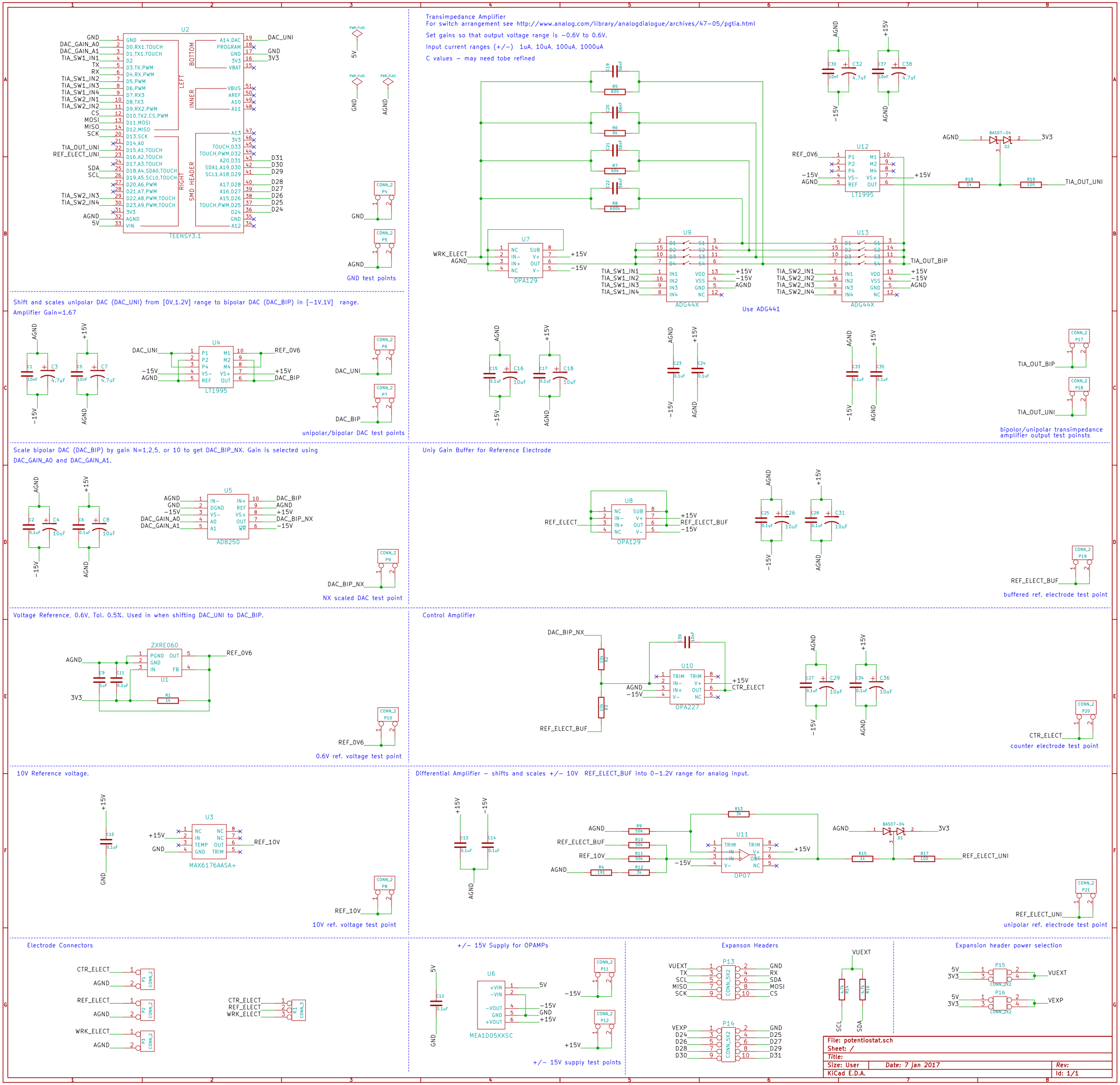
U2
TEENSY3.1
GND
DAC_GAIN_A0
DAC_GAIN_A1
TIA_SW1_IN1
TX
RX
TIA_SW1_IN2
TIA_SW1_IN3
TIA_SW1_IN4
TIA_SW2_IN1
TIA_SW2_IN2
CS
MOSI
MISO
SCK
TIA_OUT_UNI
REF_ELECT_UNI
SDA
SCL
TIA_SW2_IN3
TIA_SW2_IN4
AGND
5V
DAC_UNI
3V3
D31
D30
D29
D28
D27
D26
D25
D24
GND test points
Transimpedance Amplifier
For switch arrangement see http://www.analog.com/library/analogdialogue/archives/47-05/pgtia.html
Set gains so that output voltage range is -0.6V to 0.6V.
Input current ranges (+/-) 1uA, 10uA, 100uA, 1000uA
C values - may need tobe refined
U7
OPA129
U9
ADG44X
U13
ADG44X
U12
LT1995
WRK_ELECT
TIA_OUT_BIP
Use ADG441
Shift and scales unipolar DAC (DAC_UNI) from [0V,1.2V] range to bipolar DAC (DAC_BIP) in [-1V,1V] range.
Amplifier Gain=1.67
U4
LT1995
REF_0V6
DAC_BIP
unipolar/bipolar DAC test points
bipolor/unipolar transimpedance amplifier output test poinsts
Scale bipolar DAC (DAC_BIP) by gain N=1,2,5, or 10 to get DAC_BIP_NX. Gain is selected using DAC_GAIN_A0 and DAC_GAIN_A1.
U5
AD8250
DAC_BIP_NX
NX scaled DAC test point
Uniy Gain Buffer for Reference Electrode
U8
OPA129
REF_ELECT
REF_ELECT_BUF
buffered ref. electrode test point
Voltage Reference, 0.6V, Tol. 0.5%. Used in when shifting DAC_UNI to DAC_BIP.
ZXRE060
U1
0.6V ref. voltage test point
Control Amplifier
U10
OPA227
CTR_ELECT
counter electrode test point
10V Reference voltage.
U3
MAX6176AASA+
REF_10V
10V ref. voltage test point
Differential Amplifier - shifts and scales +/- 10V REF_ELECT_BUF into 0-1.2V range for analog input.
U11
OP07
REF_ELECT_UNI
unipolar ref. electrode test point
Electrode Connectors
+/- 15V Supply for OPAMPs
U6
MEA1D05XXSC
+/- 15V supply test points
Expanson Headers
P13
P14
VUEXT
VEXP
Expansion header power selection
P15
P16
File: potentiostat.sch
Sheet: /
Title:
Size: User
Date: 7 jan 2017
Rev:
KiCad E.D.A.
Id: 1/1