Power Supply

LiPo Charger

CHARGING

BL4054B-42TPRN(SOT23-5)
IBAT = 1000/Rprog = 455mA

Vout=0.6*(1+Ra/Rb)

External Power Sense

SY8089AAC(SOT23-5)

DW02R

ESP-WROOM-32 MODULE

ESP-WROOM-32 MODULE

U9

ESP-WROOM-32

3V3	GPIO0/ADC2_CH1/TOUCH1/RTC_GPIO11/CLK_OUT1/EMAC_TX_CLK
GND	GPIO1/U0TXD/CLK_OUT3/EMAC_RXD2
GND	GPIO2/ADC2_CH2/TOUCH2/RTC_GPIO12/HSPIWP/HS2_DATA0/SD_DATA0
	GPIO3/U0RXD/CLK_OUT2
GPIO4/ADC2_CH0/TOUCH0/RTC_GPIO10/HSPIHD/HS2_DATA1/EMAC_TX_ER	
GPIO5/VSPICS0/HS1_DATA6/EMAC_RX_CLK	
THERMAL_PAD	GPIO6/SD_CLK/SPICLK/HS1_CLK/U1CTS
EN	GPIO7/SD_DATA0/SPIQ/HS1_DATA0/U2RTS
	GPIO8/SD_DATA1/SPID/HS1_DATA1/U2CTS
NC	GPIO9/SD_DATA2/SPIHD/HS1_DATA2/U1RXD
	GPIO10/SD_DATA3/SPIWP/HS1_DATA3/U1TXD
	GPIO11/SD_CMD/SPICS0/HS1_CMD/U1RTS
GPIO12/ADC2_CH5/TOUCH5/RTC_GPIO15/MTDI/HSPIQ/HS2_DATA2/EMAC_TXD3	
GPIO13/ADC2_CH4/TOUCH4/RTC_GPIO14/MTCK/HSPID/HS2_DATA3/SD_DATA3/EMAC_RX_ER	
GPIO14/ADC2_CH6/TOUCH6/RTC_GPIO16/MTMS/HSPICLK/HS2_CLK/SD_CLK/EMAC_TXD2	
GPIO15/ADC2_CH3/TOUCH3/MTDO/HSPICS0/RTC_GPIO13/HS2_CMD/SD_CMD/EMAC_RXD3	
GPIO16/HS1_DATA4/U2RXD/EMAC_CLK_OUT	
GPIO17/HS1_DATA5/U2TXD/EMAC_CLK_OUT_180	
GPIO18/VSPICLK/HS1_DATA7	
GPIO19/VSPIQ/U0CTS/EMAC_TXD0	
GPIO21/VSPIHD/EMAC_TX_EN	
GPIO22/VSPIWP/U0RTS/EMAC_TXD1	
GPIO23/VSPID/HS1_STROBE	
GPIO25/DAC_1/ADC2_CH8/RTC_GPIO6/EMAC_RXD0	
GPIO26/DAC_2/ADC2_CH9/RTC_GPIO7/EMAC_RXD1	
GPIO27/ADC2_CH7/TOUCH7/RTC_GPIO17/EMAC_RX_DV	
GPIO32/XTAL_32K_P/ADC1_CH4/TOUCH9/RTC_GPIO9	
GPIO33/XTAL_32K_N/ADC1_CH5/TOUCH8/RTC_GPIO8	
GPIO34/ADC1_CH6/RTC_GPIO4	
GPIO35/ADC1_CH7/RTC_GPIO5	
GPIO36/SENSOR_VP/ADC_H/ADC1_CH0/RTC_GPIO0	
GPIO39/SENSOR_VN/ADC1_CH3/ADC_H/RTC_GPIO3	

Buttons

BUT1
RST1

SD/MMC Card

MICRO_SD1

TFC-9P-1.7H(ATFFS150A01BR016)

Ethernet

The PHY is setted up as follows:
MODE: All capable(10/100Base)
-Auto-negotiation enabled
-RMII Configuration
-SMI address: 0x00

U4
LAN8710A-EZC(QFN32)

In RMII Mode

LAN_CON1

RJP-003TC1(LPJ4112CNL)
Single 10/100 BASE-TX Filter Connector Module

2x1000pF/2KV
2x75 Ohm

PoE Power Supply

The input filter capacitor must be >5 µF for to MPS!

250mW(50mA@5V) minimal power consumption on the PD required for to Maintain Power Signature(MPS)!

VOUT=1.35*(1+Ra/Rb)

Class=0 (0.44 to 12.95W)

Si3402-B-GM(QFN-20,5x5mm)

U8

Vpos
Vss
Vss
Vneg

EN_CT1 Closed
EN_CT2 Closed

Extensions

EXT1
NS(HN1x10)

EXT2
NS(HN1x10)

+5V
+3.3V
GND

UEXT

UEXT1
B-V-10-LF(GBH254SMT-10)

USB to UART

USB-UART1
MISB-SWMM-5B-LF(USB_MICRO)

U1
CH340T(SSOP20W)

Q12MHz/20pF/10ppm/4P/3.2x2.5mm

Q1, Q2, Q3 BC817-40(SOT23)

D2 BAT54C(SOT23-3)

Auto program

DTR	RTS	>EN	IO0
1	1	1	1
0	0	1	1
1	0	0	1
0	1	1	0

!!!WARNING!!!
When the board is powered via PoE, don't include the USB cable for to programming it!!!
In case this is required, USB-ISO must be used for to guarantee galvanic isolation!
See: https://www.olimex.com/Products/USB-Modules/USB-ISO/

Notes:

Software Selectable Pins

Interface	Signal	Pin
EMAC	EMAC_MDC_out	Any GPIO
	EMAC_MDI_in	
	EMAC_MDO_out	
	EMAC_CRS_out	
	EMAC_COL_out	
I2C	I2CEXT0_SCL_in	Any GPIO
	I2CEXT0_SDA_in	
	I2CEXT1_SCL_in	
	I2CEXT1_SDA_in	
	I2CEXT0_SCL_out	
	I2CEXT0_SDA_out	
	I2CEXT1_SCL_out	
	I2CEXT1_SDA_out	
General Purpose SPI	HSPIQ_in/_out	Any GPIO
	HSPID_in/_out	
	HSPICLK_in/_out	
	HSPICS0_in/_out	
	HSPICS1_in/_out	
	HSPICS2_in/_out	
	VSPIQ_in/_out	
	VSPID_in/_out	
	VSPICLK_in/_out	
	VSPICS0_in/_out	
	VSPICS1_in/_out	
	VSPICS2_out	

For more information refer to esp_wroom_32_datasheet_en.pdf.

Internal Bootstrapping Resistors

MTDI/GPIO12:	Pull-Down
GPIO0:	Pull-Up
GPIO2:	Pull-Down
GPIO4:	Pull-Down
MTDO/GPIO15:	Pull-Up
GPIO5:	Pull-Up

Bootstrapping Pins Settings

Voltage of Internal LDO(VDD_SDIO)

Pin	Default	3.3V	1.8V
GPIO12/MTDI	Pull-Down	0	1

Booting Mode

Pin	Default	SPI Flash Boot	Download Boot
GPIO0	Pull-Up	1	0
GPIO2	Pull-Down	Don't-care	0

Debugging Log on UOTXD During Booting

Pin	Default	U0TXD Toggling	U0TXD Silent
GPIO15/MTDO	Pull-Up	1	0

Timing of SDIO Slave

Pin	Default	Falling-edge Output	Falling-edge Input Rising-edge Output	Rising-edge Input Falling-edge Output	Rising-edge Output
GPIO15/MTDO	Pull-Up	0	0	1	1
GPIO5	Pull-Up	0	1	0	1

Fiducials

FID1 Fiducial   FID2 Fiducial   FID3 Fiducial
FID4 Fiducial   FID5 Fiducial   FID6 Fiducial

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open source hardware

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