Power Supply

+5V_Only!!!

PWR_FLAG +5V_USB PWR_FLAG +5V

FET2 WPM2015-3/TR

+5V_EXT

D6 1N5822/SS34/SMA

D2 LED_E1 Closed PWRLED1 LED/RED/0603

GND1 PWR_FLAG

R30 1M/0603

R4 2.2k/R0603

U2 IN EN GND FB LX SY8089AAAC(SOT23-5)

Vout=0.6*(1+Ra/Rb)

L2 2.2uH/1.5A/DCR=72mΩ/20%/2.0x2.0x0.55mm/C032[MDCI]CR2R)

R19 Ra 220k/R0603

R20 Rb 49.9k/1%/R0603

C3 C4 C5 C1 47uF/6.3V/X5R/0805

+3.3V PWR_FLAG

Ethernet

+3.3V +3.3VLAN PWR_FLAG

L1 NA(FB0805/600R/2A)

FET1 WPM2015-3/TR

L3 FB0805/600R/2A

T1 DTC114YKA

GPIO5\PHY_PWR

LAN1 RJLD-060TC1(LPJ4013EDNL)

RJ45 SIDE GREEN YELLOW

U4 LAN8710A-EZC(QFN32)

In RMII Mode

VDDIO VDD1A VDD2A VDDCR

TXD0 TXD1 TXD2 TXD3 TXEN TXCLK NINT/TXER/TXD4 RXD0/MODE0 RXD1/MODE1 RXD2/RMIISEL RXD3/PHYAD2 RXDV RXCLK/PHYAD1 RXER/RXD4/PHYAD0 XTAL2 XTAL1/CLKIN MDC MDIO LED2/NINTSEL LED1/REGOFF CRS COL/CRS_DV/MODE2 TXP TXN RXP RXN NRST RBIAS

GPIO19\EMAC_TXD0(RMII)
GPIO22\EMAC_TXD1(RMII)
GPIO21\EMAC_TX_EN(RMII)
RXD0/MODE0
RXD1/MODE1
RMIISEL
PHYAD3
PHYAD0
GPIO17\EMAC_CLK_OUT_180
GPIO25\EMAC_RXD0(RMII)
GPIO26\EMAC_RXD1(RMII)
GPIO27\EMAC_RX_CRS_DV

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

PHY_RST1 Opened

RA1206_(4x0603)_4R8_2.2k
RM3D RM2A RM2B RM2C PHYAD3 PHYAD0 RMIISEL

+3.3VLAN

PWR_FLAG VDD1A=2A
PWR_FLAG VDDCR

USB to UART

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

PWR_FLAG

R35 10k/R0603
R40 10k/R0603

U5 CH340T(SSOP20W)

VCC V3 TXD RXD RTS# CTS# DTR# DSR# DCD# RI# NOS# IR# XI XO

D1 1N581954/SOD123
D3 1N581954/SOD123

GPIO3\U0RXD
GPIO1\U0TXD
ESP_EN

Q4 BC817-40(SOT23)
Q5 BC817-40(SOT23)

R41 1k/R0603
R42 1k/R0603

Auto program
DTR	RTS	>EN	IO0
1	1	1	1
0	0	1	1
1	0	0	1
0	1	1	0

Q3 Q12MHz/20pF/30ppm/2P/HC-49SMD

R37 220k/R0603

D4 BAT54C(SOT23-3)

GPIO0
GPIO2\HS2_DATA0
D_Com

ESP-WROOM-32 MODULE

U3 ESP32-WROOM-32D-4MB

R54 NA/R0603 +3.3V

+3.3V GND

R24 1M/R0603

ESP_EN

3V3 GND GND GND THERMAL_PAD NC

GPIO0/ADC2_CH1/TOUCH1/RTC_GPIO11/CLK_OUT1/EMAC_TX_CLK
GPIO1/U0TXD/CLK_OUT3/EMAC_RXD2
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
GPIO6/SD_CLK/SPICLK/HS1_CLK/U1CTS
GPIO7/SD_DATA0/SPIQ/HS1_DATA0/U2RTS
GPIO8/SD_DATA1/SPID/HS1_DATA1/U2CTS
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/SD_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/DAC1/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/XTAL32K_P/ADC1_CH4/TOUCH9/RTC_GPIO9
GPIO33/XTAL32K_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

GPIO0
GPIO1\U0TXD
GPIO3\U0RXD
GPIO4\HS2_DATA1
GPIO5\PHY_PWR
GPIO12\HS2_DATA2
GPIO13\HS2_DATA3
GPIO14\HS2_CLK
GPIO15\HS2_CMD
GPIO16
GPIO17\EMAC_CLK_OUT_180
GPIO18(RMII)
GPIO19\EMAC_TXD0(RMII)
GPIO22\EMAC_TXD1(RMII)
GPIO23
GPIO25\EMAC_RXD0(RMII)
GPIO26\EMAC_RXD1(RMII)
GPIO27\EMAC_RX_CRS_DV
GPIO32
GPIO33\LED
GPIO34\BUT1
GPIO35
GPIO36
GPIO39

Extension

CON1 NA(NH1x20)

+3.3V GND ESP_EN GPIO5\PHY_PWR GPIO2\HS2_DATA0 GPIO4\HS2_DATA1 GPIO12\HS2_DATA2 GPIO13\HS2_DATA3 GPIO14\HS2_CLK GPIO15\HS2_CMD GPIO16 GPIO17\EMAC_CLK_OUT_180 GPIO32 GPIO33\LED GPIO34\BUT1 GPIO35 GPIO36 GPIO39 GND +5V_EXT

SD-Card's signals were connected here for to be available on the extension and used like GPIOs when SD card is not present.

SD/MMC Card

+3.3V

MICRO_SD1 TFC-WXCP11-08-LF

R2 2.2k/R0603 GPIO13\HS2_DATA3 R9 NA/R0603
R29 10k/R0603 GPIO15\HS2_CMD
L4 FB0805/600R/2A
GND C10 47uF/6.3V/20%/X5R/C0805
R3 2.2k/R0603 GPIO14\HS2_CLK
R7 2.2k/R0603 GPIO2\HS2_DATA0 R43 10R/R0603
R8 2.2k/R0603 R16 220R/R0603
R10 NA/R0603 GPIO4\HS2_DATA1
R11 NA/R0603 GPIO12\HS2_DATA2

CD/DAT3/CS CMD/DI VDD VSS CLK/SCLK DAT0/DO DAT1/RES DAT2/RES PACK2

LED

GPIO33\LED LED1 LED/GREEN/0603 R1 2.2k/R0603 GND

Buttons

GND R14 220R/R0603 BUT1 TL1107A(6x3.8x2.5MM) GPIO34\BUT1 R45 10k/R0603 +3.3V
R46 NA/R0603 D_Com
GND RST1 TL1107A(6x3.8x2.5MM) ESP_EN

Mounting Holes

MH2
MH1
GND

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	
	HSPI_CS1_out	
	HSPI_CS2_out	
	VSPIQ_in/_out	
	VSPID_in/_out	
	VSPICLK_in/_out	
	VSPICS0_in/_out	
	VSPI_CS1_out	
	VSPI_CS2_out	

For more information refer to esp_wroom_32_datasheet_en.pdf.

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

		Timing of SDIO Slave			
Pin	Default	Falling-edge Input Rising-edge Output		Rising-edge Input Rising-edge Output	
GPIO15/MTDO	Pull-Up	0	0	1	1
GPIO5\PHY_PWR	Pull-Up				

Internal Bootstrapping Resistors

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

Fiducials

FID1 Fiducial   FID2 Fiducial   FID3 Fiducial