J5
DB15
BULKHEAD MALE CONNECTOR

1	+15V RAW
9	GND
2	-15V RAW
10	GND
3	Vc ADJUST
11	GND (Vc ADJUST REF)
4	TSENSE
12	GND (TSENSE REF)
5	DC OUT
13	GND (DC OUT REF)
6	ENABLE IN
14	GND (ENABLE IN REF)
7	STATUS/OTEMP OUT
15	GND (STATUS/OTEMP OUT REF)
8	NOT USED

15-CONDUCTOR
RIBBON CABLE

J4
IDC-16

GND

GND FOR SIGNAL RETURNS

OUTSIDE THE ENCLOSURE
INSIDE THE ENCLOSURE

ENABLE IN must be HIGH (i.e. +5V) to enable the photodiode.

OUTSIDE THE RF CAGE
WITHIN THE RF CAGE

FLT5 EMI FILTER IN(1) OUT(2) GND
FLT6 EMI FILTER IN(1) OUT(2) GND
FLT7 EMI FILTER IN(1) OUT(2) GND
FLT8 EMI FILTER IN(1) OUT(2) GND
FLT9 EMI FILTER IN(1) OUT(2) GND

L1 10uH
C5 1uF
C10 0.01uF
C11 0.01uF
C6 1uF
FLT1 EMI FILTER IN(1) OUT(2) GND +15V

U1 LM309H
Vin +5V GND
C2 1uF
C1 1uF
FLT2 EMI FILTER IN(1) OUT(2) GND +5V

L2 10uH
C7 1uF
C12 0.01uF
C13 0.01uF
C8 1uF
FLT3 EMI FILTER IN(1) OUT(2) GND -15V

U2 LM120H-5
GND Vin -5V
C3 1uF
C4 1uF
FLT4 EMI FILTER IN(1) OUT(2) GND -5V

RF FENCE,
26 GND pins

D980454-00-C
8045401a.SCH

Vc ADJUST		
TSENSE		
DC_OUT	+15V	+15V
ENABLE IN	+5V	+5V
STATUS/OTEMP		
	-15V	-15V
DC OUT SMA		
	-5V	-5V
RF OUT SMA		
TEST INPUT SMA		

J3
SMA FEEDTHROUGH
DC OUT

J2
SMA FEEDTHROUGH
RF OUT

J1
SMA FEEDTHROUGH
TEST INPUT

Date Last Modified: *17-May-99*

LIGO Laboratory
California Institute of Technology
Massachusetts Institute of Technology

LIGO

Title: ***LSC Photodiode***

Size: B	DCC Number: D980454-01-C	PCB / SCH Revision: B / 1	Engineer: *J. Suina* *D. Ouimette*	Date: 12-Aug-1999
				Time: 16:56:47
File: S:\SYSTEMS\LSC\PHOTOD~1\FINAL\SCHEMA~1\8045400A.PRJ				Sheet 1 of 2

CIRCUITRY ON THIS PAGE IS WITHIN THE RF CAGE

POX11

633nH

80pF

1.39uH

L4 See table 2-Omega Bandstop Filter

C34 5.0-40pF

Multiple resistors divide out the distributed capacitance between TEST INPUT and RF CIRCUIT

R24 may not be installed. In the previous revision 100pF has been installed on the R3 pad in order to achieve 81/162 MHz operation.

At lower frequencies a resistor may be installed to impedance match the input and output of the Bandstop Filter.

TEST INPUT SMA

R14 2.00K 1%
R15 2.00K 1%
R16 2.00K 1%
R17 2.00K 1%
R18 2.00K 1%

R3 49.9 1%

C25 0.1uF

R24 See table

L3 1.45uH

C24 0.1uF
C21 1nF

U3 MAX4107ESA

R4 20

RF OUT SMA

RF Out, Gain = +10

R1 453 1%

R2 49.9 1%

C20 1nF
C22 0.1uF

C29 0.1uF
C28 0.1uF

U11 AD620BR

Output scale is +10.0 mV/°C
e.g., 0.25V = 25°C

TSENSE

R31 200 1%
R32 6.81K 1%

U10 LM35AH

Aluminum Thermal Block Temp Sense

THERMBLOK ALUMINUM THERMAL BLOCK

4 screw holes connected to GND

See Note 1

C30642 D1 CASE

1-omega Bandpass Filter

2 shield pins connected to GND

L5 SHLDCOIL

R30 200 1%

C32 0.0056uF

+15V
+5V
-15V
-5V

C39 2.2uF
C19 0.01uF

U8

C33 0.0056uF

R22 10 1%

OP27GS

C18 0.01uF
C40 2.2uF

C37 2.2uF
C17 0.01uF

U7

R6 20

DC_OUT

DC OUT is a transfer function
Vdc out / Ipd ==> 10 VDC = 150mA
GAIN = 66.7

20 Ohm resistors are line capacitance isolation resistors to prevent OP27GS from oscillating.

R5 20

DC OUT SMA

R13 2.67K 1%

R23 475 1%

C16 0.01uF
C38 2.2uF

C35 2.2uF
C15 0.01uF

U6

C30 10uF
C23 0.1uF

U4 OPA547F

E/S

R8 2.67K 1%

R7 124K

Input allows for adjustment of the BIAS VOLTAGE to compensate for changes due to temperature, laser bandwidth, frequency-dependent RF circuit impedance, etc.

Vc ADJUST

R10 2.67K 1%
R9 2.67K 1%

Summing Amplifier

R12 2.67K 1%
R11 2.67K 1%

OP27GS

C14 0.01uF
C36 2.2uF

R21 1.33K 1%

Photodiode Current Positive Feedback Loop, GAIN = +2

Photodiode Bias Voltage, Vi = 6.98Volts

U5 LM117H

+Vout Vin ADJ

R19 294 1%
R20 1.33K 1%

C9 1uF
C31 10uF
C26 0.1uF

+5V U9E SN74HC05D

+5V U9F SN74HC05D

U9-14 U9A U9-7 U9B U9C U9D SN74HC05D

R29 1K 1%
R26 1K 1%
R25 1K 1%
R27 1K 1%
R28 1K 1%

C27 0.1uF

ENABLE IN

STATUS/OTEMP

E/S = TTL logic HIGH ENABLES the OPA547F Op Amp

NOTES:

1) The same TO-5 footprint accomodates the following diodes: C30642, GAP2000

2) See table on page 3 for frequencies and values of L4, L5, R24.

Alberto Stochino
40M Upgrade
March-7-2010

Title: *LSC Photodiode*			**Date Last Modified:** *17-May-99*
			LIGO Laboratory
			California Institute of Technology
			Massachusetts Institute of Technology
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