



## Specifications

The following specifications are valid for model AP034 probes after the probe has reached operating temperature. This takes 20 minutes with power applied, in an environment with stable ambient temperature. The probe must be operating within the environmental conditions listed in the General Characteristics section, and must have been calibrated within the past 12 months in an ambient temperature of  $23 \pm 5$  °C.

### NOMINAL CHARACTERISTICS

Nominal characteristics describe parameters and attributes that are guaranteed by design, but do not have associated tolerances.

Input Configuration:	True Differential (+ and – Inputs); with shield Ground connector.
Effective Gain <sup>1</sup> :	X1, $\div 10^1$ , $\div 20^1$
Input coupling:	DC. AC Coupling obtained by installing AC Coupling Adapter.
Differential Mode Range:	$\pm 400$ mV ( $\div 1$ Attenuation) $\pm 4$ V ( $\div 10$ Attenuation <sup>1</sup> ) $\pm 8$ V ( $\div 100$ Attenuation <sup>1</sup> )
Common Mode Range:	$\pm 16$ V ( $\div 1$ Attenuation) $\pm 42$ V ( $\div 10$ Attenuation <sup>1</sup> ) $\pm 42$ V ( $\div 20$ Attenuation <sup>1</sup> )
Maximum Input Voltage:	$\pm 42$ V either input from ground



### WARRANTED ELECTRICAL CHARACTERISTICS

Warranted characteristics are parameters with guaranteed performance. Unless otherwise noted, tests are provided in the Performance Verification Procedure for all warranted specifications.

LF Gain Accuracy: 2% into 50.0  $\Omega$  load<sup>2</sup>,  
measured at 1 kHz

Common Mode Rejection Ratio<sup>3</sup>: (probe head grounded, DC  
coupled without attenuator)

70 Hz  $\geq$  80 dB  
1 MHz  $\geq$  40 dB  
100 MHz  $\geq$  25 dB

Notes: <sup>1</sup>  $\pm$ 10 and  $\pm$ 20 obtained with external plug-on attenuators

<sup>2</sup> Output impedance is 50  $\Omega$ , intended to drive 50  $\Omega$ . Add uncertainty of termination impedance to accuracy.

<sup>3</sup> LeCroy measures CMRR with a fixture that connects the probe tip ground to the signal source ground. This method is necessary to obtain a reproducible CMRR measurement.

Often, users leave the probe tip ungrounded when measuring high frequency signals. Not grounding the probe tip can actually improve CMRR by allowing some of the common mode signal to be impressed across the entire length of the probe cable instead of from probe tip to probe ground. The CMRR improvement obtained without grounding the probe tip depends on proximity to probe cable ground; therefore, it is nonreproducible.

LeCroy has chosen to use a reproducible method of measurement, rather than obtain a more optimistic measurement.

## TYPICAL ELECTRICAL CHARACTERISTICS

Typical characteristics are parameters with no guaranteed performance. Tests for typical characteristics are not provided in the Performance Verification Procedure.

Bandwidth, probe only

(–3 dB): DC to 1 GHz

Output Zero: < 3 mV within 30 minutes  
of autobalance

Residual Autobalance

Offset:  $\leq 100 \mu\text{V}$  referred to input with X1  
effective gain

Differential Offset

Range:  $\pm 1.6 \text{ V}$  ( $\pm 1$  Attenuation)  
 $\pm 16 \text{ V}$  ( $\pm 10$  Attenuation)  
 $\pm 42 \text{ V}$  ( $\pm 20$  Attenuation)

CMRR: See Figure 13.

Input Resistance

(each side to ground): 1 M $\Omega$

Input Capacitance

(between inputs): < 0.85 pF (See Figure 1.)

Input Capacitance

(each side to ground): < 1.5 pF (See Figure 1.)

Noise

(referred to input,

10 to 1000 MHz): 35 nV/ $\sqrt{\text{Hz}}$  ( $\pm 1$  Attenuation)  
350 nV/ $\sqrt{\text{Hz}}$  ( $\pm 10$  Attenuation)  
700 nV/ $\sqrt{\text{Hz}}$  ( $\pm 20$  Attenuation)

Output Impedance: 50  $\Omega$  nominal. Intended to drive 50  $\Omega$

Harmonic Distortion

3<sup>rd</sup> order distortion: –60 dB below fundamental (200 mV<sub>p-p</sub>  
output, at 100 MHz)

3<sup>rd</sup> order intercept: +20 dBm (at 100 MHz at output)

AC Coupling LF Cutoff

(–3 dB): 16 Hz (using plug-on AC coupler)

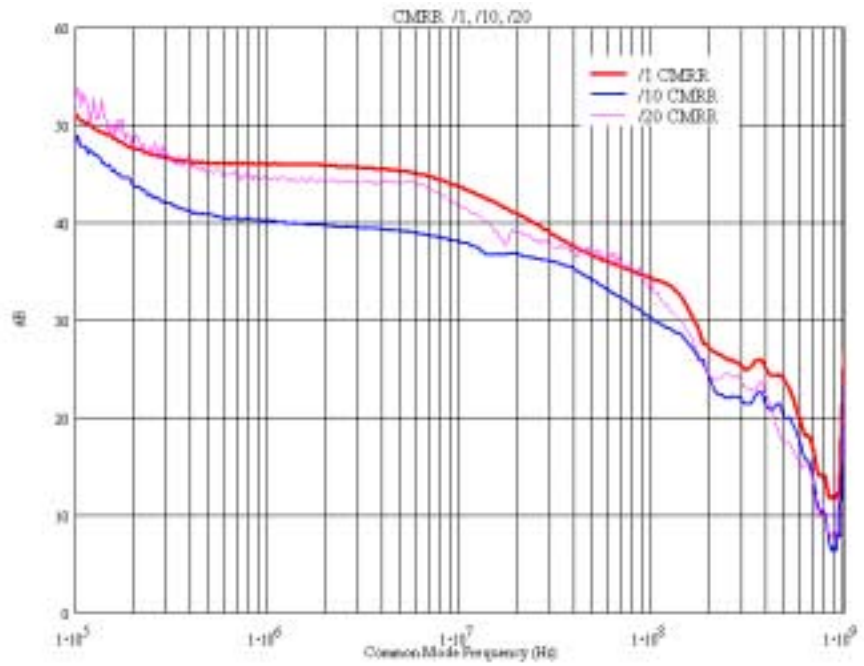


Figure 13. Typical CMRR Graphs

## GENERAL CHARACTERISTICS

Temperature: 0 to 50 °C (operating)  
–40 to 75 °C (storage)

Input Connectors: compatible with 0.025 in. (0.635 mm)  
square pins  
0.036 in. (0.91 mm) maximum  
diameter (for round pins)

Power Requirements: powered from oscilloscope through  
ProBus interface or with ADPPS  
power supply

### Dimensions:

Control Housing:	Length:	3.625 in.	(9.2 cm)
	Width:	1.50 in.	(3.8 cm)
	Height:	1.00 in.	(2.5 cm)
Head:	Length:	4.0 in.	(10.1 cm) w/o Attenuator or AC Coupler
	Width:	2.25 in.	(2.25 cm)
	Height:	0.625 in.	(1.6 cm)
Cable:	Length:	42 in.	(106 cm)
	Diameter:	0.275 in.	(7.0 mm)
Weight:	Probe only:	6.4 oz	(0.18 kg)
	Shipping:	2 lbs, 8.4 oz	(1.15 kg)



### COMPLIANCE AND CERTIFICATIONS

- EC Declaration of Conformity: Conforms to EMC Directive 89/335/EEC for electromagnetic emission and immunity requirements.
- EN 55011:1997: The probe has been tested to verify compliance with this standard, Class B for Conducted and Radiated Emissions.
- NE 50082-1:1997: The probe has been tested to verify compliance with this standard for ESD, Radiated Immunity, EFT/Burst Immunity, Fast Surge Immunity, Conducted Immunity, and Voltage Sags & Interruptions. The line-related tests were performed with a model ADPPS Probe Power Supply.
- Conforms to Low Voltage Directive 73/23/EEC for product safety.
- The probe has been designed to comply with EN 61010-1 Installation Category I, 42.4 V, Pollution Degree 1.

### OPERATOR SAFETY

The probe is intended to be used only with instruments that are connected to earth ground through the input BNC connector. When you are using a ADPPS Power Supply Adapter, make sure that the adapter is connected to a BNC connector that is grounded by the test instrument before connecting the probe inputs to the test circuit.

Do not use in wet or explosive atmospheres. Remove any contamination from the probe housing before connecting the probe inputs to any circuit. Make sure that the surface of the probe head is completely dry before connecting the inputs.

The use of the probe and/or the instrument it is connected to in a manner other than specified may impair the protection mechanisms.

Do not use the probe if any part is damaged. All maintenance should be referred to qualified service personnel.

## STANDARD ACCESSORIES

Hard Case

÷10 Plug-on Attenuator

÷20 Plug-on Attenuator

Plug-on AC Coupler

Probe Connection Accessory Kit:

Flex Lead Set (1)

Mini Clip, 0.8 mm (3)

Mini Clip, 0.5 mm (2)

Ground Lead (1)

Offset Pins, Round (4)

Square Pin Header Strip (1)

Manual, AP034 Active Differential Probe Instruction

## OPTIONAL ACCESSORIES

ADPPS Power Supply

## OSCILLOSCOPE SOFTWARE COMPATIBILITY

For full control functionality of the probe, the LeCroy oscilloscope must have software version 8.1.0 or higher loaded. The software version installed in a LeCroy oscilloscope can be verified by pressing the **SHOW STATUS** button on the front panel, then selecting the **System** menu choice. The probe can be used with earlier versions of software; however, probe offset can only be controlled through the buttons on the probe body. Also, the scale factor will be displayed incorrectly in some modes.

If required, contact your local LeCroy representative for information on upgrading the software in your oscilloscope.

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