

Calibration Certificate

Report No:9847:20131125085315

Manufacturer: Keithley Instruments
Model Number: 2002
Serial Number: 0840404
ID Number: 9847

Calibration Date: 25 November 2013
Temperature: 23.2 °C
Relative Humidity: 37.9 %
Procedure: QA-7009C.6

Condition as Received / Returned: **IN TOLERANCE**

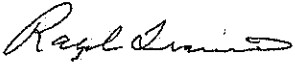
Customer Information: **TEKTRONIX INC TAIWAN**

- Keithley Instruments, a Tektronix Company, certifies that the above instrument meets or exceeds all specifications as stated in the referenced procedure (unless otherwise noted). This instrument has been calibrated using measurement standards traceable to the International System of Units (SI) through the National Institute of Standards and Technology (NIST), or other National Metrology Institutes (such as NPL, PTB, etc.), and meets the requirements of ISO/IEC 17025:2005 and ANSI/NCSL Z540.3-2006.
- The quality system is registered to ISO 9001.
- This calibration is a direct comparison of the unit under test to the listed reference standards and did not involve any sampling plans to complete. No allowance has been made for the instability of the test device due to use, time, etc. Such allowances would be made by the customer as needed.
- The uncertainties were computed in accordance with the ISO Guide to the Expression of Uncertainty in Measurement (GUM). A coverage factor of approximately 2 sigma ($k=2$) has been applied to the standard uncertainty to express the expanded uncertainty at approximately 95% confidence level.
- This calibration certificate shall not be reproduced except in full without the written approval of Keithley Instruments.
- Testpoints marked with a preceding " * " are not accredited to ISO/IEC 17025:2005 or ANSI/NCSL Z540.3-2006
- Testpoints marked with a preceding " # " are not accredited to ANSI/NCSL Z540.3-2006
- No adjustments were made to the unit under test during this calibration event.

Calibration Facility

Keithley Primary Standards Laboratory
28775 Aurora Road
Cleveland, Ohio 44139 USA
440-248-0400

Technician: 1515

Approved By: 
Ralph Travise
Keithley Test Engineering
and Metrology Manager

Certificate Issue Date: 25-Nov-2013

Measurement Report - As-Received / As-Returned

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Standards Used

<u>Control Number</u>	<u>Description</u>	<u>Due Date</u>
7753	Fluke 910R GPS Controlled Frequency Standard	07-Dec-2013
7757	Fluke 5725A Amplifier	03-Feb-2014
8230	Fluke 5720A Multifunction Calibrator	08-Dec-2013
8265	Agilent Technologies 33250A Function/Arbitrary Waveform Gen	09-Mar-2014
8932	Keithley Instruments 2001-758D Resistance Standard	21-Jan-2014

Measurement Report - As-Received / As-Returned

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Test Description	Expected Value	Measured Value	Measurement Uncertainty	Lower Limit	Upper Limit	Test Status
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mV SIMULATED THERMOCOUPLE ACCURACY TESTS - TYPE J

CONFIG: NPLC=1 | FILT=OFF

-190.00 °C	-190.000 °C	-190.00 °C	2.1e-002 °C	-190.50 °C	-189.50 °C	Pass
0.00 °C	0.000 °C	0.00 °C	1.2e-002 °C	-0.50 °C	0.50 °C	Pass
25.00 °C	25.000 °C	25.00 °C	1.2e-002 °C	24.50 °C	25.50 °C	Pass
100.00 °C	100.000 °C	100.00 °C	1.2e-002 °C	99.50 °C	100.50 °C	Pass
750.00 °C	750.000 °C	750.00 °C	1.2e-002 °C	749.50 °C	750.50 °C	Pass

DC VOLTAGE ACCURACY TESTS - ENHANCED ACCURACY

CONFIG: NPLC=10 | FILT=10 COUNT,REP

200mV Range

# 100.000000 mV	100.000000 mV	100.001072 mV	1.2e-006 V	99.995980 mV	100.004020 mV	Pass
# 190.000000 mV	190.000000 mV	190.001376 mV	1.7e-006 V	189.993982 mV	190.006018 mV	Pass
# -100.000000 mV	-100.000000 mV	-100.000905 mV	1.2e-006 V	-100.004020 mV	-99.995980 mV	Pass
# -190.000000 mV	-190.000000 mV	-190.001569 mV	1.7e-006 V	-190.006018 mV	-189.993982 mV	Pass

2V Range

# 1.00000000 V	1.00000000 V	1.00000229 V	4.2e-006 V	0.99998500 V	1.00001500 V	Pass
# 1.90000000 V	1.90000000 V	1.90000299 V	7.4e-006 V	1.89997312 V	1.90002688 V	Pass
# -1.00000000 V	-1.00000000 V	-1.00000385 V	4.2e-006 V	-1.00001500 V	-0.99998500 V	Pass
# -1.90000000 V	-1.90000000 V	-1.90000751 V	7.4e-006 V	-1.90002688 V	-1.89997312 V	Pass

20V Range

10.0000000 V	10.00000000 V	10.0000218 V	2.8e-005 V	9.9998710 V	10.0001290 V	Pass
19.0000000 V	19.00000000 V	19.0000425 V	5.2e-005 V	18.9997576 V	19.0002424 V	Pass
-10.0000000 V	-10.00000000 V	-10.0000377 V	2.8e-005 V	-10.0001290 V	-9.9998710 V	Pass
-19.0000000 V	-19.00000000 V	-19.0000699 V	5.2e-005 V	-19.0002424 V	-18.9997576 V	Pass

200V Range

100.000000 V	100.000000 V	99.999910 V	3.9e-004 V	99.997140 V	100.002860 V	Pass
190.000000 V	190.000000 V	189.999706 V	7.1e-004 V	189.994926 V	190.005074 V	Pass
-100.000000 V	-100.000000 V	-100.000125 V	3.9e-004 V	-100.002860 V	-99.997140 V	Pass
-190.000000 V	-190.000000 V	-190.000068 V	7.1e-004 V	-190.005074 V	-189.994926 V	Pass

1000V Range

500.000000 V	500.000000 V	500.00132 V	2.7e-003 V	499.98480 V	500.01520 V	Pass
1000.000000 V	1000.000000 V	1000.00497 V	4.9e-003 V	999.95500 V	1000.04500 V	Pass
-500.000000 V	-500.000000 V	-500.00211 V	2.7e-003 V	-500.01520 V	-499.98480 V	Pass
-1000.000000 V	-1000.000000 V	-1000.00646 V	4.9e-003 V	-1000.04500 V	-999.95500 V	Pass

AC VOLTAGE ACCURACY TESTS - LOW FREQUENCY RMS MODE

CONFIG: NPLC=1 | FILT=OFF | COUP=DC | DET=LFRMS

200mV Range

# 190.000 mV @ 10 Hz	190.0000 mV	189.960 mV	5.4e-005 V	189.856 mV	190.144 mV	Pass
190.000 mV @ 50 Hz	190.0000 mV	189.962 mV	2.1e-005 V	189.904 mV	190.096 mV	Pass
190.000 mV @ 100 Hz	190.0000 mV	189.974 mV	2.1e-005 V	189.903 mV	190.097 mV	Pass

2V Range

Measurement Report - As-Received / As-Returned

Report Number:
9847:20131125085315

Test Description	Expected Value	Measured Value	Measurement Uncertainty	Lower Limit	Upper Limit	Test Status
# 1.90000 V @ 10 Hz	1.900000 V	1.90025 V	4.6e-004 V	1.89894 V	1.90106 V	Pass
1.90000 V @ 50 Hz	1.900000 V	1.90019 V	8.4e-005 V	1.89922 V	1.90077 V	Pass
1.90000 V @ 100 Hz	1.900000 V	1.90018 V	8.4e-005 V	1.89922 V	1.90078 V	Pass
20V Range						
# 19.0000 V @ 10 Hz	19.00000 V	18.9969 V	4.6e-003 V	18.9856 V	19.0144 V	Pass
19.0000 V @ 50 Hz	19.00000 V	18.9973 V	8.1e-004 V	18.9903 V	19.0097 V	Pass
19.0000 V @ 100 Hz	19.00000 V	18.9986 V	8.1e-004 V	18.9913 V	19.0087 V	Pass
200V Range						
# 190.000 V @ 10 Hz	190.0000 V	190.023 V	4.6e-002 V	189.868 V	190.132 V	Pass
190.000 V @ 50 Hz	190.0000 V	190.019 V	9.6e-003 V	189.906 V	190.094 V	Pass
190.000 V @ 100 Hz	190.0000 V	190.018 V	9.6e-003 V	189.906 V	190.094 V	Pass
750V Range						
750.00 V @ 50 Hz	750.000 V	750.10 V	5.2e-002 V	749.09 V	750.91 V	Pass
750.00 V @ 100 Hz	750.000 V	750.15 V	4.9e-002 V	749.09 V	750.91 V	Pass
AC VOLTAGE ACCURACY TESTS - RMS MODE						
200mV Range						
CONFIG: NPLC=1 FILT=OFF COUP=AC DET=RMS						
190.000 mV @ 20 Hz	190.0000 mV	189.201 mV	2.4e-005 V	188.716 mV	191.284 mV	Pass
190.000 mV @ 50 Hz	190.0000 mV	189.840 mV	2.1e-005 V	189.704 mV	190.296 mV	Pass
CONFIG: NPLC=1 FILT=OFF COUP=DC DET=RMS						
190.000 mV @ 20 Hz	190.0000 mV	189.745 mV	2.4e-005 V	189.495 mV	190.505 mV	Pass
190.000 mV @ 50 Hz	190.0000 mV	189.930 mV	2.1e-005 V	189.837 mV	190.163 mV	Pass
# 190.000 mV @ 1 kHz	190.0000 mV	189.992 mV	2.1e-005 V	189.922 mV	190.078 mV	Pass
# 190.000 mV @ 5 kHz	190.0000 mV	189.995 mV	2.1e-005 V	189.922 mV	190.078 mV	Pass
# 190.000 mV @ 25 kHz	190.0000 mV	189.995 mV	4.1e-005 V	189.912 mV	190.088 mV	Pass
190.000 mV @ 50 kHz	190.0000 mV	189.966 mV	9.7e-005 V	189.400 mV	190.600 mV	Pass
190.000 mV @ 100 kHz	190.0000 mV	189.756 mV	1.6e-004 V	188.525 mV	191.475 mV	Pass
190.000 mV @ 0.2 MHz	190.0000 mV	189.264 mV	1.6e-004 V	186.000 mV	194.000 mV	Pass
2V Range						
CONFIG: NPLC=1 FILT=OFF COUP=AC DET=RMS						
1.90000 V @ 20 Hz	1.900000 V	1.89268 V	1.8e-004 V	1.88716 V	1.91284 V	Pass
1.90000 V @ 50 Hz	1.900000 V	1.89898 V	8.4e-005 V	1.89704 V	1.90296 V	Pass
CONFIG: NPLC=1 FILT=OFF COUP=DC DET=RMS						
1.90000 V @ 20 Hz	1.900000 V	1.89810 V	1.8e-004 V	1.89495 V	1.90505 V	Pass
1.90000 V @ 50 Hz	1.900000 V	1.89987 V	8.4e-005 V	1.89837 V	1.90163 V	Pass
1.90000 V @ 1 kHz	1.900000 V	1.90018 V	8.4e-005 V	1.89922 V	1.90078 V	Pass
1.90000 V @ 5 kHz	1.900000 V	1.90019 V	8.4e-005 V	1.89922 V	1.90078 V	Pass
1.90000 V @ 25 kHz	1.900000 V	1.90014 V	1.4e-004 V	1.89913 V	1.90087 V	Pass
1.90000 V @ 50 kHz	1.900000 V	1.89963 V	2.3e-004 V	1.89400 V	1.90600 V	Pass
1.90000 V @ 100 kHz	1.900000 V	1.89748 V	7.3e-004 V	1.88525 V	1.91475 V	Pass
1.90000 V @ 0.2 MHz	1.900000 V	1.89256 V	7.3e-004 V	1.86000 V	1.94000 V	Pass

20V Range

CONFIG: NPLC=1 | FILT=OFF | COUP=AC | DET=RMS

Measurement Report - As-Received / As-Returned

Report Number:
9847:20131125085315

Test Description	Expected Value	Measured Value	Measurement Uncertainty	Lower Limit	Upper Limit	Test Status
19.0000 V @ 20 Hz	19.00000 V	18.9216 V	1.8e-003 V	18.8716 V	19.1284 V	Pass
19.0000 V @ 50 Hz	19.00000 V	18.9855 V	8.1e-004 V	18.9704 V	19.0296 V	Pass
CONFIG: NPLC=1 FILT=OFF COUP=DC DET=RMS						
19.0000 V @ 20 Hz	19.00000 V	18.9754 V	1.8e-003 V	18.9495 V	19.0505 V	Pass
19.0000 V @ 50 Hz	19.00000 V	18.9941 V	8.1e-004 V	18.9837 V	19.0163 V	Pass
19.0000 V @ 1 kHz	19.00000 V	18.9996 V	8.1e-004 V	18.9913 V	19.0087 V	Pass
19.0000 V @ 5 kHz	19.00000 V	18.9968 V	8.1e-004 V	18.9894 V	19.0106 V	Pass
19.0000 V @ 25 kHz	19.00000 V	18.9995 V	1.4e-003 V	18.9875 V	19.0125 V	Pass
19.0000 V @ 50 kHz	19.00000 V	19.0015 V	2.0e-003 V	18.9400 V	19.0600 V	Pass
19.0000 V @ 100 kHz	19.00000 V	18.9936 V	5.5e-003 V	18.8525 V	19.1475 V	Pass
19.0000 V @ 0.2 MHz	19.00000 V	18.9776 V	5.5e-003 V	18.2000 V	19.8000 V	Pass

200V Range

CONFIG: NPLC=1 | FILT=OFF | COUP=AC | DET=RMS

190.000 V @ 20 Hz	190.0000 V	189.267 V	1.8e-002 V	188.709 V	191.291 V	Pass
190.000 V @ 50 Hz	190.0000 V	189.900 V	9.6e-003 V	189.697 V	190.303 V	Pass

CONFIG: NPLC=1 | FILT=OFF | COUP=DC | DET=RMS

190.000 V @ 20 Hz	190.0000 V	189.809 V	1.8e-002 V	189.488 V	190.512 V	Pass
190.000 V @ 50 Hz	190.0000 V	189.988 V	9.6e-003 V	189.830 V	190.170 V	Pass
190.000 V @ 1 kHz	190.0000 V	190.012 V	9.5e-003 V	189.906 V	190.094 V	Pass
190.000 V @ 5 kHz	190.0000 V	189.992 V	9.6e-003 V	189.887 V	190.113 V	Pass
190.000 V @ 25 kHz	190.0000 V	190.020 V	1.5e-002 V	189.868 V	190.132 V	Pass
190.000 V @ 50 kHz	190.0000 V	190.010 V	2.7e-002 V	189.393 V	190.607 V	Pass
190.000 V @ 100 kHz	190.0000 V	189.898 V	1.7e-001 V	188.538 V	191.462 V	Pass

750V Range

CONFIG: NPLC=1 | FILT=OFF | COUP=AC | DET=RMS

750.00 V @ 50 Hz	750.000 V	749.61 V	5.1e-002 V	748.19 V	751.81 V	Pass
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CONFIG: NPLC=1 | FILT=OFF | COUP=DC | DET=RMS

750.00 V @ 50 Hz	750.000 V	749.97 V	5.0e-002 V	748.72 V	751.28 V	Pass
750.00 V @ 1 kHz	750.000 V	750.16 V	4.9e-002 V	749.09 V	750.91 V	Pass
750.00 V @ 5 kHz	750.000 V	750.17 V	1.0e-001 V	749.02 V	750.98 V	Pass
750.00 V @ 25 kHz	750.000 V	750.14 V	2.8e-001 V	748.87 V	751.13 V	Pass

AC VOLTAGE ACCURACY TESTS - PEAK MODE

200mV Range

CONFIG: NPLC=1 | FILT=10 COUNT,REP | COUP=DC | DET=PEAK

141.4 mVp @ 20 Hz	141.40 mVp	142.0 mVp	7.3e-005 Vp	139.9 mVp	142.9 mVp	Pass
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CONFIG: NPLC=1 | FILT=10 COUNT,REP | COUP=AC | DET=PEAK

141.4 mVp @ 5 kHz	141.40 mVp	141.5 mVp	2.1e-004 Vp	139.9 mVp	142.9 mVp	Pass
141.4 mVp @ 25 kHz	141.40 mVp	141.5 mVp	9.4e-005 Vp	139.9 mVp	142.9 mVp	Pass
141.4 mVp @ 50 kHz	141.40 mVp	141.4 mVp	1.2e-004 Vp	139.6 mVp	143.2 mVp	Pass
141.4 mVp @ 100 kHz	141.40 mVp	141.5 mVp	1.5e-004 Vp	138.6 mVp	144.2 mVp	Pass
141.4 mVp @ 250 kHz	141.40 mVp	141.2 mVp	1.6e-004 Vp	138.6 mVp	144.2 mVp	Pass
141.4 mVp @ 500 kHz	141.40 mVp	139.5 mVp	4.2e-004 Vp	132.2 mVp	150.6 mVp	Pass
141.4 mVp @ 750 kHz	141.40 mVp	137.7 mVp	4.2e-004 Vp	127.3 mVp	155.5 mVp	Pass
141.4 mVp @ 1 MHz	141.40 mVp	137.0 mVp	4.2e-004 Vp	127.3 mVp	155.5 mVp	Pass

2V Range

Measurement Report - As-Received / As-Returned

Report Number:
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Test Description	Expected Value	Measured Value	Measurement Uncertainty	Lower Limit	Upper Limit	Test Status
CONFIG: NPLC=1 FILT=10 COUNT,REP COUP=DC DET=PEAK						
1.414 Vp @ 20 Hz	1.4140 Vp	1.416 Vp	8.7e-004 Vp	1.407Vp	1.421Vp	Pass
CONFIG: NPLC=1 FILT=10 COUNT,REP COUP=AC DET=PEAK						
1.414 Vp @ 5 kHz	1.4140 Vp	1.414 Vp	5.8e-004 Vp	1.407Vp	1.421Vp	Pass
1.414 Vp @ 25 kHz	1.4140 Vp	1.412 Vp	5.9e-004 Vp	1.407Vp	1.421Vp	Pass
1.414 Vp @ 50 kHz	1.4140 Vp	1.412 Vp	6.8e-004 Vp	1.404Vp	1.424Vp	Pass
1.414 Vp @ 100 kHz	1.4140 Vp	1.413 Vp	8.8e-004 Vp	1.394Vp	1.434Vp	Pass
1.414 Vp @ 250 kHz	1.4140 Vp	1.409 Vp	9.3e-004 Vp	1.394Vp	1.434Vp	Pass
1.414 Vp @ 500 kHz	1.4140 Vp	1.392 Vp	2.6e-003 Vp	1.330Vp	1.498Vp	Pass
1.414 Vp @ 750 kHz	1.4140 Vp	1.371Vp	2.6e-003 Vp	1.281Vp	1.547Vp	Pass
1.414 Vp @ 1 MHz	1.4140 Vp	1.351Vp	2.6e-003 Vp	1.281Vp	1.547Vp	Pass
20V Range						
CONFIG: NPLC=1 FILT=10 COUNT,REP COUP=DC DET=PEAK						
14.14 Vp @ 20 Hz	14.140 Vp	14.17 Vp	8.9e-003 Vp	13.99Vp	14.29Vp	Pass
CONFIG: NPLC=1 FILT=10 COUNT,REP COUP=AC DET=PEAK						
14.14 Vp @ 5 kHz	14.140 Vp	14.14 Vp	2.6e-002 Vp	13.98Vp	14.30Vp	Pass
14.14 Vp @ 25 kHz	14.140 Vp	14.13 Vp	1.1e-002 Vp	13.98Vp	14.30Vp	Pass
14.14 Vp @ 50 kHz	14.140 Vp	14.13 Vp	9.7e-003 Vp	13.96Vp	14.32Vp	Pass
14.14 Vp @ 100 kHz	14.140 Vp	14.15 Vp	8.5e-003 Vp	13.86Vp	14.42Vp	Pass
14.14 Vp @ 250 kHz	14.140 Vp	14.14 Vp	7.3e-003 Vp	13.86Vp	14.42Vp	Pass
14.14 Vp @ 500 kHz	14.140 Vp	14.10 Vp	2.4e-002 Vp	13.22Vp	15.06Vp	Pass
14.14 Vp @ 750 kHz	14.140 Vp	13.95 Vp	2.4e-002 Vp	12.73Vp	15.55Vp	Pass
14.14 Vp @ 1 MHz	14.140 Vp	13.96 Vp	2.4e-002 Vp	12.73Vp	15.55Vp	Pass
200V Range						
CONFIG: NPLC=1 FILT=10 COUNT,REP COUP=DC DET=PEAK						
268.7 Vp @ 20 Hz	268.70 Vp	268.7 Vp	9.8e-002 Vp	267.8 Vp	269.6Vp	Pass
CONFIG: NPLC=1 FILT=10 COUNT,REP COUP=AC DET=PEAK						
268.7 Vp @ 5 kHz	268.70 Vp	268.5 Vp	6.6e-002 Vp	267.8 Vp	269.6Vp	Pass
268.7 Vp @ 25 kHz	268.70 Vp	268.3 Vp	8.4e-002 Vp	267.7 Vp	269.7Vp	Pass
268.7 Vp @ 50 kHz	268.70 Vp	268.3 Vp	6.9e-002 Vp	267.4 Vp	270.0Vp	Pass
268.7 Vp @ 100 kHz	268.70 Vp	268.7 Vp	2.5e-001 Vp	265.4 Vp	272.0Vp	Pass
750V Range						
CONFIG: NPLC=1 FILT=10 COUNT,REP COUP=AC DET=PEAK						
1061 Vp @ 5 kHz	1061.0 Vp	1060 Vp	6.0e-001Vp	1054 Vp	1068Vp	Pass
1061 Vp @ 25 kHz	1061.0 Vp	1059 Vp	7.0e-001Vp	1054 Vp	1068Vp	Pass
AC VOLTAGE ACCURACY TESTS - RMS MODE						
CONFIG: NPLC=1 FILT=OFF COUP=AC DET=RMS						
200mV Range						
* 190.000 mV @ 2 MHz	190.0000 mV	192.848 mV	9.6e-004 V	180.100 mV	199.900mV	Pass
2V Range						
* 1.90000 V @ 2 MHz	1.900000 V	1.90839 V	8.1e-003 V	1.80100 V	1.99900V	Pass
SIMULATED RTD ACCURACY TESTS - PT385						
CONFIG: MODE=4W NPLC=1 FILT=OFF						

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Test Description	Expected Value	Measured Value	Measurement Uncertainty	Lower Limit	Upper Limit	Test Status
-0.0100 °C	-0.0100 °C	0.000 °C	2.4e-003 °C	-0.031 °C	0.011 °C	Pass

RESISTANCE ACCURACY TESTS

CONFIG: MODE=4W | NPLC=10 | FILT=10 CNT,REP | OCOM=ON

20 Ω Range

# 10.0000000 Ω	10.00007600 Ω	10.0002112 Ω	2.1e-004 Ω	9.9994910 Ω	10.0006610 Ω	Pass
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200 Ω Range

# 100.000000 Ω	99.9957600 Ω	99.996640 Ω	9.0e-004 Ω	99.992490 Ω	99.999030 Ω	Pass
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2 kΩ Range

# 1.00000000 kΩ	1.000007100 kΩ	1.00000970 kΩ	7.5e-003 Ω	0.99999090 kΩ	1.00002330 kΩ	Pass
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20 kΩ Range

# 10.0000000 kΩ	10.00031800 kΩ	10.0002879 kΩ	7.5e-002 Ω	10.0001420 kΩ	10.0004940 kΩ	Pass
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200 kΩ Range

CONFIG: MODE=4W | NPLC=10 | FILT=10 CNT,REP | OCOM=OFF

100.000000 kΩ	100.0010600 kΩ	100.000758 kΩ	9.0e-001 Ω	99.996650 kΩ	100.005470 kΩ	Pass
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2 MΩ Range

1.00000000 MΩ	0.999974800 MΩ	0.99996775 MΩ	1.5e+001 Ω	0.99989390 MΩ	1.00005570 MΩ	Pass
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20 MΩ Range

CONFIG: MODE=2W | NPLC=10 | FILT=10 CNT,REP | OCOM=OFF

10.0000000 MΩ	9.99945100 MΩ	9.9993049 MΩ	3.1e+002 Ω	9.9967901 MΩ	10.0021119 MΩ	Pass
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200 MΩ Range

100.000000 MΩ	100.0015900 MΩ	99.998926 MΩ	9.5e+003 Ω	99.944499 MΩ	100.058681 MΩ	Pass
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1 GΩ Range

0.9155966260 GΩ	0.9155966260 GΩ	0.915453894 GΩ	4.6e+005 Ω	0.913691011 GΩ	0.917502241 GΩ	Pass
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DC CURRENT ACCURACY TESTS

CONFIG: NPLC=1 | FILT=10 CNT,REP

200uA Range

100.0000 μA	100.00000 μA	100.0010 μA	9.5e-009 A	99.9557 μA	100.0443 μA	Pass
190.0000 μA	190.00000 μA	190.0010 μA	1.3e-008 A	189.9203 μA	190.0797 μA	Pass
-100.0000 μA	-100.00000 μA	-100.0011 μA	9.5e-009 A	-100.0443 μA	-99.9557 μA	Pass
-190.0000 μA	-190.00000 μA	-190.0024 μA	1.3e-008 A	-190.0797 μA	-189.9203 μA	Pass

2mA Range

1.000000 mA	1.0000000 mA	1.000009 mA	3.7e-008 A	0.999570 mA	1.000430 mA	Pass
1.900000 mA	1.9000000 mA	1.900008 mA	6.4e-008 A	1.899219 mA	1.900781 mA	Pass
-1.000000 mA	-1.0000000 mA	-1.000011 mA	3.7e-008 A	-1.000430 mA	-0.999570 mA	Pass
-1.900000 mA	-1.9000000 mA	-1.900023 mA	6.4e-008 A	-1.900781 mA	-1.899219 mA	Pass

20mA Range

10.000000 mA	10.000000 mA	10.00011 mA	3.4e-007 A	9.99555 mA	10.00445 mA	Pass
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Measurement Report - As-Received / As-Returned

Report Number:
9847:20131125085315

Test Description	Expected Value	Measured Value	Measurement Uncertainty	Lower Limit	Upper Limit	Test Status
19.00000 mA	19.000000 mA	19.00011mA	6.1e-007 A	18.99190mA	19.00810mA	Pass
-10.00000 mA	-10.000000 mA	-10.00012 mA	3.4e-007 A	-10.00445mA	-9.99555mA	Pass
-19.00000 mA	-19.000000 mA	-19.00025 mA	6.1e-007 A	-19.00810mA	-18.99190mA	Pass
200mA Range						
100.0000 mA	100.00000 mA	100.0017 mA	4.7e-006 A	99.9423 mA	100.0577mA	Pass
190.0000 mA	190.00000 mA	190.0010 mA	1.0e-005 A	189.8940 mA	190.1060mA	Pass
-100.0000 mA	-100.00000 mA	-100.0022 mA	4.7e-006 A	-100.0577 mA	-99.9423mA	Pass
-190.0000 mA	-190.00000 mA	-190.0032 mA	1.0e-005 A	-190.1060mA	-189.8940mA	Pass
2A Range						
1.000000 A	1.0000000 A	0.999962 A	7.2e-005 A	0.999081A	1.000919A	Pass
1.900000 A	1.9000000 A	1.899632 A	2.2e-004 A	1.898290 A	1.901710A	Pass
-1.000000 A	-1.0000000 A	-0.999942 A	7.2e-005 A	-1.000919 A	-0.999081A	Pass
-1.900000 A	-1.9000000 A	-1.899625 A	2.2e-004 A	-1.901710 A	-1.898290A	Pass
AC CURRENT ACCURACY TESTS						
CONFIG: NPLC=1 FILT=OFF COUP=DC						
200uA Range						
190.000 μ A @ 40 Hz	190.0000 μ A	189.922 μ A	2.9e-008 A	189.305 μ A	190.695 μ A	Pass
190.000 μ A @ 100 Hz	190.0000 μ A	189.977 μ A	2.9e-008 A	189.590 μ A	190.410 μ A	Pass
190.000 μ A @ 1 kHz	190.0000 μ A	189.906 μ A	6.0e-008 A	189.020 μ A	190.980 μ A	Pass
190.000 μ A @ 10 kHz	190.0000 μ A	189.962 μ A	2.4e-007 A	189.020 μ A	190.980 μ A	Pass
2mA Range						
1.90000 mA @ 40 Hz	1.900000 mA	1.89921mA	2.4e-007 A	1.89400 mA	1.90600mA	Pass
1.90000 mA @ 100 Hz	1.900000 mA	1.89980 mA	2.4e-007 A	1.89685 mA	1.90315mA	Pass
1.90000 mA @ 1 kHz	1.900000 mA	1.89989 mA	4.5e-007 A	1.89742 mA	1.90258mA	Pass
# 1.90000 mA @ 10 kHz	1.900000 mA	1.89983 mA	2.4e-006 A	1.89495 mA	1.90505mA	Pass
20mA Range						
19.0000 mA @ 40 Hz	19.00000 mA	18.9932 mA	2.4e-006 A	18.9400 mA	19.0600mA	Pass
19.0000 mA @ 100 Hz	19.00000 mA	18.9993 mA	2.4e-006 A	18.9685 mA	19.0315mA	Pass
19.0000 mA @ 1 kHz	19.00000 mA	19.0011mA	4.0e-006 A	18.9742 mA	19.0258mA	Pass
# 19.0000 mA @ 10 kHz	19.00000 mA	19.0003 mA	2.2e-005 A	18.9495 mA	19.0505mA	Pass
200mA Range						
190.000 mA @ 40 Hz	190.0000 mA	190.032 mA	2.4e-005 A	189.400 mA	190.600mA	Pass
190.000 mA @ 100 Hz	190.0000 mA	190.094 mA	2.3e-005 A	189.685 mA	190.315mA	Pass
190.000 mA @ 1 kHz	190.0000 mA	190.113 mA	3.8e-005 A	189.685 mA	190.315mA	Pass
190.000 mA @ 10 kHz	190.0000 mA	190.159 mA	1.8e-004 A	189.020 mA	190.980mA	Pass
2A Range						
1.90000 A @ 40 Hz	1.900000 A	1.90079 A	6.5e-004 A	1.89295 A	1.90705A	Pass
1.90000 A @ 100 Hz	1.900000 A	1.90153 A	5.0e-004 A	1.89580 A	1.90420A	Pass
1.90000 A @ 1 kHz	1.900000 A	1.90164 A	8.2e-004 A	1.89105 A	1.90895A	Pass
# 1.90000 A @ 10 kHz	1.900000 A	1.90170 A	1.2e-002 A	1.87110 A	1.92890A	Pass

FREQUENCY ACCURACY TESTS

Measurement Report - As-Received / As-Returned

Report Number:
9847:20131125085315

Test Description	Expected Value	Measured Value	Measurement Uncertainty	Lower Limit	Upper Limit	Test Status
CONFIG: NPLC=1 VOLTRANG=10 COUPLING=AC						
1.1000 Hz @ 5 Vpp	1.10000 Hz	1.1000 Hz	5.8e-005 Hz	1.0997 Hz	1.1003 Hz	Pass
10.000 Hz @ 5 Vpp	10.0000 Hz	10.000 Hz	6.5e-004 Hz	9.997 Hz	10.003 Hz	Pass
100.00 Hz @ 5 Vpp	100.000 Hz	100.00 Hz	5.8e-003 Hz	99.97 Hz	100.03 Hz	Pass
1.1000 kHz @ 5 Vpp	1.10000 kHz	1.1000 kHz	5.8e-002 Hz	1.0997 kHz	1.1003 kHz	Pass
10.000 kHz @ 5 Vpp	10.0000 kHz	10.000 kHz	5.8e-001 Hz	9.997 kHz	10.003 kHz	Pass
100.00 kHz @ 5 Vpp	100.000 kHz	100.00 kHz	5.8e+000 Hz	99.97 kHz	100.03 kHz	Pass
1.1000 MHz @ 5 Vpp	1.10000 MHz	1.1000 MHz	5.8e+001 Hz	1.0997 MHz	1.1003 MHz	Pass
10.000 MHz @ 5 Vpp	10.0000 MHz	10.000 MHz	5.8e+002 Hz	9.997 MHz	10.003 MHz	Pass
15.000 MHz @ 5 Vpp	15.0000 MHz	15.000 MHz	5.9e+002 Hz	14.996 MHz	15.005 MHz	Pass

Comments:

ALL RANGES ON BEFORE DATA ARE WITHIN PUBLISHED SPECIFICATIONS. NO ADJUSTMENTS NECESSARY.

***** End of Measurement Report *****