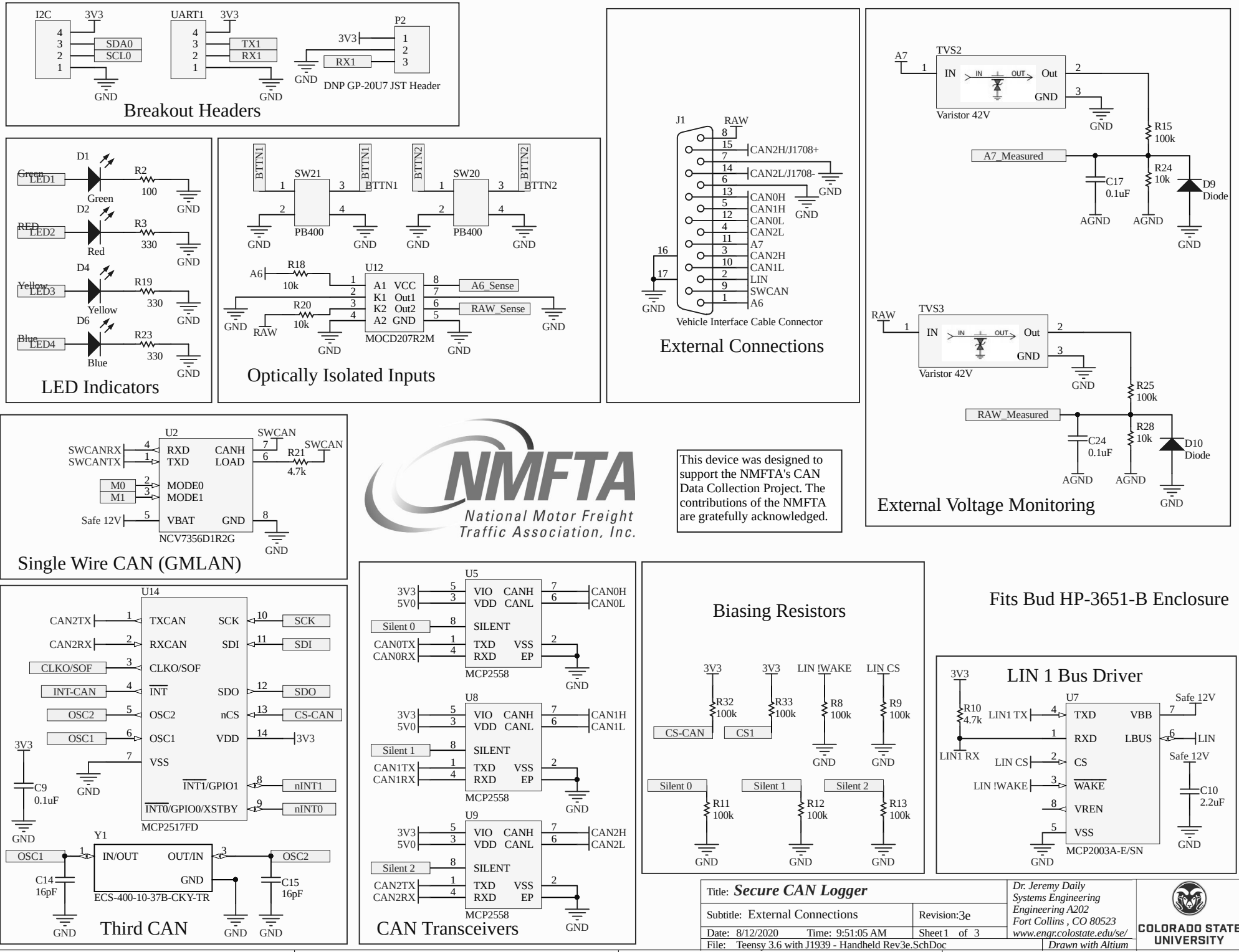

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Subtitle:	External Connections
Revision:	3e
Date:	8/12/2020
Time:	9:51:05 AM
Sheet	1 of 3
File:	Teensy 3.6 with J1939 - Handheld Rev3e.SchDoc

Dr. Jeremy Daily
Systems Engineering
Engineering A202
Fort Collins , CO 80523
www.engr.colostate.edu/se/

Drawn with Altium

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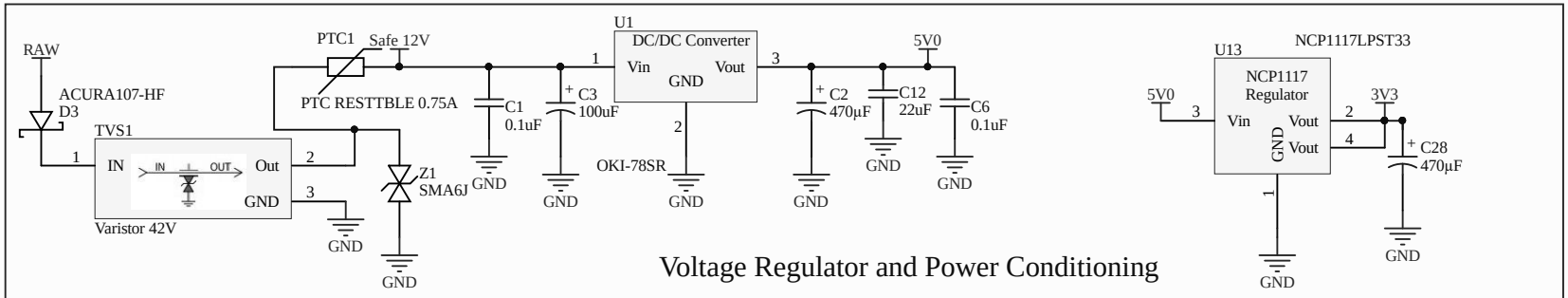
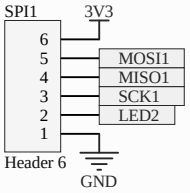
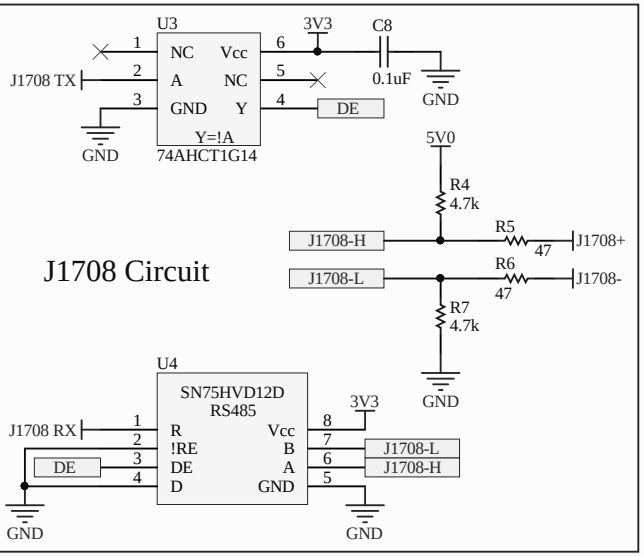


Voltage Regulator and Power Conditioning

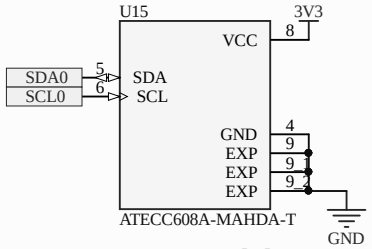


Breakout Header

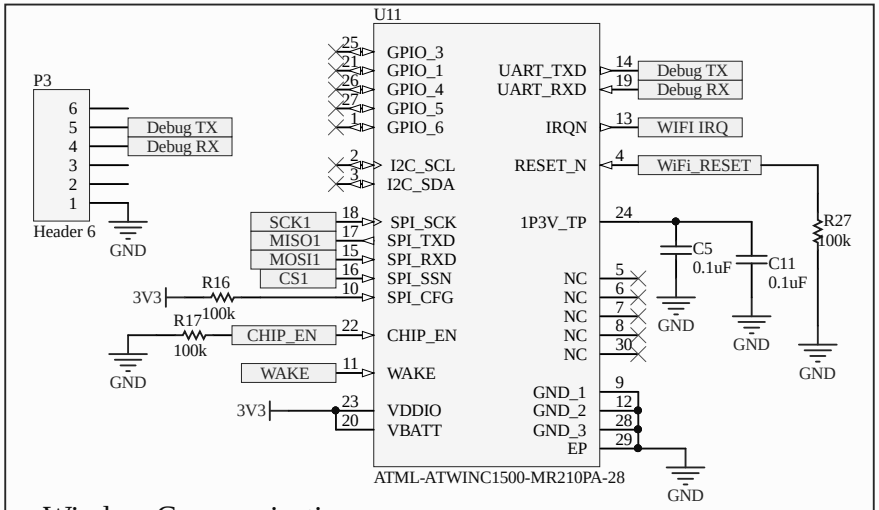


J1708 Circuit

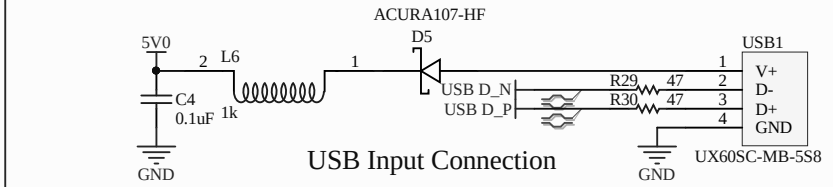
Light Pipes



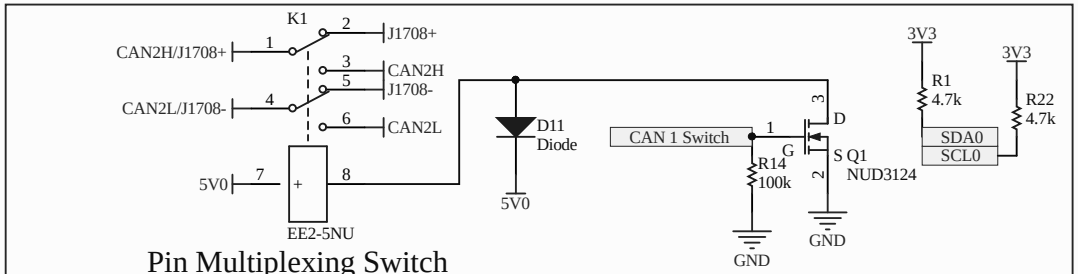
Security Module



Wireless Communications



USB Input Connection



Pin Multiplexing Switch

This material is based upon work supported by the National Science Foundation under Grant No. 1715409 with the following title:

SaTC: CORE: Small: Collaborative: GOALI: Detecting and Reconstructing Network Anomalies and Intrusions in Heavy Duty Vehicles.

Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation.

Title: ***Secure Handheld J1939 Logger***		*Dr. Jeremy Daily* *Systems Engineering* *Engineering A202* *Fort Collins, CO 80523* *www.engr.colostate.edu/se/*
Subtitle: Wifi, J1708, USB, and Security	Revision: 3e	
Date: 8/12/2020 Time: 9:51:06 AM	Sheet 2 of 3	
File: Additional Circuits - Handheld - Rev 3e.SchDoc		*Drawn with Altium*

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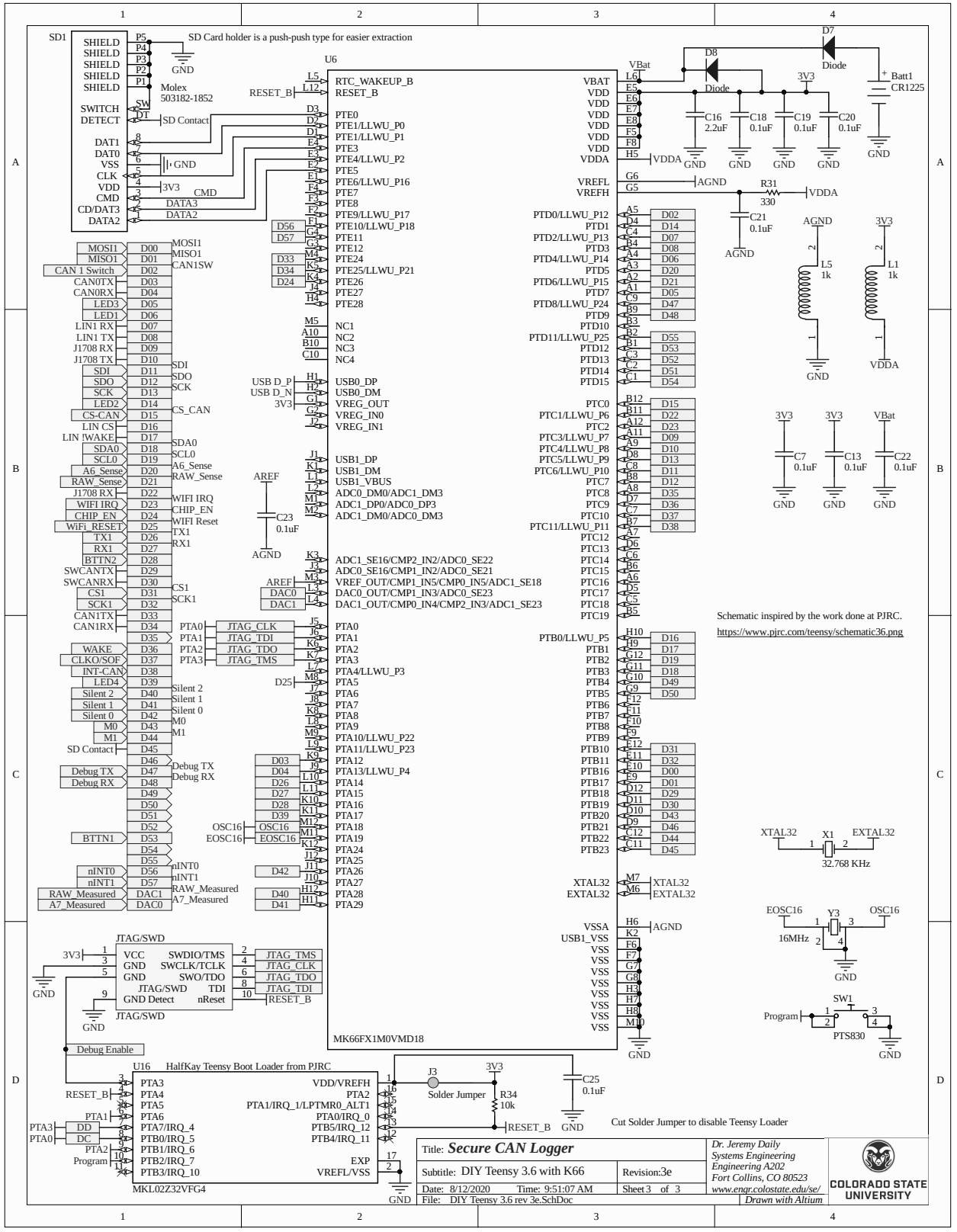
SD1
SHIELD
SHIELD
SHIELD
SHIELD
SHIELD
SWITCH
DETECT
DAT1
DAT0
VSS
CLK
VDD
CMD
CD/DAT3
DAT2
Molex
503182-1852
SD Card holder is a push-push type for easier extraction
SD Contact
GND
3V3
CMD
DATA3
DATA2
U6
RTC_WAKEUP_B
RESET_B
PTE0
PTE1/LLWU_P0
PTE1/LLWU_P1
PTE3
PTE4/LLWU_P2
PTE5
PTE6/LLWU_P16
PTE7
PTE8
PTE9/LLWU_P17
PTE10/LLWU_P18
PTE11
PTE12
PTE24
PTE25/LLWU_P21
PTE26
PTE27
PTE28
NC1
NC2
NC3
NC4
USB0_DP
USB0_DM
VREG_OUT
VREG_IN0
VREG_IN1
USB1_DP
USB1_DM
USB1_VBUS
ADC0_DM0/ADC1_DM3
ADC1_DP0/ADC0_DP3
ADC1_DM0/ADC0_DM3
ADC1_SE16/CMP2_IN2/ADC0_SE22
ADC0_SE16/CMP1_IN2/ADC0_SE21
VREF_OUT/CMP1_IN5/CMP0_IN5/ADC1_SE18
DAC0_OUT/CMP1_IN3/ADC0_SE23
DAC1_OUT/CMP0_IN4/CMP2_IN3/ADC1_SE23
PTA0
PTA1
PTA2
PTA3
PTA4/LLWU_P3
PTA5
PTA6
PTA7
PTA8
PTA9
PTA10/LLWU_P22
PTA11/LLWU_P23
PTA12
PTA13/LLWU_P4
PTA14
PTA15
PTA16
PTA17
PTA18
PTA19
PTA24
PTA25
PTA26
PTA27
PTA28
PTA29
VBAT
VDD
VDDA
VREFL
VREFH
PTD0/LLWU_P12
PTD1
PTD2/LLWU_P13
PTD3
PTD4/LLWU_P14
PTD5
PTD6/LLWU_P15
PTD7
PTD8/LLWU_P24
PTD9
PTD10
PTD11/LLWU_P25
PTD12
PTD13
PTD14
PTD15
PTC0
PTC1/LLWU_P6
PTC2
PTC3/LLWU_P7
PTC4/LLWU_P8
PTC5/LLWU_P9
PTC6/LLWU_P10
PTC7
PTC8
PTC9
PTC10
PTC11/LLWU_P11
PTC12
PTC13
PTC14
PTC15
PTC16
PTC17
PTC18
PTC19
PTB0/LLWU_P5
PTB1
PTB2
PTB3
PTB4
PTB5
PTB6
PTB7
PTB8
PTB9
PTB10
PTB11
PTB16
PTB17
PTB18
PTB19
PTB20
PTB21
PTB22
PTB23
XTAL32
EXTAL32
VSSA
USB1_VSS
VSS
MK66FX1M0VMD18
VBat
Diode
D7
D8
Batt1
CR1225
3V3
C16 2.2uF
C18 0.1uF
C19 0.1uF
C20 0.1uF
C21 0.1uF
R31 330
AGND
VDDA
L5 1k
L1 1k
C7 0.1uF
C13 0.1uF
C22 0.1uF
AREF
C23 0.1uF
Schematic inspired by the work done at PJRC.
https://www.pjrc.com/teensy/schematic36.png
XTAL32
X1
EXTAL32
32.768 KHz
EOSC16
Y3
OSC16
16MHz
SW1
Program
PTS830
JTAG/SWD
VCC
GND
GND Detect
SWDIO/TMS
SWCLK/TCLK
SWO/TDO
JTAG/SWD
TDI
nReset
JTAG_TMS
JTAG_CLK
JTAG_TDO
JTAG_TDI
RESET_B
Debug Enable
U16 HalfKay Teensy Boot Loader from PJRC
PTA3
PTA4
PTA5
PTA6
PTA7/IRQ_4
PTB0/IRQ_5
PTB1/IRQ_6
PTB2/IRQ_7
PTB3/IRQ_10
VDD/VREFH
PTA2
PTA1/IRQ_1/LPTMR0_ALT1
PTA0/IRQ_0
PTB5/IRQ_12
PTB4/IRQ_11
EXP
VREFL/VSS
MKL02Z32VFG4
J3
Solder Jumper
R34 10k
C25 0.1uF
Cut Solder Jumper to disable Teensy Loader
Title: Secure CAN Logger
Subtitle: DIY Teensy 3.6 with K66
Revision: 3e
Date: 8/12/2020 Time: 9:51:07 AM
Sheet 3 of 3
File: DIY Teensy 3.6 rev 3e.SchDoc
Dr. Jeremy Daily
Systems Engineering
Engineering A202
Fort Collins, CO 80523
www.engr.colostate.edu/se/
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