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# VisionCB-6ULL-STD Datasheet and Pinout

Rev. 20200709131021

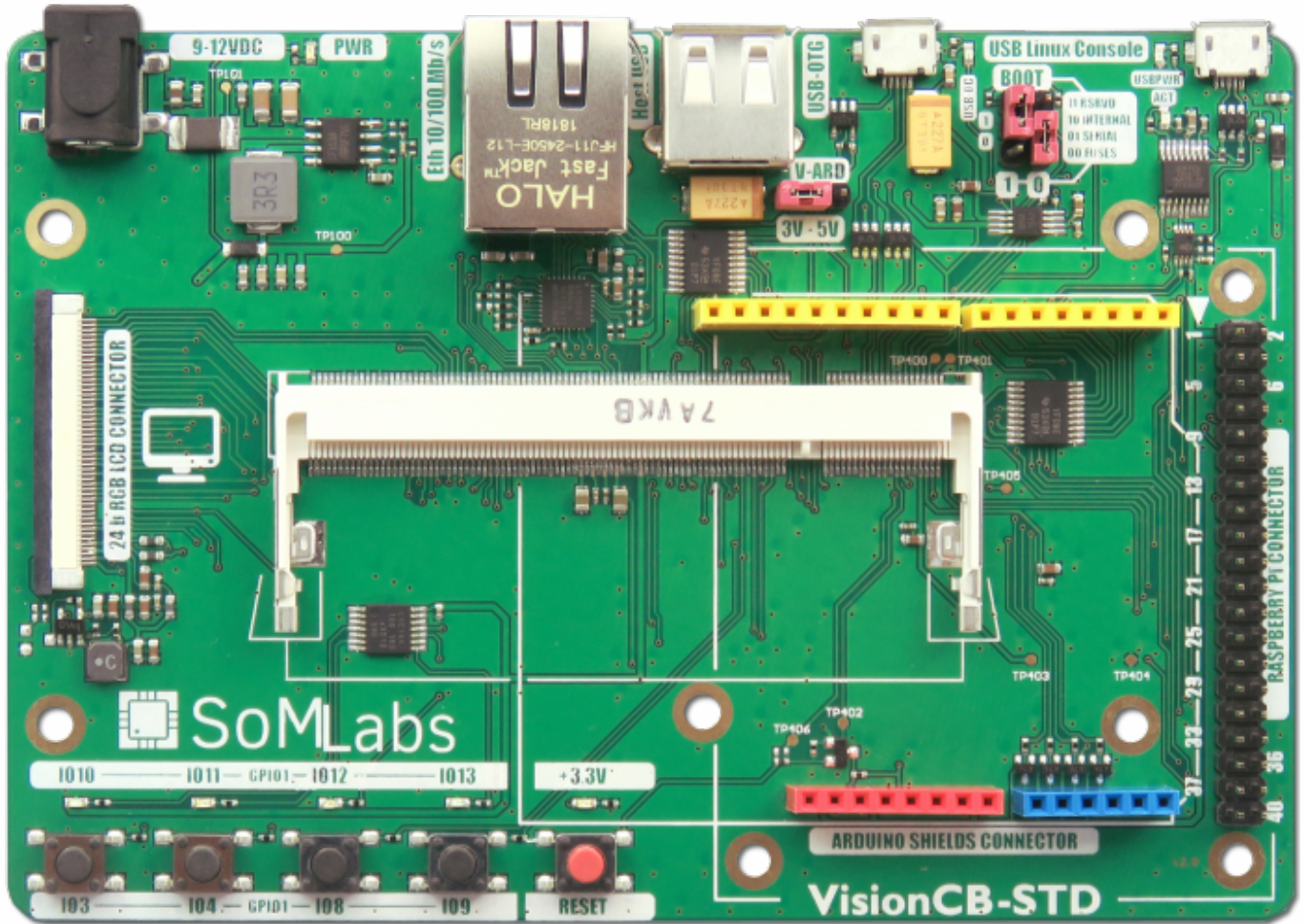
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# VisionCB-6ULL-STD v.2.0 Datasheet and Pinout

## General description



VisionCB-6ULL-STD v2.0 is a carrier board for the VisionSOM family of computer-on-modules which are powered by NXP i.MX 6UL or i.MX 6ULL application processors (ARM Cortex-A7). 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 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 SODIMM connector.

## Applications

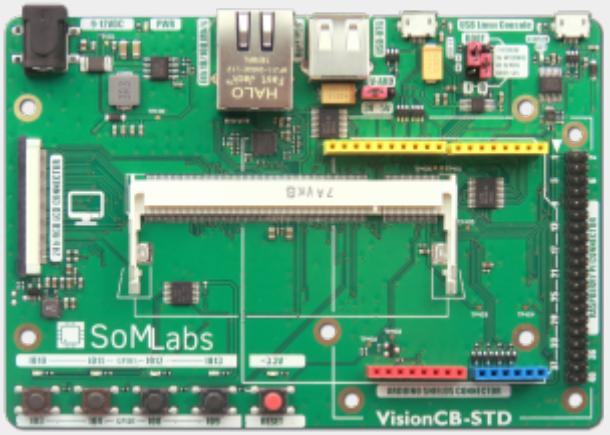
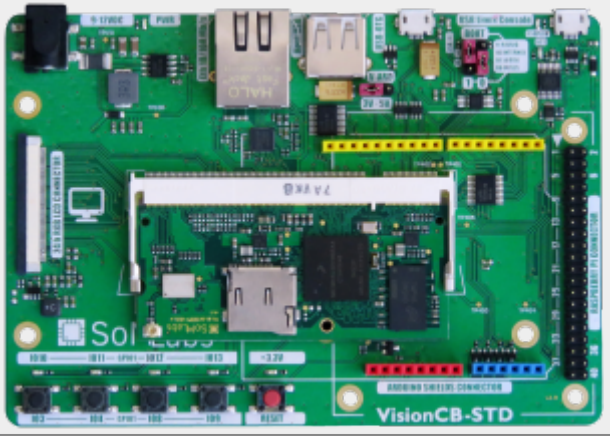
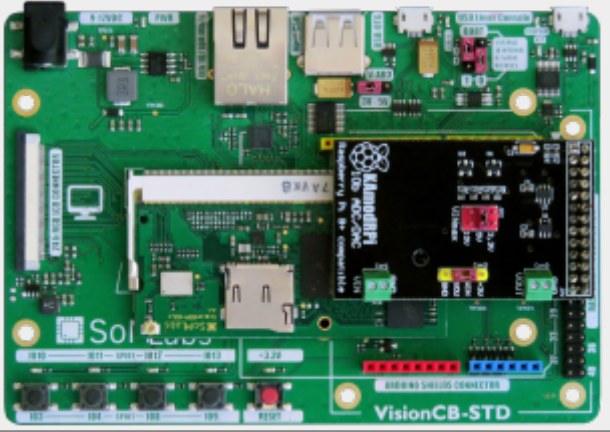
- Industrial embedded Linux computer
- Home Appliances
- Home Automation - Smart Home
- Human-machine Interfaces (HMI)
- Point-of-sales (POS) terminals
- Cash Register
- 2D barcode scanners and printers

- Smart grid Infrastructure
- IoT gateways
- Residential gateways
- Machine vision equipment
- Robotics
- Fitness/outdoor equipment

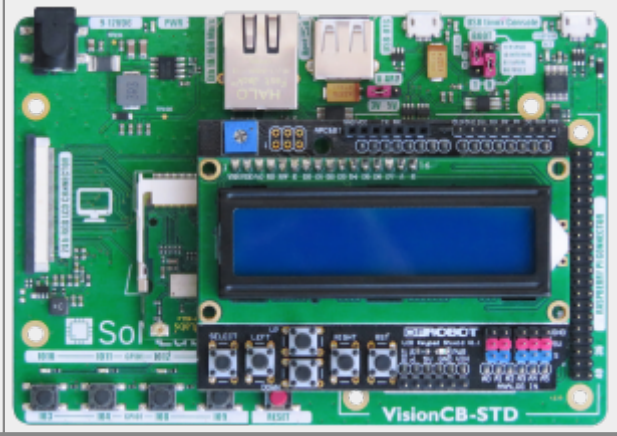
## Features

- Carrier Board (Base Board) compatible with the VisionSOM family of modules based on NXP i.MX 6UL / 6ULL application processors
- Core clock up to 696MHz (VisionSOM-6UL) or up to 900MHz (VisionSOM-6ULL)
- Up to 512MB SDRAM DDR3L (depends on used VisionSOM module)
- Up to 512MB NAND Flash / 32GB eMMC / uSD memory card (depends on used VisionSOM module)
- Optional Murata 802.11b/g/n Wi-Fi and Bluetooth v4.1+EDR module
- SoM Interface: SODIMM200
- Expansion Connectors:
  - Arduino Uno Rev. 3 1x8, 1x6, 1x8, 1x10 Pin Headers (Female)
  - Raspberry Pi compatible connectors 2x20 Pin Header (Male)
- 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 (via FTDI FT230 UART to USB converter)
- Display Interface: 50-pin FFC/FPC Parallel RGB - 24-bit, (1366 x 768 Max. Resolution)
- User Interface:
  - 5 Pushbuttons
  - 5 LEDs
- Boot selector
- Power Supply
  - DC connector: Input Voltage 9-12V DC
  - MicroUSB connector: Input Voltage 5V DC
- Temperature Range: 0 to +70°C
- Board Size: 130mm x 90mm x 17mm

## Pictures of VisionCB-6ULL-STD v2.0 board

Version	Photo
VisionCB-6ULL-STD v2.0 board only	
VisionCB-6ULL-STD v2.0 board with VisionSOM-6ULL	
VisionCB-6ULL-STD v2.0 board with Raspberry Pi HAT	

VisionCB-6ULL-STD v2.0 board with Arduino Shield

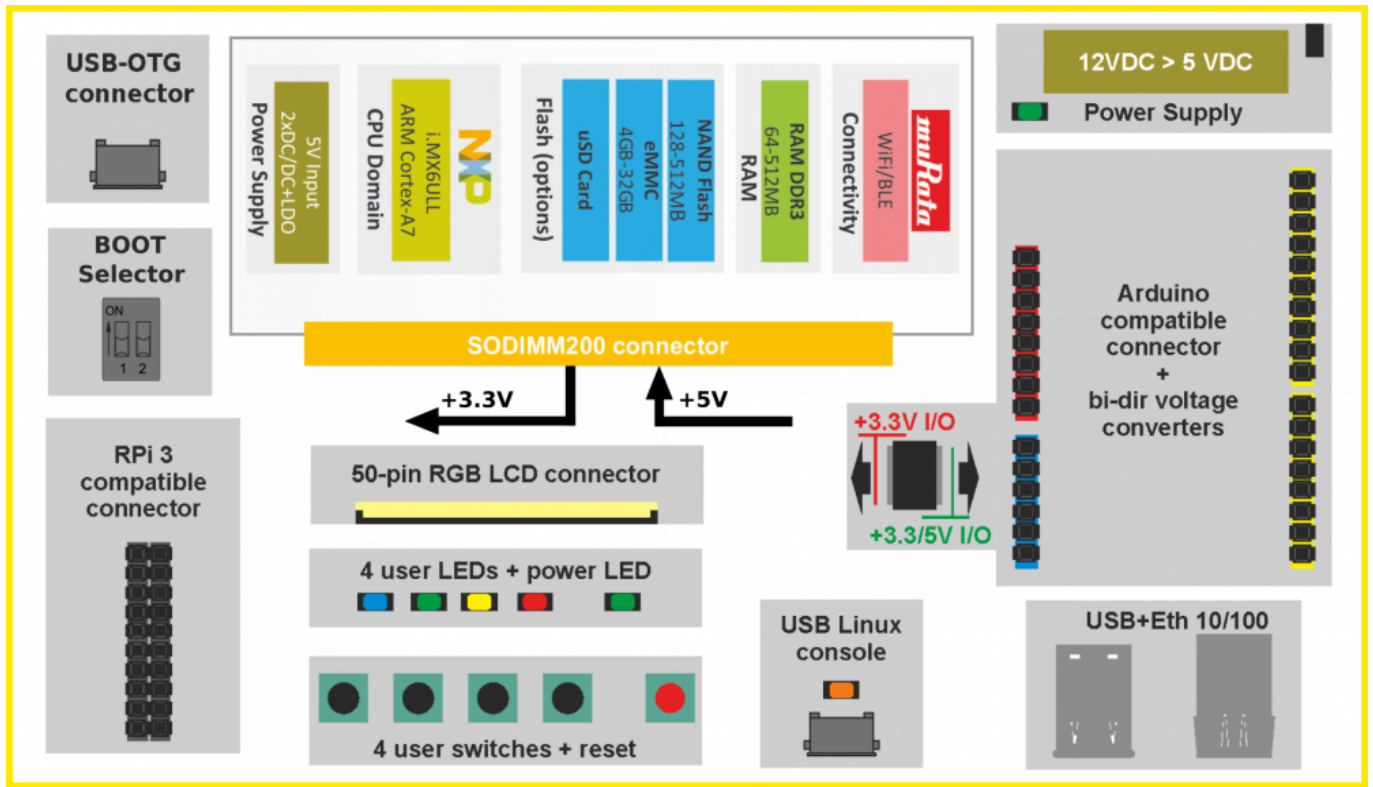


## Ordering info

VisionCB-6ULL-STD v2.0



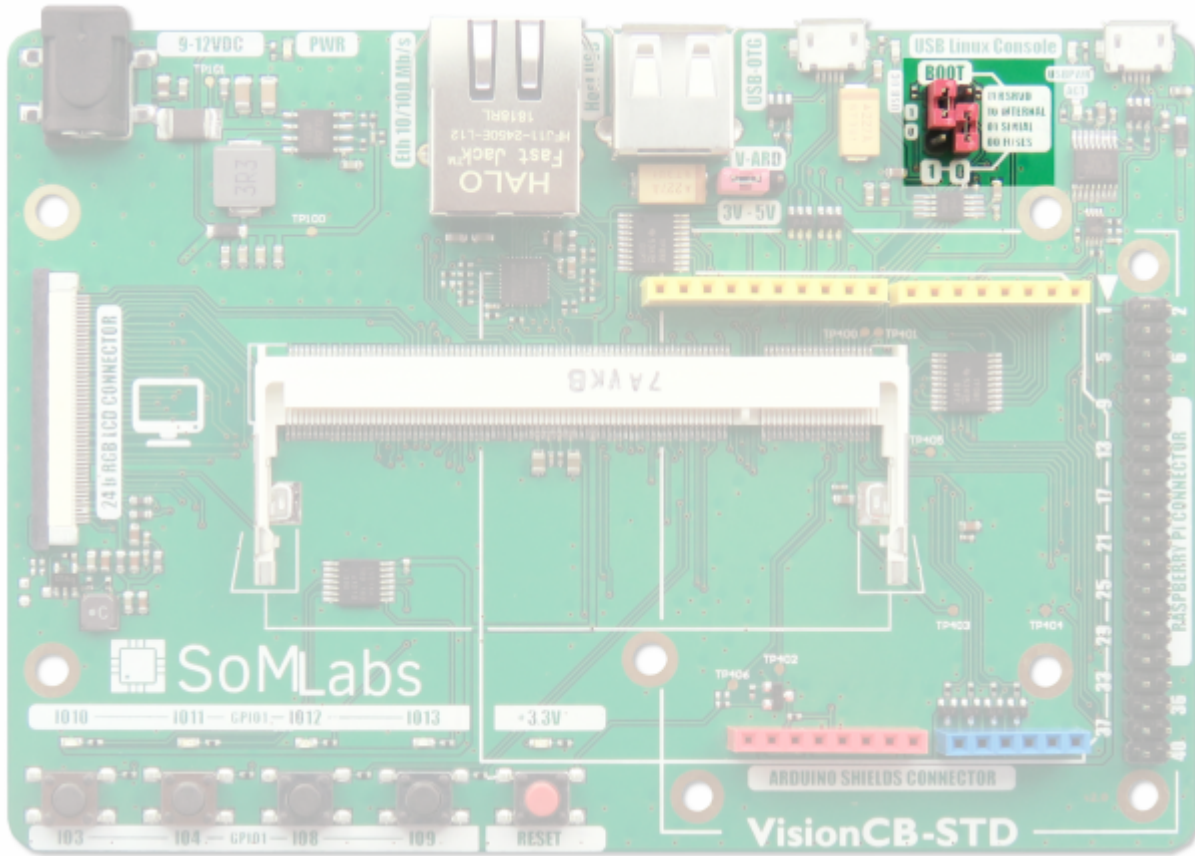
# Block Diagram



## Electrical parameters

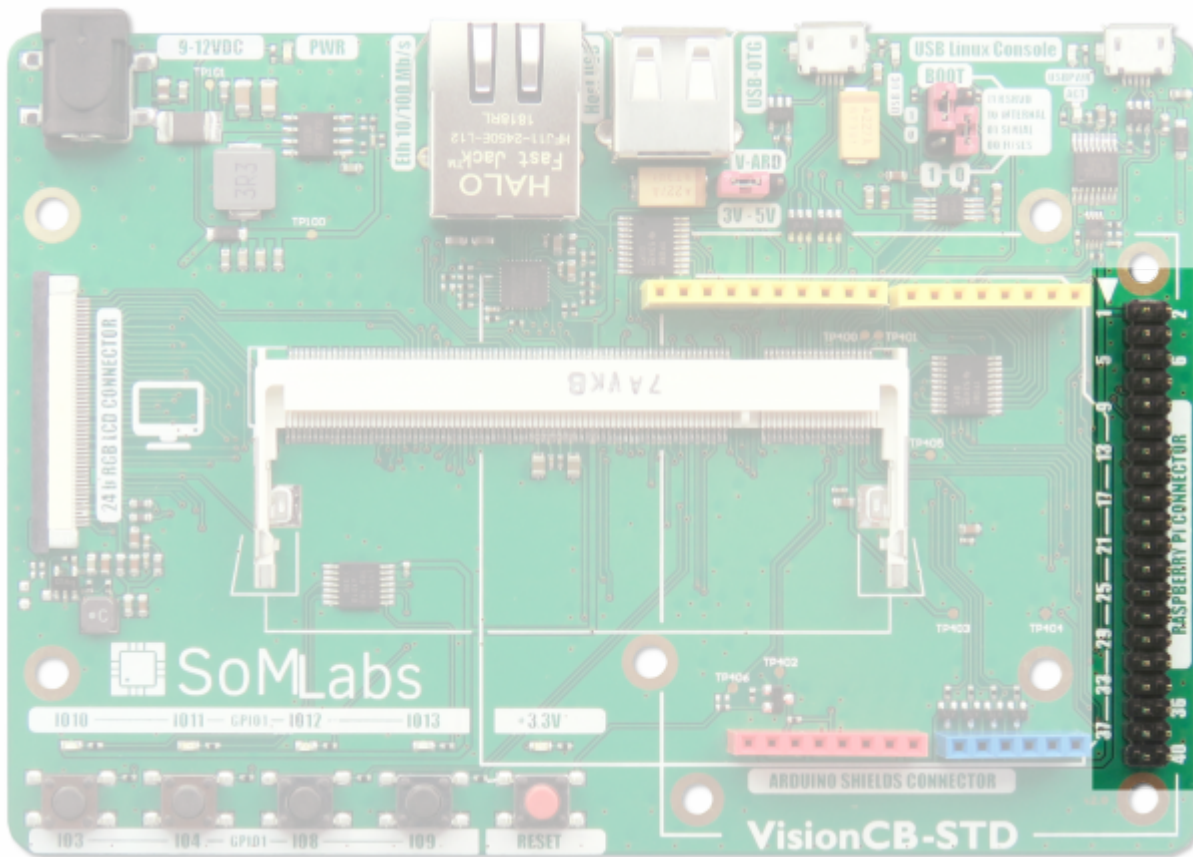
Parameter	Value			Units	Comment
	Min.	Typ.	Max.		
Power Supply (J100 input)	9.0	12.0	15.0	V	Positive pole on central connector of J100
Supply current	-	-	0.15	A	Excluding LCD, USB and antoher external loads
USB power supply	4.75	4.9	5.5	V	On J201 (Linux USB console connector)
Input GPIO voltage (J405)	0	-	3.3	V	LCD-RGB connector
Input GPIO voltage (J504)	0	-	3.3	V	Raspberry Pi compatible
Input GPIO voltage (J502, J503)	0	-	3.3/5	V	Arduino compatible connector (digital I/O)
Input GPIO voltage (J501)	0	-	3.3	V	Arduino compatible connector (analog inputs)

## Boot Selector



BOOTx		Boot Mode
BOOT1	BOOT0	
1	1	Reserved
1	0	Internal
0	1	Serial
0	0	Fuses

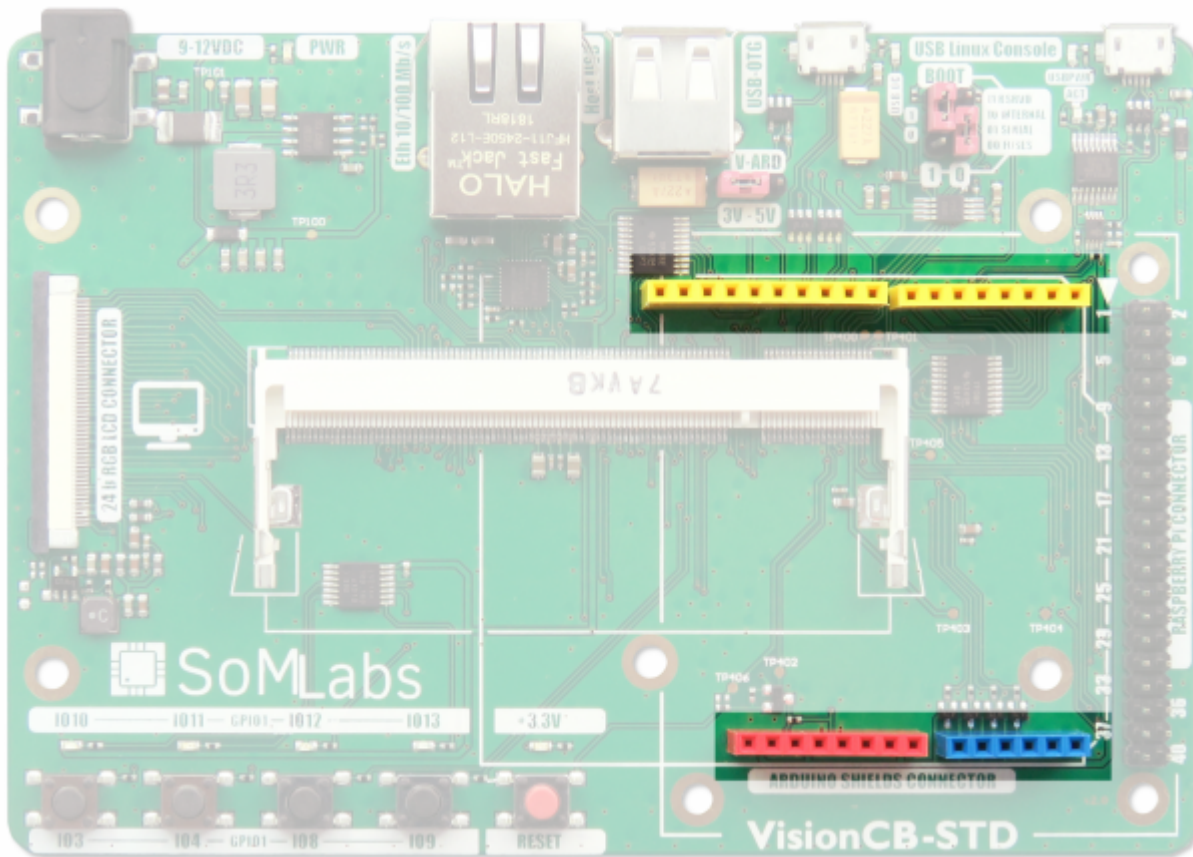
## Raspberry Pi compatible I/O header (J504)



J504 Pin	Default function name	Description
1	VCC-3V3	+3.3V generated by internal SOM LDO converter (limited load current).
2	VCC-5V0	+5V generated by carrier board built-in DC/DC converter.
3	UART5-RXD	Default: UART5 RxD input or universal GPIO with 3.3V logic levels.
4	VCC-5V0	+5V generated by carrier board built-in DC/DC converter.
5	UART5-TXD	Default: UART5 TxD output or universal GPIO with 3.3V logic levels.
6	GND	-
7	ENET2_TXD0	Default: ENET2 TXD0 line or universal GPIO with 3.3V logic levels.
8	UART4-TXD	Default: UART4 TXD output or universal GPIO with 3.3V logic levels.
9	GND	-
10	UART4-RXD	Default: UART4 RXD input or universal GPIO with 3.3V logic levels.
11	ENET2_CRSDV	Default: ENET2 CRS_DV line or universal GPIO with 3.3V logic levels.
12	GPIO5	Universal GPIO with 3.3V logic levels.
13	UART1-CTS	Default: UART1 CTS line or universal GPIO with 3.3V logic levels.
14	GND	-
15	UART1-RTS	Default: UART1 RTS line or universal GPIO with 3.3V logic levels.
16	GPIO8	Universal GPIO with 3.3V logic levels.
17	VCC-3V3	+3.3V generated by internal SOM LDO converter (limited load current)
18	GPIO9	Universal GPIO with 3.3V logic levels.
19	UART2-CTS	Default: UART2 CTS line or universal GPIO with 3.3V logic levels.
20	GND	-

21	UART2-RTS	Default: UART2 RTS line or universal GPIO with 3.3V logic levels.
22	GPIO0	Universal GPIO with 3.3V logic levels.
23	UART2-RXD	Default: UART2 RXD input or universal GPIO with 3.3V logic levels.
24	UART2-TXD	Default: UART2 TXD input or universal GPIO with 3.3V logic levels.
25	GND	-
26	ENET2_TXEN	Default: ENET2 TXEN line or universal GPIO with 3.3V logic levels.
27	-	-
28	-	-
29	ENET2_TX_CLK	Default: ENET2 TX_CLK line or universal GPIO with 3.3V logic levels.
30	GND	-
31	ENET2_RXER	Default: ENET2 RXER line or universal GPIO with 3.3V logic levels.
32	JTAG-MOD	Default: JTAG MOD input or universal GPIO with 3.3V logic levels.
33	UART3-CTS	Default: UART3 CTS line or universal GPIO with 3.3V logic levels.
34	GND	-
35	UART3-RTS	Default: UART3 RTS line or universal GPIO with 3.3V logic levels.
36	JTAG-TDO	Default: JTAG TDO output or universal GPIO with 3.3V logic levels.
37	ENET2_RXD1	Default: ENET2 RXD1 line or universal GPIO with 3.3V logic levels.
38	JTAG-TDI	Default: JTAG TDI input or universal GPIO with 3.3V logic levels.
39	GND	-
40	JTAG-TMS	Default: JTAG TMS output or universal GPIO with 3.3V logic levels.

## Arduino compatible I/O headers (J500-J503)



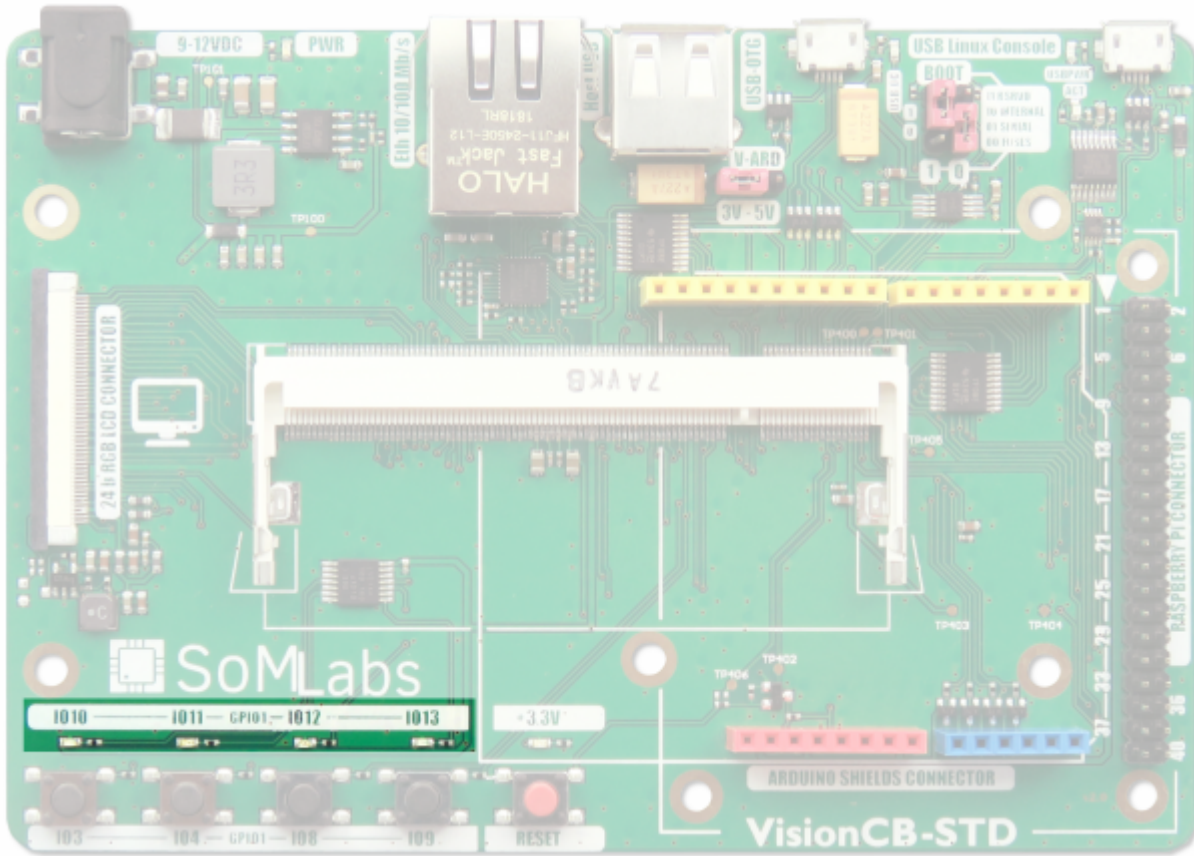
Pin	Arduino name	Default function name	Description
Power connector J500, red connector			
1	-	-	-
2	IOREF	VCC-3V3	+3.3V generated by internal SOM LDO converter (limited load current).
3	RESET	POR-B	External warm reset input, active L.
4	3.3V	VCC-3V3	+3.3V generated by internal SOM LDO converter (limited load current).
5	5V	VCC-5V0	+5V generated by carrier board built-in DC/DC converter.
6	GND	GND	-
7	GND	GND	-
8	VIN	VCC-3V3	+3.3V generated by internal SOM LDO converter (limited load current).
Analog inputs connector J501, blue connector			
1	AIN0	GPIO1	Universal GPIO with 3.3V logic levels.
2	AIN1	GPIO5	Universal GPIO with 3.3V logic levels.
3	AIN2	GPIO8	Universal GPIO with 3.3V logic levels.
4	AIN3	GPIO9	Universal GPIO with 3.3V logic levels.
5	-	-	-
6	-	-	-
Digital I/Os connector J503, yellow connector			
1	DIO0	UART4-RXD	Default: UART4 RXD line or universal GPIO with 5V logic levels.
2	DIO1	UART4-TXD	Default: UART4 TXD line or universal GPIO with 5V logic levels.
3	DIO2	UART3-RTS	Default: UART3 RTS line or universal GPIO with 5V logic levels.

4	DIO3	UART3-CTS	Default: UART3 CTS line or universal GPIO with 5V logic levels.
5	DIO4	ENET2_RXER	Default: ENET2 RX ER line or universal GPIO with 5V logic levels.
6	DIO5	ENET2_TX_CLK	Default: ENET2 TX CLK line or universal GPIO with 5V logic levels.
7	DIO6	UART1-RTS	Default: UART1 RTS line or universal GPIO with 5V logic levels.
8	DIO7	UART1-CTS	Default: UART1 CTS line or universal GPIO with 5V logic levels.
Digital I/Os connector J502, yellow connector			
1	DIO8	ENET2_TXD0	Default: ENET2 TXD0 line or universal GPIO with 5V logic levels.
2	DIO9	ENET2_CRSDV	Default: ENET2 CRS DV line or universal GPIO with 5V logic levels.
3	DIO10	UART2-TXD	Default: UART2 TXD line or universal GPIO with 5V logic levels.
4	DIO11	UART2-CTS	Default: UART2 CTS line or universal GPIO with 5V logic levels.
5	DIO12	UART2-RTS	Default: UART2 RTS line or universal GPIO with 5V logic levels.
6	DIO13	UART2-RXD	Default: UART2 RXD line or universal GPIO with 5V logic levels.
7	GND	GND	-
8	AREF	VCC-3V3	+3.3V generated by internal SOM LDO converter (limited load current).
9	DIO14-SCL	UART5-RXD	Default: UART5 RXD line or universal GPIO with 5V logic levels.
10	DIO15-SDA	UART5-TXD	Default: UART5 TXD line or universal GPIO with 5V logic levels.

Notes:

1. All I/O lines are 5V compatible.
2. RESET line is 5V compatible.
3. Preferred voltage range on AIN0...AIN3 lines is 0...+3.3V.
4. Voltage level compatibility can be changed using jumper selector (V-ARD), but voltage range on AIN0...AIN3 lines must be 0...+3.3V.

## User LEDs connections



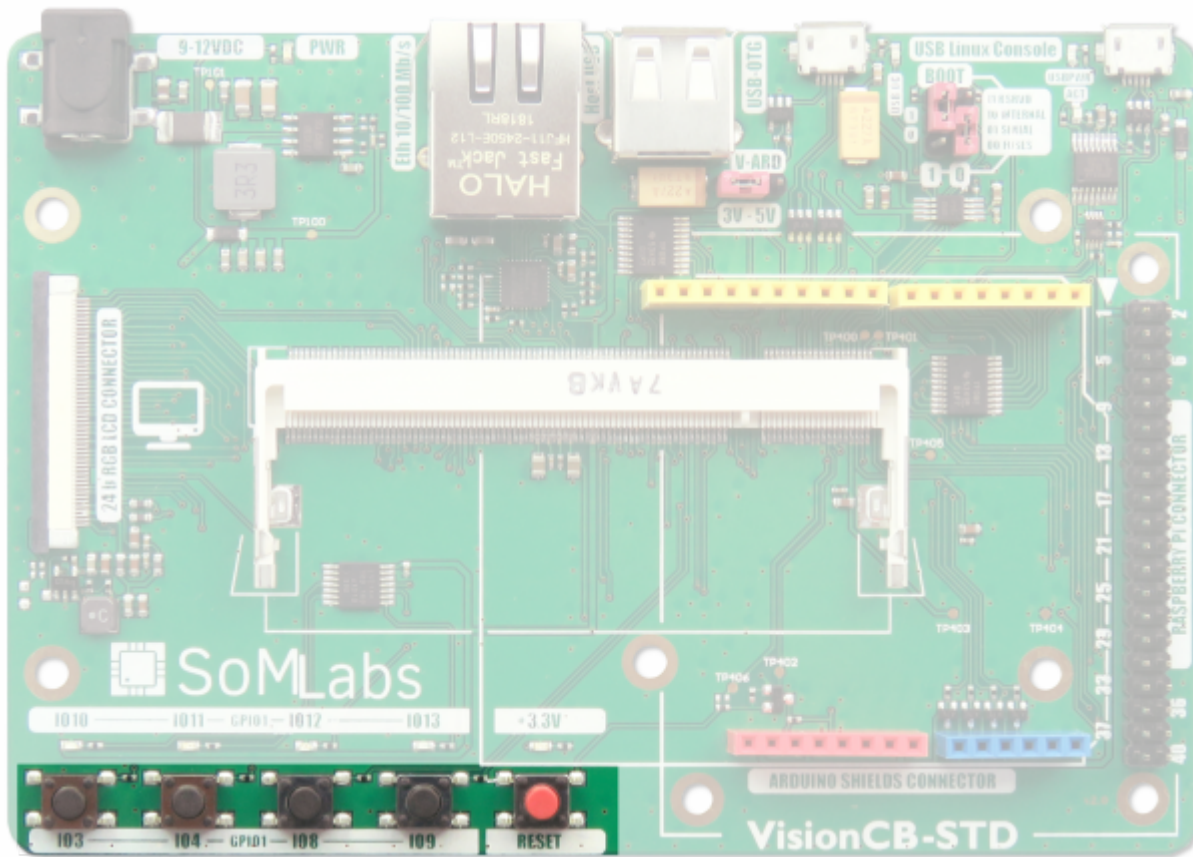
LED	PCB symbol	GPIO	Description
D400/blue	GPIO10	GPIO1_10	Default: JTAG MOD input or universal GPIO with 3.3V logic levels.
D401/green	GPIO11	GPIO1_11	Default: JTAG TMS input or universal GPIO with 3.3V logic levels.
D403/yellow	GPIO12	GPIO1_12	Default: JTAG TDO input or universal GPIO with 3.3V logic levels.
D402/red	GPIO13	GPIO1_13	Default: JTAG TDI input or universal GPIO with 3.3V logic levels.

### Notes:

1. LEDs are switched on by logic „1” set at the GPIO outputs.
2. LEDs are controlled by current drivers and do not load the GPIOs.



## User switches connections

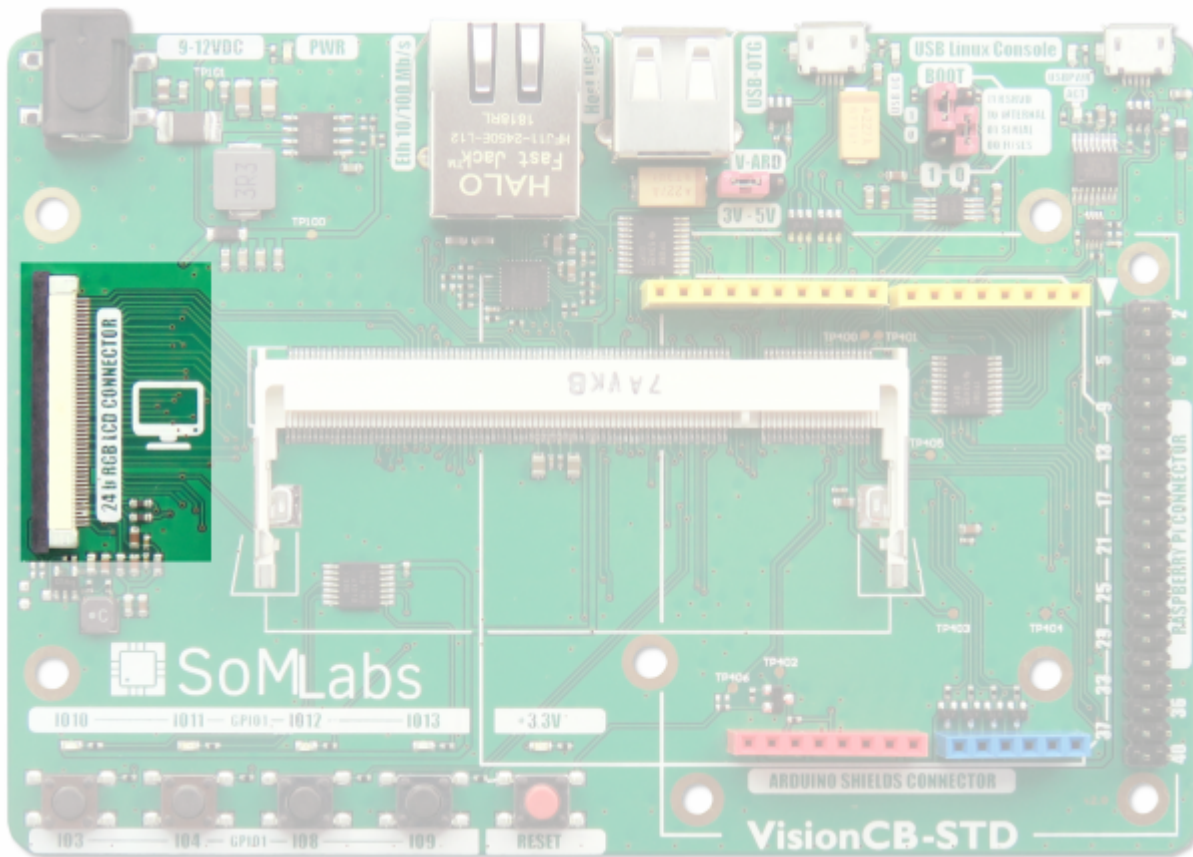


Switch	PCB symbol	GPIO	Description
S402	GPIO3	GPIO1_IO03	Universal GPIO with 3.3V logic levels.
S403	GPIO4	GPIO1_IO04	Universal GPIO with 3.3V logic levels.
S404	GPIO8	GPIO1_IO08	Universal GPIO with 3.3V logic levels.
S405	GPIO9	GPIO1_IO09	Universal GPIO with 3.3V logic levels.

### Notes:

1. After button pressing on GPIO lines are set to „0”.
2. GPIO lines connected to switches are separated from board’s environment by 1k resistors.

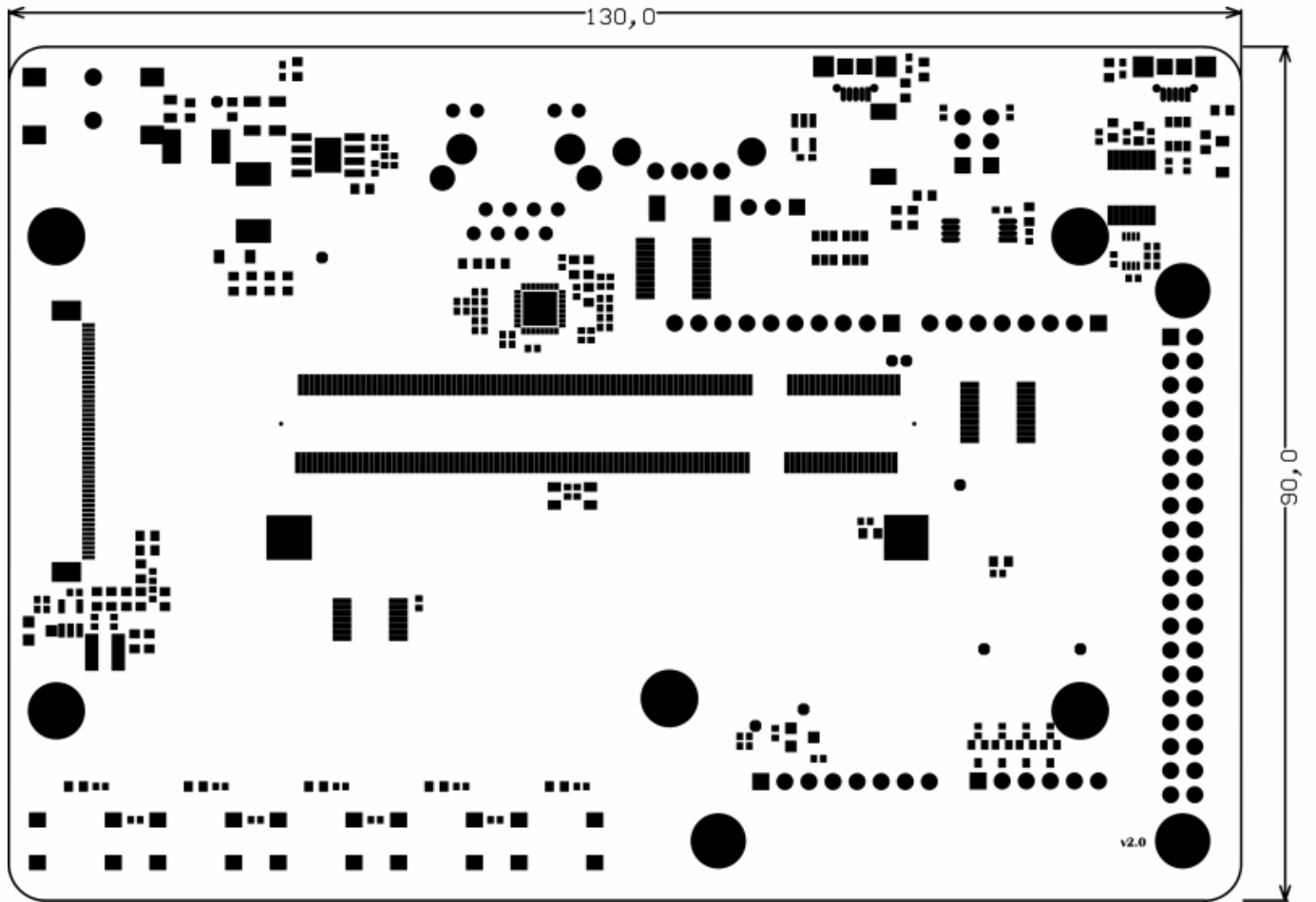
## TFT LCD connector (RGB 24b, J405)



J405 pin	Default function name	LCD interface name
1	LCD-DATA0	LCD-B0
2	LCD-DATA1	LCD-B1
3	LCD-DATA2	LCD-B2
4	LCD-DATA3	LCD-B3
5	LCD-DATA4	LCD-B4
6	LCD-DATA5	LCD-B5
7	LCD-DATA6	LCD-B6
8	LCD-DATA7	LCD-B7
9	GND	GND
10	LCD-DATA8	LCD-G0
11	LCD-DATA9	LCD-G1
12	LCD-DATA10	LCD-G2
13	LCD-DATA11	LCD-G3
14	LCD-DATA12	LCD-G4
15	LCD-DATA13	LCD-G5
16	LCD-DATA14	LCD-G6
17	LCD-DATA15	LCD-G7
18	GND	GND
19	LCD-DATA16	LCD-R0
20	LCD-DATA17	LCD-R1

21	LCD-DATA18	LCD-R2
22	LCD-DATA19	LCD-R3
23	LCD-DATA20	LCD-R4
24	LCD-DATA21	LCD-R5
25	LCD-DATA22	LCD-R6
26	LCD-DATA23	LCD-R7
27	GND	GND
28	LCD-DE	DE
29	LCD-HSYNC	HSYNC
30	LCD-VSYNC	VSYNC
31	GND	GND
32	LCD-PCLK	DCLK
33	GND	GND
34	GPIO4	TS-YPUL
35	GPIO3	TS-YNUR
36	GPIO2	TS-YPLL
37	GPIO1	TS-YNLR
38	-	-
39	-	-
40	-	-
41	-	-
42	UART5-TXD	I2C-SCL
43	UART5-RXD	I2C-SDA
44	GND	GND
45	VCC-LCD	+3.3V (controlled by ENET2_TXEN)
46	VCC-LCD	+3.3V (controlled by ENET2_TXEN)
47	VCC-5V0	+5.0V
48	VCC-5V0	+5.0V
49	LCD-RESET	RESET
50	JTAG-nTRST	PWREN

# Dimensions





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