

5

4

3

2

1

DATE

Change log

20200115

Initial release

20200320

- 1. SD\_DET->IO39; Button\_DET->IO36;
- 2. add switch for MIC array
- 3. change capacitor on feedbacks to fix overshoot issue
- 4. add P-mos for power softstart

D

D

C

C

B

B

A

A

**ESPRESSIF**

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Title

<ESP32-Korvo-DU1906>

Size

A

Document Number

<01\_Revision\_History>

Rev

1.0

Date:

Friday, March 20, 2020

Sheet

1

of

9

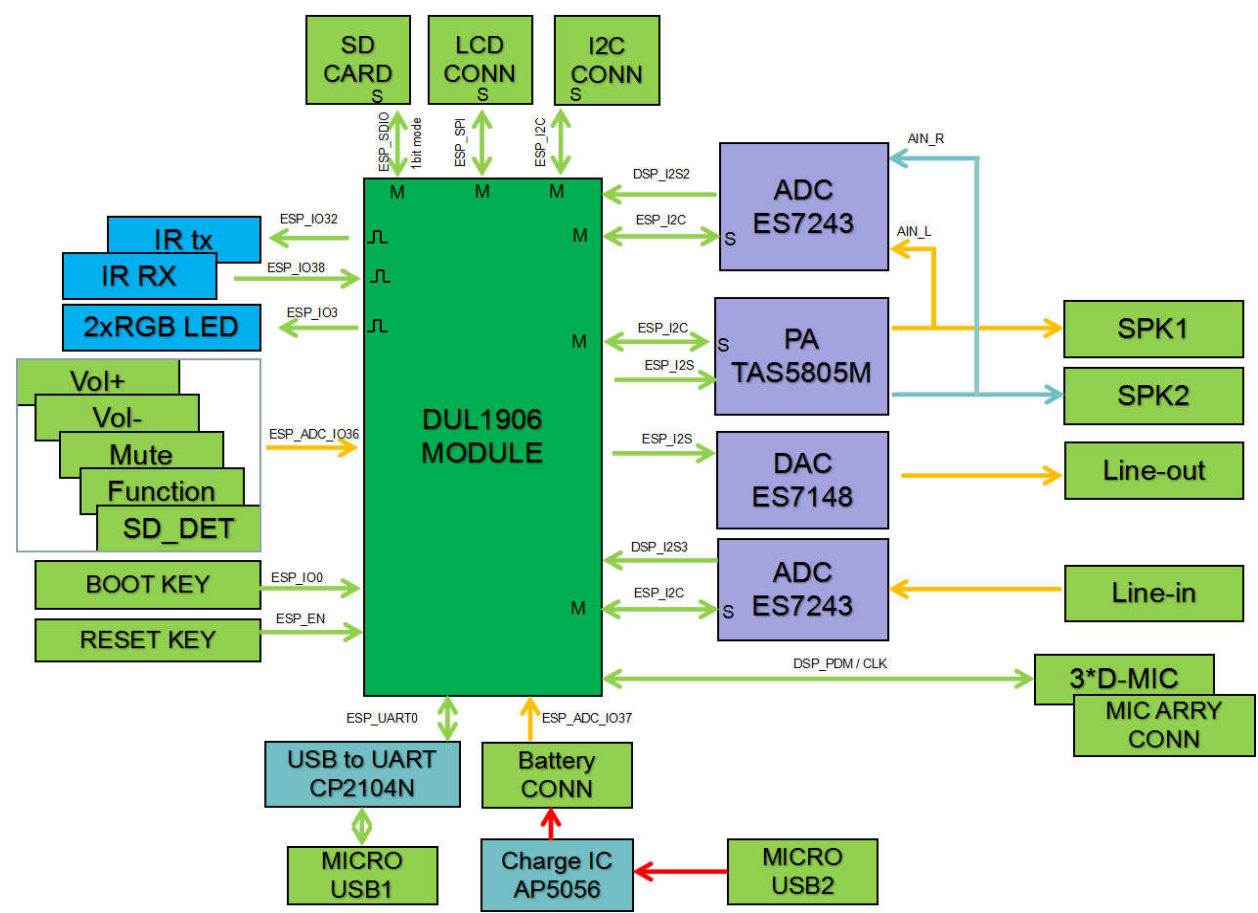
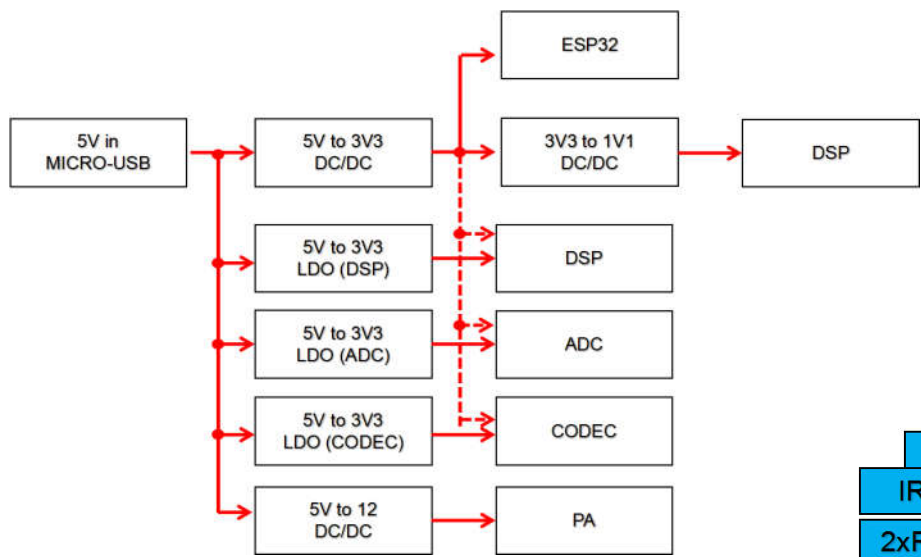
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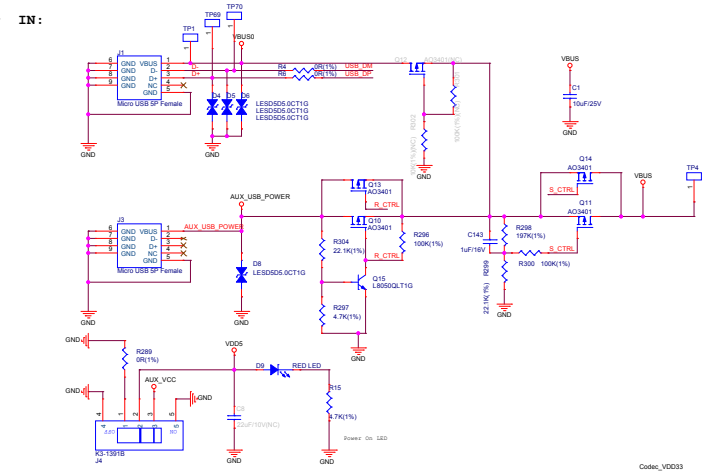
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2

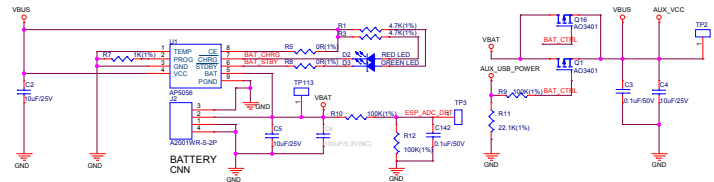
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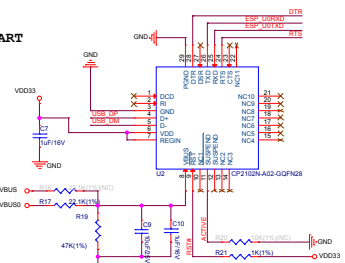
Power IN:



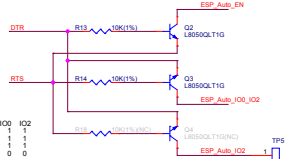
BATTERY



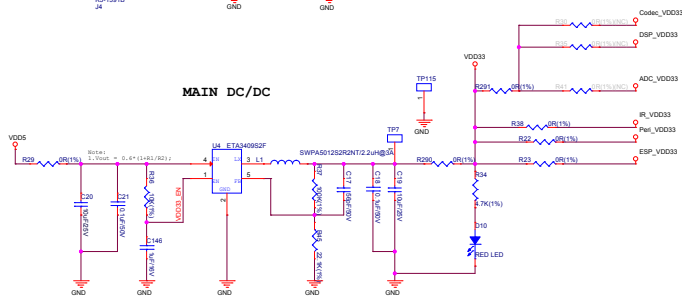
UART



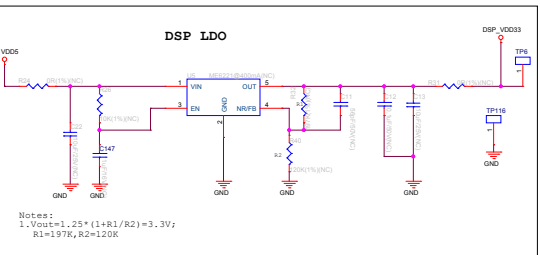
Auto program  
DTR RTS=EN IO0 IO2  
1 0 0 1 1 1  
0 0 0 0 0 0  
0 1 1 0 0 0



MAIN DC/DC

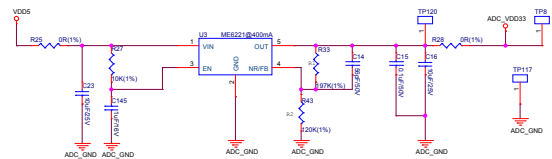


DSP LDO



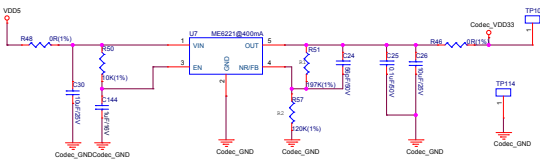
Notes:  
1.  $V_{out} = 1.25 * (1 + R1/R2) = 3.3V$ ;  
 $R1 = 197K, R2 = 120K$

ADC LDO



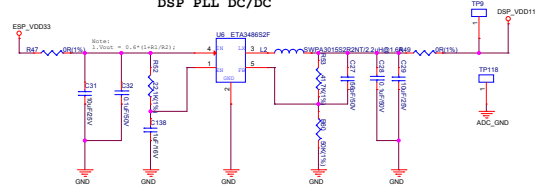
Notes:  
1.  $V_{out} = 1.25 * (1 + R1/R2) = 3.3V$ ;  
 $R1 = 197K, R2 = 120K$

CODEC LDO

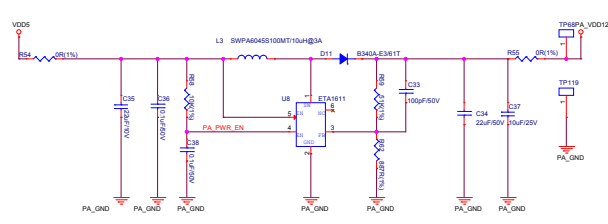


Notes:  
1.  $V_{out} = 1.25 * (1 + R1/R2) = 3.3V$ ;  
 $R1 = 197K, R2 = 120K$

DSP PLL DC/DC

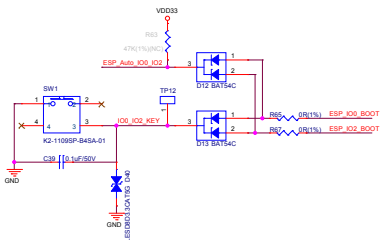


PA DC/DC

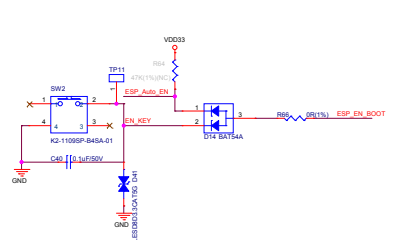


Notes:  
1.  $V_{out} = 0.2 * (1 + R1/R2) = 1.2V$ ;

BOOT BUTTON



RST BUTTON

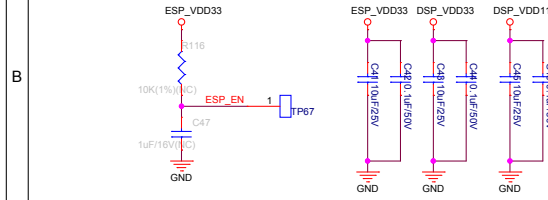
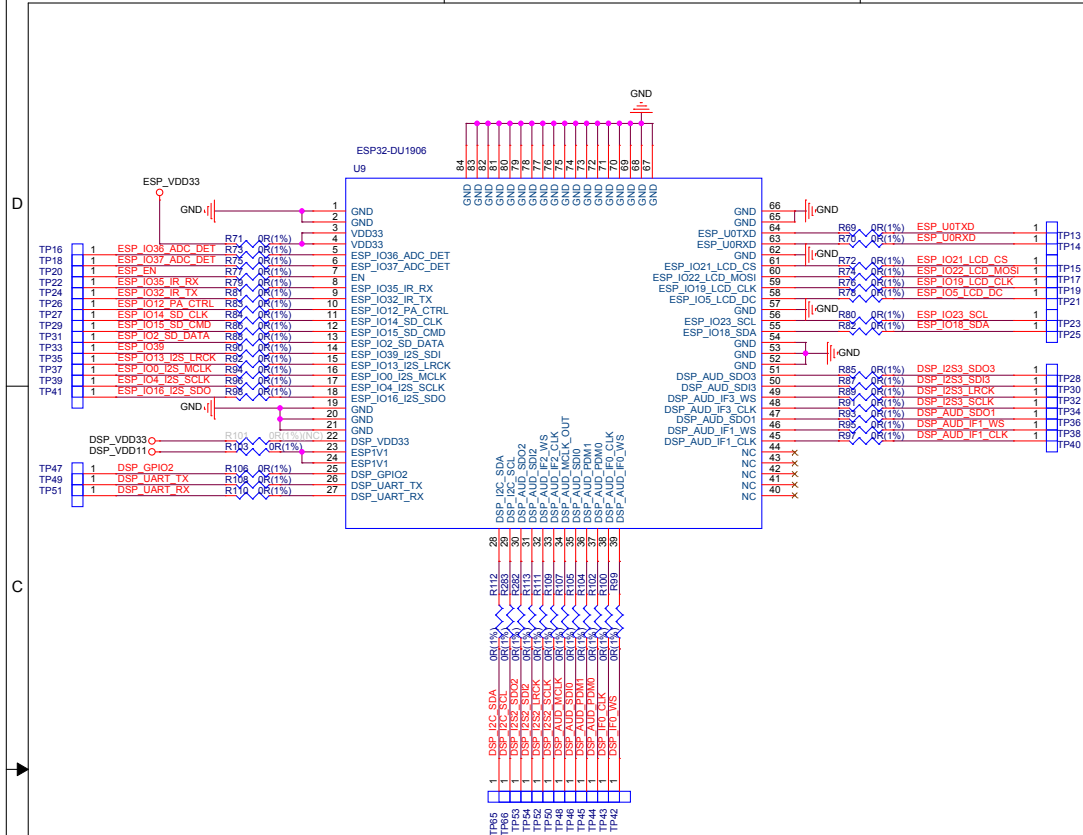


- [4] ESP\_LMTXD <-> ESP\_U0TXD
- [4,9] ESP\_L0GDD <-> ESP\_L0GDD
- [4] ESP\_IO0\_BOOT <-> ESP\_Boot\_IO0
- [4] ESP\_IO2\_BOOT <-> ESP\_Boot\_IO2
- [4] ESP\_EN\_BOOT <-> ESP\_Boot\_EN
- [4] ESP\_BATTERY\_DET <-> ESP\_ADC\_DET
- [5] AND\_PA\_CTRL\_R8B <-> AND\_PA\_CTRL\_R8B PA\_PWR\_EN

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<ESP32-Korvo-DU1906>

Doc	Document Number	Rev
<b>B</b>	<b>&lt;02_Block_Diagram&gt;</b>	<b>1.0</b>
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[3]	ESP_U0TXD	ESP_U0TXD	ESP_DBG interface.
[3,9]	ESP_U0RXD	ESP_U0RXD	
[3]	ESP_IO0_BOOT	ESP_IO0_BOOT	
[3]	ESP_IO2_BOOT	ESP_IO2_BOOT	
[3]	ESP_EN	ESP_EN	
[8]	ESP_SD_DET	ESP_IO39	ESP ADC for Button, SD card and Battery.
[8]	ESP_BUTTON_DET	ESP_IO36_ADC_DET	
[3]	ESP_BATTERY_DET	ESP_IO37_ADC_DET	
[7]	ESP_IR_RX	ESP_IO35_IR_RX	IR transmitter and receiver.
[7]	ESP_IR_TX	ESP_IO32_IR_TX	
[8]	ESP_LCD_CS	ESP_IO21_LCD_CS	ESP SPI to LCD.
[8]	ESP_LCD_MOSI	ESP_IO22_LCD_MOSI	
[8]	ESP_LCD_DC	ESP_IO5_LCD_DC	
[8]	ESP_LCD_CLK	ESP_IO19_LCD_CLK	
[8]	ESP_SD_CLK	ESP_IO14_SD_CLK	ESP SDIO to SD Card.
[8]	ESP_SD_CMD	ESP_IO15_SD_CMD	
[8]	ESP_SD_DATA	ESP_IO2_SD_DATA	
[5,6,8,9]	ESP_SCL	ESP_IO23_SCL	ESP I2C.
[5,6,8,9]	ESP_SDA	ESP_IO18_SDA	
[5]	ESP_PA_CTRL	ESP_IO12_PA_CTRL	ESP I2S to CODEC.
[5]	ESP_I2S_LRCK	ESP_IO13_I2S_LRCK	
[5]	ESP_I2S_MCLK	ESP_IO4_I2S_MCLK	
[5]	ESP_I2S_MCLK	ESP_IO0_I2S_MCLK	
[5]	ESP_I2S_SDO	ESP_IO16_I2S_SDO	
[6,9]	DSP_IF0_WS	DSP_IF0_WS	DSP I2S0/PDM/TDM input.
[6,9]	DSP_IF0_CLK	DSP_IF0_CLK	
[6,9]	DSP_AUD_SDIO	DSP_AUD_SDIO	
[6,9]	DSP_AUD_PDM1	DSP_AUD_PDM1	
[6,9]	DSP_AUD_PDM0	DSP_AUD_PDM0	
[9]	DSP_AUD_IF1_CLK	DSP_AUD_IF1_CLK	DSP TDM output.
[9]	DSP_AUD_IF1_WS	DSP_AUD_IF1_WS	
[9]	DSP_AUD_SDO1	DSP_AUD_SDO1	
[6]	DSP_AUD_MCLK	DSP_AUD_MCLK	DSP I2S2 to ADC.
[6]	DSP_I2S2_SCLK	DSP_I2S2_SCLK	
[6]	DSP_I2S2_LRCK	DSP_I2S2_LRCK	
[6]	DSP_I2S2_SDO2	DSP_I2S2_SDO2	
[6]	DSP_I2S2_SDI2	DSP_I2S2_SDI2	
[6]	DSP_I2S3_SCLK	DSP_I2S3_SCLK	DSP I2S3 to AEC.
[6]	DSP_I2S3_LRCK	DSP_I2S3_LRCK	
[6]	DSP_I2S3_SDO3	DSP_I2S3_SDO3	
[6]	DSP_I2S3_SDI3	DSP_I2S3_SDI3	
[9]	DSP_I2C_SCL	DSP_I2C_SCL	DSP I2C.
[9]	DSP_I2C_SDA	DSP_I2C_SDA	
[6]	DSP_UART_TX	DSP_UART_TX	DSP UART and other GPIO.
[6]	DSP_UART_RX	DSP_UART_RX	
[6]	Line_in_DET	DSP_GPIO2	

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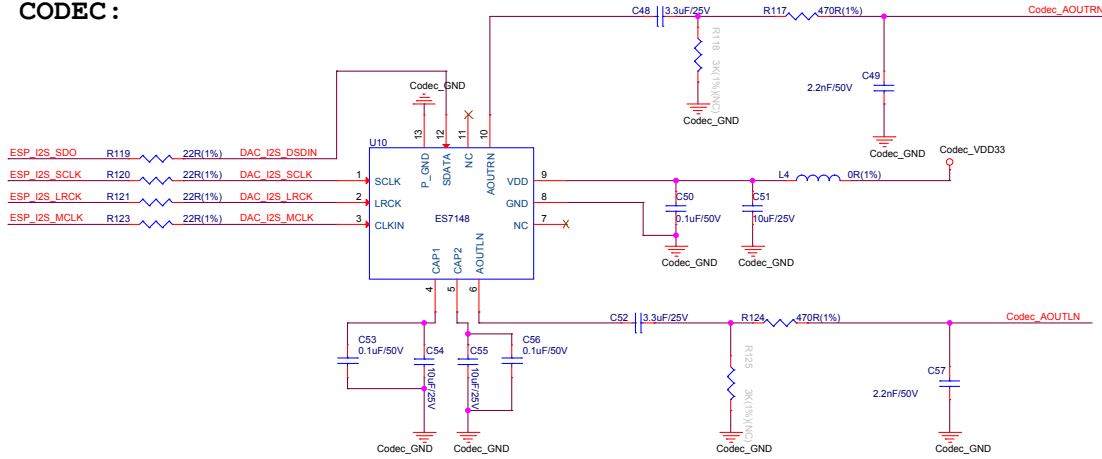
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**<ESP32-Korvo-DU1906>**

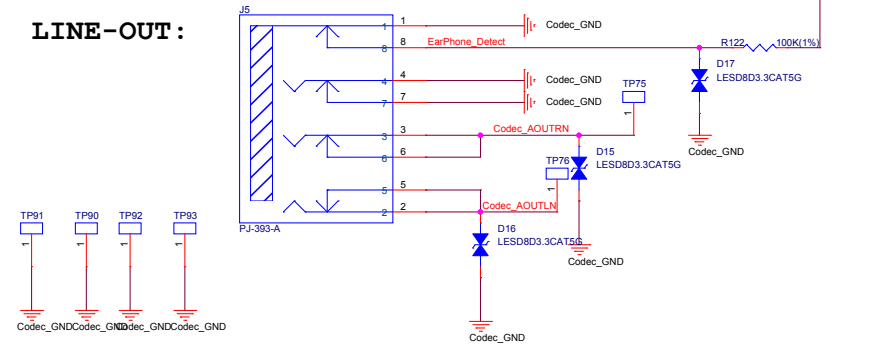
Size	Document Number	Rev
A	<04_DUL1906>	1.0

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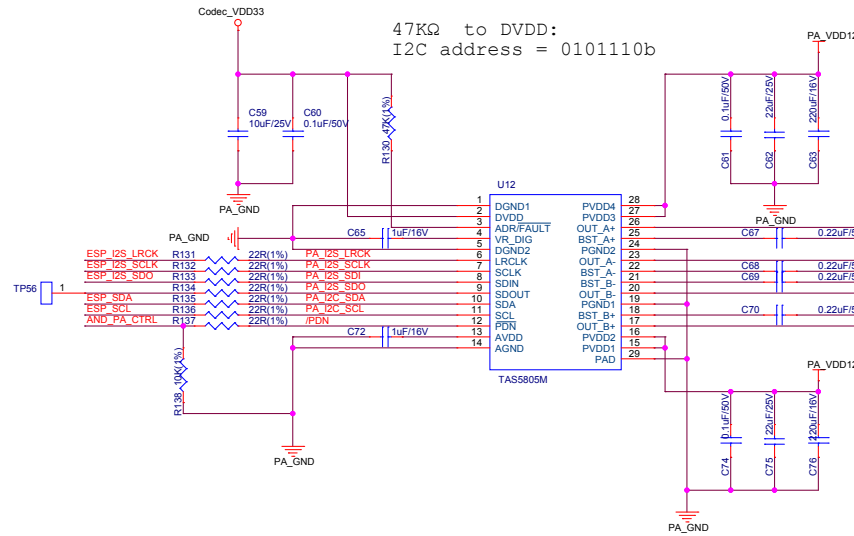
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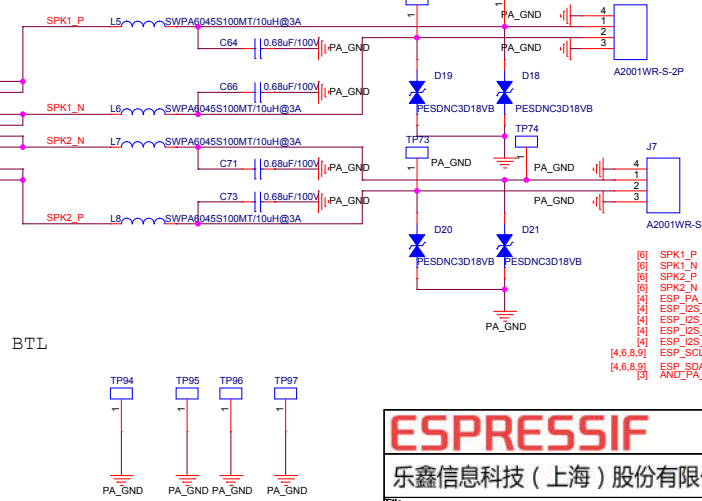
**LINE-OUT :**



47KΩ to DVDD:  
I2C address = 0101110b



**BTL**



Notes:  
1. When EarPhone NO plug in, EarPhone Detect keep low, thus Q off, and then B=H, AND\_PA\_CTRL will follow the status of PA\_CTRL ;  
2. When Earphone plug in, EarPhone Detect switch to high, thus Q ON, and then B=L, AND\_PA\_CTRL will keep low ;

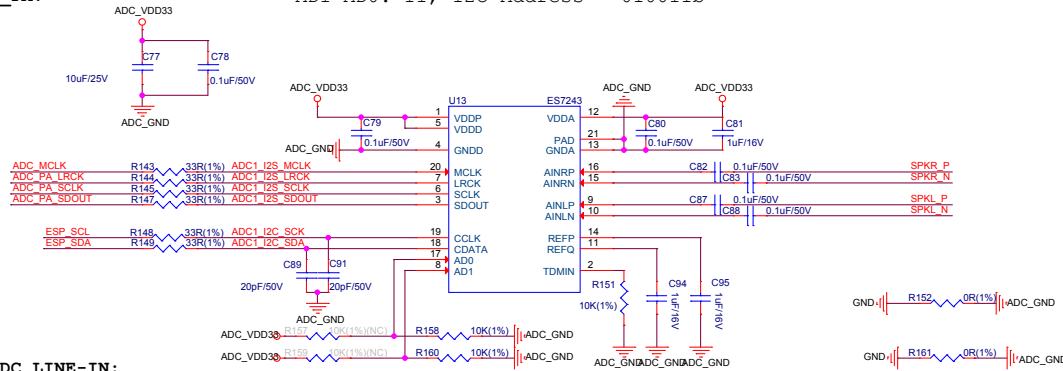
- [6] SPK1\_P
- [6] SPK1\_N
- [6] SPK2\_P
- [6] SPK2\_N
- [4] ESP\_PA\_CTRL
- [4] ESP\_I2S\_LRCK
- [4] ESP\_I2S\_SCLK
- [4] ESP\_I2S\_MCLK
- [4] ESP\_I2S\_SDO
- [4.6.8.9] ESP\_SCL
- [4.6.8.9] ESP\_SDA
- [4.6.8.9] AND\_PA\_CTRL
- [6] SPK1\_P
- [6] SPK1\_N
- [6] SPK2\_P
- [6] SPK2\_N
- [4] ESP\_PA\_CTRL
- [4] ESP\_I2S\_LRCK
- [4] ESP\_I2S\_SCLK
- [4] ESP\_I2S\_MCLK
- [4] ESP\_I2S\_SDO
- [4.6.8.9] ESP\_SCL
- [4.6.8.9] ESP\_SDA
- [4.6.8.9] AND\_PA\_CTRL

**ESPRESSIF**

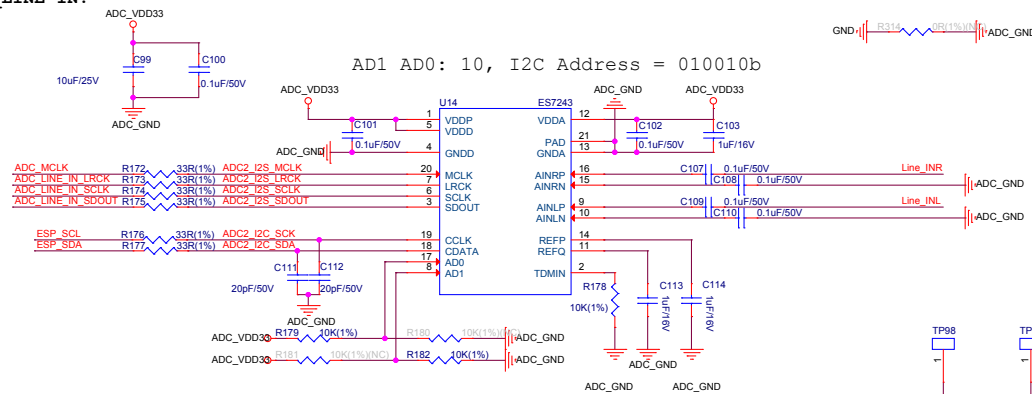
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Size	Document Number	Rev
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Date:	Friday, March 20, 2020	Sheet 5 of 9

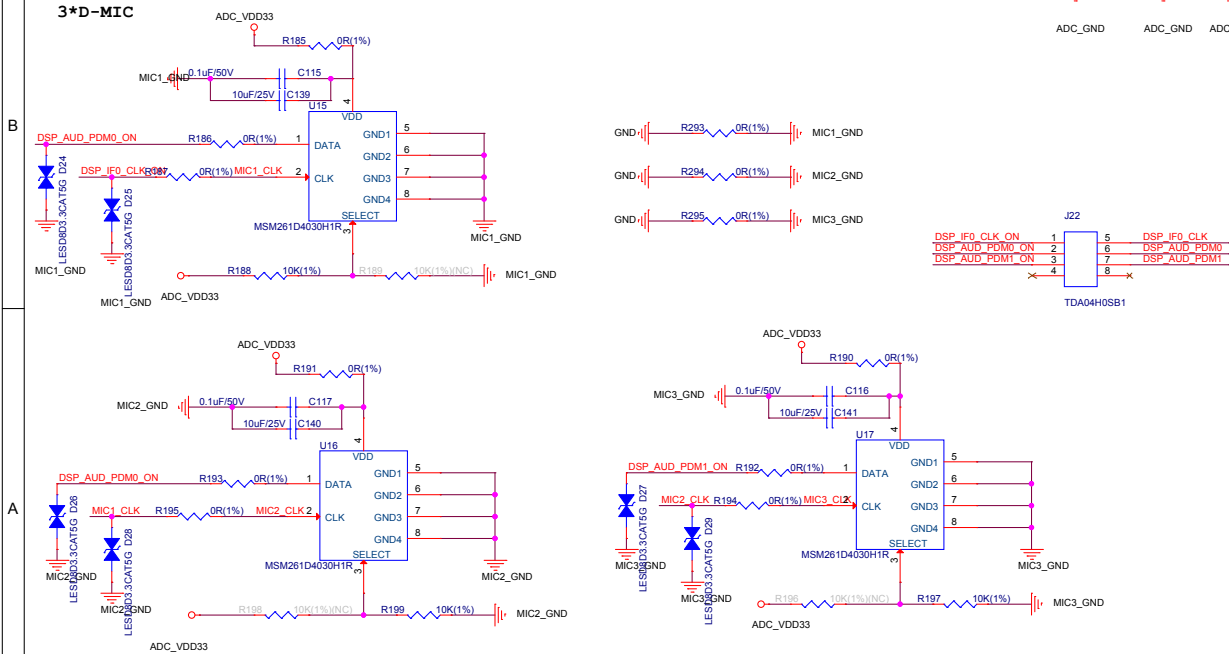
**ADC\_PA:** AD1 AD0: 11, I2C Address = 010011b



**ADC\_LINE-IN:** AD1 AD0: 10, I2C Address = 010010b

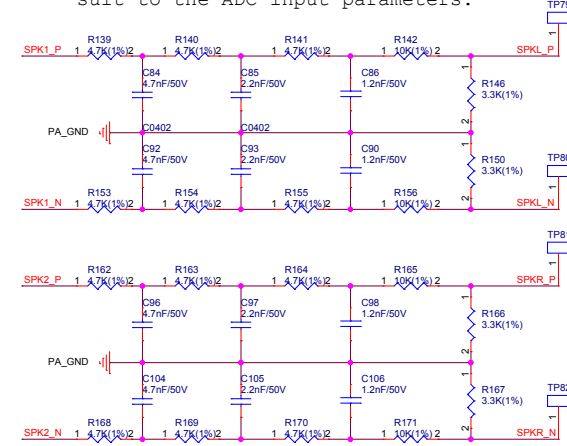


**3\*D-MIC**

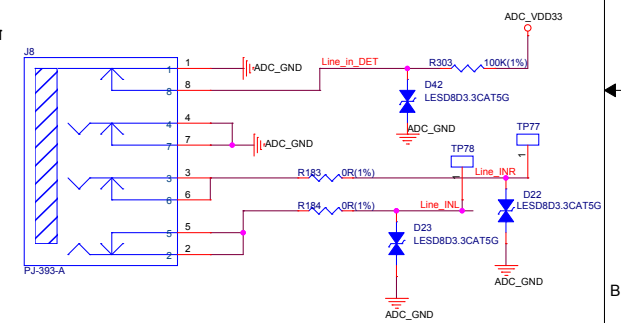


**LOOPBACK**

Closed to SPK.  
Notice the divided voltage should be suit to the ADC input parameters.



**LINE-IN**



- [4] DSP\_I2S3\_SCLK
- [4] DSP\_I2S3\_LRCK
- [4] DSP\_I2S3\_SDO3
- [4] DSP\_I2S3\_SD13
- [5] SPK1\_P
- [5] SPK1\_N
- [5] SPK2\_P
- [5] SPK2\_N
- [4] DSP\_AUD\_MCLK
- [4] DSP\_I2S2\_SCLK
- [4] DSP\_I2S2\_LRCK
- [4] DSP\_I2S2\_SD12
- [4.5.8.9] ESP\_SCL
- [4.5.8.9] ESP\_SDA
- [4] Line\_in\_DET
- [4.9] DSP\_IF0\_CLK
- [4.9] DSP\_AUD\_PDM0
- [4.9] DSP\_AUD\_PDM1
- ADC\_LINE\_IN\_SCLK
- ADC\_LINE\_IN\_LRCK
- DSP\_I2S3\_SDO3
- ADC\_LINE\_IN\_SDOOUT
- SPK1\_P
- SPK1\_N
- SPK2\_P
- SPK2\_N
- ADC\_MCLK
- ADC\_PA\_SCLK
- ADC\_PA\_LRCK
- ADC\_PA\_SDOOUT
- ESP\_SCL
- ESP\_SDA
- Line\_in\_DET
- DSP\_IF0\_CLK
- DSP\_AUD\_PDM0
- DSP\_AUD\_PDM1

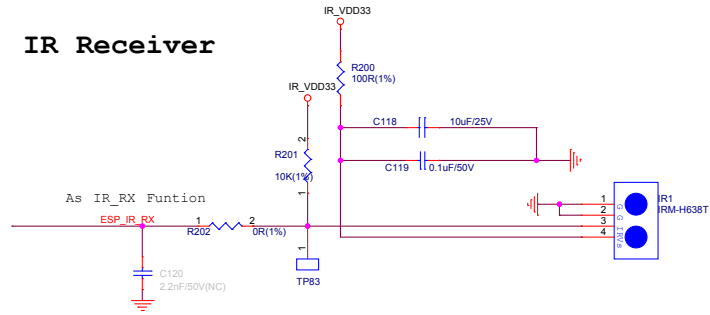
**ESPRESSIF**

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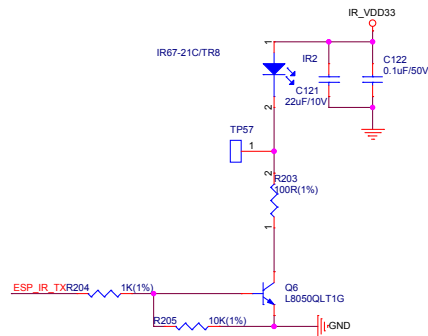
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Size	Document Number	Rev
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### IR Receiver



### IR transmitter



[4] ESP\_IR\_RX  
[4] ESP\_IR\_TX

ESP\_IR\_RX  
ESP\_IR\_TX

**ESPRESSIF**

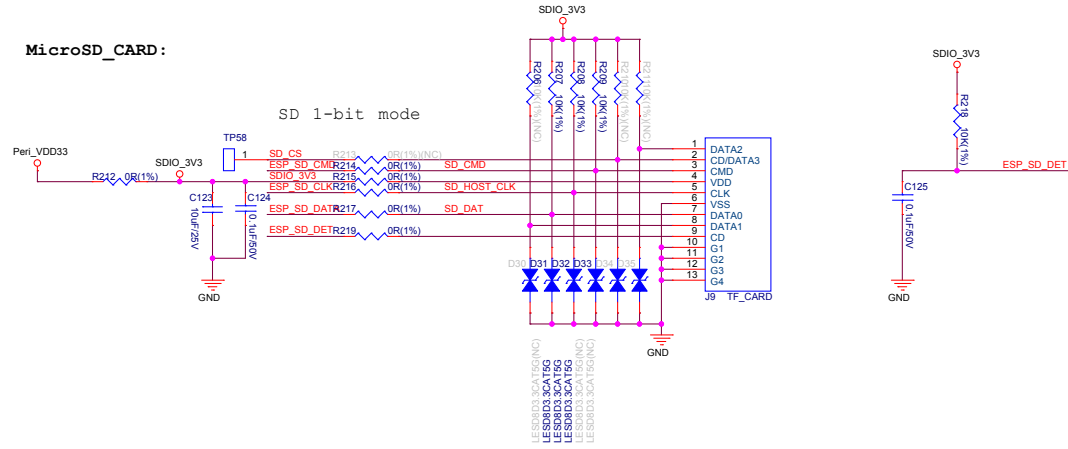
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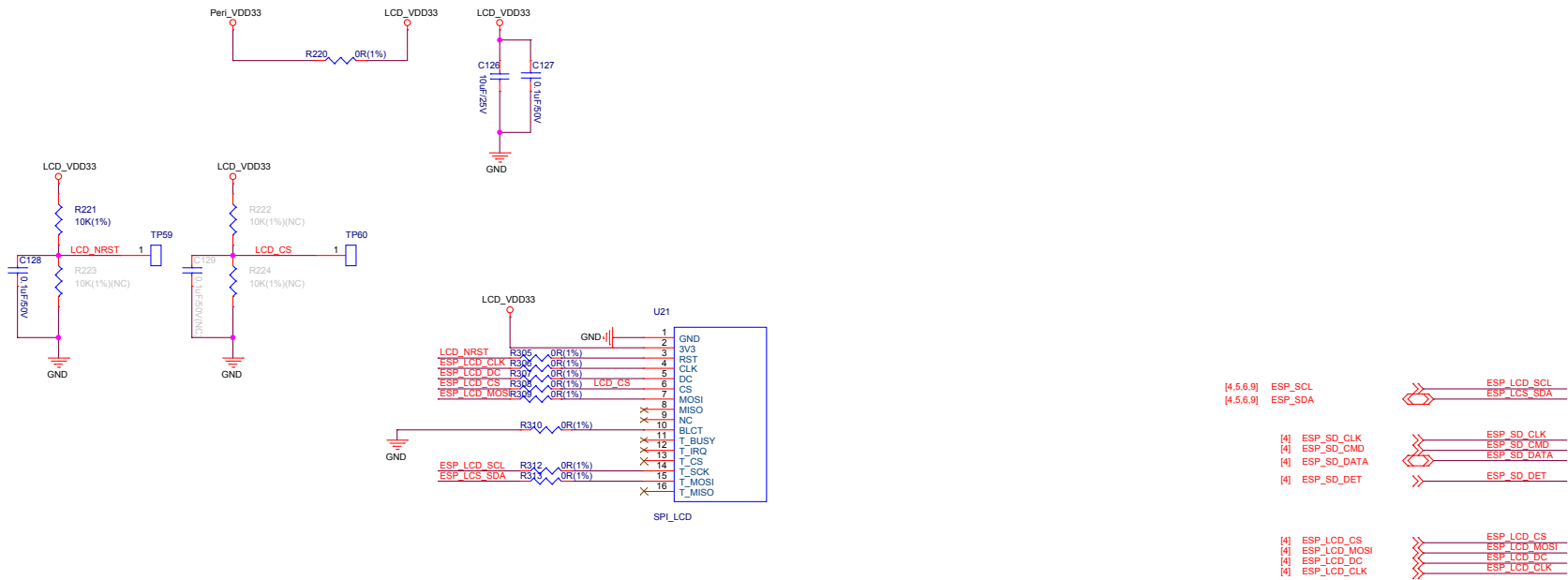
Size	Document Number	Rev
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**MicroSD\_CARD :**



**LCD :**



3.2 inch, resolution 320x240 ,TFT LCD

**ESPRESSIF**

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Title  
<ESP32-Korvo-DU1906>

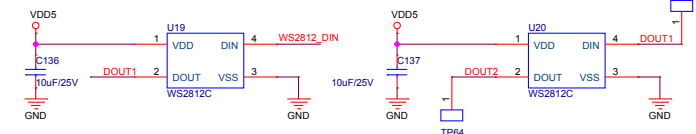
Size	Document Number	Rev
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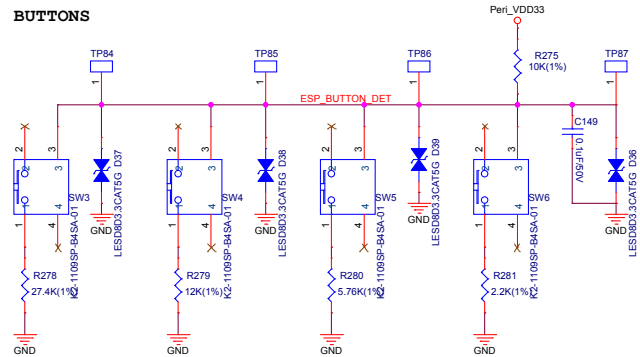




**RGB LED**



**BUTTONS**

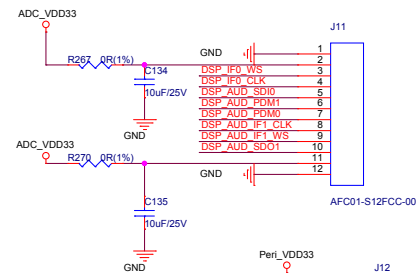


FUNCTION	MUTE	VOL-	VOL+
2.4V	1.8V	1.2V	0.6V

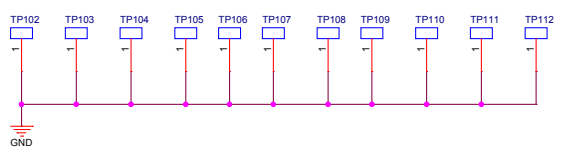
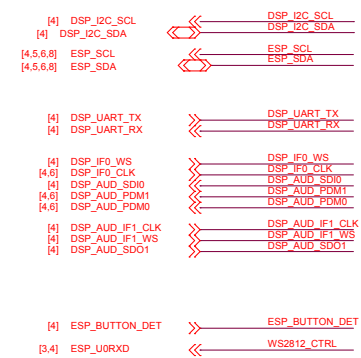
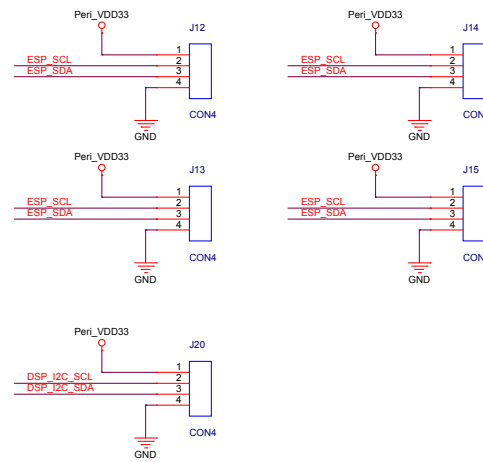
**SCREW HOLE**



**MIC-ARRAY CONN**



**I2C CONN**



**ESPRESSIF**  
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Title: <ESP32-Korvo-DU1906>

Size: A | Document Number: <08\_BUTTON&LEDS> | Rev: 1.0

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