

# Capture Transient Current with Industry-Lowest Noise Differential Sensor

## Measurement challenges using a small shunt resistor

A differential probe across a shunt resistor is one of the most common ways to measure your current waveform as well as a current probe and a DMM. A conventional oscilloscope with a differential probe doesn't have the high sensitivity because of the large noise floor, and the noise floor increases when extending the cable. All of these challenges make temperature testing more difficult.

## Unveiled true dynamic characteristics by sub- $\mu\text{V}$ CX1105A ultra-low noise differential sensor

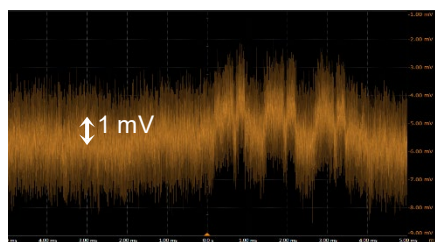
The Keysight CX3300 Series device current waveform analyzer is the new solution which enables precision dynamic current and voltage measurement. The CX1105A's ultra-low noise differential sensor supports low noise and wide dynamic range measurement from 400 nV to 2.5 V up to 100 MHz bandwidth. It has a dedicated 1 m cable that supports the low noise floor — useful for accurate temperature testing.



### Applications and Benefits

- Characterization of power rail current and voltage
- Optimize the circuit design against inrush current
- Achieve lower power consumption
- Validate the circuit in various temperature conditions
- Characterize the impedance for power integrity

Conventional differential probe



CX1105A ultra-low noise differential sensor with CX3300 device current waveform analyzer

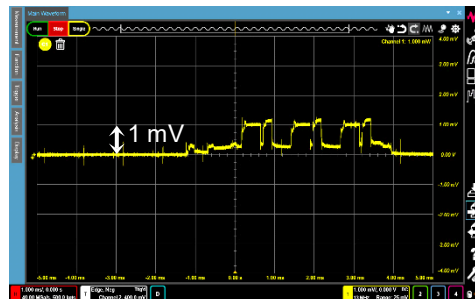


Figure 1. The CX1105A enables quantitative evaluation and effective debugging

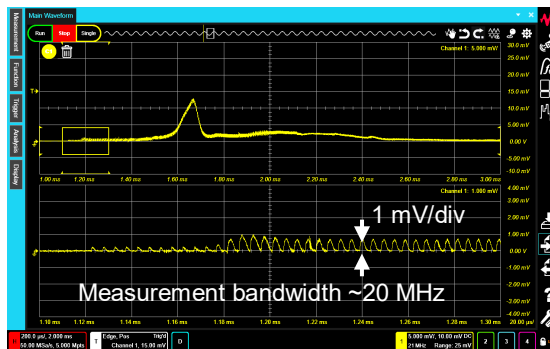
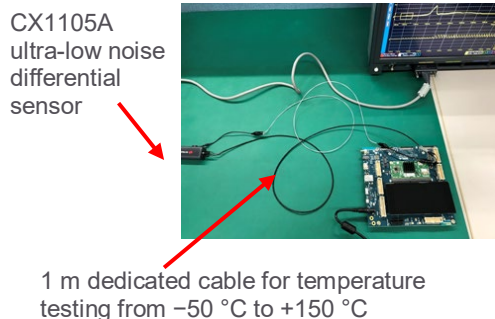


Figure 2. The CX1105A enables to measure differential voltage under 1 mV even with dedicated 1 m extension cable

## CX3300 Series Device Current Waveform Analyzer

The CX330 Series is an all-in-one solution for power rail current and voltage characterization. It enables you to solve circuit power rail problems for devices such as IoT, mobile, medical, and automotive

### Precision scope

- ✓ Wide bandwidth
- ✓ Fast sampling rate



### DMM

- ✓ High sensitivity
- ✓ Low noise



### Data logger

- ✓ Long measurement



**CX3300 series device current waveform analyzer**

### Key features

- Maximum 200 MHz bandwidth, 1 GSa/s, 256 Mpts/ch memory depth
- Clearly view the waveform with 14/16-bit high resolution
- Low noise and a wide dynamic range with high sensitivity from sub-nA and sub- $\mu$ V
- Long-duration measurement — up to 100 hours at 10 MSa/s maximum using a storage device
- Efficient analysis functions — current profiler, waveform playback, waveform analytics, and waveform trend analyzer



## Additional Resources

- [CX3300 Series Device Current Waveform Analyzer - Product Fact Sheet](#)
- [Characterize, Validate, and Debug Advanced Devices with Precision Dynamic Current Measurements](#)

Learn more at: [www.keysight.com](http://www.keysight.com)

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