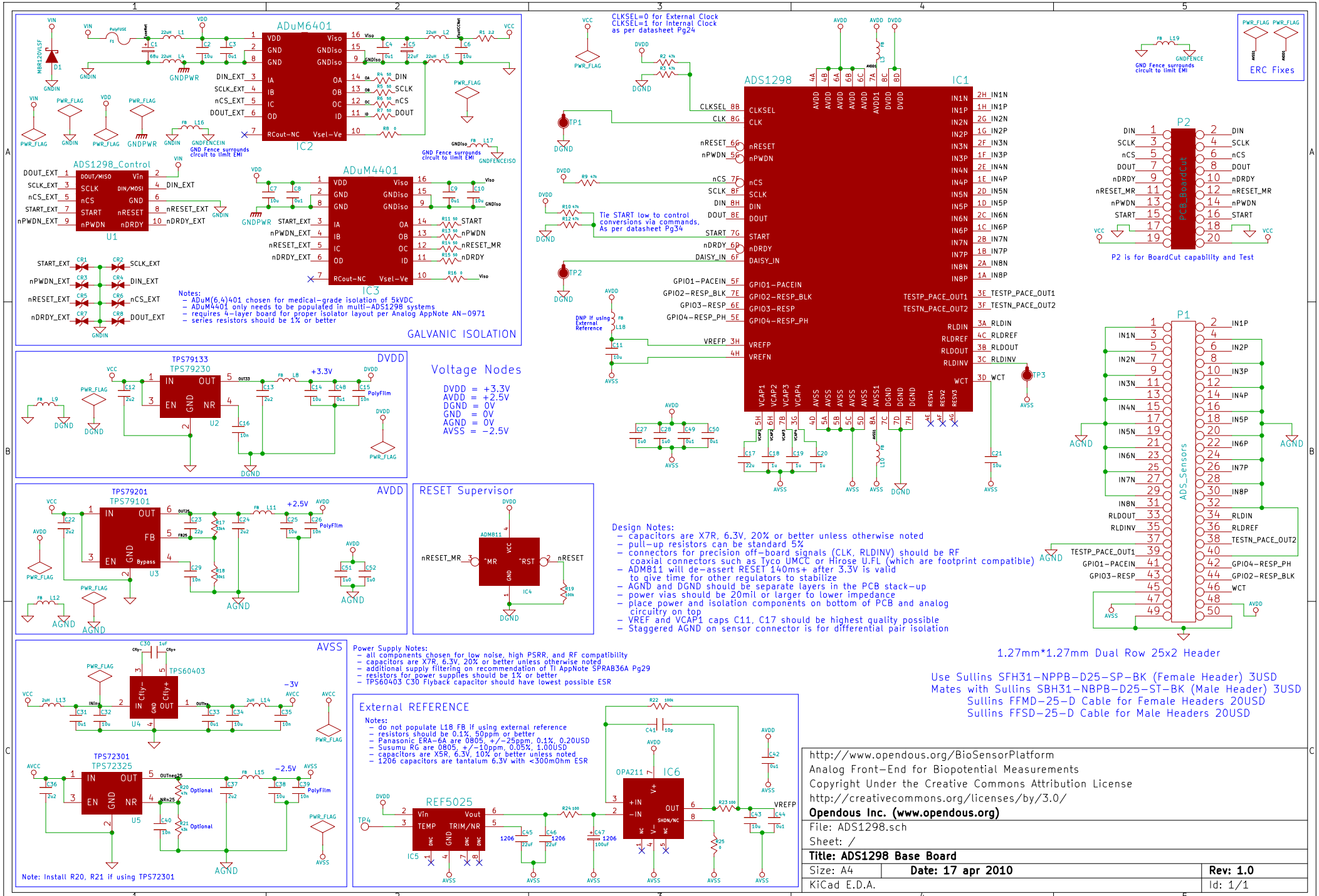
ADuM6401
IC2
ADS1298_Control
U1
ADuM4401
IC3
GALVANIC ISOLATION
Notes:
– ADuM(6,4)401 chosen for medical-grade isolation of 5kVDC
– ADuM4401 only needs to be populated in multi-ADS1298 systems
– requires 4-layer board for proper isolator layout per Analog AppNote AN-0971
– series resistors should be 1% or better
TPS79133
TPS79230
U2
DVDD
TPS79201
TPS79101
U3
AVDD
RESET Supervisor
ADM811
IC4
AVSS
TPS60403
U4
TPS72301
TPS72325
U5
Note: Install R20, R21 if using TPS72301
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
OPA211
IC6
Voltage Nodes
DVDD = +3.3V
AVDD = +2.5V
DGND = 0V
GND = 0V
AGND = 0V
AVSS = -2.5V
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
DNP if using External Reference
ADS1298
IC1
GND Fence surrounds circuit to limit EMI
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
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: 17 apr 2010
Rev: 1.0
KiCad E.D.A.
Id: 1/1