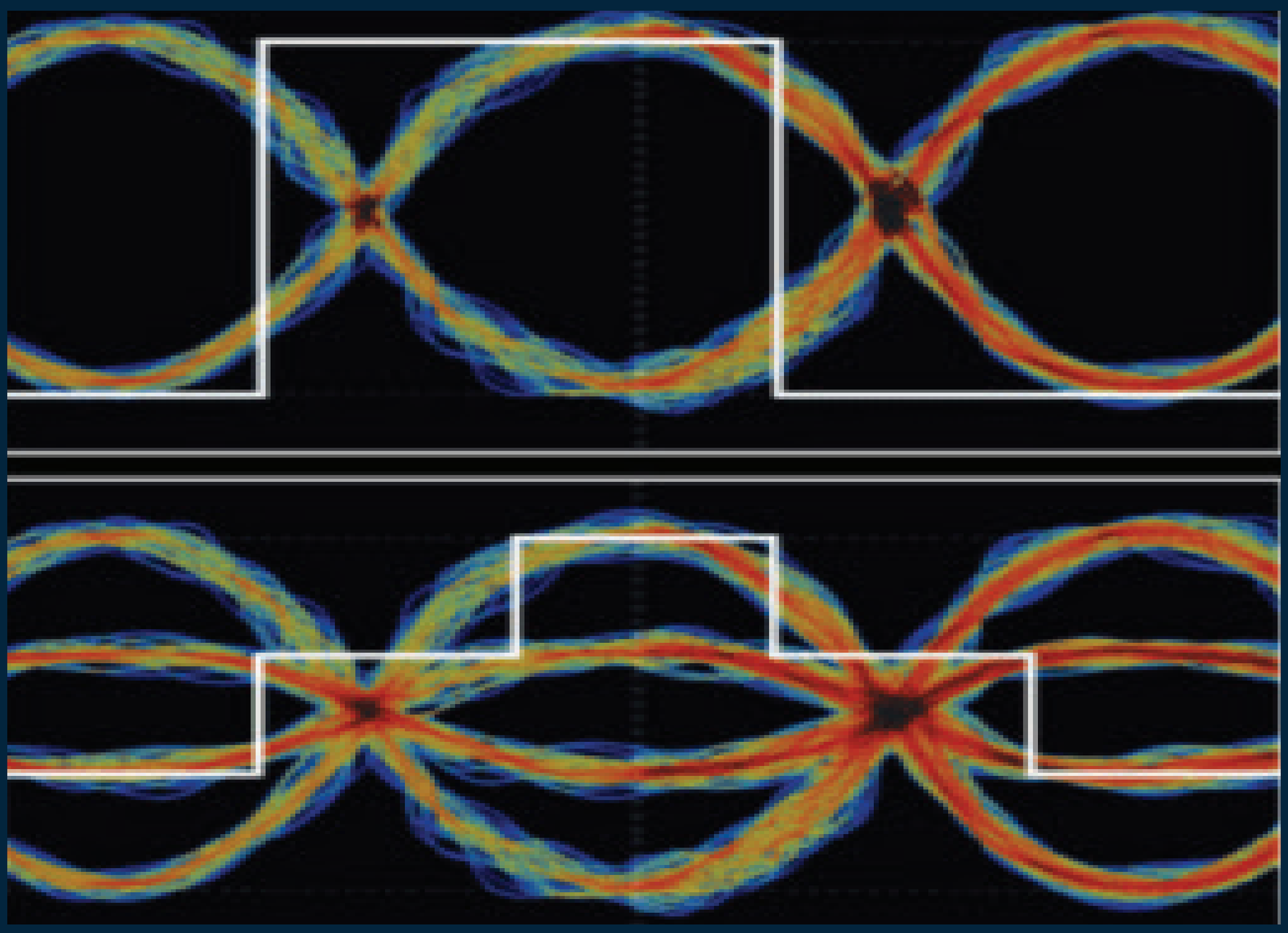
Is Your Probe Closing the Eye?

Evaluating wafer-probe performance for 224G and 448G



FormFactor™

More Bandwidth.
More Power. Thinner Margins.

High-speed test at 224G and above adds compounding test challenges.

Speed Doubles

224 to 448G PAM-4.

Bandwidth exceeds 112 GHz.

Timing tolerances near zero.

Minimal room for error.

Current Rises

Test probes must carry 1.5 to 2.0 amps per pin.

More current means more heat and more stress on probes.

Margins Shrink

PAM-4 is less tolerant of noise.

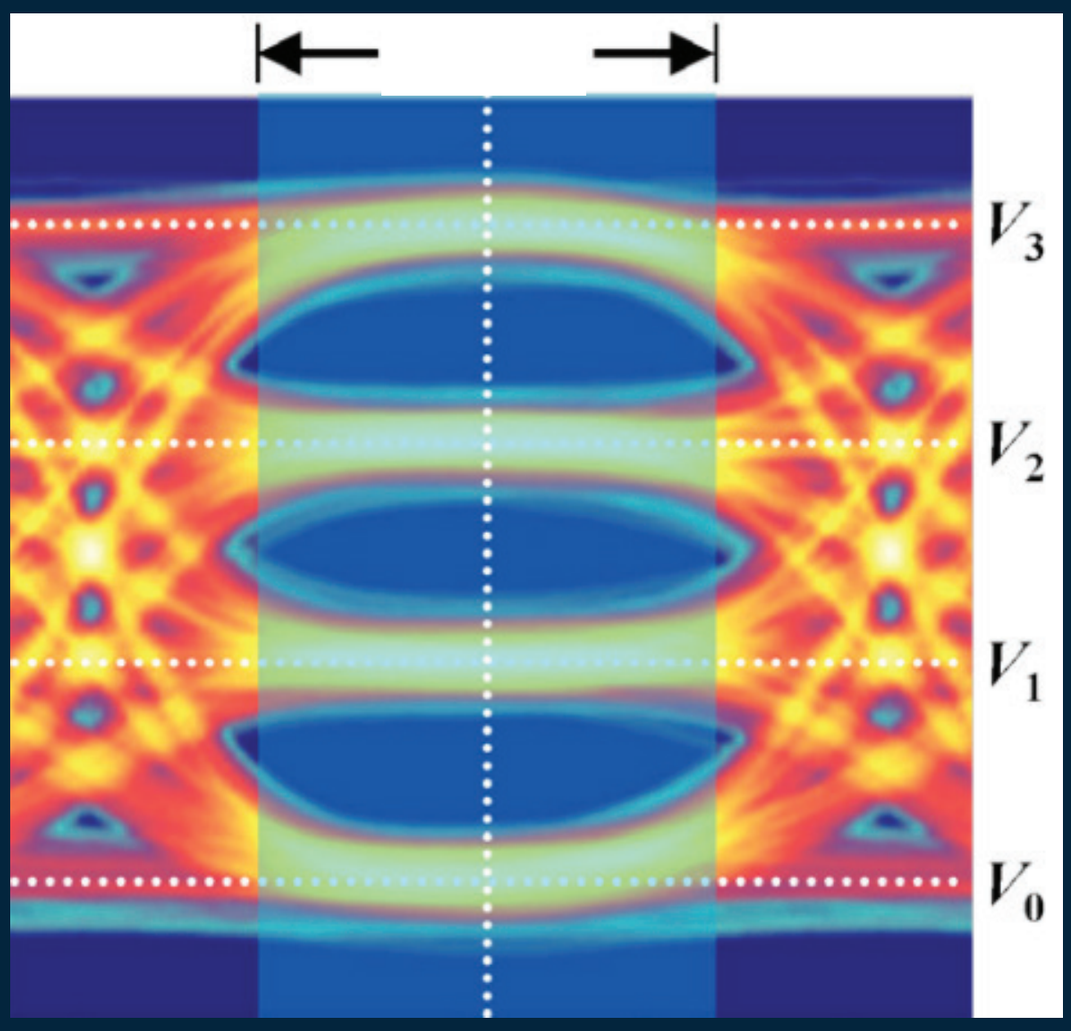
A few dB of probe loss causes test failure.

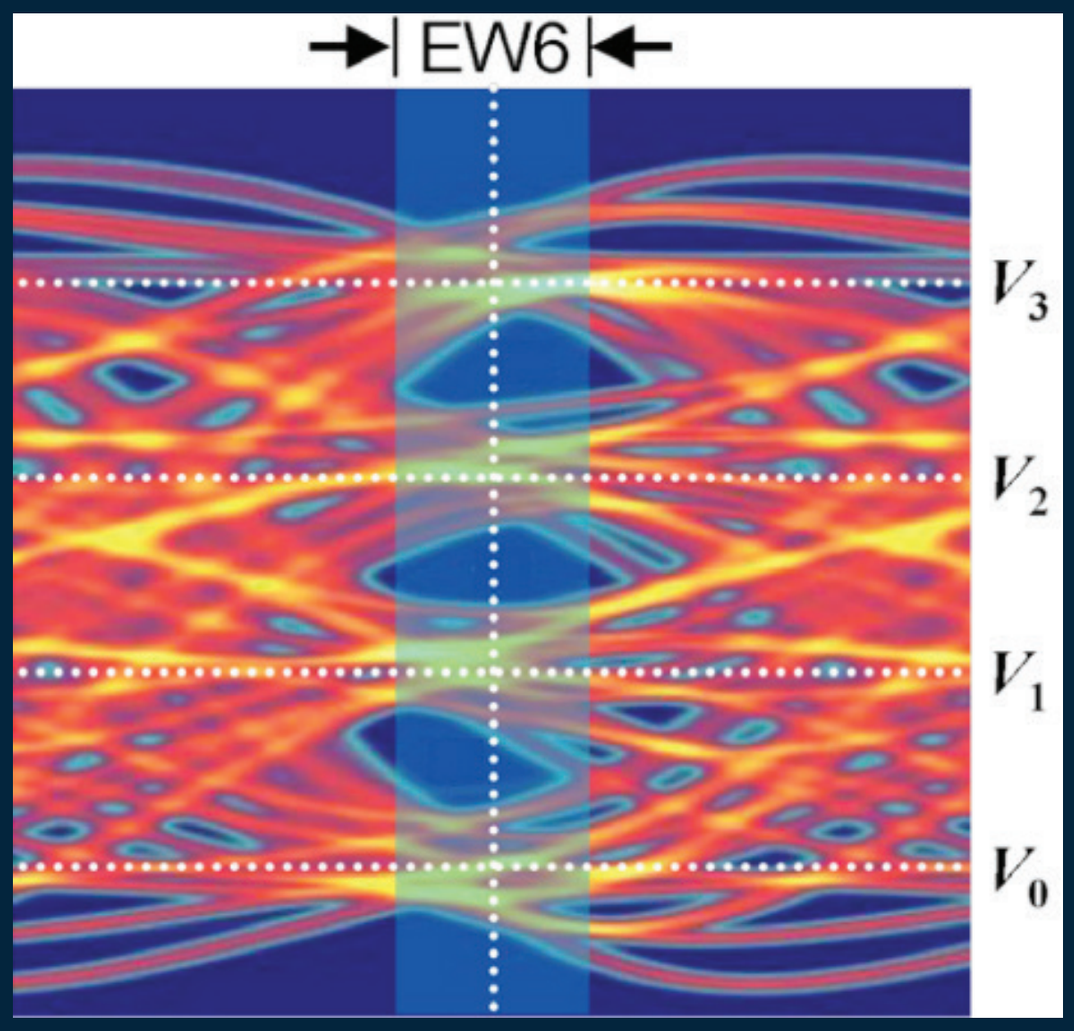
The margin between testable and not testable is very thin.

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“Is this the die or is it the probe?”

The test team’s nightmare.



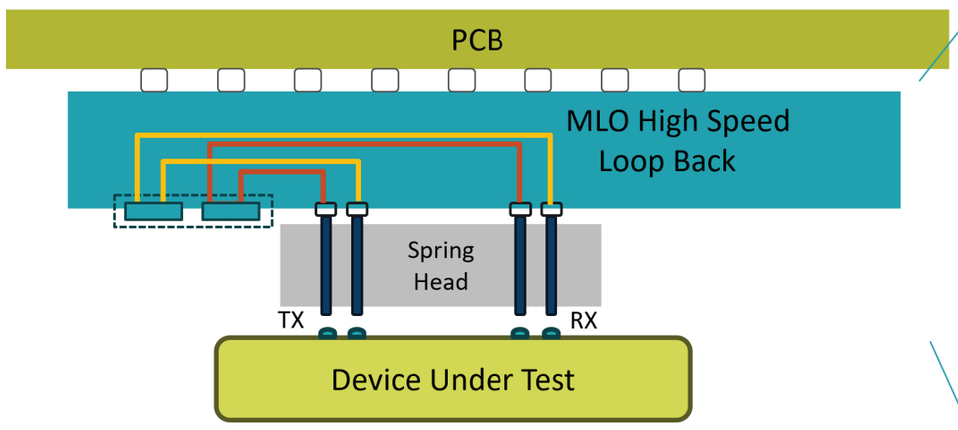


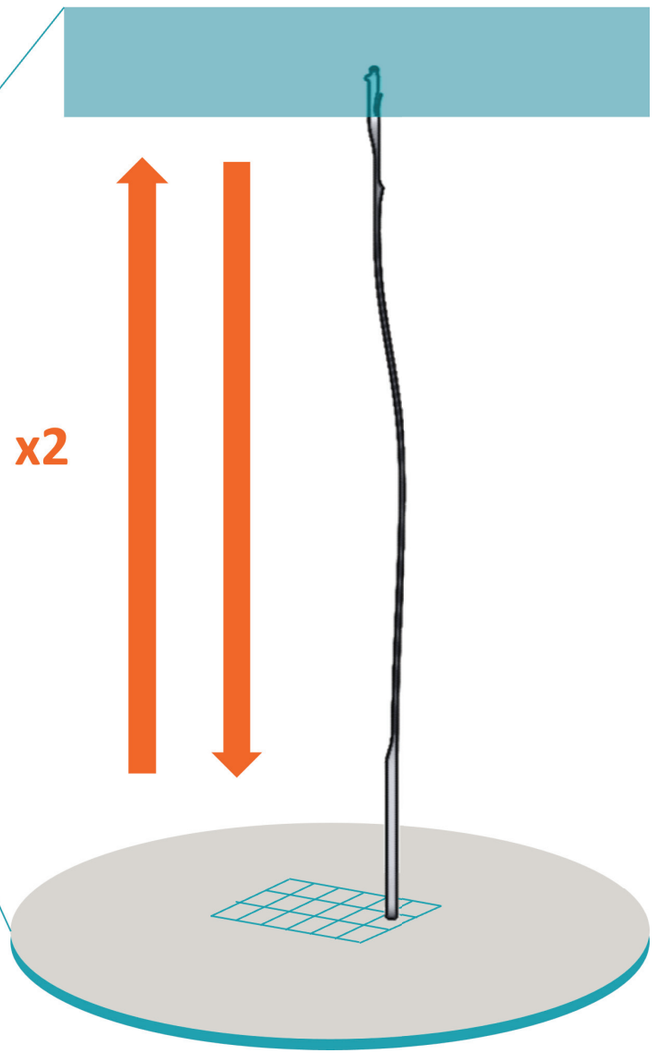
When the signal path runs through long probes and MLO paths, losses accumulate. Insertion loss. Return loss. Crosstalk. Noise. At 224G, a corrupted signal leaves one question unanswered.

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At High Speeds, Long Probes Behave Like Uncontrolled RF Structures

Signal losses accumulate as the signal travels through long probes and MLO paths.





Longer path means more insertion loss.

Stub resonance creates destructive nulls.

Radiation and crosstalk compound the problem.

At 224G, probe geometry, force and scrub behavior, and electrical path length all affect what you measure. The probe is part of the signal path. It has to be treated that way.

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Don’t Just Accept High-Speed Claims. Ask for Proof.

The right probe architecture preserves margin, reduces risk, and gives test results you can act on.

1. **Is the signal path lithographically controlled?**
2. **Do they preserve eye margin with measured S-parameter and channel evidence?**
3. **Does contact resistance stay stable over time in real test conditions?**
4. **Can they carry high current without excessive force, scrub, or hot spots?**
5. **Can the architecture scale across dense arrays and probe heads?**

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