EPSON

HM-3000

April 1994

Index time: 1.3 seconds
Throughput: Up to 3,000 pieces per hour (or 2,400 pieces per hour with individual tests)
No. pieces capable of being simultaneously tested: 3
Devices handled: chips up to 70 mm square
Test environment temperature:
From room temperature to 130°C
Dimensions: (W) 1280 x (D) 1800 x (H) 1880 mm
Weight: Approximately 1 ton

Product Features

Epson's HM-3000 IC test handler, introduced to the market in April 1994, represented the coalescence of Epson's robotics technologies. A high-speed, high-precision general-purpose IC handler, the HM-3000 was designed to flexibly accommodate a wide range of different multi-pin surface-mount ICs loaded in trays. This flexible handler was also designed to open the door to markets outside Japan.
IC test handlers are used in the IC back-end process. A robot arm loads manufactured and packaged ICs into a tester, another robot performs final performance tests to measure qualities such as electrical characteristics and appearance, and a third robot sorts the ICs into nondefective and defective groups according to the test results.
The HM-3000 represents a continuation of the concepts behind the MTH-1800, an IC handler sold only in Japan, in that it combines three separate units for the IC loading process, testing process, and sorting process, with each unit controlled as a separate robot. The HM-3000's index time is a mere 1.3 seconds and it can handle from one to three ICs at a time, in sizes up to 70 mm square. For the single-chip testing method (the main method used in the United States), the HM-3000 provides throughput of 2,400 chips per hour—a 30% improvement in throughput over competing products in the market at that time. Behind this high throughput stands one of Epson's key robotics technologies: multi-task controller technology that enables one controller to control several robots at once. Taking on a market dominated by sequence controllers made by other companies, Epson developed and introduced the SRC-200, a multi-task controller that featured more efficient control functions. Another of Epson's strengths lies in the high-precision repeatability feature of its precision assembly robots. Epson's robotics products are also known for their ease of use, with operations aided by CRT monitoring, track-ball control, and on-line help functions.

Background

After selling robotics products to other companies for the first time in 1984, Epson answered the needs of manufacturers who use industrial robots by developing IC handlers that incorporate Epson's SCARA robotics technologies. This was the starting point of Epson's IC handler business. Initially, Epson manufactured and sold IC handlers only as special-order industrial products, but by the mid 1980s Epson began developing common-specification IC handlers in response to growing needs for IC handlers and as a new addition to its robotics business following the introduction of its SCARA robots. These common specifications represent a compilation of all the required specifications previously received from clients. To boost throughput, Epson decided to switch from using only one robot in its IC handler to using three robots—one each for the three independent processing units. This new approach was featured in the MTH-1800, Epson's first general-purpose IC handler, which was sold only in Japan at first. Although the MTH-1800 provided a base from which to start, it was the introduction of the HM-3000, a product with amazingly fast throughput of up to 2,400 pieces per hour in one-piece testing (the standard method in the United States), that established the global presence of Epson's IC handler business.

Impact

The HM-3000 IC handler dominated the competition in terms of throughput, thanks to the servo and controller technologies Epson had developed in the course of pursing its robotics business. It was widely adopted as a standard IC handler by fab-less chip manufacturers, which first gained ascendancy in the United States. The HM-3000 served as a springboard for Epson's successful marketing of IC handlers to test houses in Taiwan starting in 1995. Since then, Epson's IC handlers have claimed the No. 1 position in Taiwan, with a dominating share of Taiwan's logic test market. The overseas expansion of HM-3000 sales fueled the growth of Epson's IC handler business. Ever since, Epson's IC handlers have enjoyed growing popularity thanks to their higher throughput, their flexibility in handling various chip dimensions, and the enhanced user-friendliness that stems from the development of a Windows-based controller. As a result, Epson's IC handler business has been steadily expanding, in pace with the growth of the semiconductor market.