LCD_3V3	23	ODD_3N
2	3V3	24	ODD_3P
3	3V3	25	GND
4	3V3	26	EVEN_0N
5	3V3	27	EVEN_0P
6	N/C	28	GND
7	N/C	29	EVEN_1N
8	N/C	30	EVEN_1P
9	N/C	31	GND
10	GND	32	EVEN_CLKN
11	ODD_0N	33	EVEN_CLKP
12	ODD_0P	34	GND
13	GND	35	EVEN_2N
14	ODD_1N	36	EVEN_2P
15	ODD_1P	37	GND
16	GND	38	EVEN_3N
17	ODD_CLKN	39	EVEN_3P
18	ODD_CLKP	40	GND
19	GND	41	N/C
20	ODD_2N	42	LED+
21	ODD_2P	43	LED+
22	GND	44	LED-
		45	LED-

MIPI_LCD1: MIPI DSI Output Connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	LED+	21	DN3
2	LED+	22	GND
3	N/C	23	DP2
4	N/C	24	DN2
5	N/C	25	GND
6	N/C	26	CLKP
7	N/C	27	CLKN
8	N/C	28	GND

9	LED-	29	DP1
10	LED-	30	DN1
11	GND	31	GND
12	N/C	32	DP0
13	N/C	33	DN0
14	N/C	34	GND
15	N/C	35	N/C
16	GND	36	RESET
17	N/C	37	N/C
18	N/C	38	3V3
19	GND	39	3V3
20	DP3+	40	N/C

CAM1: MIPI CSI Connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	LED-	16	MDP2
2	LED+	17	MDN2
3	N/C	18	RESET
4	DGND	19	MDP3
5	N/C	20	MDN3
6	DGND	21	NC
7	MDP1	22	SDA
8	MDN1	23	SCL
9	DGND	24	PWDN
10	MCP	25	MCLK
11	MCN	26	DVDD_1V5
12	DGND	27	DOVDD_1V8
13	MDP0	28	AGND
14	MDN0	29	AVDD_2V8
15	DGND	30	DGND

SW2: Front Panel Connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	3	GND
2	RESET	4	PWR_ON

CN4: SATA 6Gb/s Connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	11	5V0
2	GND	12	N/C
3	GND	13	N/C
4	GND	14	GND
5	GND	15	SATA_RXP
6	N/C	16	SATA_RXN
7	5V0	17	GND
8	5V0	18	SATA_TXN
9	5V0	19	SATA_TXP
10	5V0	20	GND

SPL1: Speaker Connector (L)			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	SPK_OUT_L_N	2	SPK_OUT_L_P

SPR1: Speaker Connector (R)			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	SPK_OUT_R_N	2	SPK_OUT_R_P

CN1: Touch Panel Connector (LVDS)			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	3V3	4	RESET
2	SCL	5	INT
3	SDA	6	GND

J1: Touch Panel Connector (MIPI DSI)			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	5	I2C_SDA
2	N/C	6	TP_INT_L
3	+3.3V	7	TP_RST_L
4	I2C_SCL	8	GND

COM1, COM2: UART Connectors			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	N/C	2	N/C
3	RXD	4	RTS
5	TXD	6	CTS
7	N/C	8	N/C
9	GND	10	N/C

USB3: USB 2.0 Connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	USB 5V	2	GND
3	USB_D-	4	USB_D+
5	USB_D+	6	USB_D-
7	GND	8	USB 5V

Board Layout: Jumper and Connector Locations (Unit: mm)

