



LIGO Laboratory / LIGO Scientific Collaboration

LIGO-T040220-D-C

LIGO

6 March 2006

Test Results for C30642 LSC Diode Elements

Richard Abbott

Distribution of this document:
LIGO Science Collaboration

This is an internal working note
of the LIGO Project.

California Institute of Technology
LIGO Project – MS 18-34
1200 E. California Blvd.
Pasadena, CA 91125
Phone (626) 395-2129
Fax (626) 304-9834
E-mail: info@ligo.caltech.edu

Massachusetts Institute of Technology
LIGO Project – NW17-161
175 Albany St
Cambridge, MA 02139
Phone (617) 253-4824
Fax (617) 253-7014
E-mail: info@ligo.mit.edu

LIGO Hanford Observatory
P.O. Box 1970
Mail Stop S9-02
Richland WA 99352
Phone 509-372-8106
Fax 509-372-8137

LIGO Livingston Observatory
P.O. Box 940
Livingston, LA 70754
Phone 225-686-3100
Fax 225-686-7189

<http://www.ligo.caltech.edu/>

1 Introduction

Measurements were taken to quantify series capacitance and series resistance for the C30642 InGaAs, 2mm photodiodes used in the LSC RF Photodetector. Data taken in January of 2003 is included for comparison.

All measurements were taken using an HP4195A and associated Impedance Test Adapter. The data was taken at 24.5 MHz with 7 volts reverse bias applied

2 Diodes from LHO and LLO, November 2004

Serial Number	Series Capacitance (pF)	Series Resistance, Ohms
A6578	105	11.9
A6579	105	11.4
A6580	105	11.6
A6581	106	10.8
A6582	105	11.8
A6584	108	10.9
A6585	106	11.3
A6590	105	11.5
A6591	105	11.7
A6592	105	11.6
A6594	107	10.6
A6595	106	11.3
A6596	105	11.4
A6598	107	10.9
A6603	107	10.6
A6604	106	11.5
A6605	107	10.7
A6606	105	11.9
A6607	106	11.1
Average	105.8421053	11.28947368
Std. Dev.	0.932633955	0.420394222

3 C30642 Diodes from LHO 10 December 2004

Serial Number	Series Capacitance (pF)	Series Resistance, Ohms
A6721	125.7	14.4
A6722	111.7	12.1
A6723	125.5	14.3
A6725	106.8	12.4
A6714	130.6	13.2
A6713	125.8	13.8
A6712	105.3	11.8
A6711	105.6	11.8
A6719	107	11.1
Average	116	12.76666667
Std. Dev	10.00177762	1.130388331

4 C30642 Diodes from CIT measured in January 2003

Serial Number	Series Capacitance (pF)	Series Resistance, Ohms
Cut off	137	7.6
Cut off	138	7.4
Cut off	69	15.4
Cut off	138	7.5
Cut off	138	7.6
Cut off	138	7.4
Cut off	137	7.3
A5890	139	7.5
A5898	139	9.1
A2486	95	11.6
A5897	139	7.4
Cut off	136	8.8
A5910	138	7.6
A5947	137	7.4
Average	129.8571429	8.542857143
Std. Dev	20.16311039	2.209626434

5 Diodes from the Wilson House shop measured 5 January 2005

Serial Number	Series Capacitance (pF)	Series Resistance, Ohms
A5437	115	12.7
A5414	118	13.2
A5434	118	12.8
A5412	118	12.5
A5446	118	13.1
A5423	117	13
A5395	117	13.3
A5427	117	13.1
A5418	118	12.7
A5464	115	13.3
A6378	127.8	9.8
A6379	133.7	9.6
A6380	133.7	8.5
A6381	128.7	9.9
A6366	127.7	10
A6367	128.6	9.8
A6368	136	9.5
A6369	132.7	9.3
A6354	131.9	9.3
A6355	133.2	9.7
A6356	131.3	7.4
A6357	131.3	7.8
Average	124.8909091	10.92272727
Std. Dev	7.399072982	1.972523031

6 Diodes from LLO 12 August 2005

Serial Number	Series Capacitance (pF)	Series Resistance, Ohms
A6717	125	13.5
A6726	104.8	12.3
A6732	104.5	12.5
A6733	105.4	12.5
A6737	104.7	11.9
A6330	127.8	8.9
A6328	128.6	8.9
A6370	133	9.7

7 Batch of 40 Diodes received 10 October 2005

Serial Number	Capacitance (pF)	Series Resistance (Ohms)	Leakage Current (nA) @ 7V bias
A6835	94.6	7.65	<10nA
A6836	94.3	6.94	<10nA
A6837	94.4	6.99	<10nA
A6838	94.3	7.39	260
A6839	94.4	7.37	40
A6840	94.5	7.57	<10nA
A6841	93.3	7.28	<10nA
A6843	94.4	7.68	<10nA
A6844	93.9	7.3	<10nA
A6848	94.5	7.17	940
A6849	94.7	7.34	<10nA
A6850	94.5	7.25	<10nA
A6851	94.2	7	<10nA
A6852	94.5	7.05	<10nA
A6854	94.7	7.72	590
A6856	93.7	7.27	60
A6857	93.3	6.91	<10nA
A6890	94.1	7.6	<10nA
A6891	94.1	7.5	<10nA
A6892	94.2	7.55	<10nA
A6893	93.8	7.38	<10nA

A6895	93.9	7.48	<10nA
A6896	93.9	7.52	<10nA
A6897	94	7.53	<10nA
A6898	93.3	7.36	<10nA
A6899	93.2	7.5	10nA
A6900	94.2	7.46	<10nA
A6901	94,5	7.47	<10nA
A6902	94	7.67	<10nA
A6903	94.1	7.57	<10nA
A6904	94.1	7.54	<10nA
A6905	91.9	7.38	<10nA
A6906	94.1	7.45	<10nA
A6908	93.7	7.35	<10nA
A6909	93	7.48	<10nA
A6910	93.9	7.42	<10nA
A6911	93.3	7.45	<10nA
A6913	94	7.55	<10nA
A6914	94.2	7.54	<10nA
A6915	93	7.36	<10nA
Average	93.95	7.40	
Standard Deviation	0.57	0.20	

8 GAP2000 Diodes measured in January 2003. Units have no serial numbers

Capacitance	Resistance
193	9.5
211	8.8
209	9.1
202	8.9
205	8.9
200	9
200	8.6
191	8.4
197	8.5
201	8.9

215	8.7
192	8.4
192	8.5
197	8.5
201	8.9
191	8.5
195	8.4
192	8.2
189	8.3
189	8.3
195	8.5
196	8.5
191	8.4
199	8.5
197	8.7
197	8.5
202	8.7
190	8.4
189	8.3
192	8.4
201	8.6
211	8.9
197	8.5
200	8.9
192	8.5
206	8.7
199	8.9
215	8.7
214	8.6
198	8.8
196	8.8
191	8.6
195	8.7
213	9.2
200	9.3

