neardi

LBD3399 行业板
产品手册
V1.2

表和插图等，仅用于解释和说明目的，与具体产品可能存在差异，请以实物为准。我们会尽力确保与实物相符。

因产品版本升级或其他需要，本公司可能会对手册进行更新，如您需要最新版手册，请与我司联系。

上海临滴科技有限公司始终以客户至上的服务宗旨，为客户提供快速高效的支持服务工作。如有任何需要，请随时联系我司，联系方式如下：

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版本历史

版 本	日 期	说 明
V1.0	2019/8/20	初始版本
V1.1	2021/02/19	更新《2.2 产品尺寸》
V1.2	2021/04/28	更新《4.2.5 UART_2（J12）》

目　录

1 产品概述

1.1 产品描述

    LBD3399 是基于瑞芯微 RK3399 芯片平台精心设计的一款多功能行业应用板，其由我司的 LCB3399 核心模块与底板组成。核心模块与底板采用 B2B 连接器的方式连接，并通过 4 颗 M2 的螺丝固定，稳定可靠。整板功能多样，接口丰富，尺寸小巧，轻薄平整，适用于结构空间受限的产品。

    LBD3399 板载 4 路 USB3.0 和 2 路 USB2.0 接口，可以外接多个 USB 摄像头；板载 2 路 AHD 摄像头输入接口，可以同时外接 2 路 AHD 摄像头；板载 mini-PCIe 接口，除了可以外接 4G 模块外还可以外接我司基于 RK1808 开发的 mini-PCIe 接口 NPU 计算卡，与多路摄像头组合成支持 3.0TOPS 算力的人工智能视觉计算板卡；另外，LBD3399 还支持双频 WIFI、BT5.0、1000M 以太网、UART、RS232、RS485 等常用通讯模块接口，支持 HDMI、eDP、MIPI、双通道 LVDS 等多种显示接口并支持多屏异显。

    LBD3399 支持 Android、Linux 和 Ubuntu 系统，具备高性能、高可靠性、高扩展性等优势，为用户开放系统源码。用户可基于此款产品二次开发和定制，我司为开发者和企业用户提供全方位的技术支持，使其高效的完成研究开发工作，大量缩短产品研发量产周期。
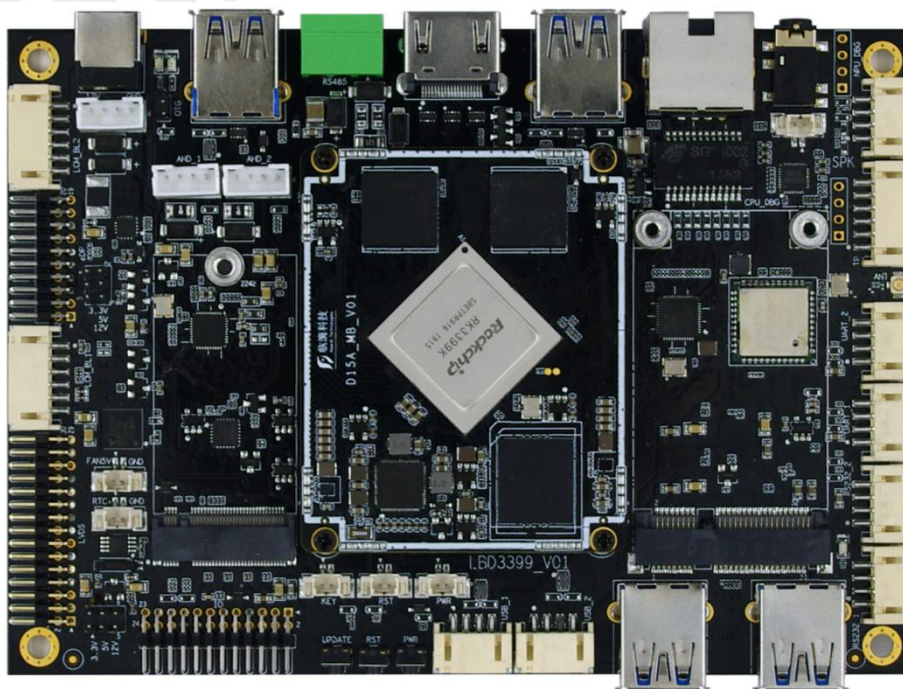
图 1-1

1.2 功能概要

- 供电方式：DC 12V/3A，支持过压，欠压，过流保护；

- 多路 USB 接口：对外提供 4 路 USB3.0 和 2 路 USB2.0 接口，板内一路 USB3.0 到 mini-PCIe 接口；

- 板载 AHD 输入接口，可外接 2 路 AHD 摄像头，最高支持 1920*1080 分辨率；

- 板载 mipi PCIe 接口，可以接 4G 模块和我司 RK1808 AI 计算卡；

- 多种显示屏接口：HDMI，双通道 LVDS，eDP，MIPI，可支持多屏异显；

- 板载千兆以太网、双频 WIFI 和 BT5.0，支持 802.11 a/b/g/n/ac 协议；

- 板载 M.2 M-KEY 接口，支持外接 NVMe 协议 SSD；

- 支持 2 路 RS-232 接口和 1 路 RS-485 接口；

- 支持 Android，Linux，Ubuntu 多种 OS；

- 超薄型设计，总高度只有 14mm，特别适用于结构高度受限的产品

1.3 产品框图

图 1-2

2 外观和尺寸

2.1 产品外观

图 2-1

2.2 产品尺寸
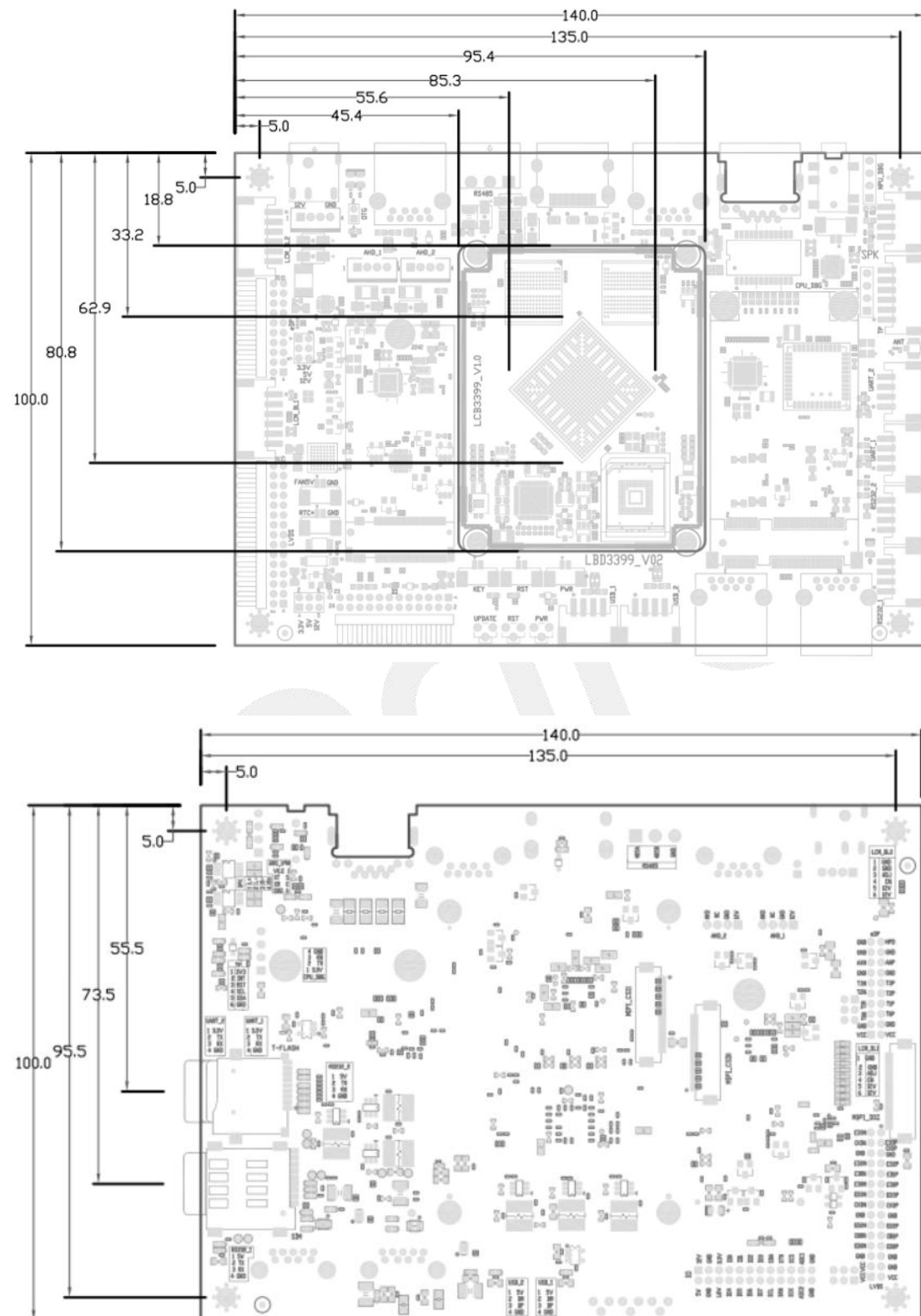
图 2-2

3 产品参数

<div align="right">表 3-1</div>

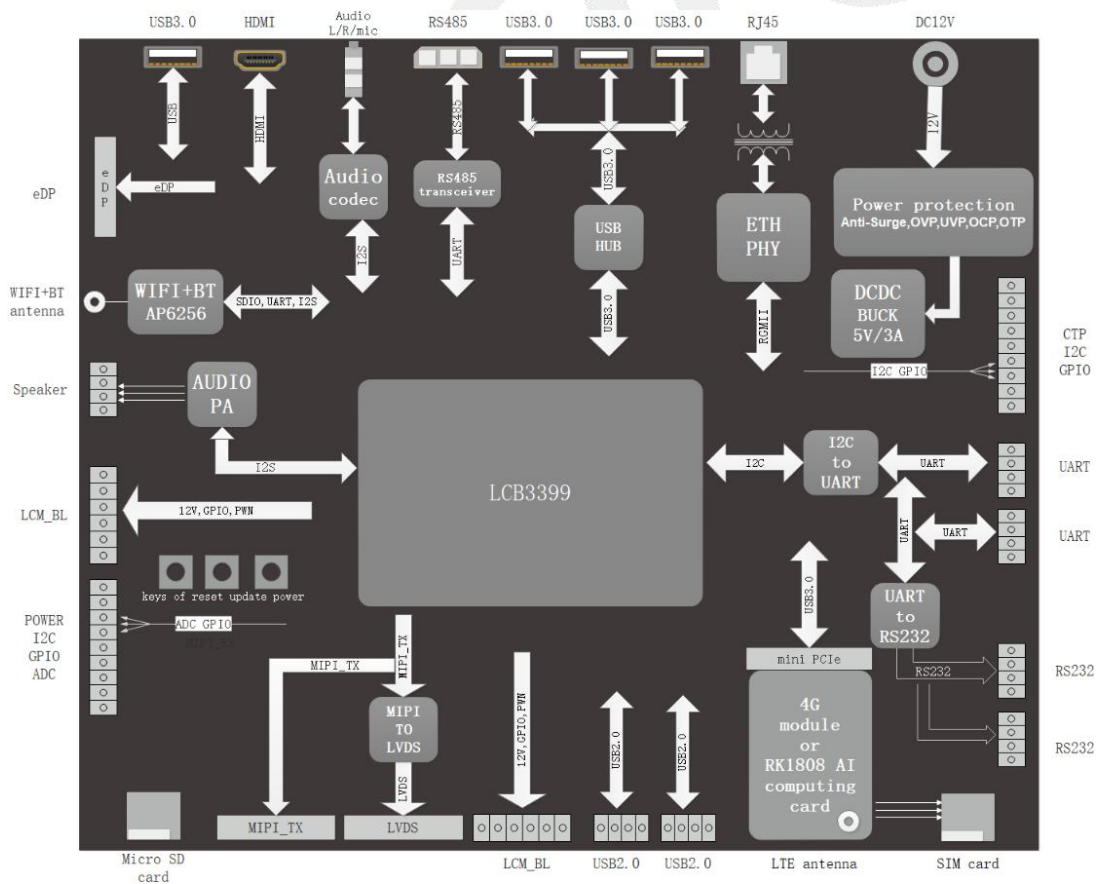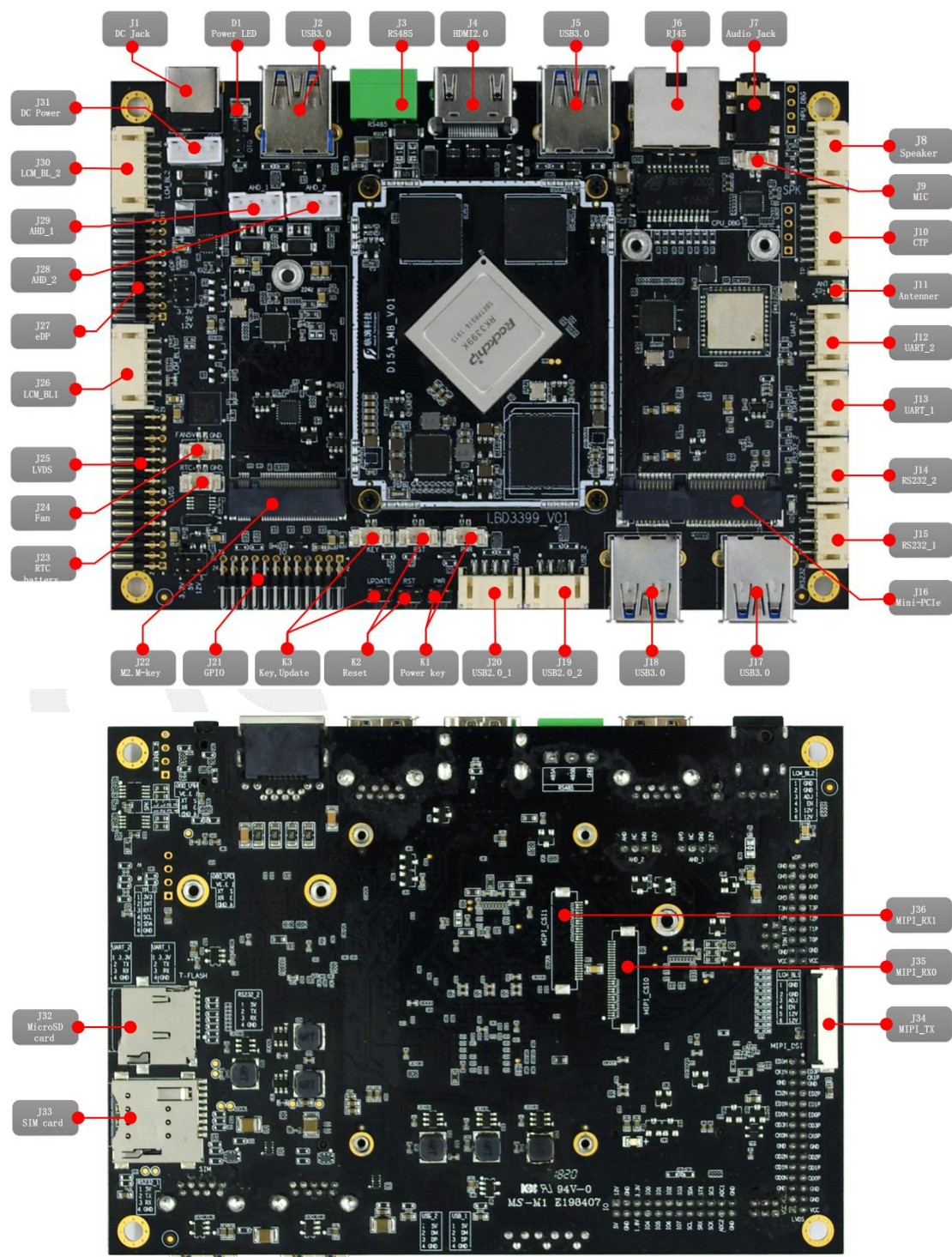| Function	Description
CPU	RK3399, 28 nm HKMG, Big cluster with dual-coreCortex-A72 + little cluster with quad-core Cortex-A53
GPU	Mali- T860 MP4，OpenGL ES1.1/2.0/3.0/3.1/3.2, OpenCL1.2, DirectX11.1
NPU(Optional)	1920 Int8 MAC operations per cycle; 64 FP16 MAC operations per cycle; 192 Int16 MAC operations per cycle
VPU	4K VP9 and 4K H265 up to 60fps video decoding 1080P@60fps multi-format video decoding (MVC, mpeg-1/2/4, VC-1) 1080P video encoding, with h.264, MVC and VP8 format supported Video anti-cross, de-noising, edge/detail/color optimization supported
DDR	LPDDR3，2GB/4GB(Optional)
eMMC	eMMC 5.1， 8GB/16GB/32GB/64GB/128GB(Optional)
PMU	RK808
Net work	10/100/1000Mbps Ethernet (Realtek RTL8211E) Wi-Fi 2.4GHz/5GHz,802.11a/b/g/n/ac, up to 433 Mbps (AP6256) BT V5.0 with BLE supported 2G/3G/4G LTE module supported (optional)
Storage	MicroSD (TF) Card Compatible with SDIO3.0
OS	Android / Ubuntu / Buildroot
PCB size	L* W (mm)：140 * 100（PCB 1.6mm）
Screw size	φ3.6mm
Hardware Interface	
Power	DC12V - 2A (DC Jack 5.5*2.1mm / PH2.0 wafer connector)
USB	4*Type-A USB3.0 HOST + 2*4Pin PH2.0 USB2.0 HOST connector
Display	Type-A HDMI 2.0 up to 4K@60HZ MIPI-DSI up to 1080P@60HZ eDP1.1 20Pin PH2.0 up to 4Kx2K @ 30fps 2x Duel channel LVDS up to 1080P@60HZ
Audio	φ3.5mm earphone Jack with L/R audio out and Mic in 1x analog microphone 1x HDMI audio out 2x 3W/4Ω speaker out with L/R channel

Camera	2x MIPI-CSI interface with ISP built-in
	2x AHD cameras with any resolution of Analog HD and SD Video, up to 1080p25/30
PCIe	mini PCIe for 2G/3G/4G LTE module
	RK1808 AI computing card
M.2	M.2 NGFF（M-KEY）PCIE V2.1 x4 with NVMe SSD supported
SD card	Compatible with SDIO 3.0 protocol, system boot up supported
SIM card	Micro sim slot for Mini-PCIe 4G LTE module
RJ-45	10/100/1000-Mbps data transfer rates
RTC	2Pin GH1.25 connector, RTC power on and off supported
Serial port	2x Uart, 2x RS232, 1x RS485
Keys	3x keys (power, reset, update)
Power output	12V, 5V, 3.3V
Others	2x ADC, 2x I2C(CTP supported), 1x SPI, 8x GPIO

4 接口定义

4.1 接口编号

表 4-1

Part reference	Part Name	Part Specifications	Part Description
J1	DC Jack	DC 5.5*2.1mm	Main power supply, DC12V – 3A
J2	USB3.0	Type-A USB3.0 host	USB3.0 host
J3	RS485	RS485 Serial communication bus	Data Rate up to 250 kbps and up to 256 Nodes
J4	HDMI	Type-A HDMI2.0	HDMI 2.0 up to 4K@60HZ
J5	USB3.0	Type-A USB3.0 host	USB3.0 host
J6	RJ45	Gigabit Ethernet	10/100/1000-Mbps data transfer rates
J7	Audio Jack	φ3.5mm 4-L Jack	L/R audio out and Mic in
J8	Speaker	PH2.0mm 4pin wafer	3W/4Ω or 1.5W/8Ω speaker for L&R channel
J9	Mic	GH1.25mm 2pin wafer	Analog microphone input
J10	CTP	PH2.0mm 6pin wafer	I2C bus and GPIO input type for CTP module
J11	Antenna	Ipex RF connector	WIFI+BT 2.4GHZ&5GHZ antenna
J12	UART_2	PH2.0mm 4pin wafer	The second channel of UART bus
J13	UART_1	PH2.0mm 4pin wafer	The first channel of UART bus
J14	RS232_2	PH2.0mm 4pin wafer	The second channel of RS232 bus
J15	RS232_1	PH2.0mm 4pin wafer	The first channel of RS232 bus
J16	Mini-PCIe	Mini-PCIe 52pin socket	For 2G/3G/4G LTE module used
J17	USB3.0	Type-A USB3.0 host	USB3.0 host
J18	USB3.0	Type-A USB3.0 host	USB3.0 host
J19	USB2.0_2	PH2.0mm 4pin wafer	The second USB2.0 host for external devices
J20	USB2.0_1	PH2.0mm 4pin wafer	The first USB2.0 host for external devices
J21	GPIO	PH2.0mm 2x12pin header	Power output, I2C, SPI, ADC and GPIOs
J22	M.2 M-key	Standard M.2 M-key connector	M.2 NGFF (M-KEY) with PCIE V2.1 x4
J23	RTC battery	GH1.25mm 2pin wafer	RTC battery power input
J24	Fan	GH1.25mm 2pin wafer	For external Cooling fan use
J25	LVDS	PH2.0mm 2x15pin header	The first dual channel 24bit LVDS output
J26	LCM_BL_1	PH2.0mm 6pin wafer	The first LCM backlight control
J27	eDP	PH2.0mm 2x10pin header	eDP1.1 up to 4Kx2K @ 30fps
J28	AHD_2	PH2.0mm 4pin wafer	The second channel AHD camera input
J29	AHD_1	PH2.0mm 4pin wafer	The first channel AHD camera input
J30	LCM_BL_2	PH2.0mm 6pin wafer	The second LCM backlight control
J31	DC power	PH2.0mm 4pin wafer	DC12V-3A power in or out
J32	Micro SD card	Micro SD (TF) Card Slot	SDIO 3.0 protocol, system boot up supported
J33	Sim card	Micro Sim card slot	Micro push-to-push sim card

J34	MIPI_TX	30pin 0.5mm pitch FPC connector	MIPI-DSI 4lane for external displays
J35	MIPI_RX0	30pin 0.5mm pitch FPC connector	MIPI-CSI 4lane for external cameras
J36	MIPI_TX1/RX1	30pin 0.5mm pitch FPC connector	MIPI-DSI/CSI 4lane for external displays/cameras
D1	Power LED	Red and green leds	Power status indicate Green: Power good Red: power anomalous (OC,OT,OV,UVLO)
K1	Power key	push-button / GH1.25mm 2pin wafer	Power on/off and suspend/resume signal input
K2	Reset	push-button / GH1.25mm 2pin wafer	System reset control
K3	Update	push-button / GH1.25mm 2pin wafer	Key for system recovery or other function

Notes:

LVDS(J25) and MIPI_TX(J34) cannot be exist simultaneously

4.2 pin 脚定义

4.2.1 RS485（J3）

表 4-2-1

Pin number	Pin name	Voltage level	Notice
1	RS485-A	RS485	-
2	RS485-B	RS485	-
3	GND	GND	-

4.2.2 Speaker（J8）

表 4-2-2

Pin number	Pin name	Voltage level	Notice
1	SPK_L+	-	Speaker left channel positive
2	SPK_L-	-	Speaker left channel negative
3	SPK_R-	-	Speaker right channel negative
4	SPK_R+	-	Speaker right channel positive

4.2.3 Mic（J9）

表 4-2-3

Pin number	Pin name	Voltage level	Notice
1	Mic+	-	-
2	Mic-	-	-

4.2.4 CTP（J10）

表 4-2-4

Pin number	Pin name	Voltage level	Notice
1	VCC3V0_TP	3.0V	-
2	TOUCH_INT	3.3V	GPIO3_B2_U
3	TOUCH_RST	3.3V	GPIO3_C0_U
4	TOUCH_SCL	3.3V	GPIO1_B4_U/I2C4_SCL
5	TOUCH_SDA	3.3V	GPIO7_B3_U/I2C4_SDA
6	GND	GND	GND

4.2.5 UART_2（J12）

表 4-2-5

Pin number	Pin name	Voltage level	Notice
1	VCC3V3_UART	3.3V	-
2	UART_TX	1.8V	-
3	UART_RX	1.8V	-
4	GND	GND	GND

4.2.6 UART_1（J13）

表 4-2-6

Pin number	Pin name	Voltage level	Notice
1	VCC3V3_UART	3.3V	-
2	UART_TX	3.3V	-
3	UART_RX	3.3V	-
4	GND	GND	GND

4.2.7 RS232_2（J14）

表 4-2-7

Pin number	Pin name	Voltage level	Notice
1	VCC5V_RS232	5.0V	-
2	RS232_TX	RS232	-
3	RS232_RX	RS232	-
4	GND	GND	GND

4.2.8 RS232_1（J15）

表 4-2-8

Pin number	Pin name	Voltage level	Notice
1	VCC5V_RS232	5.0V	-
2	RS232_TX	RS232	-
3	RS232_RX	RS232	-
4	GND	GND	GND

4.2.9 USB2.0_2（J19）

表 4-2-9

Pin number	Pin name	Voltage level	Notice
1	VCC5V0_USB	5V	-
2	USB_DM	-	-
3	USB_DP	-	-
4	GND	GND	-

4.2.10 USB2.0_1（J20）

表 4-2-10

Pin number	Pin name	Voltage level	Notice
1	VCC5V0_USB	5V	-
2	USB_DM	-	-
3	USB_DP	-	-
4	GND	GND	-

4.2.11 GPIO（J21）

表 4-2-11

Pin number	Pin name	Voltage level	Notice
1	VCC12V	12V	-
2	VCC5V	5V	-
3	GND	GND	-
4	GND	GND	-
5	VCC3V3	3.3V	-
6	VCC1V8	1.8V	-
7	GPIO0	1.8V~3.3V	-
8	GPIO1	1.8V~3.3V	-
9	GPIO2	1.8V~3.3V	-
10	GPIO3	1.8V~3.3V	-
11	GPIO3	1.8V~3.3V	-
12	GPIO5	1.8V~3.3V	-
13	GPIO6	1.8V~3.3V	-

14	GPIO7	1.8V~3.3V	-
15	I2C_SDA	1.8V	GPIO4_A1_U
16	I2C_SCL	1.8V	GPIO4_A2_U
17	SPI_TX	3.3V	GPIO2_B2_U
18	SPI_RX	1.8V	GPIO2_B1_U
19	SPI_CS	1.8V	GPIO2_B4_U -
20	SPI_CLK	1.8V	GPIO2_B3_U -
21	ADC3	0V~1.8V	ADC_IN3
22	ADC2	0V~1.8V	ADC_IN2
23	GND	GND	-
24	GND	GND	-

4.2.12 RTC battery（J23）

表 4-2-12

Pin number	Pin name	Voltage level	Notice
1	VCC3V0_RTC	2.5V~3.3V	RTC battery positive
2	GND	GND	-

4.2.13 Fan（J24）

表 4-2-13

Pin number	Pin name	Voltage level	Notice
1	VCC5V0_Fan	5.0V	-
2	GND	GND	-

4.2.14 LVDS（J25）

表 4-2-14

Pin number	Pin name	Voltage level	Notice
1	VCC_LVDS	3.3V/5V/12V	-
2	VCC_LVDS	optional by	-
3	VCC_LVDS	jumper	-
4	GND	GND	-
5	GND	GND	-
6	GND	GND	-
7	LVDS_OD0N	-	-
8	LVDS_OD0P	-	-
9	LVDS_OD1N	-	-
10	LVDS_OD1P	-	-
11	LVDS_OD2N	-	-
12	LVDS_OD2P	-	-

13	GND	GND	-
14	GND	GND	-
15	LVDS_ODCKN	-	-
16	LVDS_ODCKP	-	-
17	LVDS_OD3N	-	-
18	LVDS_OD3P	-	-
19	LVDS_ED0N	-	-
20	LVDS_ED0P	-	-
21	LVDS_ED1N	-	-
22	LVDS_ED01P	-	-
23	LVDS_ED2N	-	-
24	LVDS_ED2P	-	-
25	GND	GND	-
26	GND	GND	-
27	LVDS_ED3N	-	-
28	LVDS_ED3P	-	-
29	LVDS_EDCKN	-	-
30	LVDS_EDCKP	-	-

4.2.15 LCM_BL_1（J26）

表 4-2-15

Pin number	Pin name	Voltage level	Notice
1	GND	GND	-
2	GND	GND	-
3	BL_ADJ	3.3V	GPIO4_C2_D/PWM0
4	BL_EN	3.3V	GPIO4_C6_D/PWM1
5	VCC12V_BL	12V	-
6	VCC12V_BL	12V	-

4.2.16 eDP（J27）

表 4-2-16

Pin number	Pin name	Voltage level	Notice
1	VCC_EDP	3.3V/5V/12V	-
2	VCC_EDP	optional by jumper	-
3	GND	GND	-
4	GND	GND	-
5	EDP_TX0N	-	-
6	EDP_TX0P	-	-
7	EDP_TX1N	-	-
8	EDP_TX1P	-	-

9	EDP_TX2N	-	-
10	EDP_TX2P	-	-
11	EDP_TX3N	-	-
12	EDP_TX03P	-	-
13	GND	GND	-
14	GND	GND	-
15	EDP_AUXN	-	-
16	EDP_AUXP	-	-
17	GND	GND	-
18	GND	GND	-
19	GND	GND	-
20	NC	NC	-

4.2.17 AHD_2（J28）

表 4-2-17

Pin number	Pin name	Voltage level	Notice
1	VCC12V_AHD2	12V	Power output for AHD camera
2	GND	GND	-
3	NC	-	-
4	AHD_IN	-	AHD signal input

4.2.18 AHD_1（J29）

表 4-2-18

Pin number	Pin name	Voltage level	Notice
1	VCC12V_AHD1	12V	Power output for AHD camera
2	GND	GND	-
3	NC	-	-
4	AHD_IN	-	AHD signal input

4.2.19 LCM_BL_2（J30）

表 4-2-19

Pin number	Pin name	Voltage level	Notice
1	GND	GND	-
2	GND	GND	-
3	BL_ADJ	3.3V	GPIO4_C2_D/PWM0
4	BL_EN	3.3V	GPIO4_C6_D/PWM1
5	VCC12V_BL	12V	-
6	VCC12V_BL	12V	-

4.2.20 DC power（J31）

Pin number	Pin name	Voltage level	Notice
1	DC-IN	12V	-
2	DC-IN	12V	-
3	GND	GND	-
4	GND	GND	-

4.2.21 MIPI_TX（J34）

Pin number	Pin name	Voltage level	Notice
1	VCC12V_LCM	12V	-
2	VCC12V_LCM	12V	-
3	VCC12V_LCM	12V	-
4	VCC5V_LCM	5V	-
5	VCC5V_LCM	5V	-
6	VCC3V3_LCM	3.3V	-
7	VCC3V3_LCM	3.3V	-
8	VCC1V8_LCM	1.8V	-
9	I2C_SCL_LCM	3.3V	GPIO4_A2_U/I2C1_SCL
10	I2C_SDA_LCM	3.3V	GPIO4_A1_U/I2C1_SDA
11	LCM_BL_ADJ	3.3V	GPIO4_C2_D/PWM0
12	LCM_BL_EN	3.3V	GPIO4_C6_D/PWM1
13	LCM_PWR_EN	3.3V	GPIO4_C5_D
14	LCM_RST	3.3V	GPIO4_D5_D
15	GND	GND	-
16	MIPI_TX_D3N	-	-
17	MIPI_TX_D3P	-	-
18	GND	GND	-
19	MIPI_TX_D2N	-	-
20	MIPI_TX_D2P	-	-
21	GND	GND	-
22	MIPI_TX_CLKN	-	-
23	MIPI_TX_CLKP	-	-
24	GND	GND	-
25	MIPI_TX_D1N	-	-
26	MIPI_TX_D1P	-	-
27	GND	GND	-
28	MIPI_TX_D0N	-	-
29	MIPI_TX_D0P	-	-

| 30 | GND | GND | - |

4.2.22 MIPI_RX0（J35）

<div align="right">表 4-2-22</div>

Pin number	Pin name	Voltage level	Notice
1	GND	GND	-
2	MIPI_RX0_D0P	-	-
3	MIPI_RX0_D0N	-	-
4	GND	GND	-
5	MIPI_RX0_D1P	-	-
6	MIPI_RX0_D1N	-	-
7	GND	GND	-
8	MIPI_RX0_CLKP	-	-
9	MIPI_RX0_CLKN	-	-
10	GND	GND	-
11	MIPI_RX0_D2P	-	-
12	MIPI_RX0_D2N	-	-
13	GND	GND	-
14	MIPI_RX0_D3P	-	-
15	MIPI_RX0_D3N	-	-
16	GND	GND	-
17	MIPI_MCLK0	1.8V	GPIO2_B3/CIF_CLKO
18	GND	GND	-
19	MIPI_RST0	1.8V	GPIO2_D3
20	MIPI_PDN0	1.8V	GPIO1_B2
21	NC	-	-
22	NC	-	-
23	VCC1V8_DVP	1.8V	-
24	I2C2_SCL_CAM1	1.8V	GPIO2_A1/I2C2_SCL
25	I2C2_SDA_CAM1	1.8V	GPIO2_A0/I2C2_SDA
26	VCC12V_RSV	12V	-
27	VCC12V_RSV	12V	-
28	VCC2V8_DVP	2.8V	-
29	VCC3V3_DVP	3.3V	-
30	VCC3V3_DVP	3.3V	-

4.2.23 MIPI_TX1/RX1（J36）

表 4-2-23

Pin number	Pin name	Voltage level	Notice
1	GND	GND	-
2	MIPI_TX1/RX1_D0P	-	-
3	MIPI_TX1/RX1_D0N	-	-
4	GND	GND	-
5	MIPI_TX1/RX1_D1P	-	-
6	MIPI_TX1/RX1_D1N	-	-
7	GND	GND	-
8	MIPI_TX1/RX1_CLKP	-	-
9	MIPI_TX1/RX1_CLKN	-	-
10	GND	GND	-
11	MIPI_TX1/RX1_D2P	-	-
12	MIPI_TX1/RX1_D2N	-	-
13	GND	GND	-
14	MIPI_TX1/RX1_D3P	-	-
15	MIPI_TX1/RX1_D3N	-	-
16	GND	GND	-
17	MIPI_MCLK1	1.8V	GPIO2_B3/CIF_CLKO
18	GND	GND	-
19	MIPI_RST1	1.8V	GPIO2_D4
20	MIPI_PDN1	1.8V	GPIO1_B1
21	NC	-	-
22	NC	-	-
23	VCC1V8_DVP	1.8V	-
24	I2C2_SCL_CAM1	1.8V	GPIO2_A1/I2C2_SCL
25	I2C2_SDA_CAM1	1.8V	GPIO2_A0/I2C2_SDA
26	VCC12V_RSV	12V	-
27	VCC12V_RSV	12V	-
28	VCC2V8_DVP	2.8V	-
29	VCC3V3_DVP	3.3V	-
30	VCC3V3_DVP	3.3V	-

5 应用场景

5.1 应用示例

智能零售 研发评估

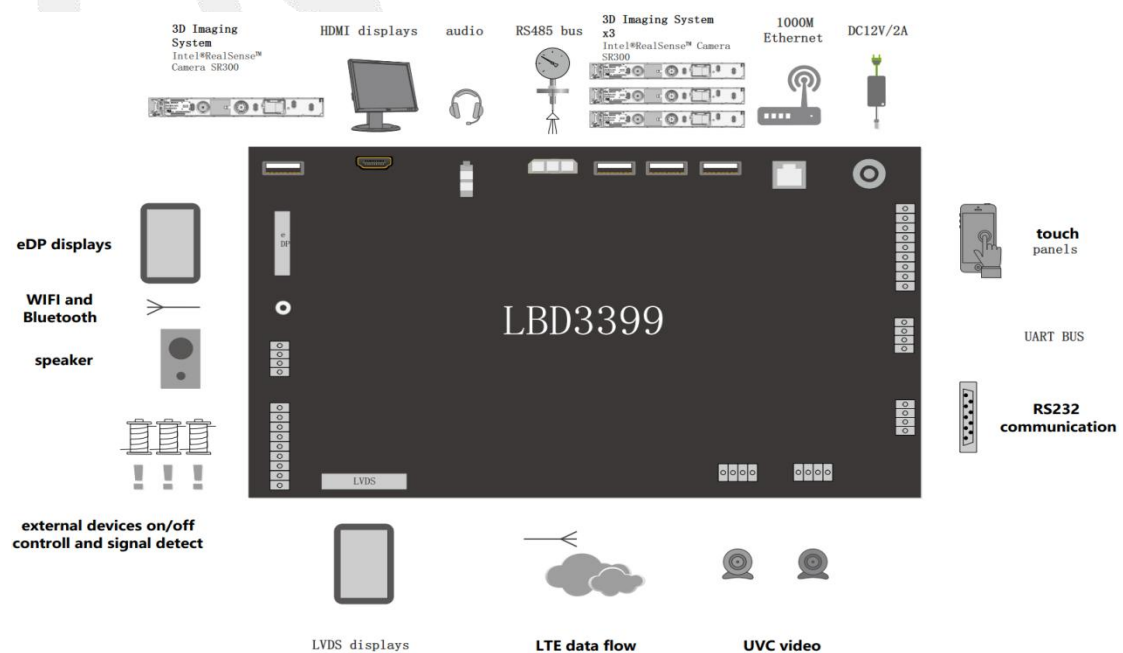功能验证 计算机视觉 商显设备

图 5-1

5.2 应用框图

图 5-2

6 支持与服务

6.1 技术支持

- 为客户提供开发相关的技术咨询；

- 为签约客户提供相关设计资料的检查工作；

6.2 售后服务

- 按照国家规定提供产品售后服务；

- 为客户提供个性化定制服务，如有任何需求，请联系我司；