

N

N Series Differential Probe



INSTRUCTION MANUAL

使用说明书

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前言

感谢您购买示波器差分探头，为此我们将给您最好的服务：

- 请认真阅读本用户手册，注意安全措施。

符号的意义



警告！请使用仪器前参阅用户手册。

未能遵守指示标志或在阅读此用户手册之前操作，可能导致人身伤害或损坏设备和装置



- 小心注意触电危险，注意最高输入电压。
- 请勿在潮湿的环境下或者易爆的风险下使用。
- 接入探头前，确保被测电路关闭。
- 测量结束后，先关闭被测电路，再关掉探头开关。
- 使用前，确认差分探头是否有破损，若有请停止使用。
- 请选择该产品标配的适配器。

一、简述

差分探头提供一个安全的仪器给所有的示波器使用，它可以转换由高输入的差动电压进入一个低电压($\leq 7V$)，并且显示波形在示波器上，使用频宽高达 200MHz，非常适合大电力测试、研发、维修使用。

差分探头输出标示是设计在操作示波器 $1M\ \Omega$ 的输入阻抗的相对衰减量，当使用 $50\ \Omega$ 匹配器进衰减量刚好为 2 倍量。

可广泛用于开关电源、变频器、电子镇流器、变频家电和其它 电气功率装置等的研发、调试或检修工作中。

二、规格

型号	N1008A	N1008B	N1015A
频宽 (-3dB)	DC-50MHz	DC-100MHz	DC-100MHz
衰减比例	1:100/10	1:100/10	1:1000/100
上升时间	7ns	3.5ns	3.5ns
精度	±1%	±1%	±1%
输入电压 V _{p-p}	800V@1/100 80V@1/10	800V@1/100 80V@1/10	1500V@1/1000 150V@1/100
输入电压 (DC) / 共模电压	400V	400V	750V
差模电压	400V@1/100 40V@1/10	400V@1/100 40V@1/10	750V@1/1000 75V@1/100
输入电压 (RMS)	280V	280V	530V
输入阻抗	2MΩ //2.5pF 4MΩ //1.25pF	2MΩ //2.5pF 4MΩ //1.25pF	4MΩ //1.18pF 8MΩ //0.59pF
型号	N1000A	N1030A	N1030B
频宽 (-3dB)	DC-50MHz	DC-50MHz	DC-100MHz
衰减比例	1:1000/100	1:1000/100	1:1000/100
上升时间	7ns	7ns	3.5ns
精度	±1%	±1%	±1%
输入电压 V _{p-p}	1500V@1/1000 150V@1/100	3000V@1/1000 300V@1/100	3000V@1/1000 300V@1/100
输入电压 (DC) / 共模电压	750V	1500V	1500V
差模电压	750V@1/1000 75V@1/100	1500V@1/1000 150V@1/100	1500V@1/1000 150V@1/100
输入电压 (RMS)	530V	1050V	1050V
输入阻抗	4MΩ //1.18pF 8MΩ //0.59pF	4MΩ //1.18pF 8MΩ //0.59pF	4MΩ //1.18pF 8MΩ //0.59pF
共同特性			
输出电压	≤7V		
示波器输入阻抗	1MΩ		
共模互斥比	60Hz>80dB, 100kHz>50dB		
电源	6V 适配器 (不支持电池供电)		

型号	N1070A*		N1070APro*		N1070B*	
频宽 (-3dB)	DC-50MHz		DC-50MHz		DC-100MHz	
衰减比例	1:1000/100		1:1000/100		1:1000/100	
上升时间	7ns		7ns		3.5ns	
精度	±1%		0.5% (DC-50Hz~1kHz)		±1%	
输入电压 V _{p-p}	7000V@1/1000 700V@1/100					
输入电压 (DC) /共模电压	3500V					
差模电压	3500V@1/1000 350V@1/100					
输入电压 (RMS)	2450V					
输入阻抗	10MΩ //1pF 20MΩ //0.5pF		10MΩ //1pF 20MΩ //0.5pF		10MΩ //1pF 20MΩ //0.5pF	

型号	N1015B*	N1100A*	N1140A*	N1140APro*	
频宽 (-3dB)	DC-100MHz	DC-100MHz	DC-100MHz	DC-50MHz	
衰减比例	1:500/50	1:1000/100	1:1000/100	1:1000/100	
上升时间	3.5ns	3.5ns	3.5ns	7ns	
精度	±1%	±1%	±1%	0.5% (DC-50Hz~1kHz)	
输入电压 V _{p-p}	1500V@1/500 150V@1/50	10kV@1/1000 1kV@1/100	14kV@1/1000 1.4kV@1/100	14kV@1/1000 1.4kV@1/100	
输入电压 (DC) / 共模电压	750V	5000V	7000V	7000V	
差模电压	750V@1/500 75V@1/50	5000V@1/1000 500V@1/100	7000V@1/1000 700V@1/100	7000V@1/1000 700V@1/100	
输入电压	530V rms	3500V rms	4900V rms	4900V rms	
输入阻抗	4MΩ //1.18pF 8MΩ //0.59pF	10MΩ //1pF 20MΩ //0.5pF	10MΩ //1pF 20MΩ //0.5pF	10MΩ //1pF 20MΩ //0.5pF	

共同特性	
输出电压	≤7V
示波器输入阻抗	1MΩ
共模互斥比	60Hz>80dB, 100kHz>50dB
电源	可用电池或 6V 适配器供电, 标配适配器



小白机差分探头示意图



大白机差分探头示意图

机械规格

名称	规格
差分测试线	30cm/60cm
BNC 输出线缆	90cm
探头探钩 BP-368N	122*38*14.5mm
探头尺寸(小白机)	165*69*26mm
探头尺寸(大白机)	186*84*38mm
探头重量(小白机)	300g
探头重量(大白机)	400g

三、操作环境及状况

	一般状态	使用操作中	储存
温度	+20℃…+30℃	0℃…+50℃	-30℃…+70℃
湿度	≤70%RH	20%…75%RH	10%…90%RH

尺寸及重量：165x69x26mm（N 系列小白机）;186x84x38mm(带*的型号/N 系列大白机)

双绝缘

安装类目Ⅲ

污染程度 2

相关电压或最大接地：5000V RMS Max.

四、操作程序

差分探头(N1070A 为例)的输出端 BNC 接口与示波器连接。

如有需要先调整示波器上的垂直开关。

将示波器上的衰减率及垂直开关调整到一致的位置。

- 测试前应估计下被测电压值，若超过电压量程，可能会损坏探头。
- 探头开机前，最好将探头档位拨到最大；电源适配器接入探头，拨动电源开关，绿色灯亮，当测试电压超过量程时，灯亮红色。
- 根据探头选择的变比，设置好示波器的衰减比例。
- 探头探钩连接被测物开始测量。
- 测试完毕后，先关掉被测电路，再关闭探头开关，将探钩与被测物断开，将 BNC 接口从示波器上拔出。

(注意)

- 电源必须打开。
- 实际的垂直偏向是等于衰减乘上示波器上所选择的垂直偏向，是使用负载 $50\ \Omega$ 的两倍。

差分探头 BNC 输出线连接示波器或者其它设备时，确保 BNC 端子可靠接地。

五、使用注意事项

在测量时应尽量使输入线缠绕，这样可以更好的消除引线电感和外界噪声，提高高频响应和抗干扰的能力。缠绕方式如下图所示：



尽量不要延长输入线，否则会引入更多的噪声。

六、配件



6V 适配器
W&T-AD1806A060030K
(6V/0.3A)



探头探钩
BP-368N
(1000V/3A)

七、维修

■ 维护

保养此产品时请使用原厂指定的工具，原厂将不负任何责任由其他不被认可的维修人员所做的维修。

■ 清洁

此产品不需要任何特定的清洁，如有需要，请用轻软干净的布沾上微量的清洁液轻轻的在产品外观擦拭。

■ 保固

除了在人为上的特意损坏，本产品是受保固并可以维修的，并不包含在安全规范的责任。

保固是以不超出发票上的金额，零件的更换及运送的费用。

保固是仅在正常操作下而造成的损坏，并不包含任何刻意的损坏，操作上的错误，机械上的操作不当，保养不当，负载或过压。原厂的保固是卖出后的 36 个月内，如有任意的非原厂的维修或更换零件，原厂保固将自然取消。

■ 维修

有任何的维修，保养或更换零件是在保固以外，请将产品退回原厂维修。

装箱清单：

名称	数量
差分探头主机	一个
探钩（BP-368N）	一对
6V 适配器 （W&T-AD1806A060030K）	一个
说明书	一份
合格证	一份

备注：产品配件默认发探钩，如需更换成其他配件，如鳄鱼夹/IC 夹等等，请与我司销售人员联系！

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General

Thank you for purchasing PINTECH oscilloscope differential probe, we will serve you wholeheartedly!

■Please read this user manual carefully before use and pay attention to safety measures.



Symbol

Please read this user manual carefully before use.

If haven't follow the signs or haven't read the user manual before use, may result in personal injury or damage to the equipment and device.



Pay attention to the risk of electric shock and pay attention to the highest input voltage.

Do not use in a humid environment or where there is a risk of explosiveness.

Before connecting the probe, make sure the circuit under test is turned off.

At the end of the measurement, turn off the circuit under test and then turn off the probe switch.

Before use, if the differential probe is damaged, please stop using it.

Please use PINTECH supply adaptor.

1. Introduction

Differential probe provides a safety means for measuring differential voltage to all models of oscilloscopes. It can convert the high differential voltage into a low voltage ($<7V$) and display on the oscilloscope. Its bandwidth is up to 200MHz, which is ideal for big power testing, development and maintain.

The Differential probe is designed to operate with the $1M\Omega$ impedance oscilloscopes. When combine with the 50Ω load, the attenuation will be 2 times.

It can be widely used in the research and development, debugging or maintenance of switching power supplies, frequency converters, electronic ballasts, frequency conversion appliances and other electrical power devices.

2. Specification

Model	N1008A	N1008B	N1015A
Bandwidth(-3dB)	DC-50MHz	DC-100MHz	DC-100MHz
Attenuation ratio	1:100/10	1:100/10	1:1000/100
Rise Time	7ns	3.5ns	3.5ns
Accuracy	±1%	±1%	±1%
Input voltage Vp-p	800V@1/100 80V@1/10	800V@1/100 80V@1/10	1500V@1/1000 150V@1/100
Input voltage(DC)/ common mode voltage	400V	400V	750V
differential mode voltage	400V@1/100 40V@1/10	400V@1/100 40V@1/10	750V@1/1000 75V@1/100
Input voltage(RMS)	280V	280V	530V
Input resistance	2MΩ//2.5pF 4MΩ//1.25pF	2MΩ//2.5pF 4MΩ//1.25pF	4MΩ//1.18pF 8MΩ//0.59pF
Model	N1000A	N1030A	N1030B
Bandwidth(-3dB)	DC-50MHz	DC-50MHz	DC-100MHz
Attenuation ratio	1:1000/100	1:1000/100	1:1000/100
Rise Time	7ns	7ns	3.5ns
Accuracy	±1%	±1%	±1%
Input voltage Vp-p	1500V@1/1000 150V@1/100	3000V@1/1000 300V@1/100	3000V@1/1000 300V@1/100
Input voltage(DC)/ common mode voltage	750V	1500V	1500V
differential mode voltage	750V@1/1000 75V@1/100	1500V@1/1000 150V@1/100	1500V@1/1000 150V@1/100
Input voltage(RMS)	530V	1050V	1050V
Input resistance	4MΩ//1.18pF 8MΩ//0.59pF	4MΩ//1.18pF 8MΩ//0.59pF	4MΩ//1.18pF 8MΩ//0.59pF
Common Characteristics			
Output voltage	≤7V		
Oscilloscope input impedance	1MΩ		
CMRR(typical)	60Hz>80dB, 100kHz>50dB		
Power	6V adapter-powered only		

Model	N1070A*		N1070APro*		N1070B*
Bandwidth(-3dB)	DC-50MHz		DC-50MHz		DC-100MHz
Attenuation ratio	1:1000/100		1:1000/100		1:1000/100
Rise Time	7ns		7ns		3.5ns
Accuracy	± 1%		0.5%(DC-50Hz~1kHz)		± 1%
Input voltage Vp-p	7000V@1/1000 700V@1/100				
Input voltage(DC)/ common mode voltage	3500V				
differential mode voltage	3500V@1/1000 350V@1/100				
Input voltage(RMS)	2450V				
Input resistance	10MΩ//1pF 20MΩ//0.5pF		10MΩ//1pF 20MΩ//0.5pF		10MΩ//1pF 20MΩ//0.5pF
Model	N1015B*	N1100A*	N1140A*	N1140APro*	
Bandwidth(-3dB)	DC-100MHz	DC-100MHz	DC-100MHz	DC-50MHz	
Attenuation ratio	1:500/50	1:1000/100	1:1000/100	1:1000/100	
Rise Time	3.5ns	3.5ns	3.5ns	7ns	
Accuracy	± 1%	± 1%	± 1%	0.5%(DC-50 Hz~1kHz)	
Input voltage Vp-p	1500V@1/500 150V@1/50	10kV@1/1000 1kV@1/100	14kV@1/1000 1.4kV@1/100	14kV@1/1000 1.4kV@1/100	
Input voltage(DC)/ common mode voltage	750V	5000V	7000V	7000V	
Differential mode voltage	750V@1/500 75V@1/50	5kV@1/1000 500V@1/100	7kV@1/1000 700V@1/100	7kV@1/1000 700V@1/100	
Input voltage(RMS)	530V	3500V	4900V	4900V	
Input resistance	4MΩ//1.18pF 8MΩ//0.59pF	10MΩ//1pF 20MΩ/0.5pF	10MΩ//1pF 20MΩ//0.5pF	10MΩ//1pF 20MΩ//0.5pF	
Common Characteristics					
Output voltage	≤7V				
Oscilloscope input impedance	1MΩ				
CMRR(typical)	60Hz>80dB, 100kHz>50dB				
Power	battery-powered/6V adapter-powered, standard packing include adaptor				

Mechanical Specifications:

Item	Specifications
Test cable length	30cm/60cm
BNC output cable	90cm
Probe hook BP-368N	122*38*14.5mm
Dimension (mall white machine)	165*69*26mm
Dimension (big white machine)	186*84*38mm
Weight (mall white machine)	300g
Weight (big white machine)	400g

3. Operating environment and conditions

	Reference	Use	Storage
Temperature	+20℃...+30℃	0℃....+50℃	-30℃....+70℃
Humidity	≤70%RH	20%...75%RH	10%...90%RH

Dimensions: 165x69x26mm(N series small white machine);

186x84x38mm(Model with */N series big white machine)

Dual insulation

Installation category III

Degree of Pollution 2

Related voltage or max line-earth: 6500V RMS Max.

4. Operating instruction

Connect the output BNC interface of the differential probe(Take N1070A as an example) to the oscilloscope.

Adjust the vertical switch on the oscilloscope if necessary.

Adjust the attenuation rate and vertical switch on the oscilloscope to a consistent position.

The measured voltage value should be estimated before the test, if the voltage range is exceeded, the probe may be damaged.

Before the probe is turned on, it is best to set the probe ratio to the maximum; The power adapter is plugged into the probe, the green light is on when the probe is power on, when the test voltage exceeds the range, the light is red.

Set the attenuation ratio of the oscilloscope according to the ratio selected by the probe.

The probe hook is connected to the object to be measured and start measuring.

After the test is completed, turn off the circuit under test first, then turn off the probe switch, disconnect the probe hook from the tested circuit, and unplug the BNC interface from the oscilloscope.

(Attention)

The power must be turned on.

The actual vertical bias is equal to the attenuation multiplied by the vertical bias selected on the oscilloscope, which is twice as high as the 50Ω load used.

When connecting the differential probe BNC output cable to an oscilloscope or other device, ensure that the BNC terminal is securely grounded.

5. Using precautions

The input cable should be wound as much as possible during the measurement, which can better eliminate the lead inductance and external noise, and improve the high-frequency response and anti-interference ability. Like this:



Better don't lengthen the input cable, otherwise will get more noise.

6. Accessories



6V Adapter
W&T-AD1806A060030K
(6V/0.3A)



Probe Hook
BP-368N
(1000V/3A)

7. Service

Maintenance

For maintenance,only use specified spare parts.The manufacturer can not be held responsible for any accident arising following a repair made other than its after sales service or approved repairs.

Cleaning

This probe does not require any particular cleaning.If necessary,clean the case with a cloth slightly moistened with the soapy water.

Warranty

Unless notified,our instruments are guaranteed against any manufacturing defect or material defect. They do not bear the specification known as the safety specification.

Our guarantee,which may not under any circumstances exceed the amount of the invoiced price,goes on further than the repair of our faulty equipment,carriage paid to our workshops.

Repair

Maintenance,repairs under or out of guarantee.Please return the product to the manufacturer.

N 系列有源差分探头选购指南

型号 Model	频宽(-3dB) Bandwidth	输入阻抗 (Input Impedance)	衰减比(Attenuation Ratio)	精度 Accuracy	最大输入 (Vp-p)
N1000A	DC-50MHz	8MΩ//0.59pF	1:1000/100	1%	1500V@1/1000 150V@1/100
N1015B*	DC-100MHz	8MΩ//0.59pF	1:500/1:50	1%	1500V@1/500 150V@1/50
N1008A	DC-50MHz	4MΩ//1.25pF	1:100/10	1%	800V@1/100 80V@1/10
N1008B	DC-100MHz	4MΩ//1.25pF	1:100/10	1%	800V@1/100 80V@1/10
N1015A	DC-100MHz	8MΩ//0.59pF	1:1000/100	1%	1500V@1/1000 150V@1/100
N1030A	DC-50MHz	8MΩ//0.59pF	1:1000/100	1%	3000V@1/1000 300V@1/100
N1030B	DC-100MHz	8MΩ//0.59pF	1:1000/100	1%	3000V@1/1000 300V@1/100
N1070A*	DC-50MHz	20MΩ//0.5pF	1:1000/100	1%	7000V@1/1000 700V@1/100
N1070APro*	DC-50MHz	20MΩ//0.5pF	1:1000/100	0.5%	7000V@1/1000 700V@1/100
N1070B*	DC-100MHz	20MΩ//0.5pF	1:1000/100	1%	7000V@1/1000 700V@1/100
N1100A*	DC-100MHz	20MΩ//0.5pF	1:1000/100	1%	10kV@1/1000 1kV@1/100
N1140A*	DC-100MHz	20MΩ//0.5pF	1:1000/100	1%	14kV@1/1000 1.4kV@1/100
N1140APro*	DC-50MHz	20MΩ//0.5pF	1:1000/100	0.5%	14kV@1/1000 1.4kV@1/100
N2008APro*	DC-200MHz	18MΩ//1pF	1:1000/100	1%	1kV@1/1000 100V@1/100
N2015APro*	DC-200MHz	18MΩ//1pF	1:1000/100	1%	2kV@1/1000 200V@1/100
N2040APro*	DC-200MHz	18MΩ//1pF	1:1000/100	1%	4kV@1/1000 400V@1/100
N2060APro*	DC-200MHz	18MΩ//1pF	1:1000/100	1%	6kV@1/1000 600V@1/100

注：带*的型号有两种供电模式（适配器供电/电池供电）

Models with * can be powered by an 6V adapter or 4*AA batteries

广州德肯电子股份有限公司

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Web: www.pintech.com.cn

Tel: 400-628-7588

86-20-82510899