

# Certificate of Calibration



Keysight Calibration  
Certificate Number 1-9838128143-1

**Model Number** DSOX2022A  
**Manufacturer** Keysight Technologies Inc  
**Description** Oscilloscope, 2-channel, 200MHz  
**Serial Number** MY54100663  
**Date of Calibration** 16 Mar 2018  
**Procedure** AGT\_X20XXA Part No. 5011-4571  
**Temperature** (23 ± 5) °C  
**Humidity** (50 ± 30) %RH

**Customer**  
Russian Federation  
300044 TULA  
Arsenalnaya St 3  
Micron Service OOO

**Location of Calibration**  
Russian Federation  
115054 Moscow  
KOSMODAMIANSKAYA NABEREZHANAYA  
52/3  
Keysight Technologies OOO

This certifies that the equipment has been calibrated using applicable Keysight Technologies procedures in compliance with a quality management system registered to ISO 9001:2015.

#### As Received Conditions

The measured values of the equipment were observed in specification at the points tested.

#### Action Taken

- No corrective actions were necessary.

#### As Completed Conditions

The measured values of the equipment were observed in specification at the points tested.

Keysight considers the uncertainties of measurements during the development of performance tests. In this report, conformance statements of "Passed" or "Failed" are determined by simple comparison of observed measurements to the warranted specifications.

#### Remarks or Special Requirements

This calibration certificate may refer to instruments manufactured by HP, Agilent and Keysight as being manufactured by Keysight Technologies, Inc.

The test limits stated in the report correspond to the published specifications of the equipment, at the points tested.

Based on the customer's request, the next calibration is due on 16 Mar 2020.

Russian Federation  
115054 Moscow  
KOSMODAMIANSKAYA  
NABEREZHANAYA 52/3  
Keysight Technologies OOO

A handwritten signature in black ink that reads "Edgar Leckel".

Edgar Leckel - European Operations Manager

# Certificate of Calibration



Keysight Calibration  
Certificate Number 1-9838128143-1

## Traceability Information

Technician ID Number 00826312

Measurements are traceable to the International System of Units (SI) via national metrology institutes ([www.keysight.com/find/NMI](http://www.keysight.com/find/NMI)) that are signatories to the CIPM Mutual Recognition Arrangement.

This certificate shall not be reproduced, except in full, without prior written approval of the laboratory.

## Calibration Equipment Used

<u>Model Number</u>	<u>Model Description</u>	<u>Equipment ID</u>	<u>Cal Due Date</u>	<u>Certificate Number</u>
11667A	DC-18 GHz power splitter, type N, 50 ohm	RU0034	18 Dec 2018	1-9498959430-1
5720A	Calibrator	RU0104	11 Jul 2018	1-8006517894-1
8482A	Power Sensor, 100 kHz to 4.2 GHz, -30 to +20 dBm	RU0015	10 Nov 2018	1-9413760905-1
E8257D	PSG analog signal generator	RU0051	23 Sep 2018	1-8178099020-1

# Measurement Report

Keysight Technologies 000  
KOSMODAMIANSKAYA NABEREZHANAYA 52/3  
Moscow  
Russia115054

**Report Number:** 1-9838128143-1

**Model Number:** DSOX2022A

**Tested Options:**

**Customer:** MICRON SERVICE 000

**Serial Number:** MY54100663

**Test Date:** 16 Mar 2018

**Temperature:** (23.0±5) °C

**Tested By:** Paul Denisov

**Humidity:** (20 to 80)% RH

**Test Program Name:** AGT\_X20XXA Part No. 5011-4571

**Test Program Version:** A.04.03

**Test Executive:** STE/9000 C.08.96W (MENDOR B.06.34)

**MUT System:** Digital Scope System: Version B.00.47

## Specification Limits:

Unless indicated otherwise, the units for minimum and/or maximum specification limits are the same as the units stated for the measured value.

# Measurement Report

**Report Number:** 1-9838128143-1  
**Model Number:** DSOX2022A

**Test Date:** 16 Mar 2018  
**Serial Number:** MY54100663

## Result Status Flags:

Each measurement result stated will contain a result status flag.

The status flags are defined as follows:

- ' ' **Passed.** The measured values of the equipment were observed in specification at the points tested. Additionally, the expanded measurement uncertainty intervals about the measured values were in specification.
- 'U' **Undetermined.** The expanded measurement uncertainty intervals about one or more measured values were in as well as out of specification. Consequently, neither compliance nor non-compliance with specification can be declared based on the stated coverage probability.
- 'F' **Failed.** One or more measured values of the equipment were observed out of specification at the points tested. Additionally, the expanded measurement uncertainty intervals about one or more measured values were entirely outside the specification.

**Traceability information is on the certificate.**

Report Number: 1-9838128143-1  
Model Number: DSOX2022A

Test Date: 16 Mar 2018  
Serial Number: MY54100663

PERFORMANCE TEST RESULTS SUMMARY

<u>Test Name</u>	<u>Status</u>
INITIAL SETUP	DONE
DC VERTICAL GAIN ACCURACY	PASSED
DUAL CURSOR ACCURACY	PASSED
ANALOG BANDWIDTH	PASSED
TIME BASE ACCURACY	PASSED
TRIGGER SENSITIVITY	PASSED

# Measurement Report

Report Number: 1-9838128143-1  
Model Number: DSOX2022A

Test Date: 16 Mar 2018  
Serial Number: MY54100663

## DC VERTICAL GAIN ACCURACY

PASSED

<u>TEST CONDITIONS</u>	<u>MINIMUM</u>	<u>MEASURED</u>	<u>MAXIMUM</u>	<u>UNCERT.</u>
CH 1 - 5 V/Div	33.80	34.94 V	36.20	0.10 V
CH 1 - 2 V/Div	13.52	13.98 V	14.48	43 mV
CH 1 - 1 V/Div	6.760	7.025 V	7.240	23 mV
CH 1 - 500 mV/Div	3.380	3.518 V	3.620	10 mV
CH 1 - 200 mV/Div	1.352	1.398 V	1.448	4.3 mV
CH 1 - 100 mV/Div	676.0	699.7 mV	724.0	2.4 mV
CH 1 - 50 mV/Div	338.0	351.8 mV	362.0	1.7 mV
CH 1 - 20 mV/Div	135.2	141.2 mV	144.8	0.46 mV
CH 1 - 10 mV/Div	67.60	69.79 mV	72.40	0.27 mV
CH 1 - 5 mV/Div	33.40	35.22 mV	36.60	0.19 mV
CH 1 - 2 mV/Div	12.72	14.00 mV	15.28	97 $\mu$ V
CH 1 - 1 mV/Div	5.720	6.975 mV	8.280	75 $\mu$ V
CH 2 - 5 V/Div	33.80	34.97 V	36.20	0.10 V
CH 2 - 2 V/Div	13.52	14.00 V	14.48	43 mV
CH 2 - 1 V/Div	6.760	7.023 V	7.240	23 mV
CH 2 - 500 mV/Div	3.380	3.516 V	3.620	10 mV
CH 2 - 200 mV/Div	1.352	1.399 V	1.448	4.3 mV
CH 2 - 100 mV/Div	676.0	700.0 mV	724.0	2.4 mV
CH 2 - 50 mV/Div	338.0	352.0 mV	362.0	1.7 mV
CH 2 - 20 mV/Div	135.2	141.0 mV	144.8	0.46 mV
CH 2 - 10 mV/Div	67.60	69.81 mV	72.40	0.27 mV
CH 2 - 5 mV/Div	33.40	35.26 mV	36.60	0.19 mV
CH 2 - 2 mV/Div	12.72	13.94 mV	15.28	97 $\mu$ V
CH 2 - 1 mV/Div	5.720	6.935 mV	8.280	75 $\mu$ V

## DUAL CURSOR ACCURACY

PASSED

<u>TEST CONDITIONS</u>	<u>MINIMUM</u>	<u>MEASURED</u>	<u>MAXIMUM</u>	<u>UNCERT.</u>
CH 1 - 5 V/Div	33.60	34.93 V	36.40	0.10 V
CH 1 - 2 V/Div	13.44	13.98 V	14.56	43 mV
CH 1 - 1 V/Div	6.720	7.025 V	7.280	23 mV
CH 1 - 500 mV/Div	3.360	3.519 V	3.640	10 mV
CH 1 - 200 mV/Div	1.344	1.398 V	1.456	4.4 mV
CH 1 - 100 mV/Div	672.0	699.6 mV	728.0	2.3 mV
CH 1 - 50 mV/Div	336.0	351.9 mV	364.0	1.5 mV
CH 1 - 20 mV/Div	134.4	141.2 mV	145.6	0.48 mV
CH 1 - 10 mV/Div	67.20	69.83 mV	72.80	0.28 mV
CH 1 - 5 mV/Div	33.20	35.23 mV	36.80	0.18 mV
CH 1 - 2 mV/Div	12.56	14.05 mV	15.44	98 $\mu$ V
CH 1 - 1 mV/Div	5.56	7.03 mV	8.44	0.11 mV
CH 2 - 5 V/Div	33.60	35.00 V	36.40	0.10 V
CH 2 - 2 V/Div	13.44	14.00 V	14.56	43 mV
CH 2 - 1 V/Div	6.720	7.025 V	7.280	23 mV

Report Number: 1-9838128143-1  
 Model Number: DSOX2022A

Test Date: 16 Mar 2018  
 Serial Number: MY54100663

DUAL CURSOR ACCURACY

CONTINUED

<u>TEST CONDITIONS</u>	<u>MINIMUM</u>	<u>MEASURED</u>	<u>MAXIMUM</u>	<u>UNCERT.</u>
CH 2 - 500 mV/Div	3.360	3.518 V	3.640	10 mV
CH 2 - 200 mV/Div	1.344	1.399 V	1.456	4.4 mV
CH 2 - 100 mV/Div	672.0	700.2 mV	728.0	2.3 mV
CH 2 - 50 mV/Div	336.0	352.1 mV	364.0	1.5 mV
CH 2 - 20 mV/Div	134.4	141.1 mV	145.6	0.48 mV
CH 2 - 10 mV/Div	67.20	69.85 mV	72.80	0.28 mV
CH 2 - 5 mV/Div	33.20	35.30 mV	36.80	0.18 mV
CH 2 - 2 mV/Div	12.56	13.98 mV	15.44	98 $\mu$ V
CH 2 - 1 mV/Div	5.56	7.00 mV	8.44	0.11 mV

ANALOG BANDWIDTH

PASSED

<u>TEST CONDITIONS</u>	<u>MINIMUM</u>	<u>MEASURED</u>	<u>UNCERT.</u>
200 MHz Bandwidth			
CH 1 - 200 mV/Div	-3.00	-0.08 dB	0.25 dB
CH 2 - 200 mV/Div	-3.00	0.03 dB	0.25 dB

TIME BASE ACCURACY

PASSED

<u>TEST COND.</u>	<u>MINIMUM</u>	<u>MEASURED</u>	<u>MAXIMUM</u>	<u>UNCERT.</u>
10.0000 MHz	-44.8	-11.9 ppm	44.8	11 ppm

TRIGGER SENSITIVITY

PASSED

<u>TEST CONDITIONS</u>	<u>STATUS</u>	<u>UNCERT.</u>
Internal Trigger		
200 MHz Bandwidth		
CH 1 - 5 mV/Div	PASS	N/A
CH 1 - 10 mV/Div	PASS	N/A
CH 2 - 5 mV/Div	PASS	N/A
CH 2 - 10 mV/Div	PASS	N/A
External Trigger		

# Measurement Report

**Report Number:** 1-9838128143-1  
**Model Number:** DSOX2022A

**Test Date:** 16 Mar 2018  
**Serial Number:** MY54100663

## TRIGGER SENSITIVITY

CONTINUED

<u>TEST CONDITIONS</u>	<u>STATUS</u>	<u>UNCERT.</u>
EXT - 100 MHz	PASS	N/A
EXT - 200 MHz	PASS	N/A

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# Measurement Report

Keysight Technologies 000  
KOSMODAMIANSKAYA NABEREZHANAYA 52/3  
Moscow  
Russia115054

**Report Number:** 1-9838128143-1  
**Model Number:** DSOX2022A  
**Tested Options:**

**Customer:** MICRON SERVICE 000  
**Serial Number:** MY54100663

**Test Date:** 16 Mar 2018  
**Temperature:** (23.0±5) °C

**Tested By:** Paul Denisov  
**Humidity:** (20 to 80)% RH

**Test Program Name:** AGT\_X20XXA Part No. 5011-4571  
**Test Program Version:** A.04.03  
**Test Executive:** STE/9000 C.08.96W (MENDOR B.06.34)  
**MUT System:** Digital Scope System: Version B.00.47

## Specification Limits:

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# Measurement Report

**Report Number:** 1-9838128143-1  
**Model Number:** DSOX2022A

**Test Date:** 16 Mar 2018  
**Serial Number:** MY54100663

## Result Status Flags:

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Report Number: 1-9838128143-1  
Model Number: DSOX2022A

Test Date: 16 Mar 2018  
Serial Number: MY54100663

PERFORMANCE TEST RESULTS SUMMARY

<u>Test Name</u>	<u>Status</u>
INITIAL SETUP	DONE
DC VERTICAL GAIN ACCURACY	PASSED
DUAL CURSOR ACCURACY	PASSED
ANALOG BANDWIDTH	PASSED
TIME BASE ACCURACY	PASSED
TRIGGER SENSITIVITY	PASSED

# Measurement Report

Report Number: 1-9838128143-1  
Model Number: DSOX2022A

Test Date: 16 Mar 2018  
Serial Number: MY54100663

## DC VERTICAL GAIN ACCURACY

PASSED

<u>TEST CONDITIONS</u>	<u>MINIMUM</u>	<u>MEASURED</u>	<u>MAXIMUM</u>	<u>UNCERT.</u>
CH 1 - 5 V/Div	33.80	34.94 V	36.20	0.10 V
CH 1 - 2 V/Div	13.52	13.98 V	14.48	43 mV
CH 1 - 1 V/Div	6.760	7.025 V	7.240	23 mV
CH 1 - 500 mV/Div	3.380	3.518 V	3.620	10 mV
CH 1 - 200 mV/Div	1.352	1.398 V	1.448	4.3 mV
CH 1 - 100 mV/Div	676.0	699.7 mV	724.0	2.4 mV
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CH 1 - 5 mV/Div	33.40	35.22 mV	36.60	0.19 mV
CH 1 - 2 mV/Div	12.72	14.00 mV	15.28	97 $\mu$ V
CH 1 - 1 mV/Div	5.720	6.975 mV	8.280	75 $\mu$ V
CH 2 - 5 V/Div	33.80	34.97 V	36.20	0.10 V
CH 2 - 2 V/Div	13.52	14.00 V	14.48	43 mV
CH 2 - 1 V/Div	6.760	7.023 V	7.240	23 mV
CH 2 - 500 mV/Div	3.380	3.516 V	3.620	10 mV
CH 2 - 200 mV/Div	1.352	1.399 V	1.448	4.3 mV
CH 2 - 100 mV/Div	676.0	700.0 mV	724.0	2.4 mV
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CH 2 - 5 mV/Div	33.40	35.26 mV	36.60	0.19 mV
CH 2 - 2 mV/Div	12.72	13.94 mV	15.28	97 $\mu$ V
CH 2 - 1 mV/Div	5.720	6.935 mV	8.280	75 $\mu$ V

## DUAL CURSOR ACCURACY

PASSED

<u>TEST CONDITIONS</u>	<u>MINIMUM</u>	<u>MEASURED</u>	<u>MAXIMUM</u>	<u>UNCERT.</u>
CH 1 - 5 V/Div	33.60	34.93 V	36.40	0.10 V
CH 1 - 2 V/Div	13.44	13.98 V	14.56	43 mV
CH 1 - 1 V/Div	6.720	7.025 V	7.280	23 mV
CH 1 - 500 mV/Div	3.360	3.519 V	3.640	10 mV
CH 1 - 200 mV/Div	1.344	1.398 V	1.456	4.4 mV
CH 1 - 100 mV/Div	672.0	699.6 mV	728.0	2.3 mV
CH 1 - 50 mV/Div	336.0	351.9 mV	364.0	1.5 mV
CH 1 - 20 mV/Div	134.4	141.2 mV	145.6	0.48 mV
CH 1 - 10 mV/Div	67.20	69.83 mV	72.80	0.28 mV
CH 1 - 5 mV/Div	33.20	35.23 mV	36.80	0.18 mV
CH 1 - 2 mV/Div	12.56	14.05 mV	15.44	98 $\mu$ V
CH 1 - 1 mV/Div	5.56	7.03 mV	8.44	0.11 mV
CH 2 - 5 V/Div	33.60	35.00 V	36.40	0.10 V
CH 2 - 2 V/Div	13.44	14.00 V	14.56	43 mV
CH 2 - 1 V/Div	6.720	7.025 V	7.280	23 mV

Report Number: 1-9838128143-1  
 Model Number: DSOX2022A

Test Date: 16 Mar 2018  
 Serial Number: MY54100663

DUAL CURSOR ACCURACY

CONTINUED

<u>TEST CONDITIONS</u>	<u>MINIMUM</u>	<u>MEASURED</u>	<u>MAXIMUM</u>	<u>UNCERT.</u>
CH 2 - 500 mV/Div	3.360	3.518 V	3.640	10 mV
CH 2 - 200 mV/Div	1.344	1.399 V	1.456	4.4 mV
CH 2 - 100 mV/Div	672.0	700.2 mV	728.0	2.3 mV
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CH 2 - 10 mV/Div	67.20	69.85 mV	72.80	0.28 mV
CH 2 - 5 mV/Div	33.20	35.30 mV	36.80	0.18 mV
CH 2 - 2 mV/Div	12.56	13.98 mV	15.44	98 µV
CH 2 - 1 mV/Div	5.56	7.00 mV	8.44	0.11 mV

ANALOG BANDWIDTH

PASSED

<u>TEST CONDITIONS</u>	<u>MINIMUM</u>	<u>MEASURED</u>	<u>UNCERT.</u>
200 MHz Bandwidth			
CH 1 - 200 mV/Div	-3.00	-0.08 dB	0.25 dB
CH 2 - 200 mV/Div	-3.00	0.03 dB	0.25 dB

TIME BASE ACCURACY

PASSED

<u>TEST COND.</u>	<u>MINIMUM</u>	<u>MEASURED</u>	<u>MAXIMUM</u>	<u>UNCERT.</u>
10.0000 MHz	-44.8	-11.9 ppm	44.8	11 ppm

TRIGGER SENSITIVITY

PASSED

<u>TEST CONDITIONS</u>	<u>STATUS</u>	<u>UNCERT.</u>
Internal Trigger		
200 MHz Bandwidth		
CH 1 - 5 mV/Div	PASS	N/A
CH 1 - 10 mV/Div	PASS	N/A
CH 2 - 5 mV/Div	PASS	N/A
CH 2 - 10 mV/Div	PASS	N/A
External Trigger		

# Measurement Report

**Report Number:** 1-9838128143-1  
**Model Number:** DSOX2022A

**Test Date:** 16 Mar 2018  
**Serial Number:** MY54100663

## TRIGGER SENSITIVITY

CONTINUED

<u>TEST CONDITIONS</u>	<u>STATUS</u>	<u>UNCERT.</u>
EXT - 100 MHz	PASS	N/A
EXT - 200 MHz	PASS	N/A

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