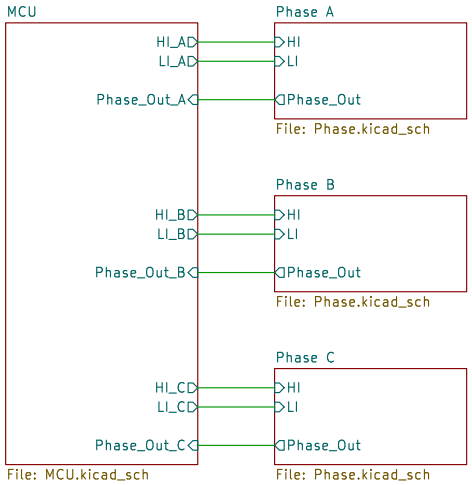


Specifications:
- Battery = 3s to 6s
- Voltage input range = 10.5V to 25.2V

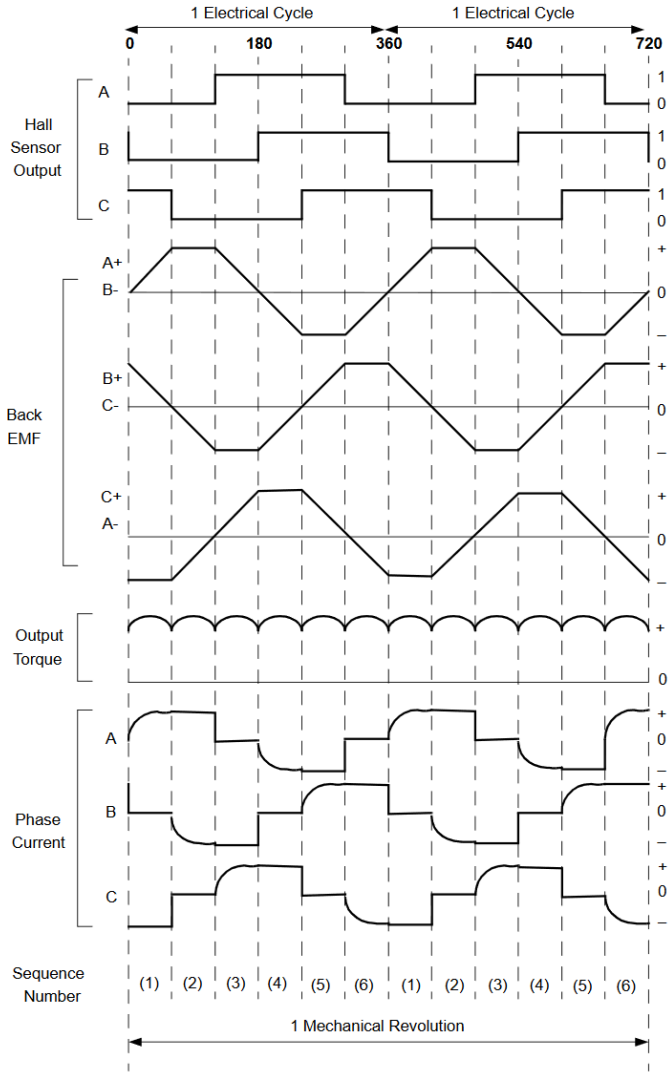


Figure 1: Hall sensor signal, back EMF, output torque and phase current
Source: https://ww1.microchip.com/downloads/en/Appnotes/00885a.pdf

Aria Tso

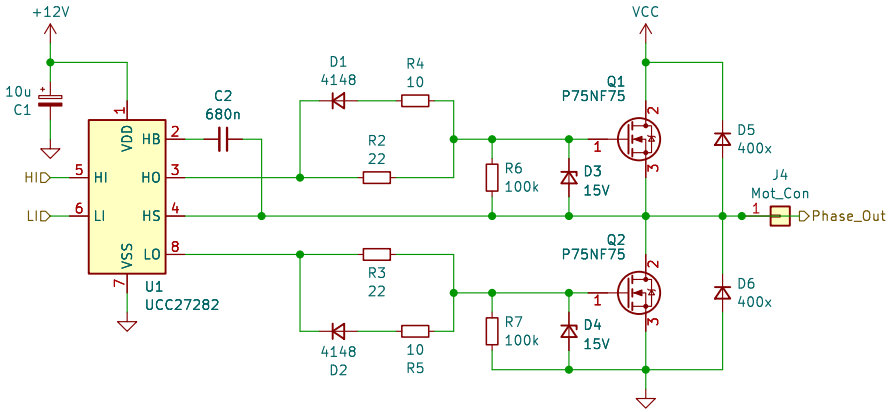
Sheet: /
File: BLDC-Controller.kicad_sch

Title: XE636 BLDC Motor Controller

Size: A4	Date: 2024-03-09	**Rev: V1.0**
KiCad E.D.A. kicad 7.0.10		Id: 1/5

Must size boot capacitor to account for skipped pulses and switching times!

UCC27282 has input interlock protection
No need for any special circuitry to prevent this

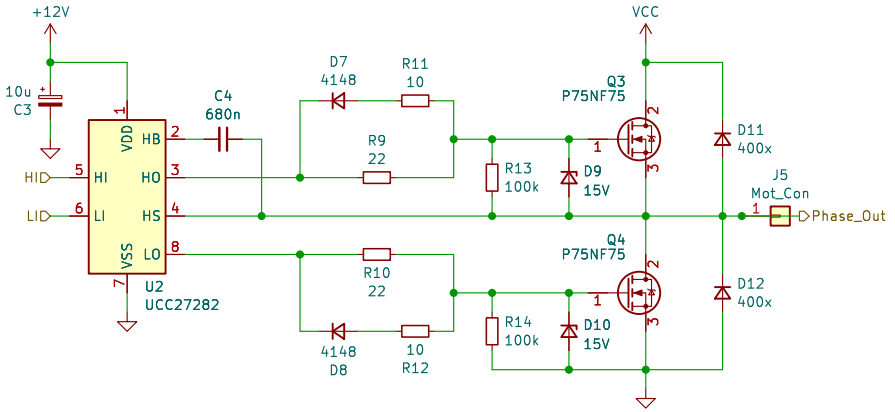


FET gates discharge faster than they charge to avoid cross-conduction

Sheet: /Phase A/		
File: Phase.kicad_sch		
Title:		
Size: A4	Date:	**Rev:**
KiCad E.D.A. kicad 7.0.10		Id: 2/5

Must size boot capacitor to account for skipped pulses and switching times!

UCC27282 has input interlock protection
No need for any special circuitry to prevent this

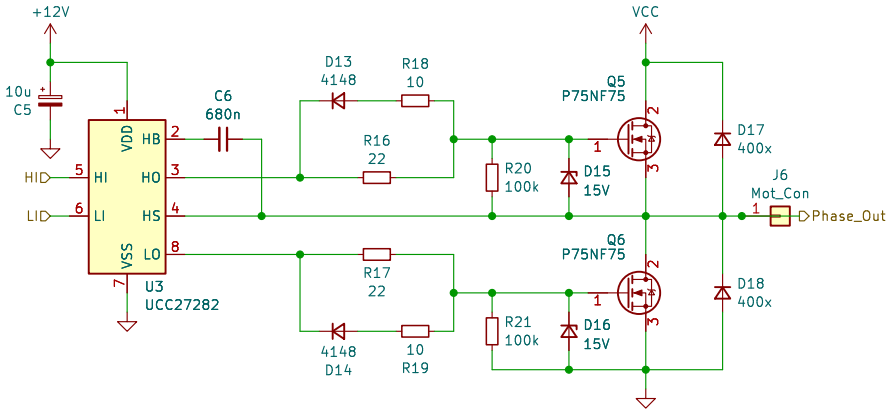


FET gates discharge faster than they charge to avoid cross-conduction

Sheet: /Phase B/		
File: Phase.kicad_sch		
Title:		
Size: A4	Date:	**Rev:**
KiCad E.D.A. kicad 7.0.10		Id: 3/5

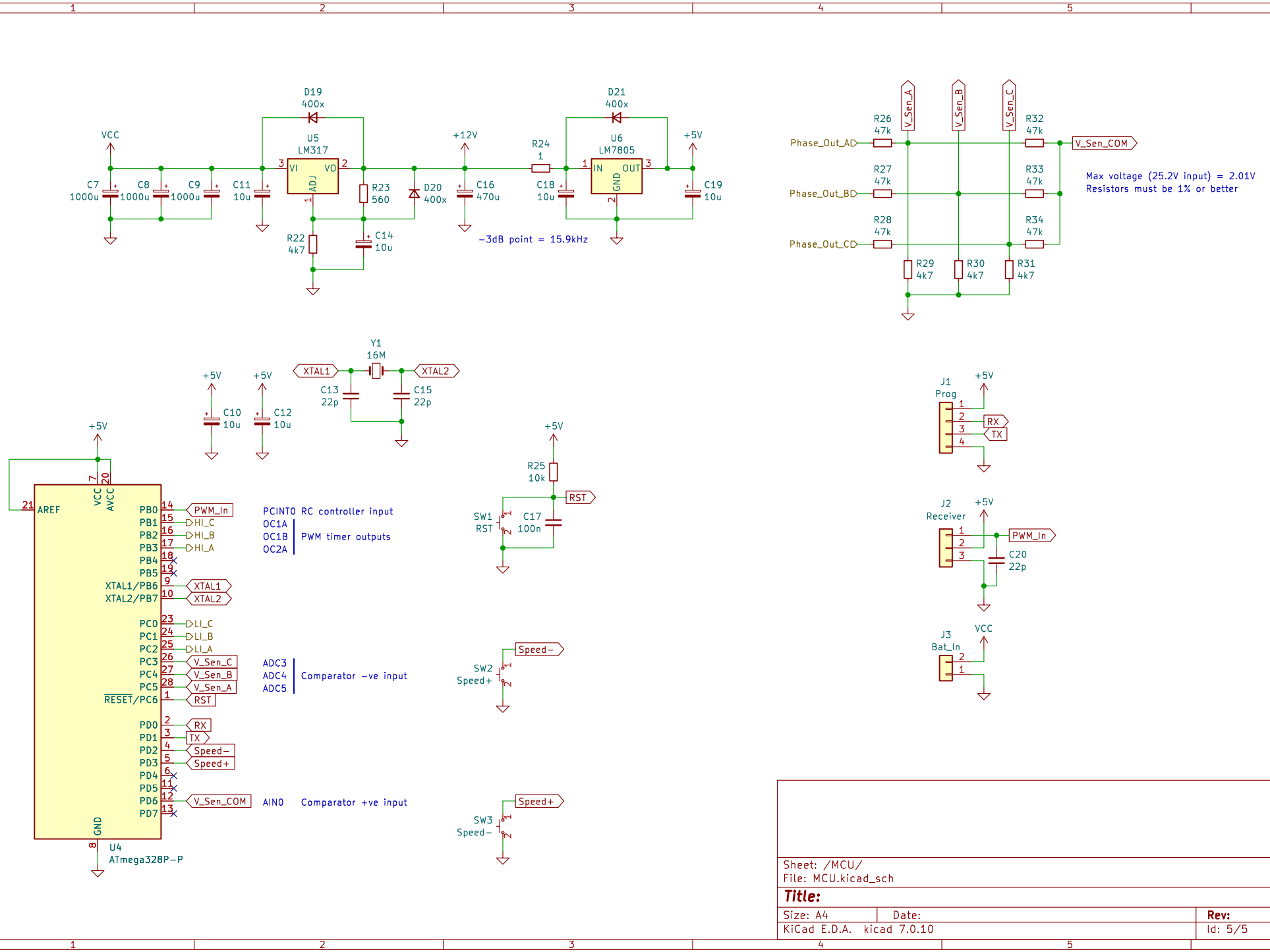
Must size boot capacitor to account for skipped pulses and switching times!

UCC27282 has input interlock protection
No need for any special circuitry to prevent this



FET gates discharge faster than they charge to avoid cross-conduction

Sheet: /Phase C/		
File: Phase.kicad_sch		
Title:		
Size: A4	Date:	**Rev:**
KiCad E.D.A. kicad 7.0.10		Id: 4/5


D19
400x
D21
400x
VCC
U5
LM317
U6
LM7805
+12V
+5V
R24
1
C7
1000u
C8
1000u
C9
C11
10u
R23
560
D20
400x
C16
470u
C18
10u
C19
10u
R22
4k7
C14
10u
−3dB point = 15.9kHz
R26
47k
R27
47k
R28
47k
R32
47k
R33
47k
R34
47k
V_Sen_A
V_Sen_B
V_Sen_C
Phase_Out_AD
Phase_Out_BD
Phase_Out_CD
V_Sen_COM
R29
4k7
R30
4k7
R31
4k7
Max voltage (25.2V input) = 2.01V
Resistors must be 1% or better
Y1
16M
XTAL1
XTAL2
C13
22p
C15
22p
C10
10u
C12
10u
J1
Prog
RX
TX
R25
10k
RST
SW1
RST
C17
100n
J2
Receiver
PWM_In
C20
22p
J3
Bat_In
SW2
Speed+
Speed−
SW3
Speed−
Speed+
AREF
VCC
AVCC
GND
PB0
PB1
PB2
PB3
PB4
PB5
XTAL1/PB6
XTAL2/PB7
PC0
PC1
PC2
PC3
PC4
PC5
RESET/PC6
PD0
PD1
PD2
PD3
PD4
PD5
PD6
PD7
HI_C
HI_B
HI_A
LI_C
LI_B
LI_A
V_Sen_C
V_Sen_B
V_Sen_A
RST
RX
TX
Speed−
Speed+
V_Sen_COM
U4
ATmega328P−P
PCINT0 RC controller input
OC1A
OC1B
OC2A
PWM timer outputs
ADC3
ADC4
ADC5
Comparator −ve input
AIN0
Comparator +ve input
Sheet: /MCU/
File: MCU.kicad_sch
Title:
Size: A4
Date:
Rev:
KiCad E.D.A. kicad 7.0.10
Id: 5/5