USB 3.0 Test Boards

Overview
Delphi needed to develop test fixtures to test their cable assemblies. In the past, they had developed a USB 2.0 fixture, but not the newer USB 3.0. This was to be challenging for them because it was extremely tedious, required a lot of expensive engineering time, increased the amount of signal traces, and needed to deal with much higher frequencies.

Objectives
Delphi required four test boards: male and female test boards, and male and female thru boards for calibration. Each test board was to function as a breakout board that connected each of the 9 pins of the USB 3.0 connector to an individual SMA connector. Each thru board was to mirror their accompanying test board. The most important design requirement for these boards was that they had to have an operable range from DC - 25 GHz.

Approach
• Looked over old designs and came up with our own preliminary design
• Presented the designs to Delphi for review and they selected our best one
• Researched the topic through internet and papers
• Talked with various professors about the design and caveats
• Built the basic pieces for the design (Connector footprints, schedule, parts, etc)
• Designed boards in CAD software (Altium)
• Reviewed board files with Delphi
• Sent board design files to be manufactured
• Investigated alternative paths
• Assembled the boards in house using SSPL (The Student Space Programs Laboratory)
• Travelled to Delphi to perform testing
• Performed our own analysis on results
• Compared results with Delphi’s previous model’s results
• Concluded the project

Outcomes
Finally, list the outcomes for this project making sure to clearly convey their implications for the sponsoring company:

• The sponsor can test their cable assemblies
• Redesign was made by us so they don’t have to spend their engineering time or money