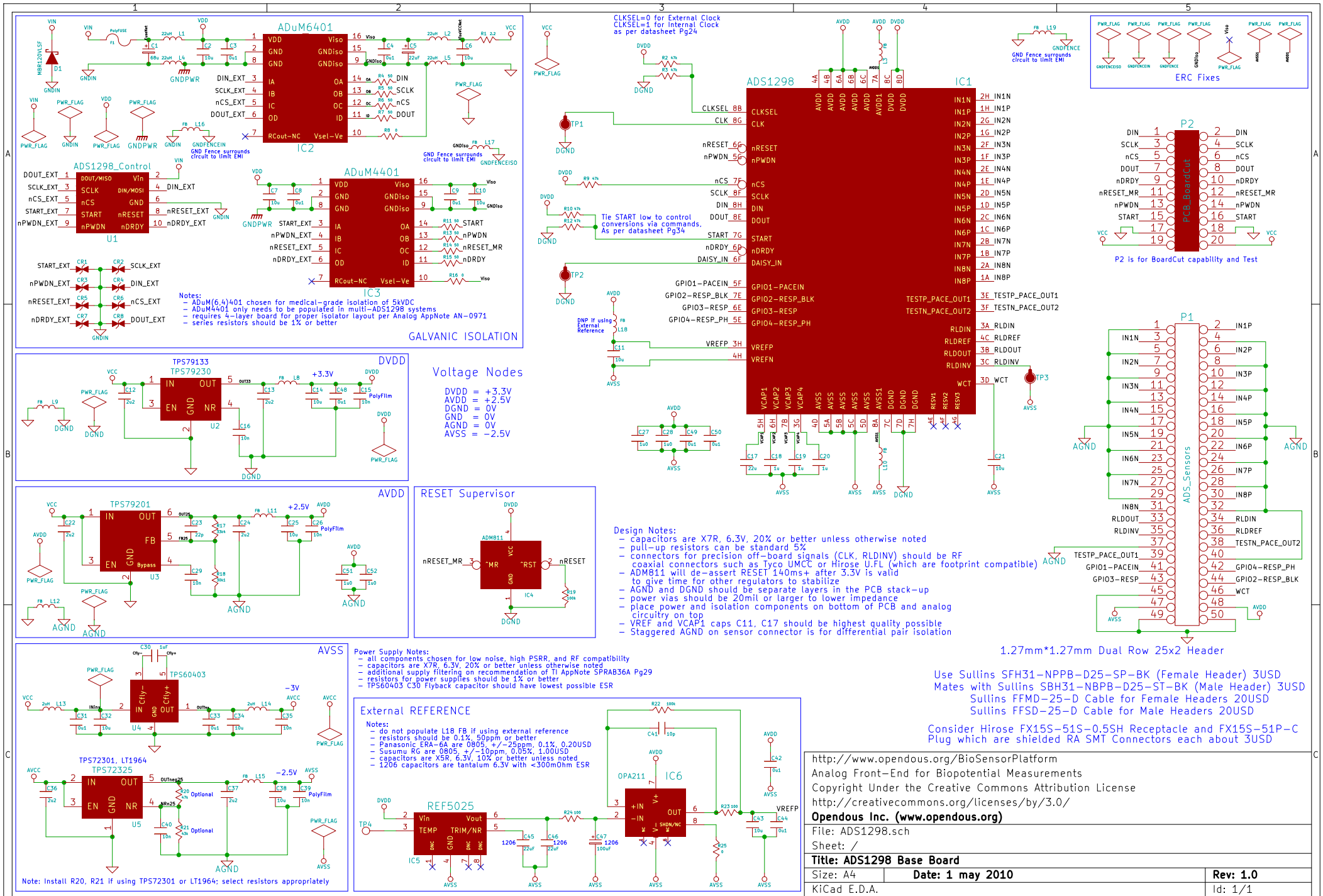
ADuM6401
IC2
ADS1298_Control
U1
ADuM4401
IC3
GALVANIC ISOLATION
Notes:
– ADuM(6,4)401 chosen for medical-grade isolation of 5kVDC
– ADuM4401 only needs to be populated in multi-ADS1298 systems
– requires 4-layer board for proper isolator layout per Analog AppNote AN-0971
– series resistors should be 1% or better
DVDD
TPS79133
TPS79230
U2
Voltage Nodes
DVDD = +3.3V
AVDD = +2.5V
DGND = 0V
GND = 0V
AGND = 0V
AVSS = -2.5V
AVDD
TPS79201
U3
RESET Supervisor
ADM811
IC4
AVSS
TPS60403
U4
TPS72301, LT1964
TPS72325
U5
Note: Install R20, R21 if using TPS72301 or LT1964; select resistors appropriately
Power Supply Notes:
– all components chosen for low noise, high PSRR, and RF compatibility
– capacitors are X7R, 6.3V, 20% or better unless otherwise noted
– additional supply filtering on recommendation of TI AppNote SPRAB36A Pg29
– resistors for power supplies should be 1% or better
– TPS60403 C30 Flyback capacitor should have lowest possible ESR
External REFERENCE
Notes:
– do not populate L18 FB if using external reference
– resistors should be 0.1%, 50ppm or better
– Panasonic ERA-6A are 0805, +/-25ppm, 0.1%, 0.20USD
– Susumu RG are 0805, +/-10ppm, 0.05%, 1.00USD
– capacitors are X5R, 6.3V, 10% or better unless noted
– 1206 capacitors are tantalum 6.3V with <300mOhm ESR
REF5025
IC5
OPA211
IC6
CLKSEL=0 for External Clock
CLKSEL=1 for Internal Clock
as per datasheet Pg24
Tie START low to control conversions via commands, As per datasheet Pg34
ADS1298
IC1
ERC Fixes
P2
PCB_BoardCut
P2 is for BoardCut capability and Test
P1
ADS_Sensors
Design Notes:
– capacitors are X7R, 6.3V, 20% or better unless otherwise noted
– pull-up resistors can be standard 5%
– connectors for precision off-board signals (CLK, RLDINV) should be RF coaxial connectors such as Tyco UMCC or Hirose U.FL (which are footprint compatible)
– ADM811 will de-assert RESET 140ms+ after 3.3V is valid to give time for other regulators to stabilize
– AGND and DGND should be separate layers in the PCB stack-up
– power vias should be 20mil or larger to lower impedance
– place power and isolation components on bottom of PCB and analog circuitry on top
– VREF and VCAP1 caps C11, C17 should be highest quality possible
– Staggered AGND on sensor connector is for differential pair isolation
1.27mm*1.27mm Dual Row 25x2 Header
Use Sullins SFH31-NPPB-D25-SP-BK (Female Header) 3USD
Mates with Sullins SBH31-NBPB-D25-ST-BK (Male Header) 3USD
Sullins FFMD-25-D Cable for Female Headers 20USD
Sullins FFSD-25-D Cable for Male Headers 20USD
Consider Hirose FX15S-51S-0.5SH Receptacle and FX15S-51P-C Plug which are shielded RA SMT Connectors each about 3USD
http://www.opendous.org/BioSensorPlatform
Analog Front-End for Biopotential Measurements
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http://creativecommons.org/licenses/by/3.0/
Opendous Inc. (www.opendous.org)
File: ADS1298.sch
Sheet: /
Title: ADS1298 Base Board
Size: A4
Date: 1 may 2010
Rev: 1.0
KiCad E.D.A.
Id: 1/1