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CASE STUDY

HW Verification of Controller board

AVISTO
EASTERN EUROPE

Case Study: HW Verification of Controller Board

HW Verification Services

To meet some specific clients' requirements, it was necessary to develop both, test HW and SW.

Since a huge number of tests must be executed in each test cycle, high level of automation is needed.

Due to the amount of data generated, efficient databases storage and test results visualization developed from the scratch was required to meet clients' needs.

Also, HW and SW test environment as well as data has to be accessible from multiple sites in different countries.

Comprehend the Client

Requirements capture, Verification Plan Development.

Goal

Development of automated test system with automatic report generation.

Solution

Test PCB development, HW verification environment setup, test framework development, test development, test execution, test report generation.

Results

Fully automated test system running on different temperatures with automatic report generation.

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Comprehend Client

Requirements capture, Verification Plan Development

Technology

Multinational energy and automation company

A Fortune Global 500 company with more than 135.000 employees worldwide.

An innovative thinker and solution providing energy and automation digital solutions by combining energy technologies, real-time automation, software and services.

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Goal

Development of automated test system with automatic report generation

Automated Test System

reliability and repeatability

Client performed verification process manually. It was extremely time consumption when they should repeat tests.

Development of automated test system brings many benefits like **reliability, repeatability** and **speed up** of the process.

Also, the client had generated test reports manually and beside time consumption this process was prone to errors. Development of automated test report generation tool brings speed in HW verification process.

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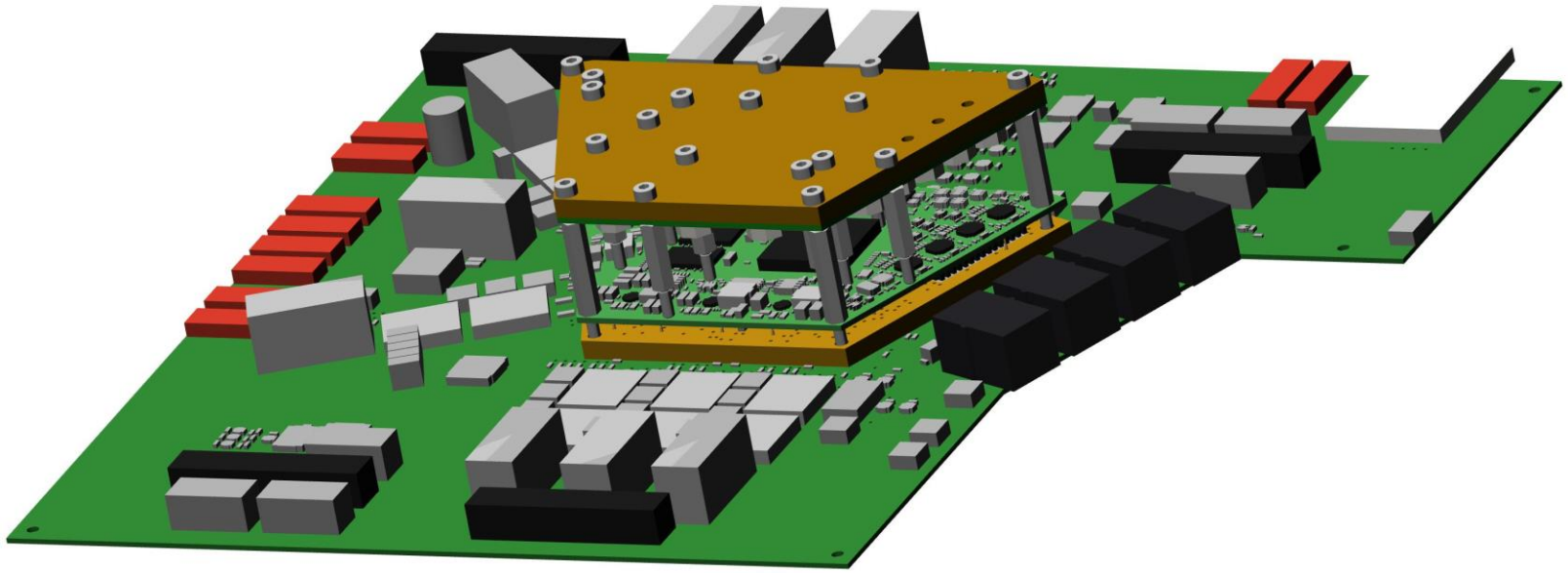
Solution

Test PCB development, HW verification environment setup, test framework development, test development, test execution, test report generation.

Test PCB Development

Development PCBs and electronic equipment necessary for DUT connection



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HW Verification Environment Setup

Connecting Instruments and necessary electronic equipment (thermal chamber), developing drivers

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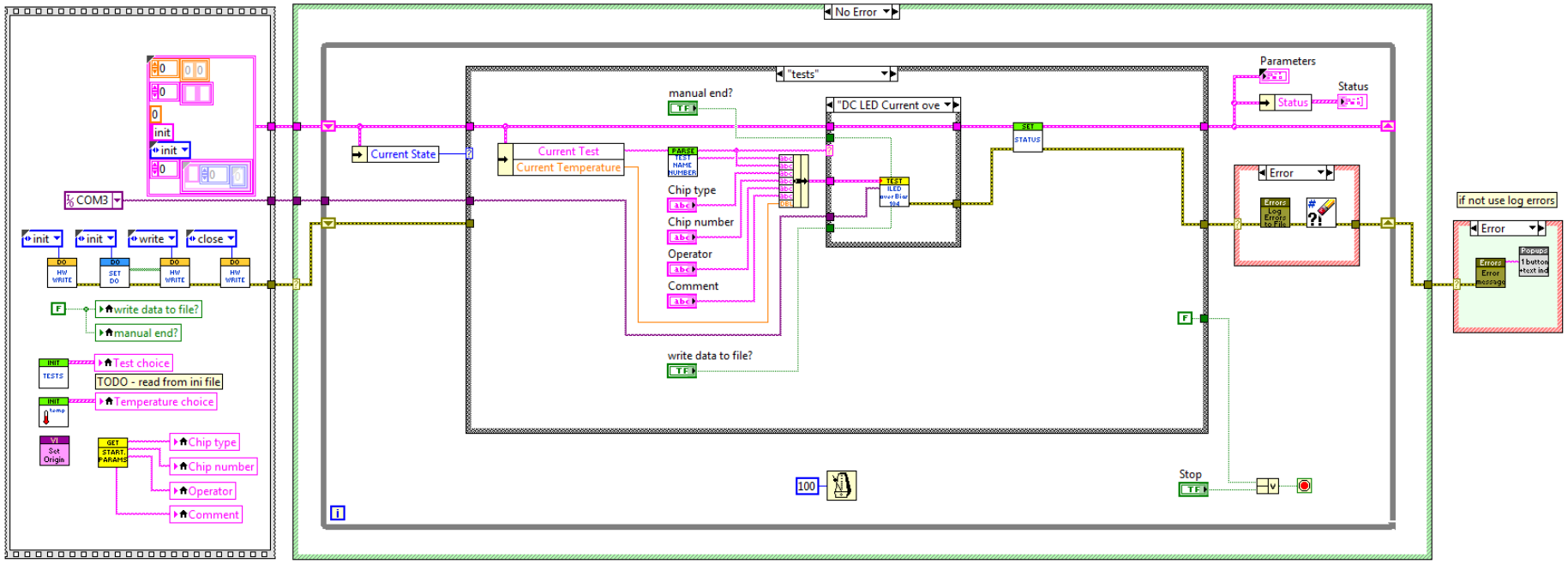
Test framework development

Automated test system able to execute tests, control instruments and acquire measurement results



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Test development

Instrument control, data acquisition, data storage and analysis

- Parametrized tests linked with HW verification plan
- Scripts used to describe the HW verification HW/SW interface

- Scripts used to describe:
  - Test loops,
  - Test conditions,
  - Measured values,
  - Expected values and
  - Acceptance criteria.

- Instrument control
- Data acquisition and storage
- Data analysis

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Test execution

Instrument control, data acquisition, data storage and analysis

- Test automation according to the script file content
- Data acquisition and storage
- Data analysis and automatic test status generation (PASS/FAIL)

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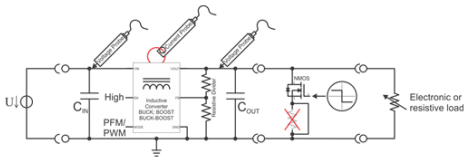
Startup after short (Vout=2.3V, normal temperature)

Preparation:
- Do test in both modes (PFM/PWM)

Observations:
- Current limit → measure current through inductor
- Soft start → measure current through inductor
- Vout overshooting
- I_Vin timing after short to switch
- I_Vin timing after short to ramp up



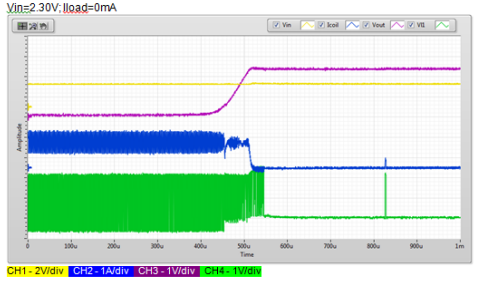
Test name	2.1 Startup after short
DUT type	TPS63025
Serial number	1041603
Input capacitors	100uF+10uF
Output capacitors	10uF+22uF
Inductor	1uH
Time	14:08:27 17.12.2014.
Operator	AP

Setup:
Power supply - Agilent E3633A
NMOS control - Tektronix AFG3102
Vin, Icoil, Vout - Tektronix DPO5104

Note:
Vin - slow

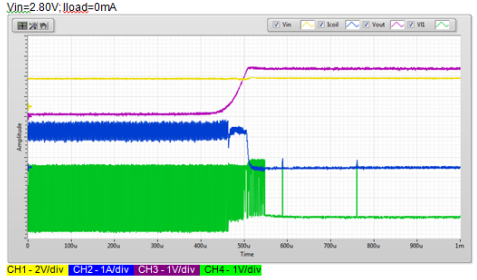
PFM mode, Enable ON, Vout=2.3

Vin=2.30V; Iload=0mA



Vout overshoot
5.32%

Vin=2.80V; Iload=0mA



Test report generation

Data analysis and test report generation

- Automatic test report generation using dedicated internally developed tool
- This process links HW Requirements, HW verification plan and test results
- Test report format is flexible (doc, xls, HTML, pictures, Minitab, …)

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Results

Fully automated test system running on different temperatures with automatic report generation

Huge Time Savings

of test cycle

- Previously, the client performed test execution and report generation manually
- They needed 6 weeks to execute 100 tests on one temperature and additional 2 weeks for report generation
- For next board they needed additional 8 weeks
- For developing automated tests system with automatic report generation, we spent 3 months
- Now execution of all tests lasts 2 hours per temperature and for automatic report generation it is necessary about an hour for all tests on all temperatures

LET'S CONNECT!

Milos Milutinovic

Regional Director
@AVISTO Eastern Europe
milos.milutinovic@avisto-eastern.com

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Where passion leads to excellence

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EASTERN EUROPE

ABOUT US

AVISTO Eastern Europe

AVISTO Eastern Europe is a service provider that focuses on empowering Industrial automation and Semiconductor projects by offering tailored made solutions in areas of Embedded Systems, Test Automation, Application Software and DevOps.

Established in 2007, AVISTO currently operates three design centers in Serbia and boasts a strong network of experienced engineers empowered by high level of technical adaptability to meet the specific requirements and demands of clients' projects.

As a French company and a member of the Advans Group, which comprises over 1000 engineers, AVISTO can deliver comprehensive product-based development support to clients at the enterprise level.

THANK YOU