

LeCroy Digital Storage Oscilloscope

Performance Certificate

LC684D Manual Performance Test Procedure Version B – Feb. 2007

Model_____ Serial Number_____ Customer_____

Software Version_____

Inspection Date_____ Next Due_____

Temperature_____ Humidity____%

Tested By_____ Report Number_____

Place of Inspection_____

Condition found_____ Condition Left_____

Approved By_____

Test Equipment Used

Instrument	Model	S/N	Cal Due Date
Signal Generator Radio Frequency	_____	_____	_____
Signal Generator Audio Frequency	_____	_____	_____
Voltage Generator DC Power Supply	_____	_____	_____
Step Generator Fast Pulser	_____	_____	_____
Digital Multimeter Voltmeter, Ohmmeter	_____	_____	_____

Traceable to_____

Table 1: LC684D Test Report

LC684D Test Record

Coupling	Volts/div.	Measured Channel 1 Impedance Ω , M Ω	Measured Channel 2 Impedance Ω , M Ω	Measured Channel 3 Impedance Ω , M Ω	Measured Channel 4 Impedance Ω , M Ω	Measured External Impedance Ω , M Ω	Measured External/5 Impedance Ω , M Ω	Lower Limit Ω , M Ω	Upper Limit Ω , M Ω
DC 1M Ω	50 mV/div					N/A	N/A	0.99 M Ω	1.01 M Ω
DC 1M Ω	50 mV/div	N/A	N/A	N/A	N/A			0.98 M Ω	1.02 M Ω
DC 1M Ω	200 mV/div					N/A	N/A	0.99 M Ω	1.01 M Ω
AC 1M Ω	50 mV/div					N/A	N/A	1.006 M Ω	1.047 M Ω
AC 1M Ω	200 mV/div					N/A	N/A	0.98 M Ω	1.02 M Ω
DC 50 Ω	50 mV/div					N/A	N/A	49.375 Ω	50.625 Ω
DC 50 Ω	200 mV/div					N/A	N/A	49.375 Ω	50.625 Ω
DC 50 Ω	50 mV/div	N/A	N/A	N/A	N/A			48.5 Ω	51.5 Ω
Grounded	50 mV/div					N/A	N/A	0.98 M Ω	1.02 M Ω

Table 2: Impedance Test Record

Coupling	Volts/div.	Measured Channel 1 Leakage mV	Measured Channel 2 Leakage mV	Measured Channel 3 Leakage mV	Measured Channel 4 Leakage mV	Measured External Leakage mV	Lower Limit mV	Upper Limit mV
DC 1M Ω	50 mV/div					N/A	-1	+1
DC 1M Ω	200 mV/div					N/A	-1	+1
DC 50 Ω	50 mV/div					N/A	-1	+1
DC 50 Ω	200 mV/div					N/A	-1	+1
DC 50 Ω	50 mV/div	N/A	N/A	N/A	N/A		-1	+1
DC 1M Ω	50 mV/div	N/A	N/A	N/A	N/A		-2	+2

Table 3: Leakage Voltage Test Record



LC684D Test Record

Coupling	Time/Div.	Measured Pkpk Channel 1 mV	Measured Pkpk Channel 2 mV	Measured Pkpk Channel 3 mV	Measured Pkpk Channel 4 mV	Limits mV
DC 1M Ω	20 ms					7.2
DC 1M Ω	1 ms					7.2
AC 1M Ω	2 μ s					7.2
DC 50 Ω	2 μ s					7.2
DC 50 Ω	20 μ s					7.2
DC 50 Ω : 2 Channel Mode	1 μ s	disabled			disabled	7.2
DC 50 Ω : 1 Channel Mode	0.5 μ s	disabled	* see note	disabled	disabled	7.2

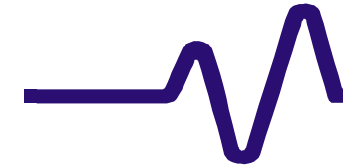
Table 4: Peak to Peak Noise Test Record

Coupling	Time/Div.	Measured sdev Channel 1 mV	Measured sdev Channel 2 mV	Measured sdev Channel 3 mV	Measured sdev Channel 4 mV	Limits mV
DC 1M Ω	20 ms					0.72
DC 1M Ω	1 ms					0.72
AC 1M Ω	2 μ s					0.72
DC 50 Ω	2 μ s					0.72
DC 50 Ω	20 μ s					0.72
DC 50 Ω : 2 Channel Mode	1 μ s	disabled			disabled	0.72
DC 50 Ω : 1 Channel Mode	0.5 μ s	disabled	* see note	disabled	disabled	0.72

Table 5: RMS Noise Test Record

- **Note: Divide measured value by 2, due to PP096 channel combining**

LC684D Test Record



Coupling	Volts/div.	Measured Channel 1 Mean (A) mV	Measured Channel 2 Mean (B) mV	Measured Channel 3 Mean (C) mV	Measured Channel 4 Mean (D) mV	Lower Limit mV	Upper Limit mV
DC 1M Ω	2 mV					-0.8	+0.8
DC 1M Ω	5 mV					-2	+2
DC 1M Ω	10 mV					-1.6	+1.6
DC 1M Ω	20 mV					-3.2	+3.2
DC 1M Ω	50 mV					-8	+8
DC 1M Ω	.1 V					-16	+16
DC 1M Ω	1 V					-160	+160

Table 6: DC 1M Ω Ground Line Test Record

Coupling	Volts/div.	Measured Channel 1 Mean (A) mV	Measured Channel 2 Mean (B) mV	Measured Channel 3 Mean (C) mV	Measured Channel 4 Mean (D) mV	Lower Limit mV	Upper Limit mV
DC 50 Ω	2 mV					-0.8	+0.8
DC 50 Ω	5 mV					-2	+2
DC 50 Ω	10 mV					-1.6	+1.6
DC 50 Ω	20 mV					-3.2	+3.2
DC 50 Ω	50 mV					-8	+8
DC 50 Ω	.1 V					-16	+16
DC 50 Ω	1 V					-160	+160
DC 50 Ω : 2 Channel Mode	.2 V	disabled			disabled	-48	+48
DC 50 Ω : 1 Channel Mode	.2 V	disabled	* see note	disabled	disabled	-64	+64

Table 7: DC 50 Ω Ground Line Test Record

- **Note:** Divide measured value by 2, due to PP096 channel combining



LC684D Test Record

Erroneous Read / Write Test is no longer required.

Volts /div.	Attenuator	P S Output	Measured Channel 1 V & mV			Measured Channel 2 V & mV			Measured Channel 3 V & mV			Measured Channel 4 V & mV			Limits mV
			DMM 1	Mean (A)	Δ 1 Mean-DMM	DMM 2	Mean (B)	Δ 2 Mean-DMM	DMM 3	Mean (C)	Δ 3 Mean-DMM	DMM 4	Mean (D)	Δ 4 Mean-DMM	
2 mV	X 100	+0.6 V													± 0.8
5 mV	X 100	+1.5 V													± 1.2
10 mV	X 100	+3.0 V													± 1.6
20 mV	X 100	+6.0 V													± 3.2
50 mV	X 10	+1.5V													± 8
.1 V	X 10	+3.0 V													± 16
1 V	X 1	+3.0 V													± 160

Table 9: DC 50 Ω , Positive DC Accuracy Test Record



LC684D Test Record

Volts /div.	Attenuator	P S Output	Measured Channel 1 V & mV			Measured Channel 2 V & mV			Measured Channel 3 V & mV			Measured Channel 4 V & mV			Limits
			DMM 1	Mean (A)	Δ 1 Mean-DMM	DMM 2	Mean (B)	Δ 2 Mean-DMM	DMM 3	Mean (C)	Δ 3 Mean-DMM	DMM 4	Mean (D)	Δ 4 Mean-DMM	
															mV
5 mV	X 100	+1.5 V													± 1.2
.1 V	X 10	+3.0 V													± 16
5 V	X 1	+15.0 V													± 800

Table 10: DC 1M Ω , Positive DC Accuracy Test Record

Volts /div.	Attenuator	P S Output	Measured Channel 1 V & mV			Measured Channel 2 V & mV			Measured Channel 3 V & mV			Measured Channel 4 V & mV			Limits
			DMM 1	Mean (A)	Δ 1 Mean-DMM	DMM 2	Mean (B)	Δ 2 Mean-DMM	DMM 3	Mean (C)	Δ 3 Mean-DMM	DMM 4	Mean (D)	Δ 4 Mean-DMM	
															mV
2 mV	X 100	-0.6 V													± 0.8
5 mV	X 100	-1.5 V													± 1.2
10 mV	X 100	-3.0 V													± 1.6
20 mV	X 100	-6.0 V													± 3.2
50 mV	X 10	-1.5V													± 8
.1 V	X 10	-3.0 V													± 16
1 V	X 1	-3.0 V													± 160

Table 11: DC 50 Ω , Negative DC Accuracy Test Record



LC684D Test Record

Volts /div.	Attenuator	P S Output	Measured Channel 1 V & mV			Measured Channel 2 V & mV			Measured Channel 3 V & mV			Measured Channel 4 V & mV			Limits
			DMM 1	Mean (A)	Δ 1 Mean-DMM	DMM 2	Mean (B)	Δ 2 Mean-DMM	DMM 3	Mean (C)	Δ 3 Mean-DMM	DMM 4	Mean (D)	Δ 4 Mean-DMM	
5 mV	X 100	-1.5 V													mV
.1 V	X 10	-3.0 V													± 1.2
5 V	X 1	-15.0 V													± 16
															± 800

Table 12: DC 1M Ω , Negative DC Accuracy Test Record

Volt /div.	Coupling DC	DSO offset	P S output	Measured Channel 1 V & mV			Measured Channel 2 V & mV			Measured Channel 3 V & mV			Measured Channel 4 V & mV			Limits
				DMM 1	Mean (A)	Δ 1 Mean-DMM	DMM 2	Mean (B)	Δ 2 Mean-DMM	DMM 3	Mean (C)	Δ 3 Mean-DMM	DMM 4	Mean (D)	Δ 4 Mean-DMM	
2mV	50 Ω	+0.4 V	-0.4 V													± 4.8
5mV	50 Ω	+1 V	-1 V													± 11.2
5mV	1 M Ω	+1 V	-1 V													± 11.2

Table 13: Positive Offset Test Record

LC684D Test Record



Volt /div.	Coupling DC	DSO offset	P S output	Measured Channel 1 V & mV			Measured Channel 2 V & mV			Measured Channel 3 V & mV			Measured Channel 4 V & mV			Limits mV
				DMM 1	Mean (A)	Δ 1 Mean-DMM	DMM 2	Mean (B)	Δ 2 Mean-DMM	DMM 3	Mean (C)	Δ 3 Mean-DMM	DMM 4	Mean (D)	Δ 4 Mean-DMM	
2mV	50 Ω	-0.4 V	+0.4 V													±4.8
5mV	50 Ω	-1 V	+1 V													±11.2
5mV	1 MΩ	-1 V	+1 V													±11.2

Table 14: Negative Offset Test Record

Frequency	Measured Power	Generator Amplitude	Measured Channel 1		Measured Channel 2		Measured Channel 3		Measured Channel 4		Lower Limit	Upper Limit
MHz	mW	mV	Sdev(1) mV	Ratio(1) to 0.3	Sdev(2) mV	Ratio(2) to 0.3	Sdev(3) mV	Ratio(3) to 0.3	Sdev(4) mV	Ratio(4) to 0.3		
0.300	0.200			N/A		N/A		N/A		N/A	N/A	N/A
1.1	0.200										0.9	1.1
30.1	0.200										0.9	1.1
300.1	0.200										0.87	1.13
700.1	0.200										0.81	1.19
1000.1	0.200										0.70	1.34
1500.1	0.200										0.70	N/A

Table 15: DC 50Ω, 50 mV/div. Bandwidth Test Record

LC684D Test Record

Frequency	Measured Power	Generator Amplitude	Measured Channel 1		Measured Channel 2		Measured Channel 3		Measured Channel 4		Lower Limit	Upper Limit
			Sdev(1) mV	Ratio(1) to 0.3	Sdev(2) mV	Ratio(2) to 0.3	Sdev(3) mV	Ratio(3) to 0.3	Sdev(4) mV	Ratio(4) to 0.3		
MHz	mW	mV										
0.300	0.800			N/A		N/A		N/A		N/A	N/A	N/A
1.1	0.800										0.9	1.1
30.1	0.800										0.9	1.1
300.1	0.800										0.87	1.13
700.1	0.800										0.81	1.19
1000.1	0.800										0.70	1.34
1500.1	0.800										0.70	N/A

Table 16: DC 50Ω, 100 mV/div. Bandwidth Test Record

Global BWL	Amplitude at 300 kHz	Measured Channel 1		Measured Channel 2		Measured Channel 3		Measured Channel 4		Lower Limit	Upper Limit
		Sdev(1) mV	Freq(1) MHz	Sdev(2) mV	Freq(2) MHz	Sdev(3) mV	Freq(3) MHz	Sdev(4) mV	Freq(4) MHz		
MHz	Sdev mV	Sdev(1) mV	Freq(1) MHz	Sdev(2) mV	Freq(2) MHz	Sdev(3) mV	Freq(3) MHz	Sdev(4) mV	Freq(4) MHz	MHz	MHz
25	200	140		140		140		140		10	37
200	200	140		140		140		140		110	290

Table 17: DC 50Ω, Bandwidth Limiter Test Record



LC684D Test Record

Frequency	Measured Channel 1		Measured Channel 2		Measured Channel 3		Measured Channel 4		Lower Limit
	MHz	Sdev(1) mV	Ratio(1) to 0.3	Sdev(2) mV	Ratio(2) to 0.3	Sdev(3) mV	Ratio(3) to 0.3	Sdev(4) mV	
0.300	200	N/A	200	N/A	200	N/A	200	N/A	N/A
500.1									0.7

The 1 Meg. Ohm BW test may be omitted if the proper 4962-10 is not available.
An adjusted passive probe may be substituted.

Table 18: DC 1MΩ, 100 mV/div. Bandwidth Test Record

Trigger Level	Trigger Slope	Channel 1	Channel 2	Channel 3	Channel 4	Lower Limit	Upper Limit
mV		Measured DC Trigger Level (1) mV	Measured DC Trigger Level (2) mV	Measured DC Trigger Level (3) mV	Measured DC Trigger Level (4) mV	mV	mV
0	Pos					-30	+30
0	Neg					-30	+30
+300	Pos					+250	+350
+300	Neg					+250	+350
-300	Pos					-250	-350
-300	Neg					-250	-350

Table 19: Channel DC Trigger Test Record



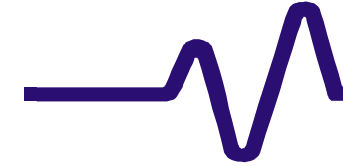
LC684D Test Record

This table has been omitted, the HFREJ test is no longer required

Table 20: Channel HFREJ Trigger Test Record

Trigger Slope	External Trigger Level	External DC	External HFREJ	External Limits		External/5 Trigger Level	External/5 DC	External/5 HFREJ	External/5 Limits	
				Lower	Upper				Lower	Upper
	mV	Measured DC Trigger Level (Ext) mV	Measured HFREJ Trigger Level (Ext) mV	mV	mV	V	Measured DC Trigger Level (Ext5) V	Measured HFREJ Trigger Level (Ext5) V	V	V
Pos	0			-50	+50	0			-0.25	+0.25
Neg	0			-50	+50	0			-0.25	+0.25
Pos	+300			+245	+355	+3			+1.7	+4.3
Neg	+300			+245	+355	+3			+1.7	+4.3
Pos	-300			-245	-355	-3			-1.7	-4.3
Neg	-300			-245	-355	-3			-1.7	-4.3

Table 21: External & Ext/5 DC Trigger Test Record
The HFREJ test is no longer required



Smart Trigger Pulse Width ns	Generator Frequency MHz	Width <	Width >	Triggered	Pass
< 10	100	On	Off	Yes	
< 10	100	Off	On	No	
> 10	40	Off	On	Yes	
> 10	40	On	Off	No	
< 100	10	On	Off	Yes	
< 100	10	Off	On	No	
> 100	4	Off	On	Yes	
> 100	4	On	Off	No	

Table 22: Smart Trigger Test Record

Generator Frequency MHz	Post Trigger Delay msec	Delay (A) ns	Delay (1) msec	Difference delay(A) - delay(1)+5msec	Lower Limit μsec	Upper Limit μsec
1.00000	5.00000				-0.5	+0.5

Table 23: Time Base Test Record

Rise time and Overshoot Test is no longer required.