# 25MHz DIFFERENTIAL PROBE
# USER' S MANUAL [LDP-6002]

This probe is in compliance with IEC-61010-031 CAT III, Pollution Degree 2.

## 1. Safety Terms and Symbols

**Terms appear in this manual:**

WARNING. Warning statements identify conditions or practice that could result in injury or loss life.

CAUTION. Caution statements identify conditions or practice that could result in damage to this product or other property.

**Symbols appear on the product:**

Danger
High Voltage

Protective
(Earth) Terminal

Attention
Refer to Manual

## 2. General Safety Summary

Review the following safety precautions to avoid injury and prevent damage to this probe or any products that connected to it.

### Observe Maximum Working Voltage

To avoid any injury, do not use the probe under the condition that the voltage between either input lead or earth is above 1000Vrms CAT III. This voltage rating applies to both of 1/20 & 1/200 settings.

## Must be Grounded

This probe is grounded with the shell of BNC connector and an auxiliary grounding terminal, through the grounding conductor of the power cord of the measurement instrument.

Before making connections to the input leads of this probe, ensure that the output BNC connector is attached to the BNC connector of the measurement instrument and the auxiliary grounding terminal is connected to a proper ground, while the measurement instrument is properly grounded.

## Use Fused Test Prods if Necessary

If this probe is intended to use for measurements in circuits of INSTALLATION CATEGORY III, it should incorporate with fused test prods.

## Do Not Operate Without Covers

To avoid electric shock or fire hazard, do not operate this probe with covers removed.

## Do Not Operate in Wet/Damp Conditions

To avoid electric shock, do not operate this probe in wet of damp conditions.

## Do Not Operate in Explosive Atmosphere

To avoid injury or fire hazard, do not operate this probe in an explosive atmosphere.

## Avoid Exposed Circuit

To avoid injury, remove jewelry such as rings, watches, and other metallic objects. Do not touch exposed connections and components when power is present.

## Use Proper Power Source

To ensure this probe function well, use four AA cells or 6VDC/60mA or regulated 9VDC/40mA mains adaptor or power lead. Do not operate this probe from a power source that applies more than the voltage specified.

## Do Not Operated With Suspected Failures

If you suspect there is damage to this probe, have it inspected by qualified service personnel.

## 3. Description

By enabling conventional oscilloscopes to display and measure in-circuit waveforms that are referenced to high common mode voltages. The differential probe extends the measurement capability of oscilloscopes in electronic power converters, inverters, motor speed controls, switch mode power supplies, and many applications.

## 4. Installation

a. Simply plug-in the BNC output connector to the vertical input of a general purposed oscilloscope or other measurement instrument, and connects the auxiliary grounding terminal to a proper ground. The measurement instrument must have a ground referenced.

b. Connect an appropriate power source to this probe and then turn it on.

c. Select the proper attenuation ratio. When measuring signals below 140V, switch the attenuation ratio to 1/20 in order to get higher resolution and less noise ratio. Otherwise, set the attenuation ratio to 1/200 when measuring signals up to 1400V.

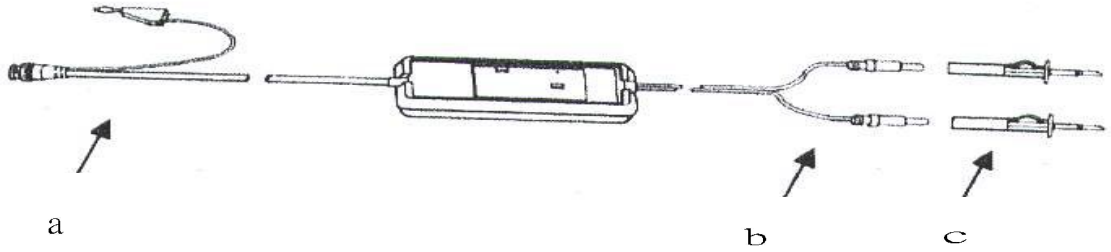
WARNING. To protect against electric shock, use only the accessories supplied with this probe.

d. Using the appropriate probe accessories, connect the inputs to the circuits under measurement.

CAUTION. This probe is to carry out differential measurement between two points on the circuit under measurement. This probe is not for electrically insulating the circuit under measurement and the measuring instrument.

# 5. Appearance

The differential probe looks as follows.




| | |
|---|---|
| a. Output Cable | The BNC output connector and an auxiliary grounding terminal are connected to the oscilloscope. |
| b. Input Leads | The input leads of the differential probe connect to sprung hooks that come with the probe. |
| c. Sprung Hooks | The sprung hooks are connected safely to test points in circuits. under measurement. |

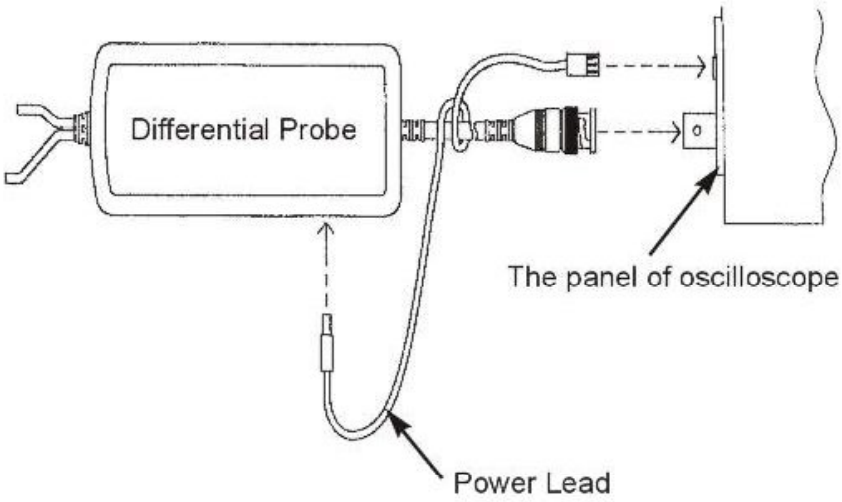
# 6. Power Leads

We offer two types power leads;

a. Adaptor-Lead®: For the oscilloscope whose power connector is Lemo® connector.

b. Adaptor-Probus® Lead: For the oscilloscope whose power connector is Probus® connector.

c. USB Power Cord: For the oscilloscope which offers USB connector



# 7. Specifications

| | |
|---|---|
| Bandwidth | DC to 25MHz (-3dB) |
| Attenuation Ratio | 1:20/200 |
| Accuracy | ±2% |
| Rise Time | 14ns |
| Input Impedance | 4MΩ//5.5pF each side to ground |
| Input Voltage | |
| - Differential Range | ±140V(DC+Peak AC) or 140Vrms @1/20 |
| | ±1400V(DC+Peak AC) or 1000Vrms @1/200 |
| - Common Mode Range | ±1400V(DC+Peak AC) or 1000Vrms @1/20 & 1/200 |
| - Absolute Max. Voltage | ±1400V(DC+Peak AC) or 1000Vrms CAT III @1/20 |
| (Differential or Common Mode) | & 1/200 |
| Output Voltage | |
| - Swing | ±7V (into 50kΩ load) |
| - Offset (typical) | <±5mV |
| - Noise (typical) | 0.7mVrms |
| - Source Impedance (typical) | 50Ω (for using 1MΩ input system oscilloscope) |
| CMRR (typical) | -80dB @50Hz, -60dB @20kHz |
| Ambient Operating Temperature | -10 to 40℃ |
| Ambient Storage Temperature | -30 to 70℃ |
| Ambient Operating Humidity | 25 to 85% RH |
| Ambient Storage Humidity | 25 to 85% RH |
| Power Requirements* | |
| - Standard | 4xAA cells |
| - Options | Power leads, Mains adaptor* (6VDC/60mA |
| | or regulated 9VDC/40mA), USB power cord |
| Length of BNC Cable | 95cm |
| Length of Input Leads | 45cm |
| Weight | 400gms (probe and PVC jacket) |
| Dimensions (LxWxH) | 170mm x 63mm x 21mm |

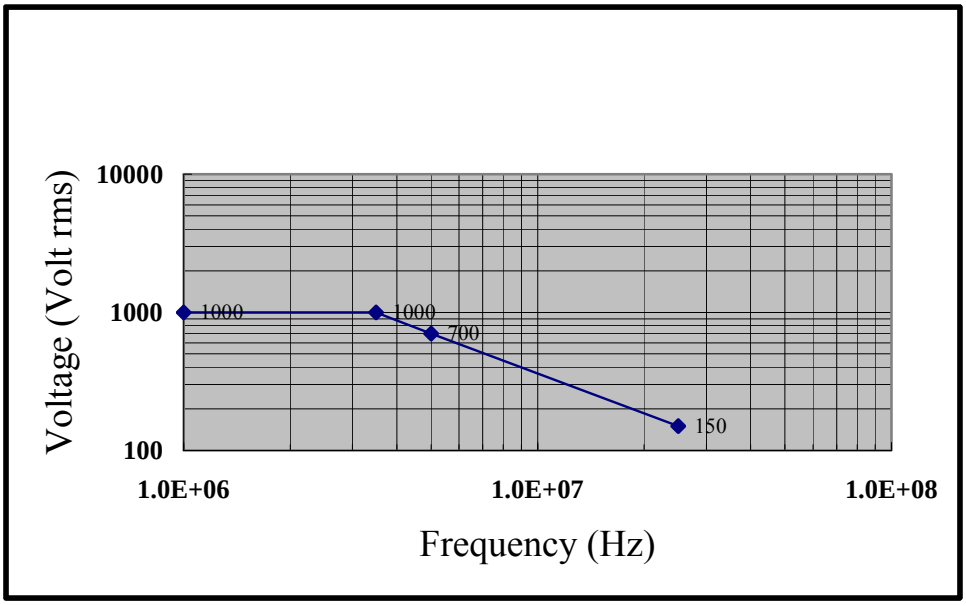
* a. The supplied voltage must be less than 12V and greater than 4.4V, otherwise the probe could be damaged or can't be operated properly.

b. polarity is "+" inside and "–" outside. For wrong polarity, built-in circuit protects the probe, no danger or damage will occur.

c. When the voltage of the cells become too low, the power indicator on the panel will flicker.

## 8. Derating Curve

The derating curve of the absolute maximum input voltage in common mode is shown as follows;




## 9. Inspection Procedure

a. Connect the BNC output connector to the vertical input of a general purposed oscilloscope.
b. To install four AA cells or connect an appropriate mains adaptor or power lead to the correct line voltage.
c. Set the oscilloscope input coupling to DC and the 1V/div. Center the trace on the display.
d. Connect the inputs of the probe to power lines.
e. Set the range of the probe to 1/200.
f. Then, a 50Hz/60Hz sine-wave of proper amplitude will be displayed on the screen of the oscilloscope and this means the probe is working properly.

## 10. Cleaning

Use a soft cloth to clean the dirt. Prevent damage to probe.

a. Avoid immersing the probe.
b. Avoid using abrasive cleaners.
c. Avoid using chemicals contains benzene or similar solvents.

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