

MICROCONTROLLER

U1 ATmega328P-AU

VCC (4, 6) +VDD

AVCC (18) +VDD

AREF (20) +VDD

ADC6 (19) +VDD

ADC7 (22) +VDD

GND (21, 5, 3) GND

(PCINT0/CLKO/ICP1)PB0 (12) NRF_CE = D8

(PCINT1/OC1A)PB1 (13) NRF_CS = D9

(PCINT2/OC1B/SS)PB2 (14)

(PCINT3/OC2A/MOSI)PB3 (15) SPI_MOSI

(PCINT4/MISO)PB4 (16) SPI_MISO

(PCINT5/SCK)PB5 (17) SPI_SCK

(PCINT6/XTAL1/TOSC1)PB6 (7)

(PCINT7/XTAL2/TOSC2)PB7 (8)

(PCINT8/ADC0)PC0 (23) NRF_IRQ

(PCINT9/ADC1)PC1 (24)

(PCINT10/ADC2)PC2 (25)

(PCINT11/ADC3)PC3 (26)

(PCINT12/SDA/ADC4)PC4 (27)

(PCINT13/SCL/ADC5)PC5 (28)

(PCINT14/RESET)PC6 (29) PROG_RST

(PCINT16/RXD)PD0 (30) PROG_RX

(PCINT17/TXD)PD1 (31) PROG_TX

(PCINT18/INT0)PD2 (32)

(PCINT19/OC2B/INT1)PD3 (1) FLOW_GND_BR

(PCINT20/XCK/T0)PD4 (2) FLOW_PULSE

(PCINT21/OC0B/T1)PD5 (9)

(PCINT22/OC0A/AIN0)PD6 (10)

(PCINT23/AIN1)PD7 (11)

Y1 PBRC8.00HR50X000

RES1

RES2

GND

+VDD

C1 0.1uF

GND

BATTERY ROUTING

SW1 EG2219 DPDT

BATT_POS (1) P2 1x2 150mAh lipo

BATT_MID (1) P3 1x2 150mAh lipo

CHRG_POS (1) P6 1x3

VBATT_2S (1) CHRG_POS

CHRG_MID (2) CHRG_POS

GND

RADIO TRANSCEIVER

U3 nRF24L01+_module

VCC (2) +VDD

CE (3) NRF_CE

CS (4) NRF_CS

IRQ (8) NRF_IRQ

GND (1) GND

SCK (5) SPI_SCK

MOSI (6) SPI_MOSI

MISO (7) SPI_MISO

+VDD

C3 10uF

GND

PROGRAMMING

P4 1x6

PROG_RX (4)

PROG_TX (5)

PROG_DTR (6)

GND

+VDD

R4 10k

C6 0.1uF

PROG_RST

PROG_DTR

P5 2x3

SPI_MISO (1)

SPI_SCK (3)

PROG_RST (5)

SPI_MOSI (2)

GND

FLOW METER INTERFACE

P1 1x3

VBATT_2S (1)

FLOW_IN_BR (2)

FLOW_GND (3)

+VDD

R3 10k

FLOW_PULSE

R1 10k

FLOW_IN_BASE

Q1 MMBT3904

GND

FLOW_GND

R2 10k

FLOW_GND_BASE

Q2 MMBT3904

GND

VOLTAGE REGULATION

VBATT_2S

U2 MIC5205-3.3

IN (1)

EN (3)

OUT (5)

BYP (4)

GND

C2 10uF

C4 0.1uF

C5 10uF

+VDD

GND

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 File: wFM-Tx_0.1.sch

Title: wirelessFlowMeter Transmitter (Tx)

Size: A4 Date: 2017-09-28 Rev: 0.1
 KiCad E.D.A. kicad 4.0.4-stable Id: 1/1

MICROCONTROLLER

U1
ATmega328P-AU

VCC
AVCC
AREF
ADC6
ADC7
GND

(PCINT0/CLKO/ICP1)PB0
(PCINT1/OC1A)PB1
(PCINT2/OC1B/SS)PB2
(PCINT3/OC2A/MOSI)PB3
(PCINT4/MISO)PB4
(PCINT5/SCK)PB5
(PCINT6/XTAL1/TOSC1)PB6
(PCINT7/XTAL2/TOSC2)PB7
(PCINT8/ADCO)PC0
(PCINT9/ADC1)PC1
(PCINT10/ADC2)PC2
(PCINT11/ADC3)PC3
(PCINT12/SDA/ADC4)PC4
(PCINT13/SCL/ADC5)PC5
(PCINT14/RESET)PC6
(PCINT16/RXD)PD0
(PCINT17/TXD)PD1
(PCINT18/INT0)PD2
(PCINT19/OC2B/INT1)PD3
(PCINT20/XCK/T0)PD4
(PCINT21/OC0B/T1)PD5
(PCINT22/OC0A/AINO)PD6
(PCINT23/AIN1)PD7

NRF_CE = D8
NRF_CS = D9
NRF_IRQ
RES1
Y1 PBCRC8.00HR50X000
RES2
GND
PROG_RST
PROG_RX
PROG_TX
FLOW_GND_BR
FLOW_PULSE
FLOW_GND = D3
FLOW_PULSE = D4

BATTERY ROUTING

SW1 EG2219 DPDT
BATT_POS
BATT_MID
CHRG_POS
VBATT_2S
CHRG_MID
GND

RADIO TRANSCEIVER

U3
nRF24L01+_module

SCK
MOSI
MISO
CE
CS
IRQ
VCC
GND

VOLTAGE REGULATION

U2
MIC5205-3.3

IN
EN
OUT
BYP
GND
GND
GND
GND

FLOW METER INTERFACE

P1 1x3
VBATT_2S
FLOW_IN_BR
FLOW_GND
R1 10k
R2 10k
R3 10k
R4 10k
Q1 MMBT3904
Q2 MMBT3904
FLOW_IN_BASE
FLOW_GND_BASE
FLOW_PULSE
FLOW_GND

PROGRAMMING

P4 1x6
PROG_RX
PROG_TX
PROG_DTR
GND
P5 2x3
SPI_MISO
SPI_SCK
PROG_RST
GND
SPI_MOSI

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MICROCONTROLLER

U1
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VCC
VCC
AVCC
AREF
ADC6
ADC7
GND
GND
GND

(PCINT0/CLKO/ICP1)PB0
(PCINT1/OC1A)PB1
(PCINT2/OC1B/SS)PB2
(PCINT3/OC2A/MOSI)PB3
(PCINT4/MISO)PB4
(PCINT5/SCK)PB5
(PCINT6/XTAL1/TOSC1)PB6
(PCINT7/XTAL2/TOSC2)PB7
(PCINT8/ADC0)PC0
(PCINT9/ADC1)PC1
(PCINT10/ADC2)PC2
(PCINT11/ADC3)PC3
(PCINT12/SDA/ADC4)PC4
(PCINT13/SCL/ADC5)PC5
(PCINT14/RESET)PC6
(PCINT16/RXD)PD0
(PCINT17/TXD)PD1
(PCINT18/INT0)PD2
(PCINT19/OC2B/INT1)PD3
(PCINT20/XCK/T0)PD4
(PCINT21/OC0B/T1)PD5
(PCINT22/OC0A/AINO)PD6
(PCINT23/AIN1)PD7

NRF_CE = D8
NRF_CS = D9
NRF_IRQ
PROG_RST
PROG_RX
PROG_TX
FLOW_GND_BR
FLOW_PULSE
FLOW_GND = D3
FLOW_PULSE = D4

RES1
RES2
Y1
P2
P3
P6

BATT_POS
BATT_MID
CHRG_POS
CHRG_MID
VBATT_2S

150mAh Lipo
150mAh Lipo

BATTERY ROUTING

SW1
EG2219
DPDT

RADIO TRANSCEIVER

U3
nRF24L01+_module

SCK
MOSI
MISO
CE
CS
IRQ

NRF_CE
NRF_CS
NRF_IRQ

PROGRAMMING

P4
P5

PROG_RST
PROG_RX
PROG_TX
PROG_DTR
SPL_MISO
SPL_SCK
SPL_MOSI

FLOW METER INTERFACE

P1

VBATT_2S
FLOW_IN_BR
FLOW_GND

R1
R2
R3
R4

10k
10k
10k
10k

Q1
Q2
MMBT3904

FLOW_IN_BASE
FLOW_IN_BR
FLOW_GND_BASE
FLOW_GND_BR
FLOW_PULSE
FLOW_GND

VOLTAGE REGULATION

U2
MIC5205-3.3

IN
EN
OUT
BYP

VBATT_2S
GND
GND
GND
GND

C2
C3
C4
C5

10uF
10uF
0.1uF
10uF

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The schematic diagram illustrates the wiring for the wirelessFlowMeter Transmitter (Tx). It includes the following sections:

- MICROCONTROLLER:** Shows the ATmega328P-AU microcontroller (U1) with its pins connected to various components. Key connections include VCC to +VDD, AVCC to VCC, AREF to GND, and various digital and analog pins to the radio transceiver, battery routing, and flow meter interface.
- BATTERY ROUTING:** Shows the connection of two 150mAh Lipo batteries (P2, P3) to the microcontroller and the radio transceiver. It also shows the connection of a 1x3 pin header (P6) to the microcontroller and the radio transceiver.
- RADIO TRANSCEIVER:** Shows the nRF24L01+ module (U3) connected to the microcontroller via SPI (SCK, MOSI, MISO) and to the battery routing via VCC and GND. It also shows the connection of the radio transceiver to the microcontroller via CE, CS, and IRQ pins.
- VOLTAGE REGULATION:** Shows the MIC5205-3.3 voltage regulator (U2) connected to the battery routing (VBATT_2S) and the microcontroller (VCC). It includes decoupling capacitors C2, C4, and C5.
- FLOW METER INTERFACE:** Shows the connection of the flow meter (P1) to the microcontroller via VCC, GND, and flow signal pins (FLOW_IN_BR, FLOW_GND, FLOW_PULSE). It includes a 10k resistor (R3) and a 10k resistor (R1).
- PROGRAMMING:** Shows the connection of the microcontroller to the programming interface (P4) via VCC, GND, and programming pins (PROG_RX, PROG_TX, PROG_DTR). It includes a 10k resistor (R4) and a 0.1uF capacitor (C6).

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