cal equipment

Keysight 3458A RoHS

Manufacturer	HEWLETT-PACKARD	Calibration date	February 25 2021
Model Number	3458A	Ambient Temperature	23.37 °C
Serial	ROHS15 meter	Relative Humidity	27.45 %
ID Number	STD Calibration test, GPIB15 unit	Pressure	1004.33
Notes	Test front spade cables	Test type	Front terminals

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

MFC last calibrated	80.0 days ago	MFC since DCV ZERO	1.0 days ago
MFC since WBFLAT	12113.0 days ago	MFC since WBGAIN	5270.0 days ago
MFC Confidence level	**24h 95% REL**	MFC Calibrate date	2020-11-12 00:00:00
MFC Calibrate date Zero	Debug	Calibrate date WB Flatness	1988-10-01 00:00:00
Calibrate date WB Gain	Debug	CAL CONST 6.5V reference voltage	6.91958636377
CAL CONST 13V reference voltage	13.8237896968	CAL CONST 22V range positive zero	398.17439
CAL CONST 22V range negative zero	398.1738	CAL CONST DAC Linearity	0.316817603263
CAL CONST 10KOHM true output resistance	9999.90542845	CAL CONST 10KOHM standard resistance	9998.84909801
CAL CONST, Zero calibration temperature	23.0	CAL CONST, All calibration temp	23.0
Booster type	VB5725,IB5725	Current output posts	AUX
Calibrate date 5725A AMP	1988-10-01 00:00:00	Calibrated days ago	2013-12-01 00:00:00
CAL CONST, Amp ACAL temperature	23.0	CAL CONST, Amp CalCheck temperature	23.0

Total uncertainty of each calibration point calculated with RSS

$$U_{95\%} = \sqrt{U_{SRC}{}^2 + U_{DUT}{}^2} * 2$$

Meter Info	HP3458A	Last calibration date	7/24/2018
CALSTR?	"PASS 55 MY59350898"	Test date	25 February 2021 22:03
DUT Internal TEMP?	32.3	DUT Calibrations number?	1
Self-test result?	0,"NO ERROR"	ACAL ALL result?	0,"NO ERROR"
Firmware	9,2	Options	1,0
CAL? 72	0.987399046	CAL? 1,1	39987.7394
CAL? 2,1	7.10805565	CAL? Res 73	0.98722338

CAL 0 TEMP	34.43	CAL 10V TEMP	34.07
CAL 10KOhm TEMP	34.07	CAL? DCI	0.98777679

Service information

CAL DUMP
[(1, 39987.7394), (1, 7.10805565), (1, -8.05442231e-06), (1, -8.70201566e-06), (1, -8.17233617e-06), (1, -8.6833162e-06), (1, -8.48009008e-06), (1, -8.78136196e-06), (1, -9.1978629e-05), (1, -9.1978629e-05), (1, -0.000112974301), (1, -0.000112974301), (1, 0.614482398), (1, 0.607038882), (1, 0.606917284), (1, 0.53107924), (1, 0.43873355), (1, -1.12353369), (1, -16.8552701), (1, -16.6756402), (1, -16.6756402), (1, 0.612721109), (1, 0.604869128), (1, 0.604770215), (1, 0.524795063), (1, 0.433165941), (1, -1.14750241), (1, -17.6037279), (1, -17.6636045), (1, -17.6636045), (1, 0.000127157062), (1, 0.00114920936), (1, 0.00104546502), (1, 0.0117824395), (1, 0.0185586956), (1, 0.137820133), (1, 2.1256202), (1, 2.24537345), (1, 2.24537345), (1, 0.000108184269), (1, 0.00108278994), (1, 0.00101037106), (1, 0.00891457519), (1, 0.0150564901), (1, 0.170777121), (1, 1.70648382), (1, 1.43703901), (1, 1.43703901), (1, 616.0), (1, 60.0), (1, 6.0), (1, 0.0), (1, 0.0), (1, 0.0), (1, 0.0), (1, 0.0), (1, 0.0), (1, 0.0), (1, 34.4256104), (1, 34.0662667), (1, 34.0742283), (1, 126.0), (1, -1.74233995e-11), (1, -3.05220706e-11), (1, -1.39258336e-10), (1, -9.20295211e-10), (1, -6.67336454e-09), (1, -6.71820359e-08), (1, -6.218338e-07), (1, -6.39822168e-06), (1, 0.986942459), (1, 0.987438821), (1, 0.987399046), (1, 0.98722338), (1, 0.987183613), (1, 0.998014084), (1, 0.997759251), (1, 0.998261053), (1, 1.00002081), (1, 0.999621724), (1, 1.0005407), (1, 0.999786453), (1, 0.999786453), (1, 0.999786453), (1, 0.998014085), (1, 0.997759262), (1, 0.998261063), (1, 1.00002084), (1, 0.999621928), (1, 1.0005407), (1, 0.999786453), (1, 0.999786453), (1, 0.999786453), (1, 0.98777679), (1, 0.987264815), (1, 0.986893674), (1, 0.986757921), (1, 0.986325942), (1, 0.984334754), (1, 0.979683949), (1, 0.986981679), (1, 45.0), (1, 53.0), (1, 4.93705756), (1, 9.99508271e-12), (1, -7.32925333e-12), (1, 10003870.4), (1, 0.00401360082), (1, -0.00122178481), (1, 0.999999613), (1, 1.00000005), (1, 1666.99653), (1, 16666.9907), (1, 5115.0), (1, 5113.0), (1, 5113.0), (1, 5114.0), (1, 5114.0), (1, 61380.0), (1, 61356.0), (1, 61356.0), (1, 61368.0), (1, 61368.0), (1, 5019.0), (1, 5020.0), (1, 5017.0), (1, 5009.0), (1, 2505.0), (1, 2503.0), (1, 2505.0), (1, 12525.0), (1, 22774.0), (1, 60228.0), (1, 60240.0), (1, 60204.0), (1, 60108.0), (1, 30060.0), (1, 30036.0), (1, 30060.0), (1, 150300.0), (1, 273288.0), (1, 5019.0), (1, 5020.0), (1, 5017.0), (1, 5009.0), (1, 2505.0), (1, 2503.0), (1, 2505.0), (1, 12525.0), (1, 22774.0), (1, 60228.0), (1, 60240.0), (1, 60204.0), (1, 60108.0), (1, 30060.0), (1, 30036.0), (1, 30060.0), (1, 150300.0), (1, 273288.0), (1, 278.0), (1, 278.0), (1, 278.0), (1, 278.0), (1, 278.0), (1, 278.0), (1, 278.0), (1, 278.0), (1, 3336.0), (1, 3336.0), (1, 3336.0), (1, 3336.0), (1, 3336.0), (1, 3336.0), (1, 3336.0), (1, 3336.0), (1, 32.2434576), (1, 32.2195765), (1, 32.244509), (1, 125.0), (1, 125.0), (1, 123.0), (1, 123.0), (1, 125.0), (1, 126.0), (1, 123.0), (1, 123.0), (1, 123.0), (1, 123.0), (1, 125.0), (1, 126.0), (1, 128.0), (1, 128.0), (1, 128.0), (1, 128.0), (1, 128.0), (1, 2405.0), (1, 2435.0), (1, 1068.0), (1, 1711.0), (1, 1876.0), (1, 1881.0), (1, 126.0), (1, 127.0), (1, 127.0), (1, 127.0), (1, 123.0), (1, 126.0), (1, 127.0), (1, 126.0), (1, 127.0), (1, -0.00106313501), (1, -0.0109501347), (1, -0.114785392), (1, -1.14758023), (1, -11.2340646), (1, -115.915825), (1, -0.00124170719), (1, -0.0111625834), (1, -0.116164503), (1, -1.15074895), (1, -11.2434233), (1, -115.966375), (1, 1.00592407), (1, 1.01178645), (1, 1.06319101), (1, 1.05654993), (1, 1.04702917), (1, 1.04727547), (1, 12520.0504), (1, 10.3645199), (1, 0.991799256), (1, 0.997661707), (1, 1.04834864), (1, 1.04180027), (1, 1.03241243), (1, 1.03265529), (1, 3.70166696e-07), (1, 3.81263637e-06), (1, 3.81263637e-05), (1, 0.000381263637), (1, 0.00381263637), (1, 0.0381263637), (1, 1.02484829), (1, 0.999860307), (1, 1.00010383), (1, 1.00004015), (1, 54.0), (1, 51.0), (1, 51.0), (1, 51.0), (1, 42.0), (1, 49.0), (1, 49.0), (1, 9.0)]
Reference
Verification
DUT Condition
xfer-calkit

Test procedure : $Id: hp3458a.py | Rev 2041 | 2021/02/25 00:33:07 Vadim $

Source procedure : $Id: f5720b.py | Rev 2035 | 2020/12/28 08:14:46 Vadim $

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	0.0000000E+00	**-2.44 µV**	0.75 µV	-0.910 µV	0.910 µV	N/A	0.16 µV	FAIL
Short 0.0 VDC	0.0000000E+00	**-2.21 µV**	0.75 µV	-0.900 µV	0.900 µV	N/A	0.15 µV	FAIL
Short 00.0 VDC	0.0000000E+00	**-2.19 µV**	0.75 µV	-1.070 µV	1.070 µV	N/A	0.32 µV	FAIL
Short 000.0 VDC	0.0000000E+00	**6.31 µV**	0.75 µV	-14.750 µV	14.750 µV	N/A	14.00 µV	PASS
Short 0000.0 VDC	0.0000000E+00	**-7.33 µV**	0.75 µV	-41.750 µV	41.750 µV	N/A	41.00 µV	PASS
DCV Test	**0.1V-1000V**	**DUT**	**Source unc.**	**Low Limit**	**Hi limit**	**Measured**	**24h spec**	**Result**
0.019 VDC (0.10 Range)	0.0190000	**0.019000062**	7.27 ppm	0.018999514	0.019000486	3.283 ppm	18.29 ppm	PASS 16.68 %
0.1 VDC (0.10 Range)	0.1000000	**0.10000016**	7.27 ppm	0.099998723	0.10000128	1.600 ppm	5.50 ppm	PASS 17.55 %
0.11 VDC (0.10 Range)	0.1100000	**0.11000014**	7.27 ppm	0.10999863	0.11000137	1.298 ppm	5.23 ppm	PASS 14.50 %
-0.019 VDC (0.10 Range)	-0.0190000	**-0.019000013**	7.27 ppm	-0.019000486	-0.018999514	0.698 ppm	18.29 ppm	PASS 3.55 %
-0.1 VDC (0.10 Range)	-0.1000000	**-0.10000012**	7.27 ppm	-0.10000128	-0.099998723	1.232 ppm	5.50 ppm	PASS 13.51 %
-0.11 VDC (0.10 Range)	-0.1100000	**-0.11000019**	7.27 ppm	-0.11000137	-0.10999863	1.693 ppm	5.23 ppm	PASS 18.90 %
0.19 VDC (1.00 Range)	0.1900000	**0.19000021**	7.27 ppm	0.18999803	0.19000197	1.110 ppm	3.08 ppm	PASS 14.06 %
1.0 VDC (1.00 Range)	1.0000000	**1.0000018**	3.86 ppm	0.99999434	1.0000057	1.764 ppm	1.80 ppm	PASS 41.42 %
1.1 VDC (1.00 Range)	1.1000000	**1.1000018**	3.86 ppm	1.0999938	1.1000062	1.625 ppm	1.77 ppm	PASS 38.27 %
-0.19 VDC (1.00 Range)	-0.1900000	**-0.19000045**	7.27 ppm	-0.19000197	-0.18999803	2.352 ppm	3.08 ppm	PASS 29.79 %
-1.0 VDC (1.00 Range)	-1.0000000	**-1.0000009**	3.86 ppm	-1.0000057	-0.99999434	0.894 ppm	1.80 ppm	PASS 21.00 %
-1.1 VDC (1.00 Range)	-1.1000000	**-1.1000009**	3.86 ppm	-1.1000062	-1.0999938	0.817 ppm	1.77 ppm	PASS 19.24 %
1.9 VDC (10.00 Range)	1.9000000	**1.9000037**	3.86 ppm	1.8999912	1.9000088	1.952 ppm	0.76 ppm	PASS 49.61 %
10.0 VDC (10.00 Range)	10.0000000	**10.000023**	2.77 ppm	9.9999668	10.000033	2.274 ppm	0.55 ppm	PASS 80.54 %
11.0 VDC (10.00 Range)	11.0000000	**11.000028**	2.73 ppm	10.999964	11.000036	2.563 ppm	0.55 ppm	PASS 92.05 %
-1.9 VDC (10.00 Range)	-1.9000000	**-1.9000018**	3.86 ppm	-1.9000088	-1.8999912	0.971 ppm	0.76 ppm	PASS 24.68 %
-10.0 VDC (10.00 Range)	-10.0000000	**-10.000016**	2.77 ppm	-10.000033	-9.9999668	1.578 ppm	0.55 ppm	PASS 55.86 %
-11.0 VDC (10.00 Range)	-11.0000000	**-11.000018**	2.73 ppm	-11.000036	-10.999964	1.593 ppm	0.55 ppm	PASS 57.21 %
19 VDC (100.00 Range)	19.0000000	**19.000062**	2.77 ppm	18.99987	19.00013	3.265 ppm	4.08 ppm	PASS 66.22 %
100 VDC (100.00 Range)	100.0000000	**100.00024**	3.73 ppm	99.999347	100.00065	2.443 ppm	2.80 ppm	PASS 52.37 %
110 VDC (100.00 Range)	110.0000000	**110.00023**	3.73 ppm	109.99928	110.00072	2.060 ppm	2.77 ppm	PASS 44.32 %
-19 VDC (100.00 Range)	-19.0000000	**-19.00005**	2.77 ppm	-19.00013	-18.99987	2.648 ppm	4.08 ppm	PASS 53.70 %
-100 VDC (100.00 Range)	-100.0000000	**-100.0003**	3.73 ppm	-100.00065	-99.999347	2.985 ppm	2.80 ppm	PASS 64.00 %
-110 VDC (100.00 Range)	-110.0000000	**-110.00031**	3.73 ppm	-110.00072	-109.99928	2.809 ppm	2.77 ppm	PASS 60.43 %
190 VDC (1000.00 Range)	190.0000000	**190.0003**	3.73 ppm	189.99872	190.00128	1.565 ppm	3.03 ppm	PASS 32.58 %
500 VDC (1000.00 Range)	500.0000000	**500.00202**	3.73 ppm	499.99678	500.00322	4.044 ppm	2.70 ppm	FAIL 108.41 %
1000 VDC (1000.00 Range)	1000.0000000	**1000.0017**	5.45 ppm	999.97995	1000.02	1.737 ppm	2.60 ppm	PASS 13.18 %
-190 VDC (1000.00 Range)	-190.0000000	**-190.00045**	3.73 ppm	-190.00128	-189.99872	2.352 ppm	3.03 ppm	PASS 48.97 %
-500 VDC (1000.00 Range)	-500.0000000	**-500.00213**	3.73 ppm	-500.00322	-499.99678	4.268 ppm	2.70 ppm	PASS 33.96 %
-1000 VDC (1000.00 Range)	-1000.0000000	**-1000.0004**	5.45 ppm	-1000.02	-999.97995	0.368 ppm	2.60 ppm	PASS 2.79 %

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	0.9999951 Ω	**1.000021 Ω**	32.0 ppm	9.9992810E-01	1.0000621E+00	25.948 ppm	35.00 ppm	PASS, 54.72 % of 47.42 ppm
1.9 Ω	1.8995806 Ω	**1.8995557 Ω**	25.0 ppm	1.8994936E+00	1.8996676E+00	-13.125 ppm	20.79 ppm	PASS, 41.33 % of 31.75 ppm
10 Ω	9.999534 Ω	**9.9994653 Ω**	5.0 ppm	9.9994040E+00	9.9996640E+00	-6.875 ppm	8.00 ppm	PASS, 76.87 % of 8.94 ppm
19 Ω	19.000082 Ω	**18.999958 Ω**	4.0 ppm	1.8999649E+01	1.9000515E+01	-6.539 ppm	18.79 ppm	PASS, 34.04 % of 19.21 ppm
100 Ω	99.99773 Ω	**99.997512 Ω**	1.7 ppm	9.9996960E+01	9.9998500E+01	-2.183 ppm	6.00 ppm	PASS, 35.00 % of 6.24 ppm
190 Ω	190.00159 Ω	**190.00126 Ω**	1.7 ppm	1.9000069E+02	1.9000249E+02	-1.754 ppm	3.05 ppm	PASS, 50.20 % of 3.49 ppm
1.0 kΩ	1000.0208 kΩ	**1000.021 kΩ**	1.7 ppm	1.0000169E+03	1.0000247E+03	0.183 ppm	2.20 ppm	PASS, 6.58 % of 2.78 ppm
1.9 kΩ	1900.036 kΩ	**1900.0377 kΩ**	1.7 ppm	1.9000270E+03	1.9000450E+03	0.879 ppm	3.05 ppm	PASS, 25.17 % of 3.49 ppm
10 kΩ	9999.916 kΩ	**9999.92 kΩ**	1.6 ppm	9.9998780E+03	9.9999540E+03	0.398 ppm	2.20 ppm	PASS, 14.64 % of 2.72 ppm
19 kΩ	19000.292 kΩ	**19000.314 kΩ**	1.7 ppm	1.9000202E+04	1.9000382E+04	1.155 ppm	3.05 ppm	PASS, 33.05 % of 3.49 ppm
100 kΩ	99998.81 kΩ	**99998.766 kΩ**	2.0 ppm	9.9998390E+04	9.9999230E+04	-0.442 ppm	2.20 ppm	PASS, 14.88 % of 2.97 ppm
190 kΩ	189999.8 kΩ	**189999.86 kΩ**	2.0 ppm	1.8999652E+05	1.9000308E+05	0.292 ppm	15.26 ppm	PASS, 1.89 % of 15.39 ppm
1.0 MΩ	999970 MΩ	**999970.38 MΩ**	2.5 ppm	9.9995650E+05	9.9998350E+05	0.375 ppm	11.00 ppm	PASS, 3.32 % of 11.28 ppm
1.9 MΩ	1900005.6 MΩ	**1900015.2 MΩ**	3.0 ppm	1.8998549E+06	1.9001563E+06	5.052 ppm	76.32 ppm	PASS, 6.62 % of 76.34 ppm
10 MΩ	9998760 MΩ	**9998720.7 MΩ**	10.0 ppm	9.9981101E+06	9.9994099E+06	-3.927 ppm	55.00 ppm	PASS, 7.03 % of 55.90 ppm
19 MΩ	18999470 MΩ	**18999533 MΩ**	20.0 ppm	1.8988590E+07	1.9010350E+07	3.305 ppm	552.63 ppm	PASS, 0.60 % of 552.99 ppm
100 MΩ	99998610 MΩ	**99990121 MΩ**	50.0 ppm	9.9942611E+07	1.0005461E+08	-84.892 ppm	510.00 ppm	PASS, 16.57 % of 512.45 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 -0.0000013 Ω**	5.000e-05 Ω	-5e-05	5e-05	N/A	8.0000e-06 Ω	PASS
100 Ω	**Range -0.0000612 Ω**	5.500e-04 Ω	-0.00055	0.00055	N/A	2.2000e-06 Ω	PASS
1.0 kΩ	**Range 0.0000194 Ω**	5.500e-03 Ω	-0.0055	0.0055	N/A	2.2000e-06 Ω	PASS
10 kΩ	**Range 0.0001497 Ω**	5.500e-02 Ω	-0.055	0.055	N/A	2.2000e-06 Ω	PASS
100 kΩ	**Range 0.0000000 Ω**	5.500e-01 Ω	-0.55	0.55	N/A	2.2000e-06 Ω	PASS
1.0 MΩ	**Range -0.0778983 Ω**	5.500e+00 Ω	-5.5	5.5	N/A	2.2000e-06 Ω	PASS
10 MΩ	**Range -1.7663605 Ω**	5.500e+01 Ω	-55	55	N/A	2.2000e-06 Ω	PASS
100 MΩ	**Range -1.9160516 Ω**	5.500e+02 Ω	-550	550	N/A	2.2000e-06 Ω	PASS
1 GΩ	**Range -1.4669771 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 0.2327006 Ω**	3.000e-01 Ω	-0.3	0.3	N/A	8.0000e-06 Ω	PASS
100 Ω	**Range 0.2399811 Ω**	3.500e-01 Ω	-0.35	0.35	N/A	2.2000e-06 Ω	PASS
1.0 kΩ	**Range 0.2399287 Ω**	4.000e-01 Ω	-0.4	0.4	N/A	2.2000e-06 Ω	PASS
10 kΩ	**Range 0.3155339 Ω**	4.000e-01 Ω	-0.4	0.4	N/A	2.2000e-06 Ω	PASS
100 kΩ	**Range 0.4020053 Ω**	5.500e-01 Ω	-0.55	0.55	N/A	2.2000e-06 Ω	PASS
1.0 MΩ	**Range 0.1258358 Ω**	5.500e+00 Ω	-5.5	5.5	N/A	2.2000e-06 Ω	PASS
10 MΩ	**Range -0.9280882 Ω**	5.500e+01 Ω	-55	55	N/A	2.2000e-06 Ω	PASS
100 MΩ	**Range -1.1077180 Ω**	5.500e+02 Ω	-550	550	N/A	2.2000e-06 Ω	PASS
1 GΩ	**Range -1.1077180 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 ANAlog mode. 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 ANA Test	1V-10V	DUT	w/Guardband	Low Limit	Hi limit	Units	Measured	24h spec	Result
1.0 VAC @ 50.0 kHz	1.0	**1.0000099**	129.09	0.99956891	1.00043109	VAC	9.876 ppm	302.0 ppm	PASS 2.29 %
1.0 VAC @ 1.0 MHz	1.0	**1.0140816**	0.2500 %	0.98749	1.01251	VAC	1.4082 %	1.0010 %	FAIL 112.56 %
10 VAC @ 40 Hz	10	**9.9991535**	0.0073 %	9.8892682	10.1107318	VAC	-0.0085 %	1.1000 %	PASS 0.76 %
10 VAC @ 200 Hz	10	**10.000722**	73.18	9.9965682	10.0034318	VAC	72.210 ppm	270.0 ppm	PASS 21.04 %
10 VAC @ 500 Hz	10	**10.000718**	73.18	9.9965682	10.0034318	VAC	71.839 ppm	270.0 ppm	PASS 20.93 %
10 VAC @ 50.0 kHz	10	**10.00018**	129.09	9.9937091	10.0062909	VAC	18.020 ppm	500.0 ppm	PASS 2.86 %
10 VAC @ 1.0 MHz	10	**10.136811**	0.3000 %	9.86	10.14	VAC	1.3681 %	1.1000 %	PASS 97.72 %

Procedure for all test points in the AC performance verification for SYNCronous 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
0.03 V AC+DC @ 10 Hz	**0.030003602**	0.0121 %	0.029994	0.030006	0.0120 %	0.0083 %	PASS 40.78 %
0.03 V AC+DC @ 20 Hz	**0.030002952**	0.0121 %	0.029994	0.030006	0.0098 %	0.0083 %	PASS 33.42 %
0.03 V AC+DC @ 40 Hz	**0.030002128**	0.0121 %	0.029994	0.030006	0.0071 %	0.0083 %	PASS 24.09 %
0.03 V AC+DC @ 100 Hz	**0.030001789**	0.0121 %	0.029994	0.030006	0.0060 %	0.0077 %	PASS 20.77 %
0.03 V AC+DC @ 1.0 kHz	**0.03000224**	0.0121 %	0.029994	0.030006	0.0075 %	0.0077 %	PASS 26.01 %
0.03 V AC+DC @ 10.0 kHz	**0.030000813**	0.0121 %	0.029992	0.030008	0.0027 %	0.0147 %	PASS 7.12 %
0.03 V AC+DC @ 20.0 kHz	**0.030000937**	0.0121 %	0.029992	0.030008	0.0031 %	0.0147 %	PASS 8.20 %
0.03 V AC+DC @ 50.0 kHz	**0.030003565**	0.0256 %	0.029983	0.030017	0.0119 %	0.0307 %	PASS 14.86 %
0.03 V AC+DC @ 100.0 kHz	**0.030005455**	0.0591 %	0.029958	0.030042	0.0182 %	0.0807 %	PASS 9.09 %
0.03 V AC+DC @ 300.0 kHz	**0.03001703**	0.0964 %	0.029880	0.030120	0.0568 %	0.3033 %	PASS 8.92 %
0.03 V AC+DC @ 500.0 kHz	**0.030042645**	0.1500 %	0.029654	0.030346	0.1421 %	1.0033 %	PASS 7.01 %
0.03 V AC+DC @ 1.0 MHz	**0.029996147**	0.3000 %	0.029609	0.030391	-0.0128 %	1.0033 %	PASS 0.61 %
0.1 V AC+DC @ 10 Hz	**0.099995647**	0.0121 %	0.099980	0.100020	-0.0044 %	0.0074 %	PASS 15.31 %
0.1 V AC+DC @ 20 Hz	**0.099992862**	0.0121 %	0.099980	0.100020	-0.0071 %	0.0074 %	PASS 25.11 %
0.1 V AC+DC @ 40 Hz	**0.099991644**	0.0121 %	0.099980	0.100020	-0.0084 %	0.0074 %	PASS 29.39 %
0.1 V AC+DC @ 100 Hz	**0.099990335**	0.0121 %	0.099981	0.100019	-0.0097 %	0.0072 %	PASS 34.25 %
0.1 V AC+DC @ 1.0 kHz	**0.099993248**	0.0121 %	0.099981	0.100019	-0.0068 %	0.0072 %	PASS 23.92 %
0.1 V AC+DC @ 10.0 kHz	**0.099988674**	0.0121 %	0.099974	0.100026	-0.0113 %	0.0142 %	PASS 30.32 %
0.1 V AC+DC @ 20.0 kHz	**0.099988569**	0.0121 %	0.099974	0.100026	-0.0114 %	0.0142 %	PASS 30.60 %
0.1 V AC+DC @ 50.0 kHz	**0.09999299**	0.0256 %	0.099944	0.100056	-0.0070 %	0.0302 %	PASS 8.85 %
0.1 V AC+DC @ 100.0 kHz	**0.099995071**	0.0591 %	0.099861	0.100139	-0.0049 %	0.0802 %	PASS 2.47 %
0.1 V AC+DC @ 300.0 kHz	**0.10004851**	0.0964 %	0.099603	0.100397	0.0485 %	0.3010 %	PASS 7.67 %
0.1 V AC+DC @ 500.0 kHz	**0.10013039**	0.1500 %	0.098849	0.101151	0.1304 %	1.0010 %	PASS 6.44 %
0.1 V AC+DC @ 1.0 MHz	**0.10004824**	0.3000 %	0.098699	0.101301	0.0482 %	1.0010 %	PASS 2.31 %
0.3 V AC+DC @ 10 Hz	**0.29998707**	0.0050 %	0.299960	0.300040	-0.0043 %	0.0083 %	PASS 22.23 %
0.3 V AC+DC @ 20 Hz	**0.2999807**	0.0050 %	0.299960	0.300040	-0.0064 %	0.0083 %	PASS 33.18 %
0.3 V AC+DC @ 40 Hz	**0.29997727**	0.0050 %	0.299960	0.300040	-0.0076 %	0.0083 %	PASS 39.08 %
0.3 V AC+DC @ 100 Hz	**0.2999787**	0.0050 %	0.299962	0.300038	-0.0071 %	0.0077 %	PASS 38.89 %
0.3 V AC+DC @ 1.0 kHz	**0.29998182**	0.0050 %	0.299962	0.300038	-0.0061 %	0.0077 %	PASS 33.20 %
0.3 V AC+DC @ 10.0 kHz	**0.29996689**	0.0050 %	0.299941	0.300059	-0.0110 %	0.0147 %	PASS 35.64 %
0.3 V AC+DC @ 20.0 kHz	**0.29996467**	0.0050 %	0.299941	0.300059	-0.0118 %	0.0147 %	PASS 38.04 %
0.3 V AC+DC @ 50.0 kHz	**0.299983**	0.0085 %	0.299882	0.300118	-0.0057 %	0.0307 %	PASS 8.90 %
0.3 V AC+DC @ 100.0 kHz	**0.30004292**	0.0138 %	0.299717	0.300283	0.0143 %	0.0807 %	PASS 8.74 %
0.3 V AC+DC @ 300.0 kHz	**0.30045323**	0.0425 %	0.298962	0.301038	0.1511 %	0.3033 %	PASS 24.66 %
0.3 V AC+DC @ 500.0 kHz	**0.30107965**	0.1100 %	0.296660	0.303340	0.3599 %	1.0033 %	PASS 17.83 %
0.3 V AC+DC @ 1.0 MHz	**0.3027114**	0.1800 %	0.296450	0.303550	0.9038 %	1.0033 %	PASS 44.33 %
1.0 V AC+DC @ 10 Hz	**0.99997826**	0.0050 %	0.999876	1.000124	-0.0022 %	0.0074 %	PASS 12.21 %
1.0 V AC+DC @ 20 Hz	**0.99995098**	0.0050 %	0.999876	1.000124	-0.0049 %	0.0074 %	PASS 27.52 %
1.0 V AC+DC @ 40 Hz	**0.99993907**	0.0050 %	0.999876	1.000124	-0.0061 %	0.0074 %	PASS 34.21 %
1.0 V AC+DC @ 100 Hz	**0.99993562**	0.0050 %	0.999878	1.000122	-0.0064 %	0.0072 %	PASS 36.83 %
1.0 V AC+DC @ 1.0 kHz	**0.99995258**	0.0050 %	0.999878	1.000122	-0.0047 %	0.0072 %	PASS 27.13 %

1.0 V AC+DC @ 10.0 kHz	**0.9999068**	0.0050 %	0.999808	1.000192	-0.0093 %	0.0142 %	PASS 30.98 %
1.0 V AC+DC @ 20.0 kHz	**0.99989371**	0.0050 %	0.999808	1.000192	-0.0106 %	0.0142 %	PASS 35.34 %
1.0 V AC+DC @ 50.0 kHz	**0.99994207**	0.0085 %	0.999613	1.000387	-0.0058 %	0.0302 %	PASS 9.23 %
1.0 V AC+DC @ 100.0 kHz	**1.000098**	0.0138 %	0.999060	1.000940	0.0098 %	0.0802 %	PASS 6.02 %
1.0 V AC+DC @ 300.0 kHz	**1.0015173**	0.0425 %	0.996565	1.003435	0.1517 %	0.3010 %	PASS 24.96 %
1.0 V AC+DC @ 500.0 kHz	**1.0035825**	0.1100 %	0.988890	1.011110	0.3583 %	1.0010 %	PASS 17.79 %
1.0 V AC+DC @ 1.0 MHz	**1.0092166**	0.1800 %	0.988190	1.011810	0.9217 %	1.0010 %	PASS 45.31 %
3.0 V AC+DC @ 10 Hz	**2.9999232**	0.0048 %	2.999605	3.000395	-0.0026 %	0.0083 %	PASS 13.29 %
3.0 V AC+DC @ 20 Hz	**2.9998527**	0.0048 %	2.999605	3.000395	-0.0049 %	0.0083 %	PASS 25.50 %
3.0 V AC+DC @ 40 Hz	**2.9998176**	0.0048 %	2.999605	3.000395	-0.0061 %	0.0083 %	PASS 31.58 %
3.0 V AC+DC @ 100 Hz	**2.9998176**	0.0048 %	2.999625	3.000375	-0.0061 %	0.0077 %	PASS 33.58 %
3.0 V AC+DC @ 1.0 kHz	**2.9998338**	0.0048 %	2.999625	3.000375	-0.0055 %	0.0077 %	PASS 30.60 %
3.0 V AC+DC @ 10.0 kHz	**2.9996971**	0.0048 %	2.999415	3.000585	-0.0101 %	0.0147 %	PASS 32.70 %
3.0 V AC+DC @ 20.0 kHz	**2.9995386**	0.0048 %	2.999415	3.000585	-0.0154 %	0.0147 %	PASS 49.82 %
3.0 V AC+DC @ 50.0 kHz	**2.9991671**	0.0085 %	2.998824	3.001176	-0.0278 %	0.0307 %	PASS 43.61 %
3.0 V AC+DC @ 100.0 kHz	**2.999728**	0.0121 %	2.997216	3.002784	-0.0091 %	0.0807 %	PASS 5.56 %
3.0 V AC+DC @ 300.0 kHz	**3.0004168**	0.0336 %	2.989891	3.010109	0.0139 %	0.3033 %	PASS 2.28 %
3.0 V AC+DC @ 500.0 kHz	**3.0058868**	0.1100 %	2.966600	3.033400	0.1962 %	1.0033 %	PASS 9.72 %
3.0 V AC+DC @ 1.0 MHz	**3.0266558**	0.1700 %	2.964800	3.035200	0.8885 %	1.0033 %	PASS 43.66 %
10.0 V AC+DC @ 10 Hz	**9.9999404**	0.0048 %	9.998778	10.001222	-0.0006 %	0.0074 %	PASS 3.37 %
10.0 V AC+DC @ 20 Hz	**9.9996459**	0.0048 %	9.998778	10.001222	-0.0035 %	0.0074 %	PASS 20.05 %
10.0 V AC+DC @ 40 Hz	**9.999568**	0.0048 %	9.998778	10.001222	-0.0043 %	0.0074 %	PASS 24.46 %
10.0 V AC+DC @ 100 Hz	**9.9995709**	0.0048 %	9.998798	10.001202	-0.0043 %	0.0072 %	PASS 24.76 %
10.0 V AC+DC @ 1.0 kHz	**9.999584**	0.0048 %	9.998798	10.001202	-0.0042 %	0.0072 %	PASS 24.01 %
10.0 V AC+DC @ 10.0 kHz	**9.9990607**	0.0048 %	9.998098	10.001902	-0.0094 %	0.0142 %	PASS 31.32 %
10.0 V AC+DC @ 20.0 kHz	**9.9985693**	0.0048 %	9.998098	10.001902	-0.0143 %	0.0142 %	PASS 47.71 %
10.0 V AC+DC @ 50.0 kHz	**9.9976255**	0.0085 %	9.996125	10.003875	-0.0237 %	0.0302 %	PASS 37.83 %
10.0 V AC+DC @ 100.0 kHz	**9.9989643**	0.0121 %	9.990766	10.009234	-0.0104 %	0.0802 %	PASS 6.38 %
10.0 V AC+DC @ 300.0 kHz	**10.001709**	0.0336 %	9.966536	10.033464	0.0171 %	0.3010 %	PASS 2.82 %
10.0 V AC+DC @ 500.0 kHz	**10.019306**	0.1100 %	9.888900	10.111100	0.1931 %	1.0010 %	PASS 9.59 %
10.0 V AC+DC @ 1.0 MHz	**10.08954**	0.1700 %	9.882900	10.117100	0.8954 %	1.0010 %	PASS 44.09 %
30 V AC+DC @ 10 Hz	**29.998247**	0.0060 %	29.991795	30.008205	-0.0058 %	0.0213 %	PASS 13.18 %
30 V AC+DC @ 20 Hz	**29.997419**	0.0060 %	29.991795	30.008205	-0.0086 %	0.0213 %	PASS 19.40 %
30 V AC+DC @ 40 Hz	**29.997136**	0.0060 %	29.991795	30.008205	-0.0095 %	0.0213 %	PASS 21.53 %
30 V AC+DC @ 100 Hz	**29.997408**	0.0060 %	29.991995	30.008005	-0.0086 %	0.0207 %	PASS 20.07 %
30 V AC+DC @ 1.0 kHz	**29.996438**	0.0060 %	29.991995	30.008005	-0.0119 %	0.0207 %	PASS 27.58 %
30 V AC+DC @ 10.0 kHz	**29.987095**	0.0060 %	29.991995	30.008005	-0.0430 %	0.0207 %	PASS 99.92 %
30 V AC+DC @ 20.0 kHz	**29.975552**	0.0060 %	29.991995	30.008005	-0.0815 %	0.0207 %	FAIL 189.30 %
30 V AC+DC @ 50.0 kHz	**29.954218**	0.0060 %	29.987495	30.012505	-0.1526 %	0.0357 %	FAIL 210.95 %
30 V AC+DC @ 100.0 kHz	**29.9738**	0.0174 %	29.958591	30.041409	-0.0873 %	0.1207 %	PASS 35.82 %
30 V AC+DC @ 300.0 kHz	**29.9182**	0.0991 %	29.849273	30.150727	-0.2727 %	0.4033 %	PASS 32.83 %
30 V AC+DC @ 500.0 kHz	**29.984036**	0.5200 %	29.393000	30.607000	-0.0532 %	1.5033 %	PASS 1.67 %
100.0 V AC+DC @ 10 Hz	**99.997134**	0.0060 %	99.973582	100.026418	-0.0029 %	0.0204 %	PASS 6.74 %
100.0 V AC+DC @ 20 Hz	**99.994311**	0.0060 %	99.973582	100.026418	-0.0057 %	0.0204 %	PASS 13.37 %
100.0 V AC+DC @ 40 Hz	**99.993332**	0.0060 %	99.973582	100.026418	-0.0067 %	0.0204 %	PASS 15.68 %
100.0 V AC+DC @ 100 Hz	**99.992672**	0.0060 %	99.973782	100.026218	-0.0073 %	0.0202 %	PASS 17.38 %

100.0 V AC+DC @ 1.0 kHz	**99.992433**	0.0060 %	99.973782	100.026218	-0.0076 %	0.0202 %	PASS 17.95 %
100.0 V AC+DC @ 10.0 kHz	**99.977266**	0.0060 %	99.973782	100.026218	-0.0227 %	0.0202 %	PASS 53.93 %
100.0 V AC+DC @ 20.0 kHz	**99.961779**	0.0060 %	99.973782	100.026218	-0.0382 %	0.0202 %	PASS 90.67 %
100.0 V AC+DC @ 50.0 kHz	**99.943794**	0.0095 %	99.955255	100.044745	-0.0562 %	0.0352 %	PASS 77.05 %
100.0 V AC+DC @ 100.0 kHz	**99.946797**	0.0174 %	99.862436	100.137564	-0.0532 %	0.1202 %	PASS 21.90 %
300.0 V AC+DC @ 100 Hz	**299.97868**	0.0079 %	299.854408	300.145592	-0.0071 %	0.0407 %	PASS 8.58 %
300.0 V AC+DC @ 1.0 kHz	**299.97749**	0.0079 %	299.854408	300.145592	-0.0075 %	0.0407 %	PASS 9.06 %
750.0 V AC+DC @ 100 Hz	**750.06044**	0.0245 %	749.514498	750.485502	0.0081 %	0.0403 %	PASS 8.55 %
750.0 V AC+DC @ 1.0 kHz	**750.07165**	0.0660 %	749.203000	750.797000	0.0096 %	0.0403 %	PASS 6.18 %

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	**-1.6908512E-11**						INFO
50 nADC	5E-08	**4.9954095E-08**						INFO
100 nADC	1E-07	**1.0000205E-07**	71.82 ppm	9.995282E-08	1.000472E-07	20.486 ppm	400 ppm	PASS 2.52 %
-100 nADC	-1E-07	**-1.0001659E-07**	71.82 ppm	-1.000492E-07	-9.995082E-08	165.861 ppm	420 ppm	PASS 19.46 %
-50 nADC	-5E-08	**-5.0022577E-08**						INFO
Zero µADC	0	**2.3004238E-11**						INFO
0.5 µADC	5E-07	**5.0003519E-07**	71.82 ppm	4.999201E-07	5.000799E-07	70.376 ppm	88 ppm	PASS 30.98 %
1.0 µADC	1E-06	**9.9998715E-07**	71.82 ppm	9.998792E-07	1.000121E-06	-12.849 ppm	49 ppm	PASS 7.39 %
-1.0 µADC	-1E-06	**-1.0000221E-06**	71.82 ppm	-1.000123E-06	-9.998772E-07	22.059 ppm	51 ppm	PASS 12.52 %
-0.5 µADC	-5E-07	**-5.0000913E-07**	71.82 ppm	-5.000819E-07	-4.999181E-07	18.251 ppm	92 ppm	PASS 7.82 %
Zero 00 µADC	0	**-2.6080348E-12**						INFO
5 µADC	5E-06	**5.0000473E-06**	71.82 ppm	4.999522E-06	5.000478E-06	9.453 ppm	24 ppm	PASS 6.25 %
10 µADC	1E-05	**1.0000055E-05**	71.82 ppm	9.999113E-06	1.000089E-05	5.512 ppm	17 ppm	PASS 3.74 %
-10 µADC	-1E-05	**-1.000002E-05**	71.82 ppm	-1.000089E-05	-9.999111E-06	2.035 ppm	17 ppm	PASS 1.38 %
-5 µADC	-5E-06	**-4.999998E-06**	71.82 ppm	-5.00048E-06	-4.99952E-06	-0.410 ppm	24 ppm	PASS 0.27 %
Zero 000 µADC	0	**-3.6006751E-12**						INFO
50 µADC	5E-05	**5.0000323E-05**	71.82 ppm	4.999531E-05	5.000469E-05	6.459 ppm	22 ppm	PASS 4.30 %
100 µADC	0.0001	**0.00010000054**	71.82 ppm	9.999122E-05	0.0001000088	5.378 ppm	16 ppm	PASS 3.65 %
-100 µADC	-0.0001	**-0.00010000027**	71.82 ppm	-0.0001000088	-9.999122E-05	2.744 ppm	16 ppm	PASS 1.86 %
-50 µADC	-5E-05	**-5.0000054E-05**	71.82 ppm	-5.000469E-05	-4.999531E-05	1.074 ppm	22 ppm	PASS 0.72 %
Zero mADC	0	**1.9226018E-11**						INFO
0.5 mADC	0.0005	**0.0004999981**	33.64 ppm	0.0004999742	0.0005000258	-3.798 ppm	18 ppm	PASS 4.98 %
1.0 mADC	0.001	**0.00099999536**	33.64 ppm	0.0009999524	0.001000048	-4.639 ppm	14 ppm	PASS 6.37 %
-1.0 mADC	-0.001	**-0.00099999334**	33.64 ppm	-0.001000048	-0.0009999524	-6.662 ppm	14 ppm	PASS 9.14 %
-0.5 mADC	-0.0005	**-0.00049999598**	33.64 ppm	-0.0005000258	-0.0004999742	-8.033 ppm	18 ppm	PASS 10.53 %
Zero 00 mADC	0	**4.6951351E-11**						INFO
5 mADC	0.005	**0.0049999826**	32.27 ppm	0.004999749	0.005000251	-3.483 ppm	18 ppm	PASS 4.71 %
10 mADC	0.01	**0.0099999614**	32.27 ppm	0.009999537	0.01000046	-3.857 ppm	14 ppm	PASS 5.48 %
-10 mADC	-0.01	**-0.0099999506**	32.27 ppm	-0.01000046	-0.009999537	-4.937 ppm	14 ppm	PASS 7.02 %
-5 mADC	-0.005	**-0.0049999676**	32.27 ppm	-0.005000251	-0.004999749	-6.472 ppm	18 ppm	PASS 8.76 %
Zero 000 mADC	0	**-1.3660238E-11**						INFO
50 mADC	0.05	**0.050000408**	53.32 ppm	0.04999568	0.05000432	8.151 ppm	33 ppm	PASS 6.50 %
100 mADC	0.1	**0.100001**	53.32 ppm	0.09999177	0.1000082	9.972 ppm	29 ppm	PASS 8.22 %
-100 mADC	-0.1	**-0.10000105**	53.32 ppm	-0.1000082	-0.09999177	10.525 ppm	29 ppm	PASS 8.67 %
-50 mADC	-0.05	**-0.050000373**	53.32 ppm	-0.05000432	-0.04999568	7.456 ppm	33 ppm	PASS 5.95 %
Zero ADC	0	**6.9394707E-11**						INFO
0.5 ADC	0.5	**0.50000817**	115.22 ppm	0.4998824	0.5001176	16.339 ppm	120 ppm	PASS 4.91 %
1.0 ADC	1	**1.0000154**	115.22 ppm	0.9997748	1.000225	15.415 ppm	110 ppm	PASS 4.84 %
-1.0 ADC	-1	**-0.99997934**	115.22 ppm	-1.000225	-0.9997748	-20.660 ppm	110 ppm	PASS 6.48 %
-0.5 ADC	-0.5	**-0.49997635**	115.22 ppm	-0.5001176	-0.4998824	-47.307 ppm	120 ppm	PASS 14.22 %

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
1.0 mA AC @ 50 Hz	0.001	**0.0010001467**	0.0160 %	0.00099921955	0.00100078045	146.674 ppm	0.0620 %	PASS 11.45 %
10 mA AC @ 50 Hz	0.01	**0.010000284**	0.0160 %	0.0099921955	0.0100078045	28.387 ppm	0.0620 %	PASS 2.22 %
100 mA AC @ 50 Hz	0.1	**0.10001003**	0.0133 %	0.099924682	0.100075318	100.309 ppm	0.0620 %	PASS 7.91 %
1.0 A AC @ 50 Hz	1.0	**1.0000825**	0.0133 %	0.99904682	1.00095318	82.533 ppm	0.0820 %	PASS 4.97 %
1.0 mA AC @ 60 Hz	0.001	**0.0010001253**	0.0129 %	0.00099925136	0.00100074864	125.344 ppm	0.0620 %	PASS 9.90 %
10 mA AC @ 60 Hz	0.01	**0.010000588**	0.0129 %	0.0099925136	0.0100074864	58.763 ppm	0.0620 %	PASS 4.64 %
100 mA AC @ 60 Hz	0.1	**0.10001117**	0.0288 %	0.099909182	0.100090818	111.745 ppm	0.0620 %	PASS 8.17 %
1.0 A AC @ 60 Hz	1.0	**1.0001105**	0.0288 %	0.99889182	1.00110818	110.459 ppm	0.0820 %	PASS 6.35 %
1.0 mA AC @ 1.0 kHz	0.001	**0.001000165**	0.0160 %	0.00099951955	0.00100048045	164.969 ppm	0.0320 %	PASS 23.04 %
10 mA AC @ 1.0 kHz	0.01	**0.010000996**	0.0160 %	0.0099951955	0.0100048045	99.628 ppm	0.0320 %	PASS 13.92 %
100 mA AC @ 1.0 kHz	0.1	**0.10001598**	0.0133 %	0.099954682	0.100045318	159.846 ppm	0.0320 %	PASS 23.06 %
1.0 A AC @ 1.0 kHz	1.0	**1.000276**	0.0133 %	0.99884682	1.00115318	0.0276 %	0.1020 %	PASS 13.42 %

Test completed

Test date	26 February 2021 14:09
UUT Internal TEMP?	32.1

Lab temperature maintained +24°C ±2°C

Internal use only

Not validated