



# CT4068-NA User Manual

## Safety Summary

To avoid personal injury and/or product damage, review and comply with the following safety precautions. These precautions apply to both operating and maintenance personnel and must be followed during all phases of operation, service, and repair of this instrument.

Only qualified personnel should use this probe. This differential voltage probe is designed to be used by personnel who are trained, experienced, or otherwise qualified to recognize hazardous situations and who are trained in the safety precautions necessary to avoid possible injury when using such a device.

This instrument is intended for usage within Measurement Category I (CAT I) only.

Do not work alone when working with high voltages.

For your own safety, inspect the probe and accessories 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 humidity, dampness or other environmental conditions that might affect safety.

The probe should be kept clean and free of any conductive contamination.

Do not remove the probe casing. Removal of the probe's casing may expose you to electric shock.

Do not use the probe with its case open.

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

### ***Use only in office-type indoor setting***

The instrument is designed to be used in office-type indoor environments. Do not operate the instrument:

- In the presence of noxious, corrosive, or flammable fumes, gases, vapors, chemicals, or finely-divided particulates.
- In environments where there is a danger of any liquid being spilled on the instrument.
- In air temperatures exceeding the specified operating temperatures.
- In atmospheric pressures outside the specified altitude limits or where the surrounding gas is not air.

***Not for critical applications.***

This instrument is not authorized for use in contact with the humanbody or for use as a component in a life-support device or system.

Hazardous voltages may be present in unexpected locations in circuitry being tested when a fault condition in the circuit exists.

Do not substitute parts that are not approved by Cal Test Electronics or modify this instrument. Return the instrument to Cal Test Electronics for service and repair to ensure that safety and performance features are maintained.

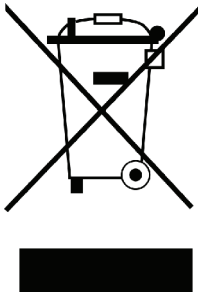
A **WARNING** statement calls attention to an operating procedure, practice, or condition, which, if not followed correctly, could result in injury or death to personnel.

A **CAUTION** statement calls attention to an operating procedure, practice, or condition, which, if not followed correctly, could result in damage to or destruction of parts or the entire product.

## Compliance Statements

### *Disposal of Old Electrical & Electronic Equipment*

(Applicable in the European Union and other European countries with separate collection systems). This product is subject to Directive 2012/19/EU of the European Parliament and the Council of the European Union on waste electrical and electronic equipment (WEEE), and in jurisdictions adopting that Directive, is marked as being put on the market after August 13, 2005, and should not be disposed of as unsorted municipal waste. Please utilize your local WEEE collection facilities in the disposition of this product and otherwise observe all applicable requirements.



# 1 Introduction

## Overview

Use the CT4068-NA 35-MHz differential probe to make safe and accurate floating measurements with an oscilloscope. The CT4068-NA differential probe allows conventional earth-grounded oscilloscopes to be used for floating signal measurements of up to  $\pm 800$  V for both differential and common mode voltage.

## Features

- 35 MHz bandwidth
- Selectable attenuation settings of 10x or 100x
- Up to  $\pm 800$  V differential and common mode voltage
- Compatible with most oscilloscopes
- Powered by included 9 VDC mains adapter

## Initial Inspection

This unit is tested prior to shipment. It is therefore ready for immediate use upon receipt. An initial physical inspection should be made to ensure that no damage has been sustained during shipment. After the inspection, verify the contents of the shipment. The included accessories for this product are:

- Two fully insulated pincer style clips (black & red)
- Two fully insulated alligator clips (black & red)
- Two 60 cm input leads (black & red)
- One 100 cm insulated BNC output cable
- One 9 V mains adapter
- User manual

## 2 Product Description

### Front Panel

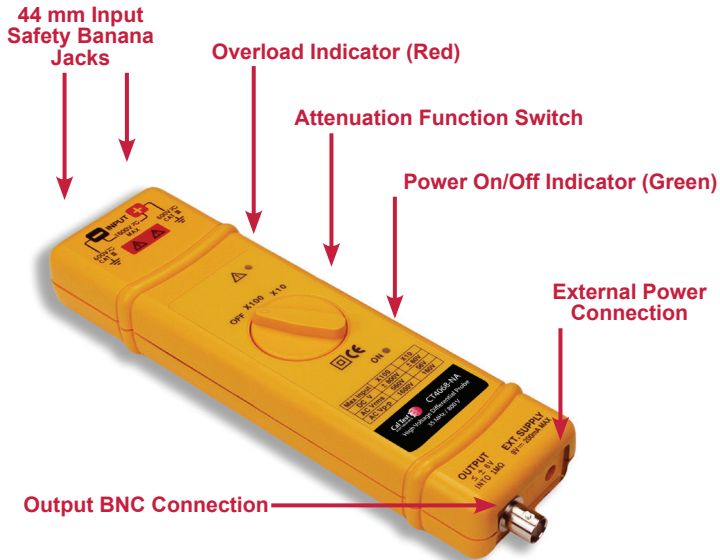


Figure 1 Front Panel Features

## 3 Using the Probe

### Getting Started

1. Connect the leads to the inputs on the probe.
2. Connect the clips to the leads.
3. Connect the probe to the oscilloscope with the BNC cable.
4. Connect the probe to the mains adapter.
5. Switch the probe from "OFF" to the desired attenuation ratio. The power light should come on.
6. Connect the clips to the circuit to be tested.

## Vertical Scale on Oscilloscope

The actual vertical scale of the oscilloscope is equal to the attenuation factor multiplied by the range of vertical scale selected on the oscilloscope. For example, with the probe on factor 10x, the oscilloscope on 0.5 V/div, the real vertical scale is  $10 \times 0.5 = 5$  V/div. With the probe on 100x, the real vertical scale is  $100 \times 0.5 = 50$  V/div. These values apply when the oscilloscope is set to 50  $\Omega$  input. When the oscilloscope is set to 1 M $\Omega$  input, the actual vertical scale will be halved: 2.5 V/div for the 10x probe setting and 25 V/div for the 100x probe setting. See the chart below.

Vertical Scale on Oscilloscope				
Probe Output Impedance	Scope Input Impedance	Probe Attenuation Setting	Vertical Scale Reading on the Oscilloscope	Actual Vertical Scale of the Oscilloscope
50 $\Omega$	50 $\Omega$	10x	0.5 V/div	5 V/div
50 $\Omega$	50 $\Omega$	100x	0.5 V/div	50 V/div
50 $\Omega$	1 M $\Omega$	10x	0.5 V/div	2.5 V/div
50 $\Omega$	1 M $\Omega$	100x	0.5 V/div	25 V/div

## External Power Source

Power consumption of the probe is about 200 mA, thus it is not suited for battery usage. Use the supplied adapter only. The probe may be damaged when the input power exceeds 12 VDC.

## Using a DMM

Using a DMM rather than an oscilloscope can significantly increase your accuracy. Use the CT2944-50 plus the CT3956 converter to use the probe with a DMM.

## 4 Cleaning

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

### **WARNING**

Dry the probe thoroughly before attempting to make voltage measurements.

### **CAUTION**

Do not subject the probe to solvents or solvent fumes as these can cause deterioration of the probe body and cables.



## 5 Specifications

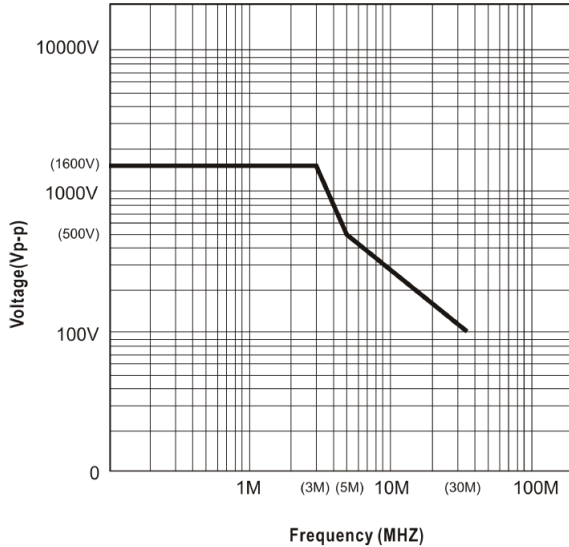
All specifications apply to the unit after a temperature stabilization time of 15 minutes over an ambient temperature range of  $25^{\circ}\text{C} \pm 5^{\circ}\text{C}$ .

<b>CT4068-NA Specifications</b>	
<b>Operating Parameters</b>	
Bandwidth	35 MHz
Rise Time	10 ns
Attenuation	10x/100x
Accuracy	$\pm 2\%$
AC CMRR	-80 dB @ 60 Hz -60 dB @ 100 Hz -50 dB @ 1 MHz
Input Impedance	Between inputs: $9\text{ M}\Omega // 1.7\text{ pF}$ Each input to ground: $4.5\text{ M}\Omega // 3.4\text{ pF}$
<b>Input Voltage</b>	
Differential Voltage (DC+ACpk)	$\pm 80\text{ V} / \pm 800\text{ V}$
Common-Mode Voltage (DC+ACpk)	$\pm 800\text{ V}$ 560 Vrms
Absolute Max Voltage (DC+ACpk)	$\pm 800\text{ V}$ 560 Vrms
<b>Output Voltage</b>	
Swing	$\pm 8\text{ V}$ ( $\pm 4\text{ V}$ into $50\ \Omega$ load)
Source Impedance (Typ.)	$50\ \Omega$
<b>General</b>	
Power Supply	External 9 VDC power supply
Power Consumption	200 mA (about 9 VDC)
Operating Temperature/ Humidity	$0^{\circ}\text{C}$ to $50^{\circ}\text{C}$ / 10% to 85% RH
Storage Temperature/Humidity	$-30^{\circ}\text{C}$ to $70^{\circ}\text{C}$ / 10% to 90% RH
Cable Length	100 cm (separate leads)
Input Leads Length	60 cm (separate leads)
Weight	250 g
Dimensions	195 x 55 x 30 mm

Specifications are subject to change without notice. To ensure the most current version of this manual, please download the current version from our website: [caltestelectronics.com](http://caltestelectronics.com).

## 6 Voltage Derating Curve

The derating curve of the absolute maximum input voltage in common mode is show as follows:



**Figure 1** *CT4068-NA Derating Curve*

## 7 Service & Warranty Information

### Limited One-Year Warranty

Cal Test Electronics warrants this product to be free from defective material or workmanship for a period of 1 year from the date of original purchase. Under this warranty, Cal Test Electronics is limited to repairing the defective device when returned to the factory, shipping charges prepaid, within the warranty period.

Units returned to Cal Test Electronics that have been subject to abuse, misuse, damage or accident, or have been connected, installed or adjusted contrary to the instructions furnished by Cal Test Electronics, or that have been repaired by unauthorized persons, will not be covered by this warranty.

Cal Test Electronics reserves the right to discontinue models, change specifications, price, or design of this device at any time without notice and without incurring any obligation whatsoever.

The purchaser agrees to assume all liabilities for any damages and/or bodily injury which may result from the use or misuse of this device by the purchaser, his employees, or agents.

This warranty is in lieu of all other representations or warranties expressed or implied and no agent or representative of Cal Test Electronics is authorized to assume any other obligation in connection with the sale and purchase of this device.

### Service

If you have a need for calibration or repair services, technical or sales support, please contact us:

22820 Savi Ranch Parkway  
Yorba Linda, CA 92887  
800-572-1028 or 714-221-9330  
[caltestelectronics.com](http://caltestelectronics.com)

