Serial Number: _________ Date: ___________

Test Engineer: _____________________________

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LSC RFPD REV D Test Plan

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This is an internal working note
of the LIGO Project.

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1 Introduction

The tests described below are required to verify the correct operation of the LSC RFPD (D980454 Rev D).

2 Test Equipment

Dual Power Supply
Voltage Calibrator
Oscilloscope
Handheld DMM
HP 8753C Network Analyzer, or equivalent
Function generator SRS DS345 or equivalent

3 Tests

3.1 DC checks

Hook up power supplies to appropriate pins on the RFPD board, or the RFPD Test board (+15V TP4, -15V TP10, and GND TP11). Record the current draw in Table 1. With a handheld DMM, read and record the Bias Voltage (TP2). With a voltage calibrator, input +1V in the VC Adjust pin (TP5), read and record the Bias Voltage (TP2). Read and record the Logic Status voltage (TP9). With clipleads, ground the Enable In pin (TP8), and read and record the Logic Status voltage. Read and record the Temperature Sense voltage (TP3).

Test	Result	Nominal
+15V	mA	110 mA +/- 15mA
-15V	mA	90 mA +/- 15mA
Bias Voltage	V	7.0V +/- 10mV
Bias Voltage (+1V applied)	V	8.35V +/- 10mV
Logic Status Voltage	V	5V +/-20mV
Logic Voltage w/shutdown	V	0V
Temp Sense	mV	300mV +/- 30mV

Table 1.

3.2 AC Checks

3.2.1 RF Tests

Using the table on the schematic, verify that the correct values are stuffed for the TBD components. The remaining tests require a variable power, modulated laser set up and a network analyzer. Put enough laser light on the PD that the output of the DC OUT SMA reads 20 mV+/- 2 mV. Record this value in Table 2 below. With the network analyzer set at a drive level of 0dBm, look at the positions of the peak and notch (where applicable). First, set the Peak to the appropriate frequency by adjusting L2 (higher L2 makes a lower peak frequency). Next, detune the active notch (C15) to allow better tuning of the passive notch. The passive notch is tuned by adjusting C3 (higher C3 makes a lower frequency notch). When the passive notch is tuned, adjust the active notch (C15) until the depth of the notch is maximized. At this point, it may be necessary to re-adjust the peak (L2). Once the peak and notch are tuned, record the frequencies and amplitudes in the table below. The RFPD passes if the values are no smaller than 1dB less than the expected.

DC OUT ______mV

	Frequency	**Value**	**Expected** (see Table 4)
Peak Frequency	MHz	dB	dB
Notch Frequency	MHz	dB	dB
Peak-to-notch	MHz	dB	dB

Table 2.

3.2.2 DAQ Tests

For the following tests, an injection point should be soldered to the top of R1. Through this injection pin, put a 1KHz, 0.1Vp-p signal as read from the front panel of a 50Ω Zout function generator. Measure this input signal with a scope probe and record in Table 3 below. Next measure the output of the DAQ output LEMO on the PD box at the appropriate pins per the table below. Repeat the above test with the signal generator set to 90 Hz.

Input________mV

	@1KHz	**@90Hz** (Pins 2 and 3 should be half value)
Pin 1	mVp-p	mVp-p
Pin 4	mVp-p	mVp-p
Pin 2	Vp-p	Vp-p
Pin 3	Vp-p	Vp-p

Table 3.

Table of average observed values for each frequency RFPD.

PD	Peak Frequency	Nominal Peak Height	Notch Frequency	Nominal Notch Depth	Peak-to-Notch
4K MC	33.289 MHz	-23 dB	66.578 MHz	-83	60dB
2K MC	26.717 MHz		53.434 MHz		
4K Main SB	24.481 MHz	-20dB	48.962 MHz	-80dB	60dB
2K Main SB	29.508 MHz	-20dB	59.016 MHz	-80dB	60dB
4K NRSB	61.202 MHz	-30dB	24.481 MHz	-60dB	30dB
2K NRSB	68.851 MHz	-31dB	29.508 MHz	-61dB	30dB
4K SPOB	48.962 MHz	-10dB	N/A	N/A	N/A
2K SPOB	59.016 MHz	-7dB	N/A	N/A	N/A

Table 4.