ODP6000B Series Optical Isolated Voltage Probe

Instruction Manual

EN01B

SIGLENT TECHNOLOGIES CO.,LTD

Copyright Information

Declaration

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Information in this publication replaces all previously corresponding material.

Contents

Preface

First of all, thank you for purchasing our products, this instruction manual is the description about the function, usage, operation attention points, etc. Before use, please read the instructions carefully and use correctly.

Manual annotation will use the following symbols to distinguish.

This symbol means it is harmful to the machine and human body; you must strictly follow the instruction manual to operate.

Warning In the case of wrong operation, the user risk injury. The content under this mark records the relevant matters needing attention to avoid such dangers.

Attention The user may suffer minor injuries and material damage with the wrong operation. To avoid such situation, the matters under this mark need attention.

Note This symbolizes important note about how to use the machine.

To the safely use the machine, you must abide by the following safety precautions strictly. The violation against the manual is likely to damage the protective function of the machine. In addition, the company is not responsible for any safety problem caused by the violation of matters needing attention in operation.

- Please be careful to the danger of electric shock and pay attention to highest input voltage.
- Do not operate in wet or combustible conditions.
- Make sure the circuit under test is turned off before access it to the probe.
- Turn off the circuit after the measurement, and then remove the probe.
- When BNC cables are connected to the oscilloscope or other instruments, ensure the BNC terminal is well grounded.
- Check the probe skin and probe lead regularly. If there is any breakage, stop using it immediately.

Vorwort

Zunächst einmal vielen Dank für den Kauf unserer Produkte, diese Bedienungsanleitung ist die Beschreibung über die Funktion, Verwendung, Bedienung Aufmerksamkeitspunkte, etc. Bitte lesen Sie vor Gebrauch die Gebrauchsanweisungen sorgfältig durch und verwenden Sie sie richtig.

Manuelle Anmerkungen verwenden die folgenden Symbole zur Unterscheidung.

Dieses Symbol bedeutet, dass es schädlich für die Maschine und den menschlichen Körper ist; Sie müssen die Bedienungsanleitung strikt befolgen, um zu bedienen.

Warning Bei falscher Bedienung riskiert der Benutzer Verletzungen. Der Inhalt unter diesem Zeichen zeichnet die relevanten Angelegenheiten auf, die beachtet werden müssen, um solche Gefahren zu vermeiden.

Attention Bei falscher Bedienung kann der Benutzer leichte Verletzungen und Materialschäden erleiden. Um eine solche Situation zu vermeiden, müssen die Themen unter diesem Zeichen behandelt werden.

Note Dies symbolisiert wichtige Hinweise zur Bedienung der Maschine.

Um die Maschine sicher zu benutzen, müssen Sie die folgenden Sicherheitsvorkehrungen strikt einhalten. Der Verstoß gegen das Handbuch kann die Schutzfunktion der Maschine beschädigen. Darüber hinaus ist das Unternehmen nicht verantwortlich für Sicherheitsprobleme, die durch die Verletzung von Angelegenheiten verursacht werden, die im Betrieb Aufmerksamkeit erfordern.

- Bitte achten Sie auf die Gefahr eines Stromschlags und achten Sie auf höchste Eingangsspannung.
- Nicht unter nassen oder brennbaren Bedingungen arbeiten.
- Stellen Sie sicher, dass der zu prüfende Stromkreis ausgeschaltet ist, bevor Sie ihn zur Sonde greifen.
- Schalten Sie den Stromkreis nach der Messung aus, und entfernen Sie dann die Sonde.
- Wenn BNC-Kabel an das Oszilloskop oder andere Geräte angeschlossen sind, stellen Sie sicher, dass die BNC-Klemme gut geerdet ist.
- Überprüfen Sie regelmäßig die Sondenhaut und die Sondenleitung. Wenn es einen Bruch gibt, hören Sie sofort auf, es zu verwenden.

Introduction

ODP6000B series is the latest optical isolated voltage probe with remarkably high CMRR. The CMRR of traditional differential probe decreases fast in high-frequency range, as a result, measuring the small voltage signal waveform (e.g., the driving voltage when measuring the upper MOSFET of the half-bridge circuit) under high CM interference voltage accurately become an extremely hard task. ODP6000B series applies optical isolation technologies and gains remarkably high CMRR in all working bandwidth, helping our customers to deal with these kinds of challenging measurement with low cost.

Product Characteristics:

- 2 chargeable batteries that can be replaced to keep the probe work continuously.
- Can be calibrated and zeroed online without disconnecting from the tested equipment.
- Multiple attenuators available, able to meet the measurement requirement of different voltage.
- Extremely high CMRR.
- Bandwidth over 1 GHz.
- Isolation voltage over 60 kV.
- High accuracy and stability in wide temperature range.
- Smaller size.

Application

ODP6000B series can be widely applied in the R&D, debugging or maintenance of switching power supply, motor driver, new energy inverter, converter, LED power supply, household appliances and other electrical power devices.

- Floating signal test.
- Measure the gate voltage drive of power devices like Si/SiC/GaN.
- Small signal measurement of differential mode under high common mode voltage.

Electric Specifications

Model	ODP6050B	ODP6100B
Bandwidth (-3 dB)	500 MHz	1 GHz
Rise time	≤0.7 ns	≤0.4 ns
Terminal load	50 Ω	50 Ω
Output voltage range	±0.5 V	±0.5 V
Typical values of host noise (Vrms)	1.5 mV	1.5 mV
DC accuracy	≤ ±1%	
Isolation voltage (DC + Peak AC)	±60 kV	
Host delay	Around 14 ns	
CMRR typical values (using standard attenuators) ODP6035B Standard 20X attenuator ODP6050B/ODP6100B Standard 50X attenuator	DC-10 MHz: 160 dB	
	10 MHz-100 MHz: 110 dB	
	100 MHz-300 MHz: 100 dB	
	300 MHz-500 MHz: 90 dB	
	500 MHz-800 MHz: 80 dB	
	800 MHz-1000 MHz: 70 dB	
Power supply method	Front end: battery powered, with a working time of approximately 8 hours and a standby time of approximately 30 days	
	Rear end: USB 5 V/2 A	
Auto calibration	Yes	
Optical fiber length	Around 2 m	

Attenuator Specifications

Probe Model	Attenuator Model	Connector Type	Attenuation Ratio	Measurement Range	Input Impedance
ODP6050B ODP6100B	CK-AT5X-2	SSMB	5:1	±2.5 Vpk	1 MΩ‖28 pF
	CK-AT10X-2	SSMB	10:1	±5 Vpk	1 MΩ‖6 pF
	CK-AT20X-2	SSMB	20:1	±10 Vpk	5 MΩ‖6 pF
	CK-AT50X-2	SSMB	50:1	±25 Vpk	10 MΩ‖4 pF
	CK-AT100X-2	SSMB	100:1	±50 Vpk	10 MΩ‖2 pF
	CK-AT200X-2	SSMB	200:1	±100 Vpk	10 MΩ‖2 pF
	CK-AT500X-2	2.54 mm socket	500:1	±250 Vpk	10 MΩ‖2 pF
	CK-AT1000X-2	2.54 mm socket	1000:1	±500 Vpk	20 MΩ‖2 pF
	CK-AT2000X-2	5.08 mm socket	2000:1	±1000 Vpk	20 MΩ‖2 pF
	CK-AT5000X-2	5.08 mm socket	5000:1	±2500 Vpk	40 MΩ‖2 pF
	CK-AT10000X-2	5.08 mm socket	10000:1	±5000 Vpk	40 MΩ‖2 pF

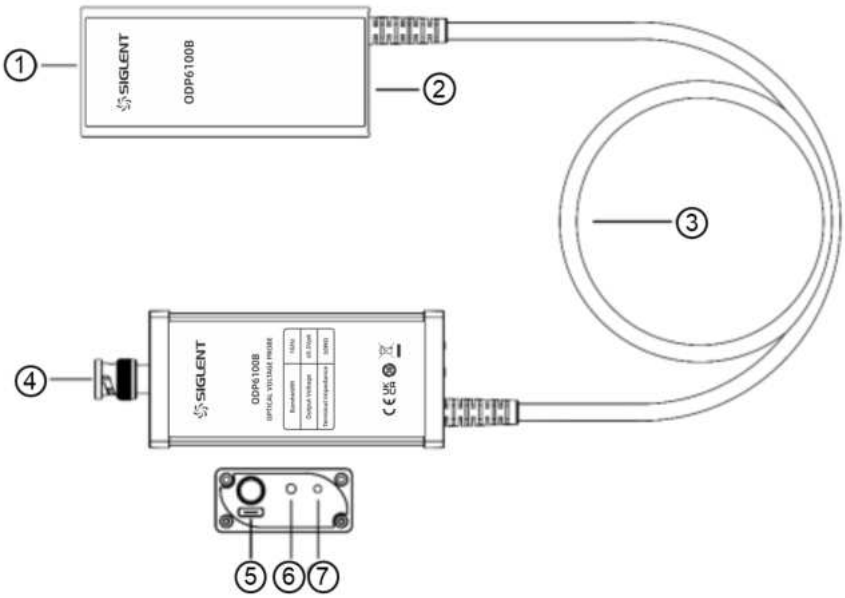
PS: ODP6050B/ODP6100B with standard CK-AT50X-2;

If you need other models of attenuators, please purchase them independently.

Optional Attenuator Packing List

Connector Type	SSMB	2.54 mm Socket	5.08 mm Socket
CK-201 (2.54_2p)	-	5	-
CK-202 (5.08_2p)	-	-	5

Probe Instruction



① Attenuator input connector: able to connect attenuator on both sides. Please do not forcefully insert the attenuator, or the connector may be damaged.

② Power supply indicator light: green light means sufficient power; red light means low power.

③ Optical fiber: do not press it heavily or bend it to 90 degrees, or the fiber will be broken.

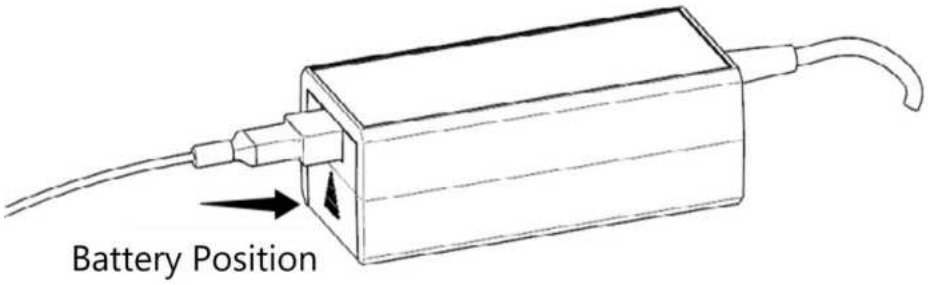
④ Output connector: standard BNC output connector.

⑤ Power supply connector: please use adaptor and power supply cable of 5 V/2 A. This probe may not work properly with insufficient power supply.

⑥ Dual color indicator light: the green light blinking means the auto-zero set is ongoing, and if there's three beeps and the green light remains, the adjustment is successfully done. However, if the buzzer sound continuously for 1~2 sec with the green light on, the auto-zero setting is failed. If the red light is on, the probe is malfunctioned, you would probably need to send it back for maintenance.

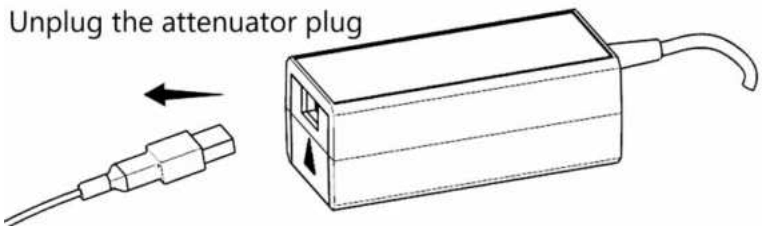
⑦ Auto-zero set button: press it lightly to activate the auto-zero set function.

Battery Description



The standard configuration contains two 7.4 V/950 mAh lithium batteries. The battery installation position is shown in the above figure. In this design, after inserting the attenuator, the attenuator plays a limiting role and the battery cannot be removed. If you need to remove the battery for charging, refer to the following steps:

First of all:



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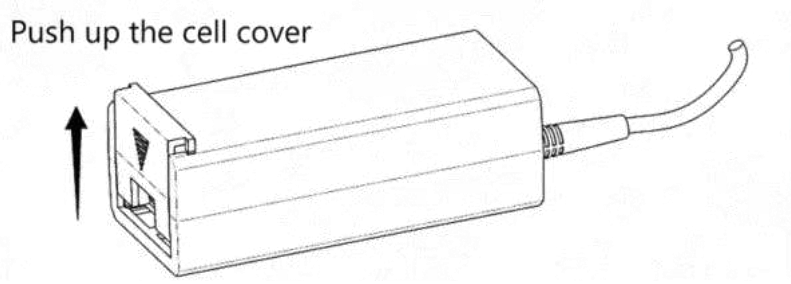
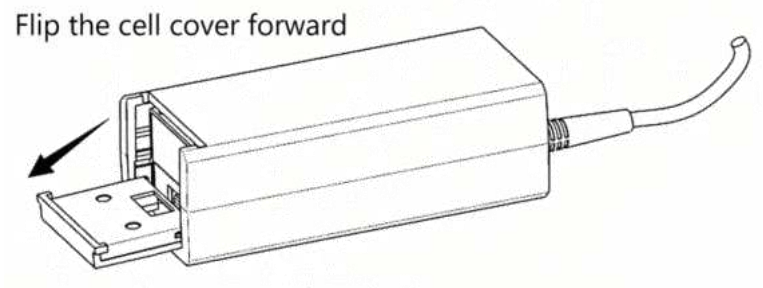
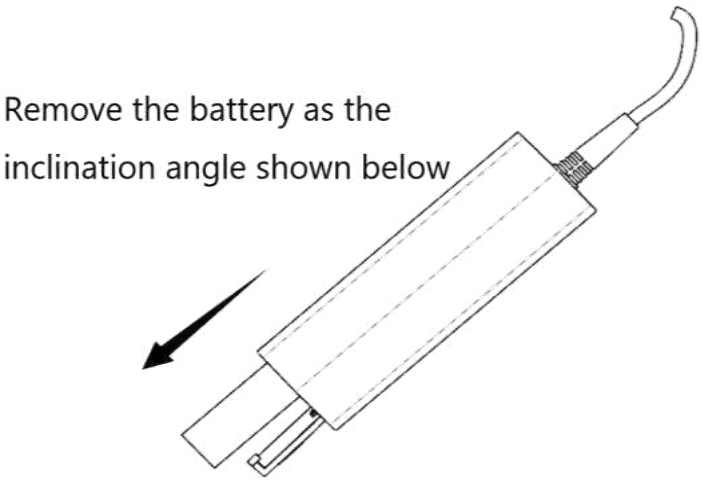


Thirdly:



Next:



The ODP6000B series optical isolation probe adopts dual battery replaceable technology to ensure uninterrupted measurement for customers. Using standard card digital camera lithium batteries, if the battery fails after several years of use, you can purchase the universal rechargeable battery yourself without having to send it back to the original factory for replacement. Avoiding possible damage to the probe and the occupation of measurement time during the shipping process, improving measurement efficiency.

Note

- Do not put heavy object (for instance, your chair) on the optical fiber, avoiding stress on the fiber is crucial to avoid malfunction.
- Do not squeeze, curl, or bend the optical fiber violently. The diameter of bending should be over 10 cm.
- Do not twist or tie the optical fiber. Do not pull or jerk the optical fiber, especially when there are twists or knots.
- Do not drop the probe, this could damage the inner optical component.
- Please store the probe in our standard case as we did when you don't need to use it.
- Please careful exam the optical fiber before usage, and if there's anything broken, please stop using it at once.

Operating Process

Attention

Please use our standard adaptor and power supply cable.

1 Estimate the range of voltage under test and insert the proper attenuator.

2 Connect the probe to the oscilloscope and power it up. Activate the auto-zero set, it will take about 20 sec depends on the environmental temperature and main component temperature.

3 Set up the attenuation ratio of the oscilloscope accordingly, and adjust the sensitivity of the oscilloscope according to the voltage under test.

4 Make sure the front end of the probe is elevated if possible, keeping it away from the high voltage pulse circuit can decrease the interference on the probe.

5 The front end of the probe is directly connected with the high voltage circuit under test. Do not take the probe off before you turn off the circuit's power supply.

Mechanical Specifications

Model		Parameter
Probe dimensions	Front-end E/O transmitter	Around 102*45*33 mm
	Rear-end O/E receiver	Around 106*49*23 mm
Attenuator length		Around 200 mm
Optical fiber length		Around 2 m
Probe weight		Around 400 g

Warranty

Please refer to the instruction on the warranty card.

Packing List

Name	ODP6050B	ODP6100B
Voltage probe	1	1
50X attenuator (CK-AT50X-2)	1	1
SSMB male socket to DuPont cable connector (CK-321)	2	2
SSMB male socket (CK-23)	10	10
USB power supply cable TYPE-C 1.5 m (CK-314A)	1	1
Power supply adaptor 5 V/2 A (CK-605)	2	2
OE transmitter support frame (CK-690A)	1	1
BNC male to SSMB male (CK-25)	1	1
Input extension cable (CK-322)	3	3
Output extension cable (CK-325)	1	1
Battery charger set (CK-691)	1	1
Instruction manual	1	1
Warranty card	1	1
Test report	1	1

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