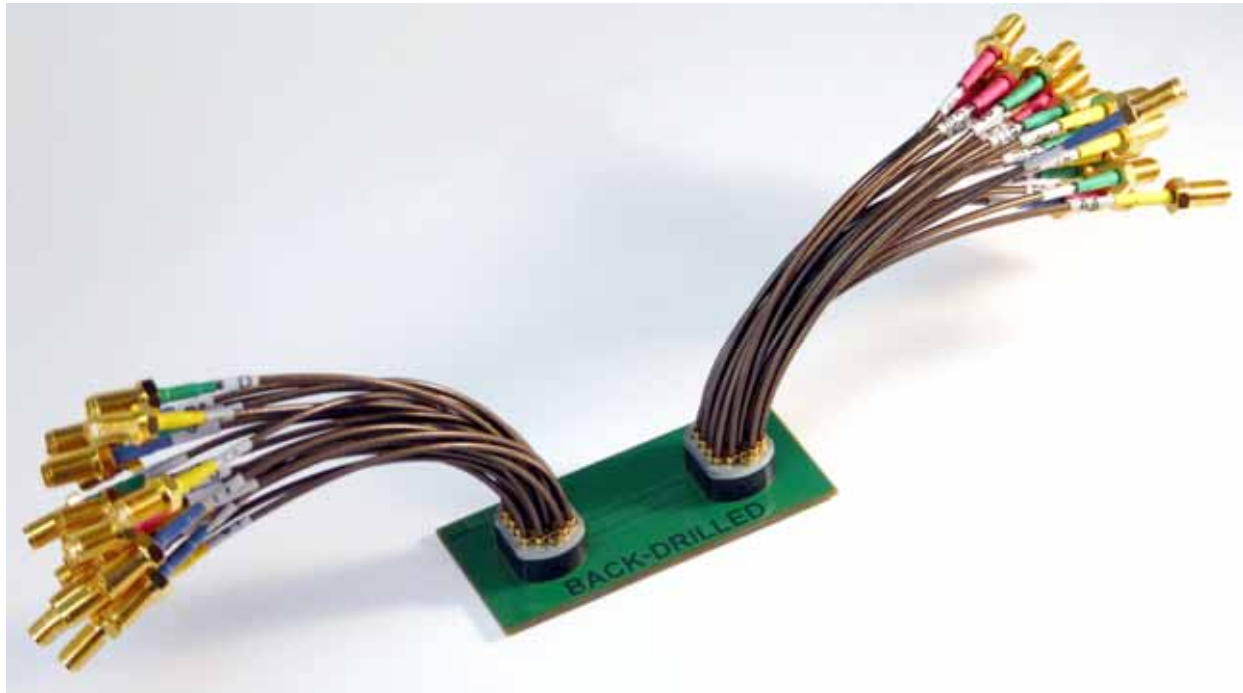




RF Characterization Report

Bull's Eye



Description: 50 Ω High Performance Test Point

Series: Bull's Eye

Description: 50 Ω High Performance Test Point

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Series: Bull's Eye**Description:** 50 Ω High Performance Test Point

Bull's Eye Testing

Introduction

This testing was performed to evaluate the electrical performance of the Bull's Eye test point. Bull's Eye enables reduced board trace lengths, higher performance and lower cost compared to traditional SMA test systems. The high density array design provides 4x the high bandwidth signals in the same real estate as SMA connectors. Bull's Eye is available in single point and 22 point versions. Additional configurations are available.

Measurements were made over the frequency range from 10MHz to 20GHz utilizing an 8 layer test board, PCB-106246-SIG. It has two Bull's Eye 22 position arrays, one on each end. Test traces were routed on layers 2, 4, 5, and 7. The measured results include a six-inch BE25S cable, the mating interface, the optimized PCB breakout region, and a short length of PCB trace. The adapters and board effects were calibrated out using Keysight Technologies Automatic Fixture Removal (AFR). See Appendix A.

Product Description

The test sample was mounted to the test board, which has 50- Ω impedance traces. The connector has an optimized launch (compensation) incorporated into the PCB design to facilitate improved impedance match over the frequency range of interest.

The actual part numbers tested are shown in Table 1. A representative picture is shown in Figure 1.

Part Number	Description
BAR-J-22	22 position test point array
BE25S-01BJ1-01.5-04-0152	Six inch Bull's Eye to SMA jack cable, 2 pairs, 1.5ps match

Table 1: Worst Case RL, VSWR, and IL

Series: Bull's Eye

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Figure 1: Test Sample Configuration

Results Summary

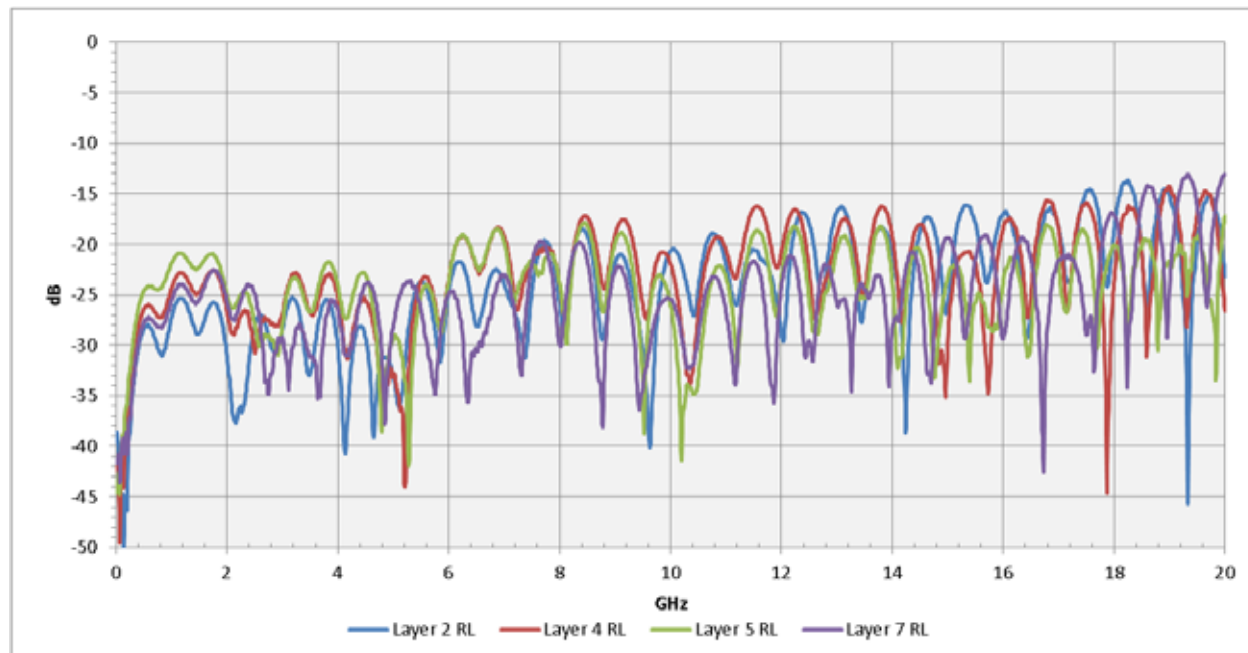
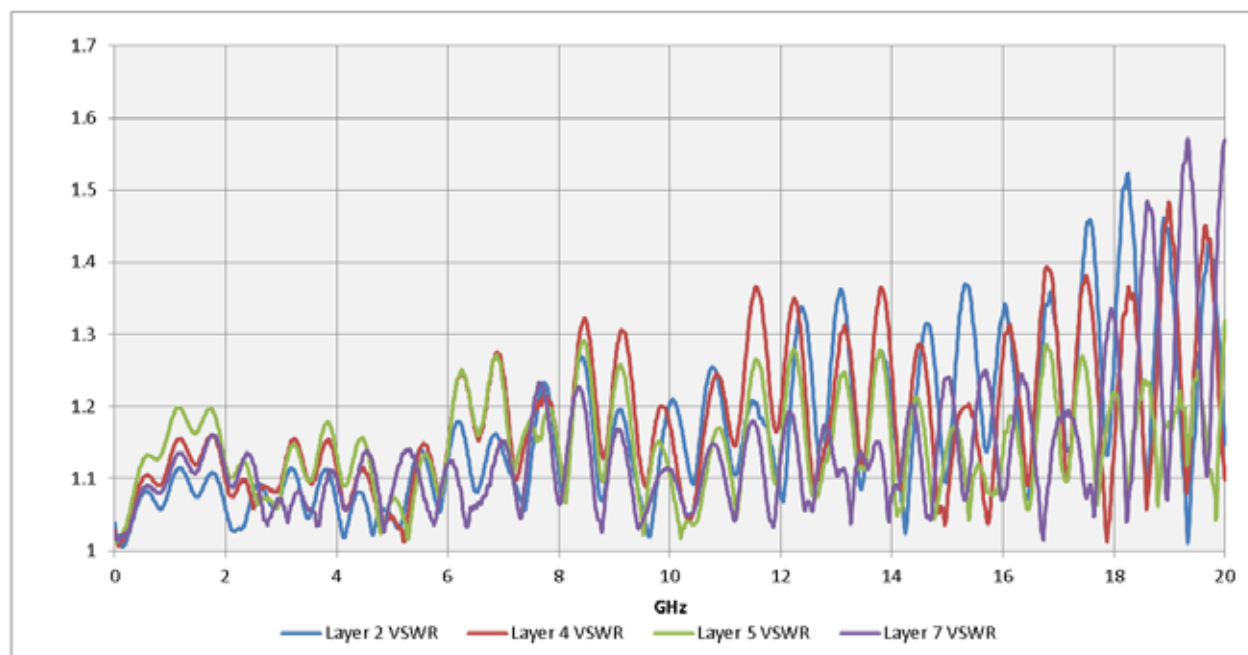
Return Loss, VSWR, Insertion Loss, and Isolation measurements were performed over the frequency range from 10 MHz to 20 GHz. The table below lists the worst case measurements. Isolation was measured in-row for each layer, and across rows from different layers.

Bull's Eye Cable Part Number	Board Mount Connector Type	Trace Layer	Return Loss	VSWR	Insertion Loss
BE25S-01BJ1-01.5-04-0152	BAR-J-22	Layer 2	-13.7dB	1.5	-3.2dB
		Layer 4	-14.2dB	1.5	-3.1dB
		Layer 5	-17.2dB	1.3	-3.1dB
		Layer 7	-13.1dB	1.6	-2.9dB

Table 2: Worst Case RL, VSWR, and IL

Configuration	Isolation
In Row	-53.07dB
Cross-Row	-57.86dB

Table 3: Worst Case Isolation

Series: Bull's Eye**Description:** 50 Ω High Performance Test Point**Data Plots****Figure 2: Return Loss****Figure 3: VSWR**

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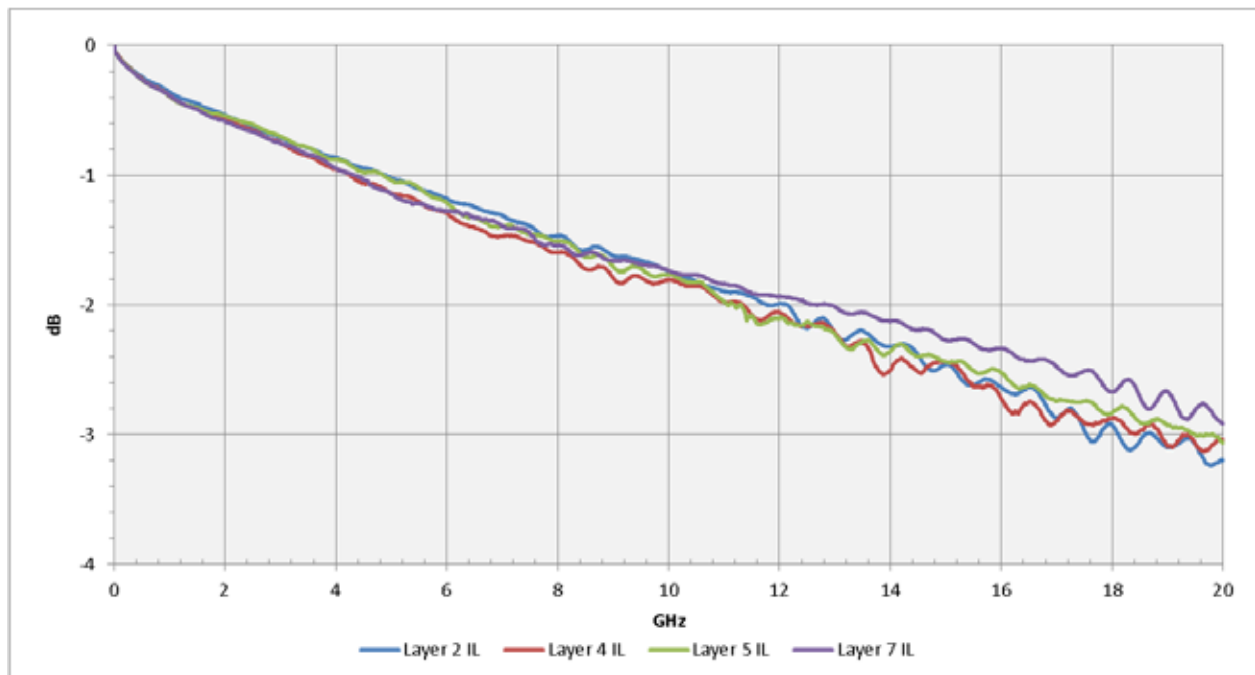


Figure 4: Insertion Loss

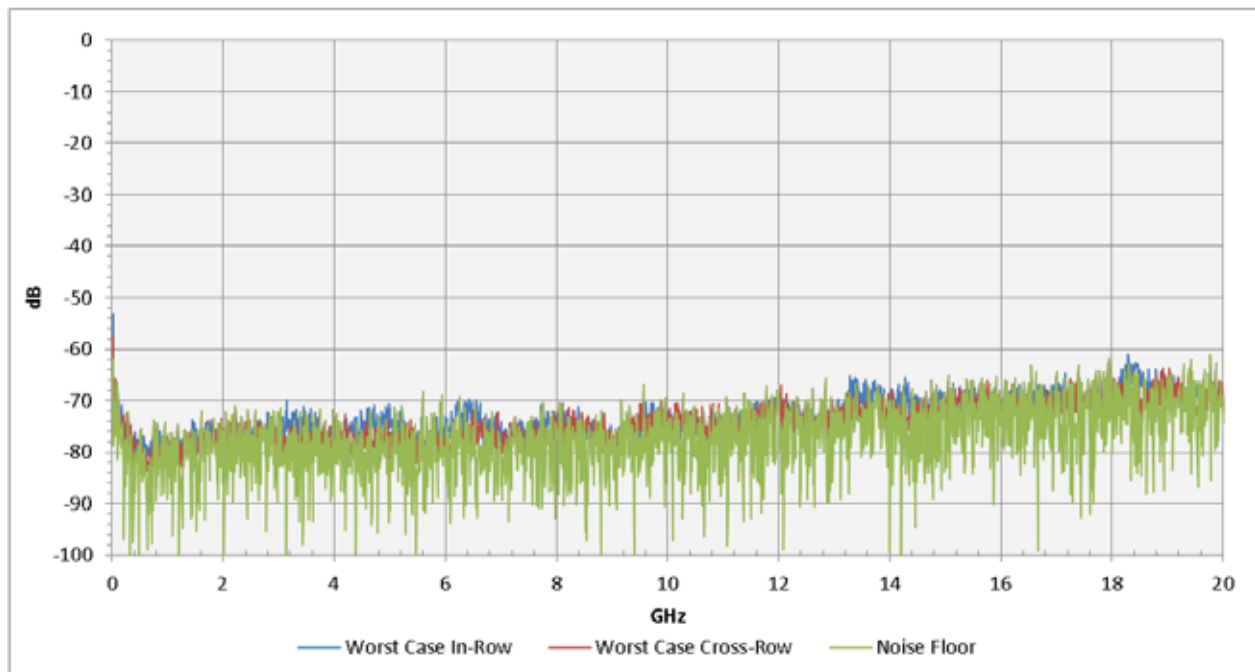


Figure 5: Isolation

Series: Bull's Eye**Description:** 50 Ω High Performance Test Point

Appendix A: Characterization Details

Fixturing

Samples were tested with test board PCB-106246-SIG. The test board sets have 50- Ω traces (nominal impedance). The traces on layers 2, 4, and 5 had their vias back-drilled.

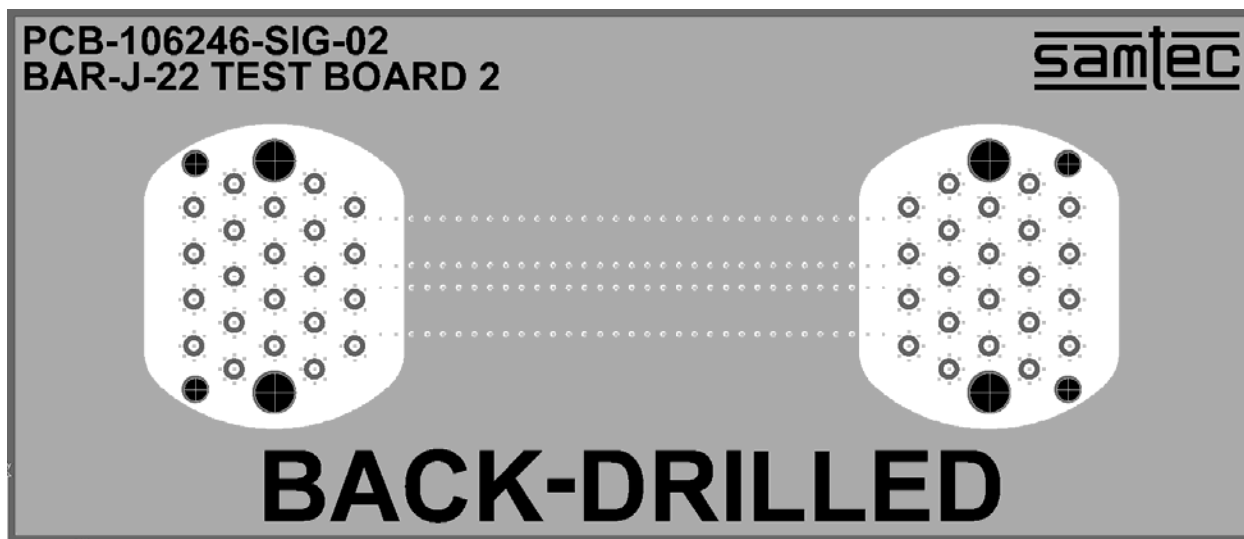
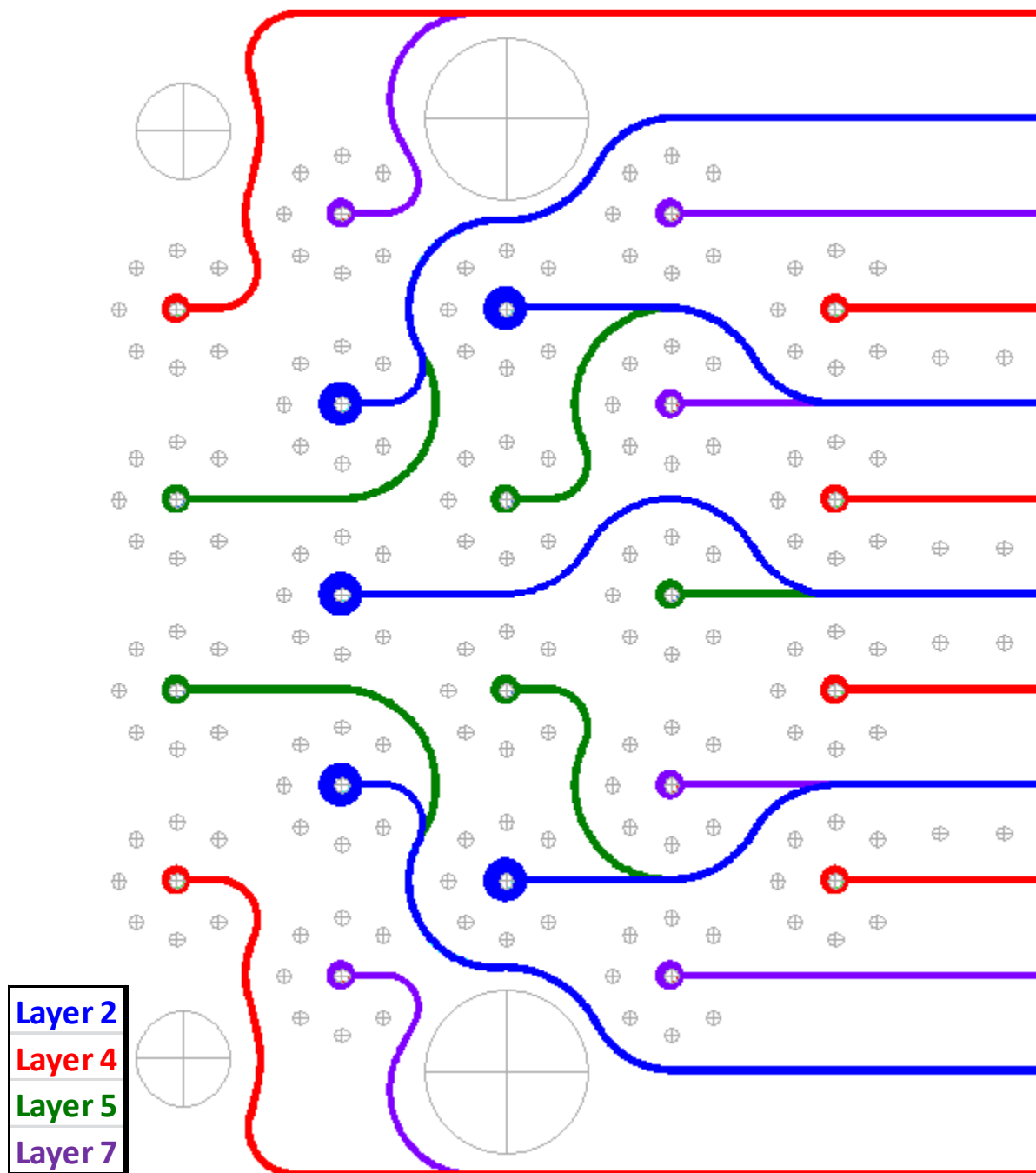


Figure 6: Test Board PCB-106246-SIG-02

Series: Bull's Eye**Description:** 50Ω High Performance Test Point**Figure 7: Test Board Trace Layout of PCB-106246-SIG (left footprint shown)**

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Frequency (S-Parameter) Domain Procedures

All measurements were made using an Agilent PNA E8364B network analyzer. It was set for a 4000-point measurement response over the frequency range from 10MHz to 40GHz. Response averaging was turned off. The IF bandwidth was set to 1 KHz. A full 4-port calibration was performed with a Maury 2.92mm 8770D calibration kit.

The test fixture response was removed in Keysight (nee Agilent) PLTS 2014 U1 using Automatic Fixture Removal (AFR).

- The far end reference plane was set at to include ~1.2" of trace. This places the reference plane well outside the breakout region

The AFR data was exported from 10MHz to 20GHz.

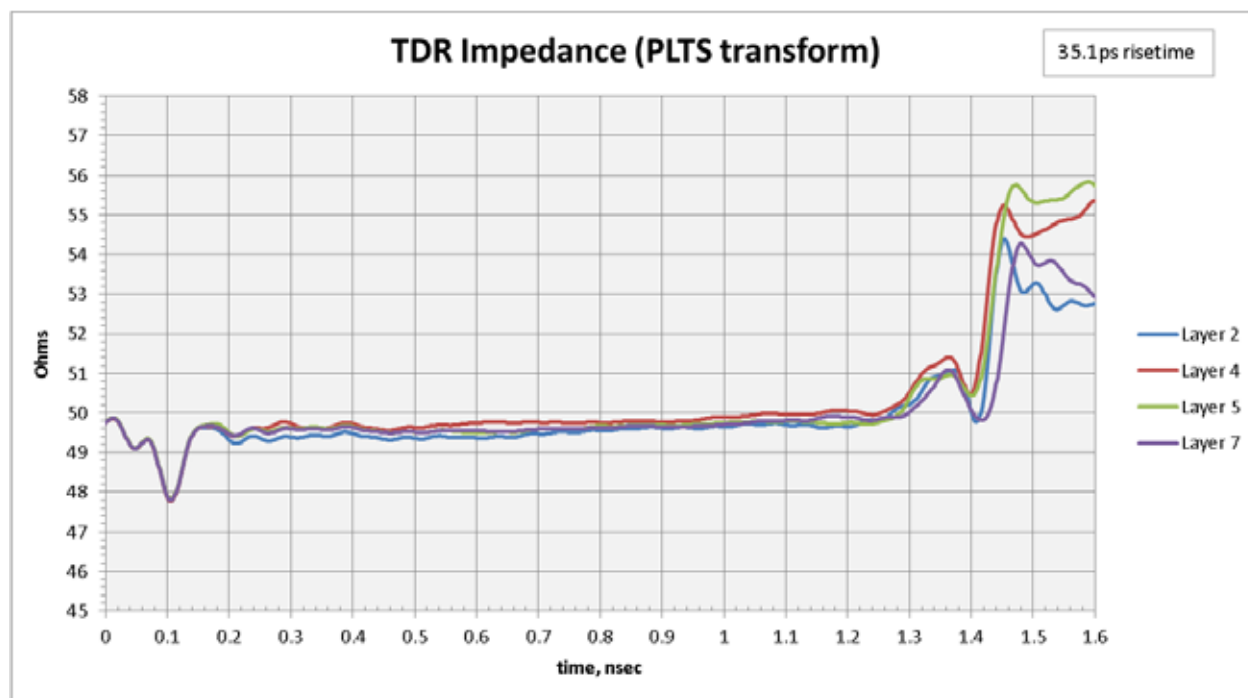


Figure 8: Gate placement



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Equipment

Agilent PNA E8364B Network Analyzer