

## **Isothermal aging affect to the growth of Sn-Cu-Ni-1 wt. % TiO<sub>2</sub> composite solder paste**

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**Abstract.** This work investigated the effects of 1.0 wt. % TiO<sub>2</sub> particles addition into Sn-Cu-Ni solder paste to the growth of the interfacial intermetallic compound (IMC) on Cu substrate after isothermal aging. Sn-Cu-Ni solder paste with TiO<sub>2</sub> particles were mechanically mixed to fabricate the composite solder paste. The composite solder paste then reflowed in the reflow oven to form solder joint. The reflowed samples were then isothermally aged 75, 125 and 150 °C for 24 and 240 h. It was found that the morphology of IMCs changed from scallop-shape to a more uniform planar shape in both Sn-Cu-Ni/Cu joints and Sn-Cu-Ni-TiO<sub>2</sub> /Cu joint. Cu<sub>6</sub>Sn<sub>5</sub> and Cu<sub>3</sub>Sn IMC were identified and grew after prolong aging time and temperature. The IMCs thickness and scallop diameter of composite solder paste were reduced and the growth of IMCs thickness after isothermal aging become slower as compared to unreinforced Sn-Cu-Ni solder paste. It is suggested that TiO<sub>2</sub> particles have influenced the evolution and retarded the growth of interfacial IMCs.

**Keywords:** Intermetallic Compound, Isothermal Aging, Sn-Cu-Ni Solder Paste, Soldering, TiO<sub>2</sub>