Power management

Barrel_Jack_MountingPin

J2
CHGR_P
CHGR_N
MP1

TP_CHGR_P
TP4
TP5
TP_CHGR_N

U2
ShengYang-BMS
CHGR_P 5 + 12.6V 4 VBAT_S3
CHGR_N 6 − 8.4V   3 VBAT_S2
              4.2V   2 VBAT_S1
              0V   1 GND

Battery_Connector
J1
12.6V 4 VBAT_S3 TP1 TP_VBAT_S3
8.4V   3 VBAT_S2 TP2 TP_VBAT_S2
4.2V   2 VBAT_S1 TP3 TP_VBAT_S1
0V   1 GND

MOTOR_GND NT1 GND
LOGIC_GND NT_GND

TP_VBAT
TP6
VBAT_S3
C1 10uF
C2 100nF

U3
DSN-1504-3A
1 IN+   OUT+ 5
2 IN+   OUT+ 6
DC/DC
3 IN−   OUT− 7
4 IN−   OUT− 8

TP_VBAT_REG
TP13
C4 10uF
VBAT_REG
R1 R
D1 LED
GND

MCU Logic
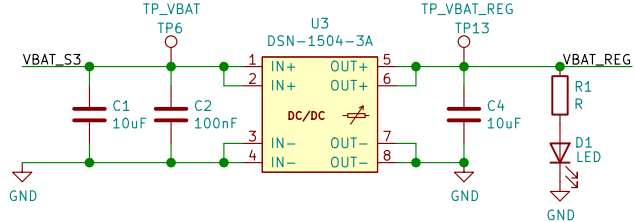
U1
STM32-NUCLEO-F446RE

GPS_UART_RX   1 PC10 SPI3_SCLK / SERIAL3_TX
GPS_UART_TX   2 PC11 SERIAL3_RX / SPI3_MISO
GPS_RESET   3 PC12 I2C2_SDA / SPI3_MOSI / SERIAL5_TX
              4 PD2   SERIAL5_RX
              5 VDD
from PSU -> VBAT_REG 6 E5V
              7 BOOT0
LOGIC_GND   8 GND
              9 NC
             10 NC
             11 NC
             12 IOREF
             13 PA13
             14 RESET
             15 PA14
<- to periphs LOGIC_3V3 16 3V3
             17 PA15 SPI1_SSEL / PWM2_1
<- to periphs LOGIC_5V 18 5V0
LOGIC_GND   19 GND
LOGIC_GND   20 GND
             21 PB7   I2C1_SDA / PWM4_2 / SERIAL1_RX
LOGIC_GND   22 GND
             23 PC13 USER_BUTTON
MOTOR_MODE   24 VIN
MOTOR1_PS   25 PC14
             26 NC
MOTOR2_PS   27 PC15
MOTOR3_PS   28 PA0   SERIAL4_TX / PWM2_1 / ADC
             29 PH0
             30 PA1   SERIAL4_RX / PWM2_2 / ADC
MOTOR1_ENC_A 31 PH1
MOTOR1_ENC_B 32 PA4   SPI1_SSEL / ADC / DAC
MOTOR2_ENC_A 33 VBAT
MOTOR2_ENC_B 34 PB0   PWM1_2N / SPI3_MOSI / ADC
MOTOR3_ENC_A 35 PC2   SPI2_MISO / ADC
MOTOR3_ENC_B 36 PC1   SPI2_MOSI / ADC
             37 PC3   SPI2_MOSI / ADC
             38 PC0   ADC

MOTOR1_INA
MOTOR1_INB
MOTOR2_INA
MOTOR2_INB
MOTOR3_INA
MOTOR3_INB

39 PC9   PWM3_4 / I2C3_SDA
40 PC8   PWM3_3
41 PB8   CAN1_RD / PWM4_3 / I2C1_SCL
42 PC6   SERIAL6_TX / PWM3_1
43 PB9   SPI2_SSEL / CAN1_TD / PWM4_4 / I2C1_SDA
44 PC5   SERIAL3_RX / ADC
45 AVDD
46 U5V
47 GND   LOGIC_GND
48 NC
49 PA5   LED1 / SC1 / DAC / PWM2_1 / ADC
50 PA12 CAN1_TD
51 PA6   SPI1_MISO / PWM3_1 / ADC
52 PA11 PWM1_4 / CAN1_RD / ADC
53 PA7   SPI1_MOSI / PWM1_1N / ADC
54 PB12 CAN2_RD / SPI2_SSEL
55 PB6   SERIAL1_TX / CAN2_TD / PWM4_1 / I2C1_SCL
56 PC7   SPI2_SCLK / PWM3_2 / SERIAL6_RX
57 GND   LOGIC_GND
58 PA9   SPI2_SCLK / PWM1_2 / SERIAL1_TX
59 PB2   PWM2_4 / SPI3_MOSI
60 PA8   PWM1_2 / I2C3_SCL
61 PB1   ADC / PWM1_3N
62 PB10 SPI2_SCLK / SERIAL3_TX / PWM2_3 / I2C2_SCL
63 PB15 PWM1_3N / SPI2_MOSI
64 PB4   SPI3_MISO / PWM3_1 / I2C3_SDA
65 PB14 PWM1_2N / SPI2_MISO
66 PB5   SPI3_MOSI / CAN2_RD / PWM3_2
67 PB13 PWM1_1N / CAN2_TD / SPI2_SCLK
68 PB3   SPI3_SCLK / PWM2_2 / I2C2_SDA
69 AGND
70 GND   LOGIC_GND
71 PA10 PWM1_3 / SERIAL1_RX
72 PC4   ADC
73 PA2   ADC / PWM2_3 / SERIAL2_TX
74 NC
75 PA3   ADC / PWM2_4 / SERIAL2_RX
76 NC

Sensors

U5
L80-M39
4 VCC   EX_ANT   11
5 V_BCKP AADET_N   8
LOGIC_3V3
GPS_UART_RX 1 RXD1   TIMER   7
GPS_UART_TX 2 TXD1   1PPS   6
GPS_RESET   10 RESET
             3 GND
LOGIC_GND   12 GND   GPS

R2 R
D2 LED
GND

U4
ICM-20948
8 VDDIO VDD 13
9   SDO/AD0
24 SDA/SDI
23 SCL/SCLK
22 CS   AUX_DA 21
                AUX_CL 20
11 FSYNC   REGOUT 10
12 INT1
     GND 18
GND
C6 100nF
GND

LOGIC_3V3
C3 100nF   C5 100nF
LOGIC_GND

LOGIC_3V3   TP7 TP_LOGIC_3V3
LOGIC_5V   TP8 TP_LOGIC_5V
LOGIC_GND   TP9 TP_LOGIC_GND
GPS_UART_RX TP10 TP_GPS_UART_RX
GPS_UART_TX TP11 TP_GPS_UART_TX
GPS_RESET   TP12 TP_GPS_RESET

Motor control

VBAT_REG NT2 MOTOR_VIN
NT_MOTOR_PWR

LOGIC_3V3 JP1 Jumper_NC_Dual
MOTOR_TR1 1
LOGIC_GND 2
           3

LOGIC_3V3 JP2 Jumper_NC_Dual
MOTOR_TR2 1
           2
LOGIC_GND 3

U6
BD65496MUV
LOGIC_3V3 1 VCC   LOGIC POWER VIN MOTOR POWER 5 MOTOR_VIN
LOGIC_GND 6 GND   GND   2 MOTOR_GND
MOTOR1_PS 7 PS   CONFIGURATION
MOTOR_MODE 12 PWM
MOTOR_TR1 8 TR1
MOTOR_TR2 9 TR2   DRIVER M
MOTOR1_INA 10 INA CONTROL INPUT OUTA CONTROL OUTPUT 3 MOTOR1_A
MOTOR1_INB 11 INB   OUTB   4 MOTOR1_B

U7
BD65496MUV
LOGIC_3V3 1 VCC   VIN 5 MOTOR_VIN
LOGIC_GND 6 GND   GND 2 MOTOR_GND
MOTOR2_PS 7 PS
MOTOR_MODE 12 PWM
MOTOR_TR1 8 TR1
MOTOR_TR2 9 TR2 DRIVER M
MOTOR2_INA 10 INA OUTA 3 MOTOR2_A
MOTOR2_INB 11 INB OUTB 4 MOTOR2_B

U8
BD65496MUV
LOGIC_3V3 1 VCC   VIN 5 MOTOR_VIN
LOGIC_GND 6 GND   GND 2 MOTOR_GND
MOTOR3_PS 7 PS
MOTOR_MODE 12 PWM
MOTOR_TR1 8 TR1
MOTOR_TR2 9 TR2 DRIVER M
MOTOR3_INA 10 INA OUTA 3 MOTOR3_A
MOTOR3_INB 11 INB OUTB 4 MOTOR3_B

J3 Motor_Connector
MOTOR1_A   1 MOTOR+
MOTOR1_B   2 MOTOR−
LOGIC_GND   3 ENC_GND
LOGIC_3V3   4 ENC_VCC
MOTOR1_ENC_A 5 ENC_A
MOTOR1_ENC_B 6 ENC_B

J4 Motor_Connector
MOTOR2_A   1 MOTOR+
MOTOR2_B   2 MOTOR−
LOGIC_GND   3 ENC_GND
LOGIC_3V3   4 ENC_VCC
MOTOR2_ENC_A 5 ENC_A
MOTOR2_ENC_B 6 ENC_B

J5 Motor_Connector
MOTOR3_A   1 MOTOR+
MOTOR3_B   2 MOTOR−
LOGIC_GND   3 ENC_GND
LOGIC_3V3   4 ENC_VCC
MOTOR3_ENC_A 5 ENC_A
MOTOR3_ENC_B 6 ENC_B

LOGIC_3V3
C7 100nF   C8 100nF   C9 100nF
LOGIC_GND

MOTOR_VIN
C10 10uF   C11 10uF   C12 10uF
MOTOR_GND

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