

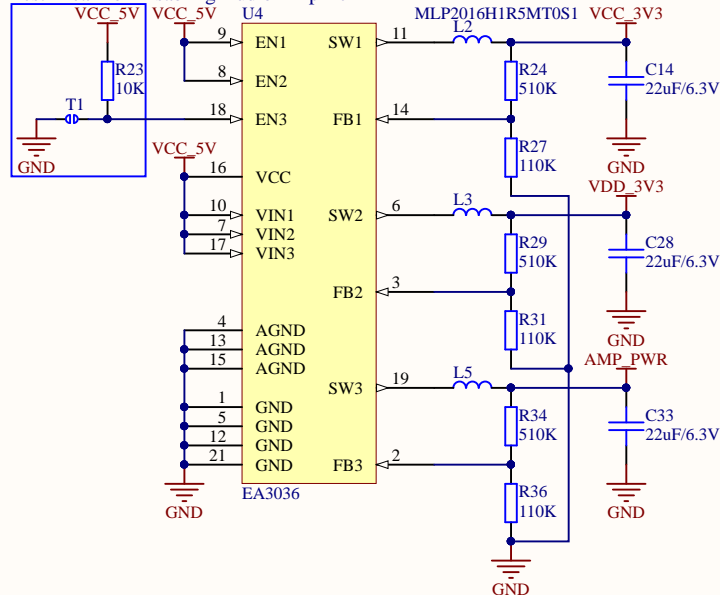
REV	DESCRIPTION	DATE	BY
A13	OFFICIAL RELEASE VERSION	10/11/2017	Han

M5
STACK

PAGE NO.	SCHEMATIC PAGE
1	COVER PAGE
2	POWER MANAGEMENT
3	ESP32 SUBSYSTEM
4	USB-UART & ACCESSORY
5	M.BUS DEFINATION
6	AUDIO AMPLIFER

M5 STACK M5 STACK CORE			
Title M5 STACK CORE COVER			
Size A4	Number 013-0000-001		Revision A
Date:	2017/12/6	Sheet	of
File:	C:\Users\...\A1-COVER.SchDoc	Drawn By:	Han Shihao

Test Break for Disabling Audio Amplifier



Speaker

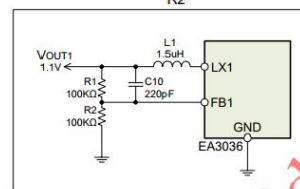
Link for Datasheet: http://198.13.102.98/bj/ingenic_support/X1000_X1000E_X1500/02_HW/00_Halley2/Halley2_coreV3.0_baseV2.0/06Datasheet/PMIC/EA3036_1.0_2014_Sep.pdf

Application Information

Output Voltage Setting

Each of the regulators output voltage can be set via a resistor divider (ex. R1, R2). The output voltage is calculated by following equation:

$$V_{out1} = 0.6 \times \frac{R1}{R2} + 0.6V$$



The following table lists common output voltage and the corresponding R1, R2 resistance value for reference.

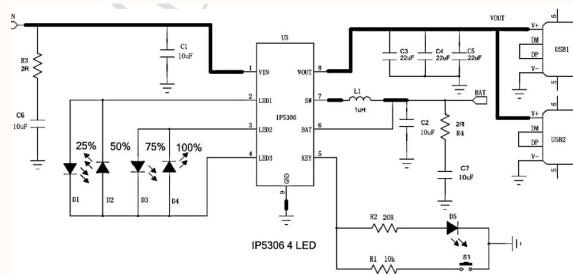
Output Voltage	R1 Resistance	R2 Resistance	Tolerance
3.3V	510KΩ	110KΩ	1%
1.8V	200KΩ	100KΩ	1%
1.5V	150KΩ	100KΩ	1%
1.2V	100KΩ	100KΩ	1%

Link for DCDC Buck Inductor: http://www.mouser.com/ds/2/400/nductor_commercial_power_mlp2016_en-838407.pdf

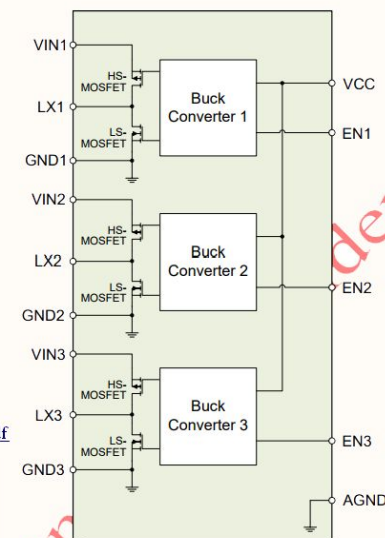
Type	Thickness T (mm)max.	L (μH)	Measuring frequency (MHz)	DC resistance (Ω)	Rated current* (mA)max.	Part No.
Low resistance	1.0	0.47 ±20%	2	0.055±25%	1700	MLP2016HF47MT0S1
	1.0	1.0 ±20%	2	0.09±25%	1300	MLP2016H1R0MT0S1
	1.0	1.5 ±20%	2	0.11±25%	1200	MLP2016H1R5MT0S1
	1.0	2.2 ±20%	2	0.11±25%	1200	MLP2016H2R2MT0S1
Low core loss	1.0	3.3 ±20%	2	0.12±25%	1200	MLP2016H3R3MT0S1
	1.0	4.7 ±20%	2	0.16±25%	1100	MLP2016H4R7MT0S1
	1.0	0.47 ±20%	2	0.07±25%	1500	MLP2016VR47MT0S1
Emphasized DC bias characteristics	1.0	1.0 ±20%	2	0.12±25%	1200	MLP2016V1R0MT0S1
	1.0	1.5 ±20%	2	0.14±25%	1150	MLP2016V1R5MT0S1
	1.0	2.2 ±20%	2	0.17±25%	1000	MLP2016V2R2MT0S1

Datasheet for IP5306:

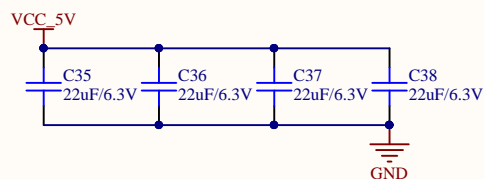
<http://www.injoinic.com/doc/IP5306%2A0datasheet%2A0v1.01.pdf>



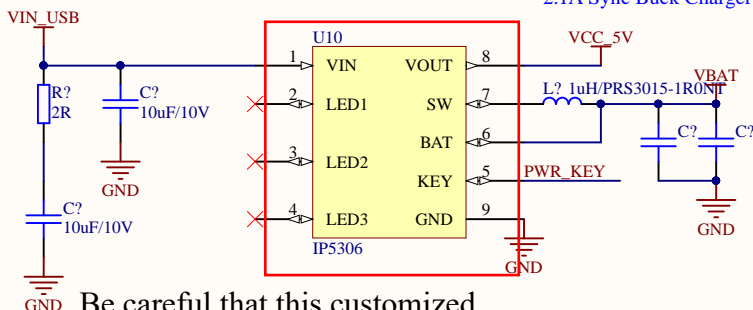
Function Block Diagram



Power



5V 2.4A Sync Boost
2.1A Sync Buck Charger



Be careful that this customized IP5306 was designed to communication with ESP32 through IIC. IIC address is 0x75.

M5 STACK CORE

Title
M5 STACK CORE POWER MANAGEMENT

Size
A4

Number
013-0000-002

Revision
A

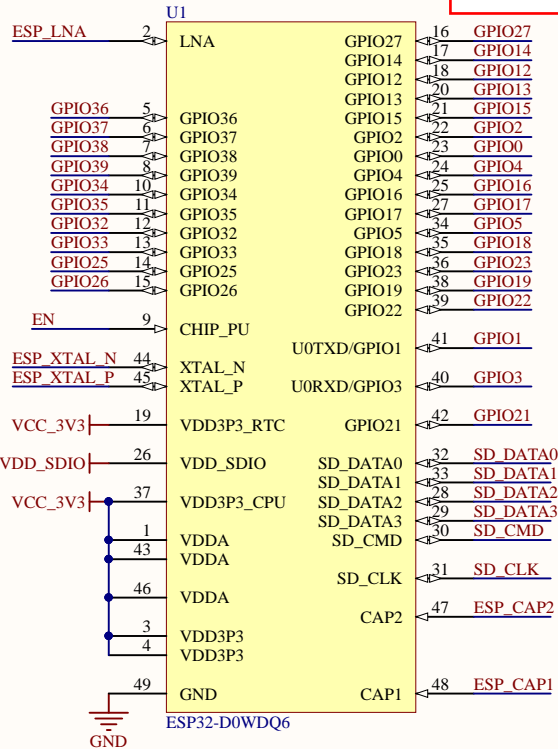
Date: 2017/12/6

Sheet of

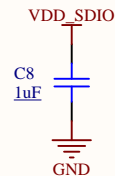
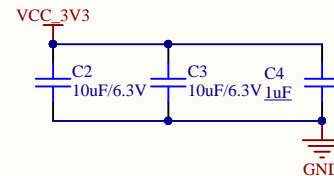
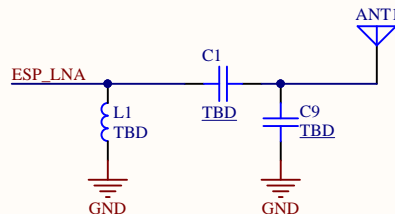
File: C:\Users\...\A1-PWR.SchDoc

Drawn By: Han Shihao

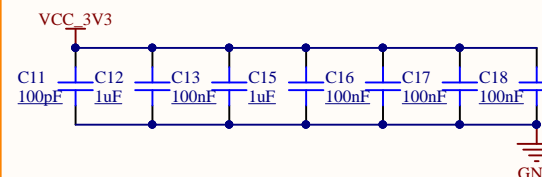
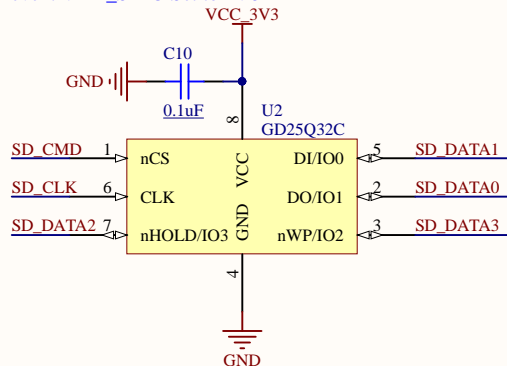
ESP32



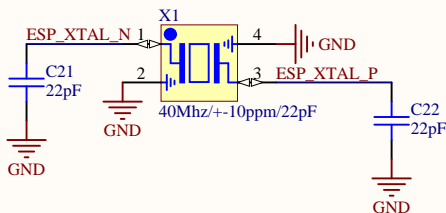
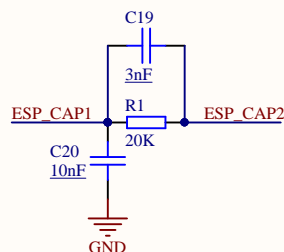
Depend on Actual Impedance Matching Result



Prevent VDD_SDIO Set to 1V8



Use 3.3nF for Manufacture



M5 STACK M5 STACK CORE

Title M5 STACK CORE ESP32 SUBSYSTEM

Size	Number	Revision
A4	013-0000-003	A
Date:	2017/12/6	Sheet of
File:	C:\Users\...\A1-ESP32.SchDoc	Drawn By: Han Shihao

1

2

3

4

Button

Btn C

Btn B

Btn A

Btn Rst

Type-C USB

LCD

Auto-download Circuit
Original: <https://github.com/nodemcu/nodemcu-devkit>

TF Card

Auto-Download

M5 M5 STACK CORE

Title
M5 STACK CORE USB-UART & ACCESSORY

Size	Number	Revision
A4	013-0000-004	A
Date:	2017/12/6	Sheet of
File:	C:\Users\...\A1-PHEP.SchDoc	Drawn By: Han Shihao

1

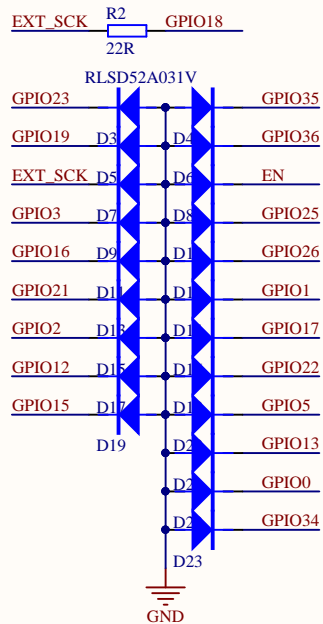
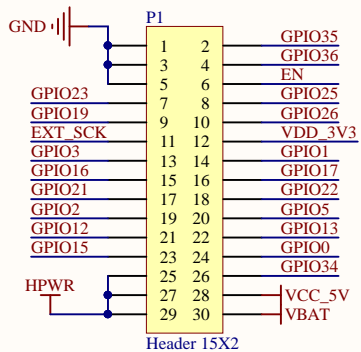
2

3

4

D

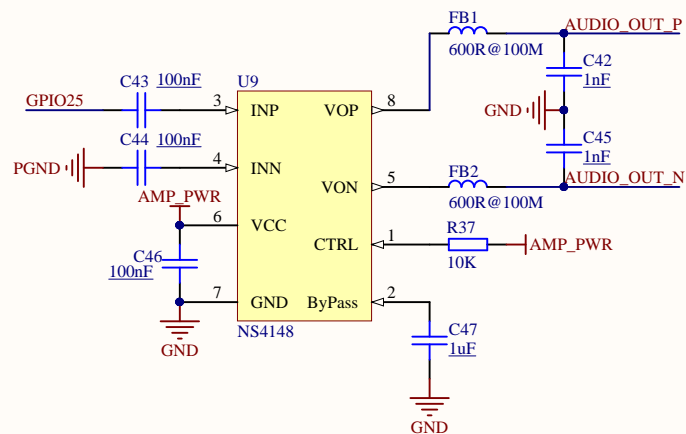
M5-Bus



	GND	1	2	ADC1	GPIO35
	GND	3	4	ADC2	GPIO36
	GND	5	6	RESET	EN
GPIO23	MOSI	7	8	DAC0/AUDIO_L	GPIO25
GPIO19	MISO	9	10	DAC1/AUDIO_R	GPIO26
GPIO18	SCK	11	12	3.3V	
GPIO3	IO0/RXD1	13	14	IO1/TXD1	GPIO1
GPIO16	IO2/RXD2	15	16	IO3/TXD2	GPIO17
GPIO21	IO4/SDA	17	18	IO5/SCL	GPIO22
GPIO2	IO6	19	20	IO7	GPIO5
GPIO12	IO8/IIS_SCLK	21	22	IO9/IIS_WS	GPIO13
GPIO15	IO10/IIS_OUT	23	24	IO11/IIS_MCLK/BOOT	GPIO0
	HPWR	25	26	ADC0/IIS_IN	GPIO34
	HPWR	27	28	5V	
	HPWR	29	30	BATTERY	

M5 STACK CORE

Title			
M5 STACK CORE M.BUS DEFINATION			
Size	Number	Revision	
A4	013-0000-005	A	
Date:	2017/12/6	Sheet	of
File:	C:\Users\...\A1-MBUS.SchDoc	Drawn By:	Han Shihao



Link for Datasheet: http://www.chipsourcetek.com/Uploads/file/20151207193630_0605.pdf

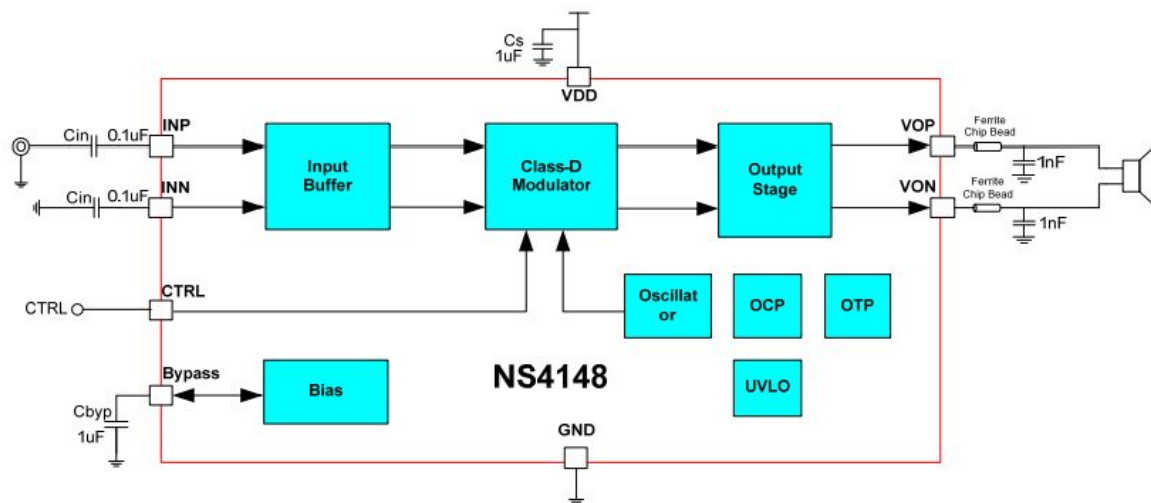


Figure3.The block diagram of NS4148

M5 STACK CORE		
Title		
M5 STACK CORE AUDIO AMPLIFIER		
Size	Number	Revision
A4	013-0000-006	A
Date:	2017/12/6	Sheet of
File:	C:\Users\...\A1-AUDIO-AMP.SchDoc	Drawn By: Han Shihao