

SMIC Beefs up Solder Products for Semiconductors



Eco Solder Ball M770

Senju Metal Industry Co., Ltd. (SMIC) has been beefing up its lineup of solder products for semiconductors toward achieving continuing reduction of pitches in semiconductor devices. SMIC offers products with unique features, which include Eco Solder Ball M770 for semiconductor packages; solder transfer sheets using the Precoated by Powder Sheets (PPS) process based on a completely new concept; DELTALUX901K5 flux with ultra-low residue for bump connection in three-dimensional connection; and copper core solder balls with solder plating.

Respond to Narrower Pitches

Amid the growing trend of semiconductor packages toward three-dimensional packaging, downsizing and lower prices, Eco Solder Ball meets the requirements for solder balls for forming bumps as it provides ultra-fineness, high precision, high sphericity, and narrow tolerance. The Eco Solder Ball M770 provides high connection reliability as a solder ball product for mobile devices, as it has drop impact resistance and thermal fatigue resistance at the same time. At present, the mainstream micro balls are $\phi 50\mu\text{m}$ products. SMIC aims at bringing $\phi 20\mu\text{m}$ balls to practical application by applying the technology of the $\phi 50\mu\text{m}$ balls, responding to the requirements for even narrower pitches.

As a measure to accommodate $30\mu\text{m}$ or narrower pitches, SMIC has developed a solder transfer sheet, PPS, by adopting a totally new concept, and realized a $25\mu\text{m}$ -pitch mounting.

PPS is a solder transfer sheet, on which a layer of ultra-fine spherical solder powders with narrow grain distribution manufactured using a membrane emulsification technique are deposited at high density. In the PPS process, the soldering surface of the solder transfer sheet is brought into contact with the sur-

face of a circuit board, and then pressure and heat are applied to transfer the solder on to the patterns only. Then, solders are formed on the required portions by tearing off the sheet.

SMIC has developed a copper core solder ball by providing solder plating or nickel (Ni) plating on a copper ball. Copper core balls have been developed for three-dimensional (3D) mounting leveraging the company's technology for solder balls. In component-embedded 3D mounting, copper core balls ensure space between semiconductors and components at high precision. SMIC offers a variety of copper core balls including an $80\mu\text{m}$ product.

The DELTALUX901K5 ultra-low residue flux was designed for bump connection in 3D connection. It allows the injection of under-fill without the need for cleaning. SMIC also offers the HQ Series preform with Ni balls for power semiconductors. It maintains dies on the level and suppresses cracks stemming from solder thickness and tilt, thus exhibiting high heat dissipation characteristic. □

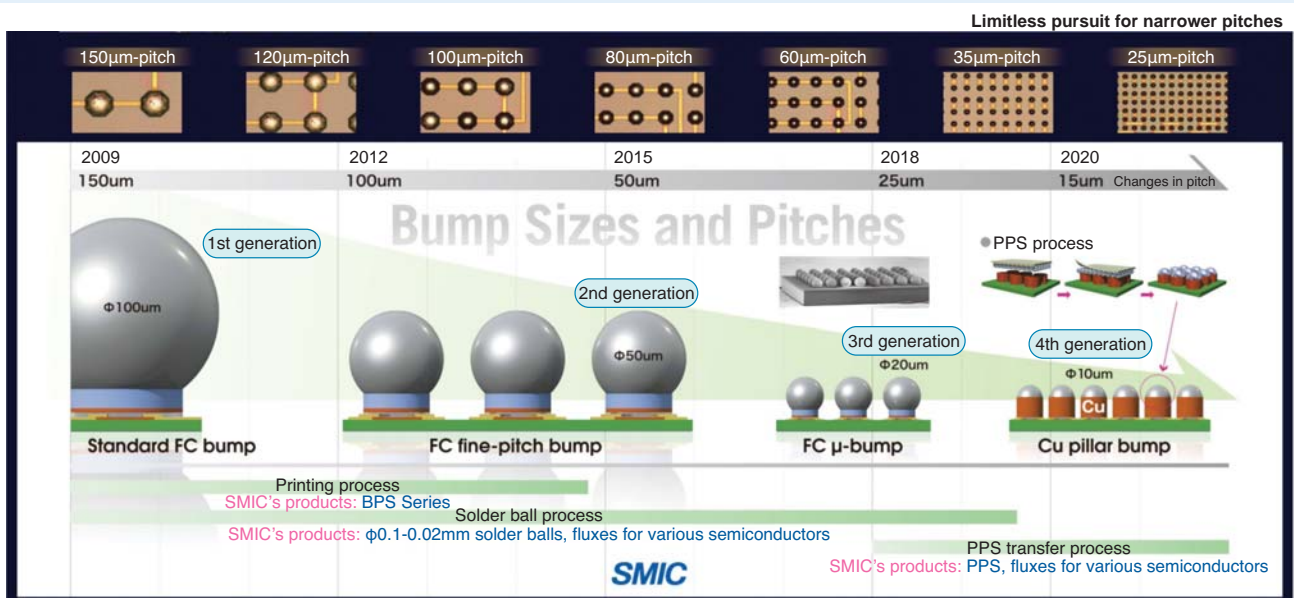


Figure: Roadmap of solder products for semiconductors