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Test Results for C30642 LSC Diode Elements

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## 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
<b>Average</b>	105.8421053	11.28947368
<b>Std. Dev.</b>	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
<b>Average</b>	116	12.76666667
<b>Std. Dev</b>	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
<b>Average</b>	129.8571429	8.542857143
<b>Std. Dev</b>	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
<b>Average</b>	124.8909091	10.92272727
<b>Std. Dev</b>	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	Series Capacitance (pF)	Series Resistance, Ohms	Dark Leakage Current (nA) 7V Bias
A6835			<10nA
A6836			<10nA
A6837			<10nA
A6838			260nA
A6839			40nA
A6840			<10nA
A6841			<10nA
A6843			<10nA
A6844			<10nA
A6848			940nA
A6849			<10nA
A6850			<10nA
A6851			<10nA
A6851			<10nA
A6852			<10nA
A6854			590nA
A6856			60nA
A6890			<10nA
A6891			<10nA
A6892			<10nA
A6893			<10nA

A6895	<10nA
A6896	<10nA
A6897	<10nA
A6898	<10nA
A6899	10nA
A6900	<10nA
A6901	<10nA
A6902	<10nA
A6903	<10nA
A6904	<10nA
A6905	<10nA
A6906	<10nA
A6908	<10nA
A6909	<10nA
A6910	<10nA
A6911	<10nA
A6913	<10nA
A6914	<10nA
A6915	<10nA

## 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
213	9.1

Serial Number	Measured Voltage (mV)	Calculated Current (nA)
6838	96	1056
2039	25	275
2293	7.5	83
2041	1003	11034
2044	4	44
2047	110	1210
2045	232	2552
2042	2	22
2046	2	22
6508	0.6	7
6482	0.7	8
6658	1.2	13
6511	0.9	10
6484	0.7	8
6660	1.1	12
6656	0.8	9
6509	0.9	10
6657	1.2	13
6652	1.1	12
6510	1	11
6533	0.8	9
6530	0.8	9
6655	1	11
6534	0.9	10
6106	1.5	17
6126	1	11
6141	7.1	78
6107	1.4	15
6094	1.5	17
6125	180	1980
6083	3	33
6081	1	11
6093	2.5	28

The results in the table above were taken in December 2012. The sense resistor was  $9.09 \times 10^4$  ohms. See page 53 of my notebook #4 for details.



