

User's Guide

Agilent Technologies N2771A 15 kV High Voltage Probe



WARNING

This high voltage probe is designed to prevent accidental shock to the operator when properly used. This operating note must be read and understood prior to using the probe. Improper procedures or incorrect analysis of the measurement situation can result in serious shock.

General Information

The Agilent Technologies N2771A High Voltage Divider Probe is an accessory to be used with analog or digital oscilloscopes having input resistance of $1\text{ M}\Omega$ ($\pm 1\%$) and nominal input capacitance between 6 and 20 pF. The Agilent Technologies N2771A is a 1000:1 divider which extends the voltage measurement capability to 15 kV dc or 10 kV rms ac (30 kV peak).

Specifications
Maximum Input Voltage

DC Voltage: 15 kV
 AC Voltage: 10 kV RMS
 PEAK Voltage: 30 kV

Temperature Coefficient

Less than 200 ppm/ °C

Compensation Range

For input capacitance of 6 pF to 20 pF

Division Ratio Accuracy

1000:1 $\pm 1\%$ when terminated in $1\text{ M}\Omega$

Bandwidth

50 MHz (-3 dB)

Pollution Degree 2
Other Characteristics
Input Resistance

100 M Ω , 1 pF

Operating Temperature

0 °C to +50 °C

Cable Length:

2 meter

Storage Temperature:

-20 °C to +70 °C

Altitude:

Up to 4,600 meters (15,000 ft)

Humidity

Up to 80% relative humidity at +40 °C

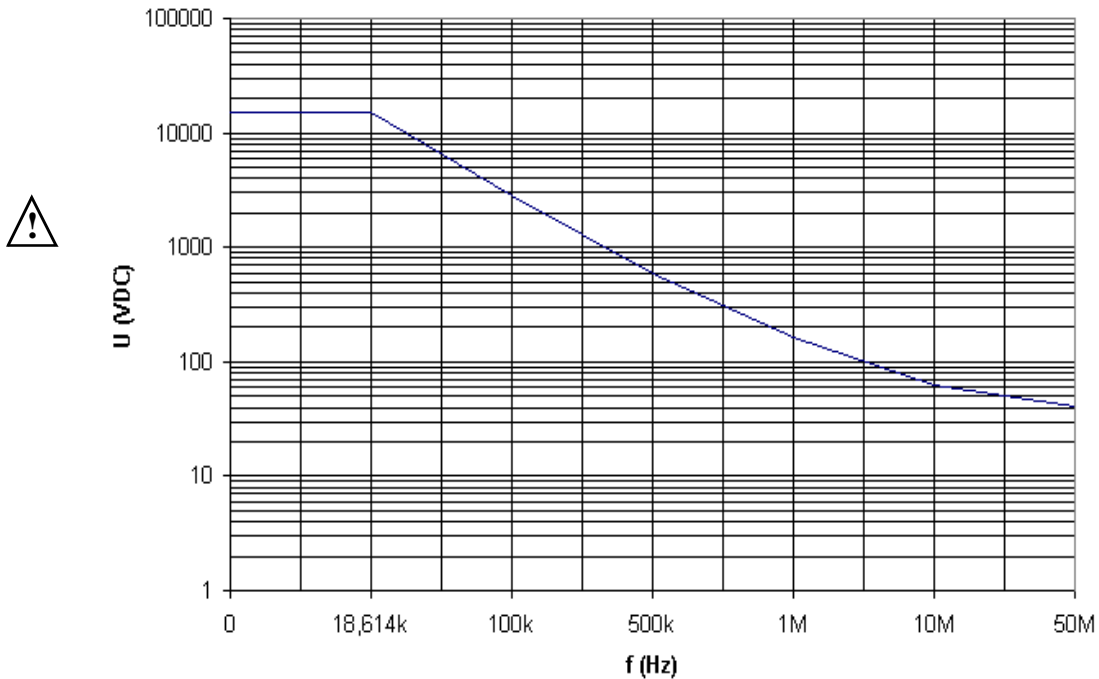
Accuracy

DC Volts: $\pm 2\%$
 AC Volts: $\pm 2\%$ at 1 kHz

Voltage Derating

The following graph shows the voltage versus frequency derating curve for the Agilent N2771A High Voltage Probe.

Voltage Versus Frequency Derating Curve

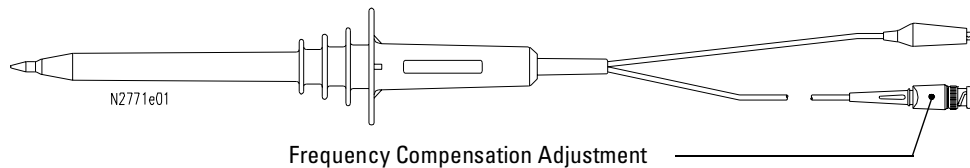


Frequency Compensation Adjustment

The N2771A High Voltage Probe has a Frequency Compensation adjustment that compensates for the input capacitance of the oscilloscope being used with the probe.

Use a square-wave generator set for approximately 100 Hz output. Proceed with the following steps for frequency compensation.

- 1 Connect the probe to the oscilloscope.
- 2 Connect probe tip to square-wave generator.
- 3 Adjust the square wave generator for approximately 10 volts amplitude.
- 4 Adjust the oscilloscope time base for 20 usec/div.
- 5 Use a trimmer tool to adjust the compensation capacitor for the flattest pulse top. See the figure below for the location of the adjustment.



Safety Precautions

- This high voltage probe must only be used by personnel who are trained, experienced, or otherwise qualified to recognize hazardous situations and who are trained in the safety precautions that are necessary to avoid possible injury when using such a device.
- Do not work alone when working with high voltage circuits
- For your own safety, inspect the probes for cracks and frayed or broken leads before each use. If defects are noted, DO NOT use the probe.
- Hands, shoes, floor and work bench must be dry. Avoid making measurements under humid, damp or other environmental conditions that might effect the safety of the measurement situation.
- It is advisable to turn the high voltage source off before connecting or disconnecting the probe.
- The probe body should be kept clean and free of any conductive contamination. Refer to the section on cleaning.

Operation

- 1 Connect the probe to the BNC input of the oscilloscope.
- 2 Select the desired volts/division range. (If you can set probe attenuation on the oscilloscope, set it to 1000:1)
- 3 Whenever possible, turn the high voltage source off before making any connections.
- 4 Connect the divider probe ground lead (alligator clip) to a good earth ground or reliable chassis ground.
- 5 Before turning on the high voltage source, make sure that no part of the person holding the probe is touching the device under test. Once this is certain, turn on the high voltage source.
- 6 Measure the voltage under test and observe the waveform on the oscilloscope. Remember the actual voltage is 1000 times greater than the oscilloscope waveform if the probe attenuation has not been set to 1000:1.
- 7 Turn off the high voltage source
- 8 Disconnect the Agilent N2771A High Voltage Probe from the high voltage source BEFORE disconnecting the ground clip lead.

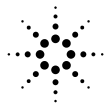
WARNING



- Do not attempt to take measurements from sources where the chassis or return lead is not grounded
- The ground lead is critical to the safe operation of the probe. Failure to make this connection when making high voltage measurements may result in personal injury or damage to the probe or oscilloscope. This connection must always be made BEFORE the probe tip comes in contact with the high voltage and must not be removed until the probe tip has been removed from the high voltage source.
- Do not connect the ground clip lead to the high voltage source for any reason.
- Do not make any floating measurements with the Agilent N2771A High Voltage probe.

Cleaning

- Clean only the exterior probe body and cables. Use a soft cotton cloth lightly moistened with a mild solution of detergent and water. Do not allow any portion of the probe to be submerged at any time.
- Dry the probe thoroughly before attempting to make voltage measurements.
- Do not subject the probe to solvents or solvent fumes as these can cause deterioration of the probe body and cables.



Agilent Technologies

Manual Part Number
N2771-92000



Agilent Technologies
1900 Garden of the Gods Road
Colorado Springs, Colorado 80907