

Backplane Test & Validation

Investing substantially in state-of-the-art testing technology allows Elma Bustronic to deliver the quality our customers have come to expect. Testing systems include driver hardware and test-point electronics in extremely high-density packaging, which enable full, simultaneous testing of dense, high pin-count connectors on backplane slots. The network connection allows engineers to download and upload test programs without disrupting backplane testing, making the process virtually seamless. Elma Bustronic's simulation and characterization tools confirm performance that is optimized to our customer's specifications.

Netlist/PCB

The Netlist test is completed for all designs to verify that the board the PCB house is building meets the design. With nearly 20 years of experience, Elma Bustronic works with specific PCB fabrication vendors for specific designs. Our team knows which vendors are stronger for different projects, depending on quantity, design complexity, backplane architecture, special requirements, and more. The PCB is then electrically tested by the PCB house. For smaller volumes, they may use a flying probe with quickly and cost-effectively tests the PCBs in small runs. Upon receipt, Elma Bustronic does full Incoming Inspection. The vendor may also be asked to meet impedance requirements for certain designs.

Incoming Inspection

Incoming inspection is done by lot size, using statistical sampling by AQL standards. The process starts with a full visual inspection of the board. The board is compared with fabrication drawings to ensure the correct markings, labels, part numbers, etc are on the board. The hole sizes are measured with pin gages. A Fluke Multimeter is used for electrical continuity.

In Process Quality Inspections

During the manufacturing process, the product can go through several inspections. First, the backplane assemblers review their kits – verifying that all parts, documentation, etc, is complete. After all SMT or soldering is complete, a visual quality inspection is done to ensure it was done properly per IPC-A-610. If conformal coating is required, the backplane is inspected before and after this process. After loading and pressing the connectors, the backplanes go to Electrical Test.

Electrical Test

Each and every backplane is 100% tested electrically to ensure there are no open or shorts. Elma Bustronic's testers hold a row of plug-in test cards inside a frame. The test cards are quickly and easily plugged into the backplane, providing a consistent and

reliable test. Once complete, the backplane is stamped to show it passed the test. Special probes and paddle cards are often created for new or custom connectors.

Final Inspection

The backplanes are inspected to ensure that there is not any damage to the board or components and that all components are in the correct location and orientation. All labels are placed on the backplane by the QC staff. Once complete, QC stamps the board and the product is now ready to ship.

Simulation/Characterization

Simulation and characterization of the backplane helps Elma Bustronic ensure the performance results of a design. For simulation, it gives the company a chance to foresee the expected results of a particular backplane design with the option of viewing the results in relation with the system's boards. This helps the engineers perfect the design before going to fabrication. When performing backplane characterization, Elma Bustronic can measure the real signal integrity of the backplane. This ensures the backplane perform as expected before being shipped to the customer.

New product lines introduced by Elma Bustronic go through simulation and characterization for performance. SI services for custom backplanes are optional.

Elma Bustronic's top-of-the-line quality and testing equipment includes:

- Adaptronic backplane tester
- TDR backplane tester
- Weetech backplane tester
- Wavetek pulse generator
- Vmetro cPCI bus analyzer
- Silicon Control analyzer/exerciser
- Several oscilloscopes
- Fibre-Lite illuminators and microscopes
- Several multimeters
- Calibrated measurement tools

Simulation/Characterization equipment includes:

- HSPICE
- P-CAD signal integrity
- Iconnect
- HP 54750 TDR
- Agilent Vector Network Analyzer (20-Gig, 4-port) with PLTS Software
- Polar SI90000

Examples of possible simulation characteristics:

- Impedance
- Cross-Talk
- Propagation Delay
- Attenuation
- Insertion & Return Loss
- Eye Diagram

Examples of possible measurement characteristics:

- Impedance for single ended and differential lines
- Cross-Talk
- Propagation Delay
- S-parameter
- Eye Diagram