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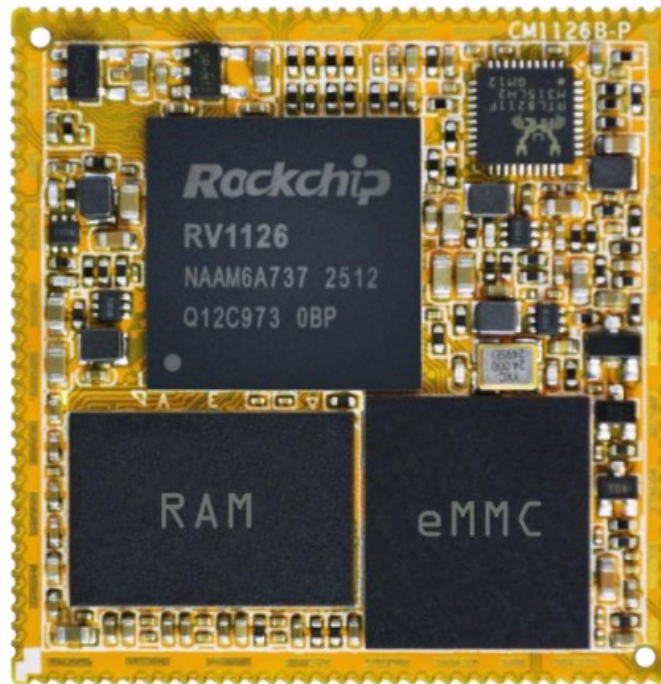
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**Boardcon
Embedded Design**

Boardcon Embedded CM1126B-P System on Module



Specifications

Feature	Specifications
CPU	Quad-core Cortex-A53
DDR	2GB LPDDR4 (up to 4GB)
eMMC FLASH	8GB (up to 256GB)
Power	DC 3.3V
MIPI DSI	4-Lane
I2S	4-CH
MIPI CSI	2-CH 4-Lane
RGB LCD	24bit
Camera	1-CH(DVP) and 2-CH(CSI)
USB	2-CH (USB HOST 2.0 and OTG 2.0)
Ethernet	1000M GMAC

SDMMC	2-CH
I2C	5-CH
SPI	2-CH
UART	5-CH, 1-CH(DEBUG)
PWM	11-CH
ADC IN	4-CH
Board Dimension	34 x 35mm

Introduction

About this Manual

This manual is intended to provide the user with an overview of the board and its benefits, complete feature specifications, and setup procedures. It contains important safety information as well.

Feedback and Update to this Manual

To help our customers make the most of our products, we are continually making additional and updated resources available on the Boardcon website (www.boardcon.com, www.armdesigner.com). These include manuals, application notes, programming examples, and updated software and hardware. Check in periodically to see what's new! When we are prioritizing work on these updated resources, feedback from customers is the number one influence, If you have questions, comments, or concerns about your product or project, please no hesitate to contact us at support@armdesigner.com.

CM1126B-P Introduction

Summary

The CM1126B-P system-on-module is equipped with Rockchip's RV1126B-P, built with a quad-core Cortex-A53, 3.0 TOPs NPU, and RISC-V MCU. It is designed specifically for the IPC/CVR devices, AI Camera devices, intelligent interactive devices, and mini

robots. High-performance and low-power solutions can help customers introduce new technologies more quickly and enhance the overall solution efficiency. The smallest size can be put on a 38board. Following the hardware revision from CM1126 (V1) to CM1126B-P (V2), where the SoC is updated to the RV1126B-P, the Reset & OTG_VBUS signals and the WIFI/BT module's GPIO voltage must operate at a 3.3V logic level.

Features

Microprocessor

- Quad-core Cortex-A53 up to 1.6GHz
- 32KB I-cache and 32KB D-cache for each core, 512KB L3 cache
- 3.0 TOPS Neural Process Unit
- RISC-V MCU to support 250ms fast boot
- Max 12M ISP

Memory Organization

- LPDDR4 RAM up to 4GB
- eMMC up to 256GB
- SPI Flash up to 8MB

Video Decoder/Encoder

- Supports video decode/encode up to 4K@30fps
- Supports real-time decoding of H.264/265
- Supports real-time UHD H.264/265 video encoding
- Picture size up to 8192×8192

Display Subsystem

- **Video Output**
 - Supports 4 lanes MIPI DSI up to 2560×1440@60fps
 - Supports 24-bit RGB parallel output
- **Image in**

- Supports up to 16-bit DVP interface
- Supports 2ch MIPI CSI 4lanes interface

I2S/PCM/ AC97

- Three I2S/PCM interface
- Support Mic array Up to 8ch PDM/TDM interface
- Support PWM audio output

USB and PCIE

- Two 2.0 USB interfaces
- One USB 2.0 OTG and one 2.0 USB host

Ethernet

- RTL8211F onboard
- Support 10/100/1000M

I2C

- Up to five I2Cs
- Support standard mode and fast mode(up to 400kbit/s)

SDIO

- Support 2CH SDIO 3.0 protocol

SPI

- Up to two SPI controllers,
- Full-duplex synchronous serial interface

UART

- Support up to 6 UARTs

- UART2 with 2 wires for debug tools
- Embedded two 664-byte FIFOs
- Support auto flow control mode for UART0/1/3/4/5

ADC

- Up to four ADC channels
- 12-bit resolution
- Voltage input range between 0V to 1.8V
- Support up to 1MS/s sampling rate

PWM

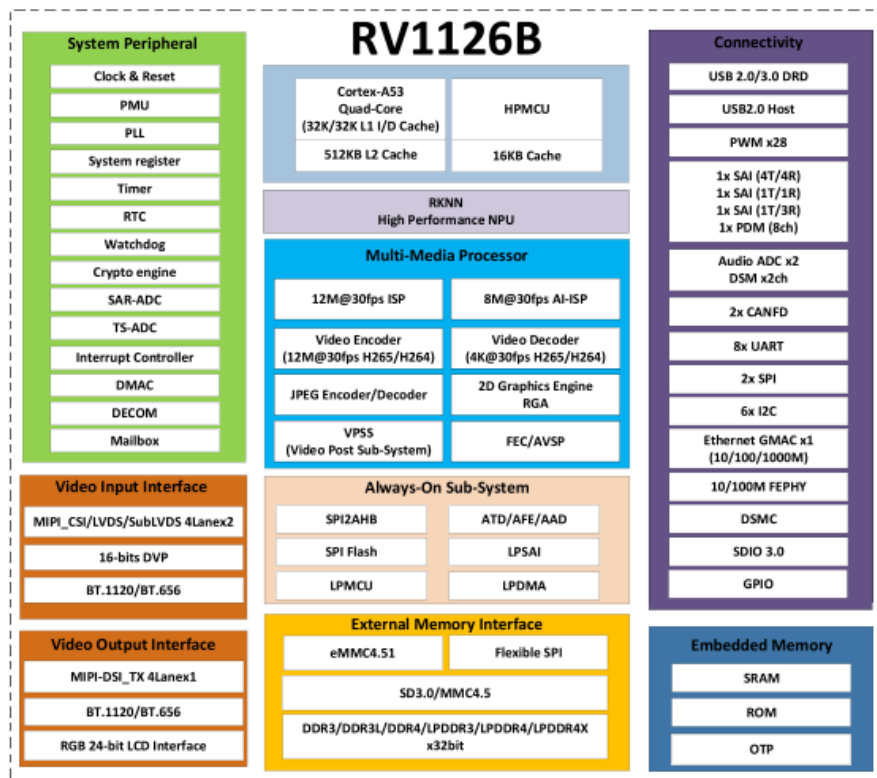
- 11 on-chip PWMs with interrupt-based operation
- Support 32-bit time/counter facility
- IR option on PWM3/7

Power unit

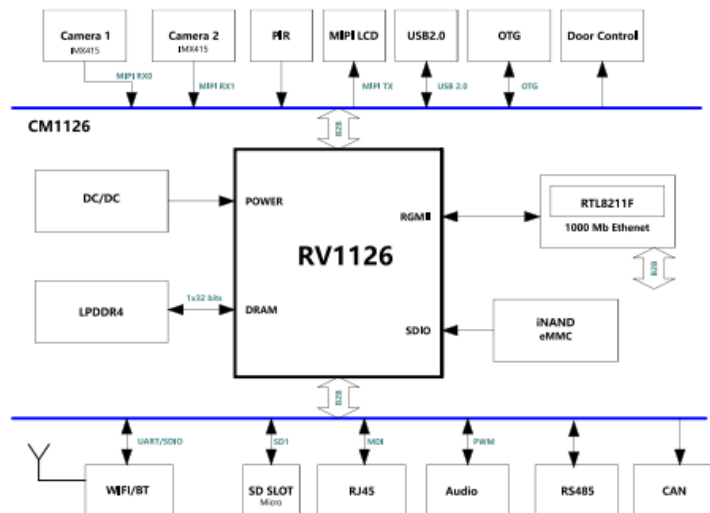
- Discrete Power on board
- Single 3.3V input

CM1126B-P Block Diagram

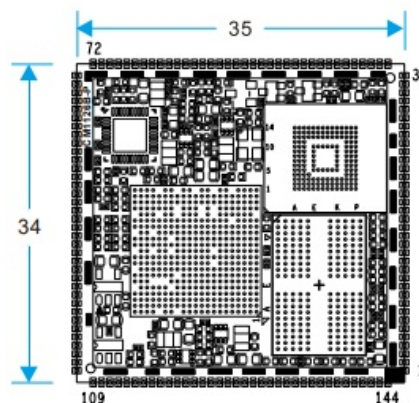
RV1126B-P Block Diagram



Development board (Idea1126) Block Diagram



CM1126B-P PCB Dimension



CM1126B-P Pin Definition

Pin	Signal	Description or functions	GPIO serial	IO Voltage
1	LCDC_D19_3V3	I2S1_MCLK_M2/CIF_D15_M1	GPIO2_C7_d	3.3V
2	LCDC_D20_3V3	I2S1_SDO_M2/CIF_VS_M1	GPIO2_D0_d	3.3V
3	LCDC_D21_3V3	I2S1_SCLK_M2/CIF_CLKO_M1	GPIO2_D1_d	3.3V
4	LCDC_D22_3V3	I2S1_LRCK_M2/CIF_CKIN_M1	GPIO2_D2_d	3.3V
5	LCDC_D23_3V3	I2S1_SDI_M2/CIF_HS_M1	GPIO2_D3_d	3.3V
6	GND	Ground		0V
7	GPIO1_D1	UART1_RX_M1/I2C5_SDA_M2	GPIO1_D1_d	3.3V(V2)
8	BT_WAKE	SPI0_CS1n_M0	GPIO0_A4_u	3.3V(V2)
9	WIFI_REG_ON	SPI0_MOSI_M0	GPIO0_A6_d	3.3V(V2)
10	BT_RST	SPI0_MISO_M0	GPIO0_A7_d	3.3V(V2)
11	WIFI_WAKE_HOST	SPI0_CLK_M0	GPIO0_B0_d	3.3V(V2)
12	BT_WAKE_HOST	SPI0_CS0n_M0	GPIO0_A5_u	3.3V(V2)
13	PWM7_IR_M0_3V3		GPIO0_B1_d	3.3V

14	PWM6_M0_3V3	TSADC_SHUT_M1	GPIO0_B2_d	3.3V
15	UART2_TX_3V3	For debug	GPIO3_A2_u	3.3V
16	UART2_RX_3V3	For debug	GPIO3_A3_u	3.3V
17	I2S0_MCLK_M0_3V3		GPIO3_D2_d	3.3V
18	I2S0_SCLK_TX_M0_3V3	ACODEC_DAC_CLK	GPIO3_D0_d	3.3V
19	I2S0_SDI3_M0_3V3	PDM_SDI3_M0 / ACODEC_ADC_DATA	GPIO3_D7_d	3.3V
20	I2S0_SDO0_M0_3V3	ACODEC_DAC_DATAR /APWM_R_M1/ADSM_LP	GPIO3_D5_d	3.3V

Pin	Signal	Description or functions	GPIO serial	IO Voltage
21	I2S0_LRCK_TX_M0_3V3	ACODEC_DAC_SYNC /APWM_L_M1/ADSM_LN	GPIO3_D3_d	3.3V
22	PDM_SDI1_3V3	I2S0_SDO3_SDI1_M0/I2C4SDA	GPIO4_A1_d	3.3V

23	PDM_CLK1_3V3	I2S0_SCK_RX_M0	GPIO3_D1_d	3.3V
24	PDM_SDI2_3V3	I2S0_SDO2_SDI2_M0/I2C4SCL	GPIO4_A0_d	3.3V
25	PDM_SDI0_3V3	I2S0_SDI0_M0	GPIO3_D6_d	3.3V
26	PDM_CLK_3V3	I2S0_LRCK_RX_M0	GPIO3_D4_d	3.3V
27	I2C2_SDA_3V3	PWM5_M0	GPIO0_C3_d	3.3V
28	I2C2_SCL_3V3	PWM4_M0	GPIO0_C2_d	3.3V
29	USB_HOST_DP			1.8V
30	USB_HOST_DM			1.8V
31	GND	Ground		0V
32	OTG_DP	Can be used for download		1.8V
33	OTG_DM	Can be used for download		1.8V
34	OTG_DET(V2)	OTG VBUS DET IN		3.3V(V2)
35	OTG_ID			1.8V
36	SPI0_CS1n_M1	I2S1_MCK_M1/UART4_TX_M2	GPIO1_D5_d	1.8V
37	VCC3V3_SYS	3.3V Main Power input		3.3V
38	VCC3V3_SYS	3.3V Main Power input		3.3V
39	USB_CTRL_3V3		GPIO0_C1_d	3.3V
40	SDMMC0_DET	Must be used for SD Card	GPIO0_A3_u	3.3V(V2)
41	CLKO_32K	RTC clock output	GPIO0_A2_u	3.3V(V2)

42	nRESET	Reset key input		3.3V(V2)
43	MIPI_CSI_RX0_ CL KP	MIPI CSI0 or LVDS0 input		1.8V
44	MIPI_CSI_RX0_ CL KN	MIPI CSI0 or LVDS0 input		1.8V
45	MIPI_CSI_RX0_ D2 P	MIPI CSI0 or LVDS0 input		1.8V
46	MIPI_CSI_RX0_ D2 N	MIPI CSI0 or LVDS0 input		1.8V
47	MIPI_CSI_RX0_ D3 P	MIPI CSI0 or LVDS0 input		1.8V
48	MIPI_CSI_RX0_ D3 N	MIPI CSI0 or LVDS0 input		1.8V

49	MIPI_CSI_RX0_ D1 P	MIPI CSI0 or LVDS0 input		1.8V
50	MIPI_CSI_RX0_ D1 N	MIPI CSI0 or LVDS0 input		1.8V
51	MIPI_CSI_RX0_ D0 P	MIPI CSI0 or LVDS0 input		1.8V

Pin	Signal	Description or functions	GPIO serial	IO Voltage
52	MIPI_CSI_RX0_ D0 N	MIPI CSI0 or LVDS0 input		1.8V
53	GND	Ground		0V
54	MIPI_CSI_RX1_ D3 P	MIPI CSI1 or LVDS1 input		1.8V
55	MIPI_CSI_RX1_ D3 N	MIPI CSI1 or LVDS1 input		1.8V

56	MIPI_CSI_RX1_ CL KP	MIPI CSI1 or LVDS1 input		1.8V
57	MIPI_CSI_RX1_ CL KN	MIPI CSI1 or LVDS1 input		1.8V
58	MIPI_CSI_RX1_ D2 P	MIPI CSI1 or LVDS1 input		1.8V
59	MIPI_CSI_RX1_ D2 N	MIPI CSI1 or LVDS1 input		1.8V
60	MIPI_CSI_RX1_ D1 P	MIPI CSI1 or LVDS1 input		1.8V
61	MIPI_CSI_RX1_ D1 N	MIPI CSI1 or LVDS1 input		1.8V
62	MIPI_CSI_RX1_ D0 P	MIPI CSI1 or LVDS1 input		1.8V

63	MIPI_CSI_RX1_D0 N	MIPI CSI1 or LVDS1 input		1.8V
64	SDMMC0_D3_3V3	UART3_TX_M1	GPIO1_A7_u	3.3V
65	SDMMC0_D2_3V3	UART3_RX_M1	GPIO1_A6_u	3.3V
66	SDMMC0_D1_3V3	UART2_TX_M0	GPIO1_A5_u	3.3V
67	SDMMC0_D0_3V3	UART2_RX_M0	GPIO1_A4_u	3.3V
68	SDMMC0_CMD_3V3	UART3_CTSn_M1	GPIO1_B1_u	3.3V
69	SDMMC0_CLK_3V3	UART3_RTSn_M1	GPIO1_B0_u	3.3V
70	GND	Ground		0V
71	LED1/CFG_LDO0	Ethernet LINK LED		3.3V
72	LED2/CFG_LDO1	Ethernet SPEED LED		3.3V
73	MDI0+	Ethernet MDI signal		1.8V
74	MDI0-	Ethernet MDI signal		1.8V

75	MDI1+	Ethernet MDI signal		1.8V
76	MDI1-	Ethernet MDI signal		1.8V
77	MDI2+	Ethernet MDI signal		1.8V
78	MDI2-	Ethernet MDI signal		1.8V
79	MDI3+	Ethernet MDI signal		1.8V
80	MDI3-	Ethernet MDI signal		1.8V
81	I2C1_SCL	UART4_CTSn_M2	GPIO1_D3_u	1.8V

Pin	Signal	Description or functions	GPIO serial	IO Voltage
82	I2C1_SDA	UART4_RTSn_M2	GPIO1_D2_u	1.8V
83	MIPI_CSI_PWD N0	UART4_RX_M2	GPIO1_D4_d	1.8V
84	SPI0_CLK_M1	I2S1_SDO_M1/UART5_RX_M2	GPIO2_A1_d	1.8V
85	SPI0_MOSI_M1	I2S1_SCK_M1/I2C3_SCL_M2	GPIO1_D6_d	1.8V
86	SPI0_CS0n_M1	I2S1_SDI_M1/UART5_TX_M2	GPIO2_A0_d	1.8V
87	SPI0_MISO_M1	I2S1_LRCK_M1/I2C3_SDA_M2	GPIO1_D7_d	1.8V
88	MIPI_CSI_CLK1	UART5_RTSn_M2	GPIO2_A2_d	1.8V
89	MIPI_CSI_CLK0	UART5_CTSn_M2	GPIO2_A3_d	1.8V
90	GND	Ground		0V

91	LCDC_D0_3V3	UART4_RTSn_M1/CIF_D0_M1	GPIO2_A4_d	3.3V
92	LCDC_D1_3V3	UART4_CTSn_M1/CIF_D1_M1	GPIO2_A5_d	3.3V
93	LCDC_D2_3V3	UART4_TX_M1/CIF_D2_M1	GPIO2_A6_d	3.3V
94	LCDC_D3_3V3	UART4_RX_M1/I2S2_SDO_M1	GPIO2_A7_d	3.3V
95	LCDC_D4_3V3	UART5_TX_M1/I2S2_SDI_M1	GPIO2_B0_d	3.3V
96	LCDC_D5_3V3	UART5_RX_M1/I2S2_SCK_M1	GPIO2_B1_d	3.3V
97	LCDC_D6_3V3	UART5_RTSn_M1/I2S2_LRCK_M1	GPIO2_B2_d	3.3V
98	LCDC_D7_3V3	UART5_CTSn_M1/I2S2_MCLK_M1/CIF_D3_M1	GPIO2_B3_d	3.3V
99	CAN_RX_3V3	UART3_TX_M2/I2C4_SCL_M0	GPIO3_A0_u	3.3V
100	CAN_TX_3V3	UART3_RX_M2/I2C4_SDA_M0	GPIO3_A1_u	3.3V

10 1	LCDC_CLK_3V3	UART3_CTSn_M2/SPI1_MISO_ M2/PWM8_M1	GPIO2_D7_d	3.3V
10 2	LCDC_VSYNC_3V3	UART3_RTSn_M2/SPI1_MOSI	GPIO2_D6_d	3.3V
10 3	MIPI_DSI_D2P			1.8V
10 4	MIPI_DSI_D2N			1.8V
10 5	MIPI_DSI_D1P			1.8V
10 6	MIPI_DSI_D1N			1.8V
10 7	MIPI_DSI_D0P			1.8V
10 8	MIPI_DSI_D0N			1.8V
10 9	MIPI_DSI_D3P			1.8V
11 0	MIPI_DSI_D3N			1.8V
11 1	MIPI_DSI_CLKP			1.8V
11 2	MIPI_DSI_CLKN			1.8V

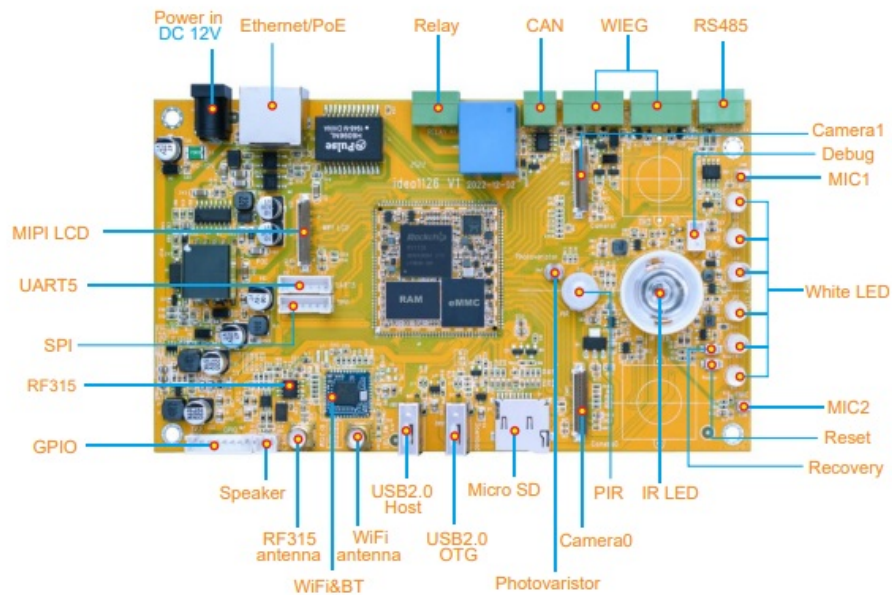
11 3	ADCIN3	ADC input		1.8V
11 4	ADCIN2	ADC input		1.8V
11 5	ADCIN1	ADC input		1.8V
11 6	ADKEY_IN0	Recovery mode set(10K P U)		1.8V
11 7	GND	Ground		0V
11 8	SDIO_CLK		GPIO1_B2_d	3.3V(V2)
11 9	SDIO_CMD		GPIO1_B3_u	3.3V(V2)

Pin	Signal	Description or functions	GPIO serial	IO Voltage
12 0	SDIO_D0		GPIO1_B4_u	3.3V(V2)
12 1	SDIO_D1		GPIO1_B5_u	3.3V(V2)
12 2	SDIO_D2		GPIO1_B6_u	3.3V(V2)
12 3	SDIO_D3		GPIO1_B7_u	3.3V(V2)

12 4	UART0_RX		GPIO1_C2_u	3.3V(V2)
12 5	UART0_TX		GPIO1_C3_u	3.3V(V2)
12 6	UART0_CTSN		GPIO1_C1_u	3.3V(V2)
12 7	UART0_RTSN		GPIO1_C0_u	3.3V(V2)
12 8	PCM_TX	I2S2_SDO_M0/SPI1_MOSI_M1	GPIO1_C4_d	3.3V(V2)
12 9	PCM_SYNC	I2S2_LRCK_M0/SPI1_CSn0_M1/UART1_CTSn_M1	GPIO1_C7_d	3.3V(V2)
13 0	PCM_CLK	I2S2_SCLK_M0/SPI1_CLK_M1/UART1_RTSn_M1	GPIO1_C6_d	3.3V(V2)
13 1	PCM_RX	I2S2_SDI_M0/SPI1_MISO_M1	GPIO1_C5_d	3.3V(V2)
13 2	LCDC_D15_3V3	CIF_D11_M1	GPIO2_C3_d	3.3V
13 3	LCDC_D14_3V3	CIF_D10_M1	GPIO2_C2_d	3.3V
13 4	LCDC_D13_3V3	CIF_D9_M1	GPIO2_C1_d	3.3V

13 5	LCDC_D12_3V3	CIF_D8_M1	GPIO2_C0_d	3.3V
13 6	LCDC_DEN_3V3	I2C3_SCL_M1/SPI1_CS0n_M2	GPIO2_D4_d	3.3V
13 7	LCDC_D10_3V3	CIF_D6_M1	GPIO2_B6_d	3.3V
13 8	LCDC_D9_3V3	CIF_D5_M1	GPIO2_B5_d	3.3V
13 9	LCDC_D8_3V3	CIF_D4_M1	GPIO2_B4_d	3.3V
14 0	LCDC_D11_3V3	CIF_D7_M1	GPIO2_B7_d	3.3V
14 1	LCDC_HSYNC_3V3	I2C3_SDA_M1/SPI1_CLK_M2	GPIO2_D5_d	3.3V
14 2	LCDC_D16_3V3	CIF_D12_M1	GPIO2_C4_d	3.3V
14 3	LCDC_D17_3V3	CIF_D13_M1	GPIO2_C5_d	3.3V
14 4	LCDC_D18_3V3	CIF_D14_M1	GPIO2_C6_d	3.3V
Note: 1. Most GPIO voltage is 1.8V, but some pins marked 3.3V. 2. GPIO voltage change to 3.3V for marked (V2).				

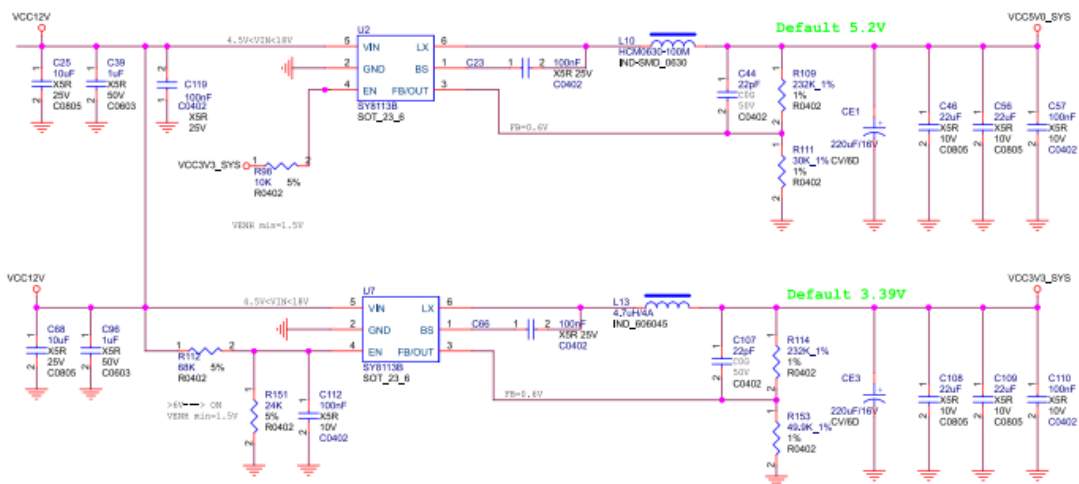
Development Kit (Idea1126)



Hardware Design Guide

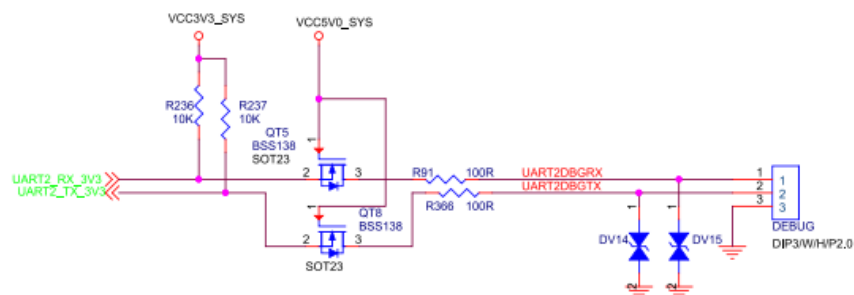
Peripheral Circuit Reference

Main Power Circuit

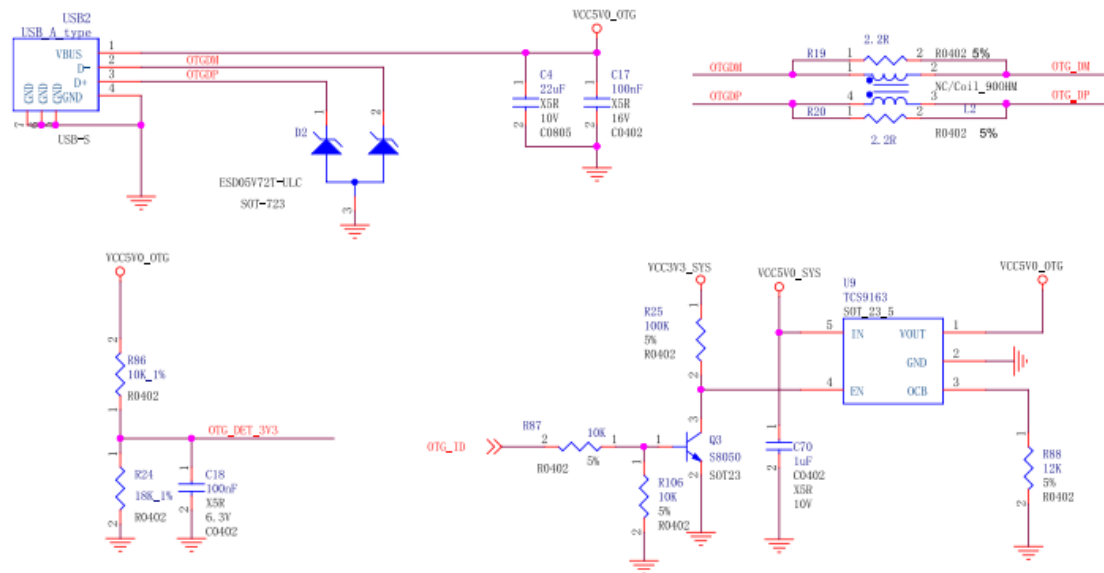


$$V_{out} = 0.6 * (1 + R_{114}/R_{153})$$

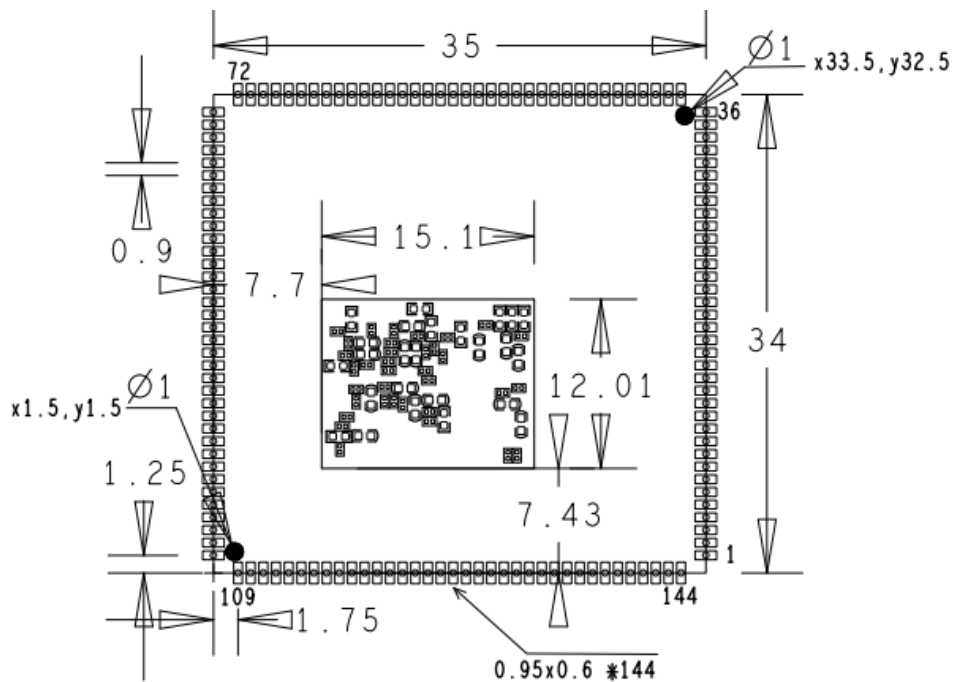
Debug Circuit



USB OTG Interface Circuit



PCB Footprint



Product Electrical Characteristics

Dissipation and Temperature

Symbol	Parameter	Min	Typ	Max	Unit
VCC3V3_SY S	System IO Voltage	3.3-5%	3.3	3.3+5%	V

Isys_in	VCC3V3_SYS input Current		850		mA
Ta	Operating Temperature	-20		70	°C
Tstg	Storage Temperature	-40		85	°C

Reliability of Test

	High Temperature Operating Test	
Contents	Operating 8h in high temperatures	55°C±2°C
Result	TBD	

	Operating Life Test	
Contents	Operating in the room	120h
Result	TBD	

Limited Warranty

Boardcon warrants this product to be free of defects in material and workmanship for one year from the date of purchase. During this warranty period, Boardcon will repair or replace the defective unit by the following process: A copy of the original invoice must be included when returning the defective unit to Boardcon. This limited warranty does not cover damages resulting from lightning or other power surges, misuse, abuse, abnormal conditions of operation, or attempts to alter or modify the function of the product. This warranty is limited to the repair or replacement of the defective unit. In no event shall Boardcon be liable or responsible for any loss or damages, including but not limited to any lost profits, incidental or consequential damages, loss of business, or

anticipatory profits arising from the use or inability to use this product. Repairs made after the expiration of the warranty period are subject to a repair charge and the cost of return shipping. Please contact Boardcon to arrange for any repair service and to obtain repair charge information.

FAQs

Q: How do I upgrade the DDR memory on CM1126B-P?

A: The CM1126B-P supports up to 4GB LPDDR4 memory. To upgrade, ensure compatibility with the specifications and follow recommended procedures.

Q: What is the power supply requirement for CM1126B-P?

A: The power requirement for CM1126B-P is DC 3.3V. Ensure to provide a stable power supply within this range for optimal performance.

Q: Can I expand the storage capacity of eMMC on CM1126B-P?

A: Yes, the eMMC storage on CM1126B-P can be expanded up to 256GB. Ensure compatibility with supported storage devices before upgrading.

Documents / Resources

	Boardcon Embedded CM1126B-P System on Module [pdf] User Manual V2.20250422, CM1126B-P System on Module, CM1126B-P, System on Module, Module
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References

- [User Manual](#)

Boardcon

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Boardcon Embedded, CM1126B-P, CM1126B-P System on Module, Module, System-On-Module, V2.20250422

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