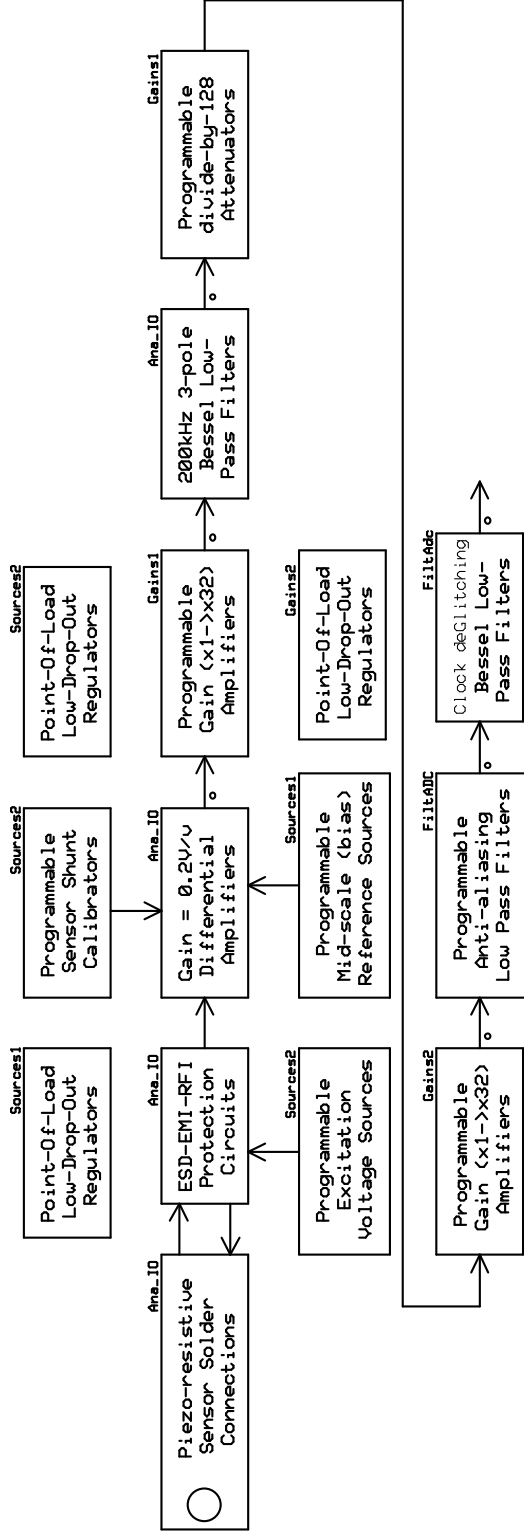


interim design of SER's Analog Circuits; about half designed

Block Diagram for the SER's Analog "board" Circuitry



I²C serial clock and serial Data: <<Shared Common Clock>>

Sda_1(2,3)_Bias = Programmable Mid-scale (bias) reference sources "Serial Data" lines
 Sda_1(2,3)_Exc = Programmable Excitation Voltage sources "Serial Data" lines
 Sda_1(2,3)_RCAL = Programmable Sensor RCAL Calibrators' "Serial Data" lines

Sources1 & 2
 Gains 1 & 2

Sda_1(2,3)_G1Ref = Programmable Reference for first Gain Stage "Serial Data" lines
 Sda_1(2,3)_G2Att = Programmable Attenuator's Gain Stage "Serial Data" lines
 Sda_1(2,3)_G3Ref = Programmable Reference for LastGain Stage "Serial Data" lines

SPI serial clock and data and Chip Selects <<Shared Common Clock & Data>>
 n)CS_1(2,3)_G1 = First Programmable Gain Stage's "Chip Select" Lines
 n)CS_1(2,3)_G3 = Last Programmable Gain Stage's "Chip Select" Lines

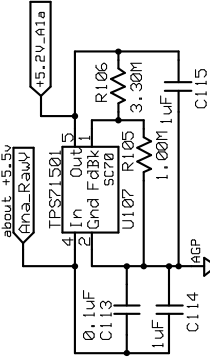
Rev 1.6: Changed ALL Serial Communications' references.

| | |
|-------------------|----------------------|
| GUSTECH | |
| SER_Analog | BlockDia |
| Thomas W. Gustin | Rev 1.6 8/22/2007 |
| Page 1 of ?? | |

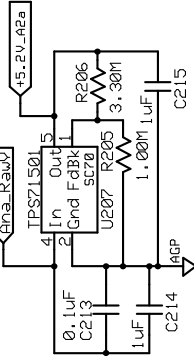
interim design of SER's Analog Circuits; about half designed

POLLDOREG: Point-of-Load, Low-Drop-Out, REGulators +5.2volt Analog Front-end Power Sources

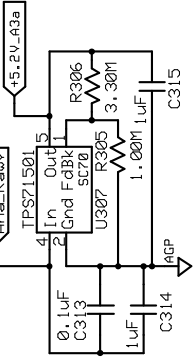
GOES TO: U101-7, U102-6, & U103-6 on the Ana_IO page; and to: U104-4, U105-1, & U106-5 on (this) Sources1 page; and to: U109-1, U110-5, & U111-1 on the Sources2 page.



GOES TO: U201-7, U202-6, & U203-6 on the Ana_IO page; and to: U204-4, U205-1, & U206-5 on (this) Sources1 page; and to: U209-1, U210-5, & U211-1 on the Sources2 page; and to:



GOES TO: U31-7, U32-6, & U33-6 on the Ana_IO page; and to: U34-4, U35-1, & U36-5 on (this) Sources1 page; and to: U309-1, U310-5, & U311-1 on the Sources2 page; and to:



NOTES for INA159 Differential Amplifier References

When REF1 (pin 8) is tied to "REFERENCE" then:

- Vref = 2.5v -> V-midscale = 2.5v & Vout = 4.5v->0.5v
- Vref = 1.8v -> V-midscale = 1.8v & Vout = 3.2v->0.048v
- Vref = 1.2v -> V-midscale = 1.2v & Vout = 3.2v->0.048v

When REF1 (pin 8) is tied to "GROUND" then:

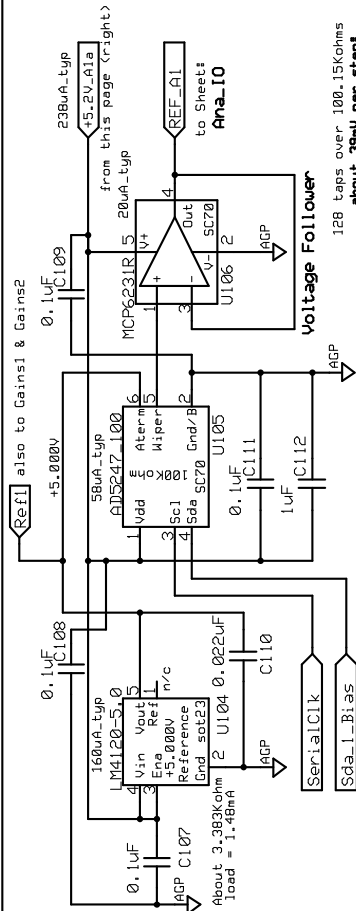
- Vref = 5.0v -> V-midscale = 2.5v & Vout = 4.5v->0.5v
- Vref = 4.096v -> V-midscale = 2.048v & Vout = 4.048v->0.048v
- Vref = 3.3v -> V-midscale = 1.65v & Vout = 3.25v->0.048v
- Vref = 2.5v -> V-midscale = 1.25v & Vout = 3.25v->0.048v
- Vref = 1.8v -> V-midscale = 0.9v & Vout = 2.9v->0.048v

Rev 1.6: Changed ALL Serial Communications' references.

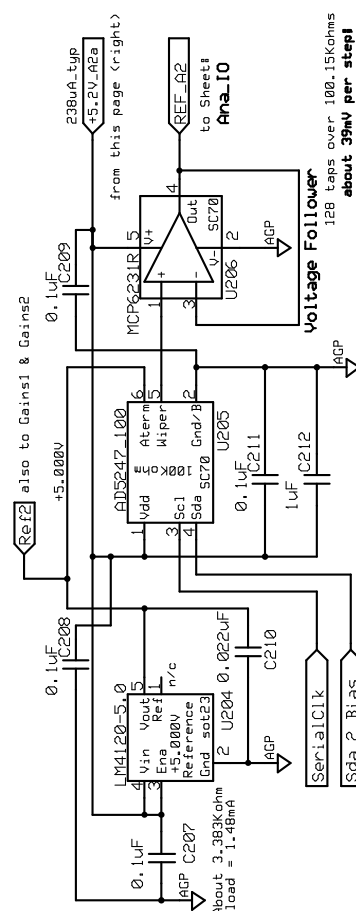
GUSTECH

SER_Analog Sources1

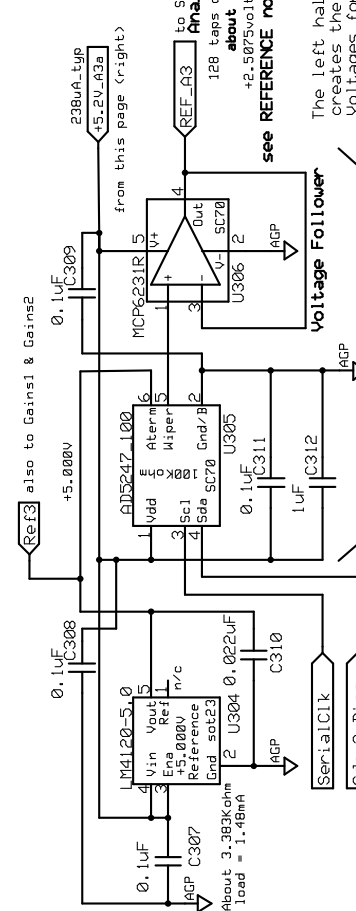
Thomas W. Gustin Rev 1.6 8/22/2007 Page 3 of ??



128 taps over 100.15Kohms about 39mV per step
+2.5075volts on power up
see REFERENCE notes below right



128 taps over 100.15Kohms about 39mV per step
+2.5075volts on power up
see REFERENCE notes below right



128 taps over 100.15Kohms about 39mV per step
+2.5075volts on power up
see REFERENCE notes right

The left half of this page creates the "Reference" Voltages for the input amplifiers as "Offset Bias" adjuster circuits.

The right half of this page creates the +5.2volt power sources for the "frontend" of the 3 analog channels.

7-bit Kelvin Divider DACs

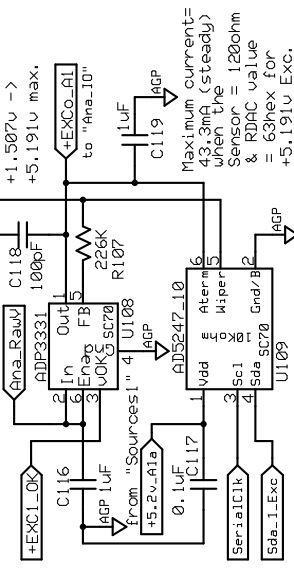
Built from 128-step DACs with Unity Gain Voltage Follower Buffers

Miniature Precision +5.000 Voltage References

interim design of SER's Analog Circuits; about half designed

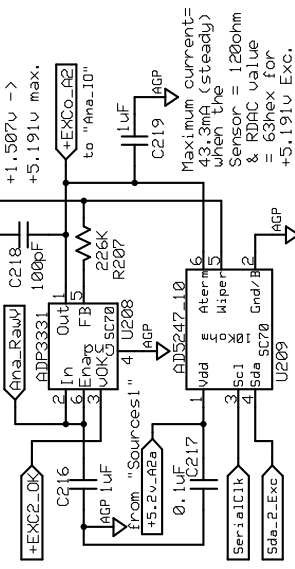
Sensor Excitation Adjustable Source

Channel #1



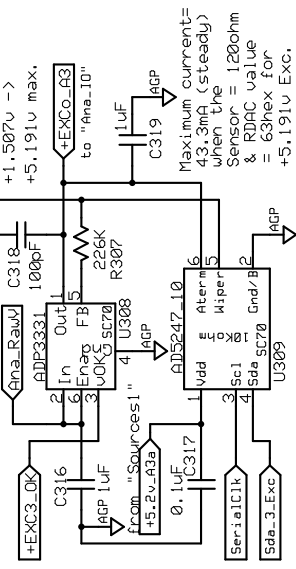
Sensor Excitation Adjustable Source

Channel #2



Sensor Excitation Adjustable Source

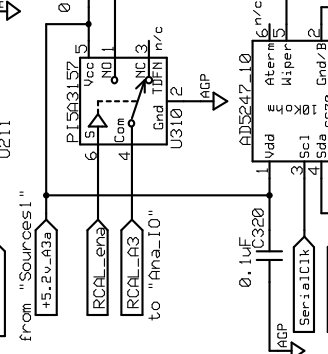
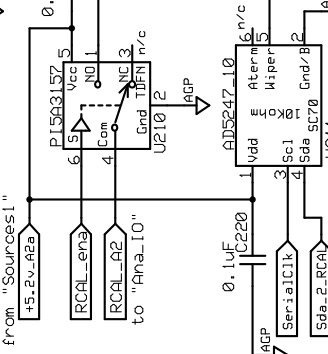
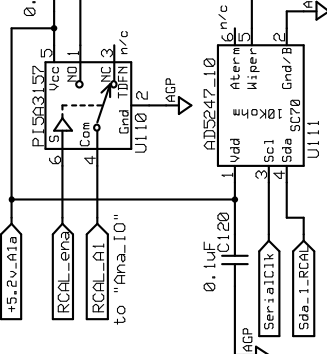
Channel #3



There are 75 discrete sensor excitation voltage outputs. They range from +1.507 to +5.191 volts out, for RDAC hexadecimal codes 19h through 63h, respectively. The step sizes increase pseudo-logarithmically from a low value of 14.39mV (codes 18-19h) to a maximum of 165.9mV at the high end (codes 62-63h). The same pseudo-logarithmic characteristics, of course, are therefore seen in the sensor currents, as well. Default = code 40h → 2.468volts
See file: ADP3331FbK-EXCGeneratorRDAC.xls (or PDF) for more details.

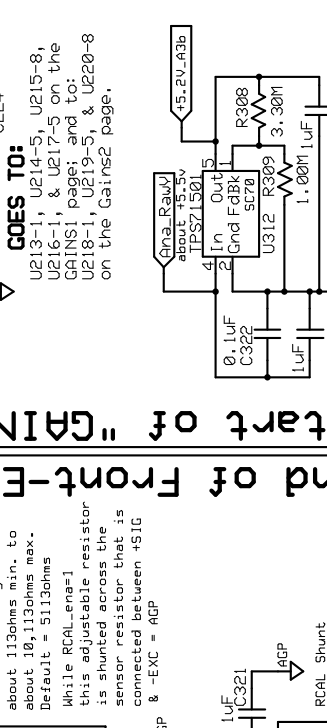
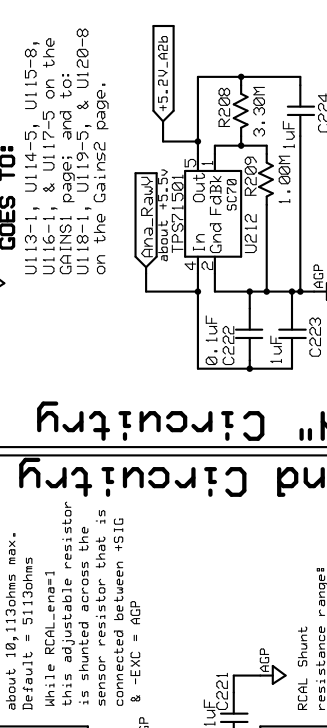
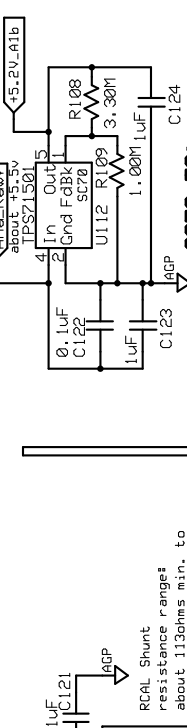
RCAL: Resistor Shunt Sensor Calibrators

from "Sources1"



POLLDREG: Point-of-Load, Low-Drop-Out, REGULATORS

+5.2volt Analog Gain-stages Power Sources

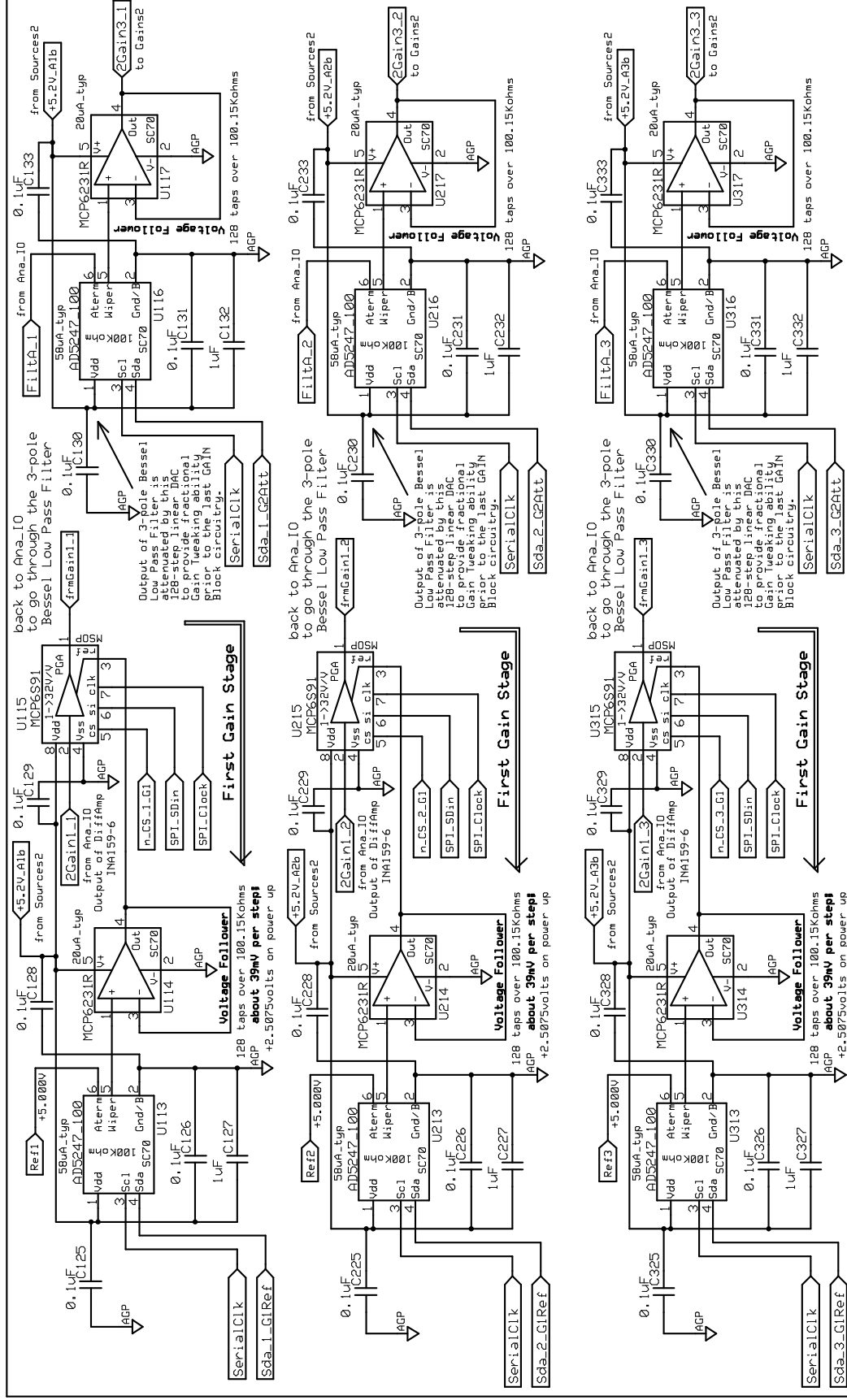


End of Front-End Circuitry

Start of "GAIN" Circuitry

| | |
|-------------------|-----------------|
| GUSTECH | |
| SER_Analog | Sources2 |
| Thomas W. Gustin | Rev 1.6 |
| 8-22-2007 | Page 4 of ?? |

interim design of SER's Analog Circuits; about half designed



Rev 1.6: Changed ALL Serial Communications' references, and finished this page's circuitry

GUSTECH

SER_Analog **Gains1**

Thomas W. Gustin Rev 1.6 Page 5 of ??

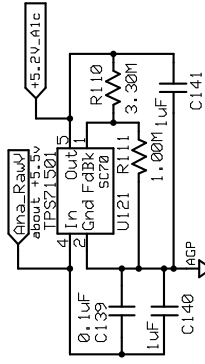
8/22/2007

Circuits on the LEFT & RIGHT of this page are:
7-bit Kelvin Divider DACs
 Built from 128-step RDACs
 with Unity Gain Voltage Follower Buffers

LEFT: Adjustable Reference for the first Gain Block
 RIGHT: Adjustable attenuator as the second Fractional Gain Block

interim design of SER's Analog Circuits; about half designed

POLLDOREG: Point-of-Load, Low-Drop-Out, Regulators, U122-?, U123-?, U124-?, U125-?, & U126-? on the FiltADC page

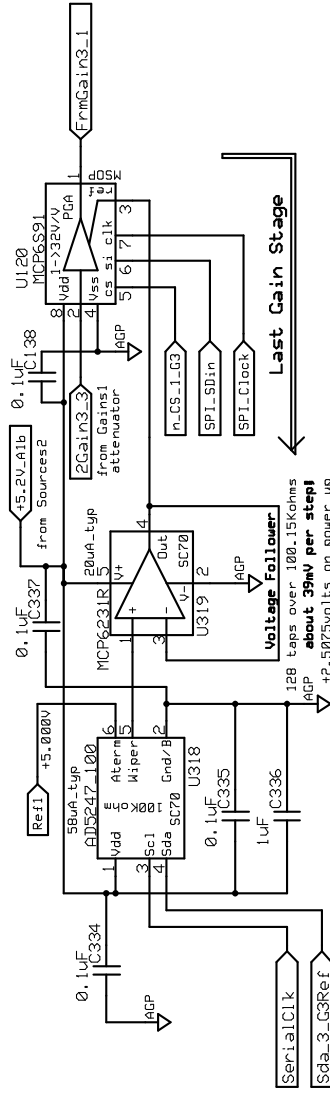
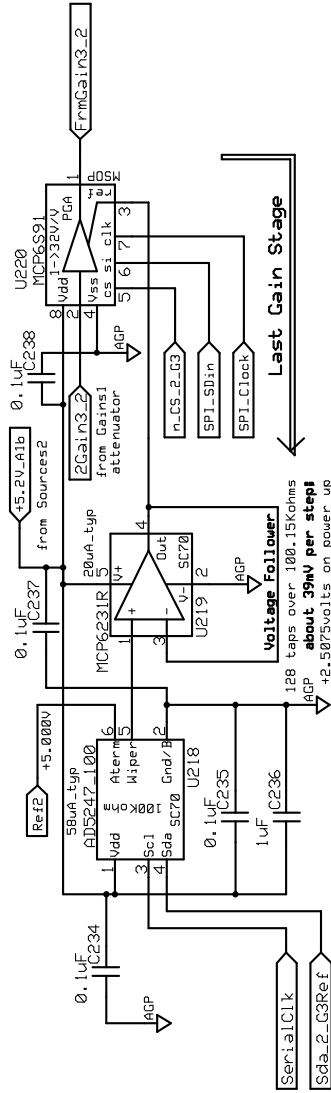
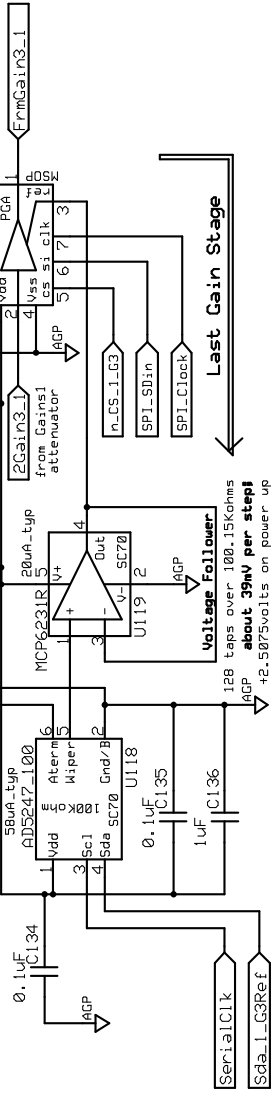


GOES TO:

U122-?, U123-?, U124-?
U125-?, & U126-? on the FiltADC page

End of GAINS Circuitry

Start of "FiltADC" Circuitry



GOES TO:

U222-?, U223-?, U224-?
U225-?, & U226-? on the FiltADC page

GOES TO:

U322-?, U323-?, U324-?
U325-?, & U326-? on the FiltADC page

Ver 1.6: added all of this circuitry

GUSTECH

SER_Analog

FiltADC

Rev 1.6

Thomas W. Gustin

8/23/2007

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interim design of SER's Analog Circuits; about half designed

Interim part list; version 1.6; as of 23 Aug 07

The next 8 pages present the current Parts List (very incomplete) for the circuitry on the first 6 pages of this document.

| REF: | Value: | DigiKey #_Part | Description: |
|------|---------|----------------|--------------------------|
| C101 | 1uF | 587-1783-1-ND | 10v_0306_X7R_TaiyoYuden |
| C102 | 0.1uF | 587-1183-1-ND | 6.3v_X5r_0201_TaiyoYuden |
| C103 | 0.1uF | 587-1183-1-ND | 6.3v_X5r_0201_TaiyoYuden |
| C104 | 100pF | 587-1174-1-ND | 25V_0201_X5R_TaiyoYuden |
| C105 | 100pF | 587-1174-1-ND | 25V_0201_X5R_TaiyoYuden |
| C106 | 220pF | PCC2126CT-ND | 25v_0201_X7R_Panasonic |
| C107 | 0.1uF | 587-1183-1-ND | 6.3v_X5r_0201_TaiyoYuden |
| C108 | 0.1uF | 587-1183-1-ND | 6.3v_X5r_0201_TaiyoYuden |
| C109 | 0.1uF | 587-1183-1-ND | 6.3v_X5r_0201_TaiyoYuden |
| C110 | 0.022uF | 587-1181-1-ND | 10v_X5R_0201_TaiyoYuden |
| C111 | 0.1uF | 587-1183-1-ND | 6.3v_X5r_0201_TaiyoYuden |
| C112 | 1uF | 587-1783-1-ND | 10v_0306_X7R_TaiyoYuden |
| C113 | 0.1uF | 587-1183-1-ND | 6.3v_X5r_0201_TaiyoYuden |
| C114 | 1uF | 587-1783-1-ND | 10v_0306_X7R_TaiyoYuden |
| C115 | 1uF | 587-1783-1-ND | 10v_0306_X7R_TaiyoYuden |
| C116 | 1uF | 587-1783-1-ND | 10v_0306_X7R_TaiyoYuden |
| C117 | 0.1uF | 587-1183-1-ND | 6.3v_X5r_0201_TaiyoYuden |
| C118 | 100pF | 587-1174-1-ND | 25V_0201_X5R_TaiyoYuden |
| C119 | 1uF | 587-1783-1-ND | 10v_0306_X7R_TaiyoYuden |
| C120 | 0.1uF | 587-1183-1-ND | 6.3v_X5r_0201_TaiyoYuden |
| C121 | 0.1uF | 587-1183-1-ND | 6.3v_X5r_0201_TaiyoYuden |
| C122 | 0.1uF | 587-1183-1-ND | 6.3v_X5r_0201_TaiyoYuden |
| C123 | 1uF | 587-1783-1-ND | 10v_0306_X7R_TaiyoYuden |
| C124 | 1uF | 587-1783-1-ND | 10v_0306_X7R_TaiyoYuden |
| C125 | 0.1uF | 587-1183-1-ND | 6.3v_X5r_0201_TaiyoYuden |
| C126 | 0.1uF | 587-1183-1-ND | 6.3v_X5r_0201_TaiyoYuden |
| C127 | 1uF | 587-1783-1-ND | 10v_0306_X7R_TaiyoYuden |
| C128 | 0.1uF | 587-1183-1-ND | 6.3v_X5r_0201_TaiyoYuden |
| C129 | 0.1uF | 587-1183-1-ND | 6.3v_X5r_0201_TaiyoYuden |
| C130 | 0.1uF | 587-1183-1-ND | 6.3v_X5r_0201_TaiyoYuden |
| C131 | 0.1uF | 587-1183-1-ND | 6.3v_X5r_0201_TaiyoYuden |
| C132 | 1uF | 587-1783-1-ND | 10v_0306_X7R_TaiyoYuden |
| C133 | 0.1uF | 587-1183-1-ND | 6.3v_X5r_0201_TaiyoYuden |
| C134 | 0.1uF | 587-1183-1-ND | 6.3v_X5r_0201_TaiyoYuden |
| C135 | 0.1uF | 587-1183-1-ND | 6.3v_X5r_0201_TaiyoYuden |
| C136 | 1uF | 587-1783-1-ND | 10v_0306_X7R_TaiyoYuden |

interim design of **SER's Analog Circuits**; about half designed

| REF: | Value: | DigiKey # | Part Description: |
|------|---------|---------------|--------------------------|
| C137 | 0.1uF | 587-1183-1-ND | 6.3v X5r 0201 TaiyoYuden |
| C138 | 0.1uF | 587-1183-1-ND | 6.3v X5r 0201 TaiyoYuden |
| C139 | 0.1uF | 587-1183-1-ND | 6.3v X5r 0201 TaiyoYuden |
| C140 | 1uF | 587-1783-1-ND | 10v 0306 X7R TaiyoYuden |
| C141 | 1uF | 587-1783-1-ND | 10v 0306 X7R TaiyoYuden |
| C201 | 1uF | 587-1783-1-ND | 10v 0306 X7R TaiyoYuden |
| C202 | 0.1uF | 587-1183-1-ND | 6.3v X5r 0201 TaiyoYuden |
| C203 | 0.1uF | 587-1183-1-ND | 6.3v X5r 0201 TaiyoYuden |
| C204 | 100pF | 587-1174-1-ND | 25V 0201 X5R TaiyoYuden |
| C205 | 100pF | 587-1174-1-ND | 25V 0201 X5R TaiyoYuden |
| C206 | 220pF | PCC2126CT-ND | 25v 0201 X7R Panasonic |
| C207 | 0.1uF | 587-1183-1-ND | 6.3v X5r 0201 TaiyoYuden |
| C208 | 0.1uF | 587-1183-1-ND | 6.3v X5r 0201 TaiyoYuden |
| C209 | 0.1uF | 587-1183-1-ND | 6.3v X5r 0201 TaiyoYuden |
| C210 | 0.022uF | 587-1181-1-ND | 10v X5R 0201 TaiyoYuden |
| C211 | 0.1uF | 587-1183-1-ND | 6.3v X5r 0201 TaiyoYuden |
| C212 | 1uF | 587-1783-1-ND | 10v 0306 X7R TaiyoYuden |
| C213 | 0.1uF | 587-1183-1-ND | 6.3v X5r 0201 TaiyoYuden |
| C214 | 1uF | 587-1783-1-ND | 10v 0306 X7R TaiyoYuden |
| C215 | 1uF | 587-1783-1-ND | 10v 0306 X7R TaiyoYuden |
| C216 | 1uF | 587-1783-1-ND | 10v 0306 X7R TaiyoYuden |
| C217 | 0.1uF | 587-1183-1-ND | 6.3v X5r 0201 TaiyoYuden |
| C218 | 100pF | 587-1174-1-ND | 25V 0201 X5R TaiyoYuden |
| C219 | 1uF | 587-1783-1-ND | 10v 0306 X7R TaiyoYuden |
| C220 | 0.1uF | 587-1183-1-ND | 6.3v X5r 0201 TaiyoYuden |
| C221 | 0.1uF | 587-1183-1-ND | 6.3v X5r 0201 TaiyoYuden |
| C222 | 0.1uF | 587-1183-1-ND | 6.3v X5r 0201 TaiyoYuden |
| C223 | 1uF | 587-1783-1-ND | 10v 0306 X7R TaiyoYuden |
| C224 | 1uF | 587-1783-1-ND | 10v 0306 X7R TaiyoYuden |
| C225 | 0.1uF | 587-1183-1-ND | 6.3v X5r 0201 TaiyoYuden |
| C226 | 0.1uF | 587-1183-1-ND | 6.3v X5r 0201 TaiyoYuden |
| C227 | 1uF | 587-1783-1-ND | 10v 0306 X7R TaiyoYuden |
| C228 | 0.1uF | 587-1183-1-ND | 6.3v X5r 0201 TaiyoYuden |
| C229 | 0.1uF | 587-1183-1-ND | 6.3v X5r 0201 TaiyoYuden |
| C230 | 0.1uF | 587-1183-1-ND | 6.3v X5r 0201 TaiyoYuden |
| C231 | 0.1uF | 587-1183-1-ND | 6.3v X5r 0201 TaiyoYuden |
| C232 | 1uF | 587-1783-1-ND | 10v 0306 X7R TaiyoYuden |
| C233 | 0.1uF | 587-1183-1-ND | 6.3v X5r 0201 TaiyoYuden |
| C234 | 0.1uF | 587-1183-1-ND | 6.3v X5r 0201 TaiyoYuden |

interim design of **SER's Analog Circuits**; about half designed

| REF: | Value: | DigiKey # | Part Description: |
|------|---------|---------------|--------------------------|
| C235 | 0.1uF | 587-1183-1-ND | 6.3v X5r 0201 TaiyoYuden |
| C236 | 1uF | 587-1783-1-ND | 10v 0306 X7R TaiyoYuden |
| C237 | 0.1uF | 587-1183-1-ND | 6.3v X5r 0201 TaiyoYuden |
| C238 | 0.1uF | 587-1183-1-ND | 6.3v X5r 0201 TaiyoYuden |
| C239 | 0.1uF | 587-1183-1-ND | 6.3v X5r 0201 TaiyoYuden |
| C240 | 1uF | 587-1783-1-ND | 10v 0306 X7R TaiyoYuden |
| C241 | 1uF | 587-1783-1-ND | 10v 0306 X7R TaiyoYuden |
| C301 | 1uF | 587-1783-1-ND | 10v 0306 X7R TaiyoYuden |
| C302 | 0.1uF | 587-1183-1-ND | 6.3v X5r 0201 TaiyoYuden |
| C303 | 0.1uF | 587-1183-1-ND | 6.3v X5r 0201 TaiyoYuden |
| C304 | 100pF | 587-1174-1-ND | 25V 0201 X5R TaiyoYuden |
| C305 | 100pF | 587-1174-1-ND | 25V 0201 X5R TaiyoYuden |
| C306 | 220pF | PCC2126CT-ND | 25v 0201 X7R Panasonic |
| C307 | 0.1uF | 587-1183-1-ND | 6.3v X5r 0201 TaiyoYuden |
| C308 | 0.1uF | 587-1183-1-ND | 6.3v X5r 0201 TaiyoYuden |
| C309 | 0.1uF | 587-1183-1-ND | 6.3v X5r 0201 TaiyoYuden |
| C310 | 0.022uF | 587-1181-1-ND | 10v X5R 0201 TaiyoYuden |
| C311 | 0.1uF | 587-1183-1-ND | 6.3v X5r 0201 TaiyoYuden |
| C312 | 1uF | 587-1783-1-ND | 10v 0306 X7R TaiyoYuden |
| C313 | 0.1uF | 587-1183-1-ND | 6.3v X5r 0201 TaiyoYuden |
| C314 | 1uF | 587-1783-1-ND | 10v 0306 X7R TaiyoYuden |
| C315 | 1uF | 587-1783-1-ND | 10v 0306 X7R TaiyoYuden |
| C316 | 1uF | 587-1783-1-ND | 10v 0306 X7R TaiyoYuden |
| C317 | 0.1uF | 587-1183-1-ND | 6.3v X5r 0201 TaiyoYuden |
| C318 | 100pF | 587-1174-1-ND | 25V 0201 X5R TaiyoYuden |
| C319 | 1uF | 587-1783-1-ND | 10v 0306 X7R TaiyoYuden |
| C320 | 0.1uF | 587-1183-1-ND | 6.3v X5r 0201 TaiyoYuden |
| C321 | 0.1uF | 587-1183-1-ND | 6.3v X5r 0201 TaiyoYuden |
| C322 | 0.1uF | 587-1183-1-ND | 6.3v X5r 0201 TaiyoYuden |
| C323 | 1uF | 587-1783-1-ND | 10v 0306 X7R TaiyoYuden |
| C324 | 1uF | 587-1783-1-ND | 10v 0306 X7R TaiyoYuden |
| C325 | 0.1uF | 587-1183-1-ND | 6.3v X5r 0201 TaiyoYuden |
| C326 | 0.1uF | 587-1183-1-ND | 6.3v X5r 0201 TaiyoYuden |
| C327 | 1uF | 587-1783-1-ND | 10v 0306 X7R TaiyoYuden |
| C328 | 0.1uF | 587-1183-1-ND | 6.3v X5r 0201 TaiyoYuden |
| C329 | 0.1uF | 587-1183-1-ND | 6.3v X5r 0201 TaiyoYuden |
| C330 | 0.1uF | 587-1183-1-ND | 6.3v X5r 0201 TaiyoYuden |
| C331 | 0.1uF | 587-1183-1-ND | 6.3v X5r 0201 TaiyoYuden |
| C332 | 1uF | 587-1783-1-ND | 10v 0306 X7R TaiyoYuden |
| C333 | 0.1uF | 587-1183-1-ND | 6.3v X5r 0201 TaiyoYuden |

interim design of **SER's Analog Circuits**; about half designed

| REF: | Value: | DigiKey # | Part Description: |
|------|-----------------------|------------------------|----------------------------|
| C334 | 0.1uF | 587-1183-1-ND | 6.3v X5r 0201 TaiyoYuden |
| C335 | 0.1uF | 587-1183-1-ND | 6.3v X5r 0201 TaiyoYuden |
| C336 | 1uF | 587-1783-1-ND | 10v 0306 X7R TaiyoYuden |
| C337 | 0.1uF | 587-1183-1-ND | 6.3v X5r 0201 TaiyoYuden |
| C338 | 0.1uF | 587-1183-1-ND | 6.3v X5r 0201 TaiyoYuden |
| C339 | 0.1uF | 587-1183-1-ND | 6.3v X5r 0201 TaiyoYuden |
| C340 | 1uF | 587-1783-1-ND | 10v 0306 X7R TaiyoYuden |
| C341 | 1uF | 587-1783-1-ND | 10v 0306 X7R TaiyoYuden |
| F11 | ESDALC6V1P6 | Mouser-511-ESDALC6V1P6 | QuadLowCapESDarray_STMicro |
| F12 | NFM18CC222R1C3 | MuRata | 3-term 0603 cap |
| F13 | NFM18CC222R1C3 | MuRata | 3-term 0603 cap |
| F14 | NFM18CC222R1C3 | MuRata | 3-term 0603 cap |
| F15 | NFM18CC222R1C3 | MuRata | 3-term 0603 cap |
| F21 | ESDALC6V1P6 | Mouser-511-ESDALC6V1P6 | QuadLowCapESDarray_STMicro |
| F22 | NFM18CC222R1C3 | MuRata | 3-term 0603 cap |
| F23 | NFM18CC222R1C3 | MuRata | 3-term 0603 cap |
| F24 | NFM18CC222R1C3 | MuRata | 3-term 0603 cap |
| F25 | NFM18CC222R1C3 | MuRata | 3-term 0603 cap |
| F31 | ESDALC6V1P6 | Mouser-511-ESDALC6V1P6 | QuadLowCapESDarray_STMicro |
| F32 | NFM18CC222R1C3 | MuRata | 3-term 0603 cap |
| F33 | NFM18CC222R1C3 | MuRata | 3-term 0603 cap |
| F34 | NFM18CC222R1C3 | MuRata | 3-term 0603 cap |
| F35 | NFM18CC222R1C3 | MuRata | 3-term 0603 cap |
| H11 | RelievedSolderConnect | | PC-board-layout-pattern |
| H12 | RelievedSolderConnect | | PC-board-layout-pattern |
| H13 | RelievedSolderConnect | | PC-board-layout-pattern |
| H14 | RelievedSolderConnect | | PC-board-layout-pattern |
| H21 | RelievedSolderConnect | | PC-board-layout-pattern |
| H22 | RelievedSolderConnect | | PC-board-layout-pattern |
| H23 | RelievedSolderConnect | | PC-board-layout-pattern |
| H24 | RelievedSolderConnect | | PC-board-layout-pattern |
| H31 | RelievedSolderConnect | | PC-board-layout-pattern |
| H32 | RelievedSolderConnect | | PC-board-layout-pattern |
| H33 | RelievedSolderConnect | | PC-board-layout-pattern |
| H34 | RelievedSolderConnect | | PC-board-layout-pattern |

interim design of **SER's Analog Circuits**; about half designed

REF: Value:

- J11 3 place solder pad switch
- J21 3 place solder pad switch
- J31 3 place solder pad switch

REF: Value: DigiKey # Part Description:

- R101 6.04K RG10P6.04KBCT-ND 0.06w 0402 0.1% Susumu
- R102 2.55K RR05P2.55KDCT-ND 0.06w 0402 0.5% Susumu
- R103 5.36K RR05P5.35KDCT-ND 0.06w 0402 0.5% Susumu
- R105 1.00M 541-1.00MABCT-ND 0.055w 0201 1.0% VishayDale
- R106 3.30M RHM3.3MAGCT-ND 0.05w 0201 5.0% Rohm
- R107 226K P226KABCT-ND 0.05w 0201 1% Panasonic
- R108 3.30M RHM3.3MAGCT-ND 0.05w 0201 5.0% Rohm
- R109 1.00M 541-1.00MABCT-ND 0.055w 0201 1.0% VishayDale
- R110 3.30M RHM3.3MAGCT-ND 0.05w 0201 5.0% Rohm
- R111 1.00M 541-1.00MABCT-ND 0.055w 0201 1.0% VishayDale
- R201 6.04K RG10P6.04KBCT-ND 0.06w 0402 0.1% Susumu
- R202 2.55K RR05P2.55KDCT-ND 0.06w 0402 0.5% Susumu
- R203 5.36K RR05P5.35KDCT-ND 0.06w 0402 0.5% Susumu
- R205 1.00M 541-1.00MABCT-ND 0.055w 0201 1.0% VishayDale
- R206 3.30M RHM3.3MAGCT-ND 0.05w 0201 5.0% Rohm
- R207 226K P226KABCT-ND 0.05w 0201 1% Panasonic
- R208 3.30M RHM3.3MAGCT-ND 0.05w 0201 5.0% Rohm
- R209 1.00M 541-1.00MABCT-ND 0.055w 0201 1.0% VishayDale
- R210 3.30M RHM3.3MAGCT-ND 0.05w 0201 5.0% Rohm
- R211 1.00M 541-1.00MABCT-ND 0.055w 0201 1.0% VishayDale
- R301 6.04K RG10P6.04KBCT-ND 0.06w 0402 0.1% Susumu
- R302 2.55K RR05P2.55KDCT-ND 0.06w 0402 0.5% Susumu
- R303 5.36K RR05P5.35KDCT-ND 0.06w 0402 0.5% Susumu
- R305 1.00M 541-1.00MABCT-ND 0.055w 0201 1.0% VishayDale
- R306 3.30M RHM3.3MAGCT-ND 0.05w 0201 5.0% Rohm
- R307 226K P226KABCT-ND 0.05w 0201 1% Panasonic
- R308 3.30M RHM3.3MAGCT-ND 0.05w 0201 5.0% Rohm
- R309 1.00M 541-1.00MABCT-ND 0.055w 0201 1.0% VishayDale
- R310 3.30M RHM3.3MAGCT-ND 0.05w 0201 5.0% Rohm
- R311 1.00M 541-1.00MABCT-ND 0.055w 0201 1.0% VishayDale

interim design of **SER's Analog Circuits**; about half designed

| REF: | Value: |
|------|-----------------------|
| TP11 | Pad or hole TestPoint |
| TP12 | Pad or hole TestPoint |
| TP13 | Pad or hole TestPoint |
| TP21 | Pad or hole TestPoint |
| TP22 | Pad or hole TestPoint |
| TP23 | Pad or hole TestPoint |
| TP31 | Pad or hole TestPoint |
| TP32 | Pad or hole TestPoint |
| TP33 | Pad or hole TestPoint |

| REF: | Value: | Mouser or DigiKey # | Part Description: |
|------|------------|------------------------------|---|
| U101 | INA159 | Mouser-5950 | INA159AIDKGTG4_0.2V/vDiffAmp_MSOP_TI-BB |
| U102 | AD8029 | AD8029AKS-R2CT-ND | RRIOopamp_120MHz_ADI |
| U103 | AD8029 | AD8029AKS-R2CT-ND | RRIOopamp_120MHz_ADI |
| U104 | LM4120-5.0 | LM4120IM5-5.0CT-ND | 5.000vREF_SOT23-5_0.5%_National |
| U105 | AD5247_100 | AD5247BKS100-R2CT-ND | 100Kohm_SC70-6_128tapIIC_ADI |
| U106 | MCP6231R | MCP5231UT-E/LTCT-ND | RRIOopamp_300kHz_Microchip |
| U107 | TPS71501 | 296-12957-1-ND | AdjLdoReg_50mA_SC70-5_TI |
| U108 | ADP3331 | ADP3331ARTZ-REEL7CT-ND | AdjLdoReg_200mA_SC70-6_ADI |
| U109 | AD5247_10 | AD5247BKSZ10-RL7CT-ND | 10KohmRDAC_SC70-6_ADI |
| U110 | PI5A3157 | PI5A3157ZAEXCT-ND | SPDTanalogSwitch_6TDFN_Pericom |
| U111 | AD5247_10 | AD5247BKSZ10-RL7CT-ND | 10KohmRDAC_SC70-6_ADI |
| U112 | TPS71501 | 296-12957-1-ND | AdjLdoReg_50mA_SC70-5_TI |
| U113 | AD5247_100 | AD5247BKS100-R2CT-ND | 100Kohm_SC70-6_128tapIIC_ADI |
| U114 | MCP6231R | MCP5231UT-E/LTCT-ND | RRIOopamp_300kHz_Microchip |
| U115 | MCP6S91 | Microchip_1->32V/V-PGA_8MSOP | |
| U116 | AD5247_100 | AD5247BKS100-R2CT-ND | 100Kohm_SC70-6_128tapIIC_ADI |
| U117 | MCP6231R | MCP5231UT-E/LTCT-ND | RRIOopamp_300kHz_Microchip |
| U118 | AD5247_100 | AD5247BKS100-R2CT-ND | 100Kohm_SC70-6_128tapIIC_ADI |
| U119 | MCP6231R | MCP5231UT-E/LTCT-ND | RRIOopamp_300kHz_Microchip |
| U120 | MCP6S91 | Microchip_1->32V/V-PGA_8MSOP | |
| U121 | TPS71501 | 296-12957-1-ND | AdjLdoReg_50mA_SC70-5_TI |
| U201 | INA159 | Mouser-5950 | INA159AIDKGTG4_0.2V/vDiffAmp_MSOP_TI-BB |
| U202 | AD8029 | AD8029AKS-R2CT-ND | RRIOopamp_120MHz_ADI |
| U203 | AD8029 | AD8029AKS-R2CT-ND | RRIOopamp_120MHz_ADI |
| U204 | LM4120-5.0 | LM4120IM5-5.0CT-ND | 5.000vREF_SOT23-5_0.5%_National |
| U205 | AD5247_100 | AD5247BKS100-R2CT-ND | 100Kohm_SC70-6_128tapIIC_ADI |
| U206 | MCP6231R | MCP5231UT-E/LTCT-ND | RRIOopamp_300kHz_Microchip |
| U207 | TPS71501 | 296-12957-1-ND | AdjLdoReg_50mA_SC70-5_TI |
| U208 | ADP3331 | ADP3331ARTZ-REEL7CT-ND | AdjLdoReg_200mA_SC70-6_ADI |

interim design of **SER's Analog Circuits**; about half designed

| REF: | Value: | Mouser or DigiKey # | Part Description: |
|-------------|---------------|----------------------------|--|
| U209 | AD5247_10 | AD5247BKSZ10-RL7CT-ND | 10KohmRDAC_SC70-6_ADI |
| U210 | PI5A3157 | PI5A3157ZAEEXCT-ND | SPDTanalogSwitch_6TDFN_Pericom |
| U211 | AD5247_10 | AD5247BKSZ10-RL7CT-ND | 10KohmRDAC_SC70-6_ADI |
| U212 | TPS71501 | 296-12957-1-ND | AdjLdoReg_50mA_SC70-5_TTI |
| U213 | AD5247_100 | AD5247BKS100-R2CT-ND | 100Kohm_SC70-6_128tapIIC_ADI |
| U214 | MCP6231R | MCP5231UT-E/LTCT-ND | RRIOopamp_300kHz_Microchip |
| U215 | MCP6S91 | Microchip_1-> | 32V/V-PGA_8MSOP |
| U216 | AD5247_100 | AD5247BKS100-R2CT-ND | 100Kohm_SC70-6_128tapIIC_ADI |
| U217 | MCP6231R | MCP5231UT-E/LTCT-ND | RRIOopamp_300kHz_Microchip |
| U218 | AD5247_100 | AD5247BKS100-R2CT-ND | 100Kohm_SC70-6_128tapIIC_ADI |
| U219 | MCP6231R | MCP5231UT-E/LTCT-ND | RRIOopamp_300kHz_Microchip |
| U220 | MCP6S91 | Microchip_1-> | 32V/V-PGA_8MSOP |
| U221 | TPS71501 | 296-12957-1-ND | AdjLdoReg_50mA_SC70-5_TTI |
| U301 | INA159 | Mouser-5950 | INA159AIDKGTG4_0.2V/vDiffAmp_MSOP_TTI-BB |
| U302 | AD8029 | AD8029AKS-R2CT-ND | RRIOopamp_120MHz_ADI |
| U303 | AD8029 | AD8029AKS-R2CT-ND | RRIOopamp_120MHz_ADI |
| U304 | LM4120-5.0 | LM4120IM5-5.0CT-ND | 5.000vREF_SOT23-5_0.5%_National |
| U305 | AD5247_100 | AD5247BKS100-R2CT-ND | 100Kohm_SC70-6_128tapIIC_ADI |
| U306 | MCP6231R | MCP5231UT-E/LTCT-ND | RRIOopamp_300kHz_Microchip |
| U307 | TPS71501 | 296-12957-1-ND | AdjLdoReg_50mA_SC70-5_TTI |
| U308 | ADP3331 | ADP3331ARTZ-REEL7CT-ND | AdjLdoReg_200mA_SC70-6_ADI |
| U309 | AD5247_10 | AD5247BKSZ10-RL7CT-ND | 10KohmRDAC_SC70-6_ADI |
| U310 | PI5A3157 | PI5A3157ZAEEXCT-ND | SPDTanalogSwitch_6TDFN_Pericom |
| U311 | AD5247_10 | AD5247BKSZ10-RL7CT-ND | 10KohmRDAC_SC70-6_ADI |
| U312 | TPS71501 | 296-12957-1-ND | AdjLdoReg_50mA_SC70-5_TTI |
| U313 | AD5247_100 | AD5247BKS100-R2CT-ND | 100Kohm_SC70-6_128tapIIC_ADI |
| U314 | MCP6231R | MCP5231UT-E/LTCT-ND | RRIOopamp_300kHz_Microchip |
| U315 | MCP6S91 | Microchip_1-> | 32V/V-PGA_8MSOP |
| U316 | AD5247_100 | AD5247BKS100-R2CT-ND | 100Kohm_SC70-6_128tapIIC_ADI |
| U317 | MCP6231R | MCP5231UT-E/LTCT-ND | RRIOopamp_300kHz_Microchip |
| U318 | AD5247_100 | AD5247BKS100-R2CT-ND | 100Kohm_SC70-6_128tapIIC_ADI |
| U319 | MCP6231R | MCP5231UT-E/LTCT-ND | RRIOopamp_300kHz_Microchip |
| U320 | MCP6S91 | Microchip_1-> | 32V/V-PGA_8MSOP |
| U321 | TPS71501 | 296-12957-1-ND | AdjLdoReg_50mA_SC70-5_TTI |

The next page shows a tiny start of the PC board layout for Channel 1 of the Analog Circuitry

interim design of **SER's Analog Circuits**; about half designed

