

Signal Power Integrity Design and Analysis

The Challenge

A startup company focused on medical diagnostic imaging needed to develop a functioning, marketable prototype as quickly as possible. The development budget was limited and the customer wanted to limit the printed circuit board (PCB) layer count.

The Process

San Diego PCB's team worked with the customer to balance the competing needs of electrical integrity vs. cost. The team presented the customer with a range of cost vs. yield vs. performance tradeoff scenarios to help them better understand the impact of their choices. A working compromise was presented that best balanced all three concerns. San Diego PCB was also able to help them find both a PCB fabricator and electronics manufacturing services (EMS) provider, which gave them an integrated solution.

The Result

San Diego PCB provided a layout that met their performance objectives in the timeframe they needed. The team could have designed the PCB with four layers, but showed the customer that the circuit would perform better and be more robust if the PCB was designed with six layers. The customer was able to get to market faster because with the six-layer PCB, since they didn't have to debug performance issues. The end solution reduced cost and time in the development cycle, but did raise the raw PCB cost. The team also added built-in test to ensure product integrity and better in-circuit test coverage. The designer placed the components on one side of the PCB because it worked better mechanically and enhanced production throughput. The San Diego PCB team was able to further reduce cost by analyzing the bill of materials, lowering part count and finding better priced sources.