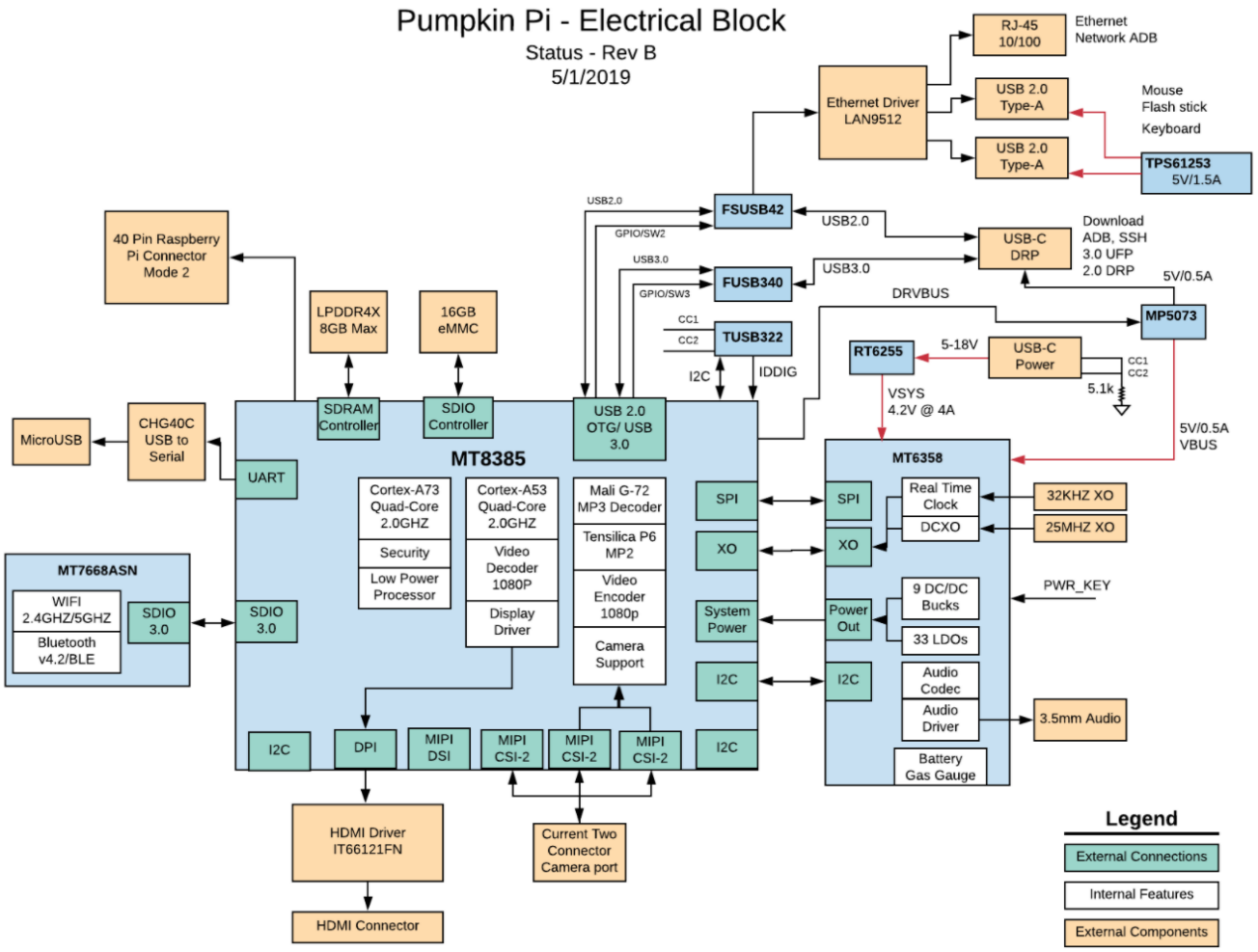
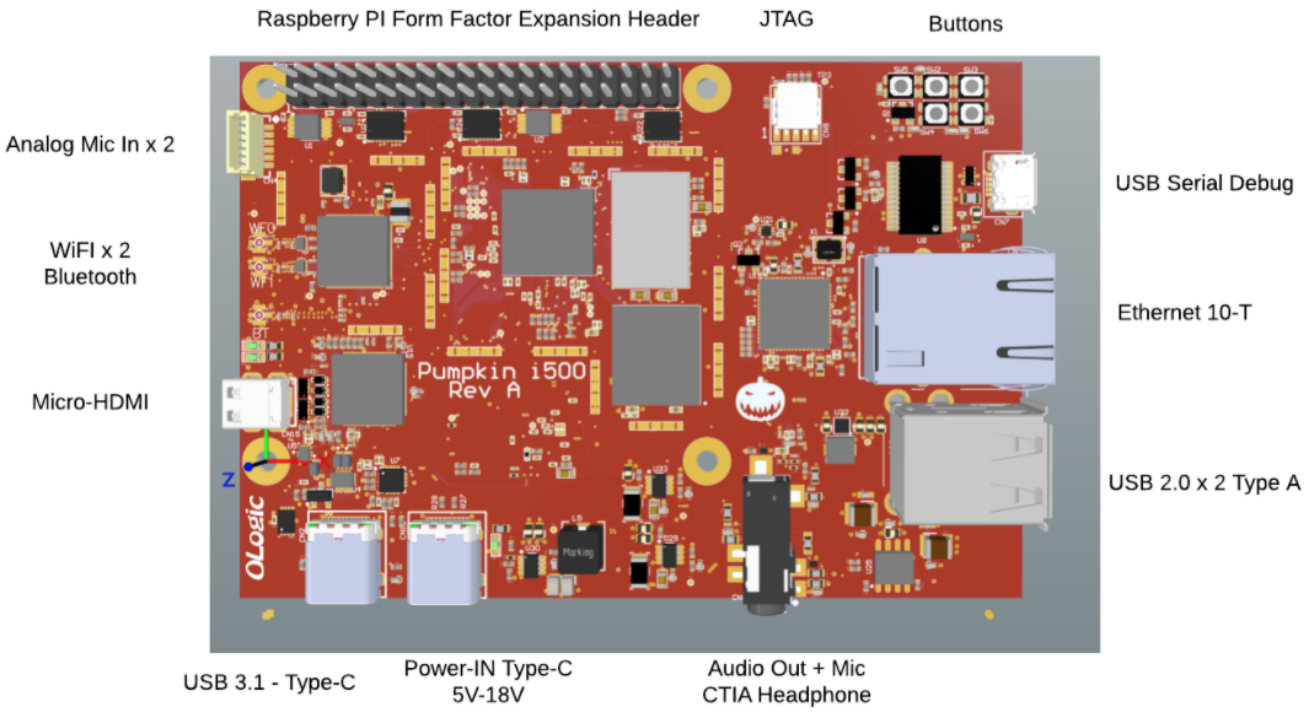
Pumpkin i500 Board Reference Guide

The purpose of this document is to give an overview of all the hardware items on the i500 Pumpkin Board.



The Top of the Pumpkin i500:

The top of the board looks like the following picture



The Type-C Power input connector is non-standard, in that it supports wide-input voltage. You can supply anywhere from 5V up to 18V into the Type-C connector to power the Pumpkin i500.

The 40-Pin Raspberry PI Compatible Connector has the following pinout. You 5V rail on this connection is output-only. Unlike a Raspberry PI, you cannot back-power the board by putting 5V on the 5V pins. You must only power the board via the Type-C power only input.

Legend

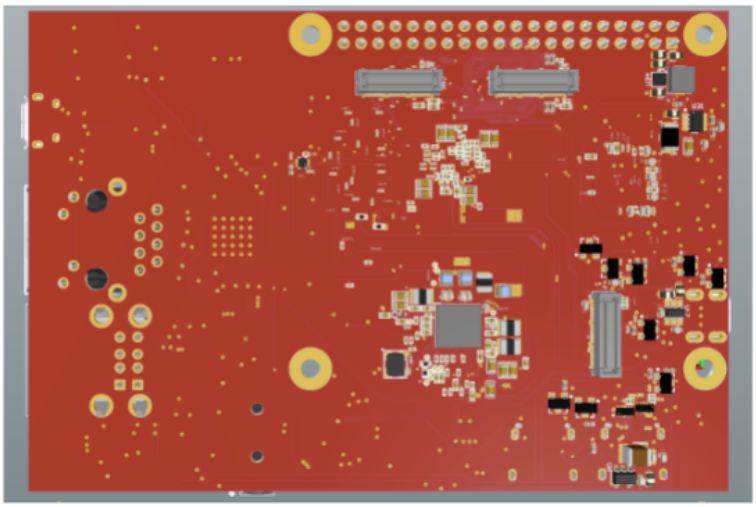
3-Ch mic-array ADC
CODEC/7.1DAC
SPI
UART
I2C
GPIO
PWM
Power
Ground
TDM

Ball Location	PAD	GPIO	MUX		Pumpkin i500			MUX	GPIO	PAD	Ball Location
				3.3V	1	2	5.0V				
AF4	PAD_SDA1	81		I2C1_SDA	3	4	5.0V				
AE4	PAD_SCL1	84		I2C1_SCL	5	6	GND				
R25	PAD_PERIPHERAL_EN0	150		GPIO150	7	8	UART1_TXD		115	PAD_CONN_BT_CLK	H4
				GND	9	10	UART1_RXD		121	PAD_CONN_HRST_B	H3
AD20	I2S1_MCK	173	TDM_DATA2	I2S1_MCLK	11	12	I2S1_BCK	TDM_LRCK	170	PAD_I2S1_BCK	AG23
M22	PAD_PERIPHERAL_EN2	152		GPIO152	13	14	GND				
AE3	PAD_KPCOL1	94	SPI2_MI	GPIO94	15	16	GPIO165	TDM_MCK	165	PAD_PERIPHERAL_EN4	Y25
				3.3V	17	18	GPIO1	SPI2_MO	1	PAD_EINT1	AB4
Y22	PAD_SPI1_MO	163		SPI1_MOSI	19	20	GND				
W22	PAD_SPI1_MI	161		SPI1_MISO	21	22	GPIO2	SPI2_CLK	2	PAD_EINT2	AG2
AA22	PAD_SPI1_CLK	164		SPI1_CLK	23	24	SPI1_CSB		162	SPI1_A_CSB	AB25
				GND	25	26	GPIO0	SPI2_CSB	0	PAD_EINT0	AB5
AC5	PAD_SDA0	82		I2C0_SDA	27	28	I2C0_SCL		83	PAD_SCL0	AB6
Y5	PAD_CAM_PDN1	98		I2S2_BCK	29	30	GND				
P26	PAD_SDA6	12		I2S2_DI2	31	32	I2S2_MCK		97	PAD_CAM_PDN0	W6
AA3	PAD_CAM_RST0	101		I2S2_LRCK	33	34	GND				
AD21	PAD_I2S1_LRCK	171	TDM_DATA0	I2S1_LRCK	35	36	GPIO151		151	PERIPHERAL_EN1	L25
AD25	PAD_PERIPHERAL_EN5	169	TDM_BCK	PWM_C	37	38	I2S2_DIN	TDM_DATA3	174	PAD_I2S2_DI	AG19
				GND	39	40	I2S1_DO	TDM_DATA1	172	PAD_I2S1_DO	AG21

Per the board programming instructions document, you can plug a computer into the Type-C data port and flash the board. When you have the Type-C data port attached it will appear as fastboot peripheral and fastboot can be used to program the board. The i500 processor only has one USB port on it. There is a Microchip LAN9512 chip on the board which provides a USB hub + Ethernet much like the original Raspberry Pi 3B. In order to give direct access to the USB port on the i500 chip during programming, the USB-C data port is connected to the i500 via a MUX that switches when plugged into, thus

disconnecting the hub. So, you can either have the LAN9512 connected to the i500, OR the direct USB-C data connection, but not both at the same time.

MIPI CSI Camera x 4



MIPI DSI Display

Pumpkin Display Connector:

The Pumpkin MIPI-DSI Display connector is located at CN2 on the bottom of the board. The following is the pinot of the connection and the type of connector used. All the logic on this connector is 1.8V logic, even though there are other power rails available on this connector for communicating with the display.

PUMPKIN i500 DSI/Display CONNECTOR PIN-OUT MAP

Shielded DF40 48-pin

DF40GB(3.0)-48DS-0.4V

VSYS (4.2V)	1	2	1.8V
VSYS (4.2V)	3	4	2.8V
VSYS (4.2V)	5	6	3.3V
	7	8	
I2S5_BCK	9	10	
I2S5_FS	11	12	DSI_CK_P
I2S5_DATA	13	14	DSI_CK_N
GND	15	16	GND
GND	17	18	GND
I25_MCLK	19	20	DSI_D3_P
DISPLAY_GPIO0	21	22	DSI_D3_N
DISPLAY_GPIO1	23	24	
DISPLAY_GPIO2	25	26	GND
I2C3_SDA	27	28	DSI_D2_P
I2C3_SCL	29	30	DSI_D2_N
GND	31	32	GND
GND	33	34	GND
DSI_D0_P	35	36	DSI_D1_P
DSI_D0_N	37	38	DSI_D1_N
	39	40	GND
	41	42	DISP_PWM
I2C45_SDA	43	44	DSI_TE
I2C5_SCL	45	46	DISP_RST
TOUCH_INT	47	48	TOUCH_RST

The display GPIO mappings to GPIO on the i500 processor are as follows:

DISPLAY_GPIO0 = GPIO158
DISPLAY_GPIO1 = GPIO159
DISPLAY_GPIO2 = GPIO153

Pumpkin i500 Camera Ports:

The Pumpkin i500 has two camera connectors used to bring out all the camera connections from the i500 processor. The i500 has two 2-Lane MIPI ports and two 4-Lane MIPI ports.

PUMPKIN i500 CAMERA CONNECTOR PIN-OUT MAP

Shielded DF40 48-pin
DF40GB(3.0)-48DS-0.4V

VSYS_4.2V	1	2	CAM_A	VCAMA
VSYS_4.2V	3	4	CAM_AF	VLDO28
CAM_D	5	6	CAM_IO	VIO18
SPI2_CLK	7	8	SPI2_MO	
SP2_CSB_CAM	9	10	SPI2_MI	
CAM0_D0_P	11	12	CAM3_D0_P	
CAM0_D0_N	13	14	CAM3_D0_N	
GND	15	16	GND	
GND	17	18	GND	
CAM0_CLK_P	19	20	CAM3_CLK_P	
CAM0_CLK_N	21	22	CAM3_CLK_N	
CAM_GPIO0	23	24	CAM_GPIO3	
CAM_GPIO1	25	26	CAM_GPIO2	
CAM0_D1_P	27	28	CAM3_D1_P	
CAM0_D1_N	29	30	CAM3_D1_N	
GND	31	32	GND	
GND	33	34	GND	
CAM0_RST	35	36	CAM3_RST	
CAM0_PDN	37	38	CAM3_PDN	
CAM1_PDN	39	40	CAM2_PDN	
CAM_SCL1	41	42	CAM_SCL2	
CAM_SDA1	43	44	CAM_SDA2	
	45	46		
CAM0_MCLK	47	48	CAM3_MCLK	

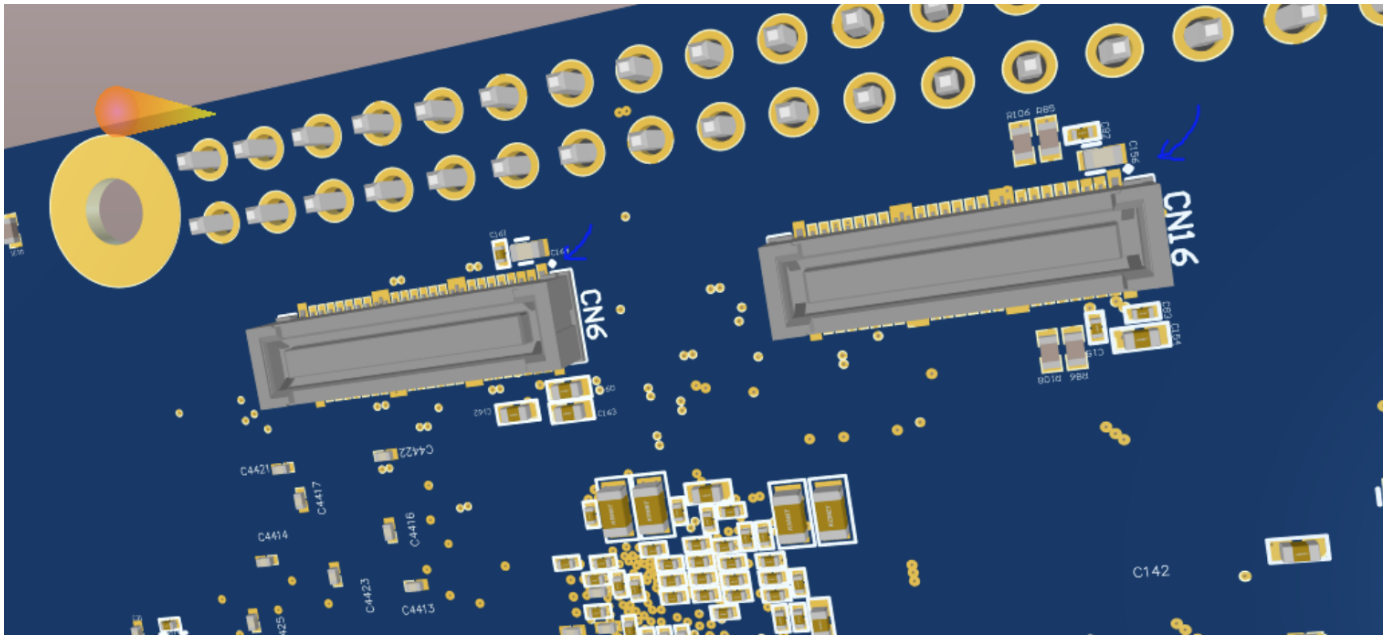
CN16
2x2L configuration
1x4L configuration

Shielded DF40 48-pin
DF40GB(3.0)-48DS-0.4V

VSYS_4.2V	1	2	CAM_A2	VCAMA2
VSYS_4.2V	3	4	CAM_AF	VLDO28
CAM_D	5	6	CAM_IO	VIO18
CAM1_RST	7	8	CAM2_RST	
	9	10		
CAM1_D0_P	11	12	CAM2_D0_P	
CAM1_D0_N	13	14	CAM2_D0_N	
GND	15	16	GND	
GND	17	18	GND	
CAM1_CLK_P	19	20	CAM2_CLK_P	
CAM1_CLK_N	21	22	CAM2_CLK_N	
CAM_GPIO4	23	24	CAM_GPIO5	
	25	26		
CAM1_D1_P	27	28	CAM2_D1_P	
CAM1_D1_N	29	30	CAM2_D1_N	
GND	31	32	GND	
GND	33	34	GND	
CAM1_D2_P	35	36	CAM2_D2_P	
CAM1_D2_N	37	38	CAM2_D2_N	
	39	40		
CAM1_D3_P	41	42	CAM2_D3_P	
CAM1_D3_N	43	44	CAM2_D3_N	
	45	46		
CAM1_MCLK	47	48	CAM2_MCLK	

CN6
Additional 2x4L configuration

The Pin 1 locations is subtle on the board itself, so see the following diagram:



The Camera GPIO's are as follows:

CAM_GPIO0 = GPIO35
CAM_GPIO1 = GPIO36
CAM_GPIO2 = GPIO37
CAM_GPIO3 = GPIO38
CAM_GPIO4 = GPIO40
CAM_GPIO5 = GPIO39

For the camera Reset and PDN pins they are as follows:

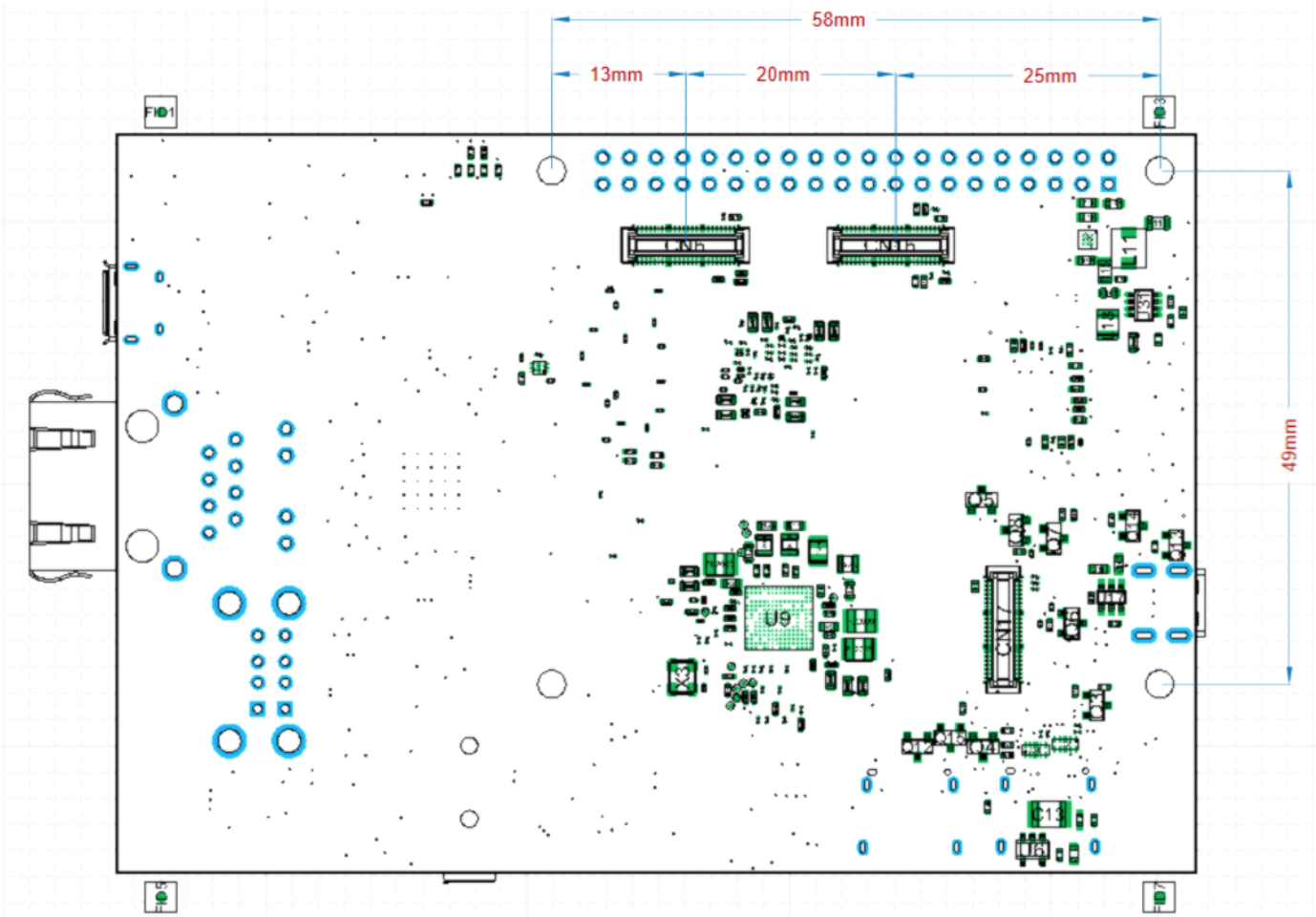
CAM0_RST = GPIO157
CAM1_RST = GPIO102
CAM2_RST = GPIO109
CAM3_RST = GPIO112
CAM0_PDN = GPIO167
CAM1_PDN = GPIO172
CAM2_PDN = GPIO107
CAM3_PDN = GPIO110

Audio Jack:

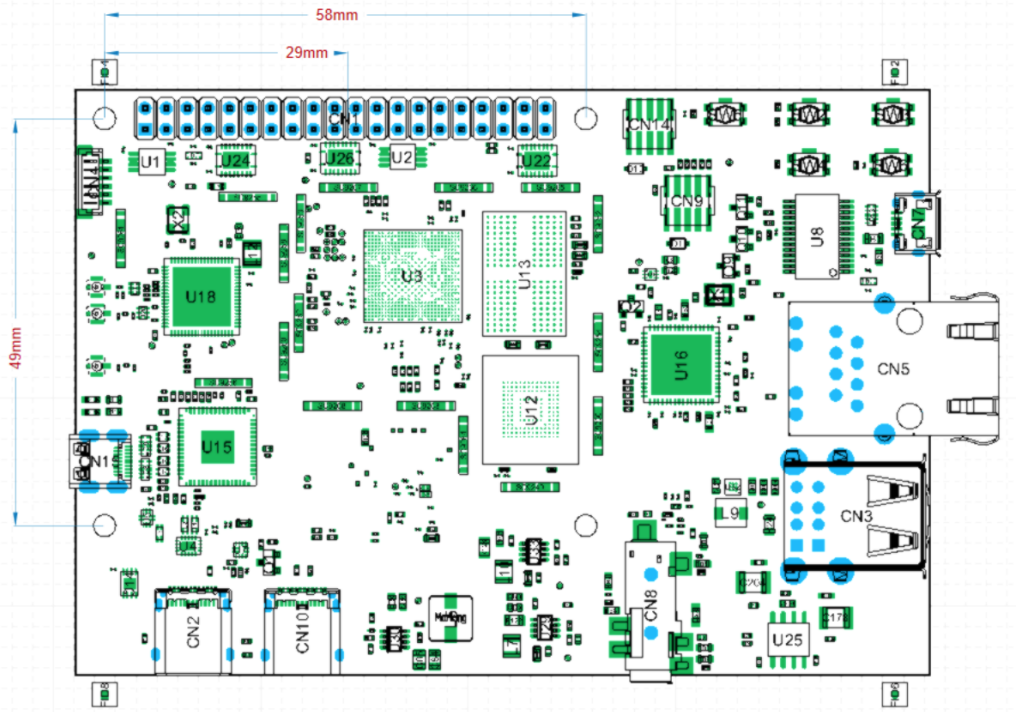
Audio – 3.5mm Jack

- AHJ (CTIA) standard
- Headset accessory detection

Mechanical Outline and Connectors:



Pumpkin i500 Bottom View



Pumpkin i500 Top View