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VisionCB-STM32MP1-STD Datasheet and Pinout

Rev. 20200709130942

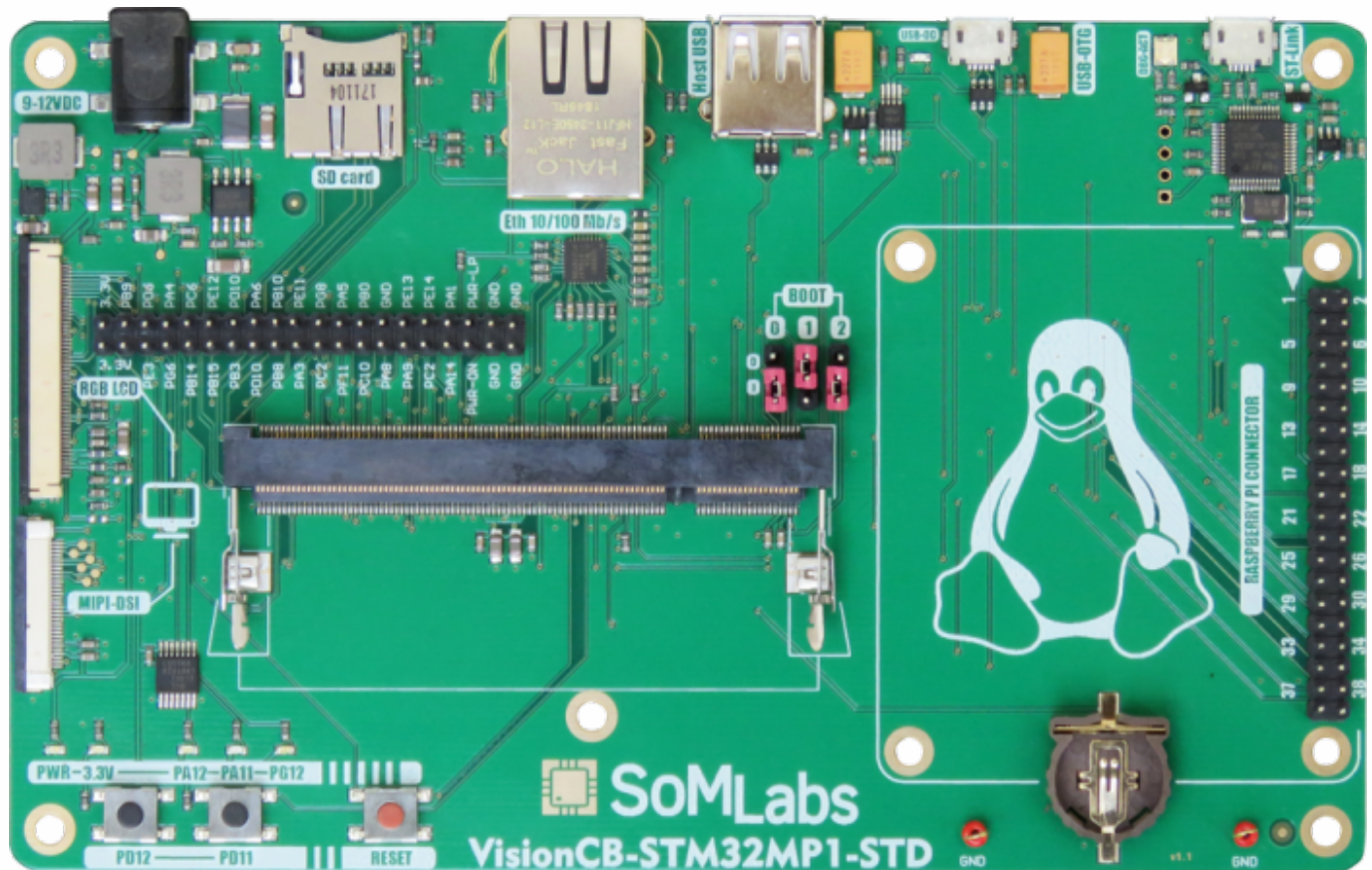
Source URL: http://wiki.somlabs.com/index.php/VisionCB-STM32MP1-STD_Datasheet_and_Pinout

Table of Contents

General description	1
Applications	1
Features	3
Pictures of VisionCB-STM32MP1-STD v1.1 board	4
Ordering info	5
Block Diagram	6
Electrical parameters	7
Boot Selector	8
Raspberry Pi compatible I/O header	9
Universal I/O header	11
User Interface (switches and LEDs)	13
Console Port	14
LCD Parallel Connector	15
LCD MIPI-CSI Connector	17
MPU internal RTC Battery Socket	19
Dimensions	20

VisionCB-STM32MP1-STD v.1.1 Datasheet and Pinout

General description



VisionCB-STM32MP1-STD is a carrier board for the VisionSOM-STM32MP1 family of computer-on-modules which are powered by STMicroelectronics STM32MP15x application processors (single or dual core ARM Cortex-A7 + internal microcontroller Cortex-M4). A carrier board, together with a System on Module (SoM), makes a complete development platform similar to SBC. The carrier board houses the most common interfaces such as debugger, USB, Ethernet, UART, etc. A large variety of interfaces allows to use it as both a complete development platform or as a stand-alone end-product.

The carrier board connects with the SoM via a standard SODIMM200 connector. VisionCB-STM32MP1-STD is equipped with internal ST-Link/v2-1 debugger with SWD interface and serial USB console port.

Applications

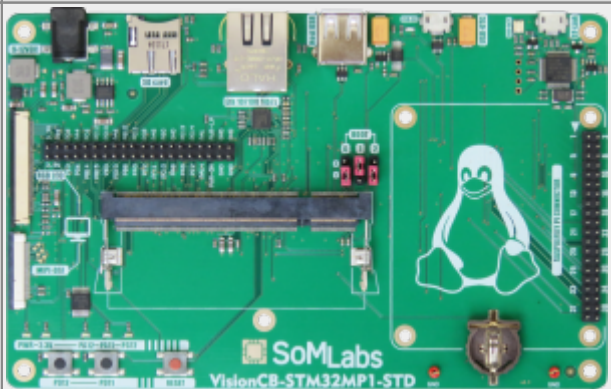
- Industrial embedded Linux computer
- Home Appliances
- Home Automation - Smart Home
- Human-machine Interfaces (HMI)
- Point-of-sales (POS) terminals
- Cash Register
- 2D barcode scanners and printers
- Smart grid Infrastructure

- IoT gateways
- Residential gateways
- Machine vision equipment
- Robotics
- Fitness/outdoor equipment

Features

- Carrier Board (Base Board) compatible with the VisionSOM-STM32MP1 family of modules based on STMicroelectronics STM32MP15x application processors
- SoM Interface: SODIMM200
- Debug Interface: built-in ST-Link/v2-1 SWD debugger
- Expansion Connectors:
 - Raspberry Pi compatible connectors 2x20 Pin Header (Male)
 - Universal 2x20 Pin Header (Male)
 - MicroSD card socket
- Communication Connectors:
 - 1x Ethernet 10/100Mbit/s, RJ45
 - 1x USB Host Type A connectors
 - 1x USB OTG Micro AB connector
 - 1x Console MicroUSB B connector
- Display Interface:
 - 50-pin FFC/FPC Parallel RGB - 24-bit
 - 30-pin FFC/FPC MIPI-DSI
- User Interface:
 - 3 Pushbuttons
 - 5 LEDs
- Boot selector
 - External Power Supply 9-12V DC
 - Temperature Range: 0 to +70°C
- Board Size: 160mm x 100mm x 17mm

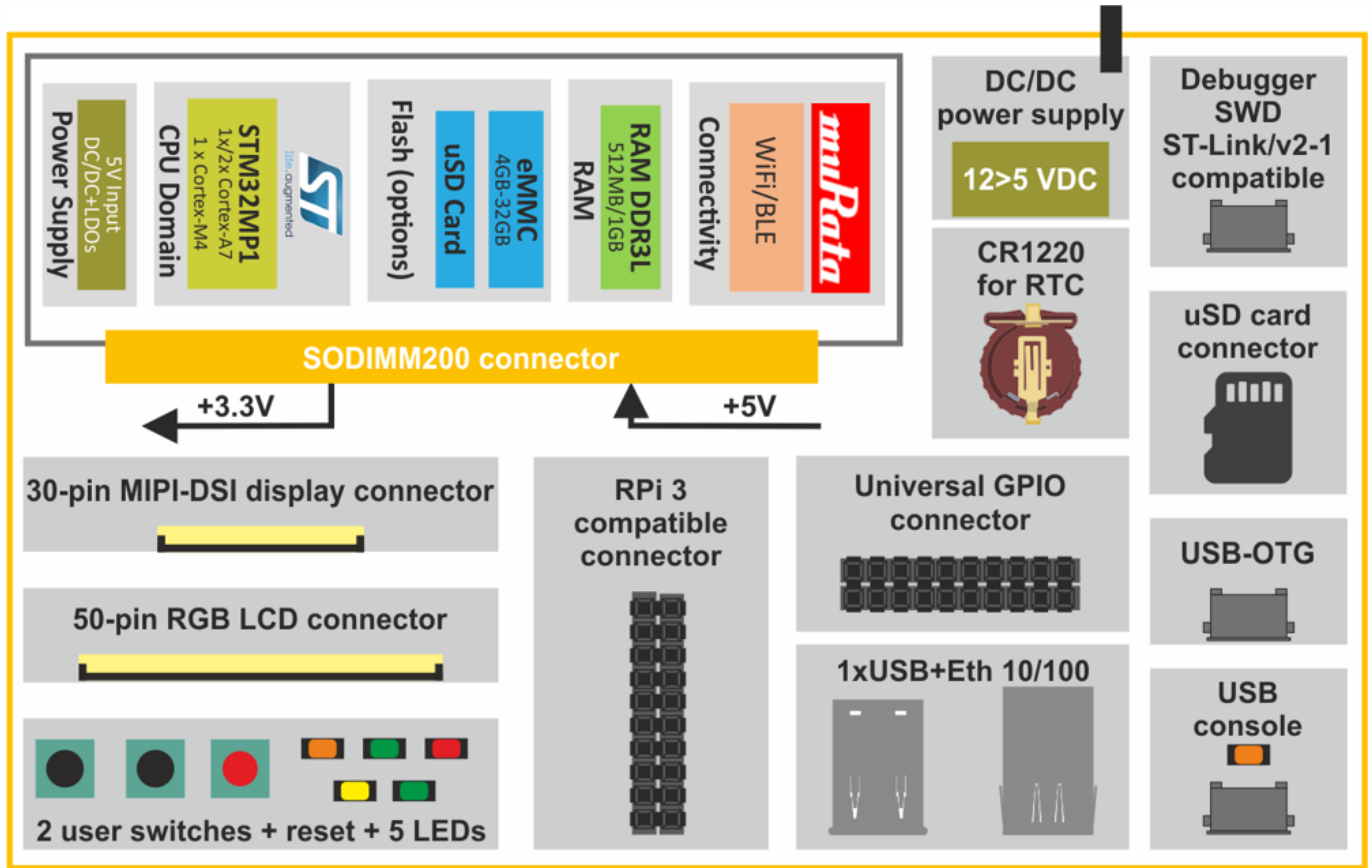
Pictures of VisionCB-STM32MP1-STD v1.1 board

Version	Photo
<p>VisionCB-STM32MP1-STD v1.1 board only</p>	

Ordering info

VisionCB-STM32MP1-STD v1.1

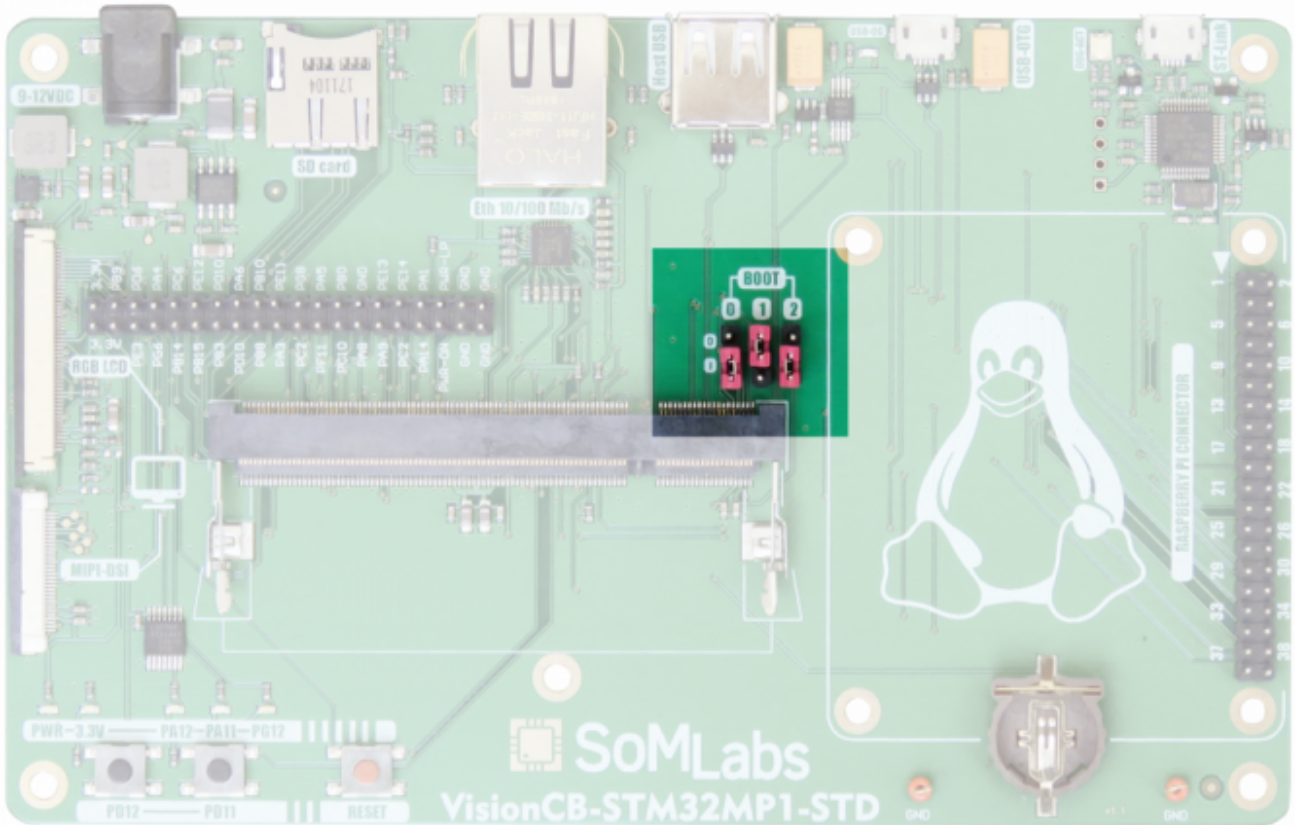
Block Diagram



Electrical parameters

Parameter	Value			Units	Comment
	Min.	Typ.	Max.		
Power Supply	9.0	12.0	15.0	V	Positive pole on central connector of J102
Supply current	-	-	0.15	A	Excluding LCD, USB and antoher external loads
LCD Power Supply	3.25	3.4	3.5	V	Optionally 5V
MicroSD Card Power Supply	3.15	3.3	3.45	V	-
GPIO voltage		3.3		V	-

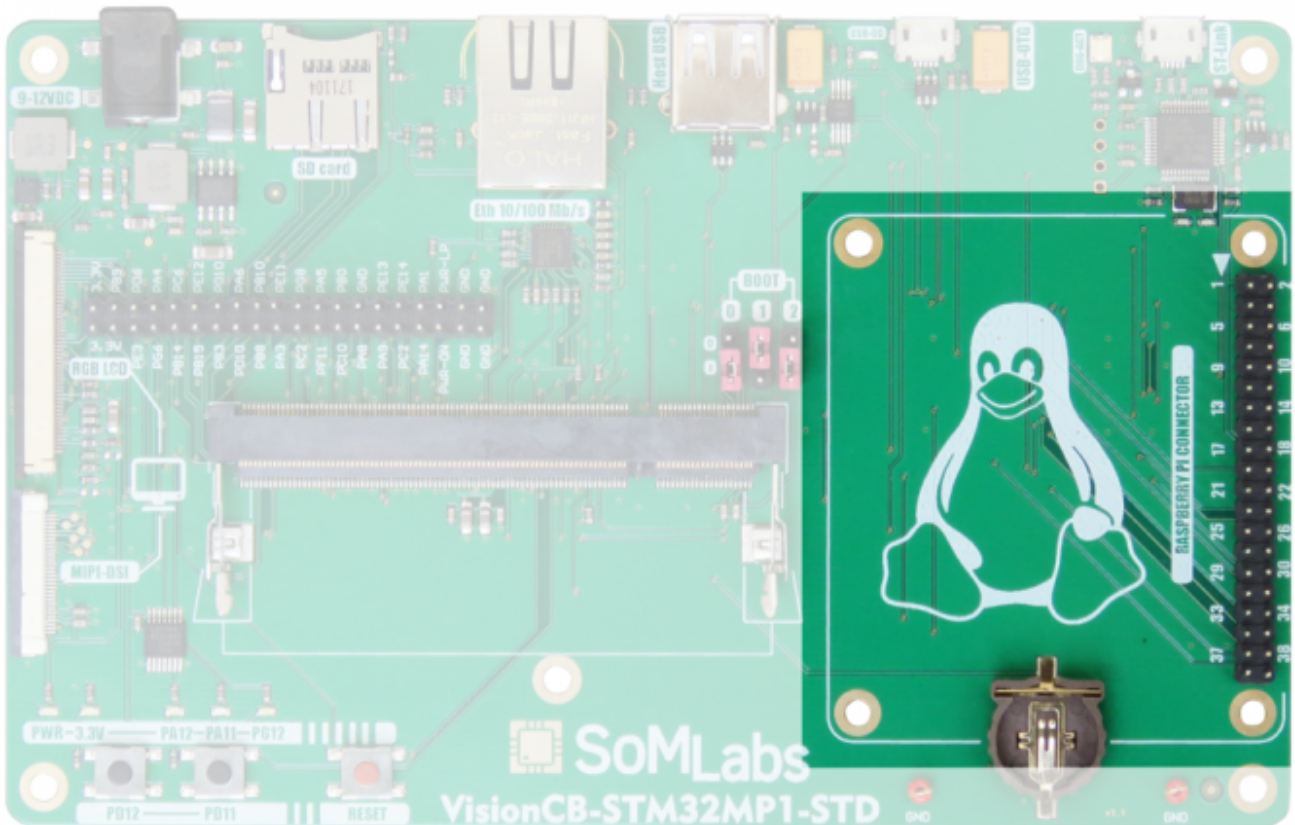
Boot Selector



BOOTx			Boot Mode	Description
BOOT2	BOOT1	BOOT0		
0	0	0	UART and USB	Wait incoming connection on: - USART2/3/6 and UART4/5/7/8 on default pins - USB high-speed device
0	0	1	Serial NOR Flash	Not used on VisionSOM-STM32MP1
0	1	0	eMMC	eMMC on SDMMC2
0	1	1	NAND Flash	Not used on VisionSOM-STM32MP1
1	0	0	-	Not used on VisionSOM-STM32MP1
1	0	1	SD card	SD card on SDMMC1
1	1	0	UART and USB	Wait incoming connection on: - USART2/3/6 and UART4/5/7/8 on default pins - USB high-speed device on OTG_HS_DP/DM pins
1	1	1	Serial NAND Flash	Not used on VisionSOM-STM32MP1

By default BOOT2...BOOT0 lines are pulled-down with 1k resistors

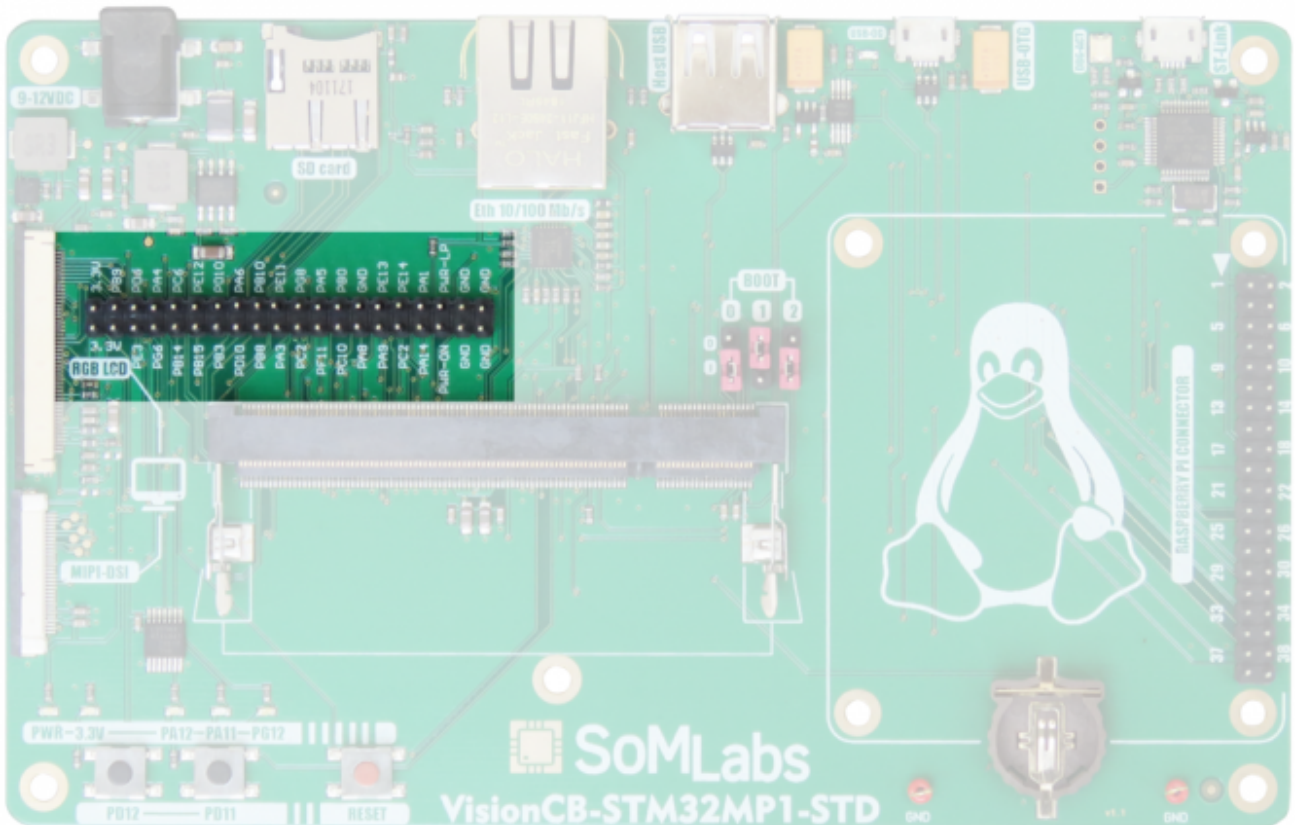
Raspberry Pi compatible I/O header



Pin	Default function name	Description
1	+3.3V	+3.3V generated by DC/DC built-in SOM (limited current load)
2	+5V	+5V generated by carrier board built-in DC/DC converter
3	DSI-I2C-SDA	I2C4 SDA line
4	+5V	+5V generated by carrier board built-in DC/DC converter
5	DSI-I2C-SCL	I2C4 SCL line
6	GND	-
7	UART8-CTS	Default: UART8 CTS line or universal GPIO with 3.3V logic levels
8	UART3-TXD	Default: UART3 TXD line or universal GPIO with 3.3V logic levels
9	GND	-
10	UART3-RXD	Default: UART3 RXD line or universal GPIO with 3.3V logic levels
11	UART8-RTS	Default: UART8 RTS line or universal GPIO with 3.3V logic levels
12	GPIO-PD12	Shared with switch S100/10k pullup
13	-	-
14	GND	-
15	-	-
16	GPIO-PD11	Shared with switch S101/10k pullup
17	+3.3V	+3.3V generated by DC/DC built-in SOM (limited current load)
18	GPIO-PG12	Shared with user LED (D102, yellow) LED is buffered by logic inverter

19	LCD-R6 (DATA22)	PA8 GPIO line SPI3 MOSI
20	GND	-
21	LCD-B3 (DATA3)	PD10 GPIO line SPI3 MISO
22	GPIO-PA12	Shared with user LED (D100, green) LED is buffered by logic inverter
23	LCD-R2 (DATA18)	PC10 GPIO line SPI3 SCK
24	GPIO-PA11	Shared with user LED (D101, red) LED is buffered by logic inverter
25	GND	-
26	USART6-RXD	Default: UART6 RXD line or universal GPIO with 3.3V logic levels
27	-	-
28	-	-
29	DSI-BL-PWM	PD15 GPIO line TIM4 CH4 PWM output
30	GND	-
31	GPIO-PB1-ADC1-5	Universal GPIO line with 3.3V logic levels or ADC input
32	USART6-TXD	Default: UART6 TXD line or universal GPIO with 3.3V logic levels
33	GPIO-PC0-ADC1-10	Universal GPIO line with 3.3V logic levels or ADC input
34	GND	-
35	GPIO-PC3-ADC1-13	Universal GPIO line with 3.3V logic levels or ADC input
36	GPIO-PA13	Shared with PHY Ethernet controller interrupt line
37	GPIO-PA0-ADC1-16	Universal GPIO line with 3.3V logic levels or ADC input
38	GPIO-PB6	Universal GPIO with 3.3V logic levels
39	GND	-
40	GPIO-PF10	Universal GPIO with 3.3V logic levels

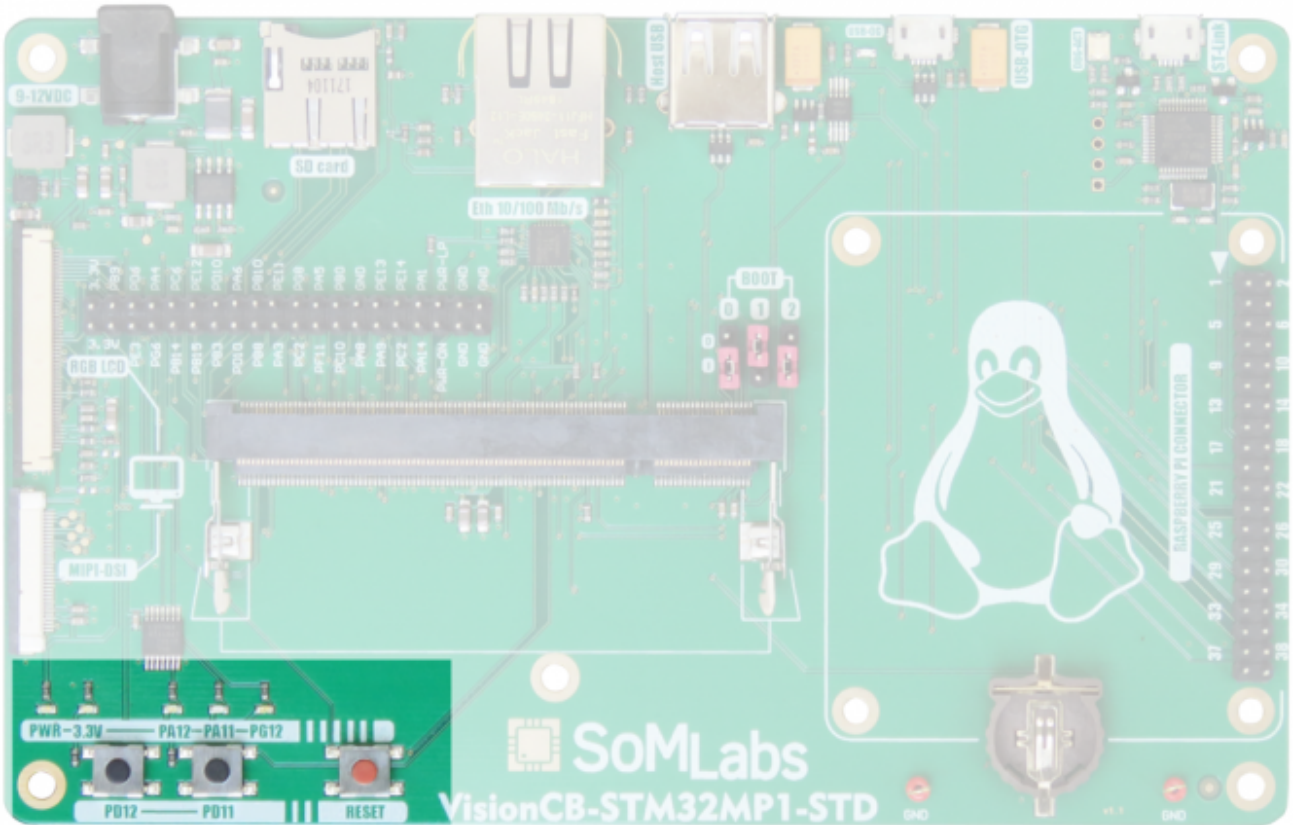
Universal I/O header



Pin	Default function name	Description
1	+3.3V	+3.3V generated by DC/DC built-in SOM (limited current load)
2	+3.3V	+3.3V generated by DC/DC built-in SOM (limited current load)
3	+3.3V	+3.3V generated by DC/DC built-in SOM (limited current load)
4	LCD-B7 (DATA7)	PB9 - universal GPIO with 3.3V logic levels
5	SD2-CLK	PE3 - universal GPIO with 3.3V logic levels
6	LCD-B2 (DATA2)	PD6 - universal GPIO with 3.3V logic levels
7	SD2-CMD	PG6 - universal GPIO with 3.3V logic levels
8	LCD-VSYNC	PA4 - universal GPIO with 3.3V logic levels
9	SD2-DATA0	PB14 - universal GPIO with 3.3V logic levels
10	LCD-HSYNC	PC6 - universal GPIO with 3.3V logic levels
11	SD2-DATA1	PB15 - universal GPIO with 3.3V logic levels
12	LCD-B4 (DATA4)	PE12 - universal GPIO with 3.3V logic levels
13	SD2-DATA2	PB3 - universal GPIO with 3.3V logic levels
14	LCD-B3 (DATA3)	PD10 - universal GPIO with 3.3V logic levels MISO line of SPI3
15	SD2-DATA3	PB4 - universal GPIO with 3.3V logic levels On the carrier board 1.1 incorrectly marked as PD10
16	LCD-G2 (DATA10)	PA6 - universal GPIO with 3.3V logic levels
17	LCD-B6 (DATA6)	PB8 - universal GPIO with 3.3V logic levels
18	LCD-G4 (DATA12)	PB10 - universal GPIO with 3.3V logic levels

19	LCD-B5 (DATA5)	PA3 - universal GPIO with 3.3V logic levels
20	LCD-G3 (DATA11)	PE11 - universal GPIO with 3.3V logic levels
21	LCD-G6 (DATA14)	PC7 - universal GPIO with 3.3V logic levels On the carrier board 1.1 incorrectly marked as PC2
22	LCD-G7 (DATA15)	PG8 - universal GPIO with 3.3V logic levels
23	LCD-G5 (DATA13)	PF11 - universal GPIO with 3.3V logic levels
24	LCD-R4 (DATA20)	PA5 - universal GPIO with 3.3V logic levels
25	LCD-R2 (DATA18)	PC10 - universal GPIO with 3.3V logic levels SCK line of SPI3
26	LCD-R3 (DATA19)	PB0 - universal GPIO with 3.3V logic levels
27	LCD-R6 (DATA22)	PA8 - universal GPIO with 3.3V logic levels MOSI line of SPI3
28	LCD-R7 (DATA23)	PE15 - universal GPIO with 3.3V logic levels On the carrier board 1.1 incorrectly marked as GND
29	LCD-R5 (DATA21)	PA9 - universal GPIO with 3.3V logic levels
30	LCD-DE	PE13 - universal GPIO with 3.3V logic levels
31	GPIO-PC2	PC2 - universal GPIO with 3.3V logic levels
32	LCD-PCLK	PE14 - universal GPIO with 3.3V logic levels
33	GPIO-PA14	PA14 - universal GPIO with 3.3V logic levels
34	LCD-RESET/DSI-RESET	PA1 - universal GPIO with 3.3V logic levels
35	PWR-ON	Function depends on LPCFG configuration (output)
36	PWR-LP	Low power mode signalling output
37	GND	-
38	GND	-
39	GND	-
40	GND	-

User Interface (switches and LEDs)



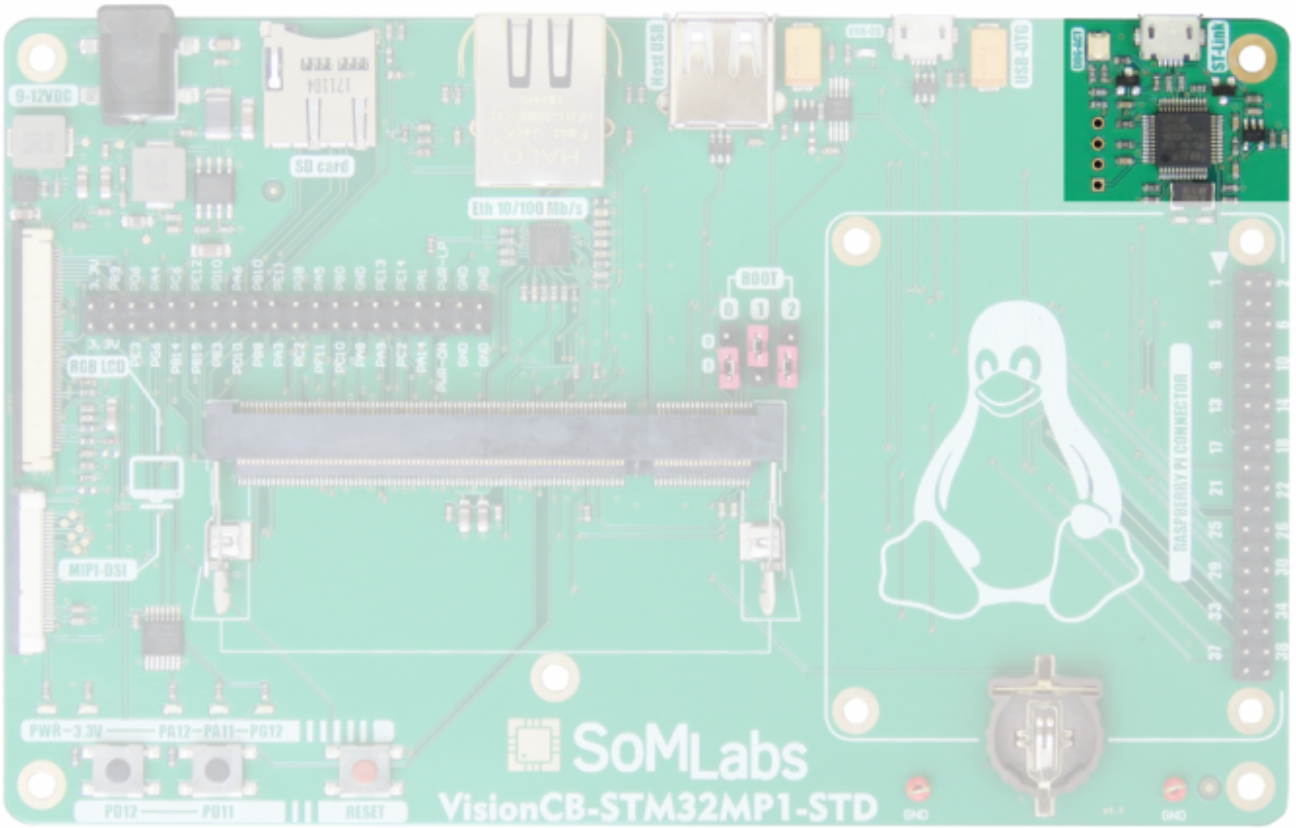
User switches

Switch	GPIO	Description
S100 (left)	PD12	10k pull-up
S101 (right)	PD11	10k pull-up

User LEDs

LED	GPIO	Description
D100	PA12	LED is buffered by logic inverter
D101	PA11	LED is buffered by logic inverter
D102	PG12	LED is buffered by logic inverter

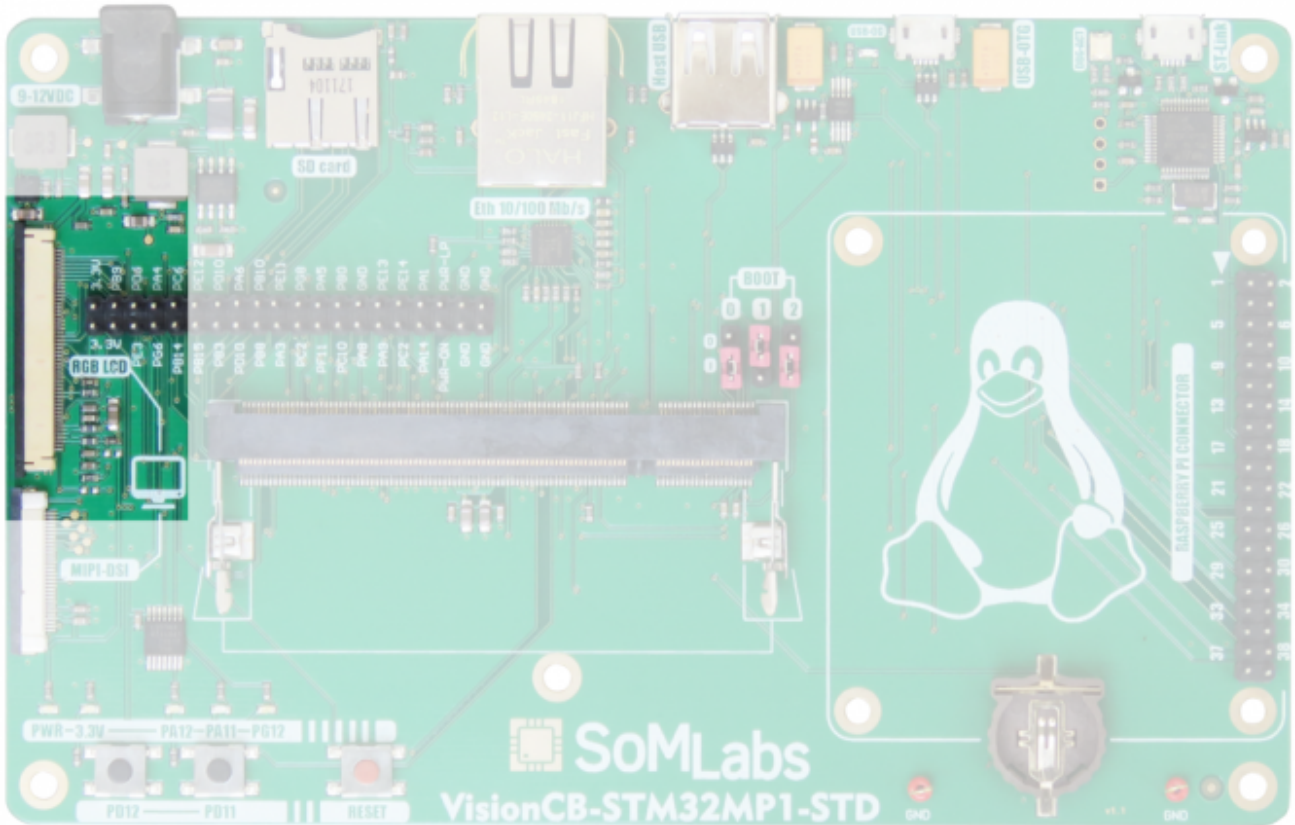
Console Port



Linux console port uses vCOM interface provided by ST-Link/v2-1.

MPU Port	GPIO	Description
UART4-TXD	PG11	-
UART4-RXD	PB2	-

LCD Parallel Connector

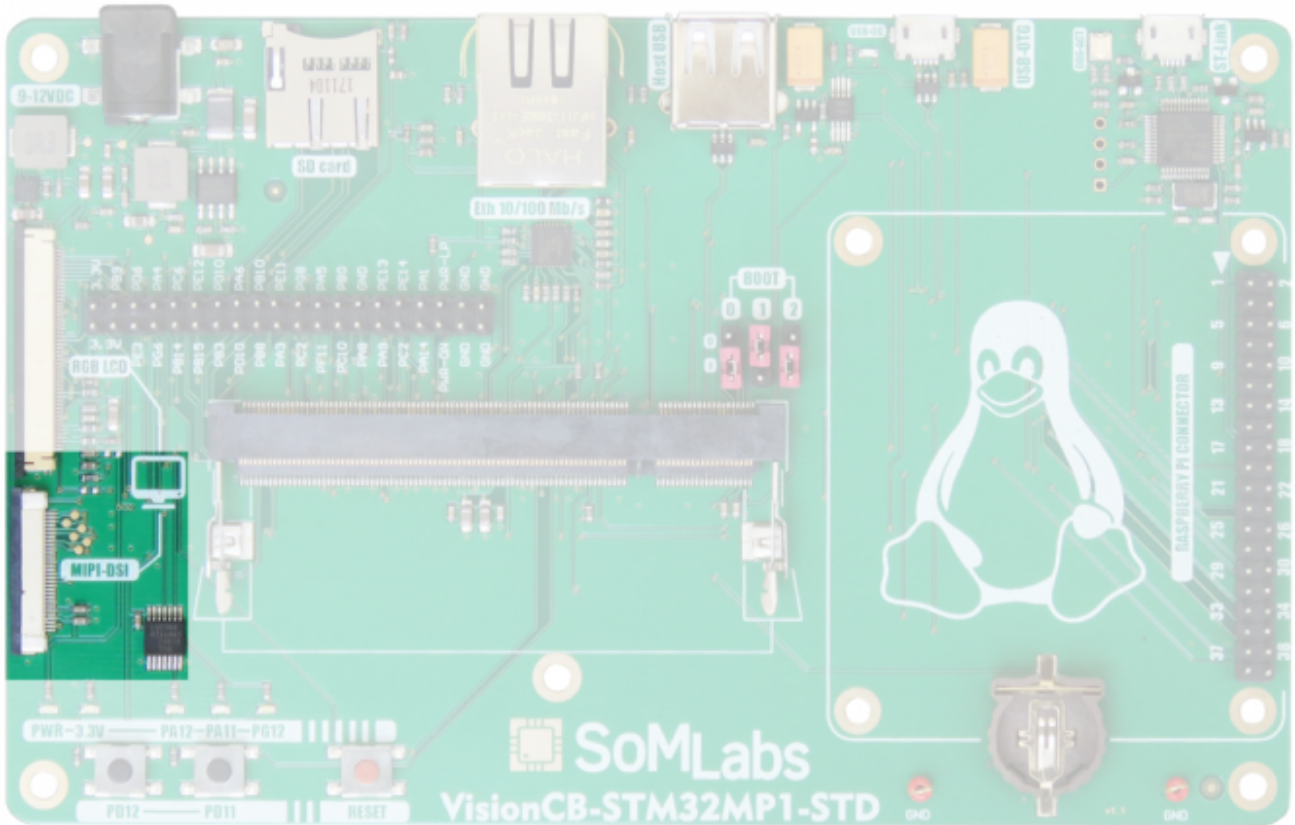


Pin	Default function name	Description
1	LCD-B0 (DATA0)	Internally connected to GND
2	LCD-B1 (DATA1)	Internally connected to GND
3	LCD-B2 (DATA2)	Connected to PD6
4	LCD-B3 (DATA3)	Connected to PD10
5	LCD-B4 (DATA4)	Connected to PE12
6	LCD-B5 (DATA5)	Connected to PA3
7	LCD-B6 (DATA6)	Connected to PB8
8	LCD-B7 (DATA7)	Connected to PB9
9	GND	-
10	LCD-G0 (DATA8)	Internally connected to GND
11	LCD-G1 (DATA9)	Internally connected to GND
12	LCD-G2 (DATA10)	Connected to PA6
13	LCD-G3 (DATA11)	Connected to PE11
14	LCD-G4 (DATA12)	Connected to PB10
15	LCD-G5 (DATA13)	Connected to PF11
16	LCD-G6 (DATA14)	Connected to PC7
17	LCD-G7 (DATA15)	Connected to PG8
18	GND	-
19	LCD-R0 (DATA16)	Internally connected to GND

20	LCD-R1 (DATA17)	Internally connected to GND
21	LCD-R2 (DATA18)	Connected to PC10
22	LCD-R3 (DATA19)	Connected to PB0
23	LCD-R4 (DATA20)	Connected to PA5
24	LCD-R5 (DATA21)	Connected to PA9
25	LCD-R6 (DATA22)	Connected to PA8
26	LCD-R7 (DATA23)	Connected to PE15
27	GND	-
28	LCD-DE	Connected to PE13
29	LCD-HSYNC	Connected to PC6
30	LCD-VSYNC	Connected to PA4
31	GND	-
32	LCD-PCLK	Connected to PE14
33	GND	-
34	-	-
35	-	-
36	TP-INT	Connected to PA14 line 4,7k pull-up
37	PWM	Connected to PD15 line PWM backlight brightness adjustment Channel 4 of TIM4 (PWM)
38	-	-
39	-	-
40	-	-
41	-	-
42	I2C4_SCL	Connected to PE2 line 4,7k pull-up
43	I2C4_SDA	Connected to PB7 line 4,7k pull-up
44	GND	
45	+3.3V	LCD logic power supply
46	+3.3V	LCD logic power supply
47	+3.3V	LCD backlight power supply
48	+3.3V	LCD backlight power supply
49	LCD-RESET	Connected to PA1 line
50	BACKLT PWR EN	Connected to PC2 line Backlight ON/OFF 4,7k pull-up

Note: Simultaneous use of both displays (MIPI-DSI and Parallel) is not possible

LCD MIPI-CSI Connector

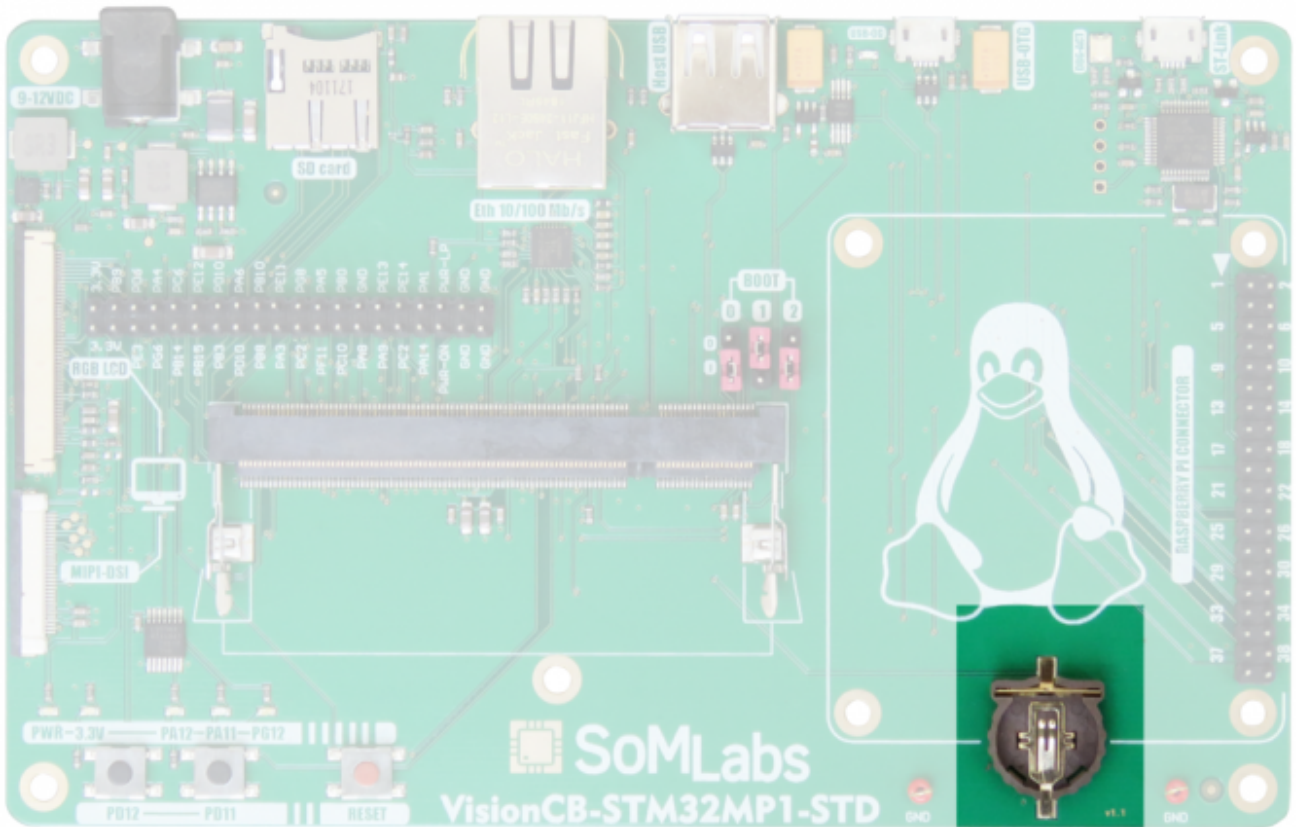


Pin	Default function name	Description
1	GND	-
2	DSI-CKp	Positive MIPI clock signal
3	DSI-CKn	Negative MIPI clock signal
4	GND	-
5	DSI-D0p	Positive Lane 0 signal
6	DSI-D0n	Negative Lane 0 signal
7	GND	-
8	DSI-D1p	Positive Lane 1 signal
9	DSI-D1n	Negative Lane 1 signal
10	GND	-
11	-	-
12	-	-
13	GND	-
14	-	-
15	-	-
16	GND	-
17	DSI-I2C-SCL	Connected to PE2 line 4,7k pull-up
18	DSI-I2C-SDA	Connected to PB7 line 4,7k pull-up
19	GND	-

20	DSI-RESET	Connected to PA1 line
21	DSI-TP-INT	Connected to PA14 line
22	DSI-TP-RST	-
23	GND	-
24	+3.3V	LCD logic power supply
25	+3.3V	LCD logic power supply
26	+5V	LCD backlight power supply
27	+5V	LCD backlight power supply
28	DSI-BL-PWM	Connected to PD15 line PWM backlight brightness adjustment Channel 4 of TIM4 (PWM)
29	DSI-BL-EN	Connected to PC2 line Backlight ON/OFF 4,7k pull-up
30	GND	-

Note: Simultaneous use of both displays (MIPI-DSI and Parallel) is not possible

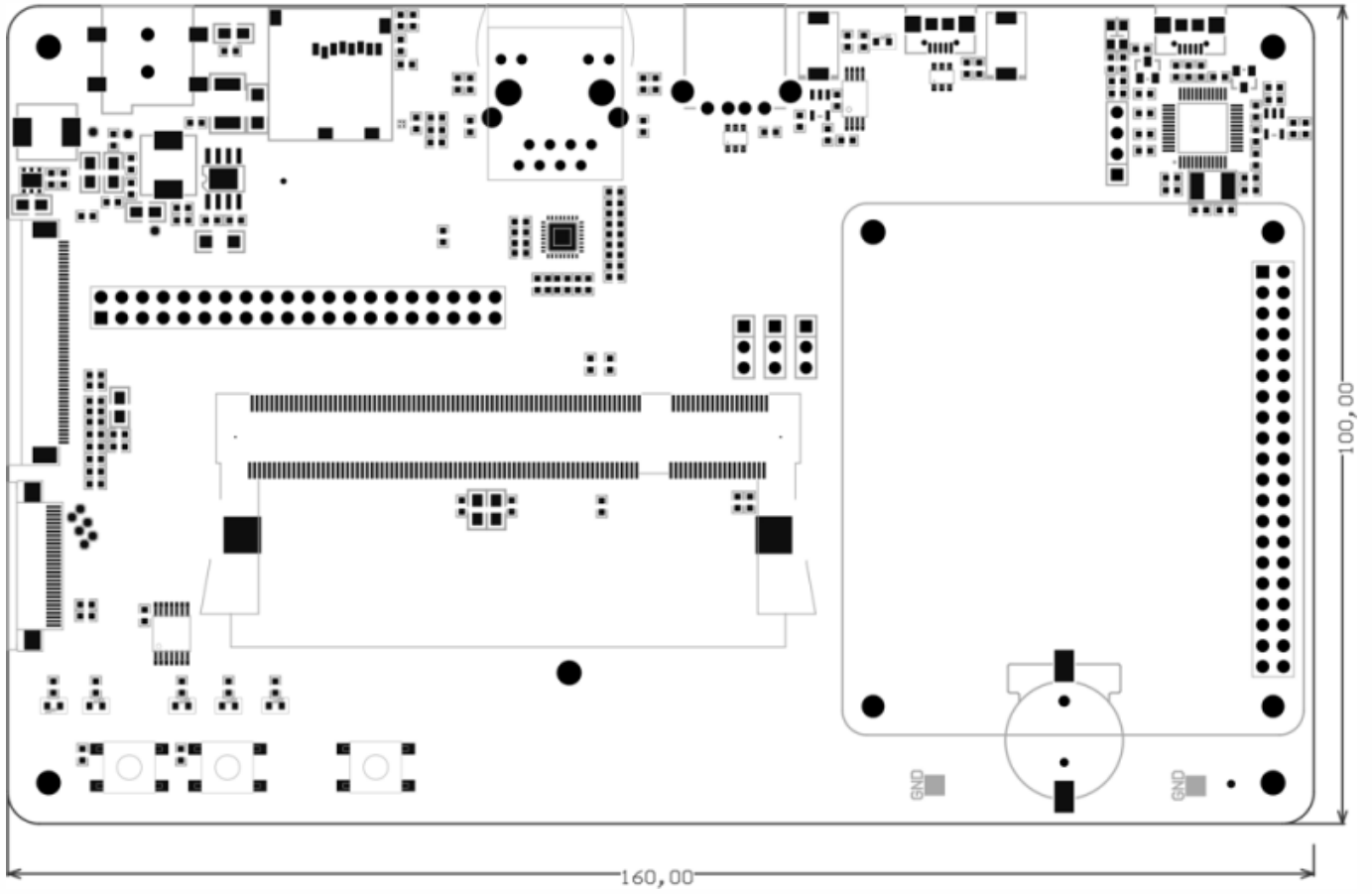
MPU internal RTC Battery Socket



Optional CR1220 lithium 3V battery is connected to VDD-COIN-3V RTC backup line.

It is not allowed to use a primary battery, because of a small reverse charging current.

Dimensions





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