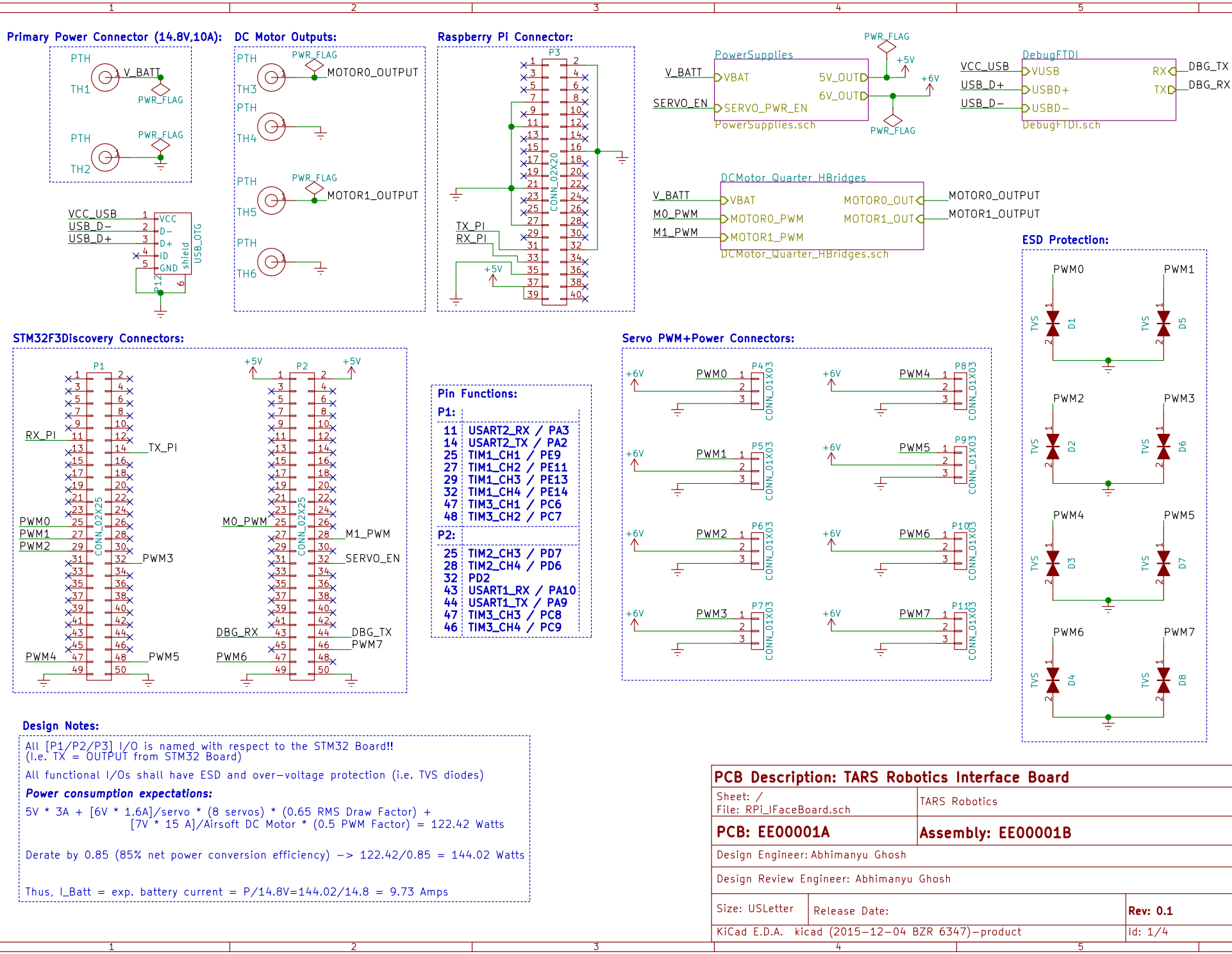
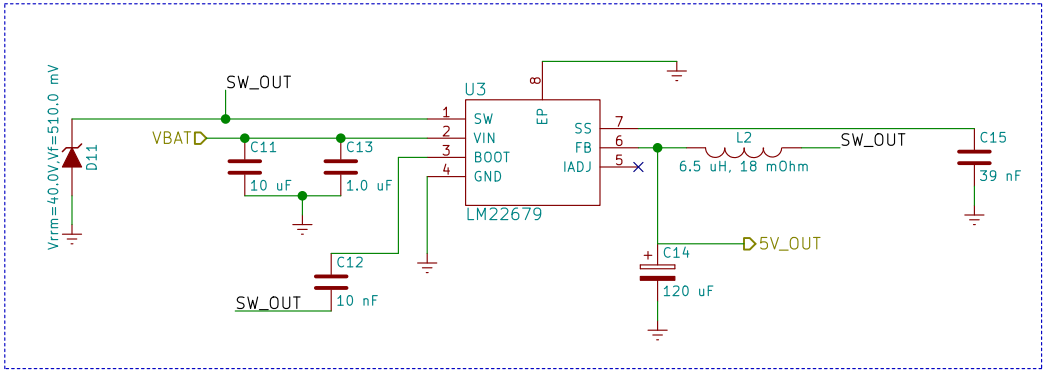
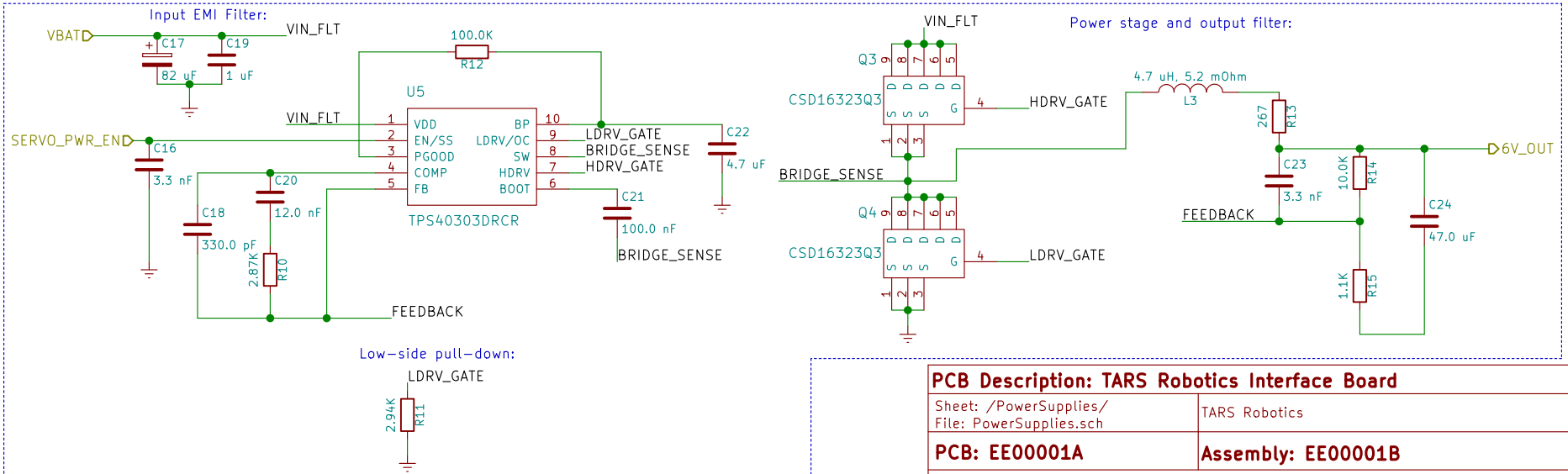

Primary Power Connector (14.8V,10A):
PTH
V_BATT
TH1
PWR_FLAG
PTH
PWR_FLAG
TH2
VCC_USB
USB_D−
USB_D+
VCC
D−
D+
ID
GND
shield
USB_OTG
P12
DC Motor Outputs:
PTH
PWR_FLAG
MOTOR0_OUTPUT
TH3
PTH
TH4
PTH
PWR_FLAG
MOTOR1_OUTPUT
TH5
PTH
TH6
Raspberry PI Connector:
P3
CONN_02X20
TX_PI
RX_PI
+5V
PowerSupplies
V_BATT
VBAT
5V_OUT
6V_OUT
SERVO_EN
SERVO_PWR_EN
PowerSupplies.sch
PWR_FLAG
+5V
+6V
PWR_FLAG
DebugFTDI
VCC_USB
USB_D+
USB_D−
VUSB
USBD+
USBD−
RX
TX
DBG_TX
DBG_RX
DebugFTDI.sch
DCMotor_Quarter_HBridges
V_BATT
M0_PWM
M1_PWM
VBAT
MOTOR0_PWM
MOTOR1_PWM
MOTOR0_OUT
MOTOR1_OUT
MOTOR0_OUTPUT
MOTOR1_OUTPUT
DCMotor_Quarter_HBridges.sch
ESD Protection:
PWM0
PWM1
PWM2
PWM3
PWM4
PWM5
PWM6
PWM7
TVS
D1
D2
D3
D4
D5
D6
D7
D8
STM32F3Discovery Connectors:
P1
CONN_02X25
RX_PI
TX_PI
PWM0
PWM1
PWM2
PWM3
PWM4
PWM5
+5V
P2
CONN_02X25
M0_PWM
M1_PWM
SERVO_EN
DBG_RX
DBG_TX
PWM7
PWM6
Pin Functions:
P1:
11 USART2_RX / PA3
14 USART2_TX / PA2
25 TIM1_CH1 / PE9
27 TIM1_CH2 / PE11
29 TIM1_CH3 / PE13
32 TIM1_CH4 / PE14
47 TIM3_CH1 / PC6
48 TIM3_CH2 / PC7
P2:
25 TIM2_CH3 / PD7
28 TIM2_CH4 / PD6
32 PD2
43 USART1_RX / PA10
44 USART1_TX / PA9
47 TIM3_CH3 / PC8
46 TIM3_CH4 / PC9
Servo PWM+Power Connectors:
+6V
PWM0
P4
PWM1
P5
PWM2
P6
PWM3
P7
PWM4
P8
PWM5
P9
PWM6
P10
PWM7
P11
CONN_01X03
Design Notes:
All [P1/P2/P3] I/O is named with respect to the STM32 Board!!
(I.e. TX = OUTPUT from STM32 Board)
All functional I/Os shall have ESD and over−voltage protection (i.e. TVS diodes)
Power consumption expectations:
5V * 3A + [6V * 1.6A]/servo * (8 servos) * (0.65 RMS Draw Factor) +
[7V * 15 A]/Airsoft DC Motor * (0.5 PWM Factor) = 122.42 Watts
Derate by 0.85 (85% net power conversion efficiency) −> 122.42/0.85 = 144.02 Watts
Thus, I_Batt = exp. battery current = P/14.8V=144.02/14.8 = 9.73 Amps
PCB Description: TARS Robotics Interface Board
Sheet: /
File: RPi_IFaceBoard.sch
TARS Robotics
PCB: EE00001A
Assembly: EE00001B
Design Engineer: Abhimanyu Ghosh
Design Review Engineer: Abhimanyu Ghosh
Size: USLetter
Release Date:
Rev: 0.1
KiCad E.D.A. kicad (2015−12−04 BZR 6347)−product
Id: 1/4

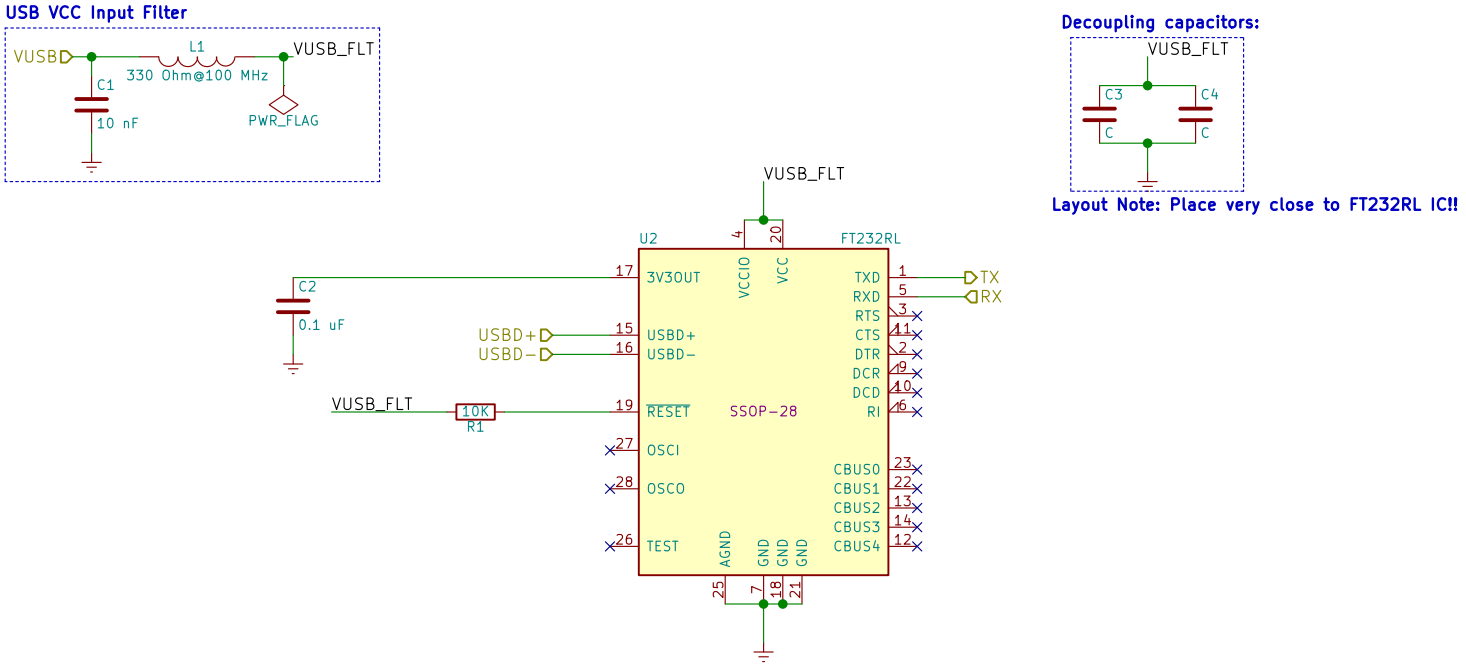
5V, 5A Switching Power Supply:



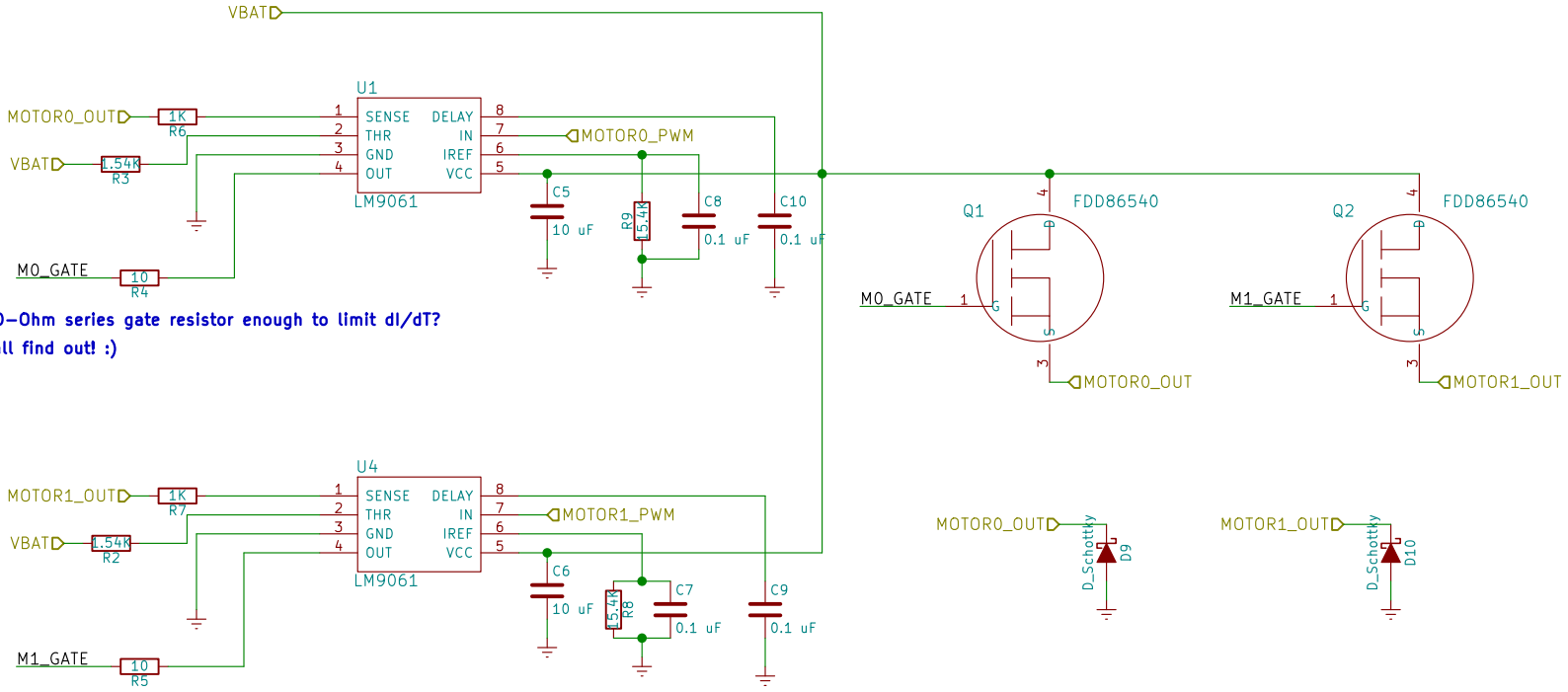

6V, 14A Switching Power Supply:




| | | |
|---|---|---|
| **PCB Description: TARS Robotics Interface Board** | | |
| Sheet: /PowerSupplies/<br>File: PowerSupplies.sch | TARS Robotics | |
| **PCB: EE00001A** | **Assembly: EE00001B** | |
| Design Engineer: Abhimanyu Ghosh | | |
| Design Review Engineer: Abhimanyu Ghosh | | |
| Size: USLetter | Release Date: | **Rev: 0.1** |
| KiCad E.D.A. kicad (2015-12-04 BZR 6347)-product | | Id: 2/4 |




| | | |
|---|---|---|
| **PCB Description: TARS Robotics Interface Board** | | |
| Sheet: /DebugFTDI/<br>File: DebugFTDI.sch | TARS Robotics | |
| **PCB: EE00001A** | **Assembly: EE00001B** | |
| Design Engineer: Abhimanyu Ghosh | | |
| Design Review Engineer: Abhimanyu Ghosh | | |
| Size: USLetter | Release Date: | **Rev: 0.1** |
| KiCad E.D.A. kicad (2015-12-04 BZR 6347)-product | | Id: 3/4 |




**Is a 10-Ohm series gate resistor enough to limit dI/dT?**

**We shall find out! :)**

**Layout note: Place ALL decoupling capacitors as close to relevant IC as possible. Place Schottky diodes close to motor outputs!!**

| | | |
|---|---|---|
| **PCB Description: TARS Robotics Interface Board** | | |
| Sheet: /DCMotor_Quarter_HBridges/<br>File: DCMotor_Quarter_HBridges.sch | TARS Robotics | |
| **PCB: EE00001A** | **Assembly: EE00001B** | |
| Design Engineer: Abhimanyu Ghosh | | |
| Design Review Engineer: Abhimanyu Ghosh | | |
| Size: USLetter | Release Date: | **Rev: 0.1** |
| KiCad E.D.A. kicad (2015-12-04 BZR 6347)-product | | Id: 4/4 |