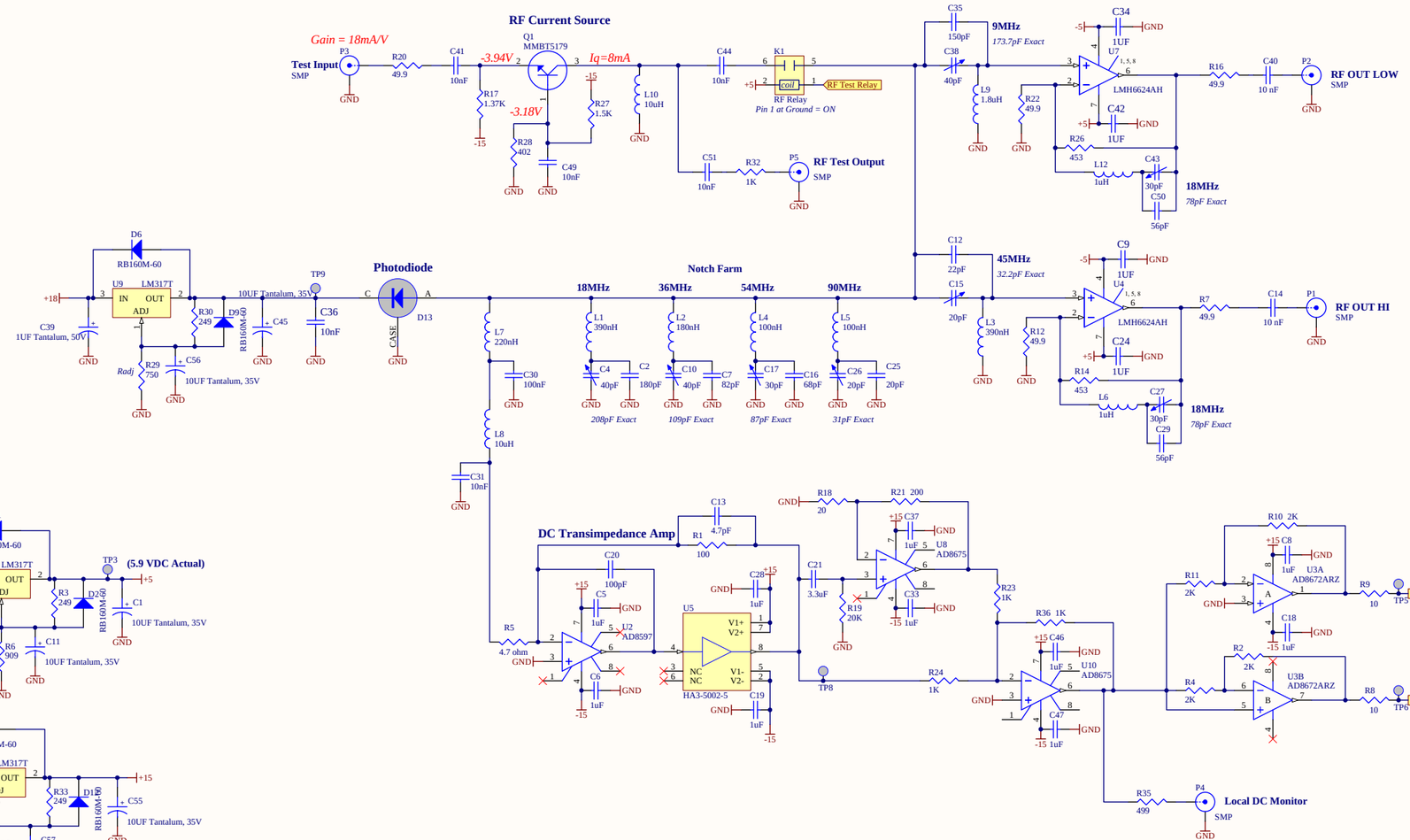
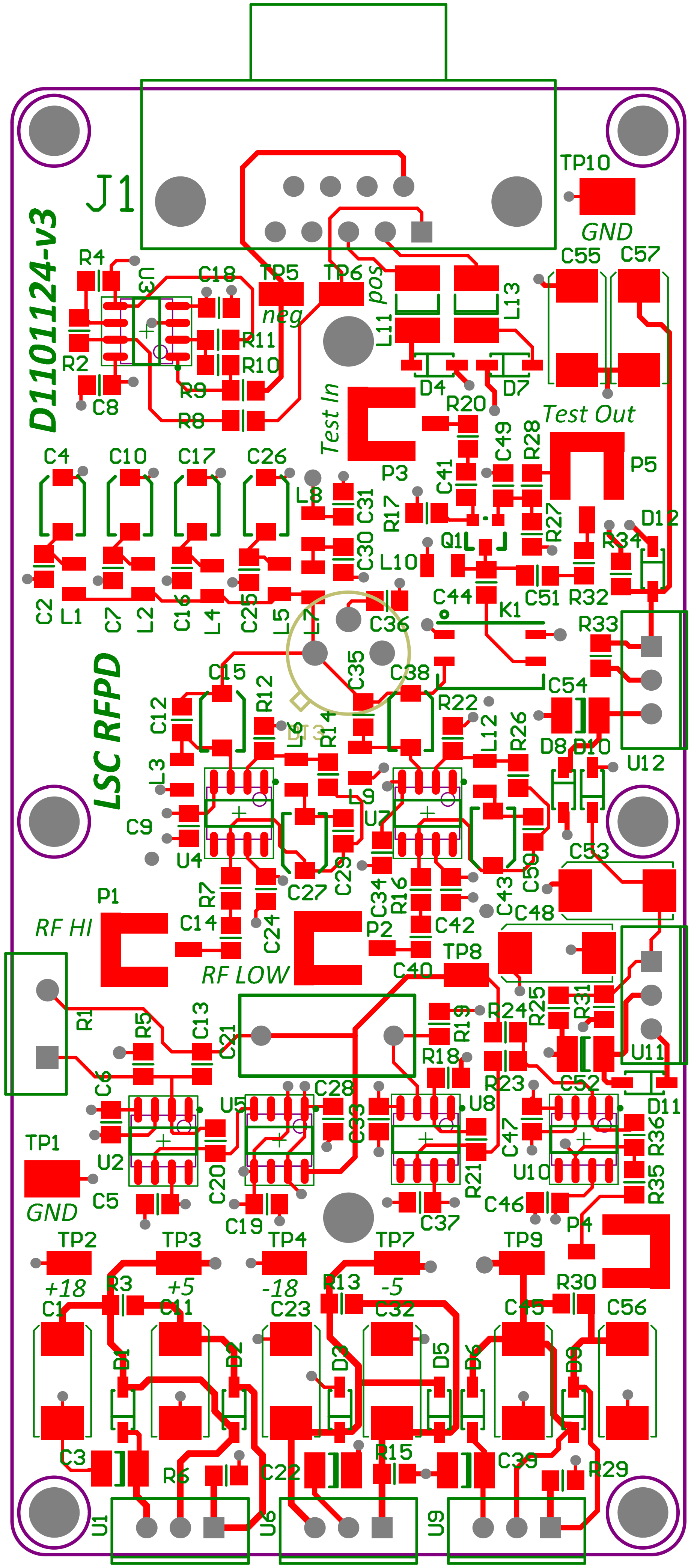

RF Current Source
Gain = 18mA/V
Test Input
SMP
P3
R20
49.9
C41
10nF
-3.94V
Q1
MMBT5179
Iq=8mA
-3.18V
R17
1.37K
R28
402
C49
10nF
R27
1.5K
L10
10uH
C44
10nF
K1
coil
RF Relay
Pin 1 at Ground = ON
RF Test Relay
C51
10nF
R32
1K
P5
RF Test Output
SMP
C35
150pF
C38
40pF
9MHz
173.7pF Exact
L9
1.8uH
R22
49.9
C34
1UF
U7
LMH6624AH
R26
453
L12
1uH
C43
30pF
C50
56pF
18MHz
78pF Exact
R16
49.9
C40
10 nF
P2
RF OUT LOW
SMP
C42
1UF
Photodiode
D13
CASE
Notch Farm
18MHz
36MHz
54MHz
90MHz
L7
220nH
C30
100nF
L8
10uH
C31
10nF
L1
390nH
C4
40pF
C2
180pF
208pF Exact
L2
180nH
C10
40pF
C7
82pF
109pF Exact
L4
100nH
C17
30pF
C16
68pF
87pF Exact
L5
100nH
C26
20pF
C25
20pF
31pF Exact
C12
22pF
C15
20pF
45MHz
32.2pF Exact
L3
390nH
R12
49.9
C9
1UF
U4
LMH6624AH
R14
453
L6
1uH
C27
30pF
C29
56pF
18MHz
78pF Exact
R7
49.9
C14
10 nF
P1
RF OUT HI
SMP
D6
RB160M-60
U9 LM317T
C39
1UF Tantalum, 50V
R30
249
D9
RB160M-60
C45
10UF Tantalum, 35V
TP9
C36
10nF
R29
750
Radj
C56
10UF Tantalum, 35V
D1
RB160M-60
U1 LM317T
TP2
TP3
(5.9 VDC Actual)
C3
1UF Tantalum, 50V
R3
249
D2
RB160M-60
C1
10UF Tantalum, 35V
R6
909
C11
10UF Tantalum, 35V
D8
RB160M-60
U12 LM317T
C54
1UF Tantalum, 50V
R33
249
D12
RB160M-60
C55
10UF Tantalum, 35V
R34
2.67K
C57
10UF Tantalum, 35V
TP10
TP1
D3
RB160M-60
U6 LM337BT
TP4
TP7
(Minus 5.9 VDC Actual)
C22
1UF Tantalum, 50V
R13
120
D5
RB160M-60
C23
10UF Tantalum, 35V
R15
453
C32
10UF Tantalum, 35V
D11
RB160M-60
U11 LM337BT
C52
1UF Tantalum, 50V
R31
120
D10
RB160M-60
C48
10UF Tantalum, 35V
R25
1.33K
C53
10UF Tantalum, 35V
DC Transimpedance Amp
C13
4.7pF
R1
100
C20
100pF
C5
1uF
U2
AD8597
R5
4.7 ohm
C6
1uF
U5
HA3-5002-5
C28
1uF
C19
1uF
C21
3.3uF
R19
20K
C33
1uF
R18
20
R21 200
C37
1uF
U8
AD8675
R23
1K
R36 1K
C46
1uF
U10
AD8675
C47
1uF
R24
1K
TP8
R10 2K
C8
1uF
U3A
AD8672ARZ
R11
2K
R9
10
TP5
DCn
C18
1uF
R2
2K
U3B
AD8672ARZ
R4
2K
R8
10
TP6
DCn
R35
499
P4
Local DC Monitor
SMP
D4
D7
60V, 1A Schottky
L13
10UH
L11
10UH
J1
D Connector 9
+/-18VDC Power Supply
Version 5 schematic uses version 3 circuit board
Voltage Regulator Equations
LM337 Vo= - 1.25(1+Radj/120)+(50uA*Radj)
LM317 Vo=1.25(1+Radj/249)+(100uA*Radj)
SPICE File Located: C:\Rich's Files\LT Spice\PhotodiodeAnalysis\lsc_rfpds\aLIGO_LSC_2011\9_45_LSC_v3.asc
Version Summary:
Version 1 - Initial release
Version 2 - Added whitening to DC readout
Version 3 - Added input DC power conditioning and DC reverse polarity protection diodes
Version 4 - Only a schematic change; Changed R27 from 750 to 909, R29 from 357 to 453. This was done to increase the voltage on the RF opamp from +/- 5 volts DC to +/- 5.9 volts DC for greater dynamic range
Version 5 - Reworked Bill of Materials to reflect actual parts used.
Last Edited: 19August2011
Title
aLIGO LSC RFPD
LIGO Laboratory
California Institute of Technology
Massachusetts Institute of Technology
LIGO
Size: C
DCC Number: D1101124
SCH / PCB Revision: v5
Engineer: R. Abbott
Date: 3/6/2012
Time: 9:46:00 AM
File: C:\Users\costheld\Documents\chub_ligo_files\ChubAltium\D1101124_v4_LSC_RFPD\2011_aligo_LSC_v5\aLIGO_LSC_v5.SchDoc
Sheet of Sheets


D1101124-v3
LSC RFPD
J1
TP10
GND
TP5
TP6
neg
pos
Test In
Test Out
P3
P5
K1
RF HI
RF LOW
P1
P2
TP8
TP1
GND
P4
TP2
TP3
TP4
TP7
TP9
+18
+5
-18
-5
U1
U6
U9
U11
U12