

TITLE: THE EFFECT OF SOLDER PASTE VOLUME ON CHIP RESISTOR SOLDER JOINT FATIGUE LIFE

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ABSTRACT

The solder joint topology plays a significant role in determining its fatigue life. Due to the complex of the actual manufacturing environment, there are variations in solder volume for each joint. Which can induce the solder shape variations and misalignment of the chip resistor. The solder shape variation can severely affect its fatigue life. In this study, we use surface evolver software to calculate the solder shape with the global minimum energy. Finite element method was used to model the resistor solder joint under thermal cycling and to predict the fatigue life for different solder paste volume. Through varying the solder past volume to get different solder joint shape, the corresponding fatigue life was predicted. The result could provide a guideline for choosing optimal solder paste volume for surface mount components. Analysis results show that larger and balanced solder volume can give the best fatigue life under thermal cycling conditions.