

## High Frequency Low Voltage Differential Probe

**DP6020B (20V/1GHz)**

**DP6040B (40V/1GHz)**

**DP6060B (60V/1GHz)**



## 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.

### Notice

The user may have suffered minor injuries and material damage while with the wrong operation, to avoid such situation, note the matters needing 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 watch out for the maximum input voltage to avoid shock accident
- Do not use the device under humid or explosive environment
- Make sure the circuit under test is off before the probe is plugged in
- Turn off the circuit and then take off the probe after the testing
- Make sure the BNC port is well grounded when the probe BNC output cable is connected to the oscilloscope or other devices.
- Check the external surface of the probe before testing. If there's any damage upon the probe, please stop the usage.
- Power the probe with the standard adapter.

## DP6020B/DP6040B/DP6060B Brief Description

Type	Maximum input differential voltage	Bandwidth	Attenuation ratio
DP6020B	20V	1GHz	10X
DP6040B	40V	1GHz	20X
DP6060B	60V	1GHz	50X

## 1. Summary

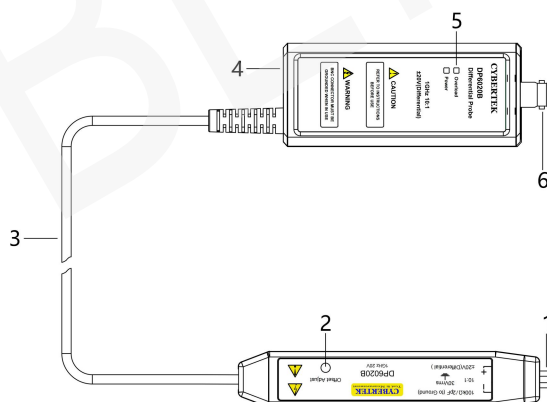
**DP6020B、DP6040B and DP6060B probe** is the low voltage differential probe with float ground testing function. The measurement voltage is  $\pm 20V(DC+Pk)$ 、 $\pm 40V(DC+Pk)$  and  $\pm 60V(DC+Pk)$ , maximum bandwidth up to 1GHz, with 10:1、20:1 and 50:1 attenuation setting. With the overload alarm function, the probes can adapt with any oscilloscope with 50 $\Omega$  BNC input, and can be powered by the USB port on oscilloscope or other computers. Widely used in many applications, DP6020B、DP6040B and DP6060B can provide excellent general differential signal testing for high speed power measurement, vehicle bus testing and digital system design.

## 2. Application

- ◆ Floating voltage measurement
- ◆ High speed power testing
- ◆ Digital differential bus
- ◆ Vehicle serial bus (CAN、LIN、FlexRay)

## 3. Product and Accessories

### ■ Product



### Detailed Instruction

- ✧ **Input Terminal:** Interface with a distance of 2.54mm , used to measure the voltage signal
- ✧ **Offset Adjust:** adjust the resistor to realize the adjusting of the output
- ✧ **Connecting Cable:** the connector of the front and back side of the probe, length around 70cm
- ✧ **Power Supply Port:** standard USB Type -C port, power up by standard USB adaptor. Can also be powered by oscilloscope, easy to use
- ✧ **Overload alarm indicator:** when the measuring range surpass the limit, the overload indicator

will be lighted, and buzzer will be activated.

- ✧ **Output Port:** standard BNC output port can be connected to the oscilloscope of any brand. The input impedance of the oscilloscope is required to be  $50\Omega$ (**recommended**), or connect to thorough  $50\Omega$  load, with input impedance set to  $1M\Omega$

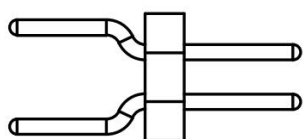
## ■ Accessories



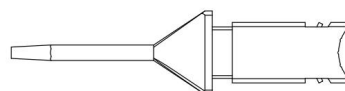
Single Signal Pin( CK-292)



Thorough type  $50\Omega$  load(CK-50)



Variable Pitch Signal Pin (CK-291)



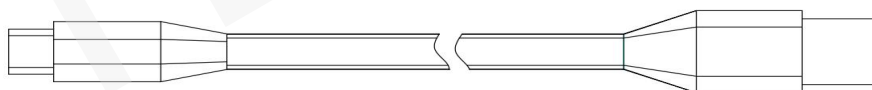
Test Hook (CK-285 one pair)



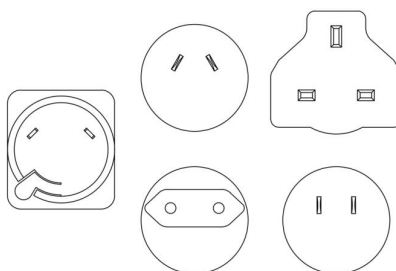
Extender Leads (CK-323 0.8 mm J-P, 5 cm and CK-324 0.8 mm J-P, 10 cm each pair)



Coaxial Output Cable (CK-310)



USB Cable (CK-314 USB-A to USB-C, 1.5m)



Power Supply Adaptor (CK-605A) USB 5V/1A

## 4. Electronics Specification

Modle		DP6020B	DP6040B	DP6060B
Bandwidth(-3dB)		1GHz(see Fig 1)	1GMHz(see Fig 2)	1GMHz(see Fig 3)
Rise time		$\leq 350\text{ps}$		
Accuracy		$\pm 1\%$		
Attenuation ratio		10:1	20:1	50:1
(DC + Peak AC) Maximum differential voltage		$\pm 20\text{V}$	$\pm 40\text{V}$	$\pm 60\text{V}$
Common mode voltage		$\pm 20\text{V}$	$\pm 40\text{V}$	$\pm 100\text{V}$
Maximum rated input voltage (to earth)		$\pm 30\text{V}$	$\pm 60\text{V}$	$\pm 100\text{V}$
Input impedance	Single to earth	100k $\Omega$	200k $\Omega$	200k $\Omega$
	Double input	200k $\Omega$	400k $\Omega$	400k $\Omega$
Input capacitance	Single to earth	$< 2\text{pF}$	$< 2\text{pF}$	$< 2\text{pF}$
	Double input	$< 1\text{pF}$	$< 1\text{pF}$	$< 1\text{pF}$
Output voltage fluctuation		$\pm 2\text{V}$ (50 $\Omega$ Oscilloscope Input)	$\pm 2\text{V}$ (50 $\Omega$ Oscilloscope Input)	$\pm 1.2\text{V}$ (50 $\Omega$ Oscilloscope Input)
Offset (Typical value)		$\pm 5\text{mV}$	$\pm 5\text{mV}$	$\pm 5\text{mV}$
Offset adjust range (Typical value)		$\pm 20\text{mV}$	$\pm 20\text{mV}$	$\pm 20\text{mV}$
CMRR	50Hz/60Hz	$> 80\text{dB}$	$> 80\text{dB}$	$> 80\text{dB}$
	100kHz	$> 60\text{dB}$	$> 60\text{dB}$	$> 60\text{dB}$
	1MHz	$> 50\text{dB}$	$> 50\text{dB}$	$> 50\text{dB}$
	50MHz	$> 40\text{dB}$	$> 40\text{dB}$	$> 40\text{dB}$
	100MHz	$> 30\text{dB}$	$> 30\text{dB}$	$> 30\text{dB}$
	500MHz	$> 15\text{dB}$	$> 15\text{dB}$	$> 15\text{dB}$
	1GHz	$> 10\text{dB}$	$> 10\text{dB}$	$> 10\text{dB}$
Noise(Vrms)		$< 4.5\text{mV}$	$< 9.0\text{mV}$	$< 22\text{mV}$
Overload indicator voltage threshold		$\geq 20\text{V}$	$\geq 40\text{V}$	$\geq 60\text{V}$
Delay time	Probe main	6ns		
	BNC(1m)	5ns		
Overload indicator		Indicator will be lighted red when overload occurs		
Terminal load requirement		50 $\Omega$		
Power supply		USB 5V/1A Adaptor		

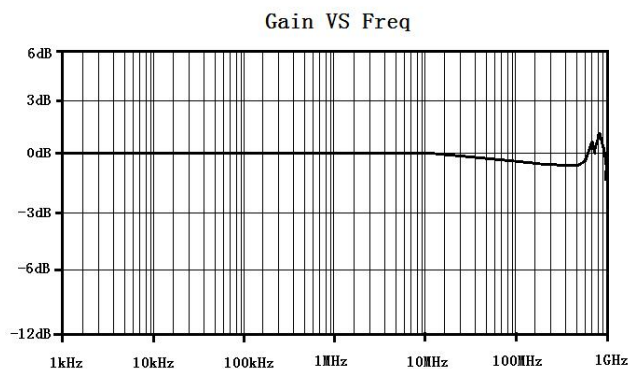


Fig 1: DP6020B Frequency Response Curve

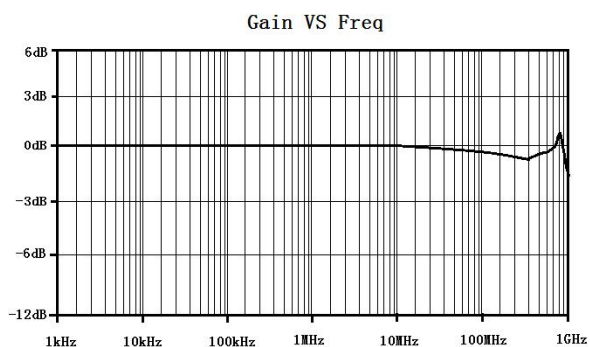


Fig 2: DP6040B Frequency Response Curve

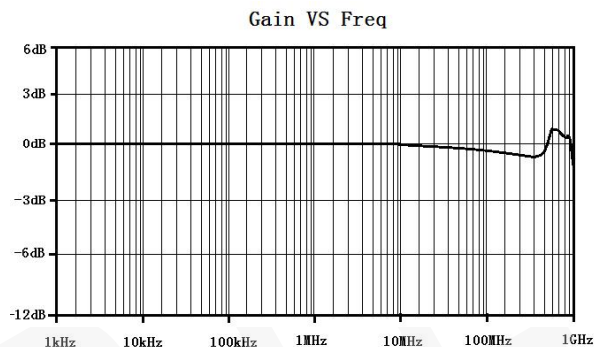


Fig 3: DP6060B Frequency Response Curve

## 5. Machinery Specification

Type		Parameter
Test Hook (CK-285)		58mm*14.5mm*4.5mm
Single Signal Pin( CK-292)		14.69mm*2mm*0.8mm
Variable Pitch Signal Pin(CK-291)		14.69mm*5.08mm*2.54mm
BNC output cable (CK-310)		1m
Extender Leads(CK-323)		0.8mm J-P,50mm
Extender Leads(CK-324)		0.8mm J-P,100mm
USB Cable(CK-314)		1.5m
Probe dimension	Front	121*22*15mm
	Back	104*40*27mm
Probe weight		122g

## 6. Environmental Characteristics

Type	Parameter
Pollution level	2
Operating temperature	0℃～50℃
Storage temperature	-30℃～70℃
Operating humidity	≤85%RH
Storage humidity	≤90%RH
Operating altitude	3000m
Storage altitude	12000m

## 7. Operating Steps

- ✧ The range of the voltage under test should be estimated before the test. Voltage surpassing the measuring range could possibly damage the probe and the product.
- ✧ Connect the input and output cable to the probe and connect the probe with oscilloscope or other test devices.
- ✧ The green power indicator will be lighted when the power supply adaptor connects with the voltage probe. When the voltage under test surpass the range, the indicator will be lighted along with the buzzer.
- ✧ Please set proper attenuation rate for the oscilloscope or other instruments according to the probe range , input impedance to 50Ω (If the probe output port is connected with 50Ω thorough type load, the input impedance should be 1MΩ) Adjust the sensitivity of the oscilloscope according to the voltage under test
- ✧ Connect the clips according to needs and start the test. The main body of the probe should be put away from the high voltage pulse circuit to minimize the interference.
- ✧ Turn off the power of the circuit under test after the test is over, then turn off the power of the probe and disconnect the two input ports from the point under test, and unplug the BNC connector from oscilloscope.

## 8.Safety Notices:

### Note

- ✧ If an input extension cable with a test hook is used during measurement, the input frequency should not exceed 150MHz. If it exceeds 150MHz, there will be some error in the output.

## 9. Maintenance

- ✧ Keep the probe dry and clean
- ✧ Clean the probe with dry cloth instead of chemical potion

- ☞ Put the probe back to its pack and store in shady, clean and dry places
- ☞ The pack of our company can provide quakeproof protection to the probe, please make sure the probe is packed during transportation
- ☞ Do not pull or draw the cable to avoid over twisting or knot

## 10. Warranty

Please refer to the instruction on warranty card

## 11. Packing List

Packing List	
Voltage probe	1
USB 5V/1A adaptor (CK-605A)	1
Test Hook (CK-285)	1
Single Signal Pin( CK-292)	6
Variable Pitch Signal Pin(CK-291)	2
Extender Leads(CK-323)	1
Extender Leads(CK-324)	1
BNC output cable(CK-310)	1
50Ω thorough type load (CK-50)	1
USB connecting cable ( USB-A to USB-C, 1.5m) CK-314	1
Instruction manual	1
Warranty card	1
Test report	1

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