

# Troubleshooting tips: General Oscilloscope best practices

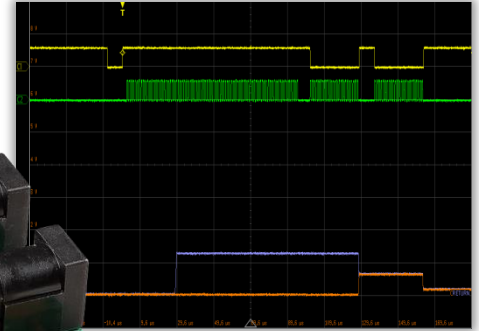
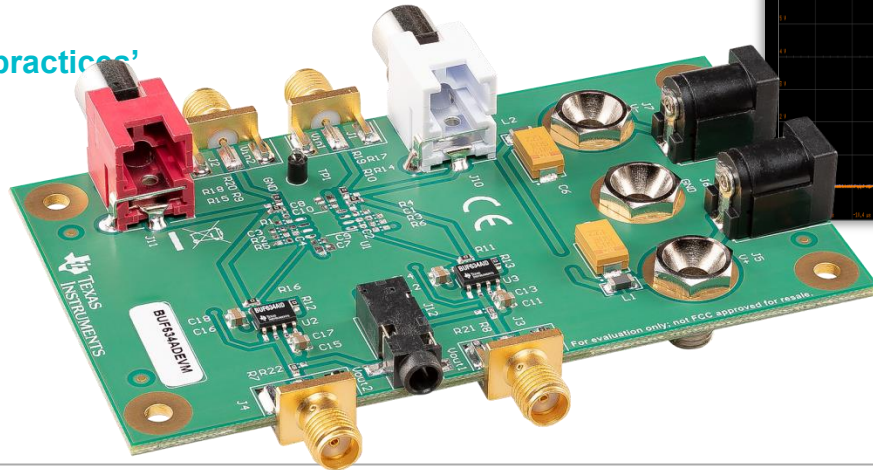
Presented by: Joseph Serritella

Prepared by: Joseph Serritella, Sanjeev Varaha, Paul Frost

# General Troubleshooting Tips

## Application Troubleshooting:

- Board level troubleshooting techniques and handling best practices should be completed before, or in parallel, to completing electrical characterization.
  - This series covers common tips which expedite the troubleshooting process
- The General troubleshooting series will review the following topics:
  - A-B-A Swap
  - WCSP Handling (Wafer Chip Scale Package)
  - Flux Contamination
  - **Oscilloscope images – ‘best practices’**
  - Curve trace analysis
  - Digital Multi Meter (DMM)
  - Board Cleaning
  - Application Questionnaires
  - EOS prevention Techniques
  - And more...



# Troubleshooting tips: Oscilloscopes

## Why are clear Oscilloscope images beneficial:

- Clear and concise oscilloscope images effectively describe the behavior of an electrical anomaly within an application
  - Helps expedite debugging of an anomaly.
  - Examples of key details are:

Color coded channels

Channels labelled on schematic

Visible time scale

Visible voltage scale

Zoomed into the point of interest

Zoomed out of point of interest

**Figure:** Key benefits of the A-B-A swap

# Troubleshooting tips: Oscilloscopes

## Best practice example:

- Cross functional communication and collaborative debugging is greatly improved

1. Channel numbers labelled
2. Voltage scale per channel identified
3. Time scale clearly showed
4. Waveforms of Device Under Test (DUT) and control highlighted



Figure: Example of a detailed oscilloscope image

# Important information

## General Troubleshooting: Oscilloscope

- Obtaining thorough oscilloscope images is critical during the troubleshooting process
- Review of the following prerequisites is recommended before proceeding

## Prerequisites:

### TI's Quality policies and processes:

Quality and Reliability

[ti.com/quality](http://ti.com/quality)

### TI E2E Support Forum:

Find expert answers to your technical questions

[ti.com/e2e](http://ti.com/e2e)

### TI Precision Labs:

TI Precision Labs: Overview

[ti.com/PrecisionLabs](http://ti.com/PrecisionLabs)

## Simulation tools:

Simulations are presented within TI troubleshooting tips series. It is recommended to install TINA-TI

TINA-TI can be downloaded for free on ti.com: <http://www.ti.com/tool/tina-ti>