Epson Inkjet Semiconductor Marking System

Additional information

1. Features of the IP-2000 Semiconductor marking system
   (1) High-visibility printing
   Use of UV cured white ink, which was developed by Epson, makes possible high-contrast, clear printing. This system is capable of printing on packages made of various materials, including silicon and resins.

Example illustrating the differences between the laser method and inkjet method for marking

(2) Protects the IC chip
   Unlike the laser method, the inkjet method does not involve cutting, so it does not affect the IC chip inside the semiconductor package. The new system can print on the entire surface of the package, without the need to limit the marking area or avoiding printing on certain parts, such as where wire bonding interconnects.
(3) High throughput
As the laser method requires individually cutting each letter or character, this method takes time in proportion to the number of letters or characters that must be cut. Because the inkjet method utilizes a multi-nozzle scanning method that employs multiple nozzles to simultaneously print an area that covers the entire surface of the semiconductor package, the throughput does not drop, even when printing a large number of such things as letters, characters, or marks.

2. Background
To ensure traceability, semiconductor manufacturers require that identification data, such as the name of the manufacturer, the product serial number, and the lot number, are printed on each semiconductor package. The most common conventional methods for printing this data are the pad method, which uses a printing plate to transfer ink onto a pad, and the laser method, which requires engraving by cutting data onto the surface of the package with a laser.

Although the pad printing method achieves superior printing speed, it has limitations in its ability to handle low-volume manufacturing of a wide variety of products, as each letter or character must be individually engraved on the printing plate. The laser method, on the other hand, has outstanding capabilities for handling low-volume manufacturing of a wide variety of products, because it uses electronic data for cutting each letter or character. However, as cutting directly onto the package is required in this method, there is the danger of affecting the IC chip inside the semiconductor package.

3. Specifications
* Specifications may be changed without notice.

Marking method On-demand inkjet marking
Ink UV cured white ink
Applicable device Silicon bare chip, wafer, epoxy resin*1
Max. work size 100 x 250 mm (standard), restricted area: 3 mm from each edge*2
Max. throughput 90 substrates per hour*3
Printing resolution 720 x 720 dpi
Min. character height 0.3 mm*4
Machine size W1,940 x D1,640 x H1,840 mm
Weight Approx. 1,230 kg
Maximum rated voltage 8 kW
4. Glossary

1 Adhesiveness varies according to the composition of the resin and level of surface contamination. Epson recommends evaluating adhesiveness before use.

2 Standard specifications. Contact your Epson sales representative for other types of work.

3 Standard Epson work throughput. Varies according to work size and substrate surface.

4 Varies according to font and substrate surface.