

Manufacturer	HEWLETT-PACKARD	Calibration date	April 17 2020
Model Number	3458A	Ambient Temperature	21.47 °C
Serial	STD2	Relative Humidity	28.15 %
ID Number	Calibration test, GPIB2 unit	Pressure	1016.81
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	4.0 days ago	MFC since DCV ZERO	0.0 days ago
MFC since WBFLAT	19.0 days ago	MFC since WBGAIN	19.0 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	6.95748127061
CAL CONST 13V reference voltage	13.855305491	CAL CONST 22V range positive zero	398.17931
CAL CONST 22V range negative zero	398.17896	CAL CONST DAC Linearity	0.0
CAL CONST 10KOHM true output resistance	9999.80675522	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	1.06 µV	0.75 µV	-0.910 µV	0.910 µV	N/A	0.16 µV	FAIL
Short 0.0 VDC	0.000000E+00	1.04 µV	0.75 µV	-0.900 µV	0.900 µV	N/A	0.15 µV	FAIL
Short 00.0 VDC	0.000000E+00	1.77 µV	0.75 µV	-1.070 µV	1.070 µV	N/A	0.32 µV	FAIL
Short 000.0 VDC	0.000000E+00	22.24 µV	0.75 µV	-14.750 µV	14.750 µV	N/A	14.00 µV	FAIL
Short 0000.0 VDC	0.000000E+00	70.05 µV	0.75 µV	-41.750 µV	41.750 µV	N/A	41.00 µV	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	0.019000015	7.27 ppm	0.018999514	0.019000486	0.798 ppm	18.29 ppm	PASS 2.03 %
0.1 VDC (0.10 Range)	0.1000000	0.09999987	7.27 ppm	0.099998723	0.10000128	-1.299 ppm	5.50 ppm	PASS 7.12 %
0.11 VDC (0.10 Range)	0.1100000	0.10999987	7.27 ppm	0.10999863	0.11000137	-1.197 ppm	5.23 ppm	PASS 6.69 %
-0.019 VDC (0.10 Range)	-0.0190000	-0.018999949	7.27 ppm	-0.019000486	-0.018999514	-2.680 ppm	18.29 ppm	PASS 6.81 %
-0.1 VDC (0.10 Range)	-0.1000000	-0.099999838	7.27 ppm	-0.10000128	-0.099998723	-1.619 ppm	5.50 ppm	PASS 8.88 %
-0.11 VDC (0.10 Range)	-0.1100000	-0.10999985	7.27 ppm	-0.11000137	-0.10999863	-1.401 ppm	5.23 ppm	PASS 7.82 %
0.19 VDC (1.00 Range)	0.1900000	0.1899997	7.27 ppm	0.18999803	0.19000197	-1.602 ppm	3.08 ppm	PASS 10.15 %
1.0 VDC (1.00 Range)	1.0000000	0.99999851	3.86 ppm	0.99999434	1.0000057	-1.489 ppm	1.80 ppm	PASS 17.48 %
1.1 VDC (1.00 Range)	1.1000000	1.0999985	3.86 ppm	1.0999938	1.1000062	-1.363 ppm	1.77 ppm	PASS 16.04 %
-0.19 VDC (1.00 Range)	-0.1900000	-0.18999977	7.27 ppm	-0.19000197	-0.18999803	-1.214 ppm	3.08 ppm	PASS 7.69 %
-1.0 VDC (1.00 Range)	-1.0000000	-0.99999968	3.86 ppm	-1.0000057	-0.99999434	-0.317 ppm	1.80 ppm	PASS 3.72 %
-1.1 VDC (1.00 Range)	-1.1000000	-1.0999994	3.86 ppm	-1.1000062	-1.0999938	-0.517 ppm	1.77 ppm	PASS 6.09 %
1.9 VDC (10.00 Range)	1.9000000	1.899998	3.86 ppm	1.8999912	1.9000088	-1.069 ppm	0.76 ppm	PASS 13.58 %
10.0 VDC (10.00 Range)	10.0000000	9.9999906	2.77 ppm	9.9999668	10.000033	-0.936 ppm	0.55 ppm	PASS 16.57 %
11.0 VDC (10.00 Range)	11.0000000	10.999988	2.73 ppm	10.999964	11.000036	-1.056 ppm	0.55 ppm	PASS 18.97 %
-1.9 VDC (10.00 Range)	-1.9000000	-1.8999978	3.86 ppm	-1.9000088	-1.8999912	-1.147 ppm	0.76 ppm	PASS 14.58 %
-10.0 VDC (10.00 Range)	-10.0000000	-9.9999879	2.77 ppm	-10.000033	-9.9999668	-1.208 ppm	0.55 ppm	PASS 21.39 %
-11.0 VDC (10.00 Range)	-11.0000000	-10.999988	2.73 ppm	-11.000036	-10.999964	-1.092 ppm	0.55 ppm	PASS 19.61 %
19 VDC (100.00 Range)	19.0000000	19.00002	2.77 ppm	18.99987	19.00013	1.057 ppm	4.08 ppm	PASS 10.72 %
100 VDC (100.00 Range)	100.0000000	99.999907	3.73 ppm	99.999347	100.00065	-0.925 ppm	2.80 ppm	PASS 9.92 %
110 VDC (100.00 Range)	110.0000000	109.99988	3.73 ppm	109.99928	110.00072	-1.103 ppm	2.77 ppm	PASS 11.86 %
-19 VDC (100.00 Range)	-19.0000000	-18.999948	2.77 ppm	-19.00013	-18.99987	-2.740 ppm	4.08 ppm	PASS 27.79 %
-100 VDC (100.00 Range)	-100.0000000	-99.999855	3.73 ppm	-100.00065	-99.999347	-1.446 ppm	2.80 ppm	PASS 15.50 %
-110 VDC (100.00 Range)	-110.0000000	-109.99983	3.73 ppm	-110.00072	-109.99928	-1.506 ppm	2.77 ppm	PASS 16.20 %
190 VDC (1000.00 Range)	190.0000000	189.99972	3.73 ppm	189.99872	190.00128	-1.475 ppm	3.03 ppm	PASS 15.35 %
500 VDC (1000.00 Range)	500.0000000	500.00058	3.73 ppm	499.99678	500.00322	1.155 ppm	2.70 ppm	PASS 15.48 %
1000 VDC (1000.00 Range)	1000.0000000	1000.0024	5.45 ppm	999.97995	1000.02	2.374 ppm	2.60 ppm	PASS 9.01 %
-190 VDC (1000.00 Range)	-190.0000000	-189.99989	3.73 ppm	-190.00128	-189.99872	-0.585 ppm	3.03 ppm	PASS 6.09 %
-500 VDC (1000.00 Range)	-500.0000000	-500.00057	3.73 ppm	-500.00322	-499.99678	1.132 ppm	2.70 ppm	PASS 4.50 %
-1000 VDC (1000.00 Range)	-1000.0000000	-1000.0027	5.45 ppm	-1000.02	-999.97995	2.682 ppm	2.60 ppm	PASS 10.17 %

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	0.99977151 Ω	32.0 ppm	9.9972401E-01	9.9985799E-01	-19.496 ppm	35.01 ppm	PASS, 20.55 % of 94.86 ppm
1.9 Ω	1.8998378 Ω	1.8998043 Ω	25.0 ppm	1.8997508E+00	1.8999248E+00	-17.636 ppm	20.79 ppm	PASS, 27.12 % of 65.03 ppm
10 Ω	10.000581 Ω	10.000573 Ω	5.0 ppm	1.0000451E+01	1.0000711E+01	-0.816 ppm	8.00 ppm	PASS, 4.33 % of 18.87 ppm
19 Ω	19.00024 Ω	19.0003 Ω	4.0 ppm	1.8999807E+01	1.9000673E+01	3.176 ppm	18.79 ppm	PASS, 8.27 % of 38.42 ppm
100 Ω	99.9966 Ω	99.996831 Ω	1.7 ppm	9.9995830E+01	9.9997370E+01	2.309 ppm	6.00 ppm	PASS, 18.51 % of 12.47 ppm
190 Ω	189.99379 Ω	189.99427 Ω	1.7 ppm	1.8999289E+02	1.8999469E+02	2.551 ppm	3.05 ppm	PASS, 36.51 % of 6.99 ppm
1.0 kΩ	1000.0256 kΩ	1000.0259 kΩ	1.7 ppm	1.0000217E+03	1.0000295E+03	0.289 ppm	2.20 ppm	PASS, 5.21 % of 5.56 ppm
1.9 kΩ	1899.9011 kΩ	1899.9031 kΩ	1.7 ppm	1.8998921E+03	1.8999101E+03	1.057 ppm	3.05 ppm	PASS, 15.12 % of 6.99 ppm
10 kΩ	9999.8 kΩ	9999.8034 kΩ	1.6 ppm	9.9997620E+03	9.9998380E+03	0.339 ppm	2.20 ppm	PASS, 6.23 % of 5.44 ppm
19 kΩ	18999.283 kΩ	18999.279 kΩ	1.7 ppm	1.8999193E+04	1.8999373E+04	-0.218 ppm	3.05 ppm	PASS, 3.12 % of 6.99 ppm
100 kΩ	99994.81 kΩ	99994.47 kΩ	2.0 ppm	9.9994390E+04	9.9995230E+04	-3.400 ppm	2.20 ppm	PASS, 57.17 % of 5.95 ppm
190 kΩ	189989.23 kΩ	189988.77 kΩ	2.0 ppm	1.8998595E+05	1.8999251E+05	-2.416 ppm	15.26 ppm	PASS, 7.85 % of 30.79 ppm
1.0 MΩ	999983.3 MΩ	999975.46 MΩ	2.5 ppm	9.9996980E+05	9.9999680E+05	-7.839 ppm	11.00 ppm	PASS, 34.75 % of 22.56 ppm
1.9 MΩ	1899980.9 MΩ	1899942.6 MΩ	3.0 ppm	1.8998302E+06	1.9001316E+06	-20.178 ppm	76.32 ppm	PASS, 13.21 % of 152.75 ppm
10 MΩ	9999100 MΩ	9998573.9 MΩ	10.0 ppm	9.9984501E+06	9.9997499E+06	-52.617 ppm	55.00 ppm	PASS, 47.06 % of 111.80 ppm
19 MΩ	18998751 MΩ	18999552 MΩ	20.0 ppm	1.8987872E+07	1.9009630E+07	42.155 ppm	552.64 ppm	PASS, 3.81 % of 1105.99 ppm
100 MΩ	1.0000484E+08 MΩ	1.0000863E+08 MΩ	50.0 ppm	9.9948837E+07	1.0006084E+08	37.912 ppm	510.00 ppm	PASS, 3.70 % 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 -0.0000000 Ω	5.000e-05 Ω	-5e-05	5e-05	N/A	8.0000e-06 Ω	PASS
100 Ω	Range -0.0000324 Ω	5.500e-04 Ω	-0.00055	0.00055	N/A	2.2000e-06 Ω	PASS
1.0 kΩ	Range -0.0000431 Ω	5.500e-03 Ω	-0.0055	0.0055	N/A	2.2000e-06 Ω	PASS
10 kΩ	Range -0.0003774 Ω	5.500e-02 Ω	-0.055	0.055	N/A	2.2000e-06 Ω	PASS
100 kΩ	Range -0.0021557 Ω	5.500e-01 Ω	-0.55	0.55	N/A	2.2000e-06 Ω	PASS
1.0 MΩ	Range 0.2766921 Ω	5.500e+00 Ω	-5.5	5.5	N/A	2.2000e-06 Ω	PASS
10 MΩ	Range 1.9403776 Ω	5.500e+01 Ω	-55	55	N/A	2.2000e-06 Ω	PASS
100 MΩ	Range 2.6590367 Ω	5.500e+02 Ω	-550	550	N/A	2.2000e-06 Ω	PASS
1 GΩ	Range 2.3356403 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 0.2594397 Ω	3.000e-01 Ω	-0.3	0.3	N/A	8.0000e-06 Ω	PASS
100 Ω	Range 0.2593427 Ω	3.500e-01 Ω	-0.35	0.35	N/A	2.2000e-06 Ω	PASS
1.0 kΩ	Range 0.2584706 Ω	4.000e-01 Ω	-0.4	0.4	N/A	2.2000e-06 Ω	PASS
10 kΩ	Range 0.2688669 Ω	4.000e-01 Ω	-0.4	0.4	N/A	2.2000e-06 Ω	PASS
100 kΩ	Range 0.2673125 Ω	5.500e-01 Ω	-0.55	0.55	N/A	2.2000e-06 Ω	PASS
1.0 MΩ	Range 0.6288449 Ω	5.500e+00 Ω	-5.5	5.5	N/A	2.2000e-06 Ω	PASS
10 MΩ	Range 3.3417554 Ω	5.500e+01 Ω	-55	55	N/A	2.2000e-06 Ω	PASS
100 MΩ	Range 3.5573537 Ω	5.500e+02 Ω	-550	550	N/A	2.2000e-06 Ω	PASS
1 GΩ	Range 3.5214209 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	0.01000045	0.0312 %	-0.290006	0.310006	0.0045 %	3000.0300 %	PASS 0.00 %
0.01 V AC+DC @ 20 Hz	0.010000269	0.0312 %	-0.290006	0.310006	0.0027 %	3000.0300 %	PASS 0.00 %
0.01 V AC+DC @ 40 Hz	0.010000045	0.0312 %	-0.290006	0.310006	0.0004 %	3000.0300 %	PASS 0.00 %
0.01 V AC+DC @ 100 Hz	0.01000014	0.0312 %	-0.100005	0.120005	0.0014 %	1100.0200 %	PASS 0.00 %
0.01 V AC+DC @ 1.0 kHz	0.010000252	0.0312 %	-0.100005	0.120005	0.0025 %	1100.0200 %	PASS 0.00 %
0.01 V AC+DC @ 10.0 kHz	0.010002045	0.0312 %	-0.100006	0.120006	0.0204 %	1100.0300 %	PASS 0.00 %
0.01 V AC+DC @ 20.0 kHz	0.010000949	0.0312 %	-0.100006	0.120006	0.0095 %	1100.0300 %	PASS 0.00 %
0.01 V AC+DC @ 50.0 kHz	0.0099990835	0.0447 %	-0.100014	0.120014	-0.0092 %	1100.1000 %	PASS 0.00 %
0.01 V AC+DC @ 100.0 kHz	0.0099809072	0.0773 %	-0.100058	0.120058	-0.1909 %	1100.5000 %	PASS 0.01 %
0.01 V AC+DC @ 300.0 kHz	0.0098383179	0.1500 %	-0.190055	0.210055	-1.6168 %	2000.4000 %	PASS 0.04 %
0.01 V AC+DC @ 500.0 kHz	0.0096206628	0.2500 %	-0.490070	0.510070	-3.7934 %	5000.4500 %	PASS 0.04 %
0.01 V AC+DC @ 1.0 MHz	0.0087586955	0.4000 %	-0.490085	0.510085	-12.4130 %	5000.4500 %	PASS 0.12 %
0.03 V AC+DC @ 10 Hz	0.030028629	0.0121 %	0.029994	0.030006	0.0954 %	0.0083 %	FAIL 324.11 %
0.03 V AC+DC @ 20 Hz	0.030028255	0.0121 %	0.029994	0.030006	0.0942 %	0.0083 %	FAIL 319.88 %
0.03 V AC+DC @ 40 Hz	0.030027439	0.0121 %	0.029994	0.030006	0.0915 %	0.0083 %	FAIL 310.64 %
0.03 V AC+DC @ 100 Hz	0.030028463	0.0121 %	0.029994	0.030006	0.0949 %	0.0077 %	FAIL 330.47 %
0.03 V AC+DC @ 1.0 kHz	0.03002822	0.0121 %	0.029994	0.030006	0.0941 %	0.0077 %	FAIL 327.65 %
0.03 V AC+DC @ 10.0 kHz	0.030029894	0.0121 %	0.029992	0.030008	0.0996 %	0.0147 %	FAIL 261.72 %
0.03 V AC+DC @ 20.0 kHz	0.030026268	0.0121 %	0.029992	0.030008	0.0876 %	0.0147 %	FAIL 229.98 %
0.03 V AC+DC @ 50.0 kHz	0.030030368	0.0256 %	0.029983	0.030017	0.1012 %	0.0307 %	FAIL 126.63 %
0.03 V AC+DC @ 100.0 kHz	0.030017178	0.0591 %	0.029958	0.030042	0.0573 %	0.0807 %	PASS 28.63 %
0.03 V AC+DC @ 300.0 kHz	0.029958193	0.0964 %	0.029880	0.030120	-0.1394 %	0.3033 %	PASS 21.89 %
0.03 V AC+DC @ 500.0 kHz	0.029907779	0.1500 %	0.029654	0.030346	-0.3074 %	1.0033 %	PASS 15.15 %
0.03 V AC+DC @ 1.0 MHz	0.02985644	0.3000 %	0.029609	0.030391	-0.4785 %	1.0033 %	PASS 22.85 %
0.1 V AC+DC @ 10 Hz	0.10000276	0.0121 %	0.099980	0.100020	0.0028 %	0.0074 %	PASS 9.71 %
0.1 V AC+DC @ 20 Hz	0.10000041	0.0121 %	0.099980	0.100020	0.0004 %	0.0074 %	PASS 1.46 %
0.1 V AC+DC @ 40 Hz	0.10000044	0.0121 %	0.099980	0.100020	0.0004 %	0.0074 %	PASS 1.54 %
0.1 V AC+DC @ 100 Hz	0.099999049	0.0121 %	0.099981	0.100019	-0.0010 %	0.0072 %	PASS 3.37 %
0.1 V AC+DC @ 1.0 kHz	0.10000339	0.0121 %	0.099981	0.100019	0.0034 %	0.0072 %	PASS 12.00 %
0.1 V AC+DC @ 10.0 kHz	0.10000306	0.0121 %	0.099974	0.100026	0.0031 %	0.0142 %	PASS 8.18 %
0.1 V AC+DC @ 20.0 kHz	0.099997605	0.0121 %	0.099974	0.100026	-0.0024 %	0.0142 %	PASS 6.41 %
0.1 V AC+DC @ 50.0 kHz	0.099998786	0.0256 %	0.099944	0.100056	-0.0012 %	0.0302 %	PASS 1.53 %
0.1 V AC+DC @ 100.0 kHz	0.099962491	0.0591 %	0.099861	0.100139	-0.0375 %	0.0802 %	PASS 18.83 %
0.1 V AC+DC @ 300.0 kHz	0.099767055	0.0964 %	0.099603	0.100397	-0.2329 %	0.3010 %	PASS 36.85 %
0.1 V AC+DC @ 500.0 kHz	0.099593338	0.1500 %	0.098849	0.101151	-0.4067 %	1.0010 %	PASS 20.09 %
0.1 V AC+DC @ 1.0 MHz	0.099420266	0.3000 %	0.098699	0.101301	-0.5797 %	1.0010 %	PASS 27.74 %
0.3 V AC+DC @ 10 Hz	0.30000911	0.0050 %	0.299960	0.300040	0.0030 %	0.0083 %	PASS 15.66 %
0.3 V AC+DC @ 20 Hz	0.30000661	0.0050 %	0.299960	0.300040	0.0022 %	0.0083 %	PASS 11.36 %

0.3 V AC+DC @ 40 Hz	0.30000018	0.0050 %	0.299960	0.300040	0.0001 %	0.0083 %	PASS 0.30 %
0.3 V AC+DC @ 100 Hz	0.30000034	0.0050 %	0.299962	0.300038	0.0001 %	0.0077 %	PASS 0.63 %
0.3 V AC+DC @ 1.0 kHz	0.30000497	0.0050 %	0.299962	0.300038	0.0017 %	0.0077 %	PASS 9.08 %
0.3 V AC+DC @ 10.0 kHz	0.29999521	0.0050 %	0.299941	0.300059	-0.0016 %	0.0147 %	PASS 5.16 %
0.3 V AC+DC @ 20.0 kHz	0.2999772	0.0050 %	0.299941	0.300059	-0.0076 %	0.0147 %	PASS 24.54 %
0.3 V AC+DC @ 50.0 kHz	0.30001054	0.0085 %	0.299882	0.300118	0.0035 %	0.0307 %	PASS 5.52 %
0.3 V AC+DC @ 100.0 kHz	0.30004125	0.0138 %	0.299717	0.300283	0.0137 %	0.0807 %	PASS 8.40 %
0.3 V AC+DC @ 300.0 kHz	0.30030044	0.0425 %	0.298962	0.301038	0.1001 %	0.3033 %	PASS 16.35 %
0.3 V AC+DC @ 500.0 kHz	0.30079559	0.1100 %	0.296660	0.303340	0.2652 %	1.0033 %	PASS 13.14 %
0.3 V AC+DC @ 1.0 MHz	0.30201978	0.1800 %	0.296450	0.303550	0.6733 %	1.0033 %	PASS 33.02 %
1.0 V AC+DC @ 10 Hz	1.0000064	0.0050 %	0.999876	1.000124	0.0006 %	0.0074 %	PASS 3.60 %
1.0 V AC+DC @ 20 Hz	0.99997837	0.0050 %	0.999876	1.000124	-0.0022 %	0.0074 %	PASS 12.14 %
1.0 V AC+DC @ 40 Hz	0.99997472	0.0050 %	0.999876	1.000124	-0.0025 %	0.0074 %	PASS 14.19 %
1.0 V AC+DC @ 100 Hz	0.99996785	0.0050 %	0.999878	1.000122	-0.0032 %	0.0072 %	PASS 18.39 %
1.0 V AC+DC @ 1.0 kHz	0.99998717	0.0050 %	0.999878	1.000122	-0.0013 %	0.0072 %	PASS 7.34 %
1.0 V AC+DC @ 10.0 kHz	0.99994142	0.0050 %	0.999808	1.000192	-0.0059 %	0.0142 %	PASS 19.47 %
1.0 V AC+DC @ 20.0 kHz	0.99991202	0.0050 %	0.999808	1.000192	-0.0088 %	0.0142 %	PASS 29.25 %
1.0 V AC+DC @ 50.0 kHz	0.99998369	0.0085 %	0.999613	1.000387	-0.0016 %	0.0302 %	PASS 2.60 %
1.0 V AC+DC @ 100.0 kHz	1.0000307	0.0138 %	0.999060	1.000940	0.0031 %	0.0802 %	PASS 1.89 %
1.0 V AC+DC @ 300.0 kHz	1.0009826	0.0425 %	0.996565	1.003435	0.0983 %	0.3010 %	PASS 16.16 %
1.0 V AC+DC @ 500.0 kHz	1.0026212	0.1100 %	0.988890	1.011110	0.2621 %	1.0010 %	PASS 13.01 %
1.0 V AC+DC @ 1.0 MHz	1.0068634	0.1800 %	0.988190	1.011810	0.6863 %	1.0010 %	PASS 33.74 %
3.0 V AC+DC @ 10 Hz	3.0001637	0.0048 %	2.999605	3.000395	0.0055 %	0.0083 %	PASS 28.34 %
3.0 V AC+DC @ 20 Hz	3.0000816	0.0048 %	2.999605	3.000395	0.0027 %	0.0083 %	PASS 14.12 %
3.0 V AC+DC @ 40 Hz	3.0000577	0.0048 %	2.999605	3.000395	0.0019 %	0.0083 %	PASS 9.99 %
3.0 V AC+DC @ 100 Hz	3.0000629	0.0048 %	2.999625	3.000375	0.0021 %	0.0077 %	PASS 11.59 %
3.0 V AC+DC @ 1.0 kHz	3.0000994	0.0048 %	2.999625	3.000375	0.0033 %	0.0077 %	PASS 18.29 %
3.0 V AC+DC @ 10.0 kHz	2.9999628	0.0048 %	2.999415	3.000585	-0.0012 %	0.0147 %	PASS 4.02 %
3.0 V AC+DC @ 20.0 kHz	2.9999548	0.0048 %	2.999415	3.000585	-0.0015 %	0.0147 %	PASS 4.88 %
3.0 V AC+DC @ 50.0 kHz	2.999977	0.0085 %	2.998824	3.001176	-0.0008 %	0.0307 %	PASS 1.20 %
3.0 V AC+DC @ 100.0 kHz	2.9992274	0.0121 %	2.997216	3.002784	-0.0258 %	0.0807 %	PASS 15.79 %
3.0 V AC+DC @ 300.0 kHz	2.9958864	0.0336 %	2.989891	3.010109	-0.1371 %	0.3033 %	PASS 22.46 %
3.0 V AC+DC @ 500.0 kHz	2.9988624	0.1100 %	2.966600	3.033400	-0.0379 %	1.0033 %	PASS 1.88 %
3.0 V AC+DC @ 1.0 MHz	3.0167887	0.1700 %	2.964800	3.035200	0.5596 %	1.0033 %	PASS 27.50 %
10.0 V AC+DC @ 10 Hz	10.000301	0.0048 %	9.998778	10.001222	0.0030 %	0.0074 %	PASS 17.06 %
10.0 V AC+DC @ 20 Hz	10.000097	0.0048 %	9.998778	10.001222	0.0010 %	0.0074 %	PASS 5.48 %
10.0 V AC+DC @ 40 Hz	10.000027	0.0048 %	9.998778	10.001222	0.0003 %	0.0074 %	PASS 1.51 %
10.0 V AC+DC @ 100 Hz	9.9999806	0.0048 %	9.998798	10.001202	-0.0002 %	0.0072 %	PASS 1.12 %
10.0 V AC+DC @ 1.0 kHz	10.000146	0.0048 %	9.998798	10.001202	0.0015 %	0.0072 %	PASS 8.45 %
10.0 V AC+DC @ 10.0 kHz	9.9997221	0.0048 %	9.998098	10.001902	-0.0028 %	0.0142 %	PASS 9.27 %
10.0 V AC+DC @ 20.0 kHz	9.9996781	0.0048 %	9.998098	10.001902	-0.0032 %	0.0142 %	PASS 10.73 %
10.0 V AC+DC @ 50.0 kHz	9.9995558	0.0085 %	9.996125	10.003875	-0.0044 %	0.0302 %	PASS 7.08 %
10.0 V AC+DC @ 100.0 kHz	9.9965969	0.0121 %	9.990766	10.009234	-0.0340 %	0.0802 %	PASS 20.98 %

10.0 V AC+DC @ 300.0 kHz	9.9861275	0.0336 %	9.966536	10.033464	-0.1387 %	0.3010 %	PASS 22.90 %
10.0 V AC+DC @ 500.0 kHz	9.9957059	0.1100 %	9.888900	10.111100	-0.0429 %	1.0010 %	PASS 2.13 %
10.0 V AC+DC @ 1.0 MHz	10.056696	0.1700 %	9.882900	10.117100	0.5670 %	1.0010 %	PASS 27.92 %
30 V AC+DC @ 10 Hz	30.000283	0.0060 %	29.991795	30.008205	0.0009 %	0.0213 %	PASS 2.13 %
30 V AC+DC @ 20 Hz	29.999917	0.0060 %	29.991795	30.008205	-0.0003 %	0.0213 %	PASS 0.63 %
30 V AC+DC @ 40 Hz	29.999807	0.0060 %	29.991795	30.008205	-0.0006 %	0.0213 %	PASS 1.45 %
30 V AC+DC @ 100 Hz	29.999643	0.0060 %	29.991995	30.008005	-0.0012 %	0.0207 %	PASS 2.76 %
30 V AC+DC @ 1.0 kHz	30.000109	0.0060 %	29.991995	30.008005	0.0004 %	0.0207 %	PASS 0.85 %
30 V AC+DC @ 10.0 kHz	29.99935	0.0060 %	29.991995	30.008005	-0.0022 %	0.0207 %	PASS 5.03 %
30 V AC+DC @ 20.0 kHz	29.998591	0.0060 %	29.991995	30.008005	-0.0047 %	0.0207 %	PASS 10.91 %
30 V AC+DC @ 50.0 kHz	29.99953	0.0060 %	29.987495	30.012505	-0.0016 %	0.0357 %	PASS 2.17 %
30 V AC+DC @ 100.0 kHz	29.994603	0.0174 %	29.958591	30.041409	-0.0180 %	0.1207 %	PASS 7.38 %
30 V AC+DC @ 300.0 kHz	29.990705	0.0991 %	29.849273	30.150727	-0.0310 %	0.4033 %	PASS 3.73 %
30 V AC+DC @ 500.0 kHz	30.024907	0.5200 %	29.393000	30.607000	0.0830 %	1.5033 %	PASS 2.61 %
100.0 V AC+DC @ 10 Hz	99.99954	0.0060 %	99.973582	100.026418	-0.0005 %	0.0204 %	PASS 1.08 %
100.0 V AC+DC @ 20 Hz	99.997656	0.0060 %	99.973582	100.026418	-0.0023 %	0.0204 %	PASS 5.51 %
100.0 V AC+DC @ 40 Hz	99.997171	0.0060 %	99.973582	100.026418	-0.0028 %	0.0204 %	PASS 6.65 %
100.0 V AC+DC @ 100 Hz	99.996646	0.0060 %	99.973782	100.026218	-0.0034 %	0.0202 %	PASS 7.96 %
100.0 V AC+DC @ 1.0 kHz	99.99829	0.0060 %	99.973782	100.026218	-0.0017 %	0.0202 %	PASS 4.06 %
100.0 V AC+DC @ 10.0 kHz	99.997323	0.0060 %	99.973782	100.026218	-0.0027 %	0.0202 %	PASS 6.35 %
100.0 V AC+DC @ 20.0 kHz	99.994502	0.0060 %	99.973782	100.026218	-0.0055 %	0.0202 %	PASS 13.04 %
100.0 V AC+DC @ 50.0 kHz	99.995777	0.0095 %	99.955255	100.044745	-0.0042 %	0.0352 %	PASS 5.79 %
100.0 V AC+DC @ 100.0 kHz	99.974928	0.0174 %	99.862436	100.137564	-0.0251 %	0.1202 %	PASS 10.32 %
300.0 V AC+DC @ 40 Hz	300.00405	0.0079 %	299.074408	300.925592	0.0014 %	0.3007 %	PASS 0.22 %
300.0 V AC+DC @ 100 Hz	300.00297	0.0079 %	299.854408	300.145592	0.0010 %	0.0407 %	PASS 1.20 %
300.0 V AC+DC @ 1.0 kHz	300.00673	0.0079 %	299.854408	300.145592	0.0022 %	0.0407 %	PASS 2.71 %
300.0 V AC+DC @ 10.0 kHz	299.99954	0.0110 %	299.784865	300.215135	-0.0002 %	0.0607 %	PASS 0.13 %
300.0 V AC+DC @ 20.0 kHz	299.99377	0.0110 %	299.784865	300.215135	-0.0021 %	0.0607 %	PASS 1.68 %
300.0 V AC+DC @ 50.0 kHz	300.14781	0.0245 %	299.564599	300.435401	0.0493 %	0.1207 %	PASS 20.01 %
300.0 V AC+DC @ 100.0 kHz	300.53962	0.0660 %	298.900000	301.100000	0.1799 %	0.3007 %	PASS 29.22 %
750.0 V AC+DC @ 40 Hz	750.03999	0.0079 %	747.689020	752.310980	0.0053 %	0.3003 %	PASS 0.89 %
750.0 V AC+DC @ 100 Hz	750.0355	0.0079 %	749.639020	750.360980	0.0047 %	0.0403 %	PASS 5.77 %
750.0 V AC+DC @ 1.0 kHz	750.04322	0.0079 %	749.639020	750.360980	0.0058 %	0.0403 %	PASS 7.02 %
750.0 V AC+DC @ 10.0 kHz	749.99503	0.0110 %	749.465162	750.534838	-0.0007 %	0.0603 %	PASS 0.54 %
750.0 V AC+DC @ 20.0 kHz	749.9568	0.0110 %	749.465162	750.534838	-0.0058 %	0.0603 %	PASS 4.70 %
750.0 V AC+DC @ 50.0 kHz	750.30699	0.0245 %	748.914498	751.085502	0.0409 %	0.1203 %	PASS 16.68 %
750.0 V AC+DC @ 50.0 kHz	750.30197	0.0660 %	748.603000	751.397000	0.0403 %	0.1203 %	PASS 14.67 %

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	1.6877608E-11						INFO
50 nADC	5E-08	5.0067478E-08						INFO
100 nADC	1E-07	1.0000627E-07	71.82 ppm	9.995282E-08	1.000472E-07	62.690 ppm	400 ppm	PASS 7.71 %
-100 nADC	-1E-07	-9.9938214E-08	71.82 ppm	-1.000492E-07	-9.995082E-08	-617.863 ppm	420 ppm	PASS 72.50 %
-50 nADC	-5E-08	-4.9939928E-08						INFO
Zero µADC	0	2.6371262E-11						INFO
0.5 µADC	5E-07	5.0001159E-07	71.82 ppm	4.999201E-07	5.000799E-07	23.170 ppm	88 ppm	PASS 10.20 %
1.0 µADC	1E-06	1.0000123E-06	71.82 ppm	9.998792E-07	1.000121E-06	12.323 ppm	49 ppm	PASS 7.09 %
-1.0 µADC	-1E-06	-9.9995819E-07	71.82 ppm	-1.000123E-06	-9.998772E-07	-41.811 ppm	51 ppm	PASS 23.73 %
-0.5 µADC	-5E-07	-4.9991772E-07	71.82 ppm	-5.000819E-07	-4.999181E-07	-164.567 ppm	92 ppm	PASS 70.50 %
Zero 00 µADC	0	8.5410827E-11						INFO
5 µADC	5E-06	4.9999641E-06	71.82 ppm	4.999522E-06	5.000478E-06	-7.186 ppm	24 ppm	PASS 4.75 %
10 µADC	1E-05	9.999916E-06	71.82 ppm	9.999113E-06	1.000089E-05	-0.844 ppm	17 ppm	PASS 0.57 %
-10 µADC	-1E-05	-9.999936E-06	71.82 ppm	-1.000089E-05	-9.999111E-06	-6.400 ppm	17 ppm	PASS 4.33 %
-5 µADC	-5E-06	-4.9999313E-06	71.82 ppm	-5.00048E-06	-4.99952E-06	-13.746 ppm	24 ppm	PASS 9.07 %
Zero 000 µADC	0	4.4079284E-11						INFO
50 µADC	5E-05	4.99999E-05	71.82 ppm	4.999531E-05	5.000469E-05	-2.002 ppm	22 ppm	PASS 1.33 %
100 µADC	0.0001	9.9999742E-05	71.82 ppm	9.999122E-05	0.0001000088	-2.584 ppm	16 ppm	PASS 1.76 %
-100 µADC	-0.0001	-9.9999694E-05	71.82 ppm	-0.0001000088	-9.999122E-05	-3.059 ppm	16 ppm	PASS 2.08 %
-50 µADC	-5E-05	-4.9999798E-05	71.82 ppm	-5.000469E-05	-4.999531E-05	-4.032 ppm	22 ppm	PASS 2.68 %
Zero mADC	0	9.8904257E-11						INFO
0.5 mADC	0.0005	0.00049999663	33.64 ppm	0.0004999742	0.0005000258	-6.741 ppm	18 ppm	PASS 8.83 %
1.0 mADC	0.001	0.00099999424	33.64 ppm	0.0009999524	0.001000048	-5.764 ppm	14 ppm	PASS 7.91 %
-1.0 mADC	-0.001	-0.00099999695	33.64 ppm	-0.001000048	-0.0009999524	-3.052 ppm	14 ppm	PASS 4.19 %
-0.5 mADC	-0.0005	-0.00049999887	33.64 ppm	-0.0005000258	-0.0004999742	-2.257 ppm	18 ppm	PASS 2.96 %
Zero 00 mADC	0	8.8533698E-11						INFO
5 mADC	0.005	0.0049999428	32.27 ppm	0.004999749	0.005000251	-11.432 ppm	18 ppm	PASS 15.47 %
10 mADC	0.01	0.009999914	32.27 ppm	0.009999537	0.01000046	-8.603 ppm	14 ppm	PASS 12.23 %
-10 mADC	-0.01	-0.0099999744	32.27 ppm	-0.01000046	-0.009999537	-2.560 ppm	14 ppm	PASS 3.64 %
-5 mADC	-0.005	-0.0049999946	32.27 ppm	-0.005000251	-0.004999749	-1.073 ppm	18 ppm	PASS 1.45 %
Zero 000 mADC	0	7.6808505E-11						INFO
50 mADC	0.05	0.050000187	53.32 ppm	0.04999568	0.05000432	3.734 ppm	33 ppm	PASS 2.98 %
100 mADC	0.1	0.099998751	53.32 ppm	0.09999177	0.1000082	-12.492 ppm	29 ppm	PASS 10.29 %
-100 mADC	-0.1	-0.099999276	53.32 ppm	-0.1000082	-0.09999177	-7.237 ppm	29 ppm	PASS 5.96 %
-50 mADC	-0.05	-0.050000035	53.32 ppm	-0.05000432	-0.04999568	0.708 ppm	33 ppm	PASS 0.56 %
Zero ADC	0	1.7805652E-10						INFO
0.5 ADC	0.5	0.49999438	115.22 ppm	0.4998824	0.5001176	-11.244 ppm	120 ppm	PASS 3.38 %

1.0 ADC	1	0.99998467	115.22 ppm	0.9997748	1.000225	-15.326 ppm	110 ppm	PASS 4.81 %
-1.0 ADC	-1	-0.99998241	115.22 ppm	-1.000225	-0.9997748	-17.594 ppm	110 ppm	PASS 5.52 %
-0.5 ADC	-0.5	-0.49999118	115.22 ppm	-0.5001176	-0.4998824	-17.647 ppm	120 ppm	PASS 5.30 %

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	1.0085434E-05	0.0160 %	-0.0002900076045	0.0003100076045	0.8543 %	3000.0600 %	INFO
100 µA AC @ 50 Hz	0.0001	0.00010002263	0.0160 %	-0.000200076045	0.000400076045	0.0226 %	300.0600 %	PASS 0.00 %
1.0 mA AC @ 50 Hz	0.001	0.0010000656	0.0160 %	0.00099921955	0.00100078045	65.645 ppm	0.0620 %	PASS 5.13 %
10 mA AC @ 50 Hz	0.01	0.010000374	0.0160 %	0.0099921955	0.0100078045	37.351 ppm	0.0620 %	PASS 2.92 %
100 mA AC @ 50 Hz	0.1	0.10000779	0.0133 %	0.099924682	0.100075318	77.866 ppm	0.0620 %	PASS 6.14 %
1.0 A AC @ 50 Hz	1.0	1.0002456	0.0133 %	0.99904682	1.00095318	245.558 ppm	0.0820 %	PASS 14.78 %
10 µA AC @ 60 Hz	1e-05	1.0084937E-05	0.0133 %	-0.0002900073318	0.0003100073318	0.8494 %	3000.0600 %	INFO
100 µA AC @ 60 Hz	0.0001	0.00010002243	0.0133 %	-0.000200073318	0.000400073318	0.0224 %	300.0600 %	PASS 0.00 %
1.0 mA AC @ 60 Hz	0.001	0.0010000978	0.0129 %	0.00099925136	0.00100074864	97.841 ppm	0.0620 %	PASS 7.73 %
10 mA AC @ 60 Hz	0.01	0.010000699	0.0129 %	0.0099925136	0.0100074864	69.901 ppm	0.0620 %	PASS 5.52 %
100 mA AC @ 60 Hz	0.1	0.10001135	0.0288 %	0.099909182	0.100090818	113.497 ppm	0.0620 %	PASS 8.30 %
1.0 A AC @ 60 Hz	1.0	1.0002609	0.0288 %	0.99889182	1.00110818	260.933 ppm	0.0820 %	PASS 15.01 %
10 µA AC @ 1.0 kHz	1e-05	1.0084537E-05	0.0160 %	-0.0002900076045	0.0003100076045	0.8454 %	3000.0600 %	INFO
100 µA AC @ 1.0 kHz	0.0001	9.9994536E-05	0.0160 %	-0.000200076045	0.000400076045	-0.0055 %	300.0600 %	PASS 0.00 %
1.0 mA AC @ 1.0 kHz	0.001	0.0010001475	0.0160 %	0.00099951955	0.00100048045	147.542 ppm	0.0320 %	PASS 20.61 %
10 mA AC @ 1.0 kHz	0.01	0.010001155	0.0160 %	0.0099951955	0.0100048045	115.491 ppm	0.0320 %	PASS 16.13 %
100 mA AC @ 1.0 kHz	0.1	0.10001646	0.0133 %	0.099954682	0.100045318	164.637 ppm	0.0320 %	PASS 23.75 %
1.0 A AC @ 1.0 kHz	1.0	1.0001488	0.0133 %	0.99884682	1.00115318	0.0149 %	0.1020 %	PASS 7.23 %

Test date	17 April 2020 18:52
UUT Internal TEMP?	35.5
Destructive overloads?	320, DESTRUCTIVE OVERLOADS valid 2941

Lab temperature maintained +24°C ±2°C

Internal use only

Not validated