

Project Summary:

BGA Construction Analysis

DfR Solutions was asked to analyze the construction of a BGA that was suspected of causing root cause failure in a communications device during drop testing. Large and very large intermetallics were found when the BGAs were cross-sectioned, which indicated high temperatures for excessive durations of time. Intermetallics can compromise the solder joint due to their hard and brittle nature. DfR recommended reduction of peak soldering temperatures and increasing the cooling rate to minimize presence of IMCs and voiding.

Keywords: BGA, cross-sectioning, gold embrittlement, excessive intermetallic growth, insufficient plating, standoff locations, reflow, Ni_3Sn_4 , excessive thermal aging, via barrel, micro via, microvia, dwell times, profile solder reflow oven, PTH plating, microstructure