

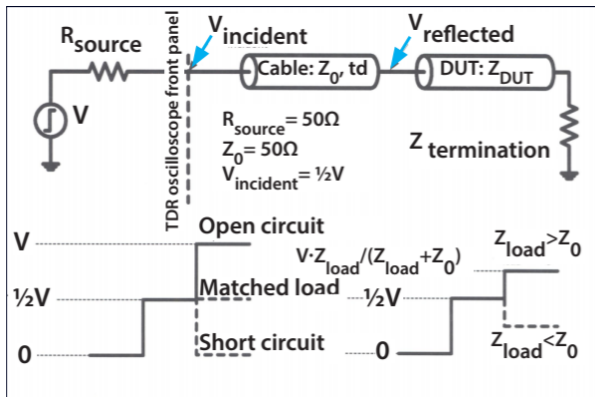
TECHNIQUE NOTE

Time Domain Reflectometry: Non-Destructive Electrical Analysis Tool

OVERVIEW

- Pulsed Current IN - Reflected Current OUT
- Non-Destructive
- Spatial Resolution: 1-2 mm
- Characterizes Continuity for IC's and PC Boards
- Real-Time Measurement

TDR THEORY



For a device or PCB suspect, a pulse edge is sent on the pin of interest (with respect to ground). At each interface of the suspect part, a portion of the pulse edge is reflected and measured over time. Scans of a known good unit, known good substrate and probe tips are compared to the suspect unit.

Four scans are overlaid in a Resistance-versus-Time plot (Z-line) using an algorithm that eliminates multiple reflections (artefacts).

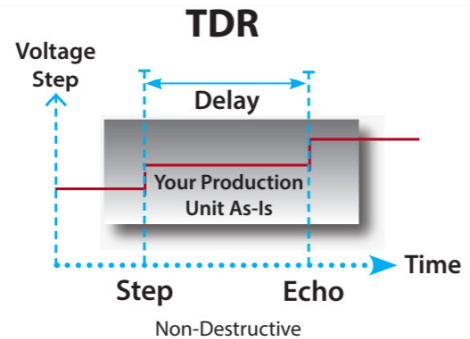
For a packaged IC, TDR is a quick non-destructive way to determine if the open or short is located in the substrate, the inter-connection interface or the die.

STRENGTHS / ADVANTAGES

- Fast (< 10 minutes)
- Non-destructive

DATA PRODUCED

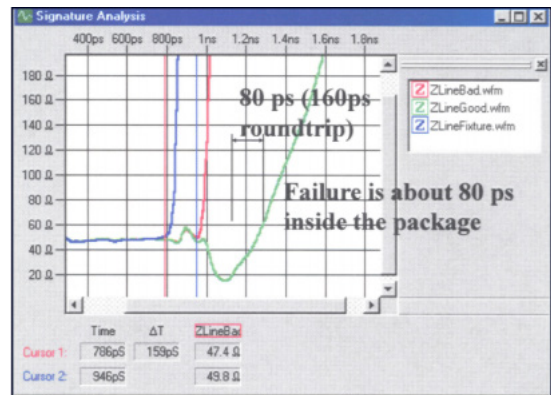
- TDR signal plots
- Need special plots - give us a call.



NanoLab's State-Of-The-Art 'TDR System'

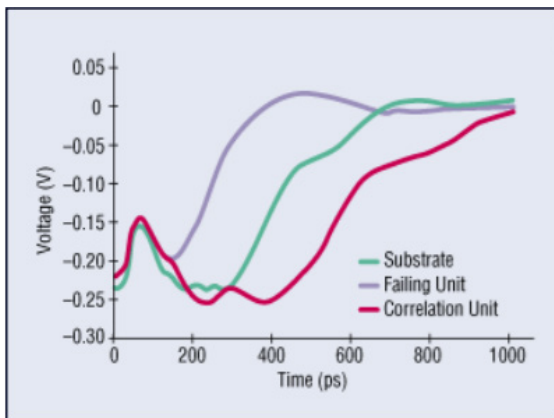


Pulse Signature Analysis

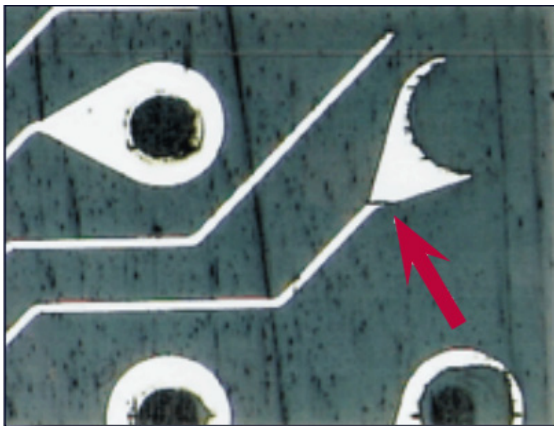


Time Domain Reflectometry: Non-Destructive Electrical Analysis Tool

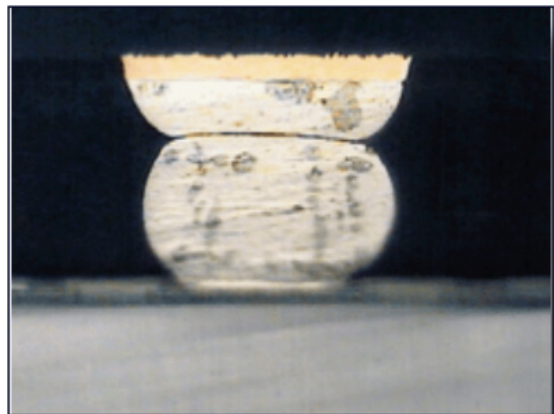
Comparison Analysis



Open Found In Substrate



Open Found In Inter-Connect



GLOBAL USES

- Prototype evaluation
- Customer returns
- Reliability rejects
- Production control
- Materials development
- Quality control
- Problem solving
- Failure analysis
- Reverse engineering

APPLICATIONS

- Internal dimensioning
- Good versus bad
- A versus B
- Locating opens
- Locating shorts
- Many more - let's talk.

FOLLOW-UP CAPABILITIES

- Curve tracing
- Physical cross-sectioning
- SEM-EDX
- Parallel lapping
- C-SAM
- X-ray imaging - 2D & 3D
- FIB-SEM
- Special needs - call us.

SAMPLE TREATMENTS

- As-received
- Compare to Golden Unit
- Advanced treatments - let us help with your special needs.