



CERTIFICATE OF CALIBRATION

CERTIFICATE NUMBER	200804-041
CALIBRATION FOR	MEASURETEST CC PO BOX 26829 MONUMENT PARK, 0105 SOUTH AFRICA
CALIBRATION OF	WAVERUNNER OSCILLOSCOPE
MANUFACTURER	LeCROY
MODEL NUMBER	LT 322
SERIAL NUMBER	00872
CALIBRATED BY	G.D. SCHUSTER
DATE OF CALIBRATION	18 APRIL 2008

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Calibrations performed by this laboratory are in terms of standards, the accuracies of which are traceable either to the National Measuring Standards as maintained by the National Metrology Institute of South Africa (NMISA) or to International Measuring Standards via the European Co-operation for Accreditation (EA) signatory countries.

The measurement results recorded in this certificate were correct at the time of calibration. The subsequent accuracy will depend on factors such as care, handling and frequency of use. It is recommended that recalibration be undertaken at an interval that will ensure that the instrument remains within the desired limits.

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**G.D. SCHUSTER (TECHNICAL SIGNATORY)
METROLOGIST**

**18-Apr-2008
DATE OF ISSUE**

1. PROCEDURE

The calibration of this unit was based on a generic procedure for Digital Oscilloscopes.

2. RESULTS

2.1 DC VOLTAGE ACCURACY

UUT RANGE (V / DIV)	UUT OFFSET (V)	INPUT VOLTAGE (V)	MEASURED VOLTAGE	
			CHANNEL 1 (V)	CHANNEL 2 (V)
10	-30	60,0	59,9	59,9
5	-15	30,0	30,0	30,0
2	-6	12,00	11,99	12,03
1	-3	6,00	5,99	6,02
500 m	-1,5	3,00	3,00	3,00
200 m	-600 m	1,200	1,199	1,203
100 m	-300 m	600 m	599 m	602 m
50 m	-150 m	300 m	300 m	301 m
20 m	-60 m	120,0 m	119,9 m	120,3 m
10 m	-30 m	60,0 m	59,9 m	60,2 m
5 m	-15 m	30,0 m	30,0 m	30,0 m
2 m	-6 m	12,00 m	11,99 m	11,99 m

Uncertainty of Measurement: $\pm 1 \text{ in } 10^3 + 0,05 \text{ mV}$

2.2 OFFSET ACCURACY

UUT RANGE (V / DIV)	UUT OFFSET (V)	INPUT VOLTAGE (V)	MEASURED OFFSET	
			CHANNEL 1 (Vmean)	CHANNEL 2 (Vmean)
2	-100	100,0	100,1	100,2
1	-50	50,00	50,03	50,08
100 m	-10	10,00	10,01	10,01
10 m	-1	1,000	1,001	1,001
2 m	-100 m	100,0 m	100,0	100,2 m
2 m	100 m	-100,0 m	-100,1 m	-100,3 m
10 m	1	-1,000	-1,000	-1,000
100 m	10	-10,00	-10,00	-10,01
1	50	-50,00	-50,03	-50,05
2	100	-100,0	-100,1	-100,2

Uncertainty of Measurement: $\pm 1 \text{ in } 10^3$


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2.3 INPUT RESISTANCE

UUT INPUT IMPEDANCE (Ω)	MEASURED RESISTANCE	
	CHANNEL 1 (Ω)	CHANNEL 2 (Ω)
1 M	1,000 M	1,000 M
50	50,44	49,94

Uncertainty of Measurement: ± 1 in 10^3

2.4 BANDWIDTH (At 100 mV/div)

UUT CHANNEL	NOMINAL FREQUENCY (MHz)	MEASURED AMPLITUDE (dB)
1	500	-2,1
2	500	-2,3

Uncertainty of Measurement: $\pm 0,4$ dB

2.5 TIME ACCURACY

PARAMETER	INPUT	UUT READING
Frequency	10 kHz	9,999 kHz
Period	100 μ s	100,01 μ s
Frequency	1 MHz	1,000 0 MHz
Period	1 μ s	1,000 0 μ s
Frequency	100 MHz	100,03 MHz
Period	10 ns	10,0 ns

Uncertainty of Measurement: ± 1 in $10^4 + 0,2$ ns

2.6 CALIBRATOR OUTPUT ACCURACY

MEASURED VOLTAGE (V _{pp})	MEASURED FREQUENCY (kHz)
0,998	1,000 0

Uncertainty of Measurement: ± 2 mV for Voltage
 ± 1 in 10^4 for Frequency



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3. REMARKS

- 3.1** External triggering was functionally tested and found satisfactory.
- 3.2** A calibration label has been affixed to the instrument bearing certificate number, cal date, due date (if requested by customer) and serial number.
- 3.3** The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor $k=2$ providing a level of confidence of approximately 95 %. The uncertainty of measurement has been estimated in accordance with the principles defined in the GUM, Guide to Uncertainty of Measurement, ISO, Geneva, 1993.
- 3.4** The environmental conditions were: Temperature : $(23 \pm 2) ^\circ\text{C}$
Relative Humidity : $(50 \pm 15) \%$

End of Certificate



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