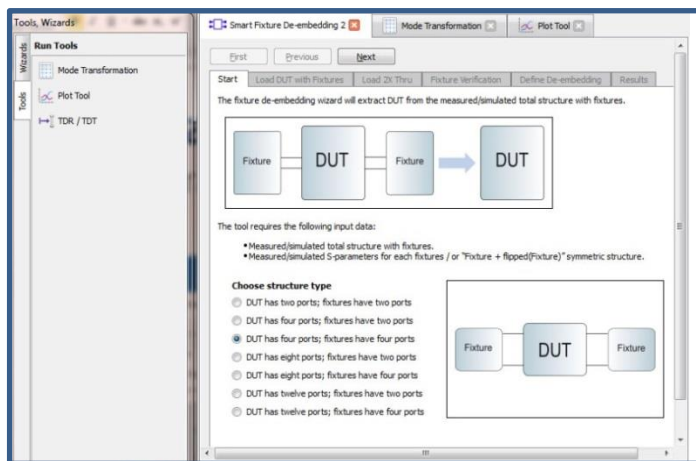


# Smart Fixture De-embedding (SFD) Tool

Accurate, Easy-to-Use Tool for PCB and Interconnect Characterization



## Features:

### • Versatile:

- Multiport fixture de-embedding for single-ended and differential devices with support of asymmetrical fixture configuration
- S-parameter and Time-Domain-parameter conversion
- Powerful plotting tool

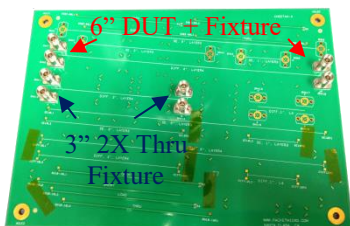
### • Accurate: Comparable to Keysight ADS

### • Easy-to-Use: User-friendly interface

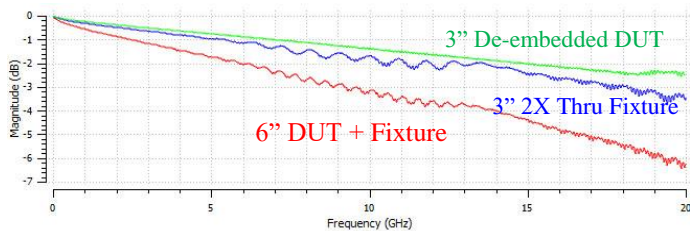
### • Fast: Fast runtime with simple installation

## Overview

The Smart Fixture De-embedding (SFD) Tool is simple and accurate, and can be used to extract large-bandwidth network parameters for modeling of interconnects, such as circuit board traces and vias, connectors, IC packages, and cables. Recently, the 2x thru de-embedding technique has gained wide acceptance, because it has comparable accuracy to traditional TRL techniques, but is much simpler to implement; only one 2x thru structure is needed. The SFD tool allows engineers to perform fast, accurate S-parameter measurements by removing the fixture effects.



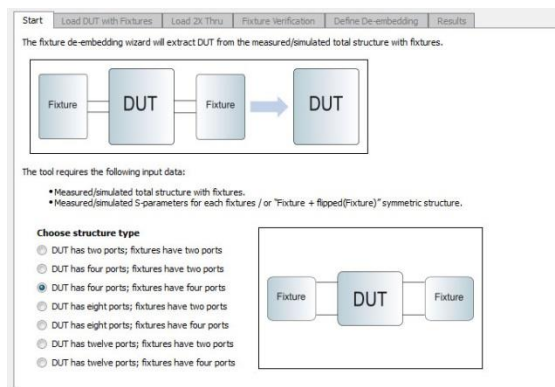
Megtron 6 test Board



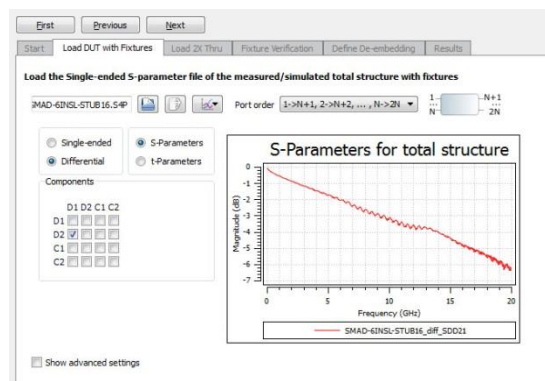
$|S_{DD21}|$  of DUT with Fixture, 2X Thru Fixture, and de-embedded DUT with EMStar SFD tool.

## SFD Tool

A user-friendly wizard guides you through all the necessary steps. You can review, plot, and save the results at each step.



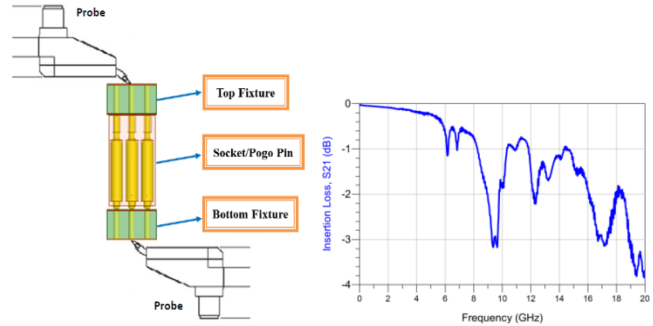
Step 1: Choose the 4-port structure type for the differential traces.



Step 2: Load the S4P file of the DUT + fixture.

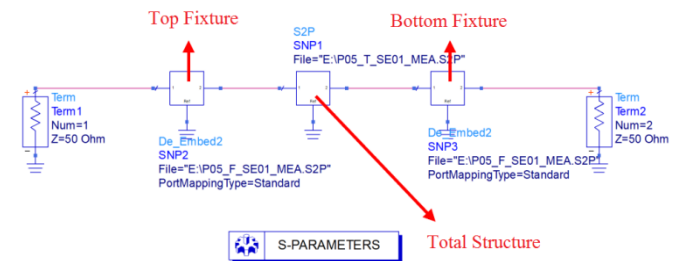
## SFD and ADS Comparison

The accuracy of the Smart Fixture De-embedding (SFD) tool has been demonstrated through measurements, and is compared with the well-known Keysight ADS software below, which shows comparable accuracy between SFD and ADS.

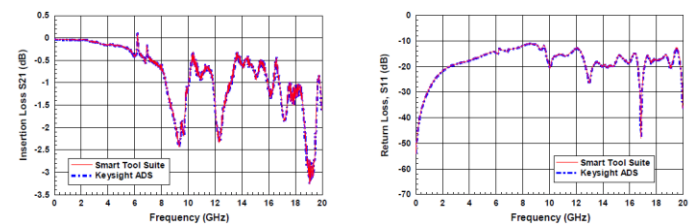


Test setup

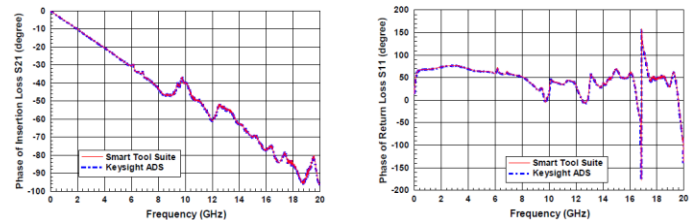
Measured  $|S_{21}|$



ADS block diagram for de-embedding the DUT.



Magnitude comparison of  $|S_{21}|$  and  $|S_{11}|$

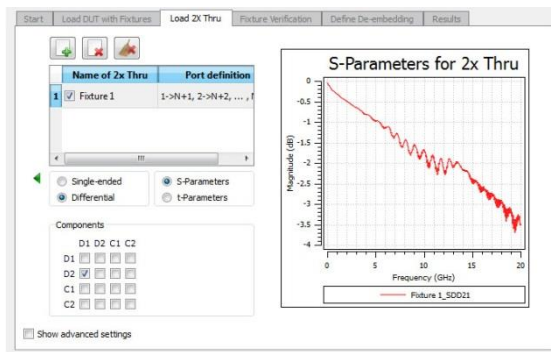


Phase comparison of  $|S_{21}|$  and  $|S_{11}|$

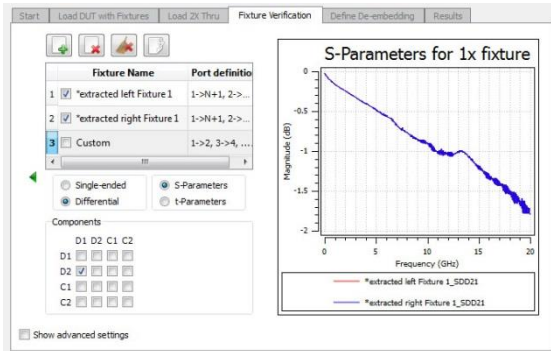
\*Comparison was performed by Jthink Technology.

## About EMStar SFD Tool

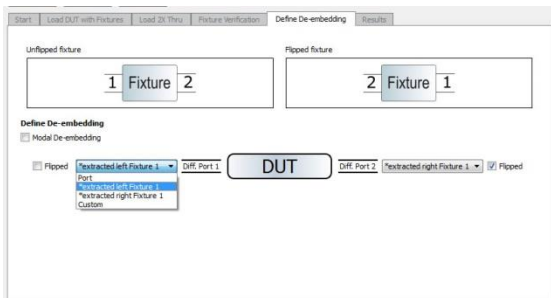
The Smart Fixture De-embedding (SFD) Tool is developed by an experienced research team, led by Professors J. Drewniak and J. Fan, at the Missouri EMC Laboratory. This versatile, easy-to-use SFD tool has been used by many companies, such as Intel.



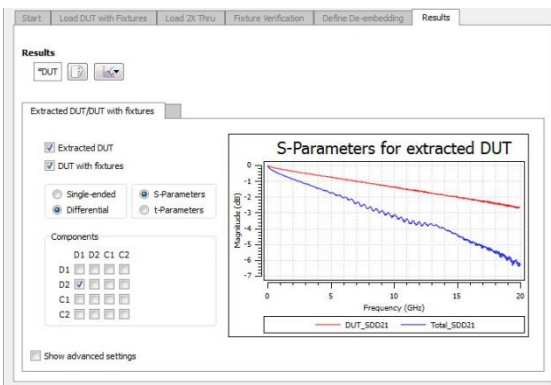
Step 3: Load the S4P file of the 2x Thru Fixture.



Step 4: Verify the left and right fixtures extracted from the 2x thru fixture. For other applications, custom fixture files can be imported here, which can have some asymmetry.



Step 5: Define your de-embedding configuration. You can use the default fixture setting or choose the custom fixtures here.



Step 6: Review and save your results in either S-parameters or Time-Domain parameters.