AT5600 Certificate of Calibration

Certificate Number:	10001120012220180906114 5
Verification Date:	2018 September 06
Model:	AT5600
Serial Number:	100011200122
Hardware Version:	203
Firmware Version:	1.001.000
AT5600 Last Calibrated:	2018 September 06
Verification Software:	88-363 Version 2.1.53.0
Ambient Conditions:	Humidity 25% - 75%
	Temperature 24 ± 3°C
Result:	Pass

Voltech

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Voltech Instruments certifies that the above instrument has been verified against the equipment listed below. The unit conforms to the manufacturer's published specification. Traceability to national standards is provided by the traceability of the equipment used.

The following equipment was used:

Keysight 3458A DMM

Serial Number: 2823A08758

Calibration Certificate: 1-9433014534-1

Keysight Precision LCR Meter E4980A

Serial Number: MY54201881

Calibration Certificate: 1-9431270297-1

The Voltech Verification Fixture uses several stable precision standard component with inductive, capacitive and resistive loads. These are precalibrated using external, traceable equipment. The results of this instruments measurements of these standard components are shown in this certificate. The results have been obtained over a range of signal levels and frequencies which have been carefully chosen to confirm that this instrument is operating within its specifications.

Verified By: _____ **Date:** _____

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Signal Level Verification

Signal Frequency	Signal Magnitude	Actual Value	Measured Value	Allowed Deviation	Actual Deviation	Pass/Fail
100.0Hz	1.000V	999.3mV	999.1mV	26.01mV	142.6µV	Pass
1.000kHz	1.500V	1.499V	1.499V	38.65mV	32.60µV	Pass
5.000kHz	100.0mV	99.81mV	100.0mV	3.550mV	204.6µV	Pass
10.00kHz	3.000mA	3.022mA	3.000mA	178.0µA	21.99µA	Pass
10.00kHz	1.000V	1.000V	999.8mV	27.00mV	607.8µV	Pass
100.0kHz	1.000V	1.004V	999.7mV	36.00mV	3.938mV	Pass
1.000MHz	1.000V	999.2mV	999.8mV	126.0mV	593.2µV	Pass
3.000MHz	1.000V	1.010V	1.000V	326.0mV	10.13mV	Pass

Signal Frequency Verification

Actual Value	Measured Value	Allowed Deviation	Actual Deviation	Pass/Fail
100.00Hz	100.0Hz	260.0mHz	3.352mHz	Pass
1.000kHz	1.000kHz	350.0mHz	1.334mHz	Pass
5.000kHz	5.000kHz	750.0mHz	39.10mHz	Pass
10.00kHz	10.00kHz	1.250Hz	52.45mHz	Pass
100.0kHz	100.0kHz	14.00Hz	600.8mHz	Pass
1.000MHz	1.000MHz	164.0Hz	88.31Hz	Pass
3.000MHz	3.000MHz	364.0Hz	270.3Hz	Pass

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Impedence Verification

Inductor 1mH Nominal

Signal Frequency	Signal Magnitude	Actual Value	Measured Value	Allowed Deviation	Actual Deviation	Pass/Fail
1.000kHz	100.0mV	936.7µH	937.8µH	5.414µH	1.088µH	Pass
1.000kHz	10.00mA	934.2µH	936.5µH	5.481µH	2.292µH	Pass
10.00kHz	300.0mV	921.8µH	923.0µH	4.739µH	1.209µH	Pass

Inductor 10µH Nominal

Signal Frequency	Signal Magnitude	Actual Value	Measured Value	Allowed Deviation	Actual Deviation	Pass/Fail
100.0kHz	100.0mV	9.700µH	9.763µH	135.8nH	62.76nH	Pass
100.0kHz	10.00mA	9.710µH	9.744µH	137.6nH	33.56nH	Pass
1.000MHz	1.000V	9.540µH	9.584µH	990.4nH	43.65nH	Pass

Capacitor 3.3nF Nominal

Signal Frequency	Signal Magnitude	Actual Value	Measured Value	Allowed Deviation	Actual Deviation	Pass/Fail
100.0Hz	1.000V	3.340nF	3.364nF	1.606nF	24.19pF	Pass
1.000kHz	1.000V	3.340nF	3.343nF	173.6pF	3.380pF	Pass
10.00kHz	1.000V	3.340nF	3.342nF	33.35pF	1.530pF	Pass
100.0kHz	1.000V	3.340nF	3.342nF	49.09pF	1.670pF	Pass

Capacitor 33pF Nominal

Signal Frequency	Signal Magnitude	Actual Value	Measured Value	Allowed Deviation	Actual Deviation	Pass/Fail
10.00kHz	1.000V	33.30pF	32.63pF	16.09pF	665.2fF	Pass
100.0kHz	1.000V	33.30pF	32.78pF	2.065pF	523.7fF	Pass
1.000MHz	1.000V	33.20pF	32.78pF	3.619pF	422.5fF	Pass

Resistor 100Ω Nominal

Signal Frequency	Signal Magnitude	Actual Value	Measured Value	Allowed Deviation	Actual Deviation	Pass/Fail
DC	8.333mA	99.70Ω	99.63Ω	478.9mΩ	70.40mΩ	Pass
10.00kHz	500.0mV	99.70Ω	99.72Ω	490.5mΩ	18.10mΩ	Pass
10.00kHz	500.0mV	9.827µ°	-2.600m°	185.6m°	2.610m°	Pass

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Resistor 1Ω Nominal

Signal Frequency	Signal Magnitude	Actual Value	Measured Value	Allowed Deviation	Actual Deviation	Pass/Fail
DC	204.1mA	1.001Ω	1.007Ω	7.350mΩ	5.680mΩ	Pass
1.000kHz	100.0mV	1.001Ω	1.005Ω	3.915mΩ	3.440mΩ	Pass
1.000kHz	100.0mV	4.287m°	233.8m°	242.5m°	229.5m°	Pass

Resistor 33mΩ Nominal

Signal Frequency	Signal Magnitude	Actual Value	Measured Value	Allowed Deviation	Actual Deviation	Pass/Fail
DC	912.9mA	33.80mΩ	33.75mΩ	1.177mΩ	49.40µΩ	Pass
1.000kHz	100.0mA	33.80mΩ	34.00mΩ	228.9µΩ	201.3µΩ	Pass
1.000kHz	100.0mA	138.5m°	301.1m°	3.101°	162.6m°	Pass

High Power Verification

Magnetizing Current with an Inductive Load

Signal Frequency	Signal Magnitude	Actual Value	Measured Value	Allowed Deviation	Actual Deviation	Pass/Fail
60.00Hz	10.00V	10.02V	9.997V	100.0mV	25.62mV	Pass
60.00Hz	10.00V	525.2mA	521.9mA	7.035mA	3.257mA	Pass
500.0Hz	110.0V	110.9V	110.1V	1.100V	785.0mV	Pass
500.0Hz	110.0V	786.3mA	774.7mA	18.05mA	11.64mA	Pass

AC HI-POT with a 4.7MΩ Load

Signal Frequency	Signal Magnitude	Actual Value	Measured Value	Allowed Deviation	Actual Deviation	Pass/Fail
50.00Hz	500.0V	505.4V	499.9V	15.16V	5.463V	Pass
60.00Hz	1.000kV	1.005kV	1.000kV	30.15V	4.693V	Pass
400.0Hz	2.000kV	2.002kV	2.000kV	60.06V	2.402V	Pass
400.0Hz	3.000kV	2.998kV	2.999kV	89.95V	409.4mV	Pass
50.00Hz	4.000kV	4.013kV	3.997kV	120.4V	16.75V	Pass
60.00Hz	5.000kV	4.980kV	5.001kV	149.4V	20.20V	Pass

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DC HI-POT Open Circuit

Signal Frequency	Signal Magnitude	Actual Value	Measured Value	Allowed Deviation	Actual Deviation	Pass/Fail
DC	1.000kV	1.009kV	1.001kV	30.27V	7.850V	Pass
DC	2.000kV	2.015kV	2.001kV	60.44V	13.88V	Pass
DC	3.000kV	3.023kV	3.002kV	90.69V	21.11V	Pass
DC	4.000kV	4.024kV	4.003kV	120.7V	20.26V	Pass
DC	5.000kV	5.009kV	4.998kV	150.3V	11.50V	Pass
DC	6.000kV	5.994kV	5.993kV	179.8V	1.316V	Pass
DC	7.000kV	6.993kV	7.006kV	209.8V	12.51V	Pass

Insulation Resistance 4.7MΩ Nominal

Signal Frequency	Signal Magnitude	Actual Value	Measured Value	Allowed Deviation	Actual Deviation	Pass/Fail
DC	500.0V	4.694MΩ	4.690MΩ	225.5kΩ	4.556kΩ	Pass

Surge into a 4.7MΩ load

Signal Frequency	Signal Magnitude	Actual Value	Measured Value	Allowed Deviation	Actual Deviation	Pass/Fail
-----	1.000kV	20.90Vs	21.05Vs	1.933Vs	156.3mVs	Pass
-----	2.000kV	38.52Vs	39.89Vs	3.900Vs	1.374Vs	Pass
-----	3.000kV	55.45Vs	57.16Vs	6.146Vs	1.709Vs	Pass
-----	4.000kV	71.65Vs	73.30Vs	8.643Vs	1.645Vs	Pass
-----	5.000kV	87.09Vs	88.42Vs	11.37Vs	1.323Vs	Pass