High Speed, Flexible Chip mounter

CP45FV/NEO

Advanced Technology
Makes It All Possible!

SAMSUNG TECHWIN CO., LTD.
CONTENT

1. OVERVIEW

2. FEATURE

3. SYSTEM CONFIGURATION

4. FEATURES OF EACH PART

5. SPECIFICATION
1. OVERVIEW

The CP45FV Neo is a high speed, flexible placement machine. With its unique technology it performs high speed mounting at 20,200 cph.

In addition it can place any type of components shown in the market ranging from tiny 0201 to large QFPs; from BGAs to fine pitch CSPs.

These characteristics of CP45FV provides you One-Machine solution.
2. FEATURE

SPEEDY 0.197 sec/chip (13,000 CPH) \( \leftrightarrow \) Flying Vision Concept
( CP45FV Neo : 0.178 sec/chip, 20,224 CPH)

FLEXIBLE Wide component coverage of 0201~\( 42 \) mm

RELIABLE \( \pm 0.04 \) mm 3 sigma accuracy for fine pitch IC

CONVENIENT Easy to use and various options for fast job change-over
3. SYSTEM CONFIGURATION

3.1 EXTERNAL APPEARANCE

CP45neo:
- LCD monitor
- Mouse
- Programming monitor
- Keyboard
- Teaching box
- Isolation switch
- Power switch
- Signal tower
- Vision monitor

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3.2 MECHANICAL STRUCTURE

Y-axis robot
X-axis robot
Stage vision
Fiducial vision
Width control motor
6 Heads
Input conv.
Work conv.
Output conv.
Feeder base

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4. FEATURES OF EACH PART

4.1 HEAD

• SHSV Flying Vision Technology
• High speed & high accurate control of Z-motion with 6 servo motor
• On-the-fly vision recognition for max. □ 22mm IC, even CSP
• Placement rate at 14,900cph (IPC9850)

① : Vacuum Valve
② : Theta Axis Motor
③ : Flying Vision
④ : Fiducial Camera
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**FLYING VISION CONCEPT**

- **Design concept:** Minimize machine travel distance

  With the flying vision mechanism, components recognition can be done during the movement from pickup position to placement.

  → It removes the unnecessary machine movement which is needed in conventional fixed vision concept.

**SEQUENCE**

- **Z down**
- **Pick up**
- **X–Y move & mirror swing (45˚) & vision inspection**
- **Mirror swing & placement**

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Flying vision vs. conventional Aligner

- Laser Aligner
  1. Recognize shadows of the image
  2. Inspect side of the component
  Can not be used for fine pitch IC, BGA or CSP

- Flying Vision
  1. Recognize actual image
  2. Inspect bottom of the component
4.3 CONVEYOR SYSTEM

HEAD achieves High Performance and High Stability through

• 3-stage Conveyor System
• Belt Clamping System

■ 3-stage conveyor system

Control of acceleration and deceleration of PCB transferring speed by 3 individual motors
- PCB soft stop → preventing the shift of components
- Optimization of Conveying speed
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Belt clamping system

- Zero PCB Flatness
- Auto Adjustment of clamping height
  - Optimization of PCB fixing status

Diagram:
- Conveyor frame
- PCB
- Belt
- Belt support plate
- Back up pin
- Back up table

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4.4 FRAME

- Low Weight & High Rigidity
  - Optimal Design by FEM analysis
- Simplified Structure using modal analysis
- Optimized Servo Tuning
4.5 CONTROLLER

- **Dual CPU Structure**
  - *Personal Computer for programming*
  - *VME CPU for machine sequence control*

- This structure makes it possible:
  - to program for the other model during the system running.
  - to stabilize the system running.
4.6 VISION SYSTEM

- Enhanced Optic Design
- High Performance Vision Algorithm
- 3-D Digital Illumination
  - Standard Components’ DB for Easy Operating
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High Performance Vision Algorithm

- **High Speed Recognition**
  - Tact time: Less than 1.6sec/QFP

- **High Resolution**
  - 256 level gray scale image process
  - Up to 0.3mm pitch QFP, 0.5mm pitch uBGA
3D DIGITAL ILLUMINATION SYSTEM

- Advanced Multi-Light System: Special Design for Fine Pitch QFP, uBGA and CSP.
- Individual brightness setting for each component is available
- Programmable light level: 16 steps

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4.7 ANC

- High Flexibility to cope with various Applications
- 37 nozzle Pockets
4.8 SOFTWARE

- Various Software for Easy Programming under User Friendly Environment
- Efficient Software for High Productivity and High Capacity due to Customer’s Needs

- User Friendly Environment
  - Windows 98 based
  - Graphic User Interface
  - Multi-tasking
  - Easy use of Database
  - Network and Print features
  - Real-time Graphic Monitoring

> Simplified & Well organized Menu Tree Structure
• 3D Animation Trouble Shooting Guide
  - Well accumulated Service DB for Long Time
  - Well classified Service DB for Various Cases
  - Maximized Visual Effect
  - Easy Analysis and Repair of Error

• Production Control System
  - Save/Analysis feature regarding Production Management Data
  - Real time monitoring for various items

• Optimizer
  - Optimization of Chips Distribution
  - Optimization of Feeder Arrangement
  - Optimization of Mounting Sequence
  > Shorter Calculation Time for Optimization
  > Better Efficient Optimization
## 5. SPECIFICATION

### 5.1 GENERAL

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Alignment method</td>
<td>Full vision</td>
</tr>
<tr>
<td>Max. feeder capacity</td>
<td>104 ea</td>
</tr>
<tr>
<td>Head</td>
<td>6 ea</td>
</tr>
<tr>
<td>PCB Size</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Min.  50mm x 50mm</td>
</tr>
<tr>
<td></td>
<td>Max.  460mm x 400mm</td>
</tr>
<tr>
<td></td>
<td>Thickness 0.38mm ~ 4.2mm</td>
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</table>
## 5. SPECIFICATION

### 5.2 SPEED

<table>
<thead>
<tr>
<th>Flying vision</th>
<th>CHIP</th>
<th>CP45 18,900 CPH (0.197sec/chip)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>CHIP (IPC9850)</td>
<td>CP45Neo 20,200 CPH (0/178 sec/chip)</td>
</tr>
<tr>
<td></td>
<td>SOP, QFP</td>
<td>13,000 CPH/Standard</td>
</tr>
<tr>
<td></td>
<td></td>
<td>14,900 CPH/Neo</td>
</tr>
<tr>
<td>Fixed vision</td>
<td>0.5mm pitch QFP</td>
<td>0.75 sec/chip</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1.6 sec/IC</td>
</tr>
</tbody>
</table>
### 5.3 COMPONENT

<table>
<thead>
<tr>
<th>Flying vision</th>
<th>Component range</th>
<th>0201 ~ □ 22mm</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Min. lead pitch of QFP</td>
<td>0.5mm pitch</td>
</tr>
<tr>
<td>Fixed vision</td>
<td>Standard</td>
<td>~ □ 32mm (0.4 pitch)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>~ □ 17mm (0.3 pitch)</td>
</tr>
<tr>
<td></td>
<td>Option for large IC</td>
<td>~ □ 42mm (0.5 pitch)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>~ □ 32mm (0.4 pitch)</td>
</tr>
<tr>
<td></td>
<td>Option for CSP</td>
<td>~ □ 17mm (0.5 pitch)</td>
</tr>
<tr>
<td>Max. component height</td>
<td>15mm</td>
<td></td>
</tr>
<tr>
<td>Summary (standard)</td>
<td>0201 ~ □ 32mm</td>
<td>Min. lead pitch: 0.3mm</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Min. ball pitch: 0.75mm</td>
</tr>
<tr>
<td>Summary (with option)</td>
<td>0201 ~ □ 42mm</td>
<td>Min. lead pitch: 0.3mm</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Min. ball pitch: 0.5mm</td>
</tr>
</tbody>
</table>
## 5. SPECIFICATION

### 5.4 E.T.C.

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length</td>
<td>1,660 mm</td>
</tr>
<tr>
<td>Width</td>
<td>1,540 mm</td>
</tr>
<tr>
<td>ANC pocket</td>
<td>37 holes</td>
</tr>
<tr>
<td>Standard nozzle types</td>
<td>7 types</td>
</tr>
<tr>
<td>MMI</td>
<td>Windows based</td>
</tr>
<tr>
<td>Z-motion control</td>
<td>6 servo motors</td>
</tr>
<tr>
<td>Theta motion control</td>
<td>3 micro stepping motors</td>
</tr>
<tr>
<td>Conveyor width control</td>
<td>Automatic</td>
</tr>
<tr>
<td>Conveyor system</td>
<td>3-stage</td>
</tr>
</tbody>
</table>
### 5. SPECIFICATION

<table>
<thead>
<tr>
<th>5.5 Sales Point</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>14,900 cph (IPC 9850)</td>
<td>New servo motor (improved 3 times &amp; sequence optimization)</td>
</tr>
<tr>
<td>55 x 55 mm</td>
<td>MFOV (option)</td>
</tr>
<tr>
<td>510 x 460 mm PCB</td>
<td>Large Board (Option)</td>
</tr>
<tr>
<td>Cushion Nozzle (the same of CP60 series)</td>
<td>No damage on the components, less noise</td>
</tr>
<tr>
<td>Components counting</td>
<td>Provide the remaining number of the components on the reel</td>
</tr>
<tr>
<td>Body machines</td>
<td>LCD Monitor, New cover</td>
</tr>
<tr>
<td>Tray feeder</td>
<td>Shuttle tray feeder</td>
</tr>
<tr>
<td>Non-stop Feeder available</td>
<td></td>
</tr>
<tr>
<td>Max Height</td>
<td>Flying vision : 9 mm</td>
</tr>
<tr>
<td></td>
<td>Stage vision : 15 mm</td>
</tr>
</tbody>
</table>