

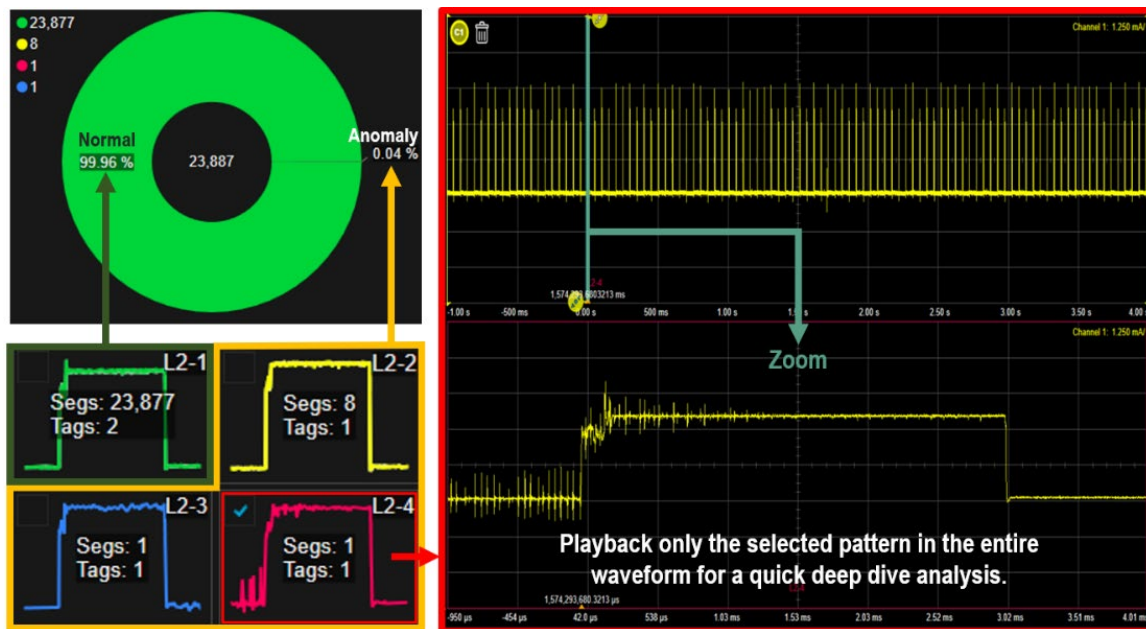
Anomalous Waveform Analytics Enabling Innovative Failure Analysis of MCUs and FPGAs

Reliability is getting increasingly important for MCUs and FPGAs used in crucial applications areas such as automotive, medical and healthcare industries.

- Numerous MCUs and FPGAs are used in vital operations of EV/HEVs, pacemakers, surgical robots, etc.
- Any malfunctions could lead to potential fatalities and detrimental business impacts such as mass product recalls
- Fast rectification on any hardware/firmware/software defects and product reliability improvements is essential prior to market launch

Example of anomalous signal detection for MCUs

- Auto detection and classification on one of the anomalous waveforms that has a periodic noise out of 23,887 waveforms (The probability of the rare event is about 0.04%).
- Anomalous Waveform Analytics speeds up root cause analysis; enabling rapid release of reliable products to the market.



Challenges in failure analysis of product reliability enhancements

Challenges	Needs	Problems Using Conventional Oscilloscopes
<ul style="list-style-type: none"> • Difficulty in capturing rare anomalous signals. 	<ul style="list-style-type: none"> • Long duration measurements without interruptions to capture rare anomalous signals. 	<ul style="list-style-type: none"> • Limited measurement time due to limited memory depth. • Dead time cause by intermittent triggered measurements.
<ul style="list-style-type: none"> • Difficulty in distinguishing minor differences between normal and anomalous current and/or voltage waveforms signals. 	<ul style="list-style-type: none"> • Precision current and/or voltage measurements with wide bandwidth, high sampling rate, high dynamic range and high sensitivity to distinguish small differences between normal and anomalous signals. 	<ul style="list-style-type: none"> • Limited dynamic range and sensitivity.
<ul style="list-style-type: none"> • Difficulty in rapid detection of rare anomalous signals from extensive amount of data. 	<ul style="list-style-type: none"> • Quick and easy identification and analysis of intermittent anomalous signals from tremendous data collection. 	<ul style="list-style-type: none"> • Time-consuming in manual identification and analyzing rare anomalous signals from tremendous data collection.

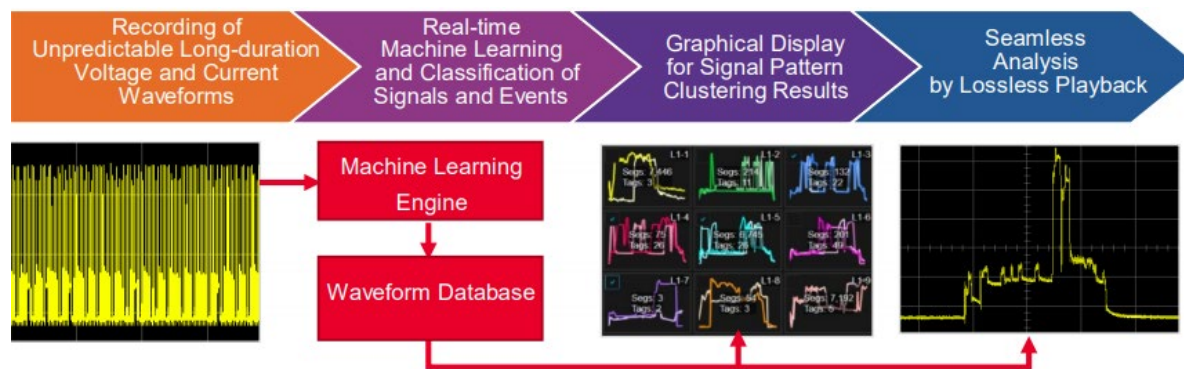
Learn more at: www.keysight.com

Resolving Challenges with CX3300A Device Current Waveform Analyzer and Anomalous Waveform Analytics

- CX3300A is capable to capture rare anomaly signals and measure the subtle differences between normal and anomalous signals precisely thanks to its excellent performance.
 - Long duration measurement up to 100 hours with 10 MSa/s sampling rate
 - Wide bandwidth up to 200 MHz
 - High-resolution at 14-bit / 16-bit
 - Low noise with high sensitivity from sub nA and sub uV
- Anomalous Waveform Analytics rapidly detects and analyzes anomalous signals in the current and voltage waveform data exceeding a terabyte that are not possible by manual analysis.



CX3300A Device Current Waveform Analyzer



Anomalous Waveform Analytics (Embedded in the CX3300A)

Summary

- CX3300A is an all-in-one measurement and analysis solution, integrating high bandwidth, high sampling rate, high sensitivity and long duration measurement recordings with waveform analytics revealing accurate current and voltage waveforms.
- CX3300A and the Anomalous Waveform Analytics enables speedy and persistent failure analysis of MCUs and FPGAs improving the product reliability.

Learn more at: www.keysight.com

Find us at www.keysight.com

This information is subject to change without notice. © Keysight Technologies, 2020, Published in USA, April 14, 2020, 3120-1277.EN