

## Project Summary:

### Root Cause Determination of PTH Failures

DfR Solutions was asked to analyze root cause failure in interconnects of double-sided, surface mount printed boards. Cross sectioning of the printed boards indicate that the plated through hole failures were due to the soldering process and not board quality. Excessive thermal mechanical stress was indicated by a crack in the shoulder of the PTH. Also, flux residue, exposed copper, and brush marks suggest that the parts had been hand soldered. Inner land separation and bond pad delamination were also noted. DfR recommended obtaining detailed soldering assembly procedures from the board assembler to audit the process in order to remedy the solder issues.

Keywords: plated through hole, PTH, failure, delamination, internal land, plating, uniformity, thickness, cracks, center pin, differential expansion / contraction, mechanical movement, shift during assembly, laminate resin, rework, solder ball, cross-section, bond pad separation, crack morphology, insufficient etch back, micro-cracks