Power Input

Battery Connector
10V – 30V

Reverse Polarity Protection

Q1
DMP4051LK3

J2
Conn_01x02_Male

TP1
TestPoint

D1
BZT52-B15_R1_00001

R1
10k,1%,63mW

GND

TP3
TestPoint

C2
10uF, 50V

12V Supply
–Input: DC 10V–30V
–Output: 12V at 1A

https://webench.ti.com/appinfo/webench/scripts/SDP.cgi?ID=054F6F9B41D36834

T1
DRQ125-330-R

GND

D2
DSK34

C10
1uF, 50V

TP12
TestPoint

+12V

U2
LM3488

VIN
FB
DR
COMP
ISEN
AGND
PGND
FA/SYNC/SD

C3
100nF, 50V

R2
634,.1%,63

C5
2200pF,10%,50V

C6
0.22uF,10%,35V

Q2
NCE0110K

R6
100,1%,63mW

C8
1nF, 50V

R4
56.2k,1%,63mW

R7
25mOhm,1%,500mW

R8
84.5k,1%,63mW

R9
10k,1%,63mW

C12
22uF, 20V

+3.3V Supply
–Input: DC 12V 100mA
–Output: 3.3V at 100mA

U4
LD1117S33TR_SOT223

VI
VO
GND

C13
100nF, 50V

C15
10uF, 50V

TP15
TestPoint

D3
LED

R12
1k,1%,25mW

H1 MountingHole
H2 MountingHole
H3 MountingHole
H4 MountingHole

FID1 Fiducial
FID2 Fiducial
FID3 Fiducial

Restrict output to 15mA using series resistors.

R18
220,1%,63mW

R20
220,1%,63mW

R16
220,1%,63mW

R25
220,1%,63mW

R24
220,1%,63mW

UART_TX
UART_RX
TACKLE_STATUS
HOME_SELECT
ELIGIBLE_SELECT

J5
Conn_01x06_Male

Tackle Status
1 – –> UART TX
2 – <– UART RX
3 – –> Status
4 – <– Home/Away
5 – <– Eligible/Ineligible
6 – GND

Status is HIGH when "okay".
Status is LOW when "tackled".

LED Driver

D4
CLV1A-FKB-CK1VW1DE1BB7C3C3

R
G
B

R11
1k,1%,25mW

R13
1k,1%,25mW

R14
1k,1%,25mW

+12V LED Output
Current – Trip: 1.50 A
Current – Hold: 750 mA
Time to Trip: 100 ms

F1
1210L075YR

J4
Conn_01x04_Male

R15
0,0.5W

R17
0,0.5W

R19
0,0.5W

C14
100nF, 50V

U5
ULN2003ADR

COM
O1
O2
O3
O4
O5
O6
O7

LED Output:
1 – +12V
2 – R
3 – G
4 – B

Behavior matches
on-board LED.

R_PWM
G_PWM
B_PWM

Programming Header

SWD interface to program MCU.

J1
Conn_ARM_JTAG_SWD_10

VTref
RESET
SWDCLK/TCK
SWDIO/TMS
SWO/TDO
NC/TDI
GNDDetect
GND

TP2
TestPoint

RST
SWCLK
SWDIO

SW1

C1
100nF, 50V

MCU

U1
STM32G031Fx

VDD
VSS
PB7/PB8
PB9/PC14-OSC32_IN
PC15-OSC32_OUT
PF2-NRST
PA0
PA1
PA2
PA3
PA4
PA5
PA6
PA7
PB0/PB1/PB2/PA8
PA11[PA9]
PA12[PA10]
PA13
PA15/PA14-BOOT0
PB3/PB4/PB5/PB6

HOME_SELECT
ELIGIBLE_SELECT
TACKLE_STATUS
RST
ACC_INT1
SPI1_SCK
UART_TX
UART_RX
SPI1_NSS
ACC_INT2
SPI1_MISO
SPI1_MOSI
B_PWM
G_PWM
SWDIO
SWCLK
R_PWM

C4
100nF, 50V

C7
1uF, 50V

R5
100k,1%,63mW

R22
100k,1%,63mW

S1
DS01-254-L-02BE

1A
1B
2A
2B

R21
10k,1%,63mW

R23
10k,1%,63mW

R3
10k,1%,63mW

Pull BOOT0 to GND with resistor.

Eligible/Ineligible Selection
– Ineligible Receiver (HIGH)
– Eligible Receiver (LOW)

Home/Away Selection
– Away (HIGH)
– Home (LOW)

Accelerometer

C9
100nF, 50V

C11
1uF, 50V

U3
LIS2DE12

Vdd
Vdd_IO
CS
SDA/SDI
SAO/SDO
SCL/SPC
INT1
INT2
GND
RES

SPI1_NSS
SPI1_MOSI
SPI1_MISO
SPI1_SCK
ACC_INT1
ACC_INT2

TestPoint TP8
TestPoint TP9
TestPoint TP10
TestPoint TP11
TestPoint TP13
TestPoint TP14

R10
0,63mW

Power supply decoupling capacitors should be placed as near as possible to pin 9 of the device.

Sheet: /
File: tackle_sensor_hardware.kicad_sch

Title: Tackle Sensor

Size: USLegal	Date: 2023-08-31	Rev: 1
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