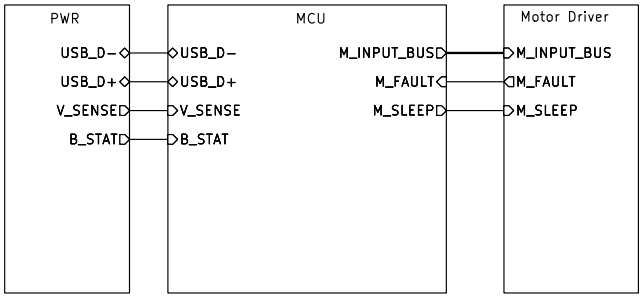
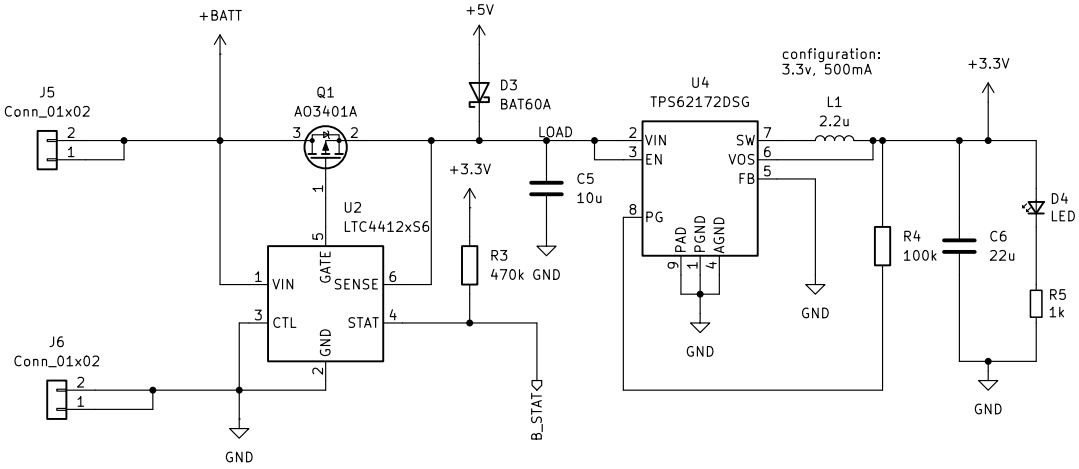


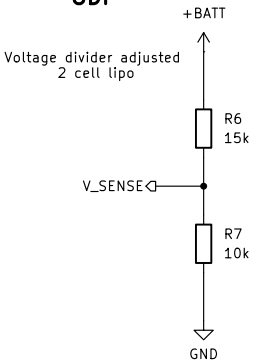
Functional Blocks

Power MUX

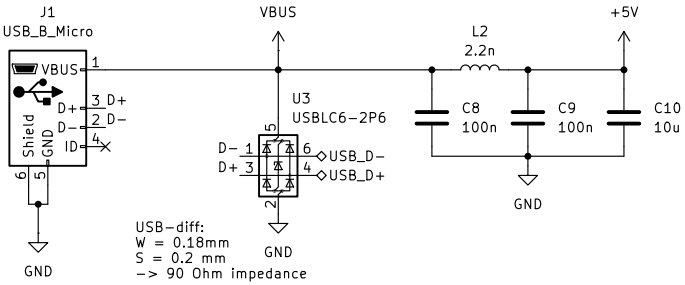
Step down regulator



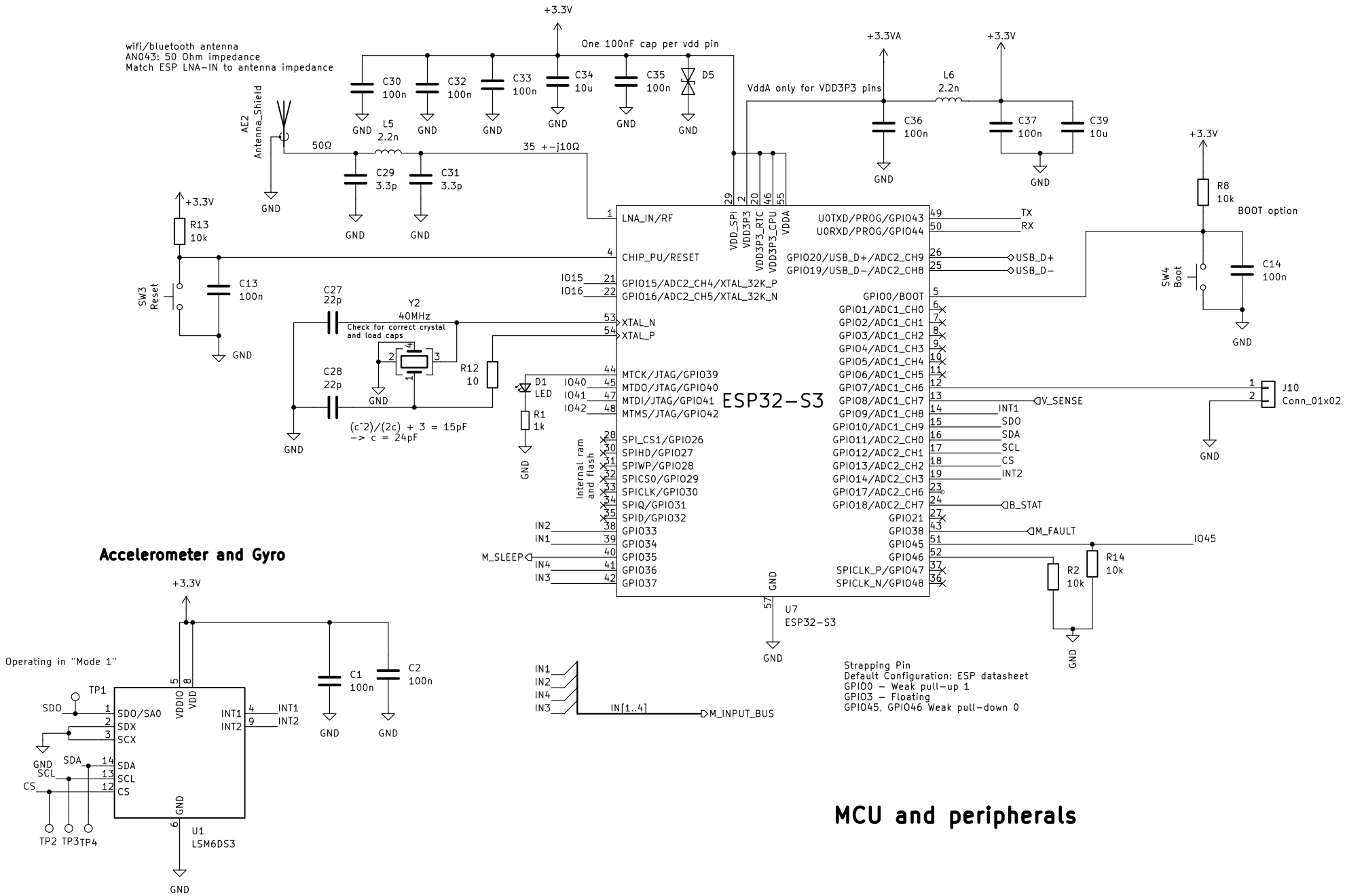
ODP

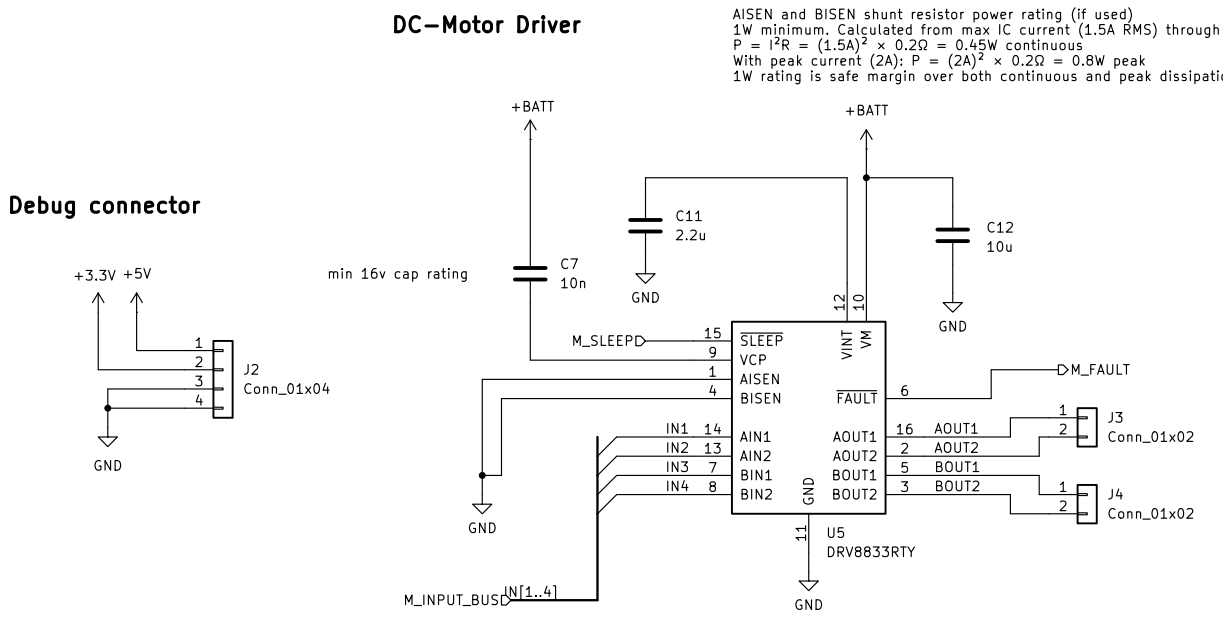


USB JTAG and Power



PWR, USB-JTAG


wifi/bluetooth antenna
AN043: 50 Ohm impedance
Match ESP LNA-IN to antenna impedance
AE2
Antenna_Shield
50Ω
L5
2.2n
35 +-j10Ω
C29
3.3p
C31
3.3p
+3.3V
One 100nF cap per vdd pin
C30
100n
C32
100n
C33
100n
C34
10u
C35
100n
D5
+3.3VA
VddA only for VDD3P3 pins
L6
2.2n
C36
100n
C37
100n
C39
10u
R13
10k
SW3
Reset
C13
100n
C27
22p
Y2
40MHz
Check for correct crystal
and load caps
C28
22p
(c^2)/(2c) + 3 = 15pF
-> c = 24pF
R12
10
D1
LED
R1
1k
ESP32-S3
LNA_IN/RF
CHIP_PU/RESET
GPIO15/ADC2_CH4/XTAL_32K_P
GPIO16/ADC2_CH5/XTAL_32K_N
XTAL_N
XTAL_P
MTCK/JTAG/GPIO39
MTDO/JTAG/GPIO40
MTDI/JTAG/GPIO41
MTMS/JTAG/GPIO42
SPI_CS1/GPIO26
SPIHD/GPIO27
SPIWP/GPIO28
SPICS0/GPIO29
SPICLK/GPIO30
SPIQ/GPIO31
SPID/GPIO32
GPIO33
GPIO34
GPIO35
GPIO36
GPIO37
Internal ram
and flash
VDD_SPI
VDD3P3
VDD3P3_RTC
VDD3P3_CPU
VDDA
U0TXD/PROG/GPIO43
U0RXD/PROG/GPIO44
GPIO20/USB_D+/ADC2_CH9
GPIO19/USB_D-/ADC2_CH8
GPIO0/BOOT
GPIO1/ADC1_CH0
GPIO2/ADC1_CH1
GPIO3/ADC1_CH2
GPIO4/ADC1_CH3
GPIO5/ADC1_CH4
GPIO6/ADC1_CH5
GPIO7/ADC1_CH6
GPIO8/ADC1_CH7
GPIO9/ADC1_CH8
GPIO10/ADC1_CH9
GPIO11/ADC2_CH0
GPIO12/ADC2_CH1
GPIO13/ADC2_CH2
GPIO14/ADC2_CH3
GPIO17/ADC2_CH6
GPIO18/ADC2_CH7
GPIO21
GPIO38
GPIO45
GPIO46
SPICLK_P/GPIO47
SPICLK_N/GPIO48
U7
ESP32-S3
TX
RX
USB_D+
USB_D-
V_SENSE
INT1
SDO
SDA
SCL
CS
INT2
B_STAT
M_FAULT
IO45
M_SLEEP
IN1
IN2
IN3
IN4
R8
10k
BOOT option
SW4
Boot
C14
100n
J10
Conn_01x02
R2
10k
R14
10k
Strapping Pin
Default Configuration: ESP datasheet
GPIO0 - Weak pull-up 1
GPIO3 - Floating
GPIO45, GPIO46 Weak pull-down 0
IN[1..4]
M_INPUT_BUS
Accelerometer and Gyro
Operating in "Mode 1"
TP1
SDO/SA0
SDX
SCX
SDA
SCL
CS
VDDIO
VDD
INT1
INT2
C1
100n
C2
100n
U1
LSM6DS3
TP2
TP3
TP4
MCU and peripherals


DC—Motor Driver
AISEN and BISEN shunt resistor power rating (if used)
1W minimum. Calculated from max IC current (1.5A RMS) through 0.2Ω:
P = I²R = (1.5A)² × 0.2Ω = 0.45W continuous
With peak current (2A): P = (2A)² × 0.2Ω = 0.8W peak
1W rating is safe margin over both continuous and peak dissipation
Debug connector
+3.3V
+5V
J2
Conn_01x04
GND
min 16v cap rating
+BATT
C7
10n
C11
2.2u
GND
+BATT
C12
10u
GND
M_SLEEP
SLEEP
VCP
AISEN
BISEN
VINT
VM
FAULT
M_FAULT
IN1
IN2
IN3
IN4
AIN1
AIN2
BIN1
BIN2
AOUT1
AOUT2
BOUT1
BOUT2
GND
J3
Conn_01x02
J4
Conn_01x02
U5
DRV8833RTY
GND
M_INPUT_BUS
IN[1..4]
Motor Driver