

Manufacturer	HEWLETT-PACKARD	Calibration date	April 18 2020
Model Number	3458A	Ambient Temperature	0.00 °C
Serial	C meter	Relative Humidity	0.00 %
ID Number	STD Calibration test, GPIB11 unit	Pressure	0.00
Notes	Test front spade cables	Test type	Front Fluke terminals banana PTFE-AWG16

This note is test dummy text block for further use. It allow to include user information for further reference

Reference standard	Mfg	Model	Options	Serial / Unc	CEID	Calibration date	Due date
DC STD	xDevs.com	792X[2]	9.9999751 VDC	±0.5 ppm	XD01	03/03/2020	03/03/2021
DC STD	Fluke	732Bx	10.0000328	±0.7 ppm	6480002	03/26/2020	06/26/2020
STDR	ESI	SR104	10000.0026 KΩ	±0.15 ppm	G202088930104	03/17/2020	03/17/2021
STDR	xDevs.com/Fluke	SL935	1.00006085 Ω	±0.17 ppm	XR03	09/13/2019	09/13/2020
STDR	xDevs.com/Fluke	SL935	9999.9737 kΩ	±0.17 ppm	XR02	09/13/2019	09/13/2020
MFC	Fluke	5720A	03/HLK	E2E6	XC01	03/28/2020	03/28/2021
Amplifier	Fluke	5725A		5930005	XB01	03/28/2020	03/28/2021
DMM	HP	3458A	001,X02	MY45040325	XD2	06/16/2019	12/16/2019
DMM	HP	3458A	001,X02	X	XD3	03/28/2020	03/28/2021
AVMS	Wavetek	4920M	80	29336	XA02	07/11/2017	07/11/2018
DC STD	Wavetek	7000	54222	±2.2 ppm	XD01	02/16/2018	02/16/2019
Divider	Fluke	752A	4295200		XR01	02/16/2018	02/16/2019

MFC last calibrated	5.0 days ago	MFC since DCV ZERO	1.0 days ago
MFC since WBFLAT	20.0 days ago	MFC since WBGAIN	20.0 days ago
MFC Confidence level	24h 95% REL	MFC Calibrate date	2020-04-13 00:00:00
MFC Calibrate date Zero	2020-04-17 00:00:00	Calibrate date WB Flatness	2020-03-29 00:00:00
Calibrate date WB Gain	2020-03-29 00:00:00	CAL CONST 6.5V reference voltage	6.957482473
CAL CONST 13V reference voltage	13.855305491	CAL CONST 22V range positive zero	398.17937
CAL CONST 22V range negative zero	398.17896	CAL CONST DAC Linearity	0.0
CAL CONST 10KOHM true output resistance	9999.80220589	CAL CONST 10KOHM standard resistance	9998.75116377

Reference

Verification

DUT Condition

xfer-calkit

Test procedure : \$Id: hp3458a.py | Rev 1500 | 2019/07/24 08:56:31 tin_fpga \$

Source procedure : \$Id: f5720b.py | Rev 1697 | 2020/04/04 04:09:52 tin_fpga \$

Main DC Voltage ranges performance test.

Checks zero offset and +/-FS calibration on all ranges

The following test for the offset voltage specification using MFC 0V source in 4-wire ext sense mode as reference.

DCV gain range points verify gain of the DC voltage function, using uncorrected 24-hour MFC output. DC voltage offset of DUT is nulled before FS tests.

Test Description	Expected Value	Measured Value	Measurement Uncertainty	Lower Limit	Upper Limit	Deviation	DUT Spec	Test Status
Short 0 mVDC	0.000000E+00	1.76 μV	0.75 μ V	-0.910 μ V	0.910 μ V	N/A	0.16 μ V	FAIL
Short 0.0 VDC	0.000000E+00	1.72 μV	0.75 μ V	-0.900 μ V	0.900 μ V	N/A	0.15 μ V	FAIL
Short 00.0 VDC	0.000000E+00	2.23 μV	0.75 μ V	-1.070 μ V	1.070 μ V	N/A	0.32 μ V	FAIL
Short 000.0 VDC	0.000000E+00	15.12 μV	0.75 μ V	-14.750 μ V	14.750 μ V	N/A	14.00 μ V	FAIL
Short 0000.0 VDC	0.000000E+00	86.15 μV	0.75 μ V	-41.750 μ V	41.750 μ V	N/A	41.00 μ V	FAIL
DCV Test	0.1V-1000V	DUT	Source unc.	Low Limit	Hi limit	Measured	24h spec	Result
0.019 VDC (0.10 Range)	0.0190000	0.018999998	7.27 ppm	0.018999514	0.019000486	-0.100 ppm	18.29 ppm	PASS 0.25 %
0.1 VDC (0.10 Range)	0.1000000	0.099999886	7.27 ppm	0.099998723	0.10000128	-1.144 ppm	5.50 ppm	PASS 6.27 %
0.11 VDC (0.10 Range)	0.1100000	0.10999978	7.27 ppm	0.10999863	0.11000137	-2.003 ppm	5.23 ppm	PASS 11.19 %
-0.019 VDC (0.10 Range)	-0.0190000	-0.019000144	7.27 ppm	-0.019000486	-0.018999514	7.557 ppm	18.29 ppm	PASS 19.20 %
-0.1 VDC (0.10 Range)	-0.1000000	-0.1000001	7.27 ppm	-0.10000128	-0.099998723	0.997 ppm	5.50 ppm	PASS 5.47 %
-0.11 VDC (0.10 Range)	-0.1100000	-0.11000013	7.27 ppm	-0.11000137	-0.10999863	1.190 ppm	5.23 ppm	PASS 6.64 %
0.19 VDC (1.00 Range)	0.1900000	0.18999961	7.27 ppm	0.18999803	0.19000197	-2.049 ppm	3.08 ppm	PASS 12.98 %
1.0 VDC (1.00 Range)	1.0000000	0.9999985	3.86 ppm	0.99999434	1.0000057	-1.498 ppm	1.80 ppm	PASS 17.59 %
1.1 VDC (1.00 Range)	1.1000000	1.0999985	3.86 ppm	1.0999938	1.1000062	-1.354 ppm	1.77 ppm	PASS 15.93 %
-0.19 VDC (1.00 Range)	-0.1900000	-0.19000037	7.27 ppm	-0.19000197	-0.18999803	1.949 ppm	3.08 ppm	PASS 12.35 %
-1.0 VDC (1.00 Range)	-1.0000000	-1.0000004	3.86 ppm	-1.0000057	-0.99999434	0.364 ppm	1.80 ppm	PASS 4.27 %
-1.1 VDC (1.00 Range)	-1.1000000	-1.1000002	3.86 ppm	-1.1000062	-1.0999938	0.197 ppm	1.77 ppm	PASS 2.32 %
1.9 VDC (10.00 Range)	1.9000000	1.9	3.86 ppm	1.8999912	1.9000088	-0.010 ppm	0.76 ppm	PASS 0.13 %
10.0 VDC (10.00 Range)	10.0000000	10.000002	2.77 ppm	9.9999668	10.000033	0.222 ppm	0.55 ppm	PASS 3.93 %
11.0 VDC (10.00 Range)	11.0000000	11.000001	2.73 ppm	10.999964	11.000036	0.094 ppm	0.55 ppm	PASS 1.68 %
-1.9 VDC (10.00 Range)	-1.9000000	-1.9000035	3.86 ppm	-1.9000088	-1.8999912	1.861 ppm	0.76 ppm	PASS 23.64 %
-10.0 VDC (10.00 Range)	-10.0000000	-10.000007	2.77 ppm	-10.000033	-9.9999668	0.711 ppm	0.55 ppm	PASS 12.59 %
-11.0 VDC (10.00 Range)	-11.0000000	-11.000009	2.73 ppm	-11.000036	-10.999964	0.799 ppm	0.55 ppm	PASS 14.35 %
19 VDC (100.00 Range)	19.0000000	19.000043	2.77 ppm	18.99987	19.00013	2.240 ppm	4.08 ppm	PASS 22.72 %
100 VDC (100.00 Range)	100.0000000	100.00004	3.73 ppm	99.999347	100.00065	0.426 ppm	2.80 ppm	PASS 4.57 %
110 VDC (100.00 Range)	110.0000000	110.00003	3.73 ppm	109.99928	110.00072	0.305 ppm	2.77 ppm	PASS 3.29 %
-19 VDC (100.00 Range)	-19.0000000	-18.999995	2.77 ppm	-19.00013	-18.99987	-0.268 ppm	4.08 ppm	PASS 2.72 %
-100 VDC (100.00 Range)	-100.0000000	-100.00004	3.73 ppm	-100.00065	-99.999347	0.428 ppm	2.80 ppm	PASS 4.58 %
-110 VDC (100.00 Range)	-110.0000000	-110.00004	3.73 ppm	-110.00072	-109.99928	0.363 ppm	2.77 ppm	PASS 3.91 %
190 VDC (1000.00 Range)	190.0000000	190.00024	3.73 ppm	189.99872	190.00128	1.276 ppm	3.03 ppm	PASS 13.28 %
500 VDC (1000.00 Range)	500.0000000	500.00204	3.73 ppm	499.99678	500.00322	4.085 ppm	2.70 ppm	PASS 54.76 %
1000 VDC (1000.00 Range)	1000.0000000	1000.0064	5.45 ppm	999.97995	1000.02	6.432 ppm	2.60 ppm	PASS 24.40 %
-190 VDC (1000.00 Range)	-190.0000000	-190.00072	3.73 ppm	-190.00128	-189.99872	3.797 ppm	3.03 ppm	PASS 39.53 %
-500 VDC (1000.00 Range)	-500.0000000	-500.00254	3.73 ppm	-500.00322	-499.99678	5.083 ppm	2.70 ppm	PASS 20.23 %
-1000 VDC (1000.00 Range)	-1000.0000000	-1000.0075	5.45 ppm	-1000.02	-999.97995	7.454 ppm	2.60 ppm	PASS 28.28 %

4W test procedure for all test points that verify Gain of the OHMF function. 4-wire kelvin connection is used between DMM and MFC.
 1GΩ resistance range is tested using the external standard, as MFC unable to provide this range value.

OHM Test	Reference	DUT	Source unc.	Low Limit	Hi limit	Measured	24h spec	Result
1 Ω	0.999791 Ω	0.99977124 Ω	32.0 ppm	9.9972401E-01	9.9985799E-01	-19.768 ppm	35.01 ppm	PASS, 20.84 % of 94.86 ppm
1.9 Ω	1.8998378 Ω	1.8998029 Ω	25.0 ppm	1.8997508E+00	1.8999248E+00	-18.357 ppm	20.79 ppm	PASS, 28.23 % of 65.03 ppm
10 Ω	10.000581 Ω	10.000573 Ω	5.0 ppm	1.0000451E+01	1.0000711E+01	-0.755 ppm	8.00 ppm	PASS, 4.00 % of 18.87 ppm
19 Ω	19.00024 Ω	19.000224 Ω	4.0 ppm	1.8999807E+01	1.9000673E+01	-0.839 ppm	18.79 ppm	PASS, 2.18 % of 38.42 ppm
100 Ω	99.9966 Ω	99.996547 Ω	1.7 ppm	9.9995830E+01	9.9997370E+01	-0.535 ppm	6.00 ppm	PASS, 4.29 % of 12.47 ppm
190 Ω	189.99379 Ω	189.99383 Ω	1.7 ppm	1.8999289E+02	1.8999469E+02	0.228 ppm	3.05 ppm	PASS, 3.26 % of 6.99 ppm
1.0 kΩ	1000.0256 kΩ	1000.0235 kΩ	1.7 ppm	1.0000217E+03	1.0000295E+03	-2.126 ppm	2.20 ppm	PASS, 38.24 % of 5.56 ppm
1.9 kΩ	1899.9011 kΩ	1899.9002 kΩ	1.7 ppm	1.8998921E+03	1.8999101E+03	-0.461 ppm	3.05 ppm	PASS, 6.60 % of 6.99 ppm
10 kΩ	9999.8 kΩ	9999.786 kΩ	1.6 ppm	9.9997620E+03	9.9998380E+03	-1.401 ppm	2.20 ppm	PASS, 25.75 % of 5.44 ppm
19 kΩ	18999.283 kΩ	18999.272 kΩ	1.7 ppm	1.8999193E+04	1.8999373E+04	-0.594 ppm	3.05 ppm	PASS, 8.50 % of 6.99 ppm
100 kΩ	99994.81 kΩ	99994.421 kΩ	2.0 ppm	9.9994390E+04	9.9995230E+04	-3.891 ppm	2.20 ppm	PASS, 65.43 % of 5.95 ppm
190 kΩ	189989.23 kΩ	189989.11 kΩ	2.0 ppm	1.8998595E+05	1.8999251E+05	-0.633 ppm	15.26 ppm	PASS, 2.05 % of 30.79 ppm
1.0 MΩ	999983.3 MΩ	999979.97 MΩ	2.5 ppm	9.9996980E+05	9.9999680E+05	-3.326 ppm	11.00 ppm	PASS, 14.74 % of 22.56 ppm
1.9 MΩ	1899980.9 MΩ	1899984.7 MΩ	3.0 ppm	1.8998302E+06	1.9001316E+06	2.006 ppm	76.32 ppm	PASS, 1.31 % of 152.75 ppm
10 MΩ	9999100 MΩ	9999028.8 MΩ	10.0 ppm	9.9984501E+06	9.9997499E+06	-7.119 ppm	55.00 ppm	PASS, 6.37 % of 111.80 ppm
19 MΩ	18998751 MΩ	18999426 MΩ	20.0 ppm	1.8987872E+07	1.9009630E+07	35.549 ppm	552.64 ppm	PASS, 3.21 % of 1105.99 ppm
100 MΩ	1.0000484E+08 MΩ	1.0001239E+08 MΩ	50.0 ppm	9.9948837E+07	1.0006084E+08	75.529 ppm	510.00 ppm	PASS, 7.37 % of 1024.89 ppm

4W and 2W Zero test procedure for all test points that verify Zero offset of the OHMF function. 4-wire kelvin connection is used between DMM and MFC. 1GΩ resistance range is tested using the external standard, as MFC unable to provide this range value.

OHM ZERO 4W	DUT	Source unc.	Low Limit	Hi limit	Measured	24h spec	Result
10 Ω	Range 0.0000036 Ω	5.000e-05 Ω	-5e-05	5e-05	N/A	8.0000e-06 Ω	PASS
100 Ω	Range -0.0000117 Ω	5.500e-04 Ω	-0.00055	0.00055	N/A	2.2000e-06 Ω	PASS
1.0 kΩ	Range -0.0000323 Ω	5.500e-03 Ω	-0.0055	0.0055	N/A	2.2000e-06 Ω	PASS
10 kΩ	Range -0.0002696 Ω	5.500e-02 Ω	-0.055	0.055	N/A	2.2000e-06 Ω	PASS
100 kΩ	Range -0.0025156 Ω	5.500e-01 Ω	-0.55	0.55	N/A	2.2000e-06 Ω	PASS
1.0 MΩ	Range 0.1185533 Ω	5.500e+00 Ω	-5.5	5.5	N/A	2.2000e-06 Ω	PASS
10 MΩ	Range 0.2875152 Ω	5.500e+01 Ω	-55	55	N/A	2.2000e-06 Ω	PASS
100 MΩ	Range 1.5094552 Ω	5.500e+02 Ω	-550	550	N/A	2.2000e-06 Ω	PASS
1 GΩ	Range 1.4375764 Ω	5.500e+03 Ω	-5500	5500	N/A	2.2000e-06 Ω	PASS
OHM ZERO 2W	DUT	Source unc.	Low Limit	Hi limit	Measured	24h spec	Result
10 Ω	Range 0.2554417 Ω	3.000e-01 Ω	-0.3	0.3	N/A	8.0000e-06 Ω	PASS
100 Ω	Range 0.2514743 Ω	3.500e-01 Ω	-0.35	0.35	N/A	2.2000e-06 Ω	PASS
1.0 kΩ	Range 0.2502765 Ω	4.000e-01 Ω	-0.4	0.4	N/A	2.2000e-06 Ω	PASS
10 kΩ	Range 0.2190418 Ω	4.000e-01 Ω	-0.4	0.4	N/A	2.2000e-06 Ω	PASS
100 kΩ	Range 0.1390791 Ω	5.500e-01 Ω	-0.55	0.55	N/A	2.2000e-06 Ω	PASS
1.0 MΩ	Range 0.5640261 Ω	5.500e+00 Ω	-5.5	5.5	N/A	2.2000e-06 Ω	PASS
10 MΩ	Range 3.6658287 Ω	5.500e+01 Ω	-55	55	N/A	2.2000e-06 Ω	PASS
100 MΩ	Range 3.8455277 Ω	5.500e+02 Ω	-550	550	N/A	2.2000e-06 Ω	PASS
1 GΩ	Range 3.6658301 Ω	5.500e+03 Ω	-5500	5500	N/A	2.2000e-06 Ω	PASS

Procedure for all test points in the AC performance verification for SYNChronous mode. This is highest AC accuracy test. AC-measurements does not suffer from TEMF offsets, test connection can be made using shielded leads terminated with dual banana plugs. MFC main AC output is used as reference source

ACV SYNC Test	DUT	w/Guardband	Low Limit	Hi limit	Measured	24h spec	Result, % spec
0.01 V AC+DC @ 10 Hz	0.010002176	0.0312 %	-0.290006	0.310006	0.0218 %	3000.0300 %	PASS 0.00 %
0.01 V AC+DC @ 20 Hz	0.010001679	0.0312 %	-0.290006	0.310006	0.0168 %	3000.0300 %	PASS 0.00 %
0.01 V AC+DC @ 40 Hz	0.010001631	0.0312 %	-0.290006	0.310006	0.0163 %	3000.0300 %	PASS 0.00 %
0.01 V AC+DC @ 100 Hz	0.010001933	0.0312 %	-0.100005	0.120005	0.0193 %	1100.0200 %	PASS 0.00 %
0.01 V AC+DC @ 1.0 kHz	0.01000264	0.0312 %	-0.100005	0.120005	0.0264 %	1100.0200 %	PASS 0.00 %
0.01 V AC+DC @ 10.0 kHz	0.010004206	0.0312 %	-0.100006	0.120006	0.0421 %	1100.0300 %	PASS 0.00 %
0.01 V AC+DC @ 20.0 kHz	0.01000294	0.0312 %	-0.100006	0.120006	0.0294 %	1100.0300 %	PASS 0.00 %
0.01 V AC+DC @ 50.0 kHz	0.0099991554	0.0447 %	-0.100014	0.120014	-0.0084 %	1100.1000 %	PASS 0.00 %
0.01 V AC+DC @ 100.0 kHz	0.009980901	0.0773 %	-0.100058	0.120058	-0.1910 %	1100.5000 %	PASS 0.01 %
0.01 V AC+DC @ 300.0 kHz	0.0098219696	0.1500 %	-0.190055	0.210055	-1.7803 %	2000.4000 %	PASS 0.04 %
0.01 V AC+DC @ 500.0 kHz	0.009556353	0.2500 %	-0.490070	0.510070	-4.4365 %	5000.4500 %	PASS 0.04 %
0.01 V AC+DC @ 1.0 MHz	0.0085590736	0.4000 %	-0.490085	0.510085	-14.4093 %	5000.4500 %	PASS 0.14 %
0.03 V AC+DC @ 10 Hz	0.03004519	0.0121 %	0.029994	0.030006	0.1506 %	0.0083 %	FAIL 511.60 %
0.03 V AC+DC @ 20 Hz	0.030043364	0.0121 %	0.029994	0.030006	0.1445 %	0.0083 %	FAIL 490.94 %
0.03 V AC+DC @ 40 Hz	0.030042348	0.0121 %	0.029994	0.030006	0.1412 %	0.0083 %	FAIL 479.43 %
0.03 V AC+DC @ 100 Hz	0.030042541	0.0121 %	0.029994	0.030006	0.1418 %	0.0077 %	FAIL 493.92 %
0.03 V AC+DC @ 1.0 kHz	0.030042063	0.0121 %	0.029994	0.030006	0.1402 %	0.0077 %	FAIL 488.37 %
0.03 V AC+DC @ 10.0 kHz	0.030047277	0.0121 %	0.029992	0.030008	0.1576 %	0.0147 %	FAIL 413.91 %
0.03 V AC+DC @ 20.0 kHz	0.030047902	0.0121 %	0.029992	0.030008	0.1597 %	0.0147 %	FAIL 419.38 %
0.03 V AC+DC @ 50.0 kHz	0.030044622	0.0256 %	0.029983	0.030017	0.1487 %	0.0307 %	FAIL 186.06 %
0.03 V AC+DC @ 100.0 kHz	0.030038352	0.0591 %	0.029958	0.030042	0.1278 %	0.0807 %	PASS 63.92 %
0.03 V AC+DC @ 300.0 kHz	0.030004418	0.0964 %	0.029880	0.030120	0.0147 %	0.3033 %	PASS 2.31 %
0.03 V AC+DC @ 500.0 kHz	0.029984396	0.1500 %	0.029654	0.030346	-0.0520 %	1.0033 %	PASS 2.56 %
0.03 V AC+DC @ 1.0 MHz	0.03001395	0.3000 %	0.029609	0.030391	0.0465 %	1.0033 %	PASS 2.22 %
0.1 V AC+DC @ 10 Hz	0.10001117	0.0121 %	0.099980	0.100020	0.0112 %	0.0074 %	PASS 39.27 %
0.1 V AC+DC @ 20 Hz	0.10001033	0.0121 %	0.099980	0.100020	0.0103 %	0.0074 %	PASS 36.33 %
0.1 V AC+DC @ 40 Hz	0.10000934	0.0121 %	0.099980	0.100020	0.0093 %	0.0074 %	PASS 32.85 %
0.1 V AC+DC @ 100 Hz	0.10000699	0.0121 %	0.099981	0.100019	0.0070 %	0.0072 %	PASS 24.78 %
0.1 V AC+DC @ 1.0 kHz	0.10001038	0.0121 %	0.099981	0.100019	0.0104 %	0.0072 %	PASS 36.77 %
0.1 V AC+DC @ 10.0 kHz	0.10001694	0.0121 %	0.099974	0.100026	0.0169 %	0.0142 %	PASS 45.35 %
0.1 V AC+DC @ 20.0 kHz	0.10001286	0.0121 %	0.099974	0.100026	0.0129 %	0.0142 %	PASS 34.41 %
0.1 V AC+DC @ 50.0 kHz	0.10001619	0.0256 %	0.099944	0.100056	0.0162 %	0.0302 %	PASS 20.44 %
0.1 V AC+DC @ 100.0 kHz	0.099991977	0.0591 %	0.099861	0.100139	-0.0080 %	0.0802 %	PASS 4.03 %
0.1 V AC+DC @ 300.0 kHz	0.099884827	0.0964 %	0.099603	0.100397	-0.1152 %	0.3010 %	PASS 18.22 %
0.1 V AC+DC @ 500.0 kHz	0.099806362	0.1500 %	0.098849	0.101151	-0.1936 %	1.0010 %	PASS 9.57 %
0.1 V AC+DC @ 1.0 MHz	0.10000408	0.3000 %	0.098699	0.101301	0.0041 %	1.0010 %	PASS 0.19 %
0.3 V AC+DC @ 10 Hz	0.30000728	0.0050 %	0.299960	0.300040	0.0024 %	0.0083 %	PASS 12.52 %
0.3 V AC+DC @ 20 Hz	0.30000183	0.0050 %	0.299960	0.300040	0.0006 %	0.0083 %	PASS 3.14 %

0.3 V AC+DC @ 40 Hz	0.3000036	0.0050 %	0.299960	0.300040	0.0012 %	0.0083 %	PASS 6.18 %
0.3 V AC+DC @ 100 Hz	0.30000202	0.0050 %	0.299962	0.300038	0.0007 %	0.0077 %	PASS 3.68 %
0.3 V AC+DC @ 1.0 kHz	0.30001484	0.0050 %	0.299962	0.300038	0.0049 %	0.0077 %	PASS 27.09 %
0.3 V AC+DC @ 10.0 kHz	0.30003259	0.0050 %	0.299941	0.300059	0.0109 %	0.0147 %	PASS 35.08 %
0.3 V AC+DC @ 20.0 kHz	0.30001391	0.0050 %	0.299941	0.300059	0.0046 %	0.0147 %	PASS 14.98 %
0.3 V AC+DC @ 50.0 kHz	0.30003075	0.0085 %	0.299882	0.300118	0.0102 %	0.0307 %	PASS 16.10 %
0.3 V AC+DC @ 100.0 kHz	0.30008007	0.0138 %	0.299717	0.300283	0.0267 %	0.0807 %	PASS 16.31 %
0.3 V AC+DC @ 300.0 kHz	0.30043394	0.0425 %	0.298962	0.301038	0.1446 %	0.3033 %	PASS 23.61 %
0.3 V AC+DC @ 500.0 kHz	0.30101991	0.1100 %	0.296660	0.303340	0.3400 %	1.0033 %	PASS 16.84 %
0.3 V AC+DC @ 1.0 MHz	0.30294043	0.1800 %	0.296450	0.303550	0.9801 %	1.0033 %	PASS 48.08 %
1.0 V AC+DC @ 10 Hz	1.0000179	0.0050 %	0.999876	1.000124	0.0018 %	0.0074 %	PASS 10.04 %
1.0 V AC+DC @ 20 Hz	0.99999902	0.0050 %	0.999876	1.000124	-0.0001 %	0.0074 %	PASS 0.55 %
1.0 V AC+DC @ 40 Hz	0.99999426	0.0050 %	0.999876	1.000124	-0.0006 %	0.0074 %	PASS 3.22 %
1.0 V AC+DC @ 100 Hz	0.99998989	0.0050 %	0.999878	1.000122	-0.0010 %	0.0072 %	PASS 5.79 %
1.0 V AC+DC @ 1.0 kHz	1.0000318	0.0050 %	0.999878	1.000122	0.0032 %	0.0072 %	PASS 18.19 %
1.0 V AC+DC @ 10.0 kHz	1.000078	0.0050 %	0.999808	1.000192	0.0078 %	0.0142 %	PASS 25.92 %
1.0 V AC+DC @ 20.0 kHz	1.0000459	0.0050 %	0.999808	1.000192	0.0046 %	0.0142 %	PASS 15.27 %
1.0 V AC+DC @ 50.0 kHz	1.000096	0.0085 %	0.999613	1.000387	0.0096 %	0.0302 %	PASS 15.29 %
1.0 V AC+DC @ 100.0 kHz	1.000199	0.0138 %	0.999060	1.000940	0.0199 %	0.0802 %	PASS 12.23 %
1.0 V AC+DC @ 300.0 kHz	1.0014321	0.0425 %	0.996565	1.003435	0.1432 %	0.3010 %	PASS 23.55 %
1.0 V AC+DC @ 500.0 kHz	1.0034178	0.1100 %	0.988890	1.011110	0.3418 %	1.0010 %	PASS 16.97 %
1.0 V AC+DC @ 1.0 MHz	1.0106735	0.1800 %	0.988190	1.011810	1.0673 %	1.0010 %	PASS 52.47 %
3.0 V AC+DC @ 10 Hz	3.0001471	0.0048 %	2.999605	3.000395	0.0049 %	0.0083 %	PASS 25.47 %
3.0 V AC+DC @ 20 Hz	3.0000782	0.0048 %	2.999605	3.000395	0.0026 %	0.0083 %	PASS 13.54 %
3.0 V AC+DC @ 40 Hz	3.0000647	0.0048 %	2.999605	3.000395	0.0022 %	0.0083 %	PASS 11.20 %
3.0 V AC+DC @ 100 Hz	3.0000619	0.0048 %	2.999625	3.000375	0.0021 %	0.0077 %	PASS 11.39 %
3.0 V AC+DC @ 1.0 kHz	3.0001558	0.0048 %	2.999625	3.000375	0.0052 %	0.0077 %	PASS 28.67 %
3.0 V AC+DC @ 10.0 kHz	3.0002453	0.0048 %	2.999415	3.000585	0.0082 %	0.0147 %	PASS 26.48 %
3.0 V AC+DC @ 20.0 kHz	3.0001711	0.0048 %	2.999415	3.000585	0.0057 %	0.0147 %	PASS 18.47 %
3.0 V AC+DC @ 50.0 kHz	3.0001401	0.0085 %	2.998824	3.001176	0.0047 %	0.0307 %	PASS 7.34 %
3.0 V AC+DC @ 100.0 kHz	2.9996827	0.0121 %	2.997216	3.002784	-0.0106 %	0.0807 %	PASS 6.48 %
3.0 V AC+DC @ 300.0 kHz	2.9968158	0.0336 %	2.989891	3.010109	-0.1061 %	0.3033 %	PASS 17.39 %
3.0 V AC+DC @ 500.0 kHz	3.0000152	0.1100 %	2.966600	3.033400	0.0005 %	1.0033 %	PASS 0.03 %
3.0 V AC+DC @ 1.0 MHz	3.015419	0.1700 %	2.964800	3.035200	0.5140 %	1.0033 %	PASS 25.25 %
10.0 V AC+DC @ 10 Hz	10.000389	0.0048 %	9.998778	10.001222	0.0039 %	0.0074 %	PASS 22.02 %
10.0 V AC+DC @ 20 Hz	10.000245	0.0048 %	9.998778	10.001222	0.0025 %	0.0074 %	PASS 13.89 %
10.0 V AC+DC @ 40 Hz	10.000192	0.0048 %	9.998778	10.001222	0.0019 %	0.0074 %	PASS 10.88 %
10.0 V AC+DC @ 100 Hz	10.00016	0.0048 %	9.998798	10.001202	0.0016 %	0.0072 %	PASS 9.25 %
10.0 V AC+DC @ 1.0 kHz	10.00046	0.0048 %	9.998798	10.001202	0.0046 %	0.0072 %	PASS 26.55 %
10.0 V AC+DC @ 10.0 kHz	10.000732	0.0048 %	9.998098	10.001902	0.0073 %	0.0142 %	PASS 24.40 %
10.0 V AC+DC @ 20.0 kHz	10.00058	0.0048 %	9.998098	10.001902	0.0058 %	0.0142 %	PASS 19.34 %
10.0 V AC+DC @ 50.0 kHz	10.000413	0.0085 %	9.996125	10.003875	0.0041 %	0.0302 %	PASS 6.58 %
10.0 V AC+DC @ 100.0 kHz	9.9983414	0.0121 %	9.990766	10.009234	-0.0166 %	0.0802 %	PASS 10.22 %

10.0 V AC+DC @ 300.0 kHz	9.9894472	0.0336 %	9.966536	10.033464	-0.1055 %	0.3010 %	PASS 17.42 %
10.0 V AC+DC @ 500.0 kHz	10.000051	0.1100 %	9.888900	10.111100	0.0005 %	1.0010 %	PASS 0.03 %
10.0 V AC+DC @ 1.0 MHz	10.079488	0.1700 %	9.882900	10.117100	0.7949 %	1.0010 %	PASS 39.14 %
30 V AC+DC @ 10 Hz	30.000306	0.0060 %	29.991795	30.008205	0.0010 %	0.0213 %	PASS 2.30 %
30 V AC+DC @ 20 Hz	29.999884	0.0060 %	29.991795	30.008205	-0.0004 %	0.0213 %	PASS 0.87 %
30 V AC+DC @ 40 Hz	29.999836	0.0060 %	29.991795	30.008205	-0.0005 %	0.0213 %	PASS 1.23 %
30 V AC+DC @ 100 Hz	29.999932	0.0060 %	29.991995	30.008005	-0.0002 %	0.0207 %	PASS 0.53 %
30 V AC+DC @ 1.0 kHz	30.000464	0.0060 %	29.991995	30.008005	0.0015 %	0.0207 %	PASS 3.59 %
30 V AC+DC @ 10.0 kHz	30.001779	0.0060 %	29.991995	30.008005	0.0059 %	0.0207 %	PASS 13.77 %
30 V AC+DC @ 20.0 kHz	30.000143	0.0060 %	29.991995	30.008005	0.0005 %	0.0207 %	PASS 1.10 %
30 V AC+DC @ 50.0 kHz	29.994665	0.0060 %	29.987495	30.012505	-0.0178 %	0.0357 %	PASS 24.58 %
30 V AC+DC @ 100.0 kHz	29.972236	0.0174 %	29.958591	30.041409	-0.0925 %	0.1207 %	PASS 37.96 %
30 V AC+DC @ 300.0 kHz	29.811287	0.0991 %	29.849273	30.150727	-0.6290 %	0.4033 %	PASS 75.73 %
30 V AC+DC @ 500.0 kHz	29.672539	0.5200 %	29.393000	30.607000	-1.0915 %	1.5033 %	PASS 34.31 %
100.0 V AC+DC @ 10 Hz	100.00216	0.0060 %	99.973582	100.026418	0.0022 %	0.0204 %	PASS 5.07 %
100.0 V AC+DC @ 20 Hz	99.999395	0.0060 %	99.973582	100.026418	-0.0006 %	0.0204 %	PASS 1.42 %
100.0 V AC+DC @ 40 Hz	99.999085	0.0060 %	99.973582	100.026418	-0.0009 %	0.0204 %	PASS 2.15 %
100.0 V AC+DC @ 100 Hz	99.999221	0.0060 %	99.973782	100.026218	-0.0008 %	0.0202 %	PASS 1.85 %
100.0 V AC+DC @ 1.0 kHz	100.00183	0.0060 %	99.973782	100.026218	0.0018 %	0.0202 %	PASS 4.35 %
100.0 V AC+DC @ 10.0 kHz	100.00769	0.0060 %	99.973782	100.026218	0.0077 %	0.0202 %	PASS 18.24 %
100.0 V AC+DC @ 20.0 kHz	100.0025	0.0060 %	99.973782	100.026218	0.0025 %	0.0202 %	PASS 5.93 %
100.0 V AC+DC @ 50.0 kHz	99.983637	0.0095 %	99.955255	100.044745	-0.0164 %	0.0352 %	PASS 22.43 %
100.0 V AC+DC @ 100.0 kHz	99.903305	0.0174 %	99.862436	100.137564	-0.0967 %	0.1202 %	PASS 39.81 %
300.0 V AC+DC @ 40 Hz	299.9321	0.0079 %	299.074408	300.925592	-0.0226 %	0.3007 %	PASS 3.76 %
300.0 V AC+DC @ 100 Hz	299.93253	0.0079 %	299.854408	300.145592	-0.0225 %	0.0407 %	PASS 27.15 %
300.0 V AC+DC @ 1.0 kHz	299.94128	0.0079 %	299.854408	300.145592	-0.0196 %	0.0407 %	PASS 23.63 %
300.0 V AC+DC @ 10.0 kHz	299.9689	0.0110 %	299.784865	300.215135	-0.0104 %	0.0607 %	PASS 8.41 %
300.0 V AC+DC @ 20.0 kHz	299.96141	0.0110 %	299.784865	300.215135	-0.0129 %	0.0607 %	PASS 10.43 %
300.0 V AC+DC @ 50.0 kHz	0.42716978	0.0245 %	299.564599	300.435401	-99.8576 %	0.1207 %	FAIL 40552.23 %
300.0 V AC+DC @ 100.0 kHz	300.32175	0.0660 %	298.900000	301.100000	0.1072 %	0.3007 %	PASS 17.42 %
750.0 V AC+DC @ 40 Hz	749.77556	0.0079 %	747.689020	752.310980	-0.0299 %	0.3003 %	PASS 4.98 %
750.0 V AC+DC @ 100 Hz	749.77503	0.0079 %	749.639020	750.360980	-0.0300 %	0.0403 %	PASS 36.56 %
750.0 V AC+DC @ 1.0 kHz	749.8026	0.0079 %	749.639020	750.360980	-0.0263 %	0.0403 %	PASS 32.08 %
750.0 V AC+DC @ 10.0 kHz	749.89586	0.0110 %	749.465162	750.534838	-0.0139 %	0.0603 %	PASS 11.33 %
750.0 V AC+DC @ 20.0 kHz	749.86078	0.0110 %	749.465162	750.534838	-0.0186 %	0.0603 %	PASS 15.15 %
750.0 V AC+DC @ 50.0 kHz	750.08142	0.0245 %	748.914498	751.085502	0.0109 %	0.1203 %	PASS 4.42 %
750.0 V AC+DC @ 50.0 kHz	750.08837	0.0660 %	748.603000	751.397000	0.0118 %	0.1203 %	PASS 4.29 %

Procedure for all test points that verify Gain of the DC current DCI function. Both +/-FS points are tested.
 2-wire connection at LO and DCI is used between DMM and MFC.
 DCI gain range points verify gain of the DC current function, using corrected 24-hour MFC output.

DCI Test	100nA-1A	DUT	Source unc.	Low Limit	Hi limit	Measured	24h spec	Result
Zero µADC	0	-1.2012703E-12						INFO
50 nADC	5E-08	4.9965678E-08						INFO
100 nADC	1E-07	9.9941958E-08	71.82 ppm	9.995282E-08	1.000472E-07	-580.426 ppm	400 ppm	PASS 71.41 %
-100 nADC	-1E-07	-1.0006515E-07	71.82 ppm	-1.000492E-07	-9.995082E-08	651.466 ppm	420 ppm	PASS 76.45 %
-50 nADC	-5E-08	-5.0037373E-08						INFO
Zero µADC	0	-2.4710469E-11						INFO
0.5 µADC	5E-07	4.9994626E-07	71.82 ppm	4.999201E-07	5.000799E-07	-107.484 ppm	88 ppm	PASS 47.31 %
1.0 µADC	1E-06	9.9994514E-07	71.82 ppm	9.998792E-07	1.000121E-06	-54.857 ppm	49 ppm	PASS 31.55 %
-1.0 µADC	-1E-06	-1.000084E-06	71.82 ppm	-1.000123E-06	-9.998772E-07	84.022 ppm	51 ppm	PASS 47.69 %
-0.5 µADC	-5E-07	-5.0013032E-07	71.82 ppm	-5.000819E-07	-4.999181E-07	260.637 ppm	92 ppm	FAIL 111.66 %
Zero 00 µADC	0	-8.4872082E-11						INFO
5 µADC	5E-06	4.9999684E-06	71.82 ppm	4.999522E-06	5.000478E-06	-6.314 ppm	24 ppm	PASS 4.17 %
10 µADC	1E-05	1.0000002E-05	71.82 ppm	9.999113E-06	1.000089E-05	0.151 ppm	17 ppm	PASS 0.10 %
-10 µADC	-1E-05	-1.0000062E-05	71.82 ppm	-1.000089E-05	-9.999111E-06	6.237 ppm	17 ppm	PASS 4.22 %
-5 µADC	-5E-06	-4.9999962E-06	71.82 ppm	-5.00048E-06	-4.99952E-06	-0.766 ppm	24 ppm	PASS 0.51 %
Zero 000 µADC	0	5.1863682E-11						INFO
50 µADC	5E-05	4.9999932E-05	71.82 ppm	4.999531E-05	5.000469E-05	-1.353 ppm	22 ppm	PASS 0.90 %
100 µADC	0.0001	9.9999958E-05	71.82 ppm	9.999122E-05	0.0001000088	-0.424 ppm	16 ppm	PASS 0.29 %
-100 µADC	-0.0001	-0.0001000009	71.82 ppm	-0.0001000088	-9.999122E-05	0.936 ppm	16 ppm	PASS 0.64 %
-50 µADC	-5E-05	-5.0000139E-05	71.82 ppm	-5.000469E-05	-4.999531E-05	2.787 ppm	22 ppm	PASS 1.85 %
Zero mADC	0	9.2800145E-11						INFO
0.5 mADC	0.0005	0.00049999845	33.64 ppm	0.0004999742	0.0005000258	-3.102 ppm	18 ppm	PASS 4.07 %
1.0 mADC	0.001	0.00099999803	33.64 ppm	0.0009999524	0.001000048	-1.969 ppm	14 ppm	PASS 2.70 %
-1.0 mADC	-0.001	-0.0010000003	33.64 ppm	-0.001000048	-0.0009999524	0.329 ppm	14 ppm	PASS 0.45 %
-0.5 mADC	-0.0005	-0.00049999974	33.64 ppm	-0.0005000258	-0.0004999742	-0.518 ppm	18 ppm	PASS 0.68 %
Zero 00 mADC	0	2.6624139E-11						INFO
5 mADC	0.005	0.0049999623	32.27 ppm	0.004999749	0.005000251	-7.531 ppm	18 ppm	PASS 10.19 %
10 mADC	0.01	0.009999954	32.27 ppm	0.009999537	0.01000046	-4.601 ppm	14 ppm	PASS 6.54 %
-10 mADC	-0.01	-0.010000013	32.27 ppm	-0.01000046	-0.009999537	1.264 ppm	14 ppm	PASS 1.80 %
-5 mADC	-0.005	-0.0050000164	32.27 ppm	-0.005000251	-0.004999749	3.280 ppm	18 ppm	PASS 4.44 %
Zero 000 mADC	0	1.4908939E-11						INFO
50 mADC	0.05	0.050000229	53.32 ppm	0.04999568	0.05000432	4.586 ppm	33 ppm	PASS 3.66 %
100 mADC	0.1	0.10000052	53.32 ppm	0.09999177	0.1000082	5.180 ppm	29 ppm	PASS 4.27 %
-100 mADC	-0.1	-0.10000134	53.32 ppm	-0.1000082	-0.09999177	13.407 ppm	29 ppm	PASS 11.04 %
-50 mADC	-0.05	-0.050000786	53.32 ppm	-0.05000432	-0.04999568	15.722 ppm	33 ppm	PASS 12.54 %
Zero ADC	0	5.5777861E-11						INFO
0.5 ADC	0.5	0.49999693	115.22 ppm	0.4998824	0.5001176	-6.150 ppm	120 ppm	PASS 1.85 %

1.0 ADC	1	0.99994807	115.22 ppm	0.9997748	1.000225	-51.929 ppm	110 ppm	PASS 16.30 %
-1.0 ADC	-1	-0.99993472	115.22 ppm	-1.000225	-0.9997748	-65.279 ppm	110 ppm	PASS 20.49 %
-0.5 ADC	-0.5	-0.49998119	115.22 ppm	-0.5001176	-0.4998824	-37.627 ppm	120 ppm	PASS 11.31 %

Procedure for all test points that verify Gain of the AC Current ACI function. Three frequency band points are tested, 50 Hz, 60 Hz and 1 kHz. 2-wire connection at LO and DCI is used between DMM and MFC.

ACI Test	200µA-2A	DUT	Source unc.	Low Limit	Hi limit	Measured	24h spec	Result, % spec
10 µA AC @ 50 Hz	1e-05	1.012134E-05	0.0160 %	-0.0002900076045	0.0003100076045	1.2134 %	3000.0600 %	INFO
100 µA AC @ 50 Hz	0.0001	0.00010003209	0.0160 %	-0.000200076045	0.000400076045	0.0321 %	300.0600 %	PASS 0.01 %
1.0 mA AC @ 50 Hz	0.001	0.0010000024	0.0160 %	0.00099921955	0.00100078045	2.429 ppm	0.0620 %	PASS 0.19 %
10 mA AC @ 50 Hz	0.01	0.009999608	0.0160 %	0.0099921955	0.0100078045	-39.201 ppm	0.0620 %	PASS 3.06 %
100 mA AC @ 50 Hz	0.1	0.099998138	0.0133 %	0.099924682	0.100075318	-18.618 ppm	0.0620 %	PASS 1.47 %
1.0 A AC @ 50 Hz	1.0	1.0001483	0.0133 %	0.99904682	1.00095318	148.329 ppm	0.0820 %	PASS 8.93 %
10 µA AC @ 60 Hz	1e-05	1.0123456E-05	0.0133 %	-0.0002900073318	0.0003100073318	1.2346 %	3000.0600 %	INFO
100 µA AC @ 60 Hz	0.0001	0.00010003363	0.0133 %	-0.000200073318	0.000400073318	0.0336 %	300.0600 %	PASS 0.01 %
1.0 mA AC @ 60 Hz	0.001	0.0010000309	0.0129 %	0.00099925136	0.00100074864	30.944 ppm	0.0620 %	PASS 2.44 %
10 mA AC @ 60 Hz	0.01	0.009999924	0.0129 %	0.0099925136	0.0100074864	-7.596 ppm	0.0620 %	PASS 0.60 %
100 mA AC @ 60 Hz	0.1	0.10000053	0.0288 %	0.099909182	0.100090818	5.253 ppm	0.0620 %	PASS 0.38 %
1.0 A AC @ 60 Hz	1.0	1.0001699	0.0288 %	0.99889182	1.00110818	169.897 ppm	0.0820 %	PASS 9.77 %
10 µA AC @ 1.0 kHz	1e-05	1.0124189E-05	0.0160 %	-0.0002900076045	0.0003100076045	1.2419 %	3000.0600 %	INFO
100 µA AC @ 1.0 kHz	0.0001	0.00010000656	0.0160 %	-0.000200076045	0.000400076045	0.0066 %	300.0600 %	PASS 0.00 %
1.0 mA AC @ 1.0 kHz	0.001	0.0010000744	0.0160 %	0.00099951955	0.00100048045	74.357 ppm	0.0320 %	PASS 10.39 %
10 mA AC @ 1.0 kHz	0.01	0.010000268	0.0160 %	0.0099951955	0.0100048045	26.832 ppm	0.0320 %	PASS 3.75 %
100 mA AC @ 1.0 kHz	0.1	0.10000466	0.0133 %	0.099954682	0.100045318	46.644 ppm	0.0320 %	PASS 6.73 %
1.0 A AC @ 1.0 kHz	1.0	1.0000798	0.0133 %	0.99884682	1.00115318	0.0080 %	0.1020 %	PASS 3.88 %

Test date	18 April 2020 17:48
UUT Internal TEMP?	32.3
Destructive overloads?	162, DESTRUCTIVE OVERLOADS valid 2941

Lab temperature maintained +24°C ±2°C

Internal use only

Not validated