On Tray Test System

New Tray Exchange System Introduction

Apply to Burn in Test
「 Burn-in Test Cost Half Solution 」

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2015/10/31
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Cost Half Solution of Burn-in Test

Cost Half Solution

1. Use Tray Exchange Type of BI-board Unit
   - Burn-in Board are Always Stay in Burn-in System
   - Test Tray are Exchanged at Each Test Process
   - Get a Big Operating Ratio Improvement of Burn-in Sys.

2. Use Market Burn-in Socket or Test Socket
   - Surface Contact Pressure Type as a Standard
   - No Need Socket Soldering

3. Use Present Burn-in Test System & Handler
   - Reduce Initial Investment money
Tray Exchange Type of Burn-in System

Burn-in System Image

- Burn-in Board are Always Stayed in Oven
- Test Tray are Only Exchanged at Each Test Process

Get a big Improvement of System Operating Ratio
Tray Exchange Type of Test Tray

Preproduction Unit

New Type Test Tray
(Tray only are exchanged)

* LQFP100p-0.5p

* Non Reverse type

New Type Test Tray
- IC Lead face is bottom side (Non Reverse Type Test Tray)
- IC Package Alignment is Based on Lead Guide Method
- 1 IC or A Few IC is Mounted in Tray and Each Tray is Aligned with Each Socket
- Test Tray Size and DUT Arrangement don’t need to follow by JEDEC Tray

Tray Exchange Type of BI-Board Unit
- Board have Lifter Structure for Tray Exchange
- Board Thickness is less than 30 mm for 40mm pitch mount
Tray Exchange Type of Burn-In Board U1

Lift up by Air Cylinder Directly (No Heat Sink Type)

*Exchange each Process
Test Tray *

Pusher (Heat sink Plate)

Vacuum Chamber (frame)

Lift up by Air Cylinder Directly (No Heat Sink Type)

*Exchange each Process
Test Tray *
Tray Exchange Type of Burn-in Board U2

Lift up by Air Cylinder & Cam (Heat sink Mount)

- Heat Sink Board
- Tray Mtg. Stage
- Burn-in Board
- Vacuum Chamber (frame)
- Lifter (Air Cylinder & Cam)
- Contact & Contact board
- Signal wave form check space terminal

*Exchange each Process

*Slot Pitch is Influenced by Heat sink Height
Tray Exchange Type of Burn-In Board U3

Pusher Type (Heat sink Board)

Type 1, Pusher Plate contact to IC surface directly (Low Cost)

Type 2, Individual Temp. Control with Heat sink

Type 3, Mixed type with Type 1 and Type 2

Pusher Type (Heat sink Board)

Heat sink board (Pusher plate)

Adjusting Plate

* Heat sink with no Fin
Cost Half Solution 1

**Use Tray Exchange Type of Burn-in Board Unit**

- Get a Big Operating Ratio Improvement of Burn-in System
  - All Time Operate except Tray Exchange Time
  - Burn-in Board Always Stay in Burn-in System
  - Test Tray are Exchanged at Each Test Process

- Reduce Burn-in Board Investment
  - No Need to Invest Any Other Burn-in Board
    * Test Tray are Invested instead of Burn-in Board

- Reduce Burn-in Board Assy. Cost and Maintenance Cost
  - Due to Use Surface Contact Pressure Type Burn-in Socket as a STD.
    * No Need Socket Contact Soldering
Cost Half Solution 2

Use Market Burn-in Socket or Test Socket

- TSOP, SOP
  - Use Surface Contact Pressure Type as a standard
  * Soldering Type is also Usable

TSOP**p-0.**p Socket Image

1 Dut Tray

Tray Base Plate

Contact Board Holder

Contact & Contact Board (Market product)

BI-Board

Alignment Pin

Reduce Burn-in Board Assembly Cost and Socket Cost
- QFP, LQFP
  - Use Surface Contact Pressure Type as a Standard
  - Soldering Type is also Usable

Reduce Burn-in Board Assembly Cost and Socket Cost
- **BGA, LGA**
  - Use Surface Contact Pressure Type as a Standard
    * Soldering Type is also Usable

Reduce Burn-in Board Assembly Cost and Socket Cost
Multi-Pin & Narrow Pitch IC

- μBGA, CSP, WLCSP
  - Use Commercial Product (Main parts)
  - Use Surface Contact Pressure Type as a ¥standard
  - *Same Cost Reduction as BGA Type

Contact & Contact Board
  *Market Product
  Same as BGA Socket

Individual Temp. Control

- Same Cost Reduction as Burn-in Board
  * Burn-in Board always Stay in Burn-in system

Reduce Burn-in Board Assembly Cost and Socket Cost
Cost Half Solution 3

Use Present Burn-in System and Board Handler

- Use Tray Exchange Type of Burn-in Board Unit
  Cost Reduction: See Cost Half Solution 1

- Board Thickness is less than 30mm for 40mm Slot pitch mount

- Test Tray Handling is same as Burn-in Board

- Need Burn-in System Modification a little Concerning about Air Control
Burn-in Test Process & Equipment

Burn-In Test System

Board Handler

Tray Loader・Unloader (Tray Rack)

* Manual, Use Special Float for Rough Alignment
**Individual Temp. Control**

* Individual Temp. control Method : Control Cooling Air direction
## Socket Quantities/ Board (ref.)

<table>
<thead>
<tr>
<th>Board size</th>
<th>Vacuum Force /board *60% (kg)</th>
<th>Contact force /pin (g)</th>
<th>Contacts / IC * for one thing (pin)</th>
<th>Socket quantities /Board</th>
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Vacuum Contact Force = (Pump ability - O ring compression Force) * Safety Ratio