



LeCroy Digital Storage Oscilloscope

Performance Certificate

WaveSurfer 400 Manual Performance Test Procedure Version D – Sept 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	_____	_____	_____
Digital Multimeter	_____	_____	_____
Power Meter	_____	_____	_____
Power Senser	_____	_____	_____

Traceable to_____

Table 1: WaveSurfer Test Report

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WaveSurfer 400 Series Test Record

Coupling	Volts/div.	Measured Channel 1 Impedance Ω , $M\Omega$	Measured Channel 2 Impedance Ω , $M\Omega$	Measured Channel 3 Impedance Ω , $M\Omega$	Measured Channel 4 Impedance Ω , $M\Omega$	Measured External Impedance Ω , $M\Omega$	Lower Limit Ω , $M\Omega$	Upper Limit Ω , $M\Omega$
DC $1M\Omega$	20 mV/div						0.990 $M\Omega$	1.010 $M\Omega$
DC $1M\Omega$	200 mV/div						0.990 $M\Omega$	1.010 $M\Omega$
DC $1M\Omega$	2 V/div						0.990 $M\Omega$	1.010 $M\Omega$
AC $1M\Omega$	20 mV/div						1.188 $M\Omega$	1.212 $M\Omega$
DC 50Ω	20 mV/div						49.5 Ω	50.5 Ω
DC 50Ω	200 mV/div						49.5 Ω	50.5 Ω
DC 50Ω	2 V/div						49.5 Ω	50.5 Ω
Ext DC 50Ω							49.5 Ω	50.5 Ω
Ext/10 DC 50Ω							49.5 Ω	50.5 Ω
Ext DC $1M\Omega$							0.990 $M\Omega$	1.010 $M\Omega$
Ext/10 DC $1M\Omega$							0.990 $M\Omega$	1.010 $M\Omega$

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 $1M\Omega$	20 mV/div						-1	+1
DC $1M\Omega$	200 mV/div						-1	+1
DC $1M\Omega$	2 V/div						-1	+1
DC 50Ω	20 mV/div						-0.5	+0.5
DC 50Ω	200 mV/div						-0.5	+0.5
DC 50Ω	2 V/div						-0.5	+0.5
Ext DC 50Ω							-0.5	+0.5
Ext/10 DC 50Ω							-0.5	+0.5
Ext DC $1M\Omega$							-1	+1
Ext/10 DC $1M\Omega$							-1	+1

Table 3: Leakage Voltage Test Record



WaveSurfer 400 Series Test Record

Coupling	V/Div.	Measured pkpk - mean Channel 1 mV	Measured pkpk - mean Channel 2 mV	Measured pkpk - mean Channel 3 mV	Measured pkpk - mean Channel 4 mV	Limits pk-pk mV
DC 1M Ω	2 mV					1.6
DC 1M Ω	10 mV					3.8

Table 4: Peak to Peak Noise Test Record
(Record the mean value)



WaveSurfer 400 Series Test Record

Volts /div.	P S	Cpl	Measured Channel 1 V & mV			Measured Channel 2 V & mV			Measured Channel 3 V & mV			Measured Channel 4 V & mV			Limits
	V		DMM 1	Mean (A)	$\Delta 1$ Mean-DMM	DMM 2	Mean (B)	$\Delta 2$ Mean-DMM	DMM 3	Mean (C)	$\Delta 3$ Mean-DMM	DMM 4	Mean (D)	$\Delta 4$ Mean-DMM	mV
2 mV	+6m	50 Ω													± 1.25
5 mV	+15m	50 Ω													± 1.625
10 mV	+30m	50 Ω													± 2.25
.1 V	+0.3	50 Ω													± 13.5
1 V	+3.0	50 Ω													± 126
2 V	+6.0	1M Ω													± 251

Table 5: Positive DC Accuracy Test Record

Volts /div.	P S	Cpl	Measured Channel 1 V & mV			Measured Channel 2 V & mV			Measured Channel 3 V & mV			Measured Channel 4 V & mV			Limits
	V		DMM 1	Mean (A)	$\Delta 1$ Mean-DMM	DMM 2	Mean (B)	$\Delta 2$ Mean-DMM	DMM 3	Mean (C)	$\Delta 3$ Mean-DMM	DMM 4	Mean (D)	$\Delta 4$ Mean-DMM	mV
2 mV	-6m	50 Ω													± 1.25
5 mV	-15m	50 Ω													± 1.625
10 mV	-30m	50 Ω													± 2.25
.1 V	-0.3	50 Ω													± 13.5
1 V	-3.0	50 Ω													± 126
2 V	-6.0	1M Ω													± 251

Table 6: Negative DC Accuracy Test Record



WaveSurfer 400 Series Test Record

Volt /div.	Coupling DC	DSO Offset V	P S Output V	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
50mV	50 Ω	+ .750	- .750													± 10.5

Table 7: Positive 50 Ω Offset Test Record

Volt /div.	Coupling DC	DSO Offset V	P S Output V	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
50mV	50 Ω	+ .750	- .750													± 10.5

Table 8: Negative 50 Ω Offset Test Record



WaveSurfer 400 Series Test Record

Frequency	Measured Power	Generator Amplitude	Measured Channel 1		Measured Channel 2		Measured Channel 3		Measured Channel 4		Lower Limit
MHz	μ W	mV	pk-pk(1) mV	Ratio(1) to 10	pk-pk (2) mV	Ratio(2) to 10	pk-pk(3) mV	Ratio(3) to 10	pk-pk(4) mV	Ratio(4) to 10	
10	8.0			N/A		N/A		N/A		N/A	N/A
200.1 (WS 42X)	8.0										0.707
350.1 (WS 43X)	8.0										0.707
500.1 (WS 45X)	8.0										0.707

Table 9: DC 50 Ω , 10 mV/div. Bandwidth Test Record

Frequency	Measured Power	Generator Amplitude	Measured Channel 1		Measured Channel 2		Measured Channel 3		Measured Channel 4		Lower Limit
MHz	mW	mV	pk-pk(1) mV	Ratio(1) to 10	pk-pk(2) mV	Ratio(2) to 10	pk-pk(3) mV	Ratio(3) to 10	pk-pk(4) mV	Ratio(4) to 10	
10	0.4			N/A		N/A		N/A		N/A	N/A
200.1 (WS 42X)	0.4										0.707
350.1 (WS 43X)	0.4										0.707
500.1 (WS 45X)	0.4										0.707

Table 10: DC 50 Ω , 50 mV/div. Bandwidth Test Record



WaveSurfer 400 Series Test Record

Frequency	Measured Power	Generator Amplitude	Measured Channel 1		Measured Channel 2		Measured Channel 3		Measured Channel 4		Lower Limit
MHz	mW	mV	pk-pk(1) mV	Ratio(1)) to 10	pk-pk(2) mV	Ratio(2) to 10	pk-pk(3) mV	Ratio(3) to 10	pk-pk(4) mV	Ratio(4) to 10	
10	0.8			N/A		N/A		N/A		N/A	N/A
200.1 (WS 42X)	0.8										0.707
350.1 (WS 43X)	0.8										0.707
500.1 (WS 45X)	0.8										0.707

Table 11: DC 50Ω, 100 mV/div. Bandwidth Test Record

Frequency	Measured Power	Generator Amplitude	Measured Channel 1		Measured Channel 2		Measured Channel 3		Measured Channel 4		Lower Limit
MHz	mW	mV	pk-pk(1) mV	Ratio(1)) to 10	pk-pk(2) mV	Ratio(2) to 10	pk-pk(3) mV	Ratio(3) to 10	pk-pk(4) mV	Ratio(4) to 10	
10	20.0			N/A		N/A		N/A		N/A	N/A
200.1 (WS 42X)	20.0										0.707
350.1 (WS 43X)	20.0										0.707
500.1 (WS 45X)	20.0										0.707

Table 12: DC 50Ω, 500 mV/div. Bandwidth Test Record



Trigger Level	Trigger Slope	Channel 1	Channel 2	Channel 3	Channel 4	Lower Limit	Upper Limit
		Measured DC Trigger Level (1)	Measured DC Trigger Level (2)	Measured DC Trigger Level (3)	Measured DC Trigger Level (4)		
mV		mV	mV	mV	mV	mV	mV
0	Pos					-27.5	+27.5
0	Neg					-27.5	+27.5
+250	Pos					+222.5	+277.5
+250	Neg					+222.5	+277.5
-250	Pos					-277.5	-222.5
-250	Neg					-277.5	-222.5

Table 13: Channel DC Trigger Test Record

Generator Frequency MHz	Freq. (Hz)	Lower Limit	Upper Limit
10.0		-100	+100

Table 14: Time Base Test Record



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