

HIGH VOLTAGE DIFFERENTIAL PROBE

差動測試棒



DP-16K
DP-16KM
DP-16KL

16KVp-p / 100MHz

INSTRUCTION MANUAL

使用說明書

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DP-16K/DP-16KM/DP-16KL

HIGH VOLTAGE DIFFERENTIAL PROBE

Read The Instructions Before Using The Instrument:

1. Must acquire a differential voltage probe & get the best service from instrument.
2. Read carefully the USER MANUAL.
3. Respect the safety precautions.

Safety Precautions:

Warning. Risk of Electric Shock

Respect the max input voltages:

1. Max differential voltage: 16 KV (DC + AC peak) or 5650 VRMS.
2. Max voltage between each input terminal and ground: 3500 VRMS.



Do not use the probe in damp environment or where there is risk of explosion.

Do not use the probe with its case open.

Disconnect the inputs and outputs of the probe before opening the case.

To Order Differential Voltage Probe and Accessories:

- An Insulated BNC/BNC lead and two $\Phi 4$ mm, length 3 inches (BP-250).
- Supplied an Adapter preset 5 VDC.
- 2 x high voltage IC clips (BP-266N).
- 2 x Banana to Banana high voltage plug (BP-366).
- 2 x Alligator plug (BP-276N) (Option).
- Instruction Manual.

FEATURES:

- The DP-16K series differential voltage probes provides a safety means of measuring floating potentials for all models of oscilloscopes incomplete safety.
- It converts the high differential voltage (≤ 16 KVDC peak) into a low voltage ($\leq \pm 8.0$ V) with reference to the earth for display on the oscilloscopes.
- The BNC output is designed to operate on an input with an impedance of $1\text{ M}\Omega$. It is 2 times of the $50\ \Omega$.
- Recommend to use PINTEK PL-10 with DP-16K series, and expand the measuring ranges. From DMM can observe more exact measured testing voltage. (Oscilloscope accuracy is 3%, and DMM is 10 times).
- DP-16K series are designed for high sensitivity modules and high dynamic range. Attenuation x100, x1000 are multiple of 10, which is easy for calculation without mistake. Maximum voltage is 16 KVp-p. These are designed for ultra high voltage.

SPECIFICATIONS:

(1) Bandwidth:

DC to 100 MHz (-3 dB) (DP-16K)

DC to 70 MHz (-3 dB) (DP-16KM)

DC to 50 MHz (-3 dB) (DP-16KL)

(2) Attenuation: x100, or x1000

(3) Accuracy: $\pm 2\%$

(4) Voltage Input Ranges (DC + AC peak to peak):

≤ 1.6 KVp-p for x100, (i.e about 565 VRMS or ± 800 VDC)

≤ 16 KVp-p for x1000, (i.e about 5650 VRMS or ± 8 KVDC)

(5) Permitted Max Input Voltage

Max differential voltage: 16 KV (DC + AC peak to peak)

Max voltage between each input terminal and ground: 3500 VRMS

(6) Input Impedance:

$10\text{ M}\Omega // 10\text{ pF}$ each side to ground

(7) Output: $\leq \pm 8.0 \text{ V}$

(8) Output Impedance: 50Ω (for $1 \text{ M}\Omega$ input oscilloscope)

(9) Rise Time: 4 ns

(10) Rejection Rate on Common Mode:

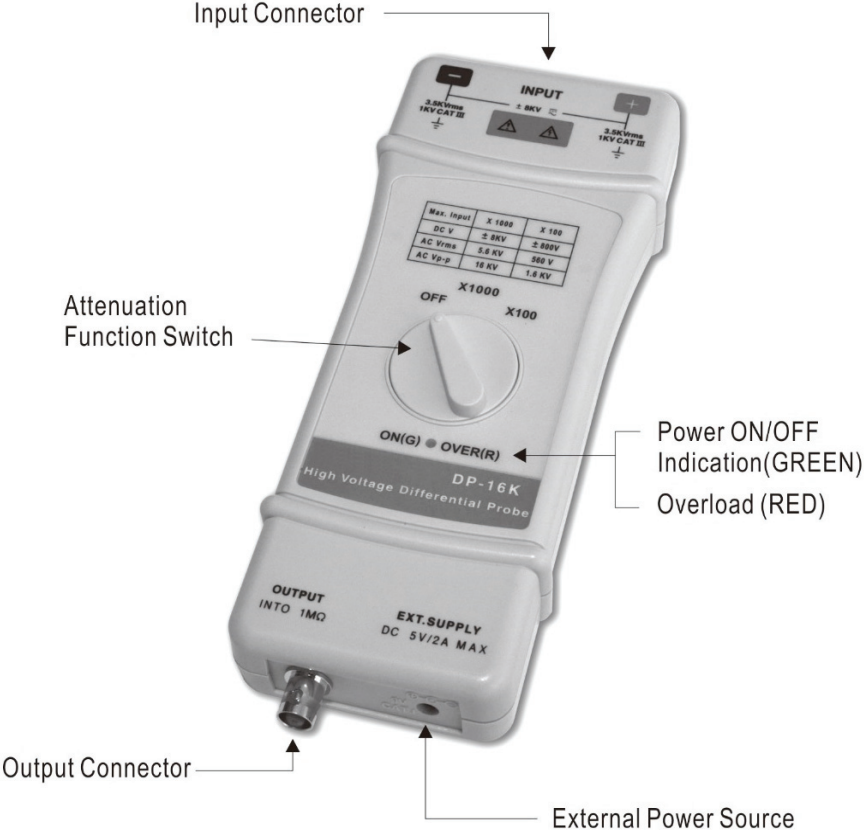
$60 \text{ Hz: } >80 \text{ dB}$; $100 \text{ Hz: } >60 \text{ dB}$; $1 \text{ MHz: } >50 \text{ dB}$

(11) Power Supply:

External 5 VDC power supply

(12) Consumption: 500 mA about (5 VDC)

PANEL DESCRIPTION:



OPERATING ENVIRONMENTAL CONDITIONS:

	Reference	Use	Storage
Temperature	+20 °C ...+30 °C	0 °C ...+50 °C	-30 °C ...+70 °C
Relative Humidity	≤ 70 %RH	10 % ...85 %RH	10 % ...90 %RH

(1) Dimensions and Weight:

220 x 85 x 30 mm; 450 g

(2) Electrical Safety to IEC 1010-1:

- Dual Insulation
- Installation Category III
- Degree of Pollution 2
- Rated Voltage or Max Live-Earth: 3500 VRMS

(3) CE Mark:

Conforms to EN 50081-1 and 50082-1 standards

OPERATING PROCEDURE:

- Connect to leads to the input and place the wire-grip on the circuit to be tested.
- Connect the probe to the oscilloscope with the insulated BNC/BNC lead.
- Adjust the vertical zero adjustment of the oscilloscope if necessary.
- Select the attenuation ratio and the vertical deviation of the oscilloscope in accordance with the conversion table below.
- **NB:** The POWER light must come on.

The conversion table gives the real vertical deviation.

Attenuation	X1000	X100
MAX Voltage Input Range(DC+AC Peak)	16 KV	1.6 KV
DC MAX INPUT	±8 KV	±800 V
AC RMS MAX INPUT	5650 V	565 V

Vertical Deviation on the Oscilloscope in V/div	Real Deviation In V/div	
	X1000 Range	X100 Range
1	1000	100
0.5	500	50
0.2	200	20
0.1	100	10
50 m	50	5
20 m	20	2
10 m	10	1
5 m	5	0.5
2 m	2	0.2



NOTE:

The real vertical deviation in V/div is equal to the attenuation factor multiplied by the range of vertical deviation selected on the oscilloscope. It will be doubled in the case of use of a 50 Ω load.

Example:

With the probe on factor x100, the oscilloscope on 0.5 V/div, the real vertical deviation is $100 \times 0.5 = 50$ V/div.

With a 50 Ω load on the input of the oscilloscope the deviation becomes 100 V/div.

EXT. POWER SOURCE:

- Power consumption of the probe is about 500 mA, thus it not suit for battery, please use the accessory adapter only.
- If there are any damage on the adaptor, please contact us and use the adaptor supply by us only. If the input power over 12 VDC will caused to the probe hard damage.

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 repairers.

CLEANING:

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

WARRANTY:

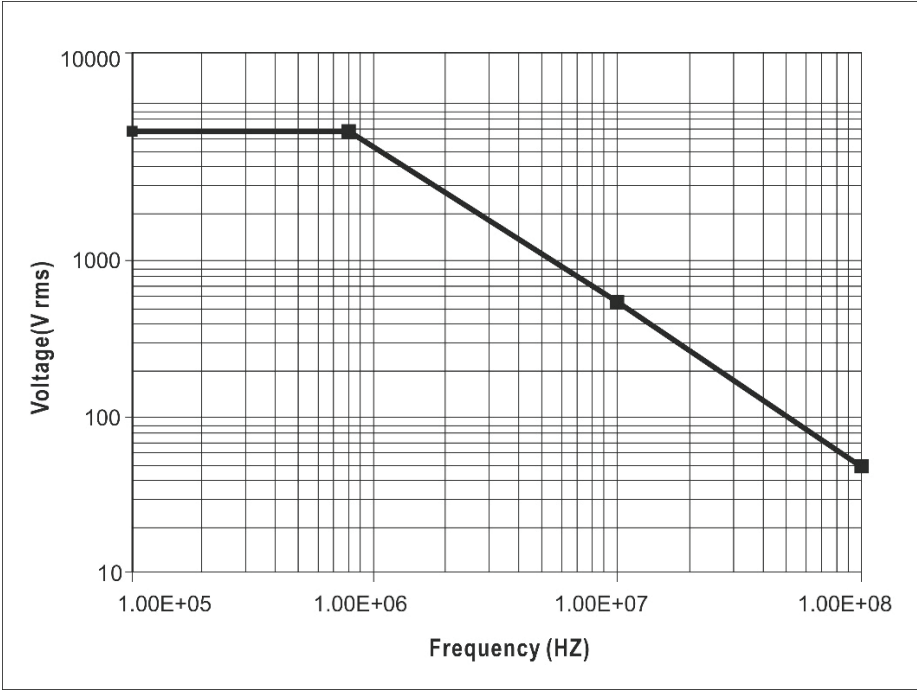
Unless notified to the contrary, our instruments are guaranteed against any manufacturing defect or material defect. They do not bear the specification known as the safety specification. Our guarantee, which may not under any circumstances exceed the amount of the invoiced price, goes no further than the repair of our faulty equipment, carriage paid to our workshops.

REPAIR:

Maintenance, repairs under or out of guarantee. Please return to product to your distributor.

DERATING CURVE:

The DP-16K derating curve of the absolute maximum input voltage in common mode is shown as below.



DP-16K/DP-16KM/DP-16KL

差動測試棒

使用前請詳細閱讀使用說明：

1. 請先獲得一支差動測試棒。
2. 從使用說明取得最佳維修及服務。
3. 請詳讀使用者操作手冊。
4. 請注意安全注意事項。

安全注意事項：

- 請小心注意觸電！
- 請注意最高輸入電壓！
- 最高差動電壓: 16 KV (DC + AC peak) 或 5650 VRMS。
- 輸入端及接地端間的最大差動電壓: 3500 VRMS。
- 請勿使用此產品在潮濕的環境下或有易爆的風險下操作！
- 請勿使用此產品當此產品的盒蓋被打開！
- 當打開此產品的盒蓋時請將輸出及輸入端切斷！

訂購差動測試棒時內含：

- 雙端 BNC 接頭的測試纜線，長度 3 英尺 (BP-250)。
- 一個 5 VDC 轉換器。
- 一對高電壓專用的 IC 夾 (BP-266N)。
- 一對指定規格的雙端香蕉插頭高電壓傳輸線 (BP-366)。
- 一對高電壓專用的鱷魚夾 (BP-276N)(選配)。
- 使用說明書。

簡述：

- DP-16K 系列差動測試棒提供一個安全的絕緣儀器給所有的示波器使用，它可以轉換由高輸入的差動電壓 (≤ 16 KV PEAK) 進入一個低電壓 ($\leq \pm 8$ V)，並且顯示波形在示波器上，使用頻率高達 100 MHz(DP-16K)，非常適合大電力測試、研發使用。
- 差動測試棒輸出標示是設計在操作示波器 1 M Ω 的輸入阻抗的相對衰減量，當使用 50 Ω 匹配器時衰減量剛好為 2 倍量。
- DP-16K 系列差動測試棒，也建議選購本公司生產的 PL-10 阻抗轉換器，可以延伸差動測試棒的應用範圍-可以在數字電表上觀測更精確的實際測試電壓值 (示波器精確度為 3%，數字電表約精準 10 倍)。
- DP-16K 系列為一高靈敏度設計，動態範圍之大前所未見，衰減器 x100, x1000 皆為 10 進位以方便使用者計算，不容易出錯，最高電壓達到 16KVp-p，為一超高電壓設計的機種。

規格：

(1) 頻寬:

DC – 100 MHz (-3 dB) (DP-16K)

DC – 70 MHz (-3 dB) (DP-16KM)

DC – 50 MHz (-3 dB) (DP-16KL)

(2) 衰減: x100, 或 x1000

(3) 精確度: $\pm 2\%$

(4) 輸入電壓範圍 (DC + AC PEAK TO PEAK)

≤ 1.6 KVp-p for x100, (約 565 VRMS 或 ± 800 VDC) \leq

16 KVp-p for x1000, (約 5650 VRMS 或 ± 8 KVDC)

(5) 允許最高輸入電壓:

最高差動電壓: 16 KV (DC + AC PEAK TO PEAK)

輸入端及接地端間最高電壓: 3500 VRMS

(6) 輸入阻抗:

各單端到接地端間的輸入阻抗: 10 M Ω // 10pF

(7) 輸出電壓: $\leq \pm 8 \text{ V}$

(8) 輸出阻抗: 50Ω (在 $1 \text{ M}\Omega$ 輸入阻抗的示波器系統中)

(9) 上升時間: 4 ns

(10) 雜訊抑制率:

60 Hz: $>80 \text{ dB}$; 100 Hz: $>60 \text{ dB}$; 1 MHz: $>50 \text{ dB}$

(11) 電源:

指定外接 5 VDC 電源 (必須使用本公司指定品)

(12) 耗電: 最大耗電量約 $500 \text{ mA} / 5 \text{ VDC}$

測試棒面板說明：



操作環境及狀況：

	一般狀態	使用操作中	儲存
溫度	+20 °C ...+30 °C	0 °C ...+50 °C	-30 °C ...+70 °C
濕度	≤70 %RH	10 % ... 85 %RH	10 % ... 90 %RH

(1) 尺寸及重量:

220 x 85 x 30 mm; 450 g

(2) 電子安全規範 IEC 1010-1:

- 雙絕緣
- 安裝類目 III
- 污染程度 2
- 相關電壓或最大接地: 3500 VRMS
- CE: EN50081-1 及 50082-1

操作程序：

- 將附件 BP-356N 與 BP-266 (或 BP-276N) 接起來後插入 DP-16K 的輸入端，並將 BP-266 (或 BP-276N) 與測量物接觸。
- 將 BP-250 與 DP-16K 的輸出端連接，並與示波器連結。
- 如有需要先調整示波器上的垂直開關。
- 將示波器上的衰減率及垂直開關調整到一致的位置，如下表。

 **注意！** 電源必須打開。

衰 減	X1000	X100
最大輸入電壓 (DC + AC Peak)	16 KV	1.6 KV
DC 最大輸入	±8 KV	±800 V
AC RMS 最大輸入	5650 V	565 V

示波器上的 垂直偏向(V/DIV)	換算實際偏向(V/DIV)	
	X1000 檔	X100 檔
1	1000	100
0.5	500	50
0.2	200	20
0.1	100	10
50 m	50	5
20 m	20	2
10 m	10	1
5 m	5	0.5
2 m	2	0.2

 **注意!**

實際的垂直偏向是等於衰減乘上示波器上所選擇的垂直偏向，如果另外使用 50 Ω 負載端子時，實際電壓值剛好是 2 倍量。

例如:

測試棒是 x100，示波器的垂直偏向在 0.5，其實際的垂直偏向為：

$$100 \times 0.5 = 50 \text{ V/div}$$

示波器輸入的負載是 50 Ω，偏向就為 100 V/div

外接電源：

- 本產品因耗電量高達 500mA，因此指定使用電轉接器。
- 請勿使用非本公司指定品，若因此造成任何損毀，本公司概不負責。

維護：

保養此產品時請使用原廠指定的工具，原廠將不負任何責任由其他不被認可的維修人員所做的維修。

清潔：

此產品不需要任何特定的清潔，如有需要，請用輕軟乾淨的布沾上微量的清潔液輕輕的在產品外觀擦拭。

保固：

除了在人為上的特意損壞，本產品是受保固並可以維修的，並不包含在安全規範的責任。

保固是以不超出發票上的金額，零件的更換及運送的費用。

保固是僅在正常操作下而造成的損壞，並不包含任何刻意的損壞，操作上的錯誤，機械上的操作不當，保養不當，負載或過壓。

原廠的保固僅包含有限的單純更換損壞的零件，使用者將不可歸據直接或間接的責任在原廠。

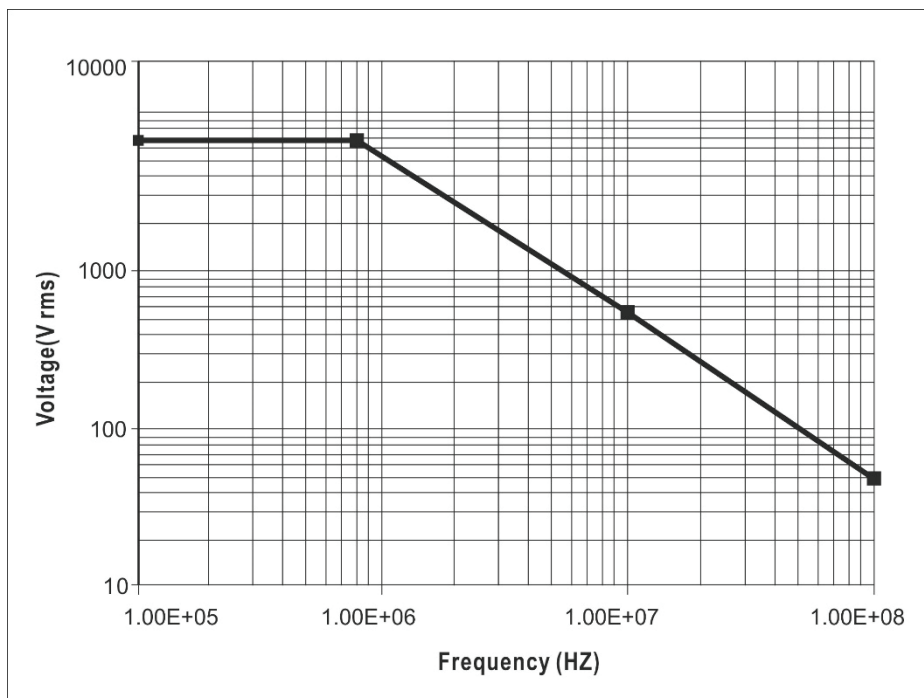
原廠的保固是賣出後的 12 個月內，如有任意的非原廠的維修或更換零件，原廠保固將自然取消。

維修：

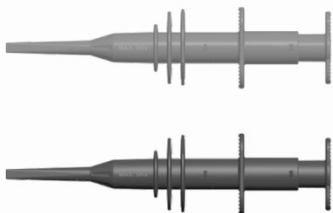
有任何的維修，保養或更換零件是在保固以外，請將產品退回原廠維修。

高頻耐壓曲線參考圖：

DP-16K 高頻耐壓曲線是以最大共模輸入電壓為例：



Accessories / 附件 :



BP-266N



BP-250



BP-276N(Optional)



BP-366



(Adapter)
100~240V: ASW-01

TINSE43 Ver.03

Made In Taiwan