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Sn-9Zn-3Bi/Cu 钎焊接头在170℃时效过程中的显微结构

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摘要: 采用ST50润湿实验仪完成了钎焊并研究了Sn-9Zn-3Bi/Cu接头在170℃下长期时效的显微结构变化。结果表明: Sn-9Zn-3Bi/Cu接头时效至200h后在界面处形成单一连续的Cu₅Zn₈化合物层; 时效至500h和1000h后, 界面处形成了3层化合物层, 从铜母材侧起, 分别为Cu-Sn化合物层, Cu-Zn化合物层和Sn-Cu化合物层; 随着时效时间的增加, 整个金属化合物层变厚, 而Cu-Zn化合物层减薄, 表明Cu-Zn化合物层在时效过程中具有不稳定性。

关键词: 无铅钎料; Sn-Zn-Bi; 显微结构; 界面反应; 金属间化合物

Microstructures of Sn-9Zn-3Bi solder/Cu joint during long-term aging at 170℃

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Abstract: Soldering process was performed by wetting test machine ST50. The microstructures of Sn-9Zn-3Bi/Cu joint were investigated under 170℃ thermal exposure conditions. The results show that a continuous single layer of Cu₅Zn₈ intermetallic compound appears when aging within 200h and three layers are formed after aging for 500h and 1000h. From the Cu substrate, they are Cu-Sn layer, Cu-Zn layer, Sn-Cu layer, respectively. The total intermetallic compound layers thicken while the thickness of Cu-Zn compound layer decreases with increasing exposure time. It indicates that the Cu-Zn compounds are not stable during long-term aging.

Key words: lead-free solder; Sn-Zn-Bi; microstructure; interface reaction; intermetallic compound

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