CAN module

U4 MCP2551-I/SN
TXD 1
RXD 4
Vref
Rs
VDD 3
CANH 7
CANL 6
VSS 2
CAN_Tx
CAN_Rx
+5V
JP1 Terminal
J1 DB9_Female
J2 DB9_Male
R8 4k7
GND
D3 PESD1CAN
R9 120
Q1 AO3407
R5 10k
MM3Z7V5 D2
GND
12Vin

Current sensor

U9 MAX471
RS+ 1
RS+ 2
SHDN 3
GND 4
RS- 8
RS- 7
SIGN 6
OUT 5
12Vin
12Vout
R31
R36 10k
C9 0.1
I12V 1V/A
GND

Bootloader init

BOOT0
R27 10k
SW2 Boot
C6 0.1
+3.3V
GND
NRST
R28 10k
SW1 Reset
C5 0.1
+3.3V
GND

I2C multiplexer

U5 74HC4051
ADDR0 11 S0
ADDR1 10 S1
ADDR2 9 S2
VEE 7
VCC 16
GND 8
EN 6 E
+3.3V
GND
Y0 13 D0
Y1 14 D1
Y2 15 D2
Y3 12 D3
Y4 1 D4
Y5 5 D5
Y6 2 D6
Y7 4 D7
I2C1_SDA
R32 22
TVS 3v3 D10
GND

U6 74HC4051
ADDR0 11 S0
ADDR1 10 S1
ADDR2 9 S2
VEE 7
VCC 16
GND 8
EN 6 E
+3.3V
GND
Y0 13 C0
Y1 14 C1
Y2 15 C2
Y3 12 C3
Y4 1 C4
Y5 5 C5
Y6 2 C6
Y7 4 C7
I2C1_SCL
R33 22
TVS 3v3 D11
GND

3v3_sensors
R10 4k7 R11 4k7
R12 4k7 R13 4k7
R14 4k7 R15 4k7
R16 4k7 R17 4k7
R18 4k7 R19 4k7
R20 4k7 R21 4k7
R22 4k7 R23 4k7
R24 4k7 R25 4k7
D0 C0 P2 RJ9-sensor
D1 C1 P3 RJ9-sensor
D2 C2 P4 RJ9-sensor
D3 C3 P5 RJ9-sensor
D4 C4 P6 RJ9-sensor
D5 C5 P7 RJ9-sensor
D6 C6 P8 RJ9-sensor
D7 C7 P9 RJ9-sensor
GND

5V power source

U1 LM2576HV
VIN 1
ON/OFF 5
GND 3
FB 4
VOUT 2
12Vout
C15 0.1
C1 47u
GND
PWR_FLAG
5Vreg
1n5822 D1
1,5A!
L1 100u
C4 100u
C8 0.1
GND GND GND

3.3V MCU power source

U2 LM1117-3.3
VI 3
GND/ADJ 1
VO 2
VO 4
5Vreg
+5V
+3.3V
5Vusb
MBRS130L D4
C2 47u
GND

3.3V sensors' power source

U3 LM1117-3.3
VI 3
GND/ADJ 1
VO 2
VO 4
+5V
C7 0.1
C3 47u
GND

Current switch

U8 TPS2051
GND 2
IN 3
IN 4
EN 1
OUT 8
OUT 7
OUT 6
OC 5
3v3_sensors
T_overcurnt
T_pow_EN
R26 10k
+3.3V

LED indicators

LED0
D5 LED0
R29 330
+3.3V
LED1
D6 LED1
R30 330
+3.3V

Board address

Conn_02x04_Odd_Even
J3
1 2 brdaddr0
3 4 brdaddr1
5 6 brdaddr2
7 8 brdaddr3
GND

ADC block (voltage)

3v3_sensors
R1 4k7
R2 4k7
V3.3
GND
12Vin
R3 220k
R4 56k
TVS 3v3 D8
V12
GND
+5V
R6 4k7
R7 4k7
TVS 3v3 D9
V5
GND

V3.3 = Usensors/2
V12 = 12Vin/4.93
V5 = U5/2

U7 STM32F042C6Tx

VDD 24
VDD 49
VDDA 9
VDDIO2 36
NRST 7 NRST
VBAT 1
PF0/CRS_SYNC/I2C1_SDA/RCC_OSC_IN 5
PF1/I2C1_SCL/RCC_OSC_OUT 6
PF11
BOOT0 44
PC13/RTC_OUT_ALARM/RTC_OUT_CALIB/RTC_TAMP1/RTC_TS/SYS_WKUP2 2
PC14/RCC_OSC32_IN 3
PC15/RCC_OSC32_OUT 4
ADDR0 18 PB0/ADC_IN8/TIM1_CH2N/TIM3_CH3/TSC_G3_IO2
ADDR1 19 PB1/ADC_IN9/TIM14_CH1/TIM1_CH3N/TIM3_CH4/TSC_G3_IO3
ADDR2 20 PB2/TSC_G3_IO4
T_overcurnt 39 PB3/I2S1_CK/SPI1_SCK/TIM2_CH2/TSC_G5_IO1
40 PB4/I2S1_MCK/SPI1_MISO/TIM17_BKIN/TIM3_CH1/TSC_G5_IO2
41 PB5/I2C1_SMBA/I2S1_SD/SPI1_MOSI/SYS_WKUP6/TIM16_BKIN/TIM3_CH2
I2C1_SCL 42 PB6/I2C1_SCL/TIM16_CH1N/TSC_G5_IO3/USART1_TX
I2C1_SDA 43 PB7/I2C1_SDA/TIM17_CH1N/TSC_G5_IO4/USART1_RX
CAN_Rx 45 PB8/CAN_RX/CEC/I2C1_SCL/TIM16_CH1/TSC_SYNC
CAN_Tx 46 PB9/CAN_TX/I2C1_SDA/IR_OUT/SPI2_NSS/TIM17_CH1
PB10/CEC/I2C1_SCL/SPI2_SCK/TIM2_CH3/TSC_SYNC
PB11/I2C1_SDA/TIM2_CH4
PB12/SPI2_NSS/TIM1_BKIN
LED0 21
LED1 22
EN 25
26 PB13/I2C1_SCL/SPI2_SCK/TIM1_CH1N
27 PB14/I2C1_SDA/SPI2_MISO/TIM1_CH2N
brdaddr3 28 PB15/RTC_REFIN/SPI2_MOSI/SYS_WKUP7/TIM1_CH3N

ADC_IN0/RTC_TAMP2/SYS_WKUP1/TIM2_CH1/TIM2_ETR/TSC_G1_IO1/USART2_CTS/PA0 10 V12 External 12V voltage control
ADC_IN1/TIM2_CH2/TSC_G1_IO2/USART2_DE/USART2_RTS/PA1 11 V5 External 5V voltage control
ADC_IN2/SYS_WKUP4/TIM2_CH3/TSC_G1_IO3/USART2_TX/PA2 12
ADC_IN3/TIM2_CH4/TSC_G1_IO4/USART2_RX/PA3 13 I12V Total power consumption
ADC_IN4/I2S1_WS/SPI1_NSS/TIM14_CH1/TSC_G2_IO1/USART2_CK/USB_OE/PA4 14
ADC_IN5/CEC/I2C1_CK/SPI1_SCK/TIM2_CH1/TIM2_ETR/TSC_G2_IO2/PA5 15
ADC_IN6/I2S1_MCK/SPI1_MISO/TIM16_CH1/TSC_G2_IO3/PA6 16 V3.3 Thermal sensors' 3.3V voltage control
ADC_IN7/I2S1_SD/SPI1_MOSI/TIM14_CH1/TIM17_CH1/TIM1_CH1N/TIM3_CH2/TSC_G2_IO4/PA7 17
CRS_SYNC/RCC_MCO/TIM1_CH1/USART1_CK/PA8 29 T_pow_EN
I2C1_SCL/TIM15_CH1/TSC_G4_IO1/USART1_TX/PA9 30
CAN_RX/I2C1_SCL/TIM1_CH3/TSC_G4_IO2/USART1_RX/PA10 31
CAN_TX/I2C1_SDA/TIM1_ETR/TSC_G4_IO4/USART1_DE/USART1_RTS/USB_DP/PA12 33
IR_OUT/SYS_SWDIO/USART1_DE/USB_OE/PA13 34 brdaddr0
SYS_SWCLK/USART2_TX/PA14 37 brdaddr1
I2S1_WS/SPI1_NSS/TIM2_CH1/TIM2_ETR/USART2_RX/USB_OE/PA15 38 brdaddr2
CAN_RX/I2C1_SCL/TIM1_CH4/TSC_G4_IO3/USART1_CTS/USB_DM/PA11 32
VSS 23
VSS 35
VSS 47
VSSA 8
C11 0.1 C12 0.1 C13 0.1 C14 0.1
GND
+3.3V VDD

USB6B1 D7
5Vusb 8
R34 22
R35 22
1
7
6
3
4
VBUS 1
D- 2
D+ 3
GND 4
shield 5
USB_A P13
GND GND
PWR_FLAG
USART_BOOT P12
GND

P15 Hole
P16 Hole
P17 Hole
P18 Hole